



**WOOD BUFFALO
ENVIRONMENTAL ASSOCIATION**

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Wood Buffalo Environmental Association

**OCTOBER 2023
MONTHLY REPORT**

CONTINUOUS MONITORING

November 29, 2023

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





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Appendix I	
Alberta Ambient Air Quality Guidelines and Objectives	



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November 29, 2023

Director, Environmental Monitoring and Evaluation Branch
Alberta Environment and Protected Areas
11th Floor, Oxbridge Place
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Edmonton, Alberta T5K 2J6

**RE: Monthly Ambient Air Quality Monitoring Report October 2023
Wood Buffalo Environmental Association**

Enclosed is the October 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	AMS19 - Firebag
AMS02 - Mildred Lake	AMS20 - MacKay River
AMS03 - Lower Camp (Meteorology)	AMS21 - Conklin
AMS04 - Buffalo Viewpoint	AMS22 - Janvier
AMS05 - Mannix	AMS23 - Fort Hills
AMS06 - Patricia McInnes	AMS25 - Waskōw ohci Pimâtisiwin
AMS07 - Athabasca Valley	AMS26 - Christina Lake
AMS08 - Fort Chipewyan	AMS27 - Jackfish 2/3
AMS09 - Barge Landing	AMS29 - Surmont 2
AMS11 - Lower Camp (Air Quality)	AMS30 - Ells River
AMS13 - Fort McKay South	AMS501 - Liesmer
AMS14 - Anzac	AMS505 - Sawbones Bay
AMS17 - Wapasu	AMS507 - Kirby South
AMS18 - Stony Mountain	AMS511 - Blackgold

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

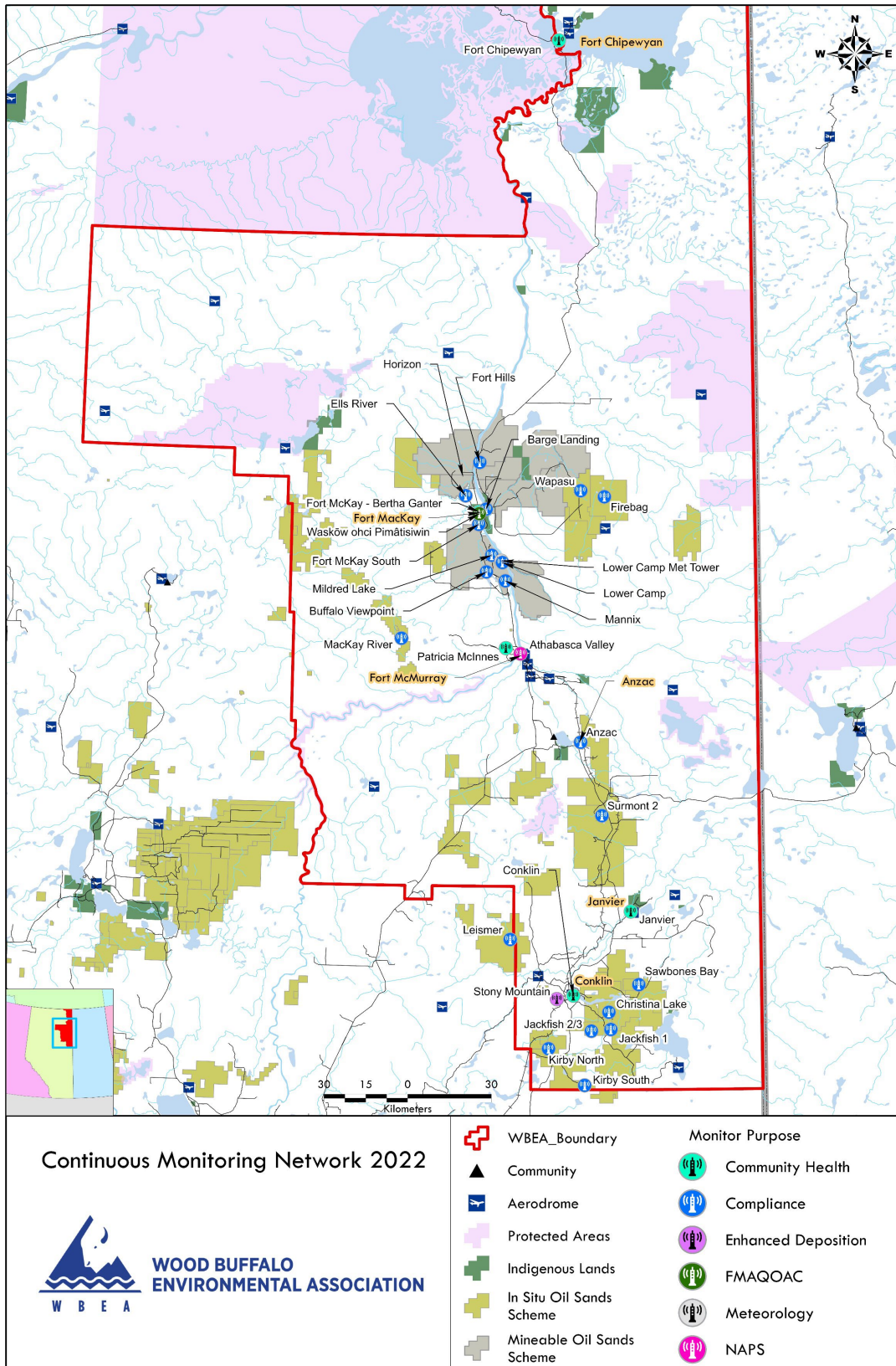


Figure 1: Map of WBEA Continuous Monitoring Network

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 15-F for CO, Dustfall, NH₃, NO₂, O₃, SO₂, TRS, and TSP.

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

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

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

There were four ambient ground-level concentrations in excess of the 24-hour PM_{2.5} objective reported to AEPA; following data validation and processing, the exceedances were 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 October 2023, there were instances that resulted in monitoring instruments operating less than 90% of the time.

1. The wind speed and wind direction (WS/WD) sensor at Stony Mountain AMS operated less than 90% of October 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 October 19, 2023 (reference number 420981).

During the daily system checks in early October, the WBEA identified that the WS/WD readings did not compare well with nearby stations. On-site maintenance was conducted and determined that an electrical shortage had interrupted the signal from the sensor to the data logger. The shortage was repaired on October 11. During the data validation process, 96 hours of data was invalidated during the incident period of Oct 6 -11.

2. The THC/NMHC/CH₄ analyzer at Conklin AMS operated for less than 90% of October 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 October 25, 2023 (reference number 421542).

On October 20, the THC/NMHC/CH₄ baseline shifted from the expected concentration after the installation of a new hydrogen cylinder. The WBEA investigated the issue by replacing the cylinder multiple times and completing further maintenance to the instrument which did not resolve the analyzer response. On Oct 23, the THC/NMHC/CH₄ instrument was replaced and left to stabilize overnight. The following day the instrument was calibrated, and the baseline returned to the expected concentration. During the data validation process, 97 hours of data was invalidated during the Oct 20 -24 incident period.

3. The NH₃ analyzer at Bertha Ganter – Fort Mckay air monitoring station (AMS) operated less than 90% of October 2023, which is a contravention of the Air Monitoring Directive (AMD) (2016, as amended), Chapter 6, Clause DQ 4-C. The NH₃ analyzer operated for 86% of the reporting period in October. This incident was reported to Alberta Environment and Protected Areas on November 27, 2023 (reference number 422415).

There were three issues associated with the operation of the NH₃ analyzer, contributing to 103 hours of downtime in October:

- The NH₃ analyzer readings flatlined intermittently throughout the month of October. Subsequent maintenance to reset the instrument resolved the issue on the days it flatlined. The unstable operation due to flatlining through the month of October resulted in 58 hours of invalid data.
- A routine calibration was performed on October 18 and 19. Due to time constraints on October 18, the WBEA extended the calibration over two days, resulting in 18 hours of downtime.
- 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 readings. The additional stabilization period following the spans and multipoint calibration in October resulted in a total of 27 hours of downtime.

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 hour following the daily spans have been reported as invalid for a total of 27 hours this month.

A flatline in the output signal of the NO₂ analyzer on October 6 and 7 resulted in 17 hours of invalid data.

A flatline in the output signal of the PM_{2.5} analyzer on October 10 resulted in 3 hours of invalid data.

A flatline in the output signal of the SO₂ analyzer on October 10 and 11 resulted in 17 hours of invalid data. Subsequent maintenance to reboot the SO₂ analyzer on October 11 resulted in a further 1 hour of downtime.

Cleaning of the sample manifold on October 19 interrupted the normal operations of all gaseous analyzers, except NH₃, for 1 hour.

The NH₃ analyzer underwent routine calibration on October 18 and 19. Due to time constraints on October 18, we needed to extend the calibration over two days, resulting in 18 hours of downtime.

Maintenance to replace the zero-air generator on October 25 interrupted the normal operations of the THC/NMHC/CH₄ analyzer for 4 hours.

A flatline in the output signal of the NH₃ analyzer on throughout the month resulted in 58 hours of invalid data. Subsequent maintenance to reboot the NH₃ analyzer on October 31 resulted in a further 1 hour of downtime.

Maintenance to reset the logger and the modem on October 31 interrupted the normal operation of all parameters, except for NH₃ analyzer, for 1 hour.

The surface leaf wetness sensor operated out of range on October 5 resulting in 3 hours of invalid data.

Maintenance to conduct a field operation check of the precipitation collector sensor on October 13 and 31 resulted in a 3 hour of downtime.

Failure to record data for the precipitation collector on October 30 and 31 resulted in 32 hours of invalid data.

Station 2, Mildred Lake

Station power failures on October 10 interrupted the normal operations of the SO₂ analyzer for a total of 1 hour and THC/NMHC/CH₄ analyzer for a total of 7 hours.

A daily span checks on October 10 for the SO₂ and THC/NMHC/CH₄ analyzers were outside the 10% AMD criteria on October 10 due to a station power failure.

Station 3, Lower Camp – Meteorology

A flatline in the output signal of the wind sensor, wind direction and vertical wind speed at 20-meter on October 5 resulted in 1 hour of invalid data.

A flatline in the output signal of the wind sensor, wind direction and vertical wind speed at 45-meter on October 5 resulted in 2 hours of invalid data.

A flatline in the output signal of the wind sensor, wind direction and vertical wind speed at 100-meter on October 5 resulted in 3 hours of invalid data.

A flatline in the output signal of the wind sensor, wind direction and vertical wind speed at 163-meter on October 5 resulted in 7 hours of invalid data.

Station 4, Buffalo Viewpoint

No operational issues to report.

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

Station 5, Mannix

Cleaning of the sample manifold on October 26 interrupted the normal operation of all air quality analyzers for 1 hour.

The relative humidity sensor at the 75-meters elevation operated out of range throughout the month resulting in 20 hours of invalid data.

The relative humidity sensor at the 90-meters elevation operated out of range throughout the month resulting in 15 hours of invalid data.

A flatline in the output signal of all wind sensors, wind directions, and vertical wind speeds on October 5 resulted in up to 4 to 8 hours of invalid data.

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 3 hours following each daily span has been reported as invalid for a total of 66 hours this month.

Cleaning of the sample manifold on October 2 interrupted the normal operations of the NH₃, NO₂, SO₂ THC/NMHC/CH₄, and TRS analyzers for 1 hour.

Station 7, Athabasca Valley

A flatline in the output signal of the THC/NMHC/CH₄ analyzer and a reset of the instrument on October 5 and 9 resulted in 5 hours of invalid data.

A flatline in the output signal of the CO analyzer and a reset of the instrument on October 4 and 5 resulted in 29 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 October. Therefore, the calibrator zeros from the September, October and November multi-point calibrations were used to validate the analyzer baseline response.

Station 8, Fort Chipewyan

Station power failures on October 1, 7, and 29 interrupted the normal operations of all air quality analyzers for a total of 8 hours.

Failure to record data for the CO and CO₂ analyzers on October 9 resulted in 1 hour of invalid data.

Unstable operations due to the sample line of the SO₂ was left disconnected on October 11 and 12 resulting in 22 hours of invalid data.

Failure to record data for the precipitation collector on October 29 resulted in 1 hour of invalid data.

A flatline in the output signal of the wind sensor on October 16 and 27 resulted in 2 hours of invalid data.

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

Station 9, Barge Landing

Station power failure on October 2 interrupted the normal operations of all air quality analyzers for 3 to 4 hours.

Maintenance to replace the calibration gas cylinder on October 5 and 11 interrupted the normal operations of the TRS resulting in 6 hours of downtime.

Maintenance to verify the daily QA check on October 8 and 13 interrupted the normal operations of the TRS analyzer for a total of 2 hours.

An internal audit on October 18 interrupted the normal operations of all air quality analyzers for 1 to 3 hours.

Cleaning of the sample manifold on October 19 interrupted the normal operation of all air quality analyzer for 1 hour.

The TRS analyzer's daily span check was outside the 10% AMD criteria between October 4 and 18 due to issues with the calibration gas cylinder's performance. Despite replacing the H₂S calibration gas cylinder on October 11, the span remained outside the AMD criteria for additional days, influenced by the stabilization period following the calibration change.

Station 11, Lower Camp

Cleaning of the sample manifold on October 12 interrupted the normal operations H₂S analyzer for 1 hour.

The relative humidity sensor operated out of range on October 3 resulting in 12 hours of invalid data.

Station 13, Fort McKay South

Cleaning of the sample manifold on October 12 interrupted the normal operations NO₂, O₃, SO₂ and THC/NMHC/CH₄ analyzers for 1 hour.

Unstable operation due to inconsistent response of the O₃ analyzer on October 4 resulted in 22 hours of invalid data. Subsequent maintenance to recalibrate the O₃ analyzer on October 6 resulted in an additional 3 hours of downtime.

Unstable operation due to flatline in analyzer output signal of PM_{2.5} analyzer on October 10 resulted in 4 hours of invalid data. Subsequent maintenance to reset the PM_{2.5} analyzer on October 10 resulted in an additional 1 hour of downtime.

Flatline in the output signal of the wind sensors on October 31 resulted in 1 hour of invalid data.

Station 14, Anzac

Maintenance to replace the O₃ analyzer on October 13 resulted in 8 hours of downtime.

The relative humidity sensor operated out of range throughout the month resulting in 13 hours of invalid data.

Automated daily zero-response checks of the O₃ analyzer did not meet WBEA's QC acceptance criteria from October 14 to present. Therefore, the calibrator zeros from the October and November multi-point calibrations were used to validate the analyzer baseline response.

Station 17, Wapasu

The relative humidity sensor operated out of range throughout the month resulting in 20 hours of invalid data.

A flatline in the output signal of the wind sensor on October 5 and 6 resulted in 30 hours of invalid data.

Station 18, Stony Mountain

Maintenance to replace the nitrogen generator and a subsequent multi-point calibration of the CO₂ analyzer on October 25 resulted in 5 hours of downtime.

Maintenance to conduct a field operation check of the precipitation collector sensor on October 11 resulted in a 1 hour of downtime.

Inconsistent response of the wind sensor due to ruptured wiring on October 7 through 11 resulted in 95 hours of invalid data. Subsequent maintenance to repair the wind sensor wiring on October 11 resulted in additional 1 hour of downtime.

A flatline in the output signal of the wind sensor on October 21 through 23 resulted in 49 hours of invalid data.

Station 19, Firebag

Cleaning of the sample manifold on October 26 interrupted the normal operations of H₂S, SO₂ and THC analyzers for 1 hour.

The relative humidity sensor operated out of range on October 2 and 3 resulting in 13 hours of invalid data.

Station 20, MacKay River

An internal audit on October 19 interrupted the normal operations of all air quality analyzers for 2 to 3 hours.

Maintenance to replace the H₂S analyzer on October 23 to 24 resulted in 24 hours of downtime.

Station 21, Conklin

Station power failure on October 12 interrupted the normal operations of all air quality analyzers for 6 hours.

Station operator activities on October 17 interrupted the normal operations of the O₃ analyzer for 1 hour.

On October 20, the THC/NMHC/CH₄ baseline shifted from the expected concentration after the installation of a new hydrogen cylinder. The WBEA investigated the issue by replacing the cylinder multiple times and completing further maintenance to the instrument which did not resolve the analyzer response. On Oct 23, the THC/NMHC/CH₄ instrument was replaced and left to stabilize overnight. The following day the instrument was calibrated, and the baseline returned to the expected concentration. This event from October 20 to 24 resulted in 94 hours of downtime.

Unstable operations of the THC/NMHC/CH₄ due to shifting of the chromatogram windows on October 25 resulted in 6 hours of invalid data. Subsequent maintenance to re-adjust the sample pressure setting on October 25 resulted in an additional 4 hours of downtime.

Unstable operations of the THC/NMHC/CH₄ due to a baseline drift on October 27 through 29 resulted in 49 hours of invalid data.

A flatline in the output signal of the wind sensor throughout the month resulted in 40 hours of invalid data.

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

Station 22, Janvier

Cleaning of the sample manifold on October 17 interrupted the normal operations of O₃, SO₂, THC/NMHC/CH₄, and TRS analyzers for 1 hour.

A flatline in the output signal of the wind sensor throughout the month resulted in 40 hours of invalid data.

Station 23, Fort Hills

Cleaning of the sample manifold on October 2 interrupted the normal operations of the NO₂, SO₂, THC/NMHC/CH₄ and TRS analyzers for 1 hour.

Failure to record data for all parameters on October 27 resulted in 1 to 2 hours of invalid data.

Station 25, Waskōw ohci Pimâtisiwin

Intermittent unstable operation in the output signal of the wind sensors on October 1 resulted in 1 hour of invalid data.

Station 26, Christina Lake

Cleaning of the sample manifold on October 26 interrupted the normal operation of H₂S analyzer for 2 hours.

Station 27, Jackfish 2/3

Cleaning of the sample manifold on October 26 interrupted the normal operation of H₂S, and SO₂ analyzers for 1 hour.

A flatline in the output signal of the temperature sensor on October 2 and 4 resulted in 7 hours of invalid data.

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

Station 29, Surmont 2

Cleaning of the sample manifold on October 24 interrupted the normal operations of the SO₂, THC and NO₂ analyzers for 2 hours.

A flatline in the output signal of the wind sensors on October 31 resulted in 1 hour of invalid data.

Station 30, Ells River

Unstable operations due to flatline signal of the THC/NMHC/CH₄ analyzer on October 2 and 3 resulted in 24 hours of invalid data.

Intermittent flatlines in the output signal of the wind sensor throughout the month resulted in 12 hours of invalid data.

Station 501, Leismer

Note: The WBEA commenced ambient air quality monitoring at the Leismer air monitoring station, at the Athabasca Oil Leismer facility on October 1, 2023. Install calibrations were completed in September and are attached with the October calibration report.

Maintenance to reset the logger and the modem on October 12 and 19 interrupted the normal operation of all parameters for 2 hours.

The daily span check for the NO₂ analyzer was outside the 10% AMD criteria on October 24, 25, and 26 due to an interruption in the station calibrator configuration.

Station 505, Sawbones Bay

The relative humidity sensor operated out of range on throughout the month resulting in 37 hours of invalid data.

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

Station 507, Kirby South

Failure to record data for all parameters on October 12 resulted in 1 hour of invalid data.

An internal audit on October 12 interrupted the normal operations of all air quality analyzers for 2 to 3 hours.

Maintenance to replace the THC sample pump on October 19 resulted in 5 hours of downtime.

Maintenance to troubleshoot the in-situ calibrator on October 19 resulted in 1 hour of downtime for the NO₂ analyzer.

Station operator activities on October 4 interrupted the normal operations of the wind sensor for 1 hour.

A flatline in the output signal of the wind sensors on October 22 resulted in 12 hours of invalid data.

Station 511, Blackgold

Note: The WBEA commenced ambient air quality monitoring at the Blackgold air monitoring station, at the Harvest Operations Corporation facility on October 1, 2023. Install calibrations were completed in September and are attached with the October calibration report.

Unstable operations due to flatline signal of the NO₂ analyzer on October 18 resulted in 6 hours of invalid data.

Maintenance to verify the daily QA check on October 18 and 21 interrupted the normal operations of all gaseous analyzers for 2 hours.

Maintenance to replace the calibration gas cylinder on October 20 interrupted the normal operations of the NO₂ analyzer for 3 hours.

A flatline in the output signal of the wind sensors on October 21 through 23 resulted in 40 hours of invalid data. Subsequent maintenance to lower the met sensor to de-ice the wind sensor resulted in additional 1 hour of downtime.

The daily span check for the NO₂ analyzer was outside the 10% AMD criteria on throughout the month of October due to an interruption in the station calibrator configuration. The station calibrator was replaced on October 20 to resolve this matter.

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

Denny Estador, Data Technician
Wood Buffalo Environmental Association
T: (780) 713-8510
E: destador@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.



Dianne McIsaac
Stakeholder Engagement Coordinator
Wood Buffalo Environmental Association
Unit 3 - 805 Memorial Drive
Fort McMurray AB T9K 0K4
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R00_2310

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION
MONTHLY AIR MONITORING SUMMARY

October 2023

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Created: November 29, 2023 11:34:00

APPROVAL NUMBERS	REPORT DATE						
	MONTH	YEAR					
289664-00-00	10	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	97	22	0	4.8	0
48263-01-00	SO2(ppb)	2	100	70.3	0	19.3	0
224816-00-00	SO2(ppb)	4	100	24.2	0	3.9	0
151469-01-00	SO2(ppb)	5	100	48.7	0	8.9	0
189942-00-00	SO2(ppb)	6	100	38.1	0	6.9	0
206355-00-00	SO2(ppb)	7	100	15.2	0	3.5	0
46586-00-00	SO2(ppb)	8	97	8.1	0	1.5	0
73203-02-00	SO2(ppb)	9	99	17.9	0	3.3	0
216466-01-00	SO2(ppb)	11	100	131.3	0	25.9	0
137467-01-00	SO2(ppb)	13	100	32.4	0	7.1	0
236394-00-00	SO2(ppb)	14	100	4.8	0	1.4	0
254465-00-00	SO2(ppb)	17	100	11.5	0	4.0	0
094-03-00	SO2(ppb)	18	100	2.8	0	0.5	0
80105-01-00	SO2(ppb)	19	100	14.5	0	3.5	0
305529-00-00	SO2(ppb)	20	100	13.6	0	3.6	0
318401-00-00	SO2(ppb)	21	99	4.7	0	0.8	0
026-03-00	SO2(ppb)	22	100	2.3	0	0.8	0
364232-00-00	SO2(ppb)	23	100	18.9	0	4.2	0
228044-00-00	SO2(ppb)	25	100	20.5	0	4.3	0
247548-00-00	SO2(ppb)	26	100	16.3	0	7.1	0
231302-00-00	SO2(ppb)	27	100	7.9	0	2.1	0
153125-01-00	SO2(ppb)	29	100	4.4	0	1.2	0
	SO2(ppb)	30	100	54.5	0	6.4	0
	SO2(ppb)	501	100	30.0	0	17.2	0
	SO2(ppb)	505	100	12.3	0	3.6	0
	SO2(ppb)	507	99	6.5	0	2.4	0
	SO2(ppb)	511	100	15.8	0	8.0	0
	H2S(ppb)	1	100	3.5	0	0.5	0
	H2S(ppb)	2	100	6.5	0	1.7	0
	H2S(ppb)	4	100	5.7	0	0.9	0
	H2S(ppb)	5	100	9.9	0	2.0	0
	H2S(ppb)	11	100	19.5	3	3.0	0
	H2S(ppb)	17	100	0.7	0	0.2	0
	H2S(ppb)	19	100	8.8	0	1.0	0
	H2S(ppb)	20	97	1.1	0	0.3	0
	H2S(ppb)	25	100	2.8	0	0.5	0
	H2S(ppb)	26	100	1.2	0	0.4	0
	H2S(ppb)	27	100	0.9	0	0.5	0
	H2S(ppb)	29	100	0.2	0	0.1	0
	H2S(ppb)	501	100	8.0	0	4.0	1
	H2S(ppb)	505	100	1.6	0	0.3	0
	H2S(ppb)	507	99	0.8	0	0.3	0
	H2S(ppb)	511	100	1.1	0	0.3	0
	TRS(ppb)	1	100	3.5	0	0.9	0
	TRS(ppb)	6	100	2.0	0	0.9	0
	TRS(ppb)	7	100	1.8	0	0.8	0
	TRS(ppb)	8	100	0.9	0	0.5	0
	TRS(ppb)	9	98	4.9	0	0.7	0
	TRS(ppb)	13	100	5.8	0	1.1	0
	TRS(ppb)	14	100	0.9	0	0.3	0
	TRS(ppb)	18	100	0.3	0	0.2	0
	TRS(ppb)	21	99	1.3	0	0.4	0
	TRS(ppb)	22	100	0.3	0	0.2	0
	TRS(ppb)	23	100	2.3	0	0.4	0
	TRS(ppb)	30	100	2.3	0	0.8	0
	THC(ppm)	1	99	5.1	-	2.8	-
	THC(ppm)	2	99	8.1	-	2.7	-
	THC(ppm)	4	100	6.3	-	2.7	-
	THC(ppm)	5	100	4.4	-	2.6	-
	THC(ppm)	6	100	3.4	-	2.4	-
	THC(ppm)	7	99	3.4	-	2.4	-
	THC(ppm)	9	99	6.4	-	2.7	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION
MONTHLY AIR MONITORING SUMMARY

October 2023

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REPORT DATE							
MONTH	YEAR						
10	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)	11	100	4.2	-	2.4	-
241311-00-00	THC(ppm)	13	100	4.1	-	2.4	-
20809-02-00	THC(ppm)	14	100	2.7	-	2.2	-
149968-01-00	THC(ppm)	17	100	2.7	-	2.4	-
237382-00-00	THC(ppm)	18	100	2.1	-	2.1	-
48522-01-00	THC(ppm)	19	100	2.8	-	2.4	-
240008-00-00	THC(ppm)	20	100	3.9	-	2.8	-
48263-01-00	THC(ppm)	21	79	2.8	-	2.2	-
224816-00-00	THC(ppm)	22	100	2.2	-	2.1	-
151469-01-00	THC(ppm)	23	100	9.0	-	3.6	-
189942-00-00	THC(ppm)	29	100	2.7	-	2.4	-
206355-00-00	THC(ppm)	30	97	3.9	-	2.4	-
46586-00-00	THC(ppm)	507	99	3.4	-	2.5	-
73203-02-00	THC(ppm)	511	100	2.8	-	2.4	-
216466-01-00	O3(ppb)	1	100	36.2	0	29.3	-
137467-01-00	O3(ppb)	4	100	45.1	0	33.4	-
236394-00-00	O3(ppb)	6	100	45.6	0	32.8	-
254465-00-00	O3(ppb)	7	100	44.4	0	31.9	-
094-03-00	O3(ppb)	8	100	38.2	0	32.8	-
80105-01-00	O3(ppb)	13	97	36.7	0	30.2	-
305529-00-00	O3(ppb)	14	99	42.6	0	33.6	-
318401-00-00	O3(ppb)	17	100	46.0	0	37.7	-
026-03-00	O3(ppb)	18	100	42.8	0	33.4	-
364232-00-00	O3(ppb)	21	99	40.3	0	31.7	-
228044-00-00	O3(ppb)	22	100	47.1	0	35.2	-
247548-00-00	NO2(ppb)	1	97	25.0	0	10.7	-
231302-00-00	NO2(ppb)	4	100	31.9	0	12.3	-
153125-01-00	NO2(ppb)	6	100	28.1	0	11.5	-
	NO2(ppb)	7	100	29.2	0	11.9	-
	NO2(ppb)	8	99	11.5	0	3.5	-
	NO2(ppb)	9	99	30.4	0	13.0	-
	NO2(ppb)	13	100	25.1	0	9.7	-
	NO2(ppb)	14	100	15.6	0	5.8	-
	NO2(ppb)	17	100	18.2	0	5.7	-
	NO2(ppb)	18	100	3.6	0	1.5	-
	NO2(ppb)	19	100	22.9	0	5.8	-
	NO2(ppb)	20	100	27.2	0	11.8	-
	NO2(ppb)	21	99	16.6	0	3.7	-
	NO2(ppb)	22	100	17.5	0	3.0	-
	NO2(ppb)	23	100	40.7	0	21.0	-
	NO2(ppb)	26	100	17.1	0	7.1	-
	NO2(ppb)	27	100	5.7	0	1.5	-
	NO2(ppb)	29	100	8.5	0	3.4	-
	NO2(ppb)	30	100	27.8	0	14.1	-
	NO2(ppb)	501	100	10.8	0	4.1	-
	NO2(ppb)	505	100	14.5	0	5.9	-
	NO2(ppb)	507	99	19.4	0	10.8	-
	NO2(ppb)	511	99	13.3	0	4.2	-
	CO(ppm)	1	100	0.6	0	0.4	-
	CO(ppm)	7	96	0.9	0	0.3	-
	CO(ppm)	8	99	0.8	0	0.3	-
	CO(ppm)	18	100	0.3	0	0.3	-
	CO2(ppm)	1	100	537.4	-	466.8	-
	CO2(ppm)	8	99	470.6	-	448.3	-
	CO2(ppm)	18	99	445.3	-	427.8	-
	NH3(ppb)	1	86	0.0	0	0.0	-
	NH3(ppb)	6	91	0.0	0	0.0	-
	PM2.5(ug/m3)	1	99	38.7	0	19.5	0
	PM2.5(ug/m3)	4	100	44.4	0	27.6	0
	PM2.5(ug/m3)	6	100	33.9	0	16.4	0
	PM2.5(ug/m3)	7	100	38.3	0	17.7	0
	PM2.5(ug/m3)	8	100	189.7	12	71.7	3
	PM2.5(ug/m3)	9	99	48.8	0	21.8	0
	PM2.5(ug/m3)	13	99	34.2	0	18.3	0

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION
MONTHLY AIR MONITORING SUMMARY

October 2023
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REPORT DATE							
MONTH	YEAR						
10	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)	14	100	28.9	0	15.6	0
241311-00-00	PM2.5(ug/m3)	17	100	27.4	0	13.4	0
20809-02-00	PM2.5(ug/m3)	18	100	20.4	0	14.1	0
149968-01-00	PM2.5(ug/m3)	21	99	194.8	7	31.3	1
237382-00-00	PM2.5(ug/m3)	22	100	31	0	12.7	0
48522-01-00	PM2.5(ug/m3)	23	100	124.1	3	27	0
240008-00-00	PM2.5(ug/m3)	29	100	51.5	0	12.3	0
48263-01-00	PM2.5(ug/m3)	30	100	37.5	0	19.9	0
224816-00-00	WS(km/h)	1	100	-	-	-	-
151469-01-00	WS(km/h)	2	100	-	-	-	-
189942-00-00	WS(km/h)	4	100	-	-	-	-
206355-00-00	WS(km/h)	5	99	-	-	-	-
46586-00-00	WS(km/h)	6	100	-	-	-	-
73203-02-00	WS(km/h)	7	100	-	-	-	-
216466-01-00	WS(km/h)	8	100	-	-	-	-
137467-01-00	WS(km/h)	9	100	-	-	-	-
236394-00-00	WS(km/h)	11	100	-	-	-	-
254465-00-00	WS(km/h)	13	100	-	-	-	-
094-03-00	WS(km/h)	14	100	-	-	-	-
80105-01-00	WS(km/h)	17	96	-	-	-	-
318401-00-00	WS(km/h)	18	81	-	-	-	-
026-03-00	WS(km/h)	19	100	-	-	-	-
364232-00-00	WS(km/h)	20	100	-	-	-	-
228044-00-00	WS(km/h)	21	95	-	-	-	-
247548-00-00	WS(km/h)	22	95	-	-	-	-
231302-00-00	WS(km/h)	23	100	-	-	-	-
153125-01-00	WS(km/h)	25	100	-	-	-	-
	WS(km/h)	26	100	-	-	-	-
	WS(km/h)	27	100	-	-	-	-
	WS(km/h)	29	100	-	-	-	-
	WS(km/h)	30	98	-	-	-	-
	WS(km/h)	501	100	-	-	-	-
	WS(km/h)	505	100	-	-	-	-
	WS(km/h)	507	98	-	-	-	-
	WS(km/h)	511	94	-	-	-	-
							
SIGNATURE OF ASSOCIATION REPRESENTATIVE					FOR ALBERTA ENVIRONMENT USE ONLY		



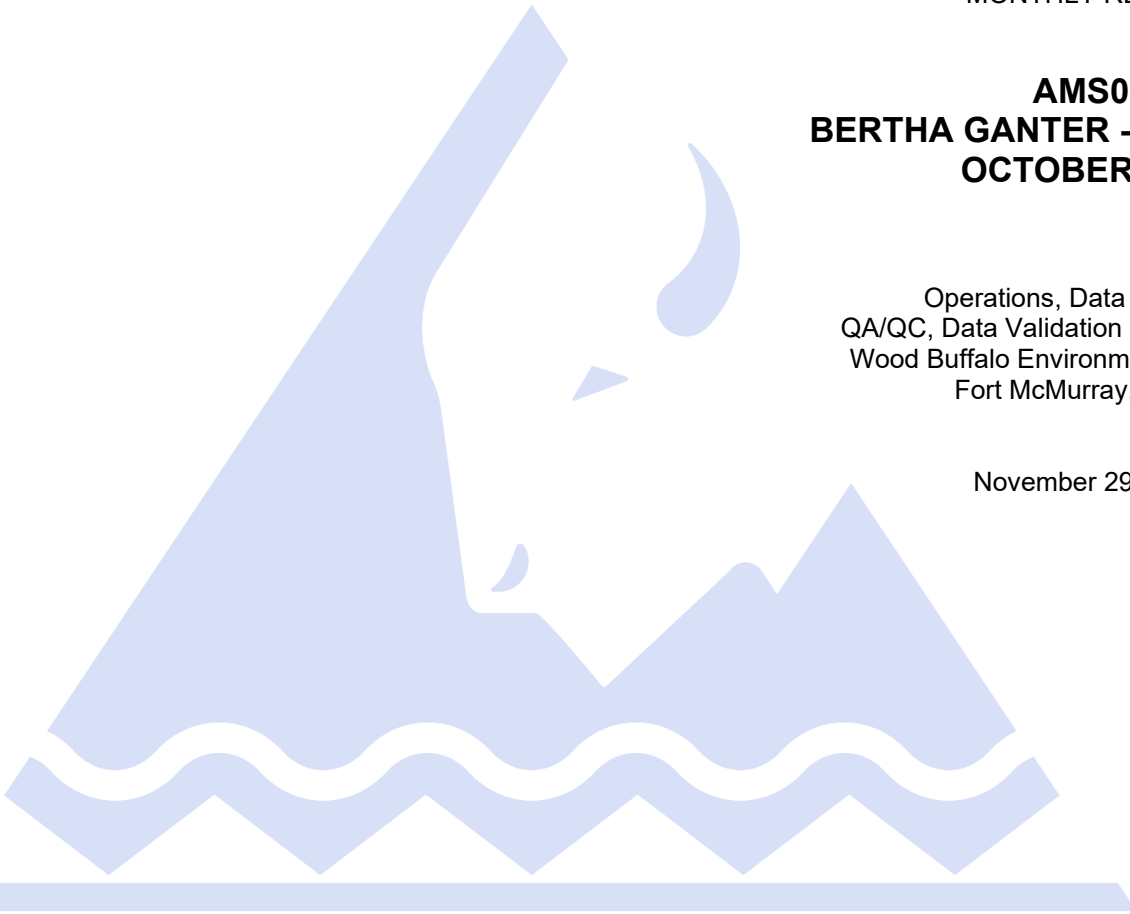
WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS01 BERTHA GANTER - FORT MCKAY OCTOBER 2023

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

November 29, 2023



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT MCKAY - BERTHA GANTER (AMS01)
OCTOBER 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	690	34	54	97.31	22.2	0	4.8	0
H2S(ppb) Average	703	39	41	99.73	3.5	0	0.5	0
TRS(ppb) Average	703	39	41	99.73	3.5	0	0.9	0
THC(ppm) Average	703	35	41	99.19	5.1	-	2.8	-
NMHC(ppm) Average	703	35	41	99.19	0.568	-	0.179	-
CH4(ppm) Average	703	35	41	99.19	4.6	-	2.6	-
O3 (ppb) Average	707	35	37	99.73	36.2	0	29.3	-
NO2 (ppb) Average	690	35	54	97.45	25	0	10.7	-
NO (ppb) Average	690	35	54	97.45	109.7	-	21.3	-
NOX (ppb) Average	690	35	54	97.45	121.7	-	28.8	-
NH3 (ppb) Average	595	45	149	86.02	0	0	0	-
PM2.5 (ug/m3) Average	737	3	7	99.46	38.7	0	19.5	0
CO(ppm) Average	707	35	37	99.73	0.6	0	0.4	0
CO2(ppm) Average	708	34	36	99.73	537.4	0	466.8	0
Temperature 2 m (C) Average	743	0	1	99.87	24.1	-	12.6	-
Temperature 10 m (C) Average	743	0	1	99.87	23.9	-	12.8	-
Relative Humidity (%) Average	743	0	1	99.87	98.6	-	89.5	-
Wind Speed 10 m (km/h) Average	743	0	1	99.87	27	-	15	-
Wind Direction 10 m (deg) Average	743	0	1	99.87	-	-	-	-
Precipitation (mm) Total	709	0	35	95.3	2.2	-	4.6	-
Leaf Wetness (% of range) Average	741	0	3	99.6	83.9	-	31.3	-
Global Solar Radiation (W/m2) Average	744	0	0	100	489.3	-	121.5	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BERTHA GANTER FORT MCKAY (AMS01)
OCTOBER 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	690	1.06	2.9	-	0	0	0	0.1	0.5	2.6	22.2
H2S (ppb) Average	703	0.21	0.3	-	0	0	0.1	0.1	0.3	0.6	3.5
TRS (ppb) Average	703	0.49	0.3	-	0.2	0.3	0.3	0.4	0.5	0.9	3.5
THC (ppm) Average	703	2.08	0.2	-	1.9	1.9	2	2	2.1	2.3	5.1
NMHC(ppm) Average	703	0.027	0.058	-	0	0	0	0	0	0.1	0.568
CH4(ppm) Average	703	2.05	0.2	-	1.9	1.9	2	2	2.1	2.2	
O3 (ppb) Average	707	16.43	9.7	-	0.1	1.6	8.5	16.6	24.3	28.9	36.2
NO2 (ppb) Average	690	5.02	4.9	-	0	0	0.6	3.8	8.2	12	25
NO (ppb) Average	690	2.34	7.7	-	0	0	0	0.1	1.6	5.4	109.7
NOX (ppb) Average	690	7.36	10.2	-	0	0	0.7	4.8	10.5	17.7	121.7
NH3 (ppb) Average	595	0	0	-	0	0	0	0	0	0	0
PM2.5 (ug/m3) Average	737	7.88	5.4	-	0.3	2.7	4.6	6.8	10	13	38.7
CO(ppm) Average	707	0.29	0.1	-	0.2	0.2	0.2	0.3	0.3	0.4	0.6
CO2(ppm) Average	708	432.86	18.7	-	410.8	418.9	421.7	427.1	436.2	452.6	537.4
Temperature 2 m (C) Average	743	4.15	7.5	-	-13.3	-5.2	-1.9	4.3	9.8	13.9	24.1
Temperature 10 m (C) Average	743	4.37	7.5	-	-13	-5.3	-1.9	4.8	10.1	13.7	23.9
Relative Humidity (%) Average	743	72.19	16.3	-	33.8	49	59.7	74	85.2	93.4	98.6
Wind Speed 10 m (km/h) Average	743	7.3	5	-	0	2	4	6	10	13	27
Wind Direction 10 m (deg) Average	743	-	-	-	-	-	-	-	-	-	-
Precipitation (mm) Total	709	-	-	12.23	-	-	-	-	-	-	-
Leaf Wetness (% of range) Average	741	7.61	13.9	-	0.7	1.5	2	2.3	4	22	83.9
Global Solar Radiation (W/m2) Average	744	73.12	119.9	-	0	0	0	0	112.3	290.2	489.3

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

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL GASEOUS ANALYZERS (except NH3)	19 Oct 2023 12:00	19 Oct 2023 12:00	1	Maintenance - sample manifold cleaned
ALL PARAMETERS (except NH3)	31 Oct 2023 10:00	31 Oct 2023 10:00	1	Maintenance - station logger/modem reset
NH3	01 Oct 2023 04:00	30 Oct 2023 03:00	27	Stabilization after daily QA check
NH3	06 Oct 2023 16:00	07 Oct 2023 07:00	16	Unstable Operation - flatline in analyzer output signal
NH3	10 Oct 2023 18:00	11 Oct 2023 10:00	17	Unstable Operation - flatline in analyzer output signal
NH3	18 Oct 2023 17:00	19 Oct 2023 10:00	18	Maintenance - calibration
NH3	30 Oct 2023 13:00	31 Oct 2023 13:00	25	Unstable Operation - flatline in analyzer output signal
NH3	31 Oct 2023 14:00	31 Oct 2023 14:00	1	Maintenance - analyzer rebooted
SO2	10 Oct 2023 17:00	11 Oct 2023 09:00	17	Unstable Operation - flatline in analyzer output signal
SO2	11 Oct 2023 10:00	11 Oct 2023 10:00	1	Maintenance - analyzer rebooted
THC/NMHC/CH4	25 Oct 2023 11:00	25 Oct 2023 14:00	4	Maintenance - ZAG replaced
NO2	06 Oct 2023 15:00	07 Oct 2023 07:00	17	Unstable Operation - flatline in analyzer output signal
PM2.5	10 Oct 2023 09:00	10 Oct 2023 11:00	3	Unstable Operation - flatline in analyzer output signal
Precipitation Collector	13 Oct 2023 13:00	13 Oct 2023 13:00	1	Maintenance - field operations check
Precipitation Collector	30 Oct 2023 01:00	31 Oct 2023 08:00	32	DAS Failure - data not recorded
Precipitation Collector	31 Oct 2023 09:00	31 Oct 2023 10:00	2	Maintenance - station logger/modem reset
Surface Leaf Wetness	05 Oct 2023 02:00	05 Oct 2023 04:00	3	Sensor operated out of range



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb

Fort McKay - Bertha Ganter - October 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 22.2 ppb on Oct 12 15:00	Maximum Daily Average: 4.8 ppb on Oct 12		Hours of Data:	690
Minimum Value: 0.0 ppb on Oct 1 01:00	Minimum Daily Average: 0.0 ppb on Oct 24		Hours of Missing Data:	54
Maximum Diurnal Average: 3.6 ppb at hour 12	Minimum Diurnal Average: 0.2 ppb at hour 5		Hours of Calibration:	34
Monthly Average: 1.06 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.5 P ₉₀ = 2.6 P ₉₉ = 16.6		Percent Operational Time:	97.3

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-Oct	0.0	0.0	0.0	0.0	0.0	Z	0.3	0.5	2.1	19.0	12.5	3.8	1.1	6.3	9.0	9.1	4.3	0.8	2.1	3.0	4.9	5.4	2.4	3.2	3.9	19.0
2-Oct	Z	1.9	1.3	2.2	1.7	0.9	0.5	0.6	0.6	1.6	2.4	1.5	1.5	1.2	0.9	0.5	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.1	0.9	2.4
3-Oct	0.0	Z	0.1	0.1	0.1	0.2	0.3	0.3	0.3	0.3	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	0.3	0.1	0.3
4-Oct	0.2	1.0	Z	0.4	0.1	0.1	0.1	0.1	C	C	C	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	1.0
5-Oct	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	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.0	0.2
6-Oct	0.3	0.3	0.1	0.3	Z	1.5	1.5	0.5	1.8	6.8	10.7	11.2	6.9	0.7	0.5	1.0	2.5	2.6	1.4	1.1	0.7	0.4	0.3	0.2	2.3	11.2
7-Oct	0.2	0.2	0.1	0.1	0.1	Z	0.1	0.1	0.2	0.2	0.6	6.2	16.6	16.7	12.2	8.6	6.1	3.3	1.5	0.9	0.4	0.3	0.2	0.1	3.3	16.7
8-Oct	Z	0.0	0.1	0.1	0.3	0.4	0.3	0.2	0.5	0.7	1.3	6.9	1.3	2.7	3.4	4.2	0.6	0.6	0.7	2.2	1.9	0.5	0.3	0.3	1.3	6.9
9-Oct	0.2	Z	0.2	0.1	0.0	0.0	0.0	0.1	0.2	2.2	7.6	15.3	2.8	0.5	0.5	0.4	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	1.3	15.3
10-Oct	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	0.2	0.3	0.1	UO	UO	UO	UO	UO	UO	UO	UO	--	0.3
11-Oct	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	0.2	2.0	0.1	0.0	0.0	1.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	--	2.0
12-Oct	0.7	0.6	1.1	1.0	Z	0.2	0.1	0.1	0.1	3.0	9.6	17.9	13.5	18.2	22.2	14.6	2.3	1.3	1.1	1.4	1.1	0.5	0.3	0.2	4.8	22.2
13-Oct	0.2	0.1	0.1	0.1	0.1	Z	0.3	0.4	1.1	2.0	1.9	5.5	4.4	2.2	4.0	4.1	0.7	0.3	0.2	0.1	0.1	0.0	0.0	0.0	1.2	5.5
14-Oct	Z	0.0	0.0	0.1	0.1	1.3	3.4	8.5	2.8	1.1	0.8	3.7	3.7	2.9	1.4	1.5	3.9	6.0	2.3	6.9	4.0	1.7	6.2	6.3	3.0	8.5
15-Oct	2.5	Z	1.6	0.8	0.5	0.3	0.2	0.3	0.7	8.2	10.7	21.9	17.6	15.2	8.7	3.9	1.7	2.9	1.6	1.7	1.7	0.9	1.5	2.0	4.6	21.9
16-Oct	1.7	2.0	Z	0.6	0.3	0.1	0.1	0.2	0.3	0.3	0.6	0.8	0.2	0.2	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.1	0.3	2.0
17-Oct	0.0	0.0	0.0	Z	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.2
18-Oct	0.0	0.0	3.4	1.2	Z	1.4	0.8	0.5	0.9	0.9	1.4	5.3	13.9	14.3	3.4	2.5	2.5	3.5	1.5	1.0	0.8	0.6	0.5	0.3	2.6	14.3
19-Oct	0.2	0.3	0.3	0.1	0.1	Z	0.1	0.1	0.2	0.2	0.2	M	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.1	0.3
20-Oct	Z	0.1	0.1	0.2	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.2
21-Oct	0.0	Z	0.1	0.1	0.0	0.0	0.2	0.6	0.8	0.9	1.5	2.5	3.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	3.1
22-Oct	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.1	0.4	0.5	0.2	0.1	0.5	0.1	0.0	0.0	0.0	0.0	0.1	1.1
23-Oct	0.0	0.0	0.0	Z	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	0.1	0.0	0.0	0.0	0.1
24-Oct	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
25-Oct	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	0.1	0.0	0.1	0.2	0.1	0.0	0.0	0.1	0.1	0.0	0.2
26-Oct	Z	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2
27-Oct	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.5	0.4	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.5
28-Oct	0.1	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.2
29-Oct	0.1	0.1	0.0	Z	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.1
30-Oct	0.0	0.0	0.0	0.0	Z	0.0	0.1	0.0	0.0	0.0	0.2	1.5	0.4	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	2.6	0.2	2.6
31-Oct	3.1	1.2	1.7	1.1	0.5	Z	0.1	0.1	0.1	M	0.0	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	0.4	3.1

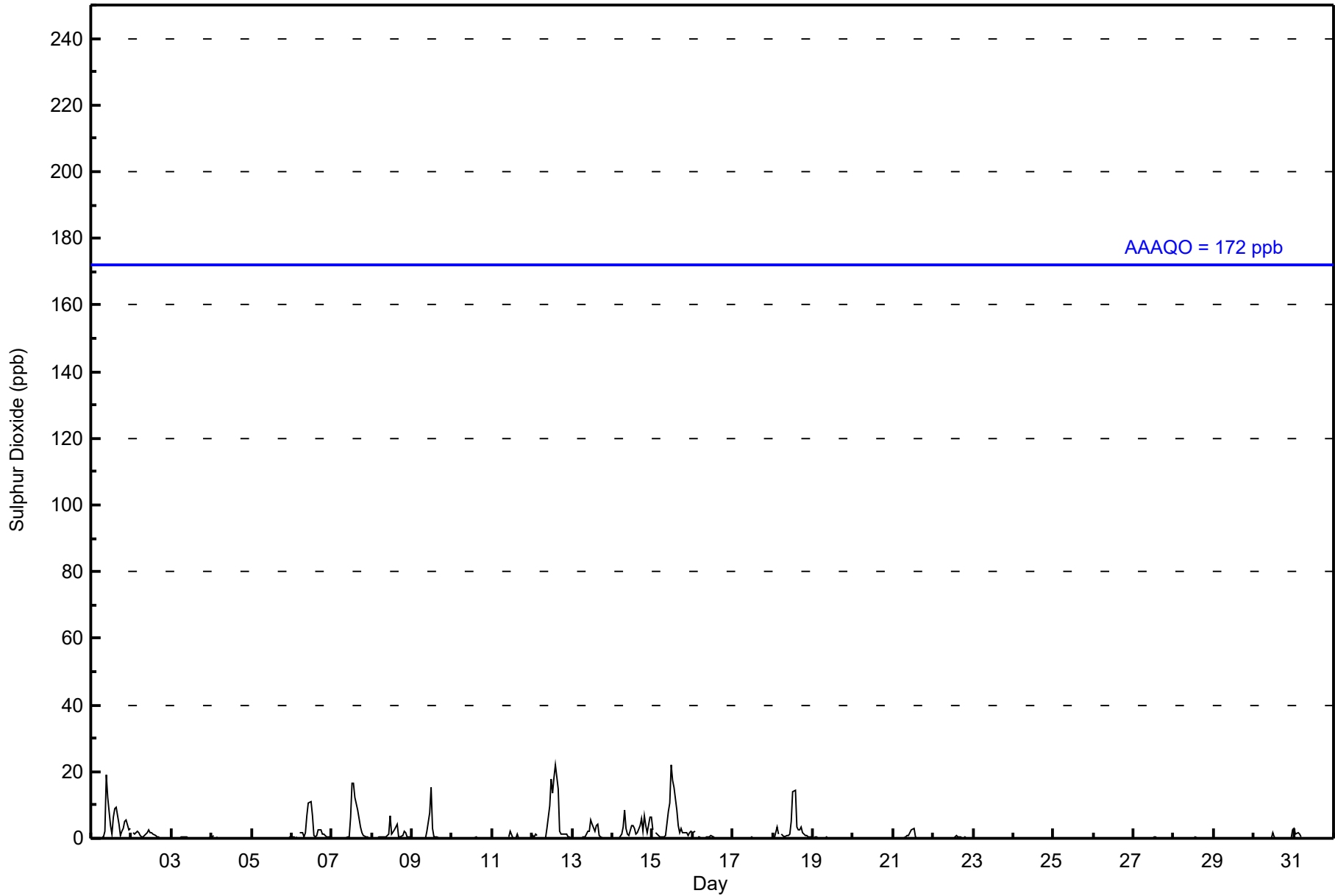
0.4	0.3	0.4	0.3	0.2	0.3	0.3	0.5	0.4	1.7	2.1	3.6	2.9	2.7	2.2	1.7	0.9	0.8	0.5	0.7	0.5	0.4	0.4	0.5	Diurnal Average	
3.1	2.0	3.4	2.2	1.7	1.5	3.4	8.5	2.8	19.0	12.5	21.9	17.6	18.2	22.2	14.6	6.1	6.0	2.3	6.9	4.9	5.4	6.2	6.3	Diurnal Maximum	

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
Fort McKay - Bertha Ganter - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	671	97.25	97.25
11 - 20	17	2.46	99.71
21 - 60	2	0.29	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
Fort McKay - Bertha Ganter - October 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	37	25	6	7	4	9	15	97	134	40	21	32	56	79	74	35	671
11 - 20	0	0	0	0	0	0	0	11	6	0	0	0	0	0	0	0	17
21 - 60	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	37	25	6	7	4	9	15	110	140	40	21	32	56	79	74	35	690

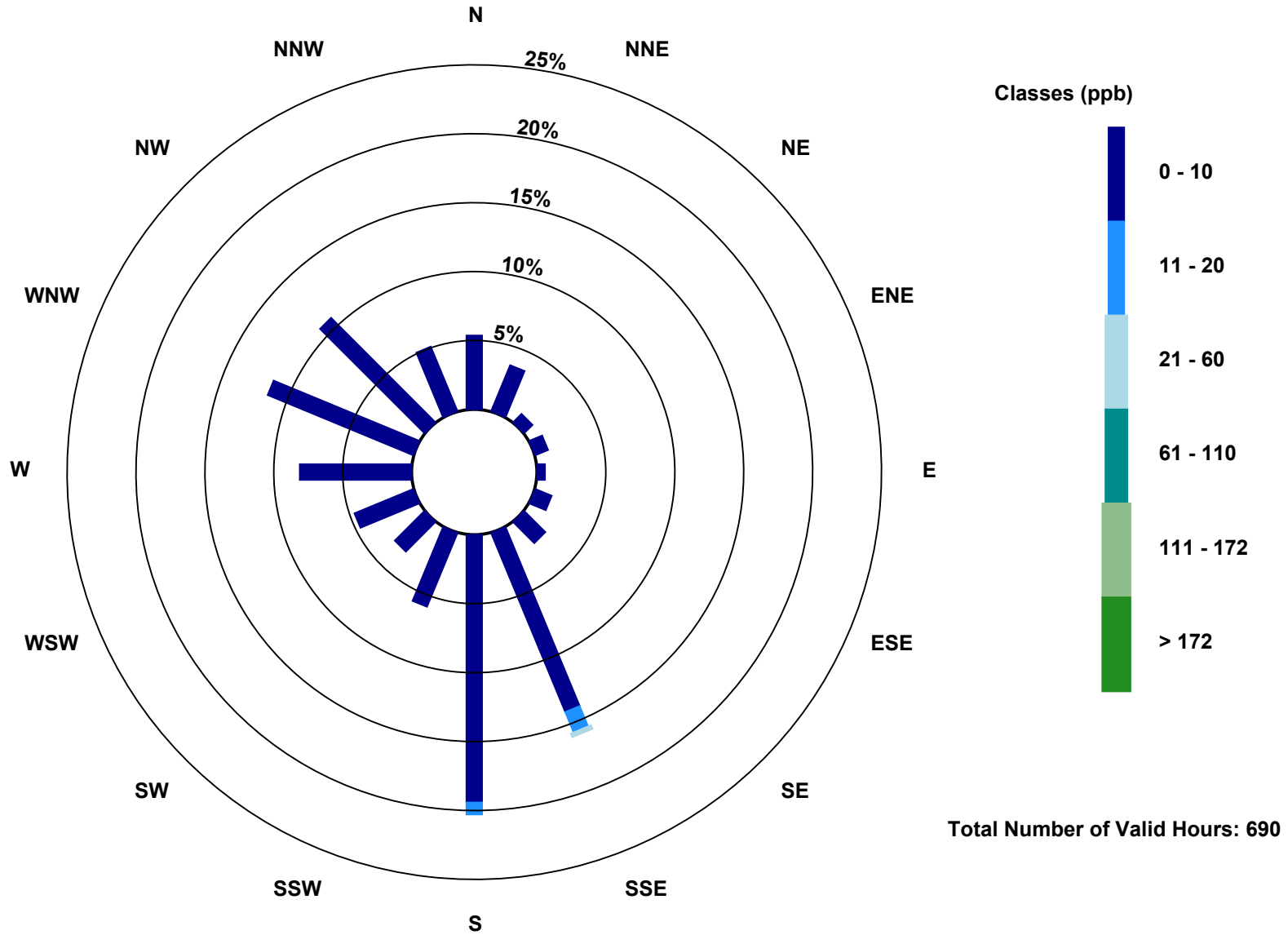
Total Number of Valid Hours: 690

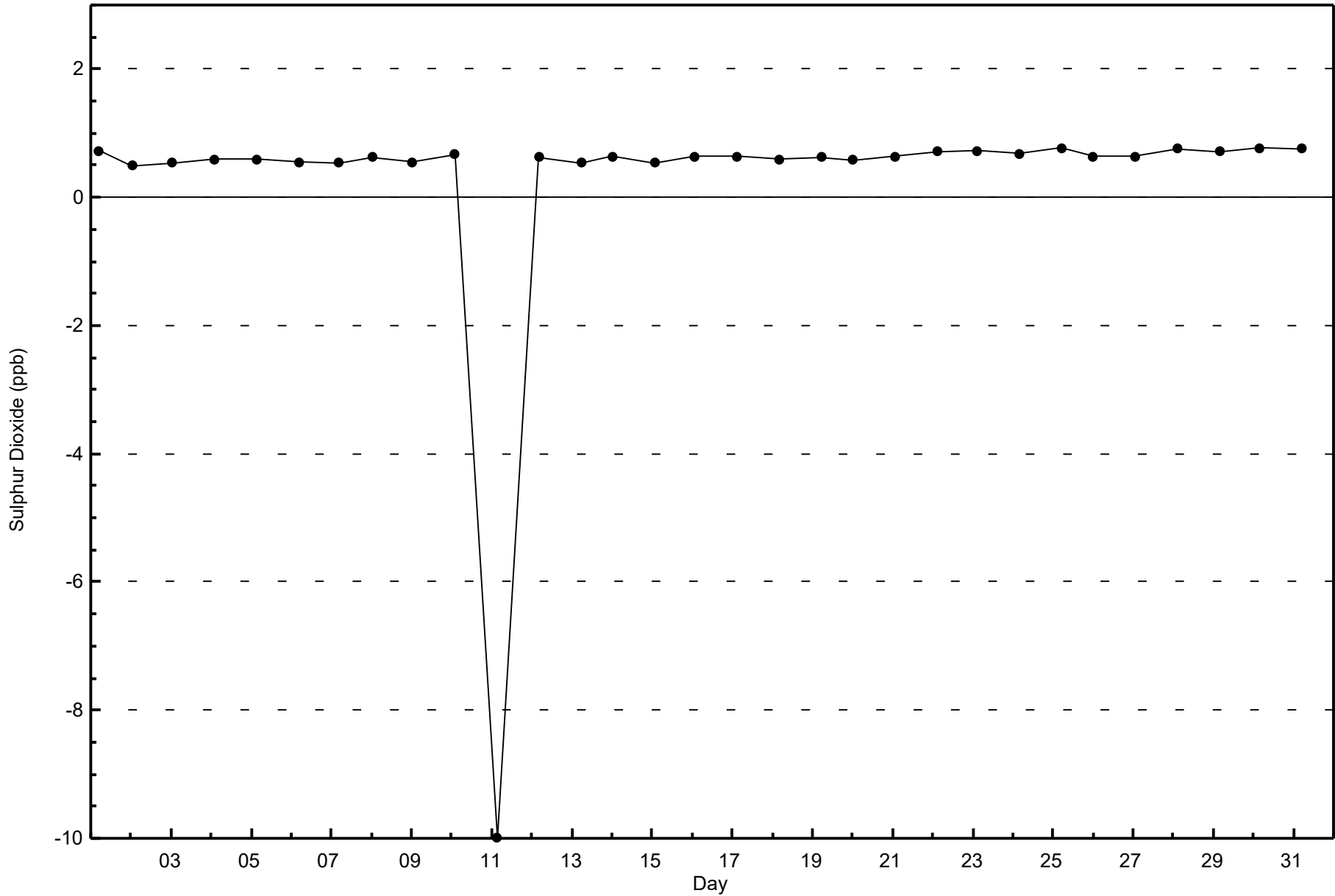
Total Number of Hours: 744

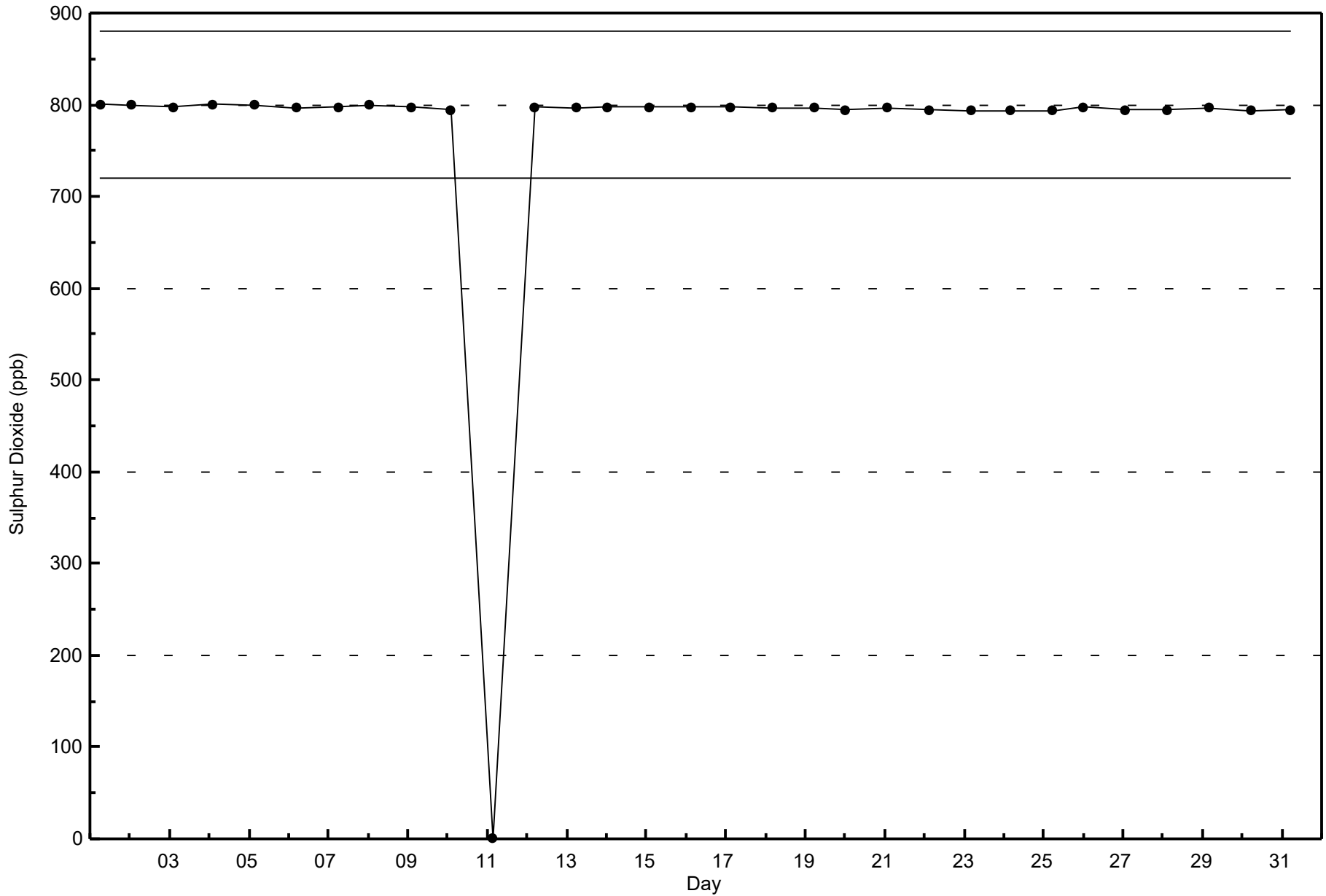


Wood Buffalo Environmental Association
Wind Rose Oct 2023

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









Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H₂S) - ppb

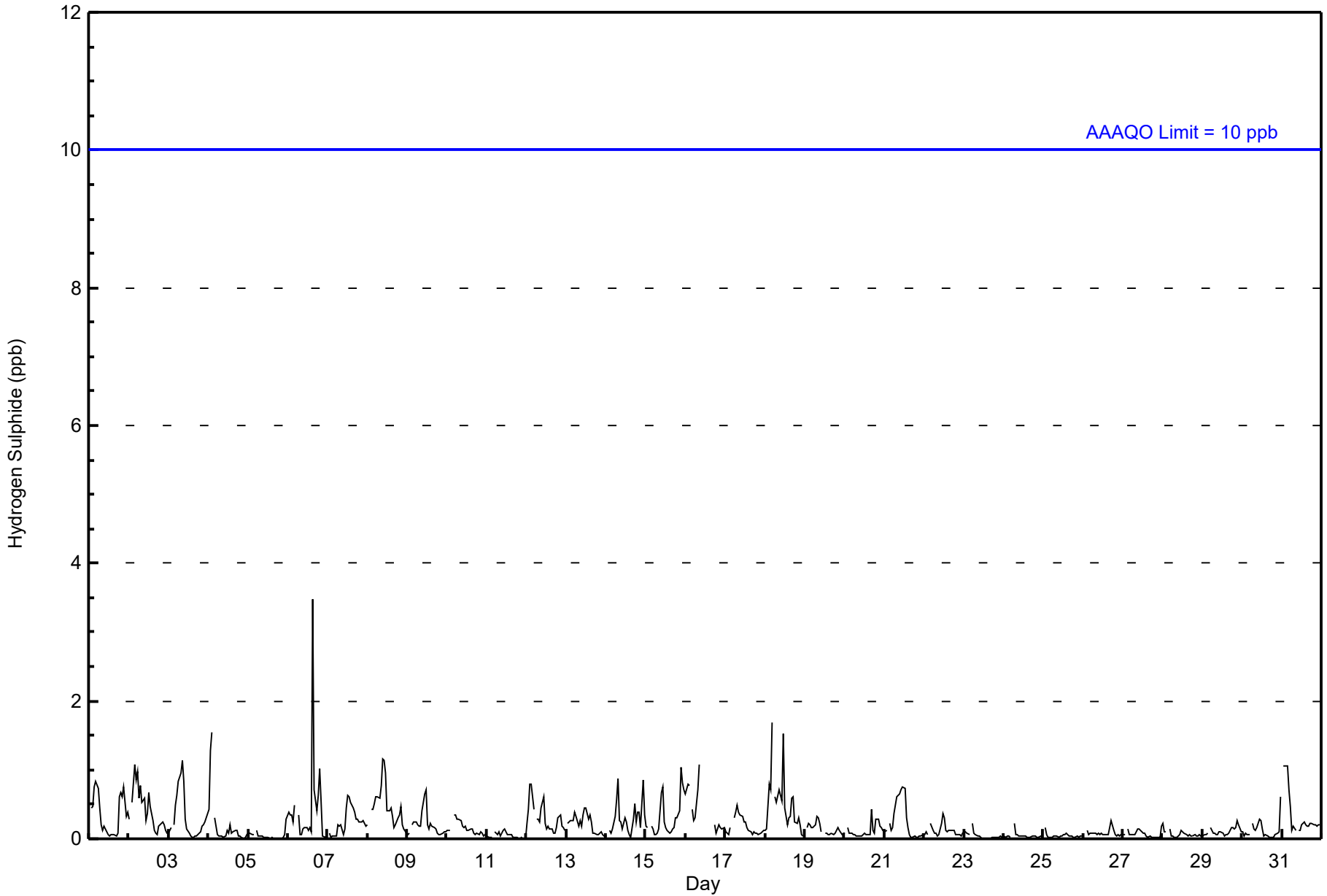
Fort McKay - Bertha Ganter - October 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		744																		
Maximum Value: 3.5 ppb on Oct 6 16:00		Maximum Daily Average: 0.5 ppb on Oct 18		Minimum Value: 0.0 ppb on Oct 5 18:00		Minimum Daily Average: 0.0 ppb on Oct 23		Hours of Data: 703																		
Maximum Diurnal Average: 0.3 ppb at hour 5		Minimum Diurnal Average: 0.1 ppb at hour 15		Monthly Average: 0.21 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.1 Q ₃ = 0.3 P ₉₀ = 0.6 P ₉₉ = 1.1		Hours of Missing Data: 41																		
								Hours of Calibration: 39																		
								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-Oct	Z	0.4	0.5	0.8	0.8	0.7	0.5	0.2	0.1	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.6	0.7	0.6	0.8	0.3	0.4	0.4	0.8
2-Oct	0.3	Z	0.5	1.1	0.9	1.0	0.6	0.8	0.5	0.6	0.3	0.4	0.7	0.5	0.3	0.1	0.1	0.1	0.2	0.2	0.3	0.2	0.1	0.1	0.4	1.1
3-Oct	0.1	0.2	Z	0.2	0.5	0.6	0.8	1.0	1.1	0.8	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.4	0.3	1.1	
4-Oct	0.4	1.3	1.6	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	0.1	0.2	1.6	
5-Oct	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	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.0	0.3	
6-Oct	0.4	0.3	0.3	0.3	0.5	Z	0.3	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.1	3.5	0.7	0.4	0.6	1.0	0.5	0.0	0.0	0.4	3.5	
7-Oct	Z	0.1	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.1	0.1	0.5	0.6	0.6	0.5	0.5	0.4	0.3	0.3	0.2	0.3	0.3	0.2	0.3	0.6	
8-Oct	0.2	Z	0.4	0.4	0.5	0.6	0.6	0.6	0.8	1.2	1.1	0.9	0.4	0.4	0.4	0.3	0.2	0.2	0.3	0.3	0.5	0.2	0.1	0.1	1.2	
9-Oct	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.6	0.7	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.7	
10-Oct	0.1	0.1	0.1	Z	0.3	0.3	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	0.1	0.0	0.1	0.3	
11-Oct	0.0	0.0	0.0	0.0	Z	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
12-Oct	0.2	0.4	0.8	0.8	0.4	Z	0.3	0.3	0.2	0.5	0.6	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.2	0.2	0.1	0.8	
13-Oct	Z	0.2	0.3	0.3	0.3	0.4	0.3	0.2	0.3	0.2	0.3	0.5	0.4	0.3	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.2	0.5	
14-Oct	0.1	Z	0.1	0.1	0.1	0.3	0.6	0.9	0.3	0.2	0.1	0.3	0.2	0.1	0.1	0.0	0.3	0.5	0.2	0.4	0.4	0.2	0.9	0.4	0.9	
15-Oct	0.2	0.2	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.7	0.8	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.4	1.0	0.8	1.0	
16-Oct	0.6	0.8	0.8	Z	0.4	0.3	0.3	0.7	1.1	C	C	C	C	C	C	C	C	C	0.2	0.1	0.1	0.2	0.2	0.1	1.1	
17-Oct	0.1	0.1	0.1	0.2	Z	0.3	0.4	0.5	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	0.1	0.1	0.5	
18-Oct	0.1	0.1	0.8	0.7	1.7	Z	0.6	0.5	0.7	0.6	0.6	1.5	0.5	0.2	0.3	0.3	0.6	0.6	0.2	0.2	0.3	0.2	0.1	0.0	1.7	
19-Oct	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.1	M	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-Oct	0.1	Z	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.4	0.1	0.1	0.3	0.3	0.2	0.2	0.1	0.4	
21-Oct	0.1	0.1	Z	0.2	0.1	0.2	0.4	0.6	0.6	0.7	0.7	0.7	0.7	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.7	
22-Oct	0.1	0.1	0.1	Z	0.2	0.1	0.1	0.1	0.0	0.1	0.2	0.4	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.4	
23-Oct	0.1	0.1	0.1	0.1	Z	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	
24-Oct	0.0	0.0	0.0	0.0	0.0	Z	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	
25-Oct	Z	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	
26-Oct	0.0	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	0.2	0.3	0.1	0.1	0.1	0.1	0.0	0.1	0.3	
27-Oct	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	
28-Oct	0.2	0.1	0.1	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.2	
29-Oct	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	0.0	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.3	0.2	0.1	0.3	
30-Oct	0.1	0.0	0.1	0.1	0.1	Z	0.2	0.2	0.1	0.2	0.3	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.6	0.6	
31-Oct	Z	1.1	1.1	1.1	0.7	0.5	0.1	0.2	0.1	M	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	1.1	
																								Diurnal Average		
																								Diurnal Maximum		
																								0.2 0.2 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.2 0.2 0.1 0.2 0.1 0.1 0.1 0.2 0.2 0.2 0.1 0.2		
																								0.6 1.3 1.6 1.1 1.7 1.0 0.8 1.0 1.1 1.2 1.1 1.5 0.7 0.6 0.5 3.5 0.7 0.6 0.6 1.0 0.6 1.0 0.9 0.7		
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
Fort McKay - Bertha Ganter - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	702	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: 703

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Fort McKay - Bertha Ganter - October 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	35	25	6	8	4	12	19	117	135	42	17	31	55	83	76	37	702
3 - 4	0	0	0	0	0	0	0	0	1	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	35	25	6	8	4	12	19	117	136	42	17	31	55	83	76	37	703

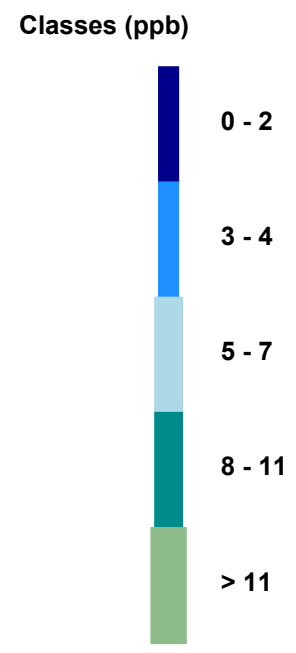
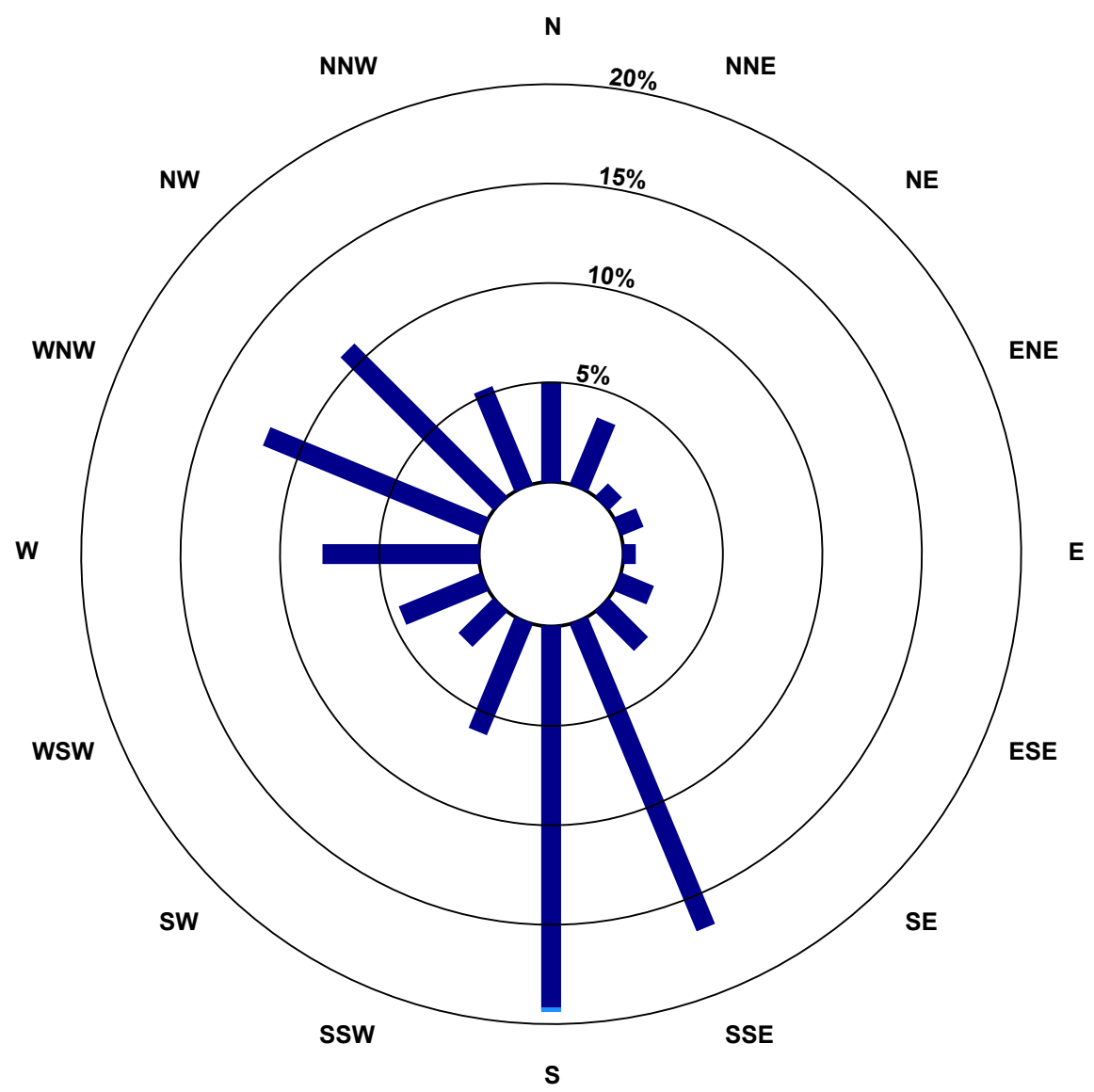
Total Number of Valid Hours: 703

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

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

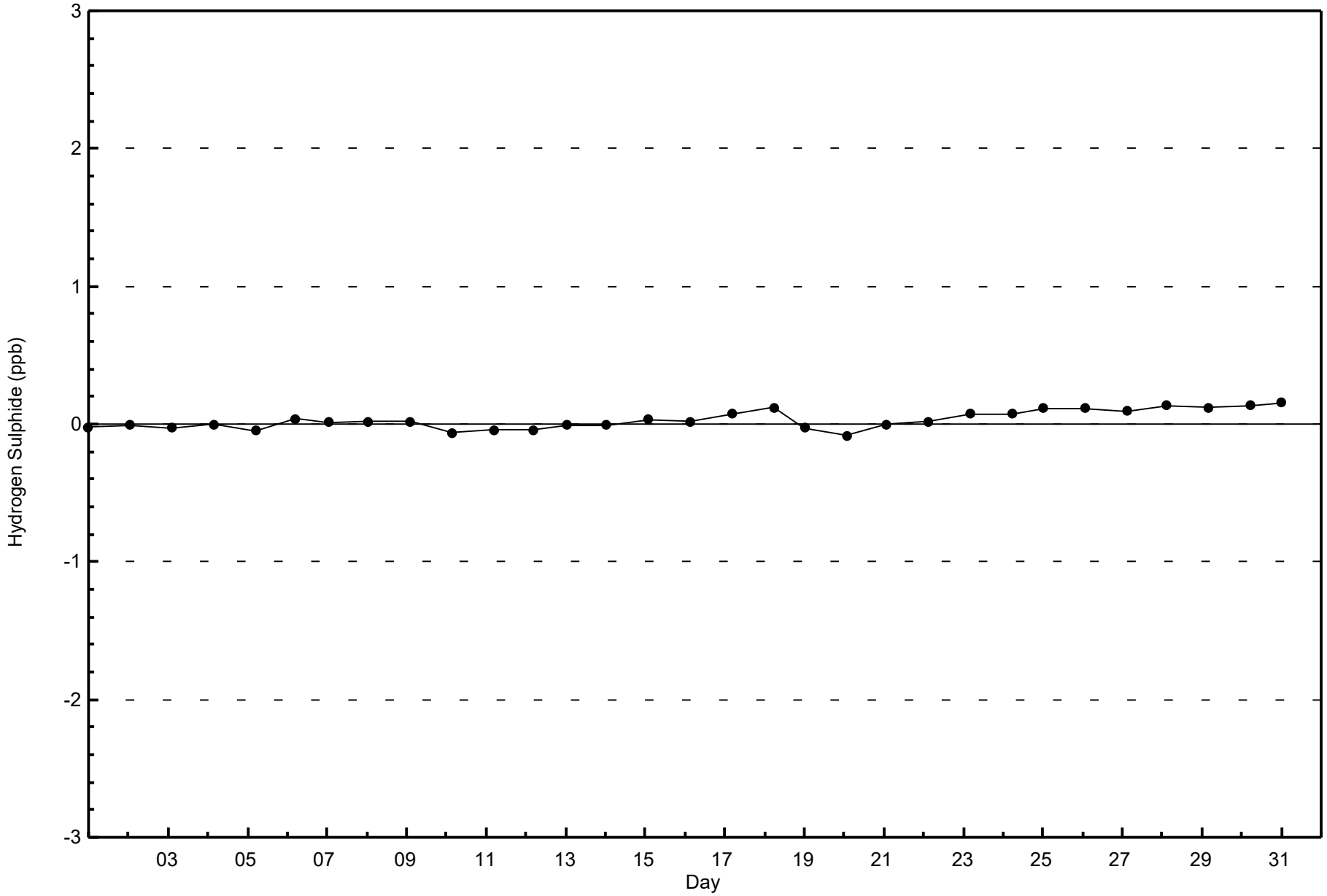


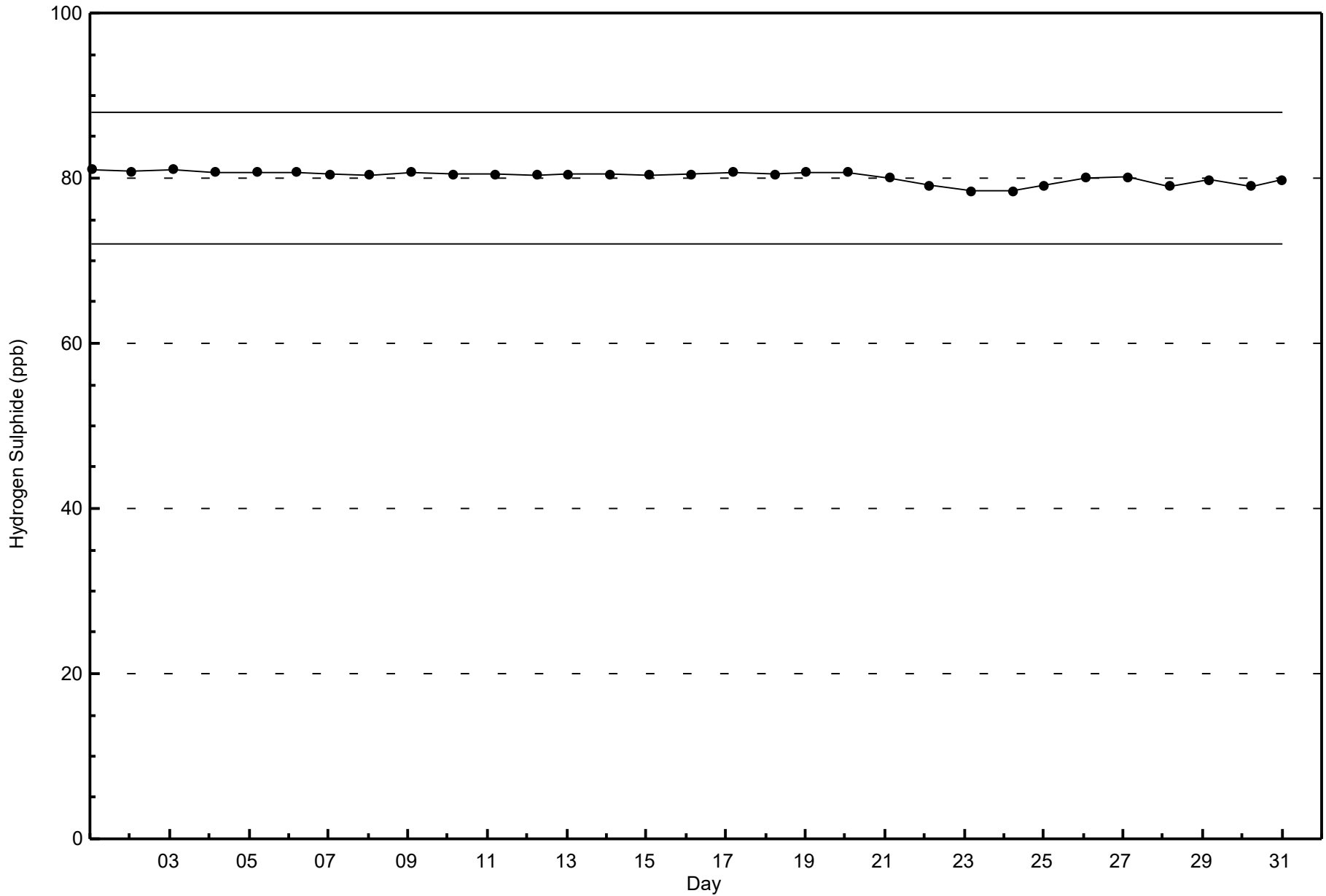
Total Number of Valid Hours: 703



Wood Buffalo Environmental Association
Zero Responses

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







Wood Buffalo Environmental Association

Summary of Hour Averages

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

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 3.5 ppb on Oct 6 16:00	Maximum Daily Average: 0.9 ppb on Oct 18		Hours of Data:	703
Minimum Value: 0.2 ppb on Oct 3 01:00	Minimum Daily Average: 0.3 ppb on Oct 23		Hours of Missing Data:	41
Maximum Diurnal Average: 0.6 ppb at hour 5	Minimum Diurnal Average: 0.4 ppb at hour 1		Hours of Calibration:	39
Monthly Average: 0.49 ppb	Percentiles: $P_1 = 0.2$ $P_{10} = 0.3$ $Q_1 = 0.3$ Median = 0.4 $Q_3 = 0.5$ $P_{90} = 0.9$ $P_{99} = 1.7$		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-Oct	Z	0.6	0.7	1.1	1.1	1.1	0.7	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.4	1.0	1.0	1.1	1.3	0.7	0.8	0.7	1.3	
2-Oct	0.6	Z	0.9	1.8	1.4	1.3	0.9	1.1	0.8	1.0	0.5	0.7	1.1	0.8	0.6	0.4	0.3	0.3	0.4	0.4	0.5	0.4	0.3	0.3	0.7	1.8	
3-Oct	0.2	0.3	Z	0.3	0.6	0.7	1.0	1.2	1.4	1.1	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.7	0.5	1.4	
4-Oct	0.7	1.5	1.9	Z	0.5	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.5	1.9	
5-Oct	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	0.4	0.3	0.3	0.4	
6-Oct	0.4	0.4	0.6	0.5	0.8	Z	0.6	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	3.5	1.1	0.9	1.0	1.3	0.8	0.4	0.3	0.4	0.7	3.5	
7-Oct	Z	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.5	0.9	1.1	1.2	1.1	0.9	0.8	0.7	0.6	0.6	0.6	0.6	0.5	0.5	0.6	1.2	
8-Oct	0.5	Z	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.8	1.0	1.2	0.5	0.6	0.7	0.6	0.4	0.5	0.6	0.7	0.9	0.6	0.4	0.4	0.6	1.2	
9-Oct	0.4	0.4	Z	0.4	0.5	0.5	0.5	0.4	0.4	0.7	1.0	1.2	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.5	1.2	
10-Oct	0.4	0.4	0.4	Z	0.5	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.3	0.4	0.4	0.4	0.3	0.4	0.6	
11-Oct	0.3	0.3	0.3	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.4	
12-Oct	0.5	0.7	1.2	1.2	0.8	Z	0.5	0.5	0.5	0.8	1.0	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.5	0.7	0.8	0.5	0.5	0.4	0.6	1.2	
13-Oct	Z	0.4	0.5	0.6	0.5	0.7	0.7	0.5	0.6	0.5	0.7	0.9	0.9	0.6	0.7	0.5	0.4	0.4	0.3	0.4	0.4	0.3	0.3	0.3	0.5	0.9	
14-Oct	0.3	Z	0.3	0.3	0.4	0.6	0.9	1.4	0.5	0.5	0.4	0.6	0.5	0.4	0.3	0.3	0.6	0.9	0.6	0.8	0.8	0.4	1.4	0.6	0.6	1.4	
15-Oct	0.4	0.4	Z	0.3	0.3	0.2	0.3	0.3	0.4	1.1	1.1	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.5	0.6	1.2	1.1	1.0	0.5	1.2
16-Oct	1.0	1.2	1.1	Z	0.6	0.5	0.5	0.8	1.1	C	C	C	C	C	C	C	C	C	0.5	0.4	0.5	0.6	0.6	0.5	0.5	--	1.2
17-Oct	0.4	0.4	0.4	0.4	Z	0.5	0.7	0.7	0.7	0.7	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.5	0.7
18-Oct	0.4	0.4	1.2	1.2	2.3	Z	0.9	0.9	1.1	1.0	0.9	2.3	0.8	0.5	0.6	0.6	1.0	1.0	0.6	0.5	0.5	0.4	0.3	0.3	0.9	2.3	
19-Oct	Z	0.3	0.4	0.4	0.4	0.4	0.4	0.6	0.5	0.5	0.3	M	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.6	
20-Oct	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	0.7	0.4	0.4	0.5	0.5	0.4	0.5	0.4	0.7	
21-Oct	0.3	0.3	Z	0.4	0.3	0.4	0.6	1.0	1.0	1.0	1.1	1.2	1.1	0.6	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.6	1.2
22-Oct	0.3	0.4	0.3	Z	0.4	0.3	0.3	0.3	0.2	0.3	0.4	0.6	0.5	0.4	0.4	0.3	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.6
23-Oct	0.3	0.3	0.3	0.3	Z	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
24-Oct	0.3	0.3	0.3	0.3	0.3	Z	0.4	0.3	0.3	0.4	0.4	0.4	0.3	0.4	0.3	0.4	0.3	0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4
25-Oct	Z	0.4	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	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4
26-Oct	0.3	Z	0.4	0.3	0.3	0.4	0.3	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.4	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.5
27-Oct	0.3	0.3	Z	0.3	0.3	0.3	0.3	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	0.5	0.5	0.5
28-Oct	0.5	0.4	0.4	Z	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.4	0.5
29-Oct	0.4	0.3	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	0.3	0.4	0.5	0.5	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.5
30-Oct	0.4	0.4	0.4	0.4	0.4	Z	0.4	0.4	0.3	0.4	0.5	0.6	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	1.4	0.4	1.4
31-Oct	Z	1.8	1.7	1.7	1.3	1.0	0.4	0.5	0.4	M	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	0.7	1.8

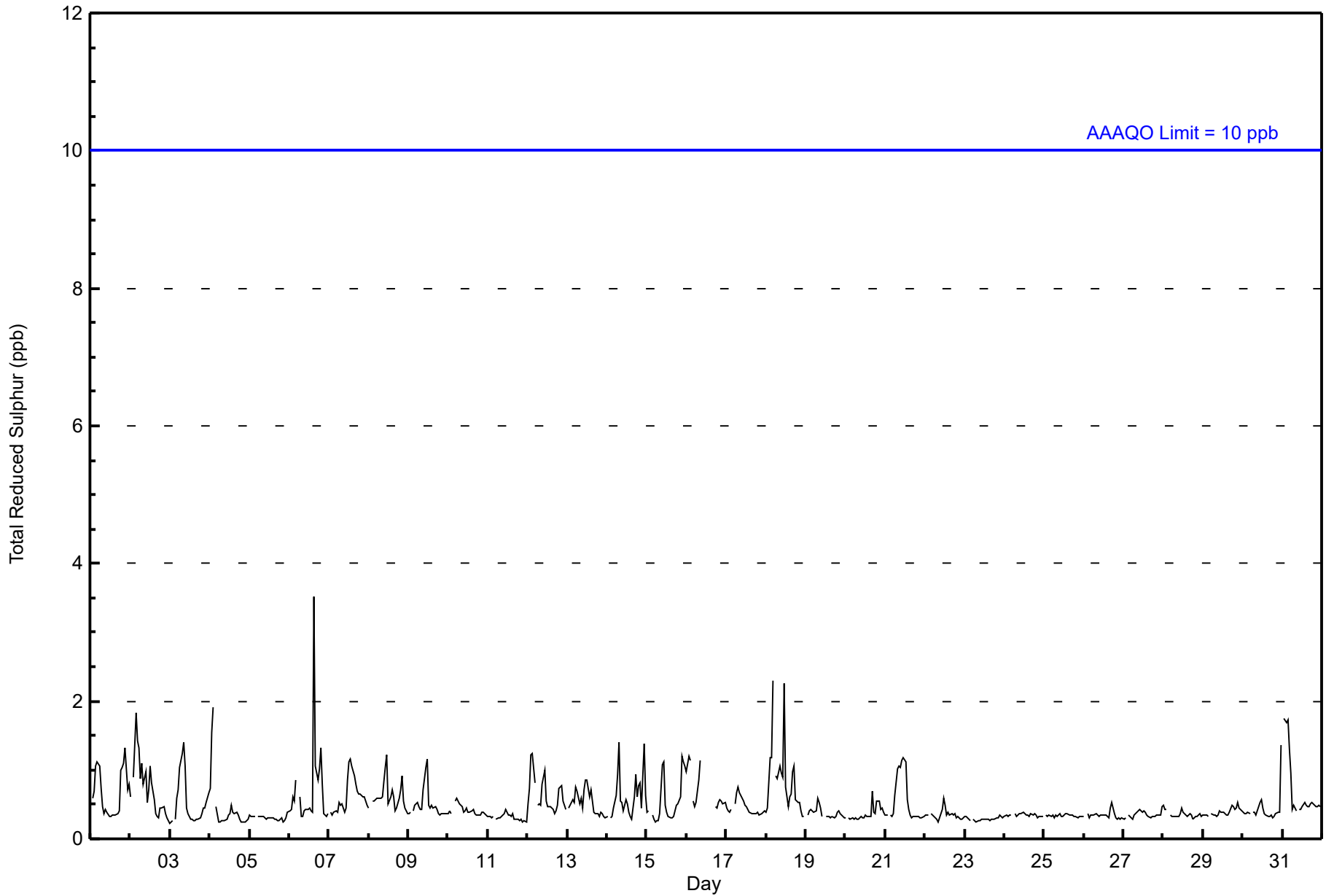
0.4	0.5	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.4	0.4	0.5	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	Diurnal Average
1.0	1.8	1.9	1.8	2.3	1.3	1.0	1.4	1.4	1.1	1.1	2.3	1.1	1.2	1.1	3.5	1.1	1.0	1.0	1.3	1.1	1.3	1.4	1.4	1.4	1.4	1.4	Diurnal Maximum

Z - zerospan C - Calibration M - Maintenance
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	702	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: 703

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Total Reduced Sulphur (TRS) - ppb
Fort McKay - Bertha Ganter - October 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	35	25	6	8	4	12	19	117	135	42	17	31	55	83	76	37	702
3 - 4	0	0	0	0	0	0	0	0	1	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	35	25	6	8	4	12	19	117	136	42	17	31	55	83	76	37	703

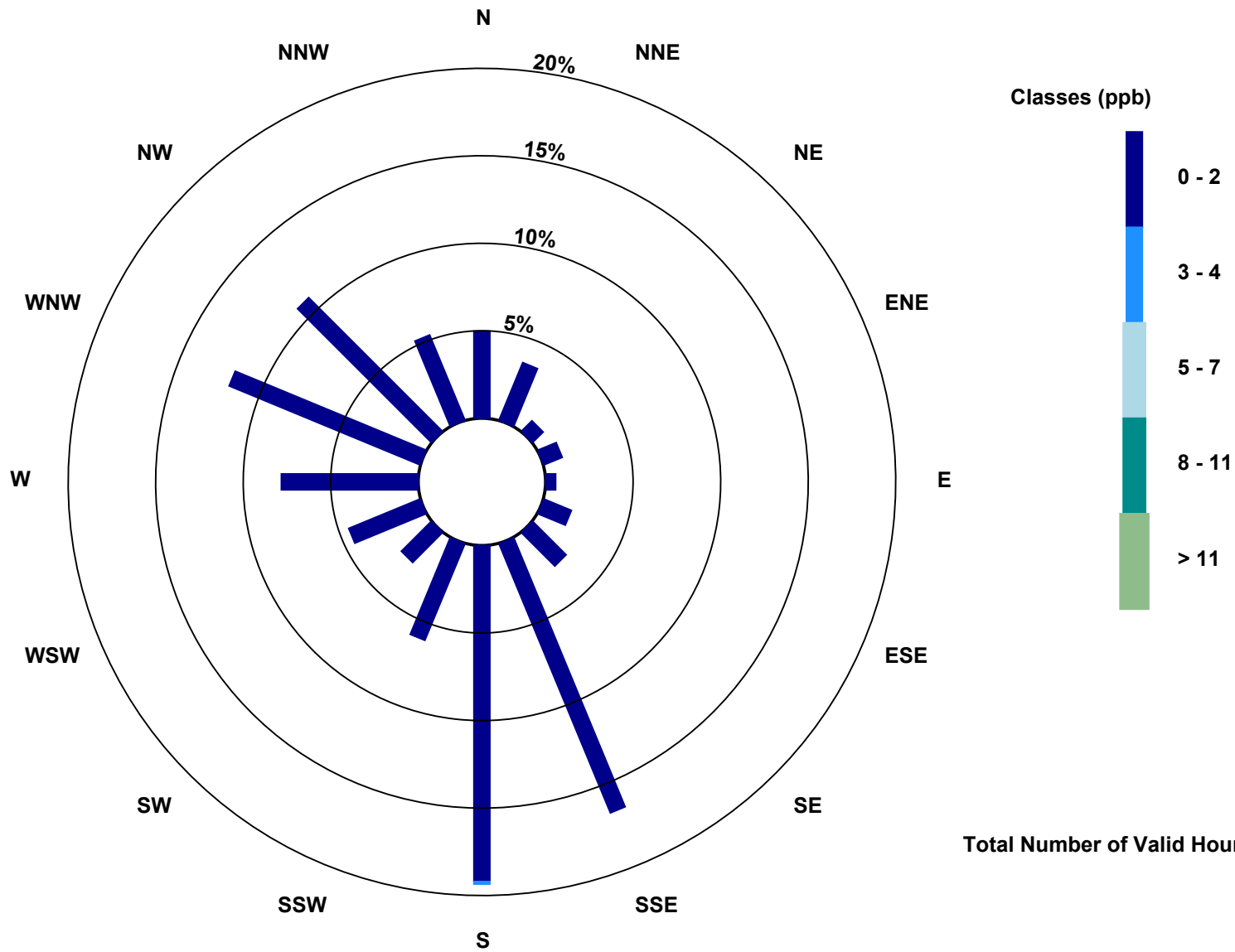
Total Number of Valid Hours: 703

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

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

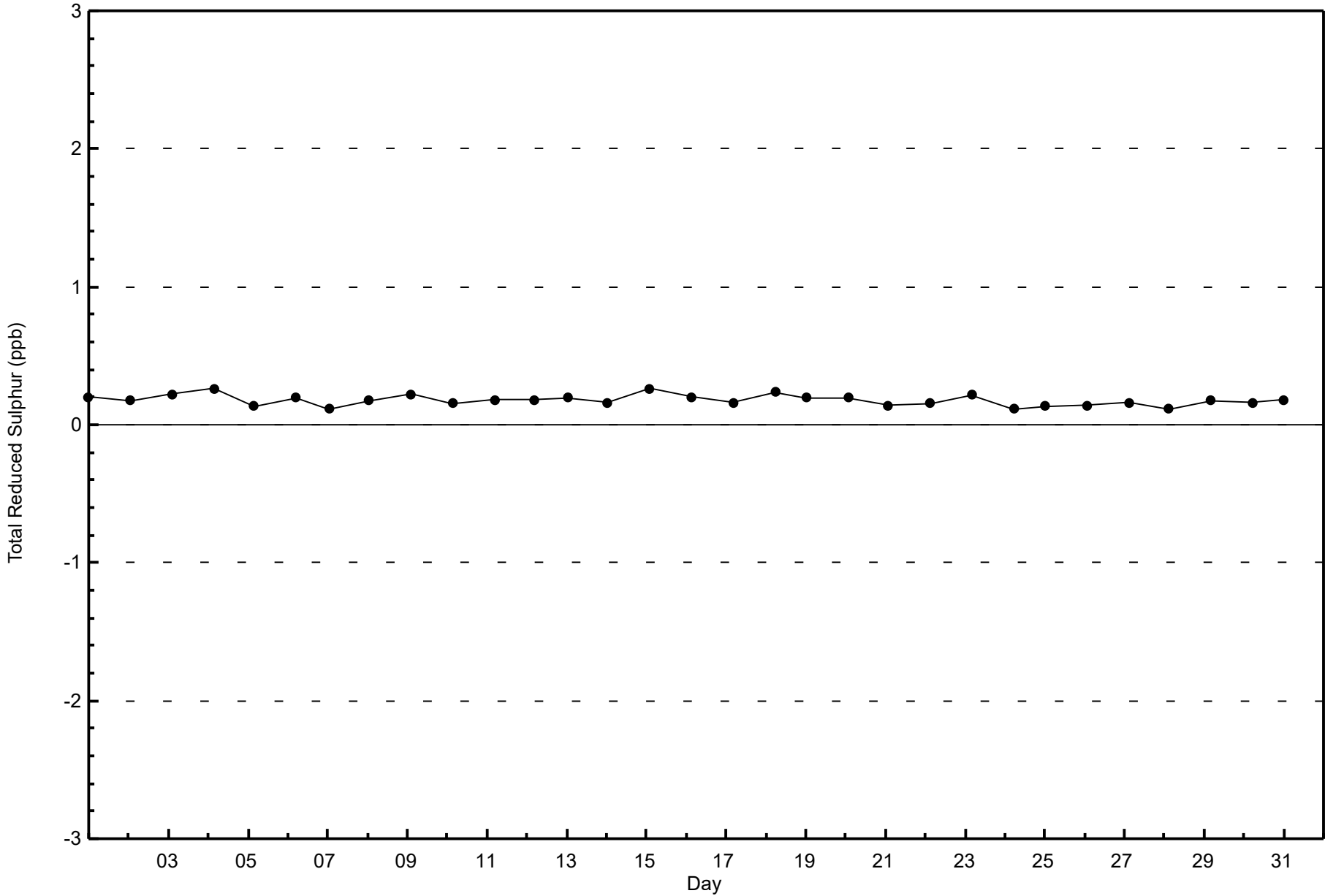


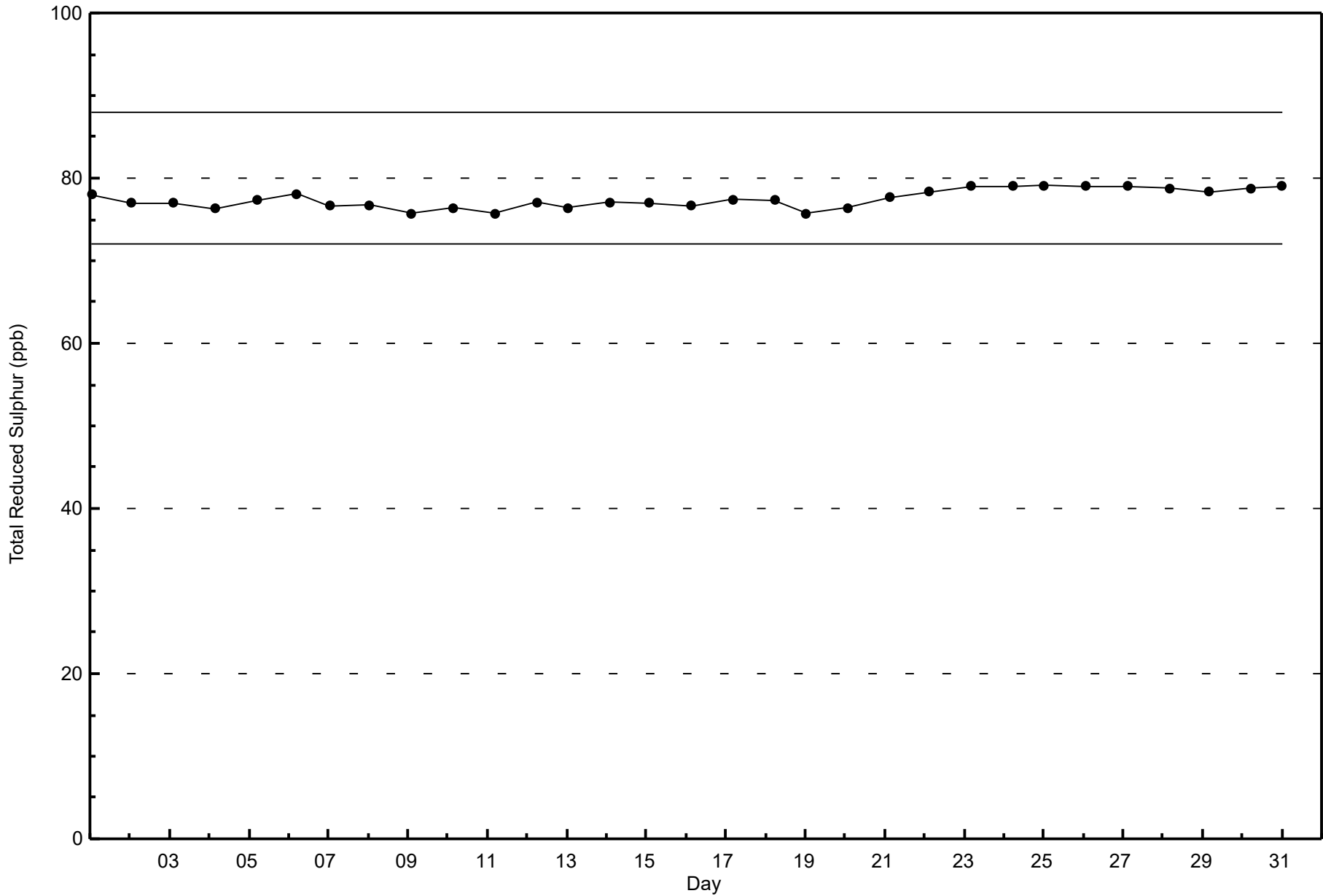
Total Number of Valid Hours: 703



Wood Buffalo Environmental Association
Zero Responses

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







Wood Buffalo Environmental Association

Summary of Hour Averages

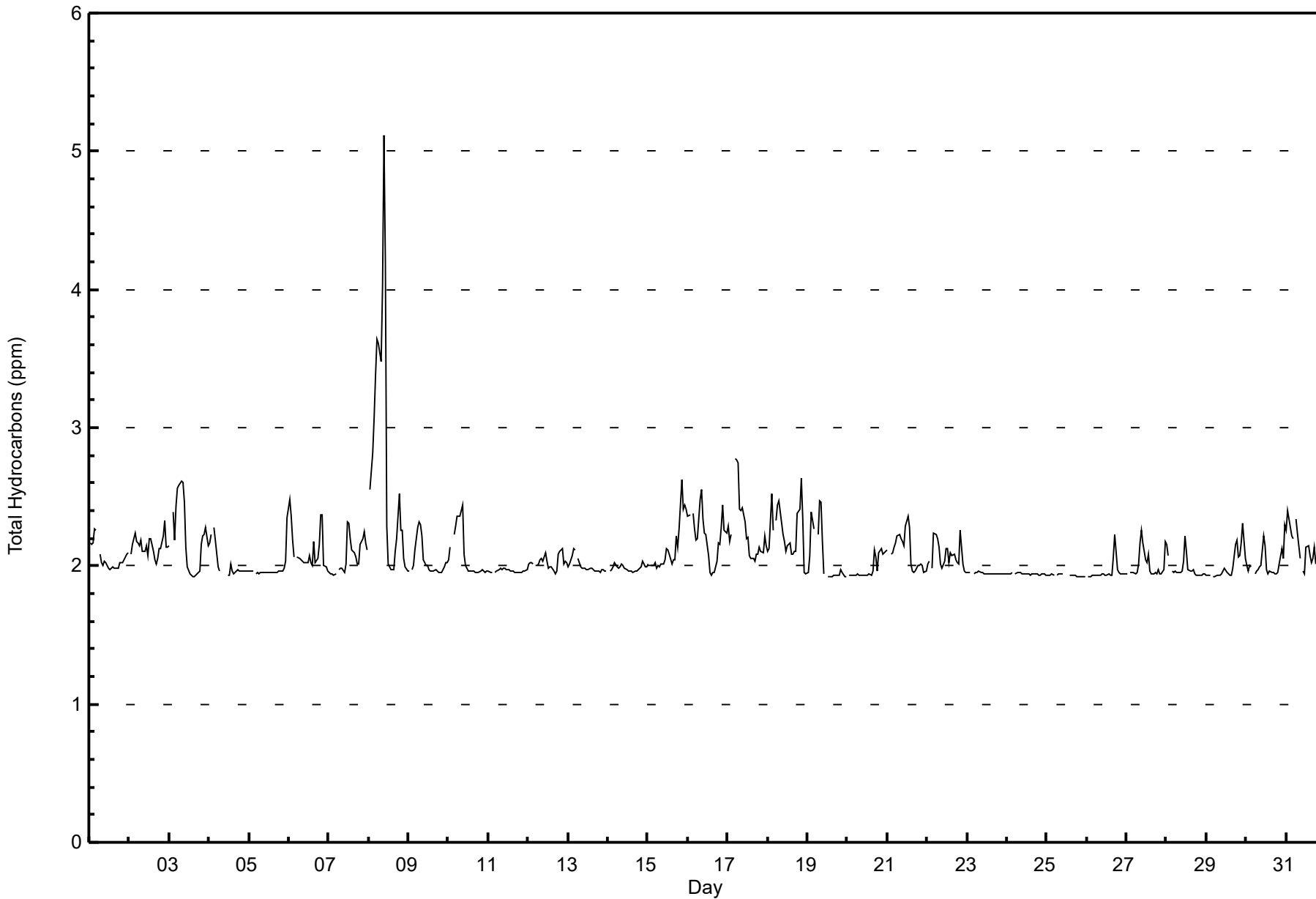
Total Hydrocarbons (THC) - ppm
Fort McKay - Bertha Ganter - October 2023

Maximum Value: 5.1 ppm on Oct 8 10:00		Maximum Daily Average: 2.8 ppm on Oct 8		Hours in Service:	744																					
Minimum Value: 1.9 ppm on Oct 26 02:00		Minimum Daily Average: 1.9 ppm on Oct 25		Hours of Data:	703																					
Maximum Diurnal Average: 2.2 ppm at hour 10		Minimum Diurnal Average: 2.0 ppm at hour 16		Hours of Missing Data:	41																					
Monthly Average: 2.08 ppm		Percentiles: P ₁ = 1.9 P ₁₀ = 1.9 Q ₁ = 2.0 Median = 2.0 Q ₃ = 2.1 P ₉₀ = 2.3 P ₉₉ = 3.1		Hours of Calibration:	35																					
				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-Oct	2.2	2.2	2.2	2.3	2.3	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	2.1	2.1	2.1	2.3	
2-Oct	Z	2.1	2.2	2.2	2.2	2.2	2.1	2.2	2.1	2.1	2.1	2.2	2.2	2.1	2.0	2.0	2.1	2.1	2.1	2.2	2.3	2.1	2.1	2.1	2.3	
3-Oct	2.1	Z	2.4	2.2	2.4	2.6	2.6	2.6	2.5	2.1	2.0	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.2	2.2	2.2	2.3	2.1	2.2	2.6	
4-Oct	2.2	2.2	Z	2.3	2.2	2.0	2.0	C	C	C	C	1.9	1.9	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3	
5-Oct	2.0	2.0	2.0	Z	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4	2.0	2.4	
6-Oct	2.5	2.4	2.2	2.1	Z	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.2	2.0	2.1	2.2	2.4	2.4	2.0	2.0	2.0	2.1	2.5	
7-Oct	2.0	1.9	1.9	1.9	1.9	Z	2.0	2.0	2.0	2.0	2.0	2.3	2.3	2.2	2.1	2.1	2.1	2.0	2.2	2.2	2.2	2.2	2.1	2.1	2.3	
8-Oct	Z	2.6	2.8	3.1	3.4	3.6	3.6	3.5	4.0	5.1	4.2	2.3	2.0	2.0	2.0	2.0	2.1	2.2	2.5	2.3	2.3	2.1	2.0	2.0	5.1	
9-Oct	2.0	Z	2.0	2.0	2.1	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	2.0	1.9	2.0	2.0	2.0	2.0	2.3	
10-Oct	2.0	2.1	Z	2.2	2.3	2.4	2.4	2.4	2.4	2.1	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.4	
11-Oct	2.0	2.0	2.0	Z	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
12-Oct	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.1	2.0	2.1	2.0	2.0	2.0	2.0	1.9	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	
13-Oct	2.0	2.0	2.1	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	2.0	2.1	
14-Oct	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	
15-Oct	2.0	Z	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	2.0	2.0	2.2	2.1	2.3	2.6	2.4	2.4	2.4	2.6	
16-Oct	2.4	2.4	Z	2.4	2.3	2.2	2.2	2.5	2.6	2.3	2.2	2.2	2.1	1.9	1.9	2.0	2.0	2.0	2.2	2.2	2.3	2.4	2.3	2.2	2.6	
17-Oct	2.3	2.2	2.2	Z	2.8	2.8	2.7	2.4	2.4	2.4	2.3	2.2	2.2	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.8	
18-Oct	2.1	2.1	2.5	2.3	Z	2.3	2.4	2.5	2.3	2.2	2.2	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.4	2.4	2.6	2.3	2.0	1.9	2.6	
19-Oct	2.0	2.1	2.4	2.3	2.3	Z	2.2	2.5	2.5	2.2	1.9	M	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	1.9	1.9	2.5	
20-Oct	Z	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	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	
21-Oct	2.1	Z	2.1	2.1	2.1	2.2	2.2	2.2	2.2	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	2.4	
22-Oct	2.0	2.0	Z	2.0	2.2	2.2	2.2	2.1	2.0	2.0	2.0	2.1	2.1	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.3	2.0	2.0	2.0	2.3	
23-Oct	2.0	2.0	2.0	Z	1.9	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	1.9	2.0	
24-Oct	1.9	1.9	1.9	1.9	Z	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	1.9	1.9	1.9	1.9	1.9	1.9	
25-Oct	1.9	1.9	1.9	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	M	M	M	M	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	
26-Oct	Z	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	1.9	2.1	2.2	2.0	2.0	1.9	1.9	1.9	1.9	2.2	
27-Oct	1.9	Z	2.0	2.0	2.0	1.9	2.0	2.0	2.2	2.3	2.2	2.0	2.0	2.1	2.0	1.9	1.9	1.9	1.9	2.0	1.9	1.9	2.0	2.2	2.3	
28-Oct	2.2	2.1	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.1	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.2	
29-Oct	1.9	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	1.9	1.9	1.9	1.9	2.0	2.2	2.2	2.1	2.1	2.2	2.3	2.1	2.3	
30-Oct	2.0	2.0	2.0	2.0	Z	1.9	2.0	2.0	2.0	2.0	2.2	2.1	2.0	1.9	2.0	2.0	2.0	1.9	1.9	2.0	2.0	2.1	2.1	2.3	2.3	
31-Oct	2.3	2.4	2.3	2.2	2.2	Z	2.3	2.2	2.1	M	2.0	1.9	2.1	2.1	2.1	2.0	2.1	2.1	2.0	2.1	2.1	2.1	2.0	2.1	2.4	
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan C - Calibration M - Maintenance																										



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	444	63.16	63.16
2.1 - 3.0	251	35.70	98.86
3.1 - 10.0	8	1.14	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
Fort McKay - Bertha Ganter - October 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	8	1	3	1	8	16	79	71	14	11	23	49	68	53	18	444
2.1 - 3.0	15	16	5	4	3	4	3	40	69	26	8	8	6	11	16	17	251
3.1 - 10.0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	5	0	8
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	37	25	6	8	4	12	19	119	140	40	19	31	55	79	74	35	703

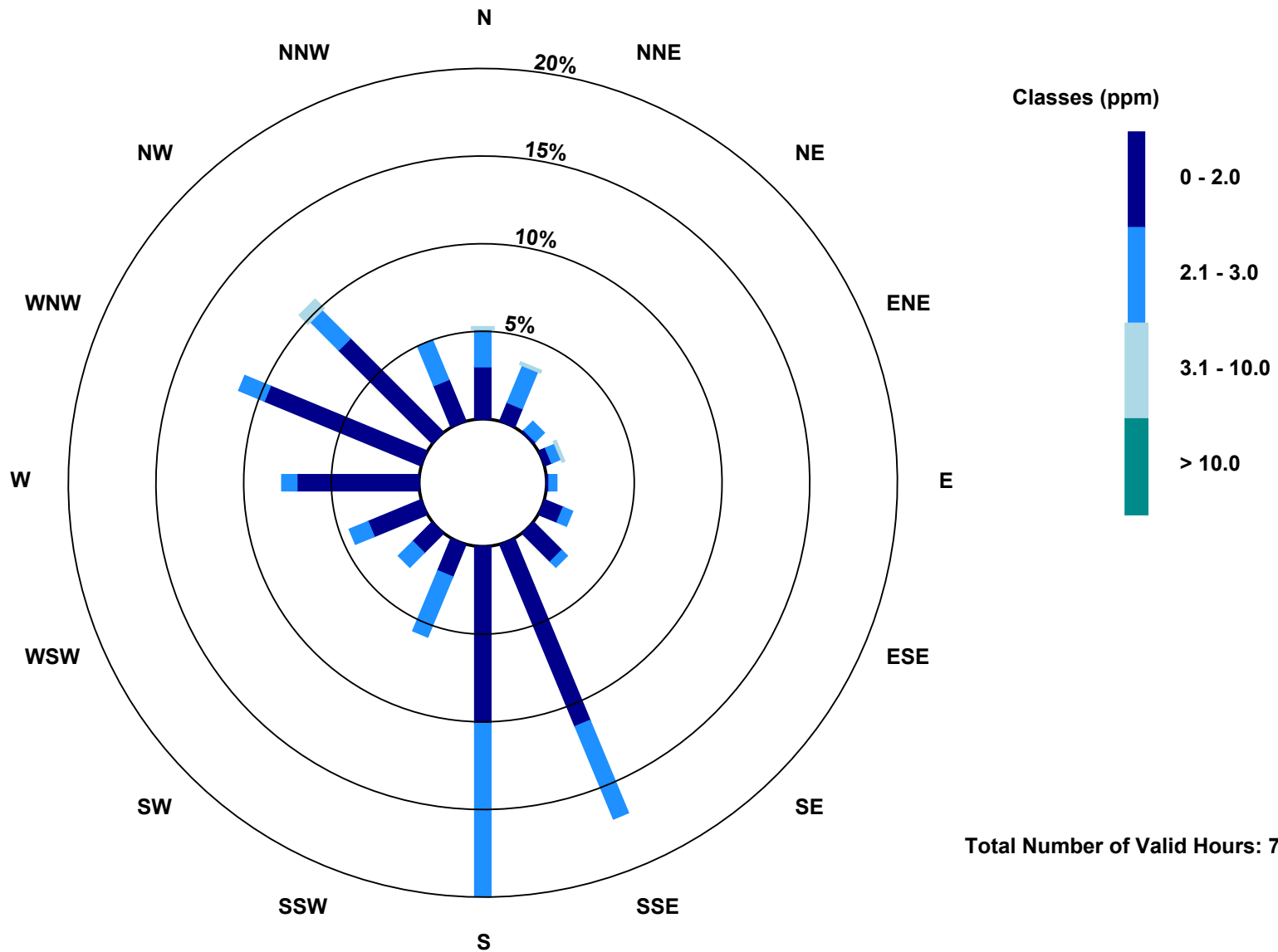
Total Number of Valid Hours: 703

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

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

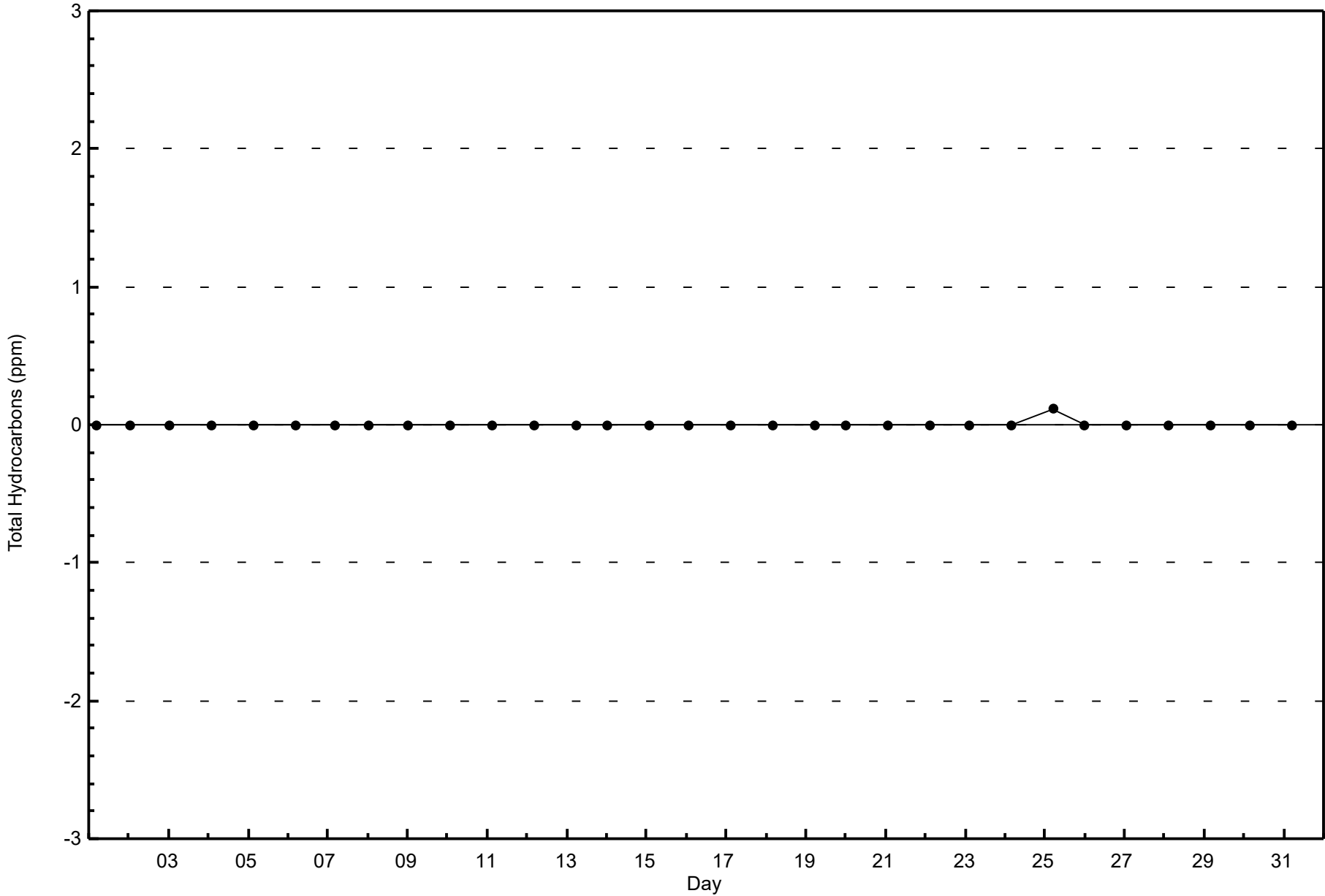


Total Number of Valid Hours: 703



Wood Buffalo Environmental Association
Zero Responses

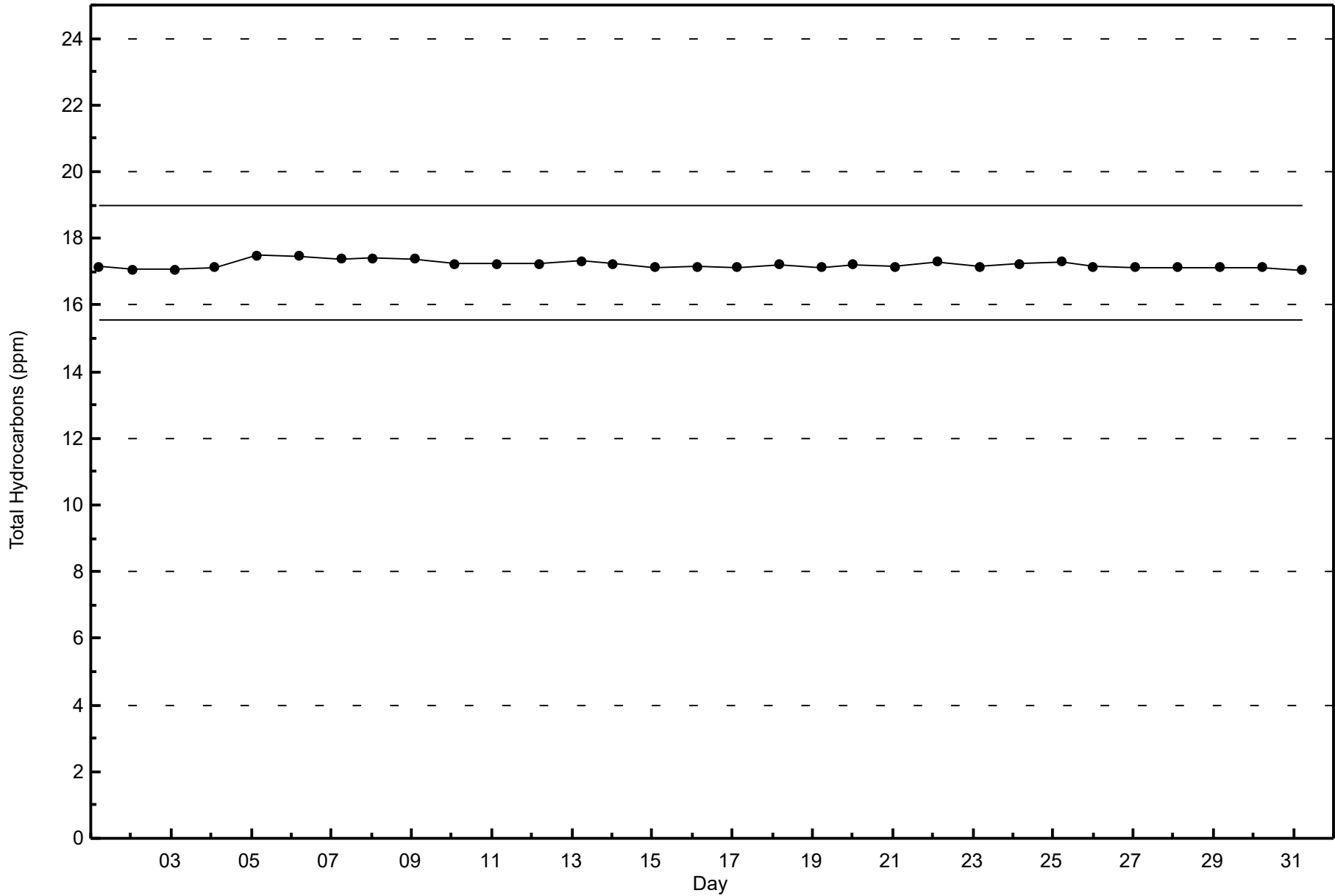
Total Hydrocarbons (THC) - ppm
Fort McKay - Bertha Ganter - October 2023





Wood Buffalo Environmental Association
Span Responses

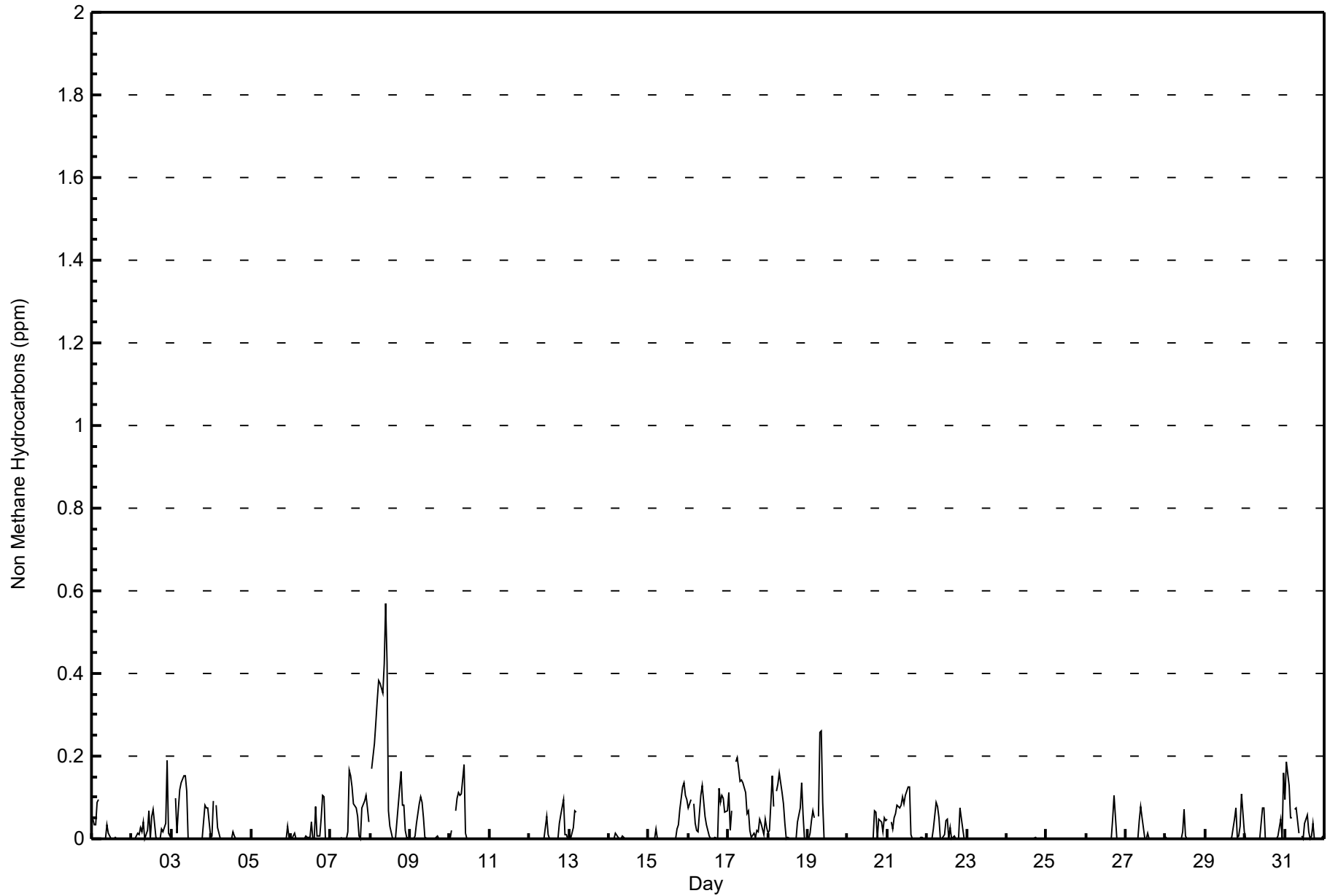
Total Hydrocarbons (THC) - ppm
Fort McKay - Bertha Ganter - October 2023





Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	456	64.86	64.86
0.006 - 0.05	120	17.07	81.93
0.06 - 0.1	101	14.37	96.30
> 0.1	26	3.70	100.00

Total Number of Valid Hours: 703

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Fort McKay - Bertha Ganter - October 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	19	8	3	3	1	9	14	84	84	13	11	24	49	67	52	15	456
0.006 - 0.05	10	5	3	3	1	0	3	17	24	14	7	4	4	7	9	9	120
0.06 - 0.1	5	11	0	1	2	1	1	16	27	12	1	3	2	4	7	8	101
> 0.1	3	1	0	1	0	2	1	2	5	1	0	0	0	1	6	3	26
Totals	37	25	6	8	4	12	19	119	140	40	19	31	55	79	74	35	703

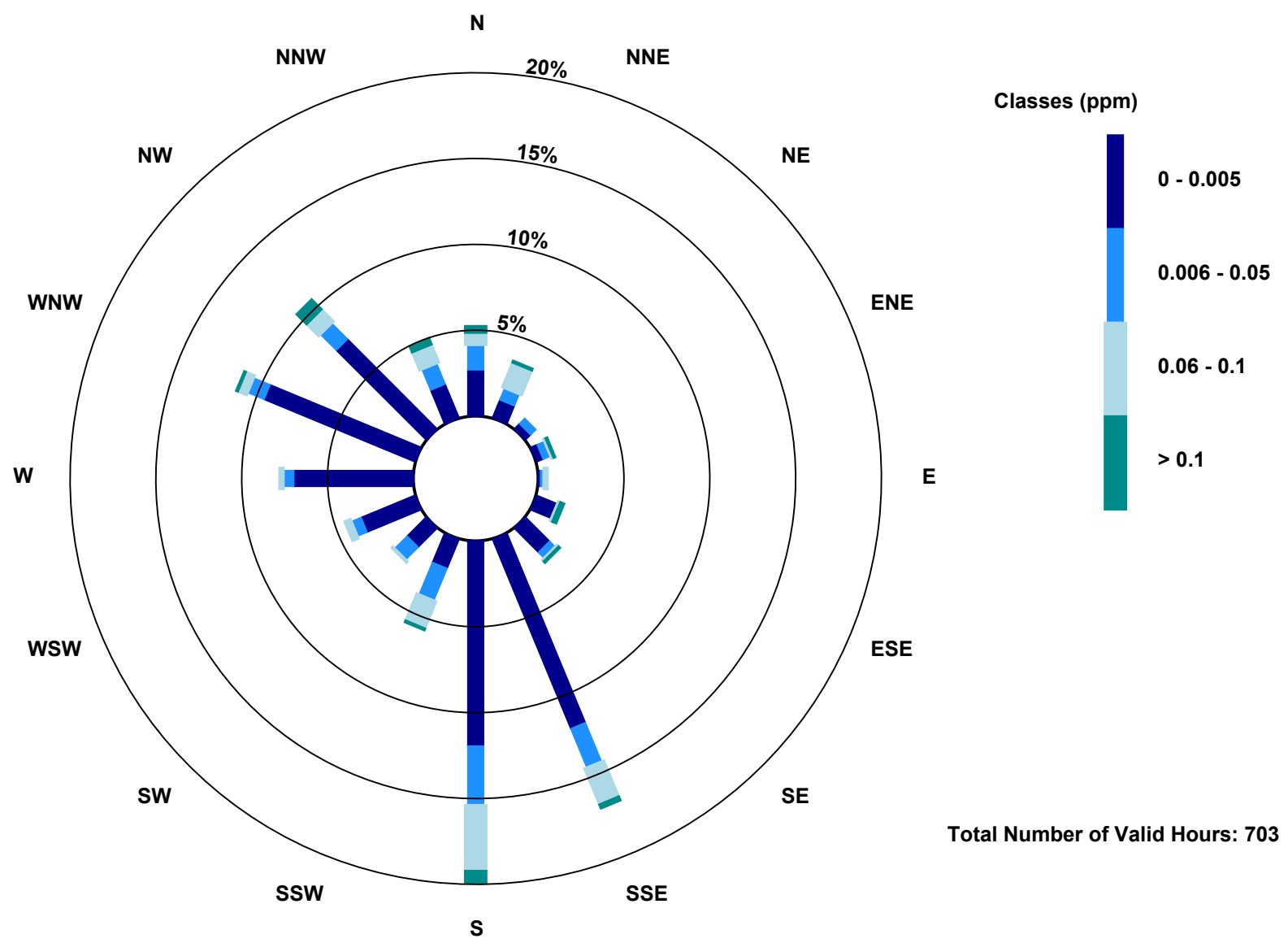
Total Number of Valid Hours: 703

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

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



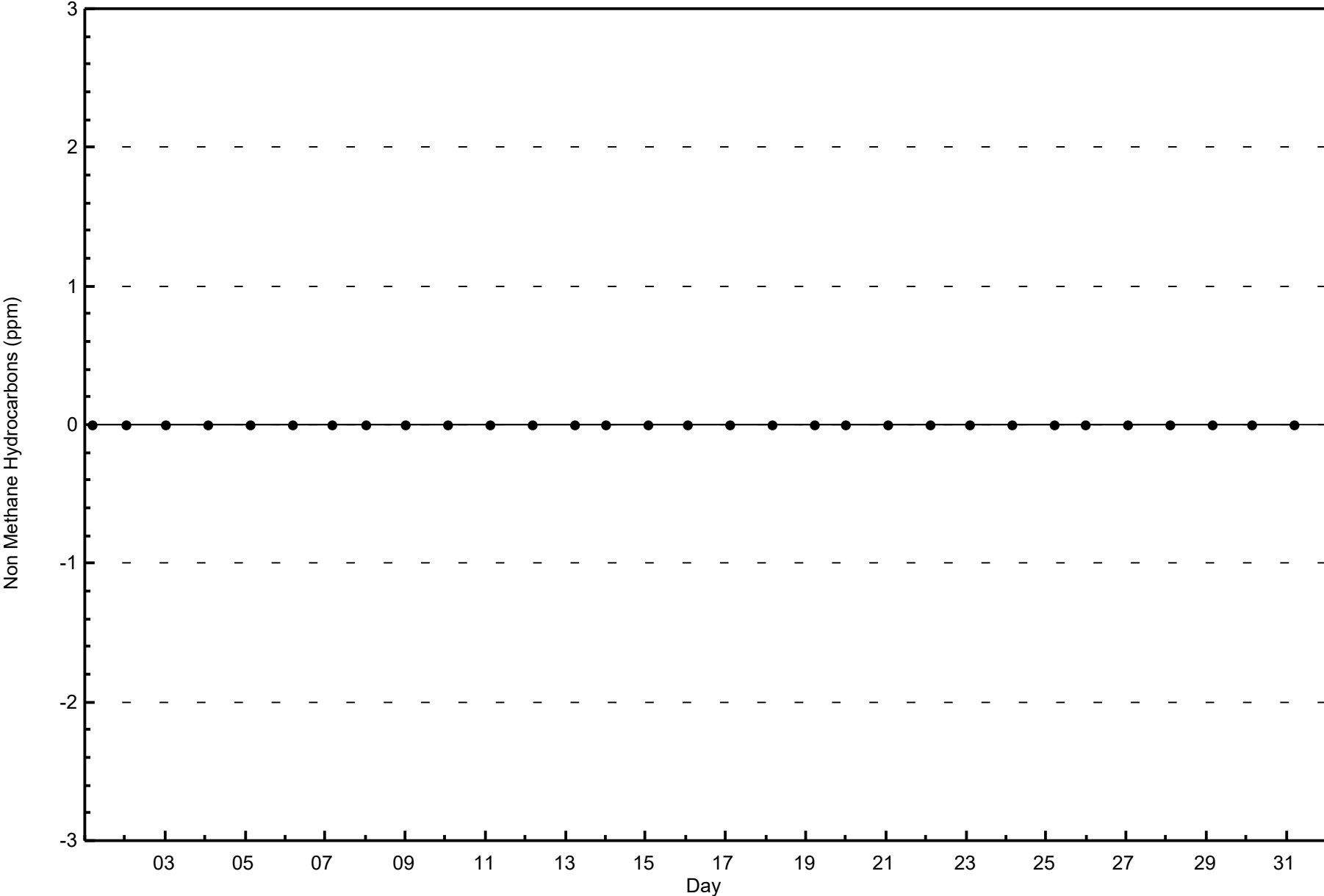


Wood Buffalo Environmental Association

Zero Responses

Non Methane Hydrocarbons (NMHC) - ppm

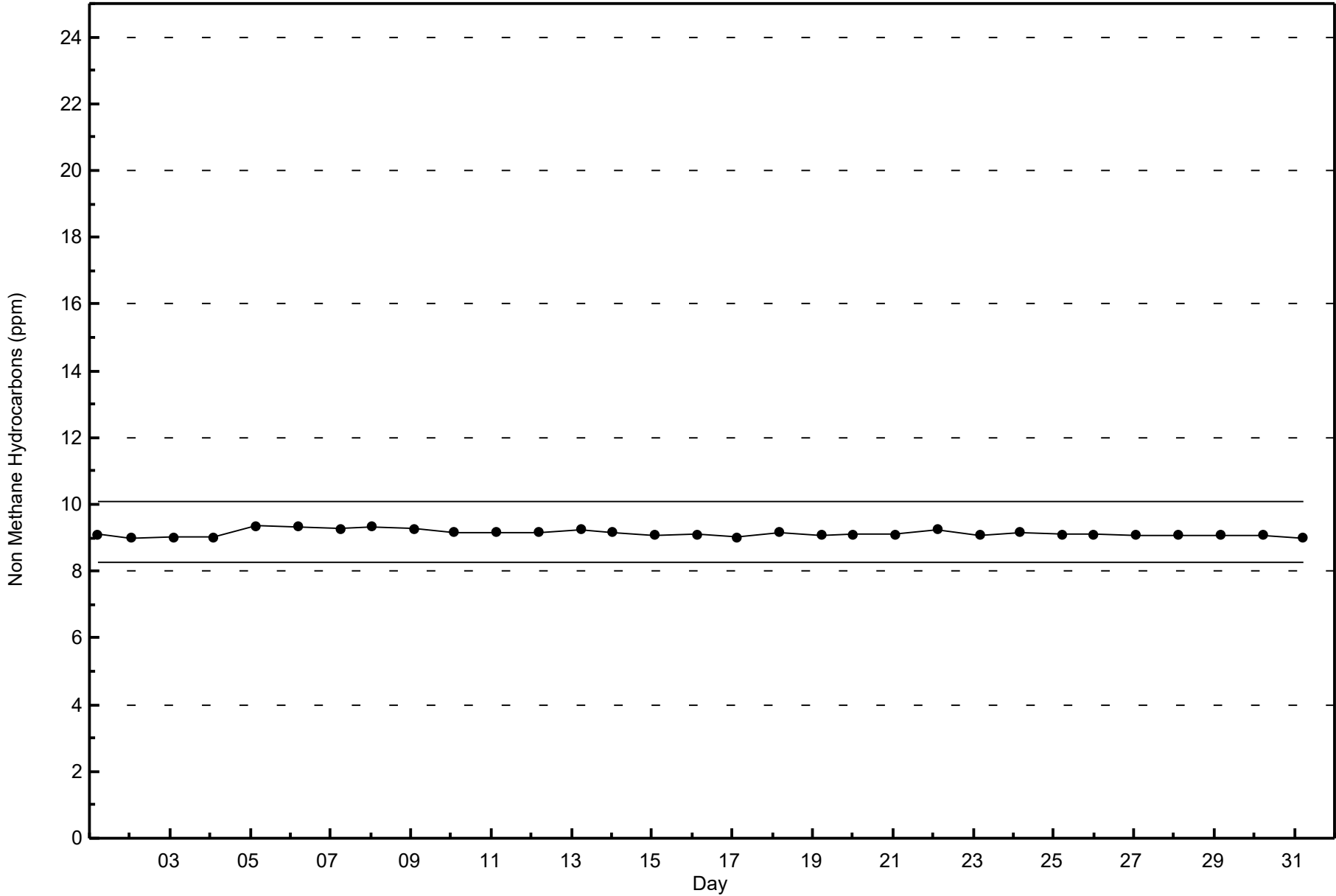
Fort McKay - Bertha Ganter - October 2023





Wood Buffalo Environmental Association
Span Responses

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





Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH₄) - ppm

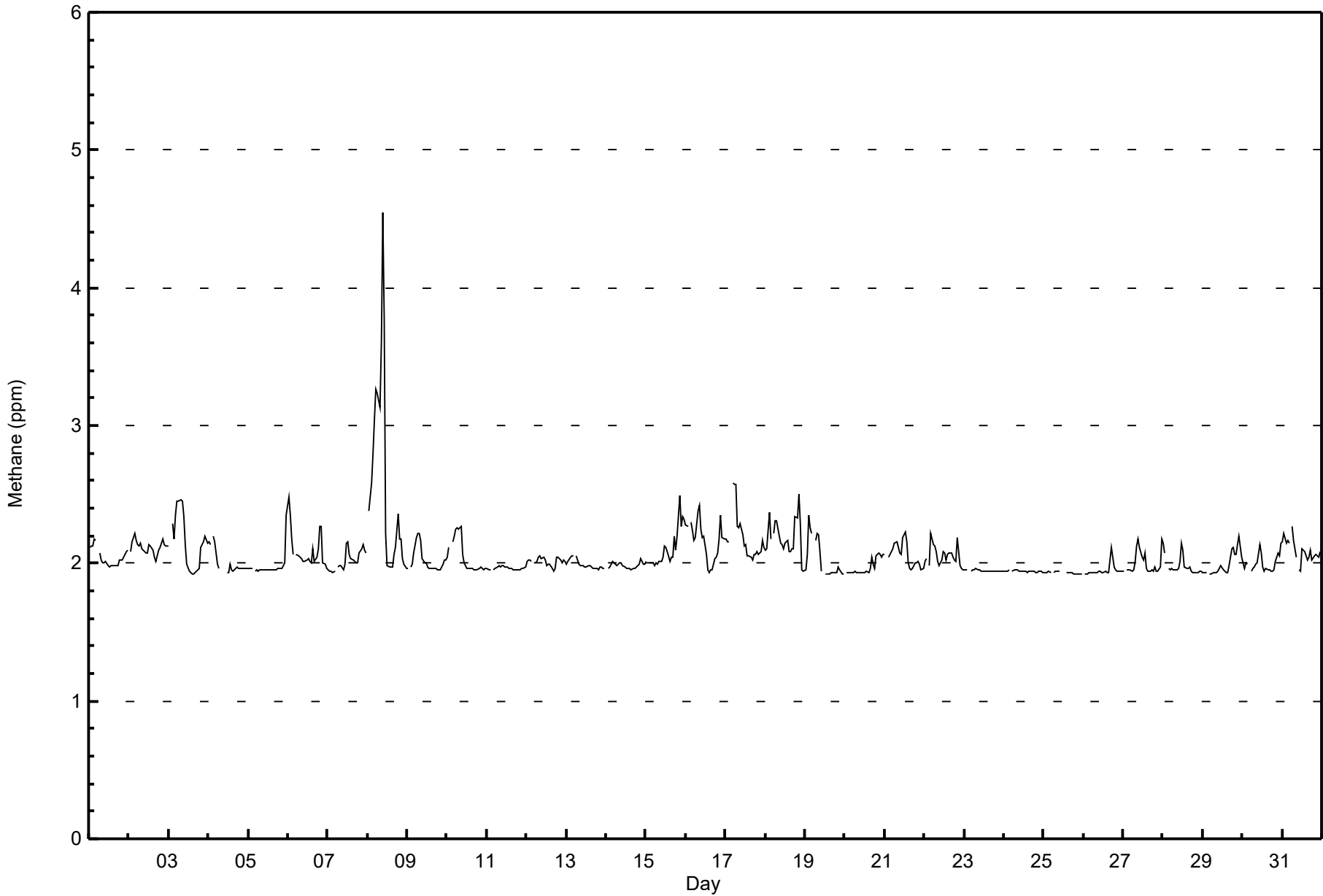
Fort McKay - Bertha Ganter - October 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		744																		
Maximum Value: 4.6 ppm on Oct 8 10:00		Maximum Daily Average: 2.6 ppm on Oct 8		Minimum Value: 1.9 ppm on Oct 26 02:00		Minimum Daily Average: 1.9 ppm on Oct 25		Hours of Data:		703																
Maximum Diurnal Average: 2.1 ppm at hour 10		Minimum Diurnal Average: 2.0 ppm at hour 16		Hours of Missing Data:		41		Hours of Calibration:		35																
Monthly Average: 2.05 ppm		Percentiles: P ₁ = 1.9 P ₁₀ = 1.9 Q ₁ = 2.0 Median = 2.0 Q ₃ = 2.1 P ₉₀ = 2.2 P ₉₉ = 2.8		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-Oct	2.1	2.1	2.1	2.2	2.2	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	2.1	2.1	2.0	2.2	
2-Oct	Z	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	
3-Oct	2.1	Z	2.3	2.2	2.4	2.4	2.4	2.5	2.5	2.3	2.1	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.1	2.1	2.2	2.2	2.1	2.2	2.5	
4-Oct	2.2	2.1	Z	2.2	2.2	2.0	2.0	C	C	C	C	1.9	1.9	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	
5-Oct	2.0	2.0	2.0	Z	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3	2.0	
6-Oct	2.5	2.4	2.2	2.1	Z	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.3	2.3	2.0	2.0	2.0	2.0	2.1	
7-Oct	2.0	1.9	1.9	1.9	1.9	Z	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.0	
8-Oct	Z	2.4	2.6	2.8	3.0	3.3	3.2	3.1	3.6	4.6	3.8	2.2	2.0	2.0	2.0	2.0	2.1	2.1	2.4	2.2	2.2	2.0	2.0	2.0	2.6	
9-Oct	2.0	Z	2.0	2.0	2.1	2.2	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	1.9	2.0	2.0	2.0	2.0	2.0	
10-Oct	2.0	2.1	Z	2.2	2.2	2.2	2.3	2.3	2.3	2.1	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
11-Oct	2.0	2.0	2.0	Z	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
12-Oct	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
13-Oct	2.0	2.0	2.0	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	2.0	2.0	
14-Oct	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	
15-Oct	2.0	Z	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	2.0	2.0	2.2	2.1	2.2	2.5	2.3	2.3	2.3	2.1	
16-Oct	2.3	2.3	Z	2.3	2.2	2.2	2.2	2.4	2.4	2.3	2.2	2.2	2.1	1.9	1.9	2.0	2.0	2.0	2.0	2.1	2.2	2.3	2.2	2.2	2.2	
17-Oct	2.2	2.2	2.2	Z	2.6	2.6	2.6	2.3	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.2	
18-Oct	2.1	2.1	2.4	2.2	Z	2.2	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.3	2.3	2.5	2.3	2.0	1.9	2.2	
19-Oct	2.0	2.1	2.3	2.3	2.2	Z	2.2	2.2	2.2	2.1	1.9	M	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	1.9	1.9	2.0	
20-Oct	Z	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	2.0	2.0	2.1	2.1	2.1	2.0	2.1	2.0	
21-Oct	2.1	Z	2.0	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	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	
22-Oct	2.0	2.0	Z	2.0	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.2	2.0	2.0	2.0	2.1	
23-Oct	2.0	2.0	2.0	Z	1.9	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	1.9	1.9	
24-Oct	1.9	1.9	1.9	1.9	Z	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	1.9	1.9	1.9	1.9	1.9	1.9	
25-Oct	1.9	1.9	1.9	1.9	1.9	Z	1.9	1.9	1.9	1.9	M	M	M	M	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	
26-Oct	Z	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	1.9	2.0	2.1	2.0	2.0	1.9	1.9	1.9	1.9	1.9	
27-Oct	1.9	Z	2.0	2.0	2.0	1.9	2.0	2.0	2.1	2.2	2.1	2.0	2.0	2.1	2.0	1.9	1.9	1.9	1.9	2.0	1.9	1.9	2.0	2.2	2.0	
28-Oct	2.1	2.1	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	
29-Oct	1.9	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	1.9	1.9	1.9	1.9	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.0	2.0	
30-Oct	2.0	2.0	2.0	2.0	Z	1.9	2.0	2.0	2.0	2.0	2.1	2.1	2.0	1.9	2.0	2.0	2.0	1.9	1.9	2.0	2.0	2.1	2.1	2.1	2.0	
31-Oct	2.2	2.2	2.1	2.2	2.1	Z	2.3	2.2	2.0	M	2.0	1.9	2.1	2.1	2.1	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.0	2.1	2.1	
																								Diurnal Average		
																								Diurnal Maximum		
																								2.1 2.5		
																								2.0 2.8		
																								Z - zerospan C - Calibration M - Maintenance		



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	464	66.00	66.00
2.1 - 3.0	233	33.14	99.15
3.1 - 10.0	6	0.85	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
Fort McKay - Bertha Ganter - October 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	12	2	3	1	9	16	84	75	14	12	23	49	69	53	18	464
2.1 - 3.0	12	12	4	4	3	3	3	35	65	26	7	8	6	10	18	17	233
3.1 - 10.0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	3	0	6
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	37	25	6	8	4	12	19	119	140	40	19	31	55	79	74	35	703

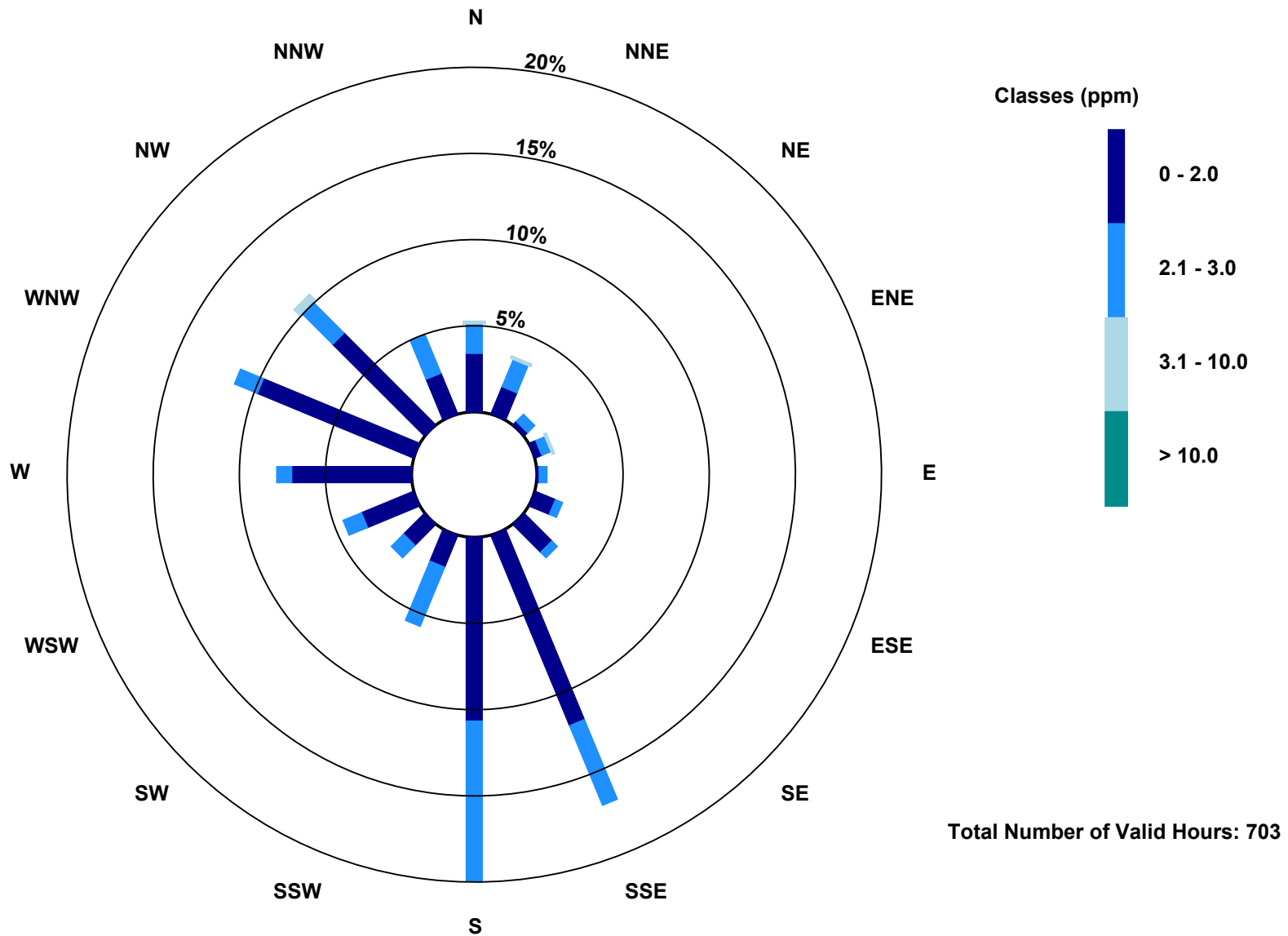
Total Number of Valid Hours: 703

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

Methane (CH₄) - ppm
Fort McKay - Bertha Ganter



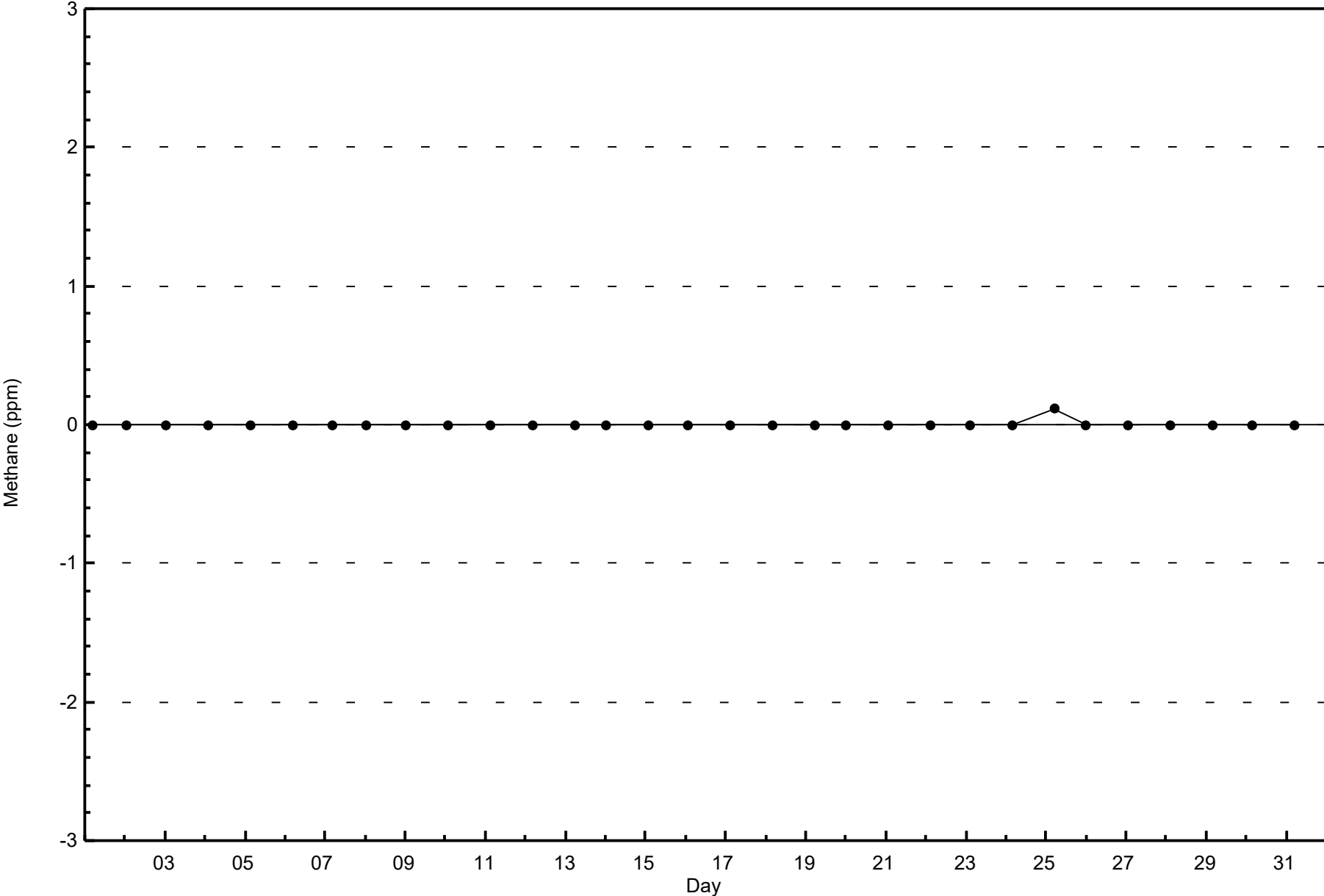


Wood Buffalo Environmental Association

Zero Responses

Methane (CH₄) - ppm

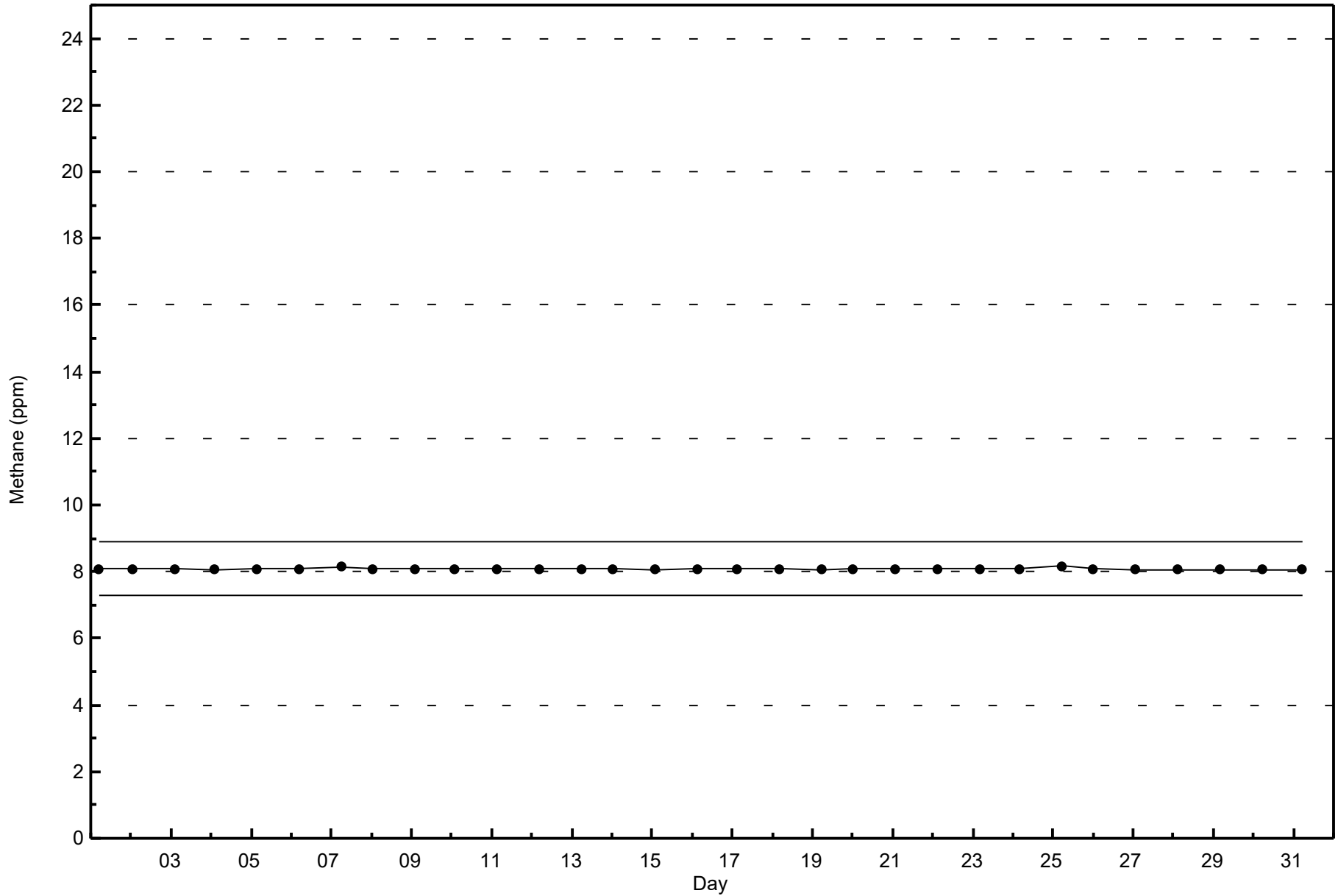
Fort McKay - Bertha Ganter - October 2023





Wood Buffalo Environmental Association
Span Responses

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





Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

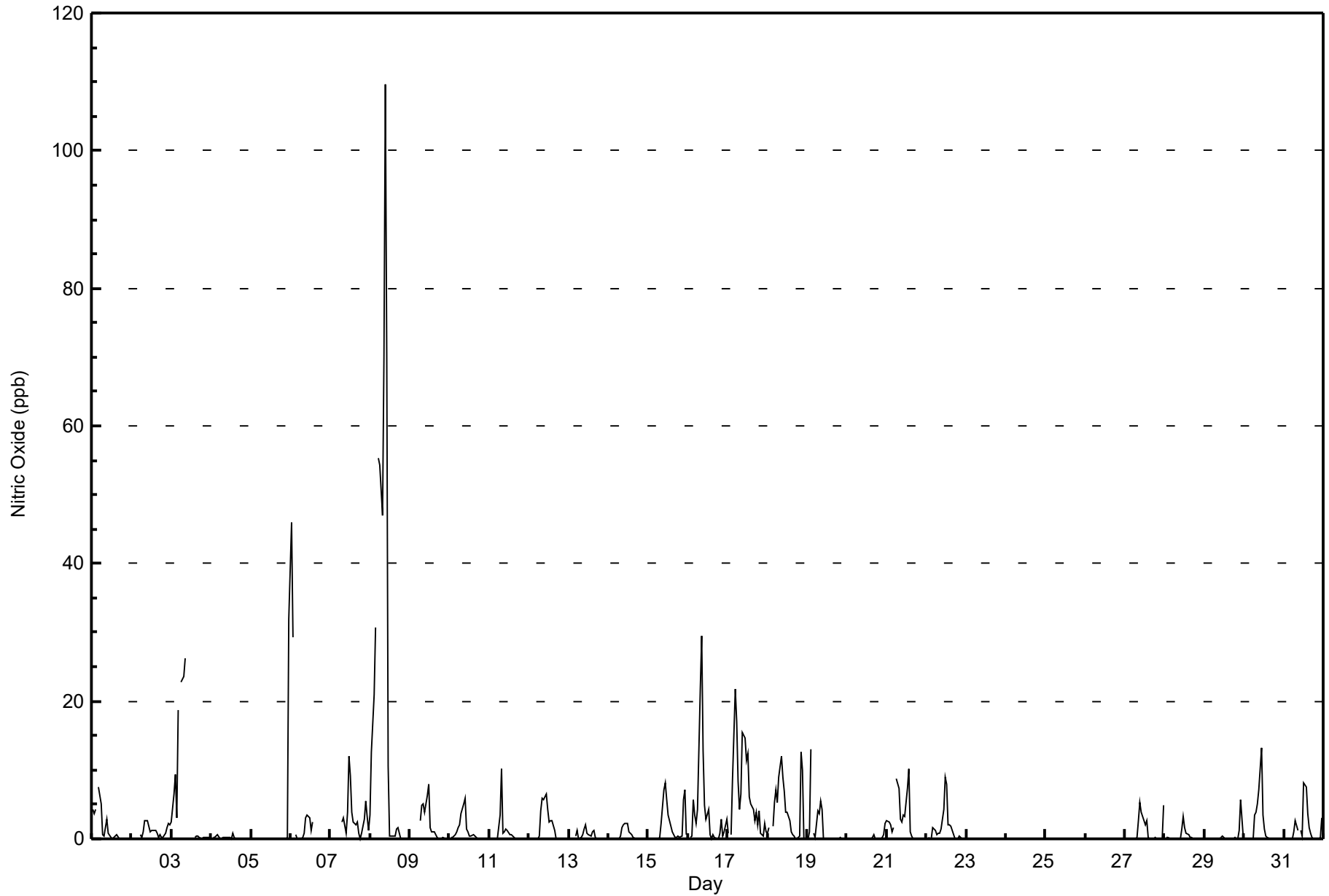
Fort McKay - Bertha Ganter - October 2023

Maximum Value: 109.7 ppb on Oct 8 10:00 Maximum Daily Average: 21.3 ppb on Oct 8 Minimum Value: 0.0 ppb on Oct 1 18:00 Minimum Daily Average: 0.0 ppb on Oct 25 Maximum Diurnal Average: 7.0 ppb at hour 10 Minimum Diurnal Average: 0.1 ppb at hour 19 Monthly Average: 2.34 ppb Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 1.6 P ₉₀ = 5.4 P ₉₉ = 33.5																								Hours in Service:	744		
																								Hours of Data:	690		
																								Hours of Missing Data:	54		
																								Hours of Calibration:	35		
																								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-Oct	4.3	3.6	4.2	Z	7.5	5.0	0.6	0.4	1.6	2.9	0.8	0.1	0.0	0.2	0.4	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	1.4	7.5		
2-Oct	0.0	0.0	0.0	0.0	Z	0.6	0.2	1.0	2.7	2.6	1.9	1.1	1.3	1.2	1.2	0.8	0.2	0.6	0.2	0.1	0.7	1.5	2.2	2.0	1.0	2.7	
3-Oct	2.4	6.5	9.3	3.0	18.7	Z	22.8	23.5	26.2	C	C	C	C	C	0.1	0.4	0.5	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	6.4	26.2
4-Oct	Z	0.2	0.3	0.5	0.6	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.9	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.9
5-Oct	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	0.3	32.0	1.4	32.0	
6-Oct	45.9	29.4	Z	0.6	0.1	0.0	0.0	0.2	0.9	3.0	3.5	3.0	1.3	2.5	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	45.9
7-Oct	UO	UO	UO	UO	UO	UO	UO	2.4	3.1	0.9	3.8	11.9	9.2	3.8	2.5	2.0	2.4	0.8	0.0	0.7	2.9	5.6	3.3	1.2	--	11.9	
8-Oct	3.5	12.6	20.9	30.8	Z	55.3	54.3	46.9	69.9	109.7	70.1	10.7	0.4	0.5	0.3	0.3	1.4	1.7	0.0	0.0	0.0	0.0	0.0	0.0	21.3	109.7	
9-Oct	0.0	0.0	0.0	0.0	0.1	Z	2.7	4.9	5.2	3.9	6.3	7.9	1.6	0.9	0.9	0.9	0.3	0.0	0.0	0.0	0.1	0.0	0.0	0.1	1.6	7.9	
10-Oct	Z	0.2	0.2	0.5	1.1	1.6	2.1	3.6	5.1	6.0	1.3	1.0	0.3	0.4	0.6	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	6.0	
11-Oct	0.0	Z	0.0	0.0	0.0	0.0	3.4	10.1	0.9	1.0	1.4	1.3	0.7	0.6	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	10.1	
12-Oct	0.0	0.0	Z	0.0	0.0	0.0	0.3	4.1	5.9	5.7	6.5	4.3	2.4	2.6	2.6	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	6.5	
13-Oct	0.0	0.0	0.1	Z	0.4	1.2	0.0	0.2	0.7	1.5	1.9	0.8	0.5	0.4	1.0	1.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.9	
14-Oct	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.5	1.7	2.0	2.3	0.9	0.7	0.5	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	2.3	
15-Oct	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.3	2.2	7.2	8.1	5.6	3.4	2.7	1.0	0.6	0.3	0.1	0.3	0.2	0.3	5.6	7.2	0.7	2.0	8.1	
16-Oct	Z	0.2	0.4	5.7	3.5	2.2	4.3	21.7	29.5	12.8	4.8	2.8	4.4	0.6	0.6	0.2	0.0	0.0	0.7	2.7	0.4	1.1	2.8	4.4	29.5		
17-Oct	0.7	Z	0.6	8.5	21.7	17.0	8.3	4.3	6.6	15.4	14.6	11.3	12.3	6.0	5.1	4.3	2.7	3.8	2.0	4.0	0.8	0.3	2.2	1.0	6.7	21.7	
18-Oct	0.9	1.6	Z	1.9	5.3	7.1	5.3	9.0	12.0	9.0	6.9	3.8	4.0	2.7	1.0	0.6	0.4	0.0	0.0	0.4	12.5	10.0	0.0	0.0	4.1	12.5	
19-Oct	0.0	0.9	13.0	Z	0.9	0.2	4.0	3.7	5.4	4.4	0.1	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	1.5	13.0	
20-Oct	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	0.2	0.5	0.1	0.0	0.0	0.0	0.2	0.5	2.3	0.2	2.3	
21-Oct	2.7	2.4	2.1	1.0	1.6	Z	8.7	7.4	2.9	2.5	3.4	3.2	7.2	10.2	0.9	0.3	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	2.5	10.2	
22-Oct	Z	0.1	0.1	0.1	1.6	1.2	0.7	0.8	0.7	1.3	4.3	9.0	7.9	2.0	2.1	1.8	0.6	0.0	0.0	0.0	0.4	0.0	0.0	0.0	1.5	9.0	
23-Oct	0.0	Z	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	0.0
24-Oct	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
25-Oct	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
26-Oct	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	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
27-Oct	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.2	2.6	5.2	3.8	2.7	2.1	2.7	0.3	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	5.0	1.1	5.2	
28-Oct	Z	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.4	3.3	1.5	0.7	0.6	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	3.3	
29-Oct	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0	1.3	5.6	0.0	0.3	5.6	
30-Oct	0.0	0.0	Z	0.0	0.0	0.0	3.5	3.9	5.1	7.2	13.2	3.4	1.5	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	13.2	
31-Oct	0.0	0.0	0.0	Z	0.0	0.0	1.1	2.6	1.3	M	1.2	0.4	8.1	7.4	3.6	1.7	0.8	0.1	0.0	0.0	0.0	0.1	0.2	3.0	1.4	8.1	
2.4 2.3 2.0 2.1 2.5 3.7 4.1 4.9 6.2 7.0 5.4 3.1 2.4 1.7 0.8 0.6 0.4 0.3 0.1 0.2 0.7 0.8 0.8 1.7																								Diurnal Average			
45.9 29.4 20.9 30.8 21.7 55.3 54.3 46.9 69.9 109.7 70.1 11.9 12.3 10.2 5.1 4.3 2.7 3.8 2.0 4.0 12.5 10.0 7.2 32.0																								Diurnal Maximum			
Z - zerospan C - Calibration M - Maintenance UO - Unstable Operation																											



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	673	97.54	97.54
21 - 40	10	1.45	98.99
41 - 80	6	0.87	99.86
81 - 159	1	0.14	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 690

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Nitric Oxide (NO) - ppb
Fort McKay - Bertha Ganter - October 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	24	6	7	4	11	18	114	135	39	18	28	53	77	72	36	673
21 - 40	1	0	0	0	0	1	1	2	0	2	0	1	0	0	1	1	10
11 - 80	1	0	0	1	0	0	0	0	0	0	1	0	0	0	3	0	6
81 - 159	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	33	25	6	8	4	12	19	116	135	41	19	29	53	77	76	37	690

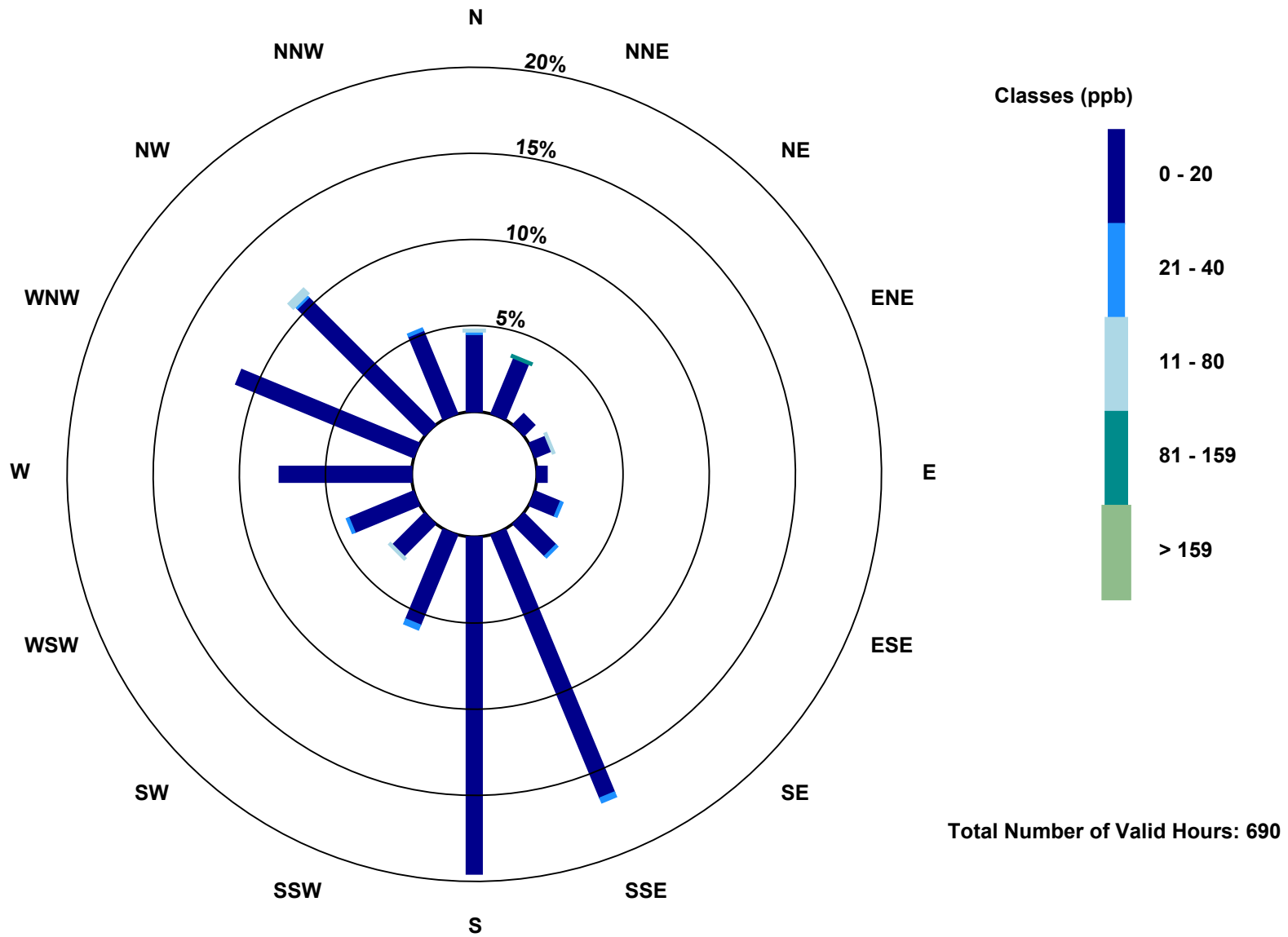
Total Number of Valid Hours: 690

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

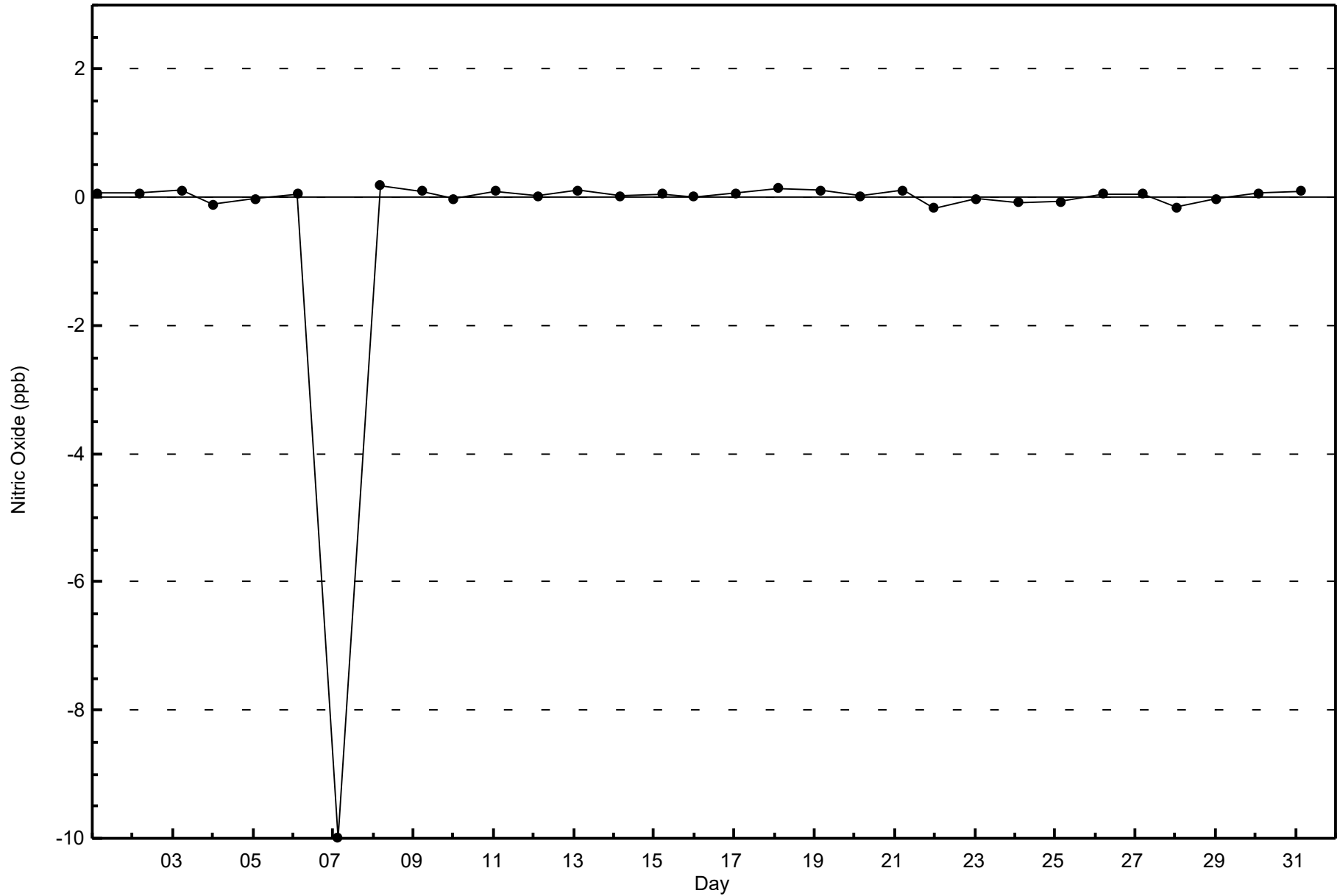
Nitric Oxide (NO) - ppb
Fort McKay - Bertha Ganter

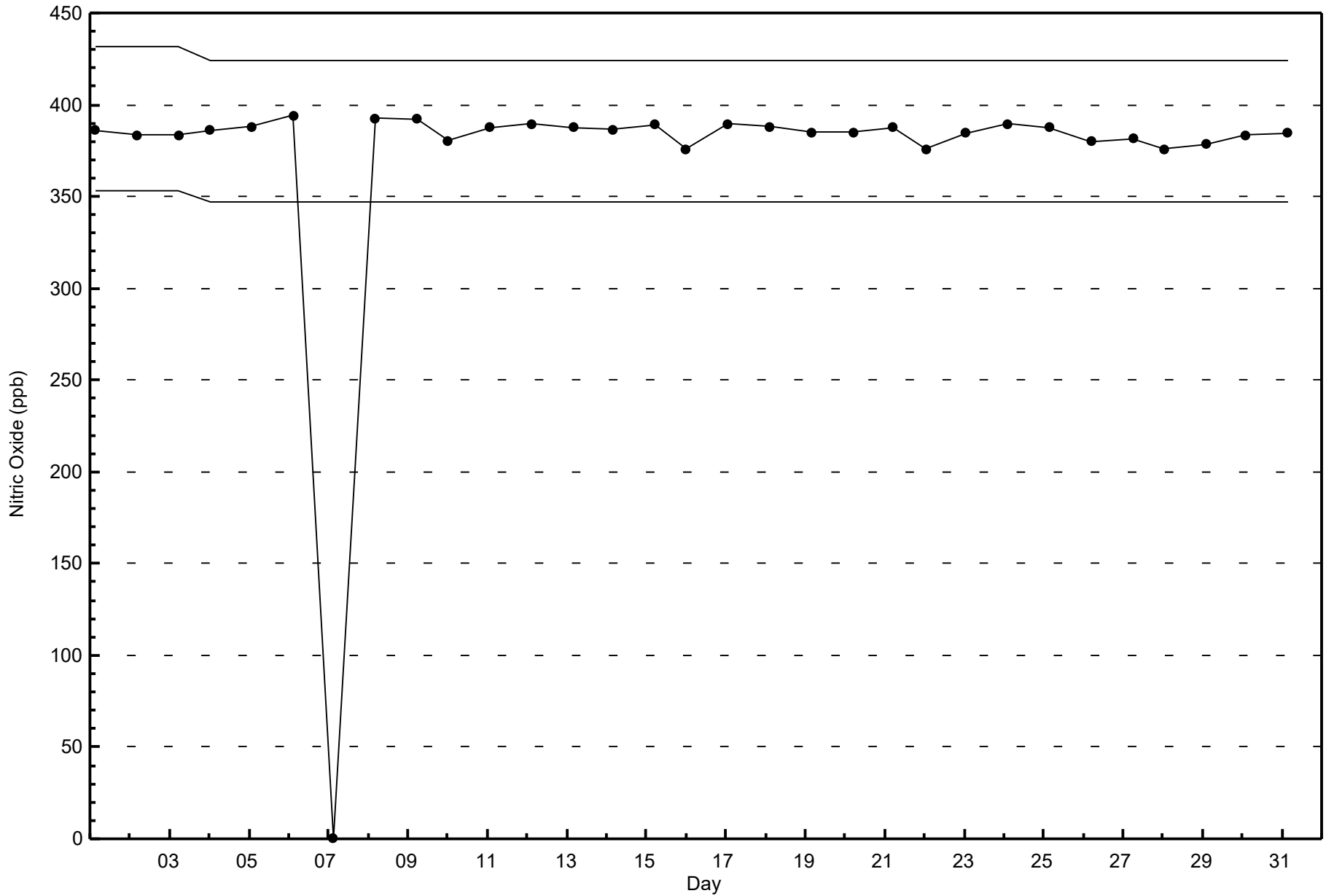




Wood Buffalo Environmental Association
Zero Responses

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







Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

Fort McKay - Bertha Ganter - October 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 25.0 ppb on Oct 16 21:00	Maximum Daily Average: 10.7 ppb on Oct 17		Hours of Data:	690
Minimum Value: 0.0 ppb on Oct 4 19:00	Minimum Daily Average: 0.2 ppb on Oct 23		Hours of Missing Data:	54
Maximum Diurnal Average: 6.4 ppb at hour 21	Minimum Diurnal Average: 3.0 ppb at hour 15		Hours of Calibration:	35
Monthly Average: 5.02 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.6 Median = 3.8 Q ₃ = 8.2 P ₉₀ = 12.0 P ₉₉ = 19.4		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-Oct	4.7	5.2	5.5	Z	7.5	8.0	6.6	4.6	4.0	4.5	1.7	0.8	0.6	1.1	1.5	2.2	1.3	1.2	2.7	5.5	4.5	3.7	2.2	2.5	3.6	8.0
2-Oct	2.4	2.5	2.6	3.2	Z	15.0	9.2	8.8	7.3	6.8	5.0	3.8	4.1	3.7	3.6	2.0	1.5	6.8	9.5	6.5	5.6	4.7	2.8	2.7	5.2	15.0
3-Oct	2.4	2.5	2.8	2.4	4.3	Z	3.2	3.3	4.5	C	C	C	C	C	0.5	2.2	3.8	2.9	7.6	8.2	7.1	10.8	5.0	4.8	4.4	10.8
4-Oct	Z	6.4	10.3	13.0	8.1	0.6	0.6	0.6	0.5	0.3	0.2	0.2	0.1	3.0	1.0	0.1	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	2.0	13.0
5-Oct	0.0	Z	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	0.3	1.4	1.4	0.2	1.1	5.3	14.3	1.1	14.3
6-Oct	16.3	10.7	Z	6.3	6.1	5.8	4.7	3.5	5.6	7.8	5.3	4.1	4.1	6.2	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	16.3
7-Oct	UO	UO	UO	UO	UO	UO	UO	4.4	3.0	1.4	4.9	14.3	12.6	11.0	9.7	9.2	11.2	11.1	10.1	12.9	12.0	12.1	9.6	7.2	--	14.3
8-Oct	6.5	7.0	6.4	5.8	Z	4.5	5.4	4.7	5.9	12.0	14.0	9.2	1.4	1.8	2.1	2.9	12.3	17.6	17.5	7.0	10.0	8.4	5.1	6.3	7.6	17.6
9-Oct	6.5	5.0	3.3	5.4	5.9	Z	6.1	5.7	3.9	5.2	8.8	9.8	3.2	2.5	3.0	3.7	2.5	1.9	1.5	2.1	2.2	2.4	3.7	2.8	4.2	9.8
10-Oct	Z	4.5	4.1	5.5	5.7	6.3	5.1	3.8	2.9	4.9	2.1	1.9	1.0	1.3	2.0	2.3	1.3	1.1	1.3	0.8	2.2	1.5	1.9	1.8	2.8	6.3
11-Oct	2.2	Z	1.3	0.8	0.7	1.4	2.5	8.7	3.3	2.3	3.1	2.7	1.9	2.1	1.8	1.9	0.9	1.3	1.2	1.2	0.6	1.6	2.5	3.3	2.1	8.7
12-Oct	7.2	9.9	Z	10.8	7.6	5.5	6.4	9.4	8.7	10.0	11.5	8.7	6.3	7.4	8.9	6.7	2.9	5.4	5.5	8.5	16.3	10.3	10.9	9.8	8.5	16.3
13-Oct	5.6	9.6	13.3	Z	13.7	11.9	5.0	2.7	3.6	4.3	5.4	3.9	3.8	3.3	3.8	4.9	3.3	2.5	2.4	1.6	2.7	3.6	1.8	1.6	5.0	13.7
14-Oct	2.9	2.8	2.8	6.0	Z	10.2	6.3	6.0	5.5	5.7	4.3	4.4	2.3	2.0	2.1	1.8	2.5	2.9	1.3	3.5	2.1	1.5	4.6	10.7	4.1	10.7
15-Oct	10.8	11.1	9.3	8.1	5.8	Z	5.5	4.5	6.8	9.6	10.5	7.3	5.7	5.3	4.5	3.5	4.0	7.7	12.8	10.2	10.1	16.0	14.4	9.8	8.4	16.0
16-Oct	Z	9.2	10.6	13.0	9.8	6.1	7.4	11.4	11.3	8.7	5.5	4.2	7.6	1.5	0.5	4.2	4.5	5.9	12.1	21.2	25.0	19.3	16.6	17.8	10.1	25.0
17-Oct	12.8	Z	9.1	10.3	13.6	16.6	16.3	14.2	11.5	12.4	10.1	8.5	9.2	7.1	7.5	7.1	7.7	10.4	11.0	11.8	10.0	8.7	10.0	9.1	10.7	16.6
18-Oct	8.1	6.6	Z	7.7	7.2	7.1	6.4	4.5	6.8	8.2	6.9	7.5	6.9	6.2	3.7	4.0	4.9	7.1	8.9	9.7	15.5	9.7	0.8	0.5	6.7	15.5
19-Oct	1.6	10.8	22.9	Z	13.9	11.5	18.4	16.6	13.5	9.0	0.4	M	0.3	0.1	0.1	0.2	1.1	0.8	0.3	1.0	8.2	2.1	0.0	0.2	6.0	22.9
20-Oct	0.2	0.2	0.1	0.5	Z	0.3	0.5	0.4	0.2	0.0	0.0	0.0	0.0	0.5	0.3	1.8	5.0	6.0	6.3	8.7	8.4	10.9	10.4	12.5	3.2	12.5
21-Oct	10.6	9.2	7.3	7.7	7.0	Z	8.8	10.5	9.2	8.8	9.4	7.8	8.7	10.7	4.4	4.6	1.4	2.8	5.2	5.7	7.3	10.7	1.5	1.4	7.0	10.7
22-Oct	Z	11.3	6.3	2.1	13.1	12.6	9.3	6.3	2.3	2.3	5.9	9.5	10.6	8.2	10.6	13.2	10.3	8.1	7.9	5.2	14.2	1.7	0.2	0.0	7.4	14.2
23-Oct	0.0	Z	0.0	0.0	0.2	0.8	0.6	0.7	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.1	0.0	0.0	0.2	0.8
24-Oct	0.1	0.0	Z	0.6	0.7	0.6	1.3	1.0	0.5	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	0.0	0.0	0.2	1.3
25-Oct	0.0	0.0	0.0	Z	0.1	0.2	0.7	1.1	0.7	0.4	0.3	0.1	0.1	0.0	0.1	0.0	0.1	0.5	0.0	0.0	0.0	0.1	0.2	0.1	0.2	1.1
26-Oct	0.0	0.0	0.0	0.0	Z	0.0	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.1	9.6	5.5	0.6	0.4	0.1	0.2	0.1	1.0	9.6
27-Oct	0.2	0.0	2.1	7.0	4.0	Z	0.2	7.0	14.5	15.0	13.6	5.9	5.6	6.8	1.4	0.1	0.0	0.2	1.0	1.4	1.4	1.4	4.5	23.6	5.1	23.6
28-Oct	Z	18.3	13.7	1.5	0.7	0.5	0.5	0.2	0.3	0.3	3.3	10.5	6.4	2.2	2.6	3.3	5.7	0.8	0.0	0.0	0.0	0.0	0.5	0.0	3.1	18.3
29-Oct	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.2	1.7	2.8	0.6	0.0	0.0	0.0	4.5	19.8	20.0	12.0	14.7	17.6	24.9	14.1	5.8	24.9
30-Oct	8.6	4.1	Z	6.7	0.7	2.9	12.2	13.8	12.3	11.3	13.5	7.6	4.0	1.6	1.5	1.2	2.1	1.6	1.3	1.2	3.6	8.2	12.3	5.6	6.0	13.8
31-Oct	6.5	5.7	5.1	Z	5.4	4.4	15.2	17.0	7.3	M	3.7	1.9	14.8	15.2	13.1	13.7	13.7	14.7	10.5	8.3	8.2	11.0	13.5	14.1	10.1	17.0

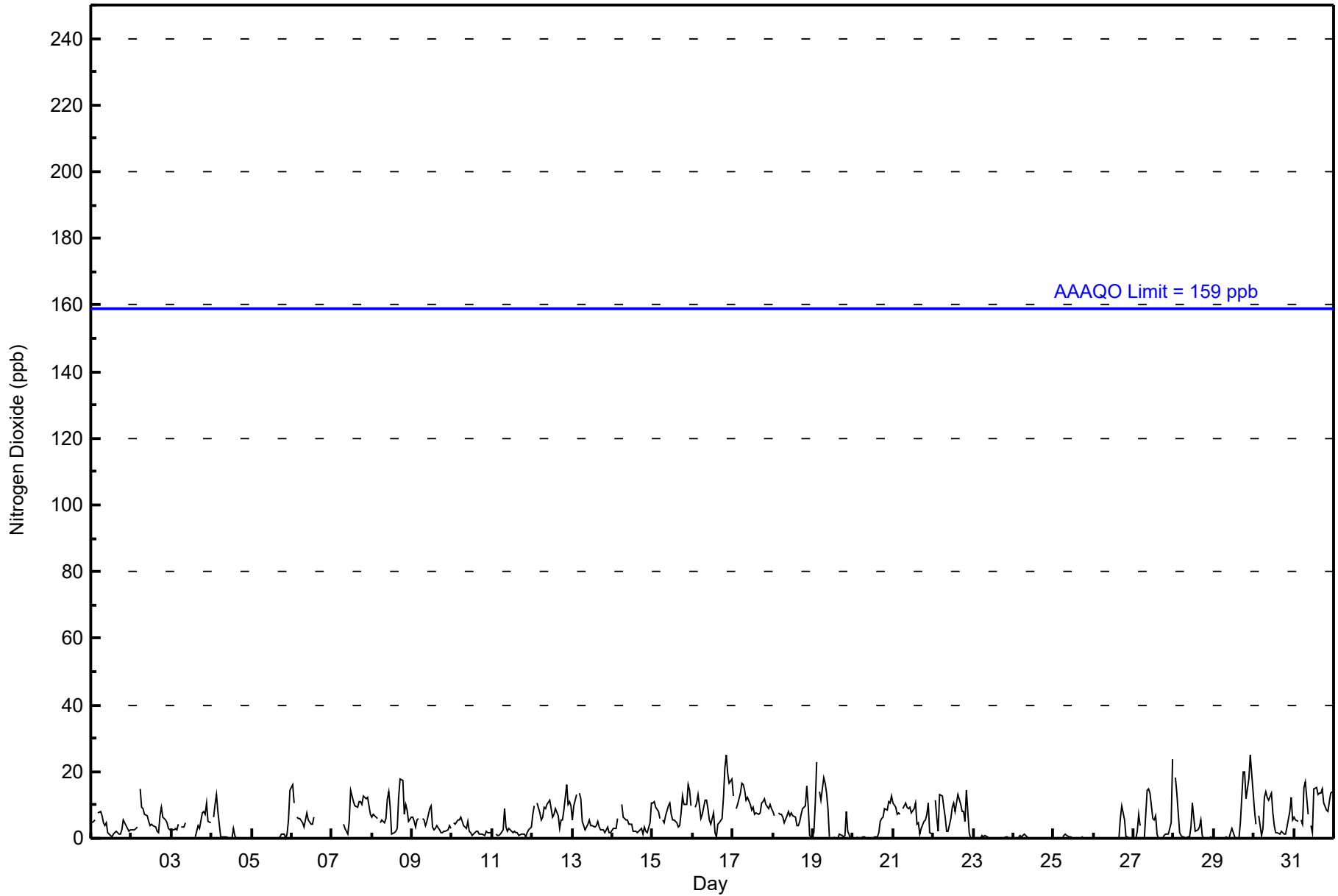
4.6	6.1	5.6	5.0	5.7	5.3	5.5	5.7	5.1	5.2	5.0	4.7	4.1	3.7	3.0	3.2	3.8	5.0	5.5	5.2	6.4	6.0	5.5	5.9	Diurnal Average	
16.3	18.3	22.9	13.0	13.9	16.6	18.4	17.0	14.5	15.0	14.0	14.3	14.8	15.2	13.1	13.7	13.7	19.8	20.0	21.2	25.0	19.3	24.9	23.6	Diurnal Maximum	

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



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	685	99.28	99.28
21 - 40	5	0.72	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: 690

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Nitrogen Dioxide (NO₂) - ppb
Fort McKay - Bertha Ganter - October 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	32	24	6	8	4	12	19	115	133	41	19	29	53	77	76	37	685
21 - 40	1	1	0	0	0	0	0	1	2	0	0	0	0	0	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	33	25	6	8	4	12	19	116	135	41	19	29	53	77	76	37	690

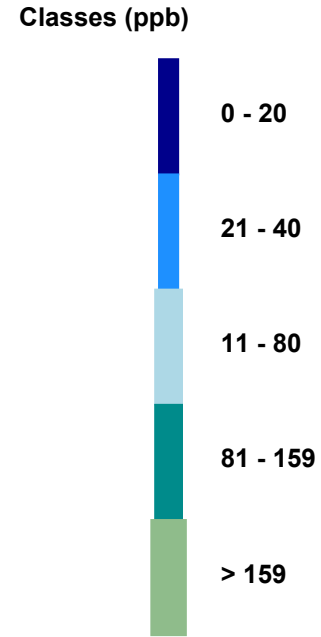
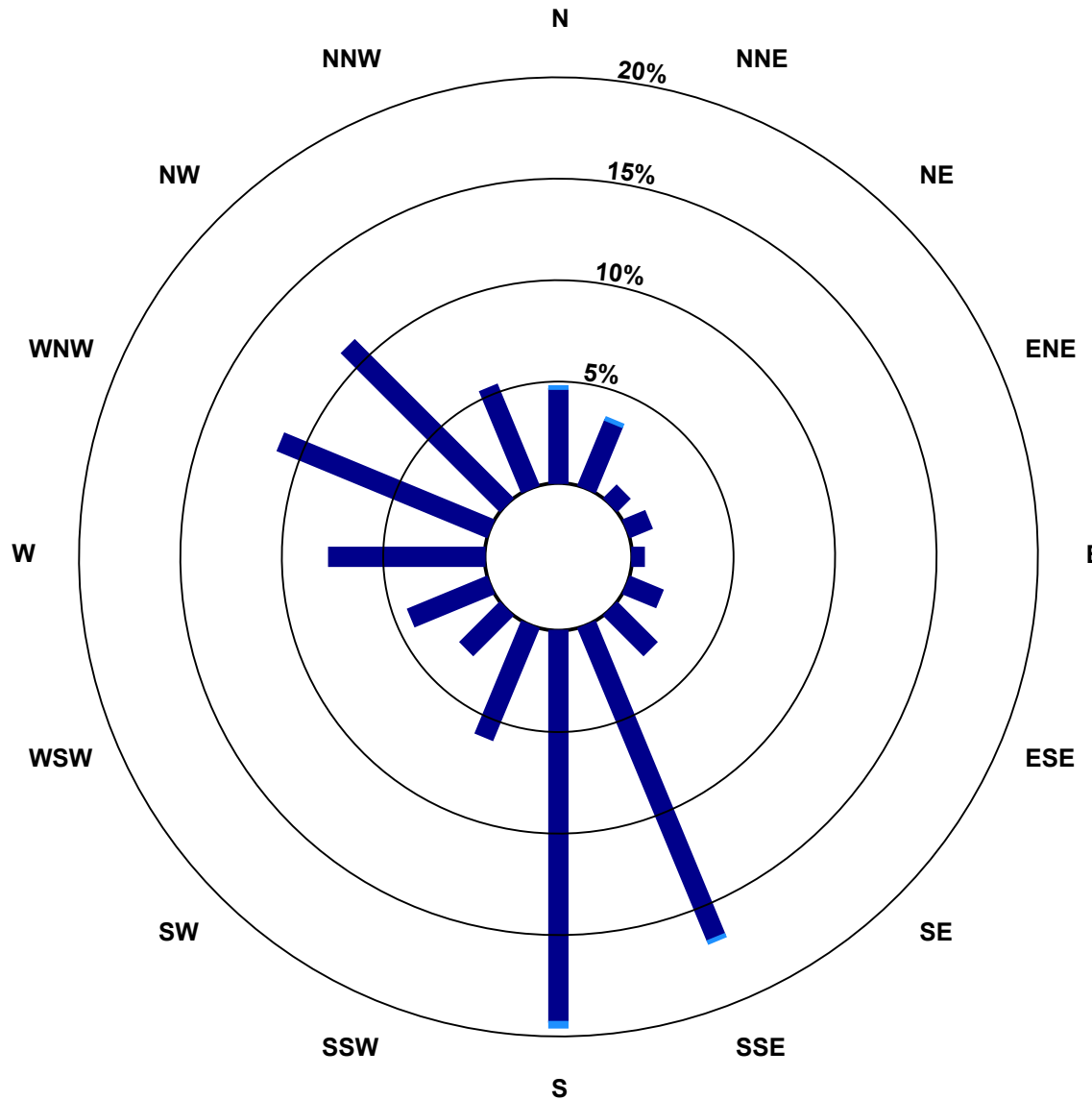
Total Number of Valid Hours: 690

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

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

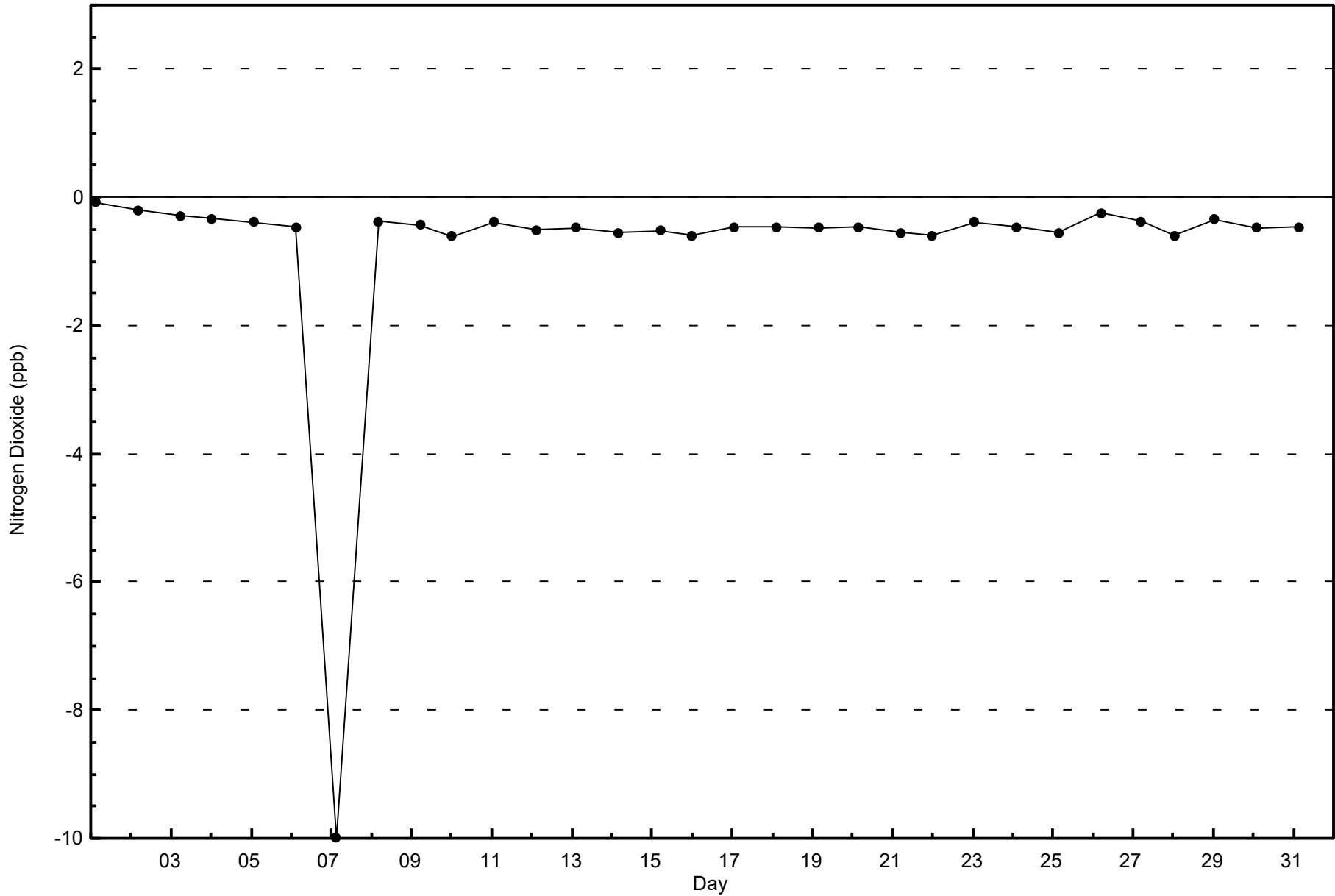


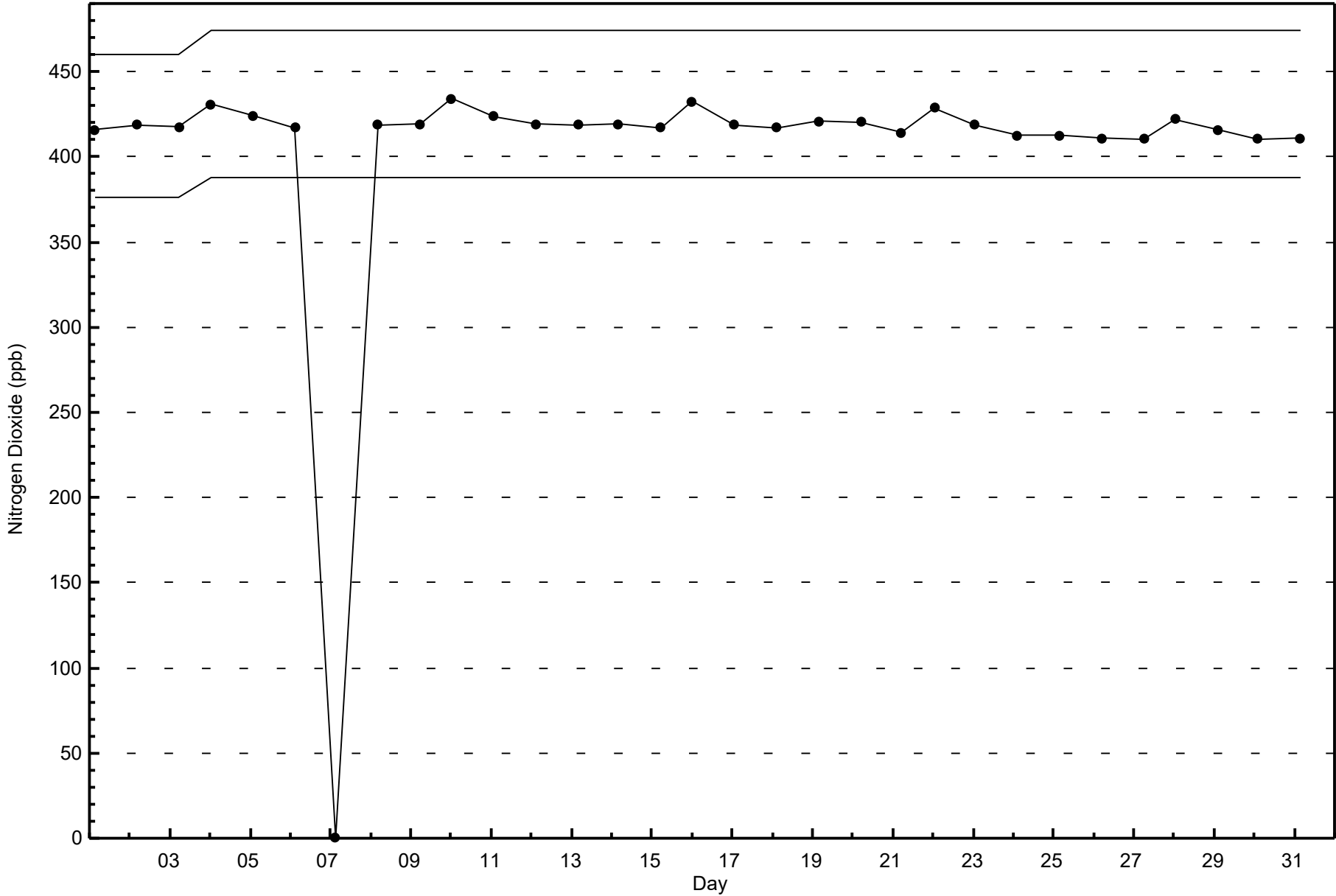
Total Number of Valid Hours: 690



Wood Buffalo Environmental Association
Zero Responses

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







Wood Buffalo Environmental Association
Summary of Hour Averages

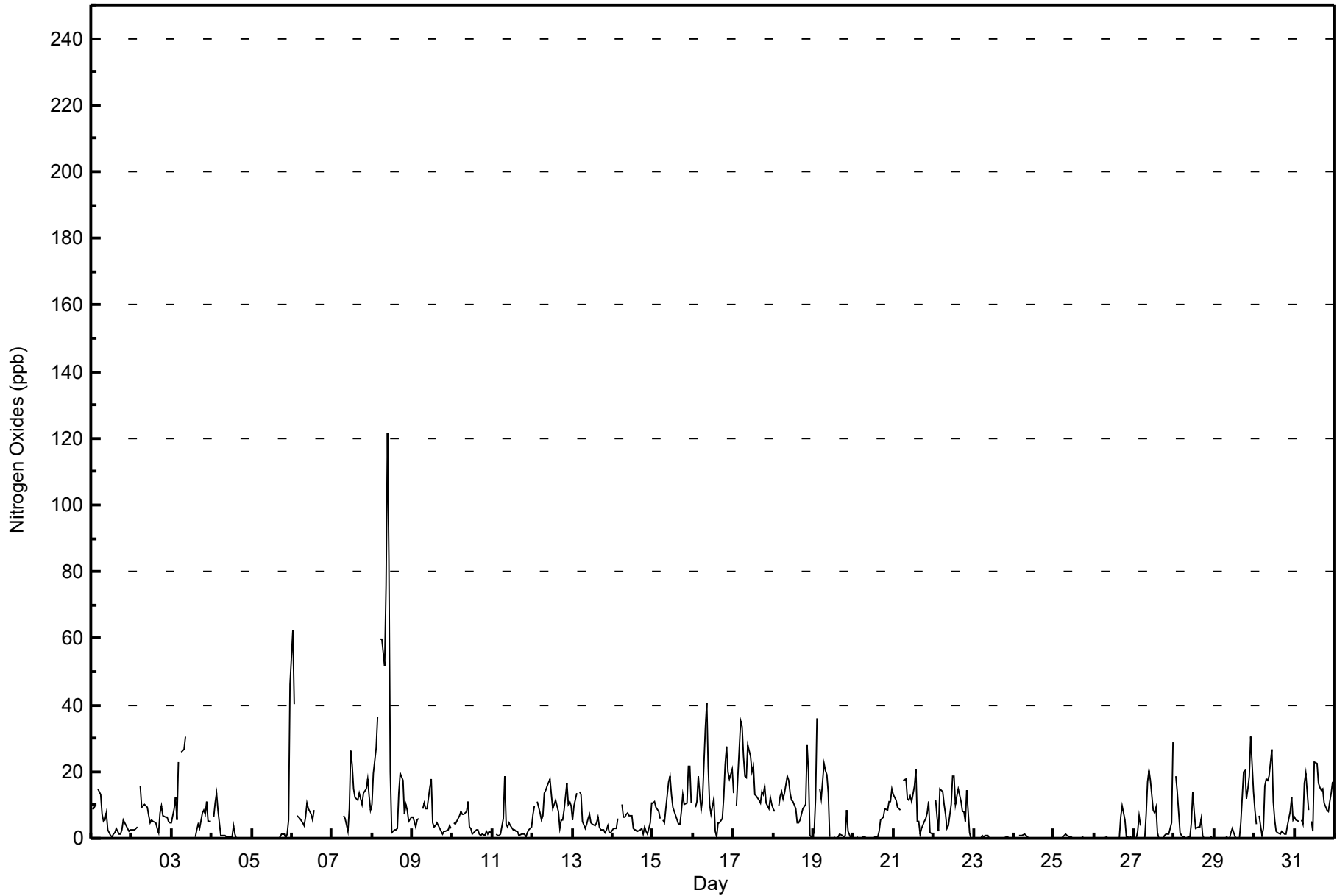
Nitrogen Oxides (NO_x) - ppb
Fort McKay - Bertha Ganter - October 2023

Maximum Value: 121.7 ppb on Oct 8 10:00																								Maximum Daily Average: 28.8 ppb on Oct 8																								Hours in Service: 744	
Minimum Value: 0.0 ppb on Oct 4 20:00																								Minimum Daily Average: 0.2 ppb on Oct 23																								Hours of Data: 690	
Maximum Diurnal Average: 12.3 ppb at hour 10																								Minimum Diurnal Average: 3.9 ppb at hour 16																								Hours of Missing Data: 54	
Monthly Average: 7.36 ppb																								Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.7 Median = 4.8 Q ₃ = 10.5 P ₉₀ = 17.7 P ₉₉ = 46.9																								Hours of Calibration: 35	
Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.7 Median = 4.8 Q ₃ = 10.5 P ₉₀ = 17.7 P ₉₉ = 46.9																								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-Oct	9.0	8.8	9.7	Z	15.0	13.0	7.2	5.0	5.6	7.4	2.5	0.9	0.6	1.3	1.9	2.8	1.4	1.2	2.7	5.5	4.5	3.7	2.2	2.5	5.0	15.0																							
2-Oct	2.4	2.5	2.6	3.2	Z	15.6	9.4	9.8	10.0	9.4	6.9	4.9	5.4	4.9	4.8	2.8	1.7	7.4	9.7	6.6	6.3	6.2	5.0	4.7	6.2	15.6																							
3-Oct	4.8	9.0	12.1	5.4	23.1	Z	26.0	26.8	30.7	C	C	C	C	C	0.6	2.6	4.3	3.0	7.7	8.3	7.2	11.0	5.1	4.9	10.7	30.7																							
4-Oct	Z	6.6	10.6	13.5	8.7	0.7	0.7	0.7	0.7	0.5	0.3	0.3	0.2	3.9	1.2	0.1	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	2.1	13.5																							
5-Oct	0.0	Z	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	0.3	1.4	1.4	0.2	1.1	5.6	46.3	2.5	46.3																							
6-Oct	62.2	40.1	Z	6.9	6.2	5.8	4.7	3.7	6.5	10.8	8.8	7.1	5.4	8.7	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	62.2																							
7-Oct	UO	UO	UO	UO	UO	UO	UO	6.8	6.1	2.3	8.7	26.2	21.8	14.8	12.2	11.2	13.6	11.9	10.1	13.6	14.9	17.7	12.9	8.4	--	26.2																							
8-Oct	10.0	19.6	27.3	36.6	Z	59.8	59.7	51.6	75.8	121.7	84.1	19.9	1.8	2.3	2.4	3.2	13.7	19.3	17.5	7.0	10.0	8.4	5.1	6.3	28.8	121.7																							
9-Oct	6.5	5.0	3.3	5.4	6.0	Z	8.8	10.6	9.1	9.1	15.1	17.7	4.8	3.4	3.9	4.6	2.8	1.9	1.5	2.1	2.3	2.4	3.7	2.9	5.8	17.7																							
10-Oct	Z	4.7	4.3	6.0	6.8	7.9	7.2	7.4	8.0	10.9	3.4	2.9	1.3	1.7	2.6	2.8	1.4	1.1	1.3	0.8	2.2	1.5	1.9	1.8	3.9	10.9																							
11-Oct	2.2	Z	1.3	0.8	0.7	1.4	5.9	18.8	4.2	3.3	4.5	4.0	2.6	2.7	2.2	2.2	0.9	1.3	1.2	1.2	0.6	1.6	2.5	3.3	3.0	18.8																							
12-Oct	7.2	9.9	Z	10.8	7.6	5.5	6.7	13.5	14.6	15.7	18.0	13.0	8.7	10.0	11.5	7.9	2.9	5.4	5.5	8.5	16.3	10.3	10.9	9.8	10.0	18.0																							
13-Oct	5.6	9.6	13.4	Z	14.1	13.1	5.0	2.9	4.3	5.8	7.3	4.7	4.3	3.7	4.8	6.2	3.6	2.5	2.4	1.6	2.7	3.6	1.8	1.6	5.4	14.1																							
14-Oct	2.9	2.8	2.8	6.0	Z	10.2	6.3	6.5	7.2	7.7	6.6	6.7	3.2	2.7	2.6	2.0	2.6	2.9	1.3	3.5	2.1	1.5	4.6	10.7	4.6	10.7																							
15-Oct	10.8	11.1	9.3	8.1	5.8	Z	5.5	4.8	9.0	16.8	18.6	12.9	9.1	8.0	5.5	4.1	4.3	7.8	13.1	10.4	10.4	21.6	21.6	10.5	10.4	21.6																							
16-Oct	Z	9.4	11.0	18.7	13.3	8.3	11.7	33.1	40.8	21.5	10.3	7.0	12.0	2.1	0.5	4.8	4.7	5.9	12.1	21.9	27.7	19.7	17.7	20.6	14.6	40.8																							
17-Oct	13.5	Z	9.7	18.8	35.3	33.6	24.6	18.5	18.1	27.8	24.7	19.8	21.5	13.1	12.6	11.4	10.4	14.2	13.0	15.8	10.8	9.0	12.2	10.1	17.3	35.3																							
18-Oct	9.0	8.2	Z	9.6	12.5	14.2	11.7	13.5	18.8	17.2	13.8	11.3	10.9	8.9	4.7	4.6	5.3	7.1	8.9	10.1	28.0	19.7	0.8	0.5	10.8	28.0																							
19-Oct	1.6	11.7	35.9	Z	14.8	11.7	22.4	20.3	18.9	13.4	0.5	M	0.3	0.1	0.1	0.2	1.1	0.8	0.3	1.0	8.5	2.1	0.0	0.2	7.5	35.9																							
20-Oct	0.2	0.2	0.1	0.5	Z	0.3	0.5	0.4	0.2	0.0	0.0	0.0	0.0	0.5	0.3	2.0	5.5	6.1	6.3	8.7	8.4	11.1	10.9	14.8	3.3	14.8																							
21-Oct	13.3	11.6	9.4	8.7	8.6	Z	17.5	17.9	12.1	11.3	12.8	11.0	15.9	20.9	5.3	4.9	1.4	2.8	5.2	5.8	7.4	10.8	1.5	1.5	9.5	20.9																							
22-Oct	Z	11.4	6.4	2.2	14.7	13.8	10.0	7.1	3.0	3.6	10.2	18.5	18.5	10.2	12.7	15.0	10.9	8.1	7.9	5.2	14.6	1.7	0.2	0.0	8.9	18.5																							
23-Oct	0.0	Z	0.0	0.0	0.2	0.8	0.6	0.7	0.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.1	0.0	0.0	0.2	0.8																							
24-Oct	0.1	0.0	Z	0.6	0.7	0.6	1.3	1.0	0.5	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	0.0	0.0	0.2	1.3																							
25-Oct	0.0	0.0	0.0	Z	0.1	0.2	0.7	1.1	0.7	0.4	0.3	0.1	0.1	0.0	0.1	0.0	0.1	0.5	0.0	0.0	0.0	0.1	0.2	0.1	0.2	1.1																							
26-Oct	0.0	0.0	0.0	0.0	Z	0.0	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.2	9.6	5.5	0.6	0.4	0.1	0.2	0.1	1.0	9.6																							
27-Oct	0.2	0.0	2.1	7.0	4.0	Z	0.2	7.2	17.1	20.2	17.4	8.6	7.7	9.5	1.7	0.1	0.0	0.2	1.1	1.4	1.4	1.4	4.5	28.6	6.2	28.6																							
28-Oct	Z	18.5	13.8	1.5	0.7	0.5	0.5	0.2	0.3	0.4	4.7	13.8	7.9	2.9	3.2	3.5	5.9	0.8	0.0	0.0	0.0	0.0	0.5	0.0	3.5	18.5																							
29-Oct	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.2	1.8	3.1	0.6	0.0	0.0	0.0	4.5	19.9	20.2	12.0	14.7	18.9	30.5	14.1	6.1	30.5																							
30-Oct	8.6	4.1	Z	6.7	0.7	2.9	15.7	17.7	17.4	18.5	26.7	11.0	5.5	1.9	1.6	1.2	2.1	1.6	1.3	1.2	3.6	8.2	12.3	5.6	7.7	26.7																							
31-Oct	6.5	5.7	5.1	Z	5.4	4.4	16.3	19.6	8.6	M	4.9	2.3	22.9	22.6	16.7	15.4	14.5	14.8	10.5	8.3	8.2	11.1	13.7	17.1	11.6	22.9																							
7.1 8.4 7.6 7.1 8.2 9.0 9.6 10.6 11.3 12.3 10.4 7.9 6.4 5.4 3.9 3.9 4.2 5.3 5.6 5.4 7.1 6.8 6.3 7.6																								Diurnal Average																									
62.2 40.1 35.9 36.6 35.3 59.8 59.7 51.6 75.8 121.7 84.1 26.2 22.9 22.6 16.7 15.4 14.5 19.9 20.2 21.9 28.0 21.6 30.5 46.3																								Diurnal Maximum																									
Z - zerospan C - Calibration M - Maintenance UO - Unstable Operation																																																	



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	650	94.20	94.20
21 - 40	31	4.49	98.70
41 - 80	7	1.01	99.71
81 - 159	2	0.29	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 690

Total Number of Hours: 744



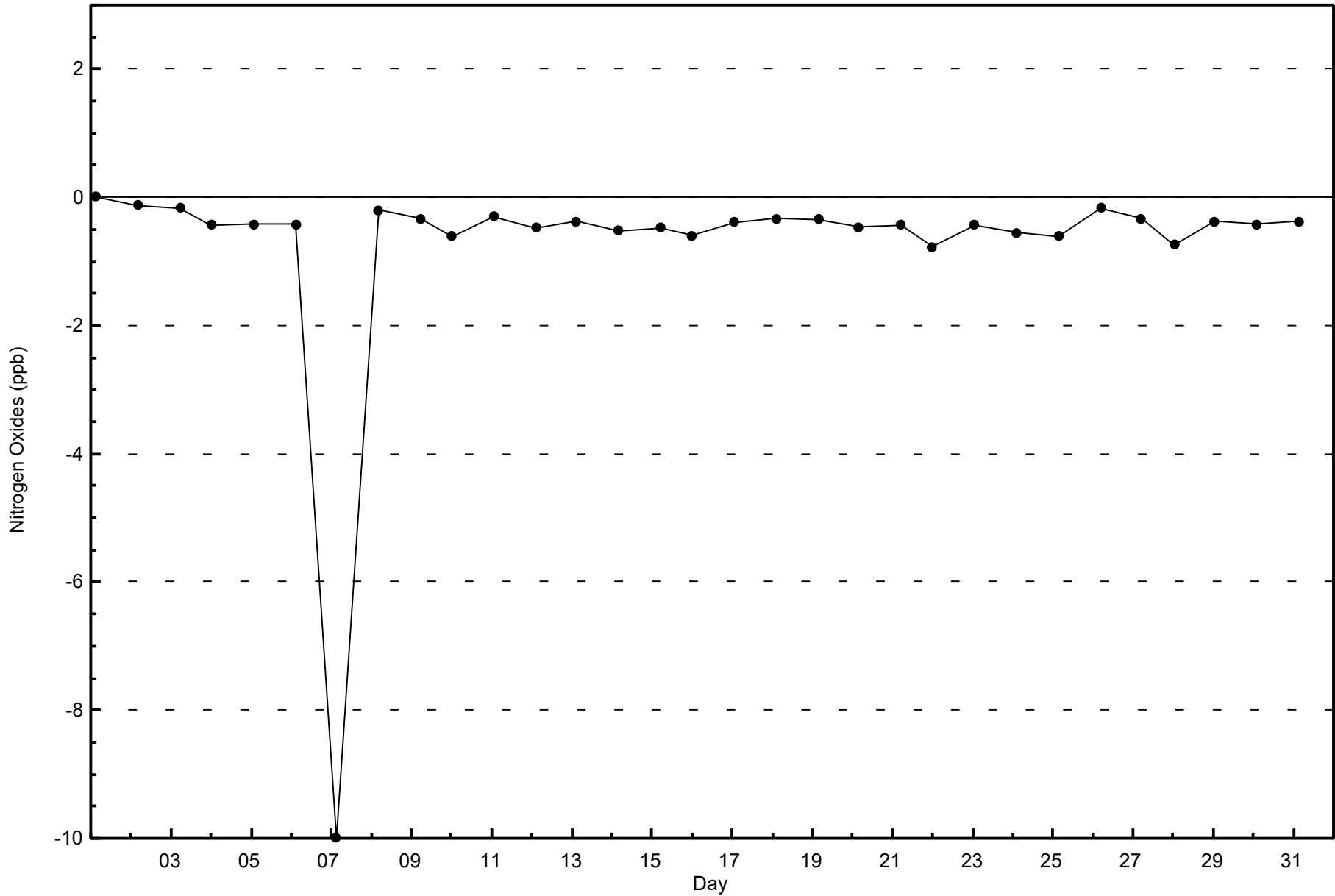
**Wood Buffalo Environmental Association
Frequency Distribution**

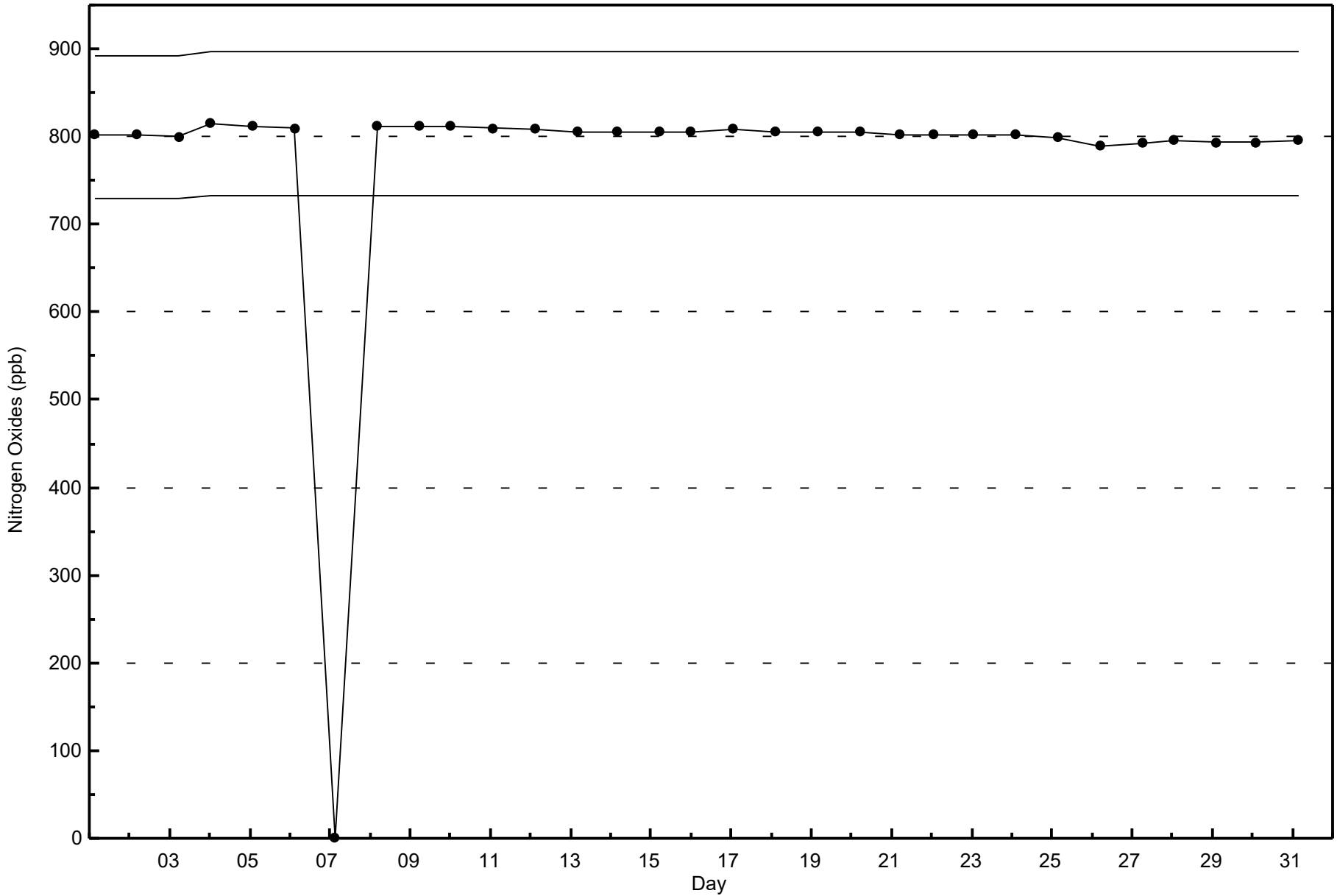
**Nitrogen Oxides (NO_x) - ppb
Fort McKay - Bertha Ganter - October 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	29	19	6	6	3	11	18	108	133	35	18	28	53	76	72	35	650
21 - 40	3	5	0	1	1	1	1	7	2	6	0	0	0	1	1	2	31
11 - 80	1	0	0	0	0	0	0	1	0	0	1	1	0	0	3	0	7
81 - 159	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	33	25	6	8	4	12	19	116	135	41	19	29	53	77	76	37	690

Total Number of Valid Hours: 690

Total Number of Hours: 744







Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O₃) - ppb

Fort McKay - Bertha Ganter - October 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 36.2 ppb on Oct 23 15:00	Maximum Daily Average: 29.3 ppb on Oct 23		Hours of Data:	707
Minimum Value: 0.1 ppb on Oct 9 06:00	Minimum Daily Average: 2.9 ppb on Oct 17		Hours of Missing Data:	37
Maximum Diurnal Average: 23.8 ppb at hour 15	Minimum Diurnal Average: 10.6 ppb at hour 6		Hours of Calibration:	35
Monthly Average: 16.43 ppb	Percentiles: P ₁ = 0.4 P ₁₀ = 1.6 Q ₁ = 8.5 Median = 16.6 Q ₃ = 24.3 P ₉₀ = 28.9 P ₉₉ = 33.9		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-Oct	0.5	Z	0.5	0.5	0.5	0.5	6.3	10.1	12.5	16.1	21.2	25.6	25.3	24.1	23.6	23.1	24.0	23.7	20.7	16.3	17.8	20.3	22.3	21.8	15.5	25.6
2-Oct	20.9	19.3	Z	13.5	7.1	1.9	5.2	5.3	6.5	C	C	C	C	10.5	10.0	14.0	16.8	11.1	5.3	3.2	1.1	0.3	0.4	0.8	8.1	20.9
3-Oct	1.4	0.5	0.4	Z	0.4	0.4	0.4	0.6	0.8	2.6	6.0	17.0	22.9	28.5	32.9	30.0	25.4	22.9	14.5	10.8	10.7	7.3	11.4	11.5	11.3	32.9
4-Oct	8.9	10.2	6.5	5.2	Z	11.7	13.3	12.5	12.4	14.4	14.3	13.4	16.8	15.8	23.0	18.8	16.0	13.7	9.5	7.9	8.2	9.0	9.5	10.1	12.2	23.0
5-Oct	10.3	10.7	12.2	12.5	15.0	Z	22.2	23.8	22.3	23.4	23.4	23.1	22.3	21.7	21.1	21.0	21.5	19.6	16.2	15.2	17.5	14.7	8.9	0.9	17.4	23.8
6-Oct	Z	0.5	0.8	5.5	6.2	6.8	9.8	13.2	13.3	12.1	15.4	16.9	16.7	16.5	20.6	20.8	18.5	13.7	8.3	4.8	5.3	14.3	14.3	14.5	11.7	20.8
7-Oct	15.2	Z	15.6	15.2	14.6	12.8	6.4	3.7	7.0	12.3	10.4	7.7	11.4	13.1	13.7	13.7	9.9	7.7	6.5	2.4	0.8	0.4	1.4	2.3	8.9	15.6
8-Oct	1.0	0.5	Z	0.4	0.3	0.4	0.2	0.4	0.5	0.9	2.7	14.0	26.4	28.3	30.2	31.4	21.1	13.3	12.2	22.8	15.3	15.3	15.9	14.0	11.6	31.4
9-Oct	11.3	12.7	11.9	Z	2.4	0.1	0.3	1.6	4.7	12.4	13.5	14.4	21.9	23.5	24.8	23.0	23.9	21.6	19.9	18.9	18.2	13.6	12.3	11.5	13.8	24.8
10-Oct	5.6	3.6	4.3	2.9	Z	0.7	0.7	1.7	3.2	8.9	16.0	18.5	21.0	22.6	24.3	23.9	22.9	21.5	20.6	22.9	22.5	25.6	25.2	24.3	14.9	25.6
11-Oct	23.6	24.8	24.1	24.4	23.9	Z	18.9	10.7	18.3	21.5	21.4	22.6	24.2	26.7	28.0	28.3	27.5	26.7	25.9	25.6	27.0	25.7	26.6	25.1	24.0	28.3
12-Oct	Z	11.6	9.2	11.1	11.9	12.1	9.6	2.8	7.8	15.5	18.9	23.1	27.5	28.0	27.8	31.0	35.1	31.5	29.2	23.8	14.4	18.3	13.7	11.8	18.5	35.1
13-Oct	13.2	Z	3.4	1.9	1.5	1.5	11.2	13.4	12.7	11.1	13.4	16.6	17.8	19.5	20.5	20.1	20.5	19.6	18.3	19.8	18.0	16.3	17.5	16.6	14.1	20.5
14-Oct	14.6	15.1	Z	13.3	10.6	10.9	14.4	14.4	15.5	15.8	18.3	21.0	23.4	24.4	25.6	27.5	27.3	26.9	27.4	23.6	23.6	23.7	19.8	13.6	19.6	27.5
15-Oct	13.1	12.5	13.5	Z	12.7	13.7	11.0	11.6	10.6	10.8	10.3	13.8	15.4	16.6	17.1	17.2	15.8	11.5	6.0	7.6	7.1	0.7	2.0	5.5	11.1	17.2
16-Oct	5.9	4.8	3.3	1.5	Z	5.7	4.2	1.1	2.3	6.2	12.4	16.4	18.0	29.2	32.7	31.1	29.9	27.4	17.6	5.5	0.9	3.4	2.7	1.3	11.5	32.7
17-Oct	2.2	1.7	2.6	1.0	0.6	Z	0.6	2.0	4.1	4.4	5.5	6.3	4.6	6.4	5.5	4.7	4.0	1.6	1.4	1.1	2.0	2.2	0.7	1.0	2.9	6.4
18-Oct	Z	0.6	0.6	0.7	0.5	0.5	0.5	0.5	0.9	3.3	8.4	9.9	11.5	11.7	13.9	14.4	13.4	10.9	7.8	6.8	1.4	9.8	23.1	23.3	7.6	23.3
19-Oct	22.0	Z	0.6	1.5	3.8	6.5	1.6	3.6	6.6	12.4	23.4	M	27.2	28.8	29.7	29.6	27.9	28.7	30.7	24.6	16.6	24.8	33.7	29.8	18.8	33.7
20-Oct	26.5	24.8	Z	23.4	23.2	22.8	22.4	22.9	24.2	26.2	27.9	29.1	28.3	29.0	30.6	29.0	17.7	11.7	11.0	7.9	8.1	5.8	5.0	1.1	19.9	30.6
21-Oct	0.9	1.2	1.0	Z	0.8	0.8	0.6	0.9	3.6	5.0	6.7	8.3	7.9	7.7	12.7	18.6	26.7	27.5	24.3	23.9	21.7	17.0	23.1	22.1	11.4	27.5
22-Oct	14.1	13.2	17.0	18.2	Z	3.5	6.1	8.6	13.4	16.7	17.4	15.9	17.0	20.1	17.9	15.2	16.5	15.3	13.2	16.7	10.6	23.5	25.9	24.9	15.7	25.9
23-Oct	24.0	23.6	23.0	23.1	23.1	Z	21.2	21.2	24.1	27.8	30.3	33.9	35.4	36.0	36.2	35.5	34.9	33.9	33.0	31.4	30.8	30.8	30.4	29.3	29.3	36.2
24-Oct	Z	28.7	27.4	27.2	26.6	26.2	25.1	24.9	25.5	27.1	27.3	27.2	28.9	30.8	32.6	31.7	30.6	30.1	29.6	30.1	30.0	29.3	28.9	29.2	28.5	32.6
25-Oct	30.2	Z	29.2	28.9	29.6	27.9	25.8	24.5	23.8	25.4	27.8	28.9	28.7	28.3	28.7	28.7	28.0	27.3	29.6	29.4	28.7	27.1	25.6	24.6	27.7	30.2
26-Oct	24.3	23.7	Z	22.4	23.3	23.3	23.2	22.7	22.1	21.9	21.9	22.8	23.2	26.3	25.1	26.5	19.5	14.5	17.4	24.6	24.4	23.7	22.1	22.0	22.7	26.5
27-Oct	19.7	19.1	20.7	Z	25.1	28.6	26.8	18.5	10.1	12.4	14.7	23.8	24.7	24.0	29.7	31.6	31.0	29.2	28.3	21.6	22.8	23.8	23.7	4.5	22.4	31.6
28-Oct	3.1	9.7	11.8	21.7	Z	20.8	20.2	20.3	19.7	18.6	16.7	10.8	18.2	23.8	23.0	22.0	18.4	25.3	26.6	26.2	25.3	25.4	24.8	27.3	20.0	27.3
29-Oct	27.2	27.6	30.3	29.6	28.4	Z	32.3	29.8	30.6	30.9	29.8	29.0	31.6	32.6	32.4	32.4	26.4	10.2	8.3	16.5	11.5	6.2	2.7	15.0	24.0	32.6
30-Oct	Z	27.0	23.0	21.9	27.4	23.1	11.1	7.0	7.4	11.4	11.5	21.5	27.5	30.4	29.7	29.5	28.2	29.0	28.8	27.6	23.8	17.9	13.6	18.9	21.6	30.4
31-Oct	17.3	Z	16.5	13.3	11.3	11.4	2.9	3.4	12.7	M	20.5	23.3	12.0	11.8	13.5	12.6	11.1	9.6	12.7	10.0	7.9	6.5	5.0	3.9	11.3	23.3

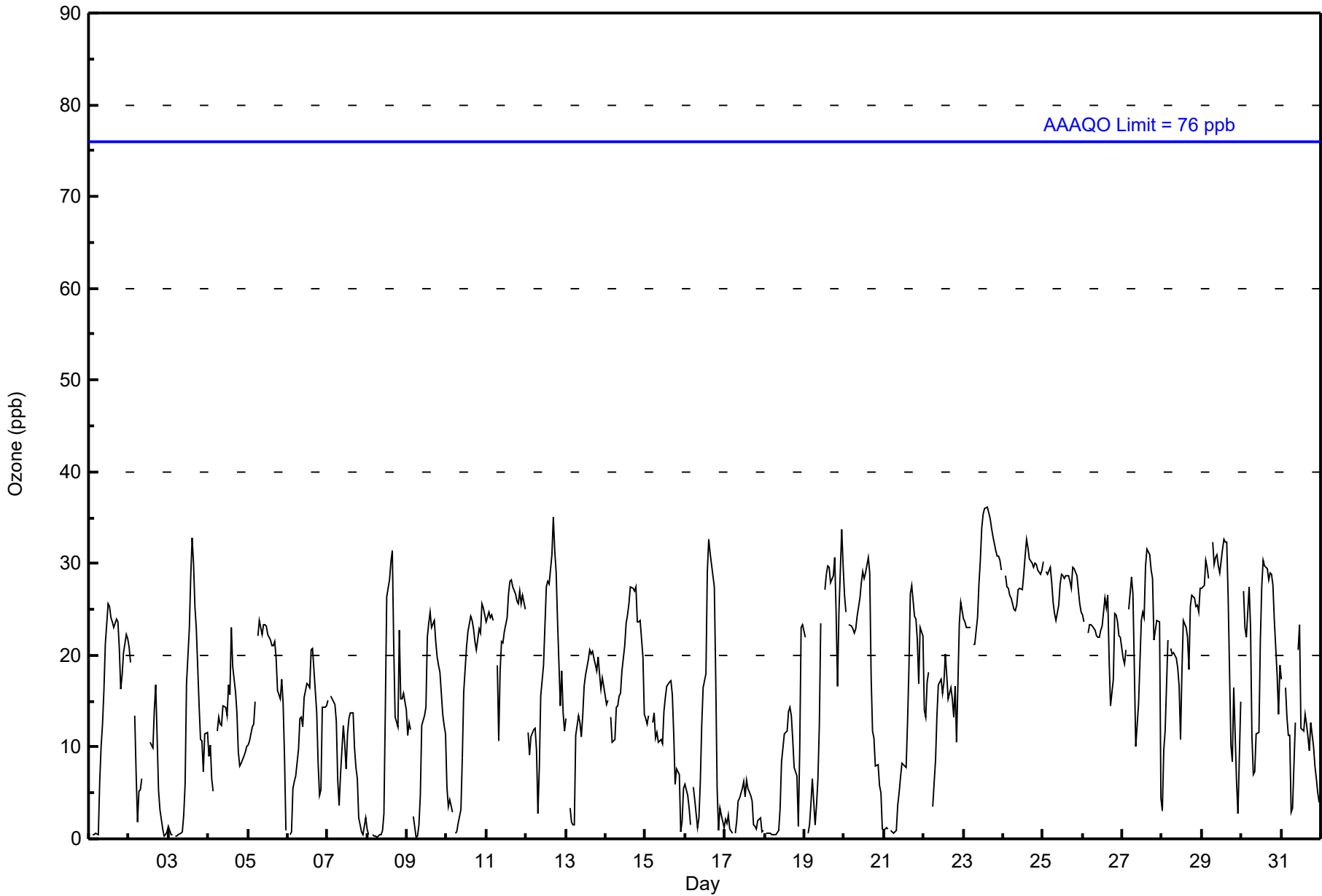
13.7	13.1	11.9	13.1	12.7	10.6	11.4	10.9	12.2	14.7	16.9	19.1	21.3	22.5	23.8	23.8	22.3	19.9	18.1	17.1	15.3	15.6	15.9	14.9	Diurnal Average	
30.2	28.7	30.3	29.6	29.6	28.6	32.3	29.8	30.6	30.9	30.3	33.9	35.4	36.0	36.2	35.5	35.1	33.9	33.0	31.4	30.8	30.8	33.7	29.8	Diurnal Maximum	

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 - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	415	58.70	58.70
21 - 50	292	41.30	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

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

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	23	20	5	7	4	7	11	84	91	35	8	9	13	29	44	25	415
21 - 50	12	4	1	1	0	5	8	35	47	6	12	20	43	52	34	12	292
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	35	24	6	8	4	12	19	119	138	41	20	29	56	81	78	37	707

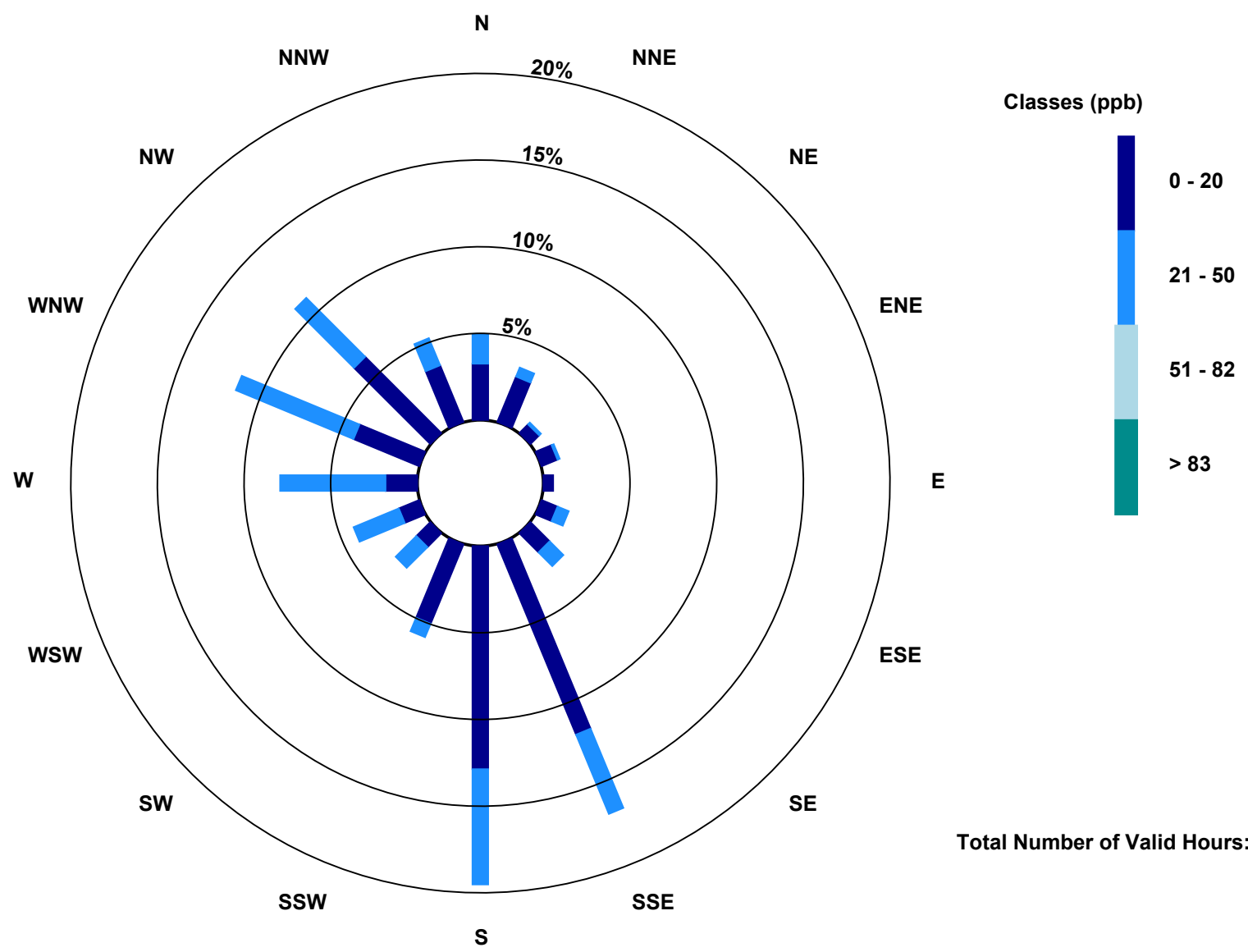
Total Number of Valid Hours: 707

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

Ozone (O₃) - ppb
Fort McKay - Bertha Ganter

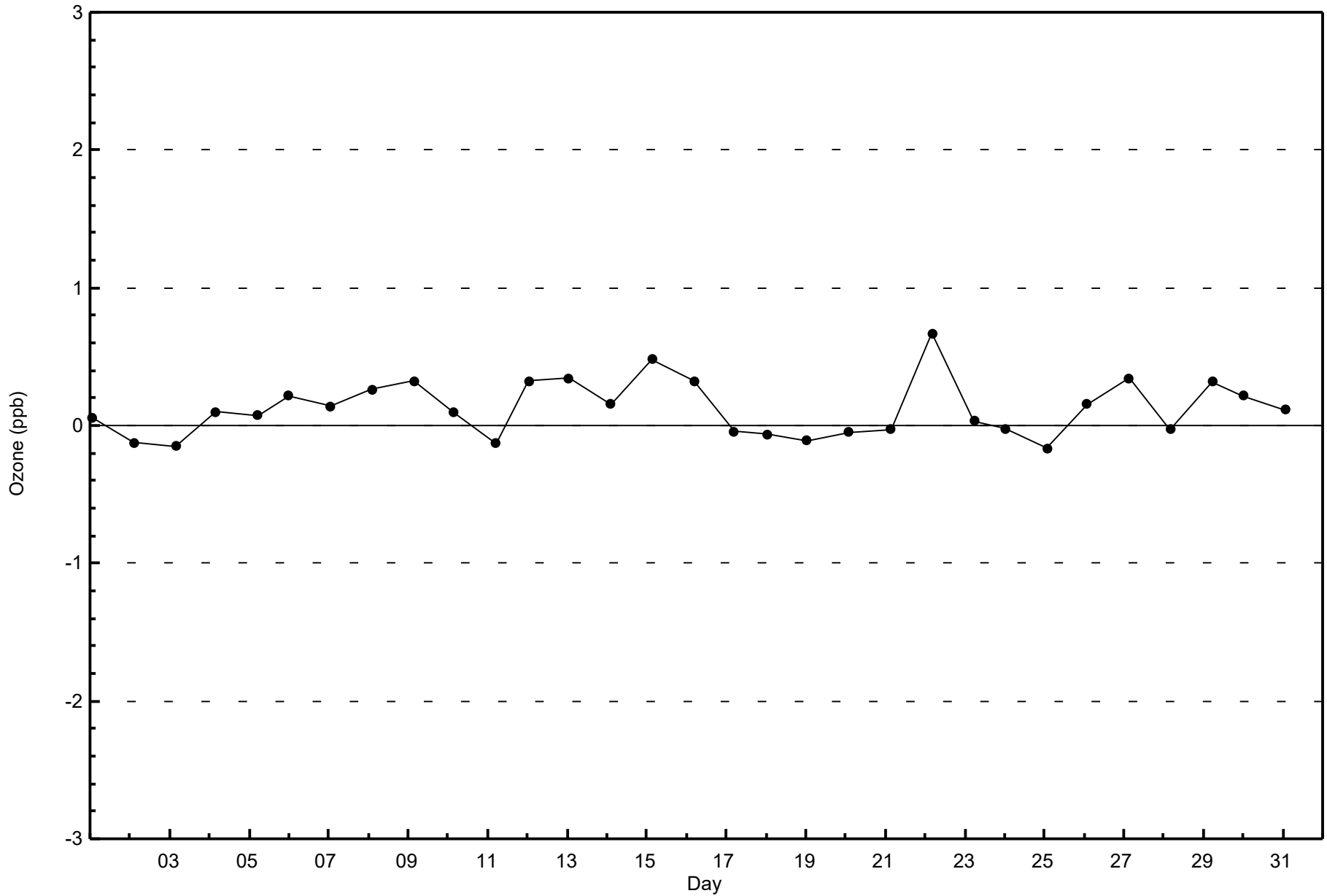


Total Number of Valid Hours: 707



Wood Buffalo Environmental Association
Zero Responses

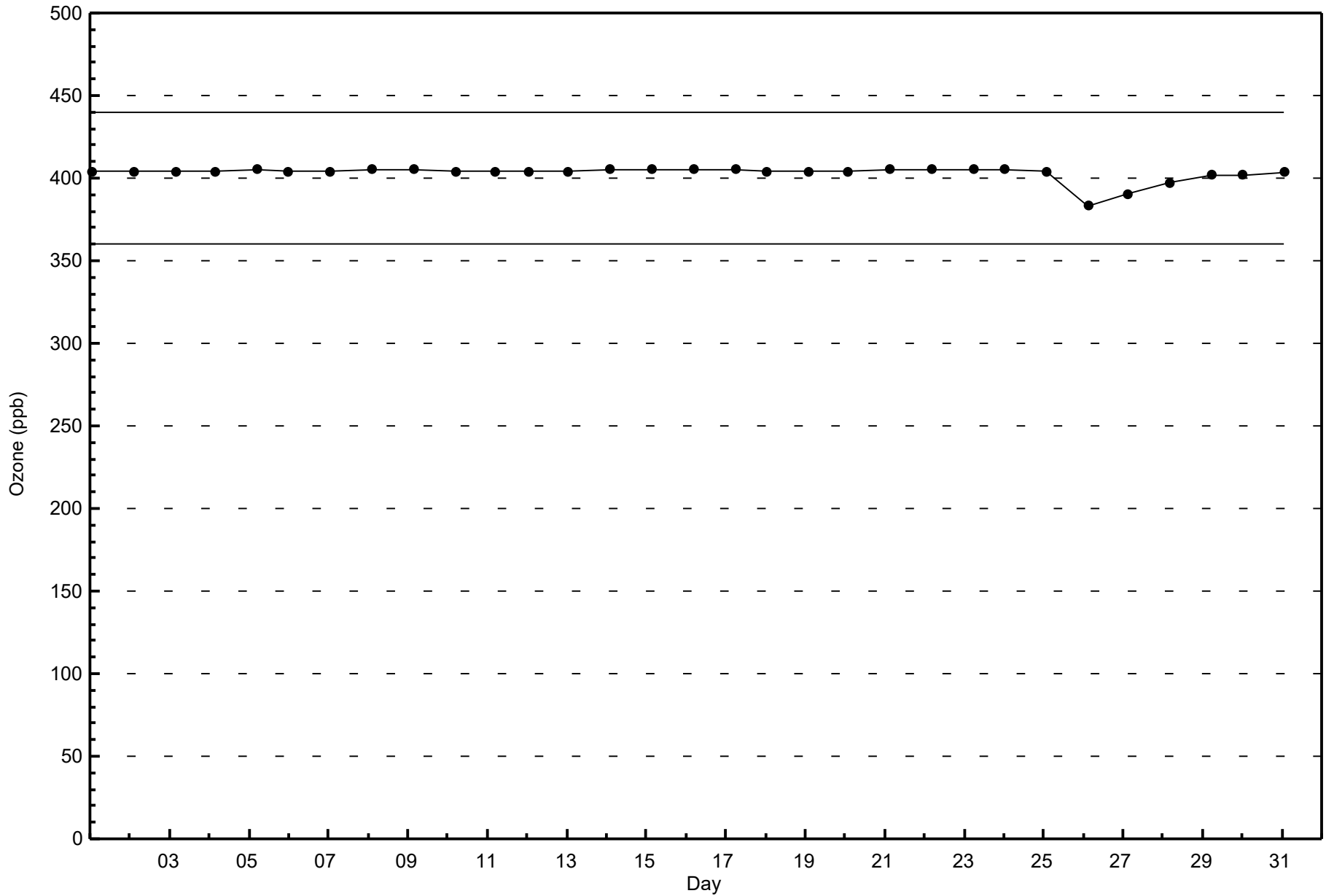
Ozone (O₃) - ppb
Fort McKay - Bertha Ganter - October 2023





Wood Buffalo Environmental Association
Span Responses

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





Wood Buffalo Environmental Association

Summary of Hour Averages

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

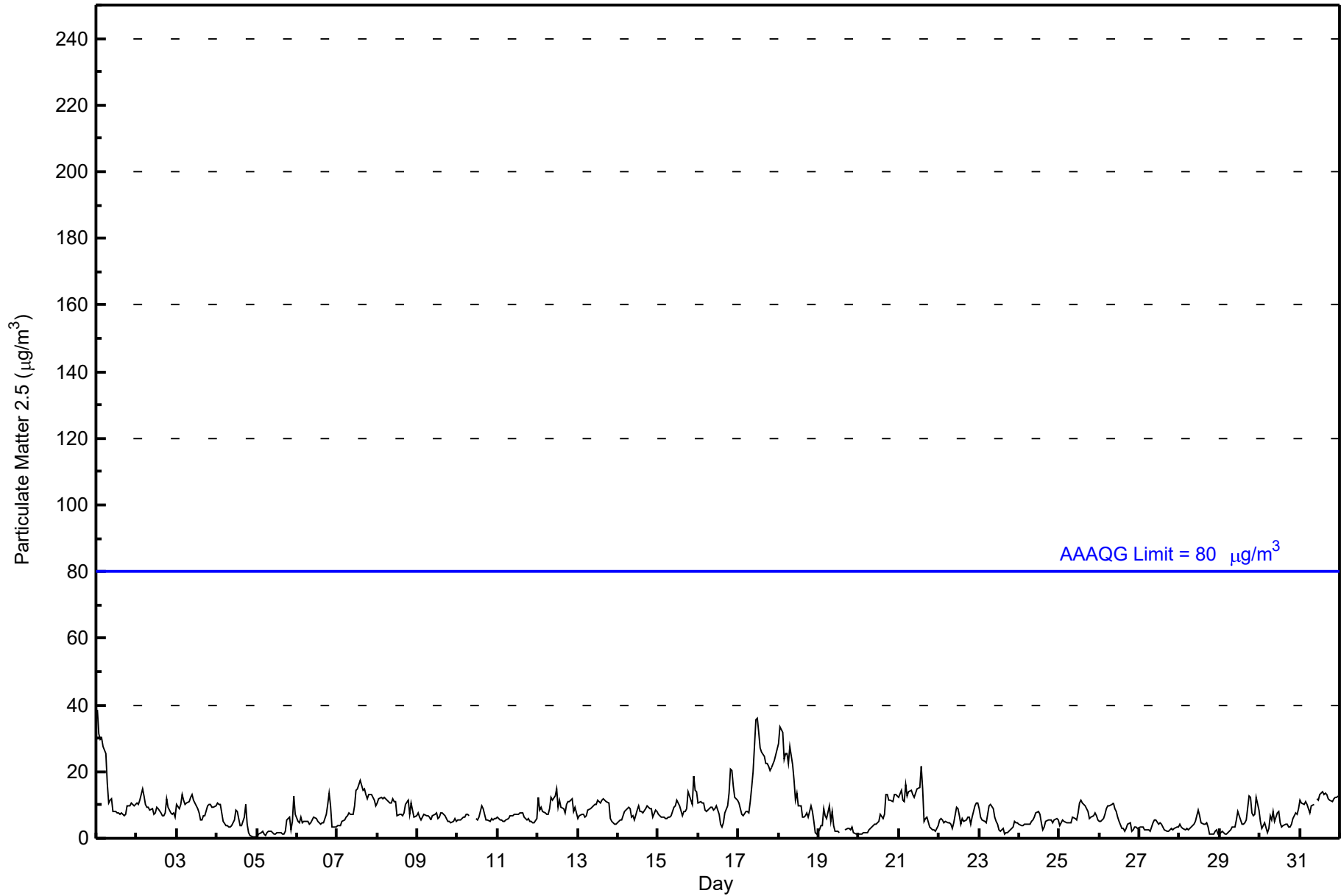
Fort McKay - Bertha Ganter - October 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 744																	Daily Average		Daily Maximum																										
Maximum Value: 38.7 µg/m ³ on Oct 1 01:00		Maximum Daily Average: 19.5 µg/m ³ on Oct 17		Hours of Data: 737																	9.0		14.7																										
Minimum Value: 0.3 µg/m ³ on Oct 4 23:00		Minimum Daily Average: 2.7 µg/m ³ on Oct 5		Hours of Missing Data: 7																	14.7		38.7																										
Maximum Diurnal Average: 9.3 µg/m ³ at hour 12		Minimum Diurnal Average: 7.0 µg/m ³ at hour 16		Hours of Calibration: 3																	9.7		13.2																										
Monthly Average: 7.88 µg/m ³		Percentiles: P ₁ = 1.1 P ₁₀ = 2.7 Q ₁ = 4.6 Median = 6.8 Q ₃ = 10.0 P ₉₀ = 13.0 P ₉₉ = 29.8		Percent Operational Time: 99.5																	5.1		10.7																										
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-Oct	38.7	31.3	29.7	29.9	27.6	25.2	16.6	10.8	11.6	11.9	8.0	7.9	7.5	7.5	7.3	7.6	6.9	7.1	9.8	9.9	9.8	10.5	9.7	10.2	14.7	38.7																							
2-Oct	10.4	10.2	11.4	14.7	12.9	10.1	9.2	9.5	8.4	8.8	7.4	7.4	9.4	8.7	7.5	6.9	6.8	7.5	11.7	9.5	7.7	7.4	7.6	6.3	9.0	14.7																							
3-Oct	10.1	8.9	10.2	13.2	11.6	10.1	10.8	11.2	12.2	13.1	11.6	10.6	8.9	7.7	5.6	5.4	6.6	6.9	9.6	10.1	10.3	9.1	9.2	9.7	9.7	13.2																							
4-Oct	10.7	10.2	10.0	7.7	5.2	3.9	3.8	3.5	3.3	3.6	5.5	8.3	8.0	6.1	3.8	3.8	6.2	10.2	4.2	1.8	0.9	0.4	0.3	0.3	5.1	10.7																							
5-Oct	0.5	1.1	1.9	2.1	1.1	0.7	1.5	2.0	2.0	1.7	1.4	1.3	1.6	1.6	1.6	1.2	1.1	2.1	5.6	6.3	2.6	5.1	12.5	7.4	2.7	12.5																							
6-Oct	5.1	4.7	6.2	4.8	5.0	5.1	5.0	4.2	4.6	5.7	6.3	5.8	5.1	4.6	4.2	4.6	4.8	7.4	10.3	13.5	9.8	3.4	3.3	3.5	5.7	13.5																							
7-Oct	3.8	3.7	4.0	5.1	5.6	6.2	6.6	7.5	7.4	7.4	9.6	14.6	14.7	16.0	17.2	14.6	14.6	13.1	12.0	13.3	13.2	12.4	11.4	9.9	10.2	17.2																							
8-Oct	10.7	11.8	12.1	11.9	12.2	12.1	11.4	10.6	10.4	11.7	10.9	11.0	6.8	7.1	7.4	6.6	7.6	10.0	11.5	7.0	10.4	8.5	6.3	6.9	9.7	12.2																							
9-Oct	7.5	6.4	5.4	6.4	7.1	6.8	6.7	6.2	5.7	6.6	7.3	7.6	5.9	6.4	7.8	7.6	6.7	6.1	5.1	5.2	4.6	5.1	6.0	5.0	6.3	7.8																							
10-Oct	5.6	5.4	5.5	6.2	6.5	7.3	7.1	6.9	UO	UO	UO	6.1	5.7	6.3	9.6	8.9	7.0	5.3	5.4	5.1	6.0	5.6	5.8	6.1	6.4	9.6																							
11-Oct	6.2	5.5	5.6	5.3	5.2	5.4	5.9	6.7	6.8	6.8	7.3	7.1	7.3	7.5	7.5	7.7	6.2	5.6	5.7	5.0	4.9	4.8	4.8	5.9	6.1	7.7																							
12-Oct	12.1	8.3	9.1	8.1	7.8	7.0	7.1	9.0	12.4	11.6	12.9	14.8	9.3	11.4	9.4	8.9	7.8	10.0	10.9	10.9	11.9	7.9	9.4	7.7	9.8	14.8																							
13-Oct	5.9	6.6	7.4	7.4	6.5	6.8	8.4	8.8	9.4	9.7	10.1	10.4	11.4	10.5	11.5	12.0	11.6	11.0	10.6	5.8	5.1	4.8	4.1	4.4	8.3	12.0																							
14-Oct	5.0	5.3	5.6	6.9	8.2	8.9	9.2	9.0	6.6	6.7	5.6	8.4	9.8	8.0	8.0	7.6	8.9	9.6	9.4	8.8	9.0	6.5	8.3	7.9	7.8	9.8																							
15-Oct	7.2	6.8	6.4	6.6	6.1	5.8	6.5	6.3	7.0	9.2	9.8	11.5	10.6	9.7	6.8	8.1	8.3	9.1	14.2	12.6	10.0	18.4	14.3	14.1	9.4	18.4																							
16-Oct	10.5	11.1	10.6	10.4	8.7	8.1	8.3	9.5	9.4	8.4	8.9	9.7	7.2	4.3	3.4	4.6	7.6	9.9	13.4	20.7	20.5	15.5	12.1	11.5	10.2	20.7																							
17-Oct	10.8	8.7	7.3	6.9	7.9	8.1	7.7	10.9	15.5	20.0	35.4	36.0	31.7	27.1	25.7	24.8	22.5	22.6	21.8	20.6	21.1	23.3	25.1	26.9	19.5	36.0																							
18-Oct	28.5	33.6	31.6	23.6	25.3	25.4	22.6	27.6	22.1	17.2	11.3	13.5	9.7	9.6	6.5	6.6	6.9	7.4	6.4	9.8	8.0	5.1	1.6	1.3	15.1	33.6																							
19-Oct	2.3	3.7	4.0	9.0	6.8	5.9	9.6	5.1	8.0	3.9	2.0	1.9	1.9	C	C	C	2.4	2.9	2.8	2.7	3.4	1.7	1.2	1.4	3.9	9.6																							
20-Oct	1.2	1.3	1.3	1.5	1.6	1.8	2.7	3.1	3.2	4.1	4.3	4.6	4.9	7.3	5.9	7.3	13.2	13.0	11.5	11.3	10.9	13.1	13.3	12.8	6.5	13.3																							
21-Oct	12.2	14.2	11.3	11.0	16.2	12.7	13.9	14.5	13.2	12.4	13.4	15.0	15.2	21.5	14.9	5.1	5.8	6.4	3.4	3.1	2.7	2.7	2.3	3.7	10.3	21.5																							
22-Oct	5.7	6.0	5.6	4.8	5.2	4.7	4.5	4.1	3.1	4.5	9.2	8.7	6.6	4.4	5.8	5.2	5.4	6.5	6.2	4.3	6.2	9.9	10.4	10.5	6.1	10.5																							
23-Oct	8.7	6.6	5.4	5.0	4.5	7.0	9.9	10.0	8.7	6.4	4.9	4.1	2.5	2.1	2.9	1.2	1.5	1.8	2.1	3.1	3.5	4.9	4.8	4.6	4.9	10.0																							
24-Oct	4.4	3.9	3.9	4.2	4.2	4.3	4.3	5.1	5.4	6.5	7.8	8.1	7.1	4.8	2.6	3.5	5.2	5.4	5.5	5.6	4.8	5.4	6.0	5.3	5.1	8.1																							
25-Oct	4.0	4.7	5.3	5.0	4.7	4.7	4.5	4.6	6.5	6.1	5.7	7.8	10.5	11.6	10.7	9.5	8.9	8.1	6.1	6.3	6.7	7.7	6.6	5.4	6.7	11.6																							
26-Oct	5.3	5.2	5.8	7.3	8.8	9.7	9.9	10.0	10.7	9.1	8.1	6.4	5.1	2.9	2.9	2.3	3.0	4.3	4.6	2.2	2.4	3.3	3.3	3.1	5.6	10.7																							
27-Oct	3.4	3.5	3.4	2.4	2.5	2.4	2.2	3.3	4.7	5.5	5.4	4.3	4.5	4.3	3.3	2.5	2.1	2.0	2.5	2.8	2.4	3.0	3.3	3.5	3.3	5.5																							
28-Oct	4.1	3.4	3.0	2.7	3.1	2.7	2.9	3.4	4.1	5.0	6.9	8.3	6.8	4.8	4.3	4.2	4.7	3.2	1.5	1.3	1.5	2.1	2.7	1.2	3.7	8.3																							
29-Oct	1.2	2.3	1.6	1.4	1.4	1.8	2.7	3.4	3.2	3.4	5.6	7.9	5.3	4.0	4.3	4.5	5.4	12.5	12.3	7.7	6.7	7.0	12.3	8.4	5.3	12.5																							
30-Oct	4.9	3.1	3.8	4.7	1.6	3.1	6.8	5.7	8.1	4.9	7.8	8.0	4.5	3.3	3.7	4.3	4.4	3.5	3.5	4.1	5.8	7.5	7.1	9.1	5.1	9.1																							
31-Oct	11.6	10.8	10.3	11.1	10.1	9.0	7.4	9.8	10.3	M	11.9	11.3	13.0	13.8	13.2	13.4	13.2	12.0	11.3	11.0	11.7	12.3	12.4	12.8	11.5	13.8																							
																								8.3	8.0	7.9	8.0	7.8	7.5	7.6	7.8	8.1	8.0	8.7	9.3	8.3	8.2	7.5	7.0	7.2	7.8	8.1	7.8	7.6	7.6	7.7	7.3	Diurnal Average	
																								38.7	33.6	31.6	29.9	27.6	25.4	22.6	27.6	22.1	20.0	35.4	36.0	31.7	27.1	25.7	24.8	22.5	22.6	21.8	20.7	21.1	23.3	25.1	26.9	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
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	263	35.69	35.69
6 - 15	434	58.89	94.57
16 - 25	25	3.39	97.96
26 - 80	15	2.04	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 737

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 - October 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	3	2	2	2	2	6	14	25	12	8	17	35	61	50	12	263
6 - 15	22	12	4	6	1	9	14	102	113	25	14	12	25	25	27	23	434
16 - 25	3	5	0	0	0	0	0	5	4	3	0	0	0	0	3	2	25
26 - 80	0	5	0	0	1	1	0	0	3	4	0	1	0	0	0	0	15
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	37	25	6	8	4	12	20	121	145	44	22	30	60	86	80	37	737

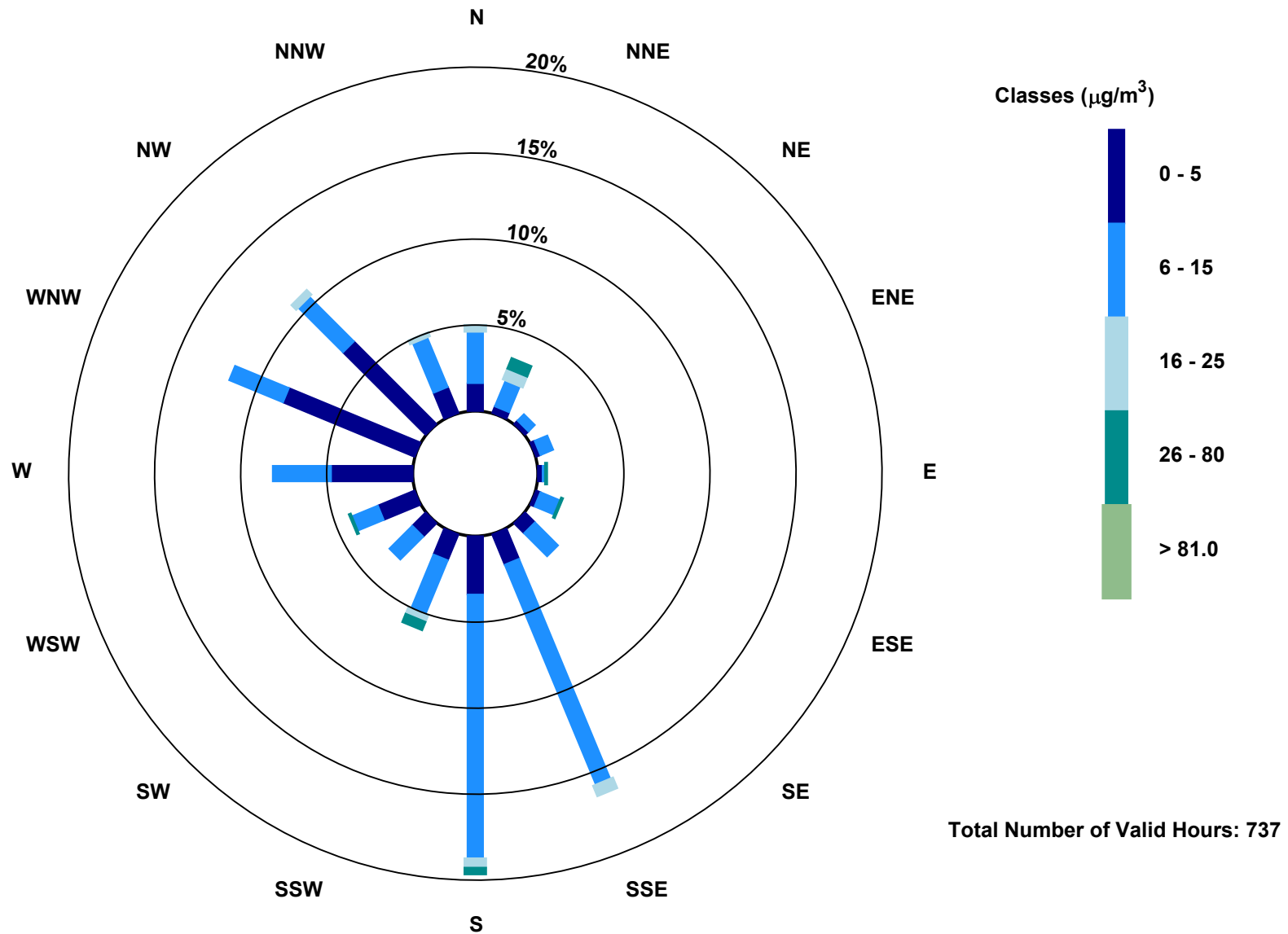
Total Number of Valid Hours: 737

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 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

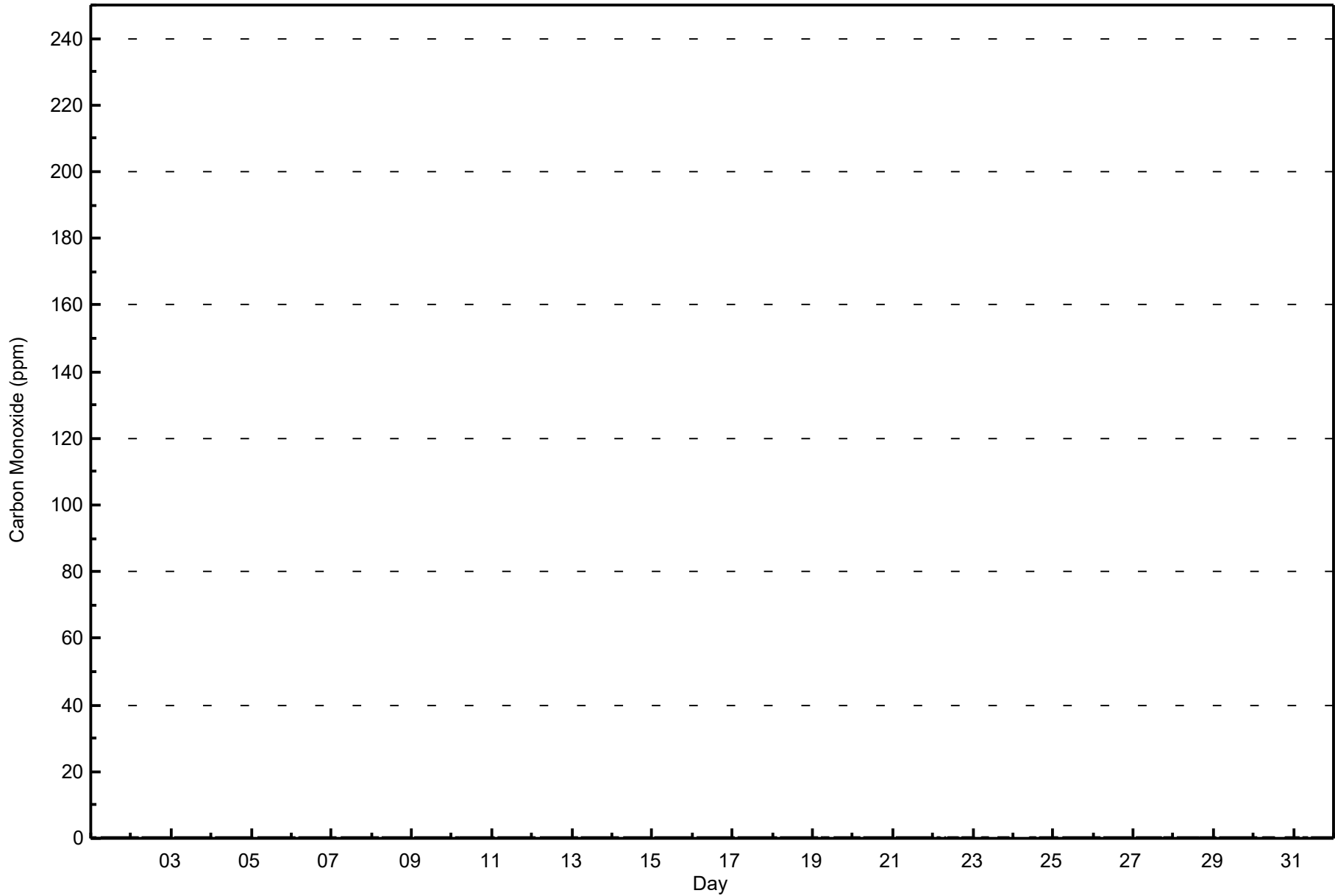
Fort McKay - Bertha Ganter - October 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0																				Hours in Service: 744												
Maximum Value: 0.6 ppm on Oct 1 01:00																				Maximum Daily Average: 0.4 ppm on Oct 2												
Minimum Value: 0.2 ppm on Oct 24 02:00																				Minimum Daily Average: 0.2 ppm on Oct 24												
Maximum Diurnal Average: 0.3 ppm at hour 19																				Minimum Diurnal Average: 0.3 ppm at hour 6												
Monthly Average: 0.29 ppm																				Percentiles: P ₁ = 0.2 P ₁₀ = 0.2 Q ₁ = 0.2 Median = 0.3 Q ₃ = 0.3 P ₉₀ = 0.4 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-Oct	0.6	0.5	0.5	0.5	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
2-Oct	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	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
3-Oct	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	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
4-Oct	0.3	Z	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	0.3	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	0.3	0.3	0.3
5-Oct	0.3	0.3	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	0.2	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
6-Oct	0.3	0.3	0.3	Z	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
7-Oct	0.2	0.2	0.2	0.2	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	0.3	0.3	0.3
8-Oct	0.3	0.3	0.3	0.3	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
9-Oct	Z	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	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
10-Oct	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
11-Oct	0.3	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
12-Oct	0.3	0.3	0.3	Z	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	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
13-Oct	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	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
14-Oct	0.3	0.3	0.3	0.3	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
15-Oct	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	0.4	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
16-Oct	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	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
17-Oct	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	0.4	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
18-Oct	0.4	0.4	0.4	Z	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	0.4	0.4	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
19-Oct	0.3	0.3	0.3	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.3	M	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
20-Oct	0.3	0.3	0.3	0.3	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
21-Oct	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	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
22-Oct	0.2	Z	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	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
23-Oct	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	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	0.2	0.2	0.2	0.2	0.2
24-Oct	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	0.2	0.2	0.2	0.2
25-Oct	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	0.3	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	0.2
26-Oct	0.2	0.2	0.2	0.2	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2
27-Oct	Z	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	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
28-Oct	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	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
29-Oct	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	0.2	0.2	0.2	0.2	0.2
30-Oct	0.2	0.2	0.2	Z	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
31-Oct	0.3	0.3	0.3	0.3	Z	0.2	0.2	0.3	0.3	M	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
0.3																										Diurnal Average						
0.6																										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 - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.3	606	85.71	85.71
0.4 - 0.5	100	14.14	99.86
0.6 - 0.7	1	0.14	100.00
0.8 - 1.4	0	0.00	100.00
1.5 - 10	0	0.00	100.00
> 10	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Carbon Monoxide (CO) - ppm
Fort McKay - Bertha Ganter - October 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	29	16	6	8	3	10	17	100	101	32	19	29	57	80	66	33	606
0.4 - 0.5	3	9	0	0	1	2	2	18	38	10	1	3	0	1	9	3	100
0.6 - 0.7	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
0.8 - 1.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.5 - 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	32	25	6	8	4	12	19	118	140	42	20	32	57	81	75	36	707

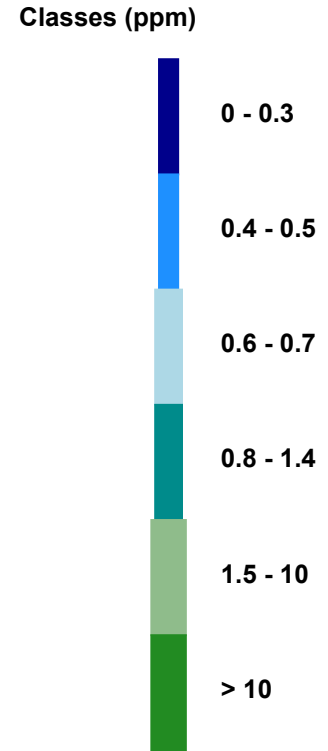
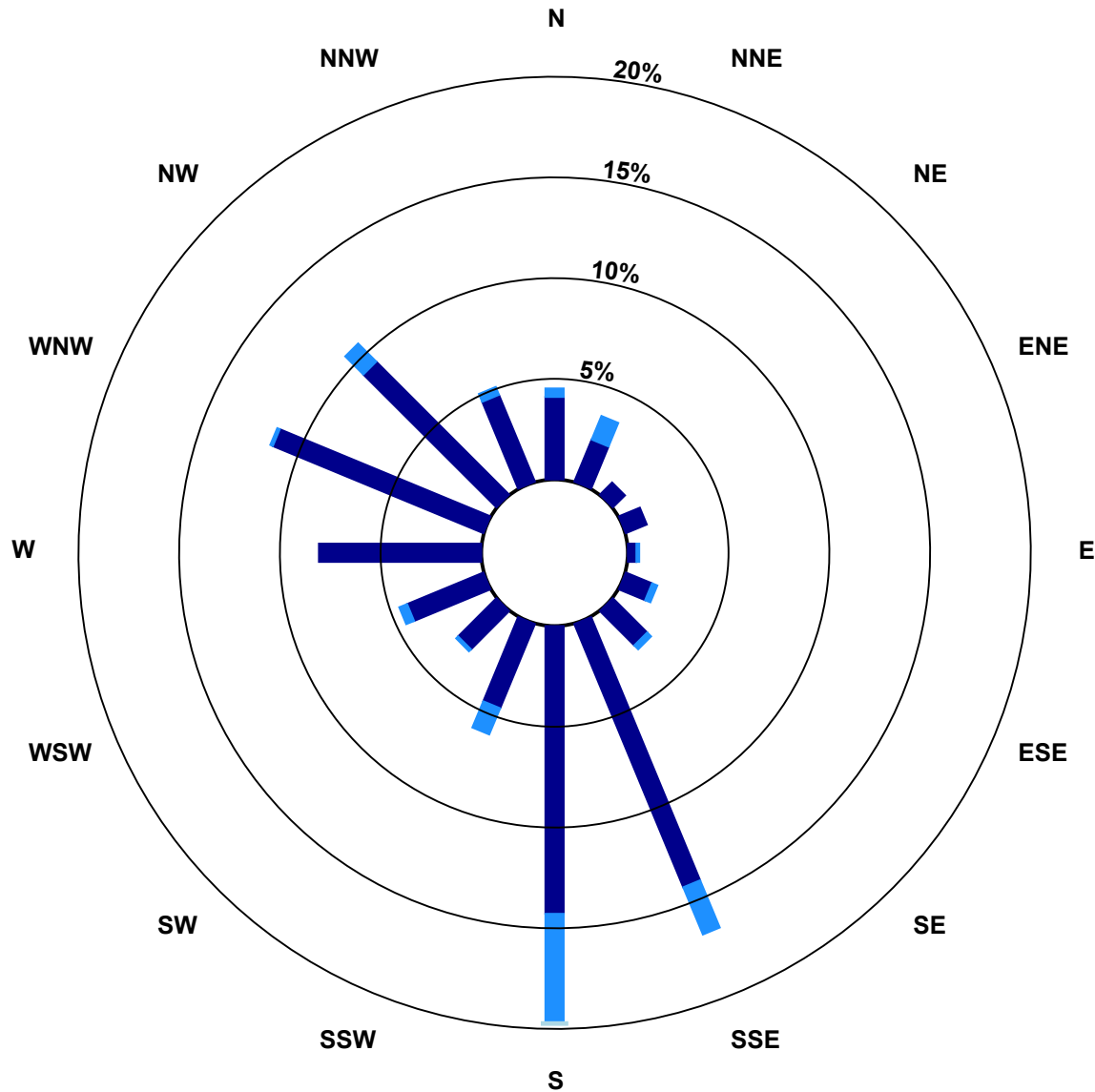
Total Number of Valid Hours: 707

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

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



Total Number of Valid Hours: 707



Wood Buffalo Environmental Association

Summary of Hour Averages

Carbon Dioxide (CO₂) - ppm

Fort McKay - Bertha Ganter - October 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 537.4 ppm on Oct 8 08:00	Maximum Daily Average: 466.8 ppm on Oct 8		Hours of Data:	708
Minimum Value: 410.8 ppm on Oct 5 16:00	Minimum Daily Average: 416.0 ppm on Oct 5		Hours of Missing Data:	36
Maximum Diurnal Average: 446.9 ppm at hour 8	Minimum Diurnal Average: 422.7 ppm at hour 16		Hours of Calibration:	34
Monthly Average: 432.86 ppm	Percentiles: P ₁ = 412.5 P ₁₀ = 418.9 Q ₁ = 421.7 Median = 427.1 Q ₃ = 436.2 P ₉₀ = 452.6 P ₉₉ = 510.9		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-Oct	464.0	462.5	465.2	469.1	Z	463.4	445.0	436.1	432.6	427.1	420.1	416.7	416.3	417.1	417.9	419.1	418.3	418.8	421.2	424.3	424.5	424.5	423.5	425.2	432.7	469.1
2-Oct	426.8	429.5	432.0	433.5	436.6	Z	438.0	440.0	440.1	439.6	439.2	436.2	434.9	433.5	432.1	429.3	426.8	428.6	435.6	442.7	446.5	454.1	468.6	468.4	438.8	468.6
3-Oct	Z	490.0	489.1	486.5	483.0	494.0	498.3	505.5	493.9	477.0	457.6	432.5	421.9	418.1	416.4	416.9	417.9	417.9	428.5	431.7	435.7	438.6	444.7	446.6	454.0	505.5
4-Oct	451.8	Z	442.0	440.3	449.0	443.6	439.1	436.2	431.5	427.3	427.5	428.5	423.9	424.7	418.8	421.1	423.5	425.8	427.9	427.9	424.8	422.3	421.1	419.8	430.4	451.8
5-Oct	419.4	418.8	Z	418.3	416.4	415.7	414.1	413.6	413.2	412.5	411.8	411.5	411.3	411.1	410.9	410.8	410.9	413.1	417.0	419.5	417.9	421.5	425.6	433.9	416.0	433.9
6-Oct	436.4	444.1	439.2	Z	430.9	432.8	431.8	426.4	427.2	436.3	434.6	431.4	429.1	421.7	420.2	420.1	423.6	428.2	442.0	437.4	438.6	429.4	431.3	431.1	431.5	444.1
7-Oct	431.8	431.4	431.5	433.1	Z	436.8	449.7	453.3	447.2	434.8	434.2	435.9	437.4	436.0	437.3	435.8	434.2	433.7	434.5	442.9	450.5	454.5	458.6	465.3	440.9	465.3
8-Oct	481.3	493.2	503.6	511.5	523.9	Z	531.1	537.4	523.8	523.8	491.2	438.0	427.1	427.5	426.8	426.4	425.7	429.1	433.4	433.9	441.4	436.2	436.4	434.0	466.8	537.4
9-Oct	Z	439.0	442.5	455.5	471.8	493.5	508.0	505.0	493.3	445.9	435.9	436.0	428.9	427.4	426.9	426.2	425.9	428.3	430.0	430.4	431.9	441.6	447.3	450.2	448.8	508.0
10-Oct	472.7	Z	474.4	484.4	497.1	504.9	515.4	511.1	502.5	454.3	435.7	430.4	428.2	427.7	427.2	426.7	426.1	426.2	428.1	427.0	427.1	425.3	425.0	426.7	452.4	515.4
11-Oct	427.4	427.4	Z	428.9	429.1	430.6	434.4	442.9	431.5	426.4	425.9	425.9	423.9	422.4	421.4	420.8	420.3	421.0	422.3	423.4	422.9	426.2	424.3	425.7	426.3	442.9
12-Oct	428.5	439.8	439.5	Z	441.1	444.5	451.2	472.5	455.8	433.7	431.4	433.3	426.5	427.8	429.0	424.9	420.0	420.1	420.9	424.8	428.7	430.3	432.1	432.9	434.3	472.5
13-Oct	431.4	432.8	436.7	437.6	Z	440.9	432.8	427.3	426.4	430.2	C	C	C	424.8	425.4	422.8	422.5	423.3	423.9	422.4	424.7	425.1	423.9	425.6	428.0	440.9
14-Oct	426.6	428.4	427.3	427.8	427.2	Z	429.6	429.6	425.0	433.6	422.2	423.0	422.3	421.6	420.2	419.7	420.6	421.4	420.1	423.0	422.1	421.7	424.7	425.2	424.0	429.6
15-Oct	Z	425.0	425.8	428.4	431.6	432.9	435.6	435.0	431.6	431.1	431.0	433.4	431.5	429.7	426.8	426.0	427.1	432.9	431.8	436.6	436.9	439.4	438.7	439.6	432.1	439.6
16-Oct	442.6	Z	444.1	444.5	451.4	452.5	452.0	455.5	449.9	443.6	436.4	433.0	427.7	422.1	420.5	421.2	421.5	423.5	428.2	436.4	440.7	444.1	449.9	453.3	438.9	455.5
17-Oct	463.1	469.1	Z	484.2	483.4	473.6	465.8	460.5	461.2	450.3	440.5	438.8	436.9	435.5	435.2	434.7	435.1	433.8	433.9	434.4	436.5	436.3	438.2	438.5	448.7	484.2
18-Oct	440.5	443.9	448.4	Z	449.5	452.8	460.5	470.6	460.2	454.5	445.2	443.0	442.9	442.9	436.0	434.6	433.9	435.9	442.3	443.1	445.4	444.9	431.2	430.3	444.9	470.6
19-Oct	431.4	434.9	439.2	443.1	Z	444.8	444.8	441.2	441.7	436.1	427.8	M	423.6	422.2	421.5	421.5	422.8	422.9	422.2	424.8	429.0	428.4	422.6	424.4	430.5	444.8
20-Oct	426.0	426.9	427.8	428.6	428.9	Z	429.4	428.5	427.0	424.9	423.1	421.4	421.3	421.6	421.5	422.8	426.3	428.7	427.8	430.0	432.2	434.6	437.6	443.6	427.8	443.6
21-Oct	Z	453.0	460.2	455.5	463.2	465.8	463.4	458.4	451.7	449.3	446.1	446.1	447.7	432.3	426.0	420.9	418.8	418.2	420.7	419.8	419.7	420.0	420.1	420.6	439.0	465.8
22-Oct	421.9	Z	421.8	424.1	434.8	437.3	437.9	438.5	434.6	430.0	425.9	428.3	426.9	423.7	426.3	423.2	426.4	429.1	433.2	428.0	425.1	421.8	421.1	421.7	427.9	438.5
23-Oct	422.1	422.0	Z	422.9	423.7	425.9	426.6	426.3	424.0	421.1	418.9	416.9	416.0	415.6	415.7	415.9	416.3	416.7	417.3	419.1	419.1	419.2	418.9	419.6	420.0	426.6
24-Oct	420.0	419.7	420.9	Z	421.6	421.8	422.2	422.6	422.0	420.6	420.2	420.2	419.1	417.9	416.8	417.3	417.8	418.0	418.1	417.7	417.8	418.3	418.6	418.4	419.5	422.6
25-Oct	418.1	418.6	418.8	419.4	Z	420.4	421.6	422.5	423.4	422.0	420.6	420.0	420.2	420.6	421.2	420.6	421.2	422.4	420.3	420.2	420.5	421.7	421.9	422.3	420.8	423.4
26-Oct	422.4	422.3	422.8	423.2	422.6	Z	422.9	422.6	422.0	421.7	421.1	420.4	420.0	419.1	419.6	419.3	421.9	423.4	423.6	421.5	423.2	423.4	424.6	423.8	422.1	424.6
27-Oct	Z	424.5	423.4	419.6	419.7	418.9	419.8	421.8	426.8	425.3	422.2	419.7	420.5	420.9	417.0	416.7	417.3	418.5	419.8	426.1	425.9	425.1	423.1	427.2	421.7	427.2
28-Oct	426.4	Z	426.3	426.4	426.9	427.3	427.5	426.9	426.9	426.7	426.7	428.1	424.2	421.2	421.2	421.9	427.6	423.0	421.4	421.7	422.0	421.5	421.4	418.9	424.4	428.1
29-Oct	419.1	419.4	Z	418.8	419.9	419.6	418.8	421.0	419.9	419.2	419.9	420.5	418.4	418.2	418.5	419.0	420.7	423.5	426.5	424.4	427.1	430.5	428.1	422.1	421.4	430.5
30-Oct	419.5	417.1	418.7	Z	418.1	421.6	431.6	432.8	431.0	428.3	425.8	422.0	418.8	418.1	419.3	420.3	420.7	420.3	420.9	422.0	423.3	425.4	427.6	428.7	423.1	432.8
31-Oct	430.0	430.4	430.0	432.2	Z	433.8	433.9	432.9	429.9	M	424.4	422.8	425.4	425.6	425.4	427.0	428.0	427.8	426.5	432.0	436.7	434.9	435.1	435.0	430.0	436.7

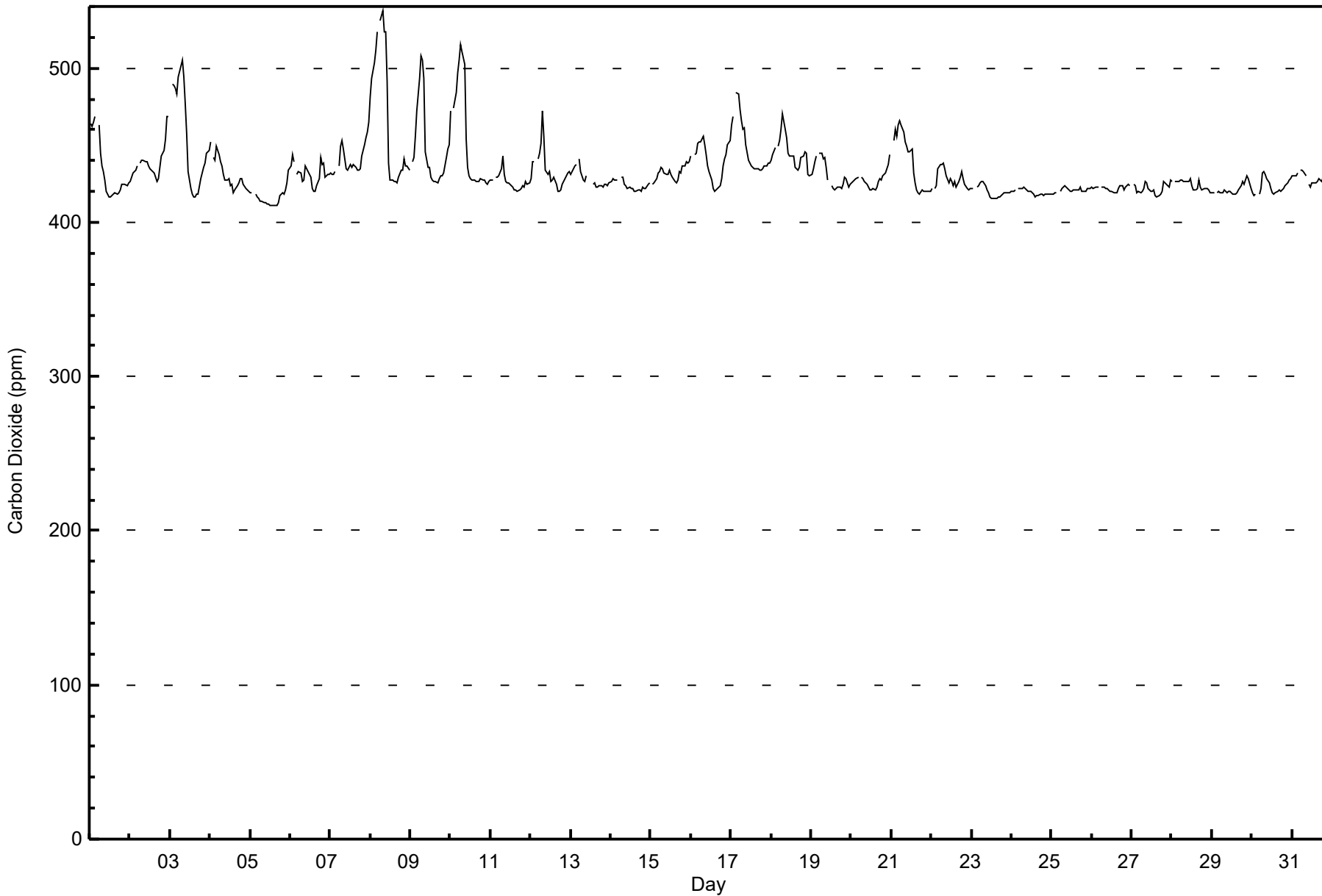
434.7	437.1	440.4	442.2	444.0	444.2	446.2	446.9	442.8	436.6	431.4	428.1	425.8	424.1	423.2	422.7	423.2	424.3	426.4	428.0	429.6	430.3	431.2	432.2	Diurnal Average	
481.3	493.2	503.6	511.5	523.9	504.9	531.1	537.4	523.8	523.8	491.2	446.1	447.7	442.9	437.3	435.8	435.1	435.9	442.3	443.1	450.5	454.5	468.6	468.4	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
400 - 420	127	17.94	17.94
420 - 440	449	63.42	81.36
440 - 460	78	11.02	92.37
460 - 480	24	3.39	95.76
480 - 500	16	2.26	98.02
> 500	14	1.98	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Carbon Dioxide (CO₂) - ppm
Fort McKay - Bertha Ganter - October 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	3	0	0	0	0	1	3	19	3	4	1	11	33	33	9	127
420 - 440	19	17	6	6	4	10	16	97	94	20	11	26	43	40	26	14	449
440 - 460	1	3	0	1	0	0	0	13	22	12	5	4	0	6	4	7	78
460 - 480	3	1	0	0	0	1	0	1	4	4	0	0	2	2	3	3	24
480 - 500	1	0	0	1	0	0	2	1	1	3	0	1	1	0	5	0	16
> 500	1	1	0	0	0	1	0	0	0	0	0	0	0	2	6	3	14
Totals	32	25	6	8	4	12	19	115	140	42	20	32	57	83	77	36	708

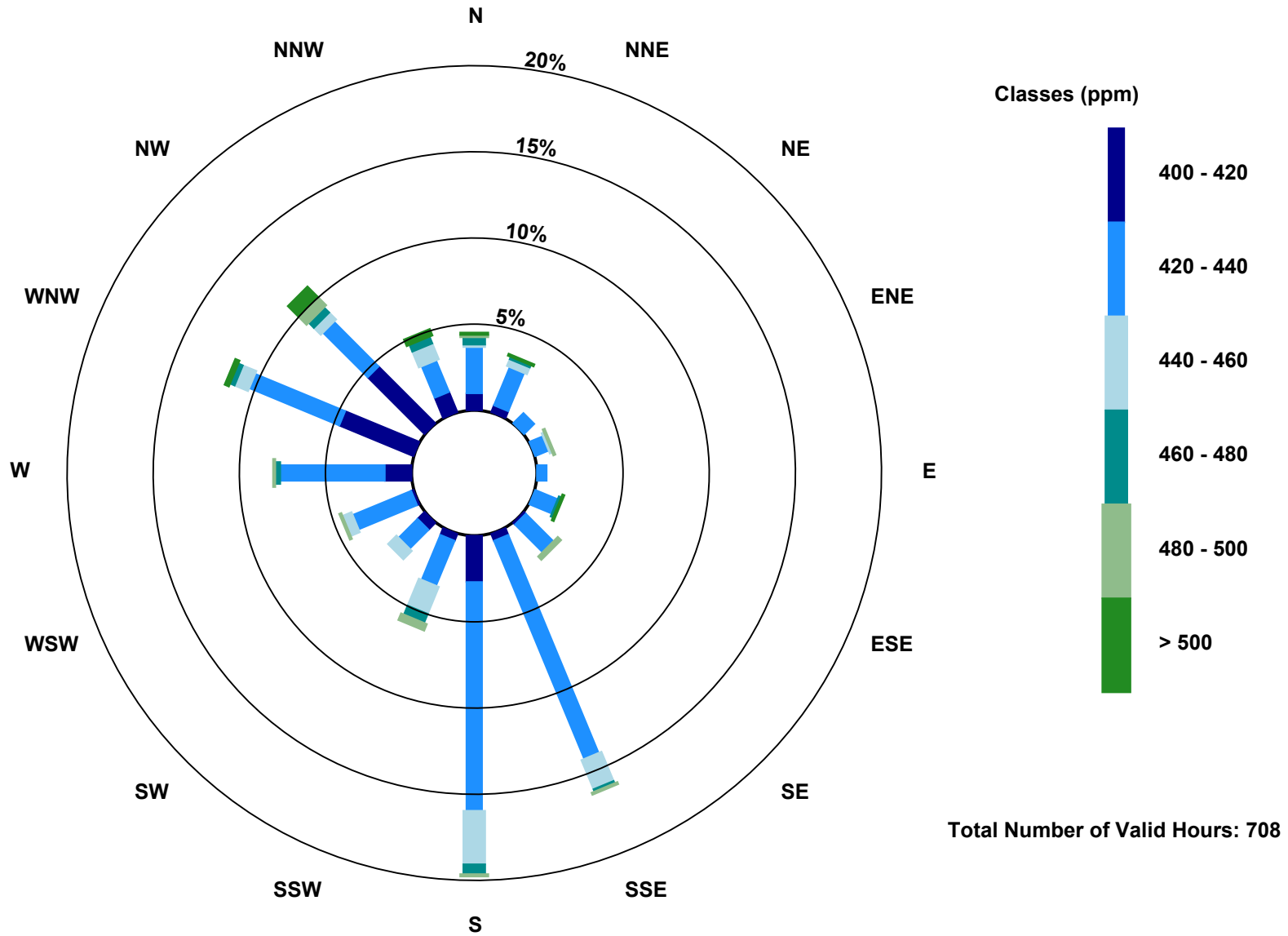
Total Number of Valid Hours: 708

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

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





Summary of Hour Averages

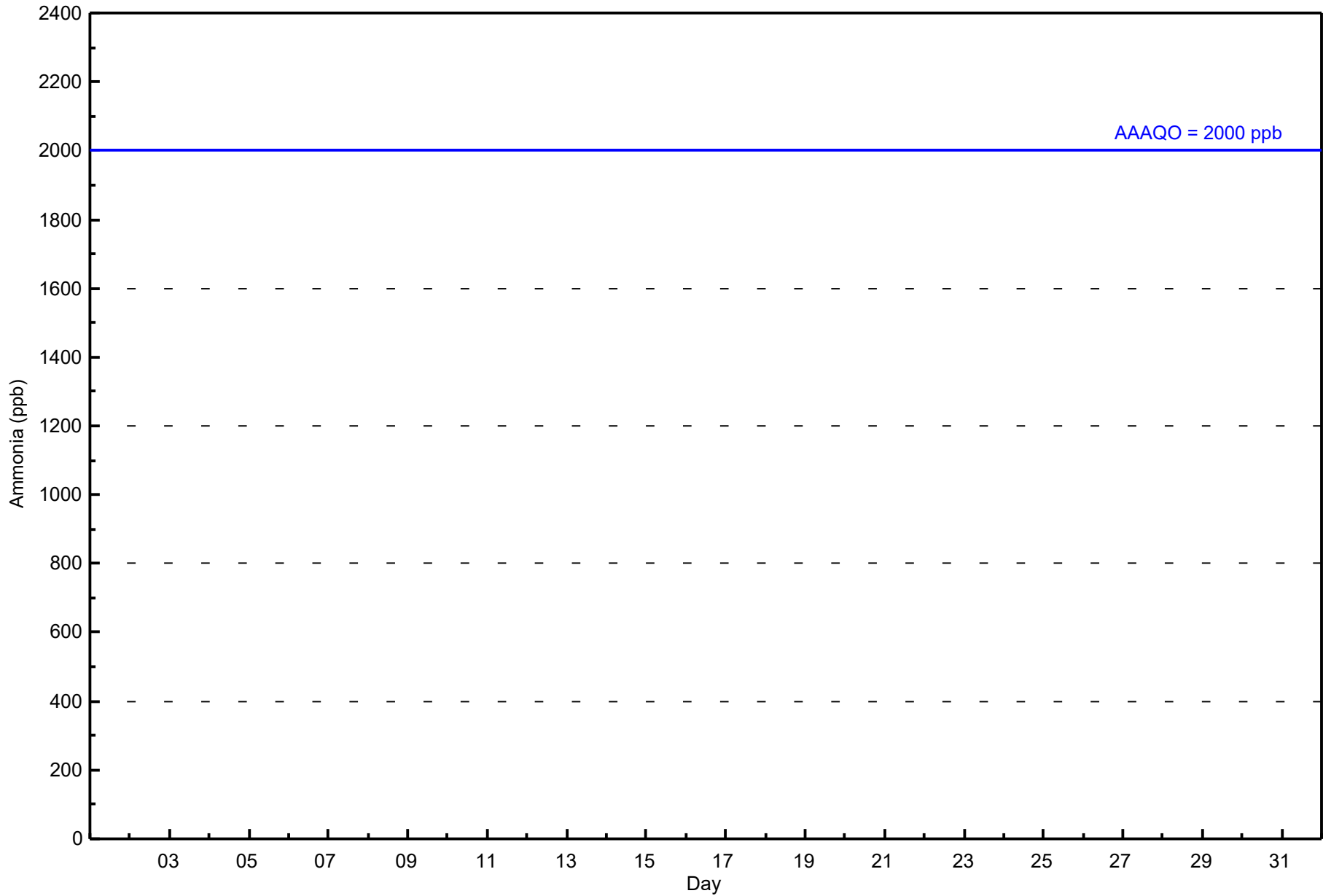
Fort McKay - Bertha Ganter - October 2023

Number of Exceedences (AAAQO):	1-hr: 0																			Hours in Service:	744																								
Maximum Value: 0.0 ppb on Oct 1 01:00	Maximum Daily Average: 0.0 ppb on Oct 1																			Hours of Data:	595																								
Minimum Value: 0.0 ppb on Oct 1 01:00	Minimum Daily Average: 0.0 ppb on Oct 1																			Hours of Missing Data:	149																								
Maximum Diurnal Average: 0.0 ppb at hour 1	Minimum Diurnal Average: 0.0 ppb at hour 1																			Hours of Calibration:	45																								
Monthly Average: 0.00 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.0 P ₉₉ = 0.0																			Percent Operational Time:	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-Oct	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																		
2-Oct	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																		
3-Oct	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																		
4-Oct	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																		
5-Oct	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																		
6-Oct	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	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	0.0																		
7-Oct	UO	UO	UO	UO	UO	UO	UO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																		
8-Oct	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																		
9-Oct	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																		
10-Oct	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	UO	UO	UO	UO	UO	UO	UO	UO	UO	0.0																		
11-Oct	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																		
12-Oct	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																		
13-Oct	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																		
14-Oct	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																		
15-Oct	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																		
16-Oct	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																		
17-Oct	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																		
18-Oct	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	C	C	C	C	C	C	C	M	M	M	M	M	M	M	M	M	M	0.0																		
19-Oct	M	M	M	M	M	M	M	M	M	C	C	C	C	C	C	C	C	C	C	C	C	C	C	0.0	0.0	0.0	0.0																		
20-Oct	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																		
21-Oct	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																		
22-Oct	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																		
23-Oct	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																		
24-Oct	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																		
25-Oct	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																		
26-Oct	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																		
27-Oct	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																		
28-Oct	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																		
29-Oct	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																		
30-Oct	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	0.0																		
31-Oct	UO	UO	UO	UO	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																								Diurnal Average																					
0.0																								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 - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 5	595	100.00	100.00
6 - 10	0	0.00	100.00
11 - 15	0	0.00	100.00
16 - 20	0	0.00	100.00
21 - 25	0	0.00	100.00
> 26	0	0.00	100.00

Total Number of Valid Hours: 595

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Ammonia (NH₃) - ppb
Fort McKay - Bertha Ganter - October 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	28	23	6	6	3	10	13	102	110	28	18	21	50	71	69	37	595
6 - 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	28	23	6	6	3	10	13	102	110	28	18	21	50	71	69	37	595

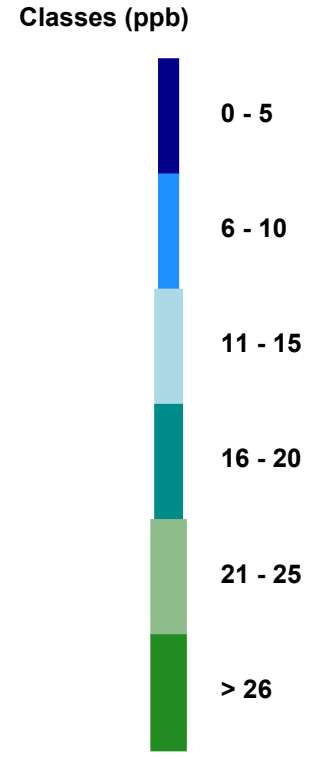
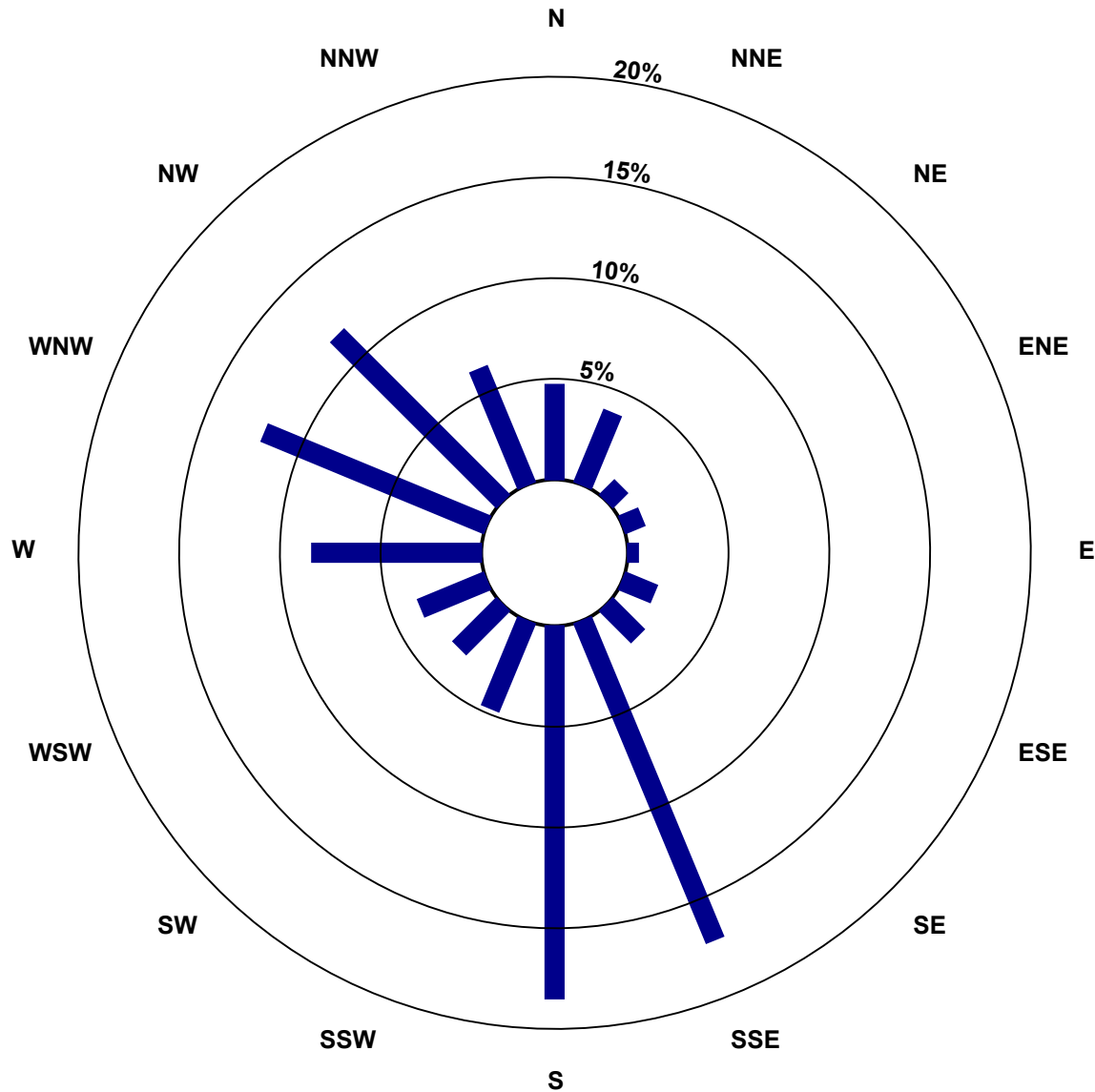
Total Number of Valid Hours: 595

Total Number of Hours: 744

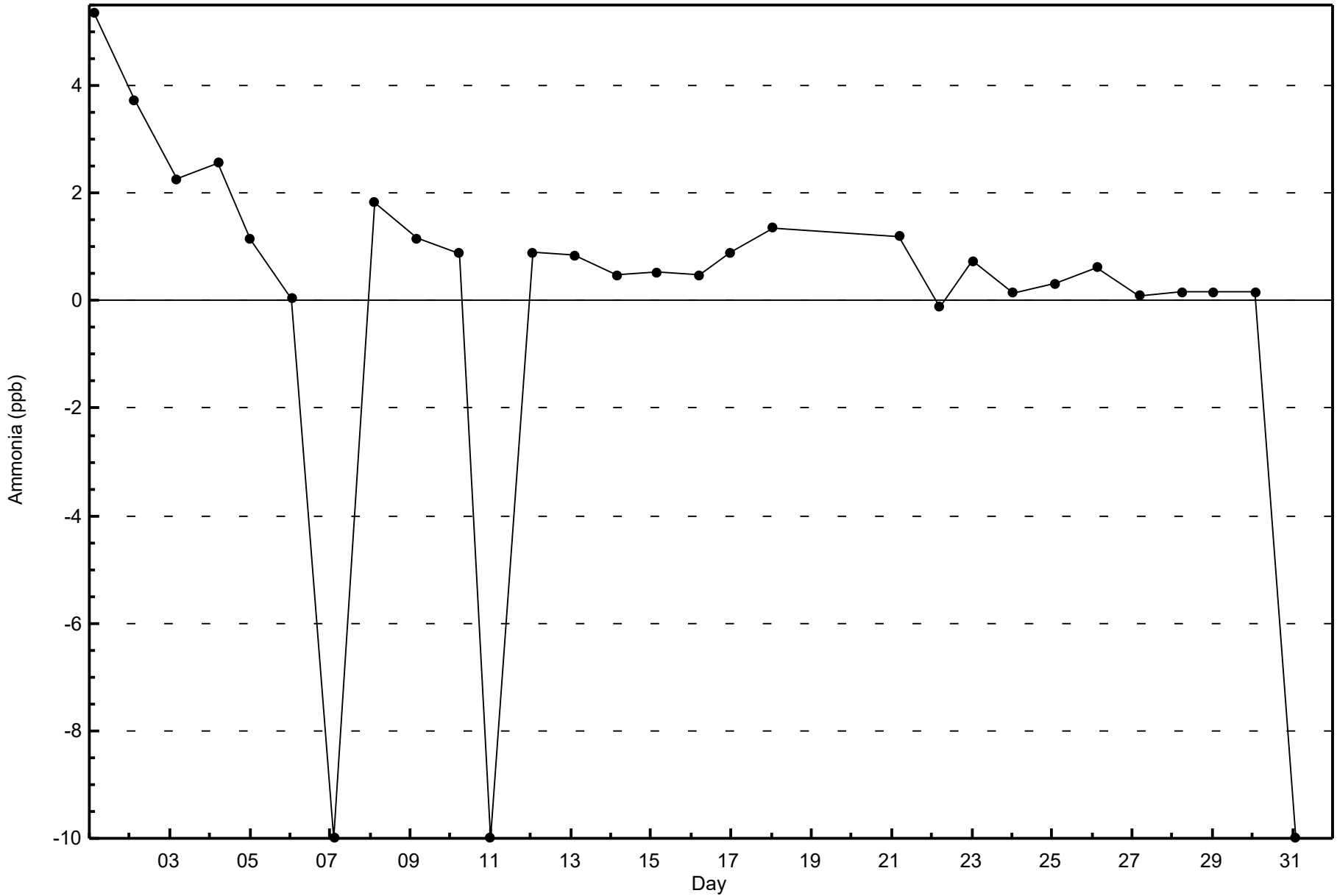


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Ammonia (NH₃) - ppb
Fort McKay - Bertha Ganter



Total Number of Valid Hours: 595



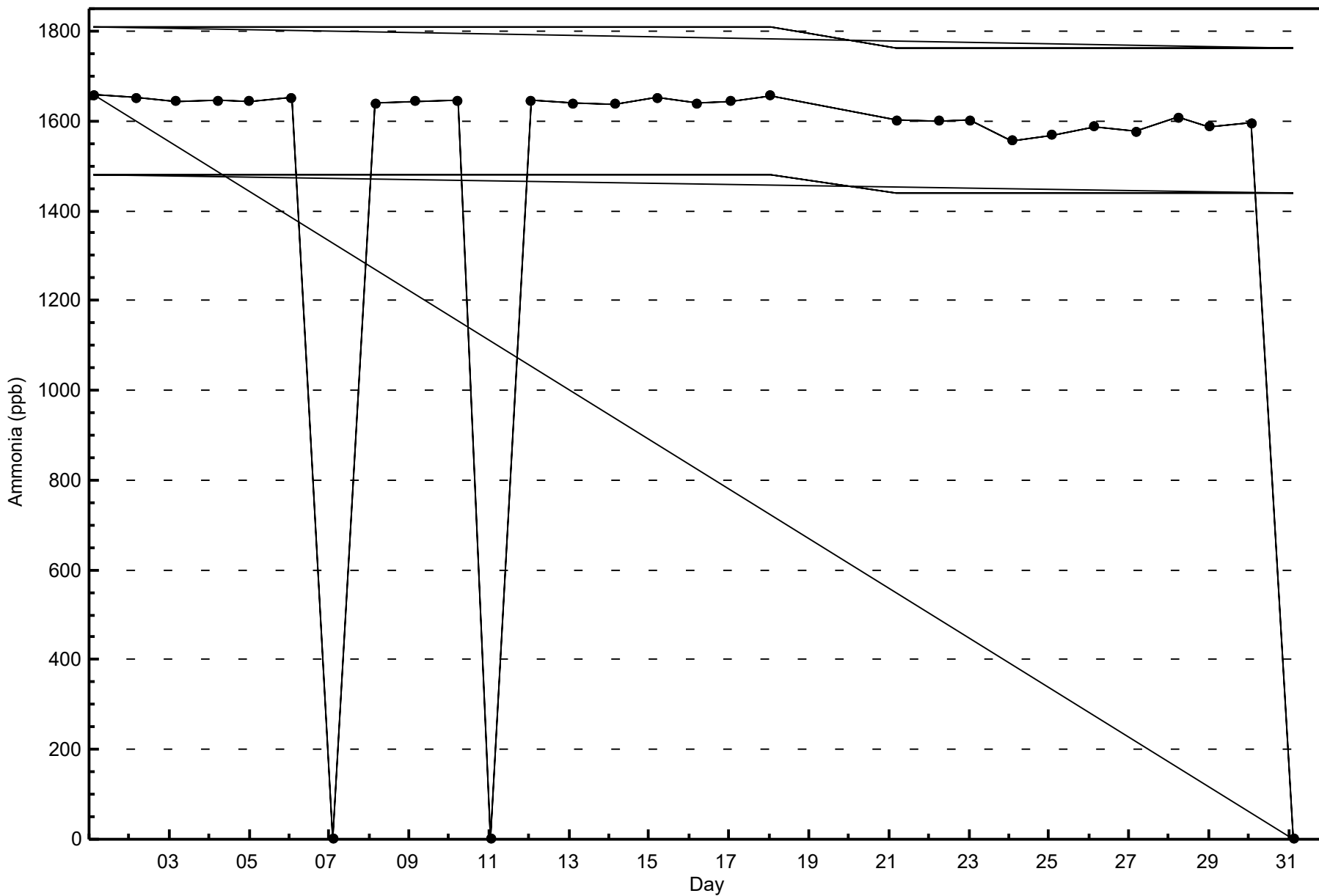


Wood Buffalo Environmental Association

Span Responses

Ammonia (NH₃) - ppb

Fort McKay - Bertha Ganter - October 2023





Wood Buffalo Environmental Association
Summary of Hour Averages

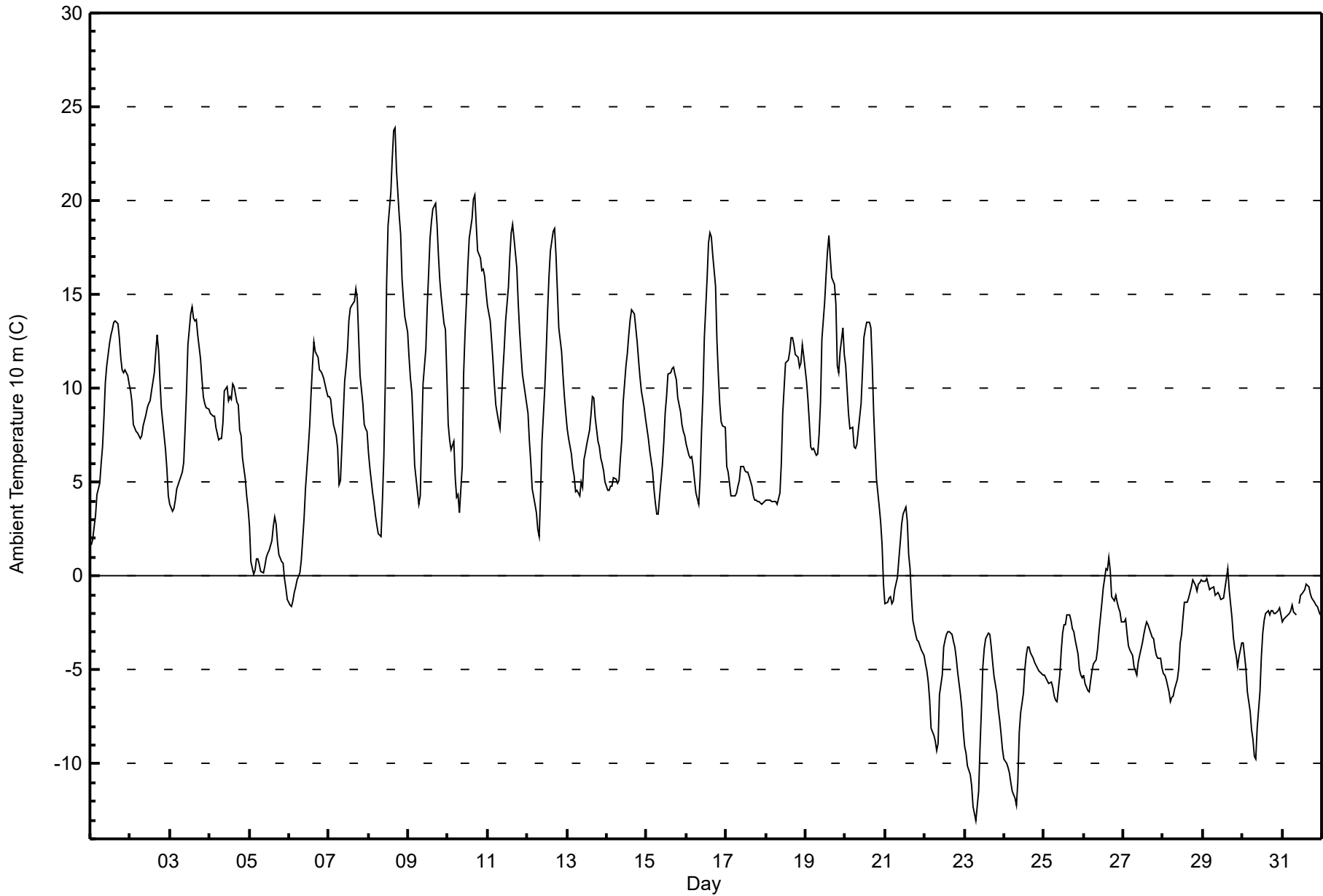
Ambient Temperature 10 m (AT 10m) - C
Fort McKay - Bertha Ganter - October 2023

Maximum Value: 23.9 C on Oct 8 17:00 Maximum Daily Average: 12.8 C on Oct 11																				Hours in Service: 744 Hours of Data: 743						
Minimum Value: -13.0 C on Oct 23 08:00 Minimum Daily Average: -7.8 C on Oct 23 Maximum Diurnal Average: 8.5 C at hour 16 Minimum Diurnal Average: 0.7 C at hour 8 Monthly Average: 4.37 C Percentiles: P ₁ = -11.1 P ₁₀ = -5.3 Q ₁ = -1.9 Median = 4.8 Q ₃ = 10.1 P ₉₀ = 13.7 P ₉₉ = 19.7																				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-Oct	1.7	2.0	2.6	3.3	4.3	4.9	6.0	6.9	8.4	10.3	11.2	12.4	12.9	13.1	13.5	13.6	13.4	12.7	11.6	11.0	10.9	11.0	10.7	10.3	9.1	13.6
2-Oct	9.9	9.3	8.1	7.7	7.6	7.5	7.3	7.5	8.0	8.6	8.9	9.2	9.3	9.9	10.8	11.9	12.8	12.0	10.4	8.9	7.5	6.8	5.7	4.3	8.7	12.8
3-Oct	3.8	3.4	3.6	4.0	4.6	4.8	5.1	5.5	6.0	7.9	9.9	12.3	14.0	14.4	13.8	13.6	13.7	12.8	11.6	10.5	9.5	9.2	9.0	8.9	8.8	14.4
4-Oct	8.7	8.6	8.5	8.5	7.9	7.3	7.3	7.3	8.1	9.9	10.1	9.3	9.6	9.4	10.3	10.1	9.3	9.1	7.8	7.5	6.3	5.2	4.3	3.6	8.1	10.3
5-Oct	2.6	0.8	0.1	0.3	0.9	0.9	0.6	0.2	0.1	0.6	1.0	1.2	1.4	1.9	2.6	3.2	2.8	1.8	1.1	0.8	0.7	-0.1	-0.7	-1.2	1.0	3.2
6-Oct	-1.5	-1.6	-1.4	-0.9	-0.6	-0.2	0.2	0.8	1.9	3.0	4.7	6.8	8.0	9.7	11.2	12.5	12.0	11.7	11.0	10.9	10.7	10.6	9.9	9.5	5.8	12.5
7-Oct	9.5	9.4	8.7	8.1	7.5	6.8	4.9	5.1	6.9	10.4	11.1	12.0	13.6	14.3	14.4	14.6	15.3	14.8	12.7	10.7	9.2	8.0	7.9	7.7	10.1	15.3
8-Oct	6.6	5.7	4.5	3.9	3.2	2.7	2.2	2.1	4.1	6.4	10.2	15.7	18.7	20.5	22.3	23.8	23.9	21.7	19.2	18.2	15.8	14.7	13.8	13.0	12.2	23.9
9-Oct	11.7	10.5	9.8	8.0	5.9	4.5	3.8	4.3	7.3	10.2	12.1	14.3	16.1	18.0	18.9	19.6	19.8	18.7	17.1	15.8	14.8	13.5	13.1	10.7	12.4	19.8
10-Oct	8.1	7.3	6.8	7.2	5.2	4.2	4.4	3.4	5.9	10.8	12.9	14.6	16.5	18.0	19.1	20.1	20.3	18.7	17.3	16.9	16.3	16.3	16.0	15.2	12.6	20.3
11-Oct	14.4	13.6	12.5	11.4	10.2	9.1	8.2	7.8	9.3	10.9	12.1	13.6	15.4	17.0	18.3	18.7	18.0	16.4	14.5	13.0	11.9	10.8	10.2	9.2	12.8	18.7
12-Oct	8.7	7.2	6.1	4.6	3.8	3.4	2.5	2.1	4.4	7.2	10.0	12.0	14.1	16.0	17.3	18.4	18.5	17.1	15.2	13.2	11.9	10.7	9.6	8.7	10.1	18.5
13-Oct	7.9	7.3	6.5	5.7	5.3	4.5	4.6	4.3	5.0	4.7	6.2	6.6	7.1	7.8	8.6	9.6	9.5	8.5	7.1	6.8	6.3	6.0	5.6	5.0	6.5	9.6
14-Oct	4.6	4.6	4.8	4.8	5.3	5.2	5.0	5.1	6.3	7.3	9.3	11.2	11.9	12.8	13.7	14.2	13.9	13.2	12.5	11.5	10.6	9.9	9.0	8.4	8.9	14.2
15-Oct	7.9	7.3	6.6	5.6	4.6	3.9	3.3	3.3	4.2	5.9	7.1	8.7	9.5	10.8	10.8	11.0	11.2	10.8	10.4	9.5	8.8	8.1	7.7	7.5	7.7	11.2
16-Oct	7.1	6.4	6.3	6.3	5.8	5.1	4.4	3.9	5.2	7.7	9.7	12.7	15.9	17.8	18.3	18.1	17.1	15.4	12.6	10.8	9.2	8.2	8.0	7.9	10.0	18.3
17-Oct	5.8	5.6	4.9	4.2	4.3	4.3	4.5	4.8	5.1	5.9	5.8	5.6	5.5	5.5	5.3	4.8	4.2	4.1	4.0	4.0	4.0	3.8	3.9	4.0	4.7	5.9
18-Oct	4.0	4.1	4.1	3.9	4.0	3.9	4.0	3.8	4.4	6.0	8.7	10.0	11.3	11.5	12.0	12.7	12.7	12.3	11.8	11.6	11.1	11.4	12.4	11.7	8.5	12.7
19-Oct	10.4	9.4	8.2	6.9	6.7	6.8	6.4	6.5	7.5	9.3	12.6	14.7	16.0	17.3	18.2	17.0	15.9	15.5	14.5	11.2	10.8	12.0	13.2	11.8	11.6	18.2
20-Oct	11.2	9.9	8.7	7.8	7.9	6.9	6.8	7.0	7.8	9.2	10.9	12.7	13.1	13.5	13.6	13.2	11.2	8.7	6.8	5.2	3.7	2.9	1.7	-0.4	8.3	13.6
21-Oct	-1.4	-1.4	-1.1	-1.1	-1.5	-1.3	-0.7	-0.1	0.9	1.8	2.7	3.3	3.7	3.0	1.1	0.4	-1.1	-2.3	-3.1	-3.4	-3.5	-3.7	-3.9	-4.2	-0.7	3.7
22-Oct	-4.7	-5.1	-5.6	-6.7	-8.1	-8.5	-8.8	-9.3	-8.9	-6.3	-5.3	-3.8	-3.4	-3.1	-3.0	-3.0	-3.1	-3.5	-3.8	-4.4	-5.1	-6.3	-7.1	-8.3	-5.6	-3.0
23-Oct	-9.1	-9.5	-10.1	-10.6	-11.2	-12.3	-12.7	-13.0	-11.4	-9.1	-7.1	-4.9	-3.9	-3.3	-3.0	-3.1	-3.8	-4.6	-5.3	-6.3	-7.1	-7.7	-8.4	-9.2	-7.8	-3.0
24-Oct	-9.7	-10.0	-10.2	-10.5	-11.0	-11.5	-11.9	-12.2	-10.9	-8.3	-7.3	-6.3	-5.0	-4.2	-3.8	-3.8	-4.1	-4.4	-4.6	-4.7	-4.9	-5.1	-5.2	-5.2	-7.3	-3.8
25-Oct	-5.3	-5.5	-5.6	-5.7	-5.7	-6.0	-6.4	-6.6	-6.7	-5.3	-4.0	-3.1	-2.6	-2.6	-2.1	-2.1	-2.3	-2.8	-3.0	-3.4	-4.1	-5.0	-5.3	-5.4	-4.4	-2.1
26-Oct	-5.3	-5.7	-6.1	-6.1	-5.6	-5.1	-4.7	-4.5	-3.8	-2.9	-2.2	-1.5	-0.6	0.4	0.3	1.0	0.3	-1.1	-1.3	-1.0	-1.4	-1.7	-1.9	-2.4	-2.6	1.0
27-Oct	-2.5	-2.3	-3.0	-3.7	-3.9	-4.2	-4.8	-5.0	-5.3	-4.6	-4.2	-3.6	-3.1	-2.8	-2.4	-2.6	-3.0	-3.2	-3.4	-3.9	-4.2	-4.4	-4.4	-4.9	-3.7	-2.3
28-Oct	-5.2	-5.3	-5.5	-6.2	-6.7	-6.5	-6.4	-6.0	-5.5	-4.9	-3.6	-3.1	-2.2	-1.4	-1.4	-1.2	-0.9	-0.6	-0.2	-0.5	-0.8	-0.4	-0.3	-0.2	-3.1	-0.2
29-Oct	-0.3	-0.3	-0.2	-0.5	-0.7	-0.7	-0.6	-1.0	-0.9	-0.9	-1.0	-1.2	-1.2	-0.7	-0.1	0.4	-0.7	-2.2	-3.3	-3.9	-4.2	-4.9	-4.3	-3.6	-1.5	0.4
30-Oct	-3.6	-4.2	-5.0	-6.2	-7.2	-8.2	-8.7	-9.6	-9.7	-8.1	-6.2	-4.3	-3.1	-2.3	-2.0	-1.8	-2.0	-1.8	-1.9	-2.0	-2.0	-1.9	-1.7	-2.0	-4.4	-1.7
31-Oct	-2.4	-2.3	-2.1	-2.1	-2.0	-1.9	-1.6	-1.9	-2.1	M	-1.5	-1.1	-0.9	-0.7	-0.4	-0.5	-0.6	-0.9	-1.2	-1.4	-1.5	-1.6	-1.8	-2.0	-1.5	-0.4
3.0 2.6 2.1 1.7 1.3 1.0 0.8 0.7 1.7 3.4 4.7 6.0 7.0 7.8 8.3 8.5 8.2 7.4 6.4 5.6 4.9 4.4 4.1 3.5																								Diurnal Average		
14.4 13.6 12.5 11.4 10.2 9.1 8.2 7.8 9.3 10.9 12.9 15.7 18.7 20.5 22.3 23.8 23.9 21.7 19.2 18.2 16.3 16.3 16.0 15.2																								Diurnal Maximum		
M - Maintenance																										



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	260	34.99	34.99
0 - 10	295	39.70	74.70
10 - 20	181	24.36	99.06
> 20	7	0.94	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

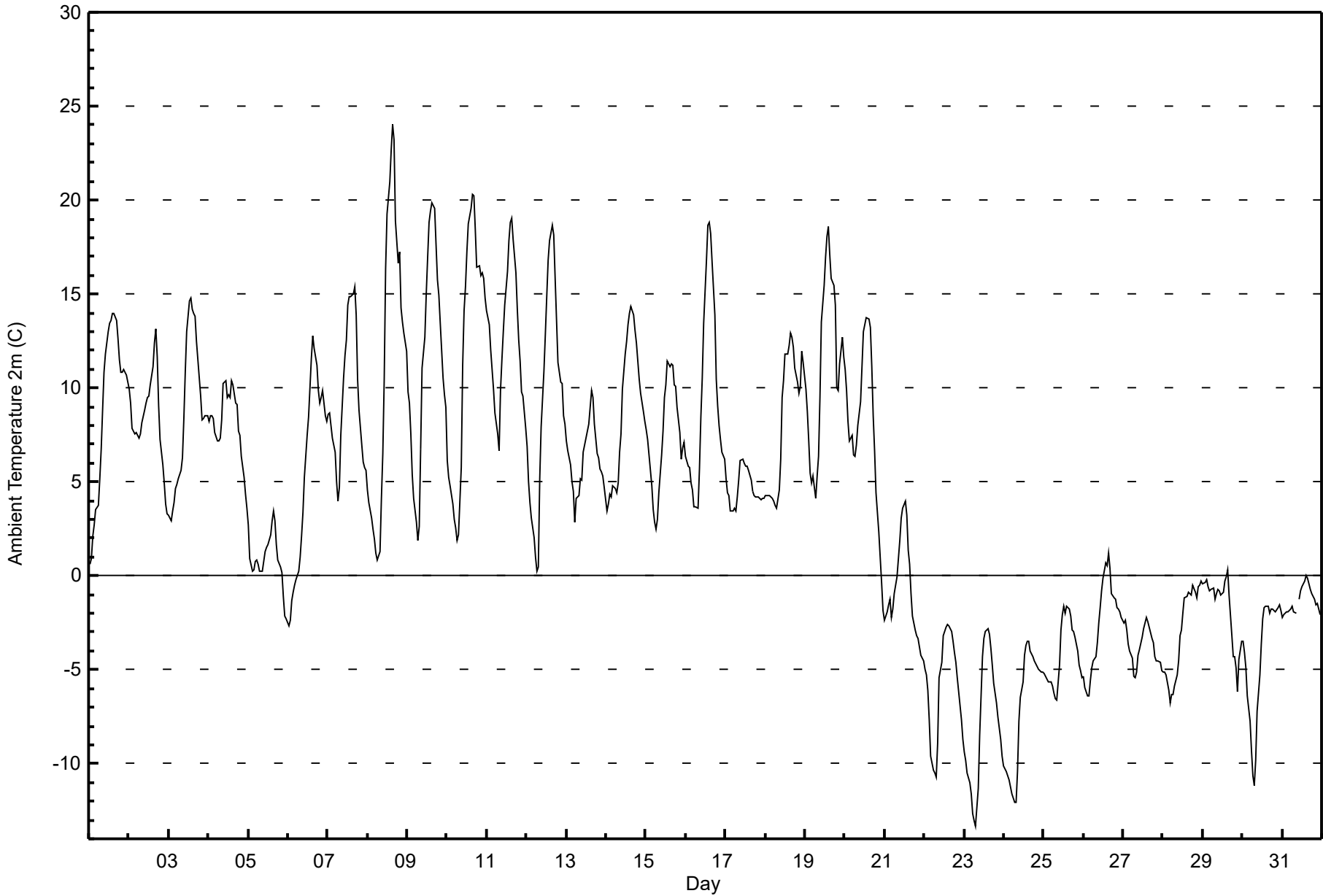
Ambient Temperature 2m (AT 2m) - C
Fort McKay - Bertha Ganter - October 2023

Maximum Value: 24.1 C on Oct 8 16:00 Maximum Daily Average: 12.6 C on Oct 11																				Hours in Service: 744 Hours of Data: 743						
Minimum Value: -13.3 C on Oct 23 08:00 Minimum Daily Average: -7.9 C on Oct 23 Maximum Diurnal Average: 8.8 C at hour 16 Minimum Diurnal Average: 0.1 C at hour 7 Monthly Average: 4.15 C Percentiles: P ₁ = -11.3 P ₁₀ = -5.2 Q ₁ = -1.9 Median = 4.3 Q ₃ = 9.8 P ₉₀ = 13.9 P ₉₉ = 19.6																				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-Oct	0.6	0.9	2.1	2.7	3.5	3.8	5.2	6.8	8.8	10.8	11.8	13.0	13.4	13.6	14.0	13.9	13.6	12.6	11.5	10.8	10.8	11.0	10.7	10.3	9.0	14.0
2-Oct	9.9	9.2	7.9	7.6	7.6	7.5	7.4	7.5	8.1	8.8	9.2	9.5	9.6	10.2	11.2	12.4	13.1	11.6	9.0	7.2	5.9	4.9	3.8	3.3	8.4	13.1
3-Oct	3.3	3.0	3.5	3.9	4.7	4.9	5.1	5.6	6.3	8.4	10.8	13.0	14.6	14.8	14.2	14.0	13.8	12.5	10.5	9.6	8.3	8.4	8.5	8.5	8.8	14.8
4-Oct	8.3	8.6	8.5	8.4	7.6	7.2	7.2	7.3	8.3	10.2	10.4	9.5	9.6	10.4	10.2	9.2	9.1	7.7	7.5	6.4	5.2	4.4	3.6	8.1	10.4	
5-Oct	2.7	0.9	0.2	0.3	0.8	0.8	0.6	0.3	0.2	0.8	1.3	1.5	1.7	2.2	2.9	3.4	2.9	1.6	0.8	0.5	0.1	-1.1	-2.1	-2.3	0.9	3.4
6-Oct	-2.6	-2.3	-1.3	-0.9	-0.5	-0.2	0.3	1.0	2.1	3.4	5.2	7.4	8.4	10.0	11.6	12.8	12.1	11.2	9.9	9.2	9.5	9.8	8.5	8.2	5.5	12.8
7-Oct	8.6	8.7	8.0	7.3	6.6	5.0	4.0	4.7	7.5	10.6	11.8	12.6	14.4	14.9	14.9	15.0	15.4	13.9	10.5	8.8	7.0	6.0	5.8	5.6	9.5	15.4
8-Oct	4.6	3.9	3.1	2.5	2.0	1.2	0.8	1.3	4.1	6.5	10.4	16.3	19.2	21.0	22.7	24.1	23.2	18.9	16.7	17.3	14.3	13.5	12.9	12.0	11.4	24.1
9-Oct	9.8	9.2	7.6	5.4	4.2	2.9	1.9	2.6	6.7	11.1	12.7	15.0	16.9	18.8	19.4	19.9	19.6	17.6	15.7	15.0	13.5	10.5	9.6	9.0	11.4	19.9
10-Oct	6.1	5.2	4.8	3.8	3.0	2.5	1.9	2.2	5.8	11.2	14.1	15.4	17.3	18.7	19.5	20.3	20.2	18.4	16.4	16.5	16.0	16.1	15.8	14.8	11.9	20.3
11-Oct	14.1	13.4	12.0	11.0	9.9	8.7	7.6	6.6	9.9	11.5	13.0	14.4	16.2	17.8	18.8	19.0	17.9	16.2	14.2	12.5	11.4	9.8	9.6	7.9	12.6	19.0
12-Oct	6.9	5.0	3.9	3.1	2.0	1.0	0.3	0.5	5.2	7.9	10.9	12.9	14.9	16.8	17.8	18.7	18.1	15.8	13.6	11.3	10.3	10.2	8.6	8.1	9.3	18.7
13-Oct	7.2	6.7	5.9	5.0	4.5	2.9	4.1	4.3	5.2	5.1	6.6	7.0	7.4	8.1	9.0	9.9	9.5	8.1	6.5	6.3	5.7	5.5	5.3	4.7	6.3	9.9
14-Oct	3.4	3.8	4.4	4.2	4.8	4.6	4.4	5.0	6.6	7.6	9.9	11.8	12.5	13.4	14.0	14.3	13.9	13.1	12.4	11.4	10.5	9.7	8.8	8.2	8.9	14.3
15-Oct	7.8	7.2	6.5	4.8	3.5	2.9	2.5	3.0	4.4	6.5	7.7	9.5	10.2	11.4	11.1	11.3	11.2	10.2	10.1	9.0	7.7	6.2	6.8	7.1	7.4	11.4
16-Oct	6.4	5.8	5.8	5.0	4.6	3.7	3.7	3.6	5.7	8.5	10.5	13.5	16.8	18.7	18.8	18.2	16.7	13.9	10.5	9.1	8.0	7.2	6.6	6.2	9.5	18.8
17-Oct	5.1	4.4	4.3	3.4	3.5	3.6	3.4	4.2	5.1	6.1	6.2	6.0	5.9	5.8	5.6	5.1	4.5	4.3	4.2	4.2	4.2	4.0	4.1	4.2	4.6	6.2
18-Oct	4.3	4.3	4.3	4.2	4.1	4.0	3.7	3.6	4.5	6.2	9.5	10.4	11.8	11.8	12.3	12.9	12.7	12.2	11.1	10.3	9.7	10.1	12.0	11.4	8.4	12.9
19-Oct	9.9	8.8	7.2	5.5	4.9	5.3	4.1	5.3	6.3	9.5	13.5	15.5	16.9	18.1	18.6	17.1	15.8	15.5	14.4	10.0	9.9	11.3	12.7	11.6	11.2	18.6
20-Oct	11.0	9.8	8.3	7.2	7.5	6.4	6.4	7.0	8.0	9.3	11.2	13.0	13.4	13.7	13.7	13.2	11.1	8.5	6.6	4.4	2.3	1.0	-0.4	-1.8	7.9	13.7
21-Oct	-2.3	-1.9	-1.5	-1.3	-2.2	-1.8	-1.0	-0.1	0.9	1.9	3.1	3.6	4.0	3.3	1.4	0.6	-0.9	-2.1	-2.9	-3.2	-3.3	-3.7	-4.3	-4.6	-0.8	4.0
22-Oct	-5.0	-5.3	-6.1	-7.6	-9.6	-10.4	-10.5	-10.7	-8.9	-5.4	-4.6	-3.2	-3.0	-2.7	-2.6	-2.6	-2.9	-3.5	-4.1	-4.6	-5.4	-6.9	-7.7	-8.7	-5.9	-2.6
23-Oct	-9.4	-9.8	-10.5	-11.0	-11.6	-12.7	-13.0	-13.3	-11.3	-8.5	-6.4	-4.3	-3.4	-2.9	-2.8	-3.1	-3.8	-4.8	-5.7	-6.8	-7.5	-8.1	-8.7	-9.6	-7.9	-2.8
24-Oct	-10.1	-10.4	-10.6	-10.8	-11.2	-11.6	-12.1	-12.1	-10.4	-7.7	-6.5	-5.6	-4.2	-3.7	-3.4	-3.5	-4.0	-4.3	-4.5	-4.7	-4.8	-5.0	-5.1	-5.2	-7.2	-3.4
25-Oct	-5.2	-5.4	-5.5	-5.6	-5.6	-5.8	-6.3	-6.5	-6.6	-4.7	-2.9	-2.0	-1.6	-2.0	-1.6	-1.7	-2.2	-2.9	-3.0	-3.3	-4.0	-4.8	-5.0	-5.4	-4.2	-1.6
26-Oct	-5.4	-6.0	-6.4	-6.4	-5.6	-4.9	-4.5	-4.3	-3.5	-2.5	-1.7	-0.8	-0.1	0.7	0.6	1.2	0.4	-1.0	-1.2	-1.3	-1.7	-1.7	-1.9	-2.2	-2.5	1.2
27-Oct	-2.5	-2.4	-2.9	-3.6	-4.0	-4.4	-5.3	-5.4	-5.1	-4.2	-3.9	-3.3	-2.8	-2.5	-2.2	-2.5	-3.0	-3.4	-3.6	-4.3	-4.5	-4.5	-4.6	-5.0	-3.7	-2.2
28-Oct	-5.1	-5.1	-5.3	-6.1	-6.7	-6.3	-6.3	-5.9	-5.3	-4.6	-3.2	-2.9	-2.0	-1.2	-1.1	-0.9	-1.0	-1.1	-0.5	-0.9	-1.2	-0.6	-0.5	-0.3	-3.1	-0.3
29-Oct	-0.4	-0.4	-0.2	-0.6	-0.8	-0.7	-0.6	-1.2	-0.9	-0.7	-0.8	-1.0	-0.9	-0.3	0.0	0.3	-1.0	-3.2	-4.3	-4.3	-4.9	-6.1	-4.4	-3.5	-1.7	0.3
30-Oct	-3.5	-4.1	-4.9	-6.4	-7.7	-9.3	-10.6	-11.1	-9.8	-7.2	-5.3	-3.6	-2.3	-1.7	-1.6	-1.7	-2.0	-1.8	-1.8	-1.8	-1.9	-1.7	-1.5	-1.8	-4.4	-1.5
31-Oct	-2.2	-2.1	-1.9	-1.9	-1.9	-1.8	-1.6	-1.9	-2.0	M	-1.2	-0.8	-0.6	-0.3	0.0	-0.1	-0.5	-0.8	-0.9	-1.3	-1.5	-1.5	-1.8	-2.0	-1.3	0.0
2.5 2.1 1.6 1.1 0.7 0.3 0.1 0.3 1.8 3.9 5.3 6.6 7.6 8.3 8.6 8.8 8.2 7.0 5.8 5.0 4.2 3.7 3.4 3.0																								Diurnal Average		
14.1 13.4 12.0 11.0 9.9 8.7 7.6 7.5 9.9 11.5 14.1 16.3 19.2 21.0 22.7 24.1 23.2 18.9 16.7 17.3 16.0 16.1 15.8 14.8																								Diurnal Maximum		
M - Maintenance																										



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	260	34.99	34.99
0 - 10	306	41.18	76.18
10 - 20	171	23.01	99.19
> 20	6	0.81	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744



Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

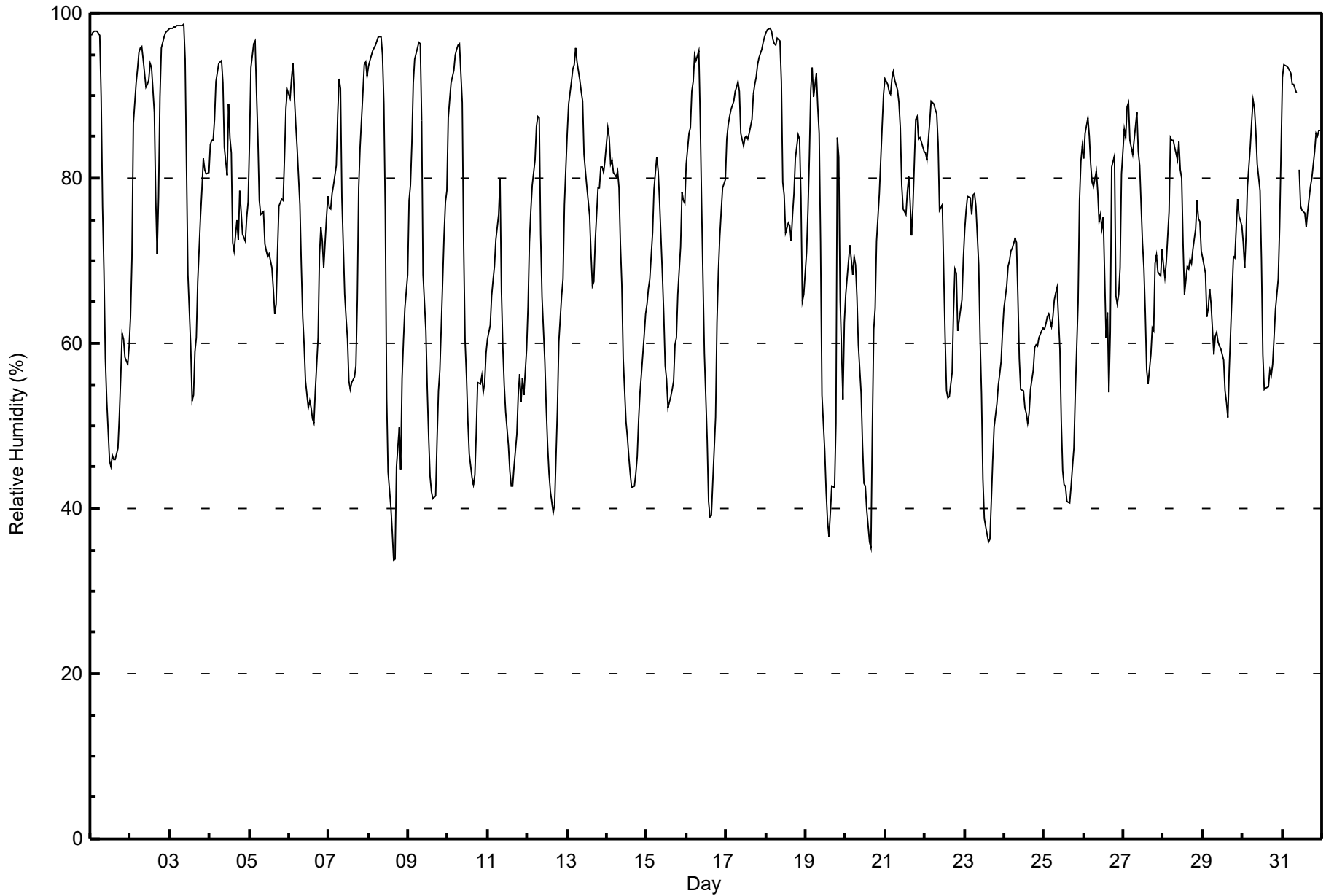
Fort McKay - Bertha Ganter - October 2023

Maximum Value: 98.6 % on Oct 3 09:00		Maximum Daily Average: 89.5 % on Oct 17		Hours in Service: 744																							
Minimum Value: 33.8 % on Oct 8 16:00		Minimum Daily Average: 57.9 % on Oct 11		Hours of Data: 743																							
Maximum Diurnal Average: 86.2 % at hour 6		Minimum Diurnal Average: 54.2 % at hour 16		Hours of Missing Data: 1																							
Monthly Average: 72.19 %		Percentiles: P ₁ = 37.4 P ₁₀ = 49.0 Q ₁ = 59.7 Median = 74.0 Q ₃ = 85.2 P ₉₀ = 93.4 P ₉₉ = 98.2		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-Oct	97.3	97.7	97.9	97.9	97.9	97.2	89.9	76.6	68.6	58.1	53.1	45.7	45.0	46.4	45.9	46.0	47.3	51.1	56.0	61.2	60.5	58.3	57.5	59.7	67.2	97.9	
2-Oct	63.2	70.3	86.6	91.5	93.3	95.2	95.8	96.0	94.4	91.0	91.4	91.9	93.9	93.4	88.0	77.5	70.9	77.6	89.8	95.7	97.1	97.7	97.8	98.0	89.1	98.0	
3-Oct	98.1	98.2	98.3	98.4	98.4	98.4	98.4	98.5	98.6	94.5	81.0	68.3	59.6	53.1	53.8	59.0	60.7	67.5	75.5	78.7	82.4	81.0	80.5	80.6	81.7	98.6	
4-Oct	84.1	84.6	84.6	87.2	91.8	93.9	94.0	94.3	91.5	83.8	80.3	89.1	84.9	83.1	72.3	71.1	74.9	72.5	78.4	76.0	73.2	72.4	75.3	77.2	82.1	94.3	
5-Oct	84.4	93.3	96.3	96.6	90.3	84.7	77.3	75.6	76.0	72.1	71.2	70.6	70.9	69.1	66.7	63.6	64.8	71.1	76.6	77.5	77.3	82.6	88.5	90.7	78.7	96.6	
6-Oct	89.6	92.0	93.9	90.0	86.6	83.8	76.8	69.4	63.3	59.8	55.4	52.2	53.1	52.2	50.9	50.4	54.2	60.7	70.7	74.1	72.4	69.1	75.2	77.8	69.7	93.9	
7-Oct	76.5	76.3	78.1	79.2	81.5	87.6	92.1	90.9	77.7	65.9	63.0	60.4	55.4	54.5	55.2	56.0	57.3	65.2	78.7	83.8	90.3	93.7	94.0	92.4	75.2	94.0	
8-Oct	93.5	94.3	95.4	95.8	96.1	96.6	97.1	97.1	94.9	89.0	76.2	53.4	44.4	40.1	37.0	33.8	33.9	45.1	49.8	44.8	55.7	60.4	64.2	68.3	69.0	97.1	
9-Oct	77.3	79.1	84.3	91.6	94.3	95.7	96.5	96.2	87.0	68.3	61.6	54.4	48.7	43.9	42.1	41.1	41.5	48.3	54.3	56.7	62.1	73.1	77.2	78.5	68.9	96.5	
10-Oct	87.2	89.6	91.4	93.0	95.0	95.6	96.1	96.2	89.2	71.8	60.3	56.2	50.6	46.6	43.8	42.8	44.1	49.2	55.2	55.0	56.1	54.1	55.3	58.8	68.1	96.2	
11-Oct	60.6	62.1	65.8	67.7	69.3	72.6	75.6	80.0	66.2	59.6	54.9	51.6	47.6	44.5	42.7	42.7	45.1	48.9	53.8	56.2	52.9	55.8	53.8	59.4	57.9	80.0	
12-Oct	64.5	72.2	76.1	79.1	82.2	86.2	87.4	87.4	73.2	65.6	57.8	52.1	47.6	44.2	42.0	39.6	40.6	46.3	52.1	60.1	65.8	67.8	76.8	81.2	64.5	87.4	
13-Oct	85.4	89.0	91.7	93.3	93.7	95.8	94.1	91.9	90.5	89.3	82.8	80.8	78.9	75.4	70.9	66.9	67.4	72.4	78.8	78.7	81.3	81.3	80.7	82.3	83.1	95.8	
14-Oct	86.1	84.9	81.7	82.3	80.6	80.1	80.8	78.8	72.0	67.0	58.2	50.6	48.7	46.2	44.3	42.5	42.7	44.2	46.3	50.6	54.1	56.3	61.0	63.5	62.6	86.1	
15-Oct	64.7	66.6	67.8	73.3	78.6	80.6	82.6	80.9	77.1	68.3	63.3	57.2	55.6	52.2	53.6	54.4	55.4	59.8	60.7	65.9	71.7	78.2	77.4	76.9	67.6	82.6	
16-Oct	81.7	85.4	86.0	90.5	91.8	94.9	94.2	95.4	87.3	77.2	67.9	58.8	48.2	40.9	39.0	39.1	43.2	51.0	62.6	68.6	72.9	76.0	78.8	79.9	71.3	95.4	
17-Oct	84.8	86.5	87.4	88.3	89.4	90.5	91.0	91.7	90.4	85.5	84.0	84.9	85.0	84.8	85.4	87.2	90.1	91.3	92.2	93.8	94.6	95.6	96.4	97.2	89.5	97.2	
18-Oct	97.7	98.0	98.1	97.9	96.8	96.3	96.1	96.9	96.6	91.7	79.5	77.9	73.4	74.5	74.3	72.4	75.6	78.2	82.4	85.3	84.7	77.6	65.1	66.0	84.7	98.1	
19-Oct	71.0	76.0	82.5	90.7	93.3	89.8	92.8	88.6	85.5	72.2	53.7	46.9	42.1	38.5	36.6	39.5	42.6	42.5	50.3	85.0	82.6	65.3	53.1	62.5	66.0	93.3	
20-Oct	66.0	68.0	69.9	71.8	68.2	70.4	69.5	65.6	59.8	53.9	47.7	43.1	42.7	39.8	35.9	35.3	49.7	61.8	64.3	72.3	78.1	82.2	86.3	90.2	62.2	90.2	
21-Oct	92.0	91.3	90.5	90.1	92.0	92.8	91.9	90.8	89.1	86.1	79.1	76.2	75.6	78.2	80.2	77.1	73.0	76.5	87.1	87.5	84.8	84.9	84.3	83.2	84.8	92.8	
22-Oct	83.1	82.2	84.6	86.8	89.2	88.9	88.4	87.8	84.2	76.2	76.8	68.7	60.6	54.2	53.3	53.6	56.4	63.7	68.9	68.5	61.6	64.1	65.2	70.1	72.4	89.2	
23-Oct	73.8	76.2	77.8	77.6	75.6	77.9	78.1	76.6	69.4	60.5	53.9	43.5	38.9	37.8	36.0	36.3	40.8	45.8	49.8	52.8	55.0	56.2	57.9	61.4	58.7	78.1	
24-Oct	64.3	67.0	69.3	70.0	71.1	71.6	72.7	72.2	65.7	58.1	54.4	54.3	52.2	51.5	50.4	51.6	54.4	56.7	59.5	59.8	59.6	60.7	61.6	61.9	61.3	72.7	
25-Oct	61.8	62.4	63.2	63.6	62.0	63.2	65.2	66.1	66.7	59.4	50.5	44.6	42.8	42.6	40.8	40.6	42.7	45.0	47.2	53.9	64.9	77.2	82.1	83.9	58.0	83.9	
26-Oct	82.4	85.4	87.2	85.0	81.7	79.5	79.1	80.9	78.5	74.8	75.6	74.0	75.3	60.6	63.8	54.0	61.4	81.4	82.7	65.8	64.8	66.0	69.2	80.4	74.6	87.2	
27-Oct	85.9	84.9	88.7	89.2	84.5	82.8	84.5	86.2	88.0	83.3	81.6	72.2	69.1	63.7	56.7	55.2	58.6	61.8	61.6	69.7	70.7	68.6	68.2	71.4	74.5	89.2	
28-Oct	69.6	68.0	69.8	75.9	84.9	84.6	84.6	83.7	82.2	84.5	81.1	80.0	72.0	65.9	69.4	69.0	70.1	69.7	71.4	73.8	77.2	75.1	74.7	71.2	75.3	84.9	
29-Oct	70.3	68.5	63.2	64.3	66.7	64.7	58.6	60.9	61.3	60.2	59.7	59.4	58.1	54.3	52.9	51.0	57.0	66.1	70.5	70.3	74.1	77.5	75.5	74.2	64.1	77.5	
30-Oct	72.2	69.2	73.1	78.9	83.7	86.7	89.5	88.5	85.5	81.7	78.5	70.2	58.7	54.4	54.5	54.8	56.7	56.1	57.4	60.7	64.1	67.8	74.0	83.1	70.8	89.5	
31-Oct	92.2	93.7	93.5	93.4	93.0	92.8	91.3	91.4	90.3	M	81.0	76.7	76.1	75.8	74.0	75.9	77.5	79.0	80.0	83.3	85.3	85.0	85.8	85.7	84.9	93.7	
		79.4	81.1	83.1	84.9	85.6	86.2	85.9	84.9	80.7	73.6	68.2	63.4	59.9	56.9	55.2	54.2	56.5	61.5	66.6	69.9	71.9	72.9	74.0	76.4	Diurnal Average	
		98.1	98.2	98.3	98.4	98.4	98.4	98.4	98.5	98.6	94.5	91.4	91.9	93.9	93.4	88.0	87.2	90.1	91.3	92.2	95.7	97.1	97.7	97.8	98.0	Diurnal Maximum	
M - Maintenance																											



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association

Summary of Hour Averages

Precipitation (PC) - mm

Fort McKay - Bertha Ganter - October 2023

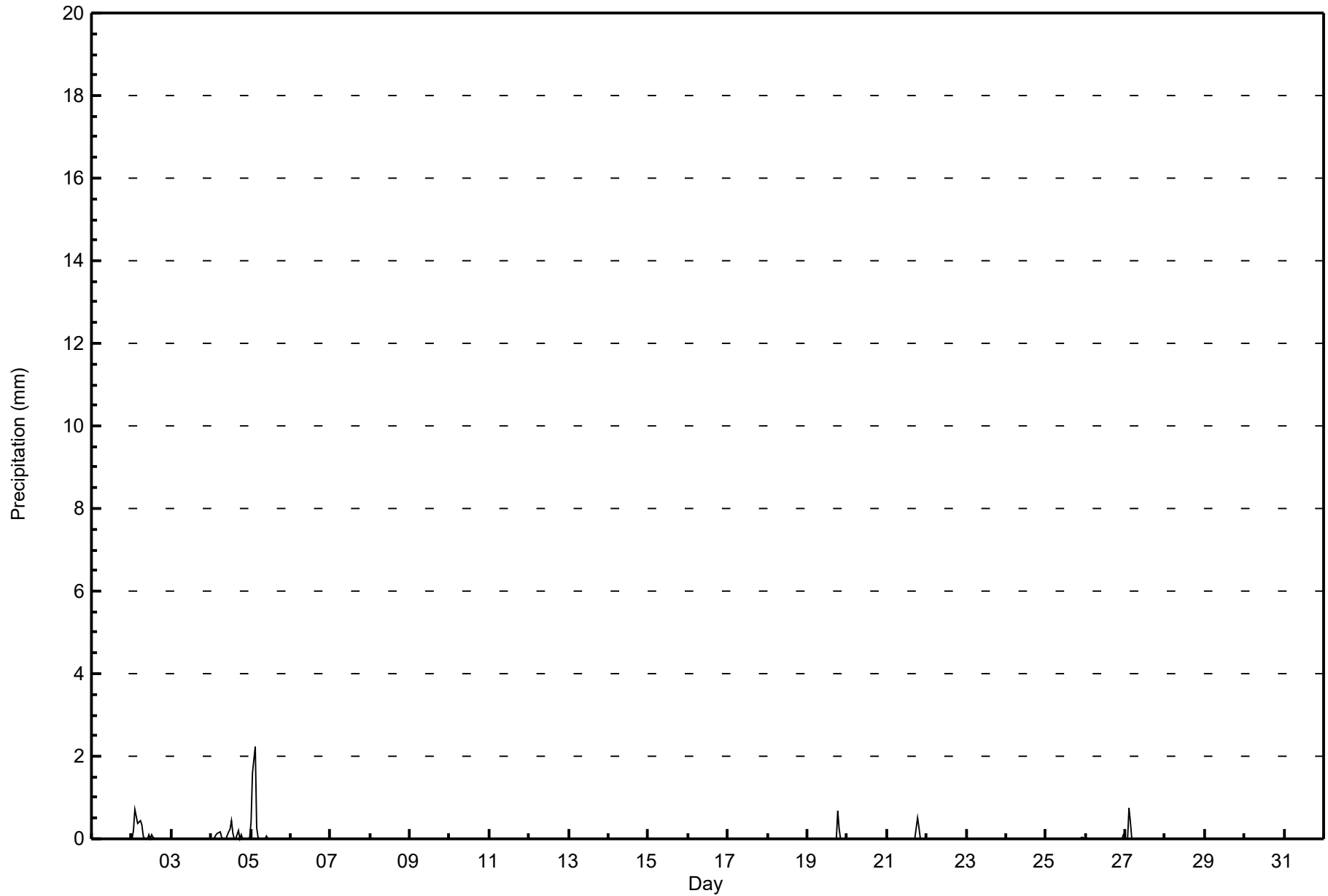
Maximum Value: 2.2 mm on Oct 5 03:00		Maximum Daily Total: 4.6 mm on Oct 5		Hours in Service: 744																												
Minimum Value: 0.0 mm on Oct 1 01:00		Minimum Daily Total: 0.0 mm on Oct 1		Hours of Data: 709																												
Maximum Diurnal Total: 3.8 mm at hour 3		Minimum Diurnal Total: 0.0 mm at hour 9		Hours of Missing Data: 35																												
Monthly Total: 12.23 mm		Percentiles: $P_1 = 0.0$ $P_{10} = 0.0$ $Q_1 = 0.0$ Median = 0.0 $Q_3 = 0.0$ $P_{90} = 0.0$ $P_{99} = 0.4$		Hours of Calibration: 0																												
				Percent Operational Time: 95.3																												
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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.2	0.7	0.4	0.4	0.5	0.3	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	0.7
3-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.1	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.2	0.3	0.4	0.1	0.0	0.0	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	1.8	0.4	
5-Oct	0.4	1.6	2.2	0.3	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.6	2.2	
6-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
14-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.7	
20-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.5		
22-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	
26-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	
27-Oct	0.0	0.0	0.8	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.8	0.8	
28-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	--	--
31-Oct	DF	DF	DF	DF	DF	DF	DF	DF	M	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	0.0	--	0.0	0.0	
																								Diurnal Average								
																								Diurnal Maximum								
																								Diurnal Average								
																								Diurnal Maximum								

M - Maintenance DF - DAS Failure



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (mm)	Number of Hours	%	Cumulative %
0 - 0.3	697	98.31	98.31
0.4 - 0.5	7	0.99	99.29
0.6 - 0.7	2	0.28	99.58
0.8 - 1.4	1	0.14	99.72
1.5 - 10	2	0.28	100.00
> 10	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744



Wood Buffalo Environmental Association

Summary of Hour Averages

Leaf Wetness (LW) - %

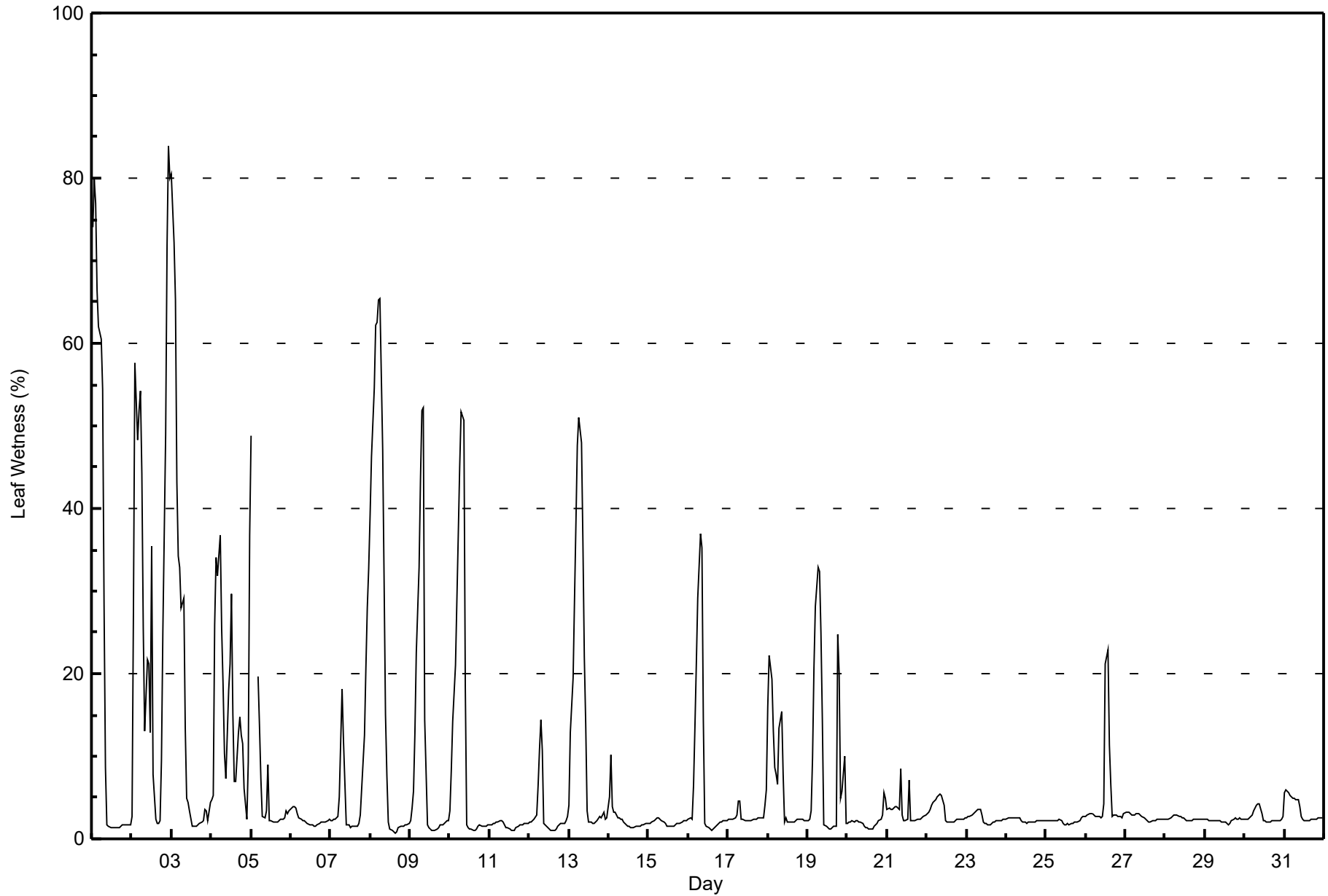
Fort McKay - Bertha Ganter - October 2023

Maximum Value: 83.9 % on Oct 2 23:00 Maximum Daily Average: 31.3 % on Oct 2																				Hours in Service: 744 Hours of Data: 741						
Minimum Value: 0.7 % on Oct 8 16:00 Minimum Daily Average: 1.7 % on Oct 11 Maximum Diurnal Average: 16.4 % at hour 7 Minimum Diurnal Average: 2.0 % at hour 16 Monthly Average: 7.61 % Percentiles: P ₁ = 1.0 P ₁₀ = 1.5 Q ₁ = 2.0 Median = 2.3 Q ₃ = 4.0 P ₉₀ = 22.0 P ₉₉ = 69.6																				Hours of Missing Data: 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-Oct	74.1	79.9	77.0	66.4	62.1	60.5	54.4	28.4	8.7	1.8	1.5	1.4	1.4	1.4	1.3	1.3	1.4	1.5	1.6	1.7	1.7	1.7	1.7	1.7	22.3	79.9
2-Oct	2.7	28.0	57.6	48.4	51.9	54.2	44.2	25.7	13.0	21.6	21.1	12.8	35.4	7.7	2.4	1.8	1.8	2.2	9.5	25.0	49.0	71.8	83.9	80.0	31.3	83.9
3-Oct	80.5	72.2	65.2	43.3	34.2	32.9	27.9	29.2	13.5	4.9	4.5	3.3	1.4	1.5	1.5	1.5	1.6	1.9	2.1	2.3	3.6	3.4	2.2	4.5	18.3	80.5
4-Oct	4.7	5.3	25.9	34.1	31.9	36.7	25.5	18.6	10.3	7.2	17.9	21.2	29.7	15.0	6.9	6.9	13.0	14.8	12.6	11.5	6.0	2.4	9.3	36.7	16.8	36.7
5-Oct	48.8	OR	OR	OR	19.7	13.7	7.3	2.7	2.6	3.4	9.0	2.2	2.2	2.1	2.1	2.0	2.1	2.2	2.4	2.4	2.5	3.4	3.0	3.4	6.6	48.8
6-Oct	3.8	4.0	4.0	3.8	3.1	2.5	2.4	2.3	2.2	2.1	1.8	1.7	1.7	1.7	1.6	1.5	1.7	1.8	2.0	2.1	2.1	2.1	2.2	2.4	2.3	4.0
7-Oct	2.3	2.3	2.3	2.4	2.7	5.0	11.7	18.1	11.8	1.8	1.7	1.6	1.4	1.5	1.5	1.5	1.5	1.8	2.9	6.2	12.5	20.7	28.0	32.7	7.3	32.7
8-Oct	39.2	46.3	54.5	62.2	62.5	65.2	65.4	47.2	31.3	15.1	7.5	2.0	1.2	1.1	0.9	0.7	0.9	1.3	1.6	1.5	1.6	1.7	1.8	1.9	21.4	65.4
9-Oct	2.2	3.7	5.7	12.8	22.6	33.0	43.5	51.9	52.2	14.5	1.7	1.4	1.2	1.0	1.0	1.0	1.2	1.4	1.6	1.7	1.8	2.0	2.1	2.3	11.0	52.2
10-Oct	3.5	8.3	14.2	21.0	28.9	37.0	45.2	51.7	50.6	18.5	1.7	1.3	1.1	1.1	1.0	1.0	1.2	1.5	1.6	1.6	1.6	1.6	1.6	1.7	12.4	51.7
11-Oct	1.7	1.7	1.9	1.9	2.0	2.1	2.2	2.3	2.0	1.7	1.4	1.3	1.2	1.1	1.0	1.0	1.3	1.5	1.6	1.7	1.7	1.8	1.8	1.9	1.7	2.3
12-Oct	2.0	2.1	2.2	2.4	2.9	6.4	10.8	14.4	10.7	1.9	1.5	1.3	1.2	1.1	1.0	0.9	1.2	1.5	1.7	1.8	1.9	1.9	2.3	2.7	3.3	14.4
13-Oct	4.1	12.9	19.5	28.9	38.1	47.6	51.0	48.0	36.0	22.0	13.8	3.4	2.1	1.9	1.8	2.0	2.2	2.7	2.6	2.9	3.2	2.4	2.5	14.7	51.0	
14-Oct	5.1	10.2	3.9	3.2	3.2	2.6	2.5	2.4	2.3	2.1	1.8	1.6	1.5	1.4	1.4	1.5	1.5	1.5	1.6	1.7	1.7	1.8	1.9	1.9	2.5	10.2
15-Oct	1.9	1.9	2.0	2.2	2.3	2.5	2.6	2.4	2.3	2.0	1.8	1.6	1.6	1.5	1.6	1.6	1.7	1.8	1.8	1.9	2.1	2.2	2.2	2.2	2.0	2.6
16-Oct	2.3	2.6	2.3	6.5	13.5	21.2	29.1	36.9	35.2	14.4	1.8	1.6	1.4	1.2	1.0	1.1	1.4	1.7	1.9	2.0	2.1	2.2	2.2	2.2	7.8	36.9
17-Oct	2.3	2.4	2.4	2.5	2.5	2.9	4.5	4.6	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.4	2.5	2.5	2.5	2.5	4.0	6.0	2.8	6.0
18-Oct	16.0	22.2	19.3	13.0	8.7	7.7	6.6	13.4	15.5	7.8	2.1	2.5	2.0	2.1	2.0	2.0	2.1	2.2	2.3	2.3	2.4	2.4	2.2	2.1	6.7	22.2
19-Oct	2.3	2.4	3.4	9.9	20.7	28.1	32.9	32.4	25.0	14.4	1.7	1.5	1.3	1.2	1.1	1.3	1.4	1.5	24.8	19.9	4.9	5.8	9.9	1.9	10.4	32.9
20-Oct	1.9	2.0	2.1	2.2	2.1	2.1	2.1	2.0	2.0	1.8	1.5	1.3	1.3	1.3	1.2	1.2	1.5	1.8	1.9	2.1	2.4	2.9	5.6	4.9	2.1	5.6
21-Oct	3.5	3.7	3.6	3.6	3.8	3.9	3.8	3.6	8.5	2.8	2.2	2.2	2.3	7.2	2.2	2.3	2.2	2.3	2.4	2.4	2.4	2.5	2.7	2.9	3.3	8.5
22-Oct	3.1	3.2	3.5	4.0	4.5	4.8	5.0	5.2	5.4	5.3	4.1	2.1	2.0	2.0	2.0	2.1	2.1	2.2	2.3	2.3	2.3	2.4	2.4	2.5	3.2	5.4
23-Oct	2.6	2.6	2.8	2.9	3.1	3.3	3.4	3.6	3.6	2.8	2.0	1.9	1.8	1.8	1.7	1.8	2.0	2.0	2.1	2.2	2.2	2.3	2.3	2.4	2.5	3.6
24-Oct	2.4	2.5	2.5	2.5	2.5	2.5	2.6	2.6	2.5	2.3	2.0	2.0	1.9	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.3	2.6
25-Oct	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.1	1.8	1.8	1.7	1.8	1.7	1.8	1.9	2.0	2.0	2.0	2.1	2.5	2.6	2.7	2.1	2.7
26-Oct	2.7	2.8	3.0	3.1	3.0	2.8	2.7	2.7	2.7	2.6	2.7	4.3	21.3	23.0	11.4	6.7	2.7	2.8	2.9	2.8	2.7	2.6	2.6	3.0	5.0	23.0
27-Oct	3.2	3.3	3.2	3.0	2.9	2.9	3.0	3.1	3.0	2.8	2.8	2.5	2.4	2.2	2.1	2.1	2.2	2.2	2.3	2.3	2.4	2.3	2.4	2.4	2.6	3.3
28-Oct	2.4	2.3	2.3	2.5	2.8	2.8	2.8	2.8	2.8	2.7	2.6	2.6	2.4	2.2	2.2	2.2	2.3	2.4	2.3	2.4	2.5	2.4	2.4	2.3	2.5	2.8
29-Oct	2.3	2.3	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.1	2.1	2.1	2.0	1.8	1.7	1.9	2.1	2.4	2.5	2.4	2.4	2.5	2.4	2.3	2.2	2.5
30-Oct	2.3	2.3	2.4	2.5	2.9	3.3	3.7	4.0	4.3	4.3	3.1	2.2	2.2	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.2	2.2	2.4	2.7	2.7	4.3
31-Oct	5.6	5.9	5.5	5.3	5.1	5.0	4.9	4.8	4.7	3.8	2.8	2.4	2.3	2.2	2.2	2.3	2.3	2.4	2.4	2.4	2.5	2.5	2.5	2.5	3.5	5.9
10.8 11.4 13.3 13.4 14.5 16.1 16.4 15.2 12.0 6.3 4.1 3.0 4.4 3.1 2.1 2.0 2.2 2.4 3.4 3.9 4.3 5.3 6.4 7.2																								Diurnal Average		
80.5 79.9 77.0 66.4 62.5 65.2 65.4 51.9 52.2 22.0 21.1 21.2 35.4 23.0 11.4 6.9 13.0 14.8 24.8 25.0 49.0 71.8 83.9 80.0																								Diurnal Maximum		
OR - Out of Range																										



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 0.3	0	0.00	0.00
0.4 - 0.5	0	0.00	0.00
0.6 - 0.7	1	0.13	0.14
0.8 - 1.4	57	7.69	7.83
1.5 - 10	550	74.22	82.05
> 10	122	16.46	98.52

Total Number of Valid Hours: 741

Total Number of Hours: 744

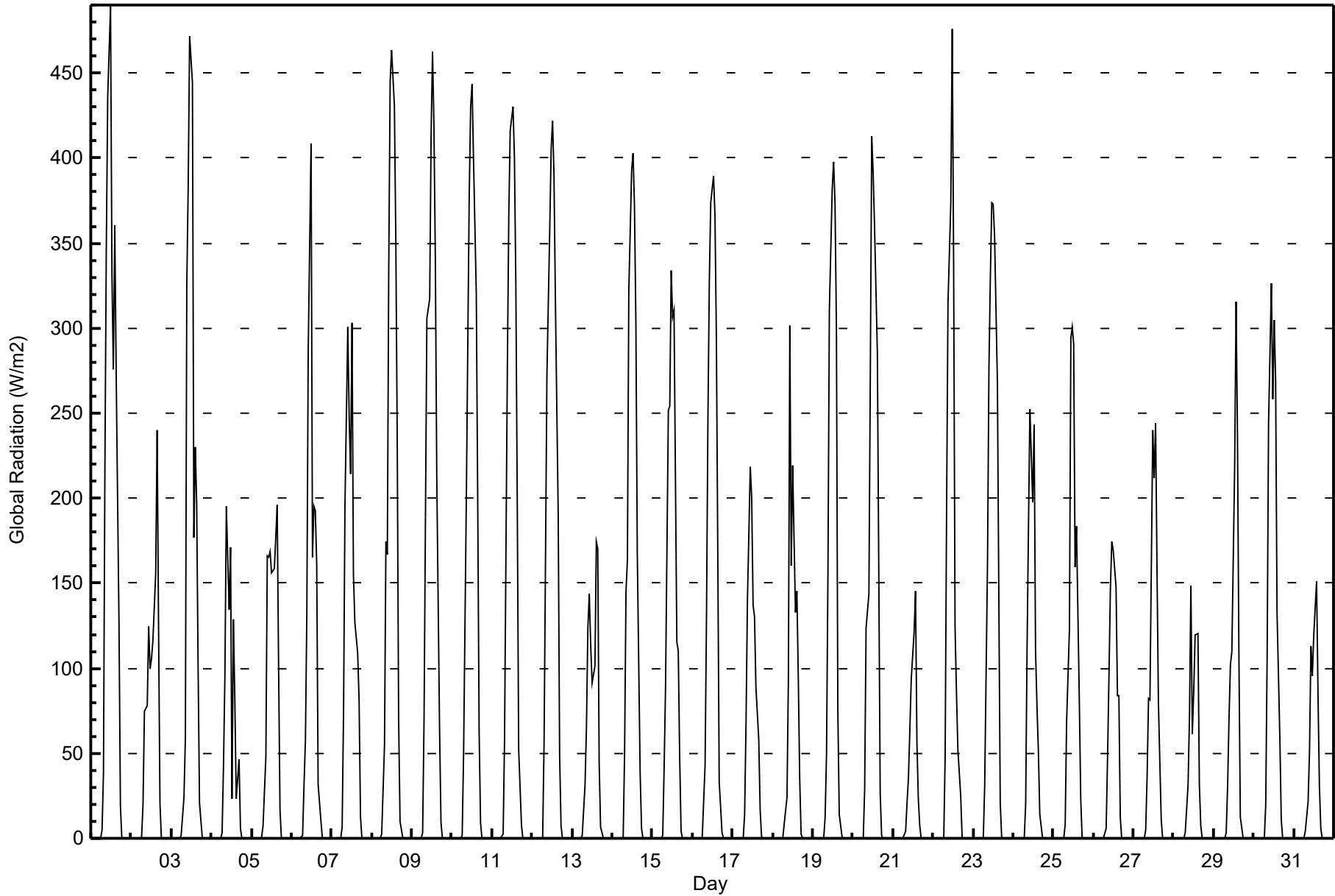


Maximum Value: 489.3 W/m2 on Oct 1 12:00 Maximum Daily Average: 121.5 W/m2 on Oct 1																							Hours in Service: 744			
Minimum Value: 0.0 W/m2 on Oct 1 01:00 Minimum Daily Average: 23.8 W/m2 on Oct 21																							Hours of Data: 744			
Maximum Diurnal Average: 286.5 W/m2 at hour 12 Minimum Diurnal Average: 0.0 W/m2 at hour 21																							Hours of Missing Data: 0			
Monthly Average: 73.12 W/m2 Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 112.3 P ₉₀ = 290.2 P ₉₉ = 440.4																							Hours of Calibration: 0			
Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 112.3 P ₉₀ = 290.2 P ₉₉ = 440.4																							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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	5.0	38.3	215.8	346.1	435.7	489.3	331.1	275.7	360.2	273.5	125.7	19.3	0.4	0.0	0.0	0.0	0.0	0.0	121.5	489.3
2-Oct	0.0	0.0	0.0	0.0	0.0	0.0	1.1	19.9	75.1	77.9	124.6	99.5	105.8	116.1	156.1	239.7	125.3	20.8	0.3	0.0	0.0	0.0	0.0	0.0	48.4	239.7
3-Oct	0.0	0.0	0.0	0.0	0.0	0.0	1.5	24.4	59.2	325.8	384.0	471.5	444.7	176.8	230.1	196.8	101.5	21.1	0.3	0.0	0.0	0.0	0.0	0.0	101.6	471.5
4-Oct	0.0	0.0	0.0	0.0	0.0	0.0	3.0	42.9	96.4	195.4	134.5	170.8	23.1	129.0	81.9	23.0	46.3	6.0	0.0	0.0	0.0	0.0	0.0	0.0	39.7	195.4
5-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.6	7.8	48.1	166.0	165.0	168.6	155.9	158.7	176.9	195.7	101.4	16.3	0.0	0.0	0.0	0.0	0.0	0.0	56.7	195.7
6-Oct	0.0	0.0	0.0	0.0	0.0	0.0	1.5	31.3	57.6	131.8	288.4	409.0	165.6	195.0	192.4	161.1	31.9	9.7	0.0	0.0	0.0	0.0	0.0	0.0	69.8	409.0
7-Oct	0.0	0.0	0.0	0.0	0.0	0.0	6.3	74.0	196.2	300.4	246.7	214.5	303.2	155.1	127.4	108.7	81.5	12.6	0.0	0.0	0.0	0.0	0.0	0.0	76.1	303.2
8-Oct	0.0	0.0	0.0	0.0	0.0	0.0	2.5	54.8	174.8	166.9	335.3	445.3	463.8	431.2	353.2	236.2	70.1	10.2	0.0	0.0	0.0	0.0	0.0	0.0	114.3	463.8
9-Oct	0.0	0.1	0.0	0.0	0.0	0.0	3.0	69.8	188.8	305.6	317.3	413.4	462.9	419.2	339.8	213.8	63.2	9.5	0.0	0.1	0.0	0.0	0.0	0.0	116.9	462.9
10-Oct	0.0	0.0	0.0	0.0	0.0	0.0	1.6	49.8	204.4	293.5	378.5	430.5	443.9	400.6	319.7	198.2	62.8	8.8	0.0	0.0	0.0	0.0	0.0	0.0	116.3	443.9
11-Oct	0.0	0.0	0.0	0.0	0.1	0.1	2.2	58.5	168.4	277.6	365.8	416.1	430.3	400.0	325.9	198.7	52.6	7.5	0.1	0.0	0.0	0.0	0.0	0.0	112.7	430.3
12-Oct	0.0	0.0	0.0	0.0	0.0	0.0	1.1	57.7	163.6	272.8	358.1	405.7	421.5	390.6	317.0	190.1	48.7	7.7	0.0	0.0	0.0	0.0	0.0	0.0	109.8	421.5
13-Oct	0.0	0.0	0.0	0.0	0.0	0.0	1.3	31.8	65.2	123.5	143.7	113.9	91.5	101.7	174.1	170.4	44.0	6.6	0.0	0.0	0.0	0.0	0.0	0.0	44.5	174.1
14-Oct	0.0	0.1	0.0	0.0	0.0	0.0	1.2	49.9	145.5	164.0	322.6	393.0	402.9	372.1	302.8	167.4	39.0	5.4	0.0	0.0	0.0	0.0	0.0	0.0	98.6	402.9
15-Oct	0.0	0.1	0.1	0.0	0.0	0.0	1.4	41.2	88.5	251.5	254.0	334.1	306.2	310.5	115.4	110.5	47.9	4.5	0.0	0.0	0.0	0.0	0.0	0.0	77.7	334.1
16-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.8	42.8	130.5	245.0	327.2	373.4	389.8	366.2	294.2	167.2	32.9	3.0	0.0	0.0	0.0	0.0	0.0	0.0	98.9	389.8
17-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.1	68.3	140.5	218.3	200.2	136.8	130.0	89.2	58.3	16.6	0.9	0.0	0.0	0.0	0.0	0.0	0.0	44.7	218.3
18-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.1	8.5	24.2	95.0	301.1	160.6	219.2	132.8	145.7	94.9	34.6	2.3	0.0	0.0	0.0	0.0	0.0	0.0	50.8	301.1
19-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.7	49.9	156.2	310.2	380.9	397.5	373.4	299.5	75.0	14.2	0.6	0.0	0.0	0.0	0.0	0.0	0.0	86.3	397.5
20-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	29.1	124.0	143.5	273.4	412.5	391.4	359.4	285.0	155.8	26.8	1.8	0.0	0.0	0.0	0.0	0.0	0.0	91.8	412.5
21-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.4	20.4	35.8	63.7	93.7	121.4	145.5	56.3	23.3	7.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.8	145.5
22-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	48.9	191.6	314.4	373.8	475.7	337.6	124.5	85.3	52.5	25.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0	84.6	475.7
23-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	31.4	163.5	276.2	330.0	373.6	373.1	353.7	267.3	143.2	20.4	0.7	0.0	0.0	0.0	0.0	0.0	0.0	97.2	373.6
24-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.1	112.0	183.8	252.3	197.8	243.1	110.8	77.9	51.8	14.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	52.7	252.3
25-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0	69.1	122.5	293.7	300.8	291.0	159.3	183.8	80.9	23.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	63.8	300.8
26-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.4	48.0	95.9	146.7	174.1	169.1	147.9	84.2	83.7	12.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	40.3	174.1
27-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.2	36.2	82.3	81.6	240.3	212.0	244.2	159.6	79.3	10.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	48.0	244.2
28-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	31.4	71.1	148.4	61.3	86.1	119.9	120.6	31.8	7.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.4	148.4
29-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.7	30.6	70.9	101.8	109.5	219.5	315.3	235.3	108.0	12.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.3	315.3
30-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.1	107.7	243.8	326.0	258.2	304.9	269.5	132.9	59.2	10.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	72.2	326.0
31-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	21.2	51.2	113.1	95.3	119.7	151.5	85.7	30.9	5.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.3	151.5
Diurnal Average																							Diurnal Average			
Diurnal Maximum																							Diurnal Maximum			



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (W/m²)	Number of Hours	%	Cumulative %
0 - 20	458	61.56	61.56
21 - 100	88	11.83	73.39
101 - 300	129	17.34	90.73
301 - 600	69	9.27	100.00
601 - 900	0	0.00	100.00
> 900	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Fort McKay - Bertha Ganter - October 2023

Maximum Speed: 27 km/h on Oct 21 17:00	Maximum Daily Speed Average: 14.4 km/h on Oct 14	Hours in Service: 744
Minimum Speed Value: 0 km/h on Oct 31 20:00	Minimum Daily Speed Average: 0.6 km/h on Oct 31	Hours of Data: 743
Maximum Diurnal Speed Average: 3.9 km/h at hour 11	Minimum Diurnal Speed Average: 1.0 km/h at hour 18	Hours of Missing Data: 1
Monthly Average Velocity: 2.2 km/h 220.6 deg	Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 4 Median = 6 Q ₃ = 10 P ₉₀ = 13 P ₉₉ = 23	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-Oct	S3	SSW3	S2	SSW2	SSW2	SSE2	S7	S6	SSE9	S15	S18	S18	S16	S18	S20	S19	S17	S12	SSE8	SSE8	SSE11	S13	S15	S15	\$10.6	S20
2-Oct	S12	S9	S7	S8	SSE8	SSE8	SSE9	S7	SSE7	S8	S9	SSE10	SSE10	SSE8	S4	SSE6	SSW5	S5	S4	SW1	NW4	WNW2	W2	W2	\$5.8	S12
3-Oct	SW2	SSW3	S4	SSW2	SSE4	SE1	SSW3	ESE1	SE2	S4	SSE5	WSW3	W4	WSW3	SSW6	S7	S7	S6	S5	S6	S4	S5	S5	SSE4	\$3.5	S7
4-Oct	SSW4	S11	S8	S5	WSW2	NW5	NW7	NW6	NW5	WNW8	WNW12	WNW9	NW10	NNW12	NNW13	NW15	NW18	NW20	NW17	NW16	WNW20	WNW11	WNW12	NW17	WNW9.0	NW20
5-Oct	NW13	NW9	NW8	NW6	NW10	NW13	NW20	NW16	NW12	NW17	NW15	NW17	NW15	NW15	NW15	NW16	NW13	W4	SW2	SSW3	W4	S1	SSW4	WSW2	NW9.7	NW20
6-Oct	SW2	SSW3	S4	S6	SSE6	S9	S13	S13	S10	S11	SSE15	SSE15	SSE14	S14	S12	S11	S5	SW3	SW1	SW4	WSW4	W5	W4	WNW6	\$6.8	SSE15
7-Oct	W6	W7	WNW6	WNW6	N3	WNW3	S4	SSW3	SSE1	N1	SE4	SSE5	SSE4	S3	SSE4	ESE1	N1	NNW1	NNW3	NNW3	NNW4	NNW2	NNW2	NW4	W1.2	W7
8-Oct	NW4	NW4	NNW4	NW4	NW5	NW4	NW5	NW4	N3	NNE4	ENE2	S12	SSE16	SSE16	SSE11	SSE6	SW3	SSE3	S5	S8	SSE6	S7	S7	SSE5	\$2.9	SSE16
9-Oct	SSE3	S5	WSW2	WNW2	NW4	NW4	WNW3	WNW2	WSW1	SSE7	S13	S11	S9	S9	S12	S11	S8	ESE5	E6	SE9	SSE4	NW2	S3	NNW2	\$4.0	S13
10-Oct	NW4	NNW4	NNW3	W2	NW4	NW4	NW3	NNW4	NNW3	SSE2	SSE7	SSE5	SE9	SSE12	S13	SSE10	ESE7	ESE8	SE6	SSE11	SSE11	SSE16	SSE14	SSE7	\$SE4.2	SSE16
11-Oct	SSE12	SSE11	SE5	SE8	SE9	SE6	SE4	ENE3	SSE8	SSE14	S14	S12	S9	S12	S12	SSE12	SE13	ESE10	SE8	SSE7	SE8	SE5	SSE5	SSE3	\$SE8.3	S14
12-Oct	S4	SSE3	N2	N3	NW2	NW2	NW2	WNW2	SSE5	SSE10	SSE12	SSE12	SSE11	SSE12	SSE10	SSE6	SSE3	S5	SSE5	SSE5	S6	S7	SSE5	SSE7	\$SE4.7	SSE12
13-Oct	SSE5	S5	S6	SSE5	SSE3	S3	S9	S12	S11	SSE11	SSE13	SSE15	SSE13	SSE13	SSE13	SSE13	SE11	ESE5	ESE4	SE4	S6	SSE7	SSE8	SSE7	\$SE8.1	SSE15
14-Oct	S4	SSE7	SSE7	SSE6	SSE9	SSE6	S8	SSE13	SSE18	SSE17	SSE16	S20	SSE22	SSE23	SSE25	SSE24	SSE22	S18	S18	S14	S13	S12	S11	S13	\$SE14.4	SSE25
15-Oct	S15	SSE13	SSE8	SSE1	SE4	SSE6	SE5	S4	SSE7	SSE15	SSE12	SSE14	SSE13	SSE14	SSE11	S11	S7	SSW5	SSW7	S6	SSW5	SSW4	SSW3	S6	\$7.9	S15
16-Oct	S6	SSW6	SSW6	S6	S6	SSW6	S6	SSE7	SSE7	SSE9	SSE13	SSE10	SSW8	SW7	SW6	S10	S6	S5	S2	S2	NNE0	NNW3	WNW2	WNW2	\$5.1	SSE13
17-Oct	N3	WNW1	NNW4	NW2	N3	N2	NNW4	N4	NNE4	NNE9	NNE11	NNE12	NNE11	NNE11	NNE11	NNE11	NNE11	N10	N9	N8	NW5	NW3	NW1	E2	\$5.7	NNE12
18-Oct	WSW1	SSW2	S7	SSE6	SSE4	SSW3	NNW1	ESE2	SSE4	S6	S12	S13	S14	S15	S13	SSE11	S13	S9	S5	S5	SSW3	WSW4	WSW6	WSW5	\$6.2	S15
19-Oct	SW5	SSW4	SSE4	SSE3	S4	SSW5	SSW4	SSW7	S4	SSW6	WSW9	WSW9	WSW10	WSW10	WSW10	WSW8	SSW7	SSW10	WSW9	SSE2	SSW6	WNW8	W8	SW8	\$W5.7	WSW10
20-Oct	W6	W7	WNW6	W3	W6	W6	W6	W8	W11	WNW12	NW8	NW21	NW23	NNW22	NNW20	N13	NNE10	NNE8	NNE7	NE2	NNW4	NNW2	WNW3	WNW3	\$NW7.2	NW23
21-Oct	W2	SW2	SW1	SW2	SSW2	SSW3	S4	S4	S5	SSW3	S5	NNE5	N9	NNE20	N24	N25	N27	N26	N19	N19	N13	NNW7	NNW7	NNW8	\$N7.5	N27
22-Oct	N9	N9	NNW7	NW6	WSW4	WSW3	W3	WNW3	W4	S3	NW2	NE4	NNE5	ENE3	ENE1	NE0	NW2	WNW2	WSW2	NW7	NW10	WNW10	WNW10	WNW9	\$NW3.6	NW10
23-Oct	WNW9	WNW9	WNW8	WNW7	WNW7	W6	W7	W5	W7	W9	WNW8	WNW13	NW13	NW14	WNW14	NW18	NW16	NW10	WNW7	W5	W6	WNW6	WNW6	WNW6	\$WNW8.8	NW18
24-Oct	WNW6	WNW5	W6	WNW6	W4	SW3	WSW2	SW3	WSW3	W7	W9	W8	W9	W7	WNW9	WNW9	WNW10	WNW9	WNW8	WNW11	WNW9	WNW8	WNW9	WNW9	\$W6.8	WNW11
25-Oct	WNW10	WNW8	WNW7	WNW5	WNW5	W5	W5	W5	W5	W6	WSW6	SW7	SW8	W7	WSW6	WSW6	WSW5	W4	NW11	NW10	WNW5	SW3	W4	W4	\$W5.5	NW11
26-Oct	W4	W4	W5	W5	WNW6	SW3	SSW3	WSW4	W6	W6	W5	W6	W4	NW11	WNW5	WNW7	N3	E3	SSW3	WNW7	W3	WSW2	WSW4	WSW3	\$W3.9	NW11
27-Oct	W4	WNW4	N9	N11	N6	NNW6	NW5	NNW4	W2	NW1	WNW3	N2	NNE4	NW7	NW10	NW13	NW7	WNW4	WNW3	NW2	WSW4	SW3	SSW3	S5	\$NW3.9	NW13
28-Oct	S7	S6	SSW4	W4	W3	W3	WNW3	WNW4	WNW3	NW5	NNE3	ENE3	NNW8	N8	ENE4	SSE2	SSW2	WNW5	WNW7	WNW6	WNW7	WNW8	WNW6	NW9	\$WNW3.0	NW9
29-Oct	WNW7	WNW7	NW10	WNW5	WNW5	WNW8	NW12	WNW4	WNW10	NNW12	NNW13	NNW13	NW11	NW7	NNW5	NW6	NE3	NNW1	NNE3	NE2	N3	NNW5	N9	NNE12	\$NW6.3	NNW13
30-Oct	NNE14	NNE12	N11	N8	NNW5	NW1	S1	WSW2	S2	SSE5	SSE9	S11	SSW12	S16	S13	S12	S11	S12	S11	S9	S8	S8	S9	S10	\$4.5	S16
31-Oct	S9	S7	S6	S4	N3	WNW2	NW4	N7	N7	M	N9	NNE6	ENE5	E4	SE3	SE2	NE3	ENE3	ESE2	ESE0	WNW1	SSE1	SSW4	SSW3	\$ENE0.6	N9

WSW2.2 SW2.4WSW1.8WSW1.7WSW1.4WSW1.9WSW2.3 SW2.0SSW2.3SSW3.4SSW3.9SSW3.8SSW3.4SSW3.0SSW3.1SSW2.7SSW1.4SSW1.0 SW1.2 SW1.4WSW2.2 SW2.6 SW2.8WSW2.4 S15 SSE13 N11 N11 NW10 NW13 NW20 NW16 SSE18 SSE17 S18 NW21 NW23 SSE23 SSE25 N25 N27 NNE26 N19 N19WNW20 SSE16 S15 NW17

Diurnal Average
Diurnal Maximum

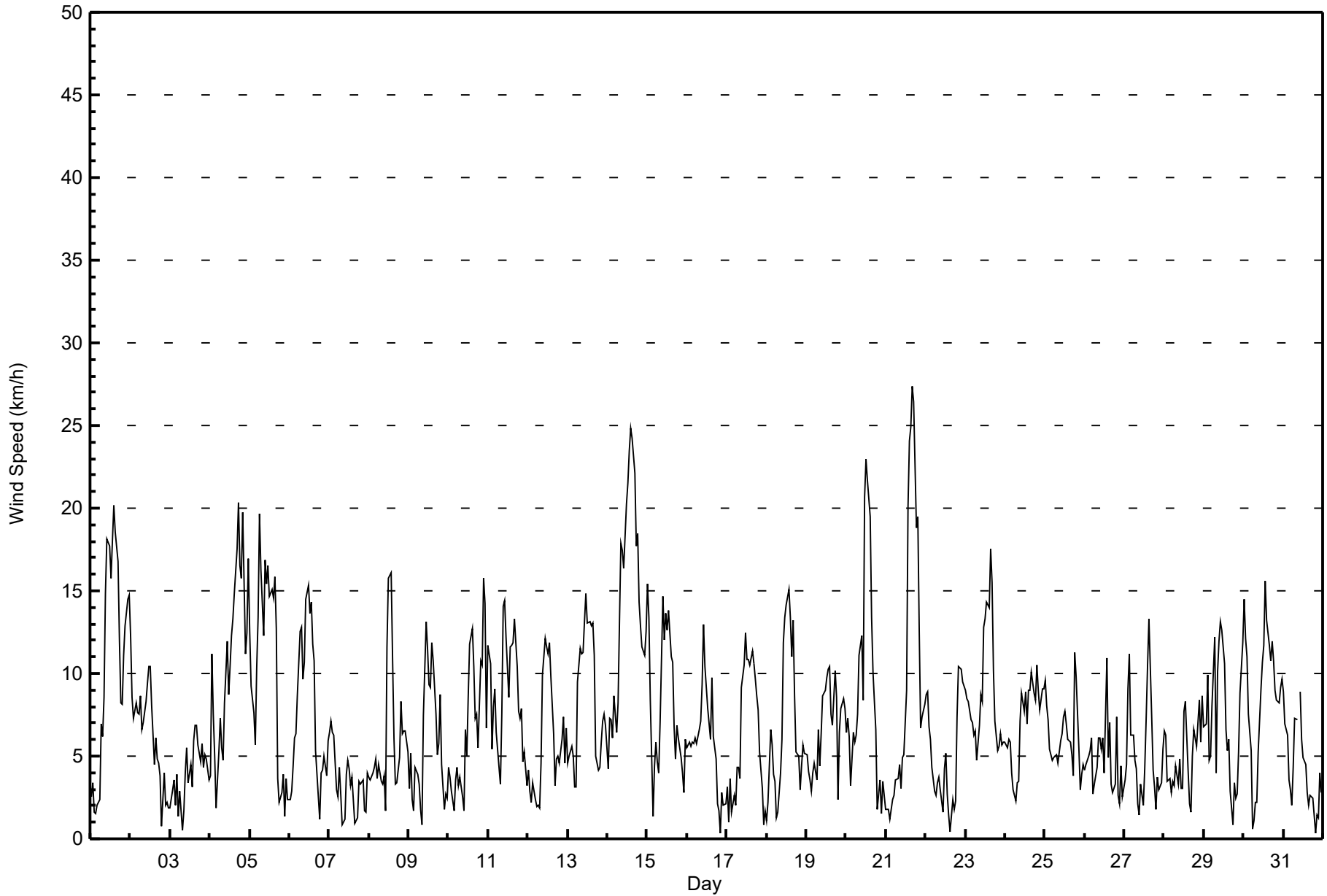
M - Maintenance

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 - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	326	43.88	43.88
6 - 11	282	37.95	81.83
12 - 19	116	15.61	97.44
20 - 28	19	2.56	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 - Bertha Ganter - October 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	8	6	8	3	8	11	34	42	32	17	22	34	32	31	24	326
6 - 11	16	11	0	0	1	4	8	51	61	11	5	11	26	48	22	7	282
12 - 19	4	4	0	0	0	0	1	33	40	1	0	0	0	5	23	5	116
20 - 28	3	2	0	0	0	0	0	5	2	0	0	0	0	1	4	2	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	37	25	6	8	4	12	20	123	145	44	22	33	60	86	80	38	743

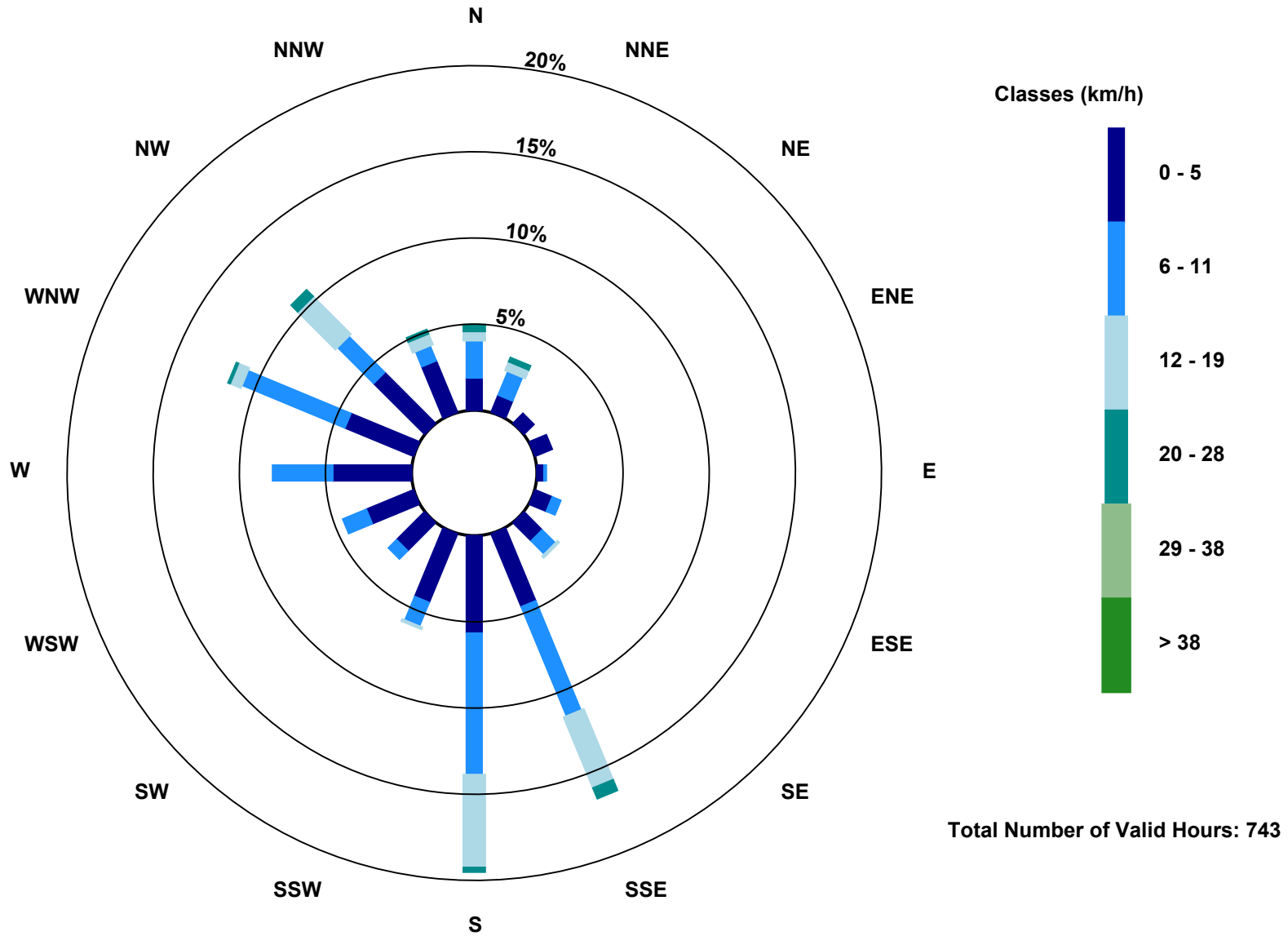
Total Number of Valid Hours: 743

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 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 - October 2023

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



Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Fort McKay - Bertha Ganter - October 2023

Direction of Maximum Speed: 7 deg on Oct 21 17:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 165.9 deg on Oct 14	Hours of Data: 743
Direction of Minimum Speed: 106 deg on Oct 31 20:00	Hours of Missing Data: 1
Direction of Minimum Daily Speed Average: 0.6 deg on Oct 31	Percent Operational Time: 99.9
Monthly Average Direction: 220.6 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-Oct	178	206	191	194	212	165	176	176	160	171	175	177	184	182	174	173	174	171	166	161	165	170	173	172	174.1	
2-Oct	175	180	172	176	166	157	161	169	157	176	173	166	167	168	179	161	202	179	189	232	305	302	261	273	174.8	
3-Oct	219	213	171	198	168	144	196	122	132	173	168	242	278	255	200	181	181	186	178	190	180	180	181	168	188.6	
4-Oct	192	178	179	184	254	311	316	310	309	296	298	301	314	331	329	307	310	314	305	307	303	307	298	303	316	303.5
5-Oct	315	305	312	304	308	310	309	313	307	312	314	308	304	305	309	309	310	276	231	201	273	176	210	239	305.5	
6-Oct	230	198	184	184	155	171	173	176	187	181	167	168	166	187	190	180	177	227	216	225	249	267	280	288	185.3	
7-Oct	276	281	287	284	10	283	186	205	167	2	132	154	166	175	152	119	1	341	335	337	336	334	339	307	273.7	
8-Oct	312	319	331	320	322	306	310	321	353	26	64	169	168	167	166	168	220	153	172	183	160	170	170	168	180.1	
9-Oct	152	169	249	293	313	308	290	289	257	168	175	175	172	173	176	178	177	115	99	137	161	304	169	345	173.7	
10-Oct	325	327	342	280	310	315	313	328	340	151	165	162	140	163	173	164	119	110	124	161	168	167	166	167	161.6	
11-Oct	156	158	146	141	140	137	129	72	152	164	176	169	172	176	176	167	132	123	135	149	144	145	152	155	153.5	
12-Oct	173	153	353	355	310	326	317	300	163	168	164	162	164	156	161	160	148	173	165	166	170	176	167	165	165.7	
13-Oct	168	173	177	163	153	173	177	175	171	155	168	157	161	161	158	155	134	102	108	134	171	163	162	159	159.4	
14-Oct	184	156	157	161	153	162	171	166	161	164	165	170	164	159	162	161	165	170	172	173	175	176	173	173	165.9	
15-Oct	170	167	165	152	126	153	146	178	165	168	166	164	164	162	167	169	186	213	194	181	194	202	204	188	170.2	
16-Oct	189	198	197	190	185	196	178	167	168	167	160	166	195	221	225	184	169	183	180	187	23	343	300	282	185.0	
17-Oct	351	292	342	322	8	350	327	8	21	27	24	23	28	31	28	16	21	357	358	353	324	317	320	92	11.0	
18-Oct	246	194	181	166	162	198	333	113	155	186	173	170	172	169	169	163	172	175	173	178	205	242	251	243	178.5	
19-Oct	214	196	168	167	169	192	204	201	186	204	250	249	242	246	240	240	211	213	242	149	199	285	269	231	226.1	
20-Oct	262	274	294	260	280	263	270	272	266	283	307	322	321	335	333	352	18	31	24	53	344	331	289	282	315.8	
21-Oct	269	219	221	231	213	197	183	188	170	197	182	13	1	15	11	10	7	11	8	8	5	341	336	347	4.9	
22-Oct	351	354	346	314	239	237	263	285	276	178	306	43	14	60	65	34	305	290	252	316	317	300	301	293	315.5	
23-Oct	292	291	292	290	284	276	278	280	280	278	287	300	304	304	301	307	311	305	296	278	274	283	286	284	293.9	
24-Oct	285	284	280	282	280	220	251	222	258	273	271	267	270	267	290	290	295	290	289	294	293	284	292	290	281.1	
25-Oct	292	284	286	284	286	263	277	266	270	272	256	222	235	262	257	244	247	272	313	322	300	216	260	270	273.0	
26-Oct	279	267	263	270	289	234	208	241	269	274	262	269	278	319	295	300	358	96	194	303	270	249	245	249	275.8	
27-Oct	276	286	350	2	352	346	320	341	269	308	303	6	20	320	325	318	305	293	299	305	245	233	193	179	319.5	
28-Oct	183	181	209	270	262	272	283	287	296	306	20	64	329	356	66	154	212	291	295	289	296	302	291	308	294.2	
29-Oct	302	292	311	296	288	294	310	288	302	341	340	327	326	326	331	313	48	346	31	45	0	329	354	12	325.9	
30-Oct	16	24	9	349	340	318	185	256	177	168	159	179	193	188	186	184	188	187	191	189	186	179	179	172	181.7	
31-Oct	176	173	180	180	2	297	316	354	354	M	4	14	73	90	135	143	35	78	123	106	294	160	199	202	78.5	

239.8 225.4 253.4 251.8 253.8 244.8 246.1 235.7 213.7 202.4 194.4 195.1 204.7 203.2 203.5 207.3 203.2 208.8 228.4 228.6 240.6 231.4 229.5 238.6

Diurnal Average

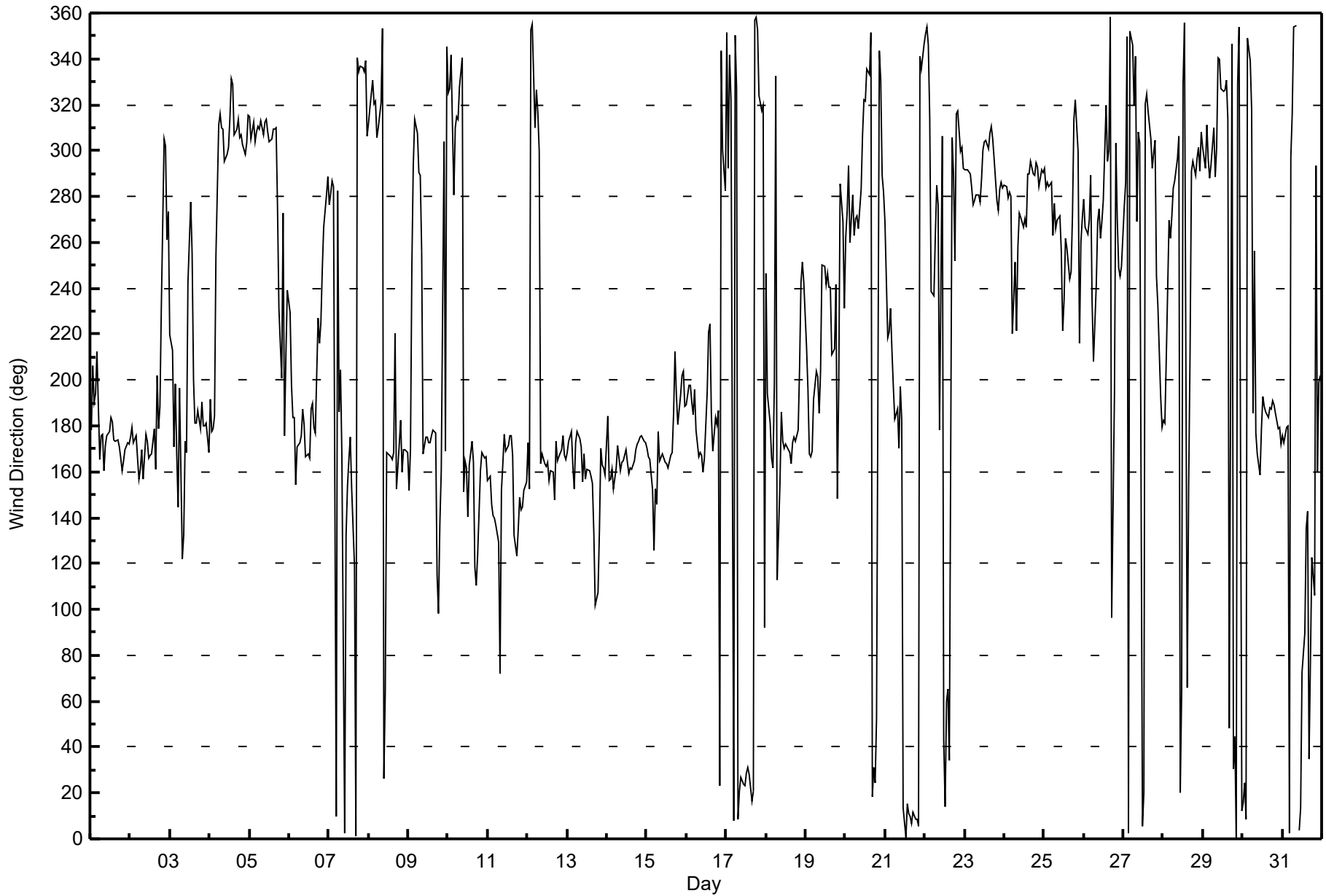
M - Maintenance

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



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 93 deg on Oct 3 08:00											Hours in Service: 744 Hours of Data: 743 Hours of Missing Data: 1 Hours of Calibration: 0 Percent Operational Time: 99.9														
Minimum Value: 7 deg on Oct 12 08:00																									
Percentiles: P ₁ = 10 P ₁₀ = 13 Q ₁ = 15 Median = 20 Q ₃ = 35 P ₉₀ = 51 P ₉₉ = 81																									
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-Oct	18	39	80	54	70	34	12	15	16	16	17	20	23	18	17	17	15	13	14	11	11	13	13	13	80
2-Oct	16	14	11	13	13	11	12	19	19	14	14	12	12	13	31	47	35	16	18	86	12	11	22	55	86
3-Oct	61	50	27	69	38	60	43	93	48	33	52	74	67	65	32	19	13	11	13	10	13	14	19	22	93
4-Oct	64	13	14	15	67	17	10	16	26	25	19	19	16	18	16	19	14	15	15	15	17	23	19	15	67
5-Oct	14	15	16	31	14	14	15	14	18	14	15	16	18	15	18	16	19	35	49	50	42	77	28	35	77
6-Oct	31	38	22	14	33	13	13	13	15	15	13	13	13	17	20	16	24	52	74	54	41	31	42	21	74
7-Oct	29	23	22	33	56	39	49	61	89	92	40	19	40	40	20	62	40	20	16	32	16	42	73	15	92
8-Oct	24	23	18	14	11	12	20	37	30	15	58	15	14	14	15	27	66	32	30	12	21	16	15	13	66
9-Oct	49	17	51	53	21	14	27	55	74	20	15	18	19	21	16	15	16	25	18	15	28	74	36	62	74
10-Oct	18	17	20	57	12	25	23	24	25	83	27	54	40	19	15	18	26	21	23	13	13	13	16	20	83
11-Oct	15	13	18	43	12	16	45	28	20	16	15	16	26	17	17	18	16	13	15	13	15	35	13	25	45
12-Oct	21	74	32	25	57	47	14	7	27	14	12	16	17	14	15	19	24	14	11	11	18	13	17	10	74
13-Oct	59	11	7	14	22	40	13	12	16	14	17	13	14	15	17	15	15	26	33	36	16	14	15	16	59
14-Oct	26	13	12	14	13	16	18	12	12	13	15	14	15	15	14	14	14	14	13	13	14	13	12	12	26
15-Oct	12	12	13	84	24	12	17	25	13	12	15	14	14	14	13	13	21	18	15	14	13	22	60	16	84
16-Oct	20	13	19	12	12	17	20	11	13	13	10	20	34	47	48	18	16	18	51	38	49	34	56	27	56
17-Oct	27	80	39	72	17	40	14	16	20	16	20	17	22	18	19	17	21	16	15	15	18	33	75	37	80
18-Oct	80	80	17	20	23	23	70	60	40	19	18	13	14	12	13	12	14	13	18	18	51	40	40	36	80
19-Oct	30	30	20	22	19	34	26	13	20	24	50	50	42	42	42	42	26	26	40	72	21	30	41	36	72
20-Oct	38	41	32	49	33	40	34	45	35	28	37	18	16	15	17	17	25	15	15	40	31	70	19	17	70
21-Oct	52	47	45	57	60	34	25	40	30	52	22	76	17	16	16	17	17	17	16	16	13	16	12	11	76
22-Oct	13	13	14	25	19	25	28	14	30	54	77	47	46	39	42	81	20	30	22	24	11	11	12	15	81
23-Oct	15	17	15	16	18	20	19	18	25	34	30	32	25	24	25	17	15	14	17	25	28	23	20	18	34
24-Oct	20	18	21	23	43	53	67	47	57	43	35	38	40	38	27	25	21	22	25	18	18	22	20	22	67
25-Oct	22	26	21	24	26	42	36	39	30	38	42	42	43	44	46	44	45	35	16	15	38	46	38	32	46
26-Oct	30	35	35	34	33	66	40	49	36	33	44	40	60	22	38	25	61	41	42	15	35	49	31	48	66
27-Oct	35	22	35	16	13	10	12	16	24	41	34	46	40	23	24	16	13	17	19	71	21	23	24	10	71
28-Oct	15	14	34	34	78	31	43	29	49	29	43	27	23	35	30	51	45	17	15	19	13	13	23	14	78
29-Oct	14	21	17	16	22	18	15	25	19	24	20	17	26	52	41	23	46	51	28	45	40	15	14	19	52
30-Oct	16	16	14	15	13	84	70	37	52	20	11	19	26	19	19	16	15	14	15	14	14	12	13	12	84
31-Oct	16	13	18	34	56	36	26	15	15	M	16	25	33	33	38	50	17	43	16	75	27	72	14	23	75
Diurnal Maximum																									
M - Maintenance																									



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS02 MILDRED LAKE OCTOBER 2023

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

November 29, 2023

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

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	709	34	35	99.87	70.3	0	19.3	0
H2S (ppb) Average	709	35	35	100	6.5	0	1.7	0
THC (ppm) Average	703	34	41	99.06	8.1	-	2.7	-
NMHC(ppm) Average	703	34	41	99.06	0.69	-	0.131	-
CH4(ppm) Average	703	34	41	99.06	7.4	-	2.5	-
Temperature (C) Average	744	0	0	100	25.1	-	15.6	-
Relative Humidity (%) Average	744	0	0	100	100	-	88.7	-
Wind Speed 10 m (km/h) Average	744	0	0	100	26	-	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 - MILDRED LAKE (AMS02)

October 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	3.27	7.5	-	0	0	0.1	0.4	2.5	9.2	70.3
H2S (ppb) Average	709	0.51	0.8	-	0	0.1	0.1	0.2	0.5	1.5	6.5
THC (ppm) Average	703	2.16	0.4	-	1.9	2	2	2	2.2	2.5	8.1
NMHC(ppm) Average	703	0.037	0.077	-	0	0	0	0	0	0.1	0.69
CH4(ppm) Average	703	2.12	0.3	-	1.9	2	2	2	2.1	2.4	7.4
Temperature 2 m (C) Average	744	4.95	7.5	-	-10.4	-5.1	-2	6.2	10.7	14.1	25.1
Relative Humidity (%) Average	744	69.97	15.5	-	27.1	48.2	59.7	69.3	82.4	90.2	100
Wind Speed 10 m (km/h) Average	744	10.9	5	-	0	4	7	11	14	17	26
Wind Direction 10 m (deg) Average	744	-	-	-	-	-	-	-	-	-	-

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

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2	10 Oct 2023 05:00	10 Oct 2023 05:00	1	Station power failure
THC/NMHC/CH4	10 Oct 2023 05:00	10 Oct 2023 05:00	1	Station power failure
THC/NMHC/CH4	10 Oct 2023 07:00	10 Oct 2023 10:00	4	Station power failure
THC/NMHC/CH4	10 Oct 2023 22:00	10 Oct 2023 23:00	2	Station power failure



Wood Buffalo Environmental Association
Summary of Hour Averages

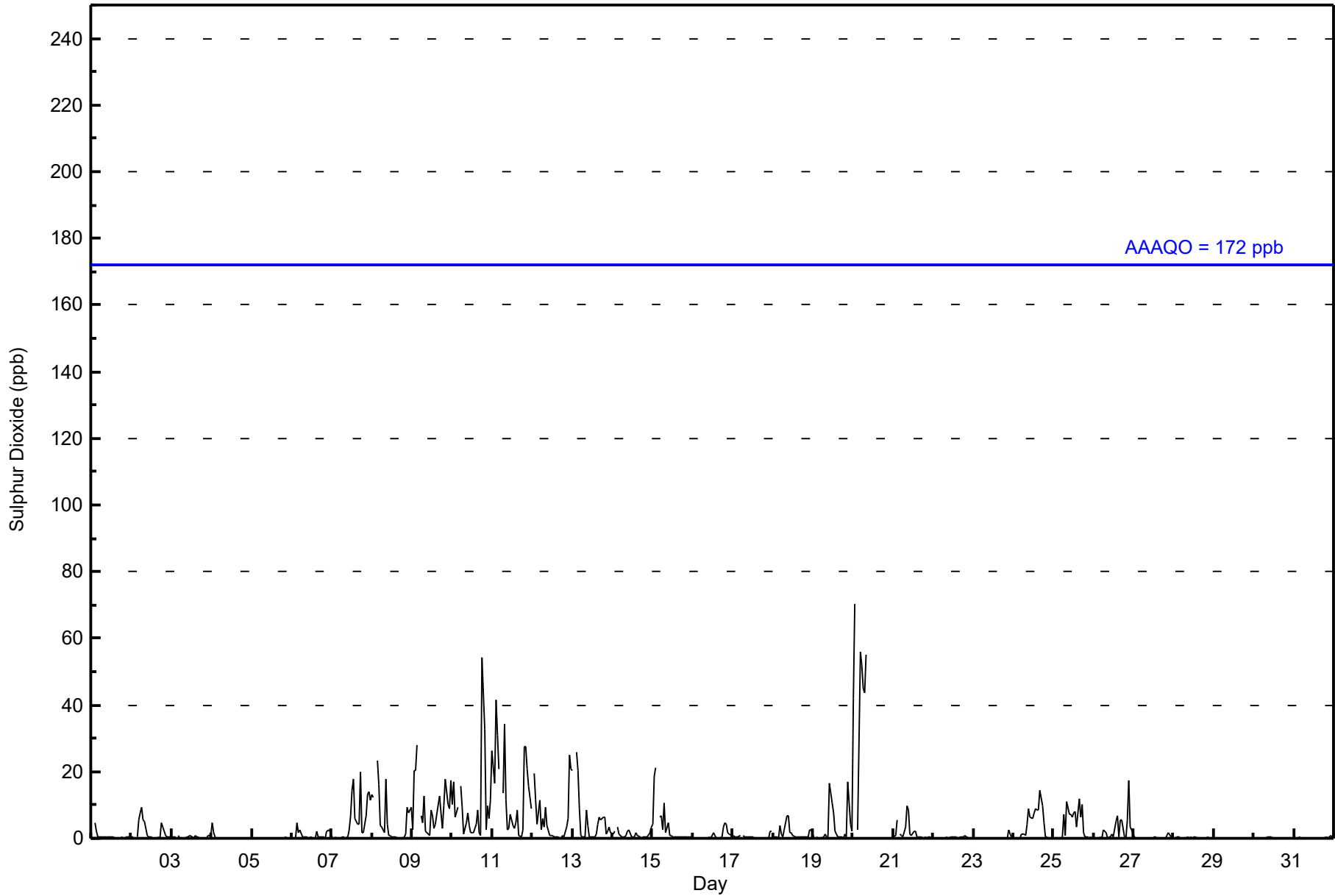
Sulphur Dioxide (SO₂) - ppb
Mildred Lake - October 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 70.3 ppb on Oct 20 02:00	Maximum Daily Average: 19.3 ppb on Oct 20		Hours of Data:	709
Minimum Value: 0.0 ppb on Oct 3 07:00	Minimum Daily Average: 0.0 ppb on Oct 5		Hours of Missing Data:	35
Maximum Diurnal Average: 7.3 ppb at hour 2	Minimum Diurnal Average: 1.5 ppb at hour 15		Hours of Calibration:	34
Monthly Average: 3.27 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.4 Q ₃ = 2.5 P ₉₀ = 9.2 P ₉₉ = 41.9		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-Oct	14.0	Z	4.6	2.3	0.5	0.4	0.4	0.3	0.4	0.5	0.5	0.3	0.3	0.2	0.1	0.2	0.2	0.2	0.2	0.5	0.2	0.2	0.2	0.3	0.2	1.2	14.0
2-Oct	0.3	0.3	Z	0.5	5.4	7.6	9.3	5.6	5.3	0.7	0.4	0.2	0.2	0.2	0.2	0.1	0.3	0.1	4.8	3.4	0.7	0.4	0.4	0.4	2.0	9.3	
3-Oct	0.3	0.6	0.3	Z	0.9	0.0	0.0	0.0	0.1	0.3	0.5	0.9	0.3	0.0	0.8	0.6	0.4	0.1	0.0	0.0	0.0	0.1	1.0	0.8	0.3	1.0	
4-Oct	4.5	1.7	0.6	0.2	Z	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	4.5	
5-Oct	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	0.2	0.0	0.0	0.0	0.0	0.2	0.2
6-Oct	Z	0.0	0.1	4.6	1.9	2.5	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.1	2.1	0.4	0.3	0.3	0.2	0.1	1.9	2.4	1.2	0.9	4.6	
7-Oct	0.3	Z	0.3	0.2	0.2	0.0	0.4	0.5	0.2	0.6	2.5	6.6	14.3	17.8	5.9	4.0	4.4	20.0	1.8	1.5	6.7	13.2	14.1	11.6	5.5	20.0	
8-Oct	13.3	12.4	Z	23.3	16.1	3.9	3.3	1.6	17.9	4.4	0.9	0.7	0.6	0.6	0.5	0.2	0.2	0.1	0.1	0.4	1.4	9.1	7.5	9.2	5.5	23.3	
9-Oct	2.7	20.2	20.4	27.9	Z	6.7	4.5	12.7	2.2	1.8	0.7	8.4	6.7	2.8	4.4	7.0	12.7	7.6	3.0	9.6	17.9	10.2	8.9	17.6	9.4	27.9	
10-Oct	10.3	16.9	6.4	9.3	PF	15.7	9.3	1.3	4.5	7.4	4.0	1.7	1.7	1.6	4.3	8.6	1.8	0.9	54.3	32.7	2.5	9.9	6.1	11.3	9.7	54.3	
11-Oct	26.1	16.6	41.7	30.8	20.9	Z	13.5	34.4	11.3	2.5	2.9	7.2	3.7	2.8	4.5	8.6	1.0	0.6	2.4	27.6	27.7	21.0	15.5	8.8	14.4	41.7	
12-Oct	Z	19.3	11.3	4.4	11.4	2.5	5.8	3.4	9.2	4.0	1.0	0.8	0.7	0.5	0.6	0.4	0.2	0.2	0.6	0.5	3.4	6.1	25.0	20.6	5.7	25.0	
13-Oct	20.3	Z	25.8	20.2	8.8	0.8	0.5	0.6	8.3	4.0	0.6	0.5	0.4	0.5	1.1	4.3	6.5	5.6	6.3	6.2	1.2	2.2	3.6	1.6	5.6	25.8	
14-Oct	1.2	2.0	Z	3.4	1.3	0.6	0.4	0.6	0.7	2.1	2.4	0.6	0.3	0.6	1.8	1.0	0.3	0.2	0.2	0.6	0.3	0.3	1.8	3.4	1.1	3.4	
15-Oct	4.4	18.5	21.2	Z	6.2	6.9	2.4	10.6	1.5	4.5	0.9	0.8	0.6	0.5	0.5	0.4	0.5	0.5	0.4	0.3	0.4	0.4	0.3	0.3	3.6	21.2	
16-Oct	0.2	0.1	0.1	0.1	Z	0.0	0.1	0.1	0.2	0.2	0.2	0.2	1.7	0.9	0.1	0.1	0.1	0.5	3.4	4.7	4.4	1.7	1.3	0.9	0.9	4.7	
17-Oct	0.7	0.6	0.5	0.4	0.8	Z	0.8	0.5	0.4	0.3	0.3	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	2.1	2.0	0.5	2.1	
18-Oct	Z	0.3	0.2	0.2	3.7	1.2	0.5	2.7	6.7	6.7	1.7	1.7	0.7	0.6	0.5	0.5	0.5	0.4	0.2	0.3	0.3	0.3	2.5	2.7	1.5	6.7	
19-Oct	0.3	Z	0.3	0.2	0.1	0.1	0.3	1.3	0.5	0.4	16.6	10.6	7.8	2.3	1.1	0.3	0.4	0.2	0.2	1.2	0.6	17.0	4.1	2.3	3.0	17.0	
20-Oct	41.9	70.3	Z	2.5	55.7	51.9	44.8	43.7	55.0	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	19.3	70.3	
21-Oct	0.3	0.7	5.6	Z	1.1	0.8	0.4	3.6	9.9	8.3	1.4	0.8	2.0	2.3	0.4	0.3	0.3	0.2	0.1	0.2	0.2	0.2	0.2	0.2	1.7	9.9	
22-Oct	0.1	0.2	0.2	0.0	Z	0.1	0.2	0.2	0.4	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.3	0.4	0.4	1.0	0.3	0.1	0.1	0.1	0.2	1.0	
23-Oct	0.1	0.0	0.2	0.2	0.0	Z	0.1	0.0	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1	2.6	1.2	0.3	0.2	2.6	
24-Oct	Z	0.1	0.0	0.1	0.2	1.2	1.3	0.7	4.2	9.1	6.4	5.9	7.5	9.0	8.3	8.7	14.2	10.0	4.8	0.5	0.2	0.2	0.2	0.2	4.0	14.2	
25-Oct	0.1	Z	0.1	0.1	0.0	0.2	7.0	0.9	10.9	7.0	7.2	6.5	7.7	8.2	3.4	11.7	6.3	10.1	1.7	0.4	0.3	0.1	0.3	0.1	3.9	11.7	
26-Oct	0.1	0.0	Z	0.1	0.3	0.1	2.6	1.5	0.2	0.2	0.2	1.4	0.3	5.0	6.8	0.5	5.6	5.4	0.4	0.1	5.3	17.2	3.2	2.5	2.6	17.2	
27-Oct	0.3	0.1	0.1	Z	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	1.0	1.8	0.6	0.2	0.2	1.8	
28-Oct	0.1	0.2	0.4	0.3	Z	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.3	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.4	
29-Oct	0.1	0.1	0.1	0.2	0.2	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	
30-Oct	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.4	0.4	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.4	
31-Oct	0.0	Z	0.0	0.3	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.9	0.5	0.2	0.9	

5.5	7.3	5.4	4.9	5.4	4.0	3.5	4.1	4.9	2.2	1.8	1.9	2.0	1.9	1.5	2.0	1.8	2.1	2.8	3.0	2.5	3.8	3.4	3.2	Diurnal Average	
41.9	70.3	41.7	30.8	55.7	51.9	44.8	43.7	55.0	9.1	16.6	10.6	14.3	17.8	8.3	11.7	14.2	20.0	54.3	32.7	27.7	21.0	25.0	20.6	Diurnal Maximum	

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	648	91.40	91.40
11 - 20	38	5.36	96.76
21 - 60	22	3.10	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: 709

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

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

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	48	12	13	2	9	31	108	102	64	20	18	13	46	79	48	35	648
11 - 20	0	0	0	0	2	3	23	3	0	0	0	3	4	0	0	0	38
21 - 60	0	0	0	0	0	4	12	0	0	0	0	1	5	0	0	0	22
61 - 110	0	0	0	0	0	0	0	0	0	0	0	1	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	48	12	13	2	11	38	143	105	64	20	18	18	55	79	48	35	709

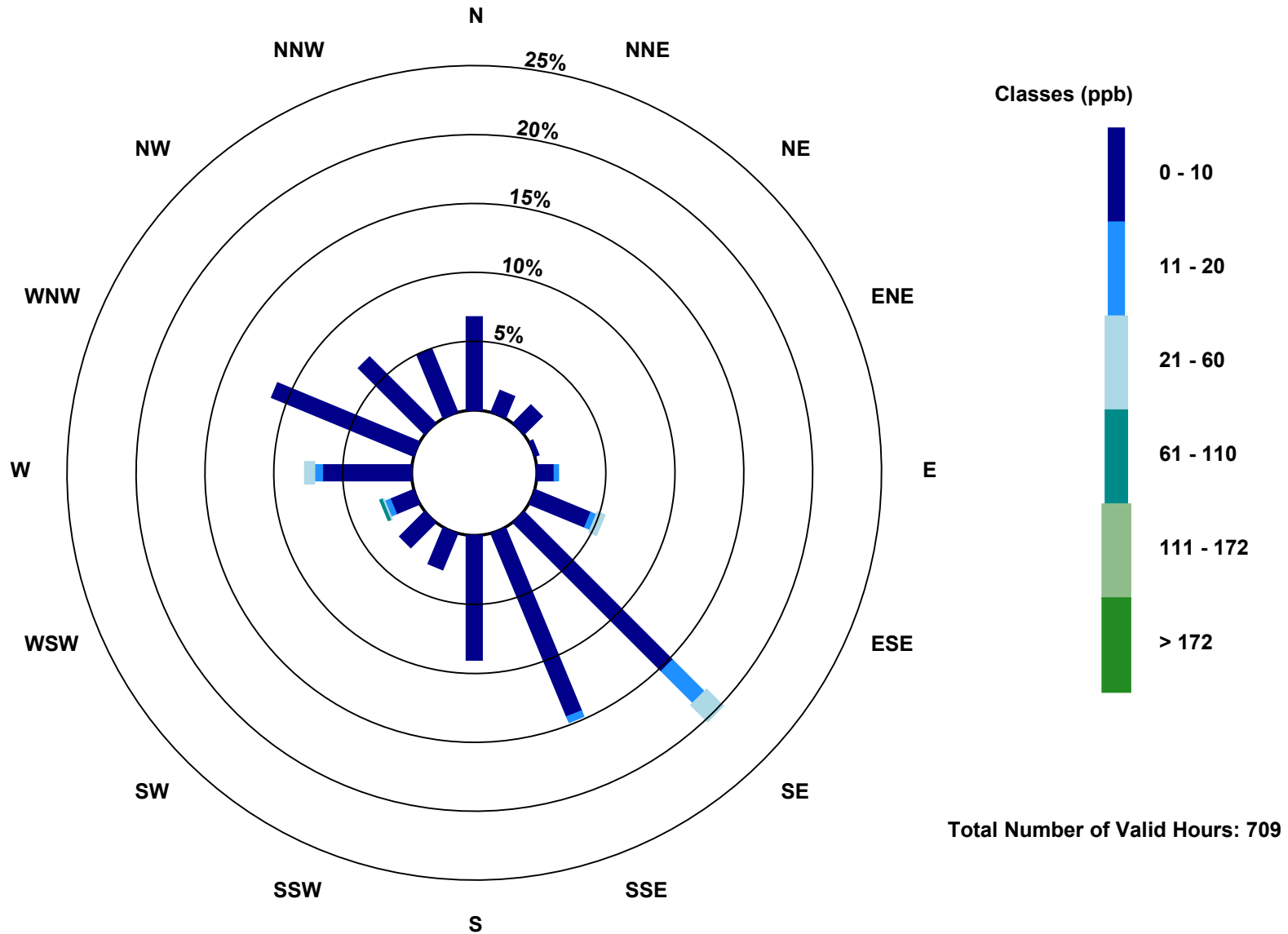
Total Number of Valid Hours: 709

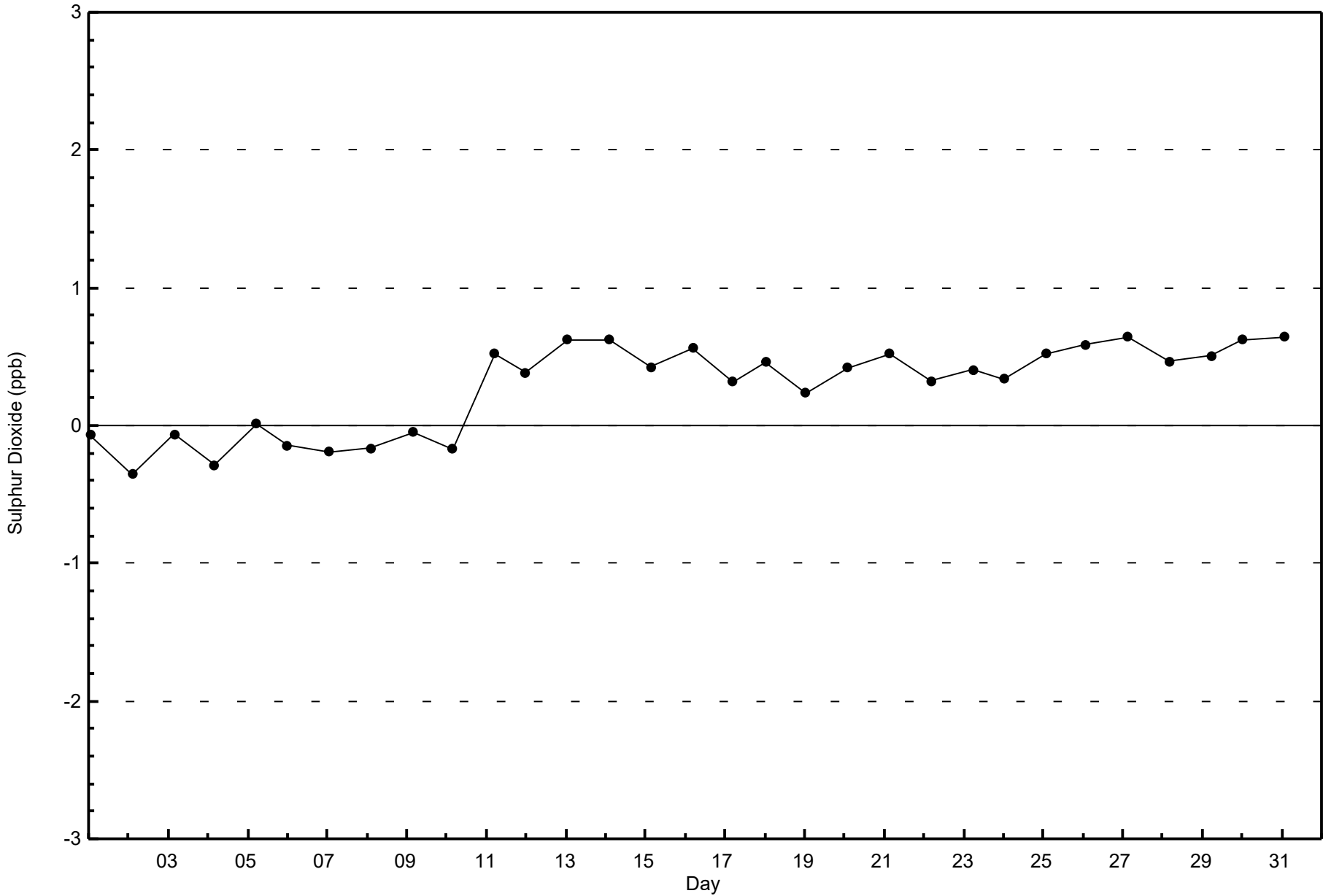
Total Number of Hours: 744

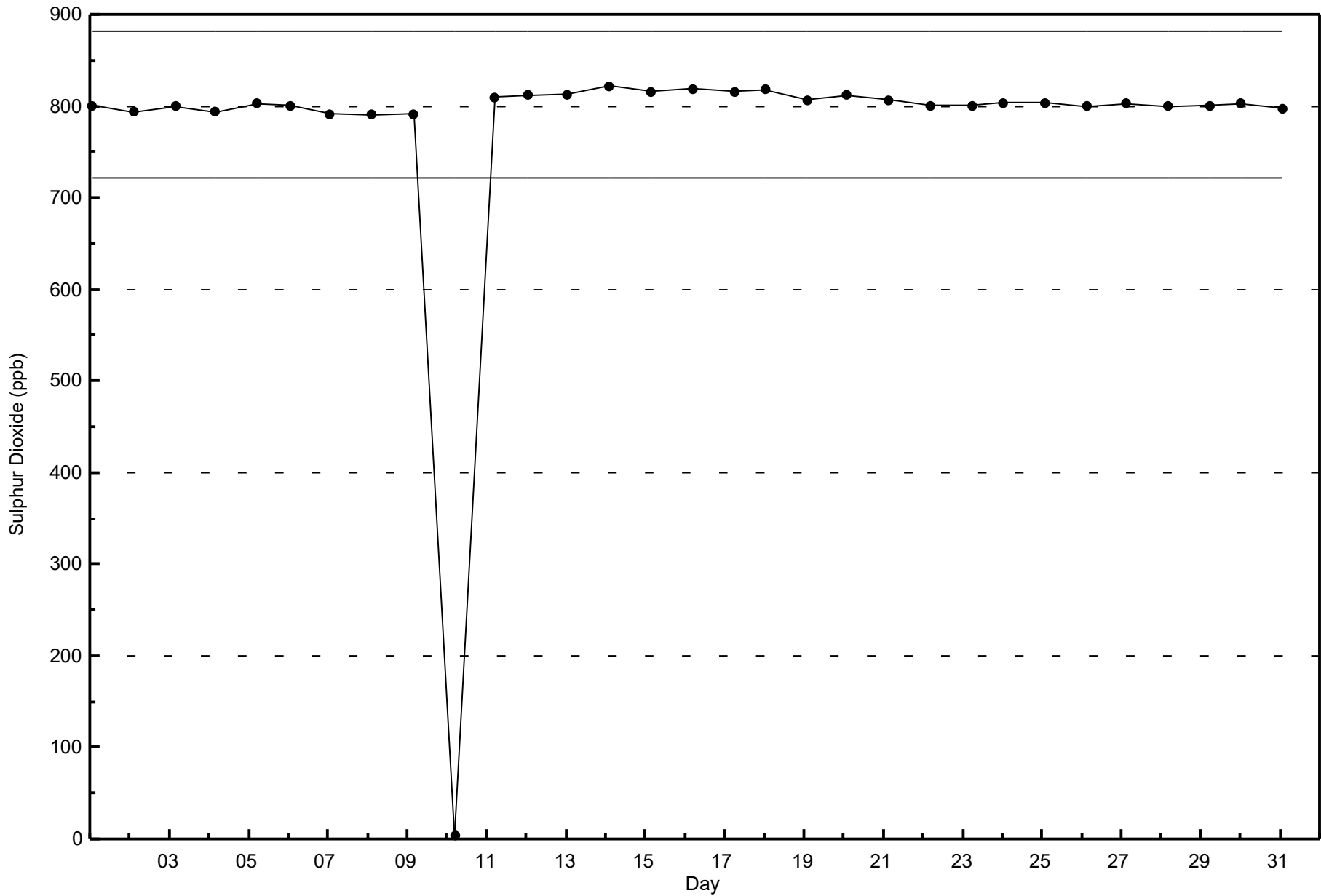


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Sulphur Dioxide (SO₂) - ppb
Mildred Lake









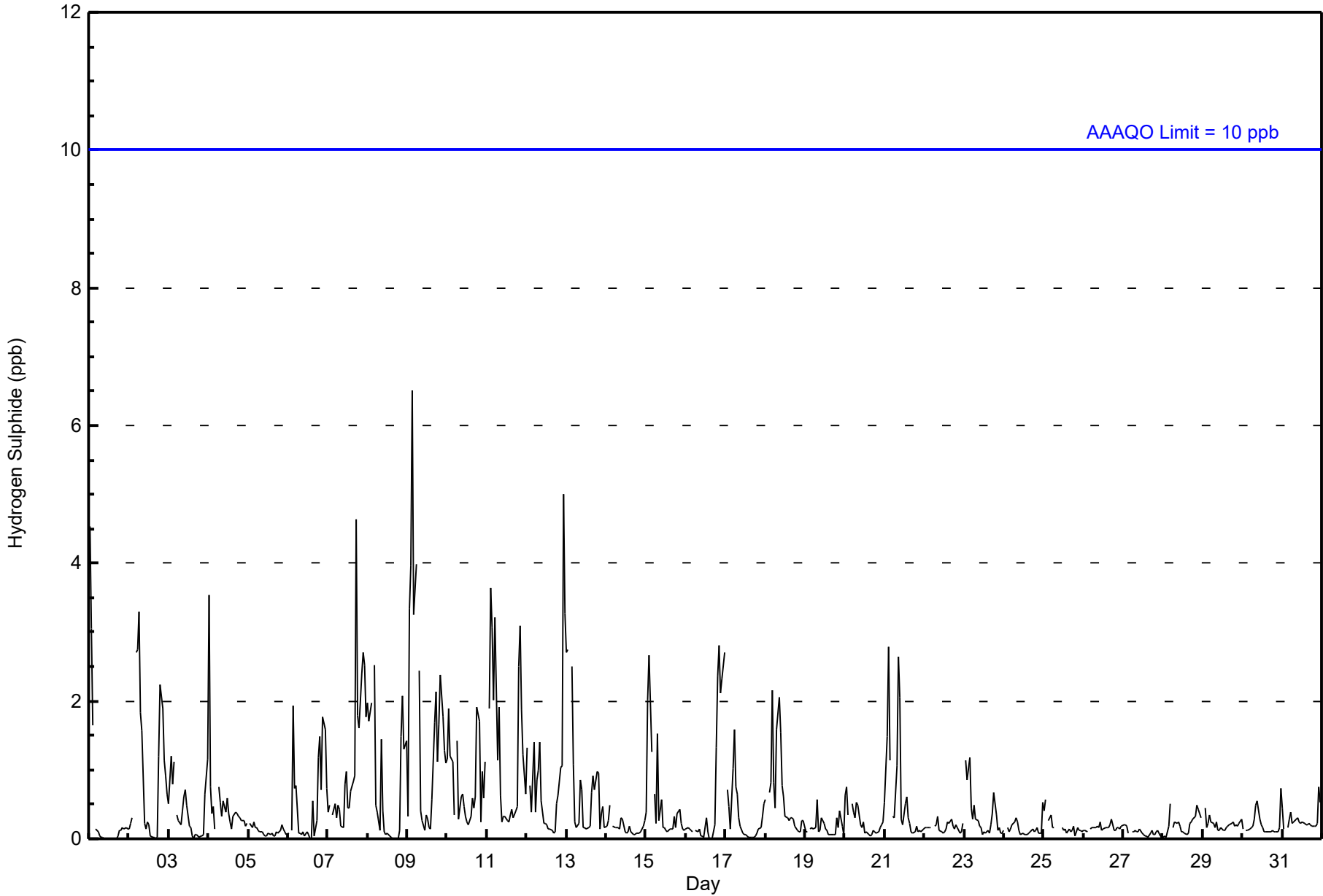
Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H₂S) - ppb

Mildred Lake - October 2023

Number of Exceedences (AAQO):		1-hr: 0		24-hr: 0		Hours in Service: 744														744																												
Maximum Value: 6.5 ppb on Oct 9 04:00		Maximum Daily Average: 1.7 ppb on Oct 9		Hours of Data: 709														709																														
Minimum Value: 0.0 ppb on Oct 1 11:00		Minimum Daily Average: 0.1 ppb on Oct 27		Hours of Missing Data: 35														35																														
Maximum Diurnal Average: 1.0 ppb at hour 2		Minimum Diurnal Average: 0.1 ppb at hour 15		Hours of Calibration: 35														35																														
Monthly Average: 0.51 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.1 Median = 0.2 Q ₃ = 0.5 P ₉₀ = 1.5 P ₉₉ = 3.5		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-Oct	4.5	3.0	1.6	Z	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.1	0.5	4.5																						
2-Oct	0.1	0.2	0.3	Z	2.7	2.7	3.3	1.8	1.6	0.2	0.1	0.2	0.2	0.0	0.0	0.0	0.0	0.0	1.2	2.2	1.9	1.1	0.9	0.6	0.9	3.3																						
3-Oct	0.5	1.2	0.8	1.1	Z	0.3	0.3	0.2	0.4	0.6	0.7	0.5	0.2	0.2	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.6	1.2	0.4	1.2																						
4-Oct	3.5	0.8	0.4	0.5	0.1	Z	0.7	0.5	0.3	0.6	0.4	0.6	0.4	0.3	0.1	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.5	3.5																						
5-Oct	Z	0.2	0.2	0.2	0.2	Z	0.2	0.1	0.1	0.1	0.1	0.0	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	0.2	0.2																					
6-Oct	0.1	Z	0.1	1.9	0.7	0.8	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.5	0.0	0.3	1.2	1.5	0.7	1.8	1.6	0.7	0.5	1.9																						
7-Oct	0.4	0.5	Z	0.3	0.5	0.3	0.5	0.4	0.2	0.2	0.8	1.0	0.5	0.4	0.7	0.8	0.9	4.6	1.8	1.6	2.4	2.7	2.5	1.8	1.1	4.6																						
8-Oct	2.0	1.7	2.0	Z	2.5	0.5	0.4	0.1	1.4	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.5	2.1	1.3	1.4	0.8	2.5																						
9-Oct	0.3	3.3	4.0	6.5	3.3	4.0	Z	2.4	0.4	0.3	0.1	0.3	0.3	0.2	0.1	0.6	1.7	2.1	1.1	1.7	2.4	1.8	1.3	1.1	1.7	6.5																						
10-Oct	1.2	1.9	1.2	1.1	0.4	Z	1.4	0.3	0.6	0.7	0.5	0.3	0.2	0.2	0.3	0.6	0.4	0.6	1.9	1.7	0.3	1.0	0.6	1.1	0.8	1.9																						
11-Oct	Z	1.9	3.6	3.1	2.0	3.2	1.1	1.9	0.6	0.2	0.3	0.3	0.3	0.2	0.3	0.4	0.3	0.4	0.5	2.5	3.1	1.9	1.2	0.6	1.3	3.6																						
12-Oct	1.3	Z	0.8	0.4	1.4	0.4	0.9	1.0	1.4	0.5	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.5	0.6	1.0	1.1	5.0	3.3	0.9	5.0																						
13-Oct	2.7	2.7	Z	2.5	1.1	0.2	0.2	0.2	0.2	0.9	0.7	0.2	0.2	0.1	0.2	0.7	0.9	0.7	1.0	0.9	0.1	0.4	0.5	0.2	0.8	2.7																						
14-Oct	0.2	0.3	0.5	Z	0.2	0.2	0.2	0.2	0.1	0.3	0.3	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.2	0.5																						
15-Oct	0.4	2.0	2.7	1.3	Z	0.7	0.2	1.5	0.3	0.6	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.4	0.4	0.2	0.1	0.1	0.5	2.7																					
16-Oct	0.1	0.2	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.0	0.0	0.0	0.3	0.1	0.0	0.0	0.0	0.2	1.3	2.4	2.8	2.1	2.3	2.7	0.7	2.8																						
17-Oct	Z	0.7	0.5	0.1	1.0	1.6	0.8	0.7	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.5	0.3	1.6																						
18-Oct	0.6	Z	0.7	0.8	2.2	0.8	0.4	1.6	2.1	1.5	0.8	0.6	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.3	0.3	0.6	2.2																						
19-Oct	0.1	0.1	Z	0.1	0.2	0.1	0.2	0.6	0.1	0.1	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.4	0.2	0.1	0.2	0.6																						
20-Oct	0.6	0.7	0.3	Z	0.5	0.4	0.3	0.5	0.5	0.2	0.2	0.3	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.7																						
21-Oct	0.5	1.5	2.8	1.1	Z	0.3	0.3	1.1	2.6	2.0	0.3	0.2	0.5	0.6	0.3	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.7	2.8																						
22-Oct	0.2	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.3	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.2	0.1	0.2	0.2	0.1	0.1	0.2	0.2	0.3																						
23-Oct	Z	1.1	0.9	1.2	0.5	0.3	0.5	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.7	0.3	0.1	0.2	0.1	0.1	0.3	1.2																						
24-Oct	0.1	Z	0.2	0.1	0.1	0.2	0.3	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.5	0.1	0.5																						
25-Oct	0.4	0.6	Z	0.3	0.3	0.2	0.2	C	C	C	C	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.6																						
26-Oct	0.1	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.3																						
27-Oct	0.2	0.2	0.2	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.2																						
28-Oct	0.0	0.0	0.0	0.2	0.5	Z	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.5	0.4	0.4	0.3	0.2	0.5																						
29-Oct	Z	0.5	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.5																						
30-Oct	0.1	Z	0.1	0.1	0.1	0.2	0.2	0.3	0.5	0.6	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	0.2	0.2	0.7																						
31-Oct	0.4	0.2	Z	0.2	0.3	0.4	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	0.7	0.5	0.3	0.7																						
																								0.8	1.0	0.9	1.0	0.8	0.7	0.5	0.6	0.5	0.4	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.4	0.4	0.6	0.6	0.6	0.7	0.6	Diurnal Average
																								4.5	3.3	4.0	6.5	3.3	4.0	3.3	2.4	2.6	2.0	0.8	1.0	0.5	0.6	0.7	0.8	1.7	4.6	1.9	2.5	3.1	2.7	5.0	3.3	Diurnal Maximum
Z - zerospan C - Calibration																																																
Alberta Ambient Air Quality Objectives (AAQO): 1-hr 10 ppb 24-hr 3 ppb																																																





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Mildred Lake - October 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	680	95.91	95.91
3 - 4	25	3.53	99.44
5 - 7	4	0.56	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
Mildred Lake - October 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	11	12	3	11	32	122	103	65	21	18	17	54	81	47	36	680
3 - 4	1	0	0	0	0	4	19	1	0	0	0	0	0	0	0	0	25
5 - 7	0	0	0	0	0	3	1	0	0	0	0	0	0	0	0	0	4
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	48	11	12	3	11	39	142	104	65	21	18	17	54	81	47	36	709

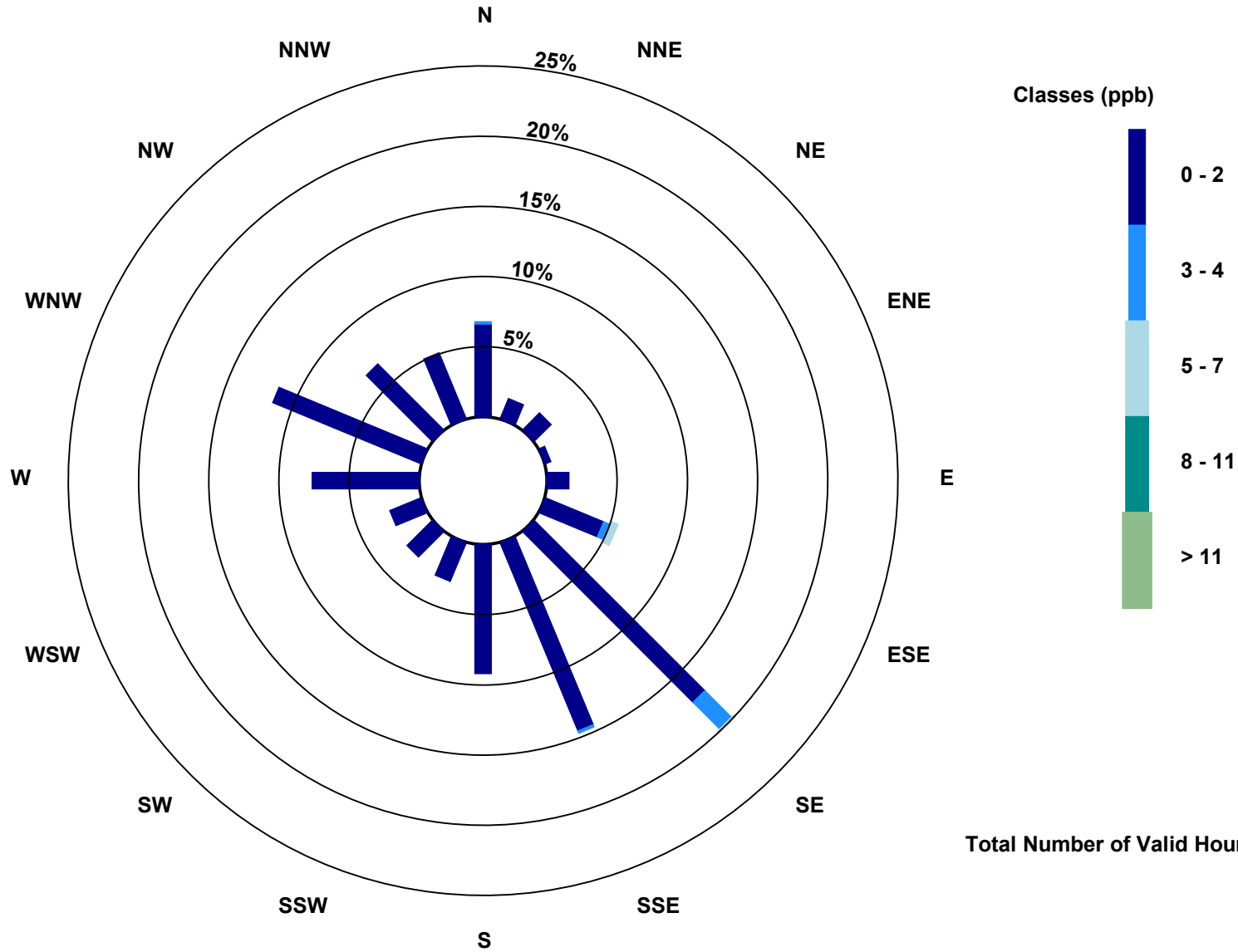
Total Number of Valid Hours: 709

Total Number of Hours: 744

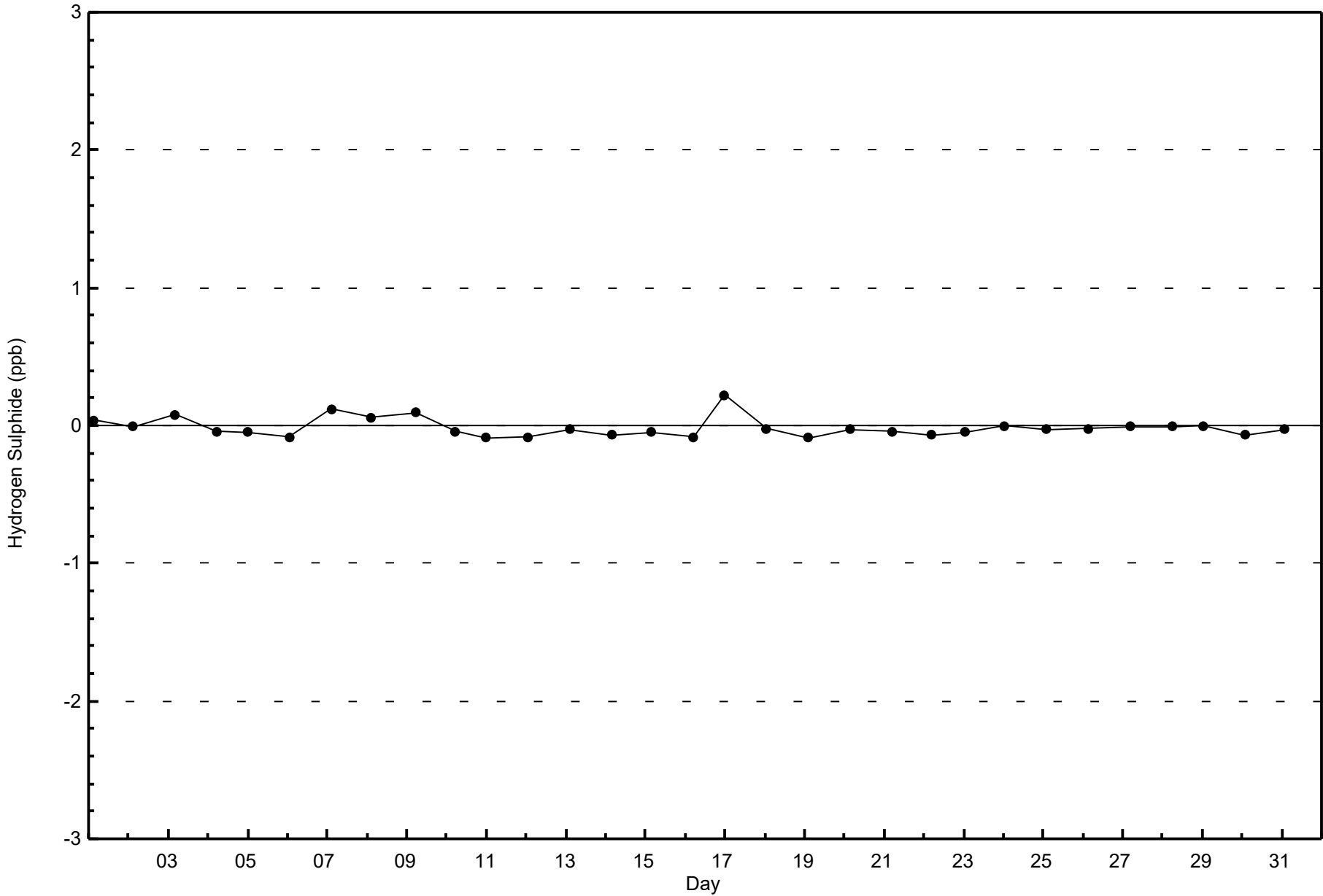


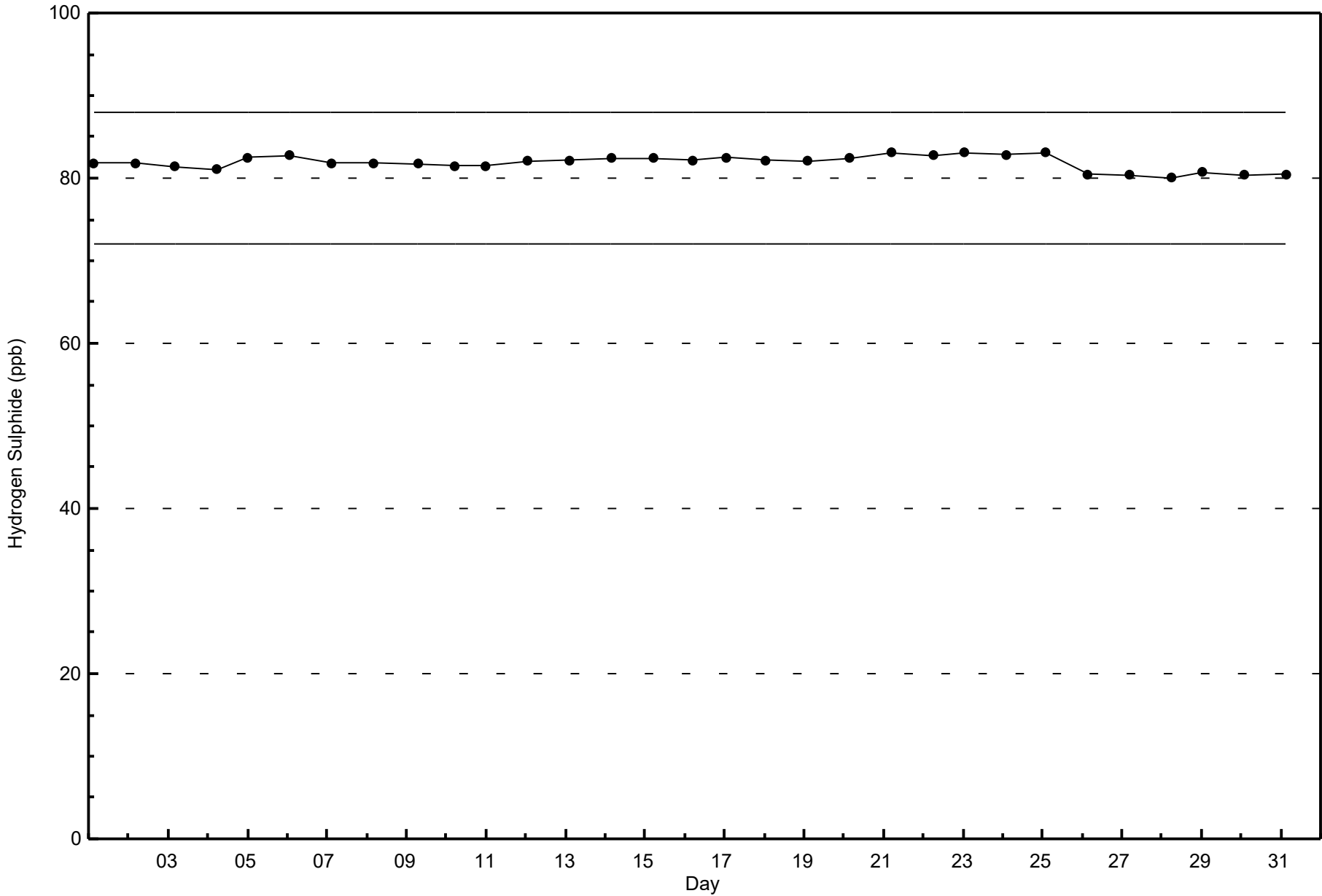
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Hydrogen Sulphide (H₂S) - ppb
Mildred Lake



Total Number of Valid Hours: 709



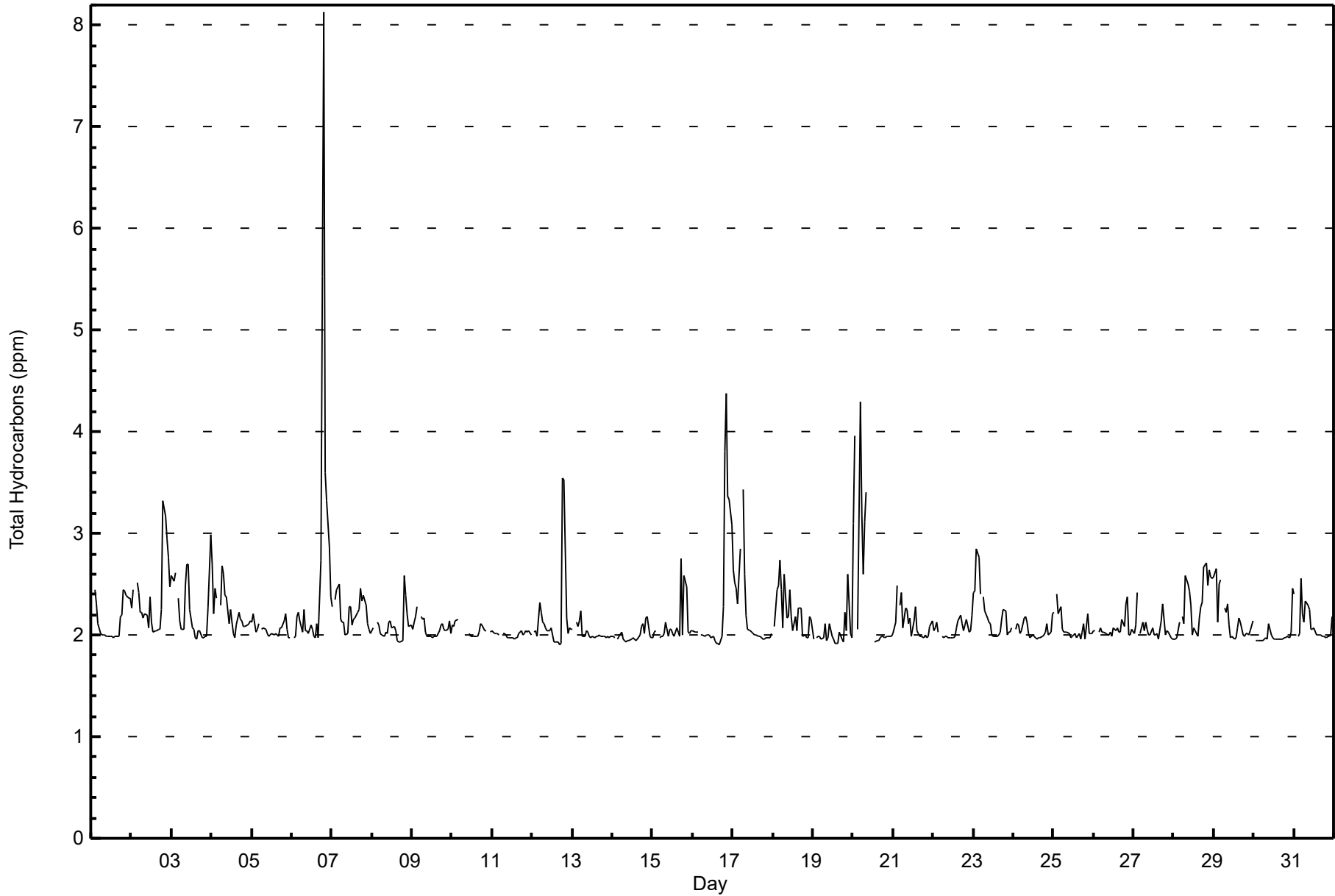




Wood Buffalo Environmental Association
Summary of Hour Averages

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

Maximum Value: 8.1 ppm on Oct 6 20:00																				Maximum Daily Average: 2.7 ppm on Oct 6					Hours in Service: 744				
Minimum Value: 1.9 ppm on Oct 16 17:00																				Minimum Daily Average: 2.0 ppm on Oct 30					Hours of Data: 703				
Maximum Diurnal Average: 2.5 ppm at hour 20																				Minimum Diurnal Average: 2.0 ppm at hour 15					Hours of Missing Data: 41				
Monthly Average: 2.16 ppm																				Percentiles: P ₁ = 1.9 P ₁₀ = 2.0 Q ₁ = 2.0 Median = 2.0 Q ₃ = 2.2 P ₉₀ = 2.5 P ₉₉ = 3.5					Hours of Calibration: 34				
																				Percent Operational Time: 99.1									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24					
1-Oct	2.5	Z	2.4	2.3	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.2	2.4	2.4	2.4	2.4	2.4	2.4	2.2	2.5			
2-Oct	2.3	2.4	Z	2.5	2.4	2.2	2.2	2.2	2.2	2.2	2.1	2.4	2.1	2.0	2.0	2.0	2.1	2.1	2.2	3.3	3.2	2.9	2.8	2.5	2.4	3.3			
3-Oct	2.6	2.5	2.6	Z	2.4	2.1	2.1	2.1	2.5	2.7	2.7	2.3	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3	3.0	2.3	3.0			
4-Oct	2.7	2.2	2.5	2.4	Z	2.3	2.7	2.6	2.4	2.4	2.1	2.3	2.1	2.0	2.0	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.7			
5-Oct	2.1	2.2	2.0	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	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.2			
6-Oct	Z	2.0	2.0	2.2	2.2	2.1	2.0	2.2	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.1	2.0	2.7	5.5	8.1	3.6	3.3	2.9	2.4	2.7	8.1			
7-Oct	2.3	Z	2.3	2.4	2.5	2.2	2.1	2.1	2.0	2.0	2.3	2.3	2.1	2.1	2.2	2.2	2.2	2.5	2.3	2.4	2.3	2.1	2.1	2.0	2.2	2.5			
8-Oct	2.0	2.1	Z	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.0	1.9	1.9	1.9	1.9	2.6	2.4	2.2	2.1	2.1	2.1	2.6			
9-Oct	2.1	2.1	2.2	2.3	Z	2.2	2.1	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.1	2.1	2.0	2.1	2.3			
10-Oct	2.1	2.1	2.1	2.1	PF	2.1	PF	PF	PF	PF	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	PF	PF	2.0	--	2.1			
11-Oct	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			
12-Oct	Z	2.0	2.0	2.0	2.3	2.2	2.1	2.1	2.1	2.0	2.0	2.1	2.0	1.9	1.9	1.9	1.9	1.9	3.5	3.5	2.2	2.0	2.1	2.1	2.2	3.5			
13-Oct	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	2.0	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-Oct	2.0	2.0	Z	2.0	2.0	2.0	2.0	1.9	1.9	1.9	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.1	2.1	2.0	2.2	2.2	2.0	2.0	2.0	2.2			
15-Oct	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.0	2.0	2.1	2.0	2.0	2.8	2.0	2.6	2.5	2.0	2.0	2.0	2.1	2.8			
16-Oct	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	1.9	1.9	1.9	1.9	2.0	2.3	3.8	4.4	3.4	3.3	3.1	2.3	4.4			
17-Oct	2.6	2.5	2.5	2.3	2.9	Z	3.4	2.6	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	3.4			
18-Oct	Z	2.1	2.4	2.5	2.7	2.4	2.1	2.6	2.2	2.2	2.4	2.2	2.0	2.2	2.3	2.3	2.3	2.0	2.0	2.0	2.0	2.2	2.2	2.2	2.2	2.7			
19-Oct	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.1	1.9	2.0	2.1	2.0	2.0	1.9	1.9	1.9	2.0	2.0	1.9	2.2	2.0	2.6	2.0	2.0	2.0	2.6			
20-Oct	3.1	4.0	Z	2.1	4.3	3.2	2.6	3.1	3.4	C	C	C	C	1.9	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.5	4.3			
21-Oct	2.0	2.1	2.5	Z	2.3	2.4	2.1	2.3	2.3	2.1	2.2	2.0	2.1	2.3	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-Oct	2.0	2.1	2.1	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.1	2.0	2.1	2.1	2.0	2.0	2.2	2.1	2.2			
23-Oct	2.4	2.4	2.9	2.8	2.4	Z	2.4	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.3	2.2	2.0	2.0	2.1	2.2	2.2	2.9			
24-Oct	Z	2.1	2.1	2.1	2.0	2.0	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	2.0	2.1	2.0	2.0	2.2	2.0	2.2			
25-Oct	2.2	Z	2.4	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	2.1	2.0	2.2	2.0	2.0	2.0	2.1	2.4			
26-Oct	2.0	2.0	Z	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.0	2.0	2.2	2.1	2.3	2.4	2.0	2.0	2.1	2.1	2.4			
27-Oct	2.0	2.1	2.4	Z	2.0	2.1	2.0	2.1	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.1	2.3	2.2	2.0	2.0	2.0	2.0	2.0	2.1	2.4			
28-Oct	2.0	2.0	2.0	2.1	Z	2.2	2.1	2.6	2.5	2.4	2.3	2.0	2.1	2.0	2.0	2.2	2.3	2.3	2.7	2.7	2.5	2.6	2.6	2.6	2.3	2.7			
29-Oct	2.6	2.7	2.1	2.5	2.5	Z	2.3	2.2	2.3	2.1	2.0	2.0	2.0	2.0	2.1	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.7			
30-Oct	Z	1.9	1.9	1.9	1.9	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	2.5	2.0	2.5			
31-Oct	2.4	Z	2.0	2.0	2.6	2.2	2.1	2.3	2.3	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	2.2	2.1	2.6			
2.2																								Diurnal Average					
3.1																								Diurnal Maximum					
Z - zerospan			C - Calibration			PF - Power Failure																							





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	377	53.63	53.63
2.1 - 3.0	306	43.53	97.16
3.1 - 10.0	20	2.84	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
Mildred Lake - October 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	28	10	9	0	6	13	80	49	50	16	16	9	34	18	20	19	377
2.1 - 3.0	19	2	3	1	5	24	52	54	14	3	2	6	17	61	28	15	306
3.1 - 10.0	1	0	1	1	0	1	5	2	0	1	0	3	4	0	0	1	20
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	48	12	13	2	11	38	137	105	64	20	18	18	55	79	48	35	703

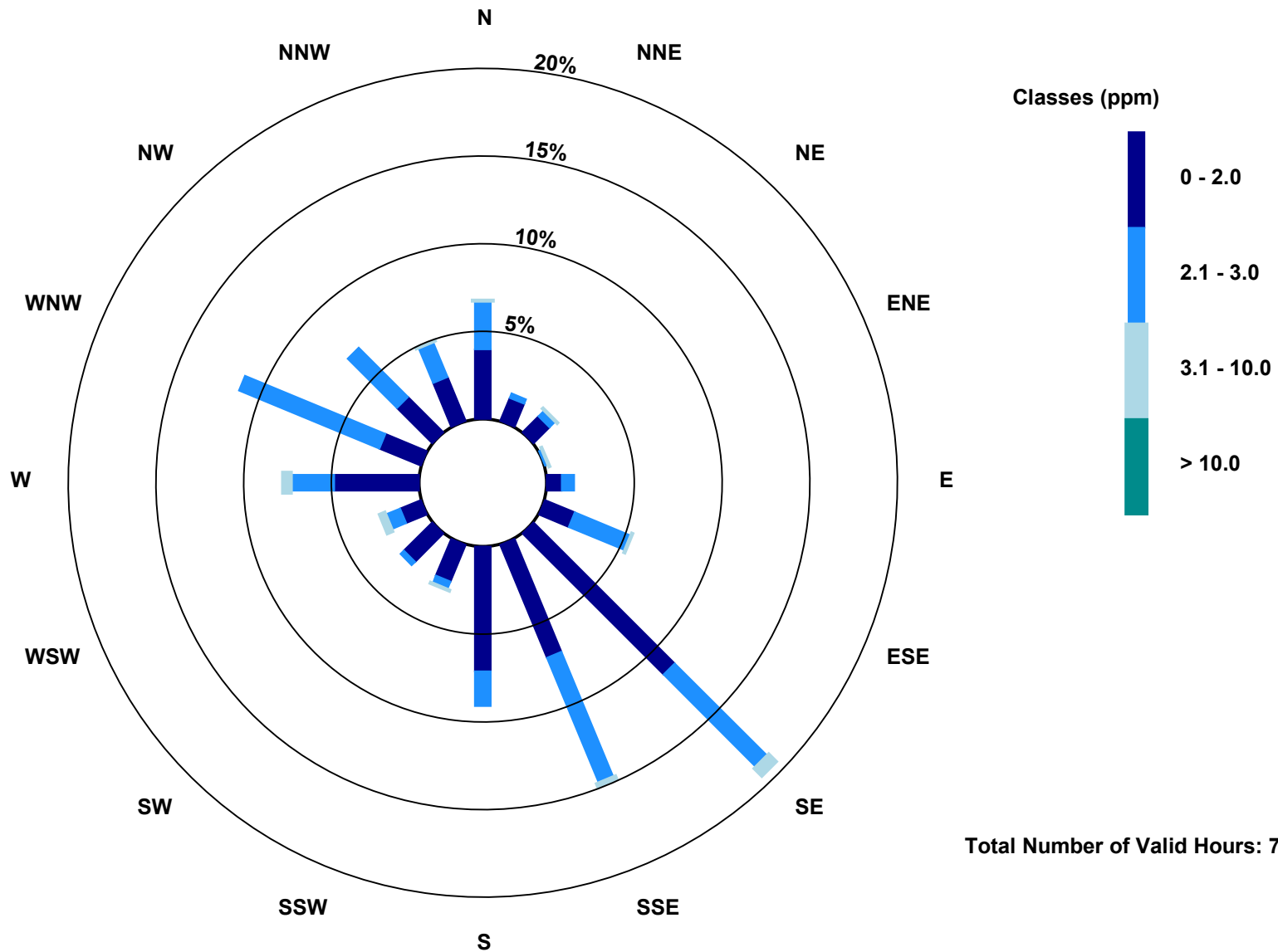
Total Number of Valid Hours: 703

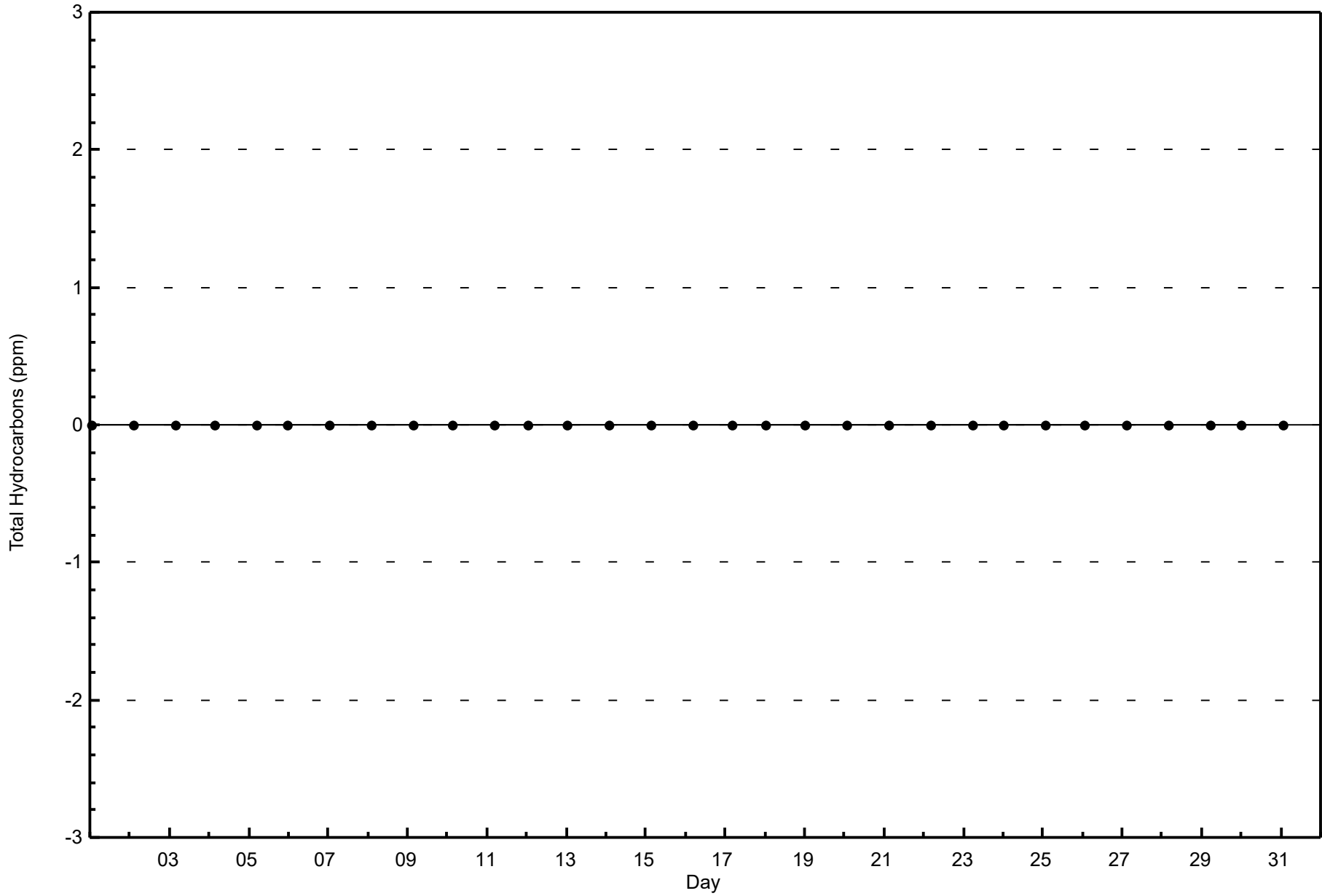
Total Number of Hours: 744

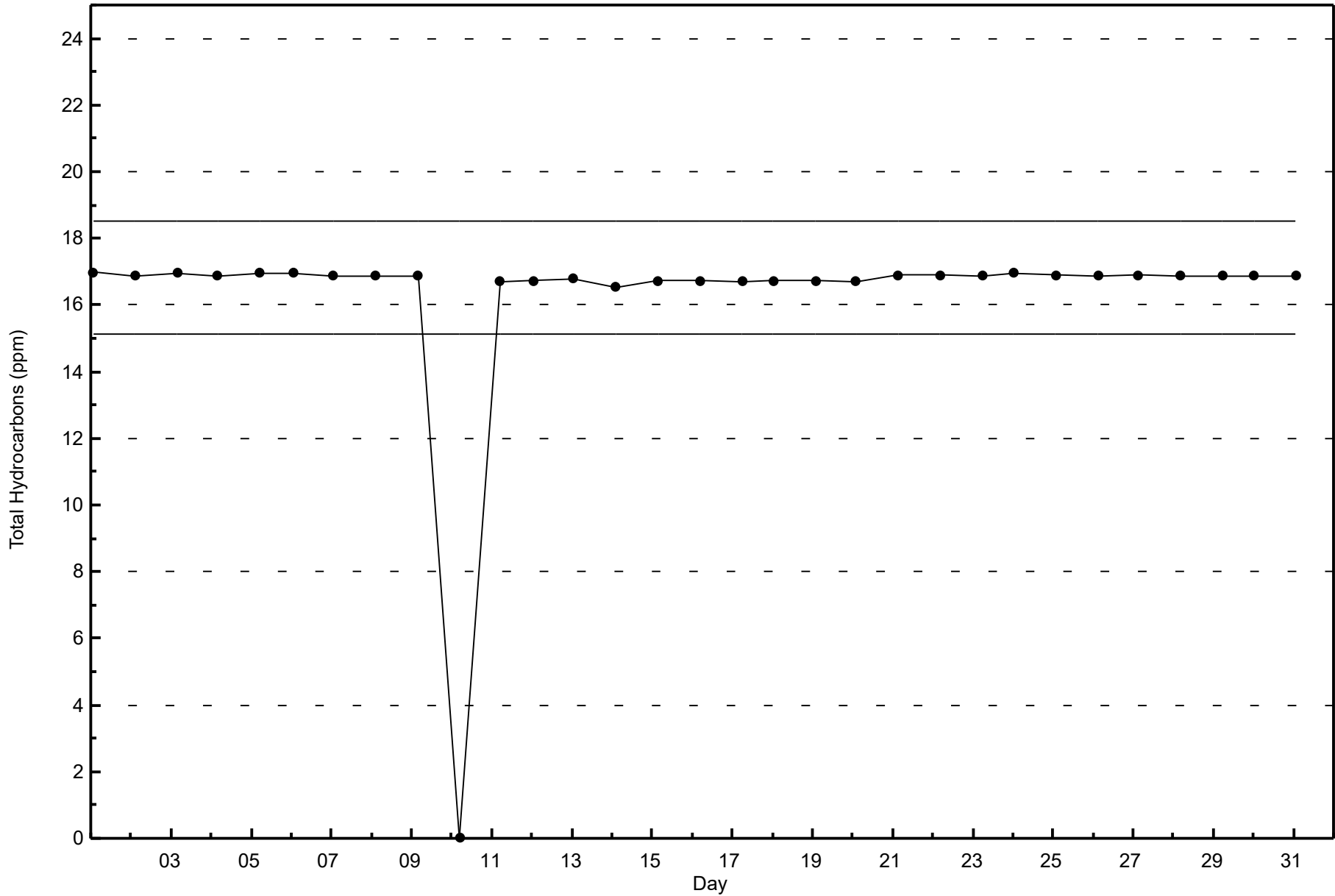


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Total Hydrocarbons (THC) - ppm
Mildred Lake





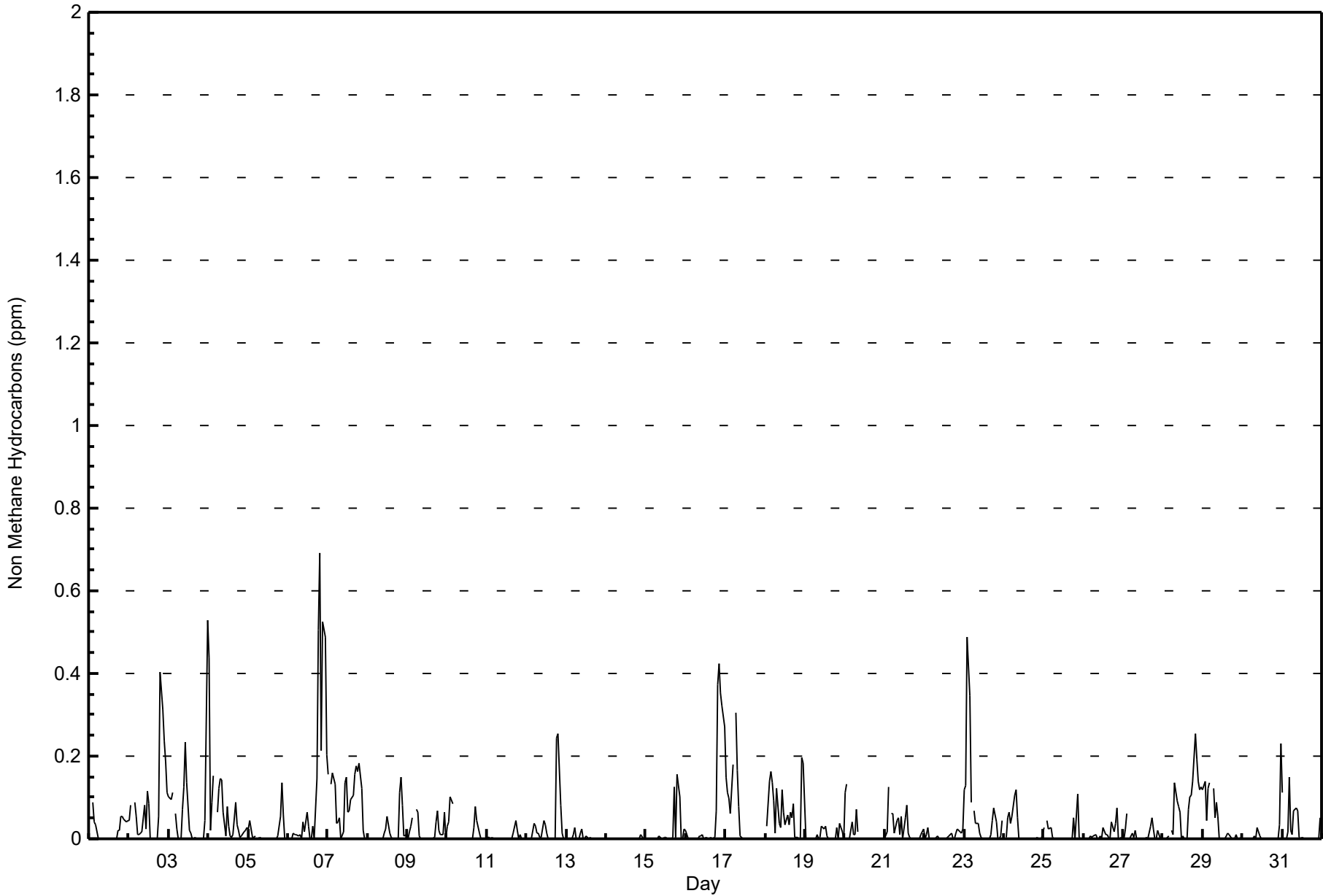




Summary of Hour Averages

Mildred Lake - October 2023

Maximum Value: 0.690 ppm on Oct 6 20:00																				Maximum Daily Average: 0.131 ppm on Oct 6					Hours in Service: 744	
Minimum Value: 0.000 ppm on Oct 1 06:00																				Minimum Daily Average: 0.001 ppm on Oct 14					Hours of Data: 703	
Maximum Diurnal Average: 0.087 ppm at hour 20																				Minimum Diurnal Average: 0.006 ppm at hour 15					Hours of Missing Data: 41	
Monthly Average: 0.037 ppm																				Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.1 P ₉₉ = 0.4					Hours of Calibration: 34	
																									Percent Operational Time: 99.1	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Oct	0.164	Z	0.089	0.040	0.033	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.019	0.019	0.054	0.055	0.046	0.042	0.043	0.026	0.164	
2-Oct	0.045	0.080	Z	0.089	0.053	0.011	0.009	0.015	0.018	0.080	0.024	0.116	0.083	0.000	0.000	0.001	0.000	0.000	0.053	0.402	0.311	0.236	0.186	0.113	0.084	0.402
3-Oct	0.102	0.095	0.110	Z	0.060	0.025	0.001	0.000	0.072	0.126	0.234	0.136	0.021	0.014	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.045	0.530	0.068	0.530	
4-Oct	0.438	0.021	0.087	0.154	Z	0.064	0.122	0.146	0.143	0.065	0.008	0.079	0.030	0.006	0.002	0.011	0.090	0.033	0.020	0.003	0.006	0.016	0.019	0.027	0.069	0.438
5-Oct	0.024	0.045	0.002	0.004	0.008	Z	0.001	0.003	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.006	0.054	0.134	0.057	0.000	0.000	0.015	0.134
6-Oct	Z	0.000	0.001	0.014	0.011	0.009	0.008	0.012	0.000	0.040	0.016	0.066	0.030	0.000	0.001	0.030	0.000	0.146	0.504	0.690	0.213	0.527	0.488	0.204	0.131	0.690
7-Oct	0.154	Z	0.133	0.160	0.132	0.038	0.042	0.050	0.000	0.018	0.134	0.149	0.065	0.068	0.096	0.106	0.157	0.176	0.164	0.183	0.121	0.020	0.000	0.000	0.094	0.183
8-Oct	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.014	0.024	0.054	0.014	0.005	0.001	0.000	0.000	0.000	0.113	0.149	0.081	0.006	0.009	0.020	0.149
9-Oct	0.002	0.016	0.030	0.050	Z	0.071	0.066	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.041	0.068	0.019	0.011	0.010	0.065	0.001	0.020	0.071
10-Oct	0.032	0.039	0.103	0.085	PF	0.002	PF	PF	PF	PF	0.000	0.001	0.000	0.000	0.000	0.000	0.028	0.079	0.043	0.012	0.000	PF	PF	0.000	--	0.103
11-Oct	0.002	0.004	0.001	0.002	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.013	0.044	0.020	0.001	0.010	0.000	0.000	0.000	0.004	0.044
12-Oct	Z	0.000	0.000	0.000	0.036	0.029	0.014	0.012	0.003	0.004	0.043	0.033	0.014	0.000	0.000	0.000	0.000	0.000	0.243	0.253	0.083	0.012	0.000	0.000	0.034	0.253
13-Oct	0.000	Z	0.000	0.000	0.009	0.026	0.001	0.001	0.015	0.024	0.000	0.000	0.005	0.000	0.002	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.004	0.026
14-Oct	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	0.001	0.000	0.000	0.001	0.011	0.000	0.000	0.001	0.011
15-Oct	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.006	0.000	0.001	0.002	0.005	0.000	0.001	0.002	0.002	0.127	0.003	0.157	0.101	0.000	0.000	0.022	0.019	0.157
16-Oct	0.021	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.008	0.006	0.010	0.000	0.002	0.001	0.000	0.002	0.000	0.002	0.069	0.371	0.422	0.354	0.323	0.271	0.081	0.422
17-Oct	0.148	0.111	0.099	0.061	0.179	Z	0.306	0.166	0.077	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.050	0.306
18-Oct	Z	0.030	0.138	0.164	0.135	0.091	0.014	0.121	0.037	0.029	0.119	0.065	0.035	0.059	0.034	0.064	0.053	0.084	0.004	0.003	0.000	0.000	0.196	0.182	0.072	0.196
19-Oct	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.012	0.000	0.004	0.032	0.023	0.029	0.006	0.000	0.000	0.000	0.000	0.000	0.026	0.002	0.038	0.017	0.001	0.008	0.038
20-Oct	0.112	0.131	Z	0.001	0.041	0.010	0.010	0.070	0.016	C	C	C	C	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.021	0.131
21-Oct	0.001	0.018	0.126	Z	0.059	0.063	0.012	0.044	0.051	0.012	0.055	0.001	0.050	0.080	0.013	0.005	0.000	0.000	0.000	0.001	0.000	0.000	0.010	0.022	0.027	0.126
22-Oct	0.000	0.011	0.029	0.001	Z	0.000	0.000	0.004	0.008	0.000	0.000	0.000	0.000	0.000	0.005	0.008	0.013	0.002	0.000	0.015	0.024	0.016	0.015	0.025	0.008	0.029
23-Oct	0.118	0.128	0.490	0.347	0.088	Z	0.069	0.038	0.039	0.012	0.003	0.000	0.001	0.000	0.000	0.000	0.009	0.046	0.075	0.042	0.001	0.001	0.008	0.045	0.068	0.490
24-Oct	Z	0.005	0.050	0.066	0.036	0.055	0.105	0.120	0.052	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.013	0.022	0.120
25-Oct	0.026	Z	0.045	0.023	0.027	0.004	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.051	0.001	0.107	0.003	0.000	0.000	0.013	0.107
26-Oct	0.000	0.000	Z	0.000	0.008	0.005	0.008	0.010	0.001	0.000	0.008	0.000	0.026	0.010	0.009	0.005	0.000	0.041	0.017	0.038	0.073	0.000	0.000	0.005	0.011	0.073
27-Oct	0.001	0.025	0.062	Z	0.000	0.015	0.004	0.021	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.029	0.052	0.024	0.000	0.000	0.020	0.000	0.000	0.011	0.062
28-Oct	0.000	0.000	0.000	0.006	Z	0.022	0.010	0.135	0.091	0.078	0.066	0.000	0.008	0.000	0.000	0.072	0.101	0.105	0.138	0.255	0.193	0.138	0.118	0.125	0.072	0.255
29-Oct	0.119	0.140	0.044	0.122	0.134	Z	0.123	0.051	0.087	0.053	0.000	0.000	0.000	0.000	0.008	0.012	0.011	0.000	0.000	0.000	0.012	0.000	0.000	0.004	0.040	0.140
30-Oct	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.000	0.028	0.006	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.035	0.231	0.013	0.231
31-Oct	0.110	Z	0.000	0.017	0.149	0.020	0.011	0.068	0.073	0.067	0.004	0.001	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.053	0.025	0.149
																				0.062 0.036 0.063 0.052 0.048 0.022 0.031 0.037 0.027 0.023 0.026 0.023 0.015 0.008 0.006 0.010 0.017 0.032 0.049 0.087 0.066 0.053 0.052 0.062					Diurnal Average	
																				0.438 0.140 0.490 0.347 0.179 0.091 0.306 0.166 0.143 0.126 0.234 0.149 0.083 0.080 0.096 0.106 0.157 0.176 0.504 0.690 0.422 0.527 0.488 0.530					Diurnal Maximum	
Z - zerospan		C - Calibration				PF - Power Failure																				





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	374	53.20	53.20
0.006 - 0.05	183	26.03	79.23
0.06 - 0.1	106	15.08	94.31
> 0.1	40	5.69	100.00

Total Number of Valid Hours: 703

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

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

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	28	10	8	0	6	8	87	48	47	14	13	7	30	25	20	23	374
0.006 - 0.05	11	1	3	0	0	14	29	35	10	3	3	4	19	28	16	7	183
0.06 - 0.1	5	1	1	1	5	12	12	17	5	1	1	4	5	20	12	4	106
> 0.1	4	0	1	1	0	4	9	5	2	2	1	3	1	6	0	1	40
Totals	48	12	13	2	11	38	137	105	64	20	18	18	55	79	48	35	703

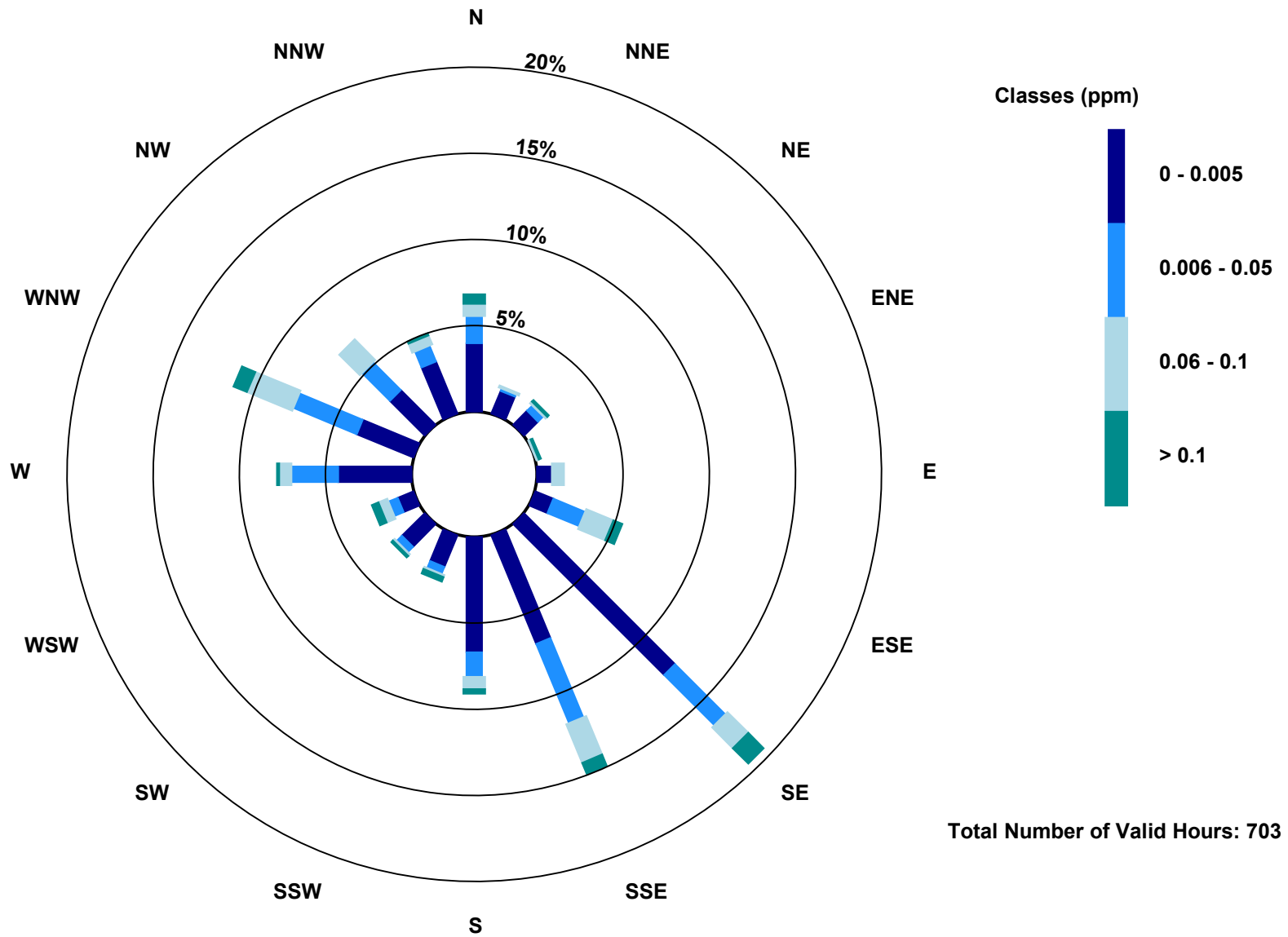
Total Number of Valid Hours: 703

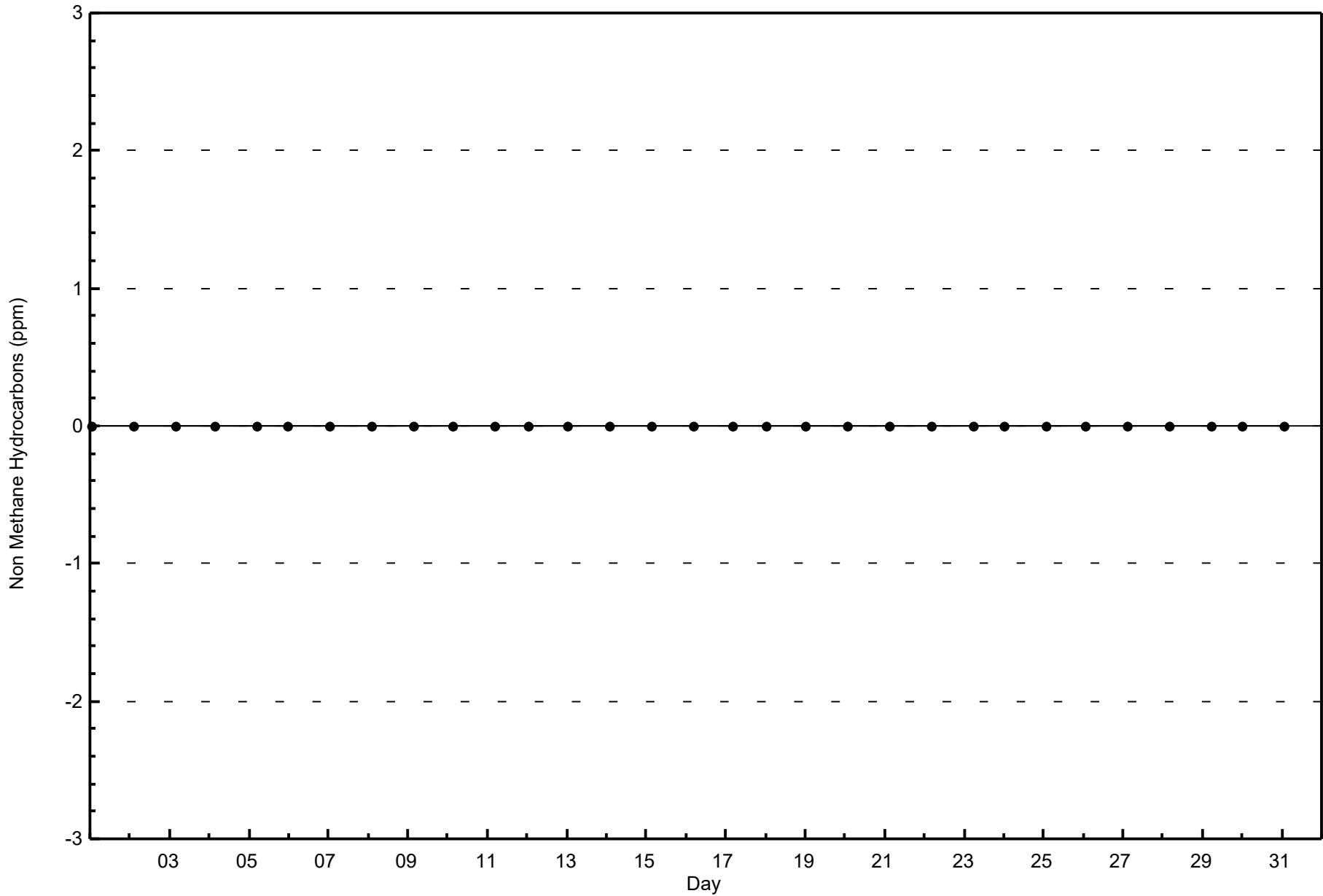
Total Number of Hours: 744

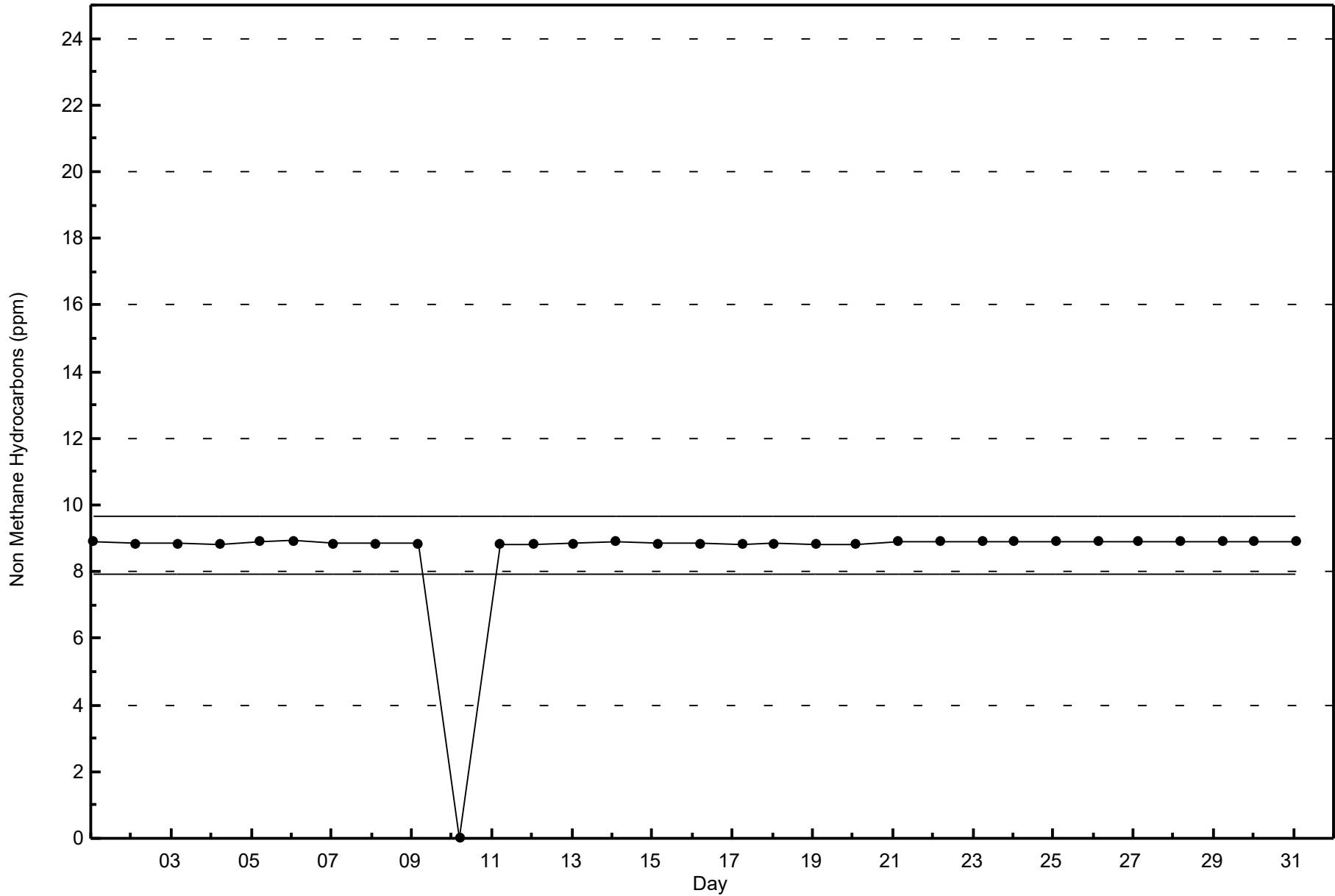


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Non Methane Hydrocarbons (NMHC) - ppm
Mildred Lake









Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH₄) - ppm

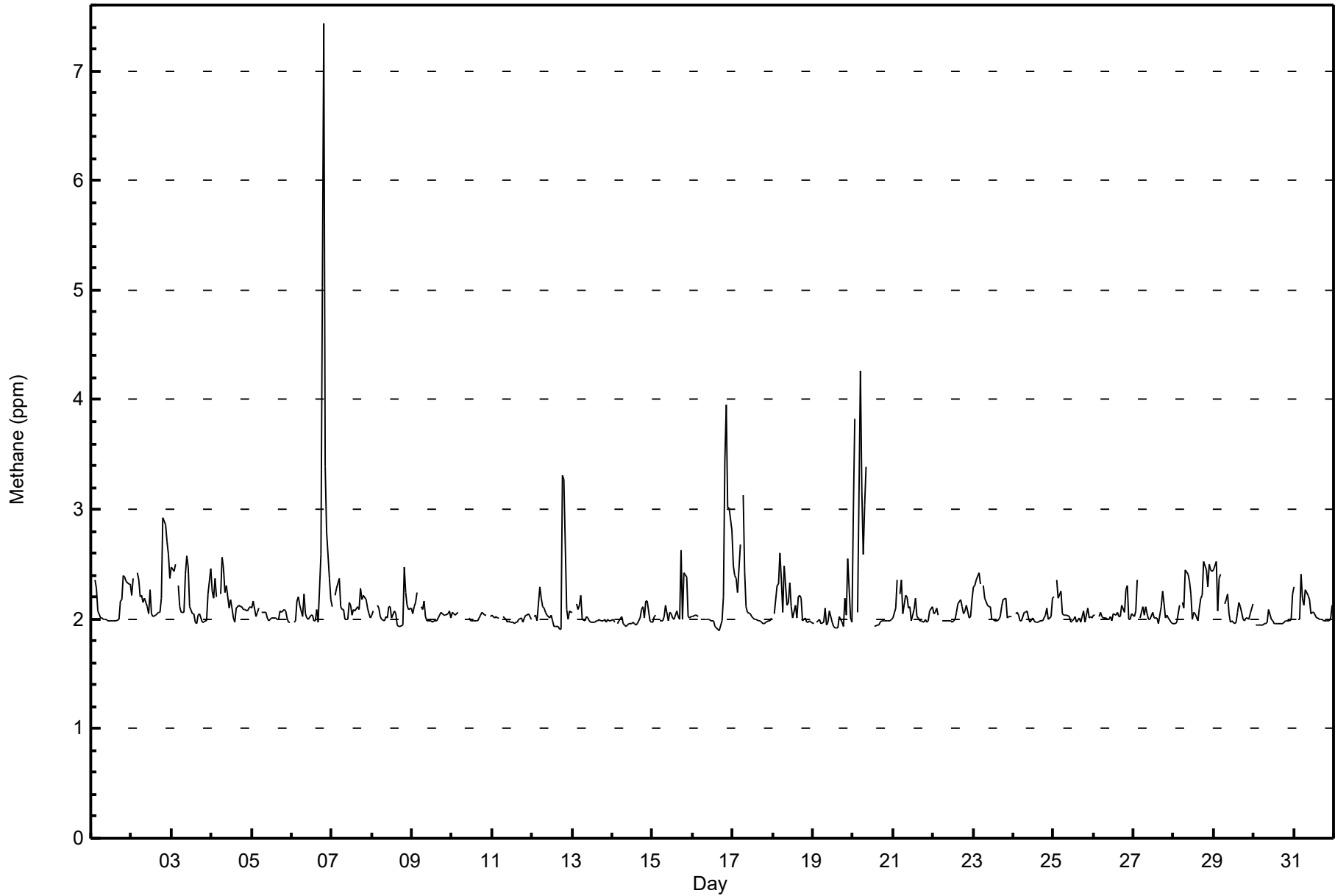
Mildred Lake - October 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 744														744																													
Maximum Value: 7.4 ppm on Oct 6 20:00		Maximum Daily Average: 2.5 ppm on Oct 6														Hours of Data: 703																																	
Minimum Value: 1.9 ppm on Oct 16 17:00		Minimum Daily Average: 2.0 ppm on Oct 30														Hours of Missing Data: 41																																	
Maximum Diurnal Average: 2.4 ppm at hour 20		Minimum Diurnal Average: 2.0 ppm at hour 15														Hours of Calibration: 34																																	
Monthly Average: 2.12 ppm		Percentiles: P ₁ = 1.9 P ₁₀ = 2.0 Q ₁ = 2.0 Median = 2.0 Q ₃ = 2.1 P ₉₀ = 2.4 P ₉₉ = 3.4														Percent Operational Time: 99.1																																	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Oct	2.4	Z	2.4	2.3	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.2	2.4	2.4	2.3	2.3	2.3	2.1	2.4																								
2-Oct	2.2	2.4	Z	2.4	2.4	2.2	2.2	2.2	2.2	2.1	2.0	2.3	2.0	2.0	2.0	2.1	2.1	2.2	2.9	2.9	2.7	2.6	2.4	2.3	2.9																								
3-Oct	2.5	2.4	2.5	Z	2.3	2.1	2.1	2.1	2.4	2.6	2.5	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.5	2.2	2.6																								
4-Oct	2.3	2.2	2.4	2.2	Z	2.2	2.6	2.5	2.2	2.3	2.1	2.2	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.6																								
5-Oct	2.1	2.2	2.0	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	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.2																								
6-Oct	Z	2.0	2.0	2.2	2.2	2.1	2.0	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.6	5.0	7.4	3.4	2.8	2.4	2.2	2.5	7.4																								
7-Oct	2.1	Z	2.2	2.3	2.4	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.0	2.1	2.1	2.1	2.3	2.2	2.2	2.2	2.1	2.1	2.0	2.1	2.4																								
8-Oct	2.0	2.1	Z	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.1	2.0	1.9	1.9	1.9	1.9	2.5	2.2	2.1	2.1	2.1	2.5																								
9-Oct	2.1	2.1	2.2	2.2	Z	2.1	2.1	2.2	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	2.0	2.1	2.2																								
10-Oct	2.1	2.1	2.0	2.1	PF	2.1	PF	PF	PF	PF	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	PF	PF	2.0	2.1																								
11-Oct	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																								
12-Oct	Z	2.0	2.0	2.0	2.3	2.2	2.1	2.1	2.1	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	3.3	3.3	2.1	2.0	2.1	2.1	3.3																								
13-Oct	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	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-Oct	2.0	2.0	Z	2.0	2.0	2.0	2.0	1.9	1.9	1.9	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.1	2.1	2.0	2.2	2.2	2.0	2.0	2.2																								
15-Oct	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.0	2.0	2.0	2.1	2.0	2.0	2.6	2.0	2.4	2.4	2.0	2.0	2.0	2.6																								
16-Oct	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	1.9	1.9	1.9	2.0	2.2	3.4	4.0	3.0	3.0	2.8	2.3	4.0																								
17-Oct	2.5	2.4	2.4	2.2	2.7	Z	3.1	2.4	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	3.1																								
18-Oct	Z	2.0	2.3	2.3	2.6	2.4	2.1	2.5	2.1	2.2	2.3	2.1	2.0	2.1	2.0	2.2	2.2	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.6																								
19-Oct	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.1	1.9	2.0	2.1	2.0	1.9	1.9	1.9	1.9	2.0	2.0	1.9	2.2	2.0	2.6	2.0	2.0	2.6																								
20-Oct	3.0	3.8	Z	2.1	4.3	3.2	2.6	3.0	3.4	C	C	C	C	1.9	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	4.3																								
21-Oct	2.0	2.1	2.4	Z	2.2	2.4	2.1	2.2	2.2	2.1	2.1	2.0	2.1	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.4																								
22-Oct	2.0	2.1	2.1	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.1	2.0	2.1	2.1	2.0	2.0	2.2	2.0	2.2																								
23-Oct	2.3	2.3	2.4	2.4	2.3	Z	2.3	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.0	2.0	2.0	2.0	2.1	2.4																								
24-Oct	Z	2.0	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.2	2.0	2.2																								
25-Oct	2.2	Z	2.4	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	2.0	2.1	2.0	2.1	2.0	2.0	2.0	2.1	2.4																								
26-Oct	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	2.1	2.0	2.0	2.1	2.1	2.3	2.3	2.0	2.0	2.0	2.1	2.3																								
27-Oct	2.0	2.1	2.4	Z	2.0	2.1	2.0	2.1	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.1	2.3	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.4																								
28-Oct	2.0	2.0	2.0	2.1	Z	2.2	2.1	2.4	2.4	2.4	2.2	2.0	2.1	2.0	2.1	2.2	2.2	2.5	2.5	2.3	2.5	2.5	2.4	2.2	2.5																								
29-Oct	2.4	2.5	2.1	2.4	2.4	Z	2.1	2.2	2.2	2.1	2.0	2.0	2.0	2.1	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.5																								
30-Oct	Z	1.9	1.9	1.9	1.9	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	2.2	2.0	2.2																								
31-Oct	2.3	Z	2.0	2.0	2.4	2.2	2.1	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	2.0	2.0	2.1	2.1	2.4																								
																								2.2	2.2	2.2	2.1	2.3	2.1	2.1	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.2	2.4	2.2	2.1	2.1	2.1	Diurnal Average			
																								3.0	3.8	2.5	2.4	4.3	3.2	3.1	3.0	3.4	2.6	2.5	2.3	2.1	2.2	2.1	2.2	2.2	2.6	5.0	7.4	4.0	3.0	3.0	2.8	Diurnal Maximum	
Z - zerospan			C - Calibration			PF - Power Failure																																											



Wood Buffalo Environmental Association
Hourly Averages

Methane (CH₄) - ppm
Mildred Lake - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Mildred Lake - October 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	398	56.61	56.61
2.1 - 3.0	293	41.68	98.29
3.1 - 10.0	12	1.71	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
Mildred Lake - October 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	28	10	9	0	8	15	80	56	52	16	17	10	38	20	20	19	398
2.1 - 3.0	20	2	4	2	3	22	53	48	12	3	1	7	14	59	28	15	293
3.1 - 10.0	0	0	0	0	0	1	4	1	0	1	0	1	3	0	0	1	12
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	48	12	13	2	11	38	137	105	64	20	18	18	55	79	48	35	703

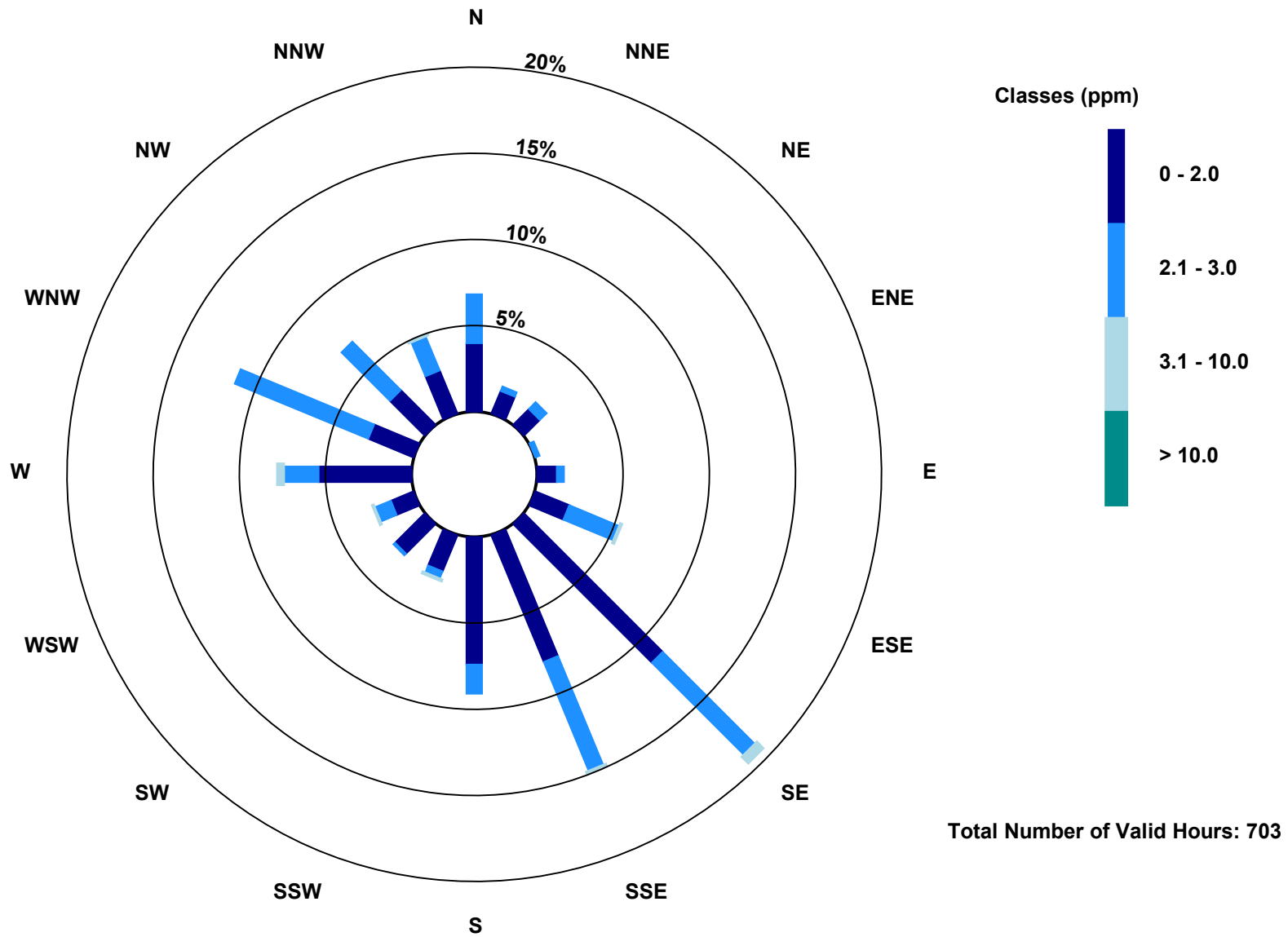
Total Number of Valid Hours: 703

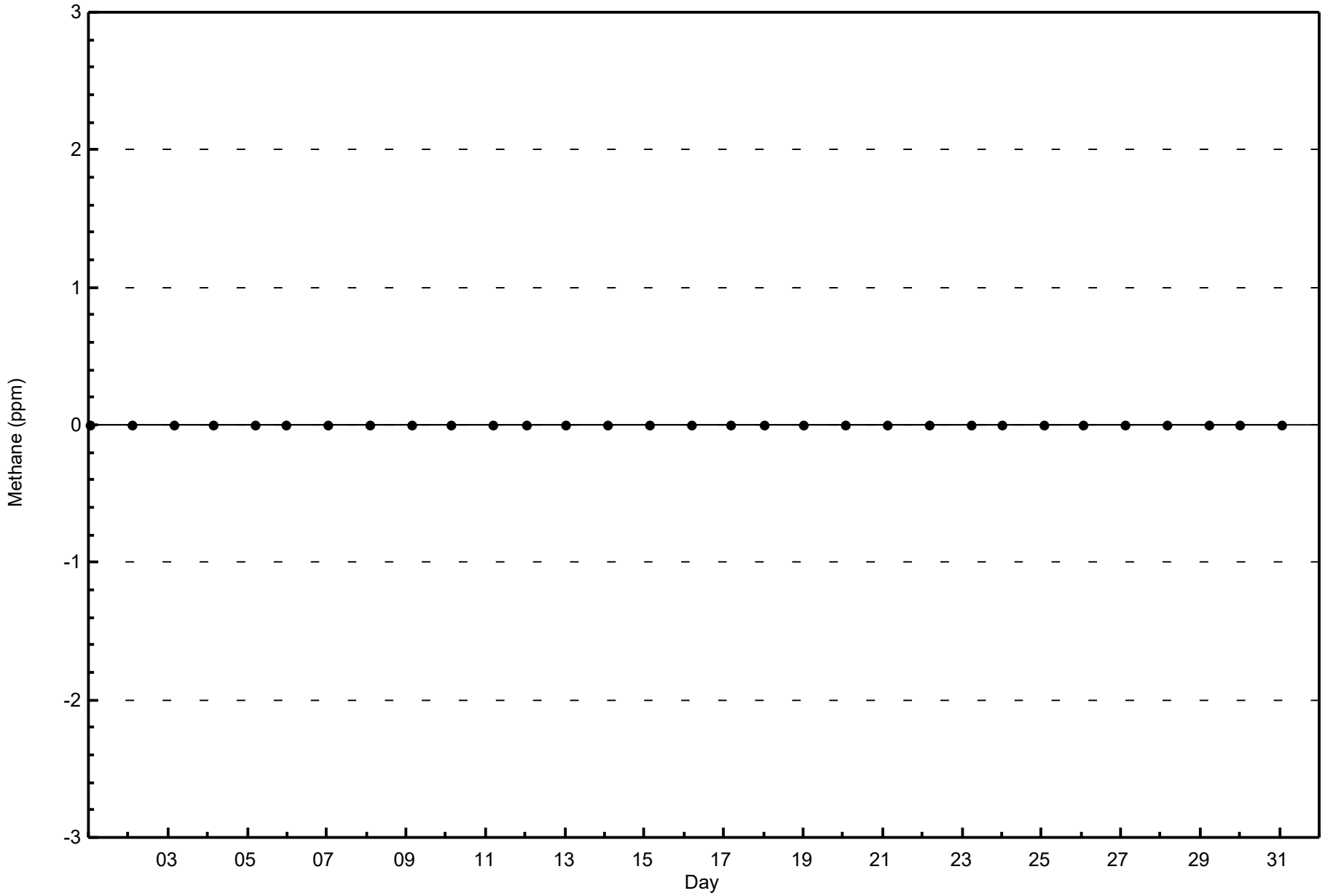
Total Number of Hours: 744

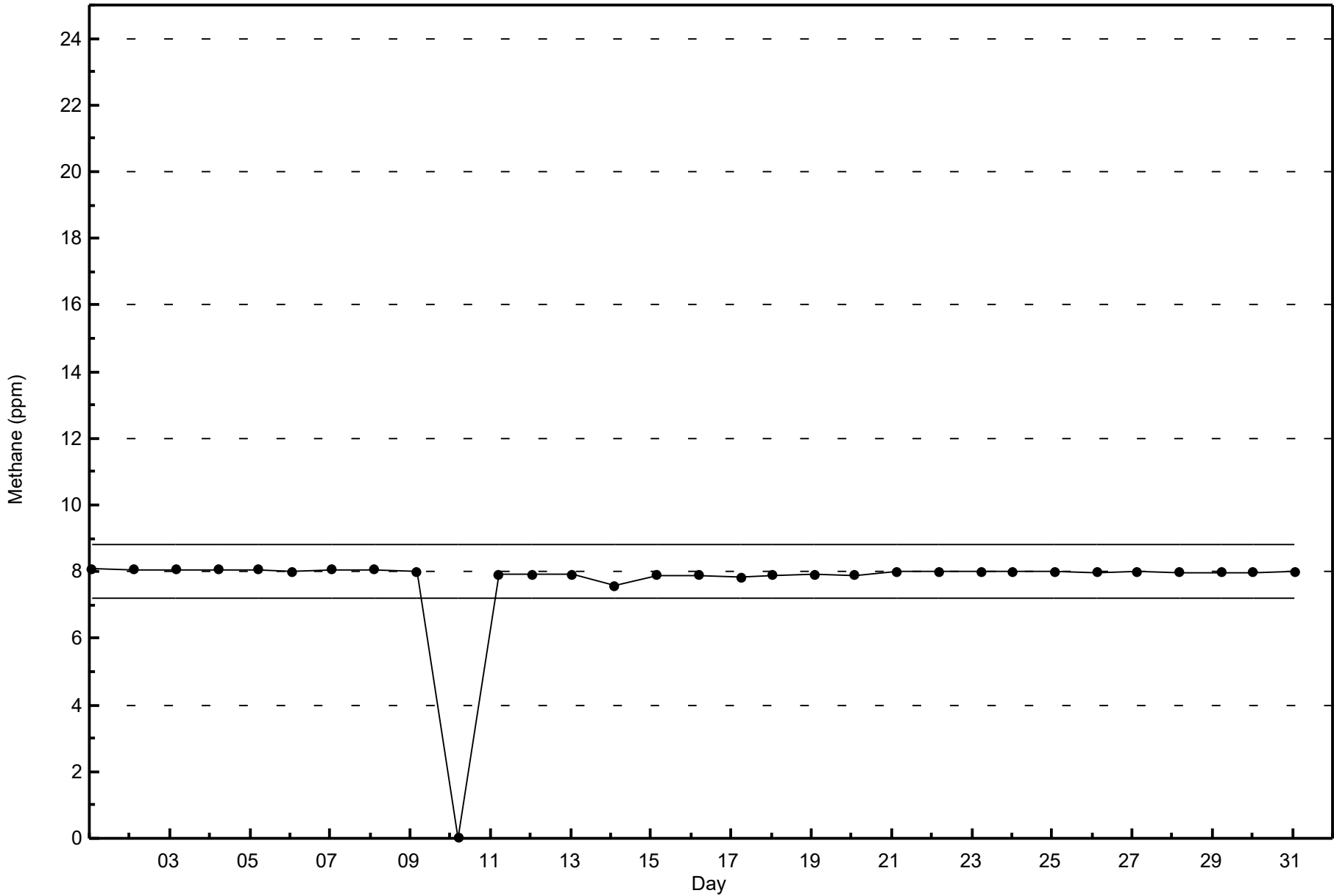


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Methane (CH₄) - ppm
Mildred Lake









Wood Buffalo Environmental Association
Summary of Hour Averages

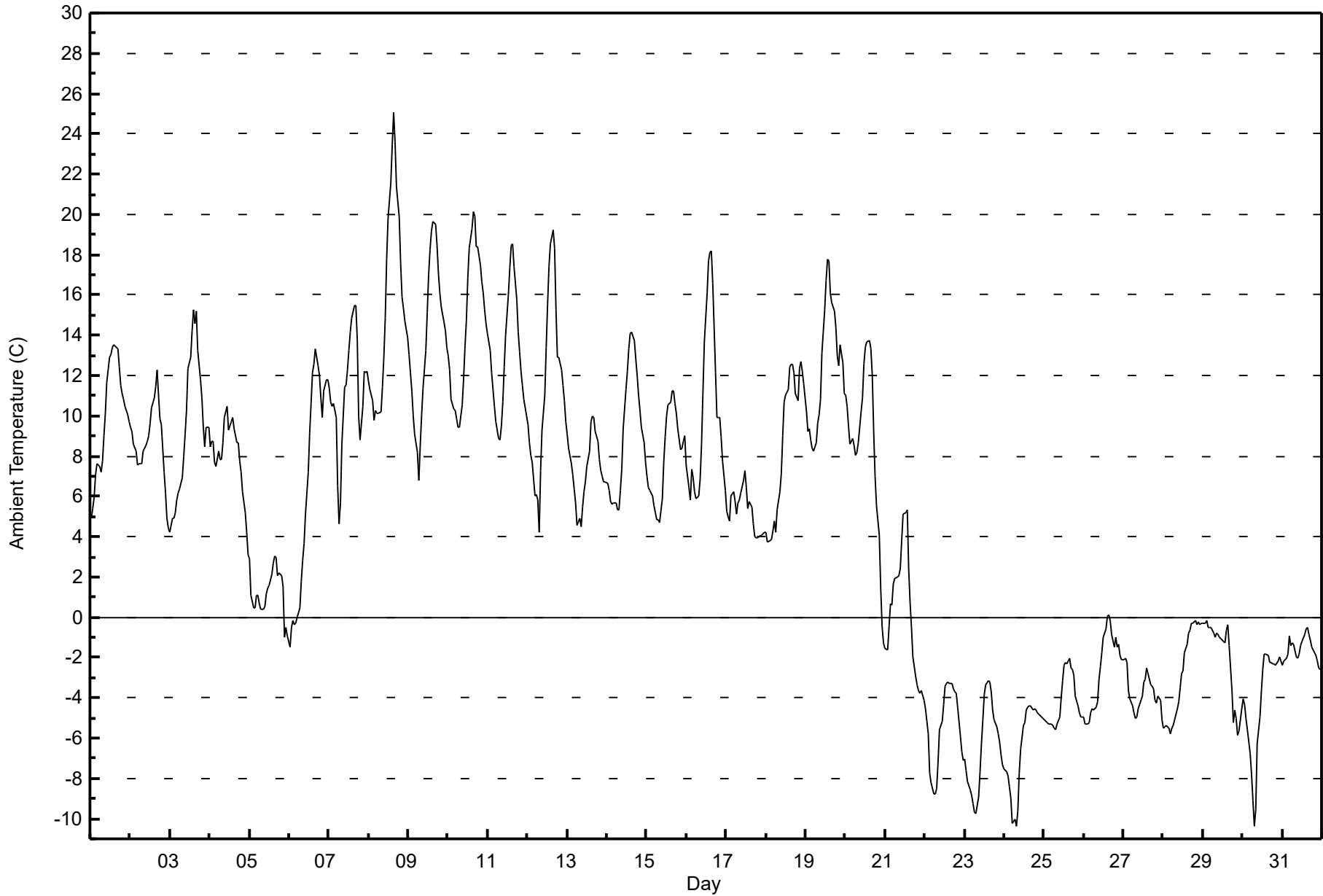
Ambient Temperature (AT) - C
Mildred Lake - October 2023

Maximum Value: 25.1 C on Oct 8 16:00		Maximum Daily Average: 15.6 C on Oct 8		Hours in Service: 744																																												
Minimum Value: -10.4 C on Oct 30 08:00		Minimum Daily Average: -6.5 C on Oct 24		Hours of Data: 744																																												
Maximum Diurnal Average: 8.6 C at hour 16		Minimum Diurnal Average: 2.1 C at hour 7		Hours of Missing Data: 0																																												
Monthly Average: 4.95 C		Percentiles: P ₁ = -9.4 P ₁₀ = -5.1 Q ₁ = -2.0 Median = 6.2 Q ₃ = 10.7 P ₉₀ = 14.1 P ₉₉ = 19.8		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-Oct	4.9	5.4	6.0	7.1	7.6	7.5	7.2	7.8	9.0	10.2	11.6	12.9	13.0	13.4	13.5	13.5	13.3	12.4	11.5	11.1	10.8	10.5	10.1	9.7	10.0	13.5																						
2-Oct	9.4	9.2	8.6	8.3	7.5	7.7	7.6	7.6	8.3	8.5	8.8	9.0	9.7	10.4	10.9	11.5	12.3	11.1	9.8	9.6	7.2	6.2	4.9	4.4	8.7	12.3																						
3-Oct	4.2	4.9	4.9	5.2	5.8	6.2	6.4	6.9	8.0	9.1	10.3	12.3	12.9	14.2	15.3	14.6	15.2	13.3	11.8	10.9	9.5	8.5	9.4	9.5	9.5	15.3																						
4-Oct	8.5	8.7	8.7	7.7	7.5	8.2	7.8	7.8	8.7	9.9	10.4	9.3	9.5	9.7	9.9	9.4	8.7	8.7	7.7	7.2	6.2	5.2	4.2	3.1	8.0	10.4																						
5-Oct	2.9	1.1	0.5	0.5	1.1	1.1	0.6	0.4	0.4	0.6	1.2	1.5	1.6	2.2	2.7	3.1	3.0	2.1	2.2	2.0	1.5	-1.0	-0.5	-0.9	1.2	3.1																						
6-Oct	-1.5	-0.5	-0.1	-0.3	-0.3	0.0	0.5	1.8	2.8	3.6	5.2	7.2	9.1	10.6	12.2	12.6	13.3	12.5	12.0	10.9	9.9	11.2	11.8	11.8	6.5	13.3																						
7-Oct	11.4	10.7	10.5	10.6	9.9	6.5	4.7	5.7	8.6	11.4	11.5	12.3	13.3	14.2	14.9	15.5	15.5	13.8	10.0	8.8	10.5	12.2	12.1	12.2	11.1	15.5																						
8-Oct	11.8	11.3	10.7	9.8	10.2	10.2	10.1	10.2	11.4	12.9	14.9	17.8	19.8	21.6	23.5	25.1	23.6	21.4	19.8	17.6	15.9	15.3	14.7	13.9	15.6	25.1																						
9-Oct	13.1	12.1	11.2	10.0	9.1	8.2	6.8	8.5	10.1	11.4	13.2	15.2	17.0	18.3	19.2	19.7	19.5	18.5	17.1	16.1	15.4	14.7	14.2	13.4	13.8	19.7																						
10-Oct	12.9	12.3	10.8	10.4	10.3	9.9	9.4	9.4	10.5	11.9	13.5	14.8	16.9	18.4	19.3	20.1	19.9	18.4	18.4	17.5	16.7	16.1	15.3	14.6	14.5	20.1																						
11-Oct	14.1	13.2	12.1	11.3	10.5	9.7	8.9	8.8	9.5	10.7	12.4	14.0	16.1	17.4	18.4	18.5	17.4	15.8	14.1	13.2	12.2	11.5	10.8	10.0	12.9	18.5																						
12-Oct	9.6	8.7	8.1	7.7	6.0	6.1	5.8	4.2	7.3	9.3	11.0	13.4	15.6	17.5	18.5	19.3	18.4	15.3	12.9	12.9	12.3	11.5	10.8	9.7	11.3	19.3																						
13-Oct	9.1	8.4	7.6	7.0	6.4	5.7	4.6	4.9	4.5	5.5	6.3	6.7	7.5	8.2	9.7	10.0	9.9	9.2	8.7	7.8	7.3	7.0	6.7	6.7	7.3	10.0																						
14-Oct	6.7	6.3	5.7	5.6	5.7	5.7	5.3	5.3	6.3	7.4	9.4	11.3	12.2	13.3	14.1	14.1	13.7	12.8	12.0	11.0	10.3	9.4	8.7	7.7	9.2	14.1																						
15-Oct	7.0	6.4	6.3	6.0	5.5	5.2	4.8	4.8	4.7	5.9	7.7	8.9	10.0	10.5	10.7	11.2	11.3	10.6	10.1	9.3	8.3	8.4	8.7	9.0	8.0	11.3																						
16-Oct	7.6	6.5	5.8	7.3	6.9	6.3	5.9	6.0	6.9	8.6	11.1	13.6	16.1	17.7	18.1	18.2	16.6	12.1	9.9	9.9	9.9	8.9	7.7	6.3	10.2	18.2																						
17-Oct	5.3	5.0	4.8	6.0	6.2	5.7	5.1	5.7	5.8	6.1	6.8	7.3	6.4	5.4	5.8	5.5	4.6	4.0	3.9	4.0	4.0	4.1	4.1	4.2	5.2	7.3																						
18-Oct	4.2	3.7	3.8	3.9	4.3	4.8	4.2	5.3	6.2	7.1	9.0	10.7	11.1	11.3	12.4	12.5	12.6	12.2	11.1	10.8	12.4	12.7	12.2	11.6	8.8	12.7																						
19-Oct	10.2	9.2	9.4	8.8	8.4	8.3	8.7	9.7	10.1	10.8	13.1	15.3	16.7	17.8	17.7	16.1	15.6	15.2	14.4	13.0	12.5	13.5	12.6	11.1	12.4	17.8																						
20-Oct	11.1	10.5	9.5	8.6	8.9	8.5	8.0	8.2	8.7	10.2	10.9	12.5	13.4	13.7	13.7	13.3	12.0	9.3	7.0	5.6	4.1	1.5	-0.4	-1.2	8.6	13.7																						
21-Oct	-1.5	-1.6	-0.4	0.7	0.6	1.7	1.9	2.0	2.0	2.4	3.8	5.1	5.2	5.3	2.4	0.8	-0.5	-2.0	-2.9	-3.3	-3.7	-3.8	-3.6	-4.1	0.3	5.3																						
22-Oct	-4.6	-5.2	-5.8	-7.7	-8.2	-8.8	-8.8	-8.5	-7.2	-5.6	-5.2	-4.3	-3.5	-3.3	-3.2	-3.3	-3.3	-3.5	-3.7	-3.8	-4.5	-5.9	-6.7	-7.1	-5.5	-3.2																						
23-Oct	-7.0	-7.6	-8.1	-8.5	-8.9	-9.3	-9.6	-9.7	-8.9	-7.7	-6.3	-5.1	-3.8	-3.4	-3.1	-3.2	-3.7	-4.6	-5.1	-5.5	-5.8	-6.2	-6.8	-7.3	-6.5	-3.1																						
24-Oct	-7.5	-7.7	-7.9	-8.4	-9.0	-10.2	-10.0	-10.3	-9.6	-7.7	-6.5	-5.4	-5.2	-4.6	-4.4	-4.4	-4.4	-4.6	-4.6	-4.6	-4.7	-4.8	-4.9	-5.0	-6.5	-4.4																						
25-Oct	-5.1	-5.1	-5.2	-5.3	-5.3	-5.4	-5.5	-5.5	-5.3	-4.9	-4.0	-3.1	-2.4	-2.2	-2.3	-2.1	-2.5	-2.6	-2.9	-3.9	-4.4	-4.7	-5.0	-5.0	-4.2	-2.1																						
26-Oct	-5.0	-5.3	-5.3	-5.2	-4.7	-4.5	-4.6	-4.5	-4.2	-3.1	-2.5	-1.8	-1.0	-0.6	0.1	0.1	-0.2	-0.8	-1.5	-1.0	-1.5	-1.4	-1.9	-2.1	-2.6	0.1																						
27-Oct	-2.1	-2.0	-2.3	-3.6	-4.0	-4.4	-4.7	-5.0	-4.9	-4.5	-4.3	-3.9	-3.2	-3.1	-2.5	-2.8	-3.3	-3.4	-3.6	-4.1	-4.3	-3.9	-4.1	-5.1	-3.7	-2.0																						
28-Oct	-5.5	-5.4	-5.4	-5.5	-5.8	-5.5	-5.4	-5.1	-4.5	-4.2	-3.5	-2.8	-2.7	-1.8	-1.3	-0.8	-0.6	-0.3	-0.3	-0.1	-0.4	-0.2	-0.4	-0.3	-2.8	-0.1																						
29-Oct	-0.3	-0.3	-0.2	-0.5	-0.5	-0.5	-0.8	-1.0	-0.8	-0.9	-1.0	-1.1	-1.2	-1.3	-0.6	-0.3	-1.4	-3.6	-5.3	-4.6	-5.1	-5.9	-5.7	-4.6	-2.0	-0.2																						
30-Oct	-4.0	-4.3	-5.0	-5.6	-6.7	-7.8	-9.1	-10.4	-9.6	-6.3	-4.9	-3.7	-2.6	-1.9	-1.9	-1.9	-2.3	-2.3	-2.3	-2.3	-2.4	-2.2	-2.0	-2.2	-4.3	-1.9																						
31-Oct	-2.4	-2.2	-2.0	-1.8	-0.9	-1.4	-1.3	-1.3	-2.0	-2.0	-1.8	-1.4	-1.2	-0.8	-0.6	-0.5	-0.9	-1.1	-1.5	-1.8	-1.9	-2.2	-2.5	-2.6	-1.6	-0.5																						
																								3.8	3.4	3.1	2.9	2.7	2.4	2.1	2.2	3.0	4.1	5.2	6.4	7.3	8.0	8.5	8.6	8.2	7.1	6.2	5.6	5.1	4.7	4.3	3.9	Diurnal Average
																								14.1	13.2	12.1	11.3	10.5	10.2	10.1	10.2	11.4	12.9	14.9	17.8	19.8	21.6	23.5	25.1	23.6	21.4	19.8	17.6	16.7	16.1	15.3	14.6	Diurnal Maximum



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	260	34.95	34.95
0 - 10	267	35.89	70.83
10 - 20	211	28.36	99.19
> 20	6	0.81	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

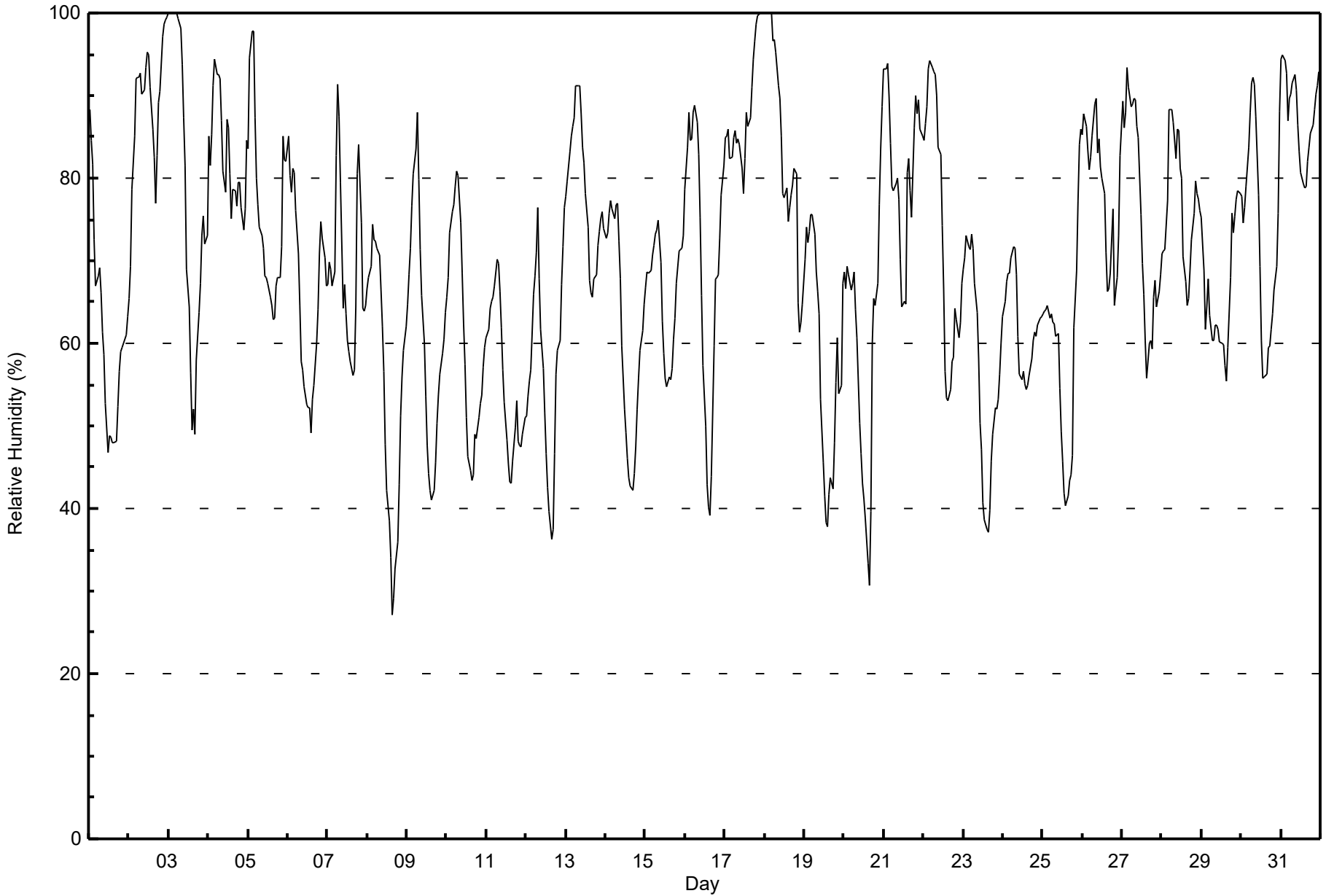
Relative Humidity (RH) - %
Mildred Lake - October 2023

Maximum Value: 100.0 % on Oct 3 02:00																								Maximum Daily Average: 88.7 % on Oct 17																								Hours in Service: 744	
Minimum Value: 27.1 % on Oct 8 16:00																								Minimum Daily Average: 54.6 % on Oct 8																								Hours of Data: 744	
Maximum Diurnal Average: 81.0 % at hour 7																								Minimum Diurnal Average: 55.2 % at hour 16																								Hours of Missing Data: 0	
Monthly Average: 69.97 %																								Percentiles: P ₁ = 36.6 P ₁₀ = 48.2 Q ₁ = 59.7 Median = 69.3 Q ₃ = 82.4 P ₉₀ = 90.2 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-Oct	88.3	84.6	81.8	72.6	66.9	68.2	69.1	66.2	61.4	58.7	52.7	46.7	48.8	48.7	48.0	47.9	48.1	52.4	56.6	59.0	59.5	60.1	61.0	63.1	61.3	88.3																							
2-Oct	65.4	69.4	78.7	85.2	92.0	92.1	92.3	92.7	90.2	90.8	93.4	95.3	94.9	91.0	85.9	82.5	76.9	82.8	89.2	90.6	97.1	98.6	99.1	99.6	88.6	99.6																							
3-Oct	100.0	100.0	100.0	100.0	100.0	100.0	99.3	98.1	93.8	87.3	81.5	68.9	64.3	56.5	49.4	52.1	49.0	58.0	63.8	67.2	73.1	75.3	72.0	73.0	78.4	100.0																							
4-Oct	85.1	81.6	85.2	91.1	94.4	92.6	92.6	92.0	87.0	80.9	78.4	87.1	86.1	80.4	75.1	78.7	78.5	76.6	79.4	79.4	76.5	73.7	76.2	84.5	83.0	94.4																							
5-Oct	83.5	94.5	97.9	97.8	87.3	80.0	76.7	74.1	73.0	71.5	68.2	67.9	67.2	65.6	64.6	62.8	63.1	66.9	67.9	67.9	71.7	85.1	82.3	82.1	75.8	97.9																							
6-Oct	85.2	80.4	78.3	81.2	80.7	76.0	70.9	64.6	57.9	56.8	54.8	52.5	52.2	52.3	49.1	53.2	54.8	60.0	64.0	70.8	74.7	72.7	70.4	66.9	65.9	85.2																							
7-Oct	67.1	69.8	69.0	66.9	68.6	82.7	91.3	87.4	79.5	64.2	67.1	63.6	60.3	59.0	57.8	56.2	56.7	64.5	80.6	84.0	74.7	64.3	63.9	64.6	69.3	91.3																							
8-Oct	66.7	68.0	69.4	74.5	72.6	72.4	71.5	70.6	66.5	62.0	56.5	47.7	42.2	38.5	34.2	27.1	29.2	32.6	35.9	42.8	51.2	55.9	59.1	62.1	54.6	74.5																							
9-Oct	64.8	68.4	71.5	76.6	80.5	83.6	88.1	79.9	71.3	65.8	59.9	53.6	47.6	44.3	42.2	41.0	42.1	45.6	50.3	53.7	56.3	58.7	60.6	63.7	61.3	88.1																							
10-Oct	65.6	68.0	73.4	75.9	76.8	78.9	80.9	80.3	74.6	68.4	62.3	57.4	51.0	46.3	44.5	43.3	44.1	49.1	48.5	50.9	52.7	53.8	57.2	59.4	61.0	80.9																							
11-Oct	60.7	61.8	64.2	65.1	65.7	67.0	70.1	69.7	66.2	61.9	56.7	52.9	48.4	45.4	43.2	43.1	45.8	49.9	53.0	48.2	47.6	47.5	48.9	50.9	55.6	70.1																							
12-Oct	51.2	53.6	55.4	56.7	66.0	68.2	71.0	76.4	67.8	61.7	56.9	51.6	46.7	42.5	39.6	36.2	37.4	46.7	56.2	59.2	60.3	67.2	71.8	76.4	57.4	76.4																							
13-Oct	77.8	79.6	83.2	85.0	86.3	87.3	91.2	91.1	91.2	87.8	83.7	81.9	78.1	74.1	67.6	66.1	65.6	67.8	68.4	71.8	73.5	75.1	75.9	73.9	78.5	91.2																							
14-Oct	72.7	73.4	75.8	77.3	76.3	75.0	76.8	76.9	72.4	67.8	59.7	52.0	49.2	46.1	43.7	42.7	42.2	44.3	47.4	52.0	55.7	59.2	61.5	64.8	61.0	77.3																							
15-Oct	66.9	68.7	68.4	68.8	70.6	71.9	73.3	73.7	74.9	69.9	62.8	58.8	55.7	54.7	55.9	55.5	57.0	60.5	63.0	67.3	71.2	71.3	71.5	73.1	66.0	74.9																							
16-Oct	78.6	83.8	88.0	84.5	84.8	88.0	88.8	86.8	82.8	75.3	65.7	57.3	49.9	42.9	40.1	39.2	43.9	59.7	67.7	67.9	68.2	72.7	77.9	81.5	69.8	88.8																							
17-Oct	84.8	85.1	86.0	82.4	82.6	84.9	85.8	84.2	84.7	84.1	81.2	78.1	82.4	88.0	86.3	87.2	90.9	94.5	96.6	98.6	99.6	100.0	100.0	100.0	88.7	100.0																							
18-Oct	100.0	100.0	100.0	100.0	100.0	96.6	96.8	95.3	91.3	89.7	85.1	78.1	77.7	78.8	74.8	76.5	78.0	79.2	81.2	80.5	64.9	61.4	62.6	64.7	83.9	100.0																							
19-Oct	70.1	74.0	72.2	73.6	75.6	75.5	73.2	68.6	66.3	63.5	53.3	45.6	41.5	38.3	37.7	41.7	43.8	42.4	47.9	55.3	60.7	54.0	54.9	67.4	58.2	75.6																							
20-Oct	68.6	66.6	69.3	68.3	66.5	67.2	68.7	64.1	60.7	50.4	46.6	43.1	41.2	38.9	33.4	30.7	39.7	60.0	65.4	64.6	67.2	76.8	83.6	88.6	59.6	88.6																							
21-Oct	93.3	93.3	93.8	89.8	84.2	79.0	78.4	79.3	79.9	77.5	70.2	64.4	65.1	64.7	80.7	82.4	78.5	75.2	86.1	89.9	87.8	89.5	86.0	85.1	81.4	93.8																							
22-Oct	84.6	86.6	88.7	93.2	94.2	93.3	92.9	92.6	90.0	83.7	82.9	74.3	66.6	56.6	53.4	53.0	54.4	57.7	58.2	64.3	62.9	60.6	62.5	67.3	73.9	94.2																							
23-Oct	68.9	70.4	73.0	71.7	71.3	73.2	71.6	67.2	63.7	58.2	50.4	47.1	40.6	38.7	37.4	37.1	39.9	45.7	49.0	52.3	52.0	53.2	56.2	60.0	56.2	73.2																							
24-Oct	63.2	65.1	67.4	68.5	68.5	70.3	71.7	71.5	68.4	60.9	56.2	55.5	56.6	55.0	54.3	54.9	56.1	58.2	60.3	61.4	60.8	62.1	63.0	63.2	62.2	71.7																							
25-Oct	63.6	63.9	64.1	64.5	63.1	63.5	62.5	62.4	60.8	61.2	54.6	49.3	45.8	41.9	40.4	41.5	43.4	44.0	46.4	61.9	68.8	77.3	84.1	85.9	59.0	85.9																							
26-Oct	85.2	87.7	86.3	83.4	81.0	82.6	85.2	89.0	89.7	83.0	84.7	81.3	80.0	78.1	71.0	66.3	66.6	68.5	76.3	64.5	66.4	67.9	73.0	82.6	78.4	89.7																							
27-Oct	89.3	86.1	88.0	93.5	91.1	88.7	88.9	89.6	89.5	86.2	84.9	75.6	69.7	65.9	60.4	55.8	59.9	60.4	59.3	65.6	67.6	64.3	66.3	68.2	75.6	93.5																							
28-Oct	70.9	71.1	71.3	77.2	88.2	88.4	88.2	86.7	82.3	85.9	85.7	81.1	79.9	70.5	67.5	64.5	65.5	68.8	72.5	75.8	79.7	78.2	77.5	76.0	77.2	88.4																							
29-Oct	75.2	68.8	61.7	64.4	67.8	63.4	60.3	60.4	62.3	62.2	61.8	60.2	60.1	59.9	57.3	55.5	59.5	67.9	75.7	73.4	75.4	77.5	78.5	78.2	66.1	78.5																							
30-Oct	77.9	74.6	76.4	79.0	83.7	88.0	91.5	92.2	91.3	87.4	78.0	69.3	60.4	55.8	55.9	56.2	59.5	59.7	61.7	63.5	66.4	69.2	75.7	88.1	73.4	92.2																							
31-Oct	94.4	94.8	94.2	92.7	86.9	89.6	90.1	91.6	92.6	90.7	86.5	83.3	80.7	79.3	78.8	78.9	82.1	83.7	85.4	86.5	88.3	90.2	91.2	92.9	87.7	94.8																							
																								76.4	77.2	78.5	79.4	79.8	80.3	81.0	79.9	76.9	72.8	68.5	63.9	61.0	58.0	55.8	55.2	56.5	60.7	65.0	67.5	68.8	70.1	71.8	74.5	Diurnal Average	
																								100.0	100.0	100.0	100.0	100.0	100.0	99.3	98.1	93.8	90.8	93.4	95.3	94.9	91.0	86.3	87.2	90.9	94.5	96.6	98.6	99.6	100.0	100.0	100.0	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

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





Maximum Speed: 26 km/h on Oct 8 08:00		Maximum Daily Speed Average: 18.6 km/h on Oct 14		Hours in Service: 744																						
Minimum Speed Value: 0 km/h on Oct 30 08:00		Minimum Daily Speed Average: 1.3 km/h on Oct 31		Hours of Data: 744																						
Maximum Diurnal Speed Average: 3.7 km/h at hour 9		Minimum Diurnal Speed Average: 1.1 km/h at hour 18		Hours of Missing Data: 0																						
Monthly Average Velocity: 2.5 km/h 191.1 deg		Percentiles: P ₁ = 2 P ₁₀ = 4 Q ₁ = 7 Median = 11 Q ₃ = 14 P ₉₀ = 17 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-Oct	ESE8	ESE8	ESE8	SE10	SSE13	S17	S15	S13	SSE14	SSE15	S15	S17	S18	SSE19	SSE19	SSE19	SSE18	SSE15	SE14	SSE15	SSE15	SE16	SE14	SSE14	SSE14.0	SSE19
2-Oct	SE13	SE11	SE10	SE11	SE10	SE12	SE10	SE10	SE11	SSE13	SSE10	SE12	SSE9	S10	SW2	SSE3	S3	ESE3	ESE5	SSE5	ENE1	S2	N2	SE1	SSE7.0	SE13
3-Oct	ESE2	S2	NE3	SE2	SSE3	SSE6	SSE5	S3	ENE0	SSE1	SSW4	WSW4	NW7	WNW8	NW7	E4	NW0	S5	S8	S7	SSW5	SSE4	SSE6	SSE6	S2.1	S8
4-Oct	SE7	SE6	S6	S8	SSW6	W8	NW8	NW10	NW9	NW12	WNW15	NW14	NW13	NW18	NW14	WNW18	WNW21	WNW21	WNW20	WNW18	WNW22	WNW20	WNW19	WNW16	WNW11.3	WNW22
5-Oct	NW15	NW14	NW15	NW12	NW17	WNW22	NW20	WNW18	WNW16	NW19	NW21	NW20	WNW21	NW20	NW18	NW19	NW17	NW10	WNW9	WNW7	W5	S5	S6	S5	WNW13.5	WNW22
6-Oct	SSE5	SSE8	SSE7	SE6	SE7	SSE12	SSE12	SSE14	SSE13	SSE13	SSE14	SSE15	SSE13	S14	S14	SSE8	S8	SE5	SE7	SSE3	SSW3	WSW7	WSW9	W7	SSE8.1	SSE15
7-Oct	W11	W12	W11	WNW11	NNW6	NE2	S2	S4	SSW4	SSW2	ESE5	E6	E6	E5	E6	ESE7	SE5	ESE4	ESE4	SE5	SE9	SE10	SE12	SE15	SE2.3	SE15
8-Oct	SE15	SE16	SE16	SE8	SE15	SE17	SE22	SE26	SE14	SSE18	SSE12	SSE13	SSE16	SSE16	SSE15	S11	SSE10	SSE12	S12	SE9	ESE11	SE12	SE10	SE12	SE13.8	SE26
9-Oct	SE12	SE9	SE9	SE7	SE8	ESE5	SE7	SSE8	SSE12	SE13	SSE14	SE13	ESE14	SE17	SE16	SE14	SE13	ESE11	ESE11	ESE11	ESE11	ESE9	ESE11	SE12	SE10.9	SE17
10-Oct	SE9	SE9	E6	SE9	SE12	SE11	SE11	SE12	SE14	SE14	SE14	ESE16	ESE16	SE19	SE19	SE15	ESE13	ESE13	ESE14	SE12	SE16	SE17	SE18	SE18	SE13.3	SE19
11-Oct	SE15	SE19	SE17	SE17	SE17	SE15	SE16	ESE12	SE22	SE19	SE15	SE13	SE14	SE16	SE15	SE15	ESE15	ESE12	ESE13	ESE14	SE13	SE12	SE15	SE16	SE15.2	SE22
12-Oct	SE18	SE16	SE14	SSE11	SSE6	SSE10	SSE8	ESE2	SSE9	SSE11	SSE12	SSE12	SSE10	S9	SSE8	SSE9	S9	S5	SE8	SE9	ESE10	ESE10	SE11	SE13	SSE9.6	SE18
13-Oct	SE10	SE9	SE10	SE11	SE11	SSE15	SSE16	SSE11	ESE12	SE12	SSE16	SSE14	SSE13	SSE15	SE14	SE14	SE13	SE14	SE16	SE16	SE15	SE15	SE15	SE16	SE13.3	SSE16
14-Oct	SE18	SE17	SE16	SE12	SE14	SE18	SE16	SE15	SE17	SE18	SE10	SE22	SE22	SE23	SE22	SE24	SSE25	SSE22	SSE21	SE18	SSE18	SSE17	SE15	SE16	SE18.6	SSE25
15-Oct	SE15	SE12	SE14	SE20	SE17	SE15	SE17	SE16	SE12	SE15	SSE14	SSE13	SSE14	SSE13	SSE13	SSE12	SSE10	SSE10	SSE9	SSE7	S5	S7	SSE6	S8	SSE12.0	SE20
16-Oct	S9	S6	SSW6	SW7	SW9	SSW7	SSW9	SW9	S9	S10	S9	S10	SSE9	SSW11	SSW10	SSW7	SSE3	SE4	ESE4	SE4	ESE4	SE2	NE3	N4	S5.5	SSW11
17-Oct	NNE3	N3	N4	N8	N9	NNW5	NNW6	N8	N12	N12	N12	N14	N15	NNW14	NNW13	NNW14	NNW11	N10	N8	N6	NNW6	NE2	ESE3	E5	N7.9	N15
18-Oct	S7	S8	SSE8	SSE9	SSE9	S7	S6	SSE8	SE12	SE11	SE10	SSE14	SSE13	SSE15	SSE13	SSE16	SSE15	SSE10	S10	SSW6	SW6	SW11	WSW11	SW8	SSE8.9	SSE16
19-Oct	SSW9	SSW9	SW11	SSW10	S9	S9	S10	SSW10	SSW10	S8	WSW9	WSW13	SW13	SW14	SW15	SW13	SW11	SW7	SW9	NE3	SW7	W19	W16	SW14	SW9.5	W19
20-Oct	WSW15	WSW19	W12	WNW8	W16	W15	W14	W14	W20	W21	WNW17	WNW20	NW21	NW22	NW22	NW19	NNW11	NNE9	N8	NNE7	NNE5	N5	NNE3	S2	WNW10.8	NW22
21-Oct	S3	ESE3	ESE6	S6	SE9	SSE11	SSE10	SE14	SE14	SE15	SSE10	S5	N8	N15	N23	N22	N26	N26	N21	N21	N15	N10	NNW12	N12	NNE5.5	N26
22-Oct	N12	N9	N6	E3	ENE3	NE4	NE5	NE4	NE2	E4	N6	N6	NNW8	NNW8	N8	N6	N5	NNW6	NNW5	WNW9	NW12	NNW11	NW11	NW11	NNW5.8	NW12
23-Oct	NW12	WNW12	WNW13	WNW12	WNW12	WNW9	WNW11	WNW10	W10	W14	WNW17	WNW16	WNW17	WNW18	WNW18	WNW18	WNW17	NW13	WNW14	WNW11	W14	W15	W14	W12	WNW13.6	WNW18
24-Oct	W11	W12	W11	W13	W12	SSW4	WSW6	WSW6	WSW8	WNW14	W15	WNW13	W15	W14	W14	W15	W17	W14	W15	WNW14	WNW16	W14	WNW15	WNW15	W12.4	W17
25-Oct	WNW14	WNW14	WNW13	WNW12	WNW11	W10	W9	WNW9	W9	W10	WSW8	WSW10	WSW9	WNW12	WNW13	W10	WSW10	W12	WNW12	NW15	WNW9	W8	W10	W10	W10.4	NW15
26-Oct	W11	W11	W12	W13	W13	WNW11	W10	W10	W13	W12	W12	W12	WNW10	W9	WNW10	WNW10	W9	WNW9	NNW5	WNW11	WNW8	W10	WSW8	W9	W10.2	W13
27-Oct	W11	WNW9	NW11	N14	N8	N8	N8	N7	NNW6	N5	NNW6	NNW7	NNW9	NNW10	WNW10	NW12	WNW11	WNW9	NNW5	WNW2	WSW4	WSW4	SSW4	S8	NW6.0	N14
28-Oct	S8	S7	SW4	W7	WNW6	WNW8	W7	WNW6	WNW8	NW10	NW11	NNW6	NNW7	NNW11	NNW9	NW8	WNW6	WNW9	WNW11	WNW10	WNW9	WNW11	NW11	WNW11	WNW6.9	NW11
29-Oct	WNW10	WNW11	NW15	WNW8	WNW10	WNW13	NW14	NW11	WNW13	NW14	NNW13	NNW12	NW12	NW8	NW7	NW8	NNW4	NNW5	NNE5	NNE4	NNE5	N7	N7	N8	NW8.5	NW15
30-Oct	N9	N10	N8	NNE7	N6	NNE6	NE5	N0	S2	S7	SSE10	S11	S13	S14	S13	S12	SSE10	S12	S12	S11	S10	SSE8	SSE9	SE10	SSE4.9	S14
31-Oct	SSE9	S8	SSE5	SW4	NW6	NNW8	NW7	NNW7	NNW9	NNW7	NNW8	NNW6	NNE5	NE4	E4	SE3	E3	NNE3	NE4	NE2	SSE1	SE1	S4	SSW5	N1.3	SSE9
S3.3 S3.2 S2.1SSW2.4SSW2.8 S3.4 S3.6 S3.4 S3.7 S3.5SSW3.2SSW3.0SSW2.4 SW2.8 SW2.2SSW1.9SSW1.6 S1.1 SSE1.5 S1.2SSW1.7SSW2.4SSW2.3 S3.2																								Diurnal Average		
SE18WSW19 SE17 SE20 SE17WNW22 SE22 SE26 SE22 W21 NW21 SE22 SE22 SE23 N23 SE24 N26 N26 N21 N21WNW22WNW20WNW19 SE18																								Diurnal Maximum		

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

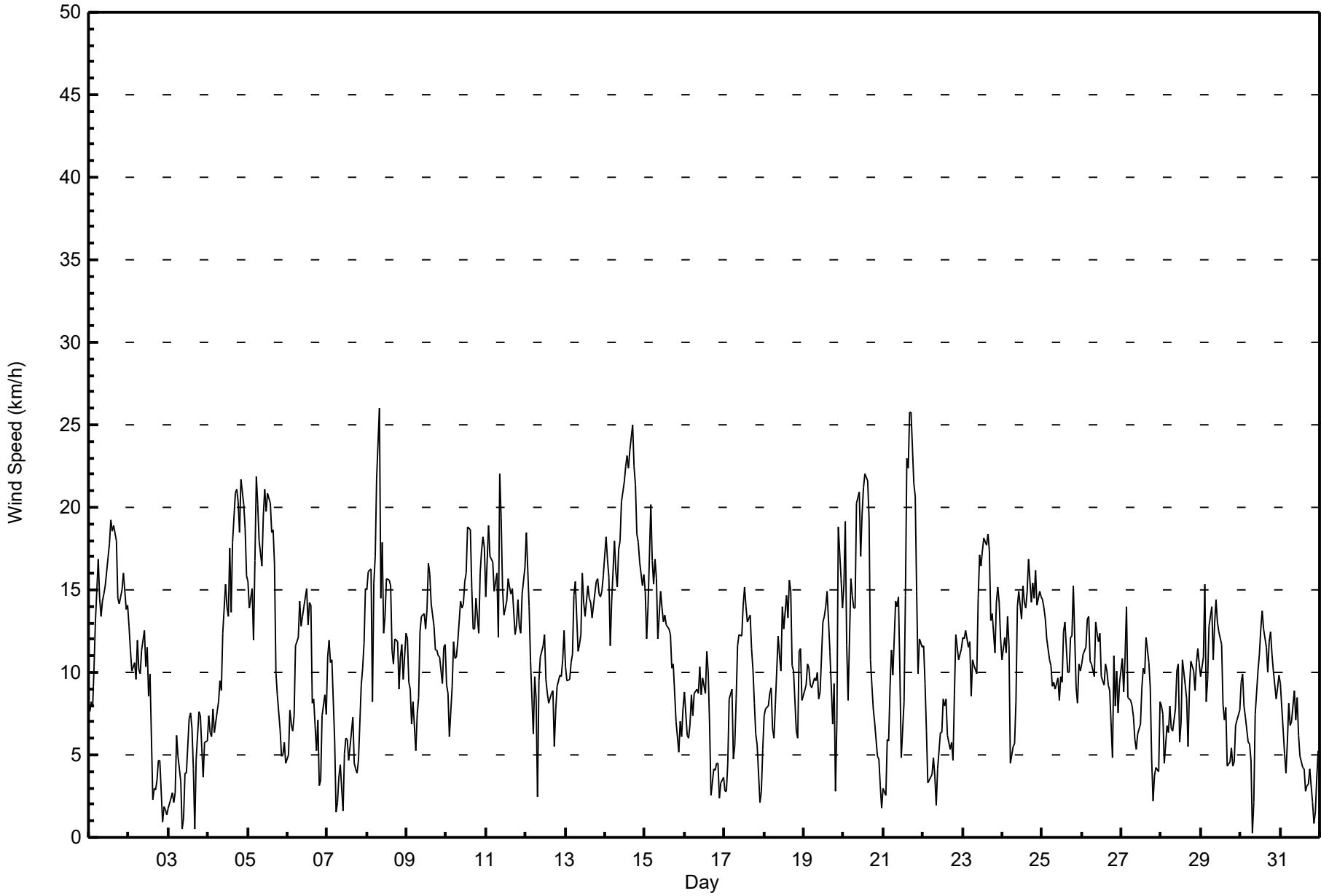
Wind Speed (WS) - km/h
Mildred Lake - October 2023

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



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	111	14.92	14.92
6 - 11	307	41.26	56.18
12 - 19	290	38.98	95.16
20 - 28	36	4.84	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
Mildred Lake - October 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	8	13	3	7	12	10	11	16	9	2	3	1	1	1	6	111
6 - 11	26	4	0	0	4	15	38	41	35	13	12	12	24	41	18	24	307
12 - 19	10	0	0	0	0	12	95	52	15	0	5	3	33	36	23	6	290
20 - 28	6	0	0	0	0	0	10	3	0	0	0	0	2	8	7	0	36
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	12	13	3	11	39	153	107	66	22	19	18	60	86	49	36	744

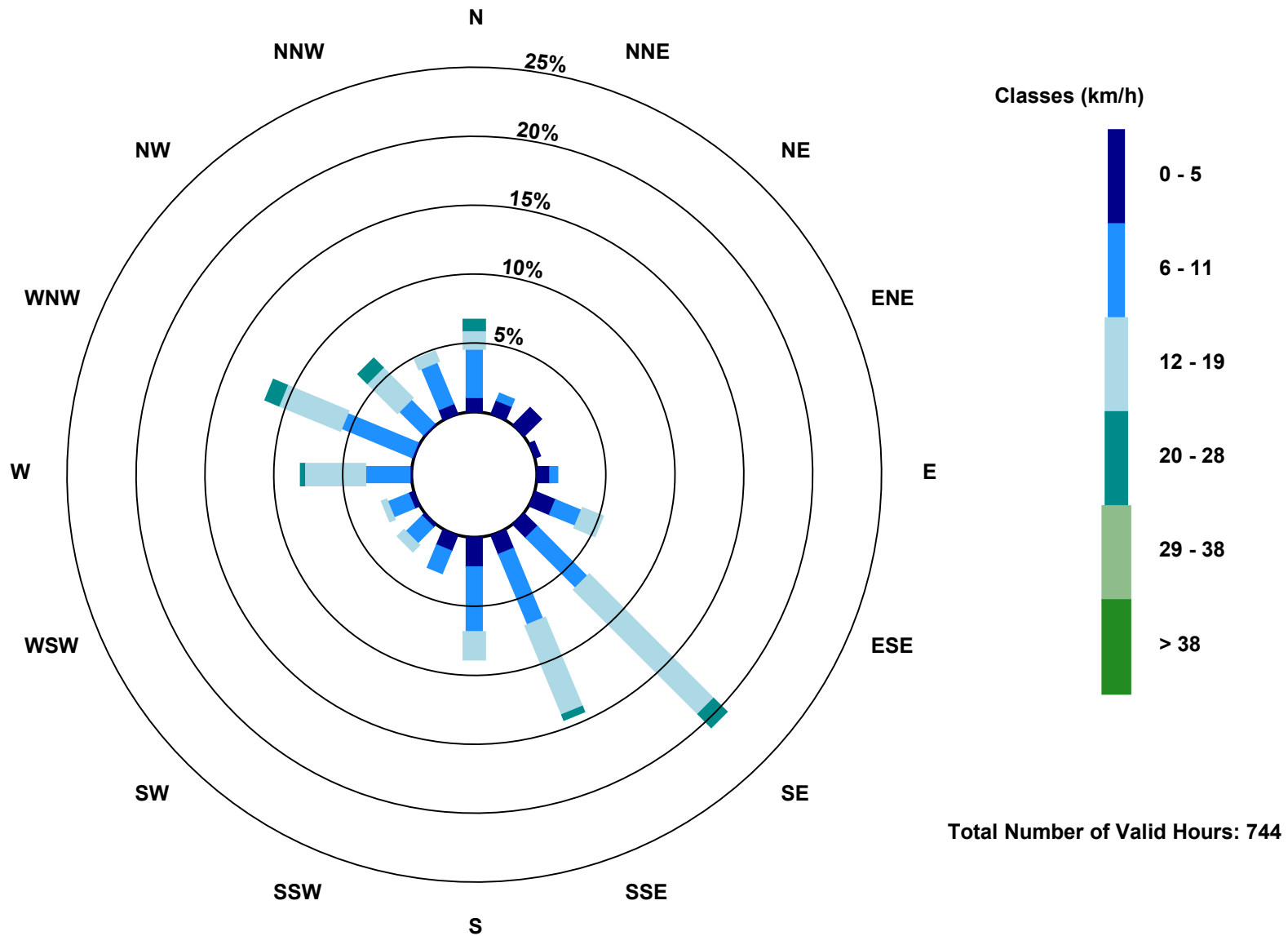
Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

Wind Speed (WS) - km/h
Mildred Lake





Wood Buffalo Environmental Association
Summary of Hour Averages

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

Direction of Maximum Speed: 145 deg on Oct 8 08:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 142.5 deg on Oct 14	Hours of Data: 744
Direction of Minimum Speed: 350 deg on Oct 30 08:00	Hours of Missing Data: 0
Direction of Minimum Daily Speed Average: 1.3 deg on Oct 31	Percent Operational Time: 100.0
Monthly Average Direction: 191.1 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-Oct	122	120	114	135	165	170	171	171	167	166	169	171	176	165	166	165	159	152	145	150	151	146	145	147	157.9
2-Oct	144	144	144	144	133	137	139	135	144	164	160	146	159	176	218	161	183	121	113	150	78	175	352	131	147.4
3-Oct	122	190	41	129	167	168	156	177	66	152	204	254	311	298	313	83	307	190	176	177	196	155	153	160	184.5
4-Oct	137	145	171	190	202	281	312	315	311	310	296	304	313	318	326	295	301	296	297	293	293	302	301	303	297.7
5-Oct	308	304	313	311	304	303	305	303	303	311	311	310	301	304	305	309	311	304	282	289	274	175	184	171	303.1
6-Oct	157	163	159	145	126	155	161	155	165	159	162	157	167	177	173	147	173	145	144	164	208	246	258	279	167.0
7-Oct	281	279	279	282	328	45	175	179	203	207	103	94	97	97	96	105	124	123	104	127	134	132	125	132	138.9
8-Oct	136	143	139	133	142	141	144	145	137	147	150	155	153	149	148	189	164	168	173	138	120	133	133	138	146.2
9-Oct	142	146	146	142	146	120	136	147	147	140	147	124	120	145	143	126	132	118	113	113	111	106	121	135	132.3
10-Oct	130	131	99	129	141	141	142	143	141	134	135	115	120	142	141	128	107	105	118	133	141	135	135	134	131.0
11-Oct	127	127	131	132	127	129	140	123	144	140	140	130	137	132	138	130	116	113	112	123	135	130	139	140	131.4
12-Oct	139	139	143	149	161	150	158	103	148	148	157	147	154	175	151	168	182	171	141	137	115	122	124	139	146.3
13-Oct	131	139	142	143	145	153	161	153	122	134	149	159	152	150	144	127	130	135	135	137	141	140	139	143	142.1
14-Oct	142	142	137	134	142	145	143	141	138	137	141	143	145	142	138	142	147	148	147	146	149	149	140	136	142.5
15-Oct	135	128	131	140	141	142	146	146	146	141	154	149	157	160	149	155	157	150	160	149	169	175	157	182	148.2
16-Oct	179	177	198	221	225	198	208	219	183	184	186	186	168	200	203	212	153	128	123	130	109	137	48	2	187.4
17-Oct	30	351	10	350	353	344	348	1	4	4	7	2	351	343	343	347	348	351	0	357	346	36	117	94	357.2
18-Oct	177	178	157	165	157	173	179	155	138	145	146	151	160	147	154	148	149	160	190	204	232	230	237	225	167.7
19-Oct	205	211	227	206	184	187	187	199	192	186	247	239	232	236	230	230	219	217	230	42	233	267	275	228	224.3
20-Oct	253	257	278	296	263	269	272	261	266	278	291	299	314	320	316	321	346	16	11	21	21	11	21	172	296.5
21-Oct	188	113	111	179	140	155	162	144	140	139	164	171	355	359	358	2	357	1	3	359	4	355	348	351	21.0
22-Oct	351	351	4	83	60	55	47	50	53	81	1	5	329	328	353	8	349	338	345	294	326	329	324	323	348.6
23-Oct	305	298	301	296	287	295	290	290	278	281	295	284	295	299	296	299	301	306	303	287	276	279	276	274	291.6
24-Oct	271	270	274	276	281	211	255	232	246	282	279	285	275	273	278	273	275	275	277	283	285	280	284	287	275.5
25-Oct	286	287	285	287	290	279	275	282	273	272	240	240	242	286	287	259	250	275	291	317	302	276	274	278	278.5
26-Oct	275	278	278	276	276	282	274	267	280	278	274	274	282	273	283	282	272	290	327	295	290	270	255	279	278.6
27-Oct	276	282	307	356	357	352	353	352	340	8	337	328	334	329	300	317	302	298	342	289	253	240	207	179	318.7
28-Oct	187	188	214	275	287	282	277	297	298	315	317	335	336	329	335	309	289	283	288	284	287	292	307	298	294.8
29-Oct	295	295	312	297	286	294	306	307	303	309	328	332	326	325	309	321	340	338	32	28	24	355	350	355	318.7
30-Oct	2	10	6	14	6	19	45	350	172	181	159	169	180	180	174	179	165	171	171	171	170	163	155	145	160.2
31-Oct	162	169	167	227	306	329	326	348	345	345	348	342	25	36	96	139	80	33	51	52	165	124	187	205	359.8

181.9	189.4	190.3	192.4	191.4	183.8	186.9	180.7	180.6	183.2	197.3	192.0	208.3	215.6	214.6	211.7	202.3	189.4	163.5	173.5	191.6	200.8	194.6	180.3
Diurnal Average																							

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

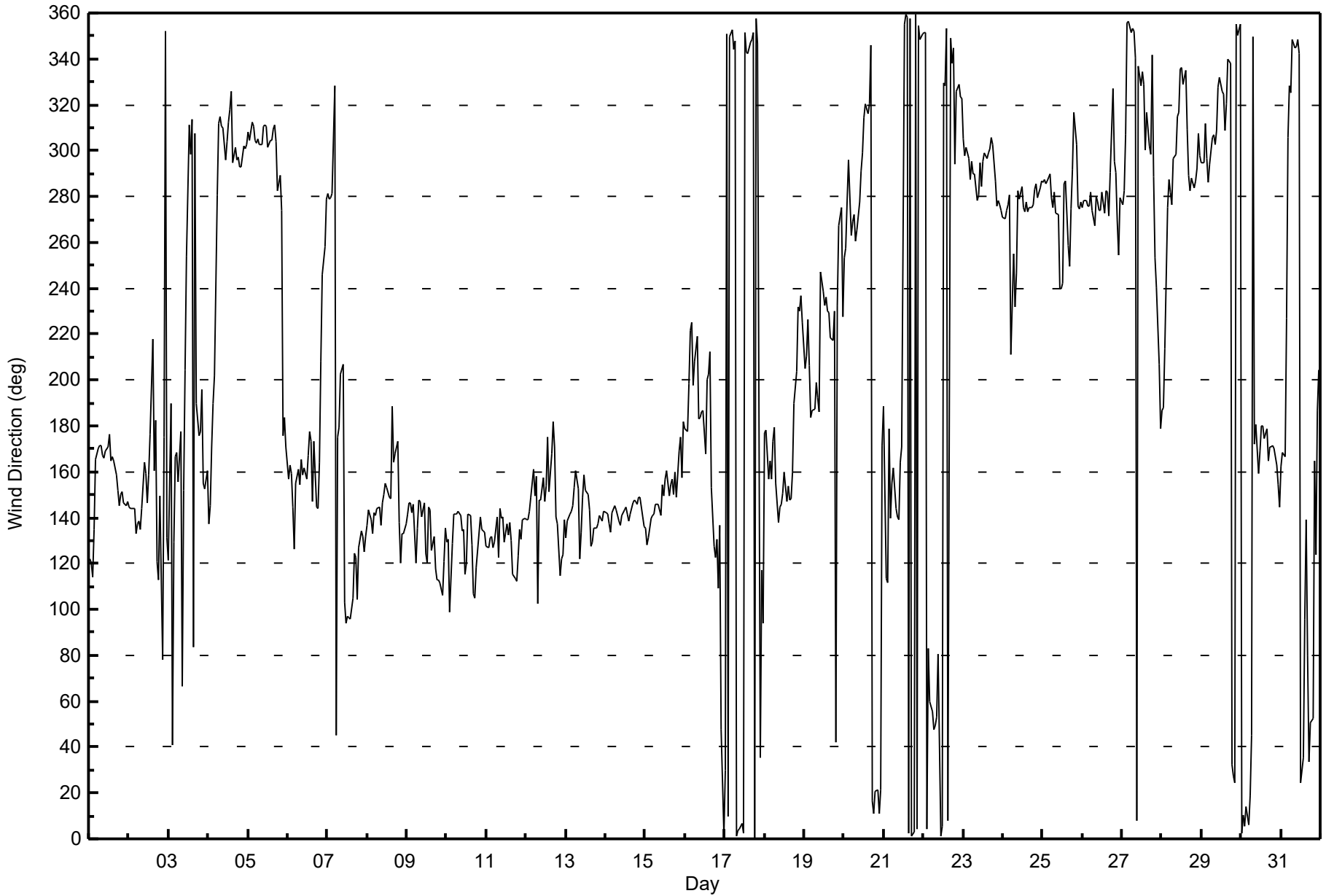
Wind Direction (WD) - deg
Mildred Lake - October 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 95 deg on Oct 30 08:00		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 Oct 17 04:00																										
Percentiles: P ₁ = 10 P ₁₀ = 13 Q ₁ = 15 Median = 17 Q ₃ = 21 P ₉₀ = 31 P ₉₉ = 79																										
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-Oct	13	15	20	22	17	14	13	14	16	17	18	18	17	17	18	16	15	14	13	12	13	12	13	12	22	
2-Oct	13	12	12	12	16	16	12	13	17	14	16	13	15	14	81	63	71	37	19	13	61	58	30	70	81	
3-Oct	54	55	59	62	46	15	24	48	82	85	39	58	28	32	59	52	88	36	16	16	22	36	16	23	88	
4-Oct	17	15	18	14	39	23	14	12	13	17	19	17	15	15	14	17	16	18	17	18	19	17	18	17	39	
5-Oct	16	16	14	17	15	16	16	16	16	16	16	15	17	17	18	16	17	17	18	18	27	17	14	21	27	
6-Oct	34	12	18	29	19	17	17	14	16	16	16	16	21	18	16	19	14	19	12	42	29	19	17	39	42	
7-Oct	20	16	16	20	57	81	64	22	28	78	30	20	22	25	17	15	20	21	21	22	13	15	17	15	81	
8-Oct	13	10	13	17	13	15	13	12	17	13	18	17	15	13	14	18	16	13	15	20	15	14	19	14	20	
9-Oct	15	14	16	12	20	25	15	15	16	17	15	22	21	16	17	20	19	17	16	17	15	14	16	13	25	
10-Oct	18	19	17	16	10	14	14	14	15	20	22	20	21	16	15	20	17	15	19	19	15	17	16	17	22	
11-Oct	19	17	17	17	19	19	16	20	14	17	16	22	20	21	19	20	17	17	16	18	17	18	15	13	22	
12-Oct	13	12	11	13	16	11	15	59	31	20	17	15	19	22	21	25	16	19	11	15	13	15	16	12	59	
13-Oct	16	14	16	14	13	11	15	16	18	21	15	16	18	18	20	19	19	16	17	16	15	15	14	13	21	
14-Oct	12	13	15	17	16	13	13	15	16	16	16	14	13	15	16	14	12	12	12	13	11	11	14	16	17	
15-Oct	17	16	16	13	15	15	12	12	16	16	15	14	17	15	13	15	13	12	16	10	16	14	24	15	24	
16-Oct	11	10	22	30	19	20	21	21	16	16	18	16	20	23	21	24	47	15	28	20	21	31	22	16	47	
17-Oct	27	37	17	9	11	18	14	15	15	16	19	20	17	15	15	17	14	16	17	27	27	75	41	26	75	
18-Oct	22	22	19	15	15	40	18	25	14	18	14	16	15	13	15	12	12	15	17	31	35	23	22	27	40	
19-Oct	22	21	25	19	17	18	16	22	18	18	32	24	24	25	22	21	22	35	34	70	62	20	23	22	70	
20-Oct	23	20	45	39	22	23	21	25	20	20	20	19	16	13	16	11	32	19	19	22	20	18	21	80	80	
21-Oct	34	47	12	33	19	13	15	13	15	15	25	75	25	17	18	18	17	19	18	17	18	15	13	14	75	
22-Oct	13	13	15	17	16	12	13	24	40	29	36	33	30	16	16	23	15	14	24	25	10	9	9	11	40	
23-Oct	18	17	16	16	17	14	16	18	23	20	19	20	21	21	19	17	17	14	15	17	18	18	18	16	23	
24-Oct	17	16	17	18	24	55	43	29	31	20	20	22	21	20	21	19	19	19	19	20	19	18	18	18	55	
25-Oct	18	17	18	18	20	17	20	18	24	26	28	25	27	24	18	30	22	20	21	12	19	19	16	17	30	
26-Oct	17	17	19	18	20	22	30	26	17	17	18	18	21	26	29	19	24	30	43	16	21	22	22	21	43	
27-Oct	19	19	16	16	14	12	12	12	16	30	20	21	21	23	22	12	16	17	31	37	44	26	36	15	44	
28-Oct	24	22	39	25	19	16	22	23	19	12	10	27	23	14	17	17	18	17	17	15	16	15	15	18	39	
29-Oct	17	16	18	17	18	16	15	16	16	14	20	20	22	19	25	16	24	25	17	20	16	11	10	15	25	
30-Oct	18	18	18	17	14	14	20	95	52	18	18	19	17	16	15	13	13	12	12	12	13	14	14	11	95	
31-Oct	21	19	43	52	34	11	11	13	13	16	15	24	28	31	31	29	43	17	21	73	84	45	18	20	84	
		54	55	59	62	57	81	64	95	82	85	39	75	30	32	81	63	88	37	43	73	84	75	41	80	
		Diurnal Maximum																								



Wood Buffalo Environmental Association
Hourly Averages

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





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS03 LOWER CAMP METEOROLOGY OCTOBER 2023

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

November 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP MET TOWER (AMS03)
OCTOBER 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	744	0	0	100	25	-	16.1	-
Temperature 45 m (C) Average	744	0	0	100	25.1	-	16.3	-
Temperature 100 m (C) Average	744	0	0	100	24.8	-	16.4	-
Temperature 163 m (C) Average	744	0	0	100	24.2	-	16.1	-
Relative Humidity 20 m (%) Average	744	0	0	100	100	-	89.2	-
Relative Humidity 45 m (%) Average	744	0	0	100	100	-	89.3	-
Relative Humidity 100 m (%) Average	744	0	0	100	97.1	-	82.9	-
Relative Humidity 163 m (%) Average	744	0	0	100	99.7	-	85.7	-
Wind Speed 20 m (km/h) Average	743	0	1	99.87	31	-	25.0	-
Wind Speed 45 m (km/h) Average	742	0	2	99.73	41	-	33.0	-
Wind Speed 100 m (km/h) Average	741	0	3	99.6	46	-	38.0	-
Wind Speed 163 m (km/h) Average	737	0	7	99.06	49	-	41.0	-
Wind Direction 20 m (deg) Average	743	0	1	99.87	-	-	-	-
Wind Direction 45 m (deg) Average	742	0	2	99.73	-	-	-	-
Wind Direction 100 m (deg) Average	741	0	3	99.6	-	-	-	-
Wind Direction 163 m (deg) Average	737	0	7	99.06	-	-	-	-
Vertical Wind Speed 20 m (km/h) Average	743	0	1	99.87	0.5	-	0.0	-
Vertical Wind Speed 45 m (km/h) Average	742	0	2	99.73	1.4	-	0.9	-
Vertical Wind Speed 100 m (km/h) Average	741	0	3	99.6	3	-	0.7	-
Vertical Wind Speed 163 m (km/h) Average	737	0	7	99.06	4.3	-	1.8	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP MET TOWER (AMS03)
OCTOBER 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	744	5.37	7.5	-	-9.7	-4.5	-1.5	6.5	11.1	14.8	25
Temperature 45 m (C) Average	744	5.43	7.6	-	-9.6	-4.7	-1.5	6.7	11.4	14.7	25.1
Temperature 100 m (C) Average	744	5.32	7.7	-	-9.9	-5	-2	7.1	11.2	14.7	24.8
Temperature 163 m (C) Average	744	5.08	7.8	-	-10.4	-5.5	-2.4	7.1	11.1	14.6	24.2
Relative Humidity 20 m (%) Average	744	68.83	15.9	-	25.5	47.5	57.2	68.8	82	90.2	100
Relative Humidity 45 m (%) Average	744	68.49	15.5	-	25.4	47.7	57.2	68.2	81.1	89.1	100
Relative Humidity 100 m (%) Average	744	65.02	14.7	-	24	46	54.3	64.3	76.6	85.2	97.1
Relative Humidity 163 m (%) Average	744	66.64	14.7	-	26.2	48.2	56	65.2	78	87.1	99.7
Wind Speed 20 m (km/h) Average	743	10.7	6	-	0	2	5	10	15	19	31
Wind Speed 45 m (km/h) Average	742	15.3	8	-	0	4	8	15	21	26	41
Wind Speed 100 m (km/h) Average	741	19.6	10	-	0	7	12	20	26	32	46
Wind Speed 163 m (km/h) Average	737	22.8	10	-	1	9	14	23	30	37	49
Wind Direction 20 m (deg) Average	743	-	-	-	-	-	-	-	-	-	-
Wind Direction 45 m (deg) Average	742	-	-	-	-	-	-	-	-	-	-
Wind Direction 100 m (deg) Average	741	-	-	-	-	-	-	-	-	-	-
Wind Direction 163 m (deg) Average	737	-	-	-	-	-	-	-	-	-	-
Vertical Wind Speed 20 m (km/h) Average	743	-0.38	0.4	-	-1.7	-0.9	-0.6	-0.3	-0.1	0	0.5
Vertical Wind Speed 45 m (km/h) Average	742	0.12	0.5	-	-1.4	-0.5	-0.1	0.1	0.4	0.7	1.4
Vertical Wind Speed 100 m (km/h) Average	741	0.1	0.7	-	-1.7	-0.7	-0.2	0.1	0.4	0.9	3
Vertical Wind Speed 163 m (km/h) Average	737	0.51	0.8	-	-1.1	-0.2	0.1	0.3	0.8	1.5	4.3

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

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
Wind Speed, Wind Direction, Vertical Wind Speed 20 m	05 Oct 2023 04:00	05 Oct 2023 04:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction, Vertical Wind Speed 45 m	05 Oct 2023 03:00	05 Oct 2023 04:00	2	Flat line in sensor output signal
Wind Speed, Wind Direction, Vertical Wind Speed 100 m	05 Oct 2023 03:00	05 Oct 2023 05:00	3	Flat line in sensor output signal
Wind Speed, Wind Direction, Vertical Wind Speed 163 m	05 Oct 2023 02:00	05 Oct 2023 08:00	7	Flat line in sensor output signal



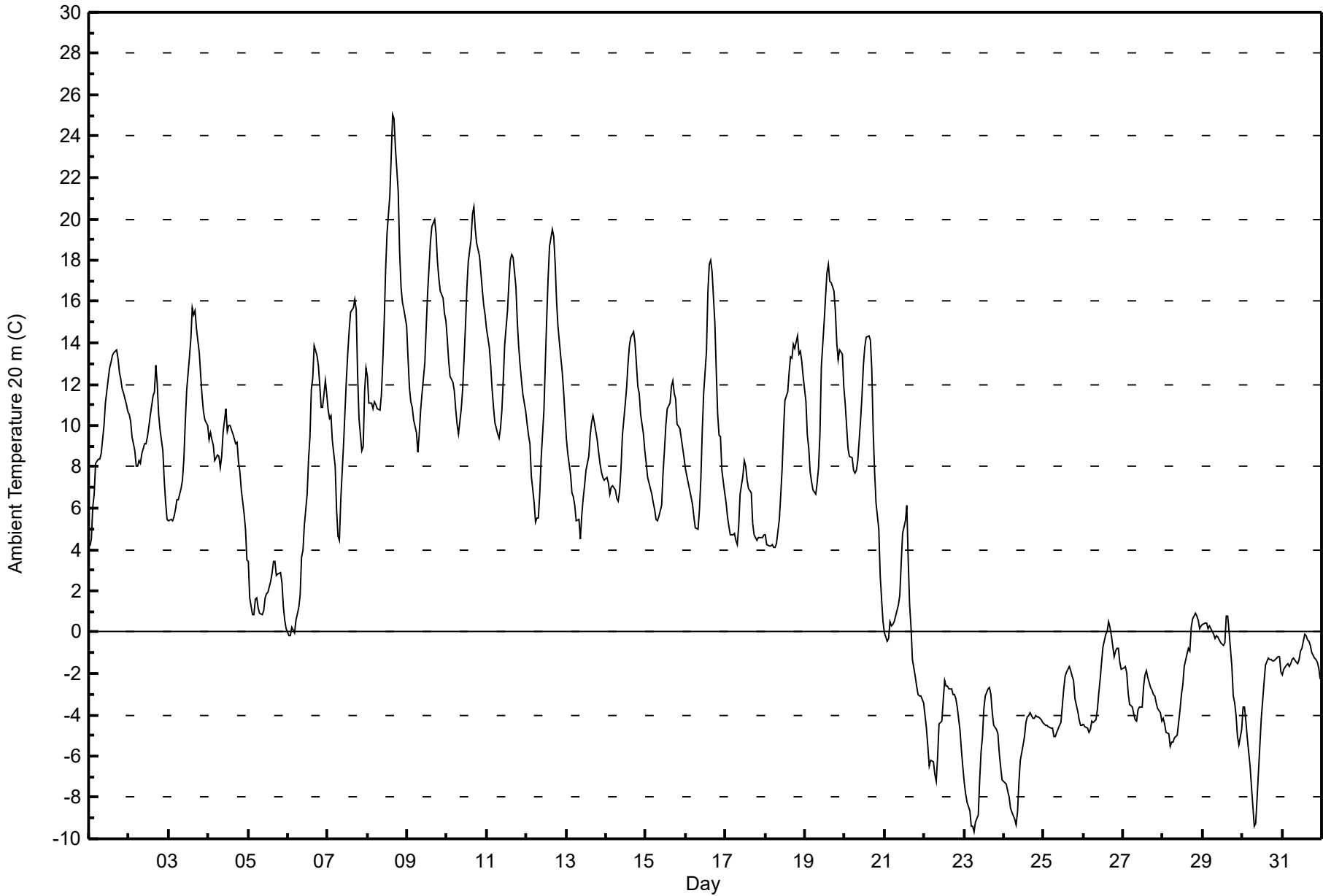
Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature 20 m (AT20m) - C

Lower Camp Met Tower - October 2023

Maximum Value: 25.0 C on Oct 8 16:00 Maximum Daily Average: 16.1 C on Oct 8																				Hours in Service: 744 Hours of Data: 744																												
Minimum Value: -9.7 C on Oct 23 07:00 Minimum Daily Average: -6.2 C on Oct 23 Maximum Diurnal Average: 8.9 C at hour 16 Minimum Diurnal Average: 2.4 C at hour 7 Monthly Average: 5.37 C Percentiles: P ₁ = -8.9 P ₁₀ = -4.5 Q ₁ = -1.5 Median = 6.5 Q ₃ = 11.1 P ₉₀ = 14.8 P ₉₉ = 20.1																				Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Oct	4.2	4.5	6.0	6.7	8.1	8.3	8.4	8.7	9.3	10.0	11.1	12.2	12.8	13.0	13.4	13.5	13.7	13.2	12.6	12.2	11.8	11.5	11.0	10.7	10.3	13.7																						
2-Oct	10.5	10.2	9.4	8.8	8.1	8.0	8.3	8.2	8.6	9.1	9.1	9.4	9.9	10.5	11.4	11.6	12.9	12.1	10.5	9.8	8.8	7.4	6.3	5.4	9.4	12.9																						
3-Oct	5.4	5.5	5.4	5.6	5.9	6.4	6.4	6.9	7.3	8.3	10.1	11.7	13.3	14.2	15.7	15.4	15.6	14.7	13.5	12.5	11.4	10.7	10.3	10.0	10.1	15.7																						
4-Oct	9.3	9.7	9.3	9.1	8.3	8.6	8.5	8.0	8.5	9.7	10.8	9.7	10.0	10.0	9.8	9.6	9.1	9.2	8.2	7.8	6.9	5.8	5.0	3.5	8.5	10.8																						
5-Oct	3.4	1.7	0.9	0.8	1.6	1.7	1.2	0.9	0.9	1.1	1.7	1.9	2.0	2.5	2.9	3.4	3.4	2.7	2.8	2.9	2.4	1.2	0.6	0.1	1.9	3.4																						
6-Oct	-0.1	-0.2	0.2	0.1	-0.1	0.6	1.2	1.8	3.6	3.9	5.2	6.7	8.3	9.5	11.8	12.3	13.9	13.4	12.9	12.0	10.8	10.9	12.2	11.5	6.8	13.9																						
7-Oct	10.8	10.4	10.4	9.2	8.0	5.9	4.7	4.5	6.4	9.1	10.7	12.2	13.5	14.6	15.5	15.7	16.1	15.6	12.5	10.3	8.8	9.0	11.6	12.8	10.8	16.1																						
8-Oct	12.4	11.1	11.1	10.8	11.1	11.0	10.8	10.8	11.5	13.1	15.0	17.6	19.3	21.1	23.0	25.0	24.8	23.4	21.3	18.4	16.7	16.0	15.6	14.8	16.1	25.0																						
9-Oct	13.3	11.8	11.1	10.9	10.3	9.6	8.7	9.6	10.7	11.5	13.1	14.8	16.4	17.7	18.9	19.6	20.0	19.3	17.9	17.1	16.5	16.2	15.4	15.1	14.4	20.0																						
10-Oct	14.2	13.1	12.4	12.1	11.7	10.8	10.1	9.6	10.8	11.8	13.3	14.8	16.7	18.0	19.0	20.2	20.6	19.5	18.8	18.2	17.4	16.6	15.8	15.3	15.0	20.6																						
11-Oct	14.7	13.8	12.9	11.8	10.9	10.2	9.6	9.4	9.9	10.8	12.3	13.9	15.6	16.9	18.0	18.3	18.1	16.7	15.0	13.8	12.9	12.1	11.5	10.7	13.3	18.3																						
12-Oct	10.1	9.5	9.1	7.6	6.2	5.3	5.5	5.5	6.7	8.4	10.8	13.1	15.2	17.2	18.7	19.5	19.2	17.9	16.1	14.8	13.3	12.7	11.7	10.5	11.9	19.5																						
13-Oct	9.4	8.6	7.7	6.8	6.5	6.1	5.4	5.5	4.5	5.7	6.5	7.1	7.8	8.5	9.5	10.1	10.5	10.2	9.3	8.7	8.1	7.8	7.5	7.4	7.7	10.5																						
14-Oct	7.5	7.2	6.7	7.0	7.1	6.9	6.5	6.4	6.8	7.9	9.5	11.0	11.8	13.0	13.9	14.2	14.5	14.0	13.0	11.9	11.5	10.5	9.6	8.8	9.9	14.5																						
15-Oct	8.2	7.5	7.2	6.7	6.3	6.0	5.5	5.4	5.6	6.1	7.7	8.8	10.0	10.8	11.1	11.9	12.2	11.6	11.3	10.0	9.9	9.4	8.9	8.4	8.6	12.2																						
16-Oct	7.9	7.2	6.9	6.5	6.2	5.6	5.1	5.0	5.9	7.5	9.7	11.6	13.6	16.4	17.8	18.0	17.5	14.9	12.7	10.6	9.5	9.4	7.8	6.7	10.0	18.0																						
17-Oct	6.2	5.6	5.1	4.7	4.7	4.8	4.4	4.2	5.2	6.7	7.6	8.3	8.0	7.4	6.9	6.7	5.3	4.7	4.6	4.5	4.5	4.6	4.6	4.7	5.6	8.3																						
18-Oct	4.7	4.3	4.2	4.2	4.2	4.1	4.1	4.3	5.5	6.6	7.9	9.7	11.2	11.7	12.6	13.3	13.3	13.9	13.7	14.3	13.4	13.6	13.1	12.4	9.2	14.3																						
19-Oct	11.2	9.6	8.9	7.8	7.3	6.9	6.7	7.2	8.0	9.6	12.9	15.0	16.2	17.4	17.8	17.0	16.9	16.5	15.6	14.0	13.2	13.7	13.4	11.9	12.3	17.8																						
20-Oct	11.1	10.0	8.9	8.5	8.4	7.8	7.7	7.9	8.3	10.3	11.4	12.9	13.8	14.2	14.4	14.1	12.7	9.7	7.7	6.3	5.0	2.8	1.6	0.5	9.0	14.4																						
21-Oct	0.0	-0.5	-0.3	0.5	0.3	0.4	0.5	1.1	1.3	1.8	3.4	4.8	5.4	6.2	3.5	1.3	0.2	-1.3	-2.2	-2.6	-3.0	-3.1	-3.1	-3.5	0.5	6.2																						
22-Oct	-4.1	-4.7	-5.5	-6.5	-6.2	-6.3	-6.9	-7.2	-6.0	-4.4	-4.3	-3.3	-2.3	-2.6	-2.6	-2.7	-2.7	-3.0	-3.0	-3.2	-3.6	-4.8	-5.8	-6.5	-4.5	-2.3																						
23-Oct	-7.3	-7.8	-8.2	-8.6	-9.4	-9.4	-9.7	-9.2	-8.9	-7.1	-5.8	-5.0	-3.7	-3.1	-2.7	-2.7	-3.0	-3.9	-4.5	-4.7	-4.9	-5.8	-6.6	-7.1	-6.2	-2.7																						
24-Oct	-7.2	-7.4	-7.7	-7.9	-8.5	-8.7	-9.0	-9.3	-8.7	-7.3	-6.2	-5.5	-5.0	-4.4	-4.1	-4.0	-3.9	-4.2	-4.1	-4.0	-4.1	-4.1	-4.3	-4.4	-6.0	-3.9																						
25-Oct	-4.5	-4.5	-4.5	-4.6	-4.7	-4.6	-5.0	-5.0	-4.8	-4.5	-4.4	-3.5	-2.7	-2.1	-1.9	-1.7	-1.9	-2.1	-2.3	-3.2	-3.8	-4.2	-4.5	-4.5	-3.7	-1.7																						
26-Oct	-4.4	-4.6	-4.7	-4.9	-4.7	-4.3	-4.4	-4.2	-3.8	-3.0	-2.3	-1.5	-0.7	-0.1	0.0	0.5	0.2	-0.2	-1.2	-0.9	-0.8	-0.8	-1.5	-1.8	-2.2	0.5																						
27-Oct	-1.8	-1.7	-2.0	-3.0	-3.5	-3.6	-3.9	-4.2	-4.3	-3.8	-3.7	-3.6	-2.6	-2.1	-1.9	-2.2	-2.6	-2.8	-3.0	-3.1	-3.4	-3.7	-3.9	-4.3	-3.1	-1.7																						
28-Oct	-4.1	-4.5	-4.8	-4.9	-5.5	-5.3	-5.3	-5.1	-5.0	-4.4	-3.7	-3.0	-2.6	-1.7	-1.0	-0.8	-0.9	0.2	0.7	0.9	0.8	0.6	0.2	0.3	-2.5	0.9																						
29-Oct	0.4	0.4	0.5	0.1	0.3	0.2	-0.1	-0.3	-0.2	-0.3	-0.4	-0.5	-0.7	-0.5	0.8	0.8	0.0	-1.7	-3.1	-3.4	-4.0	-5.0	-5.4	-4.7	-1.1	0.8																						
30-Oct	-3.6	-3.6	-4.3	-5.1	-6.5	-7.5	-8.4	-9.4	-9.2	-8.1	-5.4	-4.1	-3.3	-2.4	-1.6	-1.3	-1.3	-1.3	-1.4	-1.4	-1.3	-1.2	-1.2	-1.9	-4.0	-1.2																						
31-Oct	-2.1	-1.8	-1.6	-1.5	-1.7	-1.6	-1.3	-1.2	-1.4	-1.5	-1.3	-0.9	-0.8	-0.1	-0.2	-0.4	-0.4	-0.7	-1.0	-1.3	-1.4	-1.5	-1.7	-2.3	-1.2	-0.1																						
																								4.4	3.9	3.6	3.2	2.9	2.7	2.4	2.4	3.0	4.0	5.2	6.3	7.3	8.1	8.7	8.9	8.8	8.1	7.3	6.6	5.9	5.4	5.0	4.5	Diurnal Average
																								14.7	13.8	12.9	12.1	11.7	11.0	10.8	10.8	11.5	13.1	15.0	17.6	19.3	21.1	23.0	25.0	24.8	23.4	21.3	18.4	17.4	16.6	15.8	15.3	Diurnal Maximum





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	234	31.45	31.45
0 - 10	277	37.23	68.68
10 - 20	225	30.24	98.92
> 20	8	1.08	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature 45 m (AT45m) - C

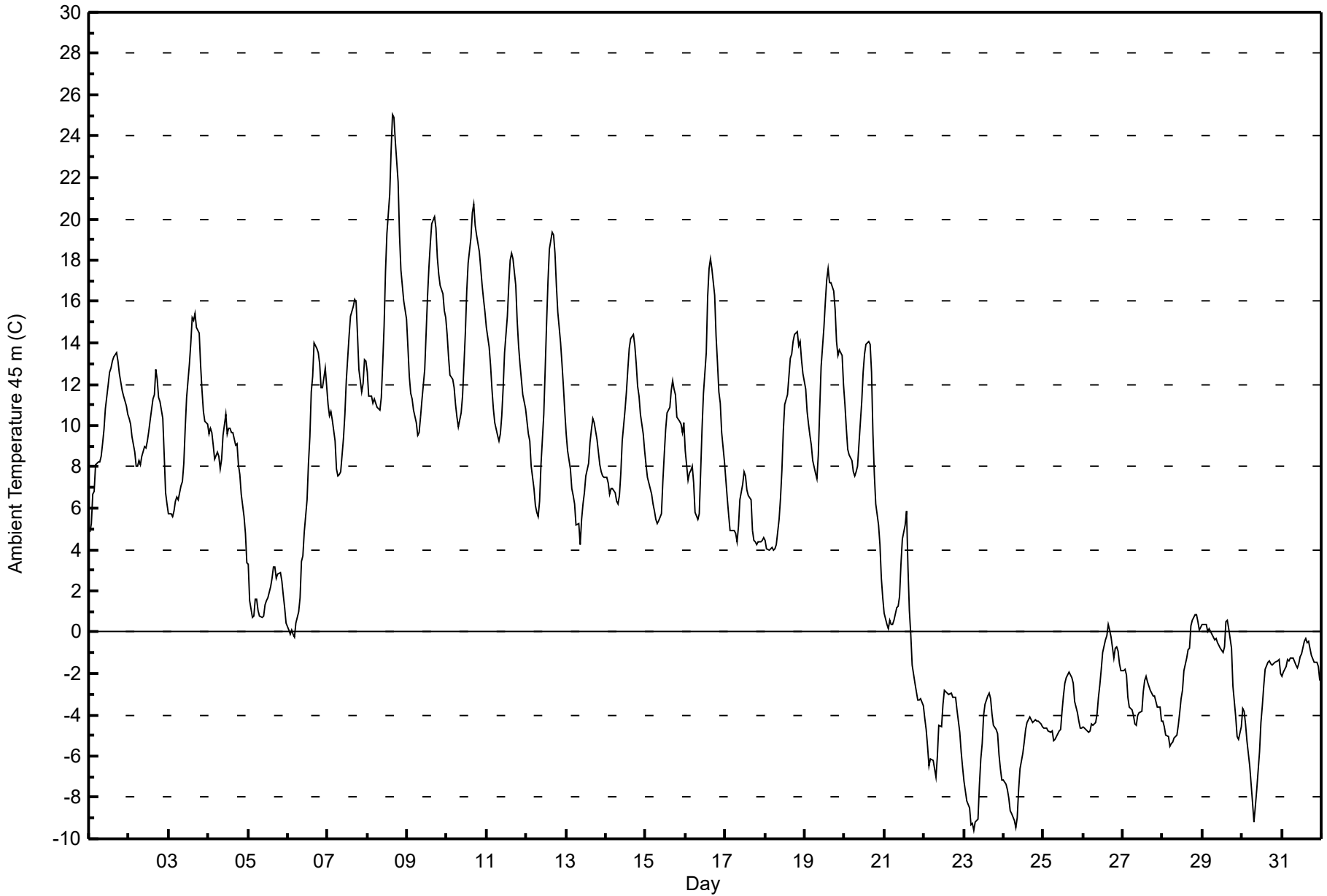
Lower Camp Met Tower - October 2023

Maximum Value: 25.1 C on Oct 8 16:00		Maximum Daily Average: 16.3 C on Oct 8		Hours in Service: 744																																												
Minimum Value: -9.6 C on Oct 23 07:00		Minimum Daily Average: -6.3 C on Oct 23		Hours of Data: 744																																												
Maximum Diurnal Average: 8.8 C at hour 16		Minimum Diurnal Average: 2.5 C at hour 8		Hours of Missing Data: 0																																												
Monthly Average: 5.43 C		Percentiles: P ₁ = -9.0 P ₁₀ = -4.7 Q ₁ = -1.5 Median = 6.7 Q ₃ = 11.4 P ₉₀ = 14.7 P ₉₉ = 20.2		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-Oct	4.9	5.2	6.7	6.8	8.1	8.2	8.3	8.5	9.1	9.8	10.8	12.0	12.6	12.8	13.1	13.3	13.5	13.1	12.5	12.1	11.7	11.4	10.9	10.5	10.3	13.5																						
2-Oct	10.4	10.1	9.4	8.7	8.1	8.0	8.3	8.1	8.5	9.0	8.9	9.2	9.7	10.3	11.3	11.5	12.7	12.2	11.3	11.1	10.3	8.6	6.7	6.2	9.5	12.7																						
3-Oct	5.7	5.7	5.6	5.9	6.3	6.5	6.4	7.1	7.3	8.2	9.8	11.4	13.0	14.0	15.2	15.1	15.4	14.8	14.5	12.9	11.7	10.7	10.2	10.1	10.1	15.4																						
4-Oct	9.6	9.9	9.7	9.1	8.4	8.7	8.5	7.9	8.4	9.5	10.6	9.6	9.9	9.8	9.6	9.7	9.1	9.1	8.1	7.6	6.7	5.6	4.8	3.4	8.5	10.6																						
5-Oct	3.3	1.5	0.7	0.8	1.6	1.6	1.1	0.8	0.7	0.8	1.4	1.6	1.7	2.2	2.6	3.1	3.2	2.6	2.8	2.9	2.5	1.8	1.2	0.5	1.8	3.3																						
6-Oct	0.1	-0.1	0.1	-0.1	-0.2	0.4	1.0	1.6	3.5	3.7	4.9	6.4	8.2	9.5	11.6	12.4	14.0	13.8	13.5	13.0	11.9	11.8	12.7	11.9	6.9	14.0																						
7-Oct	11.0	10.4	10.7	10.3	9.3	7.9	7.5	7.6	7.8	9.4	10.5	12.1	13.3	14.4	15.3	15.8	16.1	16.0	14.4	12.7	11.6	12.0	13.2	13.1	11.8	16.1																						
8-Oct	12.6	11.4	11.4	11.1	11.3	11.1	10.9	10.7	11.4	13.0	14.8	17.5	19.3	21.2	23.3	25.1	24.9	23.8	21.8	19.2	17.5	16.8	16.0	15.2	16.3	25.1																						
9-Oct	13.8	12.4	11.5	11.3	10.7	10.2	9.5	9.7	10.4	11.2	12.7	14.5	16.2	17.6	18.8	19.7	20.1	19.5	18.2	17.3	16.8	16.4	15.6	15.2	14.6	20.1																						
10-Oct	14.4	13.3	12.4	12.2	11.8	11.0	10.4	9.9	10.6	11.4	12.9	14.5	16.5	17.9	19.1	20.3	20.7	19.7	19.2	18.4	17.6	16.8	16.1	15.5	15.1	20.7																						
11-Oct	14.8	13.8	12.9	11.8	10.8	10.1	9.5	9.3	9.6	10.5	11.8	13.5	15.3	16.8	18.0	18.4	18.1	16.8	15.1	13.9	13.0	12.2	11.5	10.8	13.3	18.4																						
12-Oct	10.2	9.6	9.2	8.0	6.9	6.1	5.8	5.6	6.3	8.1	10.6	12.7	15.0	16.9	18.5	19.4	19.2	18.3	16.8	15.5	14.0	13.0	11.9	10.7	12.0	19.4																						
13-Oct	9.6	8.8	7.9	7.0	6.6	6.2	5.2	5.2	4.3	5.4	6.2	6.8	7.6	8.1	9.2	9.8	10.3	10.2	9.3	8.7	8.1	7.8	7.5	7.5	7.6	10.3																						
14-Oct	7.5	7.2	6.7	7.0	7.0	6.7	6.3	6.2	6.6	7.7	9.3	10.8	11.6	12.7	13.8	14.2	14.4	13.9	13.0	11.9	11.4	10.5	9.6	8.8	9.8	14.4																						
15-Oct	8.1	7.5	7.2	6.7	6.2	5.9	5.4	5.3	5.4	5.7	7.3	8.5	9.8	10.6	10.9	11.7	12.2	11.7	11.5	10.4	10.2	10.1	9.7	10.1	8.7	12.2																						
16-Oct	8.7	7.3	7.7	7.8	8.0	7.2	5.8	5.4	5.7	7.8	9.8	11.5	13.5	16.3	17.6	18.0	17.6	16.3	14.4	13.1	11.6	11.1	9.7	8.2	10.8	18.0																						
17-Oct	7.3	6.5	5.6	4.9	4.9	4.9	4.8	4.4	5.1	6.4	7.2	7.8	7.6	6.9	6.6	6.4	4.9	4.4	4.3	4.3	4.4	4.4	4.5	4.5	5.5	7.8																						
18-Oct	4.5	4.0	4.0	4.0	4.1	4.0	4.0	4.2	5.5	6.5	7.8	9.7	11.0	11.5	12.4	13.2	13.5	14.1	14.4	14.6	13.9	14.0	13.2	12.5	9.2	14.6																						
19-Oct	11.7	10.7	10.0	9.5	9.1	8.3	7.7	7.4	8.6	10.8	12.9	14.7	15.9	17.1	17.6	16.9	16.9	16.5	15.7	14.1	13.4	13.7	13.4	11.9	12.7	17.6																						
20-Oct	11.0	9.9	8.8	8.6	8.3	7.8	7.6	7.7	8.1	10.1	11.2	12.6	13.5	13.9	14.0	13.9	12.5	9.6	7.6	6.2	5.2	4.2	2.6	1.6	9.0	14.0																						
21-Oct	0.9	0.4	0.2	0.5	0.3	0.4	0.6	1.2	1.2	1.7	3.3	4.5	5.2	5.8	3.1	1.0	-0.1	-1.6	-2.4	-2.9	-3.3	-3.3	-3.2	-3.5	0.4	5.8																						
22-Oct	-4.2	-4.7	-5.5	-6.4	-6.2	-6.2	-6.6	-7.0	-6.0	-4.5	-4.5	-3.5	-2.8	-2.9	-2.9	-3.0	-2.9	-3.1	-3.2	-3.2	-3.7	-4.8	-5.8	-6.6	-4.6	-2.8																						
23-Oct	-7.2	-7.7	-8.2	-8.5	-9.3	-9.2	-9.6	-9.2	-9.1	-7.4	-6.1	-5.4	-4.0	-3.5	-3.1	-2.9	-3.2	-4.0	-4.5	-4.7	-4.9	-5.9	-6.6	-7.2	-6.3	-2.9																						
24-Oct	-7.2	-7.3	-7.6	-8.0	-8.6	-8.8	-9.1	-9.4	-9.0	-7.7	-6.6	-5.8	-5.4	-4.7	-4.4	-4.2	-4.1	-4.4	-4.3	-4.2	-4.3	-4.3	-4.5	-4.6	-6.2	-4.1																						
25-Oct	-4.7	-4.7	-4.7	-4.8	-4.8	-4.8	-5.2	-5.2	-5.0	-4.8	-4.7	-3.8	-3.1	-2.4	-2.2	-1.9	-2.0	-2.2	-2.5	-3.4	-3.9	-4.3	-4.6	-4.7	-3.9	-1.9																						
26-Oct	-4.6	-4.7	-4.8	-4.9	-4.8	-4.4	-4.5	-4.4	-4.0	-3.2	-2.6	-1.8	-1.0	-0.4	-0.2	0.3	0.1	-0.2	-1.2	-0.8	-0.7	-0.9	-1.5	-1.9	-2.4	0.3																						
27-Oct	-1.9	-1.8	-2.1	-3.2	-3.6	-3.8	-4.0	-4.4	-4.5	-4.1	-3.9	-3.9	-2.9	-2.3	-2.1	-2.4	-2.8	-3.0	-3.1	-3.1	-3.3	-3.6	-3.6	-4.3	-3.2	-1.8																						
28-Oct	-4.3	-4.6	-5.0	-5.1	-5.5	-5.4	-5.3	-5.1	-5.0	-4.5	-3.9	-3.2	-2.8	-1.9	-1.3	-0.8	-0.8	0.3	0.6	0.8	0.8	0.5	0.1	0.2	-2.5	0.8																						
29-Oct	0.4	0.4	0.4	0.1	0.2	0.0	-0.2	-0.4	-0.3	-0.5	-0.6	-0.8	-1.0	-0.7	0.5	0.6	0.2	-0.8	-2.6	-3.3	-4.1	-5.0	-5.2	-4.6	-1.1	0.6																						
30-Oct	-3.7	-3.8	-4.5	-5.2	-6.4	-7.3	-8.3	-9.2	-8.4	-7.6	-5.8	-4.4	-3.6	-2.6	-1.8	-1.5	-1.4	-1.5	-1.6	-1.5	-1.5	-1.4	-1.3	-2.0	-4.0	-1.3																						
31-Oct	-2.1	-1.9	-1.7	-1.3	-1.4	-1.3	-1.3	-1.3	-1.6	-1.7	-1.5	-1.2	-1.1	-0.4	-0.3	-0.5	-0.5	-0.8	-1.1	-1.4	-1.4	-1.5	-1.6	-2.3	-1.3	-0.3																						
																								4.5	4.0	3.7	3.4	3.1	2.9	2.6	2.5	2.9	3.9	5.0	6.1	7.1	7.9	8.5	8.8	8.8	8.2	7.5	6.8	6.2	5.7	5.3	4.7	Diurnal Average
																								14.8	13.8	12.9	12.2	11.8	11.1	10.9	10.7	11.4	13.0	14.8	17.5	19.3	21.2	23.3	25.1	24.9	23.8	21.8	19.2	17.6	16.8	16.1	15.5	Diurnal Maximum



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	233	31.32	31.32
0 - 10	267	35.89	67.20
10 - 20	235	31.59	98.79
> 20	9	1.21	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

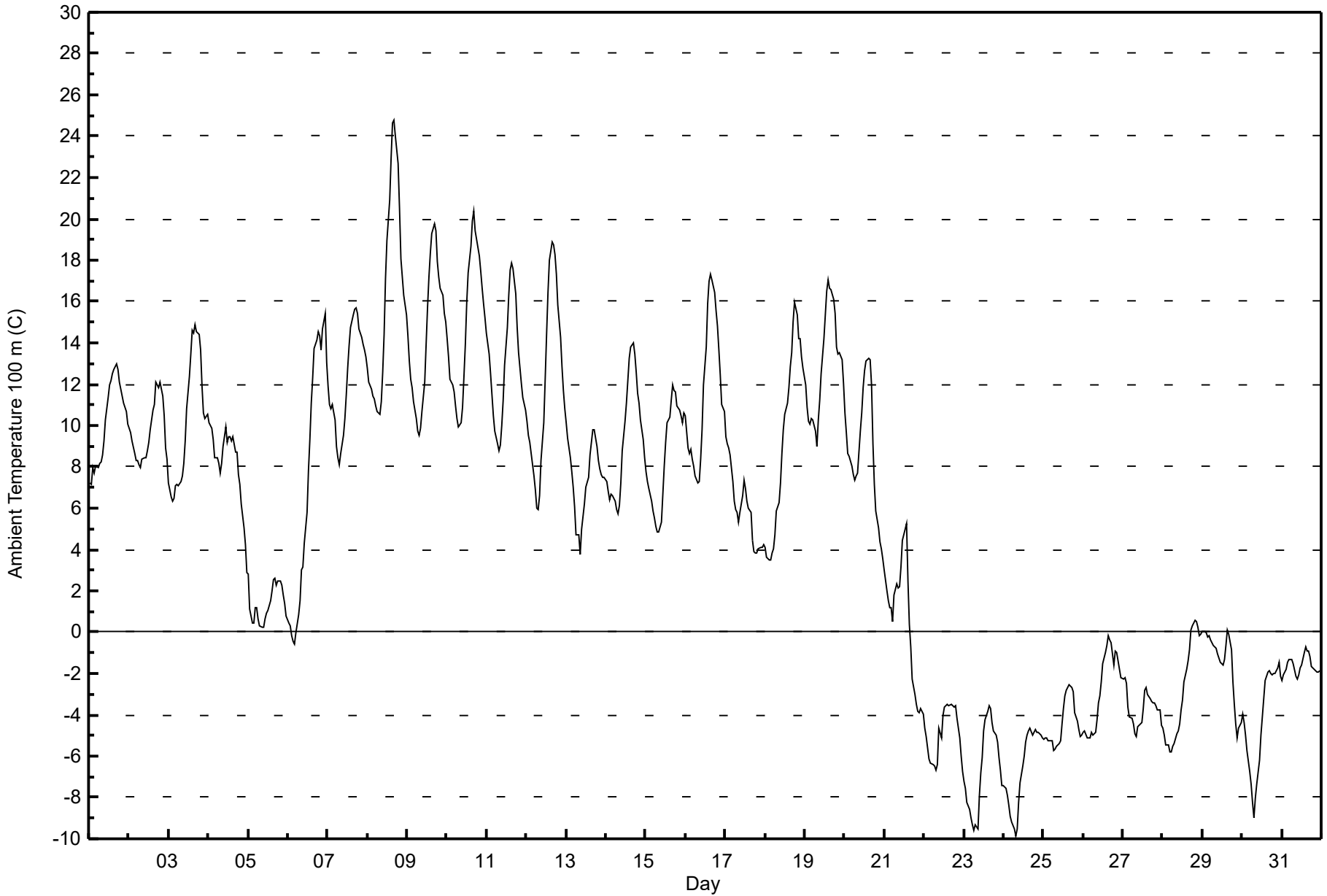


Maximum Value: 24.8 C on Oct 8 17:00																				Maximum Daily Average: 16.4 C on Oct 8					Hours in Service: 744																							
Minimum Value: -9.9 C on Oct 24 08:00																				Minimum Daily Average: -6.7 C on Oct 24					Hours of Data: 744																							
Maximum Diurnal Average: 8.3 C at hour 17																				Minimum Diurnal Average: 2.6 C at hour 8					Hours of Missing Data: 0																							
Monthly Average: 5.32 C																				Percentiles: P ₁ = -9.1 P ₁₀ = -5.0 Q ₁ = -2.0 Median = 7.1 Q ₃ = 11.2 P ₉₀ = 14.7 P ₉₉ = 20.1					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-Oct	7.2	7.2	8.0	7.7	8.0	8.0	8.1	8.2	8.6	9.2	10.3	11.4	12.0	12.2	12.5	12.7	13.0	12.7	12.1	11.8	11.4	11.1	10.7	10.1	10.2	13.0																						
2-Oct	9.9	9.6	9.3	8.6	8.3	8.3	8.1	8.0	8.4	8.5	8.4	8.7	9.2	9.8	10.7	11.0	12.1	12.0	11.8	12.1	11.4	10.5	8.9	8.4	9.7	12.1																						
3-Oct	7.2	6.5	6.3	6.5	7.1	7.2	7.1	7.3	7.6	8.2	9.3	10.8	12.3	13.5	14.6	14.5	14.9	14.5	14.4	13.7	11.9	10.6	10.3	10.5	10.3	14.9																						
4-Oct	10.1	10.0	9.9	9.3	8.5	8.5	8.2	7.7	8.2	9.0	9.9	9.2	9.5	9.4	9.3	9.4	8.7	8.7	7.6	7.1	6.2	5.1	4.2	2.9	8.2	10.1																						
5-Oct	2.8	1.1	0.4	0.4	1.2	1.2	0.6	0.3	0.2	0.2	0.7	0.9	1.1	1.5	2.0	2.5	2.6	2.3	2.4	2.5	2.3	1.8	1.4	0.8	1.4	2.8																						
6-Oct	0.5	0.3	-0.2	-0.5	-0.6	0.0	0.9	1.5	3.0	3.1	4.3	5.8	7.8	9.3	11.1	12.3	13.8	14.1	14.5	14.3	13.7	14.7	15.4	13.0	7.2	15.4																						
7-Oct	11.9	11.0	10.8	11.0	10.3	9.0	8.4	8.1	8.7	9.5	10.4	11.5	12.8	13.8	14.7	15.3	15.7	15.7	15.4	14.7	14.3	13.9	13.7	13.3	12.2	15.7																						
8-Oct	12.8	12.1	11.7	11.4	11.3	11.0	10.7	10.5	11.1	12.6	14.4	17.1	19.0	20.9	23.0	24.7	24.8	24.1	22.7	20.5	18.1	17.2	16.3	15.3	16.4	24.8																						
9-Oct	14.3	13.1	12.2	11.8	11.1	10.3	9.7	9.5	9.9	10.6	12.1	13.9	15.7	17.2	18.3	19.3	19.8	19.4	17.9	17.2	16.7	16.3	15.4	15.0	14.5	19.8																						
10-Oct	14.2	13.3	12.3	12.0	11.6	11.0	10.3	10.0	10.1	10.9	12.3	13.9	16.0	17.4	18.7	19.9	20.3	19.4	19.0	18.2	17.4	16.6	15.9	15.2	14.8	20.3																						
11-Oct	14.5	13.5	12.5	11.5	10.5	9.8	9.1	8.8	9.0	10.0	11.2	12.9	14.7	16.3	17.5	17.9	17.6	16.4	14.8	13.5	12.8	12.0	11.3	10.7	12.9	17.9																						
12-Oct	10.2	9.5	9.2	8.6	7.6	6.9	6.0	5.9	6.6	8.3	10.2	12.2	14.4	16.4	18.0	18.9	18.8	18.3	17.3	15.9	14.3	12.9	11.7	10.8	12.0	18.9																						
13-Oct	10.1	9.4	8.4	7.7	7.0	6.1	4.7	4.7	3.7	5.0	5.6	6.2	7.0	7.5	8.5	9.2	9.8	9.8	9.0	8.3	7.9	7.6	7.5	7.5	7.4	10.1																						
14-Oct	7.3	6.8	6.4	6.7	6.6	6.3	5.9	5.8	6.1	7.2	8.8	10.2	11.1	12.2	13.3	13.8	14.0	13.5	12.6	11.5	11.1	10.2	9.3	8.5	9.4	14.0																						
15-Oct	7.8	7.3	7.0	6.4	5.9	5.5	5.1	4.9	4.9	5.3	6.7	8.0	9.2	10.2	10.4	11.2	12.0	11.7	11.6	11.0	10.7	10.4	10.1	10.6	8.5	12.0																						
16-Oct	10.5	8.9	8.7	8.8	8.4	8.1	7.6	7.2	7.3	8.4	9.8	12.0	13.8	15.9	17.0	17.3	17.0	16.5	15.5	14.8	13.7	12.4	11.0	10.7	11.7	17.3																						
17-Oct	9.5	9.1	8.9	8.6	7.3	6.3	5.9	5.8	5.3	5.8	6.6	7.3	6.9	6.4	6.0	5.8	4.4	3.9	3.8	3.9	4.0	4.1	4.1	4.2	6.0	9.5																						
18-Oct	4.1	3.6	3.5	3.5	3.8	4.0	4.7	5.9	6.3	7.2	8.6	9.8	10.5	11.1	11.8	12.8	13.5	15.0	15.9	15.3	14.2	14.2	13.3	12.8	9.4	15.9																						
19-Oct	12.0	10.9	10.2	10.1	10.3	10.3	9.8	9.0	10.3	11.2	12.5	14.2	15.4	16.5	17.1	16.6	16.6	16.1	15.4	13.8	13.5	13.5	13.2	12.0	12.9	17.1																						
20-Oct	10.6	9.7	8.6	8.5	8.0	7.6	7.3	7.6	7.7	9.7	10.6	11.9	12.7	13.1	13.3	13.2	11.9	9.1	7.2	5.8	5.1	4.4	4.0	3.6	8.8	13.3																						
21-Oct	3.0	2.0	1.5	1.2	1.2	0.5	1.8	2.4	2.1	2.2	3.1	4.4	5.0	5.3	2.5	0.4	-0.7	-2.2	-3.0	-3.5	-3.9	-3.9	-3.7	-4.0	0.6	5.3																						
22-Oct	-4.6	-5.1	-5.6	-6.1	-6.4	-6.4	-6.5	-6.7	-6.4	-4.6	-5.1	-4.0	-3.6	-3.5	-3.5	-3.6	-3.5	-3.6	-3.7	-3.6	-4.1	-5.1	-6.0	-6.7	-4.9	-3.5																						
23-Oct	-7.2	-7.6	-8.2	-8.6	-9.0	-9.3	-9.6	-9.3	-9.5	-7.9	-6.8	-6.1	-4.8	-4.2	-3.8	-3.6	-3.7	-4.4	-4.8	-5.0	-5.3	-6.1	-6.6	-7.4	-6.6	-3.6																						
24-Oct	-7.4	-7.6	-7.9	-8.4	-8.9	-9.2	-9.6	-9.9	-9.5	-8.3	-7.3	-6.5	-6.0	-5.3	-5.0	-4.8	-4.7	-5.0	-4.8	-4.7	-4.8	-4.8	-5.0	-5.1	-6.7	-4.7																						
25-Oct	-5.2	-5.1	-5.1	-5.2	-5.3	-5.3	-5.7	-5.7	-5.5	-5.4	-5.3	-4.4	-3.7	-3.1	-2.8	-2.5	-2.6	-2.7	-2.9	-3.9	-4.3	-4.7	-5.0	-5.0	-4.4	-2.5																						
26-Oct	-4.8	-4.8	-5.1	-5.1	-5.1	-4.8	-5.0	-4.8	-4.3	-3.5	-3.1	-2.4	-1.5	-1.0	-0.7	-0.1	-0.3	-0.5	-1.6	-0.9	-1.0	-1.4	-1.8	-2.2	-2.7	-0.1																						
27-Oct	-2.3	-2.2	-2.4	-3.6	-4.1	-4.2	-4.5	-4.9	-5.0	-4.6	-4.5	-4.3	-3.7	-2.8	-2.7	-3.0	-3.3	-3.3	-3.4	-3.4	-3.5	-3.8	-3.8	-4.5	-3.7	-2.2																						
28-Oct	-4.6	-5.0	-5.5	-5.5	-5.8	-5.8	-5.6	-5.4	-4.9	-4.8	-4.4	-3.8	-3.3	-2.4	-1.8	-1.4	-0.9	0.1	0.3	0.6	0.5	0.2	-0.2	-0.1	-2.9	0.6																						
29-Oct	0.1	0.0	-0.1	-0.3	-0.2	-0.4	-0.6	-0.7	-0.8	-1.0	-1.2	-1.4	-1.6	-1.3	-0.6	0.1	-0.1	-0.8	-2.4	-3.5	-4.4	-5.1	-4.6	-4.4	-1.5	0.1																						
30-Oct	-4.0	-4.4	-5.0	-5.8	-6.7	-7.4	-8.3	-8.9	-8.0	-7.4	-6.2	-5.0	-4.1	-3.2	-2.4	-2.0	-1.8	-2.0	-2.0	-2.0	-2.0	-1.7	-1.5	-2.1	-4.3	-1.5																						
31-Oct	-2.3	-2.1	-1.8	-1.5	-1.3	-1.3	-1.3	-1.5	-2.1	-2.3	-2.1	-1.7	-1.6	-1.0	-0.7	-0.9	-0.9	-1.2	-1.7	-1.8	-1.9	-2.0	-2.0	-1.9	-1.6	-0.7																						
																								4.8	4.2	3.8	3.5	3.2	3.0	2.7	2.6	2.9	3.6	4.5	5.6	6.5	7.4	7.9	8.3	8.3	8.0	7.5	6.9	6.3	5.8	5.4	4.9	Diurnal Average
																								14.5	13.5	12.5	12.0	11.6	11.0	10.7	10.5	11.1	12.6	14.4	17.1	19.0	20.9	23.0	24.7	24.8	24.1	22.7	20.5	18.1	17.2	16.3	15.3	Diurnal Maximum



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	244	32.80	32.80
0 - 10	253	34.01	66.80
10 - 20	239	32.12	98.92
> 20	8	1.08	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

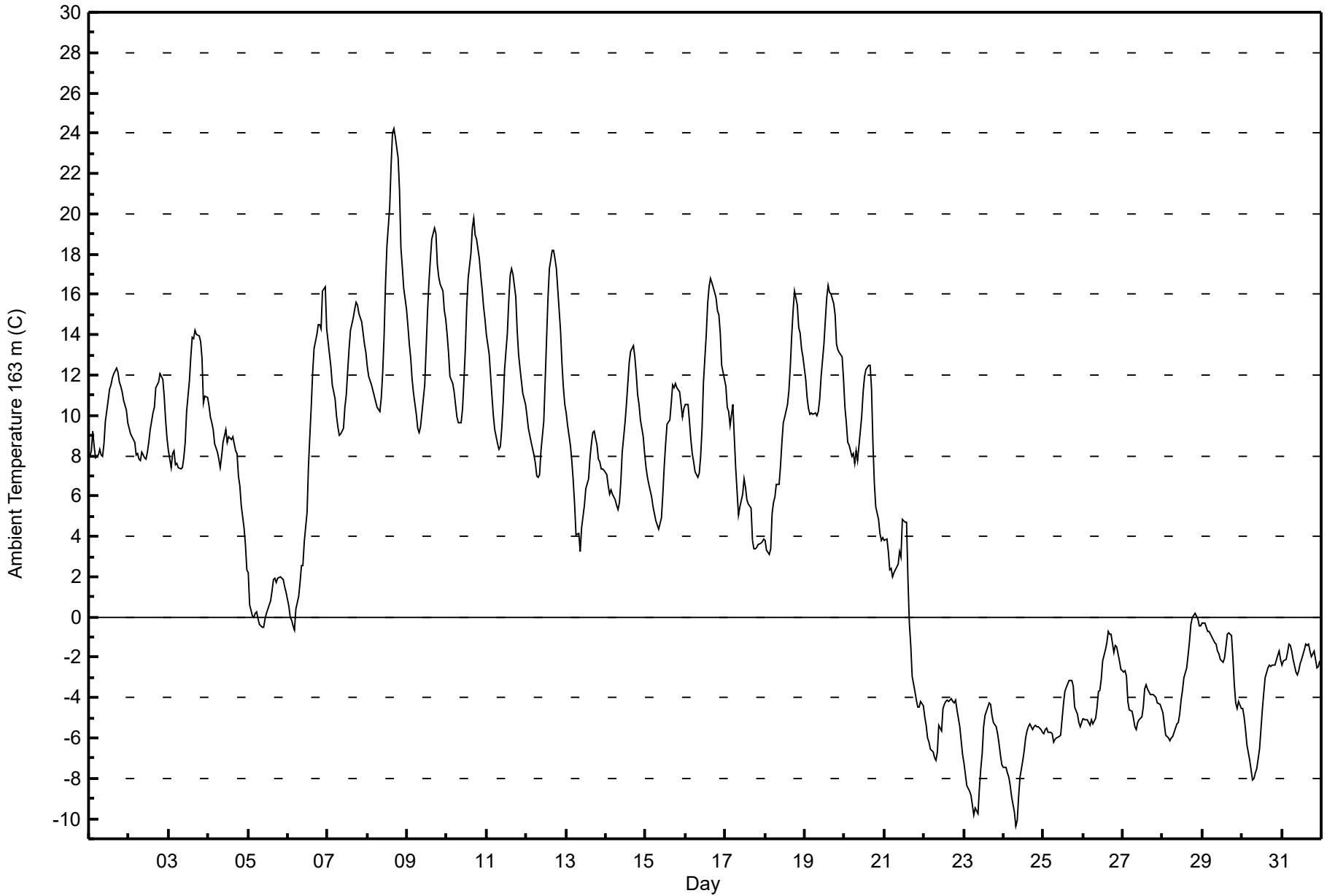


Maximum Value: 24.2 C on Oct 8 17:00		Maximum Daily Average: 16.1 C on Oct 8		Hours in Service: 744																																												
Minimum Value: -10.4 C on Oct 24 08:00		Minimum Daily Average: -7.1 C on Oct 24		Hours of Data: 744																																												
Maximum Diurnal Average: 7.8 C at hour 17		Minimum Diurnal Average: 2.5 C at hour 8		Hours of Missing Data: 0																																												
Monthly Average: 5.08 C		Percentiles: P ₁ = -8.9 P ₁₀ = -5.5 Q ₁ = -2.4 Median = 7.1 Q ₃ = 11.1 P ₉₀ = 14.6 P ₉₉ = 19.6		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-Oct	8.0	8.3	9.2	8.4	7.9	8.0	8.3	8.0	8.0	8.6	9.7	10.7	11.3	11.5	11.9	12.1	12.3	12.2	11.7	11.5	11.2	10.8	10.2	9.6	10.0	12.3																						
2-Oct	9.4	9.1	9.0	8.7	8.0	8.1	7.9	7.8	8.2	7.9	7.8	8.2	8.6	9.3	10.2	10.4	11.4	11.5	11.6	12.1	11.8	11.0	9.8	8.9	9.4	12.1																						
3-Oct	8.2	7.4	8.1	8.2	7.5	7.6	7.4	7.3	7.4	7.9	8.7	10.2	11.7	12.9	13.9	13.8	14.2	14.0	13.9	13.7	12.8	10.6	11.0	10.9	10.4	14.2																						
4-Oct	10.5	9.9	9.6	9.3	8.6	8.1	7.8	7.4	7.9	8.7	9.3	8.6	9.0	8.9	8.8	9.0	8.2	8.1	7.0	6.5	5.6	4.4	3.6	2.4	7.8	10.5																						
5-Oct	2.2	0.6	0.0	0.0	0.2	0.3	-0.1	-0.4	-0.5	-0.5	-0.1	0.2	0.4	0.8	1.3	1.8	1.9	1.7	1.9	2.0	1.9	1.9	1.5	1.2	0.9	2.2																						
6-Oct	0.6	0.0	-0.1	-0.4	-0.7	0.4	1.0	1.7	2.5	2.6	3.7	5.2	7.5	9.0	10.5	12.1	13.3	14.0	14.5	14.5	14.3	16.2	16.4	14.3	7.2	16.4																						
7-Oct	13.7	13.1	12.4	11.5	10.8	10.0	9.5	9.0	9.1	9.3	10.4	11.1	12.2	13.3	14.2	14.9	15.2	15.6	15.5	15.0	14.7	14.1	13.5	13.1	12.6	15.6																						
8-Oct	12.4	11.9	11.5	11.3	11.0	10.6	10.4	10.2	10.9	12.1	14.0	16.6	18.4	20.3	22.5	24.1	24.2	23.8	22.8	21.2	18.4	17.3	16.3	15.3	16.1	24.2																						
9-Oct	14.5	13.5	12.8	11.8	11.1	10.1	9.4	9.2	9.4	10.1	11.5	13.4	15.1	16.6	17.7	18.7	19.3	19.0	17.5	16.9	16.5	16.2	15.2	14.8	14.2	19.3																						
10-Oct	14.0	13.1	12.0	11.6	11.2	10.5	9.9	9.6	9.6	10.3	11.7	13.3	15.4	16.8	18.1	19.3	19.8	19.0	18.7	17.8	17.0	16.2	15.4	14.7	14.4	19.8																						
11-Oct	14.0	13.0	12.0	11.0	10.0	9.3	8.6	8.3	8.5	9.4	10.6	12.3	14.1	15.7	16.9	17.3	17.0	15.9	14.3	13.1	12.4	11.7	11.1	10.5	12.4	17.3																						
12-Oct	10.0	9.4	9.0	8.7	8.0	7.6	7.0	6.9	7.1	8.2	9.7	11.7	13.8	15.8	17.3	18.2	18.2	17.8	17.3	16.3	14.2	12.6	11.4	10.6	11.9	18.2																						
13-Oct	10.1	9.5	8.5	7.8	6.8	5.6	4.1	4.2	3.2	4.4	5.0	5.6	6.4	6.9	7.9	8.6	9.2	9.2	8.5	7.8	7.7	7.4	7.3	7.3	7.0	10.1																						
14-Oct	7.0	6.5	6.1	6.3	6.1	5.8	5.5	5.4	5.7	6.7	8.2	9.6	10.5	11.6	12.6	13.2	13.4	12.9	12.1	11.0	10.5	9.8	9.0	8.1	8.9	13.4																						
15-Oct	7.4	6.9	6.6	5.9	5.5	5.1	4.8	4.6	4.4	4.9	6.1	7.5	8.6	9.6	9.8	10.6	11.5	11.4	11.6	11.4	11.1	10.6	9.9	10.3	8.2	11.6																						
16-Oct	10.5	10.5	9.7	8.8	8.1	7.7	7.2	6.9	7.2	8.0	9.4	11.6	14.0	15.5	16.4	16.8	16.6	16.1	15.8	15.2	15.0	14.1	12.5	11.8	11.9	16.8																						
17-Oct	11.5	10.4	10.2	9.5	10.5	9.0	7.4	6.2	5.0	5.5	6.1	6.8	6.4	5.8	5.6	5.4	3.8	3.4	3.4	3.5	3.6	3.6	3.7	3.9	6.3	11.5																						
18-Oct	3.8	3.3	3.1	3.4	5.1	5.7	6.0	6.6	6.6	7.5	8.7	9.6	9.9	10.5	11.3	12.4	14.0	15.2	16.1	15.5	14.3	14.1	13.3	12.9	9.5	16.1																						
19-Oct	11.8	10.9	10.3	10.1	10.2	10.1	10.1	10.0	10.2	10.8	12.0	13.5	14.7	15.8	16.5	16.1	16.0	15.6	15.0	13.5	13.2	13.1	12.9	11.8	12.7	16.5																						
20-Oct	10.4	9.7	8.7	8.6	8.0	8.1	7.6	8.3	7.7	9.3	10.0	11.2	12.0	12.3	12.5	12.5	11.3	8.6	6.7	5.5	4.8	4.1	3.8	3.9	8.6	12.5																						
21-Oct	3.8	3.9	3.2	2.3	2.4	2.0	2.2	2.5	2.6	3.3	3.0	4.8	4.7	4.7	1.9	-0.3	-1.4	-2.9	-3.7	-4.1	-4.5	-4.5	-4.2	-4.4	0.7	4.8																						
22-Oct	-4.9	-5.4	-6.0	-6.2	-6.6	-6.7	-6.9	-7.1	-6.7	-5.4	-5.7	-4.6	-4.4	-4.2	-4.1	-4.2	-4.1	-4.2	-4.3	-4.1	-4.6	-5.4	-6.1	-6.8	-5.4	-4.1																						
23-Oct	-7.2	-7.8	-8.4	-8.6	-8.9	-9.3	-9.8	-9.5	-9.7	-8.5	-7.5	-6.7	-5.4	-4.9	-4.5	-4.3	-4.3	-4.9	-5.2	-5.4	-5.8	-6.3	-6.8	-7.3	-7.0	-4.3																						
24-Oct	-7.5	-7.5	-7.8	-7.9	-8.3	-8.9	-9.7	-10.4	-10.1	-8.9	-7.9	-7.1	-6.6	-6.0	-5.6	-5.5	-5.3	-5.6	-5.5	-5.3	-5.4	-5.4	-5.6	-5.7	-7.1	-5.3																						
25-Oct	-5.8	-5.6	-5.5	-5.7	-5.7	-5.8	-6.2	-6.1	-6.0	-6.0	-5.9	-5.1	-4.3	-3.7	-3.5	-3.2	-3.2	-3.2	-3.4	-4.5	-4.8	-5.2	-5.4	-5.2	-5.0	-3.2																						
26-Oct	-5.1	-5.1	-5.1	-5.2	-5.4	-5.1	-5.3	-5.0	-4.4	-3.7	-3.7	-3.1	-2.2	-1.6	-1.3	-0.7	-0.8	-0.9	-1.7	-1.4	-1.4	-1.8	-2.2	-2.6	-3.1	-0.7																						
27-Oct	-2.7	-2.6	-2.9	-4.2	-4.6	-4.7	-5.0	-5.5	-5.6	-5.2	-5.1	-5.0	-4.5	-3.6	-3.3	-3.6	-3.8	-3.8	-3.9	-3.9	-4.0	-4.3	-4.3	-4.5	-4.2	-2.6																						
28-Oct	-4.8	-5.3	-5.9	-6.0	-6.2	-6.0	-5.9	-5.7	-5.3	-5.2	-4.8	-4.1	-3.7	-3.0	-2.5	-1.9	-1.2	-0.4	0.0	0.2	0.1	-0.1	-0.4	-0.4	-3.3	0.2																						
29-Oct	-0.3	-0.3	-0.5	-0.7	-0.7	-0.9	-1.1	-1.2	-1.4	-1.7	-1.8	-2.1	-2.2	-2.1	-1.5	-0.9	-0.8	-0.9	-2.0	-3.3	-4.3	-4.6	-4.2	-4.5	-1.8	-0.3																						
30-Oct	-4.5	-5.0	-5.6	-6.3	-7.1	-7.6	-8.1	-8.0	-7.7	-7.5	-6.6	-5.6	-4.6	-3.8	-3.0	-2.6	-2.4	-2.5	-2.4	-2.4	-2.4	-1.9	-1.7	-2.1	-4.6	-1.7																						
31-Oct	-2.4	-2.2	-2.1	-1.7	-1.3	-1.4	-1.7	-2.1	-2.7	-2.9	-2.7	-2.3	-2.1	-1.6	-1.3	-1.4	-1.4	-1.7	-2.0	-1.7	-2.1	-2.5	-2.4	-2.2	-2.0	-1.3																						
																								4.8	4.3	3.9	3.6	3.3	3.0	2.7	2.5	2.6	3.2	4.0	5.0	6.0	6.7	7.3	7.7	7.8	7.6	7.2	6.7	6.2	5.7	5.3	4.9	Diurnal Average
																								14.5	13.5	12.8	11.8	11.2	10.6	10.4	10.2	10.9	12.1	14.0	16.6	18.4	20.3	22.5	24.1	24.2	23.8	22.8	21.2	18.4	17.3	16.4	15.3	Diurnal Maximum



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	256	34.41	34.41
0 - 10	250	33.60	68.01
10 - 20	231	31.05	99.06
> 20	7	0.94	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

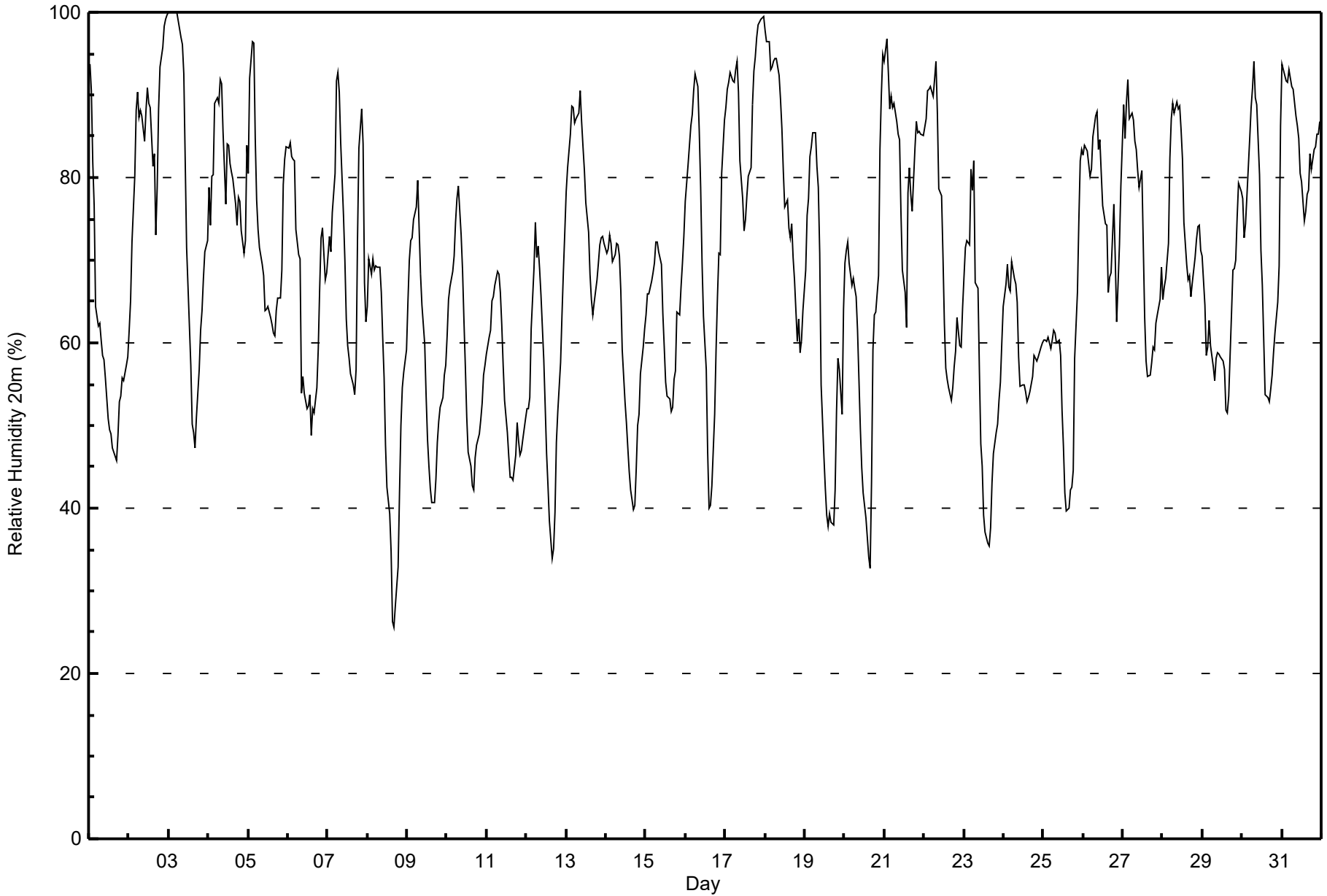
Relative Humidity 20m (RH20m) - %
Lower Camp Met Tower - October 2023

Maximum Value: 100.0 % on Oct 3 02:00																						Maximum Daily Average: 89.2 % on Oct 17																						Hours in Service: 744			
Minimum Value: 25.5 % on Oct 8 17:00																						Minimum Daily Average: 53.0 % on Oct 8																						Hours of Data: 744			
Maximum Diurnal Average: 80.5 % at hour 7																						Minimum Diurnal Average: 54.1 % at hour 16																						Hours of Missing Data: 0			
Monthly Average: 68.83 %																						Percentiles: P ₁ = 34.9 P ₁₀ = 47.5 Q ₁ = 57.2 Median = 68.8 Q ₃ = 82.0 P ₉₀ = 90.2 P ₉₉ = 99.4																						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-Oct	93.7	90.6	81.9	76.6	64.5	62.1	62.4	60.3	58.4	58.0	55.7	50.9	49.4	49.0	47.3	46.7	45.8	48.8	53.0	53.5	55.7	55.4	57.4	58.4	59.8	93.7																					
2-Oct	61.5	65.1	72.2	80.2	88.1	90.4	87.3	88.2	87.5	84.5	88.2	90.8	89.0	88.4	81.4	82.8	73.0	78.9	88.3	93.3	95.7	98.2	99.1	99.6	85.5	99.6																					
3-Oct	99.9	100.0	100.0	100.0	100.0	100.0	99.0	96.9	96.1	92.5	82.1	71.5	62.0	57.2	50.2	49.2	47.3	51.0	56.7	61.5	63.9	67.8	71.1	72.4	77.0	100.0																					
4-Oct	78.9	74.2	80.1	80.3	89.0	89.7	89.0	91.8	91.3	85.6	76.8	84.1	83.8	81.7	80.6	79.8	76.8	74.2	77.7	77.2	73.5	70.9	72.4	83.9	81.0	91.8																					
5-Oct	80.5	92.1	96.4	96.3	84.8	77.3	73.7	71.5	69.5	68.1	63.9	64.1	64.3	63.1	62.2	61.1	60.9	64.0	65.3	65.4	68.8	79.1	82.2	83.7	73.3	96.4																					
6-Oct	83.6	84.3	82.6	82.2	82.1	73.7	70.7	70.2	54.0	55.9	53.9	52.1	52.4	53.7	48.9	52.1	51.5	54.6	59.4	66.6	72.6	73.9	67.6	68.4	65.3	84.3																					
7-Oct	70.6	72.8	70.9	75.8	80.5	91.8	92.8	90.3	84.2	75.4	69.9	62.8	59.7	58.2	56.3	55.0	53.6	56.7	72.3	83.6	88.2	84.1	67.3	62.5	72.3	92.8																					
8-Oct	64.4	70.1	68.4	70.2	68.8	69.3	69.1	69.1	66.2	60.8	55.8	47.6	42.5	39.3	34.8	26.2	25.5	28.2	32.9	41.9	50.0	54.6	56.4	59.1	53.0	70.2																					
9-Oct	65.0	70.1	72.4	72.7	74.9	76.5	79.7	73.8	68.3	64.7	59.9	53.5	48.4	45.0	42.4	40.6	40.7	43.5	47.9	50.5	52.2	53.4	56.1	57.3	58.7	79.7																					
10-Oct	60.8	65.3	66.8	68.7	70.5	74.6	77.4	79.0	73.0	68.8	62.7	57.0	51.0	46.8	45.0	42.7	42.3	46.0	47.7	49.0	50.6	52.6	56.1	57.2	58.8	79.0																					
11-Oct	58.7	60.6	61.6	65.1	65.6	67.0	68.6	68.4	66.0	62.3	57.3	53.0	49.2	46.3	43.8	43.8	43.4	46.5	50.3	48.2	46.5	47.0	48.3	50.9	54.9	68.6																					
12-Oct	52.1	52.1	53.3	61.7	69.1	74.6	70.4	71.8	69.0	65.7	58.0	52.3	46.6	42.7	38.5	33.9	35.1	39.6	48.0	51.8	57.6	63.5	68.6	73.4	56.2	74.6																					
13-Oct	78.3	81.2	85.3	88.7	88.5	86.6	87.1	87.9	90.5	86.8	83.8	80.9	76.9	73.5	68.3	65.2	63.4	64.9	67.7	69.7	71.8	72.7	72.8	72.0	77.7	90.5																					
14-Oct	70.8	71.4	73.1	72.0	69.9	70.7	72.0	71.9	70.4	66.2	59.2	52.8	50.3	47.4	44.3	42.3	39.8	40.3	44.8	50.0	51.3	56.3	59.5	61.6	58.7	73.1																					
15-Oct	63.3	65.9	65.9	67.4	68.5	69.7	72.2	72.1	71.0	69.6	63.6	59.5	55.2	53.6	53.2	51.7	52.1	55.5	56.7	63.7	63.3	66.8	69.6	72.8	63.5	72.8																					
16-Oct	77.1	81.5	83.9	86.4	87.7	90.5	92.5	91.1	85.6	78.8	69.6	63.2	56.8	46.7	40.1	40.3	42.8	51.4	59.2	65.6	70.8	70.7	80.5	87.0	70.8	92.5																					
17-Oct	88.5	90.8	91.5	92.7	91.7	91.5	93.0	94.1	90.3	82.0	77.4	73.5	74.9	77.8	80.2	81.2	88.8	92.9	94.6	96.9	98.5	99.1	99.3	99.5	89.2	99.5																					
18-Oct	97.7	96.5	96.4	93.1	93.4	94.1	94.5	94.5	92.3	89.5	85.9	80.8	76.5	77.2	74.0	72.6	74.5	70.3	67.6	60.2	62.9	58.8	60.3	63.9	80.3	97.7																					
19-Oct	68.7	75.5	77.5	82.5	83.7	85.4	85.5	81.3	78.9	70.9	55.0	46.2	42.4	39.2	37.8	39.3	38.3	37.9	42.3	51.6	58.1	56.8	51.3	64.0	60.4	85.5																					
20-Oct	69.7	71.2	72.2	69.6	66.9	67.8	66.5	65.6	61.5	49.6	44.9	41.9	40.3	38.8	34.0	32.7	43.2	59.2	63.4	63.6	68.2	83.4	90.0	94.9	60.8	94.9																					
21-Oct	94.1	96.8	92.8	88.3	89.8	88.4	89.1	86.8	85.3	84.6	75.8	68.8	66.1	61.9	78.1	81.2	78.0	75.9	83.5	86.8	85.4	85.6	85.3	85.0	83.1	96.8																					
22-Oct	86.2	87.1	90.5	90.6	90.9	89.8	91.9	94.1	87.7	78.6	77.8	70.5	62.4	57.0	55.7	54.6	53.0	54.6	57.1	58.9	63.1	59.7	59.5	64.3	72.3	94.1																					
23-Oct	68.0	71.5	72.3	71.9	81.1	78.5	82.1	67.3	66.5	56.5	47.8	45.0	39.2	37.1	35.8	35.4	37.6	43.1	46.6	49.1	50.2	53.1	55.3	60.1	56.3	82.1																					
24-Oct	64.3	67.1	69.4	66.8	66.3	69.8	67.9	67.2	65.0	58.3	54.7	54.9	55.0	54.0	52.8	53.4	54.1	56.0	58.5	58.1	57.9	58.4	59.5	59.9	60.4	69.8																					
25-Oct	60.3	60.4	60.1	60.7	59.4	60.3	61.5	61.1	60.1	60.3	58.4	51.9	47.4	41.8	39.6	40.0	42.2	42.5	44.6	58.1	66.1	74.7	82.0	83.4	57.4	83.4																					
26-Oct	82.8	83.8	83.2	81.6	80.2	81.1	85.0	87.4	88.0	83.5	84.7	80.5	76.6	74.4	74.2	66.2	68.0	68.5	76.7	70.2	62.6	67.2	71.9	79.0	77.4	88.0																					
27-Oct	88.9	84.7	89.2	91.9	87.2	87.9	87.0	84.5	83.4	80.8	78.8	80.9	71.9	63.1	57.8	56.0	56.1	57.7	59.4	59.1	62.4	63.4	65.2	69.2	73.6	91.9																					
28-Oct	65.2	66.7	67.9	72.0	82.4	87.2	89.1	87.9	89.1	88.3	88.7	85.7	82.1	74.6	69.5	67.7	68.1	65.7	67.3	70.4	72.6	74.1	74.2	71.2	76.1	89.1																					
29-Oct	70.5	64.6	58.5	59.5	62.7	59.6	57.1	55.4	58.2	58.7	58.6	58.4	57.8	56.7	51.9	51.6	53.5	63.6	68.9	69.0	70.0	75.0	79.3	78.3	62.4	79.3																					
30-Oct	77.5	72.7	74.4	77.7	84.8	88.5	90.9	94.1	89.7	88.8	80.3	71.1	67.0	60.4	53.7	53.3	52.9	54.5	56.2	58.8	61.3	65.0	69.4	86.3	72.0	94.1																					
31-Oct	93.7	93.0	91.6	91.5	93.1	92.1	91.0	90.7	87.5	86.3	84.8	80.5	79.5	74.7	76.0	78.0	78.5	82.9	81.0	83.4	83.7	85.2	85.3	86.8	85.5	93.7																					
																						75.3	76.8	77.5	78.5	79.6	80.2	80.5	79.6	76.9	72.9	68.2	64.1	60.5	57.5	55.1	54.1	54.2	57.1	61.1	64.1	66.3	68.6	70.1	73.1	Diurnal Average	
																						99.9	100.0	100.0	100.0	100.0	100.0	99.0	96.9	96.1	92.5	88.7	90.8	89.0	88.4	81.4	82.8	88.8	92.9	94.6	96.9	98.5	99.1	99.3	99.6	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	25	3.36	3.36
40 - 60	210	28.23	31.59
60 - 80	293	39.38	70.97
80 - 100	211	28.36	99.33

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

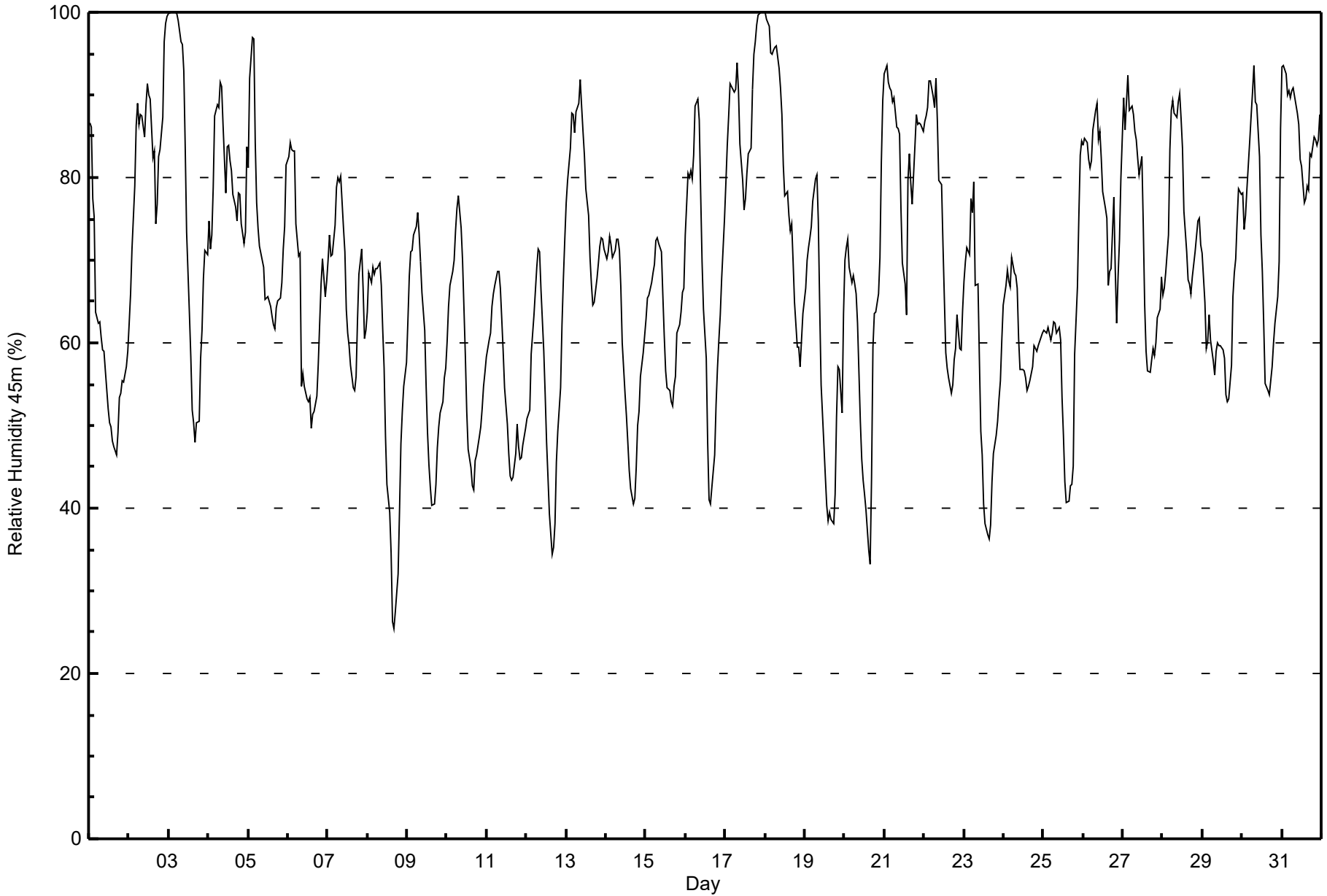
Relative Humidity 45m (RH45m) - %
Lower Camp Met Tower - October 2023

Maximum Value: 100.0 % on Oct 3 02:00 Maximum Daily Average: 89.3 % on Oct 17 Minimum Value: 25.4 % on Oct 8 17:00 Minimum Daily Average: 52.4 % on Oct 8 Maximum Diurnal Average: 79.5 % at hour 7 Minimum Diurnal Average: 54.7 % at hour 17 Monthly Average: 68.49 % Percentiles: P ₁ = 35.1 P ₁₀ = 47.7 Q ₁ = 57.2 Median = 68.2 Q ₃ = 81.1 P ₉₀ = 89.1 P ₉₉ = 99.9																						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-Oct	86.6	86.2	77.5	75.2	63.7	62.3	62.5	60.6	59.2	58.9	56.6	52.0	50.4	49.9	48.2	47.5	46.5	49.1	53.3	53.9	55.4	55.3	57.2	59.0	59.5	86.6
2-Oct	62.3	65.9	71.4	78.9	86.3	89.0	86.4	87.6	87.5	84.9	88.9	91.4	90.0	89.6	82.4	83.3	74.4	76.8	82.5	83.5	87.4	96.4	98.7	99.5	84.4	99.5
3-Oct	99.9	100.0	100.0	100.0	100.0	99.9	99.0	96.4	96.0	92.9	83.7	73.3	63.6	58.3	51.9	50.4	48.0	50.4	50.5	58.1	61.6	67.8	71.2	70.6	76.8	100.0
4-Oct	74.7	71.3	73.0	78.9	87.5	88.8	88.4	91.5	91.1	86.4	78.2	83.7	83.9	82.0	80.9	78.0	76.5	74.7	78.2	78.0	74.4	72.0	73.5	83.8	80.4	91.5
5-Oct	81.1	92.1	97.0	96.8	84.3	76.9	73.8	71.7	70.0	69.1	65.3	65.4	65.6	64.4	63.3	62.2	61.8	64.2	65.2	65.4	67.3	71.4	74.1	81.6	72.9	97.0
6-Oct	82.5	84.2	83.5	83.2	83.2	74.4	70.5	70.8	54.8	56.3	54.8	53.2	53.0	53.5	49.6	51.4	51.7	53.6	57.4	62.3	67.1	70.2	65.7	67.4	64.8	84.2
7-Oct	70.0	73.1	70.5	70.6	74.3	78.8	80.1	79.4	80.2	73.9	71.0	64.1	61.3	59.6	57.3	54.7	54.2	55.9	62.7	68.3	71.3	66.6	60.4	61.5	67.5	80.2
8-Oct	63.7	68.5	67.3	69.1	68.3	69.0	69.0	69.6	66.9	61.7	57.0	48.6	42.9	39.4	34.5	26.3	25.4	27.5	32.0	39.6	47.7	51.7	54.7	57.6	52.4	69.6
9-Oct	62.8	68.1	71.0	71.2	73.0	74.1	75.7	73.2	69.9	66.0	61.5	54.8	49.2	45.2	42.6	40.3	40.6	42.9	47.3	49.9	51.5	52.8	55.7	57.0	58.2	75.7
10-Oct	60.2	64.4	66.9	68.6	69.9	73.5	76.3	77.8	73.8	70.0	64.2	58.6	51.7	47.2	45.0	42.8	42.2	45.7	46.5	48.6	49.8	52.1	54.7	56.5	58.6	77.8
11-Oct	58.3	60.3	61.2	64.4	65.9	67.0	68.7	68.6	66.6	62.8	58.9	54.5	50.2	46.5	43.8	43.3	43.8	46.7	50.2	47.5	45.9	46.2	47.7	49.6	54.9	68.7
12-Oct	50.8	51.4	51.9	58.6	63.4	66.3	69.2	71.3	71.0	66.5	59.0	53.8	47.9	43.8	39.3	34.5	35.2	38.2	45.5	49.3	54.6	62.1	67.8	72.6	55.2	72.6
13-Oct	76.9	79.6	83.5	87.8	87.7	85.4	88.0	89.0	91.9	88.7	85.6	82.7	78.7	75.4	70.4	67.0	64.7	64.9	67.8	69.6	71.6	72.7	72.6	71.3	78.1	91.9
14-Oct	70.1	71.1	72.8	71.9	70.4	71.3	72.5	72.5	71.2	66.8	60.0	53.9	51.1	48.0	44.6	42.3	40.5	41.1	44.9	50.0	51.7	55.9	58.8	60.8	58.9	72.8
15-Oct	62.8	65.4	65.7	67.3	68.5	69.6	72.4	72.6	72.1	71.0	65.8	60.8	56.7	54.6	54.3	52.8	52.3	54.7	55.9	61.1	62.2	63.8	66.1	66.6	63.1	72.6
16-Oct	73.1	80.4	80.0	80.8	79.9	82.6	88.6	89.4	87.0	78.1	69.8	64.0	58.1	48.0	41.1	40.5	42.5	46.4	52.5	57.0	60.4	63.3	67.8	74.9	66.9	89.4
17-Oct	79.4	84.0	87.5	91.3	90.7	90.4	90.7	93.9	90.5	84.0	79.6	76.1	77.4	80.5	82.8	83.6	90.7	94.9	96.5	98.4	99.6	100.0	100.0	100.0	89.3	100.0
18-Oct	100.0	99.2	98.3	95.1	94.9	95.5	95.8	95.9	93.3	90.9	87.6	81.5	77.8	78.4	75.4	73.6	74.3	69.9	64.9	59.4	59.5	57.2	60.3	63.6	80.9	100.0
19-Oct	66.5	70.0	71.5	72.7	74.0	77.1	79.9	80.3	74.8	64.2	54.9	47.7	43.8	40.3	38.5	39.5	38.6	38.1	41.6	51.0	57.1	56.8	51.5	63.6	58.1	80.3
20-Oct	70.1	71.5	72.5	69.2	67.4	68.1	67.1	66.0	62.4	50.6	46.0	43.3	41.7	39.9	35.0	33.2	43.6	59.4	63.5	63.7	65.9	70.3	81.9	89.3	60.1	89.3
21-Oct	92.6	93.6	91.5	90.8	90.4	89.2	89.6	86.1	85.9	85.3	76.3	69.6	67.1	63.3	79.6	82.8	79.3	76.8	83.9	87.7	86.5	86.6	86.4	85.6	83.6	93.6
22-Oct	86.7	87.5	88.5	91.7	91.8	89.8	88.4	92.0	86.8	79.7	79.2	71.9	65.3	58.8	56.9	55.7	53.9	54.9	57.9	59.4	63.3	59.4	59.1	63.9	72.6	92.0
23-Oct	67.4	69.8	71.6	70.6	77.5	75.8	79.5	66.9	67.2	58.0	49.4	46.5	40.6	38.1	36.8	36.2	38.0	43.3	46.6	48.8	50.5	53.3	55.4	60.4	56.2	79.5
24-Oct	64.6	67.0	68.8	67.4	66.7	70.3	68.5	68.1	66.7	60.4	56.8	56.8	56.6	55.7	54.3	54.7	55.4	57.1	59.7	59.3	59.0	59.6	60.7	61.2	61.5	70.3
25-Oct	61.5	61.4	61.1	61.8	60.4	61.2	62.6	62.3	61.2	61.8	60.3	53.5	48.8	43.3	40.7	40.9	42.7	42.8	45.1	58.7	66.8	75.2	82.8	84.5	58.4	84.5
26-Oct	83.8	84.7	84.2	82.3	81.1	82.1	85.8	88.1	89.0	84.5	85.6	82.4	78.3	76.3	75.1	67.0	68.7	69.0	77.6	68.8	62.4	68.0	72.4	79.9	78.2	89.0
27-Oct	89.6	85.7	89.2	92.4	88.1	88.6	87.6	85.5	84.6	82.4	80.3	82.6	74.3	64.5	58.9	56.6	56.4	58.0	59.3	58.4	60.1	63.0	64.1	67.9	74.1	92.4
28-Oct	65.8	66.6	68.6	73.1	83.4	88.1	89.3	87.9	87.3	89.1	90.1	87.1	83.5	76.0	71.0	67.7	67.1	65.9	68.0	71.0	72.9	74.7	75.0	71.9	76.7	90.1
29-Oct	70.9	65.0	59.3	60.1	63.5	60.3	57.8	56.1	59.0	60.0	59.6	59.7	59.2	58.1	53.8	53.0	53.3	57.3	65.5	68.5	70.1	74.7	78.6	78.0	62.6	78.6
30-Oct	78.1	73.7	75.4	78.7	84.4	87.5	90.3	93.6	89.1	88.8	82.6	73.0	68.7	62.2	55.1	54.2	53.7	55.4	57.2	59.9	62.4	65.6	69.9	85.9	72.7	93.6
31-Oct	93.4	93.5	92.6	90.0	90.6	89.6	90.5	90.9	88.9	87.8	86.5	82.2	81.4	77.0	77.5	78.9	78.5	82.9	82.5	84.9	84.6	83.8	84.6	87.6	85.9	93.5
	74.4	76.0	76.6	77.8	78.4	78.8	79.5	79.2	77.3	73.6	69.5	65.4	61.9	58.6	56.1	54.7	54.7	56.7	60.1	62.6	64.5	66.7	68.7	72.1	Diurnal Average	
	100.0	100.0	100.0	100.0	100.0	99.9	99.0	96.4	96.0	92.9	90.1	91.4	90.0	89.6	82.8	83.6	90.7	94.9	96.5	98.4	99.6	100.0	100.0	100.0	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	22	2.96	2.96
40 - 60	207	27.82	30.78
60 - 80	320	43.01	73.79
80 - 100	188	25.27	99.06

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

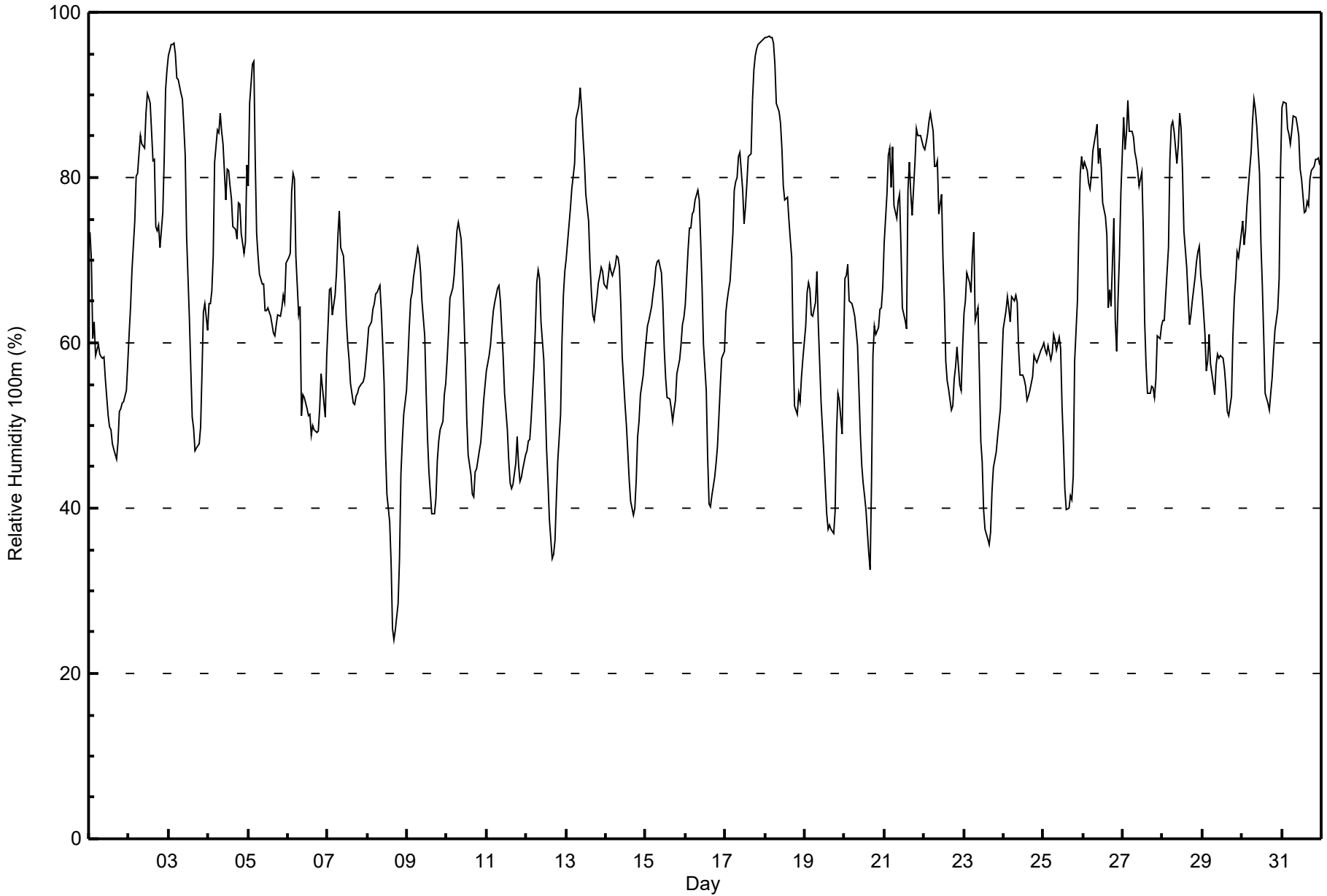
Relative Humidity 100m (RH100m) - %
Lower Camp Met Tower - October 2023

Maximum Value: 97.1 % on Oct 18 03:00 Maximum Daily Average: 82.9 % on Oct 31																						Hours in Service: 744 Hours of Data: 744				
Minimum Value: 24.0 % on Oct 8 17:00 Minimum Daily Average: 49.4 % on Oct 8 Maximum Diurnal Average: 74.7 % at hour 7 Minimum Diurnal Average: 53.1 % at hour 17 Monthly Average: 65.02 % Percentiles: P ₁ = 34.1 P ₁₀ = 46.0 Q ₁ = 54.3 Median = 64.3 Q ₃ = 76.6 P ₉₀ = 85.2 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-Oct	73.3	70.2	60.5	62.5	58.5	59.8	58.7	58.3	58.2	58.4	55.6	51.2	49.8	49.5	47.8	47.1	45.9	47.9	51.7	52.1	52.7	52.9	54.3	57.7	55.6	73.3
2-Oct	61.2	64.5	68.8	74.8	80.1	80.5	82.8	85.0	84.2	83.6	87.8	90.1	89.6	89.0	82.0	82.1	74.0	73.5	74.3	71.6	75.8	82.3	90.7	93.1	80.1	93.1
3-Oct	94.8	96.1	96.1	96.3	95.0	92.1	91.8	90.1	89.4	86.3	82.8	72.9	62.9	56.7	51.0	49.6	46.9	47.3	47.8	49.8	56.4	63.7	64.8	61.5	72.6	96.3
4-Oct	64.8	64.7	66.3	70.6	81.8	85.8	85.5	87.9	85.5	84.0	77.4	81.0	80.9	78.9	77.4	74.0	73.7	72.6	76.9	76.8	73.2	70.8	72.1	81.5	76.8	87.9
5-Oct	79.0	88.9	93.8	94.1	82.1	73.2	70.6	68.3	67.2	67.1	63.8	63.9	64.2	63.2	62.2	61.2	60.8	62.2	63.4	63.2	64.2	65.8	64.8	69.7	69.9	94.1
6-Oct	70.3	70.9	78.3	80.6	79.9	70.5	63.4	64.4	51.3	53.7	53.3	52.0	51.1	51.3	48.8	50.0	49.5	49.2	49.3	52.0	56.3	54.5	51.0	58.3	58.7	80.6
7-Oct	62.3	66.4	66.7	63.3	65.8	68.4	72.9	76.0	71.6	70.5	67.3	62.9	60.0	58.0	55.1	52.7	52.5	53.6	54.0	54.6	55.0	55.2	55.9	57.7	61.6	76.0
8-Oct	59.7	61.9	62.5	64.0	64.7	65.9	66.2	66.9	64.0	59.8	55.1	47.0	41.6	38.4	33.4	25.4	24.0	25.3	28.5	33.9	44.0	48.2	51.3	54.3	49.4	66.9
9-Oct	58.1	62.1	65.2	66.1	68.0	70.4	71.6	70.6	68.6	65.1	60.9	54.1	48.5	44.3	41.8	39.4	39.3	41.1	45.8	48.2	49.5	50.5	53.6	55.2	55.7	71.6
10-Oct	58.0	61.4	65.3	66.6	68.2	70.9	73.5	74.6	72.6	69.0	63.5	57.9	50.8	46.4	44.0	41.8	41.3	44.4	44.8	46.9	48.0	50.1	52.9	54.8	57.0	74.6
11-Oct	56.6	58.4	59.8	62.0	63.9	65.0	66.6	66.9	65.1	61.8	58.3	53.9	49.6	45.8	43.1	42.4	42.9	45.5	48.7	45.2	43.2	43.7	44.8	46.4	53.3	66.9
12-Oct	47.0	48.2	48.3	50.9	57.1	61.8	67.4	68.9	67.9	62.5	57.9	52.9	47.2	43.2	38.7	33.9	34.4	36.2	41.2	45.8	51.4	60.4	65.8	68.6	52.4	68.9
13-Oct	70.2	72.2	76.2	78.6	80.1	81.6	87.1	88.6	90.9	88.2	85.0	82.1	77.9	74.7	69.6	66.2	63.4	62.6	65.5	67.2	68.1	69.1	68.7	67.1	75.0	90.9
14-Oct	66.5	68.0	69.5	68.6	68.2	69.3	70.6	70.4	69.1	64.6	58.3	52.6	49.9	46.8	43.3	40.9	39.1	40.0	43.5	48.7	50.4	53.7	56.1	58.3	56.9	70.6
15-Oct	60.1	62.0	62.7	64.4	65.9	67.1	69.2	69.8	69.9	68.5	64.7	59.3	55.7	53.4	53.3	52.0	50.5	51.9	53.0	56.3	57.9	59.8	62.3	63.0	60.5	69.9
16-Oct	64.5	71.2	73.9	73.9	75.6	75.9	77.2	78.4	77.2	72.3	66.8	59.8	54.3	46.1	40.5	40.1	41.6	43.7	45.5	47.5	51.1	54.7	58.2	59.0	60.4	78.4
17-Oct	63.6	65.2	66.4	67.5	73.3	78.4	79.5	79.9	82.6	83.0	78.5	74.4	76.4	79.3	82.5	82.9	89.3	93.1	94.8	95.7	96.2	96.4	96.6	96.9	82.2	96.9
18-Oct	97.0	97.0	97.1	97.0	97.0	96.3	93.8	88.9	87.9	86.7	83.5	78.9	77.3	77.6	74.9	72.6	70.4	59.9	52.4	51.3	53.8	52.9	55.9	58.1	77.4	97.1
19-Oct	62.0	66.2	67.2	66.4	63.3	63.2	65.0	68.7	62.1	57.4	52.8	46.4	42.7	39.4	37.5	37.9	37.4	37.0	39.6	49.2	53.8	53.0	49.0	59.3	53.2	68.7
20-Oct	67.8	68.2	69.5	65.0	64.7	64.0	63.2	61.5	59.6	49.0	45.3	43.0	41.6	39.8	34.7	32.6	43.4	58.5	62.1	61.0	61.9	64.0	64.3	66.7	56.3	69.5
21-Oct	72.0	78.0	82.8	83.5	78.9	83.8	76.6	75.2	77.0	77.9	71.8	64.3	62.7	61.7	78.5	81.9	78.1	75.5	81.9	86.0	85.1	85.1	85.1	83.8	77.8	86.0
22-Oct	83.5	84.2	85.2	86.7	87.9	85.6	81.4	81.3	82.0	75.6	78.0	70.2	65.0	57.8	55.5	54.3	51.8	52.3	55.6	57.1	59.5	54.9	54.2	59.3	69.1	87.9
23-Oct	63.5	65.1	68.5	67.2	66.1	70.7	73.5	62.7	64.3	56.4	48.2	45.6	39.8	37.5	36.2	35.5	37.2	42.0	44.9	46.7	48.7	50.4	52.0	57.2	53.3	73.5
24-Oct	61.8	63.9	65.6	64.3	62.5	65.6	65.1	65.7	64.9	59.3	56.0	56.0	55.6	54.7	53.1	53.6	54.2	55.9	58.4	58.0	57.6	58.2	59.2	59.6	59.5	65.7
25-Oct	60.0	59.1	58.6	59.6	57.9	58.8	61.0	60.3	59.1	60.7	59.4	52.3	47.9	42.3	39.9	40.0	41.5	41.1	43.9	57.7	65.1	73.9	80.5	82.5	56.8	82.5
26-Oct	81.0	81.9	80.8	79.3	78.7	80.3	83.3	85.3	86.5	81.6	83.5	81.3	77.0	75.2	73.1	64.2	66.5	64.4	75.0	62.7	59.0	65.4	70.6	78.2	75.6	86.5
27-Oct	87.3	83.3	85.4	89.4	85.6	85.6	84.9	83.0	82.2	80.8	79.0	80.7	73.7	62.5	57.3	53.9	53.9	54.8	54.6	53.4	55.7	60.8	60.5	62.0	71.3	89.4
28-Oct	62.7	62.8	65.8	71.5	82.2	86.2	86.8	85.6	81.8	84.0	87.8	85.9	80.8	73.6	69.2	65.6	62.2	63.4	65.0	67.9	69.9	71.0	71.7	68.2	73.8	87.8
29-Oct	66.5	61.2	56.7	57.8	61.1	57.5	55.1	53.7	57.2	58.6	58.2	58.4	58.1	56.7	54.6	51.6	51.1	53.6	60.8	65.4	67.8	71.0	70.4	73.1	59.8	73.1
30-Oct	74.8	71.9	73.6	76.6	81.0	83.0	86.7	89.4	88.2	86.3	80.4	72.1	66.9	60.7	53.9	52.7	51.8	54.0	55.7	58.8	61.5	64.1	67.7	81.3	70.6	89.4
31-Oct	88.4	89.2	88.9	85.9	85.3	84.1	85.6	87.4	87.4	86.3	85.0	81.1	79.8	75.8	76.0	77.1	76.6	79.8	80.9	81.4	82.3	82.2	82.4	81.4	82.9	89.2
69.0 70.5 71.8 72.7 73.6 74.2 74.7 74.6 73.4 70.9 67.9 64.0 60.6 57.4 55.1 53.4 53.1 54.3 56.8 58.5 60.5 62.5 64.1 66.9																								Diurnal Average		
97.0 97.0 97.1 97.0 97.0 96.3 93.8 90.1 90.9 88.2 87.8 90.1 89.6 89.0 82.5 82.9 89.3 93.1 94.8 95.7 96.2 96.4 96.6 96.9																								Diurnal Maximum		



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	30	4.03	4.03
40 - 60	258	34.68	38.71
60 - 80	308	41.40	80.11
80 - 100	148	19.89	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

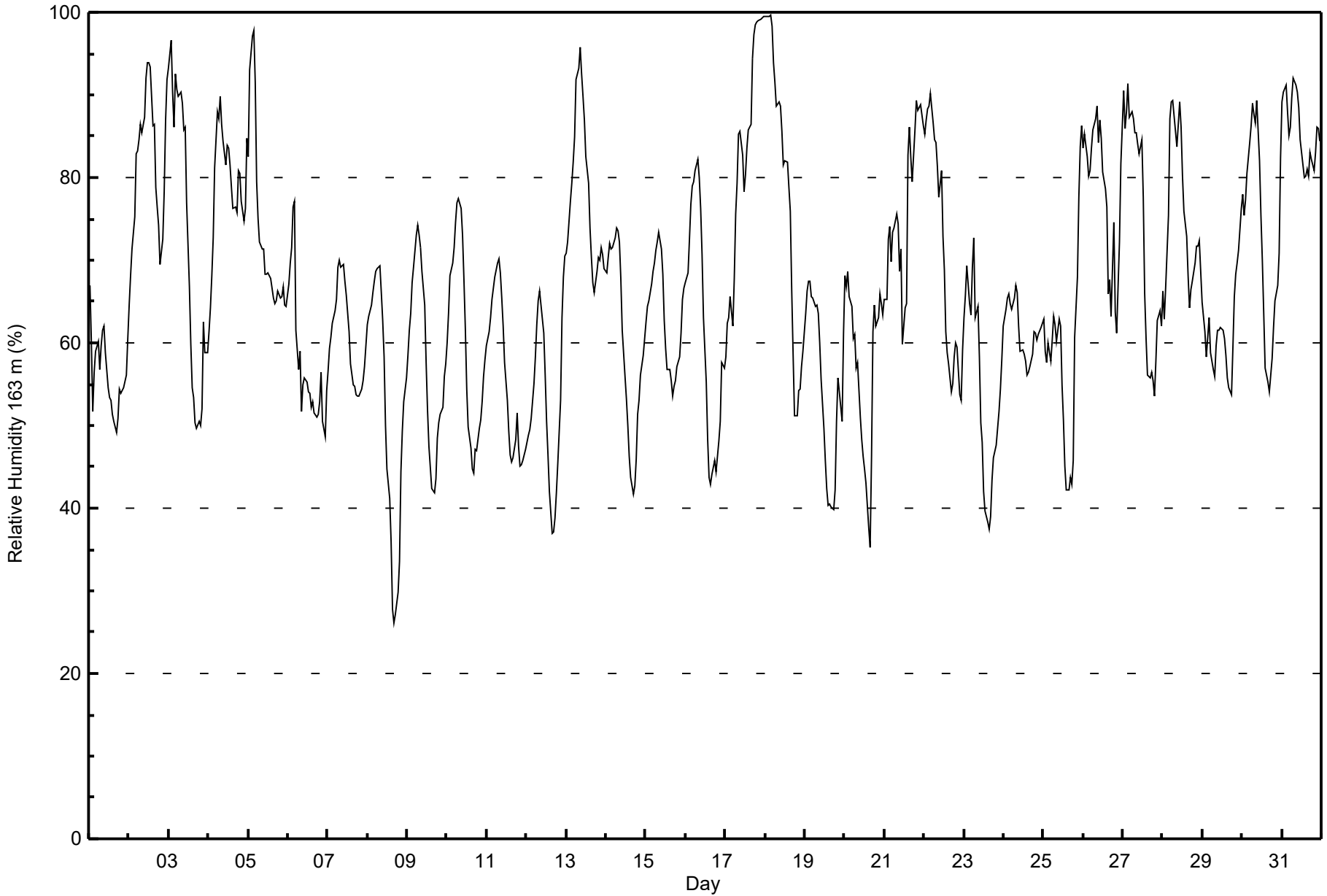
Relative Humidity 163 m (RH163m) - %
Lower Camp Met Tower - October 2023

Maximum Value: 99.7 % on Oct 18 04:00 Maximum Daily Average: 85.7 % on Oct 31 Minimum Value: 26.2 % on Oct 8 17:00 Minimum Daily Average: 51.5 % on Oct 8 Maximum Diurnal Average: 75.5 % at hour 8 Minimum Diurnal Average: 55.7 % at hour 17 Monthly Average: 66.64 % Percentiles: P ₁ = 37.0 P ₁₀ = 48.2 Q ₁ = 56.0 Median = 65.2 Q ₃ = 78.0 P ₉₀ = 87.1 P ₉₉ = 99.0																						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-Oct	66.9	60.2	51.8	56.4	59.0	60.1	56.7	59.7	61.5	62.0	58.9	54.6	53.4	53.1	51.3	50.4	49.1	50.8	54.4	53.9	54.2	54.5	56.2	60.6	56.2	66.9																					
2-Oct	64.6	68.1	71.4	75.2	82.9	83.2	84.6	86.5	85.4	87.2	92.0	93.9	94.0	93.3	86.3	86.4	78.8	76.4	74.2	69.5	72.6	78.3	87.0	91.8	81.8	94.0																					
3-Oct	93.2	96.6	90.3	86.1	92.5	90.7	89.8	90.3	89.0	85.7	86.1	76.9	66.7	59.8	54.5	53.5	50.4	49.6	50.5	50.0	52.0	62.5	58.8	58.9	72.3	96.6																					
4-Oct	61.3	64.3	68.2	72.6	81.2	87.9	87.2	89.8	86.5	84.5	81.5	83.9	83.5	81.5	78.8	76.3	76.4	75.7	80.8	80.6	77.2	74.8	76.3	84.7	79.0	89.8																					
5-Oct	82.6	93.0	97.1	97.7	91.6	79.6	75.2	72.2	71.3	71.4	68.3	68.5	67.7	66.6	65.4	64.7	65.1	66.3	65.4	65.7	66.8	64.5	64.5	73.3	97.7	97.7																					
6-Oct	67.1	69.7	71.6	76.4	77.1	61.6	56.8	59.0	51.8	54.9	55.8	55.2	54.1	54.0	52.2	52.9	51.6	51.0	51.3	52.8	56.5	50.5	48.7	54.3	57.8	77.1																					
7-Oct	56.6	59.3	60.7	62.4	64.0	65.2	69.1	69.9	69.2	69.5	67.5	65.7	63.6	61.3	57.5	54.8	54.7	53.7	53.5	53.6	54.4	55.4	57.2	59.7	60.8	69.9																					
8-Oct	62.2	63.2	64.6	66.1	67.4	68.6	68.9	69.4	66.2	62.7	58.3	50.1	44.7	41.2	35.9	27.7	26.2	27.1	29.8	33.5	44.4	49.3	52.9	55.8	51.5	69.4																					
9-Oct	58.5	61.5	63.5	67.3	69.2	73.1	74.2	73.1	71.5	68.7	64.6	57.6	51.9	47.5	44.9	42.3	41.9	43.5	48.4	50.4	51.4	52.2	55.9	57.5	57.9	74.2																					
10-Oct	60.0	63.6	68.2	69.7	71.5	74.5	76.9	77.4	76.3	73.0	67.6	61.7	54.3	49.8	47.3	44.8	44.3	47.1	46.9	49.6	50.7	52.9	56.0	57.9	60.1	77.4																					
11-Oct	59.7	61.3	63.1	65.2	66.7	67.9	69.6	70.1	68.5	65.4	62.1	57.6	53.1	49.3	46.4	45.5	46.0	48.3	51.5	47.5	45.0	45.3	45.8	47.2	56.2	70.1																					
12-Oct	47.9	48.8	49.4	50.8	55.1	58.3	62.2	65.0	66.3	64.6	61.2	56.1	50.5	46.4	42.0	37.0	37.1	38.9	41.9	45.5	53.0	63.0	68.0	70.5	53.3	70.5																					
13-Oct	70.8	72.2	77.1	79.3	81.9	84.9	91.9	93.2	95.8	92.6	89.8	86.9	82.6	79.3	74.0	70.4	67.3	66.1	68.6	70.4	70.1	71.6	70.6	69.0	78.2	95.8																					
14-Oct	68.5	70.4	72.0	71.3	71.5	72.8	73.9	73.6	72.2	67.8	61.5	56.0	53.2	50.0	46.4	43.8	41.7	42.6	46.0	51.3	53.1	56.1	58.5	60.6	59.8	73.9																					
15-Oct	62.6	64.4	65.1	67.1	68.7	69.7	71.3	72.2	73.3	71.3	68.4	62.8	59.3	56.8	56.8	55.4	53.6	54.8	55.5	57.1	58.3	61.2	65.2	66.6	63.2	73.3																					
16-Oct	67.2	68.5	72.5	76.7	79.0	79.5	80.9	82.2	80.0	76.3	70.7	63.1	55.2	48.4	43.8	42.9	44.1	45.8	44.4	46.3	48.2	50.5	57.6	57.0	61.7	82.2																					
17-Oct	58.4	62.4	63.0	65.7	62.1	67.8	75.6	79.3	85.3	85.7	82.7	78.4	80.4	83.5	85.8	86.4	94.4	97.4	98.5	98.9	99.1	99.2	99.3	99.4	82.8	99.4																					
18-Oct	99.5	99.5	99.6	99.7	98.4	93.8	91.5	88.7	89.1	88.6	85.6	81.5	82.0	81.8	78.8	76.0	66.5	58.6	51.1	51.2	54.3	54.5	57.1	58.9	78.6	99.7																					
19-Oct	63.6	66.3	67.4	67.5	65.5	65.4	64.5	64.6	63.5	60.0	55.6	49.6	45.8	42.4	40.4	40.5	40.1	39.8	42.2	50.5	55.8	54.1	50.5	61.2	54.9	67.5																					
20-Oct	68.1	66.9	68.6	65.5	64.5	60.5	61.1	57.0	57.6	51.1	48.4	46.2	44.8	43.1	37.6	35.2	46.3	61.4	64.6	62.0	63.1	65.9	64.7	63.4	57.0	68.6																					
21-Oct	65.3	65.3	72.5	74.0	69.8	73.4	73.9	75.6	74.4	68.7	71.4	59.8	64.3	64.8	82.7	86.2	82.5	79.6	85.8	89.3	88.1	88.4	88.8	86.3	76.3	89.3																					
22-Oct	85.2	86.9	88.3	88.7	90.1	86.7	84.6	84.2	81.3	77.7	80.9	72.9	68.9	61.3	58.7	57.5	54.1	55.1	58.3	59.9	59.5	53.8	53.1	59.1	71.1	90.1																					
23-Oct	63.0	65.7	69.3	64.8	63.5	69.2	72.7	63.0	64.4	58.3	50.4	48.0	42.1	39.7	38.3	37.5	39.0	43.4	46.1	47.6	49.7	51.8	54.4	58.0	54.2	72.7																					
24-Oct	62.1	64.0	65.4	66.0	64.7	64.1	65.5	66.9	66.2	62.1	59.0	59.2	58.7	57.8	56.1	56.5	57.0	58.6	61.3	61.1	60.4	60.9	61.9	62.3	61.6	66.9																					
25-Oct	62.9	59.0	57.6	60.0	57.7	60.3	63.3	62.1	60.1	62.9	62.0	55.0	50.8	45.0	42.2	42.2	43.7	42.8	45.7	60.7	67.9	77.7	83.8	86.3	58.8	86.3																					
26-Oct	83.6	85.3	82.5	80.2	80.9	83.5	85.8	87.1	88.7	84.2	87.0	84.8	80.6	78.7	76.4	66.0	67.7	63.2	74.6	63.7	61.2	66.9	72.2	81.7	77.8	88.7																					
27-Oct	90.4	85.9	87.9	91.4	87.4	87.9	87.1	85.4	85.5	84.0	82.9	84.6	77.7	66.0	60.6	56.0	55.7	56.5	55.4	53.5	57.8	62.7	63.8	62.1	73.7	91.4																					
28-Oct	66.3	62.8	66.7	75.4	87.2	89.2	89.3	87.5	83.7	86.4	89.1	86.1	80.1	75.9	72.9	68.1	64.2	66.5	67.4	69.7	71.8	71.7	72.3	68.6	75.8	89.3																					
29-Oct	65.0	61.4	58.4	60.7	63.1	58.9	56.8	55.9	59.7	61.6	61.5	61.9	61.6	60.5	58.5	55.8	54.6	53.8	59.5	65.5	68.4	69.7	71.2	76.2	61.7	76.2																					
30-Oct	77.9	75.5	77.3	80.4	84.2	86.3	89.0	87.6	86.5	89.2	82.0	75.5	69.9	63.6	56.9	55.3	54.0	56.0	58.2	61.8	65.0	66.9	70.9	82.3	73.0	89.2																					
31-Oct	89.2	90.4	91.2	87.9	85.0	86.1	89.7	92.0	91.2	90.3	88.5	84.6	83.1	79.9	80.2	81.0	80.2	83.1	82.2	80.9	83.0	86.1	85.9	84.5	85.7	92.0																					
																						69.4	70.4	71.7	73.2	74.3	74.5	75.5	75.5	74.9	73.2	71.0	67.0	63.9	60.8	58.4	56.4	55.7	56.5	58.5	59.8	61.7	63.7	65.5	68.0	Diurnal Average	
																						99.5	99.5	99.6	99.7	98.4	93.8	91.9	93.2	95.8	92.6	92.0	93.9	94.0	93.3	86.3	86.4	94.4	97.4	98.5	98.9	99.1	99.2	99.3	99.4	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	16	2.15	2.15
40 - 60	244	32.80	34.95
60 - 80	312	41.94	76.88
80 - 100	172	23.12	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Maximum Speed: 31 km/h on Oct 14 16:00		Maximum Daily Speed Average: 24.6 km/h on Oct 14		Hours in Service: 744																						
Minimum Speed Value: 0 km/h on Oct 7 05:00		Minimum Daily Speed Average: 0.5 km/h on Oct 31		Hours of Data: 743																						
Maximum Diurnal Speed Average: 4.4 km/h at hour 13		Minimum Diurnal Speed Average: 2.2 km/h at hour 21		Hours of Missing Data: 1																						
Monthly Average Velocity: 3.3 km/h 165.8 deg		Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 5 Median = 10 Q ₃ = 15 P ₉₀ = 19 P ₉₉ = 28		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-Oct	SE2	ESE3	SE11	SE13	SSE17	S21	SSE17	SSE17	SSE17	SSE19	SSE18	SSE21	SSE24	S26	SSE26	SSE25	SSE23	SSE20	SSE20	SSE21	SSE20	SSE20	SSE20	SSE23	SSE18.2	SSE26
2-Oct	SSE15	SSE14	SE10	SE9	SE9	SE10	SE8	SE10	SE13	SSE20	SSE17	SE15	SSE15	SSE12	S8	ESE2	SW4	SE4	SE3	SE1	NNW1	NNW2	NW2	SE1	SSE7.8	SSE20
3-Oct	ENE1	NNW1	NNE1	SE2	E2	SE7	ESE5	SE6	ESE5	SE5	S3	SW7	WSW5	S2	WNW6	N2	SW9	SSW9	S12	SSE8	ESE3	ESE7	SE8	SE10	SSE3.2	S12
4-Oct	SE9	SE8	SE8	SE11	SE6	W2	NW5	NNW4	NNW3	NNW4	NW13	NW13	NW11	NW12	NNW7	WNW15	NW19	NNW21	WNW20	WNW18	WNW22	NW19	WNW16	WNW13	WNW8.0	WNW22
5-Oct	NW15	NW15	NW13	UO	NW16	NW19	NW20	WNW18	NW16	NW17	NW18	NW19	NW19	NW17	NW17	NW16	NW14	NW10	W6	W5	WSW6	SE6	SE5	ESE3	NW11.9	NW20
6-Oct	ESE6	SE7	SE9	ESE6	ESE6	SSE16	SE13	SE6	SSE15	SSE15	SSE18	SSE19	SE17	SE18	SSE15	SE13	SSE9	SE7	SE9	SE5	S3	W8	W10	NW4	SSE8.9	SSE19
7-Oct	WNW2	NW3	WSW1	SW5	ESE0	S1	SE4	SE5	SE6	ESE5	SE5	SE2	SE4	SE2	E1	SE5	SSE4	ESE2	ESE0	N2	N2	SE2	ESE11	SE11	SE2.5	ESE11
8-Oct	SE9	S2	SE6	SE7	SE12	SE15	SE16	SE13	SE15	SE17	SE13	SE18	SE23	SSE20	SE19	SSE19	SSE19	S20	SSE15	SE13	ESE11	SE13	SE11	SE11	SE13.4	SE23
9-Oct	SSE4	ESE2	NE2	ESE5	ESE6	ESE5	ESE6	ESE8	SE6	SE13	SE10	SE15	SE17	SE20	SE19	SE18	SE13	SE9	SE14	SE17	SE17	SE18	SE17	SE15	SE11.3	SE20
10-Oct	SE13	ESE6	E8	ESE8	SE9	ESE5	ESE6	ESE6	SE15	SE14	SE14	SE15	SE19	SE23	SE19	SE16	SE12	SE12	SE16	SE18	SE21	SE20	SE24	SE20	SE13.9	SE24
11-Oct	SE18	SE17	SE27	SE13	SE10	SE11	SE14	SE15	SE18	SE26	SE15	SE14	SE16	SE21	SE21	SE19	SE16	ESE12	ESE9	SE13	SE13	SE14	SE15	SE12	SE15.7	SE27
12-Oct	SE10	SE9	SE11	ESE2	E1	ESE2	ESE6	ESE6	E4	SE7	SE10	SE10	SSE11	SSE10	S8	S17	SSE14	SSE9	SE11	ESE12	SE12	SE14	SE15	SE6	SE8.5	S17
13-Oct	SE5	SE5	SE7	SE6	SE11	SSE13	SSE15	SE13	ESE12	SE12	SSE16	SE16	SSE16	SE15	SE16	SE14	SE13	SE15	SE14	SE19	SE15	SE15	SE16	SE15	SE12.9	SE19
14-Oct	SE18	SE18	SE17	SE20	SE28	SE28	SE30	SE29	SE22	SE23	SE25	SE28	SE28	SE26	SE29	SE31	SSE29	SSE27	SSE23	SSE23	SSE25	SE23	SE22	SE22	SE24.6	SE31
15-Oct	SE23	SE17	SE15	SE11	SE12	SE14	SE9	SE13	SE14	SE12	SE11	SSE13	SSE14	SSE15	SSE17	SE16	SSE15	SSE14	SSE18	SE10	SE8	SE12	SE13	SE17	SE13.6	SE23
16-Oct	SE14	SE9	SE10	SE11	SE11	SE12	SE10	SE9	SE9	SE12	SE10	SE13	SE13	S7WSW11	SSW4	ESE3	SE2	SSE2	SE3	SE1	SSW1	NNW3	NW2	SE6.3	SE14	
17-Oct	NW2	NW4	NW3	NW3	NW4	NW4	NNW3	NNW3	N6	NNW7	N12	N15	N14	N12	NW11	NNW11	N12	NNW9	NNW7	NNW6	NW4	NW2	N1	E3	NNW6.1	N15
18-Oct	S8	S10	SE5	E4	ESE3	NE1	ESE4	SE6	SE3	SE5	SE4	SE10	SSE17	SSE19	SSE21	SSE22	SE21	SSE23	S21	SSW12	SSE3	WSW9	W11	WSW9	SSE8.6	SSE23
19-Oct	SE5	SE10	SE9	SE12	SE13	SE12	SE10	ESE9	SE10	SSE6	SW6	WSW15	WSW19	WSW17	WSW17	WSW15	SW15	SSW8	SW8	NNW1	SSW4	WSW19	W18	SW20	SSW7.0	SW20
20-Oct	WSW18	W19	W12	WSW5	W13	W15	W16	W19	W22	WNW18	NW13	WNW18	NW18	NNW15	NW17	NNW11	N10	NNW7	NNW7	N4	NNW1	N2	WNW1	N1	WNW9.7	W22
21-Oct	ESE2	E1	ESE5	ESE3	ESE5	ESE4	ESE6	SE13	SE11	SE7	E5	SE12	E2	NNW12	N21	N24	N26	N26	N21	N20	N16	N11	NNW6	NNW6	NNE6.3	N26
22-Oct	N7	NNE6	ENE3	NNE2	NNE1	NNE2	NNE2	NW1	NNW1	NE1	NNW5	NNW5	NW6	NW7	N9	NNW6	N5	NW5	NNW5	WNW4	NW9	NW8	NW8	NNW8	NNW4.4	NW9
23-Oct	NNW7	NNW7	N8	N8	NNE3	NNE3	NNE2	WNW7	W10	WNW11	NW15	WNW18	WNW17	NW18	NW16	NW13	NW13	WNW11	W12	W14	W13	WNW7	WNW10.1	NW18		
24-Oct	NW4	WNW5	WNW5	W10	W9	W12	W11	W9	W11	W11	W14	W14	W17	W13	W14	W13	W13	W12	WNW9	WNW13	WNW16	WNW19	WNW18	WNW14	W11.7	WNW19
25-Oct	NW13	WNW14	WNW15	WNW12	WNW8	W10	WSW12	W10	W9	WSW12	WSW16	WSW15	WSW14	W15	W13	W14	WSW13	W11	WNW12	NW13	NW8	WNW7	W10	W9	W10.8	WSW16
26-Oct	W11	W10	WSW15	W6	WNW4	W4	W9	WSW11	W12	W12	W12	W11	WNW11	W9	W9	WNW6	WSW10	W9	NNW1	NW6	WNW9	W12	WSW12	WSW7	W8.8	WSW15
27-Oct	W9	W7	NNW5	N13	N8	NNW5	NNW8	N8	NNW5	NNW5	NNW7	N5	NNW6	N8	NNW6	NW7	NW10	NW8	N3	WSW2	WSW5	SW6	S4	SSE6	NW4.6	N13
28-Oct	SSE13	SSE7	SSE3	SW2	WSW4	WSW5	NNE2	N2	NNW3	N4	N4	N4	NW3	N5	N6	NNE1	E1	W9	WNW15	WNW14	WNW13	WNW9	NW7	WNW12	WNW3.6	WNW15
29-Oct	WNW11	WNW12	NW14	NW9	WNW12	WNW14	WNW15	NW10	WNW13	NW12	NNW11	NNW9	NNW10	N7	NNW4	NNW3	N1	WNW2	NNW2	NW2	NE3	N3	NW3	NNW4	NW7.1	WNW15
30-Oct	N8	NNE11	N9	NNE7	N3	NNE2	E2	NNW2	ENE1	SE4	SE9	SSE13	SE14	SSE16	SSE17	S13	SSE16	SSE18	SSE21	SSE15	SSE14	SSE14	SSE16	SE16	SE7.6	SSE21
31-Oct	SE14	SE12	SSE7	SE8	NNE2	NW4	NNW3	NNW7	NNW8	NNW6	NW5	NNW6	NNE3	N4	SSE1	SSW3	ENE1	N2	ENE2	ENE1	NW1	SE1	SSW3	SSW6	ENE0.5	SE14
SSE3.5 SSE2.3 SE2.7 SE3.1 SE2.9 SSE3.4 SSE3.3 SSE3.2 SSE3.6 SSE4.1 SSE3.1 S4.0 S4.4 S3.9 S4.0 S3.8 S3.6 S3.2 S3.3 SSE2.5 S2.2 S2.9 S3.6 SSE3.8																								Diurnal Average		
SE23 W19 SE27 SE20 SE28 SE28 SE30 SE29 SE22 SE26 SE25 SE28 SE28 S26 SE29 SE31 SSE29 SSE27 SSE23 SSE23 SSE25 SE23 SE24 SSE23																								Diurnal Maximum		
UO - Unstable Operation																										
All monthly, daily, and diurnal averages have been calculated using vector methods																										



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

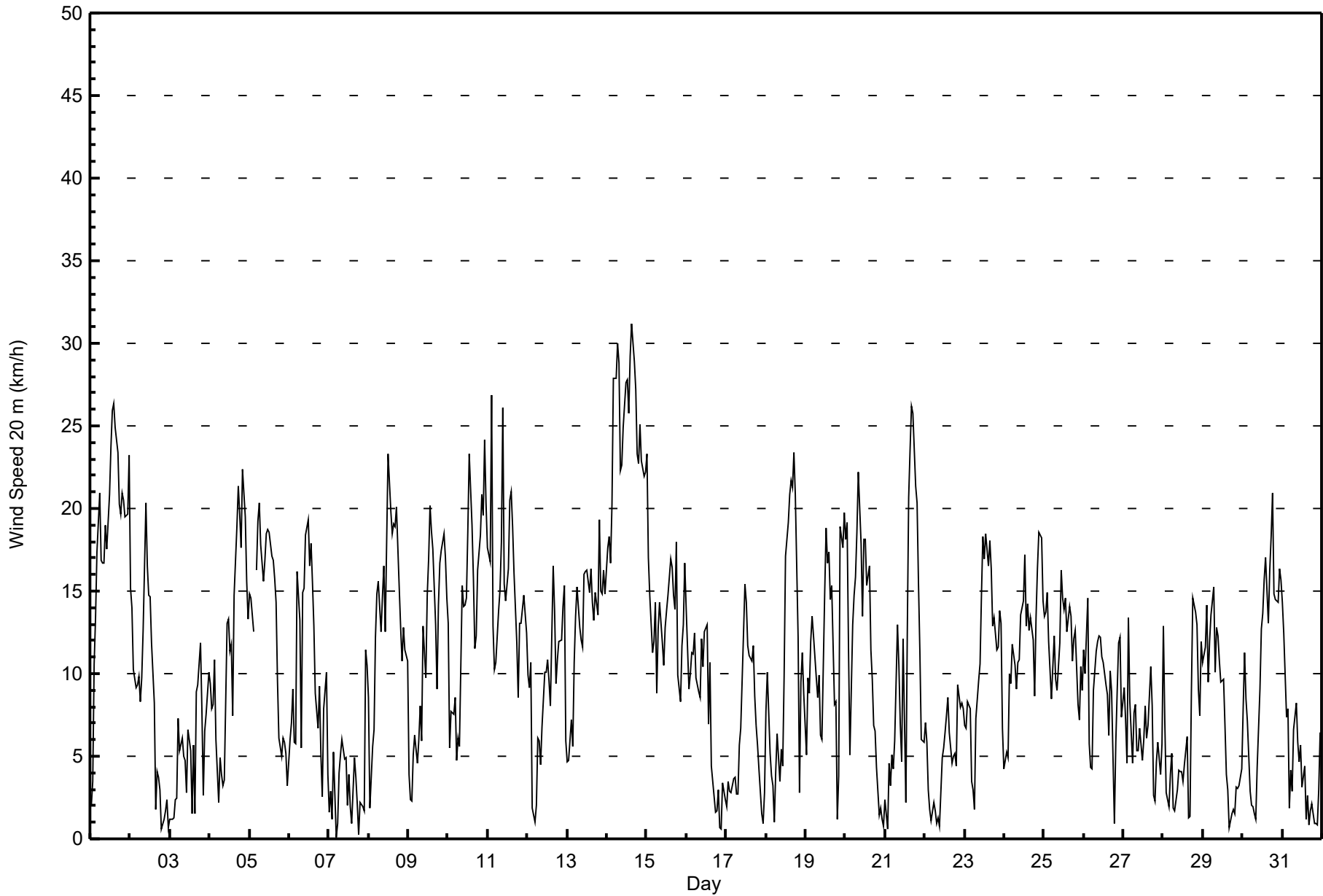
Wind Speed 20 m (WS20m) - km/h
Lower Camp Met Tower - October 2023

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



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	193	25.98	25.98
6 - 11	217	29.21	55.18
12 - 19	265	35.67	90.85
20 - 28	63	8.48	99.33
29 - 38	5	0.67	100.00
> 38	0	0.00	100.00

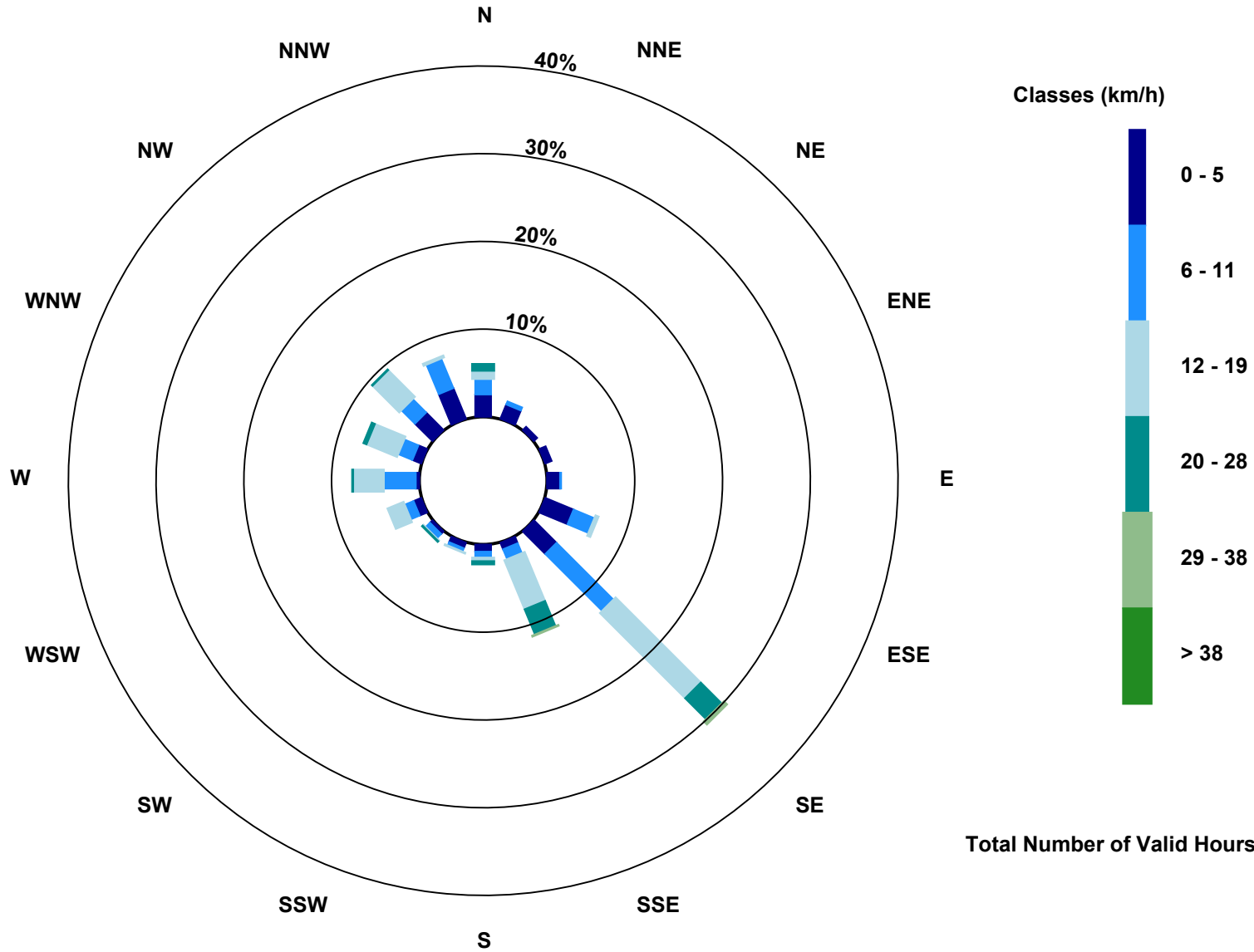
Total Number of Valid Hours: 743

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

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





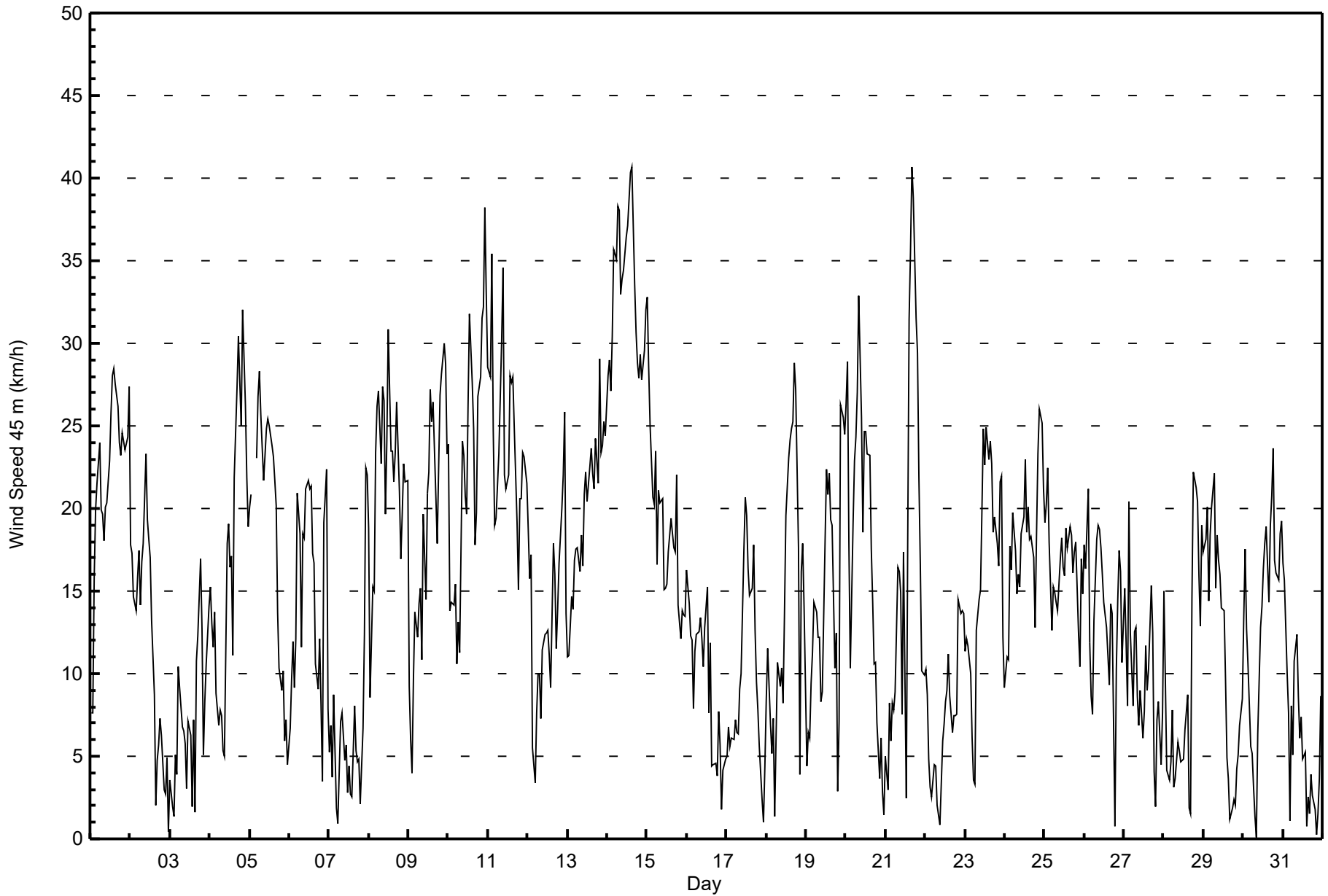
Maximum Speed: 41 km/h on Oct 21 17:00		Maximum Daily Speed Average: 33.0 km/h on Oct 14		Hours in Service: 744																						
Minimum Speed Value: 0 km/h on Oct 30 09:00		Minimum Daily Speed Average: 0.8 km/h on Oct 31		Hours of Data: 742																						
Maximum Diurnal Speed Average: 5.6 km/h at hour 10		Minimum Diurnal Speed Average: 3.3 km/h at hour 21		Hours of Missing Data: 2																						
Monthly Average Velocity: 4.4 km/h 163.9 deg		Percentiles: P ₁ = 1 P ₁₀ = 4 Q ₁ = 8 Median = 15 Q ₃ = 21 P ₉₀ = 26 P ₉₉ = 38		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-Oct	SE8	SE8	SE16	SE20	SSE22	S24	S20	SSE20	SSE18	SSE20	SSE20	SSE23	SSE26	S28	SSE29	SSE28	SSE26	SSE24	SSE23	SSE25	SE24	SSE24	SSE24	SSE27	SSE21.5	SSE29
2-Oct	SSE18	SE17	SE15	SE14	SE16	SE17	SE14	SE17	SE18	SSE23	SSE19	SE18	SSE17	SSE13	S9	ESE2	SW5	SE6	SE7	SE6	ESE3	NNW3	NNW5	E0	SE10.7	SSE23
3-Oct	ESE4	S2	E1	SE5	SE4	SE10	SE9	SE7	SE7	SE6	SSW3	SW7	W6	WSW2	WNW7	NNE2	SW11	SSW12	S17	S13	SSE5	ESE8	SE11	SE14	SSE4.9	S17
4-Oct	SE15	SE13	SSE12	SSE14	SSE9	W7	NW8	NNW7	NNW5	NNW5	WNW18	NW19	NW16	NW17	NNW11	WNW22	NW27	WNW30	WNW28	WNW25	WNW32	NW26	WNW22	WNW19	WNW11.7	WNW32
5-Oct	NW20	WNW21	UO	UO	NW23	NW27	NW28	WNW26	WNW22	NW23	NW25	NW25	NW25	NW24	NW23	NW22	NW20	NW14	W10	W9	WSW10	SSE6	SSE7	SE5	WNW16.9	NW28
6-Oct	SE7	SE10	SE12	ESE9	ESE12	SE21	SE18	SE12	SSE18	SSE18	SSE21	SSE22	SE21	SE21	SSE17	SE17	S11	SE9	SE12	SE8	SW3	WSW19	W22	WNW8	SSE11.2	W22
7-Oct	W5	W7	WNW4	WSW9	WSW2	ESE1	SSE4	SSE7	SE8	ESE5	ESE6	ESE3	SE4	ESE3	ESE3	ESE8	SSE5	SE5	SE5	ESE2	ESE7	ESE12	SE22	SE22	SE4.6	SE22
8-Oct	SE19	SE9	SE15	SE15	SE23	SE26	SE27	SE23	SE27	SE27	SE20	SE24	SE31	SSE23	SE23	SSE22	S23	S26	S21	SE17	ESE20	ESE23	SE22	SE22	SE21.2	SE31
9-Oct	SE9	SE6	ESE4	ESE10	ESE14	ESE12	SE14	SE15	SE11	SE20	ESE14	SE21	SE22	SE27	SE25	SE26	SE21	SE18	SE22	SE27	SE28	SE30	SE29	SE23	SE18.7	SE30
10-Oct	SE24	ESE14	ESE14	ESE14	SE15	ESE11	SE13	SE11	SE24	SE23	SE21	SE20	SE26	SE32	SE28	SE25	ESE18	SE20	SE27	SE28	SE32	SE32	SE38	SE33	SE22.5	SE38
11-Oct	SE29	SE28	SE35	SE25	SE19	SE19	SE23	SE27	SE30	SE35	SE22	SE21	SE22	SE28	SE28	SE28	ESE25	ESE19	ESE15	SE21	SE21	SE23	SE23	SE22	SE24.4	SE35
12-Oct	SE19	SE16	SE17	SE6	SE3	ESE8	ESE10	ESE10	ESE7	SE11	SSE12	SE12	SSE13	SSE11	S9	S18	SSE16	SSE12	SE14	SE17	ESE20	SE22	SE26	SE14	SE12.8	SE26
13-Oct	SE11	SE11	SE15	SE14	SE17	SSE18	SSE18	SE16	ESE18	SE17	SE21	SE22	SE20	SE23	SE24	SE22	SE21	SE24	SE22	SE29	SE23	SE24	SE25	SE24	SE19.8	SE29
14-Oct	SE28	SE29	SE27	SE30	SE36	SE35	SE38	SE38	SE33	SE34	SE34	SE36	SE37	SE39	SE40	SE41	SSE34	SSE31	SSE29	SE28	SSE29	SE28	SE30	SE32	SE33.0	SE41
15-Oct	SE33	SE29	SE25	SE21	SE20	SE23	SE17	SE21	SE20	SE21	SE15	SSE15	SSE15	SSE17	SSE19	SSE18	SSE18	SSE17	SSE22	SE14	SE12	SE14	SE14	SSE13	SE18.6	SE33
16-Oct	SE16	SE14	SE12	SE12	SSE8	SSE11	SE12	SE13	SE13	SE12	SE10	SE13	SE15	S8	SW12	SSW4	ESE4	SE5	SE4	SE8	ESE6	SE2	NNW4	NNW5	SE7.8	SE16
17-Oct	NNW5	NNW7	NNW6	NNW6	NNW6	NNW7	NNW6	N6	NNW9	NNW10	N17	N21	N20	N16	NW15	NNW15	N18	NNW13	NNW9	NNW8	NW6	NNW2	NE1	ESE4	NNW9.3	N21
18-Oct	S8	S12	SE7	ESE5	SE7	E1	SE6	SE11	SE9	SE10	SE8	SE14	SSE20	SSE23	SSE24	SSE25	SSE25	SSE29	S27	SSW18	SSW4	WSW16	WSW18	WSW14	SSE11.3	SSE29
19-Oct	SSW4	S6	S6	SE9	SE11	SE14	SE14	SE12	SE12	SSW8	SW9	WSW18	WSW22	WSW21	WSW22	WSW19	SW19	SSW10	SW12	NNW3	SW7	WSW26	W26	SW25	SW9.9	WSW26
20-Oct	WSW26	WSW29	W18	WSW10	W19	W23	WSW24	WSW27	W33	WNW26	NW19	WNW25	NW25	NNW23	NW23	NNW18	N14	N11	NNW11	N7	N4	N6	NNW3	NW1	WNW14.2	W33
21-Oct	SE5	ESE3	SE8	SE6	SE8	ESE8	SE9	SE16	SE16	SE15	ESE8	SE17	E2	NNW18	N31	N36	N41	N39	N31	N29	N22	N17	NNW10	NNW10	NNE9.1	N41
22-Oct	N10	N9	NE5	NE3	NE3	NE4	NNE4	NNE2	N1	NE1	NNW6	NNW7	NW8	NW9	N11	N9	NNE6	NW7	NNW7	WNW8	NW14	NNW14	NNW14	NNW14	NNW6.6	NW14
23-Oct	NNW11	NNW12	NNW12	NNW10	N6	N4	NNW3	WNW13	WSW15	WNW15	WNW20	WNW25	WNW23	NW25	WNW23	WNW24	NW23	NNW19	NW20	WNW18	W17	W22	W22	W12	WNW14.9	NW25
24-Oct	W9	W11	W11	W18	W16	WSW20	WSW17	W15	W16	W15	W19	W20	W23	W19	W20	W18	W18	W17	W13	WNW18	WNW23	WNW26	WNW25	WNW21	W17.5	WNW26
25-Oct	WNW19	WNW20	WNW22	WNW18	WNW13	W15	WSW15	W14	W14	WSW17	WSW18	WSW16	WSW16	W19	W18	WSW19	WSW18	W16	WNW17	NW18	NW12	WNW10	W17	W15	W15.3	WNW22
26-Oct	WSW18	W16	WSW21	W12	WNW9	W8	W13	WSW18	W19	W19	W18	W16	WNW14	W13	W11	WNW9	WSW14	W14	NE1	WNW10	WNW14	WSW17	WSW16	WSW11	W13.3	WSW21
27-Oct	W15	W12	NW8	N20	N12	NNW8	N13	N13	NNW9	NNW7	NNW9	N6	NNW8	N12	NNW9	NW10	NW15	NW12	N4	W2	WSW7	WSW8	SSW5	SSE8	NW7.0	N20
28-Oct	SSE15	S10	SSE4	WSW4	W5	WSW8	WNW3	NW4	NNW6	NNW5	NNW5	N5	NW5	N7	N9	N2	WNW1	W15	WNW22	WNW21	WNW20	WNW16	NW13	WNW19	WNW6.5	WNW22
29-Oct	WNW17	WNW18	NW20	NW14	WNW18	WNW20	WNW22	NW15	WNW18	NW17	NNW16	NNW14	NNW14	N10	NNW5	NNW4	N1	NW2	NNE2	NNE2	NE4	N5	NNW7	NNW8	NW10.5	WNW22
30-Oct	N13	N18	N13	NNE11	N6	NNE5	ENE3	NNW1	WSW0	SE6	SE13	SSE14	SE16	SSE18	SSE19	S14	SSE19	SSE21	SSE24	SSE17	SSE16	SSE16	SSE18	SE19	SE8.2	SSE24
31-Oct	SSE17	SE16	SSE10	SSE8	NNW1	NNW8	NNW5	NNW11	NNW12	NNW9	NNW6	NNW7	NNE5	N5	ESE1	SSW3	ENE2	NNE4	NE3	E2	NNW0	ESE2	SSW4	SW9	NE0.8	SSE17
SSE5.3 SSE3.9 SE5.0 SE4.7 SSE4.4 SSE4.8 SSE5.0 SSE4.9 SSE5.3 SSE5.6 SSE3.7 S4.5 S4.7 SSE4.2 S4.2 S4.1 S3.7 S3.9 S4.4 SSE3.5 SSE3.3 S4.3 S5.3 SSE5.5																								Diurnal Average		
SE33 SE29 SE35 SE30 SE36 SE35 SE38 SE38 SE33 SE35 SE34 SE36 SE37 SE39 SE40 SE41 N41 N39 N31 N29 WNW32 SE32 SE38 SE33																								Diurnal Maximum		
UO - Unstable Operation																										
All monthly, daily, and diurnal averages have been calculated using vector methods																										



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 9 km/h on Oct 6 22:00 Minimum Value: 1 km/h on Oct 30 09:00 Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 2 Median = 3 Q ₃ = 4 P ₉₀ = 6 P ₉₉ = 8																	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-Oct	2	1	4	2	4	4	3	3	3	4	4	4	5	4	5	5	5	6	4	4	3	3	4	4	6
2-Oct	4	6	2	3	4	4	2	2	3	3	3	3	3	3	3	2	2	3	1	1	2	1	1	2	6
3-Oct	2	2	1	2	3	3	2	2	2	2	2	2	4	3	5	4	3	2	2	3	3	1	4	3	5
4-Oct	3	2	2	2	3	3	2	2	2	4	7	7	4	5	4	7	6	8	7	6	8	6	7	6	8
5-Oct	4	4	UO	UO	6	6	7	5	5	5	6	6	6	7	6	5	6	5	2	2	4	2	2	1	7
6-Oct	4	3	2	3	4	6	4	4	4	4	3	3	3	3	5	3	3	1	2	3	1	9	8	4	9
7-Oct	5	3	2	3	2	1	2	2	2	1	2	2	2	2	2	2	2	2	2	2	3	4	2	3	5
8-Oct	5	6	4	4	4	4	4	4	5	5	5	5	5	3	4	5	4	3	4	2	3	3	4	3	6
9-Oct	6	3	3	3	3	4	4	4	5	4	4	4	3	3	3	4	4	3	4	3	3	4	7	4	7
10-Oct	5	4	3	3	3	3	3	5	4	3	4	4	8	4	4	6	5	3	3	5	5	5	4	4	8
11-Oct	5	6	3	5	4	4	5	5	6	5	4	4	4	4	3	5	5	4	3	4	4	3	3	3	6
12-Oct	4	3	3	3	2	2	1	1	2	3	2	3	3	4	4	3	2	2	1	1	2	3	3	7	7
13-Oct	3	2	2	3	3	3	5	3	4	4	4	4	5	5	4	5	5	4	4	4	3	4	3	3	5
14-Oct	4	3	3	6	5	5	4	5	4	4	4	5	5	5	6	6	6	6	6	4	5	3	3	3	6
15-Oct	3	4	3	4	3	3	4	5	5	3	4	2	3	4	3	3	2	3	3	2	3	2	2	2	5
16-Oct	2	2	2	2	2	3	3	2	2	2	1	2	1	3	2	2	1	1	1	1	2	1	3	1	3
17-Oct	2	1	2	2	2	3	1	1	2	3	3	3	4	3	3	4	4	3	3	2	2	1	1	2	4
18-Oct	2	2	3	2	3	1	3	2	3	4	4	3	4	4	4	3	3	3	3	6	2	6	4	3	6
19-Oct	3	2	2	2	2	2	2	2	1	2	4	5	3	4	4	4	5	6	4	5	9	5	8	3	9
20-Oct	5	6	6	5	4	5	5	5	6	8	5	6	6	6	7	5	4	3	3	3	2	1	1	1	8
21-Oct	3	1	5	3	2	2	3	2	5	5	6	5	3	6	6	7	9	8	6	6	6	4	2	2	9
22-Oct	3	2	2	2	2	3	2	1	1	1	3	2	3	3	3	3	2	2	3	4	3	4	3	3	4
23-Oct	2	2	2	2	2	2	2	6	4	5	6	6	6	6	6	6	6	4	3	3	4	4	5	5	6
24-Oct	4	4	4	5	5	4	5	5	5	5	7	5	5	5	5	5	4	5	5	6	7	5	5	5	7
25-Oct	6	5	5	4	3	4	3	3	5	4	3	3	3	4	4	4	4	5	6	4	3	3	3	4	6
26-Oct	3	3	3	5	4	3	4	3	5	4	4	4	4	4	4	3	4	6	2	5	2	3	2	3	6
27-Oct	4	6	4	5	5	2	3	3	3	3	3	2	4	3	4	3	3	4	2	1	3	2	1	3	6
28-Oct	3	5	2	2	2	3	2	1	2	1	2	2	2	2	2	2	2	4	4	4	4	4	3	4	5
29-Oct	3	3	6	2	4	4	4	4	4	5	4	4	4	4	3	2	1	1	2	2	1	2	2	3	6
30-Oct	4	4	3	2	1	2	1	1	1	2	4	3	2	3	3	3	3	4	3	3	2	2	2	2	4
31-Oct	3	5	2	3	2	2	2	3	3	2	2	2	1	2	1	1	1	2	1	1	1	1	2	2	5
Diurnal Maximum																									
UO - Unstable Operation																									





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	107	14.42	14.42
6 - 11	161	21.70	36.12
12 - 19	240	32.35	68.46
20 - 28	187	25.20	93.67
29 - 38	42	5.66	99.33
> 38	5	0.67	100.00

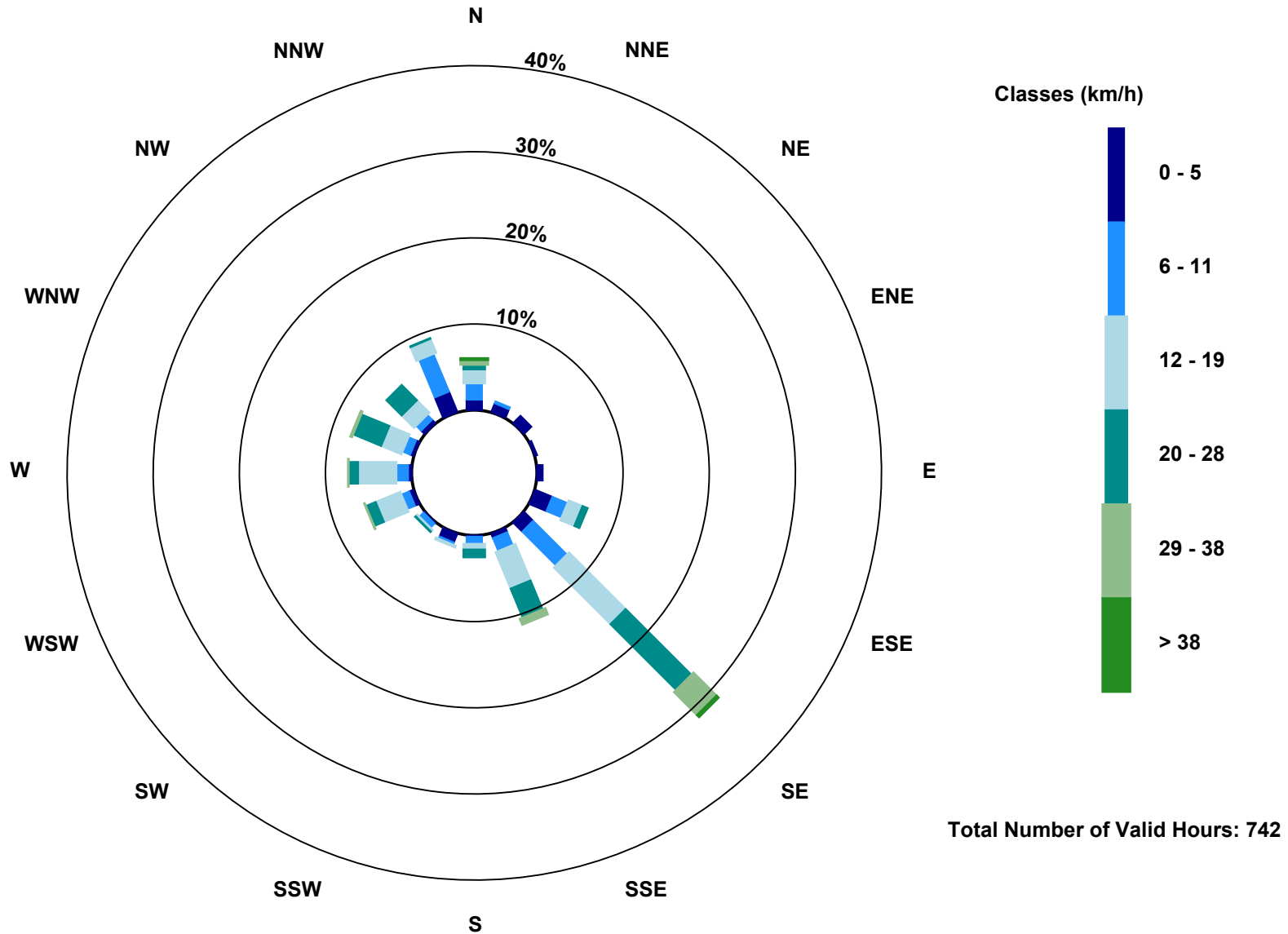
Total Number of Valid Hours: 742

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

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





Maximum Speed: 46 km/h on Oct 21 17:00	Maximum Daily Speed Average: 38.2 km/h on Oct 14	Hours in Service: 744
Minimum Speed Value: 0 km/h on Oct 2 23:00	Minimum Daily Speed Average: 1.9 km/h on Oct 31	Hours of Data: 741
Maximum Diurnal Speed Average: 7.5 km/h at hour 1	Minimum Diurnal Speed Average: 4.1 km/h at hour 14	Hours of Missing Data: 3
Monthly Average Velocity: 5.8 km/h 178.8 deg	Percentiles: P ₁ = 1 P ₁₀ = 7 Q ₁ = 12 Median = 20 Q ₃ = 26 P ₉₀ = 32 P ₉₉ = 42	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-Oct	SE15	SSE15	SSE23	SSE26	SSE29	S32	S29	S27	SSE21	SSE21	SSE22	SSE25	SSE28	S31	SSE31	SSE31	SSE30	SSE29	SSE28	SSE29	SSE28	SSE30	SSE32	SSE34	SSE26.6	SSE34
2-Oct	SSE22	SSE21	SE17	SE18	SE22	SE27	SE17	SE18	SSE22	SSE26	SSE22	SSE21	SSE19	SSE13	SSW10	SSE2	SW6	SSE4	SE9	S10	SSE6	S2	NNE0	SSW2	SSE13.5	SE27
3-Oct	SSE6	S6	SW1	SE7	S5	SSE11	SSE8	SSW6	SSW3	SSW3	SW5	SW7	W7	WNW5	WNW9	ESE1	SW12	SW14	S17	SSW24	SSW15	SE10	SSE14	SSE15	SSW6.9	SSW24
4-Oct	SE17	SSE14	SSE13	S16	SSW11	W13	NW13	NW12	NW11	NW10	WNW22	NW25	NW23	NW25	NNW16	WNW29	WNW35	WNW38	WNW34	WNW31	WNW39	NW33	WNW28	WNW25	WNW16.7	WNW39
5-Oct	NW25	WNW26	UO	UO	UO	NW34	NW35	WNW32	NW28	NW30	NW31	NW31	NW31	NW30	NW29	NW27	NW25	NW19	W13	W12	WSW12	SW5	SSW9	S9	WNW21.6	NW35
6-Oct	S8	S9	SSE13	SE13	SE20	SSE27	SSE26	SE21	SSE23	SSE22	SSE22	SSE23	SSE21	SSE20	SSE19	SSE16	S15	SSE13	SSE13	S11	WSW16	W31	W33	WNW18	S13.5	W33
7-Oct	W16	W19	WNW9	WNW7	NNW5	NNW7	WSW4	SSW5	SW6	SSW3	E5	E5	ESE5	E5	ESE7	ESE11	SE8	SE9	SE15	SE19	SE22	SE23	SE31	SE32	SE6.1	SE32
8-Oct	SE27	SE25	SE27	SE28	SE33	SE35	SE36	SE32	SE36	SE33	SE25	SE26	SE32	SSE24	SSE25	SSE25	S31	S38	S36	SSE24	SE26	SE29	SE29	SE31	SE28.7	S38
9-Oct	SE21	SE20	SE19	SE20	SE24	SE20	SE21	SE24	SE19	SE23	SE18	SE23	SE23	SE29	SE28	SE31	SE28	SE26	SE29	SE34	SE35	SE37	SE36	SE29	SE25.7	SE37
10-Oct	SE28	SE23	SE21	SE19	SE21	SE18	SE22	SE23	SE30	SE27	SE23	SE22	SE30	SE35	SE31	SE30	ESE22	SE25	SE34	SE35	SE39	SE42	SE45	SE41	SE28.6	SE45
11-Oct	SE36	SE35	SE38	SE31	SE27	SE28	SE32	SE33	SE36	SE38	SE24	SE24	SE24	SE30	SE30	SE31	ESE30	ESE25	SE22	SE26	SE29	SE32	SE32	SE28	SE30.0	SE38
12-Oct	SE26	SE23	SE23	SE16	SE13	SE15	SE12	SE13	SE14	SE18	SSE15	SE14	SSE15	S13	S11	S19	S18	S15	SSE21	SSE20	SE25	SE27	SE31	SE22	SSE17.8	SE31
13-Oct	SE21	SE20	SE23	SE24	SSE24	SSE23	SSE20	SE18	SE22	SE20	SE23	SE25	SE23	SE27	SE27	SE26	SE26	SE31	SE28	SE35	SE31	SE33	SE33	SE33	SE25.5	SE35
14-Oct	SE36	SE36	SE35	SE39	SE42	SE39	SE41	SE44	SE38	SE39	SE37	SE39	SE40	SE43	SE44	SSE39	SSE36	SSE35	SE32	SSE35	SSE32	SE35	SE38	SE38	SE38.2	SE44
15-Oct	SE39	SE36	SE32	SE28	SE26	SE29	SE25	SE29	SE25	SE25	SE18	SSE16	SSE17	SSE18	SSE21	SSE22	SSE22	SSE23	S27	SSE17	S17	S14	S10	SSW12	SSE22.1	SE39
16-Oct	S15	SSE13	S10	SSW9	SW8	SSW12	SSW13	SSW9	S11	S9	SSE9	SSE11	SSE12	SSW9	SW13	SW5	ESE4	SE6	SSE6	SSE9	SE11	SE9	ESE4	ESE4	S7.9	S15
17-Oct	SE3	NNW1	NNE4	N11	N11	NNW15	NNW11	N16	N15	N13	N19	N20	N21	N16	NNW17	NNW17	N20	N15	N12	NNW10	NNW7	N3	ENE1	ESE7	N10.9	N21
18-Oct	SSE9	S13	SE9	SE8	SE13	SE7	SSE9	SE21	SE22	SE21	SE16	SSE18	SSE23	SSE25	SSE27	SSE30	SSE31	S32	SSW34	SW29	SW13	WSW26	WSW28	WSW24	S15.9	SSW34
19-Oct	WSW15	WSW15	WSW14	SW10	SW11	S7	SSE8	S10	SSW6	SW14	WSW14	WSW21	WSW25	WSW25	WSW26	SW26	SW25	SW14	SW19	NNW6	WSW14	WSW35	W33	WSW31	WSW16.2	WSW35
20-Oct	WSW35	WSW39	W26	W16	W26	W32	WSW32	WSW35	W40	WNW32	WNW23	WNW30	NW31	NNW30	NW29	NNW24	N18	NNE14	N14	N11	NNE7	NNE7	E4	S3	WNW17.6	W40
21-Oct	SSE7	SE7	SE13	SSE9	SSE12	SSE12	S16	SSE19	SE20	SE25	SSE14	SSE21	NE2	N20	N36	N41	N46	N44	N36	N34	N26	N19	N13	N14	NNE8.1	N46
22-Oct	N16	N14	NNE9	NE12	NE8	NE10	NE10	NE9	NNE5	NE1	NNW6	NNW8	NW9	NNW11	N13	N10	N8	NNW9	NNW9	WNW10	NNW21	NNW20	NW22	NW22	N9.5	NW22
23-Oct	NW17	NW16	NW14	NW14	NW12	WNW6	WNW9	WNW19	W17	WNW18	WNW24	WNW28	WNW26	NW29	WNW28	WNW29	NW28	NW25	NW26	WNW24	W21	W26	W27	W21	WNW20.3	WNW29
24-Oct	W17	W19	W19	W25	W24	WSW26	WSW23	WSW21	WSW20	W19	W21	W22	W26	W21	W24	W21	W22	W21	W16	WNW24	WNW28	WNW30	WNW29	WNW27	W22.3	WNW30
25-Oct	WNW25	WNW26	WNW27	WNW23	WNW17	W18	WSW16	W17	W16	WSW19	WSW19	WSW17	WSW18	WSW21	W20	WSW21	WSW21	W21	WNW22	NW24	NW17	WNW14	W21	W19	W18.5	WNW27
26-Oct	W21	W20	W25	W19	W16	W12	W18	WSW22	W25	W22	W21	W20	WNW17	W15	W13	WNW13	WSW18	W18	NE1	WNW18	WNW19	WSW22	WSW18	W14	W17.3	W25
27-Oct	W20	W16	NW15	N25	N16	N14	N17	N17	N12	N9	NNW11	N7	NNW9	NNW13	NNW11	NNW13	NW20	WNW18	NNW9	NNW4	WSW9	WSW10	SW6	S12	NW9.7	N25
28-Oct	S21	S15	SSW6	WSW7	WNW7	W10	W9	WNW8	WNW12	NW10	NW9	NNW6	NNW9	NNW9	NNW9	NW5	WNW8	WNW20	WNW30	WNW29	WNW27	WNW24	NW22	NW27	WNW11.0	WNW30
29-Oct	NW24	WNW25	NW27	NW20	WNW24	WNW26	NW28	NW22	WNW23	NW21	NNW20	NNW17	NNW16	NNW11	NW6	NW4	NW3	NNW5	NE8	NE6	ENE6	N7	N15	N17	NW14.1	NW28
30-Oct	N19	NNE21	N16	NNE15	N9	N11	NE6	E2	SW4	S8	SSE13	SSE14	SSE16	SSE19	SSE21	S17	SSE24	SSE26	SSE28	SSE21	SSE19	SSE16	S19	SSE21	SSE8.6	SSE28
31-Oct	SSE19	SSE17	S10	SSW8	WNW7	NNW15	NNW11	N15	N16	NNW11	NNW9	NNW9	NNE6	N6	NE1	S2	NNE3	NNE7	NE5	ENE6	E1	E2	SSW5	SW10	NNW1.9	SSE19

S7.5	S6.6	SSE6.6	SSE6.2	SSE6.8	S6.1	S6.4	S6.2	S6.4	S6.7	S4.4	S5.1	S4.6	S4.1	SSW4.5	S4.7	S4.9	S5.1	S6.2	S5.3	S5.5	SSW6.3	S6.9	S7.5	Diurnal Average
SE39	WSW39	SE38	SE39	SE42	SE39	SE41	SE44	W40	SE39	SE37	SE39	SE40	SE43	SE44	SE44	N46	N44	S36	SE35	SE39	SE42	SE45	SE41	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

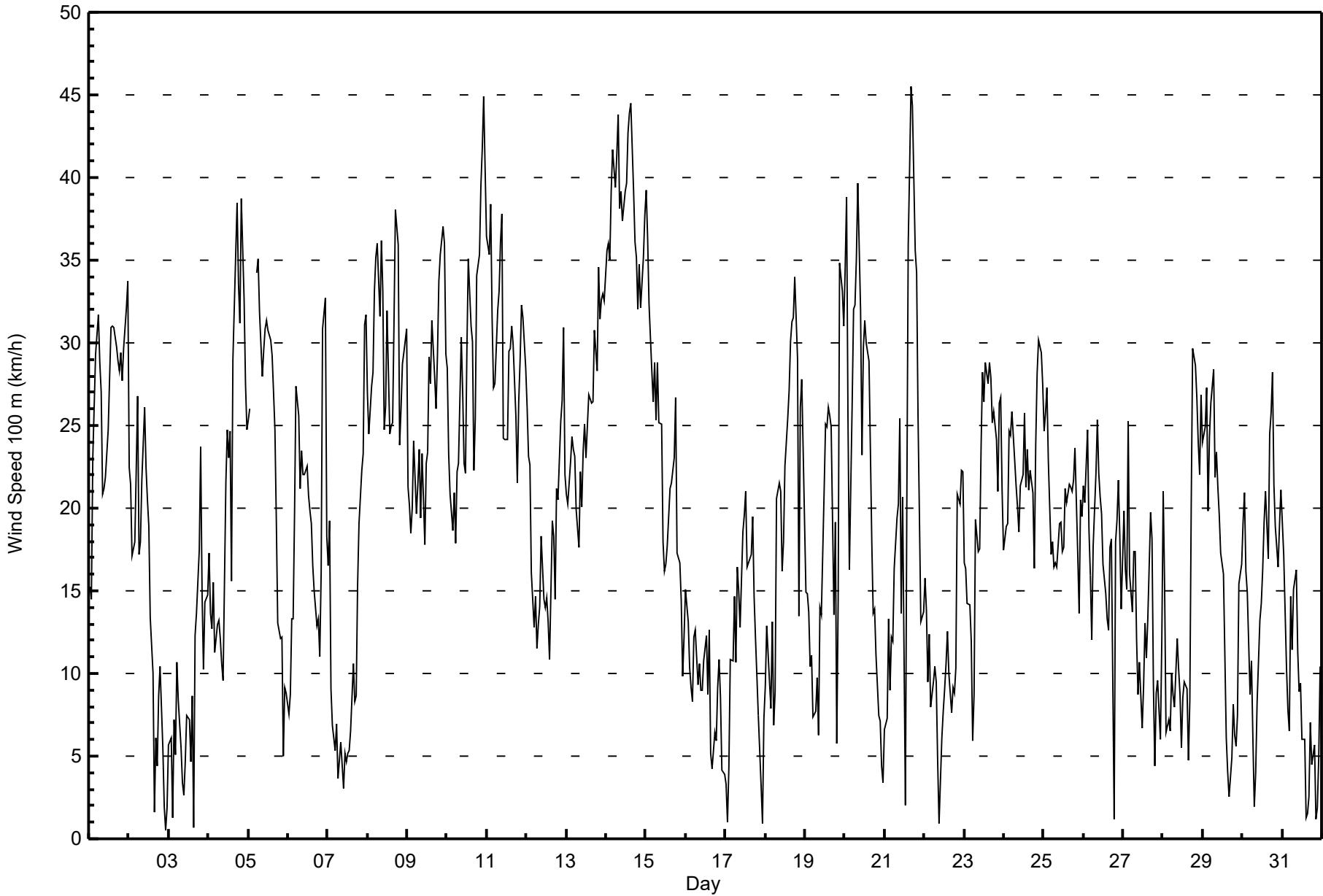
Wind Speed 100 m (WS100m) - km/h
Lower Camp Met Tower - October 2023

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



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	50	6.75	6.75
6 - 11	131	17.68	24.43
12 - 19	185	24.97	49.39
20 - 28	229	30.90	80.30
29 - 38	123	16.60	96.90
> 38	23	3.10	100.00

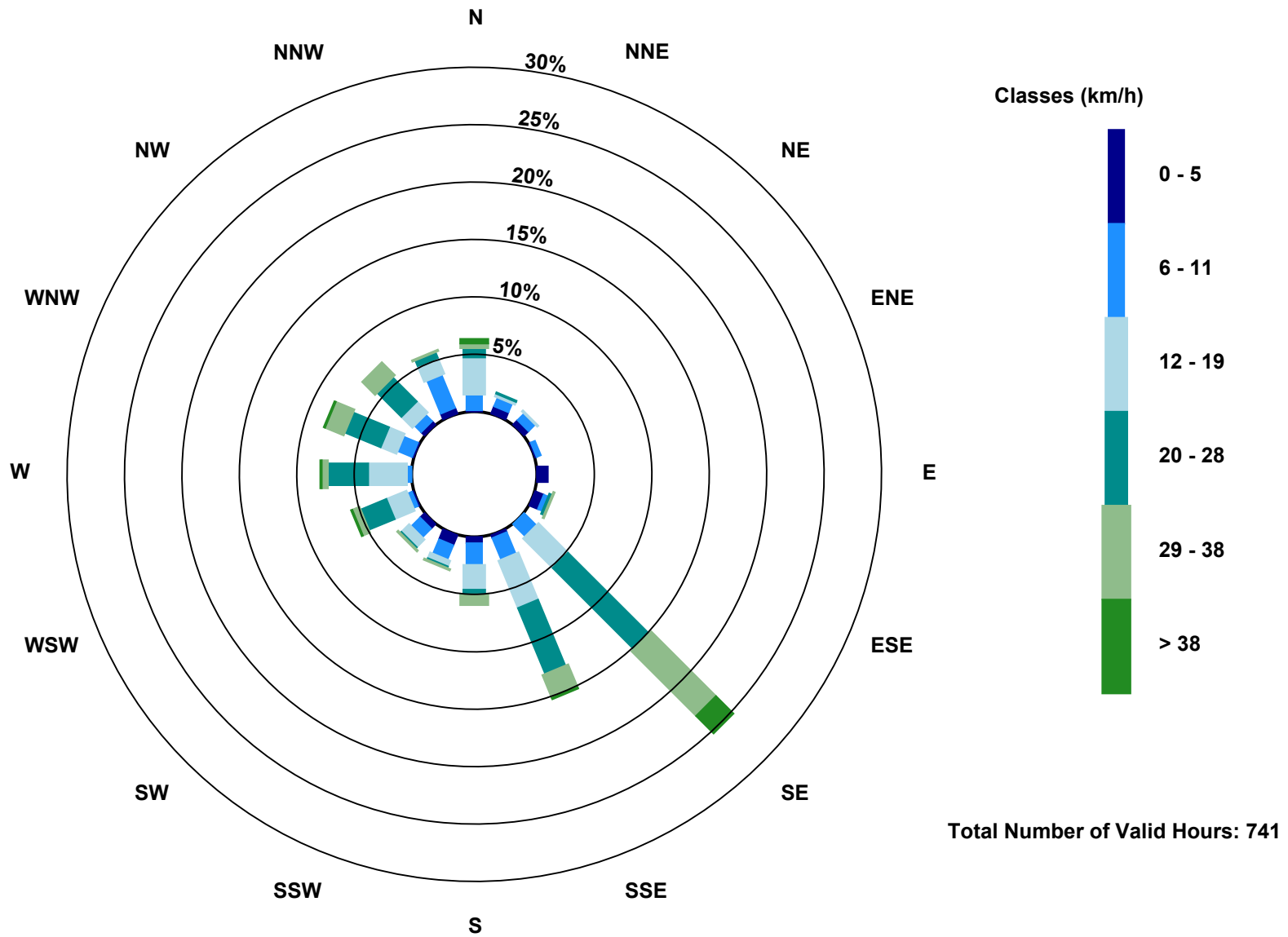
Total Number of Valid Hours: 741

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

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





Maximum Speed: 49 km/h on Oct 10 23:00	Maximum Daily Speed Average: 40.8 km/h on Oct 14	Hours in Service: 744
Minimum Speed Value: 1 km/h on Oct 31 16:00	Minimum Daily Speed Average: 4.0 km/h on Oct 31	Hours of Data: 737
Maximum Diurnal Speed Average: 8.4 km/h at hour 2	Minimum Diurnal Speed Average: 4.3 km/h at hour 14	Hours of Missing Data: 7
Monthly Average Velocity: 6.4 km/h 189.1 deg	Percentiles: P ₁ = 3 P ₁₀ = 9 Q ₁ = 14 Median = 23 Q ₃ = 30 P ₉₀ = 37 P ₉₉ = 46	Percent Operational Time: 99.1

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Oct	SSE22	S23	S29	SSE35	S37	S38	S36	S34	SSE24	SSE22	SSE22	S26	S29	S32	SSE32	SSE33	SSE32	SSE31	SSE32	SSE36	SSE35	SSE37	SSE39	SSE38	SSE31.1	SSE39	
2-Oct	SSE27	SSE24	SSE22	SSE24	SSE22	SE27	SSE21	SSE20	SSE27	SSE29	SSE23	SSE22	SSE20	S14	SSW11	SSW4	SW7	SSW5	S7	S10	S9	S9	S7	SSW5	SSE15.7	SSE29	
3-Oct	SSW3	SSW6	WNW6	W1	SSW6	S11	SSW12	WSW8	W5	SW3	SW6	WSW8	W8	WNW8	WNW9	SSW2	SW13	SW13	SSW17	SSW25	SW25	S13	S19	SSW18	SW8.8	SW25	
4-Oct	S11	S10	S9	SSW15	SW17	W16	NW20	NW19	NW17	NW16	NW23	NW29	NW28	NW29	NNW20	NNW35	NW43	WNW44	WNW39	WNW36	WNW43	NW36	NW32	NW30	WNW22.1	WNW44	
5-Oct	NW30	UO	UO	UO	UO	UO	UO	UO	WNW35	NW38	NW34	NW35	NW33	NW32	NW31	NW30	NW27	NW23	WNW14	WNW13	W14	W7	SW10	SSW12	---	NW38	
6-Oct	SSW11	SSW12	S15	S14	SSE21	SSE35	SSE28	SSE28	SSE26	SSE23	SSE23	SSE21	S21	S21	S19	SSW19	SSW13	SSW12	SSW11	W23	WNW37	WNW36	WNW29	S15.2	WNW37		
7-Oct	WNW27	WNW28	WNW24	WNW16	NW14	NW13	W9	WSW3	SW6	SW6	SE4	ESE7	ESE6	ESE7	SE10	SE12	SE13	SE15	SE22	SE27	SE26	SE29	SE38	SE37	SSE6.3	SE38	
8-Oct	SE30	SE30	SE32	SE34	SE38	SE41	SE41	SE37	SE41	SE37	SE27	SSE26	SSE31	SSE25	SSE25	SSE27	S34	S43	S42	S33	SE28	SE35	SE33	SE35	SSE32.3	S43	
9-Oct	SE28	SE28	SE30	SE26	SE32	SE23	SE25	SE29	SE26	SE26	SE20	SE23	SE24	SE30	SE28	SE34	SE33	SE32	SE34	SE39	SE40	SE41	SE38	SE34	SE30.2	SE41	
10-Oct	SE33	SE30	SE24	SE23	SE25	SE21	SE26	SE30	SE35	SE29	SE23	SE24	SE31	SE36	SE32	SE34	SE26	SE32	SE42	SE39	SE45	SE47	SE49	SE44	SE32.4	SE49	
11-Oct	SE41	SE40	SE41	SE35	SE32	SE32	SE37	SE38	SE39	SE40	SE25	SE25	SE25	SE30	SE31	SE32	SE33	ESE30	SE26	SE31	SE34	SE38	SE37	SE34	SE33.5	SE41	
12-Oct	SE31	SE30	SE26	SE23	SE23	SE23	SE23	SE25	SE24	SSE20	SSE17	SSE16	SSE17	S14	S12	S20	S19	S17	SSE23	SSE29	SE29	SE30	SE34	SE25	SSE22.2	SE34	
13-Oct	SE23	SSE22	SSE22	SSE26	SSE27	SSE28	SSE22	SSE18	SE25	SE22	SE23	SE24	SSE24	SE28	SE27	SE28	SE29	SE34	SE34	SE38	SE37	SE38	SE38	SE37	SE27.9	SE38	
14-Oct	SE40	SE41	SE41	SE44	SE45	SSE41	SSE41	SE46	SE41	SE43	SE40	SE39	SE38	SE43	SE45	SE46	SSE41	SSE40	SSE40	SSE34	SSE38	SSE35	SSE37	SE41	SE40.8	SE46	
15-Oct	SE43	SE39	SE36	SE32	SE30	SE31	SE30	SE33	SE28	SE26	SE17	SSE17	SSE17	SSE17	SSE21	SSE24	S25	SSE23	S25	SSW21	SSW20	SW16	SW11	SW15	SSE22.6	SE43	
16-Oct	SW17	SW16	SW17	WSW14	WSW17	SW18	SW17	SW12	SW12	SSW9	SSW10	SSW11	S10	SW10	SW12	SW6	ESE3	SE7	SSW10	S11	SE13	SE14	SE6	ESE10	SSW9.7	SW18	
17-Oct	SE14	SE10	ESE11	NNE7	NNE13	NNE11	NNE12	NNE20	NNE18	NNE14	N18	N18	N20	N16	NNW17	N17	N19	N15	N13	N11	N7	NNE3	SE1	ESE8	NNE10.1	NNE20	
18-Oct	SSE9	SSE13	SSE11	SSE12	SSE22	SSE20	SSE16	SE26	SE26	SE27	SSE21	SSE22	SSE24	SSE26	SSE30	SSE35	SSE35	SSW32	SW36	WSW36	WSW24	WSW34	WSW37	WSW32	S18.9	WSW37	
19-Oct	WSW23	WSW26	WSW26	SW21	SW19	SW13	SW11	SW14	SW13	WSW19	WSW18	WSW23	WSW27	WSW27	WSW29	WSW30	SW29	SW16	WSW25	NW9	WSW21	W40	W39	WSW35	WSW22.0	W40	
20-Oct	W41	W46	W33	W21	W34	W38	W37	W42	W49	WNW39	WNW28	WNW32	NW33	NNW32	NW32	NNW26	NNE20	NNE20	NNE19	NNE18	NE14	NE8	E6	SE6	WNW20.5	W49	
21-Oct	S13	SSE12	SSE18	SSE17	SSE22	SSE24	S25	SSE24	SSE29	SSE37	SSE21	S23	N3	N20	N36	N43	N47	N46	N38	N37	N28	N22	N15	N19	NE5.6	N47	
22-Oct	N23	N18	NNE14	NE17	NE15	NE15	NE10	NE8	NE5	ENE2	N6	N7	NNW10	NNW11	N12	N10	N7	NNW9	NNW9	WNW12	NNW25	NNW26	NNW29	NW29	N11.6	NW29	
23-Oct	NW25	NW23	NW23	NW25	WNW23	WNW16	WNW15	WNW23	WNW18	WNW20	WNW27	WNW30	WNW28	NW31	WNW29	NW31	NW31	NW30	NW32	WNW29	WNW27	WNW29	WNW27	WNW23	WNW25.3	NW32	
24-Oct	WNW21	WNW24	WNW24	WNW25	WNW24	W25	W24	W24	W24	W23	W21	W22	WNW22	W27	W22	W26	W23	W25	W24	W19	WNW26	WNW32	WNW32	WNW32	WNW31	WNW24.6	WNW32
25-Oct	WNW28	WNW29	WNW29	WNW26	WNW22	W18	W18	W16	W17	WSW20	WSW19	WSW18	WSW18	W22	W22	WSW22	WSW22	W25	WNW25	NW26	NW21	WNW15	W19	WNW18	W20.1	WNW29	
26-Oct	WNW20	WNW20	WNW22	WNW22	WNW22	WNW16	W20	W24	WNW26	WNW21	W21	W20	WNW19	W16	W15	WNW16	W21	W21	NNW4	WNW23	WNW22	W24	W20	W16	W19.3	WNW26	
27-Oct	W20	WNW18	NW21	N29	N21	N19	N22	NNE23	N15	N11	N11	N6	NNW10	NNW13	NNW11	NNW15	NW22	NW20	NNW13	N8	W8	WSW10	SW7	SSW13	NNW11.8	N29	
28-Oct	S26	SSW21	SW11	W9	WNW10	WNW11	W12	WNW13	WNW16	NW15	NW13	NW10	NNW14	NNW13	NNW10	NW9	WNW14	WNW25	WNW34	NW32	NW30	NW29	NW29	NW33	WNW14.5	WNW34	
29-Oct	NW30	NW31	NW33	NW24	WNW28	WNW31	NW33	NW26	NW28	NW24	NNW20	NNW19	NNW16	NNW11	NW8	WNW5	NW4	NNW11	NNE8	NE13	ENE12	NNE13	N25	NNE24	NNW17.0	NW33	
30-Oct	N23	NNE24	NNE19	NNE18	N12	NNE14	NE10	E3	SSW7	SSW10	S14	S15	SSE15	SSE19	S22	S19	S27	SSE30	S31	S26	S22	SSW19	SSW19	S20	SSE8.4	S31	
31-Oct	S20	S17	SSW10	SSW11	WNW14	N18	N14	N16	N19	N14	N12	NNW12	NNE7	NNE7	NE2	SSE1	NNE4	NE8	NE7	NNE9	NE5	ENE3	SSW4	SSW10	NNW4.0	S20	

S8.0	S8.4	S7.1	S6.4	S7.4	S7.8	S8.0	S7.7	S7.0	S7.2	SSW5.2	SSW5.6	SSW4.7	SSW4.3	SSW4.8	SSW5.3	SSW5.8	SSW5.5	S6.4	SSW5.7	SSW6.4	SSW7.0	SSW7.0	SSW7.7	Diurnal Average
SE43	W46	SE41	SE44	SE45	SSE41	SE41	SE46	W49	SE43	SE40	SE39	SE38	SE43	SE45	SE46	N47	N46	SE42	SE39	SE45	SE47	SE49	SE44	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

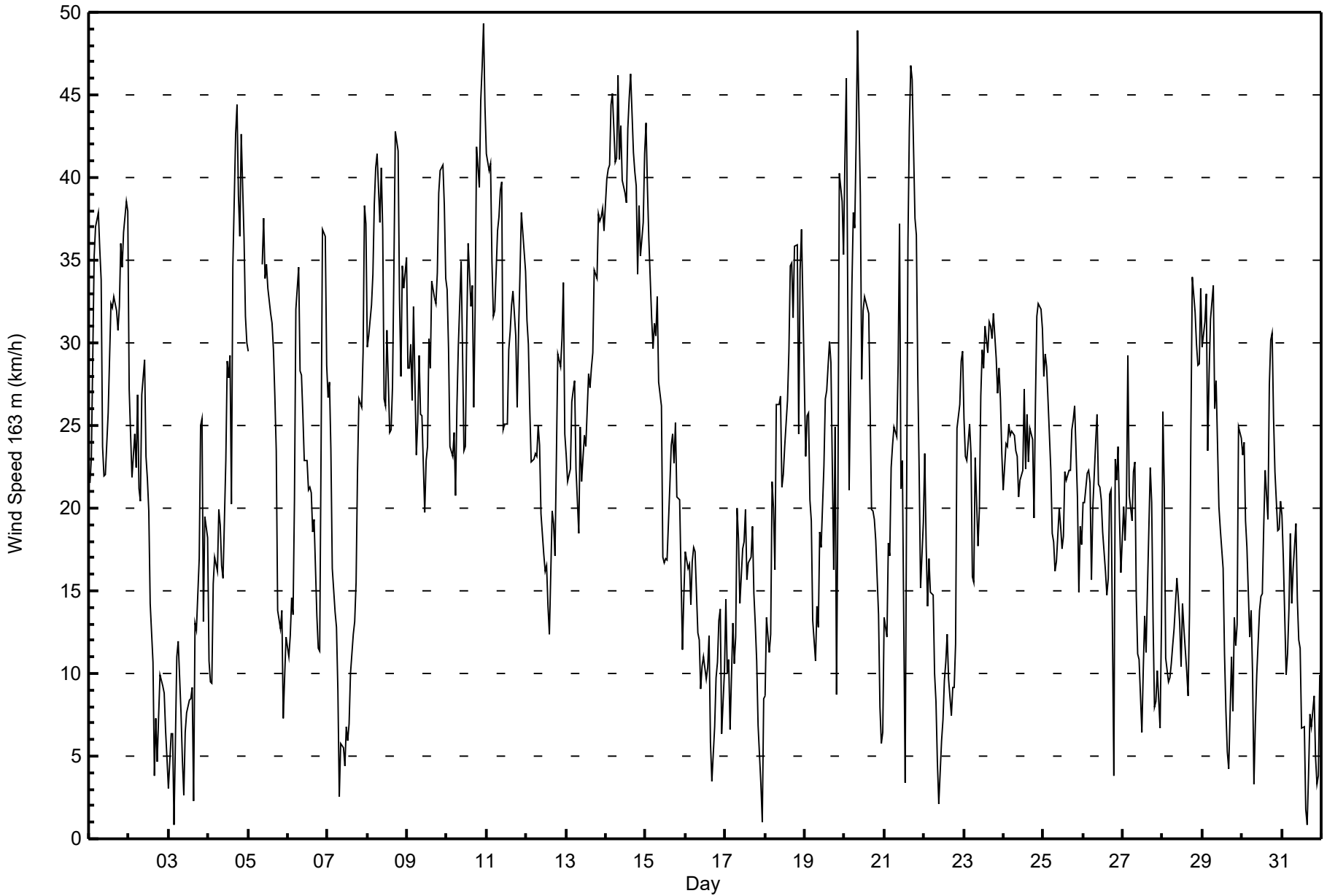
Wind Speed 163 m (WS163m) - km/h
Lower Camp Met Tower - October 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 13 km/h on Oct 19 21:00 Minimum Value: 1 km/h on Oct 31 18:00 Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 2 Median = 3 Q ₃ = 4 P ₉₀ = 5 P ₉₉ = 8																		Hours in Service: 744 Hours of Data: 737 Hours of Missing Data: 7 Hours of Calibration: 0 Percent Operational Time: 99.1							
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Oct	1	2	3	4	3	2	3	3	4	3	4	4	5	4	5	5	5	6	4	4	4	4	3	3	6
2-Oct	4	4	2	2	2	2	2	2	5	3	2	2	2	3	2	3	2	1	1	1	2	1	2	1	5
3-Oct	1	3	3	2	1	3	3	2	1	1	2	3	3	4	6	3	2	2	3	4	9	3	3	9	
4-Oct	3	4	3	2	3	3	3	2	2	4	5	5	4	5	4	7	5	7	6	6	8	7	7	8	
5-Oct	5	UO	UO	UO	UO	UO	UO	UO	6	7	5	5	5	6	5	4	5	4	3	2	4	1	1	2	7
6-Oct	2	1	2	2	3	5	3	4	5	4	4	3	3	3	5	3	3	2	2	2	5	3	3	4	5
7-Oct	5	2	5	4	4	2	4	1	1	2	1	1	1	2	2	2	2	1	4	2	2	4	3	4	5
8-Oct	3	3	2	2	2	3	3	3	4	4	6	5	5	4	4	4	3	2	4	5	3	5	3	2	6
9-Oct	3	3	2	2	3	3	4	4	5	4	2	2	2	3	2	4	3	3	3	3	3	3	4	2	5
10-Oct	4	3	3	2	2	2	2	4	4	3	3	3	6	4	4	4	6	5	4	4	4	3	3	4	6
11-Oct	4	4	3	4	3	3	3	3	4	6	3	3	3	4	3	4	4	4	3	4	4	3	2	3	6
12-Oct	3	3	2	2	2	1	1	1	1	2	3	3	4	4	5	4	2	2	5	2	2	3	2	5	5
13-Oct	2	2	2	2	3	4	5	4	2	3	3	4	4	3	3	4	3	2	4	3	2	2	2	2	5
14-Oct	3	3	3	4	6	5	5	4	5	4	5	4	4	4	5	5	7	6	6	6	4	4	3	7	7
15-Oct	3	3	3	3	2	2	2	3	5	4	3	2	3	3	3	2	2	1	2	1	2	3	2	3	5
16-Oct	2	2	2	2	3	2	3	3	2	2	2	2	2	4	2	3	2	1	1	3	1	3	2	3	4
17-Oct	4	2	3	3	3	4	3	1	2	2	2	2	2	2	2	2	3	2	2	2	2	2	1	2	4
18-Oct	2	3	1	2	4	2	4	2	3	3	4	4	3	4	4	3	2	3	2	4	3	4	2	4	4
19-Oct	4	3	2	3	3	4	4	3	3	3	4	3	2	2	4	4	5	7	6	9	13	3	9	4	13
20-Oct	3	3	6	8	3	4	3	2	5	8	6	6	5	5	5	4	4	5	3	5	3	3	2	1	8
21-Oct	2	2	4	2	4	2	2	3	5	5	9	9	2	5	5	6	8	7	5	5	6	3	4	5	9
22-Oct	2	3	2	1	3	2	2	1	2	1	3	2	3	3	2	4	2	2	2	4	3	3	2	2	4
23-Oct	3	2	3	2	3	4	5	8	3	5	5	5	5	5	5	5	5	3	4	4	5	3	2	2	8
24-Oct	2	2	2	2	1	2	2	2	3	5	5	4	4	4	4	3	4	5	5	6	5	3	3	4	6
25-Oct	5	3	3	3	4	3	2	2	4	2	2	2	3	3	3	2	4	4	5	3	3	3	1	2	5
26-Oct	2	1	2	2	4	2	2	3	2	2	2	3	3	3	4	3	3	7	4	4	4	2	2	3	7
27-Oct	3	4	3	5	4	3	3	3	4	2	2	2	5	3	3	3	2	2	2	2	2	1	1	3	5
28-Oct	3	7	3	2	2	2	1	2	1	1	2	3	2	2	3	2	3	4	2	2	2	3	4	3	7
29-Oct	2	2	5	1	4	2	3	4	4	5	3	3	4	3	3	3	2	3	4	4	4	3	3	3	5
30-Oct	3	3	3	2	3	1	2	1	3	2	3	3	3	2	3	3	4	2	1	2	2	2	1	1	4
31-Oct	2	5	2	3	2	2	2	2	3	3	3	3	2	2	1	1	3	1	1	1	2	2	2	1	5
Diurnal Maximum																									
UO - Unstable Operation																									



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	26	3.53	3.53
6 - 11	98	13.30	16.83
12 - 19	156	21.17	37.99
20 - 28	230	31.21	69.20
29 - 38	172	23.34	92.54
> 38	55	7.46	100.00

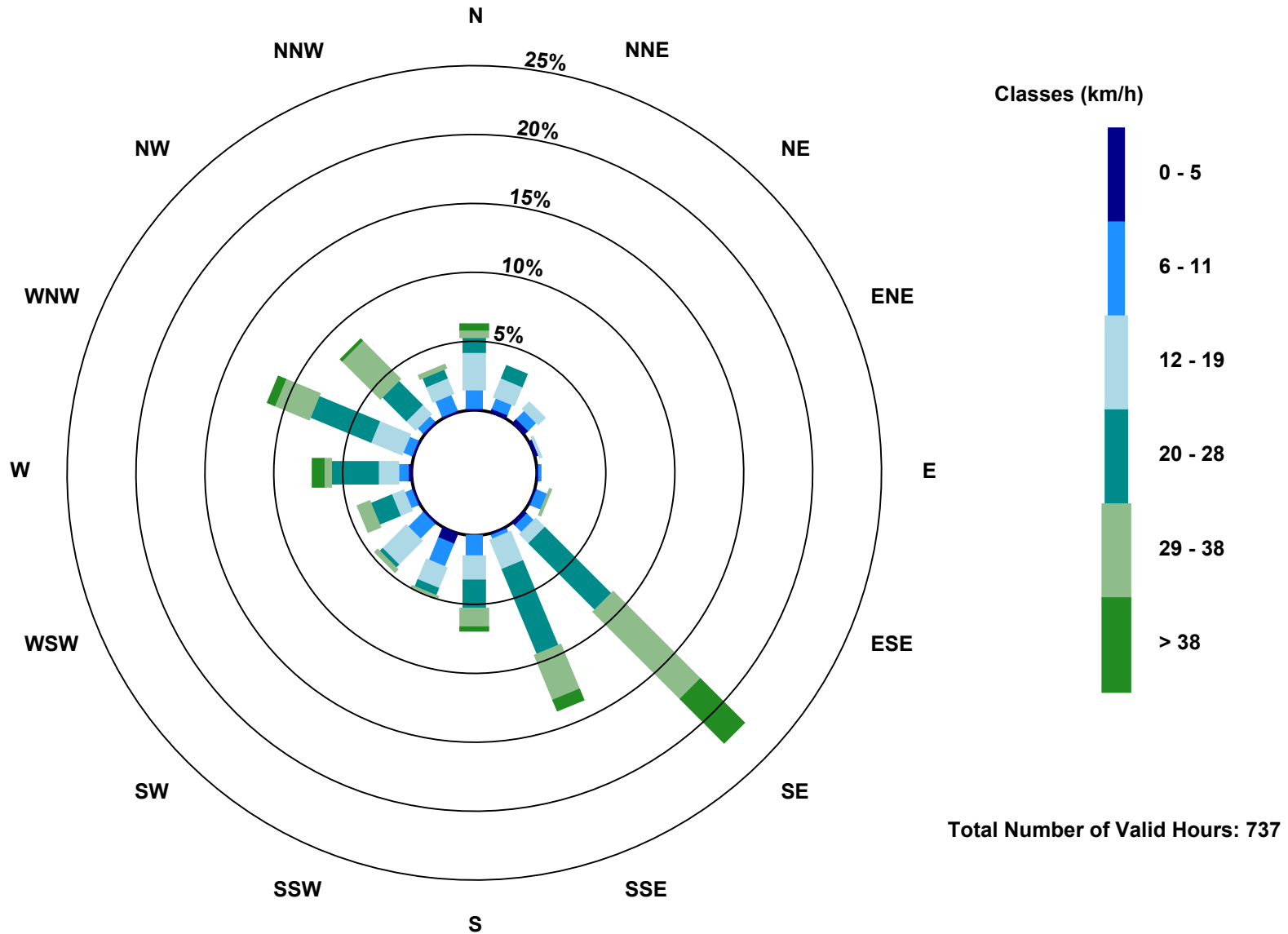
Total Number of Valid Hours: 737

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 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 - October 2023

Direction of Maximum Speed: 144 deg on Oct 14 16:00		Hours in Service: 744
Direction of Maximum Daily Speed Average: 142.4 deg on Oct 14		Hours of Data: 743
Direction of Minimum Speed: 106 deg on Oct 7 05:00	Direction of Minimum Daily Speed Average: 0.5 deg on Oct 31	Hours of Missing Data: 1
Monthly Average Direction: 165.8 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-Oct	124	119	131	130	156	169	167	163	162	165	158	164	167	171	165	165	162	160	152	153	148	150	150	150	158.1
2-Oct	154	147	135	139	140	139	131	126	143	152	151	146	149	149	185	115	227	146	125	124	348	343	308	128	146.7
3-Oct	58	287	30	124	92	133	116	131	121	130	181	229	255	190	287	2	228	205	182	166	121	110	134	138	162.5
4-Oct	136	141	139	144	140	266	316	331	346	348	304	312	314	319	340	300	305	299	302	298	297	309	303	302	303.7
5-Oct	308	304	309	UO	308	307	307	301	304	311	312	311	312	312	311	312	309	312	277	275	238	131	131	109	306.6
6-Oct	123	129	133	116	114	147	146	131	151	149	151	151	142	141	159	138	156	134	134	137	190	267	271	312	147.7
7-Oct	288	308	248	228	106	170	132	137	125	116	138	128	140	131	90	131	160	119	117	353	3	136	119	124	132.6
8-Oct	135	180	139	139	138	141	141	136	133	133	138	146	145	150	144	159	168	177	166	124	119	125	130	134	144.4
9-Oct	150	106	39	104	110	113	118	122	124	136	126	136	141	142	142	137	134	128	137	131	131	132	132	129	131.9
10-Oct	133	120	101	121	125	109	117	110	130	137	136	139	139	140	140	135	127	128	135	137	138	132	137	133	132.8
11-Oct	134	134	143	133	127	130	133	133	136	140	129	134	139	141	142	138	126	119	121	138	135	133	127	128	134.4
12-Oct	130	127	140	119	84	115	108	111	99	135	146	142	153	163	173	169	165	157	129	122	125	129	131	130	139.3
13-Oct	136	134	126	129	142	149	154	145	119	137	147	145	149	134	133	126	129	135	132	138	136	131	127	127	136.4
14-Oct	134	135	133	138	144	144	142	140	136	137	139	142	141	136	139	144	154	156	151	149	151	146	141	138	142.4
15-Oct	139	135	132	131	133	136	124	135	143	133	133	148	157	151	155	159	159	152	153	131	130	135	131	133	141.4
16-Oct	128	133	134	135	133	127	127	125	124	136	140	138	134	179	238	201	120	144	155	129	137	213	331	325	139.2
17-Oct	321	318	324	317	325	304	337	341	352	343	350	354	349	352	323	333	359	342	337	328	321	319	2	97	341.6
18-Oct	172	172	134	97	103	47	120	128	133	135	132	132	156	151	152	152	146	159	178	203	159	250	259	253	161.6
19-Oct	145	138	134	128	128	130	127	122	126	159	215	243	242	246	243	240	218	199	232	340	210	256	273	232	207.9
20-Oct	252	262	270	240	261	264	260	259	261	286	306	302	319	330	320	329	1	347	340	356	333	6	285	359	289.7
21-Oct	118	98	109	123	115	103	116	142	129	129	96	135	97	347	351	358	358	356	356	352	351	349	336	345	14.7
22-Oct	356	16	77	18	25	17	17	318	328	42	330	340	323	325	354	346	8	321	341	299	319	326	326	329	339.7
23-Oct	344	342	350	356	22	27	15	303	261	291	304	294	298	304	301	304	306	313	309	294	275	267	264	295	302.4
24-Oct	307	291	302	267	274	264	265	272	260	280	269	274	277	272	269	269	280	277	283	300	295	285	286	292	278.7
25-Oct	304	293	289	297	301	267	245	263	260	257	238	237	239	260	265	259	250	262	299	316	313	298	264	265	270.4
26-Oct	259	266	255	270	299	276	261	255	269	262	264	269	287	276	266	293	255	273	328	308	288	259	239	253	266.9
27-Oct	266	274	330	352	351	338	343	355	334	343	344	4	339	351	342	324	306	310	9	241	243	234	190	156	324.0
28-Oct	160	163	156	219	251	254	12	353	347	352	357	359	322	357	350	28	82	279	286	288	290	299	313	299	295.5
29-Oct	299	295	311	308	290	294	301	305	300	308	336	333	342	353	345	342	349	288	339	326	36	0	326	329	314.0
30-Oct	354	13	6	16	359	17	91	340	70	125	135	158	141	149	162	170	161	159	157	156	153	147	147	140	144.6
31-Oct	144	141	147	137	19	317	345	348	346	333	323	333	27	358	158	210	69	10	59	57	320	128	203	213	77.7

157.8 163.2 142.5 132.8 144.7 163.9 157.7 155.5 158.3 158.5 167.9 174.5 174.1 169.1 182.7 175.4 180.5 183.9 169.6 161.4 171.6 179.2 173.8 162.2
 Diurnal Average

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

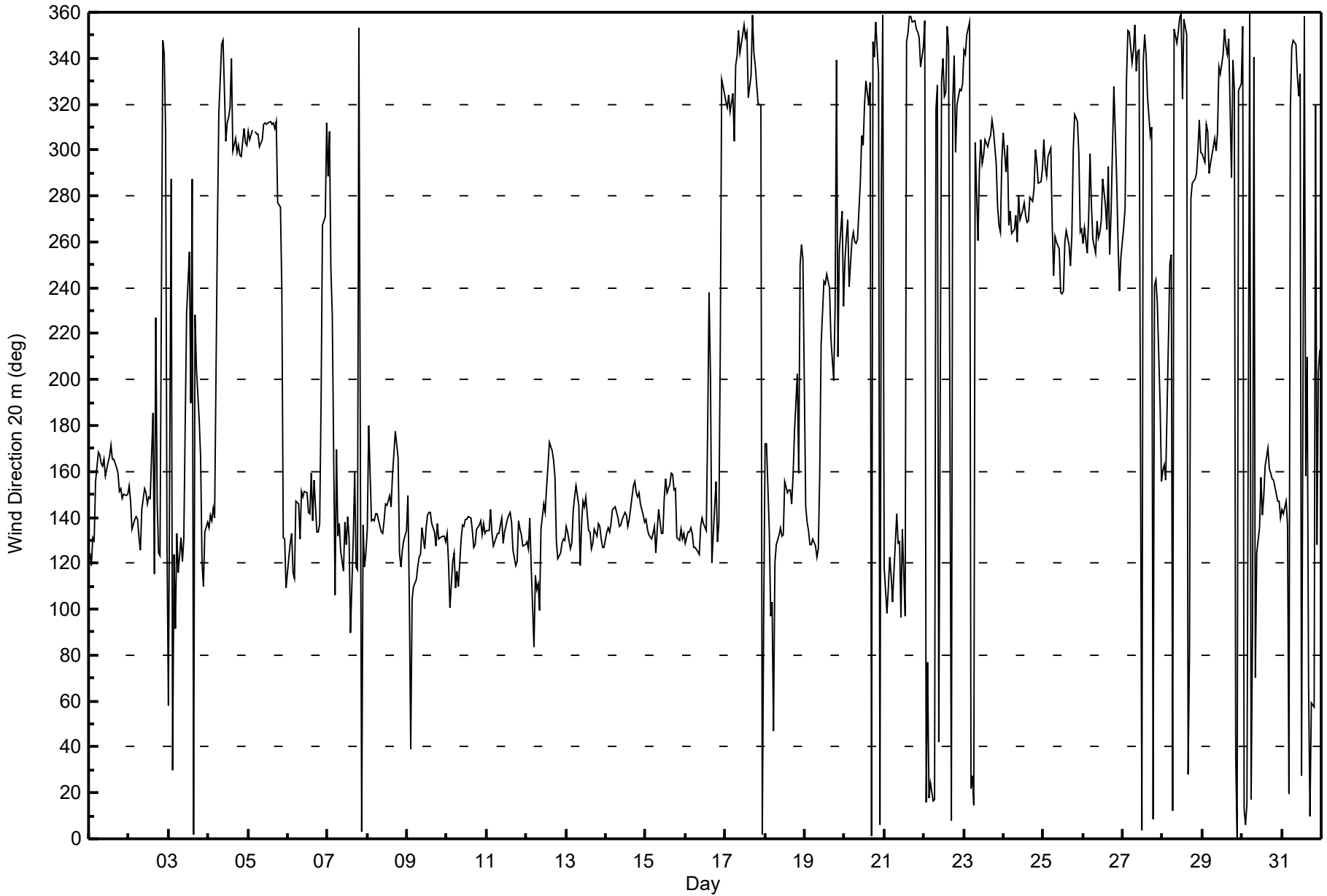
Wind Direction 20 m (WD20m) - deg
Lower Camp Met Tower - October 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 105 deg on Oct 7 05:00 Minimum Value: 6 deg on Oct 16 00:00 Percentiles: P ₁ = 7 P ₁₀ = 10 Q ₁ = 14 Median = 18 Q ₃ = 28 P ₉₀ = 56 P ₉₉ = 89																		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-Oct	32	22	15	13	11	9	8	9	11	11	16	15	12	11	10	11	10	12	9	8	8	8	10	9	32
2-Oct	11	18	13	16	20	19	20	16	14	8	10	10	9	12	25	72	29	29	18	72	67	29	21	83	83
3-Oct	60	84	72	52	80	17	20	18	16	16	46	24	55	96	60	97	20	15	14	21	79	12	26	15	97
4-Oct	19	16	12	17	27	86	19	21	28	38	20	16	16	17	25	18	15	17	18	17	18	16	20	18	86
5-Oct	16	15	16	UO	15	14	15	16	17	16	17	16	17	20	20	17	18	16	19	21	41	15	14	21	41
6-Oct	14	12	17	32	39	22	16	58	13	13	11	10	14	9	15	11	21	16	8	23	43	62	49	57	62
7-Oct	90	65	86	22	105	61	19	12	12	13	17	42	25	42	79	16	16	63	93	74	42	93	12	20	105
8-Oct	30	79	35	26	18	16	17	21	19	17	18	16	11	10	11	10	7	6	15	7	13	14	19	18	79
9-Oct	78	52	59	13	17	40	31	19	39	18	23	18	13	12	13	15	16	21	15	14	14	14	17	15	78
10-Oct	19	36	25	23	16	27	29	42	17	18	17	15	16	13	14	17	18	15	13	15	12	14	11	14	42
11-Oct	15	17	9	22	22	22	19	20	18	10	17	18	15	11	10	14	17	19	18	14	15	15	14	15	22
12-Oct	20	20	13	48	74	50	11	13	27	23	13	15	16	24	25	11	8	22	9	7	10	13	14	68	74
13-Oct	30	36	19	37	18	11	12	15	17	24	15	15	17	18	17	18	17	14	16	13	12	13	13	14	37
14-Oct	13	13	14	13	10	10	9	10	13	14	12	12	11	14	12	11	9	10	12	10	10	8	9	10	14
15-Oct	9	14	15	19	16	15	21	22	16	20	18	13	15	14	12	9	9	8	10	9	14	10	9	6	22
16-Oct	9	12	7	8	7	8	12	9	14	10	10	8	10	45	11	45	18	42	55	15	75	87	31	34	87
17-Oct	45	24	31	32	22	36	37	25	17	19	14	13	16	20	17	18	22	18	20	23	30	73	80	36	80
18-Oct	26	15	36	31	56	70	25	24	77	38	40	17	11	12	9	8	8	6	8	18	32	14	16	16	77
19-Oct	37	10	13	9	6	9	14	11	8	30	47	17	11	13	14	12	12	30	30	93	66	17	18	10	93
20-Oct	15	16	21	64	17	20	18	15	16	22	24	19	18	18	18	19	30	22	18	32	82	58	53	84	84
21-Oct	60	83	44	37	20	30	27	11	18	49	63	30	68	18	17	16	16	16	15	14	15	16	18	19	83
22-Oct	16	18	29	49	77	58	61	88	56	93	42	27	33	29	18	23	28	15	30	36	17	15	13	15	93
23-Oct	16	15	11	10	39	45	72	31	23	26	22	20	24	21	21	17	15	13	12	17	15	18	20	41	72
24-Oct	64	49	57	28	31	25	28	32	23	24	23	24	20	21	22	20	18	23	28	23	19	15	17	19	64
25-Oct	23	17	16	18	19	22	14	17	26	18	11	13	15	18	20	17	17	20	24	14	14	22	18	27	27
26-Oct	17	19	13	74	69	47	19	20	23	18	18	21	20	27	53	35	21	28	86	61	17	16	10	21	86
27-Oct	21	31	29	20	16	19	14	19	22	26	19	23	29	21	36	24	16	20	33	67	36	18	44	16	67
28-Oct	10	52	43	72	45	30	42	36	19	14	15	20	31	29	22	75	58	27	15	15	15	22	20	17	75
29-Oct	16	14	18	13	16	16	15	19	16	17	24	23	23	25	41	47	73	82	33	74	29	41	32	21	82
30-Oct	21	19	18	17	30	60	33	50	64	21	20	15	14	11	12	8	7	8	7	7	7	7	6	8	64
31-Oct	9	15	17	13	48	22	33	17	18	20	23	22	38	22	66	25	72	58	37	80	54	64	27	14	80
90 84 86 74 105 86 72 88 77 93 63 42 68 96 79 97 73 82 93 93 82 93 80 84																									
Diurnal Maximum																									
UO - Unstable Operation																									



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Summary of Hour Averages

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

Direction of Maximum Speed: 360 deg on Oct 21 17:00															Hours in Service: 744											
Direction of Maximum Daily Speed Average: 139.6 deg on Oct 14															Hours of Data: 742											
Direction of Minimum Speed: 237 deg on Oct 30 09:00										Direction of Minimum Daily Speed Average: 0.8 deg on Oct 31										Hours of Missing Data: 2						
Monthly Average Direction: 163.9 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-Oct	129	125	139	133	156	170	169	165	161	164	157	163	165	171	164	163	161	157	149	151	146	148	148	148	156.4	
2-Oct	150	145	134	134	136	136	129	126	138	151	149	144	149	148	190	110	232	142	129	126	105	334	344	88	141.8	
3-Oct	118	188	83	146	135	140	129	143	130	130	199	232	261	250	290	25	229	208	188	180	160	113	133	137	167.0	
4-Oct	137	140	148	148	151	264	315	333	342	331	301	310	313	317	338	298	304	298	300	296	295	307	302	301	300.5	
5-Oct	307	302	UO	UO	305	304	305	300	303	309	311	311	311	311	309	311	309	309	309	273	266	242	153	154	141	303.0
6-Oct	138	136	133	121	121	143	141	129	150	147	148	149	141	141	160	138	169	134	133	140	214	258	263	293	151.4	
7-Oct	279	280	287	244	238	115	152	150	139	113	121	110	126	107	109	122	148	136	126	106	123	119	125	126	135.1	
8-Oct	126	129	129	130	134	135	134	132	130	132	135	142	141	147	142	159	169	176	172	127	117	123	124	129	138.7	
9-Oct	130	126	118	120	121	122	125	126	124	131	122	131	135	138	137	132	130	125	131	128	129	130	128	127	129.3	
10-Oct	130	122	112	121	126	122	124	127	129	133	133	133	133	136	136	129	121	127	132	133	136	132	136	133	130.6	
11-Oct	132	133	140	131	128	128	131	131	132	136	126	129	134	136	138	134	123	118	122	136	133	132	127	128	131.4	
12-Oct	129	128	136	135	132	104	111	112	113	135	148	138	151	163	170	170	166	164	138	126	122	129	131	128	137.1	
13-Oct	127	129	131	132	138	150	152	141	119	130	140	137	143	131	130	124	127	133	130	135	135	132	129	128	133.4	
14-Oct	133	134	133	136	141	141	139	138	135	135	137	139	138	134	136	140	150	154	148	145	148	144	139	137	139.6	
15-Oct	138	133	131	131	133	134	129	133	139	131	130	147	153	148	153	160	161	156	155	131	138	143	135	149	140.7	
16-Oct	136	132	139	143	158	147	141	134	129	140	140	134	131	178	236	207	115	130	143	132	115	131	341	341	141.5	
17-Oct	339	331	333	345	340	335	341	353	347	343	353	355	350	352	323	333	359	346	341	332	325	340	42	102	345.4	
18-Oct	169	171	133	113	125	92	131	130	129	130	128	134	156	149	151	152	147	162	186	211	213	243	252	249	164.5	
19-Oct	208	174	171	140	141	132	131	126	132	203	229	242	241	245	241	238	219	204	231	345	225	254	272	230	218.7	
20-Oct	250	258	264	247	260	260	256	257	261	285	304	300	319	330	320	329	4	357	347	359	351	357	332	311	289.0	
21-Oct	134	121	125	133	124	115	130	137	128	127	121	136	84	348	351	359	360	357	358	355	355	352	340	348	18.7	
22-Oct	1	7	46	54	38	36	33	15	354	38	336	343	321	326	356	350	14	325	344	290	322	328	327	327	343.3	
23-Oct	336	342	345	342	360	353	330	294	257	290	302	292	298	304	299	303	305	309	306	294	276	265	262	272	298.7	
24-Oct	278	274	276	261	264	256	258	267	259	276	268	274	276	270	266	268	277	273	281	297	293	286	287	292	274.7	
25-Oct	299	292	289	294	298	266	245	261	260	255	239	238	241	259	264	257	250	259	297	314	311	294	262	261	270.6	
26-Oct	258	266	253	271	284	276	259	252	267	262	263	265	287	274	267	292	253	269	41	302	287	255	237	253	265.4	
27-Oct	261	270	318	353	355	347	349	359	340	345	345	5	335	352	347	325	306	304	350	275	247	239	204	163	324.2	
28-Oct	167	171	167	238	273	252	287	317	332	328	340	356	325	352	350	351	298	280	286	288	289	295	305	299	291.3	
29-Oct	299	297	312	305	289	294	301	305	300	307	339	332	341	352	336	333	355	319	27	25	44	360	343	340	315.2	
30-Oct	358	11	8	16	360	12	68	328	237	139	135	156	140	148	163	173	161	158	156	158	155	148	149	142	141.4	
31-Oct	147	143	149	151	330	333	335	348	347	339	329	333	28	6	120	199	64	27	55	81	337	104	201	218	34.8	

158.0	163.3	146.1	140.2	150.1	162.4	157.5	154.7	156.7	157.6	162.7	170.7	170.0	165.6	181.7	172.3	181.6	184.1	169.3	159.8	167.1	179.0	174.6	163.1	
Diurnal Average																								

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 744
Maximum Value: 98 deg on Oct 3 14:00	Hours of Data: 742
Minimum Value: 3 deg on Oct 16 13:00	Hours of Missing Data: 2
Percentiles: P ₁ = 5 P ₁₀ = 7 Q ₁ = 9 Median = 12 Q ₃ = 18 P ₉₀ = 35 P ₉₉ = 87	Hours of Calibration: 0
	Percent Operational Time: 99.7

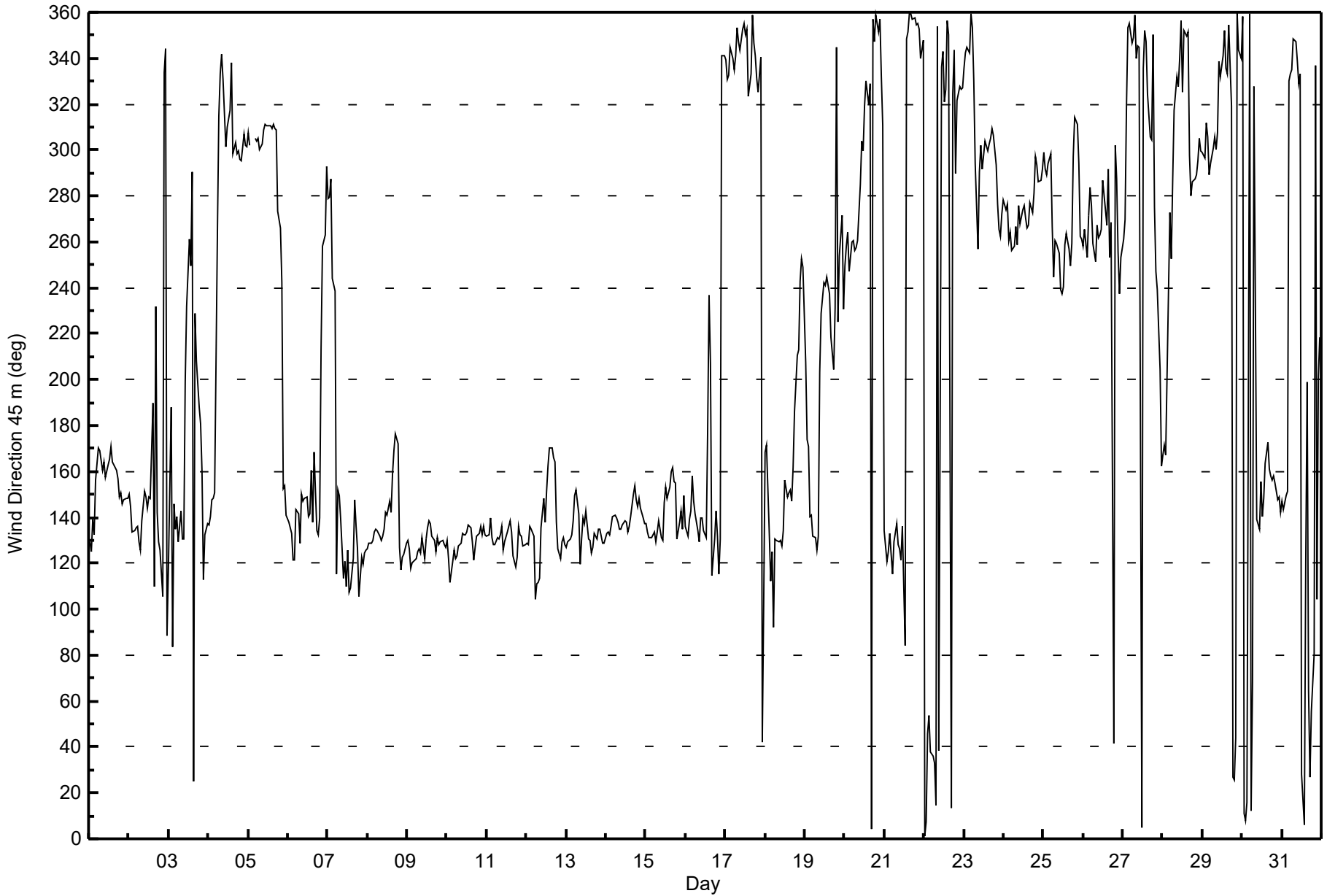
Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Oct	7	6	7	8	9	7	8	8	10	10	14	15	11	10	10	10	9	12	8	8	7	7	9	8	15	
2-Oct	10	14	8	8	8	8	10	7	10	7	8	9	8	11	26	67	26	25	4	15	54	24	10	89	89	
3-Oct	33	53	57	21	80	12	8	15	11	13	50	24	48	98	61	94	18	16	9	15	51	10	16	15	98	
4-Oct	11	6	7	11	30	34	13	10	14	35	15	11	10	13	19	12	10	12	12	11	12	12	15	13	35	
5-Oct	11	10	UO	UO	10	10	10	10	10	12	12	13	12	13	14	13	13	13	11	12	11	22	19	15	22	22
6-Oct	16	7	12	22	18	13	11	24	11	11	9	8	12	7	13	10	18	12	6	29	40	25	16	38	40	
7-Oct	74	33	42	19	82	82	28	10	10	14	13	36	18	58	38	10	17	14	12	57	23	6	5	7	82	
8-Oct	10	35	12	11	7	7	7	8	8	8	11	12	8	9	9	9	6	5	9	10	8	6	8	6	35	
9-Oct	53	25	60	9	6	8	9	10	21	11	12	11	7	6	7	7	9	8	7	6	5	5	7	6	60	
10-Oct	7	14	12	8	7	11	11	19	8	7	10	9	9	8	7	9	12	7	6	8	7	6	4	6	19	
11-Oct	7	8	4	9	12	10	10	8	9	6	9	10	8	5	5	8	9	11	9	8	7	6	6	6	12	
12-Oct	8	11	6	14	32	7	5	6	16	13	12	11	15	23	23	11	8	17	6	6	5	7	5	19	32	
13-Oct	11	9	6	9	8	10	12	12	10	17	11	10	14	10	10	10	6	9	5	5	6	5	6	6	17	
14-Oct	5	5	5	7	7	7	5	5	6	6	6	7	7	6	6	8	9	9	11	8	8	6	5	4	11	
15-Oct	4	6	6	7	6	6	11	11	10	7	12	12	16	13	11	9	7	6	7	5	12	11	9	12	16	
16-Oct	9	6	10	8	15	15	18	6	6	9	8	6	3	49	8	50	15	18	16	8	13	44	42	10	50	
17-Oct	10	9	10	13	19	14	9	12	11	11	8	5	9	13	14	13	14	13	15	20	24	59	77	26	77	
18-Oct	26	13	26	29	25	86	17	11	22	14	22	16	9	10	8	7	7	7	8	12	27	8	11	11	86	
19-Oct	44	24	26	15	14	5	7	7	5	32	26	13	8	9	10	9	10	24	19	90	67	13	14	9	90	
20-Oct	9	9	15	47	11	12	10	10	9	18	19	14	13	12	14	13	27	18	13	22	49	7	34	67	67	
21-Oct	17	18	15	18	11	13	15	6	9	18	66	13	65	11	12	9	9	9	8	9	10	10	11	13	66	
22-Oct	11	13	28	66	50	50	21	53	59	96	41	22	27	24	14	17	20	10	25	31	14	9	9	9	96	
23-Oct	9	7	7	9	16	41	42	22	15	21	16	13	19	16	17	13	12	9	8	12	11	10	9	22	42	
24-Oct	28	27	22	13	17	11	13	17	13	18	21	19	16	16	14	14	18	21	17	13	9	10	11	11	28	
25-Oct	15	11	9	11	13	17	12	10	14	11	9	10	13	13	13	11	14	16	20	11	10	19	9	13	20	
26-Oct	9	9	6	23	42	28	12	9	12	9	11	13	14	23	49	30	18	29	94	57	14	10	7	19	94	
27-Oct	11	28	19	16	12	12	9	12	16	21	14	17	23	16	25	17	10	14	30	54	24	13	34	16	54	
28-Oct	9	40	34	43	38	15	47	28	13	13	15	16	22	22	16	86	84	14	8	8	8	12	15	9	86	
29-Oct	8	9	14	9	10	10	9	12	11	13	21	19	18	20	35	44	63	52	50	74	23	30	13	13	74	
30-Oct	12	11	10	10	14	23	19	61	90	11	14	13	12	10	11	8	7	7	6	8	7	5	5	6	90	
31-Oct	8	11	12	17	84	9	17	10	11	14	20	17	31	18	83	35	63	26	35	64	88	44	16	11	88	
	74	53	60	66	84	86	47	61	90	96	66	36	65	98	83	94	84	52	94	90	88	59	77	89		
Diurnal Maximum																										

UO - Unstable Operation



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Summary of Hour Averages

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

Direction of Maximum Speed: 358 deg on Oct 21 17:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 141.4 deg on Oct 14	Hours of Data: 741
Direction of Minimum Speed: 15 deg on Oct 2 23:00	Hours of Missing Data: 3
Direction of Minimum Daily Speed Average: 1.9 deg on Oct 31	Percent Operational Time: 99.6
Monthly Average Direction: 178.8 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-Oct	143	147	156	153	163	175	175	169	161	165	160	165	166	171	166	163	161	157	150	152	151	152	152	151	159.9
2-Oct	150	150	145	146	137	137	138	136	148	156	152	149	154	163	195	168	234	160	146	169	165	170	15	192	150.8
3-Oct	153	190	234	133	183	162	163	200	198	192	217	234	268	286	292	123	229	216	191	198	203	138	152	167	192.7
4-Oct	146	148	158	170	198	262	310	320	318	314	303	307	313	318	331	298	303	300	299	296	296	305	302	302	297.8
5-Oct	308	302	UO	UO	UO	304	305	302	304	309	311	311	309	311	310	309	309	305	279	266	255	217	194	180	301.5
6-Oct	184	171	148	138	134	149	151	140	156	153	155	153	152	158	167	155	182	160	157	170	242	265	272	282	170.4
7-Oct	268	269	287	297	330	334	238	200	218	210	101	100	106	101	117	121	133	127	135	133	129	134	135	135	144.5
8-Oct	132	132	133	134	136	136	136	136	133	135	140	146	144	150	148	161	170	177	178	155	129	132	132	134	143.5
9-Oct	135	134	136	132	136	132	133	136	134	131	126	130	135	139	138	132	133	127	132	132	133	133	129	130	132.8
10-Oct	134	131	124	132	135	133	134	137	132	134	133	132	133	136	136	130	122	126	130	136	138	136	137	135	133.2
11-Oct	133	132	136	132	132	133	133	132	134	137	128	131	133	135	139	133	123	119	127	135	134	135	134	136	132.5
12-Oct	138	141	140	138	141	142	142	143	143	138	157	146	156	169	170	171	170	180	159	151	133	140	137	136	147.4
13-Oct	136	136	135	140	147	156	157	145	125	135	141	138	143	133	131	127	130	136	133	136	137	136	135	135	137.2
14-Oct	135	135	137	139	142	143	142	139	138	138	139	140	140	135	138	142	149	153	149	146	150	147	142	140	141.4
15-Oct	139	139	136	135	136	135	134	135	140	134	135	153	155	153	154	163	164	157	169	166	171	179	180	193	148.3
16-Oct	188	167	181	196	217	209	213	200	174	177	163	168	149	195	232	214	112	133	156	148	133	133	110	117	176.3
17-Oct	124	348	31	1	356	333	327	349	349	350	355	354	350	350	331	339	358	350	349	344	338	3	66	113	350.2
18-Oct	166	171	140	138	134	142	157	139	132	140	146	150	158	151	154	156	152	176	205	229	233	241	246	244	174.1
19-Oct	242	238	237	218	215	178	163	170	203	230	240	242	241	244	240	236	221	214	233	329	238	257	273	237	236.8
20-Oct	250	256	263	259	260	260	258	256	262	283	301	301	319	329	321	329	5	13	3	9	15	20	87	177	288.6
21-Oct	162	138	139	149	155	150	174	147	139	144	148	149	34	351	353	0	358	357	359	356	357	355	349	353	21.4
22-Oct	360	360	16	54	48	47	45	49	33	46	341	345	324	328	357	354	9	332	345	285	327	329	325	321	350.6
23-Oct	318	322	318	312	308	291	285	287	266	290	302	293	299	304	300	303	304	308	305	293	280	275	271	269	295.6
24-Oct	268	271	270	263	264	256	256	258	256	276	270	276	276	272	267	266	275	268	276	295	293	286	287	292	273.1
25-Oct	296	293	289	293	295	269	249	264	260	253	243	239	241	258	264	255	248	259	295	316	310	287	267	266	272.4
26-Oct	268	274	262	271	278	274	263	255	272	271	265	267	288	272	270	291	254	269	43	297	288	256	249	264	269.6
27-Oct	262	272	310	355	358	355	355	5	350	351	345	359	331	348	343	327	307	303	328	329	255	251	223	179	324.4
28-Oct	178	183	192	252	292	262	266	289	296	308	319	331	329	339	340	311	295	285	290	291	292	302	310	307	290.1
29-Oct	304	300	312	305	291	297	305	311	302	308	338	332	339	347	314	315	310	327	52	56	59	353	351	0	319.0
30-Oct	3	13	8	16	7	11	41	100	227	180	149	161	149	153	168	178	164	161	160	166	166	167	169	157	150.4
31-Oct	164	161	171	207	286	335	330	349	351	347	339	336	17	8	50	184	30	33	52	63	85	85	203	224	344.0

176.2 180.6 165.4 156.7 164.7 179.0 180.7 171.1 173.5 170.8 178.0 184.3 184.7 182.4 191.5 183.0 189.4 191.1 178.0 181.6 183.5 191.4 186.5 179.1
 Diurnal Average

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

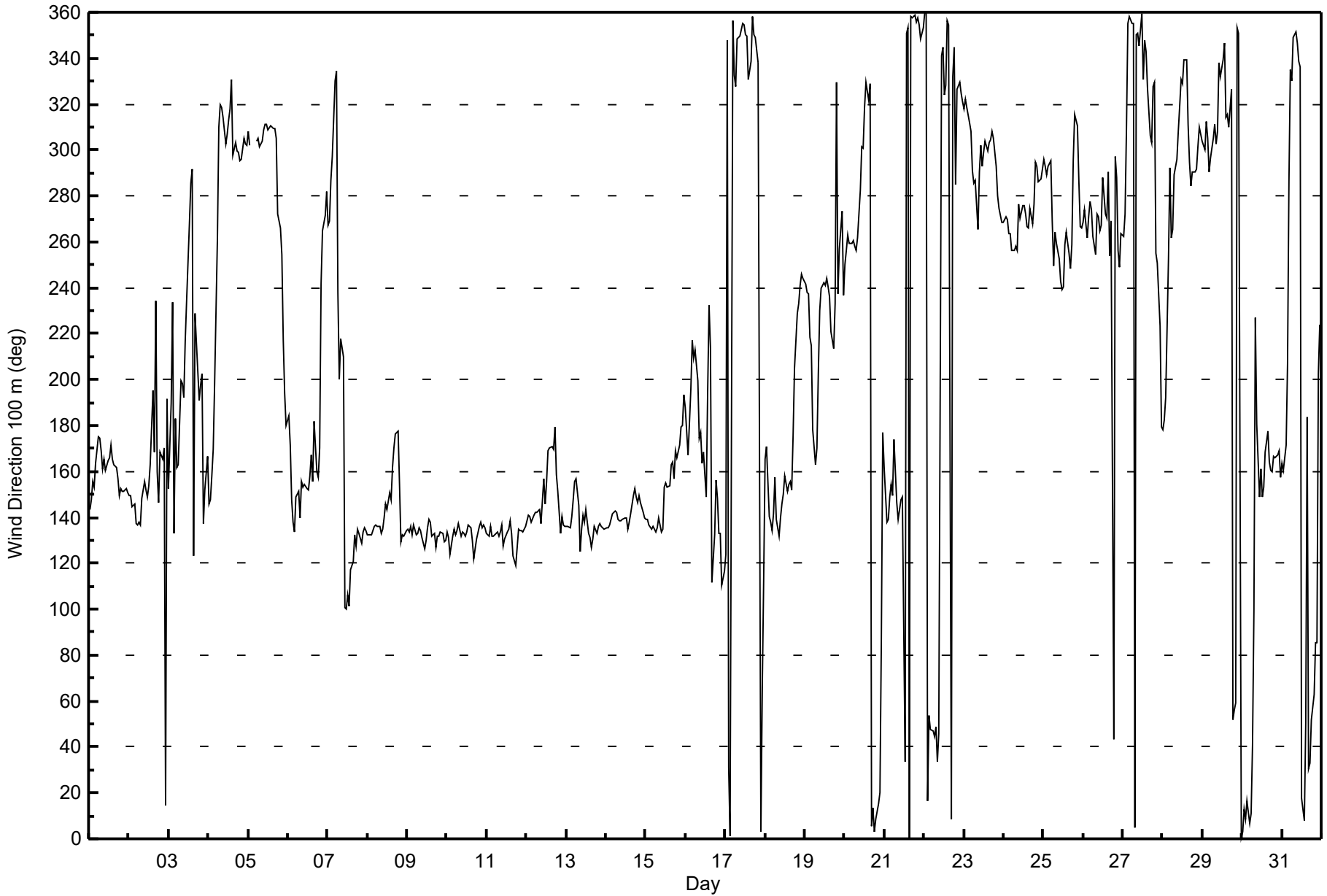
Wind Direction 100 m (WD100m) - deg
Lower Camp Met Tower - October 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0										Hours in Service: 744															
Maximum Value: 100 deg on Oct 26 19:00										Hours of Data: 741															
Minimum Value: 2 deg on Oct 13 03:00										Hours of Missing Data: 3															
Percentiles: P ₁ = 3 P ₁₀ = 4 Q ₁ = 6 Median = 9 Q ₃ = 13 P ₉₀ = 22 P ₉₉ = 74										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-Oct	4	5	6	7	6	4	5	5	9	10	13	14	10	8	8	10	8	9	7	7	7	7	6	6	14
2-Oct	9	8	7	8	4	3	6	4	9	6	6	7	7	14	15	86	23	32	10	4	9	26	77	52	86
3-Oct	18	40	94	20	39	12	10	17	24	30	27	17	38	66	57	85	16	17	10	10	36	15	16	22	94
4-Oct	13	12	6	7	25	14	11	6	8	20	11	8	7	10	13	10	8	9	10	9	9	9	11	11	25
5-Oct	9	7	UO	UO	UO	7	8	7	9	8	9	9	10	10	9	10	10	8	9	8	11	20	16	11	20
6-Oct	12	19	8	12	8	8	7	9	9	9	9	9	11	11	11	16	13	6	6	20	10	10	4	22	22
7-Oct	43	11	17	19	47	13	31	25	10	29	8	16	14	16	16	10	11	11	8	5	3	4	3	3	47
8-Oct	2	3	3	3	3	3	3	4	3	5	7	11	8	9	10	7	4	2	3	12	5	4	4	3	12
9-Oct	6	6	9	3	4	4	4	5	9	7	7	7	5	4	5	5	5	5	5	4	3	3	4	4	9
10-Oct	3	5	5	5	4	4	4	7	5	5	6	6	7	5	5	6	10	6	4	5	4	3	3	3	10
11-Oct	4	5	3	4	5	5	5	4	4	4	6	6	6	5	4	6	6	7	7	5	4	3	3	3	7
12-Oct	6	7	3	5	9	4	7	7	8	5	12	12	15	17	18	9	9	11	7	9	5	5	3	5	18
13-Oct	3	3	2	3	7	8	12	13	6	10	9	6	13	5	7	7	6	4	6	3	3	3	3	3	13
14-Oct	3	3	3	4	6	6	5	4	5	4	5	5	4	5	6	8	8	8	9	8	8	6	5	4	9
15-Oct	3	4	3	3	3	3	4	4	6	4	7	11	15	11	8	8	5	4	5	5	7	14	12	12	15
16-Oct	10	8	9	12	15	10	12	10	13	11	15	10	13	45	7	43	18	18	32	10	6	9	20	23	45
17-Oct	40	77	37	9	9	7	12	4	5	6	5	5	6	10	10	10	9	9	12	19	20	42	80	16	80
18-Oct	21	12	16	17	10	27	12	4	6	8	8	11	7	7	7	6	4	13	8	7	7	5	4	6	27
19-Oct	9	8	13	18	14	24	19	25	16	10	16	9	6	6	7	6	8	17	13	68	45	11	12	8	68
20-Oct	5	4	12	24	7	7	4	5	6	15	15	10	10	9	10	9	26	14	13	16	19	12	15	27	27
21-Oct	25	27	6	17	11	10	10	7	7	9	56	12	69	8	9	7	6	6	6	6	7	6	9	9	69
22-Oct	7	5	17	8	16	16	5	9	25	84	38	20	20	19	11	14	13	10	27	28	11	6	4	4	84
23-Oct	6	7	8	9	13	36	22	13	10	18	13	10	16	13	13	9	9	6	6	10	10	7	4	8	36
24-Oct	11	11	9	5	7	5	7	9	9	15	16	17	15	15	11	11	11	13	19	13	10	6	6	8	19
25-Oct	10	7	5	7	10	14	9	8	12	8	7	9	11	12	9	8	10	10	21	8	10	15	5	5	21
26-Oct	6	5	4	11	17	14	9	6	7	5	8	9	11	20	43	24	12	32	100	12	13	6	5	15	100
27-Oct	6	23	10	14	9	8	6	8	10	11	10	10	19	11	19	14	8	7	23	24	19	9	22	13	24
28-Oct	6	17	31	23	19	6	14	16	6	10	7	12	13	16	13	20	21	9	5	4	5	6	8	6	31
29-Oct	6	6	13	9	7	7	6	9	9	9	17	15	13	15	32	37	35	30	12	28	19	17	7	8	37
30-Oct	7	9	9	7	11	6	18	69	25	28	14	11	12	8	9	7	6	5	3	6	6	6	7	6	69
31-Oct	7	12	15	21	38	5	4	10	7	11	15	13	20	15	52	70	66	8	19	14	57	48	18	4	70
Diurnal Maximum																									
UO - Unstable Operation																									



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Summary of Hour Averages

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

Direction of Maximum Speed: 138 deg on Oct 10 23:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 145.6 deg on Oct 14	Hours of Data: 737
Direction of Minimum Speed: 151 deg on Oct 31 16:00	Hours of Missing Data: 7
Direction of Minimum Daily Speed Average: 4.0 deg on Oct 31	Percent Operational Time: 99.1
Monthly Average Direction: 189.1 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-Oct	162	174	176	166	170	182	182	172	165	168	167	169	170	174	168	165	164	160	154	157	158	158	159	158	166.4
2-Oct	155	156	159	160	147	143	149	149	157	166	162	157	165	178	201	207	235	197	180	190	191	186	182	203	163.4
3-Oct	193	205	283	277	206	190	202	242	272	228	229	241	276	297	292	192	234	224	199	210	221	184	188	201	219.0
4-Oct	176	176	187	201	227	277	313	320	323	311	306	309	315	320	330	301	306	303	302	299	297	305	304	305	300.6
5-Oct	311	UO	UO	UO	UO	UO	UO	UO	302	311	311	311	308	310	311	310	311	306	284	282	274	261	231	213	--
6-Oct	209	196	179	169	154	168	162	154	164	162	165	160	168	176	172	179	192	195	192	209	263	282	287	292	190.1
7-Oct	284	283	288	294	315	306	278	240	220	229	144	117	103	111	126	131	133	135	139	140	139	140	139	138	161.9
8-Oct	135	134	134	134	137	137	137	137	133	138	146	153	150	156	155	165	172	179	184	169	140	141	141	140	147.6
9-Oct	140	135	138	137	139	135	136	137	139	136	133	130	134	140	139	133	135	129	132	134	137	138	133	133	135.5
10-Oct	136	135	134	138	139	136	137	139	133	134	133	131	134	138	136	132	125	127	131	137	139	138	138	138	135.2
11-Oct	135	132	134	130	131	133	134	132	135	139	132	133	133	135	139	133	125	123	131	133	135	136	139	142	133.7
12-Oct	144	146	142	136	139	140	142	141	141	147	164	158	162	175	170	174	174	188	163	160	139	145	140	140	150.5
13-Oct	142	148	149	148	156	161	165	153	133	142	146	142	147	136	134	131	134	138	136	139	141	139	141	140	142.6
14-Oct	139	139	141	144	146	148	148	144	143	142	143	144	144	139	142	145	152	155	153	150	154	151	148	145	145.6
15-Oct	143	145	142	139	139	138	136	138	144	140	145	160	161	160	158	168	172	159	189	201	204	214	220	226	156.9
16-Oct	219	221	231	237	241	229	232	230	220	208	193	194	189	214	229	217	116	145	198	171	142	142	134	122	205.4
17-Oct	135	125	111	25	27	27	14	17	16	15	3	1	358	353	345	352	360	358	2	2	357	28	125	123	14.5
18-Oct	163	167	148	152	151	155	150	142	135	144	151	159	163	156	160	162	166	194	222	245	244	249	252	250	183.0
19-Oct	244	245	245	236	232	224	222	226	236	241	248	247	245	247	244	240	226	223	239	316	244	264	280	246	245.0
20-Oct	260	264	272	276	269	273	271	266	270	285	301	303	320	332	324	332	12	29	21	28	37	51	97	146	295.9
21-Oct	174	162	151	163	160	164	174	157	156	161	165	175	349	358	360	5	2	2	4	1	6	359	358	359	41.3
22-Oct	4	3	14	41	48	49	50	56	48	69	354	355	330	334	1	2	3	339	344	287	334	331	331	325	355.4
23-Oct	315	314	310	308	297	285	286	292	286	294	301	295	301	305	302	304	305	310	307	298	288	289	286	286	299.4
24-Oct	285	288	287	286	286	277	273	266	262	281	275	282	278	277	269	270	277	270	278	297	296	289	290	295	281.3
25-Oct	297	298	295	297	300	279	261	277	267	257	250	245	247	260	267	257	254	265	297	317	311	289	281	282	279.0
26-Oct	285	287	282	283	287	284	277	274	286	284	273	276	289	276	273	293	261	280	345	299	294	269	267	278	281.2
27-Oct	278	286	311	2	6	4	3	13	2	2	349	353	330	344	341	328	311	307	333	349	271	257	232	193	332.3
28-Oct	188	195	222	266	291	288	277	291	297	315	320	325	341	335	333	306	298	292	302	304	304	318	323	317	299.3
29-Oct	314	309	316	309	297	302	311	318	307	313	340	333	340	341	313	303	314	327	33	56	64	28	11	16	327.2
30-Oct	10	20	14	20	10	12	36	100	211	196	169	170	164	161	174	182	171	168	170	178	185	195	192	187	165.0
31-Oct	187	189	207	245	298	354	350	357	360	356	349	347	16	14	42	151	21	34	43	19	40	62	205	213	344.2

189.5	189.2	187.6	175.6	178.3	178.8	179.9	169.3	179.6	181.0	193.7	197.8	202.9	198.5	197.4	192.4	198.1	200.3	190.6	194.6	196.7	200.2	196.7	191.4
Diurnal Average																							

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



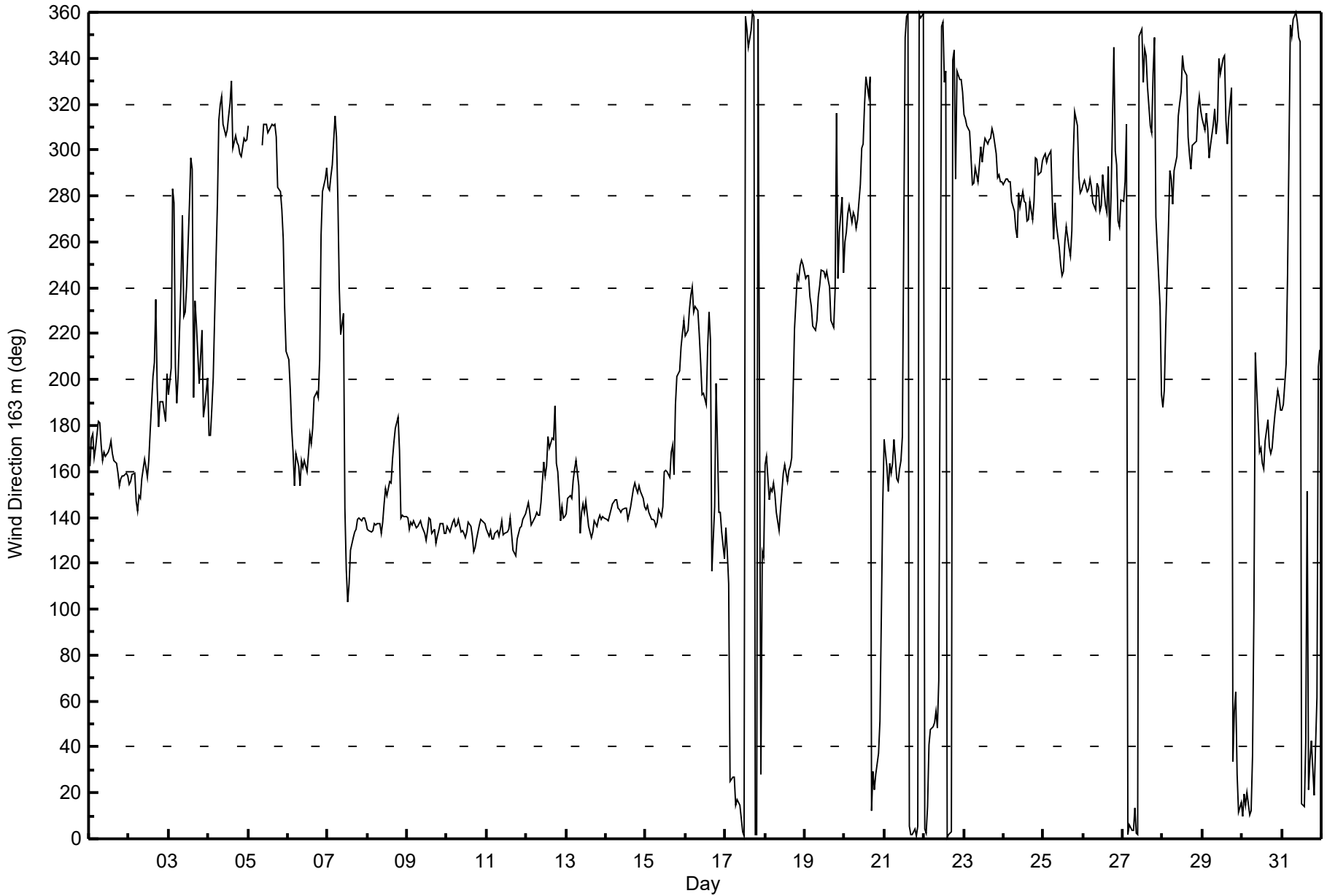
Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 744
Maximum Value: 85 deg on Oct 3 04:00	Hours of Data: 737
Minimum Value: 2 deg on Oct 12 06:00	Hours of Missing Data: 7
Percentiles: P ₁ = 2 P ₁₀ = 4 Q ₁ = 5 Median = 7 Q ₃ = 11 P ₉₀ = 16 P ₉₉ = 58	Hours of Calibration: 0
	Percent Operational Time: 99.1

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Oct	3	9	6	4	5	4	4	3	9	9	12	13	10	7	8	9	7	8	7	5	6	5	4	5	13
2-Oct	8	6	6	6	6	4	6	6	7	6	6	7	6	13	12	71	15	18	11	6	7	6	10	17	71
3-Oct	41	37	23	85	26	10	10	16	24	24	17	16	35	31	54	72	14	15	13	12	12	15	16	16	85
4-Oct	23	18	12	7	19	12	7	6	7	10	9	7	6	10	9	8	6	8	8	7	7	9	9	9	23
5-Oct	7	UO	UO	UO	UO	UO	UO	UO	11	7	7	7	9	10	8	8	8	9	10	9	10	10	13	11	13
6-Oct	12	11	13	14	10	9	5	7	7	7	9	9	9	11	10	14	7	8	8	15	8	6	3	7	15
7-Oct	6	4	6	8	17	11	17	39	8	15	21	13	10	12	6	12	6	4	3	3	3	3	3	3	39
8-Oct	3	2	2	2	3	3	3	3	3	4	8	10	8	9	9	6	3	2	3	11	6	4	4	3	11
9-Oct	3	3	2	2	2	3	3	4	6	7	6	4	5	4	5	4	4	4	4	4	3	3	3	3	7
10-Oct	3	3	4	5	3	4	3	4	4	4	6	5	6	5	5	5	9	5	4	4	4	3	3	3	9
11-Oct	4	4	4	4	4	4	4	4	4	4	5	5	5	5	4	6	4	6	5	5	4	3	3	4	6
12-Oct	5	5	4	3	3	2	3	2	2	7	9	12	13	15	16	8	9	5	4	4	4	4	3	4	16
13-Oct	4	5	4	4	7	7	11	13	5	10	10	9	12	5	6	6	5	3	4	4	3	3	3	3	13
14-Oct	3	4	3	5	6	6	5	5	5	4	5	6	7	5	4	6	7	7	8	7	7	6	6	5	8
15-Oct	4	4	3	4	3	3	3	5	6	6	9	10	12	8	7	7	6	5	8	4	6	9	13	8	13
16-Oct	8	7	6	7	6	6	9	7	7	14	11	9	14	34	7	34	31	18	20	11	6	5	13	10	34
17-Oct	9	7	9	30	10	21	8	3	4	6	5	6	6	9	9	8	6	9	10	16	20	41	84	14	84
18-Oct	19	16	9	10	4	6	7	3	7	10	6	8	6	6	6	5	6	13	9	5	4	5	3	6	19
19-Oct	5	3	4	6	8	16	17	18	10	7	12	7	5	4	6	5	7	15	10	51	32	9	9	7	51
20-Oct	4	3	11	13	5	4	3	6	4	12	12	9	8	7	9	8	26	8	10	12	11	19	13	15	26
21-Oct	10	10	7	5	4	4	4	6	6	6	18	12	67	7	8	6	6	6	7	6	8	7	10	8	67
22-Oct	3	4	9	9	6	6	5	12	12	40	37	20	16	16	10	13	12	10	21	24	11	6	3	3	40
23-Oct	7	5	5	4	6	12	12	14	8	15	12	10	13	12	11	8	8	5	4	9	8	6	4	4	15
24-Oct	4	5	4	3	3	6	7	6	7	12	13	15	13	14	10	10	10	10	15	10	8	5	5	6	15
25-Oct	8	5	5	6	9	12	9	8	14	7	7	9	8	10	7	7	7	7	19	6	8	13	6	6	19
26-Oct	5	4	4	7	9	9	6	6	5	5	7	8	9	18	36	18	10	29	60	7	11	6	7	9	60
27-Oct	8	15	8	13	7	6	5	6	9	9	9	12	15	11	18	13	6	5	19	15	18	9	20	6	20
28-Oct	4	9	20	16	7	7	9	8	5	6	5	10	10	10	11	14	14	7	4	4	5	5	5	4	20
29-Oct	5	5	13	9	7	5	5	8	8	7	16	13	11	17	22	25	23	15	21	13	11	13	4	5	25
30-Oct	7	9	7	5	8	4	9	38	20	25	10	11	12	8	8	7	5	3	3	6	7	6	6	5	38
31-Oct	6	12	22	13	26	6	7	9	6	9	11	10	15	15	52	62	52	5	10	6	22	51	61	5	62
	41	37	23	85	26	21	17	39	24	40	37	20	67	34	54	72	52	29	60	51	32	51	84	17	
	Diurnal Maximum																								

UO - Unstable Operation





Maximum Value: 0.5 km/h on Oct 3 20:00 Maximum Daily Average: 0.0 km/h on Oct 22 Minimum Value: -1.7 km/h on Oct 14 16:00 Minimum Daily Average: -1.2 km/h on Oct 14 Maximum Diurnal Average: -0.2 km/h at hour 4 Minimum Diurnal Average: -0.6 km/h at hour 13 Monthly Average: -0.38 km/h Percentiles: $P_1 = -1.4$ $P_{10} = -0.9$ $Q_1 = -0.6$ Median = -0.3 $Q_3 = -0.1$ $P_{90} = 0.0$ $P_{99} = 0.2$																						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-Oct	0.0	0.0	-0.3	-0.7	-0.7	-1.0	-0.7	-0.8	-0.7	-1.2	-1.0	-1.3	-1.3	-1.5	-1.4	-1.3	-1.1	-1.1	-0.8	-1.1	-1.2	-0.9	-0.9	-1.3	-0.9	0.0	
2-Oct	-0.8	-0.6	-0.4	-0.4	-0.5	-0.3	-0.4	-0.5	-0.7	-0.9	-0.9	-0.9	-0.6	-0.7	-0.4	-0.2	-0.3	0.0	0.1	0.0	0.0	0.0	0.0	0.0	-0.1	-0.4	0.1
3-Oct	0.1	-0.1	0.1	0.0	0.0	-0.2	-0.2	0.0	0.0	0.0	-0.1	-0.5	-0.3	-0.2	-0.2	0.0	-0.4	-0.3	-0.2	0.5	-0.1	-0.3	-0.3	-0.3	-0.1	0.5	
4-Oct	-0.3	-0.2	-0.1	-0.4	-0.1	0.0	-0.3	0.0	0.1	-0.1	-0.5	-0.4	-0.5	-0.4	-0.2	-0.4	-0.7	-0.8	-0.8	-0.6	-0.6	-1.0	-0.5	-0.6	-0.4	0.1	
5-Oct	-0.6	-0.6	-0.6	UO	-0.6	-0.9	-1.0	-0.6	-0.6	-0.6	-0.8	-0.7	-0.6	-0.4	-0.5	-0.5	-0.4	-0.5	-0.2	-0.2	-0.1	0.1	0.0	0.0	-0.5	0.1	
6-Oct	-0.1	-0.1	-0.3	-0.5	-0.1	-0.7	-0.5	-0.2	-0.7	-0.8	-0.8	-1.2	-0.9	-1.3	-0.8	-0.6	-0.2	0.0	-0.1	0.1	0.0	0.0	-0.1	-0.2	-0.4	0.1	
7-Oct	-0.1	-0.3	0.0	-0.1	0.0	0.0	0.1	-0.1	0.0	-0.2	-0.2	-0.1	-0.1	0.2	0.1	-0.1	-0.1	0.0	0.0	0.0	0.1	0.0	-0.2	-0.3	-0.1	0.2	
8-Oct	-0.3	0.1	0.1	-0.2	-0.3	-0.5	-0.5	-0.3	-0.3	-0.8	-0.4	-0.8	-1.2	-1.3	-1.0	-0.8	-1.1	-1.2	-0.6	-0.3	-0.5	-0.6	-0.4	-0.3	-0.6	0.1	
9-Oct	0.0	0.1	0.1	0.0	-0.1	-0.1	-0.1	-0.3	-0.2	-0.5	-0.3	-0.8	-1.0	-1.3	-1.0	-0.6	-0.5	-0.2	-0.6	-0.7	-0.9	-0.8	-0.8	-0.8	-0.5	0.1	
10-Oct	-0.4	0.1	-0.4	-0.3	-0.4	-0.1	-0.1	0.1	-0.7	-0.6	-0.6	-0.6	-1.0	-1.3	-0.8	-0.6	-0.4	-0.6	-0.5	-0.7	-1.0	-0.8	-0.9	-0.9	-0.6	0.1	
11-Oct	-0.8	-0.5	-1.5	-0.5	-0.3	-0.4	-0.5	-0.4	-0.6	-1.2	-0.8	-0.5	-0.8	-1.1	-1.2	-0.7	-0.6	-0.3	-0.3	-0.3	-0.5	-0.5	-0.7	-0.5	-0.7	-0.3	
12-Oct	-0.4	-0.4	-0.5	0.0	0.0	0.0	0.0	-0.3	-0.2	-0.4	-0.5	-0.6	-0.5	-0.4	-0.5	-0.9	-0.7	-0.2	-0.1	-0.2	-0.6	-0.6	-0.7	-0.2	-0.4	0.0	
13-Oct	-0.3	-0.1	0.0	0.0	-0.5	-0.5	-0.7	-0.7	-0.5	-0.6	-0.7	-0.8	-0.9	-0.3	-0.9	-0.4	-0.3	-0.5	-0.6	-0.8	-0.5	-0.5	-0.6	-0.5	-0.5	0.0	
14-Oct	-0.7	-0.6	-0.6	-0.8	-1.5	-1.3	-1.6	-1.3	-1.1	-0.9	-1.2	-1.3	-1.5	-1.0	-1.5	-1.7	-1.6	-1.1	-1.1	-1.3	-1.3	-1.4	-1.2	-0.8	-1.2	-0.6	
15-Oct	-1.1	-0.6	-0.5	-0.4	-0.6	-0.7	-0.2	-0.4	-0.5	-0.2	-0.2	-0.8	-0.7	-0.7	-0.9	-0.8	-0.7	-0.4	-0.6	-0.5	-0.3	-0.3	-0.4	-0.3	-0.5	-0.2	
16-Oct	-0.4	-0.4	-0.2	-0.3	0.1	0.0	0.1	0.1	0.0	-0.4	-0.5	-0.5	-0.7	-0.4	-0.7	-0.2	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	-0.2	0.1	
17-Oct	0.0	-0.1	-0.1	-0.1	-0.2	-0.2	0.0	0.0	0.0	0.0	-0.5	-0.8	-0.5	-0.5	0.0	-0.2	0.0	-0.1	0.0	-0.2	-0.1	0.0	0.0	0.0	-0.1	0.0	
18-Oct	-0.5	-0.6	-0.3	-0.2	0.0	0.0	-0.1	-0.3	-0.2	-0.3	0.0	-0.5	-0.8	-0.9	-0.9	-1.1	-0.8	-0.8	-1.2	-0.4	0.1	-0.4	-0.5	-0.4	-0.5	0.1	
19-Oct	0.0	0.0	-0.1	0.1	0.0	-0.2	-0.1	-0.2	0.0	-0.2	-0.3	-0.8	-1.1	-1.0	-0.8	-0.5	-0.6	-0.3	-0.3	-0.1	-0.2	-0.9	-0.8	-0.8	-0.4	0.1	
20-Oct	-0.7	-0.8	-0.6	-0.3	-0.8	-0.8	-0.8	-0.8	-0.8	-0.8	-0.5	-0.4	-0.3	0.2	-0.2	0.0	-0.1	-0.1	-0.2	-0.1	0.1	0.0	0.0	0.0	-0.4	0.2	
21-Oct	0.0	0.0	-0.2	0.0	-0.1	-0.2	-0.2	-0.5	-0.4	-0.4	0.2	-0.4	-0.2	-0.3	-0.1	-0.4	-0.3	-0.5	-0.3	-0.6	-0.5	-0.2	0.1	0.1	-0.2	0.2	
22-Oct	0.0	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	0.0	0.1	-0.1	-0.1	0.0	-0.1	0.0	-0.1	0.0	0.0	0.1	
23-Oct	0.0	-0.1	-0.1	0.1	0.2	0.0	0.1	-0.1	-0.3	-0.2	-0.5	-0.8	-0.6	-0.6	-0.3	-0.7	-0.7	-0.5	-0.6	-0.3	-0.5	-0.4	-0.1	0.0	-0.3	0.2	
24-Oct	0.0	0.1	0.1	0.0	0.0	-0.2	-0.3	-0.2	-0.4	-0.3	-0.5	-0.6	-1.0	-0.4	-0.5	-0.6	-0.8	-0.5	-0.3	-0.3	-0.4	-0.8	-0.8	-0.3	-0.4	0.1	
25-Oct	-0.3	-0.4	-0.4	-0.3	-0.1	-0.4	-0.5	-0.5	-0.2	-0.2	-0.8	-0.8	-0.5	-0.8	-0.5	-0.9	-0.5	-0.4	-0.3	-0.4	-0.3	-0.3	-0.3	-0.1	-0.4	-0.1	
26-Oct	-0.4	-0.3	-0.7	-0.1	0.0	-0.1	-0.4	-0.3	-0.4	-0.4	-0.5	-0.3	-0.7	-0.4	-0.4	-0.3	-0.4	-0.3	0.0	-0.2	-0.3	-0.5	-0.3	-0.2	-0.3	0.0	
27-Oct	-0.2	-0.2	0.0	-0.2	-0.2	0.0	-0.1	-0.1	0.1	-0.2	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	-0.4	-0.3	-0.1	-0.1	-0.1	0.0	-0.1	-0.2	-0.1	0.1	
28-Oct	-0.4	-0.3	-0.1	-0.1	-0.2	-0.3	0.2	0.0	0.0	0.1	-0.1	0.0	-0.1	-0.1	-0.2	0.0	0.0	-0.4	-0.4	-0.3	-0.4	-0.1	-0.2	-0.4	-0.2	0.2	
29-Oct	-0.3	-0.3	-0.4	-0.4	-0.5	-0.4	-0.6	-0.3	-0.5	-0.4	-0.1	-0.1	0.0	-0.1	0.2	0.0	0.0	0.0	0.0	0.1	-0.1	-0.1	-0.2	-0.1	-0.2	0.2	
30-Oct	0.1	0.1	0.1	0.2	0.0	0.1	0.0	0.0	0.0	0.1	-0.3	-0.7	-0.8	-0.7	-1.0	-0.7	-1.0	-1.0	-1.0	-0.6	-0.7	-0.8	-0.8	-0.7	-0.4	0.2	
31-Oct	-0.8	-0.6	-0.4	0.1	0.1	-0.1	0.0	0.0	0.0	-0.1	0.0	-0.1	0.1	-0.1	-0.1	-0.2	-0.1	0.1	-0.2	0.0	0.0	0.0	0.0	-0.2	-0.1	0.1	
																								Diurnal Average			
																								Diurnal Maximum			
UO - Unstable Operation																											



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 4.7 km/h on Oct 21 17:00		Hours in Service: 744 Hours of Data: 743 Hours of Missing Data: 1 Hours of Calibration: 0 Percent Operational Time: 99.9																							
Minimum Value: 0.1 km/h on Oct 2 22:00																									
Percentiles: $P_1 = 0.2$ $P_{10} = 0.5$ $Q_1 = 1.0$ Median = 1.7 $Q_3 = 2.5$ $P_{90} = 3.0$ $P_{99} = 3.9$																									
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-Oct	0.3	0.4	1.2	2.0	1.8	1.8	1.5	1.7	1.8	2.0	2.2	2.5	2.4	2.4	2.6	2.6	2.5	2.1	2.1	2.1	1.9	2.1	2.3	2.5	2.6
2-Oct	1.9	1.8	1.4	1.4	1.8	2.0	1.6	1.9	1.8	1.9	1.8	1.8	1.5	1.6	1.1	1.0	0.9	0.4	0.3	0.1	0.1	0.1	0.2	0.2	2.0
3-Oct	0.3	0.3	0.3	0.4	0.6	1.0	0.9	0.7	0.9	1.1	1.1	1.4	1.5	1.1	2.2	1.1	1.1	0.7	0.8	1.1	1.1	0.7	1.0	1.4	2.2
4-Oct	1.3	1.1	0.9	1.1	1.1	1.1	0.7	0.7	0.8	1.1	2.7	2.5	2.0	2.2	1.6	2.9	3.3	3.8	3.6	3.1	4.1	3.5	3.0	2.5	4.1
5-Oct	2.5	2.6	2.2	UO	2.8	3.3	3.3	3.1	2.7	3.0	3.4	3.2	3.4	3.3	3.1	2.9	2.6	1.7	1.2	0.9	1.0	0.6	0.4	0.5	3.4
6-Oct	0.6	0.8	1.3	1.4	2.0	2.3	2.0	1.9	2.1	2.2	2.2	2.2	2.5	2.1	1.8	1.6	1.0	0.4	0.5	0.4	0.4	2.1	2.6	1.3	2.6
7-Oct	1.2	1.3	0.7	0.6	0.4	0.2	0.3	0.4	0.6	0.8	1.1	0.8	1.0	0.8	0.7	0.7	0.4	0.3	0.2	0.4	0.4	0.3	1.7	2.4	2.4
8-Oct	2.2	1.1	1.7	1.5	2.7	2.9	3.1	2.9	3.4	3.4	2.7	2.8	3.2	2.2	2.1	1.8	1.6	1.3	1.1	0.8	1.6	1.9	2.2	2.2	3.4
9-Oct	1.0	0.6	0.7	0.6	1.2	1.2	1.2	1.8	1.8	2.8	2.3	2.8	2.5	2.9	2.6	3.1	2.5	2.0	2.3	3.0	3.0	3.3	3.5	2.6	3.5
10-Oct	2.7	1.7	1.9	1.7	1.6	1.1	1.4	1.6	3.0	3.1	2.7	2.6	3.1	3.4	3.0	3.0	2.3	2.1	2.7	3.1	3.1	3.5	3.8	3.4	3.8
11-Oct	3.4	3.1	3.0	3.0	2.5	2.5	3.2	3.4	3.9	3.4	2.9	2.9	2.8	3.0	2.6	3.0	3.2	2.5	1.7	2.2	2.2	2.5	2.7	2.5	3.9
12-Oct	2.1	1.8	1.7	0.4	0.4	0.4	0.6	0.9	1.1	1.7	1.6	1.8	1.7	1.7	1.5	1.5	0.9	0.5	0.6	0.8	1.4	2.1	2.7	1.8	2.7
13-Oct	1.1	1.2	1.4	1.4	1.7	1.5	2.1	1.8	2.5	2.1	2.4	2.6	2.5	2.9	3.0	3.0	2.8	2.6	2.3	3.1	2.5	2.5	2.7	2.4	3.1
14-Oct	2.9	3.0	2.9	3.2	3.3	3.2	3.6	3.6	3.6	3.7	3.5	3.7	3.6	4.4	4.0	3.8	3.0	3.1	2.8	2.7	2.8	2.2	2.6	2.9	4.4
15-Oct	2.9	3.1	2.7	2.4	2.2	2.6	2.0	2.7	2.5	2.7	2.4	1.6	1.7	1.8	1.6	1.7	1.1	1.1	1.1	1.0	0.9	1.2	1.3	1.1	3.1
16-Oct	1.3	1.2	0.7	0.8	0.8	0.9	1.1	0.9	1.5	1.5	1.3	1.4	1.7	1.6	1.1	1.0	0.3	0.4	0.2	0.2	0.2	0.1	0.3	0.3	1.7
17-Oct	0.3	0.3	0.4	0.4	0.4	0.5	0.3	0.5	0.9	1.4	2.0	2.3	2.4	2.2	2.2	2.2	2.2	1.8	1.3	1.1	0.8	0.6	0.5	0.7	2.4
18-Oct	0.9	1.1	1.2	0.9	1.2	0.6	0.7	1.4	1.3	1.4	1.1	1.4	1.8	2.1	2.3	2.0	1.7	1.6	1.4	1.7	0.5	1.4	1.8	1.3	2.3
19-Oct	0.8	1.1	1.2	1.0	0.7	1.0	1.0	0.8	0.7	0.8	1.2	2.0	2.2	2.3	2.3	1.7	1.7	1.3	1.2	1.0	1.5	2.9	3.3	1.9	3.3
20-Oct	2.9	3.4	2.4	1.4	2.4	2.9	3.0	3.2	4.1	3.6	2.8	3.4	3.4	3.2	3.1	2.4	2.1	1.3	1.3	1.1	0.6	0.3	0.1	0.2	4.1
21-Oct	0.2	0.1	0.7	0.6	0.9	1.0	1.0	1.5	1.9	2.1	2.1	2.3	1.0	2.1	3.6	4.0	4.7	4.4	3.5	3.1	2.6	2.0	1.2	1.1	4.7
22-Oct	1.4	1.1	0.6	0.6	0.7	0.6	0.3	0.3	0.5	0.9	1.2	1.4	1.9	1.7	1.5	1.3	1.0	0.7	1.1	1.0	1.7	1.4	1.5	1.5	1.9
23-Oct	1.1	1.1	1.1	1.0	0.6	0.5	0.6	1.8	2.0	2.5	3.0	3.3	3.2	3.5	3.2	2.7	2.1	2.0	1.9	2.0	2.7	2.7	2.2	2.2	3.5
24-Oct	1.7	1.8	1.7	2.4	2.4	2.6	2.4	2.3	2.4	2.5	2.8	2.9	3.0	2.6	2.9	2.5	2.3	2.5	2.1	2.6	3.2	3.0	3.1	2.9	3.2
25-Oct	2.7	2.5	2.7	2.4	1.6	1.8	1.5	1.7	1.9	2.2	1.7	1.6	1.9	2.5	2.4	2.3	2.2	2.0	2.4	2.2	1.4	1.2	2.2	2.0	2.7
26-Oct	2.1	1.9	2.2	1.7	1.6	1.1	1.8	2.1	2.5	2.4	2.3	2.4	1.9	1.8	1.7	1.3	1.5	1.8	0.6	1.3	1.4	1.9	1.2	1.2	2.5
27-Oct	1.9	1.7	1.1	2.4	1.5	0.9	1.4	1.5	1.2	1.1	1.3	0.9	1.5	1.7	1.4	1.4	1.7	1.5	0.6	0.2	0.6	0.6	0.3	0.7	2.4
28-Oct	1.2	1.2	0.9	0.7	0.6	0.8	0.6	0.4	0.5	0.7	0.8	0.9	0.8	1.1	1.3	0.5	0.5	1.6	2.5	2.4	2.2	1.9	1.6	2.1	2.5
29-Oct	1.9	1.9	2.5	1.4	2.1	2.5	2.6	1.9	2.3	2.3	2.0	2.0	2.0	1.3	1.3	1.0	0.4	0.2	0.3	0.7	0.6	0.5	0.5	0.7	2.6
30-Oct	1.6	2.1	1.6	1.3	0.5	0.4	0.2	0.2	0.2	0.6	1.8	1.7	2.0	1.8	1.6	1.2	1.5	1.7	1.7	1.4	1.2	1.2	1.3	1.7	2.1
31-Oct	1.4	1.6	1.0	0.8	0.4	0.5	0.4	1.1	1.5	1.2	1.0	1.2	0.9	1.1	0.6	0.3	0.2	0.5	0.5	0.4	0.3	0.2	0.3	0.6	1.6
Diurnal Maximum																									
3.4 3.4 3.0 3.2 3.3 3.3 3.6 3.6 4.1 3.7 3.5 3.7 3.6 4.4 4.0 4.0 4.7 4.4 3.6 3.1 4.1 3.5 3.8 3.4																									
UO - Unstable Operation																									



Maximum Value: 1.4 km/h on Oct 3 20:00		Maximum Daily Average: 0.9 km/h on Oct 14		Hours in Service: 744																						
Minimum Value: -1.4 km/h on Oct 5 06:00		Minimum Daily Average: -0.7 km/h on Oct 5		Hours of Data: 742																						
Maximum Diurnal Average: 0.3 km/h at hour 4		Minimum Diurnal Average: 0.0 km/h at hour 17		Hours of Missing Data: 2																						
Monthly Average: 0.12 km/h		Percentiles: P ₁ = -1.2 P ₁₀ = -0.5 Q ₁ = -0.1 Median = 0.1 Q ₃ = 0.4 P ₉₀ = 0.7 P ₉₉ = 1.1		Hours of Calibration: 0																						
				Percent Operational Time: 99.7																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Oct	0.3	0.4	0.6	0.1	0.2	-0.2	0.0	-0.1	0.2	-0.4	-0.1	-0.1	-0.2	-0.3	-0.3	-0.1	0.0	-0.2	0.8	0.6	0.6	0.6	0.6	0.5	0.1	0.8
2-Oct	0.3	0.2	0.3	0.2	0.4	0.7	0.2	0.1	0.3	0.2	0.3	0.3	0.4	0.2	0.3	-0.1	-0.3	0.4	0.4	0.4	0.2	0.1	0.1	0.1	0.2	0.7
3-Oct	0.1	0.1	0.1	0.2	0.2	0.3	0.1	0.4	0.4	0.4	0.2	0.0	-0.2	-0.1	-0.1	-0.1	0.2	0.5	1.2	1.4	0.7	-0.3	0.1	0.4	0.3	1.4
4-Oct	0.5	0.8	0.7	0.4	0.4	0.2	-0.3	-0.2	0.0	-0.1	-0.7	-0.9	-0.7	-0.7	-0.1	-0.7	-1.3	-1.2	-1.2	-0.8	-1.1	-1.2	-0.8	-0.7	-0.4	0.8
5-Oct	-1.0	-0.8	UO	UO	-1.1	-1.4	-1.4	-1.2	-0.9	-1.0	-0.9	-1.0	-0.8	-0.6	-1.0	-0.8	-0.9	-0.7	0.0	0.1	0.4	0.3	0.2	0.0	-0.7	0.4
6-Oct	0.2	0.4	0.3	0.0	0.3	0.7	0.5	0.4	0.3	0.3	0.6	0.2	0.3	0.3	0.1	0.2	0.4	0.4	0.7	0.5	0.2	0.8	0.8	0.1	0.4	0.8
7-Oct	0.1	0.0	-0.1	0.1	0.0	0.0	0.2	0.3	0.5	-0.1	0.1	0.0	0.2	0.2	0.1	0.2	0.2	0.0	0.2	0.2	0.3	0.6	0.5	0.7	0.2	0.7
8-Oct	0.6	0.5	0.7	0.5	0.6	0.9	0.9	0.5	0.8	0.6	0.7	1.1	0.9	0.6	0.7	0.2	-0.3	-0.4	0.1	0.4	0.1	0.3	0.7	0.9	0.5	1.1
9-Oct	0.5	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.1	0.4	0.3	0.5	0.7	0.8	0.7	0.7	0.5	0.6	0.7	0.5	0.4	0.5	0.5	0.2	0.5	0.8
10-Oct	0.7	0.4	0.1	-0.1	0.1	0.2	0.4	0.4	0.7	0.6	0.4	0.6	0.6	0.6	0.9	0.5	0.4	0.4	0.8	0.8	0.9	0.7	1.0	0.8	0.5	1.0
11-Oct	0.8	0.9	1.2	1.0	0.6	0.6	0.8	0.8	1.1	0.8	0.3	0.4	0.4	0.8	0.7	0.9	0.4	0.5	0.4	0.8	0.4	0.5	0.4	0.5	0.7	1.2
12-Oct	0.5	0.3	0.6	0.4	0.2	0.4	0.2	-0.1	0.0	0.4	0.0	0.2	0.2	0.3	0.1	-0.3	-0.2	0.4	0.7	0.5	0.0	0.4	0.8	0.6	0.3	0.8
13-Oct	0.3	0.5	0.7	0.8	0.5	0.4	0.1	0.5	0.3	0.6	1.3	1.1	0.7	0.8	0.6	0.5	0.6	1.0	0.6	1.1	0.9	0.7	0.5	0.6	0.6	1.3
14-Oct	0.9	1.2	0.9	1.3	1.0	1.1	1.2	0.9	1.2	1.1	0.8	0.9	0.7	0.8	0.8	0.9	0.7	0.6	0.8	0.9	0.4	0.8	1.1	1.0	0.9	1.3
15-Oct	1.0	0.9	0.7	0.7	0.4	0.7	0.7	1.1	1.0	0.8	0.6	0.0	0.1	0.4	0.1	0.0	0.0	0.9	0.3	0.2	0.1	0.7	0.2	0.2	0.5	1.1
16-Oct	0.4	0.1	0.5	0.4	0.2	0.4	0.8	0.9	0.7	0.4	0.1	0.0	0.0	0.4	-0.1	0.1	0.1	0.3	0.1	0.4	0.3	0.1	0.1	0.1	0.3	0.9
17-Oct	0.0	-0.1	0.0	0.0	-0.2	-0.2	-0.1	-0.1	-0.1	-0.2	-0.3	-0.7	-0.5	-0.4	-0.2	-0.5	-0.1	-0.2	-0.1	-0.2	-0.1	0.2	0.2	0.2	-0.2	0.2
18-Oct	0.1	-0.2	0.3	0.1	0.2	0.2	0.1	0.4	0.4	0.4	0.2	0.2	0.1	0.6	0.5	0.3	0.9	0.1	0.3	0.7	0.1	-0.1	-0.4	-0.2	0.2	0.9
19-Oct	0.3	0.2	0.3	0.5	0.5	0.5	0.7	0.2	0.6	0.2	-0.1	-0.3	-0.3	-0.2	-0.1	0.0	0.4	0.0	0.2	0.0	0.2	-0.3	-0.5	0.3	0.1	0.7
20-Oct	-0.1	-0.4	-0.5	0.2	-0.4	-0.4	0.0	-0.4	-0.6	-1.0	-0.9	-0.7	-0.7	-0.5	-0.7	-0.3	-0.2	-0.1	-0.2	0.1	0.0	0.1	0.0	0.0	-0.3	0.2
21-Oct	0.3	0.1	0.1	0.3	0.3	0.0	0.4	0.6	0.4	0.6	0.8	0.5	0.0	-0.4	-0.4	-0.3	-0.4	-0.2	-0.2	-0.4	-0.3	-0.4	-0.1	0.0	0.1	0.8
22-Oct	0.0	-0.1	-0.2	0.1	0.2	-0.1	0.0	0.0	0.1	0.1	0.0	-0.1	0.3	-0.4	-0.1	0.1	0.3	-0.2	-0.3	0.1	-0.4	-0.4	-0.4	-0.5	-0.1	0.3
23-Oct	-0.2	-0.4	-0.4	-0.2	0.2	-0.2	0.0	0.0	0.1	-0.1	-0.6	-1.4	-0.8	-1.2	-0.5	-1.3	-1.0	-0.9	-1.1	-0.6	-0.3	-0.2	0.2	0.9	-0.4	0.9
24-Oct	0.6	0.6	0.9	0.6	0.8	0.8	0.3	0.3	-0.1	-0.2	-0.1	-0.6	-1.0	-0.1	-0.1	-0.3	-0.7	-0.2	0.0	-0.7	-0.6	-1.1	-0.9	-0.6	-0.1	0.9
25-Oct	-0.6	-0.6	-0.6	-0.6	-0.3	0.0	0.3	-0.1	0.1	0.2	0.0	-0.1	0.3	-0.4	-0.1	-0.4	0.0	-0.1	-0.6	-0.9	-0.6	-0.3	0.1	0.6	-0.2	0.6
26-Oct	0.2	0.0	0.1	0.5	0.3	-0.1	0.0	0.4	0.1	-0.3	-0.2	0.1	-0.6	-0.2	0.1	-0.2	0.0	0.0	0.1	-0.2	-0.4	-0.2	0.4	0.1	0.0	0.5
27-Oct	0.1	0.2	0.0	0.0	-0.1	0.0	-0.1	0.1	0.2	-0.2	-0.1	0.1	-0.3	-0.1	0.2	-0.3	-0.6	-0.3	0.0	0.0	0.2	0.4	0.0	0.3	0.0	0.4
28-Oct	0.2	0.4	0.0	0.1	-0.1	-0.2	0.0	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2	0.0	0.0	-0.4	-0.6	-0.7	-0.7	-0.2	-0.2	-0.5	-0.2	0.4
29-Oct	-0.7	-0.6	-0.9	-0.6	-0.7	-0.7	-0.9	-0.5	-0.9	-0.5	-0.2	-0.2	-0.2	0.0	0.5	0.0	0.0	0.1	0.1	0.0	-0.1	-0.1	-0.1	-0.2	-0.3	0.5
30-Oct	0.1	0.1	0.1	0.4	0.0	0.0	0.1	0.1	0.1	0.3	0.4	0.2	0.3	0.1	-0.3	0.0	-0.3	-0.1	0.0	-0.1	0.1	0.3	0.3	0.7	0.1	0.7
31-Oct	0.4	0.2	0.0	0.4	0.1	-0.1	0.0	-0.1	-0.1	-0.3	0.1	-0.2	0.2	0.0	0.1	0.0	0.0	0.0	-0.2	0.0	0.0	0.1	0.1	0.3	0.0	0.4
																								Diurnal Average		
																								Diurnal Maximum		
UO - Unstable Operation																										



Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0																				Hours in Service: 744					
Maximum Value: 4.1 km/h on Oct 4 21:00																				Hours of Data: 742					
Minimum Value: 0.1 km/h on Oct 2 22:00																				Hours of Missing Data: 2					
Percentiles: P ₁ = 0.2 P ₁₀ = 0.6 Q ₁ = 1.0 Median = 1.6 Q ₃ = 2.1 P ₉₀ = 2.7 P ₉₉ = 3.7																				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-Oct	0.6	0.5	0.8	1.5	2.0	1.7	1.7	1.9	2.3	2.5	2.3	2.8	3.0	2.9	3.0	3.1	2.9	2.4	2.3	2.4	1.8	2.2	2.5	2.6	3.1
2-Oct	2.2	1.8	1.0	1.1	1.4	1.5	1.3	1.4	1.5	2.0	1.7	1.6	1.5	1.6	1.3	1.0	1.0	0.4	0.3	0.3	0.3	0.1	0.2	0.2	2.2
3-Oct	0.4	0.4	0.3	0.5	0.6	0.8	0.8	0.7	0.7	0.9	1.3	1.6	1.4	1.5	2.2	1.1	1.2	0.7	0.6	1.5	1.6	0.8	1.3	1.3	2.2
4-Oct	1.1	1.1	0.7	0.9	1.1	1.4	0.9	0.7	0.7	1.3	2.7	2.6	2.0	2.4	1.8	2.8	3.2	3.7	3.6	3.2	4.1	3.7	3.4	2.8	4.1
5-Oct	2.6	2.4	UO	UO	2.8	3.1	3.5	2.9	3.0	3.2	3.7	3.8	3.7	3.6	3.5	3.0	2.7	1.6	1.2	1.0	1.0	0.7	0.7	0.7	3.8
6-Oct	0.7	0.7	1.3	1.5	2.1	2.2	1.9	2.2	2.3	2.4	2.3	2.2	2.1	1.5	2.1	1.2	1.1	0.4	0.4	0.5	0.8	2.0	2.4	1.7	2.4
7-Oct	1.5	1.7	0.9	0.7	0.5	0.3	0.3	0.4	0.8	0.6	0.7	0.9	0.9	0.8	0.7	0.7	0.6	0.5	0.5	0.8	0.8	0.6	1.3	1.9	1.9
8-Oct	1.9	1.7	1.9	1.6	2.1	2.3	2.4	2.2	2.6	2.6	2.3	2.5	2.4	2.1	1.8	2.0	1.7	1.4	1.4	0.9	1.1	1.2	1.8	1.7	2.6
9-Oct	1.3	1.2	1.2	0.8	1.1	0.9	1.1	1.7	1.9	2.3	2.0	1.7	1.6	1.6	1.7	2.1	2.0	1.6	1.8	2.0	2.0	2.0	2.3	1.7	2.3
10-Oct	1.8	1.8	1.8	1.3	1.2	1.1	1.5	2.0	2.3	2.1	1.9	1.9	2.0	2.1	1.9	2.3	2.1	1.6	1.8	2.3	2.2	2.5	2.1	2.2	2.5
11-Oct	2.5	2.5	1.7	2.4	2.3	2.2	2.8	2.6	3.0	2.0	2.3	2.3	1.9	1.6	1.5	1.8	2.6	2.2	1.5	1.8	1.8	1.9	1.9	1.7	3.0
12-Oct	1.7	1.8	1.2	0.8	0.9	0.5	0.5	0.7	1.0	1.1	1.6	1.6	2.0	1.8	1.7	1.7	1.0	0.7	0.9	0.8	0.9	1.7	1.5	1.5	2.0
13-Oct	1.1	1.0	1.1	1.4	1.4	1.8	2.4	1.7	1.9	1.8	2.2	2.2	2.1	2.4	2.4	2.6	2.2	1.9	1.8	1.8	1.5	1.8	1.7	1.7	2.6
14-Oct	1.7	1.9	1.8	2.3	2.6	2.6	2.3	2.2	2.4	2.3	2.3	2.7	2.6	2.8	2.5	2.7	3.4	3.6	3.0	2.8	3.3	1.8	1.7	1.5	3.6
15-Oct	1.6	2.0	1.8	1.8	1.5	1.6	1.8	2.1	2.0	1.8	2.1	1.6	1.7	1.6	1.6	1.8	1.1	1.2	1.0	0.7	1.1	1.0	1.0	0.9	2.1
16-Oct	1.0	0.8	0.7	0.8	0.8	1.1	1.3	0.7	1.0	0.9	0.8	0.7	0.6	1.7	1.1	1.0	0.4	0.6	0.3	0.2	0.4	0.2	0.2	0.2	1.7
17-Oct	0.7	0.3	0.3	0.4	0.5	0.5	0.3	0.4	0.8	1.3	1.4	1.3	1.9	1.6	2.5	2.1	1.6	1.5	1.3	1.1	0.9	0.6	0.6	0.8	2.5
18-Oct	1.0	1.1	1.3	1.0	1.4	0.7	0.7	1.2	1.3	1.5	0.9	1.2	2.1	2.1	2.4	2.1	1.6	1.4	1.6	2.0	0.7	1.3	1.7	1.2	2.4
19-Oct	1.1	1.2	1.4	1.2	1.1	1.1	0.9	1.0	0.7	0.8	1.4	1.9	2.0	2.1	2.0	1.7	2.0	1.5	1.5	1.0	1.6	2.7	3.3	1.8	3.3
20-Oct	2.6	3.2	2.6	1.3	2.3	2.9	2.7	2.8	3.5	3.7	3.3	3.7	3.8	3.5	3.4	2.6	2.1	1.4	1.3	1.3	0.8	0.4	0.2	0.2	3.8
21-Oct	0.4	0.2	0.6	0.6	0.9	1.0	0.9	1.2	1.3	2.1	2.5	1.7	0.8	1.7	3.0	3.3	3.5	3.7	3.0	2.7	2.3	1.7	1.3	1.3	3.7
22-Oct	1.4	1.2	0.7	0.8	1.0	0.7	0.4	0.4	0.6	1.0	1.4	1.6	2.2	1.8	1.5	1.3	1.0	0.6	1.1	1.1	1.7	1.4	1.5	1.5	2.2
23-Oct	1.1	0.9	0.8	0.9	0.9	0.9	1.0	1.9	1.8	2.6	3.3	3.3	3.5	3.4	3.5	3.2	2.8	2.2	1.8	1.8	2.2	2.4	2.5	2.4	3.5
24-Oct	2.0	2.1	2.1	2.5	2.5	2.4	2.3	2.5	2.4	2.5	2.8	2.6	2.8	2.7	2.9	2.6	2.6	2.8	2.4	2.8	3.1	2.7	2.7	2.9	3.1
25-Oct	2.7	2.6	2.3	2.1	1.7	1.6	1.5	1.5	1.7	2.0	1.7	1.8	2.1	2.4	2.3	2.1	1.9	2.1	2.5	2.3	1.3	1.2	1.9	1.9	2.7
26-Oct	1.8	1.8	1.6	1.9	2.0	1.3	1.8	1.7	2.4	2.0	2.1	2.5	2.0	1.8	1.5	1.4	1.4	1.7	0.8	1.6	1.2	1.8	1.0	1.2	2.5
27-Oct	1.9	1.9	1.5	2.4	1.2	1.1	1.2	1.4	1.3	1.1	1.2	1.0	1.6	1.5	1.5	1.3	1.5	1.5	0.8	0.2	0.9	0.7	0.5	0.9	2.4
28-Oct	1.4	1.5	1.2	1.0	0.7	0.8	0.8	0.5	0.5	0.6	0.6	0.7	0.9	1.1	1.1	0.5	0.7	1.6	2.1	2.0	1.7	1.8	1.8	1.9	2.1
29-Oct	1.6	1.7	2.5	1.2	1.9	2.2	2.3	1.9	2.2	2.4	1.9	1.8	1.9	1.4	1.5	1.1	0.5	0.3	0.5	0.9	0.7	0.5	0.6	0.8	2.5
30-Oct	1.5	1.9	1.4	1.3	0.7	0.4	0.3	0.4	0.2	0.6	1.5	2.0	1.7	1.8	1.8	1.5	1.6	1.9	1.8	1.5	1.4	1.0	1.0	1.2	2.0
31-Oct	1.1	1.2	1.0	0.7	0.4	0.6	0.5	1.0	1.4	1.2	1.1	1.2	0.9	1.1	0.6	0.3	0.2	0.5	0.6	0.4	0.3	0.4	0.4	0.6	1.4
2.7 3.2 2.6 2.5 2.8 3.1 3.5 2.9 3.5 3.7 3.7 3.8 3.8 3.6 3.5 3.3 3.5 3.7 3.6 3.2 4.1 3.7 3.4 2.9																									
Diurnal Maximum																									
UO - Unstable Operation																									



Maximum Value: 3.0 km/h on Oct 24 00:00		Maximum Daily Average: 0.7 km/h on Oct 13		Hours in Service: 744																						
Minimum Value: -1.7 km/h on Oct 4 18:00		Minimum Daily Average: -0.8 km/h on Oct 5		Hours of Data: 741																						
Maximum Diurnal Average: 0.4 km/h at hour 4		Minimum Diurnal Average: -0.1 km/h at hour 16		Hours of Missing Data: 3																						
Monthly Average: 0.10 km/h		Percentiles: P ₁ = -1.4 P ₁₀ = -0.7 Q ₁ = -0.2 Median = 0.1 Q ₃ = 0.4 P ₉₀ = 0.9 P ₉₉ = 2.1		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-Oct	0.5	0.2	0.3	0.3	0.1	-0.4	-0.3	-0.5	0.1	-0.6	0.1	0.0	-0.4	-0.8	-0.5	-0.4	0.1	-0.2	0.9	0.5	0.5	0.5	0.4	0.4	0.0	0.9
2-Oct	0.4	0.1	-0.1	0.5	0.5	0.9	0.0	0.0	0.3	-0.1	0.2	0.3	0.2	0.5	0.5	-0.2	-0.3	0.1	0.3	0.0	0.0	0.0	0.1	0.1	0.2	0.9
3-Oct	0.1	0.1	0.1	0.3	0.0	-0.1	-0.2	-0.2	-0.1	0.0	0.1	-0.2	-0.7	-0.3	0.3	0.2	0.1	0.1	0.6	2.1	1.9	-0.7	-0.5	0.2	0.1	2.1
4-Oct	0.5	0.6	0.6	0.3	0.0	0.8	-0.7	-0.3	-0.2	-0.1	-0.5	-0.9	-1.0	-0.8	-0.2	-0.9	-1.6	-1.7	-1.4	-0.7	-1.5	-1.3	-1.1	-1.0	-0.5	0.8
5-Oct	-1.2	-1.3	UO	UO	UO	-1.6	-1.3	-1.2	-0.8	-1.0	-1.3	-0.9	-0.5	-0.8	-1.5	-0.9	-1.0	-0.8	0.1	0.2	0.1	0.0	0.2	-0.5	-0.8	0.2
6-Oct	-0.4	-0.2	0.1	-0.1	1.4	1.8	1.2	1.5	0.3	-0.1	0.5	0.1	0.3	0.1	-0.1	0.1	0.0	0.0	0.3	0.1	0.2	1.4	2.2	1.2	0.5	2.2
7-Oct	1.5	1.4	0.1	-0.1	0.1	-0.1	0.0	-0.1	-0.1	-0.1	0.0	0.1	0.3	0.4	0.3	0.3	0.0	-0.1	0.6	0.7	0.6	0.6	0.4	0.6	0.3	1.5
8-Oct	0.9	1.6	1.1	0.9	0.8	1.1	0.9	0.8	0.6	0.4	0.9	1.9	1.3	1.8	0.8	-0.3	-0.8	-1.2	-0.5	0.2	0.0	0.1	0.7	0.7	0.6	1.9
9-Oct	1.0	0.5	0.5	0.2	0.4	0.2	0.0	0.2	0.5	0.4	0.2	0.0	0.0	0.3	0.2	0.2	0.4	0.6	0.3	0.1	0.0	-0.1	0.0	-0.2	0.2	1.0
10-Oct	0.5	1.3	0.2	-0.2	-0.2	0.3	0.6	0.6	0.2	0.4	0.2	0.1	0.0	-0.1	0.6	0.3	0.7	0.1	0.0	0.7	0.6	0.4	0.6	0.2	0.3	1.3
11-Oct	0.7	0.9	0.5	1.0	1.2	1.3	1.0	0.8	1.0	0.2	-0.2	-0.1	-0.3	0.2	0.1	0.5	0.3	0.7	0.4	0.6	0.2	0.1	0.1	0.5	0.5	1.3
12-Oct	0.7	0.4	0.4	0.7	0.7	0.6	-0.1	-0.3	0.1	1.1	-0.4	0.3	0.3	0.5	0.3	-0.6	-0.5	0.1	0.3	0.5	0.0	0.4	0.4	1.5	0.3	1.5
13-Oct	1.0	1.2	0.8	1.8	0.7	0.2	-0.1	0.4	0.4	1.3	2.5	1.8	1.6	0.7	0.0	0.5	0.6	0.4	0.4	0.2	0.1	0.2	0.0	0.3	0.7	2.5
14-Oct	0.1	0.2	0.4	0.9	1.0	1.1	1.1	0.2	0.7	0.3	0.1	0.6	0.5	0.2	0.0	0.6	1.9	1.1	1.2	1.4	0.2	0.8	0.8	0.3	0.7	1.9
15-Oct	0.6	1.1	0.8	0.7	0.0	0.1	0.8	1.5	1.4	0.4	0.6	0.0	0.1	0.3	0.0	-0.2	-0.3	1.2	-0.4	0.1	-1.0	-0.1	-0.3	-0.5	0.3	1.5
16-Oct	-0.2	-0.6	-0.3	-0.3	-0.2	-0.4	0.1	-0.2	0.0	-0.3	-0.3	-0.2	-0.3	0.5	-0.3	0.2	0.1	0.2	0.1	0.3	0.4	0.3	0.1	0.2	0.0	0.5
17-Oct	0.0	0.1	0.2	0.2	0.1	-0.2	-0.1	-0.1	-0.1	-0.1	-0.1	-0.6	0.2	-0.1	-0.2	-0.1	-0.1	0.1	0.0	0.0	0.1	0.4	0.4	0.4	0.0	0.4
18-Oct	0.1	-0.5	0.9	0.4	0.7	0.3	0.0	1.0	1.1	1.2	0.9	-0.1	-0.2	0.7	0.3	0.1	0.6	-0.5	0.1	0.2	-0.3	-0.7	-1.0	-0.7	0.2	1.2
19-Oct	0.1	0.3	-0.2	-0.4	-0.5	-0.2	0.1	0.0	-0.2	-0.3	-0.3	-0.6	-0.9	-0.6	-0.7	-0.3	0.0	-0.1	-0.1	0.1	-0.2	-0.8	-0.8	-0.4	-0.3	0.3
20-Oct	-0.6	-0.4	-0.6	0.3	-1.0	-0.3	-0.2	-0.9	-0.7	-0.9	-0.6	-0.6	-1.1	-0.9	-0.7	-0.6	0.5	0.6	0.2	0.2	0.2	0.1	0.2	0.0	-0.3	0.6
21-Oct	0.1	0.2	0.0	0.0	0.2	0.2	-0.2	0.5	0.3	2.0	1.0	0.3	0.1	0.0	0.5	0.3	0.5	0.5	0.1	0.2	0.5	-0.1	0.2	0.5	0.3	2.0
22-Oct	0.4	0.1	0.3	1.0	0.3	0.2	0.1	-0.1	0.2	0.1	0.4	-0.2	0.9	-0.3	0.4	0.1	0.8	0.1	-0.2	0.3	-0.5	-0.6	-0.5	-0.8	0.1	1.0
23-Oct	-0.6	-0.8	-0.7	-0.9	-0.4	-0.4	0.7	0.8	0.6	0.5	-0.8	-1.7	-1.2	-1.5	-0.8	-1.6	-1.2	-1.2	-1.2	-1.0	0.0	-0.1	0.5	3.0	-0.4	3.0
24-Oct	2.6	2.2	2.5	1.8	2.2	1.7	1.0	1.0	-0.2	0.1	0.1	-1.0	-1.4	0.1	-0.2	0.1	-0.5	0.5	0.8	-1.0	-0.7	-1.1	-1.0	-0.6	0.4	2.6
25-Oct	-0.4	-0.9	-0.8	-0.7	-0.5	-0.1	1.0	0.0	0.3	0.2	-0.2	-0.4	-0.2	-0.4	-0.4	-0.5	-0.1	0.0	-0.6	-0.8	-0.6	-0.4	0.3	1.2	-0.2	1.2
26-Oct	0.4	0.2	0.1	1.6	0.9	0.1	0.2	0.6	0.3	-0.3	-0.2	0.0	-0.4	-0.2	-0.1	-0.1	0.0	0.2	0.1	-0.5	-0.6	-0.1	-0.1	0.2	0.1	1.6
27-Oct	0.3	0.5	0.1	0.4	0.2	0.2	0.3	1.0	0.5	-0.1	-0.1	0.3	-0.4	0.2	0.9	-0.3	-0.7	-0.4	0.0	0.0	0.3	0.2	-0.1	1.0	0.2	1.0
28-Oct	0.2	0.8	0.0	0.4	-0.1	-0.3	-0.1	-0.2	-0.4	-0.3	-0.5	-0.1	0.0	-0.3	0.1	-0.1	-0.2	-0.5	-0.7	-0.8	-0.7	-0.2	-0.1	-0.8	-0.2	0.8
29-Oct	-0.8	-1.1	-1.0	-0.8	-0.8	-1.3	-1.2	-0.7	-1.1	-0.6	0.0	-0.2	-0.1	0.2	0.8	0.0	-0.3	0.1	0.2	0.3	0.0	0.0	0.1	0.0	-0.3	0.8
30-Oct	0.4	0.7	0.4	0.9	0.4	0.2	0.1	0.2	0.0	-0.1	0.5	0.7	0.2	-0.3	-0.7	-0.2	-0.6	-0.5	-0.3	-0.5	-0.4	-0.5	-0.8	-0.1	0.0	0.9
31-Oct	-0.3	-0.2	-0.4	0.0	-0.1	-0.2	-0.1	0.1	0.1	0.0	0.3	-0.1	0.4	0.2	0.1	0.1	0.0	0.4	0.0	0.2	0.0	0.0	0.0	0.4	0.0	0.4
																								Diurnal Average		
																								Diurnal Maximum		
																								UO - Unstable Operation		



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 4.2 km/h on Oct 20 10:00		Hours in Service: 744 Hours of Data: 741 Hours of Missing Data: 3 Hours of Calibration: 0 Percent Operational Time: 99.6																							
Minimum Value: 0.2 km/h on Oct 21 00:00																									
Percentiles: P ₁ = 0.3 P ₁₀ = 0.7 Q ₁ = 1.0 Median = 1.5 Q ₃ = 2.0 P ₉₀ = 2.8 P ₉₉ = 3.7																									
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-Oct	0.6	0.7	0.9	1.7	1.8	1.4	1.2	1.4	2.7	2.8	3.0	3.2	3.5	3.4	3.4	3.5	3.1	2.3	2.7	2.8	2.5	2.7	2.7	2.6	3.5
2-Oct	2.5	2.0	1.4	1.4	1.1	1.0	1.3	1.1	2.0	2.0	1.7	1.7	1.4	1.7	1.6	1.1	1.1	0.4	0.4	0.3	0.4	0.2	0.2	0.3	2.5
3-Oct	0.4	0.4	0.3	0.7	0.6	0.7	0.6	0.5	0.3	0.4	1.2	1.7	1.8	1.7	2.3	1.4	1.4	0.5	0.5	1.4	2.2	1.0	1.3	1.6	2.3
4-Oct	1.2	1.3	0.7	0.7	1.1	1.3	1.2	0.8	0.9	1.6	2.6	2.4	1.6	2.1	2.1	2.9	3.2	3.6	3.7	3.5	3.7	3.8	3.3	2.9	3.8
5-Oct	2.5	2.3	UO	UO	UO	3.2	3.3	2.8	2.8	3.1	3.5	3.4	3.5	3.4	2.9	2.8	2.4	1.6	1.2	0.9	1.0	0.8	0.9	1.3	3.5
6-Oct	0.8	0.8	1.1	1.5	1.6	1.8	1.9	2.0	2.7	2.7	2.8	2.5	2.3	1.8	2.7	1.4	1.2	0.6	0.8	0.6	0.6	1.0	1.6	2.2	2.8
7-Oct	2.1	1.9	1.3	1.0	0.8	0.4	0.3	0.4	0.4	0.4	0.4	0.6	0.6	0.7	0.7	0.8	0.8	0.7	0.7	1.1	0.8	0.7	1.3	1.3	2.1
8-Oct	0.9	1.1	1.0	1.1	1.4	1.7	1.7	1.6	1.6	2.0	2.6	3.2	3.0	3.1	2.5	2.0	1.4	0.8	0.7	0.9	0.7	0.8	1.1	1.0	3.2
9-Oct	1.3	1.3	2.0	0.7	1.3	0.7	0.9	1.4	2.0	2.0	1.7	1.5	1.5	1.8	1.7	2.0	1.8	1.5	1.8	1.7	1.6	1.5	1.8	1.3	2.0
10-Oct	1.1	1.3	1.4	1.2	1.0	0.8	1.3	2.1	2.1	1.7	2.0	2.0	2.0	2.2	2.1	2.3	2.3	1.9	2.0	2.2	2.3	2.0	2.2	1.9	2.3
11-Oct	2.1	2.3	2.0	2.0	1.9	1.9	2.3	2.1	2.2	2.1	2.1	2.1	1.9	1.9	1.9	2.0	2.4	2.0	1.5	1.9	1.6	1.4	1.3	1.3	2.4
12-Oct	1.9	2.1	1.2	0.9	1.3	0.8	0.7	1.0	1.2	0.8	1.9	1.9	2.4	2.3	2.2	2.0	1.0	0.6	1.1	1.2	0.8	1.8	1.3	1.4	2.4
13-Oct	0.9	1.0	0.8	1.0	1.8	2.2	2.8	2.0	1.8	2.2	2.2	2.2	2.4	2.2	2.2	2.5	2.1	1.6	1.8	1.7	1.4	1.4	1.2	1.3	2.8
14-Oct	1.5	1.7	1.6	2.6	3.1	3.3	3.0	2.4	2.5	2.4	2.8	3.2	3.2	2.5	2.8	3.5	4.1	4.0	3.9	3.5	3.7	2.8	2.3	1.9	4.1
15-Oct	1.9	1.8	1.4	1.2	1.0	1.2	1.5	1.6	1.9	1.3	1.8	2.0	2.2	2.1	1.8	1.7	0.8	1.0	0.6	0.7	1.1	1.0	0.9	0.9	2.2
16-Oct	1.0	0.6	0.8	0.7	1.1	1.1	1.2	0.7	0.8	0.9	1.0	1.0	1.0	2.1	1.0	1.0	0.5	0.6	0.5	0.4	0.3	0.4	0.3	0.4	2.1
17-Oct	0.7	0.3	0.6	0.4	0.4	0.3	0.4	0.4	0.7	1.0	1.1	1.1	1.7	1.6	2.3	1.8	1.4	1.5	1.2	1.1	1.0	0.7	0.8	0.7	2.3
18-Oct	1.0	1.1	1.3	1.1	1.4	1.3	0.7	0.9	1.0	1.2	1.2	1.8	2.2	2.4	2.6	2.3	1.6	1.2	1.0	1.1	1.1	1.0	0.9	1.0	2.6
19-Oct	1.2	1.2	1.9	1.4	1.6	1.5	1.3	1.4	0.9	1.2	1.5	1.8	1.7	1.6	1.6	1.3	2.0	1.7	1.8	1.1	1.5	2.4	3.0	1.6	3.0
20-Oct	1.9	1.7	2.3	1.3	1.9	2.2	1.6	1.8	2.8	4.2	3.8	3.9	3.3	3.2	3.0	2.2	2.1	2.0	1.6	1.9	1.2	0.7	0.2	0.2	4.2
21-Oct	0.6	0.4	0.7	0.6	0.9	1.3	1.1	1.5	1.5	2.3	2.7	1.7	0.6	1.5	2.8	3.5	3.7	3.5	3.0	2.9	2.5	1.9	1.6	1.8	3.7
22-Oct	1.2	0.9	0.7	0.9	1.5	1.0	0.4	0.4	0.9	1.0	1.8	1.6	2.4	2.1	1.8	1.5	1.3	0.6	1.4	1.0	1.4	1.2	1.1	1.1	2.4
23-Oct	1.1	1.1	1.2	1.4	1.5	1.3	1.5	1.5	1.6	3.0	3.6	3.2	3.6	3.7	3.4	3.2	2.9	1.8	1.7	1.8	2.3	1.8	1.5	1.8	3.7
24-Oct	1.8	1.8	1.8	1.6	1.7	1.4	1.8	2.2	2.0	2.8	2.7	2.6	2.7	2.8	2.8	2.6	2.8	3.0	2.8	2.8	2.9	2.3	2.2	2.6	3.0
25-Oct	2.5	2.1	1.6	1.7	1.8	1.4	1.7	1.1	1.6	1.9	1.8	2.0	2.2	2.4	2.1	2.0	1.8	2.0	2.3	1.9	1.2	1.1	1.1	1.2	2.5
26-Oct	1.1	1.0	1.1	1.9	2.2	1.5	1.6	1.4	1.7	1.0	1.7	1.8	1.9	1.8	1.7	1.5	1.4	1.7	1.1	1.8	0.9	1.3	0.8	1.1	2.2
27-Oct	1.4	1.5	1.5	2.4	1.3	1.3	1.1	1.5	1.3	1.2	1.2	1.1	1.8	1.6	1.8	1.1	1.3	1.1	0.9	0.2	1.1	0.8	0.6	1.3	2.4
28-Oct	1.3	1.7	1.5	1.1	0.7	0.7	0.9	0.8	0.7	0.7	0.7	0.5	0.8	1.2	1.3	0.8	0.9	1.7	1.2	1.3	1.3	1.4	1.4	1.6	1.7
29-Oct	1.5	1.6	2.1	1.0	1.6	1.9	1.9	1.5	2.0	2.2	1.9	1.9	2.0	1.6	1.8	1.3	0.7	0.4	0.8	1.5	1.0	0.5	0.9	1.2	2.2
30-Oct	1.6	2.1	1.5	1.1	0.7	0.5	0.5	0.4	0.3	0.8	1.5	2.5	1.8	1.8	1.8	1.6	1.3	1.7	1.1	1.4	1.3	1.0	0.7	1.2	2.5
31-Oct	1.1	1.4	1.2	0.7	0.7	0.6	0.8	1.0	1.4	1.3	1.3	1.4	1.0	1.0	0.7	0.4	0.3	0.6	0.7	0.5	0.4	0.4	0.4	0.5	1.4
2.5 2.3 2.3 2.6 3.1 3.3 3.3 2.8 2.8 4.2 3.8 3.9 3.6 3.7 3.4 3.5 4.1 4.0 3.9 3.5 3.7 3.8 3.3 2.9																									
Diurnal Maximum																									
UO - Unstable Operation																									



Maximum Value: 4.3 km/h on Oct 24 01:00		Maximum Daily Average: 1.8 km/h on Oct 24		Hours in Service: 744																						
Minimum Value: -1.1 km/h on Oct 8 18:00		Minimum Daily Average: 0.0 km/h on Oct 1		Hours of Data: 737																						
Maximum Diurnal Average: 0.8 km/h at hour 2		Minimum Diurnal Average: 0.2 km/h at hour 12		Hours of Missing Data: 7																						
Monthly Average: 0.51 km/h		Percentiles: P ₁ = -0.8 P ₁₀ = -0.2 Q ₁ = 0.1 Median = 0.3 Q ₃ = 0.8 P ₉₀ = 1.5 P ₉₉ = 3.3		Hours of Calibration: 0																						
				Percent Operational Time: 99.1																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Oct	0.2	-0.4	-0.4	0.4	0.4	-0.2	-0.2	-0.3	0.1	-0.3	0.2	0.3	-0.4	-0.9	-0.2	-0.8	-0.1	0.1	1.1	0.4	0.0	0.3	0.4	0.7	0.0	1.1
2-Oct	0.5	0.0	-0.5	1.0	0.7	1.1	0.0	-0.1	0.0	0.0	0.4	0.4	0.1	0.7	1.3	-0.2	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.2	1.3
3-Oct	0.1	0.2	0.1	0.2	0.2	0.0	0.0	0.2	0.1	0.1	0.4	0.1	-0.5	-0.4	1.8	0.3	0.6	0.5	0.8	2.9	3.8	-0.9	-0.8	0.3	0.4	3.8
4-Oct	0.4	0.3	0.2	1.0	0.9	1.9	-0.2	0.0	0.1	0.2	0.6	0.2	-0.1	0.3	0.2	0.1	-0.1	0.1	0.1	0.5	0.2	0.2	0.3	-0.1	0.3	1.9
5-Oct	-0.4	UO	UO	UO	UO	UO	UO	UO	1.0	1.2	-0.7	-0.3	0.4	0.1	-0.4	0.2	-0.1	-0.2	1.2	0.8	0.7	0.4	0.9	-0.3	--	1.2
6-Oct	-0.2	-0.4	-0.2	-0.3	2.0	3.0	1.9	2.1	0.6	0.1	0.7	0.1	0.1	0.4	-0.4	0.0	0.2	-0.1	-0.2	0.1	1.7	2.7	3.0	2.4	0.8	3.0
7-Oct	2.9	3.7	1.6	0.3	0.4	0.1	0.2	0.1	0.2	0.1	0.1	0.0	0.0	0.2	0.3	0.5	0.4	0.3	0.5	0.7	0.6	0.6	0.4	1.0	0.6	3.7
8-Oct	1.2	1.5	1.2	0.9	0.9	1.4	1.2	1.1	0.9	0.4	0.7	2.3	1.5	2.1	1.1	0.1	-0.6	-1.1	-0.2	0.3	0.1	0.5	0.9	0.7	0.8	2.3
9-Oct	1.4	0.5	0.8	0.4	0.3	0.2	-0.2	0.1	0.3	0.4	-0.1	-0.5	-0.6	-0.1	-0.2	0.0	0.2	0.7	0.4	0.1	0.1	0.0	0.3	-0.5	0.2	1.4
10-Oct	0.5	1.7	0.3	-0.3	-0.3	0.4	0.7	0.5	0.1	0.2	0.0	-0.7	-0.5	-0.5	0.4	0.2	0.2	-0.3	-0.3	0.8	0.4	0.5	0.4	0.3	0.2	1.7
11-Oct	0.9	0.9	-0.2	0.8	1.4	1.5	0.9	0.8	1.2	-0.2	-0.2	-0.7	-0.7	-0.1	-0.3	0.4	0.0	0.4	0.4	0.2	0.1	0.0	0.3	0.9	0.4	1.5
12-Oct	1.2	0.8	0.2	0.6	1.1	0.8	0.1	0.0	0.4	1.4	-0.8	0.4	0.4	0.9	0.3	-0.3	-0.3	0.3	0.6	1.2	0.2	0.6	0.7	1.6	0.5	1.6
13-Oct	1.0	1.7	1.0	1.9	1.0	0.3	-0.2	0.2	0.1	1.6	3.3	2.4	2.2	0.9	-0.2	0.2	0.4	0.4	0.5	-0.1	0.0	0.0	0.1	0.4	0.8	3.3
14-Oct	-0.1	0.0	0.5	1.1	1.6	1.6	1.5	0.7	0.8	0.0	0.1	0.7	0.4	0.1	-0.3	0.6	2.5	1.5	1.6	1.9	0.1	0.8	0.9	0.2	0.8	2.5
15-Oct	0.9	1.4	1.2	0.9	-0.1	0.0	0.5	1.8	1.8	0.7	0.4	-0.2	0.2	0.3	0.1	0.4	-0.5	1.1	0.0	0.7	-0.7	0.3	0.1	0.1	0.5	1.8
16-Oct	0.4	0.1	0.5	0.4	0.2	0.3	0.6	0.2	0.3	0.0	-0.2	-0.1	0.0	1.0	0.3	0.7	0.0	0.2	0.1	0.0	0.3	0.4	0.2	0.2	0.3	1.0
17-Oct	0.2	0.1	0.1	0.3	0.5	0.1	0.5	0.6	0.4	0.4	0.1	-0.6	0.6	0.1	0.4	0.6	-0.2	0.2	0.2	0.2	0.2	0.6	0.6	0.3	0.3	0.6
18-Oct	0.1	-0.2	1.1	0.6	1.6	1.1	0.5	1.2	1.3	1.6	1.5	0.1	0.2	0.9	0.7	0.4	0.4	-0.2	1.2	1.5	0.4	0.5	0.5	0.7	0.7	1.6
19-Oct	1.3	1.6	0.9	0.2	-0.2	0.0	0.2	0.4	0.0	0.2	0.3	0.5	0.2	0.5	0.5	1.0	1.1	0.4	0.7	0.5	0.8	1.1	0.7	0.9	0.6	1.6
20-Oct	1.5	1.7	1.0	1.7	0.6	2.1	1.9	1.0	1.4	1.4	0.1	0.6	0.4	0.1	0.4	0.4	1.2	1.2	0.4	0.4	0.2	0.0	0.0	0.2	0.8	2.1
21-Oct	-0.1	0.0	0.1	0.3	0.3	1.0	-0.1	0.9	0.7	3.0	0.8	-0.1	0.2	0.2	0.9	0.3	0.7	0.8	0.5	0.3	0.7	0.0	0.7	0.7	0.5	3.0
22-Oct	0.7	0.3	0.8	1.0	0.2	0.0	-0.2	-0.2	0.0	0.2	0.4	0.0	1.6	-0.1	0.9	0.1	0.8	0.3	0.2	1.0	0.4	0.0	0.6	0.0	0.4	1.6
23-Oct	-0.1	-0.3	-0.3	-0.6	0.1	0.1	2.3	2.0	1.5	1.8	0.3	-0.6	-0.1	-0.6	0.0	-0.8	-0.4	-0.3	-0.4	0.0	1.1	0.7	1.5	4.3	0.5	4.3
24-Oct	4.3	3.7	4.0	2.9	3.1	2.8	2.9	3.2	1.6	1.6	1.4	0.0	-0.1	1.6	1.0	1.8	1.5	2.1	2.7	0.5	0.6	0.2	0.2	0.7	1.8	4.3
25-Oct	1.0	0.2	0.3	0.4	0.1	0.7	2.1	1.0	1.6	1.4	0.7	0.2	0.7	0.9	0.6	0.4	0.9	1.4	0.0	0.0	-0.1	0.4	1.0	1.9	0.8	2.1
26-Oct	1.1	1.1	1.2	3.3	2.8	1.0	1.1	2.2	1.4	0.4	0.7	1.0	0.5	0.7	0.9	0.6	1.2	1.1	0.2	0.4	0.3	1.1	0.9	1.1	1.1	3.3
27-Oct	1.5	1.4	1.0	0.5	0.1	0.2	0.4	1.6	0.6	0.0	0.0	0.3	-0.2	0.5	1.7	0.1	-0.1	0.2	0.2	0.2	0.6	0.6	0.2	1.5	0.6	1.7
28-Oct	0.9	1.9	1.5	1.3	0.4	0.1	0.4	0.2	0.3	-0.1	-0.3	0.0	0.2	0.1	0.3	0.0	0.4	0.4	0.2	0.1	0.1	0.5	0.8	0.0	0.4	1.9
29-Oct	0.0	-0.2	-0.1	-0.2	0.0	-0.3	-0.3	0.0	-0.2	0.2	0.3	0.2	0.1	0.5	1.2	0.1	-0.5	0.4	0.2	0.2	-0.1	0.4	0.2	0.4	0.1	1.2
30-Oct	0.4	0.5	0.6	1.1	0.6	0.1	0.2	0.0	0.2	0.1	0.3	0.7	0.2	-0.8	-0.7	0.1	-0.5	-0.2	-0.3	-0.5	-0.4	-0.1	-0.5	-0.3	0.0	1.1
31-Oct	-0.3	-0.2	0.0	0.4	0.4	0.3	0.3	0.4	0.4	0.2	0.5	0.2	0.5	0.0	0.0	0.1	0.0	0.6	0.1	0.5	0.1	-0.1	0.1	0.5	0.2	0.6
																								Diurnal Average		
																								Diurnal Maximum		
0.8 0.8 0.6 0.8 0.7 0.7 0.6 0.7 0.6 0.6 0.4 0.2 0.2 0.3 0.4 0.2 0.3 0.4 0.4 0.5 0.4 0.4 0.5 0.7																								0.8		
4.3 3.7 4.0 3.3 3.1 3.0 2.9 3.2 1.8 3.0 3.3 2.4 2.2 2.1 1.8 1.8 2.5 2.1 2.7 2.9 3.8 2.7 3.0 4.3																								4.3		
UO - Unstable Operation																										



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 4.5 km/h on Oct 14 17:00 Minimum Value: 0.2 km/h on Oct 3 01:00 Percentiles: P ₁ = 0.3 P ₁₀ = 0.7 Q ₁ = 1.0 Median = 1.5 Q ₃ = 2.1 P ₉₀ = 2.8 P ₉₉ = 4.0																				Hours in Service: 744 Hours of Data: 737 Hours of Missing Data: 7 Hours of Calibration: 0 Percent Operational Time: 99.1					
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Oct	0.5	0.7	0.8	1.1	1.5	1.0	0.9	1.0	2.7	3.0	3.3	3.7	3.7	3.6	3.7	3.3	3.0	2.6	3.1	2.6	2.9	2.4	2.1	2.1	3.7
2-Oct	2.6	1.7	1.5	1.2	1.3	1.3	1.6	1.5	1.9	2.0	1.4	1.5	1.2	1.9	2.0	1.5	1.1	0.4	0.4	0.3	0.6	0.3	0.3	0.3	2.6
3-Oct	0.2	0.5	0.4	0.6	0.6	0.8	0.8	0.4	0.4	0.3	1.3	1.9	2.0	1.9	2.6	1.7	1.4	0.6	0.3	1.3	2.4	1.6	2.0	1.9	2.6
4-Oct	1.3	1.4	0.8	0.9	1.2	1.5	1.3	1.1	1.1	1.6	2.8	2.5	1.6	2.0	1.9	2.6	3.0	3.1	3.7	3.5	3.7	3.9	3.6	2.8	3.9
5-Oct	2.4	UO	UO	UO	UO	UO	UO	UO	3.8	3.3	3.1	3.3	3.7	3.8	3.0	3.0	2.5	1.4	1.5	1.1	1.2	0.7	0.8	1.6	3.8
6-Oct	1.0	0.9	1.0	1.6	1.7	1.2	1.5	2.3	2.3	2.5	2.9	2.6	2.5	1.9	2.6	1.6	1.0	0.5	0.9	0.8	0.7	1.1	1.5	2.2	2.9
7-Oct	1.9	1.2	1.6	1.5	1.3	0.5	0.5	0.3	0.2	0.4	0.4	0.5	0.5	0.6	0.6	0.9	0.7	0.7	0.7	0.9	1.3	1.4	1.6	1.6	1.9
8-Oct	1.2	0.9	0.8	1.0	1.3	1.6	1.6	1.6	1.4	2.1	3.0	3.7	3.5	3.5	2.6	2.0	1.2	0.5	0.6	0.8	1.0	1.4	1.6	1.3	3.7
9-Oct	1.2	0.9	1.2	0.8	1.1	0.8	1.1	1.2	1.8	1.9	1.7	1.3	1.6	1.8	1.7	1.8	1.5	1.6	1.8	1.9	1.8	1.6	1.9	1.5	1.9
10-Oct	1.4	1.3	1.2	1.2	1.2	1.0	1.3	1.9	2.1	1.9	2.0	2.0	2.1	2.4	2.3	2.2	2.5	2.3	2.4	2.3	2.4	2.0	2.3	2.2	2.5
11-Oct	2.2	2.5	2.4	2.2	2.1	1.9	2.1	2.2	2.1	2.1	2.2	2.1	2.0	2.0	2.1	2.1	1.9	1.7	1.7	2.3	1.8	1.3	1.7	1.9	2.5
12-Oct	2.2	2.1	1.4	0.7	1.2	0.7	0.8	0.9	1.0	1.1	2.2	2.3	2.7	2.8	2.6	2.3	1.2	0.6	1.0	0.9	1.1	1.9	1.5	1.5	2.8
13-Oct	1.3	1.3	1.2	1.3	2.1	2.1	2.7	2.0	1.5	2.7	2.6	2.7	2.5	2.6	2.4	2.3	1.9	1.7	1.8	2.0	1.6	1.5	1.6	1.5	2.7
14-Oct	1.6	1.8	1.8	3.1	3.9	3.8	3.4	2.9	3.1	2.9	3.5	3.7	4.1	3.1	3.3	4.1	4.5	4.2	4.2	4.0	3.9	3.4	2.9	2.7	4.5
15-Oct	2.4	2.5	1.8	1.4	1.1	1.2	1.1	1.4	2.1	1.5	1.9	2.3	2.4	2.3	1.8	1.3	0.9	0.9	0.6	0.9	1.1	1.2	1.2	0.9	2.5
16-Oct	1.1	0.8	0.8	1.0	1.1	0.9	1.2	0.8	0.7	1.2	1.1	1.1	1.2	2.2	1.1	1.2	0.6	0.8	0.6	0.4	0.4	0.4	0.3	0.4	2.2
17-Oct	0.7	0.5	0.8	0.5	0.4	0.4	0.5	0.5	0.8	0.8	1.0	1.2	1.7	1.7	1.7	1.8	1.3	1.7	1.4	1.1	1.1	0.9	1.0	0.8	1.8
18-Oct	0.9	1.1	1.0	0.9	1.8	1.5	0.8	1.2	1.4	1.2	1.7	2.1	2.0	2.2	2.3	1.6	1.3	1.4	1.2	0.9	0.9	1.0	0.9	1.0	2.3
19-Oct	1.4	1.1	1.3	1.3	1.8	2.3	1.9	1.9	1.5	1.6	1.6	1.7	1.5	1.3	1.6	1.3	2.0	2.3	2.1	1.7	1.7	2.3	2.3	1.8	2.3
20-Oct	1.4	1.4	1.8	1.6	1.6	1.7	1.1	1.2	2.2	4.0	4.1	4.4	3.4	2.6	3.0	2.1	1.9	2.2	1.9	2.1	1.5	0.7	0.4	0.3	4.4
21-Oct	0.7	0.5	0.8	0.9	1.2	1.4	0.9	1.4	1.8	2.2	3.3	1.5	0.7	1.3	2.8	3.4	3.9	3.8	3.0	3.1	2.8	1.7	2.3	2.3	3.9
22-Oct	0.8	0.7	0.7	0.5	1.2	0.6	0.3	0.3	0.5	1.0	2.1	1.9	2.8	2.5	2.2	1.7	1.4	0.7	1.8	1.2	1.2	1.0	0.7	0.7	2.8
23-Oct	1.2	1.2	1.4	1.2	1.6	1.7	1.9	1.6	1.7	3.3	3.8	3.6	3.9	3.7	3.6	3.3	2.6	1.6	1.6	1.8	2.6	1.8	1.4	1.5	3.9
24-Oct	1.2	1.4	1.3	1.0	1.1	1.0	1.6	1.9	1.9	2.6	3.0	2.6	2.9	3.1	2.7	2.8	2.6	3.0	3.1	2.8	2.7	2.0	2.1	2.3	3.1
25-Oct	2.6	1.7	1.3	1.4	1.6	1.4	1.7	1.1	1.5	1.7	1.8	1.9	2.2	2.7	2.3	2.0	1.9	1.9	2.4	1.9	1.1	1.3	1.0	1.0	2.7
26-Oct	0.9	0.8	1.1	2.0	2.3	1.4	1.5	1.3	1.5	0.9	1.6	1.9	2.1	1.9	1.8	1.4	1.3	1.8	1.7	1.7	0.9	1.4	1.2	1.4	2.3
27-Oct	1.4	1.5	1.4	2.5	1.4	1.5	1.0	1.6	1.4	1.2	1.1	1.1	2.0	1.7	2.0	1.3	1.1	0.9	0.6	0.3	1.3	1.0	0.7	0.8	2.5
28-Oct	0.6	1.9	1.6	1.2	0.6	0.7	0.9	0.8	0.6	0.7	0.7	0.7	0.9	1.3	1.6	1.2	1.1	1.7	0.9	0.9	1.2	1.2	1.1	1.0	1.9
29-Oct	1.1	1.1	2.0	0.8	1.5	1.5	1.5	1.4	1.8	2.2	2.0	1.9	1.9	2.0	2.0	1.5	1.0	0.4	0.8	1.6	1.1	1.0	1.0	1.5	2.2
30-Oct	1.6	1.9	1.3	0.8	0.7	0.3	0.4	0.4	0.5	0.8	1.6	2.5	2.0	1.9	1.7	1.5	0.8	1.0	0.9	1.1	1.1	0.9	0.5	0.5	2.5
31-Oct	0.7	1.3	1.0	0.7	0.8	0.7	0.8	1.1	1.5	1.2	1.4	1.4	1.1	1.0	0.8	0.4	0.4	0.4	0.7	0.4	0.5	0.7	0.5	0.5	1.5
Diurnal Maximum																								2.8	
UO - Unstable Operation																									



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS04 BUFFALO VIEWPOINT OCTOBER 2023

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

November 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BUFFALO VIEWPOINT (AMS04)

OCTOBER 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	24.2	0	3.9	0
H2S (ppb) Average	709	35	35	100	5.7	0	0.9	0
THC (ppm) Average	710	34	34	100	6.3	-	2.7	-
NMHC(ppm) Average	710	34	34	100	1.23	-	0.173	-
CH4(ppm) Average	710	34	34	100	5	-	2.5	-
O3(ppb) Average	710	34	34	100	45.1	0	33.4	-
NO2(ppb) Average	707	37	37	100	31.9	0	12.3	-
NO(ppb) Average	707	37	37	100	176.3	-	16.2	-
NOX(ppb) Average	707	37	37	100	208.2	-	25.8	-
PM2.5(ug/m3) Average	743	1	1	100	44.4	0	27.6	0
Temperature (C) Average	744	0	0	100	25.5	-	14.9	-
Relative Humidity (%) Average	744	0	0	100	98.5	-	88	-
Wind Speed 10 m (km/h) Average	744	0	0	100	27	-	17	-
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)
OCTOBER 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	0.43	1.8	-	0	0	0	0.1	0.2	0.6	24.2
H2S (ppb) Average	709	0.18	0.4	-	0	0	0.1	0.1	0.1	0.3	5.7
THC (ppm) Average	710	2.08	0.2	-	1.9	2	2	2	2.1	2.2	6.3
NMHC(ppm) Average	710	0.018	0.08	-	0	0	0	0	0	0	1.23
CH4(ppm) Average	710	2.06	0.2	-	1.9	2	2	2	2.1	2.1	5
O3(ppb) Average	710	22.92	8.6	-	2.2	11.1	17.4	23.9	29.2	33.1	45.1
NO2(ppb) Average	707	3.24	4.9	-	0	0.2	0.5	1.2	3.7	9	31.9
NO(ppb) Average	707	1.07	7.7	-	0	0	0	0.1	0.3	1.2	176.3
NOX(ppb) Average	707	4.31	10.8	-	0	0.3	0.5	1.4	4	11	208.2
PM2.5(ug/m3) Average	743	8.82	6.7	-	0.3	3.3	5.1	7	9.9	16.9	44.4
Temperature 2 m (C) Average	744	4.71	7.6	-	-11.1	-5.3	-2	5.6	10.4	14	25.5
Relative Humidity (%) Average	744	69.71	15.9	-	25.4	47.8	58.6	70.1	82.1	90.6	98.5
Wind Speed 10 m (km/h) Average	744	10.2	5	-	1	5	7	10	13	17	27
Wind Direction 10 m (deg) Average	744	-	-	-	-	-	-	-	-	-	-

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

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
<hr/>				
No operational issues to report				



Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 744																	Daily Average		Daily Maximum						
Maximum Value: 24.2 ppb on Oct 22 08:00		Maximum Daily Average: 3.9 ppb on Oct 22		Hours of Data: 710																	Hours of Missing Data: 34		Hours of Calibration: 34						
Minimum Value: 0.0 ppb on Oct 1 01:00		Minimum Daily Average: 0.0 ppb on Oct 11		Hours of Calibration: 34																	Percent Operational Time: 100.0								
Maximum Diurnal Average: 1.4 ppb at hour 13		Minimum Diurnal Average: 0.1 ppb at hour 3		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.2 P ₉₀ = 0.6 P ₉₉ = 6.8																									
Monthly Average: 0.43 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-Oct	0.0	0.2	0.2	0.2	Z	0.1	0.0	0.0	0.2	0.6	0.3	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.1	0.1	0.2	0.1	0.6	0.1	0.6	
2-Oct	0.0	0.2	0.0	0.1	0.1	Z	0.4	0.3	0.3	0.2	0.5	0.3	0.3	0.0	0.0	0.1	0.4	0.3	0.6	0.4	0.3	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.6
3-Oct	Z	0.6	0.3	0.6	0.7	0.4	0.1	0.0	0.0	0.3	0.0	0.2	0.1	0.6	0.4	0.3	0.4	0.3	0.1	0.1	0.3	0.2	0.3	0.2	0.3	0.3	0.3	0.7	
4-Oct	0.5	Z	0.5	0.2	0.3	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.2	0.2	0.2	0.2	0.5	
5-Oct	0.2	0.0	Z	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.2	0.4	0.4	0.2	0.7	0.3	0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7	
6-Oct	0.0	0.0	0.0	Z	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	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.3	
7-Oct	0.0	0.0	0.0	0.0	Z	0.2	0.2	0.3	0.2	1.8	3.2	2.7	1.5	1.1	1.1	0.8	0.6	0.6	0.4	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.7	3.2	
8-Oct	0.0	0.1	0.0	0.0	0.1	Z	0.1	0.0	0.0	0.1	0.2	0.2	0.3	0.3	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	
9-Oct	Z	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.1	0.4	0.5	0.6	0.6	0.2	0.2	0.2	0.3	0.5	0.6	0.4	0.5	0.1	0.3	0.2	0.2	0.6	0.6	
10-Oct	0.3	Z	0.1	0.1	0.2	0.1	0.1	0.3	0.3	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	0.1	0.1	0.1	0.1	0.3	
11-Oct	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
12-Oct	0.0	0.0	0.1	Z	0.0	0.0	0.0	0.1	0.1	0.2	0.4	0.5	0.4	0.4	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	0.5	
13-Oct	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.3	0.3	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.3	0.3	
14-Oct	0.0	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.2	
15-Oct	Z	0.2	0.1	0.1	0.1	0.1	0.0	0.2	0.1	0.2	0.4	0.6	0.5	0.4	0.4	0.5	0.5	0.5	0.3	0.4	0.4	0.3	0.2	0.1	0.0	0.3	0.6	0.6	
16-Oct	0.2	Z	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	1.0	0.4	0.1	0.1	0.1	0.0	0.8	0.2	0.2	1.0	1.0	
17-Oct	0.4	1.3	Z	0.4	0.2	0.3	1.0	0.4	0.2	0.2	0.2	0.1	0.1	0.1	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.3	1.1	1.1	0.3	0.3	1.3	1.3	
18-Oct	1.0	0.7	0.4	Z	0.2	0.2	0.2	0.1	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	0.2	0.1	0.1	0.2	0.2	0.2	1.0	
19-Oct	0.1	0.2	0.0	0.1	Z	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.3	0.3	0.3	
20-Oct	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	0.9	1.3	1.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.2	0.2	0.2	1.3	
21-Oct	Z	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.3	0.3	0.4	0.6	1.3	0.3	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.3	
22-Oct	0.0	Z	0.0	2.5	0.7	0.8	20.0	24.2	15.8	2.9	2.5	2.9	6.8	4.0	0.2	0.1	0.2	0.2	1.3	3.3	1.0	0.2	0.0	0.1	3.9	24.2	24.2		
23-Oct	0.0	0.0	Z	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.3	0.3	0.3	
24-Oct	0.0	0.0	0.1	Z	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.2	0.1	0.2	0.2	0.2	
25-Oct	0.1	0.1	0.2	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	0.0	0.0	0.0	0.2	
26-Oct	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.2	0.1	0.1	0.1	0.1	0.0	0.2	0.2	0.2	
27-Oct	Z	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	1.3	1.5	0.2	0.2	0.0	0.0	4.7	0.3	0.1	0.2	0.1	0.0	0.4	4.7	4.7		
28-Oct	0.0	Z	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	6.8	13.2	2.6	1.5	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	1.2	13.2	13.2		
29-Oct	0.2	0.2	Z	0.1	0.0	0.1	0.2	0.1	0.2	0.2	0.5	5.8	16.9	3.3	0.3	0.2	0.2	0.2	0.2	0.2	0.9	1.3	0.3	0.1	1.4	16.9	16.9		
30-Oct	0.0	0.2	0.1	Z	0.2	0.1	0.2	0.8	0.8	0.2	0.5	0.3	0.2	0.2	0.2	0.2	0.0	0.2	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0.8	0.8		
31-Oct	0.1	0.0	0.1	0.1	Z	0.2	0.2	0.4	0.2	0.2	0.1	2.5	0.2	0.4	1.1	1.3	1.0	1.6	1.9	16.3	13.3	2.6	0.8	0.4	2.0	16.3	16.3		
																								Diurnal Average		Diurnal Maximum			
																								0.1		1.0			
																								0.2		1.3			
																								0.1		0.5			
																								0.2		2.5			
																								0.1		0.7			
																								0.2		0.8			
																								0.8		20.0			
																								0.9		24.2			
																								0.6		15.8			
																								0.3		2.9			
																								0.4		3.2			
																								0.9		6.8			
																								1.4		4.0			
																								0.6		1.5			
																								0.3		1.3			
																								0.2		1.1			
																								0.2		1.6			
																								0.4		4.7			
																								0.8		16.3			
																								0.6		13.3			
																								0.2		2.6			
																								0.1		1.1			
																								0.2		1.1			

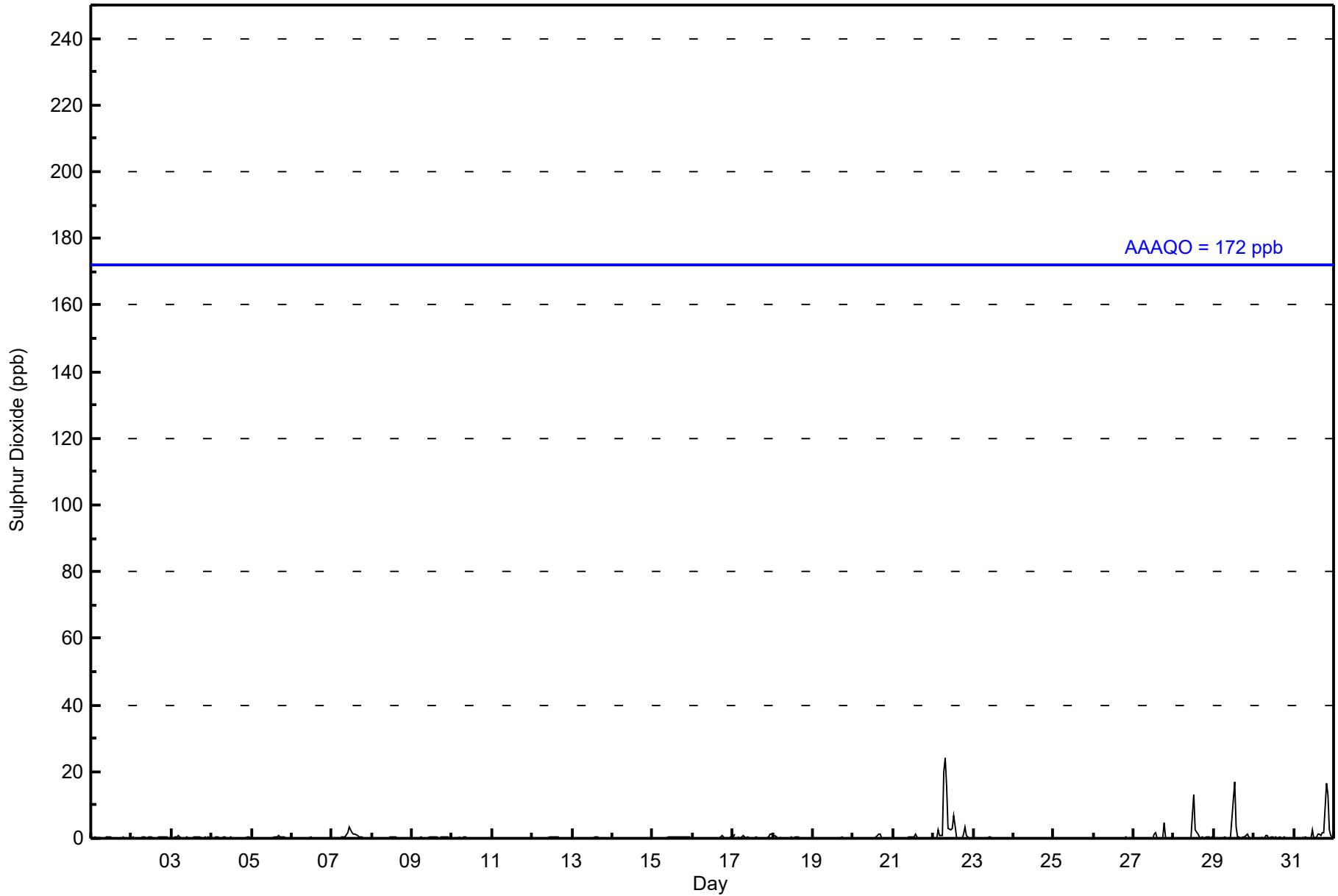
Z - zerospan C - Calibration

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



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	703	99.01	99.01
11 - 20	6	0.85	99.86
21 - 60	1	0.14	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 710

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Buffalo Viewpoint - October 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	16	9	7	0	26	101	183	43	17	15	51	68	43	62	16	703
11 - 20	0	0	0	1	1	1	0	0	1	0	0	0	0	0	0	2	6
21 - 60	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	46	16	9	9	1	27	101	183	44	17	15	51	68	43	62	18	710

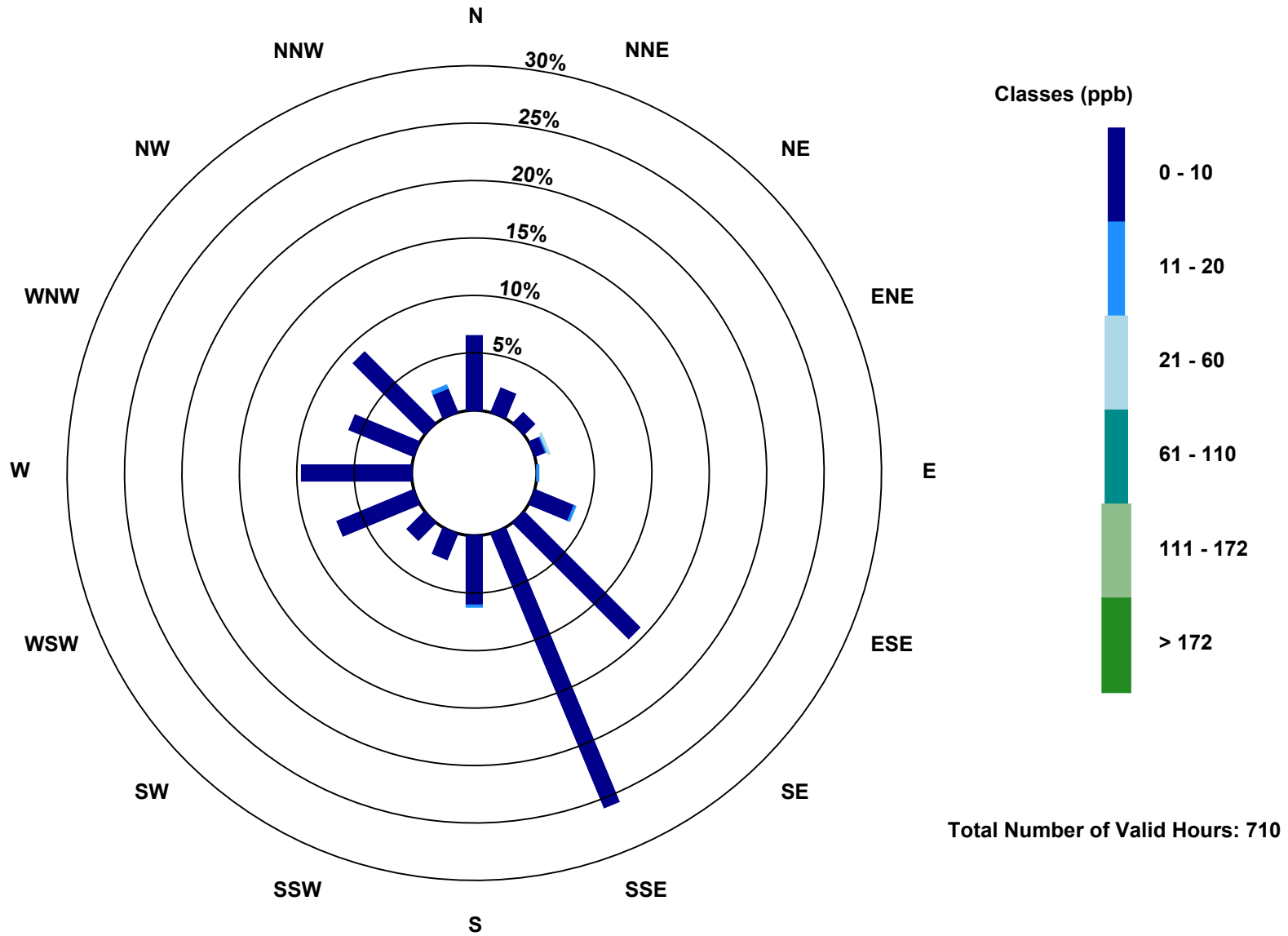
Total Number of Valid Hours: 710

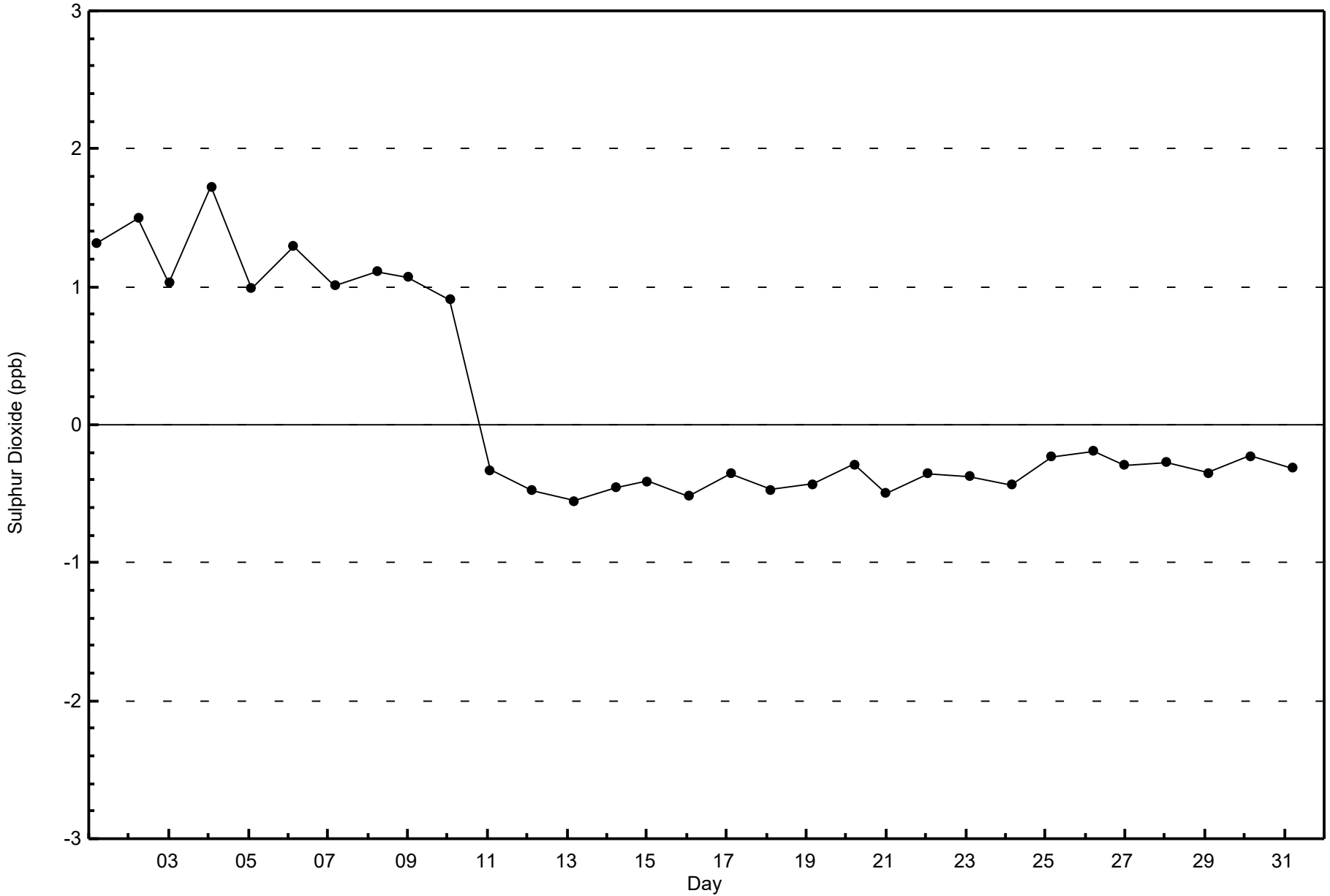
Total Number of Hours: 744

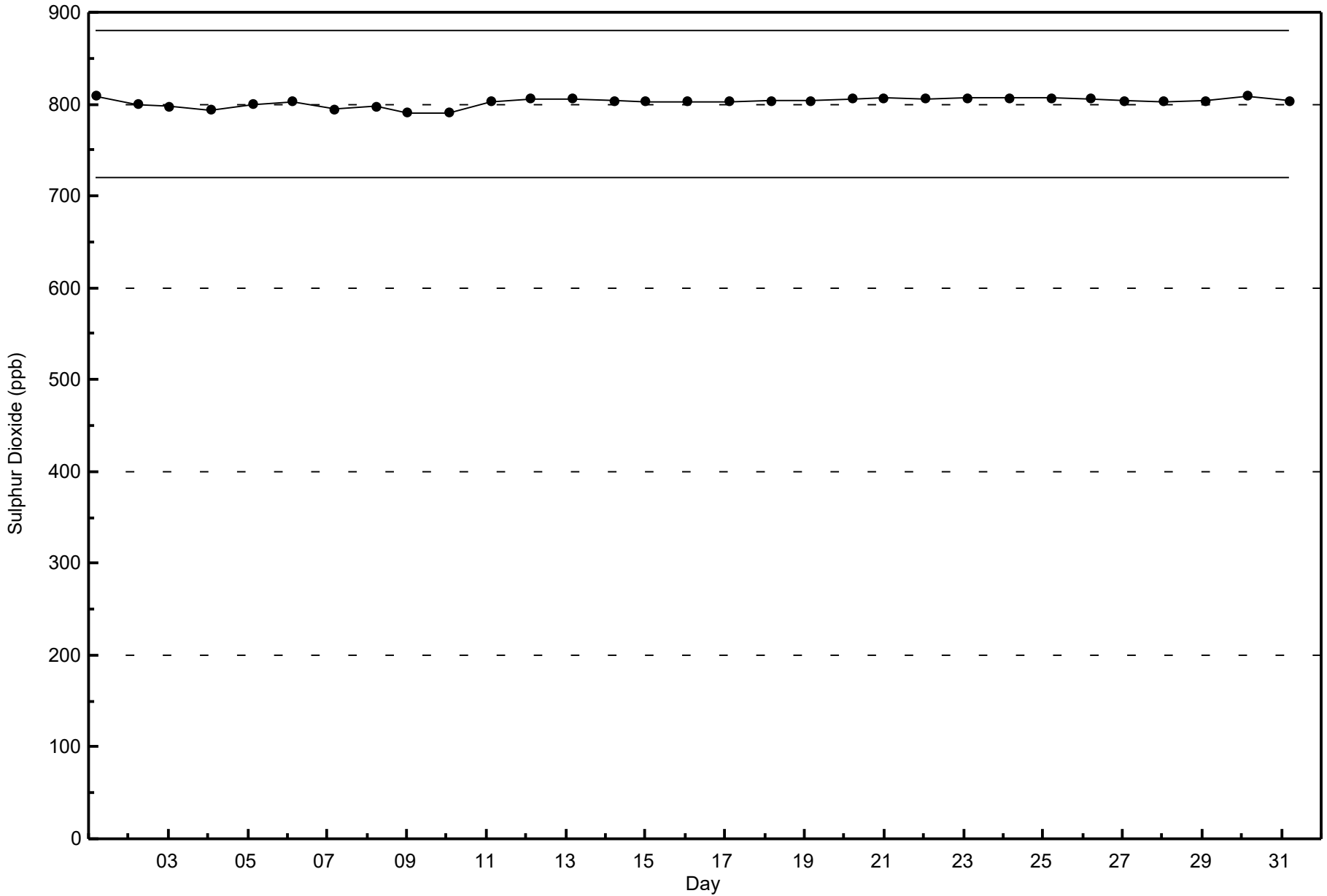


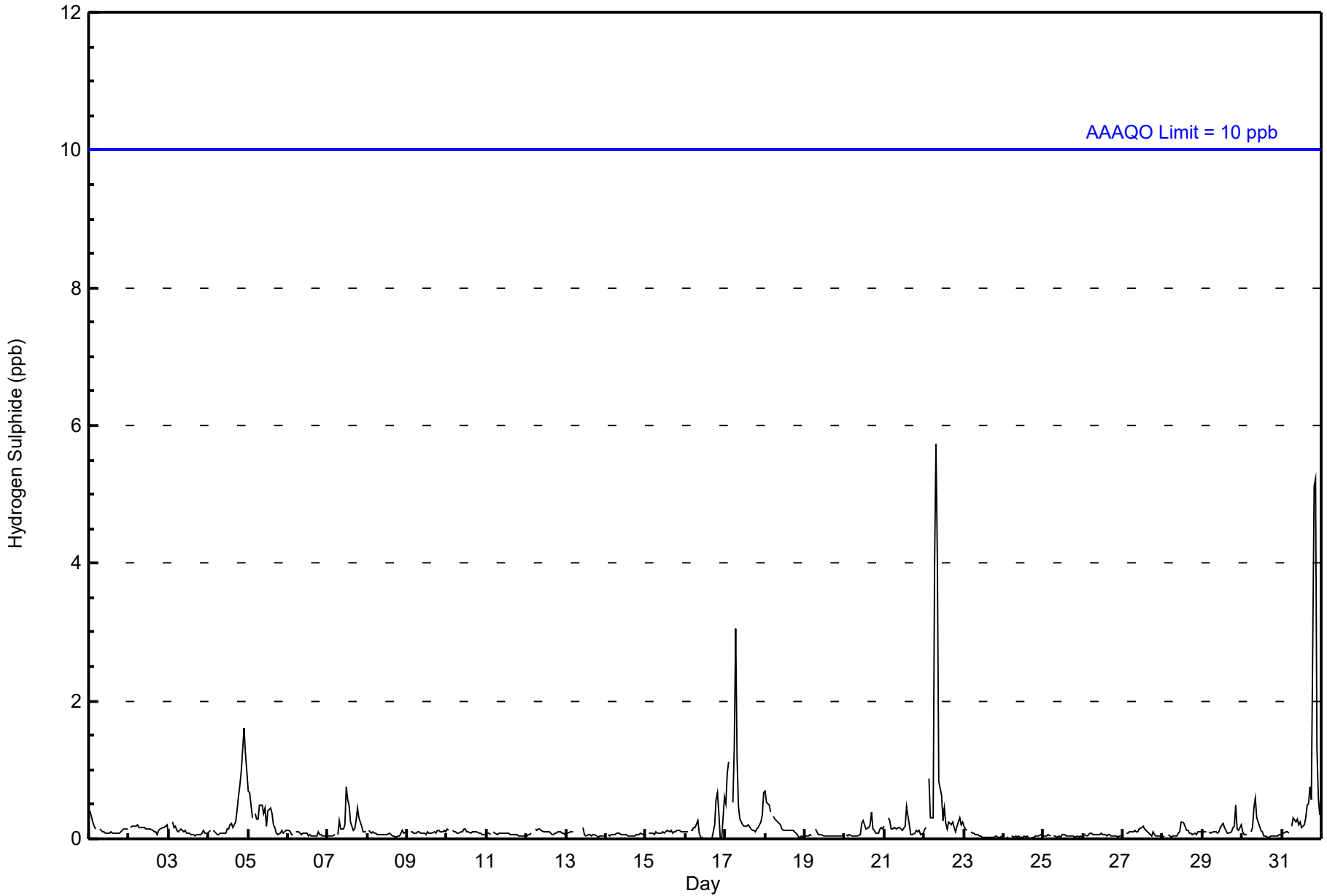
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Sulphur Dioxide (SO₂) - ppb
Buffalo Viewpoint











**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	703	99.15	99.15
3 - 4	3	0.42	99.58
5 - 7	3	0.42	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 - October 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	15	9	7	0	28	96	187	42	16	15	48	72	42	63	16	703
3 - 4	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	3
5 - 7	0	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0	3
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	47	15	9	9	1	29	96	187	43	16	15	48	72	42	63	17	709

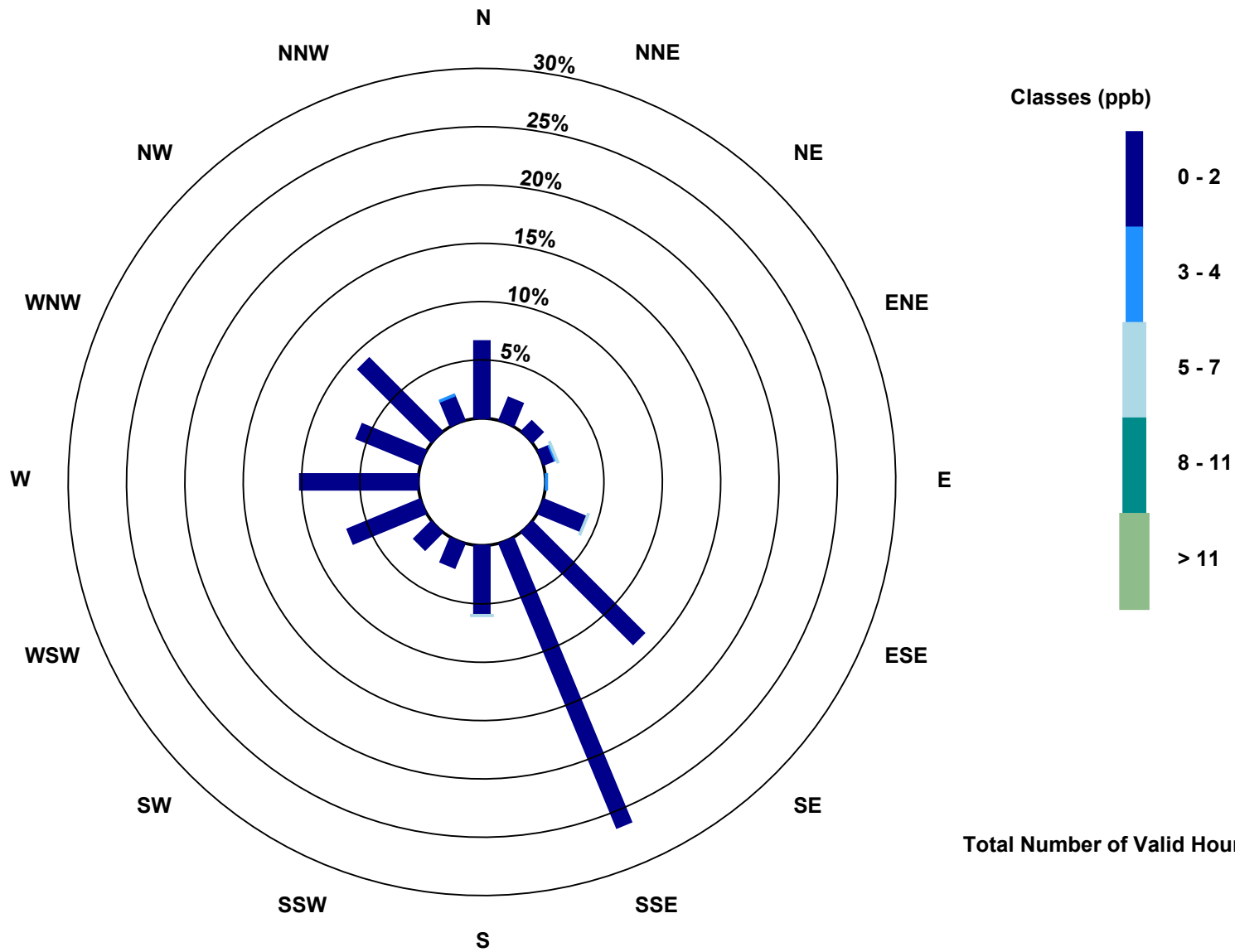
Total Number of Valid Hours: 709

Total Number of Hours: 744

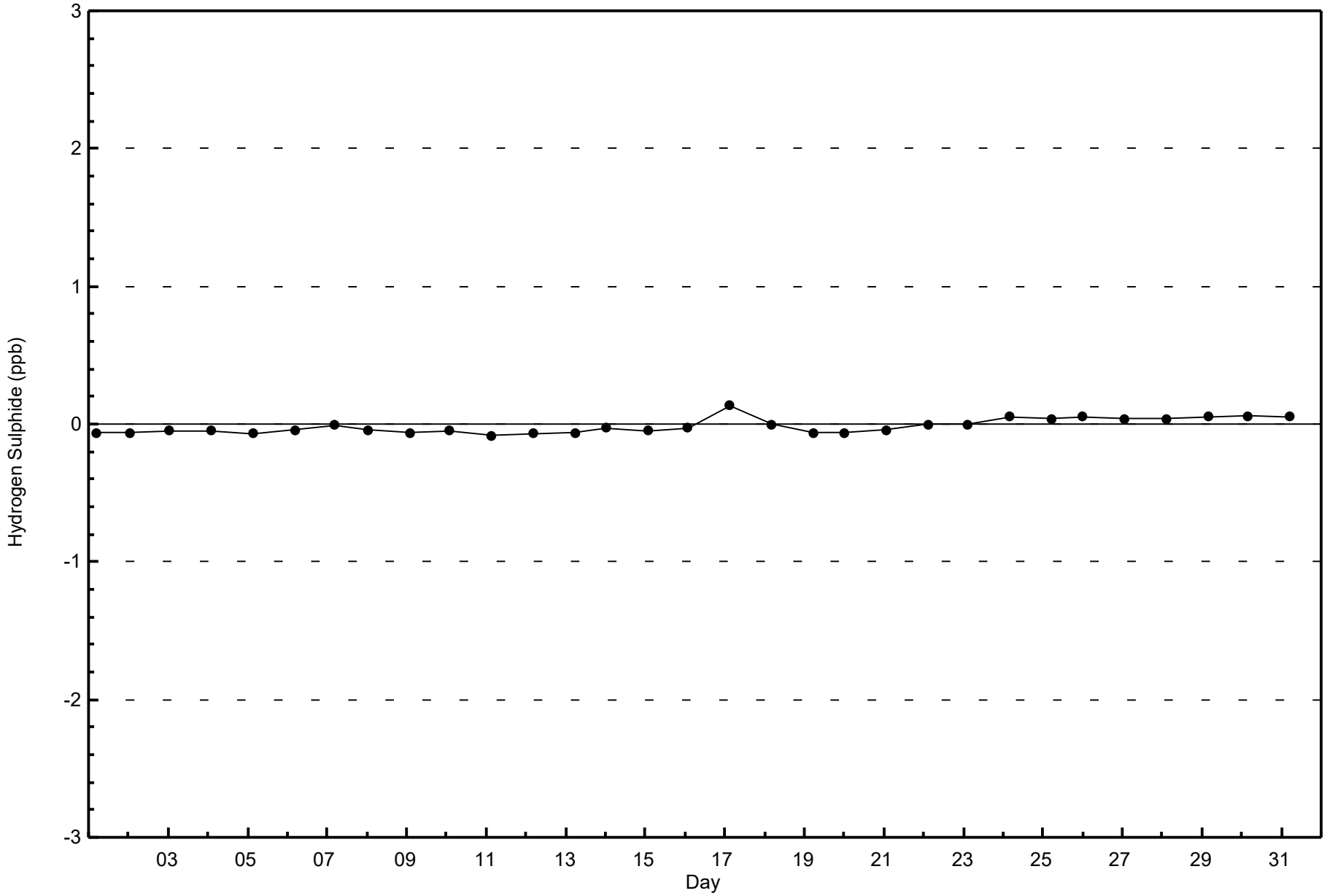


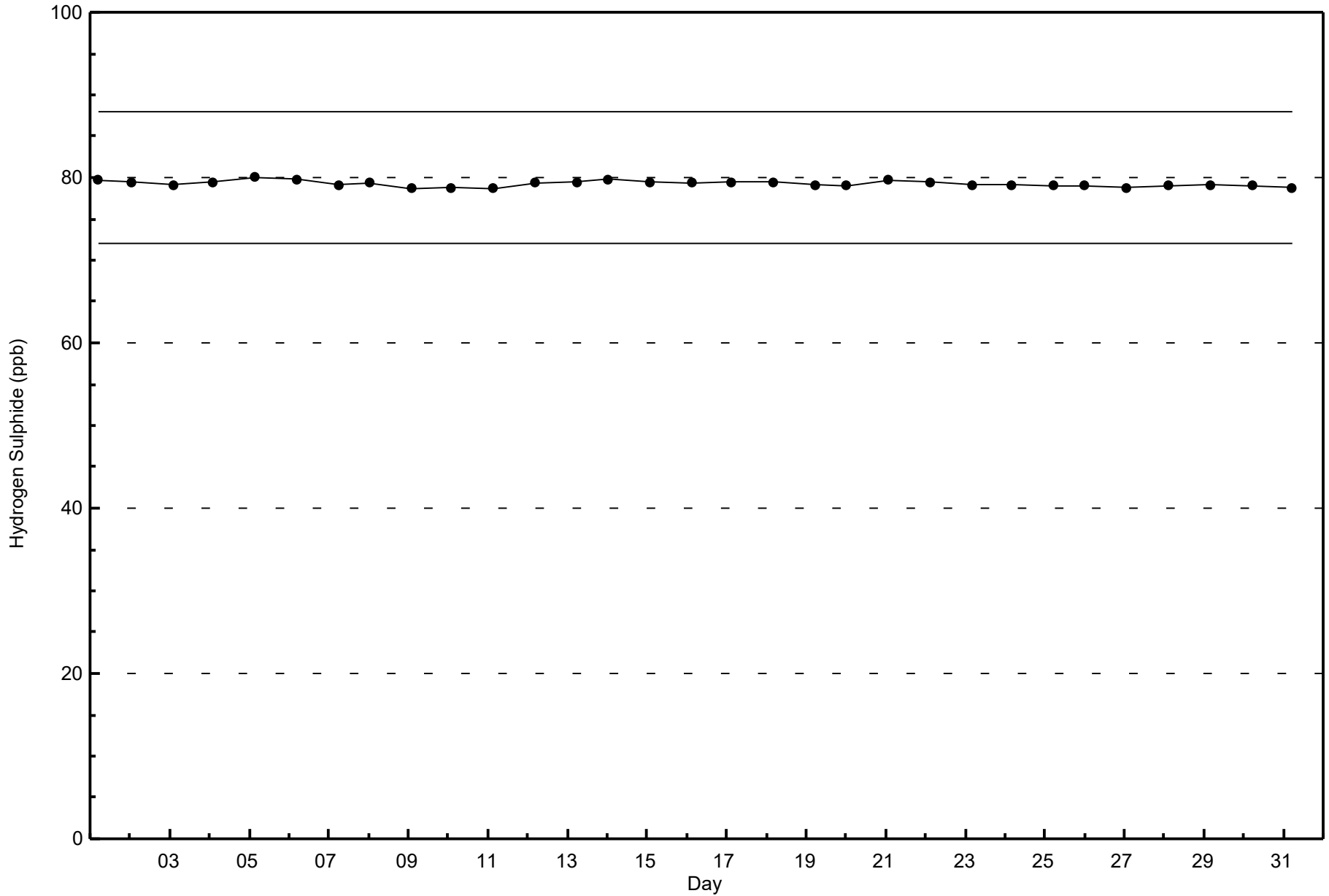
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Hydrogen Sulphide (H₂S) - ppb
Buffalo Viewpoint



Total Number of Valid Hours: 709

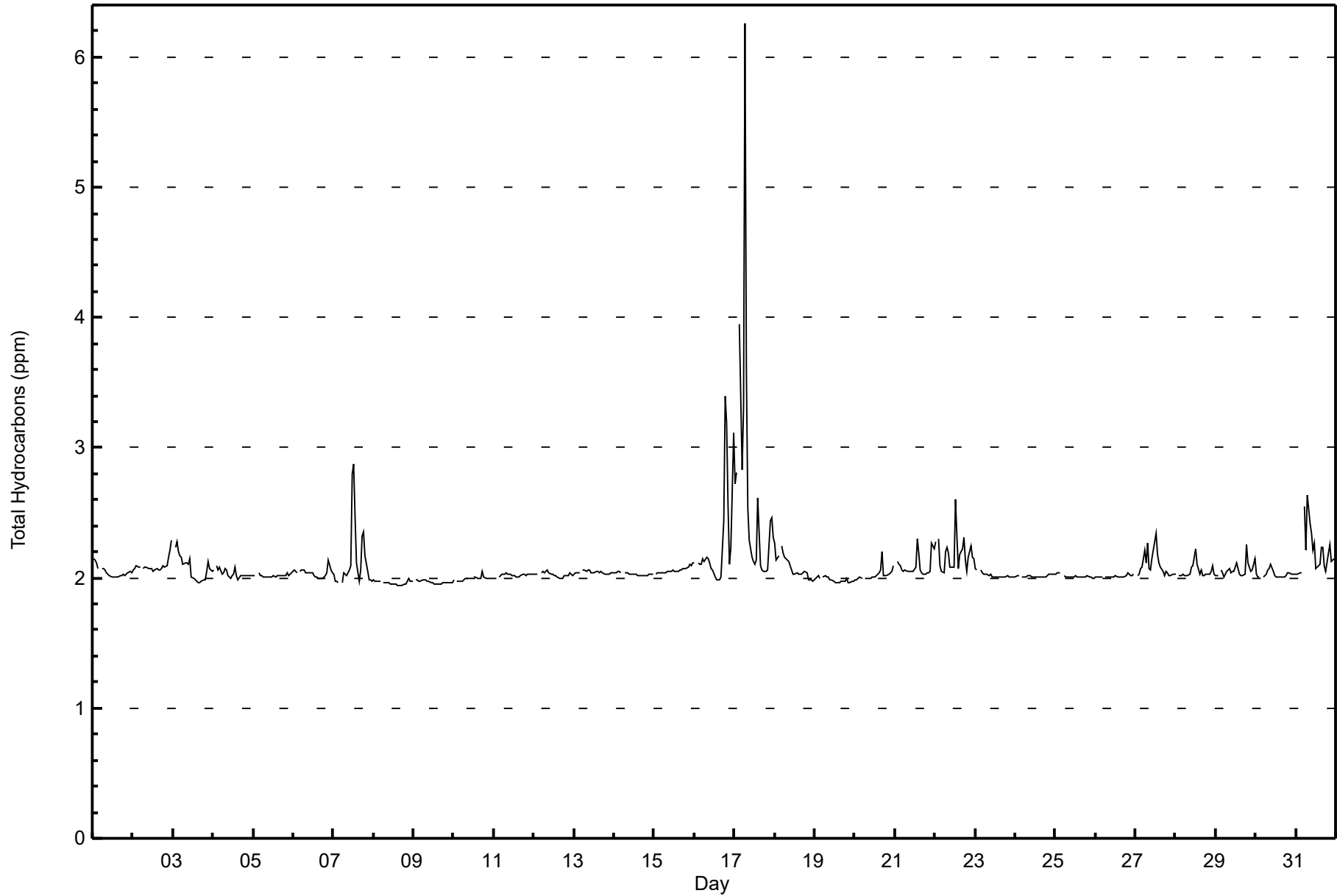






Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	481	67.75	67.75
2.1 - 3.0	222	31.27	99.01
3.1 - 10.0	7	0.99	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 - October 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	7	1	3	0	20	73	122	27	8	13	50	64	39	42	3	481
2.1 - 3.0	36	9	7	6	1	7	27	60	17	9	2	1	4	4	20	12	222
3.1 - 10.0	1	0	1	0	0	0	1	1	0	0	0	0	0	0	0	3	7
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	46	16	9	9	1	27	101	183	44	17	15	51	68	43	62	18	710

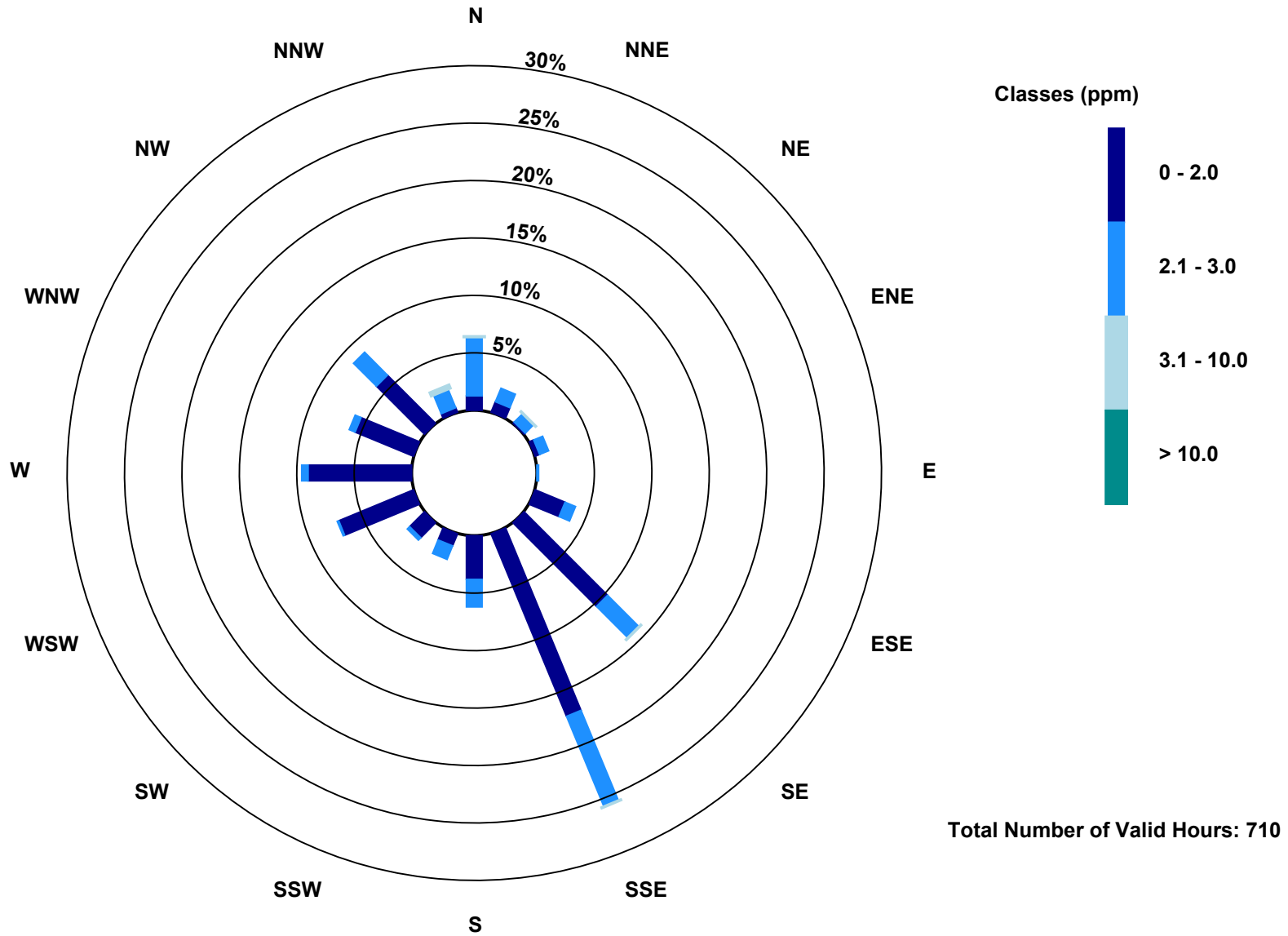
Total Number of Valid Hours: 710

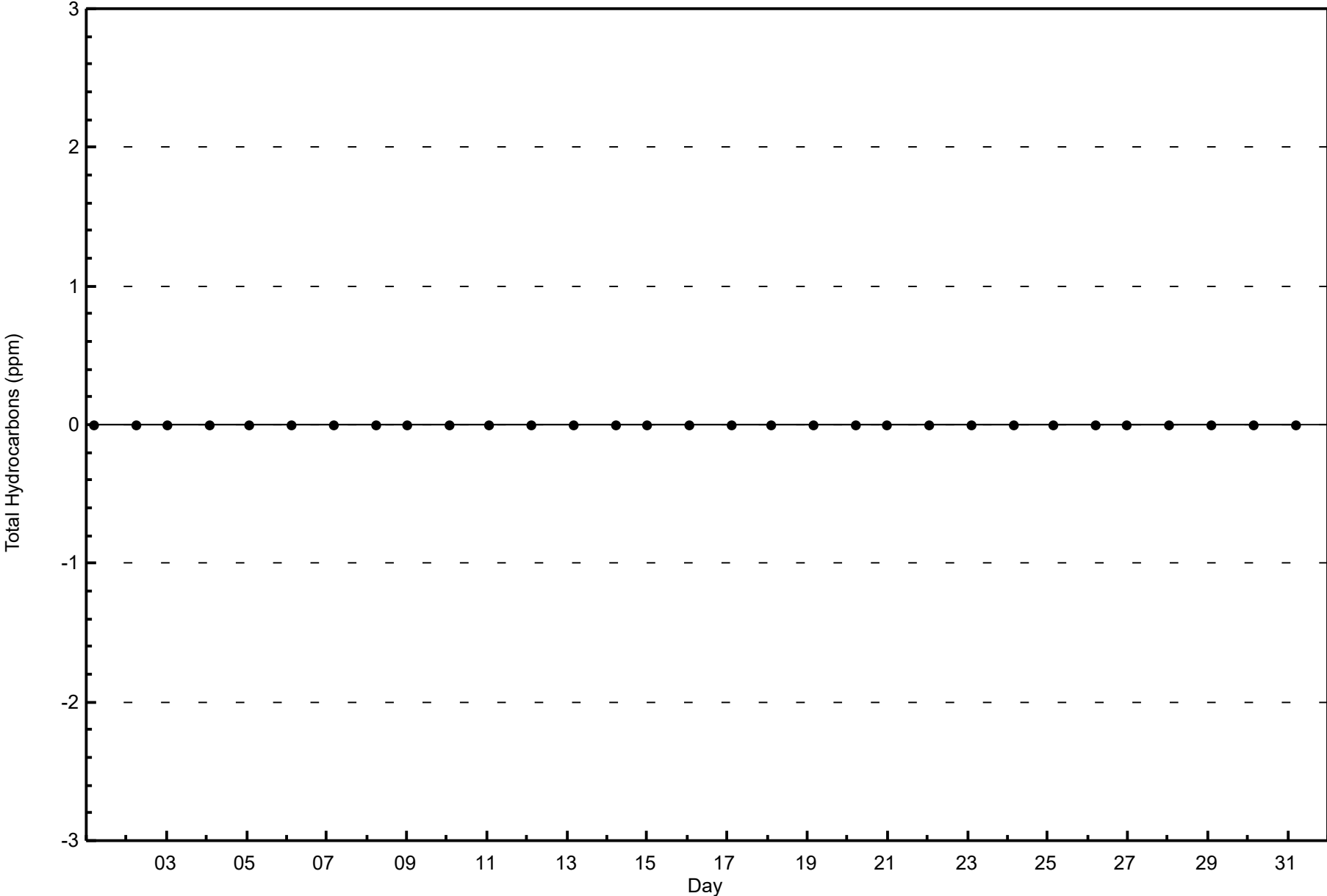
Total Number of Hours: 744

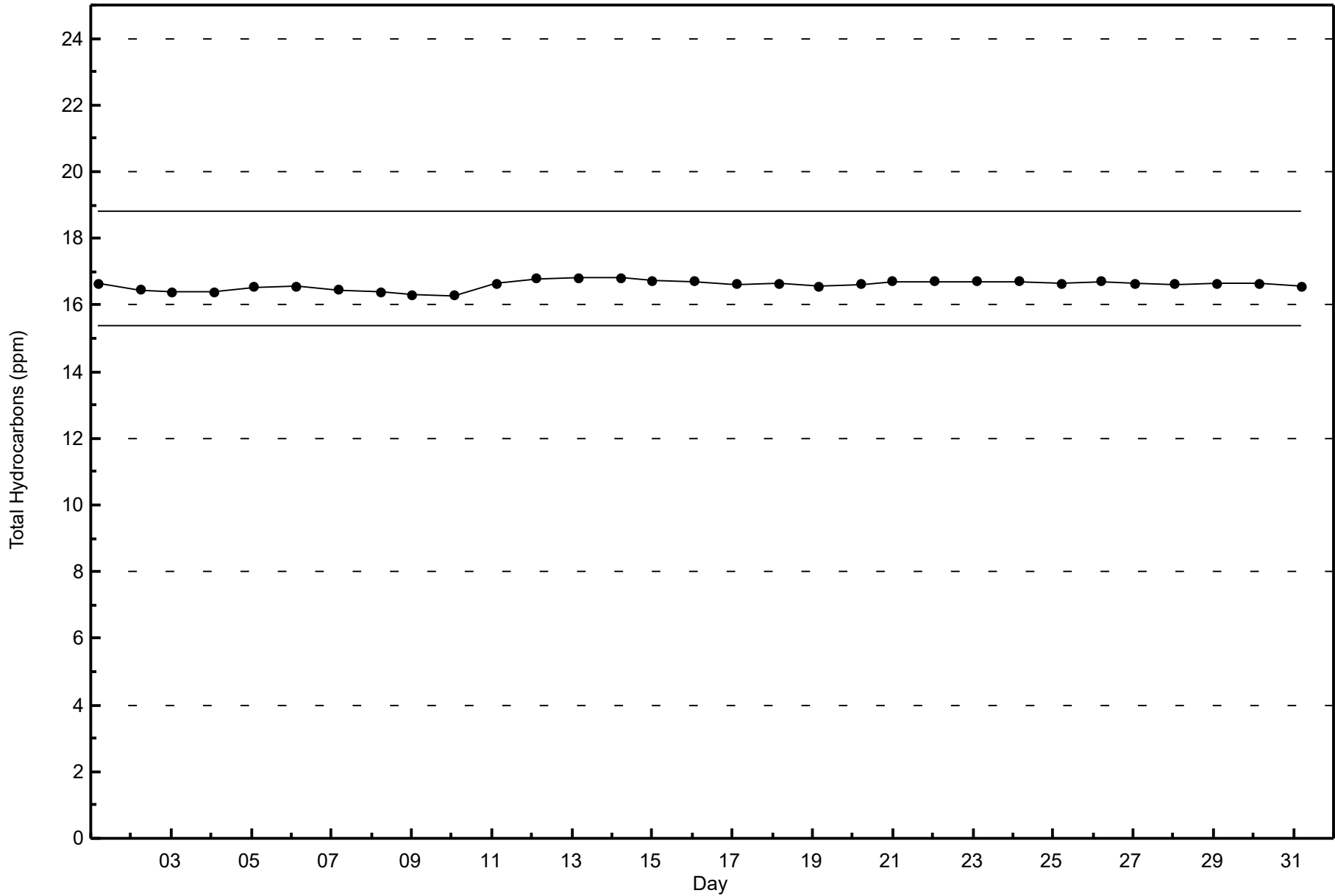


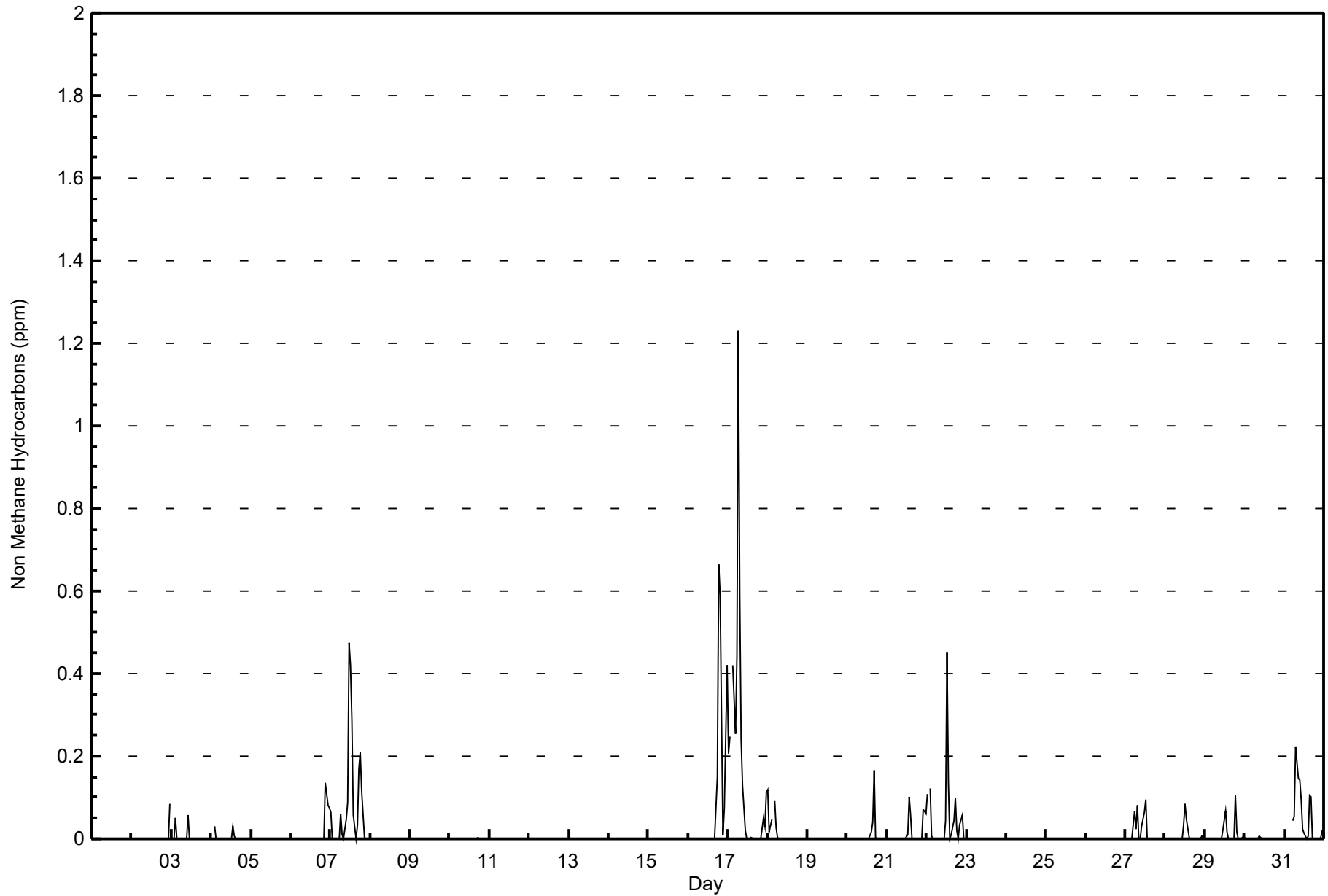
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Total Hydrocarbons (THC) - ppm
Buffalo Viewpoint











**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	615	86.62	86.62
0.006 - 0.05	38	5.35	91.97
0.06 - 0.1	36	5.07	97.04
> 0.1	21	2.96	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 - October 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	23	11	5	7	1	21	91	177	36	17	13	50	64	41	55	3	615
0.006 - 0.05	6	3	2	1	0	1	2	4	5	0	1	0	0	1	6	6	38
0.06 - 0.1	12	2	1	0	0	3	3	1	2	0	1	1	4	1	1	4	36
> 0.1	5	0	1	1	0	2	5	1	1	0	0	0	0	0	0	5	21
Totals	46	16	9	9	1	27	101	183	44	17	15	51	68	43	62	18	710

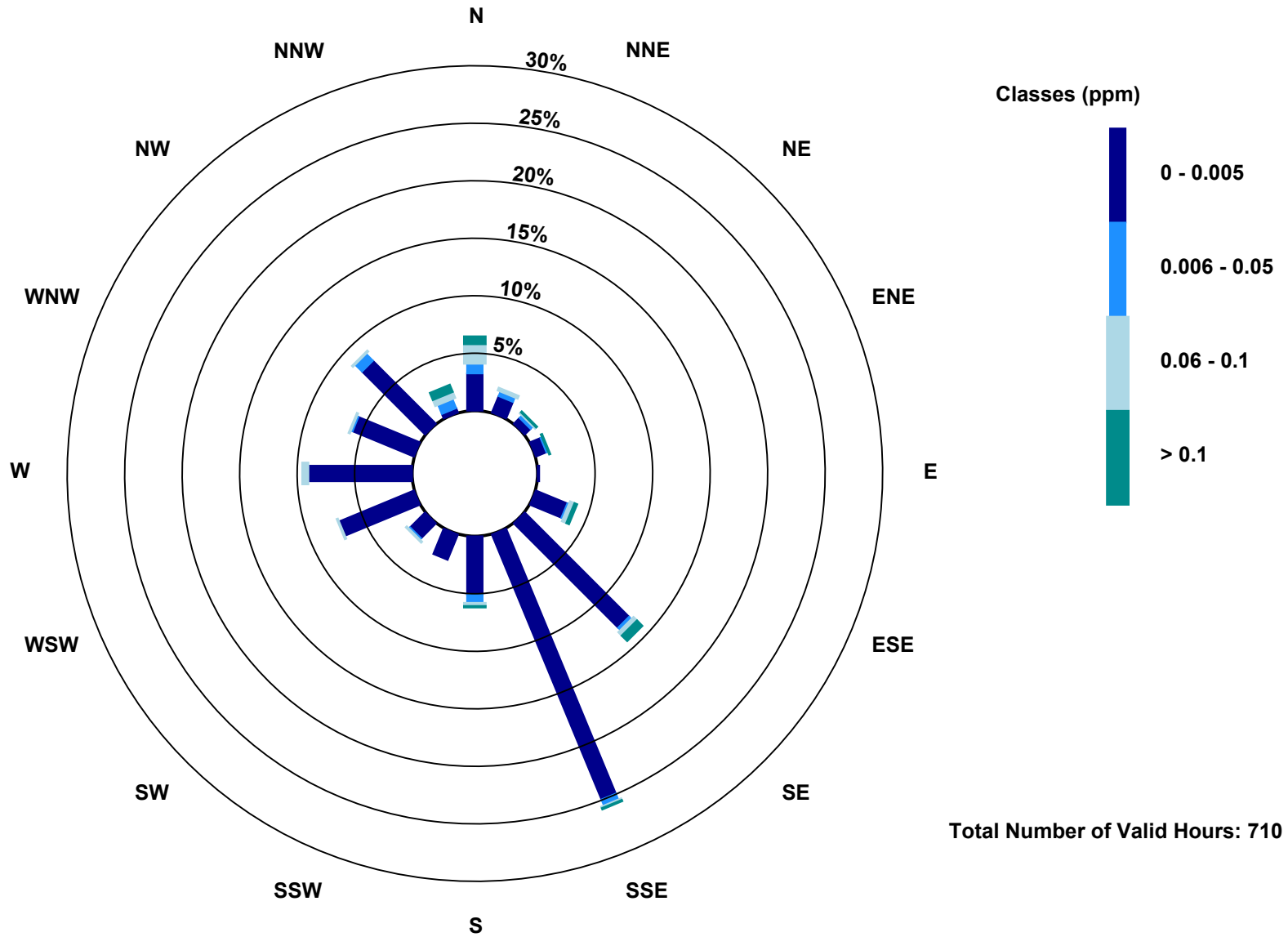
Total Number of Valid Hours: 710

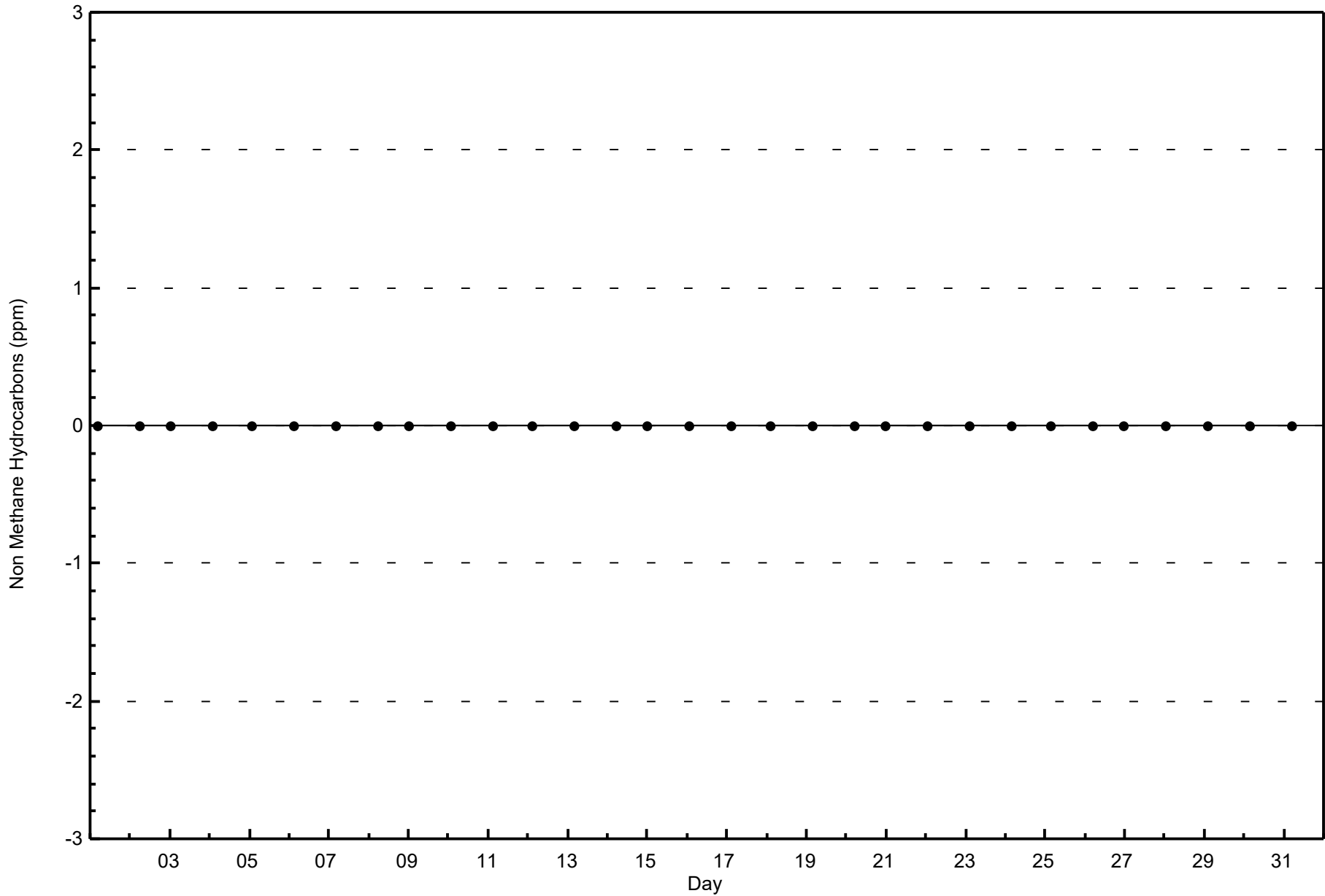
Total Number of Hours: 744

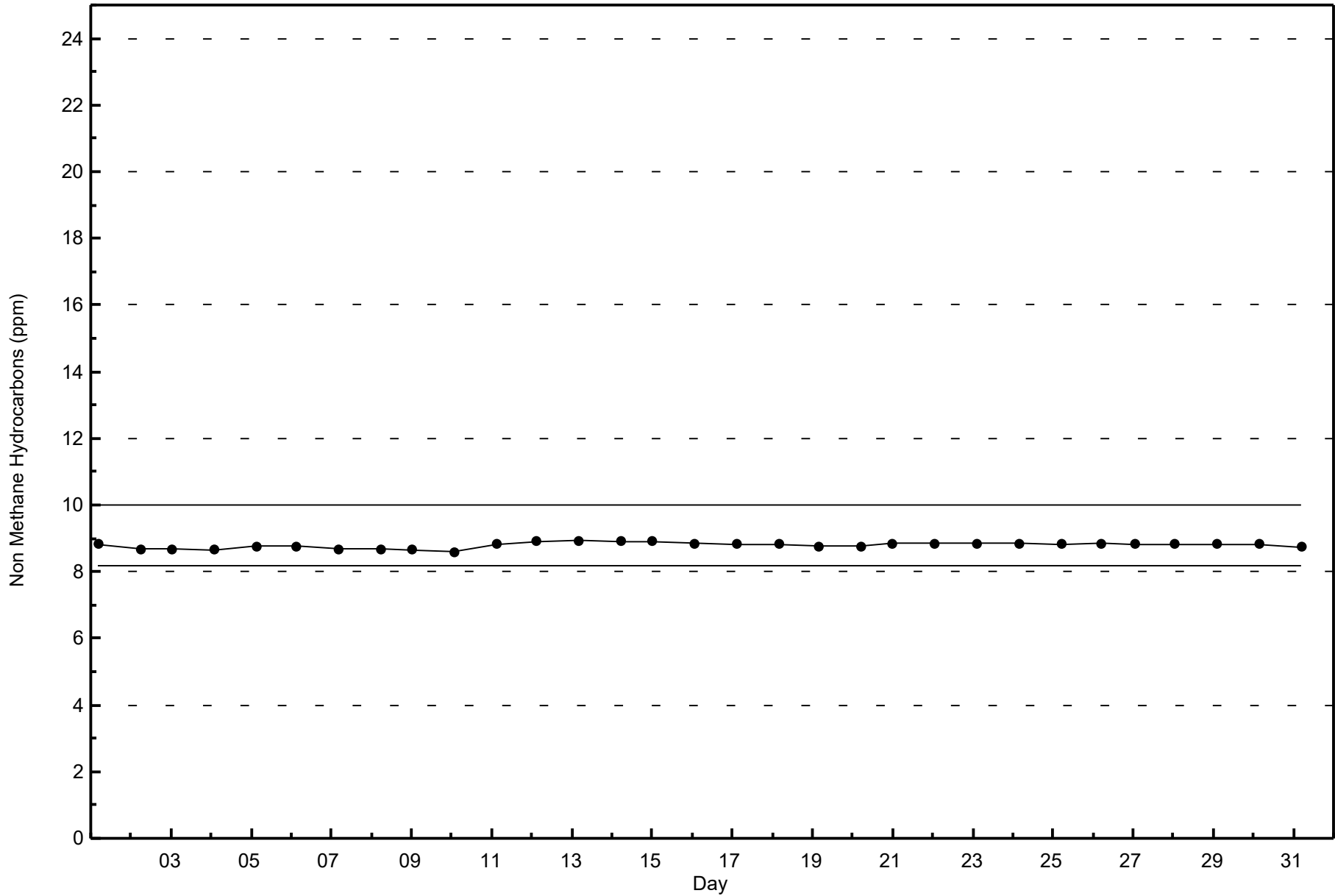


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Non Methane Hydrocarbons (NMHC) - ppm
Buffalo Viewpoint









Wood Buffalo Environmental Association

Methane (CH₄) - ppm

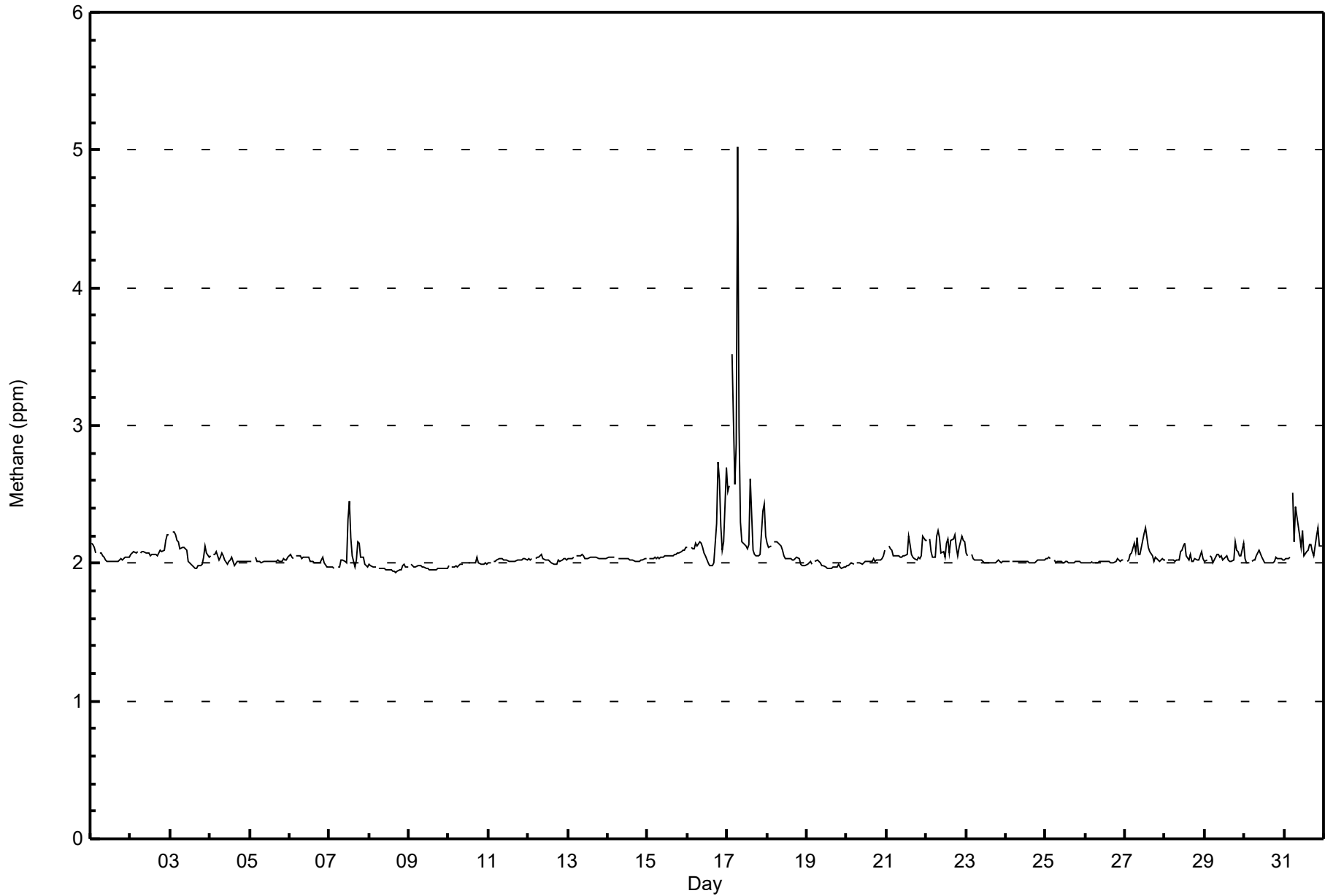
Summary of Hour Averages

Buffalo Viewpoint - October 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 5.0 ppm on Oct 17 07:00	Maximum Daily Average: 2.5 ppm on Oct 17		Hours of Data:	710
Minimum Value: 1.9 ppm on Oct 8 17:00	Minimum Daily Average: 2.0 ppm on Oct 8		Hours of Missing Data:	34
Maximum Diurnal Average: 2.1 ppm at hour 7	Minimum Diurnal Average: 2.0 ppm at hour 16		Hours of Calibration:	34
Monthly Average: 2.06 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 = 2.6		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24									
1-Oct	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	2.0	2.0	2.0	2.0	2.0	2.1
2-Oct	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2
3-Oct	Z	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	
4-Oct	2.1	Z	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	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-Oct	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
6-Oct	2.1	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	
7-Oct	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.3	2.5	2.2	2.1	2.0	2.0	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	2.5	
8-Oct	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	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	2.0	2.0	2.0	2.0	2.0	
9-Oct	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	2.0	2.0	2.0	2.0	
10-Oct	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
11-Oct	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
12-Oct	2.0	2.0	2.0	Z	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	2.0	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-Oct	2.0	2.0	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	2.0	2.0	2.0	2.0	2.1	
14-Oct	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	2.0	2.0	2.0	2.0	2.0	2.0	
15-Oct	Z	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	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
16-Oct	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.3	2.7	2.6	2.3	2.1	2.2	2.7	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.7	
17-Oct	2.5	2.6	Z	3.5	2.6	2.9	5.0	3.0	2.3	2.2	2.1	2.1	2.1	2.1	2.6	2.1	2.1	2.1	2.0	2.1	2.1	2.4	2.4	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.5	5.0	
18-Oct	2.1	2.1	2.1	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	2.0	2.0	2.0	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	
19-Oct	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
20-Oct	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	2.0	2.0	2.0	2.0	2.0	2.0	
21-Oct	Z	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	
22-Oct	2.2	Z	2.2	2.1	2.0	2.0	2.2	2.2	2.2	2.2	2.1	2.1	2.0	2.1	2.2	2.1	2.2	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	2.2	2.2	
23-Oct	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	
24-Oct	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
25-Oct	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
26-Oct	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	2.0	2.0	2.0	2.0	2.0	2.0	
27-Oct	Z	2.0	2.0	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.2	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	2.0	2.0	2.1	2.3	
28-Oct	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.0	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	2.0	2.1	
29-Oct	2.0	2.0	Z	2.1	2.0	2.0	2.0	2.1	2.1	2.0	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.0	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	
30-Oct	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
31-Oct	2.0	2.0	2.0	2.0	Z	2.5	2.2	2.4	2.3	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.5	

2.1	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	2.0	2.0	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	Diurnal Average	
2.5	2.6	2.2	3.5	2.6	2.9	5.0	3.0	2.3	2.2	2.1	2.3	2.5	2.2	2.6	2.2	2.2	2.3	2.7	2.6	2.3	2.4	2.4	2.7	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	Diurnal Maximum	
Z - zerspan C - Calibration																																	





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	492	69.30	69.30
2.1 - 3.0	216	30.42	99.72
3.1 - 10.0	2	0.28	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 - October 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	1	3	0	22	74	123	27	8	13	50	66	39	43	6	492
2.1 - 3.0	36	9	8	6	1	5	27	60	17	9	2	1	2	4	19	10	216
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	46	16	9	9	1	27	101	183	44	17	15	51	68	43	62	18	710

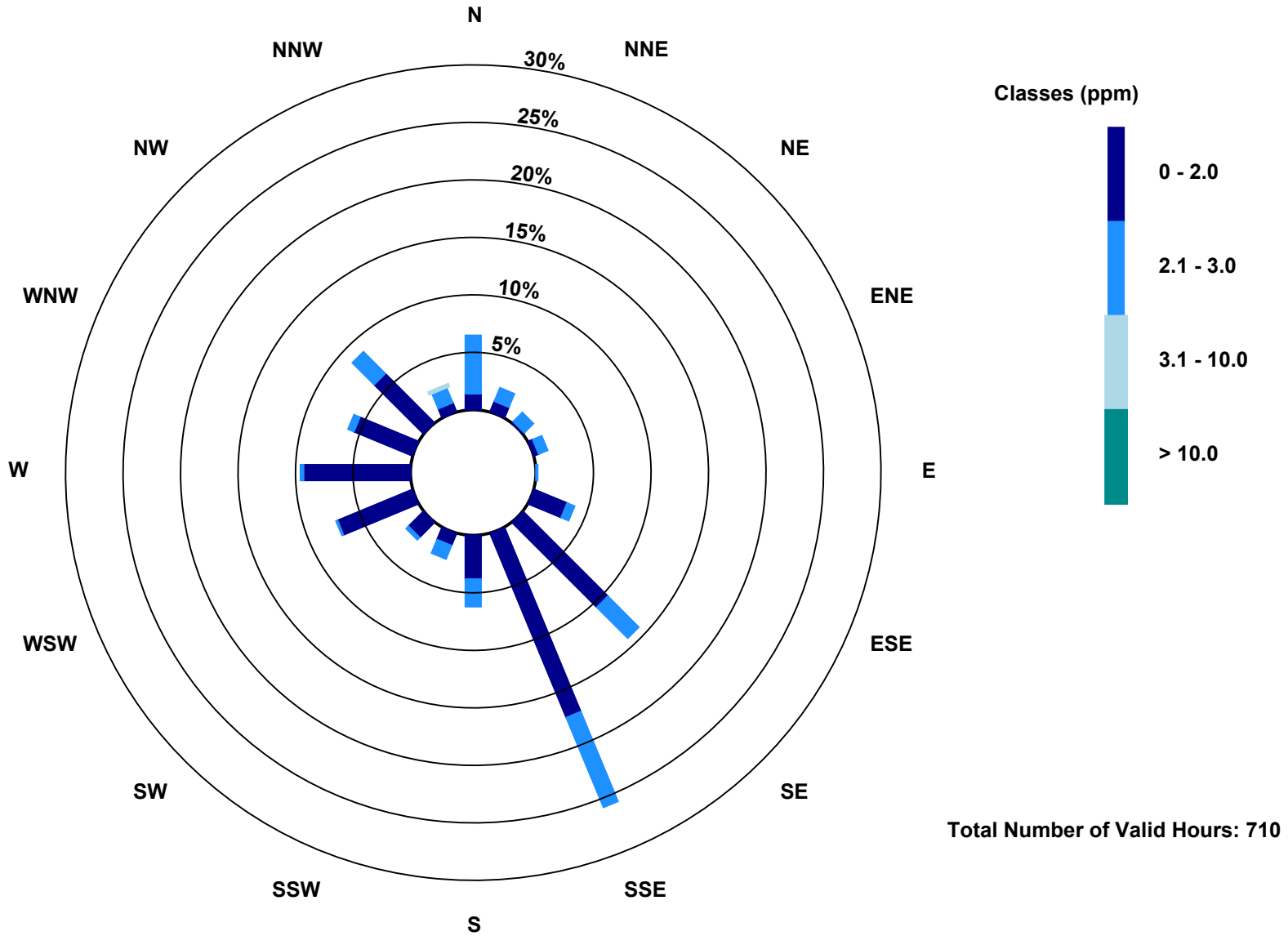
Total Number of Valid Hours: 710

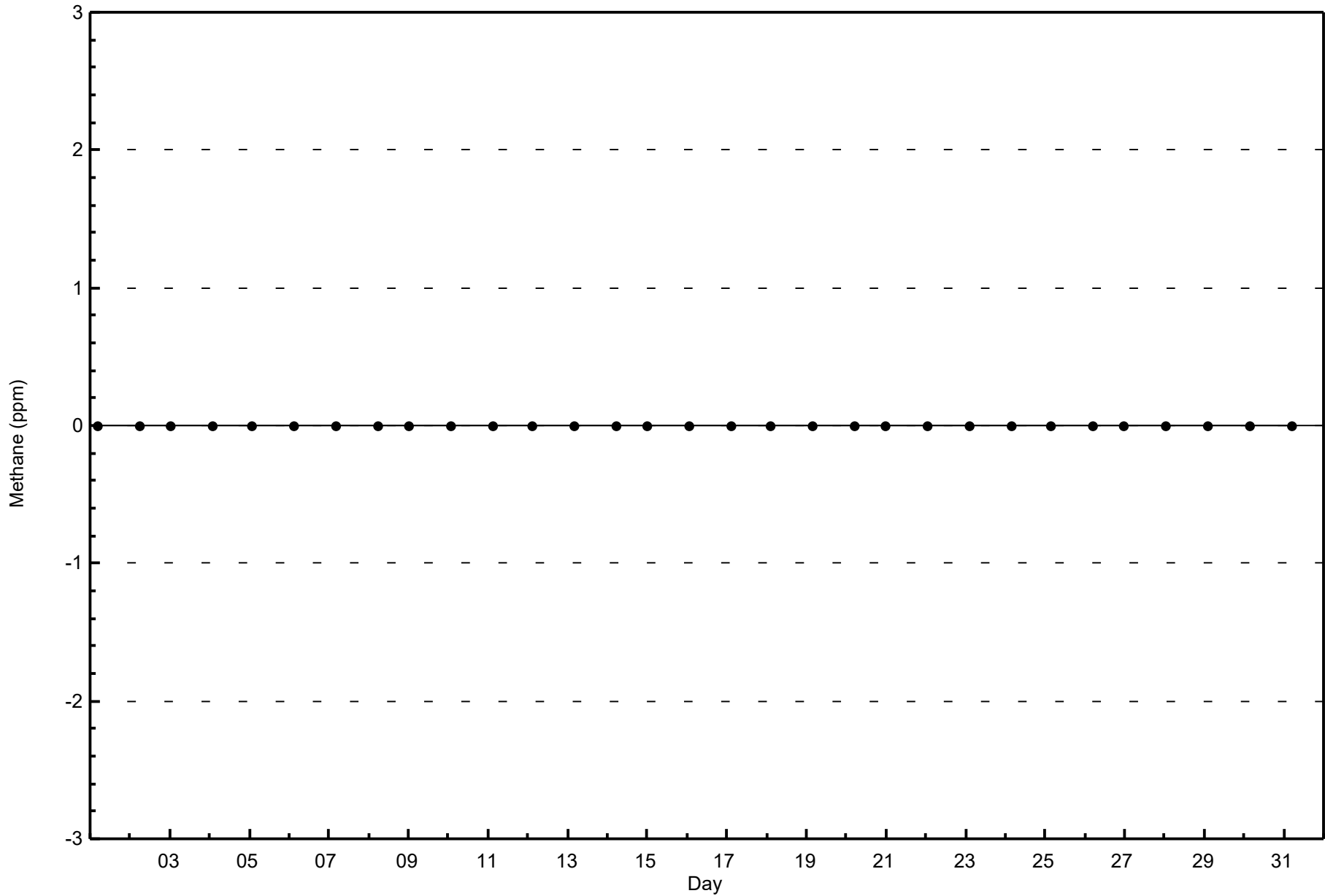
Total Number of Hours: 744

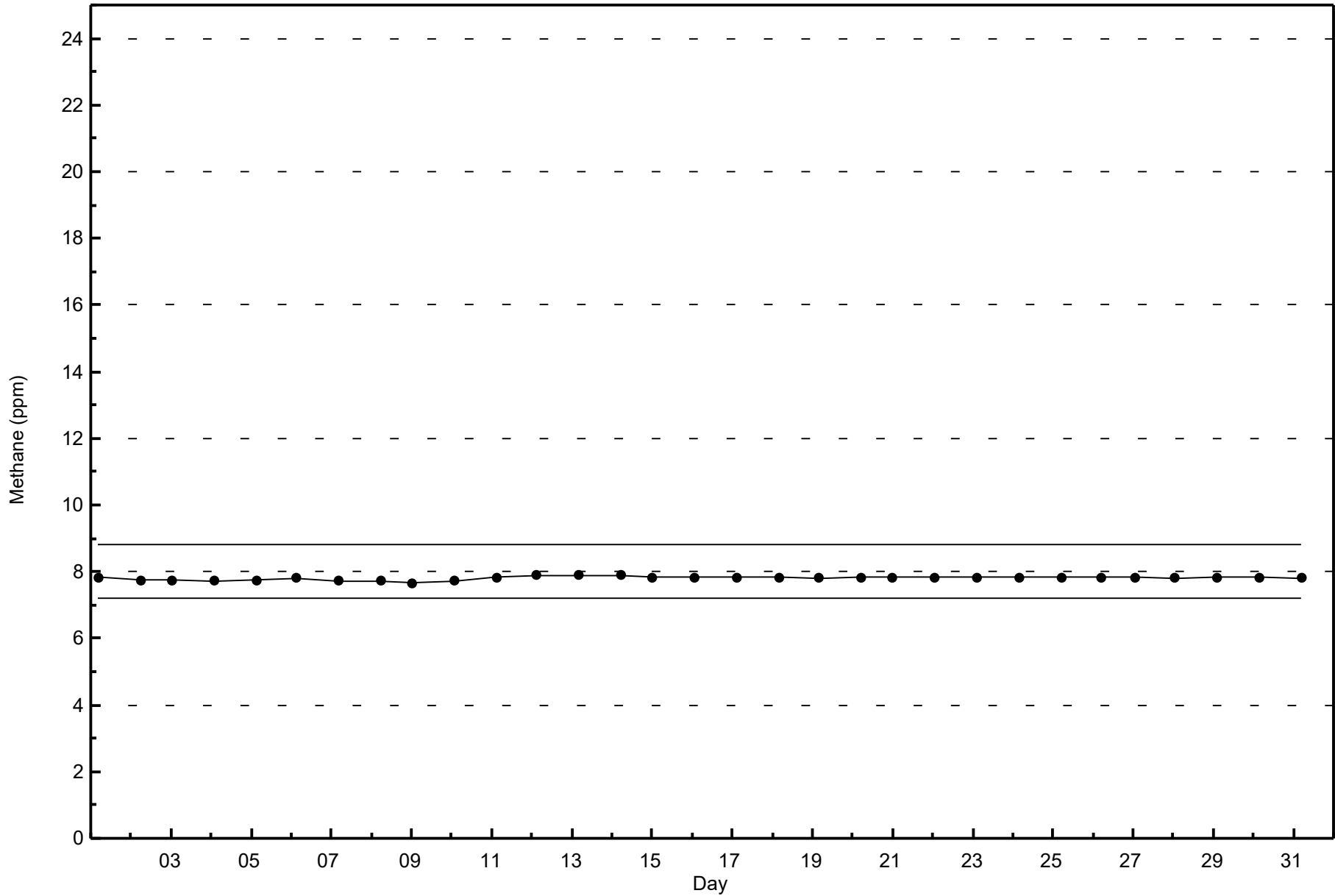


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Methane (CH₄) - ppm
Buffalo Viewpoint







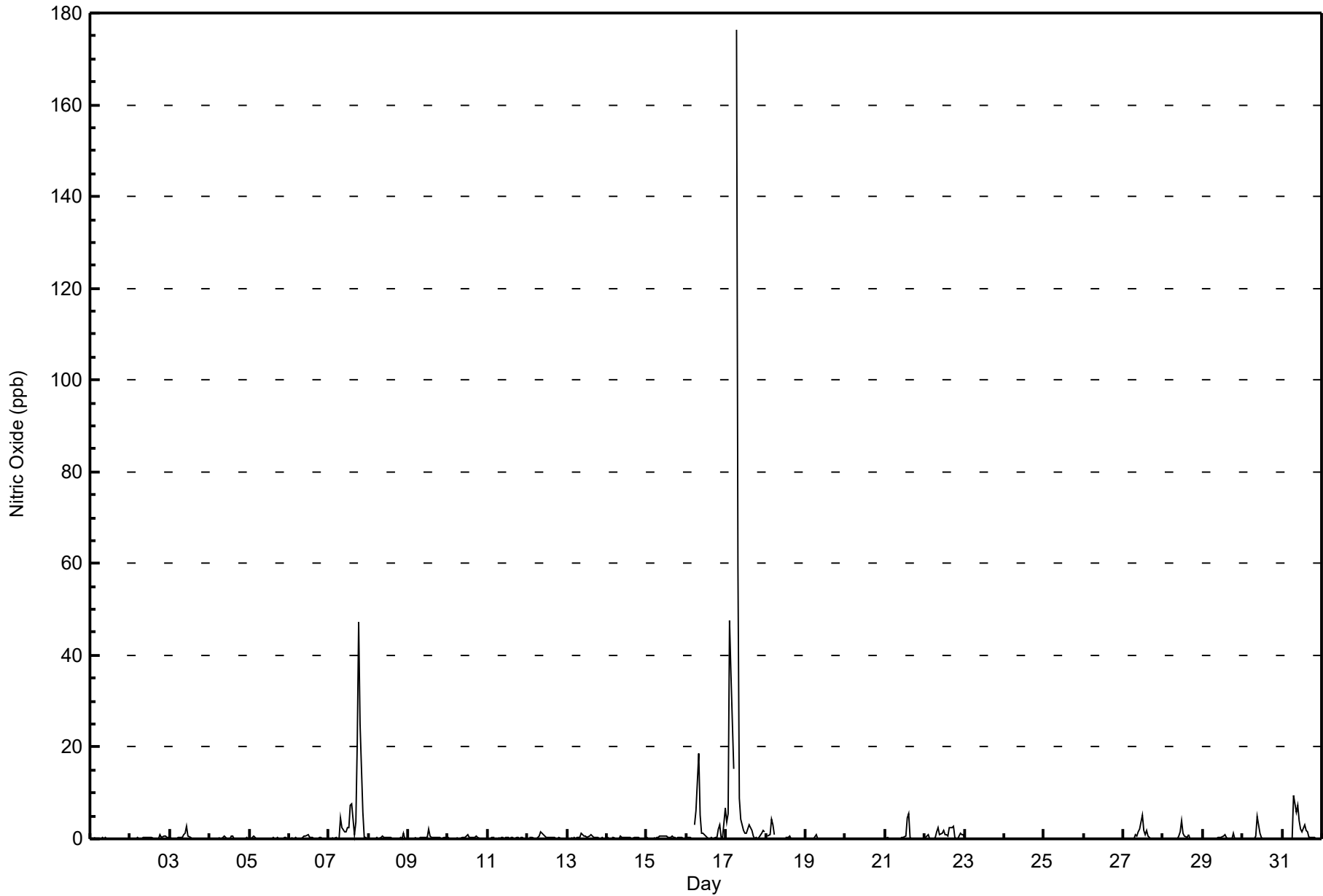


Maximum Value: 176.3 ppb on Oct 17 07:00		Maximum Daily Average: 16.2 ppb on Oct 17		Hours in Service: 744																							
Minimum Value: 0.0 ppb on Oct 1 04:00		Minimum Daily Average: 0.0 ppb on Oct 23		Hours of Data: 707																							
Maximum Diurnal Average: 6.2 ppb at hour 7		Minimum Diurnal Average: 0.2 ppb at hour 23		Hours of Missing Data: 37																							
Monthly Average: 1.07 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.3 P ₉₀ = 1.2 P ₉₉ = 18.5		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-Oct	0.5	Z	0.2	0.0	0.0	0.1	0.0	0.2	0.1	0.2	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	
2-Oct	0.0	0.0	Z	0.1	0.2	0.0	0.1	0.0	0.2	0.3	0.4	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.9	0.2	0.6	0.7	0.3	0.2	0.2	0.2	0.9
3-Oct	0.3	0.1	0.1	Z	0.1	0.2	0.2	0.3	0.8	1.2	2.8	0.5	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	2.8	
4-Oct	0.0	0.1	0.1	0.0	Z	0.2	0.0	0.1	0.3	0.6	0.1	0.1	0.1	0.6	0.6	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.6	
5-Oct	0.1	0.1	0.7	0.2	0.1	Z	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.0	0.0	0.1	0.2	0.2	0.0	0.1	0.7	
6-Oct	Z	0.2	0.1	0.1	0.2	0.0	0.1	0.1	0.3	0.5	0.7	0.8	0.3	0.2	0.2	0.1	0.1	0.0	0.3	0.3	0.1	0.1	0.0	0.0	0.2	0.8	
7-Oct	0.0	Z	0.2	0.1	0.2	0.0	0.1	4.6	2.6	1.7	1.5	2.3	2.5	7.4	7.7	0.9	3.6	21.0	47.2	24.9	5.8	0.2	0.2	0.1	5.9	47.2	
8-Oct	0.0	0.1	Z	0.1	0.0	0.2	0.1	0.2	0.5	0.3	0.4	0.3	0.2	0.2	0.1	0.0	0.2	0.1	0.0	0.2	0.1	1.2	0.1	0.0	0.2	1.2	
9-Oct	0.0	0.0	0.1	Z	0.2	0.0	0.1	0.2	0.4	0.4	0.3	0.4	2.0	0.7	0.2	0.3	0.4	0.2	0.3	0.2	0.1	0.2	0.4	0.1	0.3	2.0	
10-Oct	0.2	0.1	0.1	0.1	Z	0.3	0.1	0.1	0.3	0.3	0.3	0.5	0.8	0.2	0.2	0.3	0.5	0.6	0.3	0.1	0.1	0.0	0.1	0.1	0.2	0.8	
11-Oct	0.1	0.1	0.2	0.2	0.2	Z	0.3	0.1	0.3	0.2	0.0	0.2	0.3	0.1	0.3	0.2	0.1	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.2	0.3	
12-Oct	Z	0.2	0.2	0.2	0.1	0.1	0.2	0.7	1.5	1.3	0.6	0.4	0.4	0.4	0.4	0.2	0.3	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.3	1.5	
13-Oct	0.0	Z	0.3	0.0	0.3	0.1	0.2	0.2	1.1	1.0	0.5	0.5	0.4	0.7	0.9	0.5	0.3	0.2	0.2	0.0	0.1	0.2	0.1	0.1	0.3	1.1	
14-Oct	0.2	0.0	Z	0.3	0.2	0.1	0.1	0.1	0.5	0.3	0.4	0.4	0.4	0.5	0.3	0.1	0.3	0.2	0.3	0.2	0.0	0.1	0.1	0.2	0.2	0.5	
15-Oct	0.2	0.0	0.2	Z	0.3	0.1	0.2	0.3	0.6	0.6	0.6	0.7	0.5	0.4	0.3	0.5	0.4	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.3	0.7	
16-Oct	0.2	0.4	0.2	0.1	Z	3.0	6.1	18.7	5.1	1.3	1.1	0.9	0.3	0.1	0.1	0.2	0.1	0.2	0.4	2.1	3.0	0.2	0.3	6.8	18.7		
17-Oct	3.6	5.4	47.6	36.0	15.3	Z	176.3	59.3	8.8	4.3	1.9	1.1	1.3	2.1	3.0	1.7	0.6	0.0	0.3	0.1	0.3	1.1	1.8	1.5	16.2	176.3	
18-Oct	Z	0.6	0.9	4.3	3.0	0.9	C	C	C	C	C	C	0.2	0.4	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	4.3	
19-Oct	0.0	Z	0.0	0.0	0.0	0.0	0.9	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	0.0	0.9	
20-Oct	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	
21-Oct	0.0	0.3	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.2	0.5	4.4	5.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	5.5	
22-Oct	0.3	0.6	1.0	0.0	Z	0.0	0.2	1.5	2.6	1.0	1.2	1.8	1.0	0.8	0.6	2.5	2.4	2.7	0.4	0.0	0.1	1.2	0.8	0.9	1.0	2.7	
23-Oct	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	
24-Oct	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	
25-Oct	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-Oct	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	
27-Oct	0.0	0.0	0.0	Z	0.0	0.0	0.0	1.0	0.6	1.5	2.2	5.3	1.9	1.0	2.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	5.3	
28-Oct	0.0	0.0	0.0	0.0	Z	0.1	0.0	0.0	0.0	0.7	1.5	4.1	1.3	0.6	0.4	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.4	4.1	
29-Oct	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.2	0.2	0.2	0.5	0.8	0.3	0.0	0.0	0.0	1.2	0.1	0.0	0.0	0.0	0.2	0.2	1.2	
30-Oct	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	4.8	1.4	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	0.3	4.8	
31-Oct	0.0	Z	0.0	0.0	0.0	0.1	0.0	9.4	5.7	7.4	3.9	2.1	1.6	3.2	1.9	1.5	0.3	0.4	0.4	0.2	0.1	0.1	0.1	0.0	1.7	9.4	
		0.2	0.3	2.0	1.6	0.8	0.2	6.2	3.2	1.1	1.0	0.7	0.8	0.6	0.8	0.8	0.4	0.3	0.8	1.7	0.9	0.4	0.2	0.2	0.3	Diurnal Average	
		3.6	5.4	47.6	36.0	15.3	3.0	176.3	59.3	8.8	7.4	3.9	5.3	2.5	7.4	7.7	2.5	3.6	21.0	47.2	24.9	5.8	1.2	1.8	6.8	Diurnal Maximum	
Z - zerospan		C - Calibration																									



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	700	99.01	99.01
21 - 40	3	0.42	99.43
41 - 80	3	0.42	99.86
81 - 159	0	0.00	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**

**Nitric Oxide (NO) - ppb
Buffalo Viewpoint - October 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	44	17	9	8	1	29	98	182	41	17	15	53	67	40	64	15	700
21 - 40	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	1	3
11 - 80	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	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	1	1
Totals	45	17	9	8	1	29	101	182	41	17	15	53	67	40	64	18	707

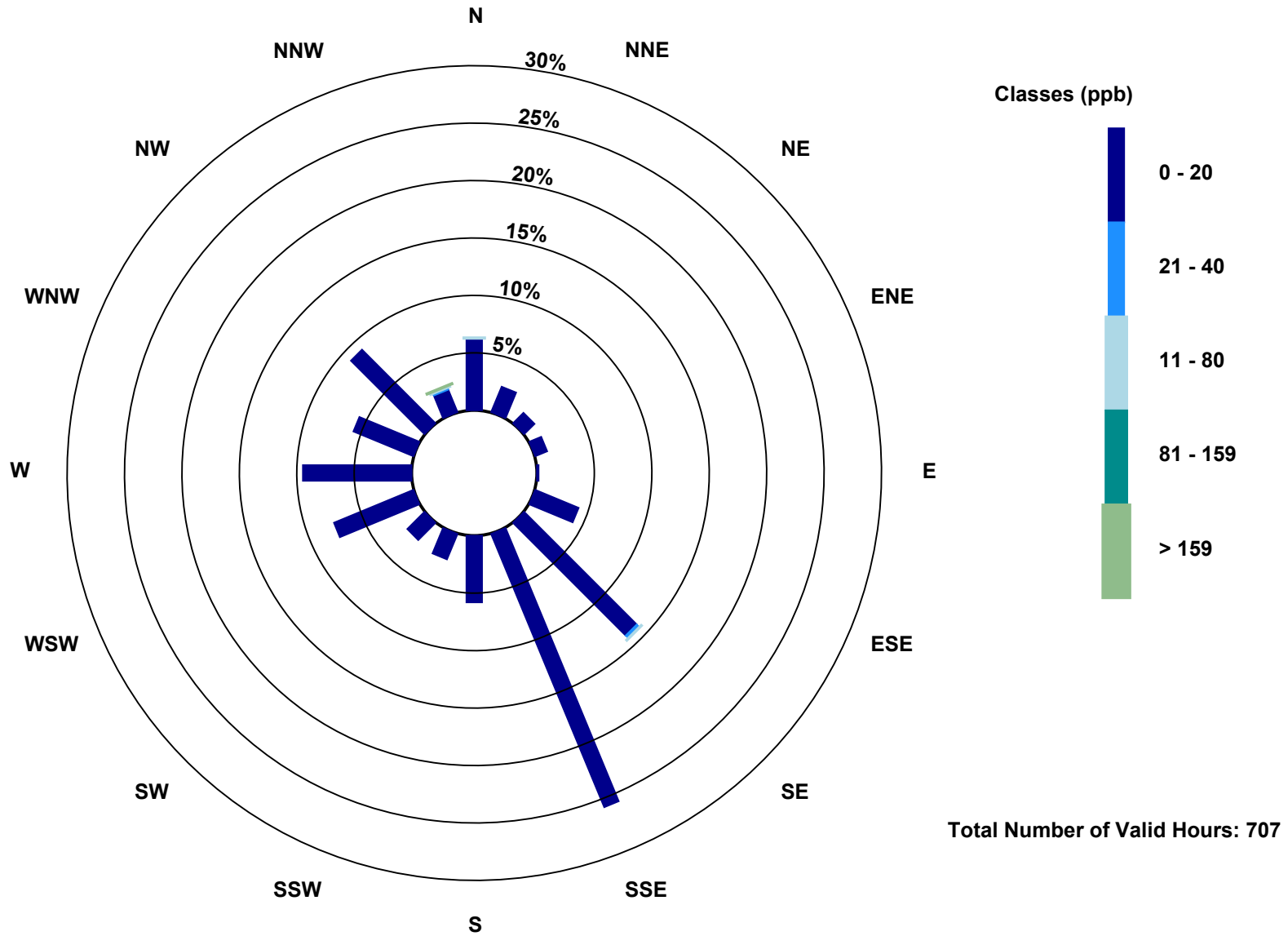
Total Number of Valid Hours: 707

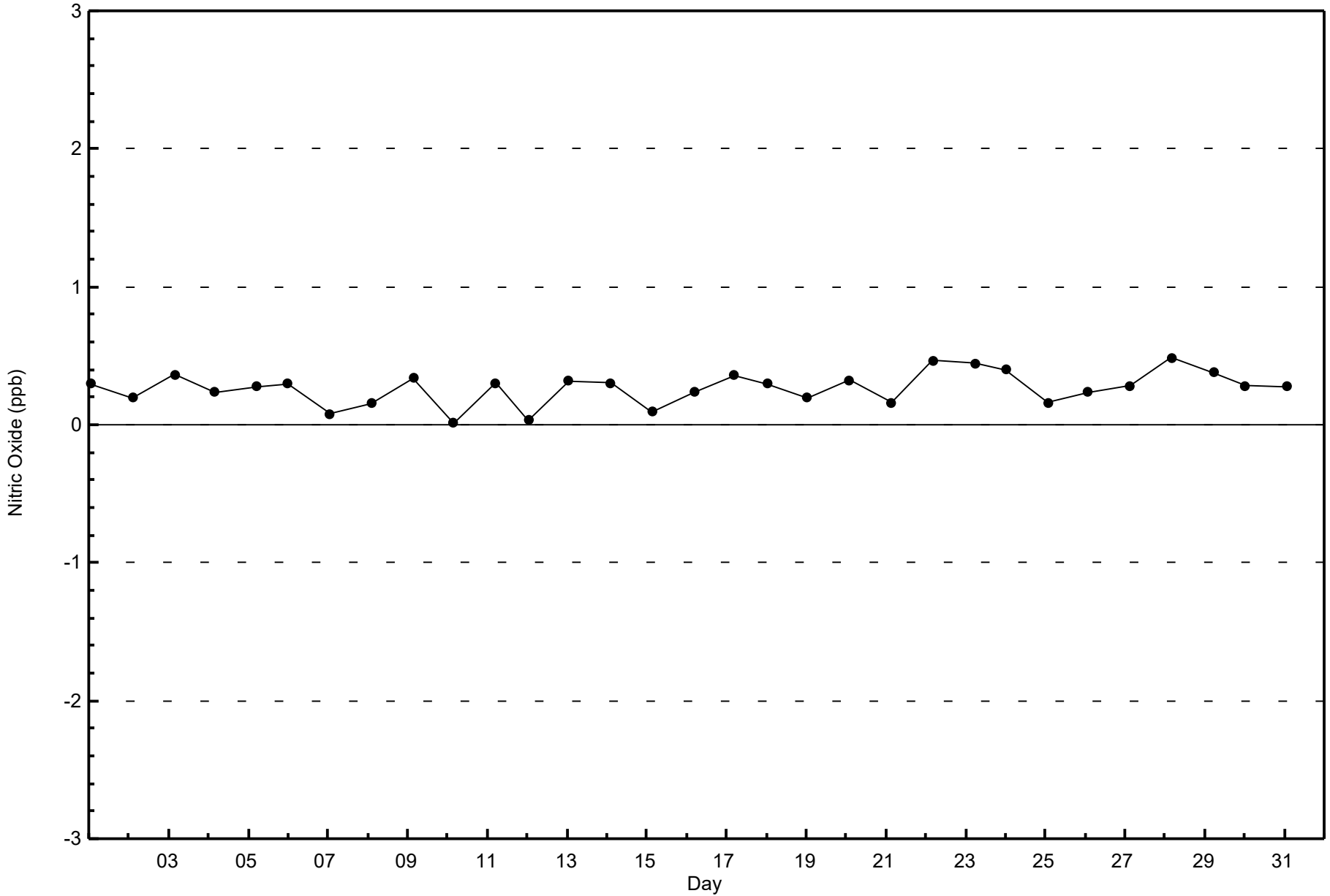
Total Number of Hours: 744

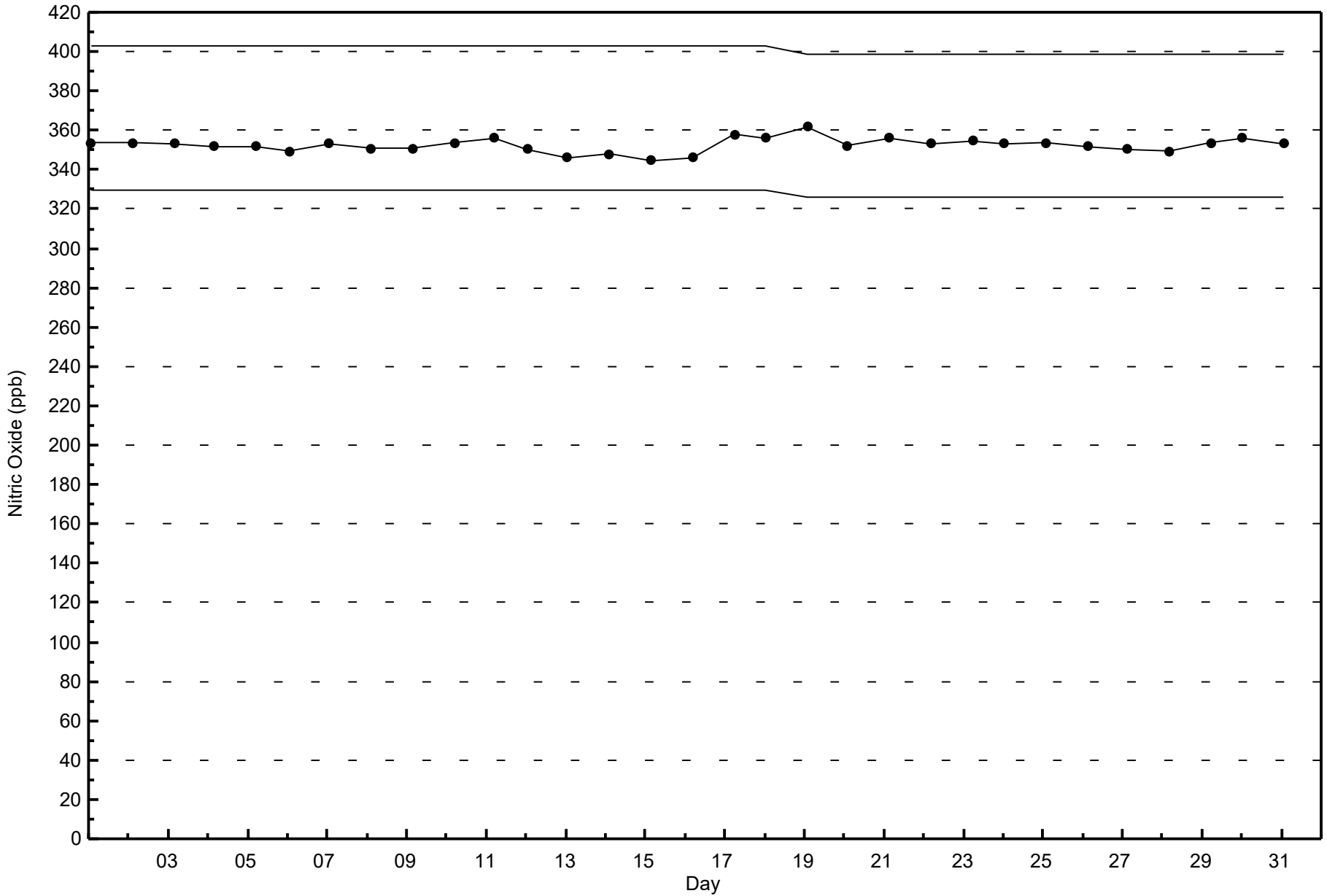


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitric Oxide (NO) - ppb
Buffalo Viewpoint









Wood Buffalo Environmental Association

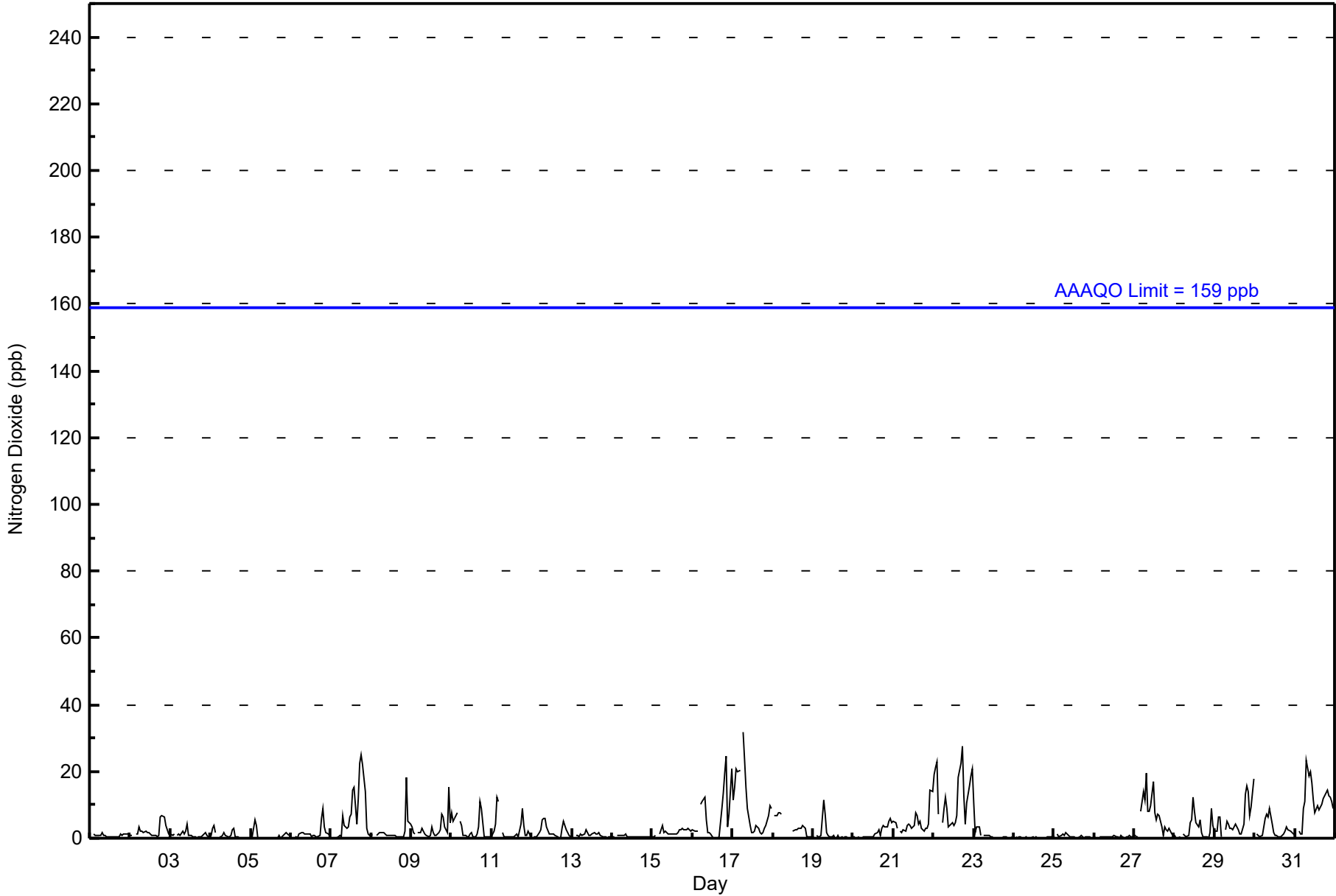
Summary of Hour Averages

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

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 31.9 ppb on Oct 17 07:00	Maximum Daily Average: 12.3 ppb on Oct 22		Hours of Data:	707
Minimum Value: 0.0 ppb on Oct 3 17:00	Minimum Daily Average: 0.3 ppb on Oct 24		Hours of Missing Data:	37
Maximum Diurnal Average: 4.9 ppb at hour 8	Minimum Diurnal Average: 2.1 ppb at hour 13		Hours of Calibration:	37
Monthly Average: 3.24 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.2 Q ₁ = 0.5 Median = 1.2 Q ₃ = 3.7 P ₉₀ = 9.0 P ₉₉ = 22.5		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-Oct	3.7	Z	1.3	0.8	1.0	0.7	0.9	1.6	0.7	0.8	0.5	0.3	0.4	0.4	0.3	0.4	0.6	0.5	1.1	0.8	1.1	1.4	1.2	1.1	0.9	3.7
2-Oct	0.9	1.0	Z	1.1	1.4	3.5	2.1	2.0	1.8	2.3	1.9	1.5	1.4	0.9	0.9	0.7	0.6	1.0	6.3	6.8	6.2	3.8	2.4	1.3	2.3	6.8
3-Oct	1.3	0.9	1.1	Z	0.7	1.2	0.9	2.1	1.4	2.2	4.1	0.8	0.7	0.4	0.4	0.0	0.3	0.4	0.7	1.4	1.6	0.8	0.1	1.0	4.1	
4-Oct	0.8	2.9	3.8	1.7	Z	0.5	0.5	0.9	1.5	1.0	0.5	0.5	1.0	2.5	3.1	0.3	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	3.8
5-Oct	0.2	0.3	5.3	3.7	0.1	Z	0.0	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.1	1.0	0.0	0.8	1.2	1.5	1.2	0.8	0.7	5.3
6-Oct	Z	0.0	0.1	0.4	0.0	1.2	1.7	1.5	1.2	1.4	1.2	1.1	0.6	0.7	0.8	0.5	0.6	0.8	5.8	9.0	3.4	1.5	1.2	0.4	1.5	9.0
7-Oct	0.1	Z	0.2	0.0	0.4	0.8	0.5	6.9	3.8	2.9	3.2	6.2	7.0	14.6	15.1	4.4	11.7	22.5	25.0	21.9	14.1	2.9	1.2	1.0	7.2	25.0
8-Oct	1.3	0.9	Z	0.9	1.2	1.5	1.6	1.8	1.2	1.0	0.7	0.7	0.9	1.0	0.7	0.3	0.4	0.4	0.5	0.4	2.2	18.2	5.2	4.3	2.1	18.2
9-Oct	3.6	1.9	1.2	Z	1.5	1.5	2.9	2.2	1.4	0.9	0.6	0.7	3.5	1.9	0.8	0.8	1.7	2.5	7.1	6.3	3.6	1.6	15.1	4.5	2.9	15.1
10-Oct	7.5	5.1	5.9	7.5	Z	4.9	4.0	0.9	0.8	0.5	0.6	1.1	1.6	0.4	0.5	1.4	3.4	11.0	8.9	0.6	0.4	0.5	0.4	0.3	3.0	11.0
11-Oct	0.4	2.0	4.2	12.2	11.0	Z	1.6	0.6	0.4	0.4	0.4	0.5	0.6	0.6	1.0	1.1	0.5	4.3	8.9	3.7	0.9	0.9	2.2	0.3	2.6	12.2
12-Oct	Z	0.4	0.5	0.6	1.7	2.6	5.3	6.1	6.0	3.3	1.4	1.3	1.1	1.2	1.0	0.3	0.2	0.1	2.9	5.1	2.7	1.8	0.8	0.5	2.0	6.1
13-Oct	0.7	Z	1.0	1.0	0.6	1.1	0.8	1.3	2.5	1.7	1.0	1.0	1.3	1.7	1.4	1.3	1.8	1.0	0.5	0.5	0.6	0.2	0.6	0.6	1.1	2.5
14-Oct	0.5	0.3	Z	0.9	0.7	0.8	0.9	1.0	1.2	0.6	0.5	0.5	0.5	0.4	0.5	0.6	0.4	0.6	0.6	0.5	0.4	0.6	0.6	0.4	0.6	1.2
15-Oct	0.4	0.5	0.7	Z	1.1	2.4	3.7	1.6	2.1	1.1	1.1	1.2	1.2	1.1	1.3	1.9	2.5	2.7	2.8	2.6	2.6	2.8	2.4	2.2	1.8	3.7
16-Oct	2.4	2.0	2.1	2.2	Z	10.0	11.1	12.1	5.3	1.5	1.9	1.4	0.2	0.2	0.1	0.1	0.5	9.0	13.5	19.4	24.6	3.5	7.1	20.6	6.6	24.6
17-Oct	11.3	15.4	20.8	20.0	20.4	Z	31.9	23.9	15.2	8.7	3.8	1.7	1.6	2.2	3.9	2.8	1.8	1.3	1.5	2.8	4.0	6.7	9.8	9.0	9.6	31.9
18-Oct	Z	6.9	6.6	7.5	7.5	7.3	C	C	C	C	C	C	2.0	2.6	2.4	3.1	3.0	3.1	3.8	2.9	0.4	0.4	0.4	0.4	--	7.5
19-Oct	0.5	Z	0.7	0.5	0.4	0.7	11.6	7.0	1.7	0.9	0.4	0.5	0.7	0.2	0.2	0.8	0.2	0.3	0.2	0.3	0.3	0.2	0.2	0.2	1.2	11.6
20-Oct	0.3	0.3	Z	0.3	0.2	0.1	0.3	0.4	0.3	0.3	0.5	0.3	0.4	1.4	1.6	2.4	1.0	2.8	3.9	3.6	3.5	5.1	5.8	4.6	1.7	5.8
21-Oct	4.9	4.5	3.0	Z	2.1	1.7	2.5	2.2	3.7	4.1	3.7	3.1	3.8	7.6	6.8	4.2	5.1	2.8	2.1	3.1	2.8	4.1	14.5	14.1	4.6	14.5
22-Oct	19.2	21.1	22.7	7.3	Z	4.5	8.7	12.4	8.7	3.5	4.1	4.8	4.0	4.7	6.7	18.1	22.4	27.7	12.9	4.1	10.6	15.5	18.7	20.8	12.3	27.7
23-Oct	10.5	1.5	3.2	3.5	0.7	Z	0.8	0.9	1.0	0.7	0.5	0.3	0.2	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.1	0.2	0.3	1.1	10.5
24-Oct	Z	0.5	0.2	0.3	0.3	0.2	0.2	0.3	0.2	0.2	0.1	0.3	0.2	0.3	0.2	0.2	0.1	0.0	0.0	0.1	0.4	0.4	0.5	0.7	0.3	0.7
25-Oct	0.6	Z	1.2	0.6	0.7	1.1	0.8	1.5	1.1	0.4	0.4	0.3	0.4	0.2	0.0	0.4	0.7	0.6	0.1	0.6	0.3	0.3	0.2	0.1	0.5	1.5
26-Oct	0.1	0.5	Z	0.6	0.5	0.3	0.4	0.5	0.4	0.5	0.4	0.5	0.7	0.5	0.3	0.2	0.7	0.3	0.2	0.4	0.5	0.7	0.5	0.6	0.4	0.7
27-Oct	0.8	0.4	0.4	Z	8.2	14.0	11.3	19.7	8.0	7.9	9.6	17.1	7.7	5.3	7.1	6.9	3.5	0.7	3.4	2.7	2.2	2.8	1.3	1.1	6.2	19.7
28-Oct	0.7	0.1	0.0	0.3	Z	1.3	1.0	0.5	0.8	4.5	5.5	12.1	8.0	4.5	3.3	5.4	1.8	0.3	0.4	0.5	0.2	1.5	9.0	3.8	2.8	12.1
29-Oct	2.0	2.3	6.5	6.4	0.3	Z	2.4	5.0	4.4	3.1	3.0	2.7	4.1	3.5	2.5	1.4	1.1	4.3	13.1	15.5	13.9	6.7	9.2	17.6	5.7	17.6
30-Oct	Z	1.2	1.0	0.6	0.8	3.5	5.9	7.3	6.3	9.1	4.3	1.6	0.9	0.8	0.4	0.4	0.8	1.2	2.1	3.4	2.6	2.2	1.6	1.1	2.6	9.1
31-Oct	1.0	Z	2.2	1.2	1.3	9.0	11.0	23.5	18.7	19.8	16.7	11.6	7.7	9.9	8.4	9.2	10.0	11.9	12.6	14.5	12.7	12.2	11.0	9.0	10.7	23.5
2.9 2.9 3.7 3.2 2.5 2.9 4.2 4.9 3.4 2.8 2.4 2.5 2.1 2.3 2.3 2.3 2.5 3.7 4.5 4.3 3.9 3.3 4.0 3.9																								Diurnal Average		
19.2 21.1 22.7 20.0 20.4 14.0 31.9 23.9 18.7 19.8 16.7 17.1 8.0 14.6 15.1 18.1 22.4 27.7 25.0 21.9 24.6 18.2 18.7 20.8																								Diurnal Maximum		

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	693	98.02	98.02
21 - 40	14	1.98	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 - October 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	15	7	8	1	29	97	182	41	17	15	53	67	40	63	16	693
21 - 40	3	2	2	0	0	0	4	0	0	0	0	0	0	0	1	2	14
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	45	17	9	8	1	29	101	182	41	17	15	53	67	40	64	18	707

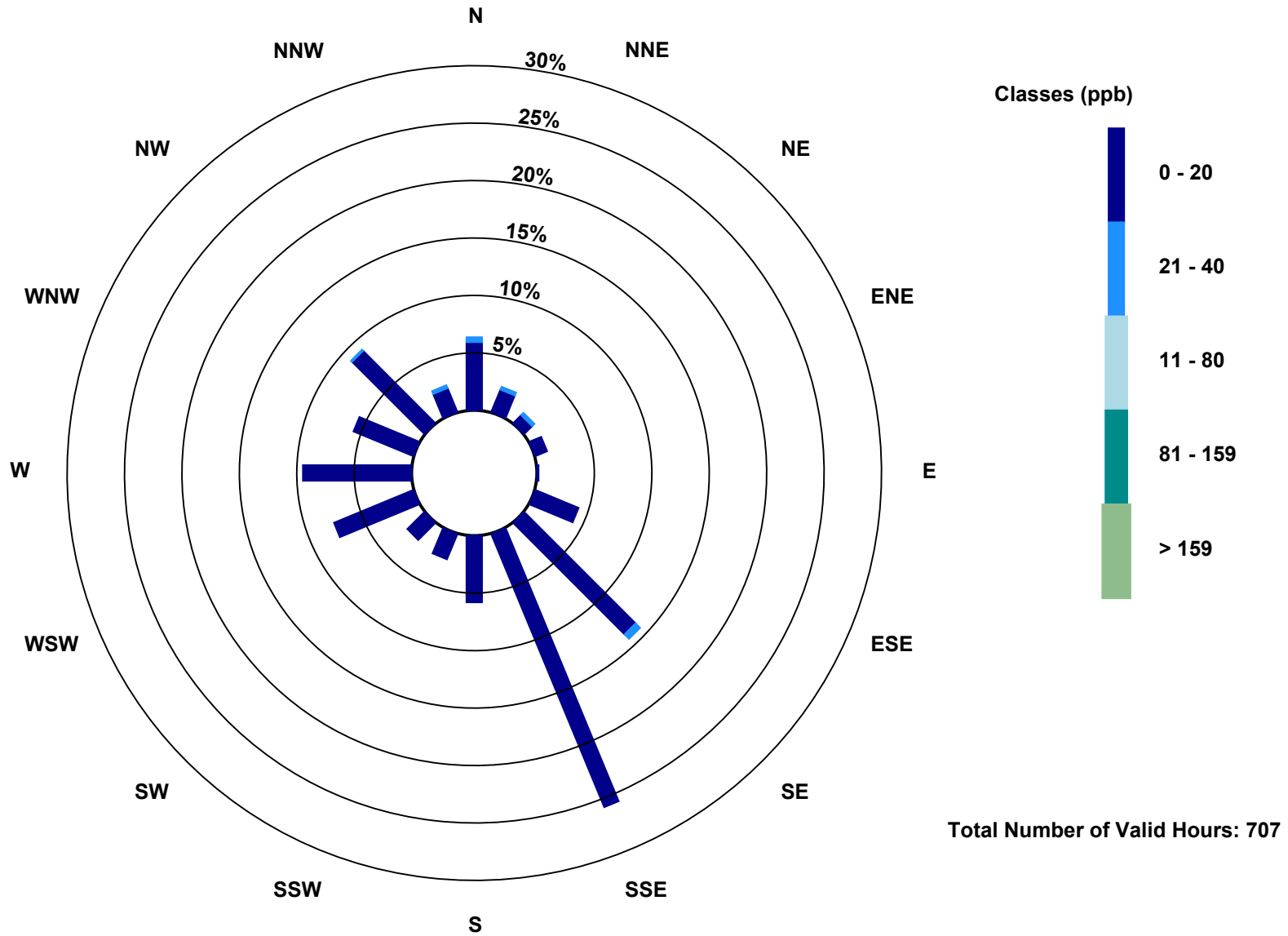
Total Number of Valid Hours: 707

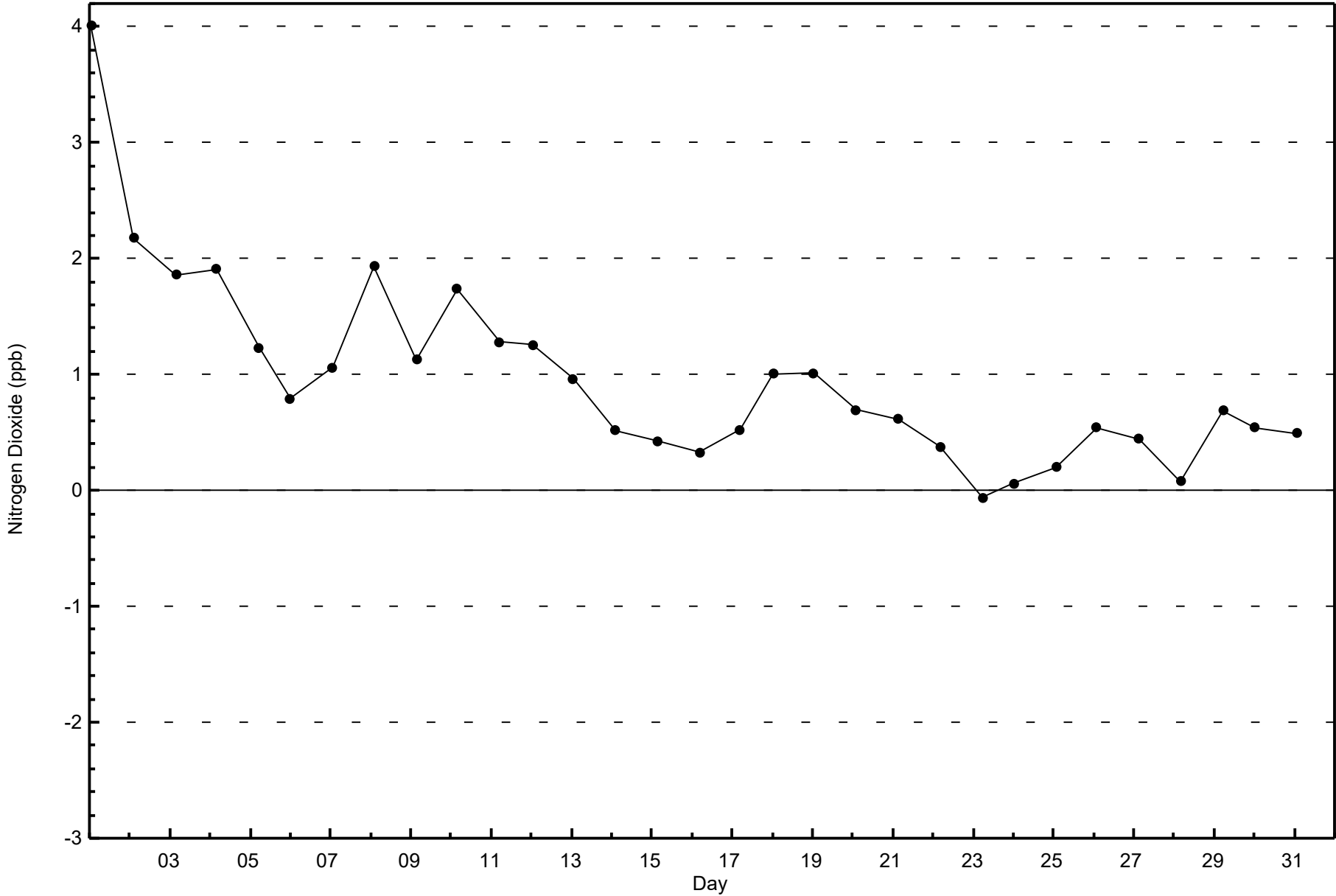
Total Number of Hours: 744

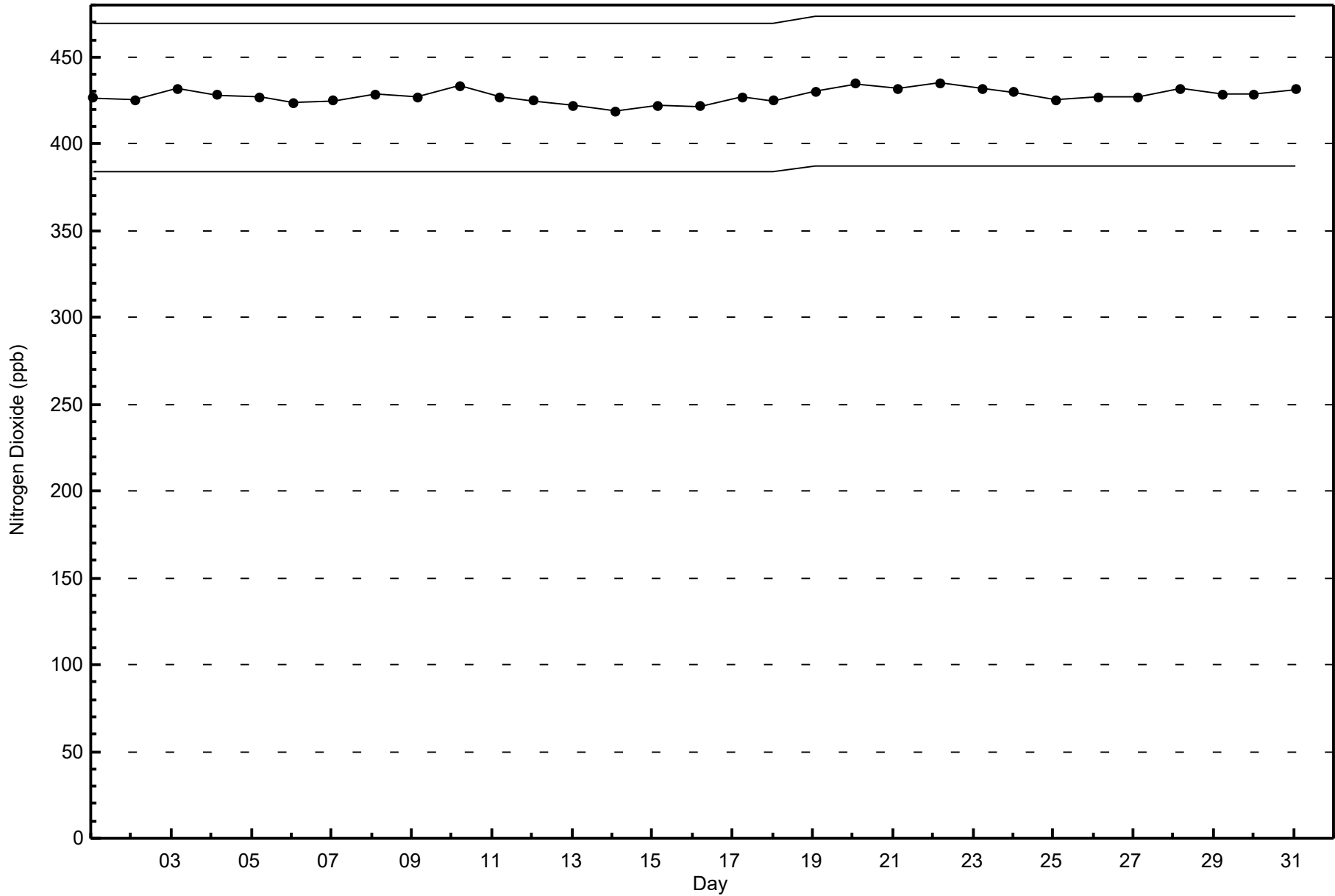


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitrogen Dioxide (NO₂) - ppb
Buffalo Viewpoint





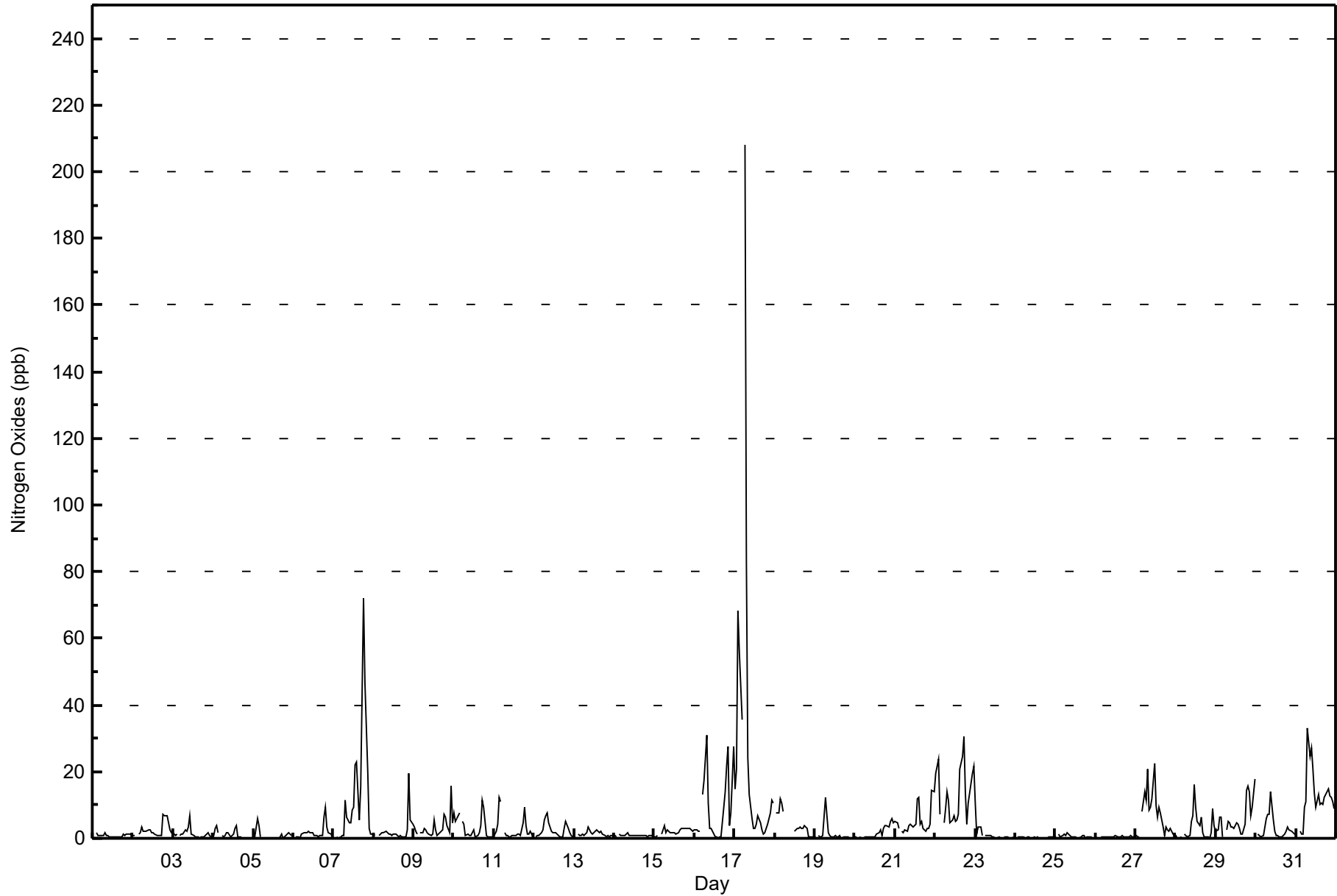




Wood Buffalo Environmental Association
Summary of Hour Averages

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

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 744																	744					
Maximum Value: 208.2 ppb on Oct 17 07:00		Maximum Daily Average: 25.8 ppb on Oct 17																	707							
Minimum Value: 0.0 ppb on Oct 5 11:00		Minimum Daily Average: 0.2 ppb on Oct 24																	37							
Maximum Diurnal Average: 10.4 ppb at hour 7		Minimum Diurnal Average: 2.6 ppb at hour 13																	37							
Monthly Average: 4.31 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.3 Q ₁ = 0.5 Median = 1.4 Q ₃ = 4.0 P ₉₀ = 11.0 P ₉₉ = 35.5																	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-Oct	4.2	Z	1.5	0.8	1.0	0.8	0.9	1.8	0.8	1.0	0.6	0.3	0.4	0.4	0.3	0.5	0.6	0.5	1.1	0.8	1.1	1.4	1.2	1.1	1.0	4.2
2-Oct	0.9	1.0	Z	1.2	1.6	3.5	2.2	2.0	2.0	2.6	2.3	1.7	1.6	1.1	1.0	0.8	0.7	1.0	7.2	7.0	6.8	4.5	2.7	1.5	2.5	7.2
3-Oct	1.6	1.0	1.2	Z	0.8	1.4	1.1	2.4	2.2	3.4	6.9	1.3	0.9	0.5	0.5	0.5	0.0	0.3	0.4	0.7	1.4	1.6	0.9	0.1	1.3	6.9
4-Oct	0.8	3.0	3.9	1.7	Z	0.7	0.5	1.0	1.8	1.6	0.6	0.6	1.1	3.1	3.7	0.3	0.4	0.0	0.1	0.1	0.1	0.1	0.2	0.1	1.1	3.9
5-Oct	0.3	0.4	6.0	3.9	0.2	Z	0.1	0.2	0.2	0.2	0.0	0.2	0.1	0.1	0.2	0.2	0.2	1.2	0.0	0.8	1.3	1.7	1.4	0.8	0.9	6.0
6-Oct	Z	0.2	0.2	0.5	0.2	1.2	1.8	1.6	1.5	1.9	1.9	1.9	0.9	0.9	1.0	0.6	0.7	0.8	6.1	9.3	3.5	1.6	1.2	0.4	1.7	9.3
7-Oct	0.1	Z	0.4	0.1	0.6	0.8	0.6	11.5	6.4	4.6	4.7	8.5	9.5	22.0	22.8	5.3	15.3	43.5	72.2	46.8	19.9	3.1	1.4	1.1	13.1	72.2
8-Oct	1.3	1.0	Z	1.0	1.2	1.7	1.7	2.0	1.7	1.3	1.1	1.0	1.1	1.2	0.8	0.3	0.6	0.5	0.5	0.6	2.3	19.4	5.3	4.3	2.3	19.4
9-Oct	3.6	1.9	1.3	Z	1.7	1.5	3.0	2.4	1.8	1.3	0.9	1.1	5.5	2.6	1.0	1.1	2.1	2.7	7.4	6.5	3.7	1.8	15.5	4.6	3.3	15.5
10-Oct	7.7	5.2	6.0	7.6	Z	5.2	4.1	1.0	1.1	0.8	0.9	1.6	2.4	0.6	0.7	1.7	3.9	11.6	9.2	0.7	0.5	0.5	0.5	0.4	3.2	11.6
11-Oct	0.5	2.1	4.4	12.4	11.2	Z	1.9	0.7	0.7	0.6	0.4	0.7	0.9	0.7	1.3	1.3	0.6	4.5	9.1	3.8	1.1	1.1	2.3	0.4	2.7	12.4
12-Oct	Z	0.6	0.7	0.8	1.8	2.7	5.5	6.8	7.5	4.6	2.0	1.7	1.5	1.6	1.4	0.5	0.5	0.3	3.0	5.3	2.8	1.9	0.9	0.6	2.4	7.5
13-Oct	0.7	Z	1.3	1.0	0.9	1.2	1.0	1.5	3.6	2.7	1.5	1.5	1.7	2.4	2.3	1.8	2.1	1.2	0.7	0.5	0.7	0.4	0.7	0.7	1.4	3.6
14-Oct	0.7	0.3	Z	1.2	0.9	0.9	1.0	1.1	1.7	0.9	0.9	0.9	0.9	0.9	0.8	0.7	0.7	0.8	0.9	0.7	0.4	0.7	0.7	0.6	0.9	1.7
15-Oct	0.6	0.5	0.9	Z	1.4	2.5	3.9	1.9	2.7	1.7	1.7	1.9	1.7	1.5	1.6	2.4	2.9	2.9	2.9	2.8	2.8	3.0	2.5	2.3	2.1	3.9
16-Oct	2.6	2.4	2.3	2.3	Z	13.0	17.2	30.8	10.4	2.8	3.0	2.3	0.5	0.3	0.2	0.3	0.6	9.2	13.9	21.5	27.6	3.7	7.4	27.4	8.8	30.8
17-Oct	14.9	20.8	68.4	56.0	35.7	Z	208.2	83.2	24.0	13.0	5.7	2.8	2.9	4.3	6.9	4.5	2.4	1.3	1.8	2.9	4.3	7.8	11.6	10.5	25.8	208.2
18-Oct	Z	7.5	7.5	11.8	10.5	8.2	C	C	C	C	C	C	2.2	3.0	2.9	3.2	3.0	3.1	3.8	2.9	0.4	0.4	0.4	0.4	--	11.8
19-Oct	0.5	Z	0.7	0.5	0.4	0.7	12.5	7.0	1.7	0.9	0.4	0.5	0.7	0.2	0.2	0.8	0.2	0.3	0.2	0.3	0.3	0.2	0.2	0.2	1.3	12.5
20-Oct	0.3	0.3	Z	0.3	0.2	0.1	0.3	0.4	0.3	0.3	0.5	0.3	0.4	1.4	1.6	2.4	1.0	2.8	3.9	3.6	3.5	5.1	5.8	4.6	1.7	5.8
21-Oct	4.9	4.8	3.0	Z	2.1	1.7	2.5	2.2	3.7	4.2	4.0	3.3	4.3	12.0	12.3	4.4	5.1	2.8	2.1	3.1	2.8	4.1	14.5	14.1	5.1	14.5
22-Oct	19.5	21.7	23.7	7.3	Z	4.5	8.9	13.9	11.3	4.5	5.3	6.6	5.0	5.5	7.3	20.6	24.8	30.4	13.3	4.1	10.7	16.7	19.5	21.7	13.3	30.4
23-Oct	10.5	1.5	3.2	3.5	0.7	Z	0.8	0.9	1.0	0.7	0.5	0.3	0.2	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.1	0.2	0.3	1.1	10.5
24-Oct	Z	0.5	0.2	0.3	0.3	0.2	0.2	0.3	0.2	0.2	0.1	0.3	0.2	0.3	0.2	0.2	0.1	0.0	0.0	0.1	0.4	0.4	0.5	0.7	0.2	0.7
25-Oct	0.6	Z	1.2	0.6	0.7	1.1	0.8	1.5	1.1	0.4	0.4	0.3	0.4	0.2	0.0	0.4	0.7	0.6	0.1	0.6	0.3	0.3	0.2	0.1	0.5	1.5
26-Oct	0.1	0.5	Z	0.6	0.5	0.3	0.4	0.5	0.4	0.5	0.4	0.5	0.7	0.5	0.3	0.2	0.7	0.3	0.2	0.4	0.5	0.7	0.5	0.6	0.4	0.7
27-Oct	0.8	0.4	0.4	Z	8.2	14.0	11.3	20.7	8.6	9.4	11.8	22.4	9.6	6.3	9.1	7.5	3.5	0.7	3.4	2.7	2.2	2.8	1.3	1.1	6.9	22.4
28-Oct	0.7	0.1	0.0	0.3	Z	1.4	1.0	0.5	0.8	5.2	7.0	16.2	9.3	5.1	3.7	6.2	1.8	0.3	0.4	0.5	0.2	1.5	9.1	3.8	3.3	16.2
29-Oct	2.0	2.3	6.5	6.4	0.3	Z	2.4	5.0	4.5	3.3	3.2	2.9	4.6	4.3	2.8	1.4	1.1	4.3	14.3	15.6	13.9	6.7	9.2	17.8	5.9	17.8
30-Oct	Z	1.2	1.0	0.6	0.8	3.5	5.9	7.3	7.1	13.9	5.7	1.9	0.9	0.8	0.4	0.4	0.8	1.2	2.1	3.4	2.6	2.2	1.6	1.1	2.9	13.9
31-Oct	1.0	Z	2.2	1.2	1.3	9.1	11.0	32.9	24.4	27.2	20.6	13.7	9.3	13.1	10.3	10.7	10.3	12.3	13.0	14.7	12.8	12.3	11.1	9.0	12.3	32.9
3.1 3.2 5.7 4.8 3.3 3.2 10.4 8.2 4.5 3.9 3.2 3.3 2.6 3.1 3.2 2.6 2.8 4.6 6.3 5.3 4.2 3.5 4.2 4.3																								Diurnal Average		
19.5 21.7 68.4 56.0 35.7 14.0 208.2 83.2 24.4 27.2 20.6 22.4 9.6 22.0 22.8 20.6 24.8 43.5 72.2 46.8 27.6 19.4 19.5 27.4																								Diurnal Maximum		
Z - zerospan C - Calibration																										





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	679	96.04	96.04
21 - 40	21	2.97	99.01
41 - 80	5	0.71	99.72
81 - 159	1	0.14	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
Buffalo Viewpoint - October 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	36	14	7	8	1	27	95	182	41	17	15	53	67	40	63	13	679
21 - 40	8	3	2	0	0	2	3	0	0	0	0	0	0	0	1	2	21
11 - 80	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	2	5
81 - 159	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Totals	45	17	9	8	1	29	101	182	41	17	15	53	67	40	64	18	707

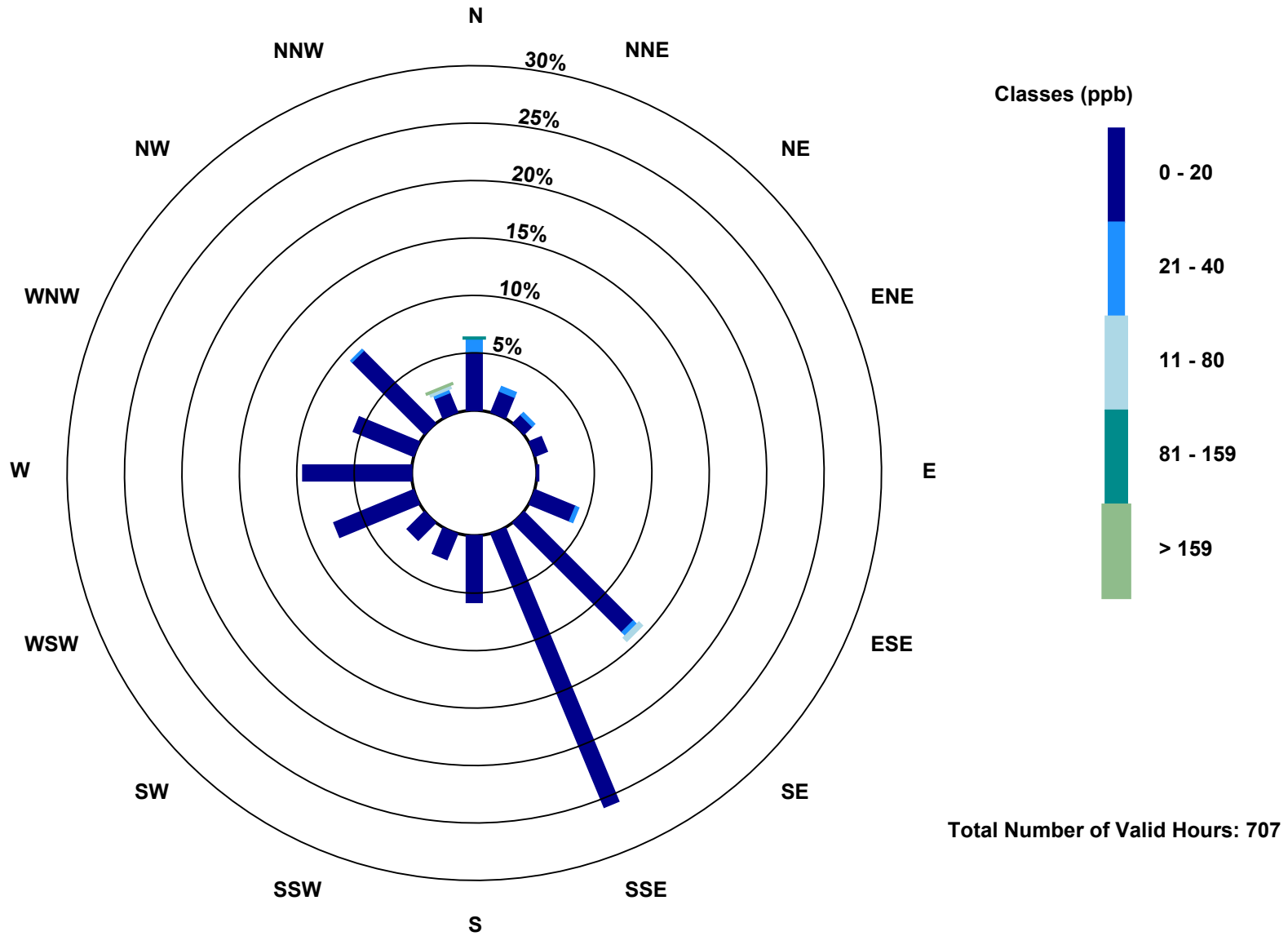
Total Number of Valid Hours: 707

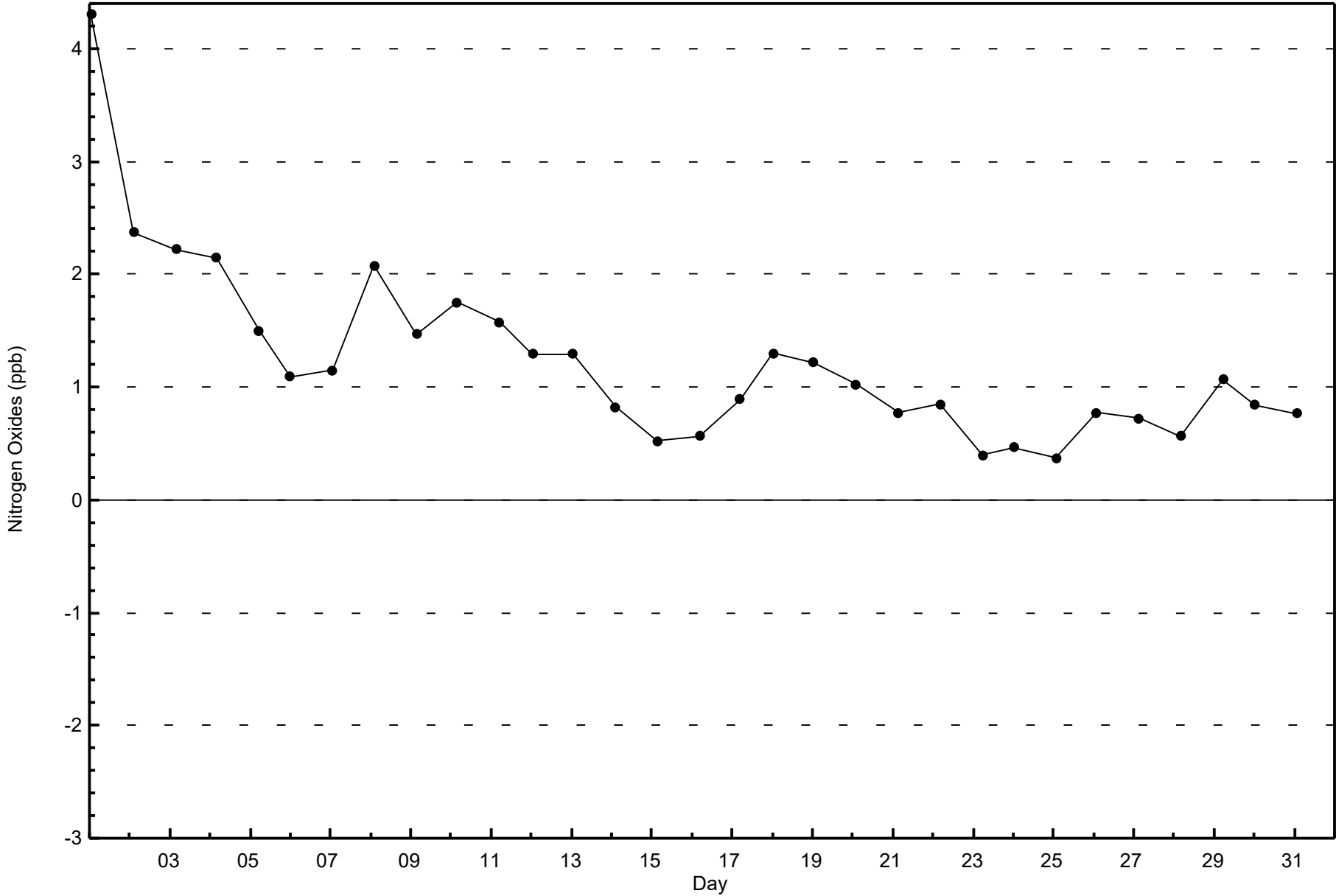
Total Number of Hours: 744

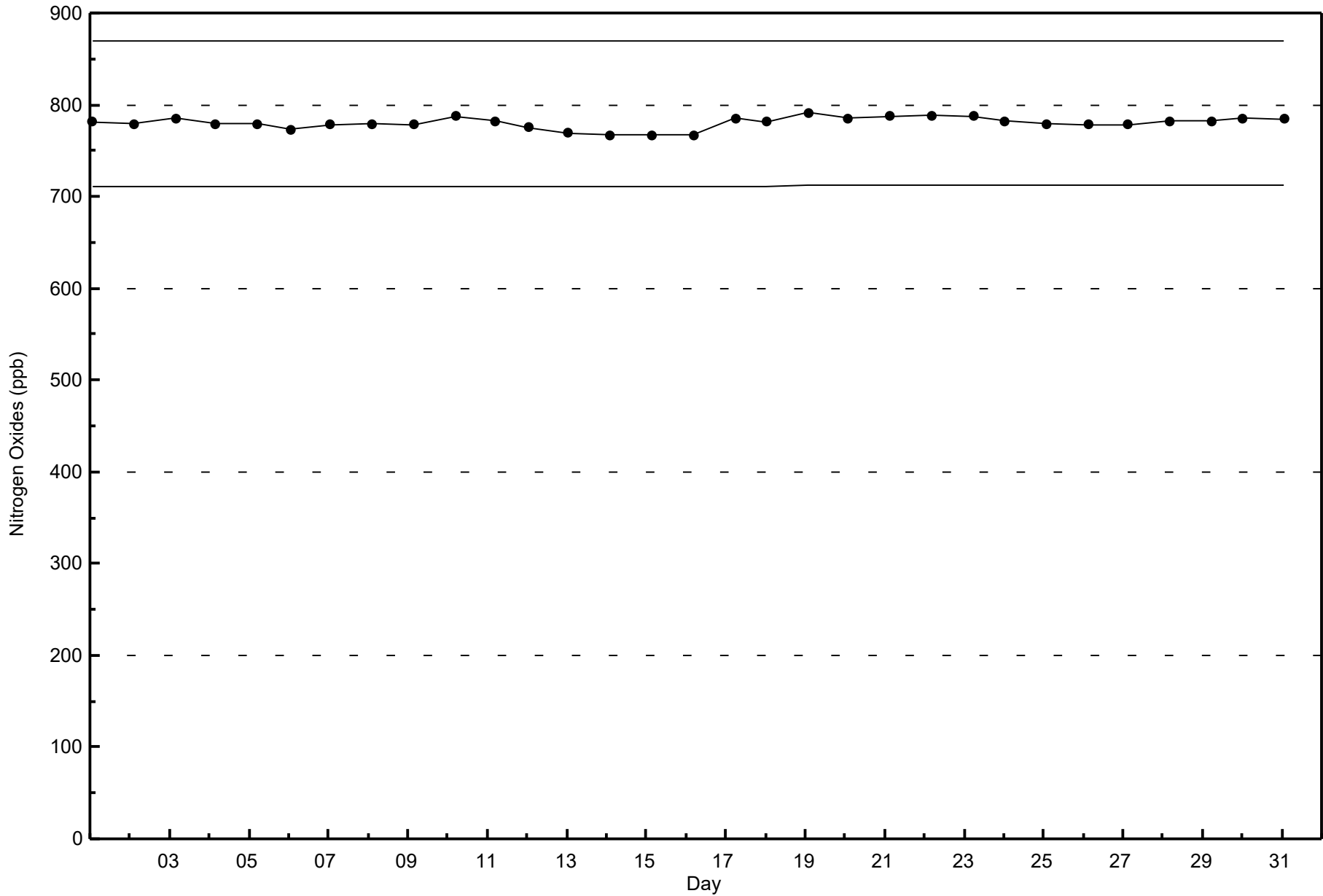


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitrogen Oxides (NO_x) - ppb
Buffalo Viewpoint









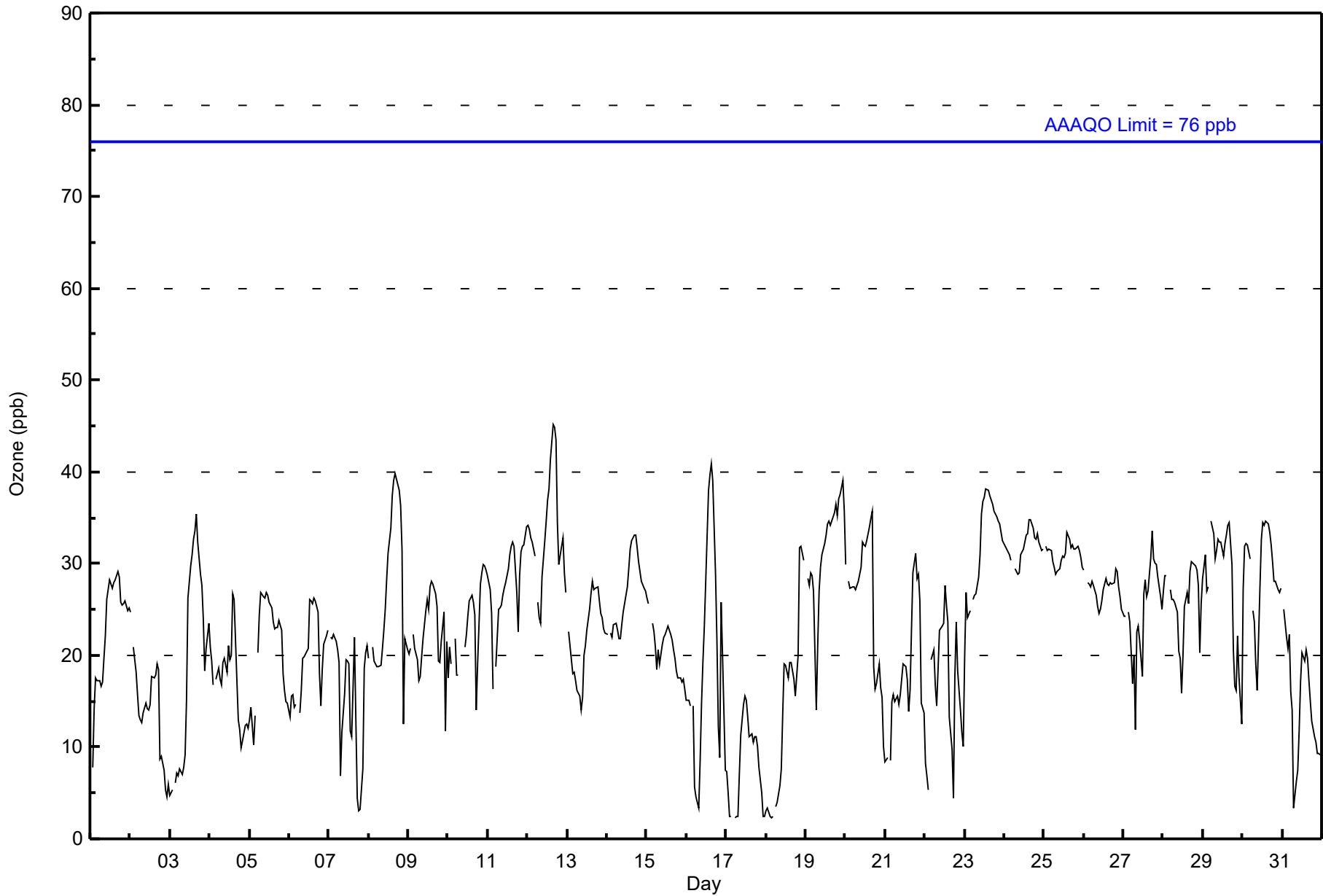
Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O₃) - ppb

Buffalo Viewpoint - October 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	744					
Maximum Value: 45.1 ppb on Oct 12 16:00		Maximum Daily Average: 33.4 ppb on Oct 12																	Hours of Data:	710							
Minimum Value: 2.2 ppb on Oct 18 04:00		Minimum Daily Average: 8.0 ppb on Oct 17																	Hours of Missing Data:	34							
Maximum Diurnal Average: 28.2 ppb at hour 16		Minimum Diurnal Average: 18.1 ppb at hour 8																	Hours of Calibration:	34							
Monthly Average: 22.92 ppb		Percentiles: P ₁ = 2.5 P ₁₀ = 11.1 Q ₁ = 17.4 Median = 23.9 Q ₃ = 29.2 P ₉₀ = 33.1 P ₉₉ = 39.2																	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-Oct	Z	7.8	14.3	17.6	17.3	17.3	16.7	17.0	19.7	22.1	26.1	28.2	27.8	27.4	27.9	28.1	29.2	28.5	25.8	25.4	25.7	25.9	24.9	25.2	22.9	29.2	
2-Oct	24.7	Z	20.9	18.1	15.8	13.5	12.9	12.7	13.8	14.8	14.2	14.0	14.7	17.7	17.5	17.9	19.0	18.5	8.7	9.0	7.5	5.4	4.6	6.0	14.0	24.7	
3-Oct	4.7	5.3	Z	6.1	7.2	6.8	7.6	7.1	7.7	9.2	15.1	26.2	29.8	31.0	32.6	33.6	35.4	32.4	28.9	27.6	23.9	18.2	20.7	23.5	19.2	35.4	
4-Oct	20.9	19.4	16.8	Z	17.3	18.6	17.4	16.8	19.2	19.7	18.2	21.1	19.5	19.9	26.7	26.2	17.2	13.0	11.9	10.0	10.7	12.3	12.5	12.1	17.3	26.7	
5-Oct	13.0	14.3	10.2	13.5	Z	20.3	24.4	26.8	26.3	26.2	26.8	26.6	25.8	25.1	23.6	22.8	23.0	23.0	23.9	22.8	17.9	16.2	15.0	14.9	21.0	26.8	
6-Oct	13.3	15.5	15.6	14.3	14.6	Z	13.7	16.1	19.6	19.9	20.1	20.7	26.0	25.9	25.6	26.2	25.9	24.7	18.0	14.5	18.5	21.3	22.1	22.8	19.8	26.2	
7-Oct	Z	22.0	21.8	22.3	21.5	20.6	19.2	6.9	11.6	15.9	19.5	19.4	19.1	11.8	11.2	21.9	13.0	4.5	3.0	3.2	7.6	18.6	20.3	21.1	15.5	22.3	
8-Oct	19.7	Z	20.9	19.4	19.0	18.7	18.8	18.9	20.8	22.7	25.0	28.2	31.1	33.9	37.4	39.0	39.9	39.2	37.9	36.3	31.4	12.5	21.8	20.6	26.7	39.9	
9-Oct	20.1	20.7	Z	22.3	20.7	19.5	17.2	17.7	19.8	21.8	24.8	26.0	25.0	27.4	28.0	27.8	26.7	25.4	19.4	19.3	21.5	24.7	11.7	21.6	22.1	28.0	
10-Oct	17.5	20.9	19.1	Z	21.8	17.9	17.9	C	C	C	20.9	22.3	24.2	25.9	26.6	25.8	24.3	14.0	19.1	27.7	28.9	29.9	29.8	29.3	23.2	29.9	
11-Oct	28.7	27.1	24.6	16.3	Z	18.7	25.1	25.2	25.4	26.5	27.4	27.9	29.4	30.9	32.0	32.3	31.8	26.9	22.5	28.6	31.3	31.8	32.0	34.1	27.7	34.1	
12-Oct	34.2	33.6	32.8	32.3	30.8	Z	25.7	24.1	23.6	28.5	32.5	34.6	36.9	38.1	41.4	45.1	44.9	43.4	34.5	29.9	31.9	32.8	29.0	26.8	33.4	45.1	
13-Oct	Z	22.5	19.6	18.0	18.2	17.3	16.1	15.6	14.0	15.5	19.9	21.0	22.7	25.0	26.7	28.1	27.1	27.3	27.4	26.0	24.6	24.0	22.9	22.4	21.8	28.1	
14-Oct	22.3	Z	22.4	22.0	23.3	23.4	22.7	21.8	21.9	23.3	24.8	26.6	27.5	29.5	31.5	32.5	33.1	33.0	31.7	30.3	29.2	28.0	27.4	26.9	26.7	33.1	
15-Oct	26.2	25.6	Z	23.6	22.5	20.8	18.5	20.5	19.1	21.2	21.9	22.3	22.7	23.1	22.3	21.7	20.6	19.6	18.2	17.5	17.5	17.0	17.4	16.3	20.7	26.2	
16-Oct	15.1	15.1	14.4	Z	14.4	5.7	4.5	3.3	8.5	14.8	19.3	23.2	33.1	38.0	39.6	40.9	39.1	28.8	21.5	12.2	8.9	25.8	20.0	7.4	19.7	40.9	
17-Oct	7.3	5.0	2.5	2.5	Z	2.3	2.5	2.4	6.9	11.3	14.7	15.6	15.0	13.3	11.2	11.5	10.6	11.1	11.1	10.0	7.8	5.1	2.5	2.4	8.0	15.6	
18-Oct	3.0	3.4	2.4	2.2	2.4	Z	3.6	4.0	5.9	7.7	13.6	19.1	18.9	17.6	19.3	19.3	18.3	17.4	15.6	20.0	31.8	31.8	31.2	30.4	14.7	31.8	
19-Oct	Z	28.3	27.6	28.9	28.6	27.0	14.1	21.1	27.1	29.5	30.9	32.2	33.1	34.3	34.6	34.1	34.6	35.5	36.4	35.3	37.1	37.5	39.1	35.6	31.4	39.1	
20-Oct	30.0	Z	28.0	27.3	27.5	27.4	27.1	27.7	28.0	29.7	32.3	32.0	31.9	32.4	34.0	35.0	35.7	18.8	16.3	17.0	19.0	16.4	15.4	10.0	26.0	35.7	
21-Oct	8.3	8.8	Z	8.6	14.9	15.7	14.9	15.6	14.6	15.7	17.4	19.1	18.7	17.4	13.9	16.2	22.7	28.9	31.1	28.4	28.8	26.0	14.8	13.7	18.0	31.1	
22-Oct	8.3	6.8	5.4	Z	19.5	20.7	16.8	14.5	18.5	22.7	23.2	23.6	27.6	25.4	23.6	13.3	9.7	4.4	17.7	23.7	18.4	14.0	11.6	10.0	16.5	27.6	
23-Oct	19.9	26.8	24.1	24.8	Z	26.1	26.6	26.7	28.5	31.0	35.4	36.7	37.2	38.1	37.9	37.4	37.0	36.5	35.8	35.0	34.7	34.3	33.4	32.5	32.0	38.1	
24-Oct	32.3	31.6	31.2	30.9	30.4	Z	29.5	29.2	28.8	29.0	31.0	31.5	32.4	33.1	33.2	34.8	34.8	33.9	32.8	32.7	33.2	32.4	31.5	31.5	31.8	34.8	
25-Oct	Z	31.9	31.5	31.6	31.4	30.2	29.7	28.9	29.1	29.4	30.4	30.8	30.7	31.2	33.4	32.6	31.7	32.0	31.5	31.6	31.9	31.4	30.7	29.6	31.0	33.4	
26-Oct	29.3	Z	27.9	27.7	27.4	28.0	27.7	26.5	25.3	24.5	25.0	26.0	27.2	28.3	27.8	27.6	27.8	27.8	27.9	29.4	29.1	27.5	26.4	25.0	27.3	29.4	
27-Oct	24.3	24.3	Z	24.8	23.6	17.0	19.9	11.9	22.6	23.1	21.7	17.7	26.7	28.2	26.5	26.9	30.6	33.5	30.5	30.1	29.9	28.5	26.4	25.1	24.9	33.5	
28-Oct	27.0	28.7	28.7	Z	27.1	26.1	26.1	25.8	24.7	20.4	19.7	15.9	20.0	25.3	26.8	25.6	29.1	30.3	30.0	29.7	29.3	27.6	20.3	25.6	25.6	30.3	
29-Oct	28.3	31.0	26.9	27.4	Z	34.6	33.3	30.6	31.5	32.6	32.4	32.3	30.8	32.3	33.2	34.2	34.4	29.9	20.7	16.7	16.2	22.1	17.6	12.6	27.9	34.6	
30-Oct	27.2	31.9	32.1	32.1	30.5	Z	24.8	23.6	19.1	16.2	27.4	32.7	34.5	34.1	34.6	34.3	33.4	32.1	30.2	28.1	28.0	27.1	26.9	27.3	29.0	34.6	
31-Oct	Z	25.0	22.0	20.8	22.3	16.1	14.0	3.3	6.2	7.5	11.7	17.0	20.3	19.4	20.6	19.7	17.2	14.9	12.8	11.1	10.5	9.3	9.3	9.2	14.8	25.0	
		20.2	20.5	20.9	20.6	21.2	19.6	19.0	18.1	19.6	21.1	23.3	24.9	26.5	27.1	27.8	28.2	27.7	25.5	23.6	23.2	23.3	23.1	21.6	21.0	Diurnal Average	
		34.2	33.6	32.8	32.3	31.4	34.6	33.3	30.6	31.5	32.6	35.4	36.7	37.2	38.1	41.4	45.1	44.9	43.4	37.9	36.3	37.1	37.5	39.1	35.6	Diurnal Maximum	
Z - zerospan		C - Calibration																									
Alberta Ambient Air Quality Objectives (AAAQO):		1-hr 76 ppb																									





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ozone (O₃) - ppb
Buffalo Viewpoint - October 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	268	37.75	37.75
21 - 50	442	62.25	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 710

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Ozone (O₃) - ppb
Buffalo Viewpoint - October 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	11	7	6	1	8	38	96	17	10	2	1	3	10	19	12	268
21 - 50	19	6	1	2	0	21	60	91	25	8	12	50	64	31	45	7	442
51 - 82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	46	17	8	8	1	29	98	187	42	18	14	51	67	41	64	19	710

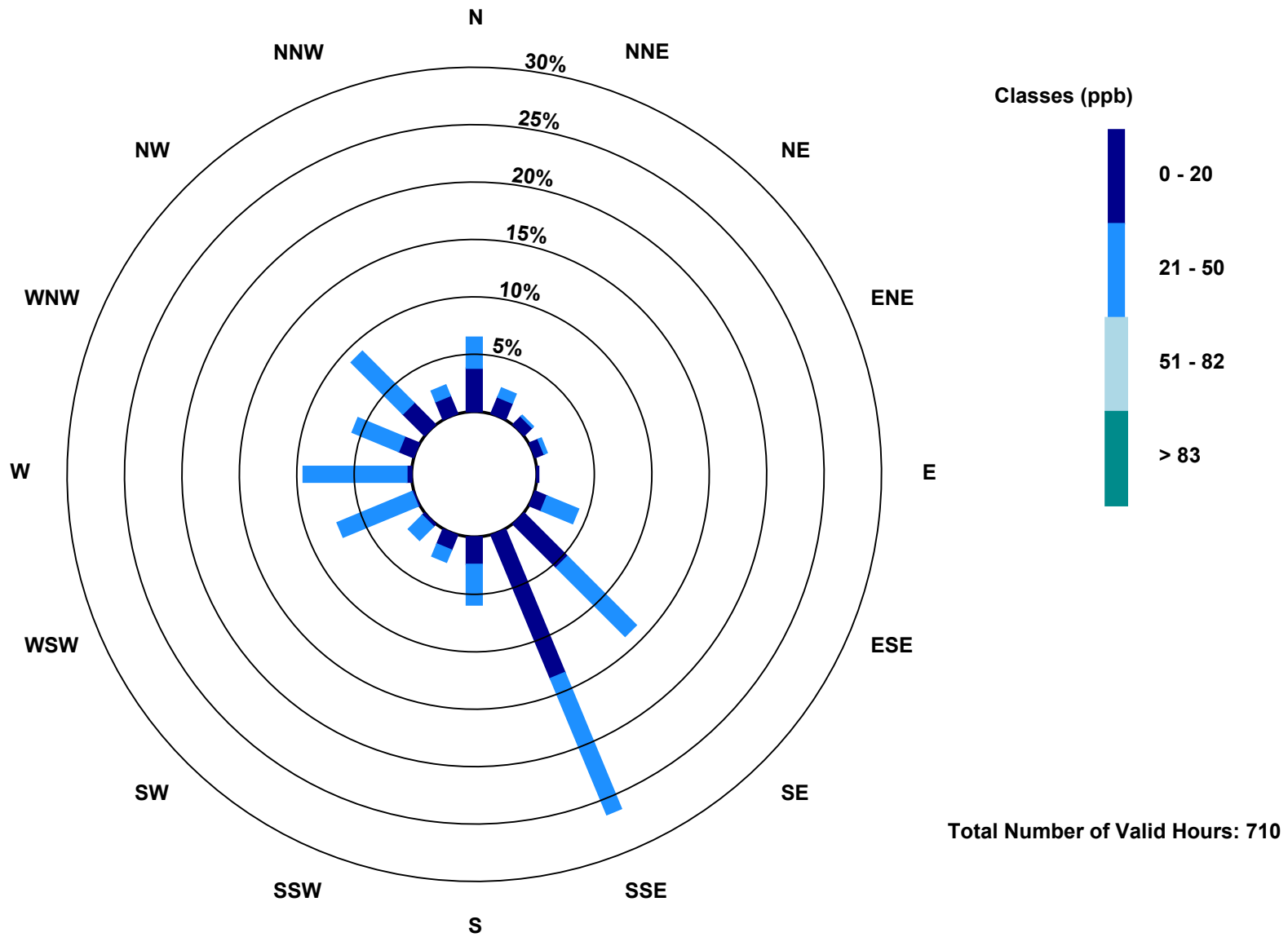
Total Number of Valid Hours: 710

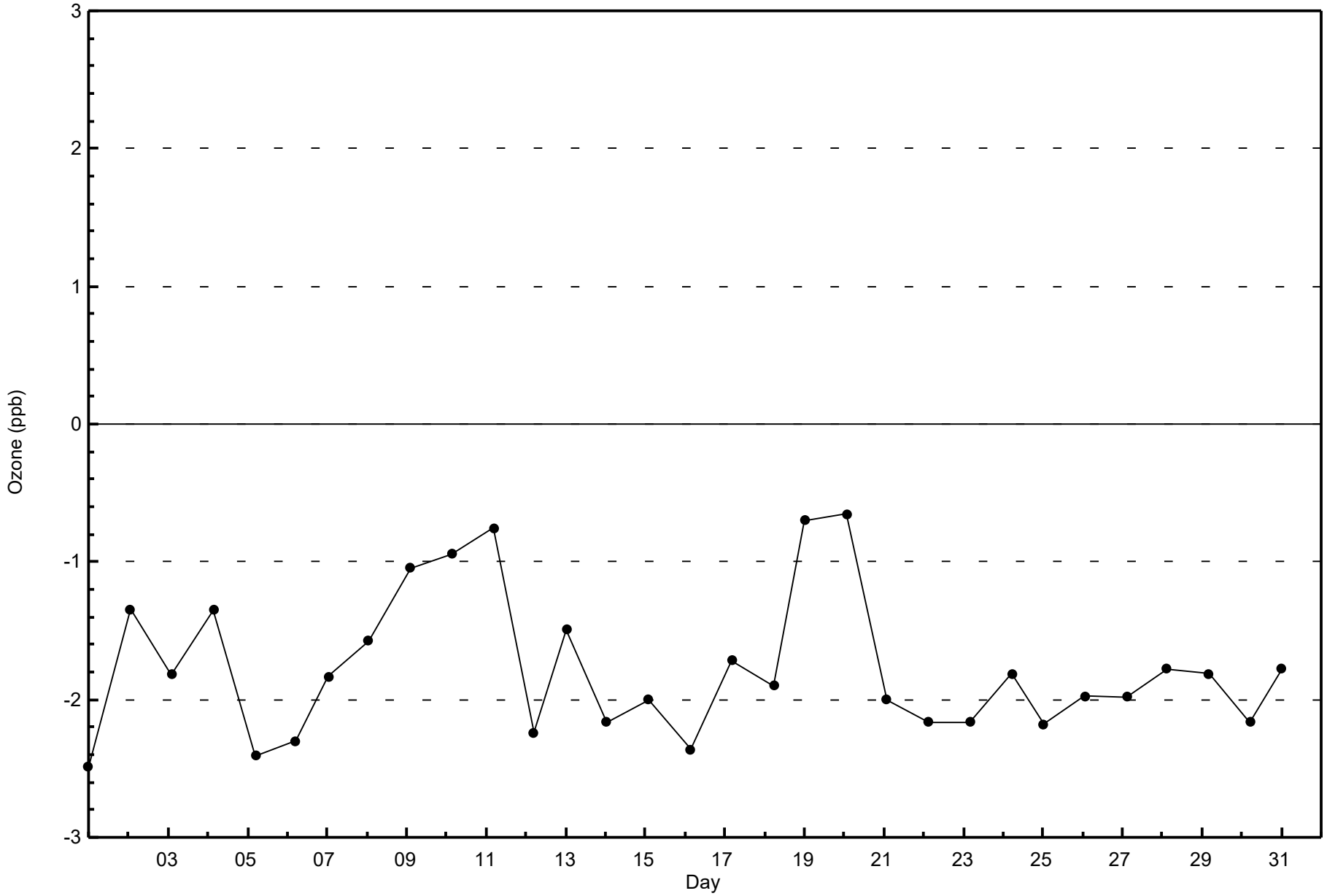
Total Number of Hours: 744

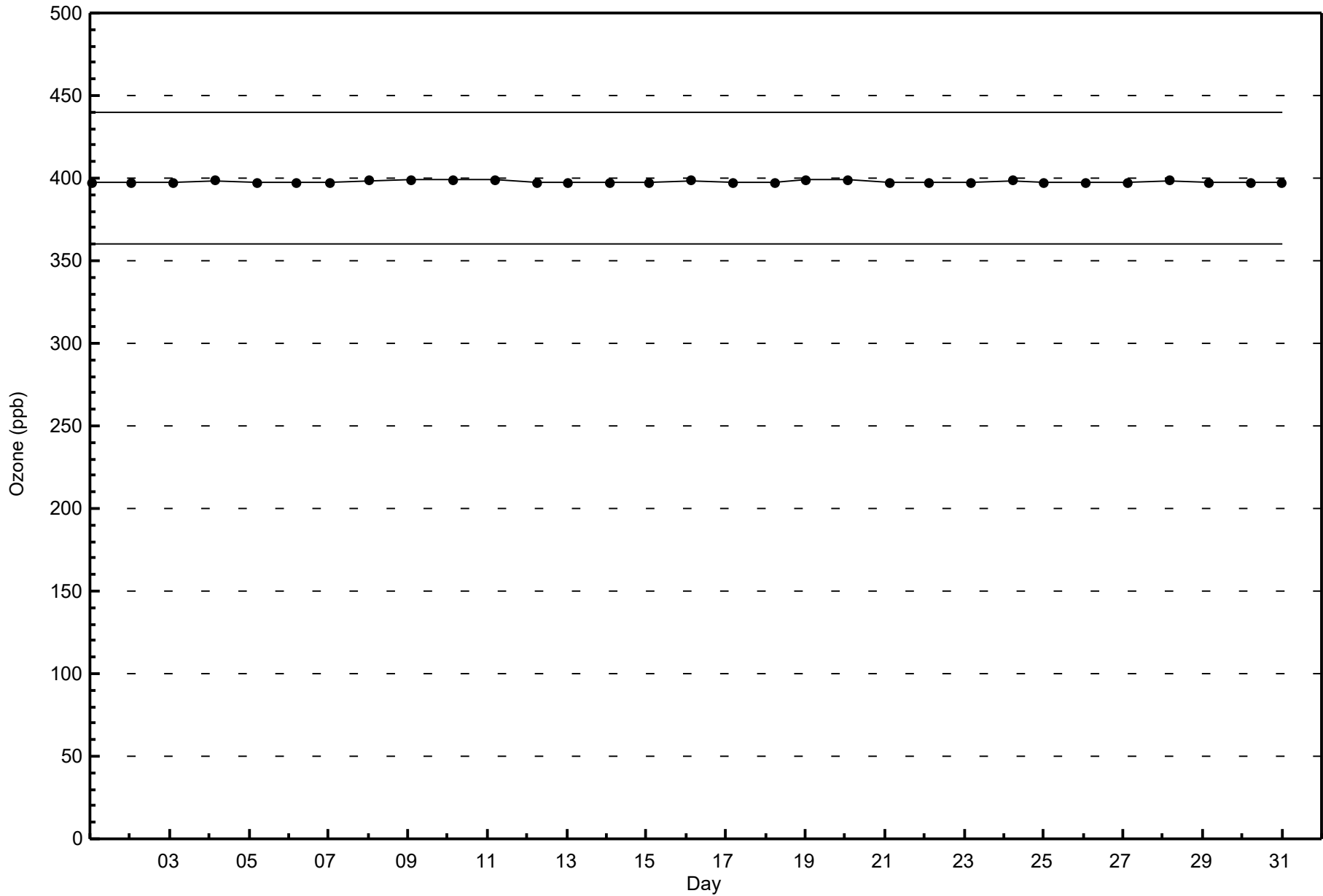


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Ozone (O₃) - ppb
Buffalo Viewpoint

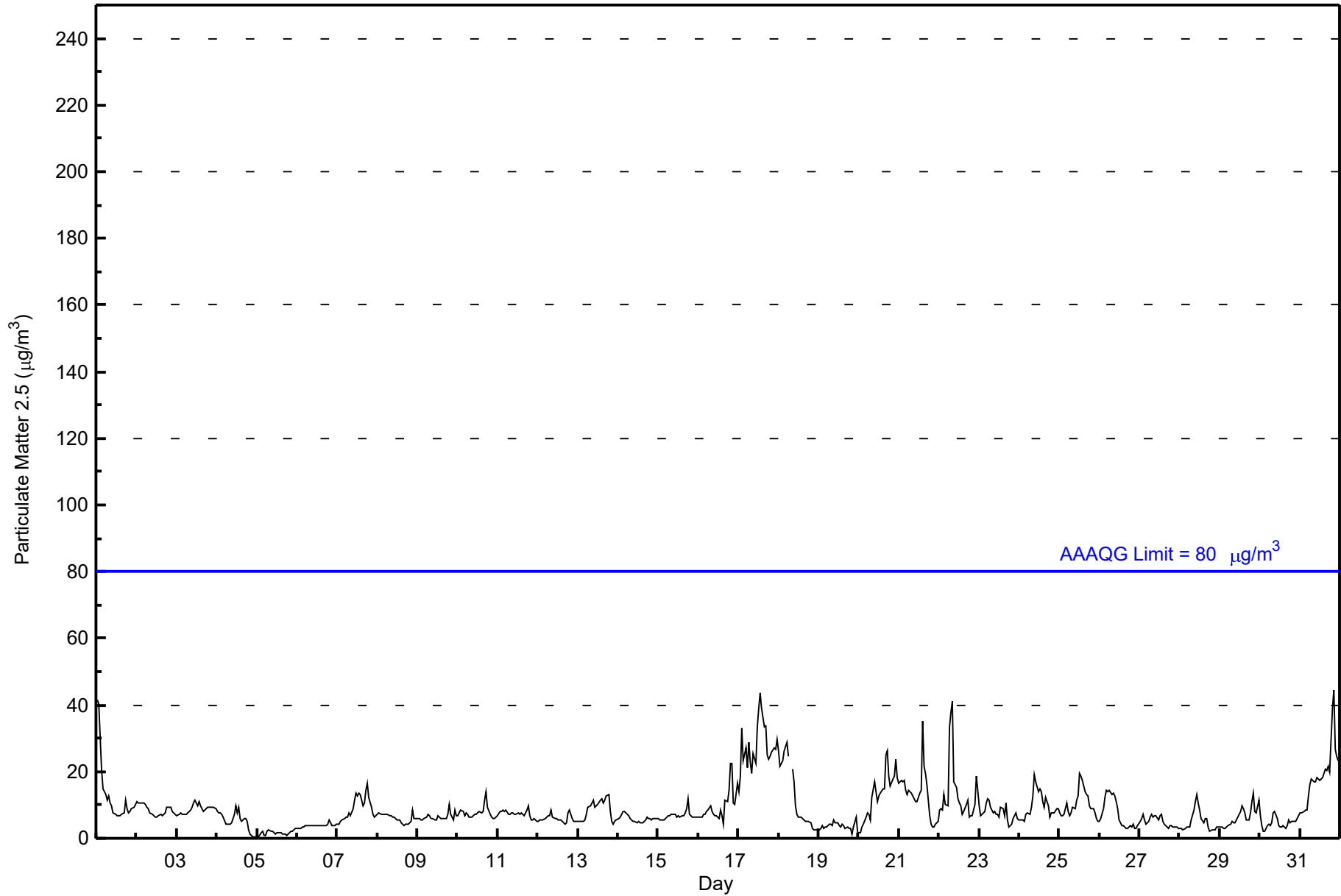








Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		744																																									
Maximum Value: 44.4 µg/m ³ on Oct 31 21:00		Maximum Daily Average: 27.6 µg/m ³ on Oct 17				Hours of Data:		743																																									
Minimum Value: 0.3 µg/m ³ on Oct 5 01:00		Minimum Daily Average: 1.7 µg/m ³ on Oct 5				Hours of Missing Data:		1																																									
Maximum Diurnal Average: 9.9 µg/m ³ at hour 9		Minimum Diurnal Average: 7.5 µg/m ³ at hour 22				Hours of Calibration:		1																																									
Monthly Average: 8.82 µg/m ³		Percentiles: P ₁ = 1.1 P ₁₀ = 3.3 Q ₁ = 5.1 Median = 7.0 Q ₃ = 9.9 P ₉₀ = 16.9 P ₉₉ = 38.4				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-Oct	41.4	40.1	30.1	20.3	14.9	13.0	11.3	12.6	10.5	9.6	7.8	7.3	6.6	6.8	6.8	7.3	7.6	11.3	8.7	7.8	8.1	8.7	9.3	10.0	13.2	41.4																							
2-Oct	10.9	10.7	10.7	10.7	10.5	10.4	9.5	8.9	7.8	7.1	6.7	6.6	6.3	6.6	7.1	7.0	7.2	7.5	9.2	9.4	9.3	8.1	7.6	7.4	8.5	10.9																							
3-Oct	6.7	7.3	7.5	7.1	7.1	7.0	7.4	8.0	8.5	9.4	10.7	11.5	9.8	11.0	9.9	9.1	8.3	8.5	9.2	9.5	9.1	9.3	9.3	8.8	8.7	11.5																							
4-Oct	8.2	7.8	7.8	7.4	6.4	4.4	4.4	4.3	4.0	4.5	7.1	9.8	7.5	9.2	5.9	5.2	5.9	5.9	5.2	2.5	1.2	0.6	0.4	0.4	5.3	9.8																							
5-Oct	0.3	0.6	1.6	2.1	1.0	0.8	1.9	2.4	2.2	2.1	1.7	1.5	1.9	1.7	1.5	1.3	1.3	1.0	1.7	2.1	2.3	2.5	2.9	1.7	2.9																								
6-Oct	3.0	3.0	3.2	3.3	3.5	3.7	3.7	3.6	3.7	3.7	3.7	3.9	4.0	4.0	4.0	3.9	3.8	3.9	4.4	5.4	4.5	3.9	3.8	4.1	3.8	5.4																							
7-Oct	4.3	4.4	5.0	5.7	6.1	6.3	6.4	7.6	6.8	9.0	11.5	13.5	12.9	13.5	13.2	9.6	10.6	14.5	16.4	12.2	9.4	7.1	6.6	6.6	9.1	16.4																							
8-Oct	7.3	7.5	7.3	7.3	7.3	7.4	7.1	6.9	6.6	6.4	6.2	5.9	5.6	5.5	4.8	4.0	4.0	4.2	4.3	4.6	5.3	8.5	5.9	6.1	6.1	8.5																							
9-Oct	6.1	5.8	5.6	5.6	5.9	6.3	7.0	6.8	6.0	5.8	5.7	5.7	6.9	6.5	6.1	6.0	6.1	5.9	7.4	10.0	7.4	5.6	8.4	6.6	6.5	10.0																							
10-Oct	6.8	7.7	8.3	7.9	6.9	7.5	7.1	6.5	6.5	6.7	7.0	7.1	7.7	7.9	7.7	7.9	11.3	13.8	9.1	7.1	6.4	5.8	6.0	6.4	7.6	13.8																							
11-Oct	6.9	8.1	7.8	8.5	8.2	8.3	7.2	7.3	7.5	7.5	7.3	7.3	7.5	7.3	7.7	7.1	6.9	8.5	9.6	6.7	5.5	5.5	5.8	5.3	7.3	9.6																							
12-Oct	5.3	5.3	5.3	5.4	6.0	6.5	6.7	6.7	8.5	6.2	6.0	6.0	5.6	5.6	5.3	4.7	4.3	4.6	7.8	8.3	6.1	5.0	5.1	5.1	5.9	8.5																							
13-Oct	5.1	5.1	5.2	5.1	5.7	7.4	9.1	9.9	10.7	11.3	9.1	9.6	10.3	11.4	11.7	10.4	11.5	12.9	13.3	8.2	5.0	4.4	4.9	5.4	8.4	13.3																							
14-Oct	5.9	6.5	7.3	7.9	7.9	7.3	6.6	6.1	5.6	5.2	5.1	4.8	4.9	4.8	4.7	4.8	5.6	6.5	6.1	5.8	5.6	5.7	5.9	6.0	5.9	7.9																							
15-Oct	5.9	5.5	5.4	5.6	5.9	6.4	6.8	6.9	7.1	7.1	7.2	6.4	6.7	6.5	6.6	6.7	7.6	8.9	11.8	7.0	6.5	6.5	6.2	6.2	6.8	11.8																							
16-Oct	6.3	6.3	6.4	7.2	7.3	8.1	8.4	9.9	8.0	7.0	6.8	7.0	6.0	8.5	6.6	4.0	11.4	11.1	14.4	22.5	22.5	10.4	10.1	16.5	9.7	22.5																							
17-Oct	13.9	18.8	33.2	23.1	27.2	21.3	28.8	22.9	19.3	25.4	22.3	33.5	39.1	43.5	39.1	33.4	33.7	24.8	23.6	24.6	25.9	27.3	26.9	29.8	27.6	43.5																							
18-Oct	26.3	21.6	23.5	26.2	27.5	28.7	24.6	C	21.0	16.9	9.7	7.1	6.5	6.3	6.0	5.7	5.1	5.2	5.2	4.6	3.0	2.5	2.7	2.7	12.5	28.7																							
19-Oct	2.5	2.8	3.7	3.1	3.6	3.4	4.0	4.3	4.0	5.5	4.6	4.9	3.8	3.4	4.1	3.9	3.1	3.3	2.9	2.8	1.3	3.4	6.2	1.6	3.6	6.2																							
20-Oct	1.7	1.6	3.5	4.2	6.3	7.7	7.3	5.5	12.1	16.8	13.8	11.1	12.6	13.6	14.8	14.8	25.1	26.2	18.5	15.9	17.9	18.6	23.6	18.0	13.0	26.2																							
21-Oct	16.3	17.2	17.1	17.5	14.3	13.2	14.5	13.5	12.8	11.7	11.1	10.9	13.5	14.3	35.1	21.8	19.4	16.2	6.6	4.2	3.4	3.4	4.1	5.2	13.2	35.1																							
22-Oct	8.3	9.1	8.4	13.2	10.3	9.9	33.6	37.6	41.2	16.7	15.1	11.7	10.6	9.8	7.2	8.0	10.3	11.3	6.5	6.6	6.7	10.0	18.7	14.3	14.0	41.2																							
23-Oct	9.8	6.7	7.1	8.2	10.5	11.9	11.5	9.2	7.7	8.0	7.4	7.0	6.4	9.3	9.0	6.8	10.4	5.4	3.5	4.0	5.9	6.8	7.5	5.8	7.7	11.9																							
24-Oct	5.7	5.5	5.3	5.2	7.4	7.5	7.1	9.4	12.8	19.2	16.9	13.8	14.9	13.9	10.9	9.3	12.3	9.8	6.2	7.6	7.4	7.7	8.9	9.1	9.7	19.2																							
25-Oct	7.8	6.9	6.7	7.1	10.6	8.1	7.0	7.7	9.2	9.1	11.4	12.8	19.5	18.8	17.4	14.2	13.2	12.9	10.0	9.1	8.9	7.5	5.9	5.3	10.3	19.5																							
26-Oct	5.1	5.8	9.0	12.2	14.3	14.0	14.5	13.1	13.7	12.6	10.8	8.8	5.5	4.0	3.7	3.4	2.8	2.9	3.8	3.6	4.2	3.1	2.9	3.8	7.4	14.5																							
27-Oct	4.9	5.9	7.1	5.3	4.0	5.3	6.2	7.0	6.4	6.9	6.8	5.3	7.0	7.1	5.1	4.1	3.3	3.1	3.7	3.9	3.4	3.2	3.2	3.1	5.1	7.1																							
28-Oct	3.1	3.1	2.7	3.1	3.4	3.5	3.5	5.4	8.3	10.9	13.0	10.6	8.4	6.0	4.5	5.7	5.9	3.4	2.2	2.7	2.7	2.7	3.5	3.2	5.1	13.0																							
29-Oct	3.3	3.2	2.8	3.1	3.4	4.0	4.0	4.9	4.7	4.7	5.4	6.4	8.2	9.7	9.1	7.4	5.4	5.4	7.7	11.0	13.7	8.1	7.6	11.3	6.4	13.7																							
30-Oct	6.6	3.8	2.1	2.2	3.7	4.3	3.7	4.8	7.5	8.1	6.0	4.0	3.2	3.2	3.7	3.1	3.6	5.3	4.8	5.0	5.0	5.1	5.9	6.8	4.6	8.1																							
31-Oct	7.5	7.6	7.9	8.3	8.5	12.8	16.1	17.8	16.9	17.0	18.4	17.6	17.2	18.1	19.4	20.7	20.4	21.5	20.1	38.9	44.4	26.7	24.6	23.2	18.8	44.4																							
																								8.2	8.1	8.5	8.4	8.6	8.6	9.6	9.2	9.9	9.6	9.1	9.0	9.2	9.6	9.6	8.4	9.3	9.2	8.5	8.8	8.6	7.5	8.1	8.0	Diurnal Average	
																								41.4	40.1	33.2	26.2	27.5	28.7	33.6	37.6	41.2	25.4	22.3	33.5	39.1	43.5	39.1	33.4	33.7	26.2	23.6	38.9	44.4	27.3	26.9	29.8	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}) - $\mu\text{g}/\text{m}^3$
Buffalo Viewpoint - October 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	223	30.01	30.01
6 - 15	435	58.55	88.56
16 - 25	57	7.67	96.23
26 - 80	28	3.77	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - μg/m³
Buffalo Viewpoint - October 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	2	1	1	0	0	23	44	13	8	12	23	25	22	37	3	223
6 - 15	17	8	4	4	0	28	74	138	24	8	3	29	43	21	27	7	435
16 - 25	15	5	3	2	0	0	6	9	4	1	0	2	4	0	1	5	57
26 - 80	6	2	1	2	1	1	2	5	3	1	0	0	0	0	0	4	28
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	47	17	9	9	1	29	105	196	44	18	15	54	72	43	65	19	743

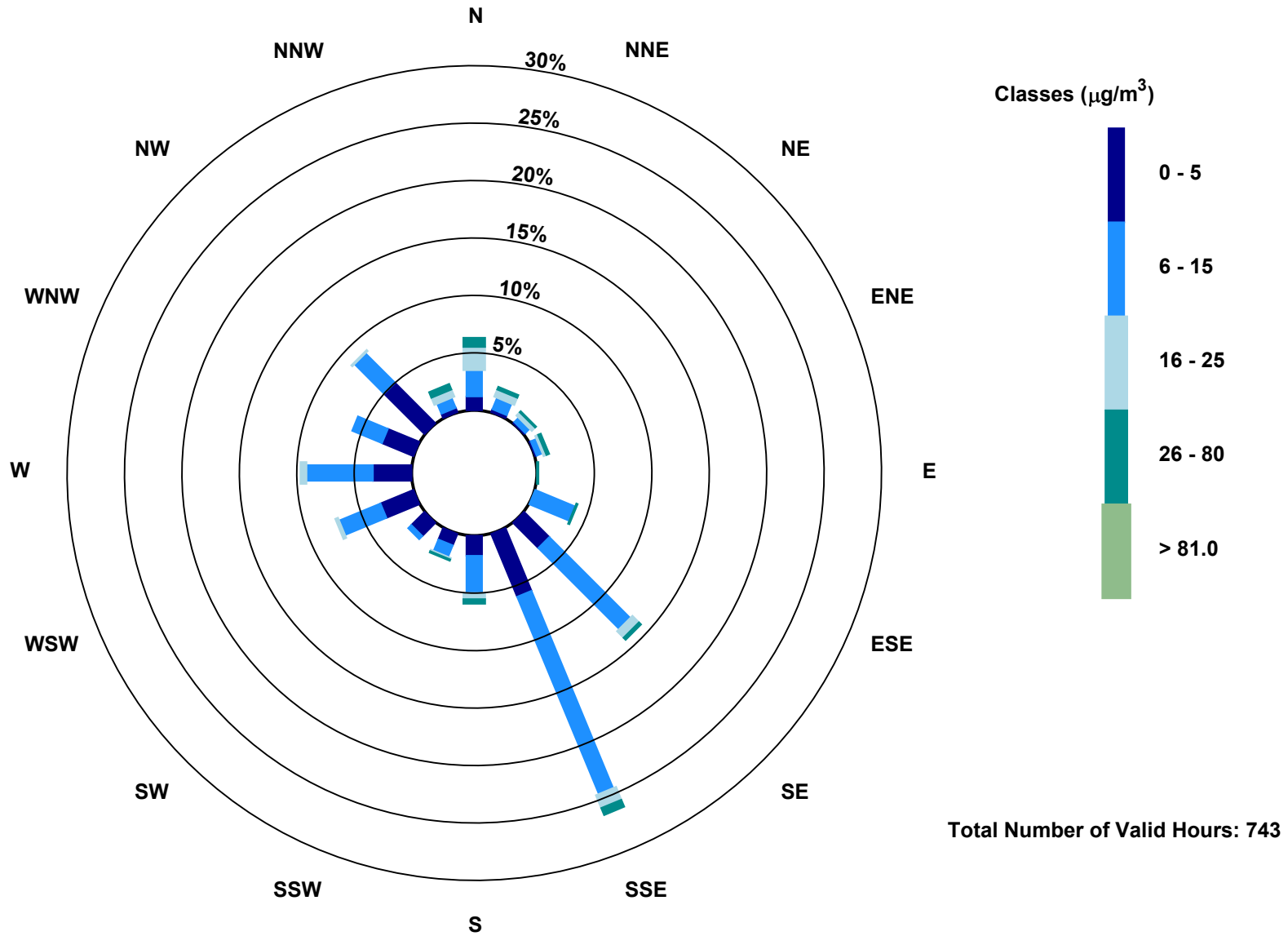
Total Number of Valid Hours: 743

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

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





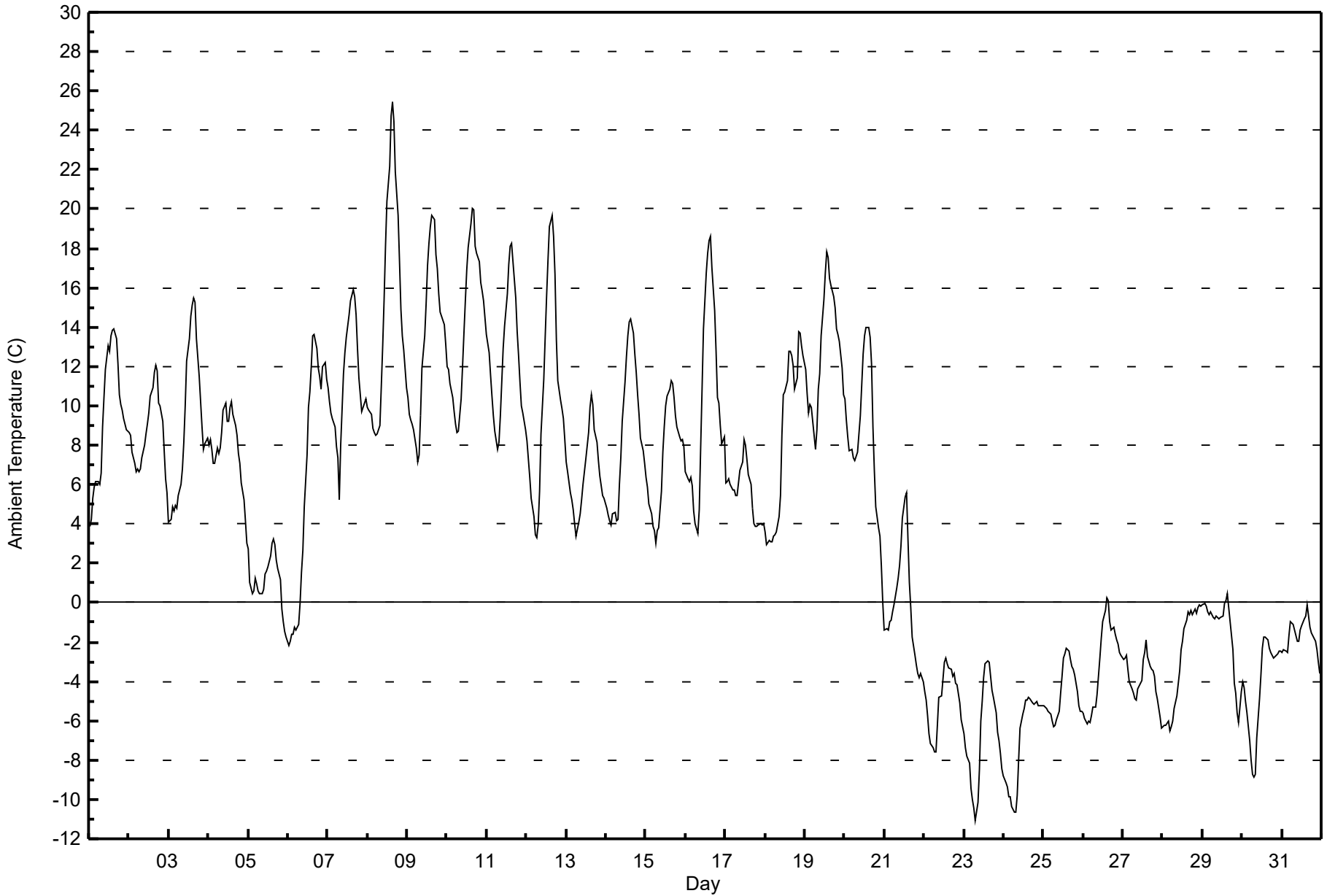
Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature (AT) - C

Buffalo Viewpoint - October 2023

Maximum Value: 25.5 C on Oct 8 16:00 Maximum Daily Average: 14.9 C on Oct 8																				Hours in Service: 744 Hours of Data: 744						
Minimum Value: -11.1 C on Oct 23 08:00 Minimum Daily Average: -7.1 C on Oct 24 Maximum Diurnal Average: 8.8 C at hour 16 Minimum Diurnal Average: 1.5 C at hour 7 Monthly Average: 4.71 C Percentiles: P ₁ = -9.9 P ₁₀ = -5.3 Q ₁ = -2.0 Median = 5.6 Q ₃ = 10.4 P ₉₀ = 14.0 P ₉₉ = 19.8																				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-Oct	3.9	4.2	5.3	5.9	6.1	6.1	6.0	6.6	8.9	10.4	11.8	13.0	12.8	13.5	13.8	13.9	13.4	12.1	10.6	10.0	9.8	9.4	8.8	8.7	9.4	13.9
2-Oct	8.6	8.5	7.7	7.0	6.6	6.8	6.7	6.8	7.3	8.0	8.6	9.0	9.6	10.5	10.9	11.7	12.1	11.7	10.2	10.0	9.2	7.7	6.3	5.6	8.6	12.1
3-Oct	4.1	4.3	4.9	4.6	5.0	4.8	5.5	6.0	6.8	8.2	10.0	12.3	13.4	14.6	15.1	15.5	15.2	13.4	11.5	10.2	9.0	7.8	8.1	8.3	9.1	15.5
4-Oct	8.0	8.3	7.8	7.1	7.1	7.9	7.6	7.8	8.7	9.8	10.1	9.2	9.2	9.9	10.2	9.6	9.0	8.5	7.6	7.1	6.1	5.2	4.2	3.0	7.9	10.2
5-Oct	2.7	1.0	0.4	0.6	1.2	1.0	0.6	0.4	0.5	0.6	1.4	1.6	1.8	2.4	3.0	3.3	2.9	2.1	1.8	1.2	-0.3	-1.0	-1.4	-1.7	1.1	3.3
6-Oct	-2.2	-2.0	-1.6	-1.6	-1.3	-1.4	-1.1	0.0	1.6	2.7	4.8	7.5	9.9	10.7	12.0	13.5	13.6	12.9	11.9	11.5	10.9	12.0	12.2	11.3	6.2	13.6
7-Oct	10.9	10.2	9.6	9.3	8.9	7.9	7.4	5.2	8.0	11.6	12.7	13.5	14.1	14.6	15.4	15.9	15.5	14.6	12.9	11.4	9.7	9.9	10.1	10.3	11.2	15.9
8-Oct	9.9	9.8	9.6	8.8	8.6	8.5	8.6	9.0	11.0	13.1	15.4	18.1	20.4	22.2	24.7	25.5	24.5	21.9	19.7	17.3	14.9	13.5	12.8	10.9	14.9	25.5
9-Oct	10.5	9.6	9.3	9.0	8.8	7.8	7.2	7.5	9.5	11.9	13.5	15.2	17.1	18.2	19.1	19.6	19.4	17.7	17.0	15.7	14.8	14.3	14.1	13.1	13.3	19.6
10-Oct	12.0	11.8	11.1	10.4	9.7	9.1	8.6	8.7	10.3	12.0	13.7	15.3	16.9	18.1	19.3	20.0	19.9	18.1	17.8	17.3	16.3	15.8	15.4	14.5	14.3	20.0
11-Oct	13.6	12.7	11.5	10.5	9.5	8.7	7.8	8.1	9.5	11.2	12.9	14.1	15.7	17.2	18.1	18.2	17.3	15.5	13.8	12.5	11.2	10.0	9.6	8.8	12.4	18.2
12-Oct	8.2	7.3	6.4	5.3	4.4	3.5	3.3	3.9	5.7	8.6	11.3	13.5	15.5	17.4	19.1	19.7	18.6	16.7	13.3	11.3	10.3	9.9	9.4	8.3	10.4	19.7
13-Oct	7.2	6.7	5.6	5.2	4.7	4.0	3.3	4.1	4.5	5.2	6.0	6.6	7.3	8.6	9.9	10.6	10.1	8.8	8.1	7.2	6.4	5.9	5.5	5.3	6.5	10.6
14-Oct	4.8	4.5	4.2	3.9	4.5	4.6	4.1	4.3	6.0	7.3	9.2	11.2	12.5	13.5	14.3	14.4	13.7	12.6	11.7	10.6	9.6	8.3	7.7	7.1	8.5	14.4
15-Oct	6.4	5.9	5.0	4.5	3.9	3.7	3.0	3.6	3.8	5.6	7.7	8.9	10.0	10.5	10.8	11.3	11.1	10.4	9.5	8.9	8.4	8.2	8.3	7.9	7.4	11.3
16-Oct	6.7	6.3	6.1	6.3	5.9	4.6	4.0	3.5	4.7	7.8	10.9	13.9	16.7	17.8	18.4	18.6	17.1	14.9	12.8	10.4	10.1	9.0	8.0	8.4	10.1	18.6
17-Oct	6.1	6.1	6.3	6.0	5.7	5.7	5.4	5.4	6.1	6.7	7.2	8.3	8.0	7.3	6.5	6.0	4.8	4.0	3.8	3.8	4.0	4.0	3.9	4.0	5.6	8.3
18-Oct	3.6	3.0	3.2	3.1	3.1	3.4	3.4	3.6	4.3	5.4	8.5	10.6	10.7	11.3	12.8	12.8	12.5	12.1	10.9	11.4	13.7	13.7	13.1	12.6	8.4	13.7
19-Oct	11.8	10.6	9.7	10.0	9.9	9.2	7.8	8.8	10.8	11.6	13.6	15.4	16.7	17.8	17.5	16.5	16.1	15.6	15.0	13.9	13.6	13.3	11.9	10.6	12.8	17.8
20-Oct	10.4	9.3	8.4	7.7	7.8	7.4	7.2	7.4	7.7	9.5	11.1	12.6	13.5	14.0	14.0	13.5	12.1	8.9	6.7	4.8	3.8	3.4	1.9	0.0	8.5	14.0
21-Oct	-1.4	-1.3	-1.4	-1.0	-0.9	-0.4	-0.1	0.7	1.3	1.9	2.9	4.3	5.3	5.6	3.2	1.0	-0.3	-1.8	-2.7	-3.2	-3.6	-3.8	-3.6	-4.0	-0.1	5.6
22-Oct	-4.5	-4.9	-5.8	-6.6	-7.1	-7.4	-7.6	-7.6	-6.2	-4.8	-4.7	-3.9	-3.0	-2.8	-3.1	-3.3	-3.4	-3.7	-3.6	-4.1	-4.2	-5.1	-5.9	-6.3	-5.0	-2.8
23-Oct	-6.7	-7.4	-7.8	-8.1	-9.4	-10.0	-10.4	-11.1	-10.2	-8.5	-6.0	-5.0	-3.8	-3.1	-2.9	-3.0	-3.7	-4.4	-4.8	-5.6	-6.6	-7.0	-7.6	-8.4	-6.7	-2.9
24-Oct	-8.8	-9.1	-9.4	-9.8	-9.9	-10.4	-10.6	-10.7	-9.8	-8.0	-6.3	-5.6	-5.4	-4.9	-5.0	-4.8	-4.8	-5.1	-5.2	-5.1	-5.1	-5.2	-5.2	-5.2	-7.1	-4.8
25-Oct	-5.3	-5.3	-5.4	-5.5	-5.7	-6.0	-6.3	-6.2	-6.0	-5.5	-4.6	-3.7	-2.8	-2.6	-2.3	-2.5	-2.9	-3.2	-3.4	-3.7	-4.5	-5.2	-5.5	-5.5	-4.6	-2.3
26-Oct	-5.6	-5.9	-6.1	-6.0	-6.1	-5.8	-5.3	-5.3	-4.6	-3.7	-2.8	-1.8	-1.0	-0.4	0.2	0.1	-0.9	-1.4	-1.3	-1.6	-1.9	-2.1	-2.5	-2.6	-3.1	0.2
27-Oct	-2.9	-2.8	-2.7	-3.4	-4.0	-4.3	-4.6	-4.9	-4.9	-4.3	-4.3	-4.0	-2.9	-2.6	-1.9	-2.8	-3.3	-3.4	-3.4	-3.8	-4.6	-4.9	-5.8	-6.4	-3.9	-1.9
28-Oct	-6.3	-6.2	-6.2	-6.0	-6.5	-6.3	-6.0	-5.3	-4.7	-4.1	-3.5	-2.4	-2.0	-1.3	-0.9	-0.5	-0.6	-0.4	-0.6	-0.3	-0.5	-0.3	-0.1	-0.2	-3.0	-0.1
29-Oct	-0.1	0.0	-0.2	-0.5	-0.6	-0.5	-0.7	-0.8	-0.7	-0.8	-0.8	-0.7	-0.7	0.0	0.1	0.5	-0.3	-1.7	-2.4	-4.1	-4.6	-5.6	-6.1	-4.5	-1.5	0.5
30-Oct	-4.0	-4.3	-5.0	-5.6	-7.0	-8.0	-8.7	-8.8	-8.7	-6.8	-4.9	-3.7	-2.3	-1.8	-1.8	-1.9	-2.3	-2.5	-2.7	-2.8	-2.7	-2.6	-2.5	-2.5	-4.3	-1.8
31-Oct	-2.5	-2.4	-2.5	-2.5	-1.7	-1.0	-1.0	-1.1	-1.7	-2.0	-2.0	-1.4	-1.2	-0.8	-0.7	-0.1	-0.7	-1.2	-1.5	-1.8	-2.0	-2.4	-3.0	-3.6	-1.7	-0.1
																								Diurnal Average		
																								Diurnal Maximum		





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	263	35.35	35.35
0 - 10	279	37.50	72.85
10 - 20	195	26.21	99.06
> 20	7	0.94	100.00

Total Number of Valid Hours: 744

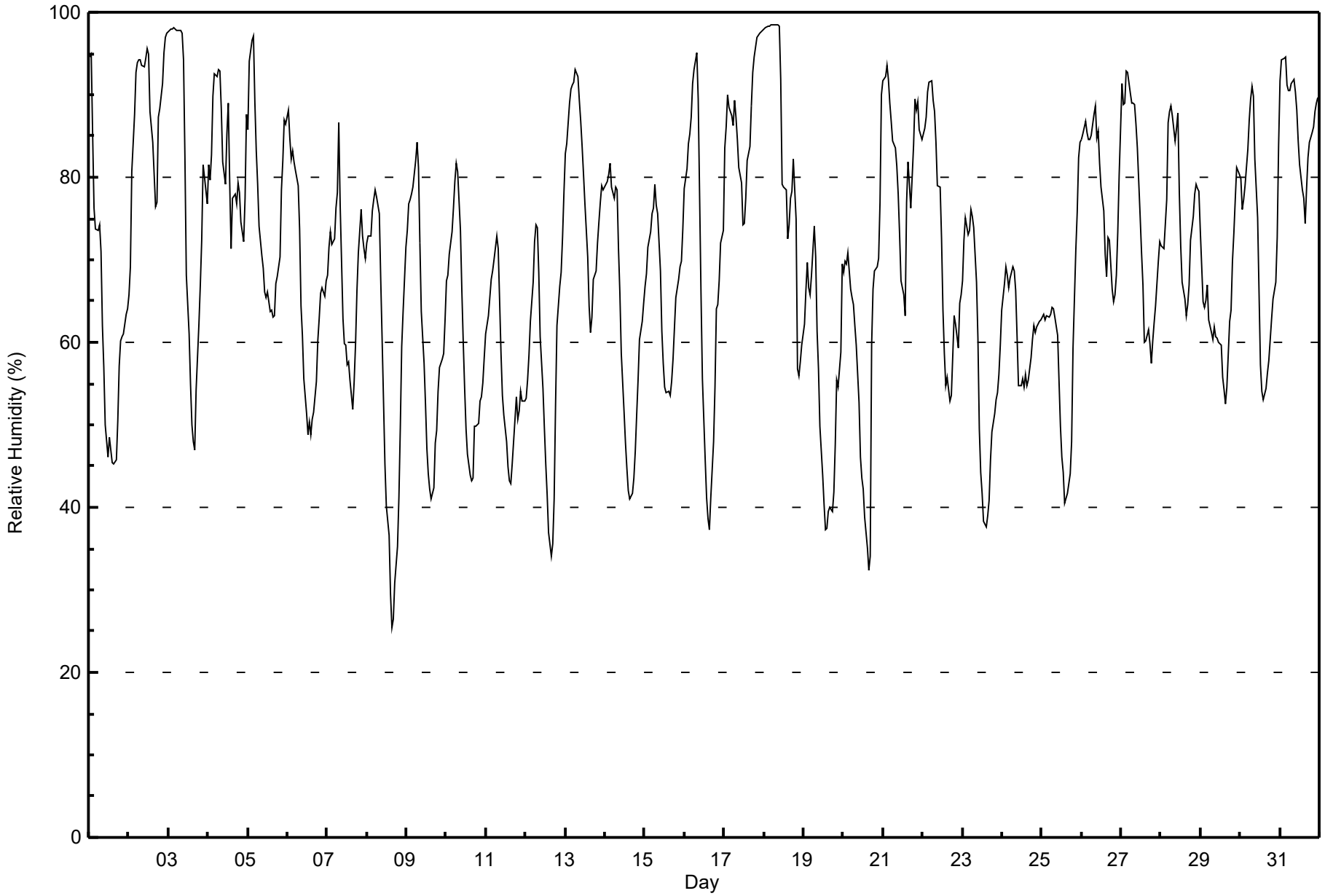
Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

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

Maximum Value: 98.5 % on Oct 18 06:00 Maximum Daily Average: 88.0 % on Oct 2 Minimum Value: 25.4 % on Oct 8 16:00 Minimum Daily Average: 54.9 % on Oct 19 Maximum Diurnal Average: 82.0 % at hour 7 Minimum Diurnal Average: 53.9 % at hour 16 Monthly Average: 69.71 % Percentiles: P ₁ = 35.1 P ₁₀ = 47.8 Q ₁ = 58.6 Median = 70.1 Q ₃ = 82.1 P ₉₀ = 90.6 P ₉₉ = 98.2																								Hours in Service:	744																								
																								Hours of Data:	744																								
																								Hours of Missing Data:	0																								
																								Hours of Calibration:	0																								
																								Percent Operational Time:	100.0																								
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Oct	94.7	95.0	85.2	76.2	73.7	73.5	74.2	71.1	62.0	57.0	50.1	46.0	48.5	47.0	45.5	45.2	45.8	50.5	57.2	60.2	60.6	61.0	63.3	64.1	62.8	95.0																							
2-Oct	65.8	69.1	80.6	87.6	92.8	94.0	94.2	94.2	93.6	93.4	94.4	95.6	95.0	88.0	84.2	80.3	76.5	76.9	87.2	88.3	91.3	95.2	96.9	97.5	88.0	97.5																							
3-Oct	97.7	97.9	98.0	98.1	98.0	97.8	97.8	97.8	97.5	94.2	82.3	68.2	61.0	54.9	50.0	47.9	46.9	54.2	62.2	66.9	72.4	81.6	79.9	76.8	78.3	98.1																							
4-Oct	81.5	79.6	82.7	89.8	92.6	92.2	93.0	92.8	88.3	81.8	79.1	85.2	89.0	79.5	71.3	77.4	78.0	76.8	79.4	78.1	74.5	72.2	77.4	87.6	82.5	93.0																							
5-Oct	85.7	94.0	96.7	97.2	89.2	83.3	93.0	79.2	74.1	70.5	69.0	66.1	65.5	66.2	63.7	63.9	63.0	63.2	67.1	68.0	70.4	78.5	82.1	86.9	86.5	76.3	97.2																						
6-Oct	88.1	84.7	82.2	83.2	81.9	80.9	79.0	73.7	64.3	60.8	55.5	51.4	48.8	50.3	48.9	50.6	51.5	55.2	60.1	62.9	66.0	66.7	65.6	67.4	65.8	88.1																							
7-Oct	68.2	71.5	73.4	71.9	72.5	76.3	78.1	86.5	76.6	63.0	59.8	59.6	57.4	57.6	55.5	51.8	55.2	59.8	66.3	70.8	76.1	72.9	71.3	70.2	67.6	86.5																							
8-Oct	72.1	72.9	72.9	75.9	77.3	78.4	77.7	75.5	67.6	60.3	52.9	45.3	40.1	36.6	29.5	25.4	26.4	30.8	35.2	41.1	49.7	59.4	63.8	71.5	55.8	78.4																							
9-Oct	73.6	76.8	77.3	77.9	78.9	82.1	84.2	81.3	72.0	63.7	57.5	52.6	47.2	44.1	42.3	41.0	42.3	47.8	49.4	54.1	56.9	58.0	58.7	62.8	61.8	84.2																							
10-Oct	67.5	68.2	70.6	73.3	76.3	79.4	81.6	80.8	73.6	66.2	60.0	54.4	49.4	46.4	43.9	43.2	43.6	49.8	49.9	50.2	52.8	53.3	55.1	58.2	60.3	81.6																							
11-Oct	61.0	63.3	65.4	67.6	68.7	70.0	73.0	71.4	65.1	58.6	53.6	51.2	48.0	44.9	43.1	42.9	45.3	50.6	53.4	50.7	51.7	54.1	52.9	53.0	56.6	73.0																							
12-Oct	53.2	55.5	58.5	62.6	67.2	72.2	74.3	73.9	68.5	60.7	54.5	49.7	45.3	41.4	36.9	34.1	35.6	41.1	52.4	62.1	66.8	68.5	72.8	78.1	57.7	78.1																							
13-Oct	82.9	84.1	89.0	90.6	91.1	91.5	93.1	92.2	89.3	86.7	83.8	80.3	76.8	70.3	64.3	61.2	63.0	67.5	68.6	72.0	74.6	77.0	79.0	78.4	79.5	93.1																							
14-Oct	79.1	79.5	80.3	81.7	78.8	77.5	78.9	78.4	71.3	66.0	58.7	51.5	47.8	44.7	42.1	41.0	41.6	43.6	46.8	51.2	55.4	60.3	62.6	64.7	61.8	81.7																							
15-Oct	66.8	68.2	71.5	73.3	75.6	76.3	79.1	76.6	75.6	68.6	61.3	57.4	54.6	53.9	54.0	53.5	55.2	57.9	61.7	65.4	67.7	69.1	69.8	73.8	66.1	79.1																							
16-Oct	78.7	81.1	84.1	85.2	87.3	91.3	93.1	95.1	89.4	77.8	66.0	55.5	45.8	41.2	38.7	37.3	41.2	47.9	54.6	64.1	64.5	67.5	72.1	73.6	68.0	95.1																							
17-Oct	83.5	86.2	90.0	88.4	87.4	86.2	89.3	87.2	84.5	81.1	79.3	74.2	74.5	77.5	82.1	83.8	88.6	92.7	94.6	95.7	96.9	97.4	97.6	97.8	87.4	97.8																							
18-Oct	98.0	98.2	98.3	98.4	98.4	98.5	98.5	98.5	98.5	98.3	91.9	79.2	78.8	78.5	72.6	74.3	77.4	78.3	82.1	75.0	56.8	55.9	57.7	59.6	83.4	98.5																							
19-Oct	62.2	66.3	69.7	66.6	65.7	68.2	74.1	70.4	61.3	56.8	49.8	43.9	40.4	37.3	37.5	39.5	40.0	39.6	41.8	47.7	55.4	54.6	58.9	69.5	54.9	74.1																							
20-Oct	68.5	69.8	69.4	70.9	66.5	65.5	64.6	62.0	59.7	52.7	46.2	43.6	42.1	38.8	35.0	32.4	34.1	59.6	66.4	68.7	69.2	70.2	77.0	89.9	59.3	89.9																							
21-Oct	91.6	92.2	93.5	91.9	89.1	86.8	84.4	83.5	81.4	78.0	73.0	67.4	65.8	63.2	77.0	81.8	79.2	76.3	83.9	89.5	88.2	89.1	85.7	84.5	82.4	93.5																							
22-Oct	85.3	85.9	87.3	90.3	91.5	91.8	89.4	87.9	84.3	78.9	78.8	72.6	63.9	58.7	54.8	55.7	52.8	53.6	58.3	63.3	62.2	59.3	64.8	65.8	72.4	91.8																							
23-Oct	67.4	72.4	75.1	73.0	73.5	76.2	75.3	74.0	67.3	60.6	49.5	44.2	41.6	38.3	37.6	39.0	40.9	45.7	49.2	51.3	53.1	53.9	56.2	59.6	57.3	76.2																							
24-Oct	64.0	67.1	69.1	68.1	66.7	67.9	69.1	68.6	66.3	60.7	54.7	54.7	55.5	54.5	56.1	54.8	55.5	58.2	60.4	62.1	61.2	61.8	62.5	62.7	61.8	69.1																							
25-Oct	63.0	63.4	62.7	63.2	63.0	63.4	64.2	64.1	63.0	60.9	55.3	49.9	46.1	44.3	40.5	41.6	42.9	44.1	48.0	59.3	71.1	75.7	82.4	84.3	59.0	84.3																							
26-Oct	84.6	85.2	86.7	85.5	84.6	84.6	85.1	87.7	88.6	84.7	85.6	81.6	78.8	76.0	70.7	68.0	72.8	72.4	66.4	64.8	65.7	68.1	73.4	80.4	78.4	88.6																							
27-Oct	91.4	88.8	88.9	92.8	92.6	90.1	89.0	89.0	88.8	86.4	83.6	75.3	70.8	67.0	60.1	60.1	61.5	59.9	57.4	60.2	62.3	64.5	69.8	72.1	75.9	92.8																							
28-Oct	71.7	71.5	71.4	77.4	86.6	88.0	88.6	87.5	84.3	86.0	87.8	78.1	71.6	67.2	65.2	63.3	64.5	66.9	72.4	75.3	78.0	79.2	78.7	78.3	76.7	88.6																							
29-Oct	73.6	64.9	64.2	65.1	67.0	62.8	61.3	60.4	61.9	60.7	60.5	60.0	59.7	55.8	54.2	52.5	54.6	62.5	63.8	69.8	73.2	77.3	81.1	80.3	64.5	81.1																							
30-Oct	79.8	76.1	77.3	78.9	83.3	87.0	89.6	91.1	89.9	82.2	75.1	66.1	57.4	54.1	53.1	54.4	56.3	57.8	60.4	62.9	65.3	67.3	72.6	83.8	71.7	91.1																							
31-Oct	91.7	94.2	94.4	94.6	91.2	90.5	90.5	91.4	91.9	90.4	88.1	84.4	81.5	78.5	77.4	74.5	78.6	82.4	84.3	85.4	86.2	88.0	88.9	89.7	87.0	94.6																							
																								77.2	78.2	79.6	80.6	80.9	81.4	82.0	81.2	77.3	72.5	67.6	62.7	59.6	56.6	54.5	53.9	55.2	58.9	62.6	65.8	67.9	69.7	72.1	74.9	Diurnal Average	
																								98.0	98.2	98.3	98.4	98.4	98.5	98.5	98.5	98.5	98.3	94.4	95.6	95.0	88.0	84.2	83.8	88.6	92.7	94.6	95.7	96.9	97.4	97.6	97.8	Diurnal Maximum	





Maximum Speed: 27 km/h on Oct 21 17:00	Maximum Daily Speed Average: 15.2 km/h on Oct 24	Hours in Service: 744
Minimum Speed Value: 1 km/h on Oct 3 03:00	Minimum Daily Speed Average: 1.8 km/h on Oct 31	Hours of Data: 744
Maximum Diurnal Speed Average: 3.3 km/h at hour 5	Minimum Diurnal Speed Average: 1.2 km/h at hour 19	Hours of Missing Data: 0
Monthly Average Velocity: 2.4 km/h 222.4 deg	Percentiles: P ₁ = 2 P ₁₀ = 5 Q ₁ = 7 Median = 10 Q ₃ = 13 P ₉₀ = 17 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-Oct	SSE4	SSE5	SE9	SSE9	SSE9	SSE9	SSE8	SSE7	SSE9	S11	S14	S15	S15	S15	S14	SSE14	SSE13	SSE10	SSE9	SSE10	SSE10	SSE11	SSE10	SSE10	SSE10.2	S15
2-Oct	SSE7	SE9	SE7	SSE7	SE7	SSE8	SSE8	SSE7	SSE8	SSE9	SSE8	SSE7	SSE6	S7	SSW4	SSW5	SSW4	SSE4	SE6	SE5	SSE6	SSE5	SSW4	SW2	SSE5.8	SSE9
3-Oct	SSE5	SSW4	SW1	S5	S5	SSE7	SSE6	SSE4	SSE4	S3	W4	WSW6	WNW10	NW7	WNW8	WNW6	WSW7	SSW6	S5	S6	SSE7	SE8	SE9	SE10	S3.2	SE10
4-Oct	SE8	SSE4	SE6	S6	SSW8	W10	W10	WNW8	WNW10	WNW14	NW16	NW16	NW12	NW19	NW18	NW18	NW23	NW25	WNW21	WNW22	WNW27	WNW24	WNW19	NW17	WNW12.6	WNW27
5-Oct	NW18	NW18	NW15	NW13	NW19	NW23	NW23	NW23	NW23	NW23	NW23	NW22	NW22	NW22	NW18	NW19	NW19	NW15	W9	SW6	SSE6	SE8	SE8	SSE8	NW13.8	NW23
6-Oct	SE7	SSE7	SSE8	SSE6	SE8	SSE9	S10	SSE9	SSE10	SSE11	SSE11	SSE10	S12	S12	S10	SSW9	S6	SSE4	SSE6	SSE6	SW5	W12	W10	WNW10	S6.6	W12
7-Oct	W10	WNW8	WNW8	W11	W9	WSW3	WSW6	SSE5	S4	SSE1	ESE5	ESE5	ESE6	ESE4	ESE5	ESE7	ESE6	SE5	SE6	SE6	SSE5	SSE6	SSE7	SSE7	S2.1	W11
8-Oct	SSE7	SSE9	SE9	SSE7	SSE9	SE9	SSE10	SSE11	SE12	SSE12	SSE11	SSE13	SSE13	SSE13	SSE11	SSW11	S10	SSE10	SSE9	SSE7	SE5	SE6	SSE5	SSE4	SSE9.1	SSE13
9-Oct	SSE6	SSE5	SSE7	SSE7	SSE10	SSE7	SSE8	SSE8	SSE8	SSE8	SE10	ESE13	ESE12	ESE15	ESE15	ESE13	ESE10	SE10	SE12	SE13	SE12	SE12	SE10	SE10	SE9.7	ESE15
10-Oct	SE9	SE11	SE10	SSE10	SSE10	SSE9	SSE10	SE9	SE11	SE12	ESE13	ESE14	ESE16	ESE16	ESE14	ESE14	ESE13	ESE11	SE12	SE9	SE10	SE13	SE13	SE13	SE11.6	ESE16
11-Oct	SE12	SE14	SE14	SE13	SE13	SE12	SE8	SE11	SE12	SE14	SE12	ESE12	ESE14	ESE15	ESE16	ESE16	ESE14	ESE12	SE10	SE11	SE9	SE10	SE11	SSE10	SE12.1	ESE16
12-Oct	SSE10	SSE9	SSE8	SSE4	S4	SSE5	SSE5	SSE7	SSE7	SSE8	SSE9	SSE11	SSE11	S9	SSE8	S9	S9	S6	SE6	SSE5	SSE5	SSE7	SSE7	S6	SSE7.1	SSE11
13-Oct	SSE5	SSE7	SSE7	SSE9	SSE9	SSE9	SSE9	SE8	SE10	SE9	SE11	SSE10	SSE11	SE13	SE13	SE12	SE10	SE10	SE12	SE10	SE10	SE11	SE11	SE11	SE9.8	SE13
14-Oct	SE11	SE10	SE10	SSE10	SSE13	SSE14	SSE14	SSE11	SSE13	SE13	SE17	SE16	SE16	SE18	SE19	SE17	SE17	SSE17	SSE16	SSE13	SSE12	SSE10	SSE11	SSE12	SSE13.7	SE19
15-Oct	SE12	SE12	SE11	SSE10	SSE7	SSE7	SSE7	SSE8	SSE7	SSE11	SE10	SSE9	SSE10	SSE9	SSE10	SSE8	SSE7	SSE5	SSE6	SSE7	SSE7	SSE7	SSE7	SSE7	SSE8.4	SE12
16-Oct	SSE7	SSE7	SSE7	SSE5	S3	SSE6	SE6	SE7	SSE6	SE6	SSE6	S6	SW8	W9	WSW5	SW4	NNE2	SE5	SSE6	SE8	SE6	S6	ESE3	NE5	SSE4.0	W9
17-Oct	S2	NNW4	NNW5	NNW5	N5	NNW5	NNW7	N10	N12	N11	N12	NNW13	NNW14	N12	N13	N13	N12	N12	N11	N9	NNE6	NE2	SSE2	SE4	N7.6	NNW14
18-Oct	S6	S7	SSE6	SSE7	SSE7	S7	SSE6	SSE7	SSE8	SSE8	SSE8	SSE9	SSE10	SSE11	SSE11	SSE11	SE10	SSE7	S6	SSW8	SW11	WSW13	WSW14	WSW12	S7.4	WSW14
19-Oct	WSW10	W8	NW5	SW9	SSW8	SSW8	SE7	SSW6	SW7	WSW10	W18	WSW17	WSW16	WSW15	WSW14	SW12	SW12	SW12	SW9	W5	WSW15	W21	W16	SW12	WSW10.4	W21
20-Oct	WSW19	WSW22	W17	W13	WSW21	WSW21	WSW21	WSW21	WSW27	W23	WNW20	NW18	NW19	NW19	NNW17	NNW17	NNW16	NNE11	NNE10	NNE8	NNE3	NNE4	ESE2	S5	WNW11.4	WSW27
21-Oct	SSE6	SSE6	SSE5	SSE6	SSE7	SSE7	SSE7	SE9	SE10	SE12	S8	S4	N5	N13	N26	N26	N27	N27	N25	N23	N18	N13	N17	N15	N6.7	N27
22-Oct	N14	N13	NNE8	ESE7	ESE7	ESE6	ESE6	ESE6	E3	SE2	N3	N6	N6	N6	N9	NNE7	NNE3	NE4	WNW7	W10	NW14	NW14	NW13	NW15	N5.5	NW15
23-Oct	NW13	NW12	NW13	NW12	W12	W7	W10	WSW7	W10	W18	WNW20	WNW22	WNW18	NW19	WNW19	WNW18	WNW17	WNW15	WNW14	WNW13	W16	W19	W16	WSW12	WNW13.9	WNW22
24-Oct	W8	W5	W7	WSW14	WSW17	W17	W18	W14	W14	W14	W17	W15	W18	W21	WSW18	W18	W20	W19	W17	W16	WNW17	W14	WNW14	WNW15	W15.2	W21
25-Oct	WNW15	WNW13	WNW11	W11	W11	WSW8	WSW9	WSW8	WSW9	WSW11	WSW10	WSW13	WSW11	WSW14	W15	WSW12	WSW9	WSW10	WNW12	NW16	WNW11	W9	W10	W12	W10.5	NW16
26-Oct	WSW12	WSW11	WSW11	W13	W12	W13	W13	WSW11	W17	W15	W15	W13	WNW12	W12	W14	W12	WSW11	WSW12	W12	W13	W10	WSW9	SW7	WSW8	W11.7	W17
27-Oct	WSW8	WSW10	W8	N15	N11	N11	N13	N11	NNE8	NE5	N5	NW6	NNE6	N7	NW9	NW10	NW14	NW10	NNW9	NW3	SW6	SSW4	SE6	SSE5	NNW5.5	N15
28-Oct	SSE5	SSE5	SSE5	W9	W7	WSW5	WSW5	W8	WNW10	NW10	NW10	NW13	NNW12	NNW13	NW12	NW9	W7	W10	WNW9	WNW10	WNW10	NW10	NW12	NW11	WNW7.1	NNW13
29-Oct	NW11	NW13	NW13	WNW8	WNW10	WNW14	NW15	NW12	NW17	NW16	NW13	NNW12	NNW10	NW8	NW7	NW6	WNW4	W5	N3	NE4	NE6	NNE7	NNE5	N11	NW8.5	NW17
30-Oct	N12	N14	N11	NNE10	NNE9	NE8	ESE2	WSW2	SSW5	S5	S8	S9	SSW10	S11	S10	S9	SSE8	SSE8	SSE9	SSE7	SSE6	SSE5	SSE6	SE8	SSE2.8	N14
31-Oct	SSE6	SSE6	SE5	SSE4	W7	NNW10	NNW8	N10	N12	N11	N10	N7	NNE6	NE4	SE4	S3	SE3	NE6	ESE3	S2	SSW3	SSW5	S5	NNE1.8	N12	

SSW2.7 SW2.5SSW1.8SSW2.5 SW3.3SSW3.1 SW2.9SSW2.7 SW3.1 SW3.0 SW3.0WSW2.7WSW2.2WSW2.2WSW1.9WSW2.1WSW2.0 SW1.5 SW1.2 SW1.7 SW2.7 SW3.1SSW3.0SSW2.7	Diurnal Average
WSW19WSW22 W17 N15 WSW21 NW23 NW23 NW23 WSW27 NW23 NW23 NW23 NW22 NW22 N26 N26 N27 N27 N25 N23WNW27WNW24WNW19WNW17	Diurnal Maximum

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

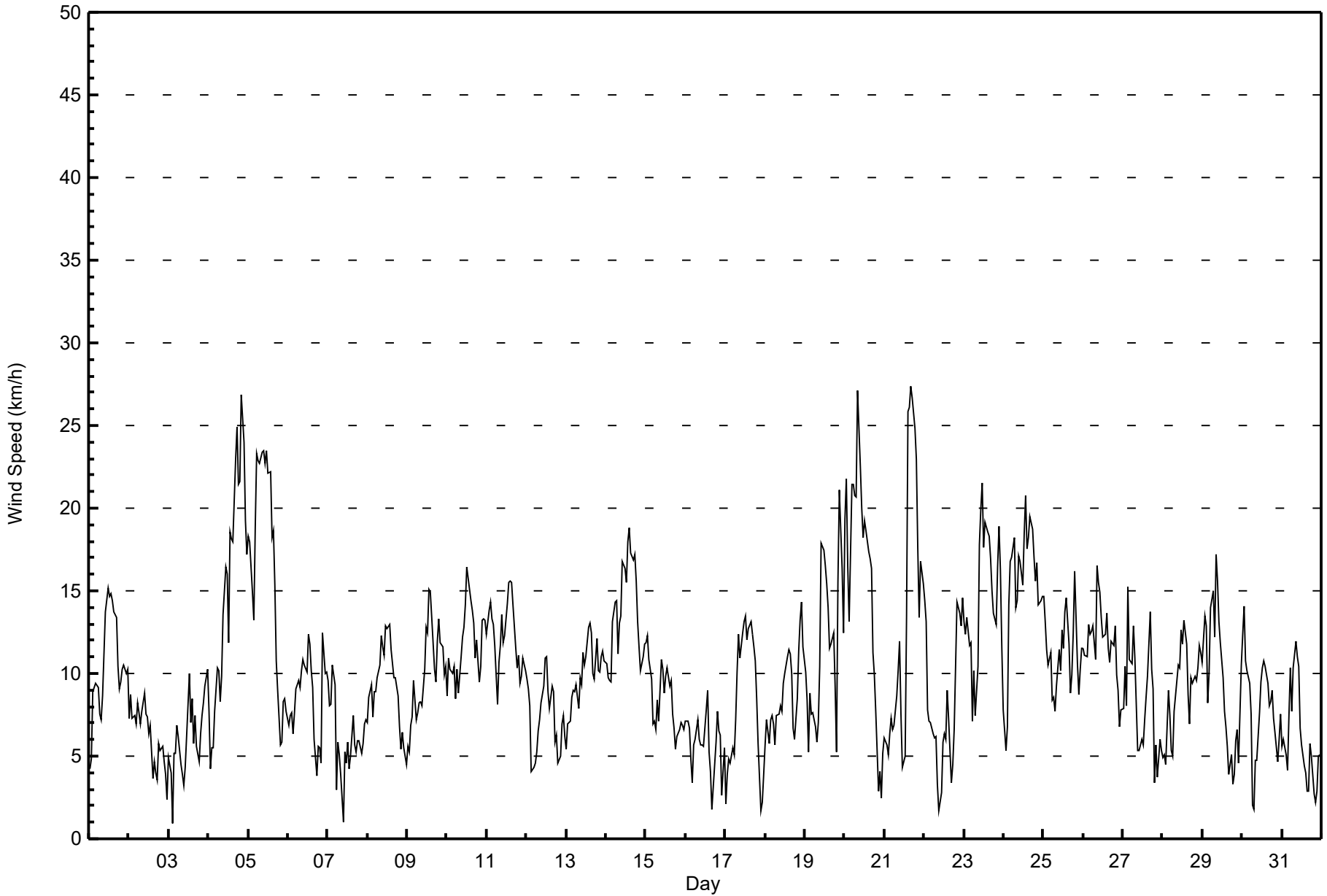
Wind Speed (WS) - km/h
Buffalo Viewpoint - October 2023

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



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	109	14.65	14.65
6 - 11	383	51.48	66.13
12 - 19	218	29.30	95.43
20 - 28	34	4.57	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 - October 2023

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	5	5	6	4	1	5	9	31	14	9	4	5	4	1	2	4	109
6 - 11	18	12	3	5	0	5	62	151	23	9	7	24	27	17	14	6	383
12 - 19	18	0	0	0	0	19	34	15	7	0	4	19	37	18	38	9	218
20 - 28	6	0	0	0	0	0	0	0	0	0	0	6	4	7	11	0	34
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	47	17	9	9	1	29	105	197	44	18	15	54	72	43	65	19	744

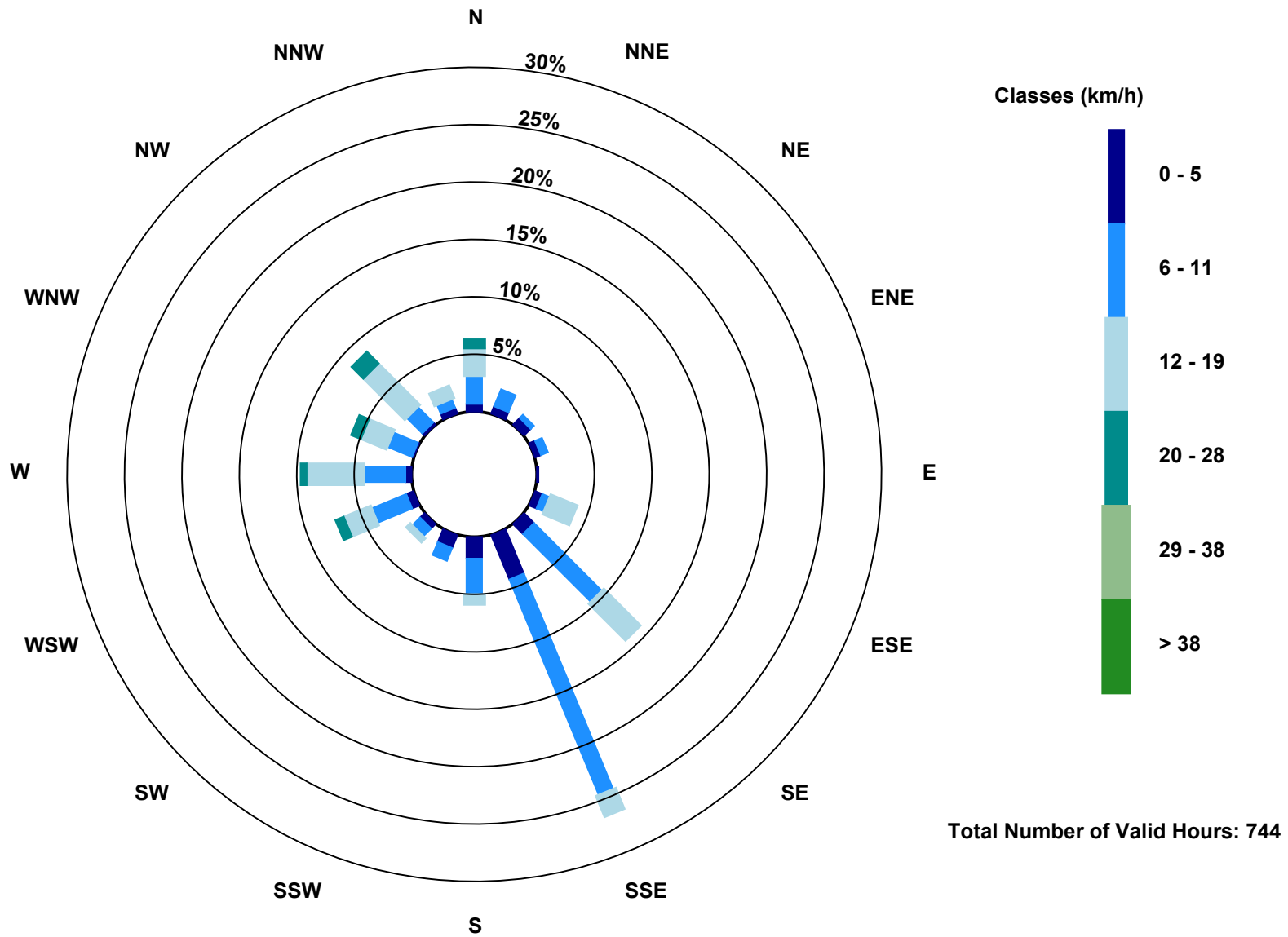
Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

Wind Speed (WS) - km/h
Buffalo Viewpoint





Wood Buffalo Environmental Association
Summary of Hour Averages

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

Direction of Maximum Speed: 356 deg on Oct 21 17:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 268.3 deg on Oct 24	Hours of Data: 744
Direction of Minimum Speed: 216 deg on Oct 3 03:00	Hours of Missing Data: 0
Direction of Minimum Daily Speed Average: 1.8 deg on Oct 31	Percent Operational Time: 100.0
Monthly Average Direction: 222.4 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-Oct	153	151	144	155	149	151	150	155	161	174	183	186	175	174	171	166	168	155	150	153	154	155	159	162	163.2
2-Oct	161	145	144	149	141	149	158	148	149	159	154	150	162	191	200	205	200	157	138	146	149	162	196	226	158.7
3-Oct	153	212	216	175	174	155	152	157	154	177	262	258	300	307	303	285	241	195	171	173	156	139	136	141	189.4
4-Oct	129	149	145	184	204	265	272	288	300	303	304	311	313	318	321	307	309	306	300	302	301	303	299	304	300.1
5-Oct	308	309	322	314	307	314	315	310	311	315	313	316	313	312	312	316	314	307	263	229	168	145	144	154	309.0
6-Oct	145	151	153	153	142	156	169	164	166	159	159	160	190	183	173	195	173	155	154	153	220	267	277	284	176.9
7-Oct	277	297	294	267	275	257	244	156	187	147	114	77	103	110	113	117	120	128	125	137	147	159	153	153	169.2
8-Oct	149	149	146	148	151	146	148	150	144	148	156	165	157	153	167	194	169	163	161	163	141	138	148	159	155.5
9-Oct	160	152	155	150	155	150	152	162	153	151	136	116	117	114	115	120	122	127	133	133	135	141	145	141	135.4
10-Oct	137	136	139	150	148	155	150	141	135	128	116	121	118	121	122	119	122	122	133	139	137	141	145	145	132.7
11-Oct	137	128	135	131	130	136	140	135	144	140	139	116	115	116	119	121	121	121	126	132	137	138	145	148	130.3
12-Oct	150	158	153	151	176	164	158	160	161	156	161	155	168	175	168	180	189	175	135	153	149	147	155	171	161.7
13-Oct	161	161	155	150	151	153	150	135	129	143	143	154	148	145	138	139	133	136	136	142	144	141	141	142	143.7
14-Oct	141	146	145	152	150	151	150	151	147	141	141	145	143	137	139	140	145	150	152	153	157	153	149	147	146.4
15-Oct	144	146	145	148	148	153	155	161	163	149	168	163	162	154	155	154	155	158	162	148	158	161	159	149	154.4
16-Oct	150	158	149	161	173	162	140	140	155	142	151	173	236	265	247	234	19	126	158	136	145	175	117	34	162.4
17-Oct	175	327	343	341	356	335	336	359	358	1	353	348	346	353	354	356	357	3	11	9	13	50	154	138	356.0
18-Oct	172	182	160	159	161	170	162	164	162	156	155	162	160	159	158	155	142	161	171	193	227	238	241	240	178.1
19-Oct	241	266	304	236	211	200	137	208	227	249	260	255	258	251	244	235	219	221	233	263	245	261	269	222	243.2
20-Oct	252	253	260	273	255	253	254	251	257	270	289	310	311	320	328	331	336	28	26	17	33	33	65	170	285.5
21-Oct	162	149	148	156	151	157	158	142	140	141	169	172	5	3	358	1	356	360	359	354	359	353	349	350	10.1
22-Oct	355	355	15	72	66	75	73	70	82	140	9	7	351	4	10	17	25	35	297	261	320	325	319	316	356.3
23-Oct	307	307	311	306	271	263	280	247	259	272	292	290	299	309	301	300	287	295	300	283	264	262	259	258	286.1
24-Oct	265	264	275	257	256	259	262	260	262	266	279	278	271	263	256	263	269	267	267	275	282	279	282	289	268.3
25-Oct	287	291	288	278	267	244	246	239	241	248	244	256	252	258	266	253	238	253	283	314	294	264	261	264	266.0
26-Oct	255	253	252	261	271	266	260	257	264	265	263	272	289	275	263	259	249	255	271	277	265	243	219	254	262.3
27-Oct	251	257	281	350	358	353	1	9	16	35	354	326	12	351	309	317	314	312	340	309	226	209	138	159	331.3
28-Oct	158	159	150	265	261	238	252	278	286	309	309	323	340	328	325	308	266	270	285	286	283	309	311	314	295.4
29-Oct	311	312	317	300	292	303	315	315	315	322	319	329	341	319	311	315	292	263	2	46	37	31	12	7	322.2
30-Oct	5	11	10	20	23	48	60	257	207	169	172	180	195	189	183	185	162	166	160	165	162	159	150	144	150.6
31-Oct	166	149	136	151	281	341	344	351	358	1	0	351	26	42	124	186	127	49	72	121	178	207	192	184	18.4

211.5 215.7 197.9 210.0 215.2 212.9 216.6 205.8 218.1 219.7 234.3 241.8 245.1 251.0 251.9 243.8 240.4 229.2 214.9 218.4 223.1 221.0 212.4 208.6
 Diurnal Average

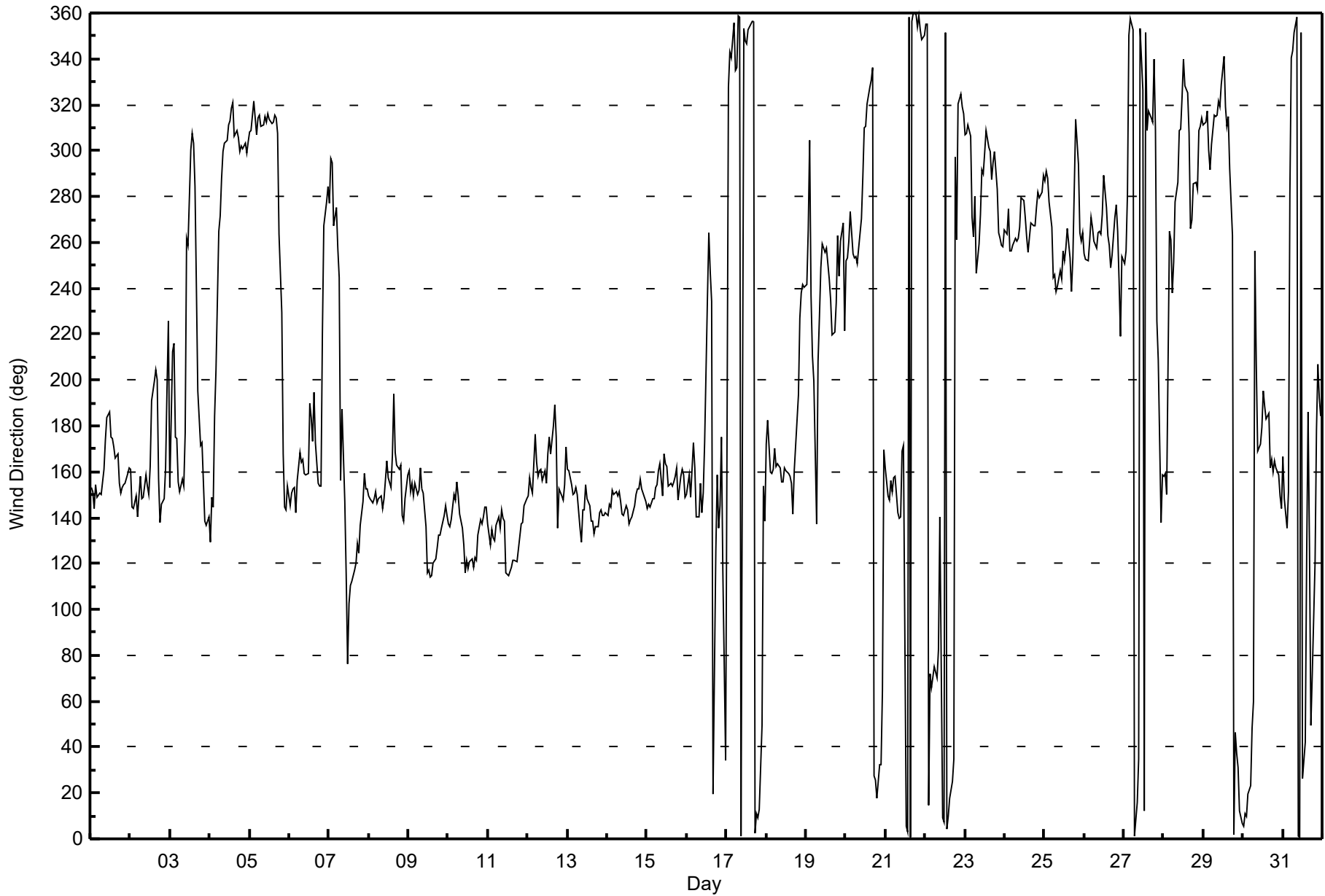
All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 98 deg on Oct 7 10:00 Minimum Value: 5 deg on Oct 16 19:00 Percentiles: P ₁ = 10 P ₁₀ = 15 Q ₁ = 19 Median = 23 Q ₃ = 28 P ₉₀ = 31 P ₉₉ = 66																		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-Oct	22	25	28	27	24	23	23	25	30	30	27	27	30	30	30	33	29	29	26	29	27	27	27	27	33
2-Oct	27	25	22	23	24	28	23	28	27	24	24	28	28	23	18	22	21	35	10	10	13	26	14	59	59
3-Oct	19	39	79	28	25	14	15	22	29	31	42	45	28	32	24	30	25	18	20	13	18	12	11	12	79
4-Oct	23	57	41	17	19	15	13	22	20	22	21	21	19	21	22	21	20	21	22	22	21	22	23	22	57
5-Oct	21	21	20	23	21	20	20	21	20	21	21	20	21	22	21	22	23	29	14	26	33	9	12	10	33
6-Oct	12	15	14	22	25	27	25	25	25	27	30	31	24	27	29	25	27	19	25	26	40	14	15	17	40
7-Oct	17	24	19	11	19	66	14	34	22	98	32	40	28	24	22	19	17	14	16	19	19	24	24	29	98
8-Oct	26	28	28	31	29	27	30	30	29	31	32	31	33	30	33	26	26	25	24	26	31	23	27	25	33
9-Oct	26	25	27	27	29	31	30	29	33	34	30	20	22	19	19	23	24	24	26	25	22	25	31	27	34
10-Oct	26	27	28	28	30	30	30	28	28	25	24	23	22	23	25	21	23	23	27	25	26	28	29	27	30
11-Oct	26	27	26	26	27	28	29	26	30	29	31	23	18	22	20	23	23	22	26	29	25	24	26	28	31
12-Oct	29	27	30	22	17	22	21	24	27	30	29	31	31	31	40	31	22	20	19	21	23	27	29	29	40
13-Oct	27	28	29	28	25	23	24	24	25	27	29	30	29	30	29	27	28	26	26	27	30	27	26	27	30
14-Oct	25	25	24	27	28	28	26	27	29	27	27	29	30	28	28	29	29	29	28	30	30	27	27	26	30
15-Oct	28	27	26	28	30	33	28	31	28	28	28	35	30	29	32	27	26	26	28	20	15	19	20	24	35
16-Oct	16	13	18	31	47	31	22	18	15	23	38	38	31	28	50	48	59	29	5	10	19	9	50	7	59
17-Oct	50	30	20	34	12	11	15	14	18	21	18	22	20	23	18	20	20	21	19	24	25	75	55	33	75
18-Oct	27	25	26	24	26	27	28	28	28	27	28	31	29	27	30	28	28	32	18	29	15	17	17	18	32
19-Oct	19	18	26	18	21	29	23	43	24	18	14	18	18	19	19	17	18	24	21	41	18	17	25	18	43
20-Oct	14	13	23	17	13	14	14	15	11	18	25	21	21	20	21	20	21	20	18	17	35	26	38	20	38
21-Oct	15	17	23	29	24	31	30	28	26	26	35	72	41	22	23	23	23	24	22	23	22	18	18	19	72
22-Oct	19	19	23	14	11	15	26	25	43	86	78	29	28	25	20	21	66	36	35	12	21	19	19	19	86
23-Oct	22	20	20	21	15	31	19	27	28	16	22	23	23	23	23	23	21	22	21	20	12	12	14	15	31
24-Oct	19	23	26	13	12	12	11	12	12	17	21	24	19	14	15	14	15	14	14	18	19	20	21	21	26
25-Oct	20	21	21	19	13	17	16	18	18	17	18	17	19	16	17	16	18	14	25	22	24	16	14	14	25
26-Oct	15	14	15	12	16	12	16	16	13	12	13	17	22	22	17	19	16	11	16	18	19	17	15	23	23
27-Oct	19	14	24	28	20	19	19	18	20	24	48	38	25	30	24	23	20	22	26	54	19	33	8	16	54
28-Oct	23	18	37	15	16	25	17	23	20	20	20	21	24	20	20	23	24	15	18	18	18	20	19	18	37
29-Oct	20	20	20	24	20	21	20	20	20	21	20	22	24	27	23	23	21	16	51	23	14	13	18	17	51
30-Oct	20	21	20	20	15	20	87	45	15	25	32	27	25	25	24	24	27	25	26	27	26	32	24	21	87
31-Oct	32	28	19	20	22	19	20	21	19	21	20	27	25	35	29	32	23	18	21	45	41	35	22	18	45
Diurnal Maximum																									





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

**AMS05
MANNIX
OCTOBER 2023**

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

November 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MANNIX (AMS05)
OCTOBER 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	48.7	0	8.9	0
H2S (ppb) Average	706	37	38	99.87	10	0	2	0
THC (ppm) Average	708	35	36	99.87	4.4	-	2.6	-
NMHC(ppm) Average	708	35	36	99.87	0.791	-	0.188	-
CH4(ppm) Average	708	35	36	99.87	3.6	-	2.4	-
Temperature 2 m (C) Average	744	0	0	100	24.6	-	15.3	-
Temperature 20 m (C) Average	744	0	0	100	24.6	-	15.8	-
Temperature 45 m (C) Average	744	0	0	100	24.3	-	15.8	-
Temperature 75 m (C) Average	744	0	0	100	24.1	-	15.7	-
Temperature 90 m (C) Average	744	0	0	100	24	-	15.8	-
Relative Humidity 2 m (%) Average	744	0	0	100	98	-	89	-
Relative Humidity 20 m (%) Average	744	0	0	100	100	-	87	-
Relative Humidity 45 m (%) Average	744	0	0	100	99	-	87	-
Relative Humidity 75 m (%) Average	724	0	20	97.31	99	-	90	-
Relative Humidity 90 m (%) Average	729	0	15	97.98	100	-	87	-
Wind Speed 20 m (km/h) Average	740	0	4	99.46	34	-	22	-
Wind Speed 45 m (km/h) Average	736	0	8	98.92	41	-	29	-
Wind Speed 75 m (km/h) Average	737	0	7	99.06	44	-	33	-
Wind Speed 90 m (km/h) Average	740	0	4	99.46	45	-	34	-
Wind Direction 20 m (deg) Average	740	0	4	99.46	-	-	-	-
Wind Direction 45 m (deg) Average	736	0	8	98.92	-	-	-	-
Wind Direction 75 m (deg) Average	737	0	7	99.06	-	-	-	-
Wind Direction 90 m (deg) Average	740	0	4	99.46	-	-	-	-
Vertical Wind Speed 20 m (km/h) Average	740	0	4	99.46	1.5	-	1.1	-
Vertical Wind Speed 45 m (km/h) Average	736	0	8	98.92	1.5	-	1	-
Vertical Wind Speed 75 m (km/h) Average	737	0	7	99.06	1.3	-	0.6	-
Vertical Wind Speed 90 m (km/h) Average	740	0	4	99.46	2.2	-	0.6	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MANNIX (AMS05)

OCTOBER 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	0.92	3.1	-	0	0	0.1	0.1	0.3	2	48.7
H2S (ppb) Average	706	0.25	0.5	-	0	0.1	0.1	0.1	0.2	0.5	9.9
THC (ppm) Average	708	2.11	0.2	-	2	2	2	2.1	2.1	2.2	4.4
NMHC(ppm) Average	708	0.027	0.082	-	0	0	0	0	0	0.1	0.791
CH4(ppm) Average	708	2.09	0.1	-	2	2	2	2.1	2.1	2.2	3.6
Temperature 2 m (C) Average	744	4.62	7.6	-	-11.2	-5.5	-2.4	5.7	10.3	14	24.6
Temperature 20 m (C) Average	744	4.92	7.7	-	-10.8	-5.5	-2.4	6.5	10.8	14.3	24.6
Temperature 45 m (C) Average	744	4.87	7.8	-	-11	-5.8	-2.5	6.7	10.8	14.2	24.3
Temperature 75 m (C) Average	744	4.84	7.8	-	-11.1	-6	-2.6	6.8	10.8	14.4	24.1
Temperature 90 m (C) Average	744	4.93	7.8	-	-11.1	-5.9	-2.5	7.1	10.9	14.4	24
Relative Humidity 2 m (%) Average	744	70.5	16	-	27	49	60	71	84	91	98
Relative Humidity 20 m (%) Average	744	68.1	15	-	26	48	57	68	80	89	100
Relative Humidity 45 m (%) Average	744	67.4	15	-	25	47	57	66	79	88	99
Relative Humidity 75 m (%) Average	724	67	15	-	25	48	56	65	77	89	99
Relative Humidity 90 m (%) Average	729	66.2	15	-	25	47	56	65	77	88	100
Wind Speed 20 m (km/h) Average	740	13.7	6	-	1	6	9	13	18	22	34
Wind Speed 45 m (km/h) Average	736	18.2	7	-	1	8	13	19	23	27	41
Wind Speed 75 m (km/h) Average	737	20.1	8	-	1	9	14	21	25	30	44
Wind Speed 90 m (km/h) Average	740	21.2	9	-	1	9	15	22	27	32	45
Wind Direction 20 m (deg) Average	740	-	-	-	-	-	-	-	-	-	-
Wind Direction 45 m (deg) Average	736	-	-	-	-	-	-	-	-	-	-
Wind Direction 75 m (deg) Average	737	-	-	-	-	-	-	-	-	-	-
Wind Direction 90 m (deg) Average	740	-	-	-	-	-	-	-	-	-	-
Vertical Wind Speed 20 m (km/h) Average	740	0.22	0.5	-	-1.7	-0.5	-0.2	0.2	0.7	0.9	1.5
Vertical Wind Speed 45 m (km/h) Average	736	0.04	0.6	-	-1.3	-0.6	-0.4	0	0.5	0.8	1.5
Vertical Wind Speed 75 m (km/h) Average	737	0.09	0.4	-	-1.1	-0.5	-0.1	0.1	0.3	0.5	1.3
Vertical Wind Speed 90 m (km/h) Average	740	-0.09	0.5	-	-1.5	-0.7	-0.4	-0.1	0.2	0.5	2.2

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MANNIX (AMS05)
OCTOBER 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
AIR QUALITY ANALYZERS	26 Oct 2023 11:00	26 Oct 2023 11:00	1	Maintenance - sample manifold cleaned
Relative Humidity 75 m	02 Oct 2023 12:00	02 Oct 2023 13:00	2	Sensor operated out of range
Relative Humidity 75 m	03 Oct 2023 02:00	03 Oct 2023 02:00	1	Sensor operated out of range
Relative Humidity 75 m	05 Oct 2023 02:00	05 Oct 2023 05:00	4	Sensor operated out of range
Relative Humidity 75 m	13 Oct 2023 09:00	13 Oct 2023 09:00	1	Sensor operated out of range
Relative Humidity 75 m	17 Oct 2023 18:00	18 Oct 2023 05:00	12	Sensor operated out of range
Relative Humidity 90m	02 Oct 2023 12:00	02 Oct 2023 14:00	3	Sensor operated out of range
Relative Humidity 90m	03 Oct 2023 02:00	03 Oct 2023 02:00	1	Sensor operated out of range
Relative Humidity 90m	17 Oct 2023 18:00	18 Oct 2023 04:00	11	Sensor operated out of range
Wind Speed, Wind Direction, Vertical Wind Speed 20m and 90m	05 Oct 2023 03:00	05 Oct 2023 06:00	4	Flat line in sensor output signal
Wind Speed, Wind Direction, Vertical Wind Speed 45m	05 Oct 2023 03:00	05 Oct 2023 10:00	8	Flat line in sensor output signal
Wind Speed, Wind Direction, Vertical Wind Speed 75m	05 Oct 2023 03:00	05 Oct 2023 09:00	7	Flat line in sensor output signal

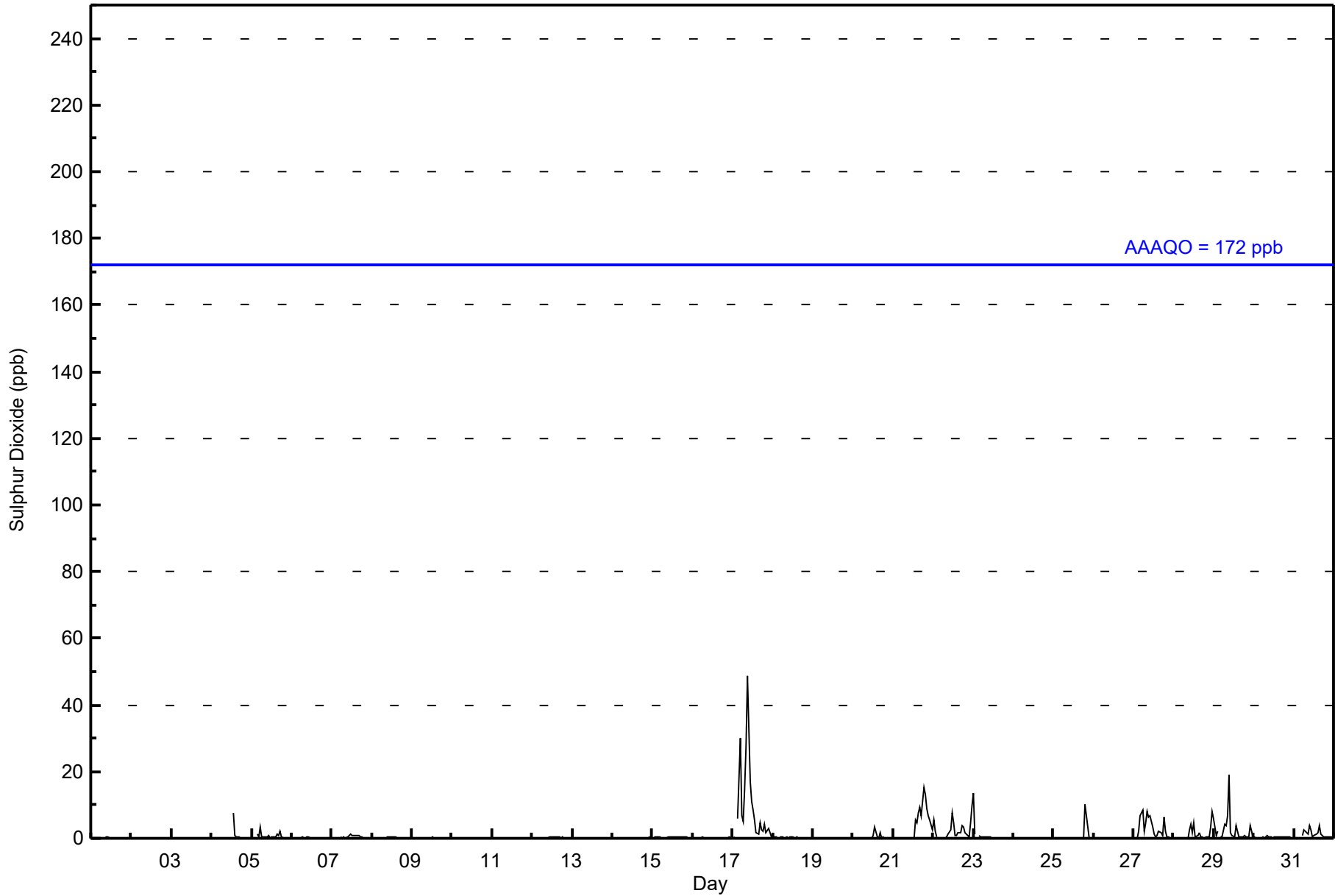


Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 744																	744																											
Maximum Value: 48.7 ppb on Oct 17 10:00		Maximum Daily Average: 8.9 ppb on Oct 17																	Hours of Data: 708																													
Minimum Value: 0.0 ppb on Oct 2 18:00		Minimum Daily Average: 0.0 ppb on Oct 26																	Hours of Missing Data: 36																													
Maximum Diurnal Average: 2.8 ppb at hour 10		Minimum Diurnal Average: 0.2 ppb at hour 3																	Hours of Calibration: 35																													
Monthly Average: 0.92 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.1 Q ₃ = 0.3 P ₉₀ = 2.0 P ₉₉ = 13.5																	Percent Operational Time: 99.9																													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Oct	0.2	0.1	0.1	0.1	Z	0.1	0.2	0.1	0.2	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.3																						
2-Oct	0.1	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	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1																						
3-Oct	Z	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.1																						
4-Oct	0.1	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	C	C	C	C	7.6	0.7	0.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5																						
5-Oct	0.2	0.2	Z	1.4	0.2	3.3	0.4	0.2	0.5	0.5	1.0	0.2	0.3	0.4	0.4	1.2	1.0	2.0	0.2	0.1	0.1	0.1	0.1	0.1	0.6	3.3																						
6-Oct	0.1	0.1	0.1	Z	0.1	0.1	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.0	0.1	0.0	0.2	0.3																						
7-Oct	0.0	0.0	0.0	0.0	Z	0.3	0.2	0.2	0.1	0.3	0.7	1.4	0.8	1.0	0.8	0.7	0.7	0.4	0.2	0.2	0.1	0.1	0.1	0.2	0.4	1.4																						
8-Oct	0.1	0.1	0.1	0.2	0.2	Z	0.2	0.1	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.2	0.4																						
9-Oct	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.2																						
10-Oct	0.1	Z	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.2																						
11-Oct	0.1	0.1	Z	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.2																						
12-Oct	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.0	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.2	0.3																						
13-Oct	0.0	0.0	0.0	0.0	Z	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.2	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2																						
14-Oct	0.0	0.0	0.0	0.0	0.1	Z	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	0.2	0.2	0.2	0.2	0.2																						
15-Oct	Z	0.3	0.3	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.3																						
16-Oct	0.1	Z	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2																						
17-Oct	0.2	0.3	Z	5.9	30.3	6.9	5.2	14.9	27.7	48.7	17.0	11.1	8.6	5.4	1.5	1.1	4.5	2.3	2.2	4.2	1.6	3.0	1.7	0.6	8.9	48.7																						
18-Oct	0.3	0.3	0.3	Z	0.2	0.3	0.3	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.3																						
19-Oct	0.1	0.1	0.1	0.0	Z	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1																						
20-Oct	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	0.9	3.5	0.6	0.1	1.5	0.0	0.3	0.0	0.0	0.0	0.0	0.2	3.5																						
21-Oct	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.2	0.2	5.7	4.8	7.8	9.2	6.8	15.1	13.0	8.7	6.9	5.5	2.6	3.8	15.1																						
22-Oct	5.3	2.2	0.3	Z	0.1	0.1	0.1	0.2	0.2	1.2	2.5	7.6	4.8	0.7	1.1	1.6	1.6	4.0	3.6	1.8	1.4	0.6	4.5	9.9	9.9																							
23-Oct	13.5	1.1	Z	0.7	0.3	0.3	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.8	13.5																						
24-Oct	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	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1																						
25-Oct	0.1	0.1	0.2	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	10.2	3.5	0.2	0.1	0.1	0.6	10.2																						
26-Oct	0.1	0.0	0.0	0.1	0.0	Z	0.0	0.0	0.1	0.1	M	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1																						
27-Oct	Z	0.0	0.0	2.3	6.6	8.4	2.2	4.8	8.1	6.2	7.0	3.3	1.1	0.5	0.7	2.0	1.7	1.0	6.2	2.0	0.4	0.2	0.2	0.2	2.8	8.4																						
28-Oct	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	2.6	4.3	1.5	4.7	0.6	1.0	1.8	0.3	0.2	0.2	0.3	0.2	0.2	3.5	8.1	8.1																							
29-Oct	5.8	1.0	1.9	Z	0.4	0.5	4.2	3.9	6.6	19.2	1.6	1.1	0.4	3.8	2.3	0.3	0.3	0.3	0.8	0.4	0.3	0.3	3.7	0.6	2.6	19.2																						
30-Oct	0.2	0.2	0.1	Z	0.2	0.4	0.1	0.4	0.8	0.4	0.4	0.2	0.3	0.4	0.3	0.3	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.3	0.8																					
31-Oct	0.2	0.2	0.2	0.2	Z	0.8	2.6	2.1	1.4	3.8	2.7	0.6	0.8	1.1	1.8	3.8	1.4	0.9	0.3	0.5	0.4	0.4	0.3	0.3	1.2	3.8																						
																								1.1	0.2	0.2	0.5	1.6	0.9	0.6	0.9	1.5	2.8	1.4	1.0	0.9	1.1	0.6	0.7	0.8	0.6	1.0	1.1	0.6	0.4	0.7	0.8	Diurnal Average
																								13.5	2.2	1.9	5.9	30.3	8.4	5.2	14.9	27.7	48.7	17.0	11.1	8.6	7.6	4.8	7.8	9.2	6.8	15.1	13.0	8.7	6.9	5.5	9.9	Diurnal Maximum
Z - zerospan C - Calibration M - Maintenance																																																
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb																																																



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Mannix - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Mannix - October 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	698	98.59	98.59
11 - 20	7	0.99	99.58
21 - 60	3	0.42	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

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

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	26	18	5	3	4	6	172	155	31	11	19	44	89	59	20	33	695
11 - 20	3	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	7
21 - 60	3	0	0	0	0	0	0	0	0	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	32	18	5	3	4	6	172	155	31	11	19	44	89	60	21	35	705

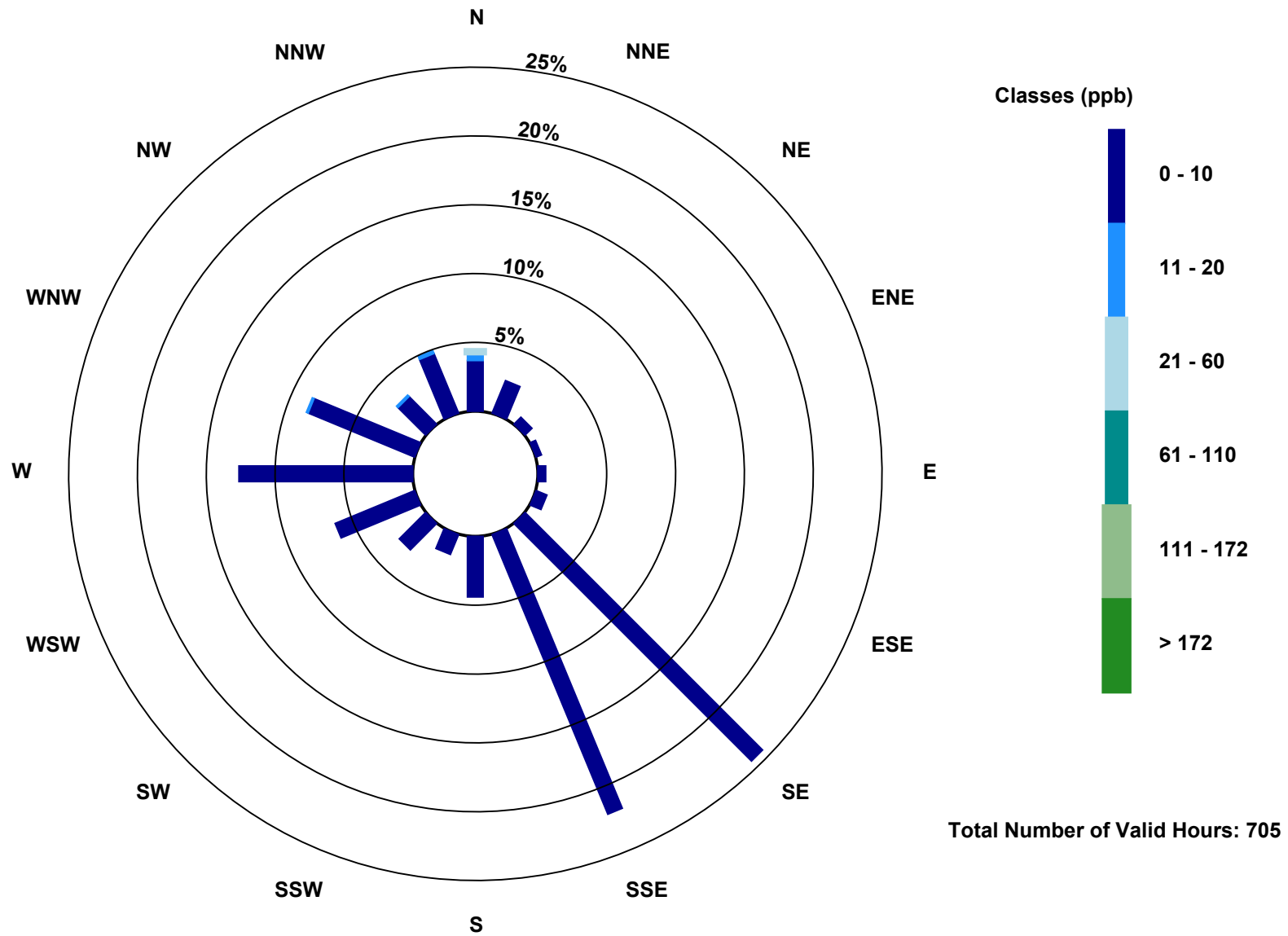
Total Number of Valid Hours: 705

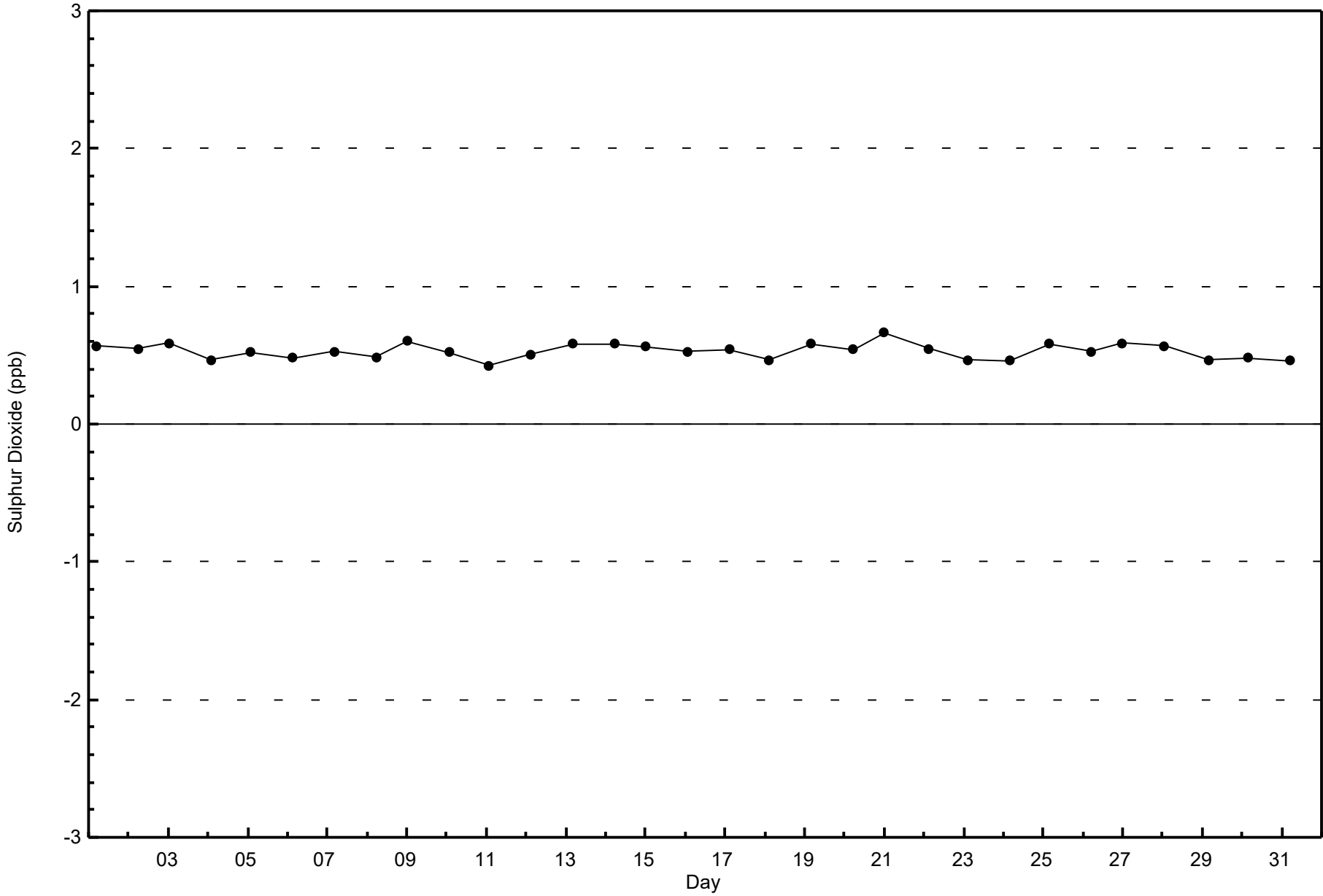
Total Number of Hours: 744

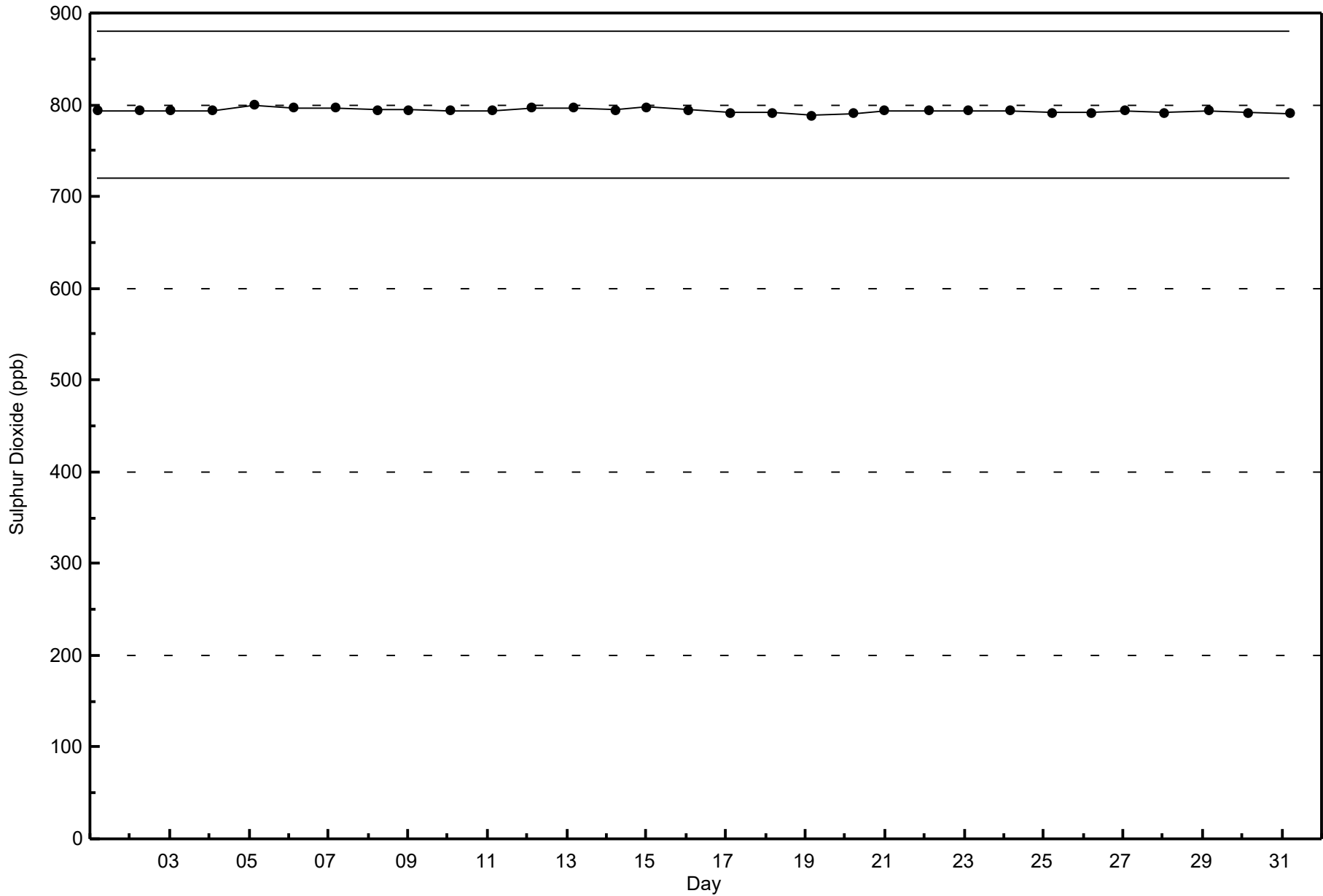


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Sulphur Dioxide (SO₂) - ppb
Mannix

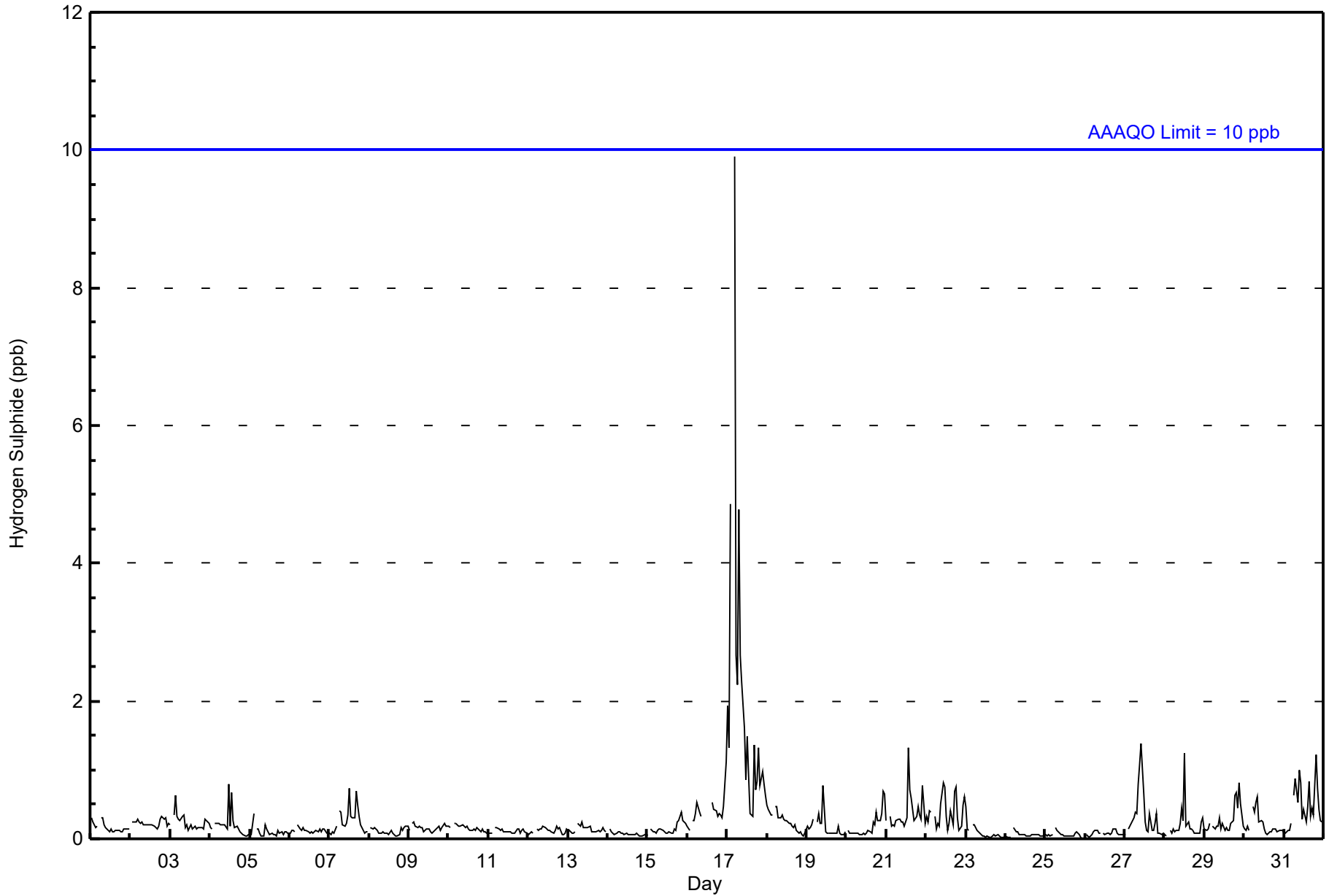








Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	744					
Maximum Value: 9.9 ppb on Oct 17 05:00		Maximum Daily Average: 2.0 ppb on Oct 17																	Hours of Data:	706							
Minimum Value: 0.0 ppb on Oct 25 23:00		Minimum Daily Average: 0.1 ppb on Oct 25																	Hours of Missing Data:	38							
Maximum Diurnal Average: 0.6 ppb at hour 5		Minimum Diurnal Average: 0.2 ppb at hour 15																	Hours of Calibration:	37							
Monthly Average: 0.25 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.1 Median = 0.1 Q ₃ = 0.2 P ₉₀ = 0.5 P ₉₉ = 1.9																	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-Oct	0.3	0.2	0.2	0.2	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	0.1	0.1	0.1	0.2	0.3	
2-Oct	Z	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	0.1	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3
3-Oct	0.2	Z	0.3	0.6	0.3	0.3	0.3	0.3	0.4	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.3	0.3	0.2	0.2	0.6	
4-Oct	0.2	0.1	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.8	0.2	0.7	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.8	
5-Oct	0.1	0.1	0.4	Z	0.1	0.2	0.1	0.0	0.0	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4	
6-Oct	0.1	0.1	0.1	0.1	Z	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	
7-Oct	0.1	0.1	0.1	0.1	0.2	Z	0.4	0.4	0.2	0.2	0.2	0.3	0.7	0.3	0.3	0.3	0.7	0.5	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.7	
8-Oct	Z	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	0.1	0.0	0.0	0.1	0.2	0.1	0.2	0.2	0.2	0.1	0.2	
9-Oct	0.1	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	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	
10-Oct	0.2	0.2	Z	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	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	
11-Oct	0.1	0.1	0.1	Z	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	
12-Oct	0.1	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	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2	
13-Oct	0.1	0.1	0.1	0.1	0.1	Z	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.3	
14-Oct	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	0.0	0.1	0.1	0.1	0.1	
15-Oct	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	0.2	0.1	0.2	0.3	0.4	0.3	0.2	0.2	0.1	0.4	
16-Oct	0.2	0.1	Z	0.3	0.3	0.4	0.5	0.4	0.3	C	C	C	C	C	C	0.5	0.4	0.4	0.3	0.4	0.3	0.3	0.5	1.1	--	1.1	
17-Oct	1.9	1.3	4.9	Z	9.9	2.7	2.2	4.8	2.7	2.3	1.6	0.8	1.5	0.9	0.4	0.3	1.4	0.7	0.8	1.3	0.8	1.0	0.8	0.6	2.0	9.9	
18-Oct	0.5	0.4	0.4	0.3	Z	0.5	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.3	0.5	
19-Oct	0.2	0.1	0.2	0.2	0.3	Z	0.2	0.4	0.2	0.2	0.8	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.8	
20-Oct	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.3	0.3	0.4	0.7	0.6	0.2	0.7	
21-Oct	0.3	Z	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.3	1.3	0.7	0.6	0.4	0.3	0.3	0.5	0.3	0.3	0.8	0.2	0.4	1.3	
22-Oct	0.3	0.2	0.4	0.4	Z	0.3	0.1	0.2	0.2	0.5	0.8	0.8	0.3	0.1	0.2	0.4	0.2	0.7	0.7	0.3	0.1	0.2	0.5	0.6	0.4	0.8	
23-Oct	0.5	0.1	0.1	Z	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.5	
24-Oct	0.0	0.0	0.0	0.0	Z	0.2	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	0.1	0.1	0.0	0.0	0.1	0.1	0.2	
25-Oct	0.1	0.0	0.1	0.0	0.1	Z	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.2	
26-Oct	Z	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	M	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
27-Oct	0.1	Z	0.1	0.2	0.2	0.3	0.4	0.4	0.8	1.1	1.4	0.6	0.3	0.1	0.1	0.4	0.1	0.1	0.2	0.4	0.1	0.1	0.1	0.1	0.1	0.3	
28-Oct	0.1	0.0	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.3	1.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.2	1.2	
29-Oct	0.1	0.1	0.1	0.2	Z	0.2	0.1	0.2	0.2	0.3	0.1	0.2	0.1	0.2	0.1	0.1	0.2	0.3	0.6	0.7	0.5	0.8	0.5	0.2	0.3	0.8	
30-Oct	0.1	0.1	0.2	0.1	Z	0.5	0.4	0.5	0.6	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	0.1	0.1	0.1	0.6	
31-Oct	0.1	0.1	0.1	0.1	0.2	Z	0.6	0.9	0.5	1.0	0.8	0.3	0.4	0.2	0.5	0.8	0.3	0.4	0.3	1.2	0.7	0.4	0.3	0.2	0.5	1.2	
																								Diurnal Average			
																								Diurnal Maximum			
																								1.9 1.3 4.9 0.6 9.9 2.7 2.2 4.8 2.7 2.3 1.6 0.8 1.5 1.3 0.7 0.8 1.4 0.7 0.8 1.3 0.8 1.0 0.8 1.1			
Z - zerospan C - Calibration M - Maintenance																											
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb																											





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	701	99.29	99.29
3 - 4	2	0.28	99.58
5 - 7	2	0.28	99.86
8 - 11	1	0.14	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
Mannix - October 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	28	18	6	3	4	6	170	151	32	11	18	46	86	65	20	34	698
3 - 4	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2
5 - 7	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
8 - 11	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	32	18	6	3	4	6	170	151	32	11	18	46	86	66	20	34	703

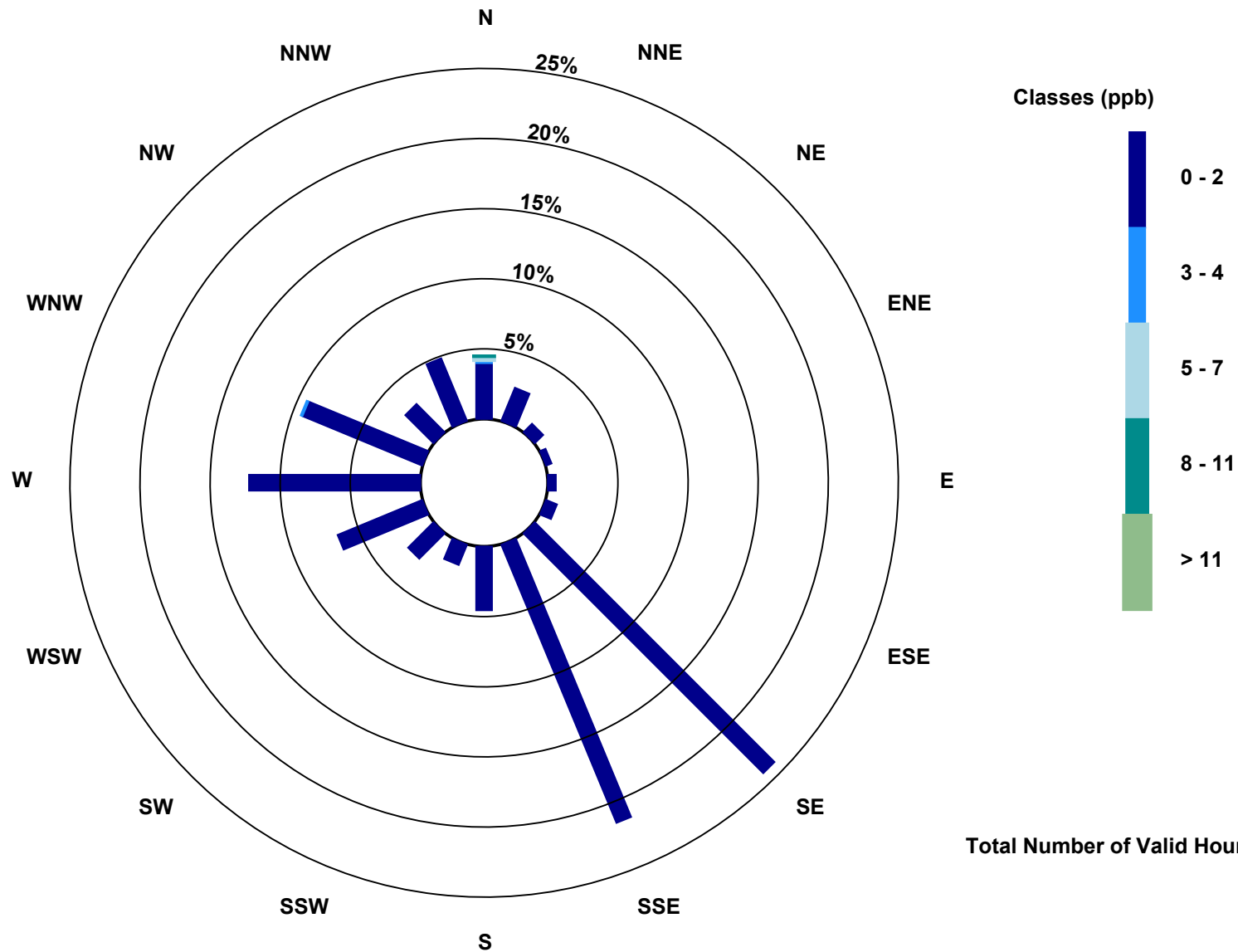
Total Number of Valid Hours: 703

Total Number of Hours: 744

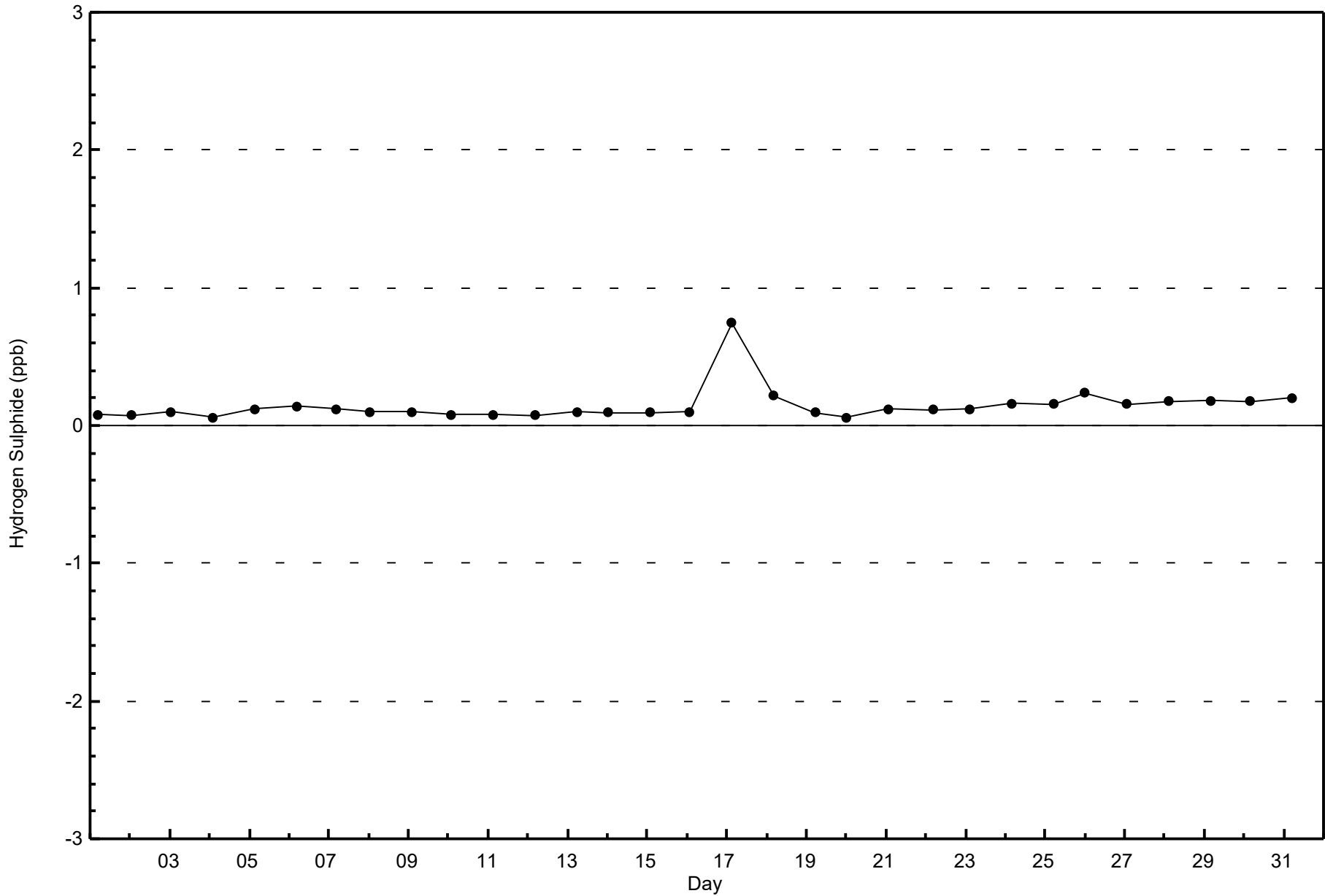


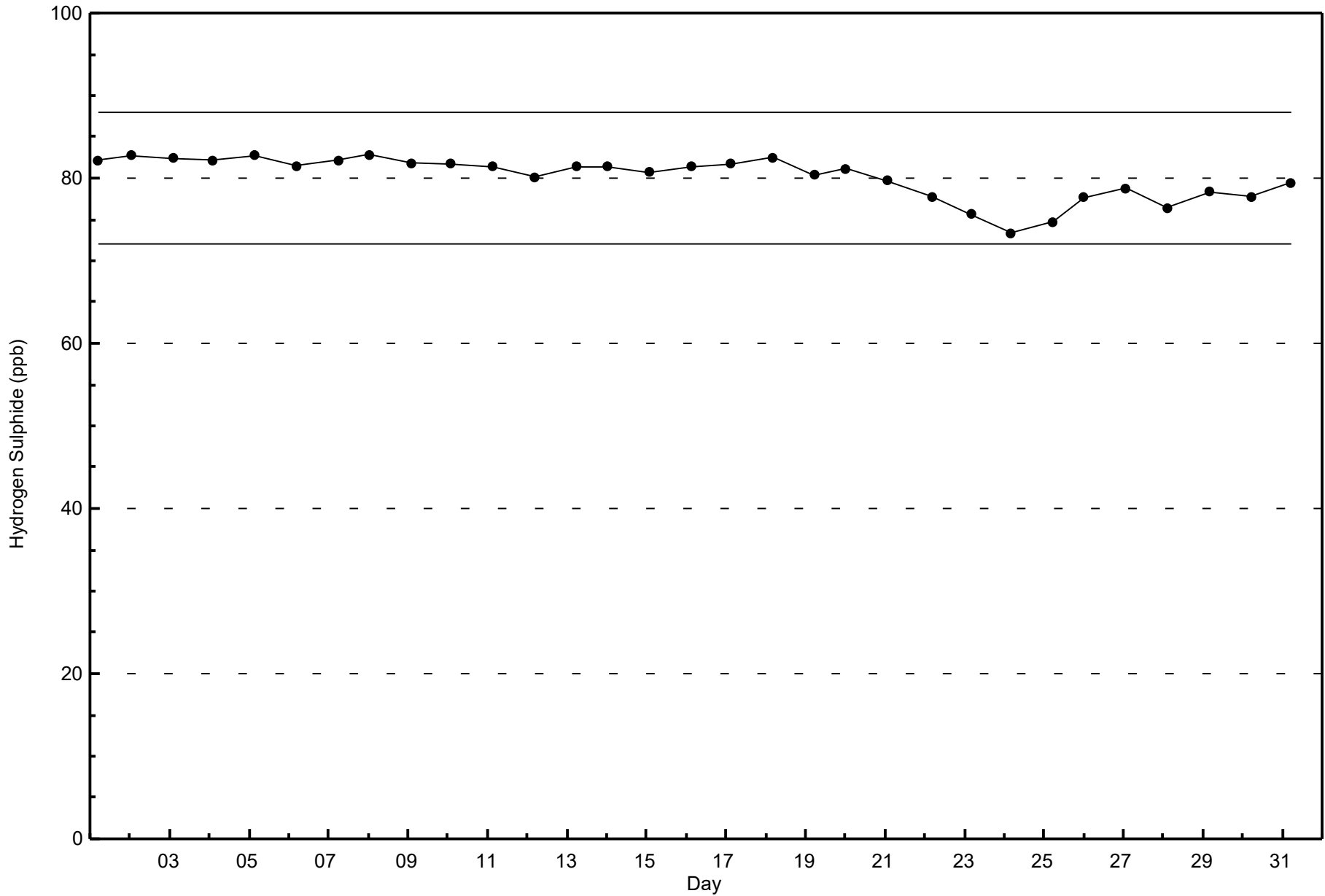
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Hydrogen Sulphide (H₂S) - ppb
Mannix



Total Number of Valid Hours: 703





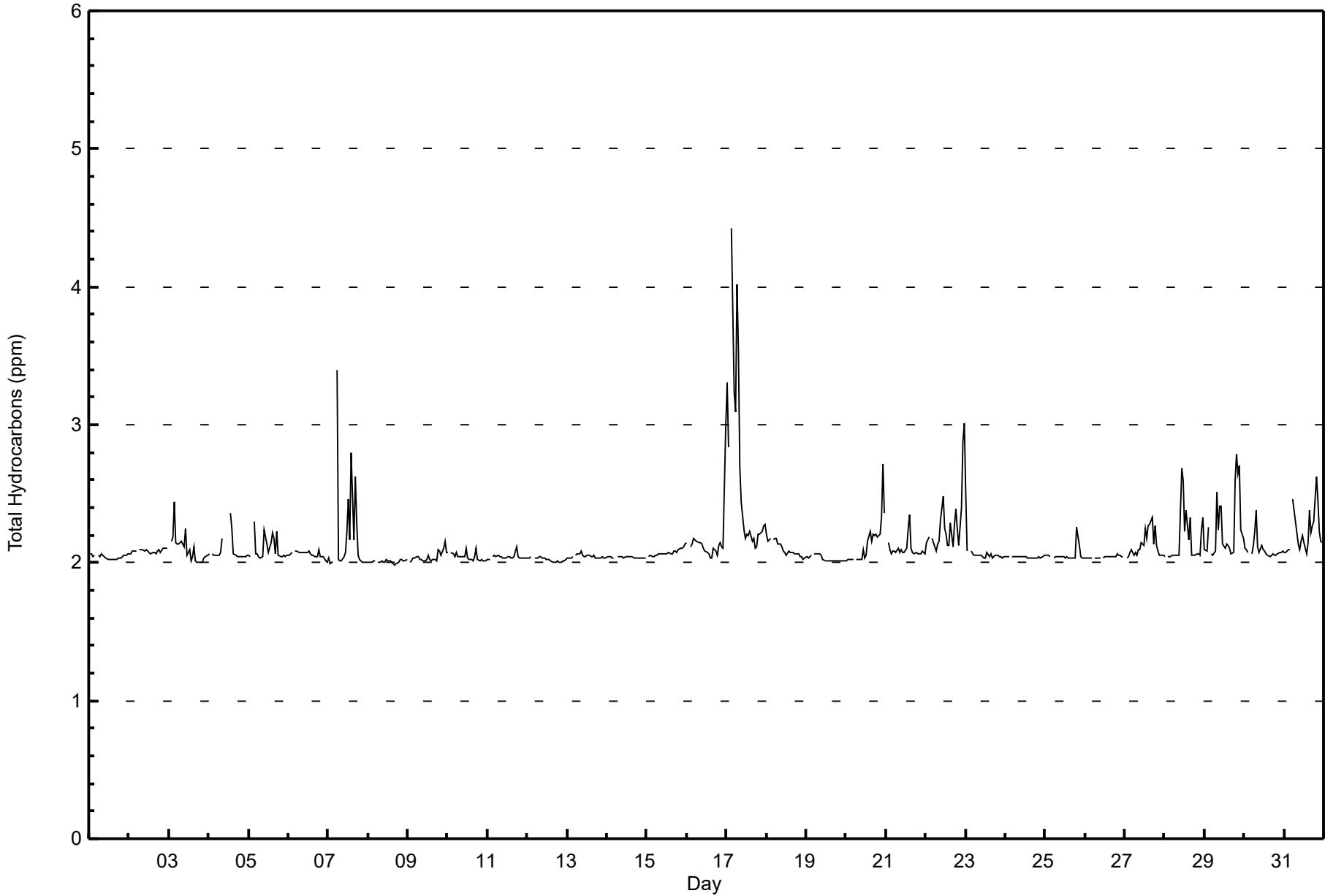


Maximum Value: 4.4 ppm on Oct 17 04:00		Maximum Daily Average: 2.6 ppm on Oct 17		Hours in Service: 744																							
Minimum Value: 2.0 ppm on Oct 8 17:00		Minimum Daily Average: 2.0 ppm on Oct 8		Hours of Data: 708																							
Maximum Diurnal Average: 2.2 ppm at hour 4		Minimum Diurnal Average: 2.1 ppm at hour 3		Hours of Missing Data: 36																							
Monthly Average: 2.11 ppm		Percentiles: P ₁ = 2.0 P ₁₀ = 2.0 Q ₁ = 2.0 Median = 2.1 Q ₃ = 2.1 P ₉₀ = 2.2 P ₉₉ = 3.0		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-Oct	2.1	2.1	2.0	2.1	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	2.0	2.1	2.1	2.1	2.0	2.1	
2-Oct	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
3-Oct	Z	2.2	2.2	2.4	2.1	2.1	2.1	2.2	2.1	2.2	2.1	2.1	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.4	
4-Oct	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.2	C	C	C	C	2.4	2.3	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.4	
5-Oct	2.1	2.0	Z	2.3	2.1	2.1	2.0	2.0	2.0	2.2	2.2	2.1	2.1	2.1	2.2	2.2	2.1	2.2	2.1	2.0	2.0	2.1	2.0	2.1	2.1	2.3	
6-Oct	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	
7-Oct	2.0	2.0	2.0	2.0	Z	3.4	2.0	2.0	2.0	2.0	2.1	2.2	2.5	2.2	2.8	2.2	2.6	2.3	2.1	2.0	2.0	2.0	2.0	2.0	2.2	3.4	
8-Oct	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	
9-Oct	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.2	2.1	2.0	2.2	
10-Oct	2.1	Z	2.1	2.1	2.0	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	2.0	2.0	2.0	2.0	2.0	2.0	2.1	
11-Oct	2.0	2.0	Z	2.0	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	
12-Oct	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	2.0	2.0	
13-Oct	2.0	2.0	2.0	2.0	Z	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	
14-Oct	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	
15-Oct	Z	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	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
16-Oct	2.1	Z	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	3.0	3.0	
17-Oct	3.3	2.8	Z	4.4	3.2	3.1	4.0	3.5	2.7	2.4	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.2	2.2	2.2	2.3	2.3	4.4		
18-Oct	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.2	
19-Oct	2.0	2.0	2.0	2.1	Z	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	
20-Oct	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.7	2.4	2.1	2.7	
21-Oct	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	2.2	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	
22-Oct	2.2	2.2	2.2	Z	2.2	2.1	2.1	2.1	2.2	2.3	2.5	2.2	2.2	2.1	2.1	2.3	2.1	2.3	2.4	2.2	2.1	2.4	2.9	3.0	2.3	3.0	
23-Oct	2.5	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.0	2.1	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.5	
24-Oct	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	2.0	2.0	
25-Oct	2.1	2.0	2.1	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	2.3	2.1	2.0	2.0	2.0	2.1	2.3	
26-Oct	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	M	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.1	
27-Oct	Z	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.2	2.3	2.3	2.3	2.1	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.3	
28-Oct	2.0	Z	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.4	2.7	2.6	2.2	2.4	2.2	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.2	2.7
29-Oct	2.1	2.1	2.3	Z	2.1	2.1	2.1	2.5	2.2	2.4	2.4	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.6	2.8	2.6	2.7	2.2	2.2	2.3	2.8
30-Oct	2.1	2.1	2.1	Z	2.1	2.1	2.2	2.4	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4
31-Oct	2.1	2.1	2.1	2.1	Z	2.5	2.4	2.3	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.4	2.2	2.3	2.3	2.6	2.4	2.2	2.2	2.1	2.2	2.6	
																								Diurnal Average			
																								Diurnal Maximum			
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerospan C - Calibration M - Maintenance																											



Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Mannix - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Mannix - October 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	312	44.07	44.07
2.1 - 3.0	389	54.94	99.01
3.1 - 10.0	7	0.99	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 - October 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	125	41	14	7	10	33	64	18	0	0	312
2.1 - 3.0	30	18	5	3	4	6	47	114	16	4	9	11	25	40	20	34	386
3.1 - 10.0	2	0	0	0	0	0	0	0	1	0	0	0	0	2	1	1	7
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	32	18	5	3	4	6	172	155	31	11	19	44	89	60	21	35	705

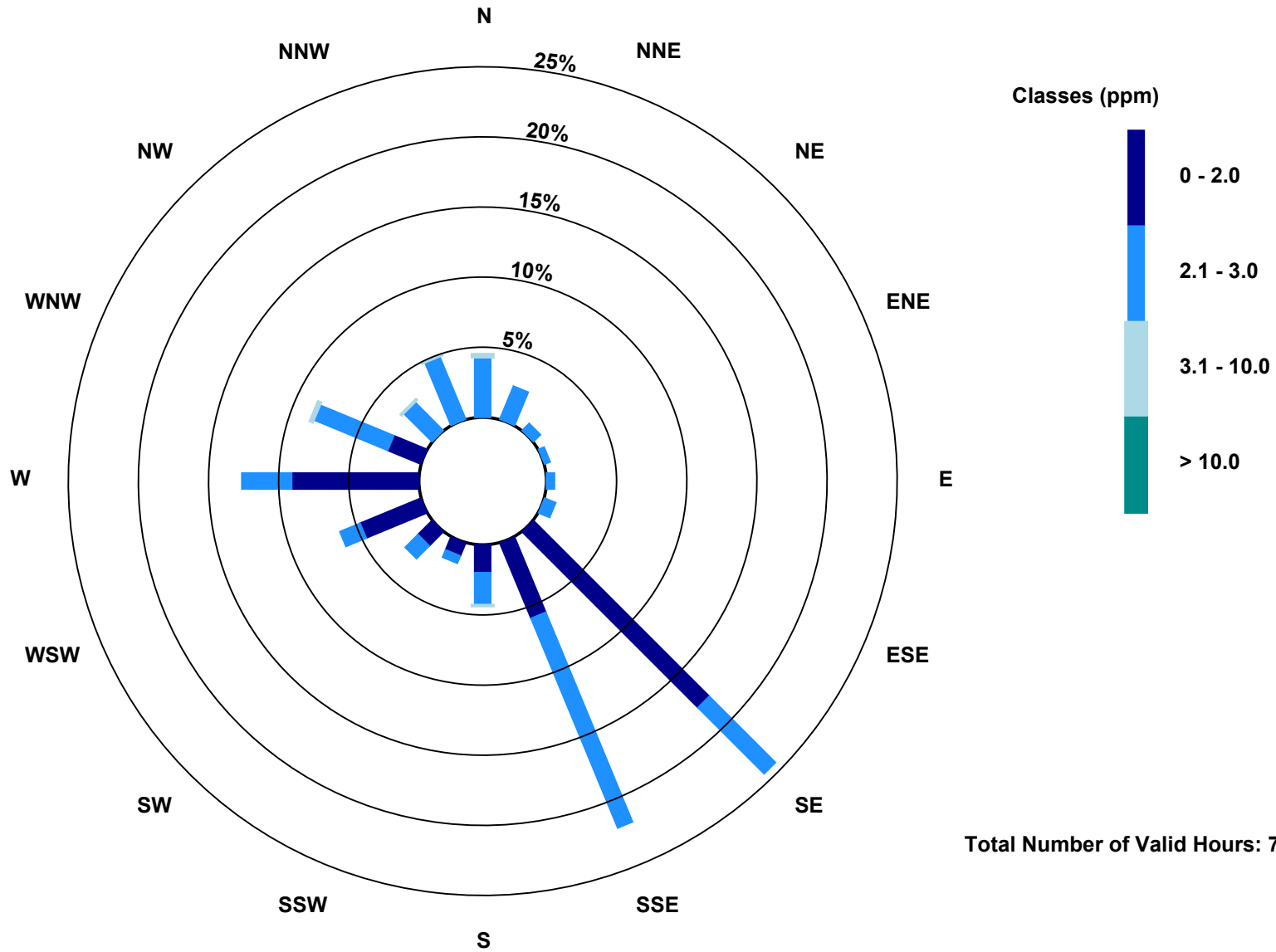
Total Number of Valid Hours: 705

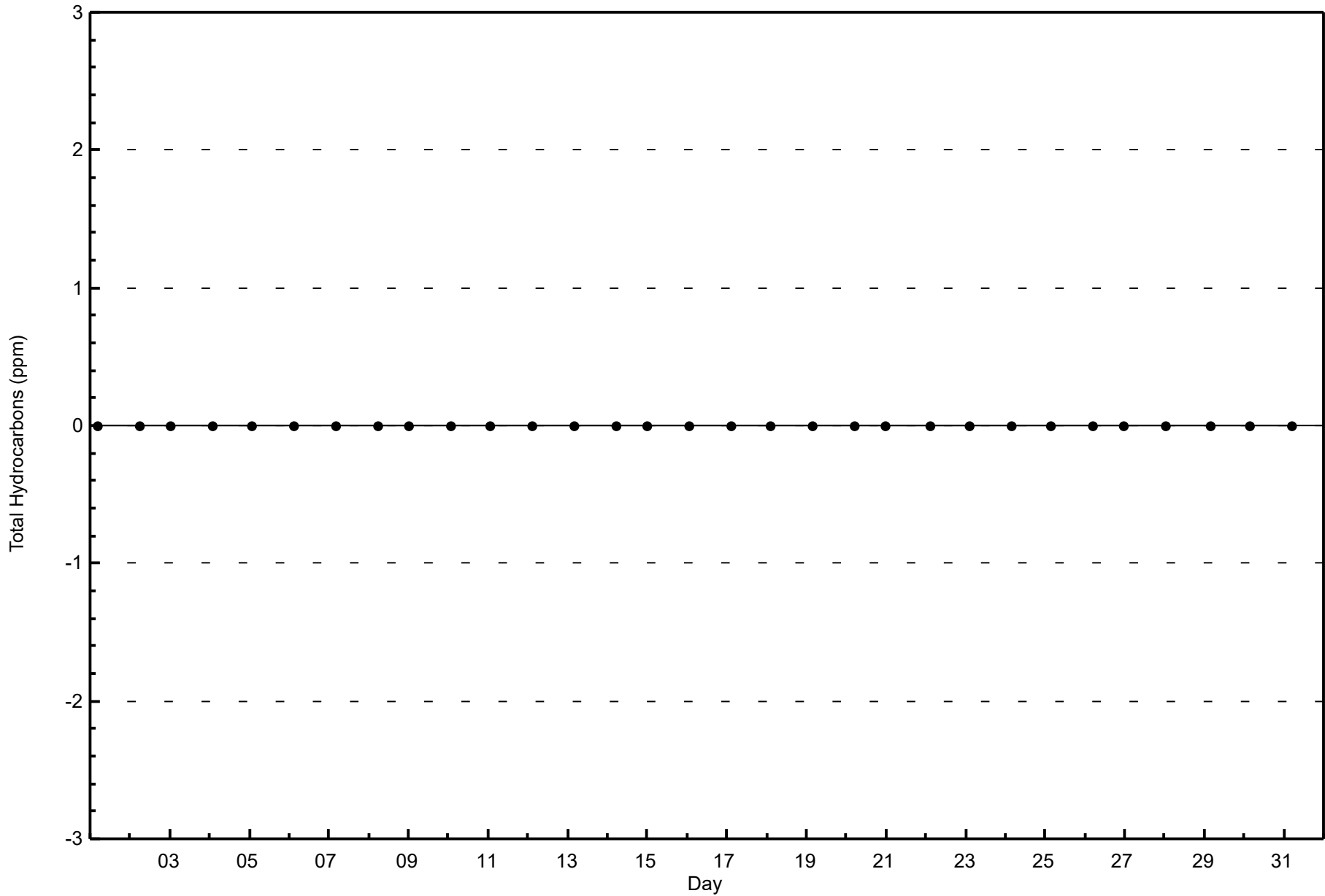
Total Number of Hours: 744

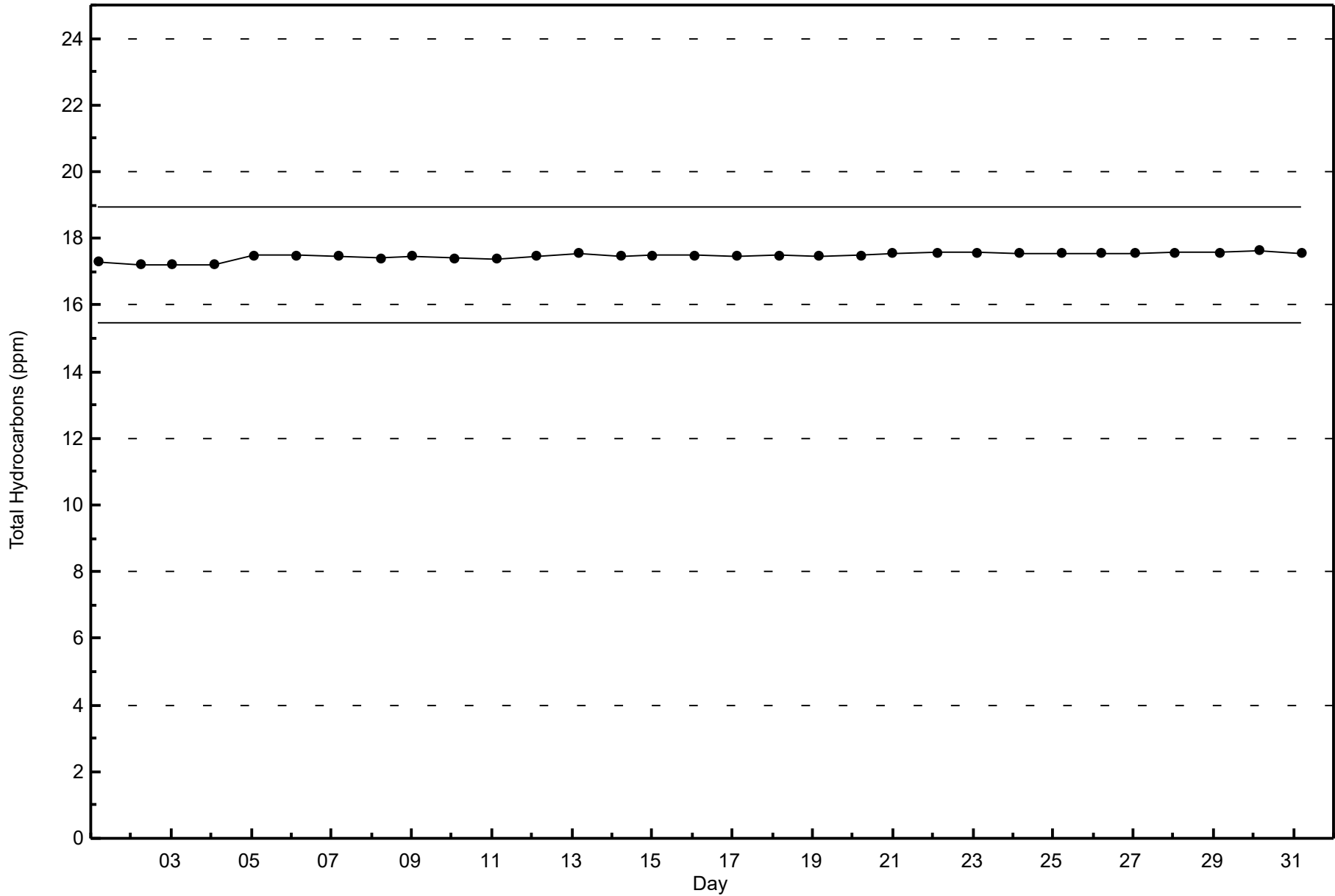


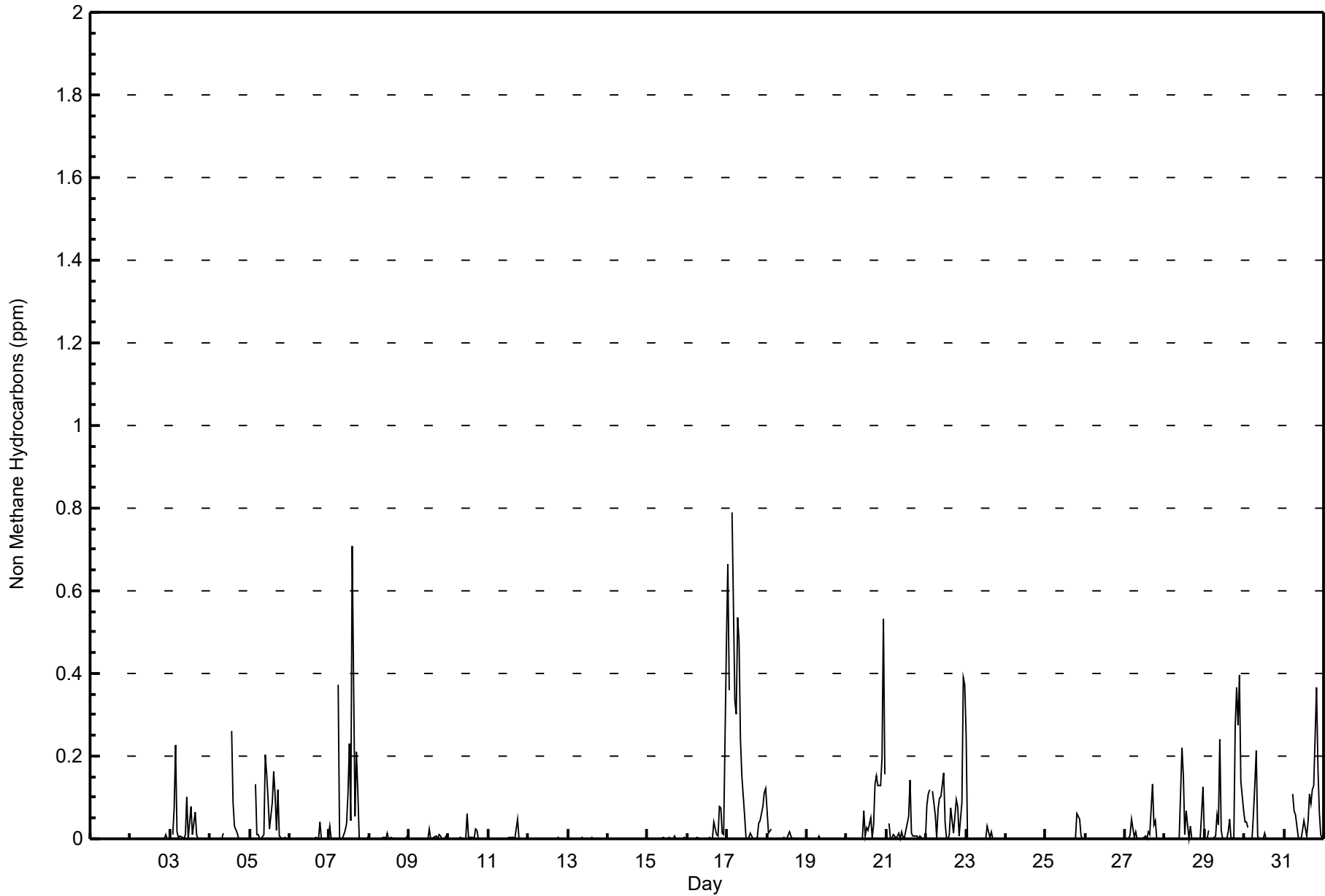
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Total Hydrocarbons (THC) - ppm
Mannix











**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	519	73.31	73.31
0.006 - 0.05	96	13.56	86.86
0.06 - 0.1	56	7.91	94.77
> 0.1	37	5.23	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 - October 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	10	0	0	0	0	0	153	137	28	9	13	41	84	22	3	19	519
0.006 - 0.05	11	4	0	1	0	5	12	16	1	0	5	1	3	21	5	9	94
0.06 - 0.1	6	11	1	2	2	1	4	2	1	1	0	2	1	10	5	6	55
> 0.1	5	3	4	0	2	0	3	0	1	1	1	0	1	7	8	1	37
Totals	32	18	5	3	4	6	172	155	31	11	19	44	89	60	21	35	705

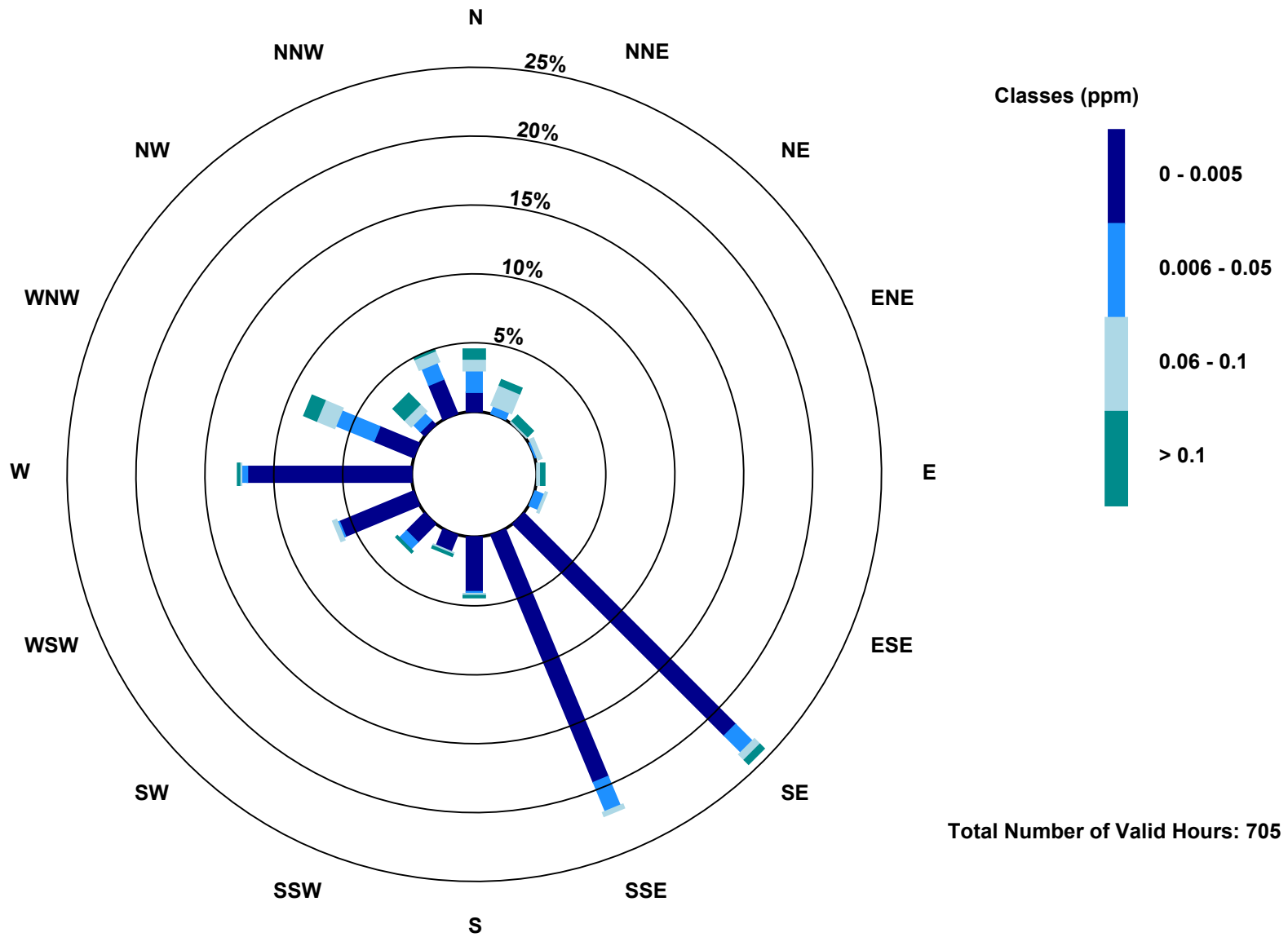
Total Number of Valid Hours: 705

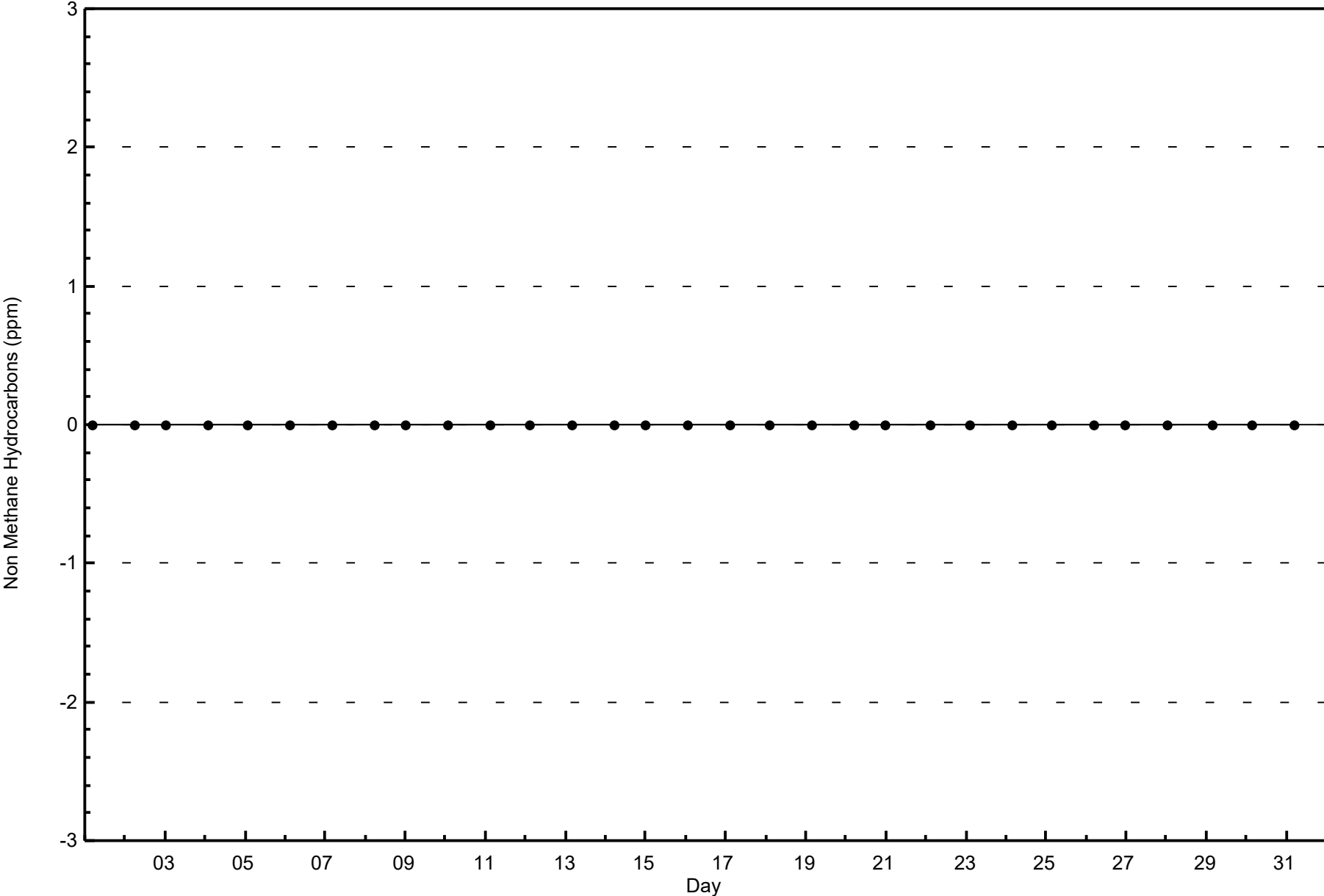
Total Number of Hours: 744

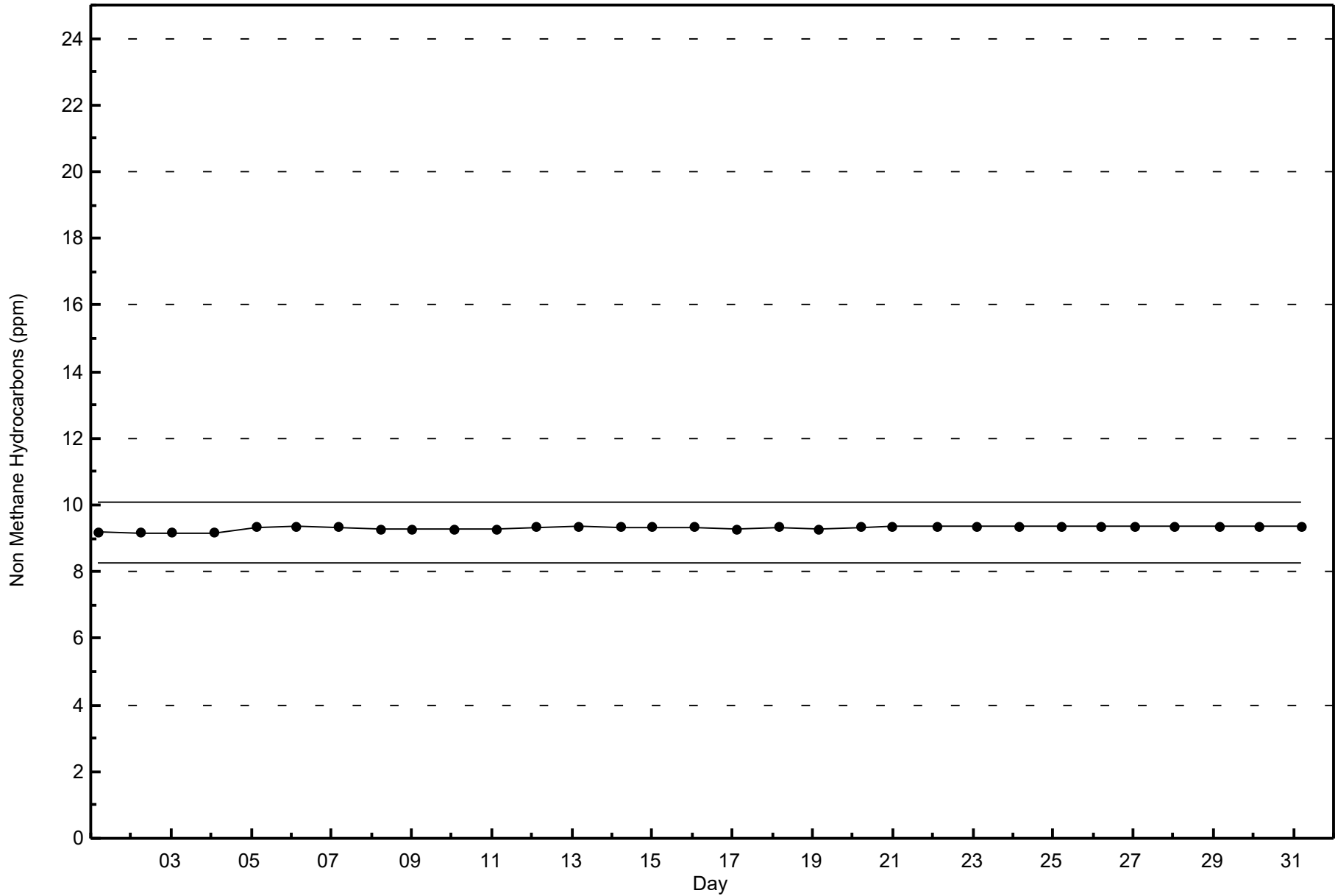


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Non Methane Hydrocarbons (NMHC) - ppm
Mannix









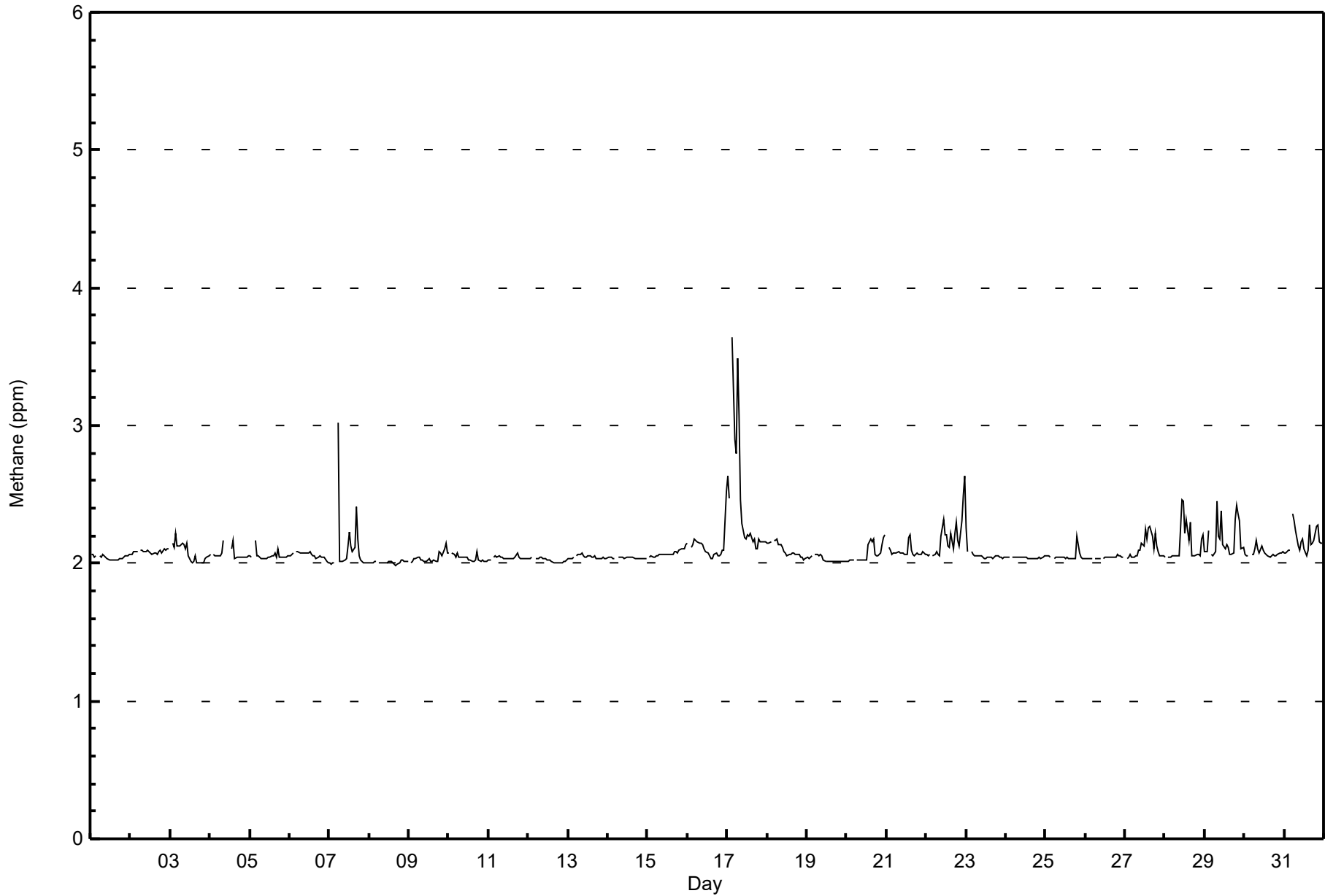
Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH₄) - ppm

Mannix - October 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 Oct 17 04:00		Maximum Daily Average: 2.4 ppm on Oct 17		Hours of Data: 708														Daily Average		Daily Maximum																														
Minimum Value: 2.0 ppm on Oct 8 17:00		Minimum Daily Average: 2.0 ppm on Oct 8		Hours of Missing Data: 36														Daily Average		Daily Maximum																														
Maximum Diurnal Average: 2.1 ppm at hour 6		Minimum Diurnal Average: 2.1 ppm at hour 3		Hours of Calibration: 35														Daily Average		Daily Maximum																														
Monthly Average: 2.09 ppm		Percentiles: P ₁ = 2.0 P ₁₀ = 2.0 Q ₁ = 2.0 Median = 2.1 Q ₃ = 2.1 P ₉₀ = 2.2 P ₉₉ = 2.6		Percent Operational Time: 99.9														Daily Average		Daily Maximum																														
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																										
1-Oct	2.1	2.1	2.0	2.1	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	2.1	2.1	2.0	2.1																								
2-Oct	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1																								
3-Oct	Z	2.1	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2																								
4-Oct	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.2	C	C	C	C	2.1	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2																								
5-Oct	2.1	2.0	Z	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	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2																								
6-Oct	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1																								
7-Oct	2.0	2.0	2.0	2.0	Z	3.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.1	2.1	2.1	2.4	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.1	3.0																								
8-Oct	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																								
9-Oct	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	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1																								
10-Oct	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1																								
11-Oct	2.0	2.0	Z	2.0	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1																								
12-Oct	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	2.0	2.0																								
13-Oct	2.0	2.0	2.0	2.0	Z	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1																								
14-Oct	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																								
15-Oct	Z	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	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1																								
16-Oct	2.1	Z	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.5	2.5																								
17-Oct	2.6	2.5	Z	3.6	2.9	2.8	3.5	3.1	2.5	2.3	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	2.4	3.6																								
18-Oct	2.1	2.1	2.2	Z	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.2																								
19-Oct	2.0	2.0	2.0	2.1	Z	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1																								
20-Oct	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	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2																								
21-Oct	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	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2																								
22-Oct	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.2	2.2	2.1	2.1	2.2	2.1	2.2	2.3	2.2	2.1	2.3	2.5	2.6	2.2	2.6																								
23-Oct	2.3	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	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.3																								
24-Oct	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	2.0	2.0																								
25-Oct	2.1	2.0	2.1	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	2.2	2.1	2.0	2.0	2.0	2.0	2.2																								
26-Oct	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	M	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.1																								
27-Oct	Z	2.0	2.0	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.3	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.3																								
28-Oct	2.0	Z	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.3	2.5	2.4	2.2	2.3	2.2	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.5																								
29-Oct	2.1	2.1	2.2	Z	2.1	2.1	2.1	2.4	2.2	2.2	2.4	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.4	2.4	2.3	2.1	2.1	2.4																								
30-Oct	2.1	2.1	2.1	Z	2.1	2.1	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	2.1	2.1	2.1	2.1	2.1	2.1	2.2																								
31-Oct	2.1	2.1	2.1	2.1	Z	2.4	2.3	2.2	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.3	2.1	2.1	2.2	2.3	2.3	2.2	2.1	2.1	2.2	2.4																								
																								2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	Diurnal Average	
																								2.6	2.5	2.2	3.6	2.9	3.0	3.5	3.1	2.5	2.3	2.5	2.4	2.2	2.3	2.3	2.3	2.4	2.2	2.3	2.4	2.4	2.3	2.5	2.6	2.1	2.6	Diurnal Maximum
Z - zerospan																								C - Calibration				M - Maintenance																						





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	331	46.75	46.75
2.1 - 3.0	374	52.82	99.58
3.1 - 10.0	3	0.42	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 - October 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	2	0	0	0	0	1	127	41	15	7	10	33	65	30	0	0	331
2.1 - 3.0	29	18	5	3	4	5	45	114	16	4	9	11	24	30	20	34	371
3.1 - 10.0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	32	18	5	3	4	6	172	155	31	11	19	44	89	60	21	35	705

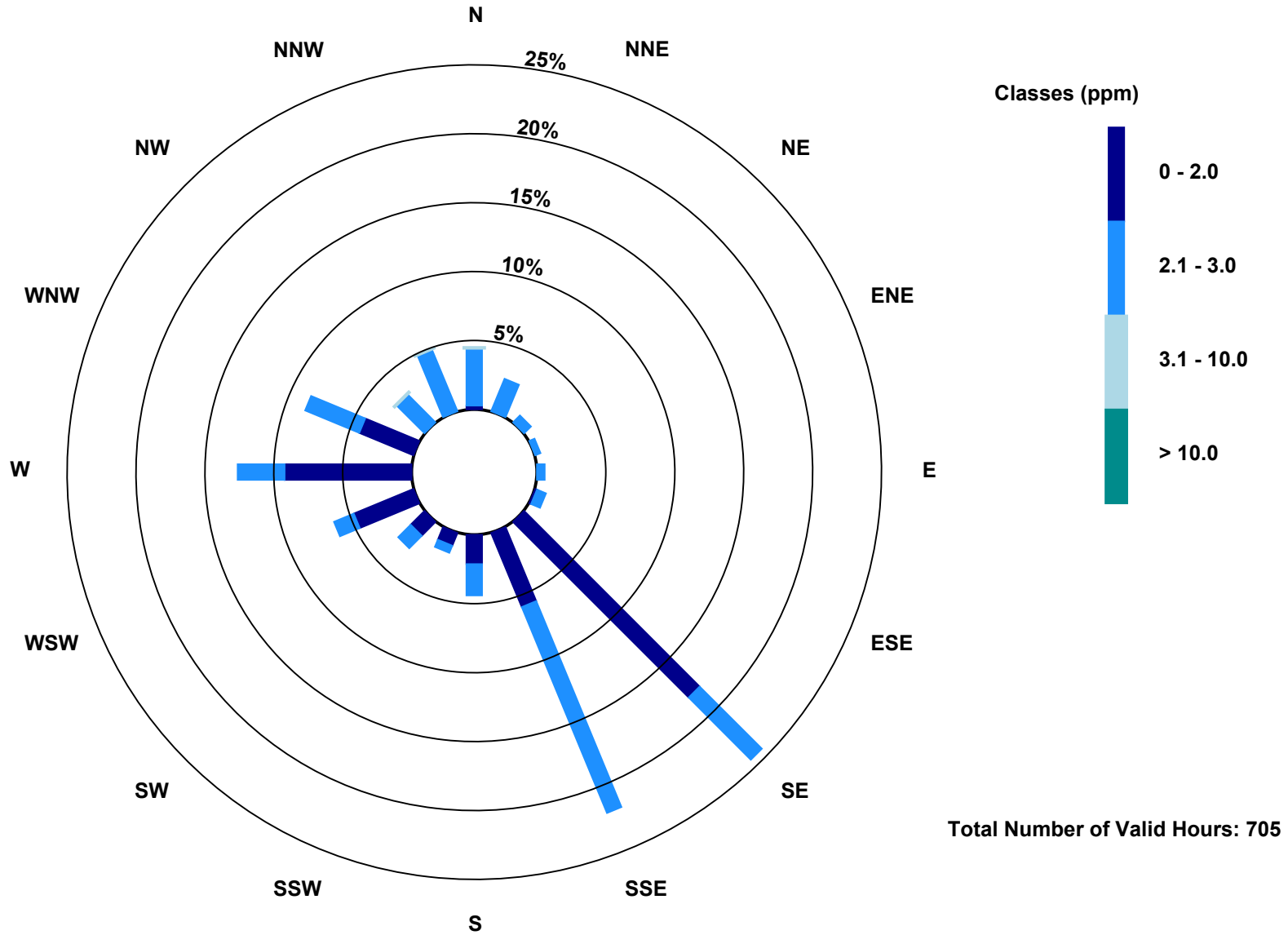
Total Number of Valid Hours: 705

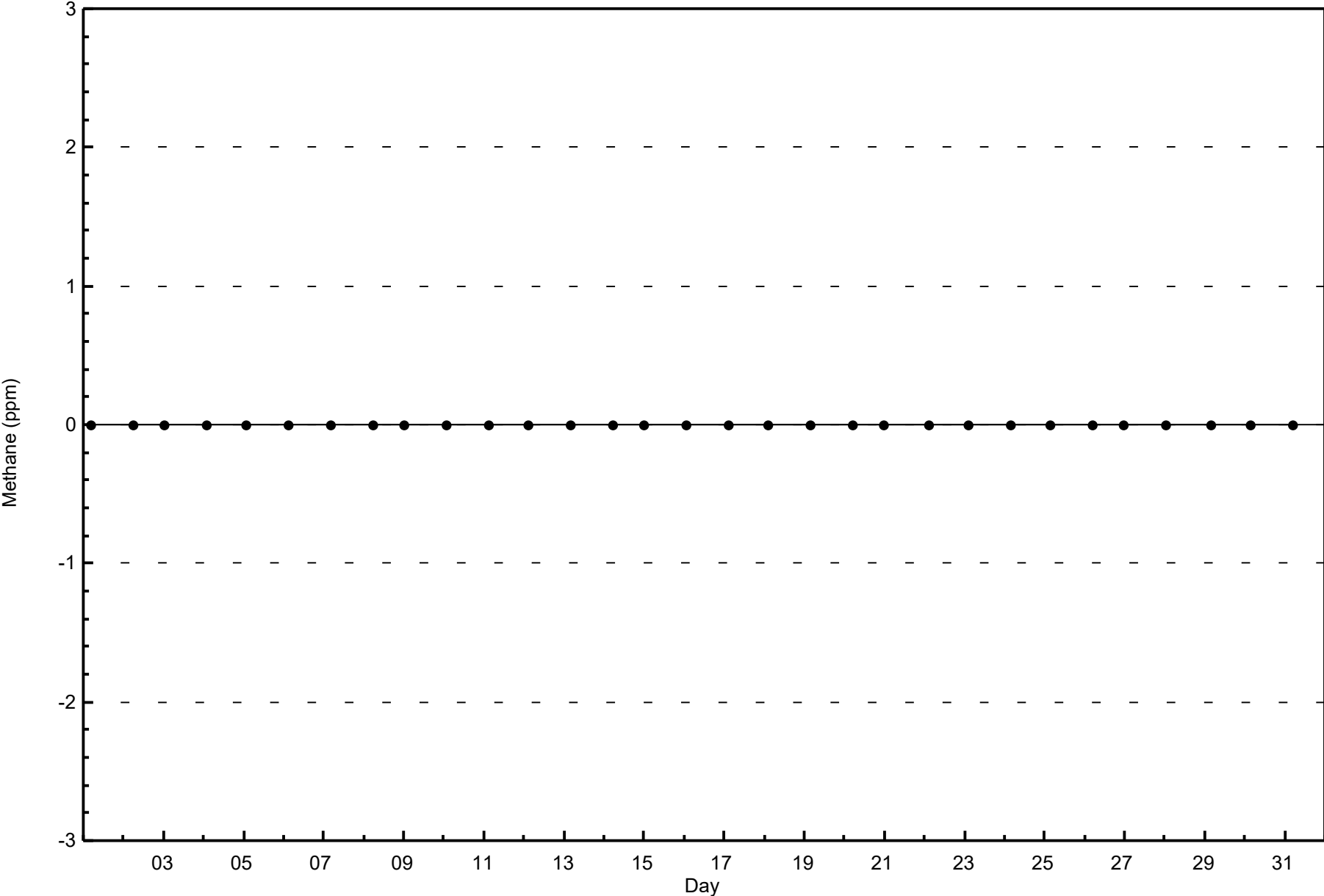
Total Number of Hours: 744

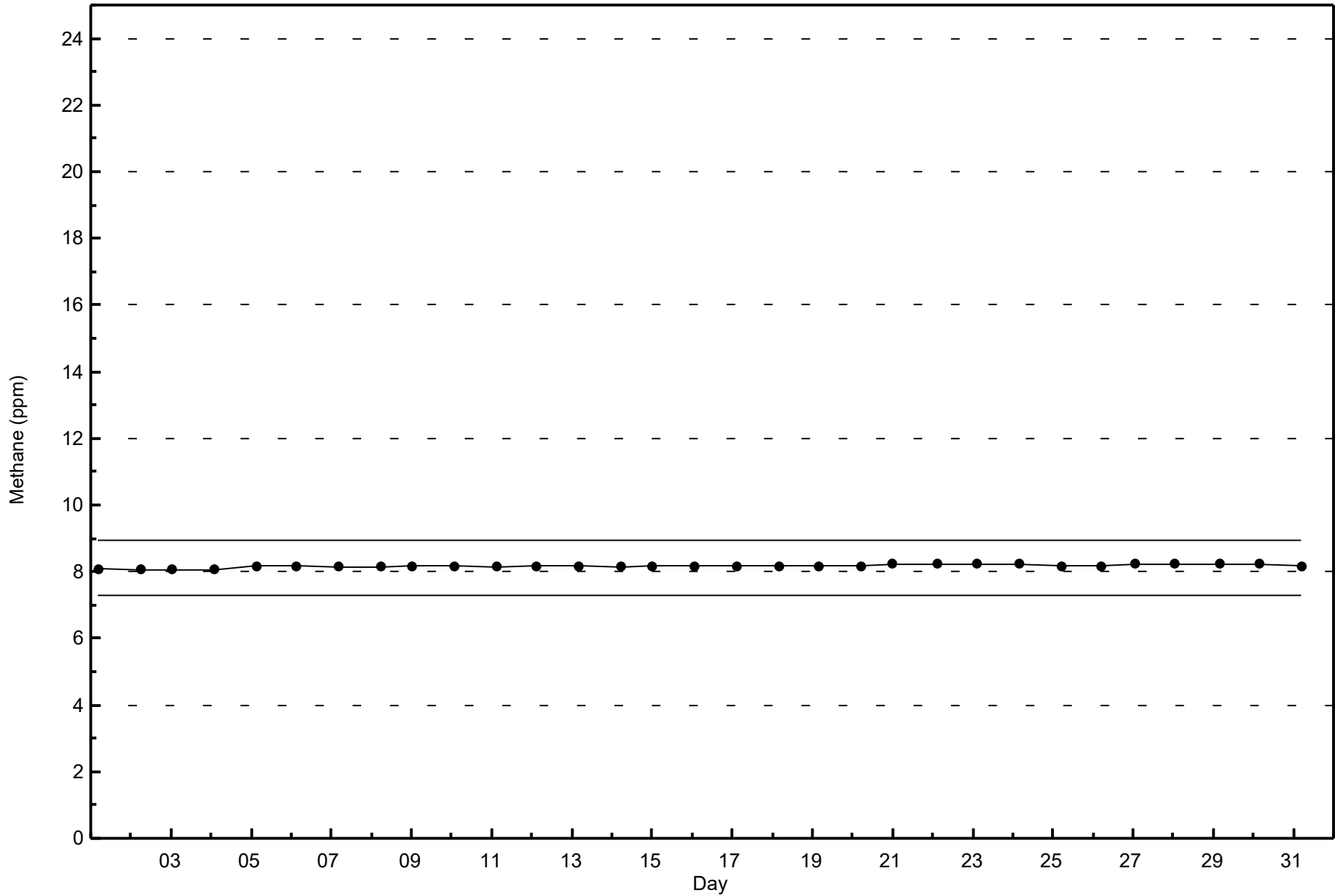


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Methane (CH₄) - ppm
Mannix

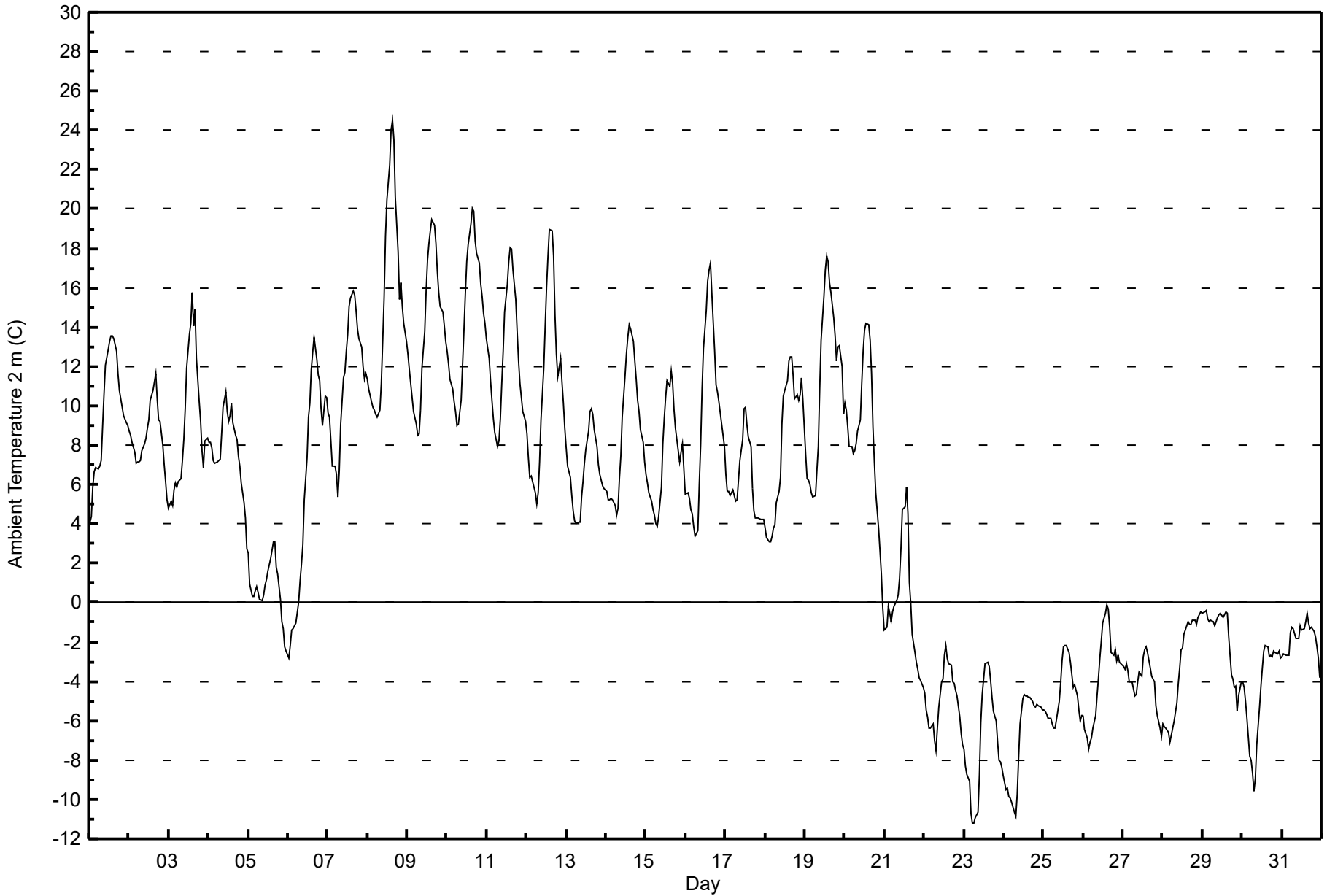








Maximum Value: 24.6 C on Oct 8 16:00 Maximum Daily Average: 15.3 C on Oct 8																				Hours in Service: 744 Hours of Data: 744						
Minimum Value: -11.2 C on Oct 23 06:00 Minimum Daily Average: -7.2 C on Oct 23 Maximum Diurnal Average: 8.6 C at hour 15 Minimum Diurnal Average: 1.5 C at hour 7 Monthly Average: 4.62 C Percentiles: P ₁ = -10.0 P ₁₀ = -5.5 Q ₁ = -2.4 Median = 5.7 Q ₃ = 10.3 P ₉₀ = 14.0 P ₉₉ = 19.7																				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-Oct	4.1	4.4	5.9	6.7	6.9	6.8	6.9	7.3	8.9	10.6	12.1	12.8	13.3	13.6	13.6	13.4	12.8	11.7	10.8	10.3	10.0	9.5	9.1	9.0	9.6	13.6
2-Oct	8.7	8.5	8.2	7.6	7.1	7.1	7.1	7.2	7.7	8.1	8.3	8.9	9.3	10.3	10.8	11.2	11.6	10.4	9.3	9.2	8.0	7.0	6.2	5.2	8.5	11.6
3-Oct	4.8	5.2	5.0	5.7	6.1	5.9	6.2	6.3	7.2	8.3	9.8	11.9	13.6	14.2	15.8	14.0	14.9	12.4	10.2	9.2	7.7	6.9	8.2	8.4	9.1	15.8
4-Oct	8.1	8.2	7.8	7.2	7.1	7.1	7.2	7.3	8.6	10.0	10.7	9.7	9.2	9.5	10.2	9.1	8.5	8.3	7.4	6.9	6.0	5.1	4.3	2.7	7.8	10.7
5-Oct	2.5	1.0	0.3	0.3	0.6	0.8	0.5	0.2	0.1	0.4	0.9	1.2	1.6	2.3	2.7	3.1	3.1	1.8	1.5	0.2	-0.9	-1.4	-2.2	-2.4	0.8	3.1
6-Oct	-2.8	-2.2	-1.4	-1.3	-1.2	-1.0	0.0	1.1	1.9	2.9	5.2	7.4	9.4	10.2	11.8	12.7	13.5	12.3	11.6	11.3	9.9	9.0	10.5	10.5	5.9	13.5
7-Oct	9.7	9.4	8.2	6.9	7.0	6.5	5.4	6.7	9.1	11.4	11.7	12.8	13.7	15.0	15.5	15.9	15.6	14.8	13.9	13.4	13.0	12.0	11.3	11.7	11.3	15.9
8-Oct	11.4	10.9	10.2	9.9	9.8	9.5	9.4	9.8	11.1	13.3	15.5	18.6	20.5	22.2	24.0	24.6	23.5	20.6	17.9	15.4	16.3	15.1	14.2	13.3	15.3	24.6
9-Oct	12.7	11.8	11.1	10.4	9.7	9.1	8.5	8.6	9.8	11.9	13.8	15.9	17.4	18.2	18.9	19.4	19.2	18.3	16.8	15.7	15.0	14.7	14.0	13.2	13.9	19.4
10-Oct	12.8	12.2	11.3	10.9	10.2	9.7	9.0	9.1	10.3	12.1	13.9	15.7	17.3	18.2	19.2	20.0	19.9	18.4	17.8	17.3	16.2	15.6	14.7	14.2	14.4	20.0
11-Oct	13.4	12.4	11.3	10.3	9.3	8.6	8.0	8.2	9.4	11.1	12.8	14.7	16.2	17.3	18.1	18.0	16.9	15.4	13.8	12.3	11.1	10.5	9.7	9.2	12.4	18.1
12-Oct	8.6	7.4	6.4	6.5	5.8	5.6	5.0	5.6	7.1	9.3	11.9	14.0	16.0	17.6	18.9	18.9	17.6	14.6	12.7	11.5	12.4	11.2	10.1	8.8	11.0	18.9
13-Oct	7.8	6.9	6.4	5.4	4.7	4.2	4.0	4.1	4.1	5.3	6.2	7.1	7.8	8.8	9.7	9.8	9.5	8.8	7.9	7.0	6.5	6.2	5.9	5.8	6.7	9.8
14-Oct	5.6	5.2	5.2	5.3	5.2	4.9	4.5	4.8	6.3	7.4	9.4	11.5	12.6	13.5	14.1	13.9	13.3	12.3	11.4	10.3	9.7	8.8	8.1	7.2	8.8	14.1
15-Oct	6.5	6.1	5.6	5.2	4.8	4.4	4.0	3.9	4.3	5.9	8.1	9.4	10.5	11.3	11.0	11.8	11.1	9.8	8.8	8.3	7.1	7.6	8.1	6.8	7.5	11.8
16-Oct	5.5	5.6	5.3	4.7	4.5	3.9	3.4	3.7	6.0	8.0	10.8	12.9	14.8	16.3	16.9	17.2	15.7	12.8	11.1	10.7	10.2	9.6	9.1	7.9	9.4	17.2
17-Oct	6.5	5.7	5.6	5.4	5.8	5.5	5.2	5.2	6.2	7.2	8.3	9.9	9.9	9.1	8.4	7.9	5.8	4.6	4.3	4.3	4.2	4.2	4.2	4.2	6.2	9.9
18-Oct	3.8	3.3	3.1	3.1	3.4	3.8	4.0	5.1	5.7	6.3	9.1	10.5	10.8	11.3	12.3	12.5	12.5	11.6	10.3	10.5	10.3	10.6	11.4	10.3	8.1	12.5
19-Oct	7.5	6.3	6.2	6.0	5.6	5.3	5.4	6.7	8.0	10.8	13.3	15.5	16.9	17.6	17.3	16.3	15.8	14.5	13.6	12.3	13.0	13.0	12.0	9.6	11.2	17.6
20-Oct	10.1	9.8	8.9	7.9	8.0	7.6	7.7	8.1	8.7	9.3	11.2	12.7	13.9	14.2	14.2	13.3	11.6	8.9	7.1	5.6	3.8	2.6	1.5	-0.2	8.6	14.2
21-Oct	-1.4	-1.3	-0.2	-0.5	-1.0	-0.5	-0.2	0.1	0.4	1.3	2.7	4.8	4.8	5.9	4.5	1.0	0.0	-1.6	-2.5	-3.0	-3.4	-3.8	-4.0	-4.3	-0.1	5.9
22-Oct	-4.6	-5.5	-5.8	-6.3	-6.4	-6.2	-7.0	-7.5	-6.4	-5.3	-4.1	-3.9	-2.7	-2.2	-2.8	-3.1	-3.2	-4.0	-4.1	-4.5	-4.7	-5.8	-6.7	-7.3	-5.0	-2.2
23-Oct	-7.5	-8.3	-8.7	-9.1	-10.7	-11.2	-11.2	-10.9	-10.7	-8.8	-6.1	-4.7	-3.9	-3.1	-3.1	-3.2	-3.9	-4.8	-5.5	-6.0	-7.1	-8.0	-8.1	-8.3	-7.2	-3.1
24-Oct	-8.8	-9.5	-9.4	-9.8	-9.9	-10.1	-10.7	-10.9	-9.7	-7.9	-6.1	-4.9	-4.6	-4.7	-4.8	-4.8	-4.8	-5.0	-5.2	-5.3	-5.2	-5.3	-5.3	-5.4	-7.0	-4.6
25-Oct	-5.5	-5.5	-5.6	-5.9	-5.9	-6.2	-6.4	-6.4	-6.0	-5.0	-4.1	-3.0	-2.3	-2.2	-2.2	-2.5	-3.0	-3.7	-4.3	-4.1	-4.7	-5.5	-6.1	-5.7	-4.7	-2.2
26-Oct	-5.8	-6.5	-6.9	-7.4	-7.1	-6.8	-6.4	-5.7	-4.7	-3.8	-2.8	-2.0	-1.0	-0.5	-0.1	-0.3	-1.2	-2.6	-2.6	-2.4	-2.9	-2.7	-3.0	-3.1	-3.7	-0.1
27-Oct	-3.2	-3.4	-3.1	-3.4	-4.0	-4.1	-4.4	-4.7	-4.7	-4.0	-3.5	-3.8	-2.7	-2.4	-2.2	-2.5	-3.3	-3.8	-3.9	-4.0	-5.2	-5.7	-6.4	-6.8	-4.0	-2.2
28-Oct	-6.2	-6.3	-6.4	-6.6	-7.1	-6.7	-6.4	-6.0	-5.1	-4.1	-3.3	-2.4	-2.3	-1.6	-1.2	-1.0	-1.1	-1.1	-0.9	-0.9	-1.1	-0.8	-0.6	-0.5	-3.3	-0.5
29-Oct	-0.5	-0.5	-0.4	-0.8	-1.0	-0.9	-1.0	-1.1	-1.0	-0.8	-0.6	-0.6	-0.8	-0.6	-0.5	-0.6	-1.7	-3.7	-3.9	-4.3	-4.2	-5.5	-4.7	-4.0	-1.8	-0.4
30-Oct	-4.0	-4.3	-5.0	-5.9	-7.8	-8.0	-8.6	-9.6	-8.9	-7.2	-5.3	-4.2	-3.3	-2.5	-2.2	-2.2	-2.7	-2.7	-2.7	-2.5	-2.5	-2.6	-2.5	-2.8	-4.6	-2.2
31-Oct	-2.8	-2.6	-2.7	-2.7	-2.7	-1.6	-1.3	-1.3	-1.8	-1.8	-1.8	-1.2	-1.4	-1.3	-1.0	-0.6	-1.1	-1.3	-1.3	-1.5	-1.8	-2.3	-2.8	-3.8	-1.8	-0.6
	3.1	2.7	2.5	2.1	1.8	1.7	1.5	1.8	2.6	3.9	5.4	6.7	7.6	8.2	8.6	8.5	7.9	6.7	5.8	5.3	4.7	4.2	3.9	3.3		Diurnal Average
	13.4	12.4	11.3	10.9	10.2	9.7	9.4	9.8	11.1	13.3	15.5	18.6	20.5	22.2	24.0	24.6	23.5	20.6	17.9	17.3	16.3	15.6	14.7	14.2		Diurnal Maximum





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

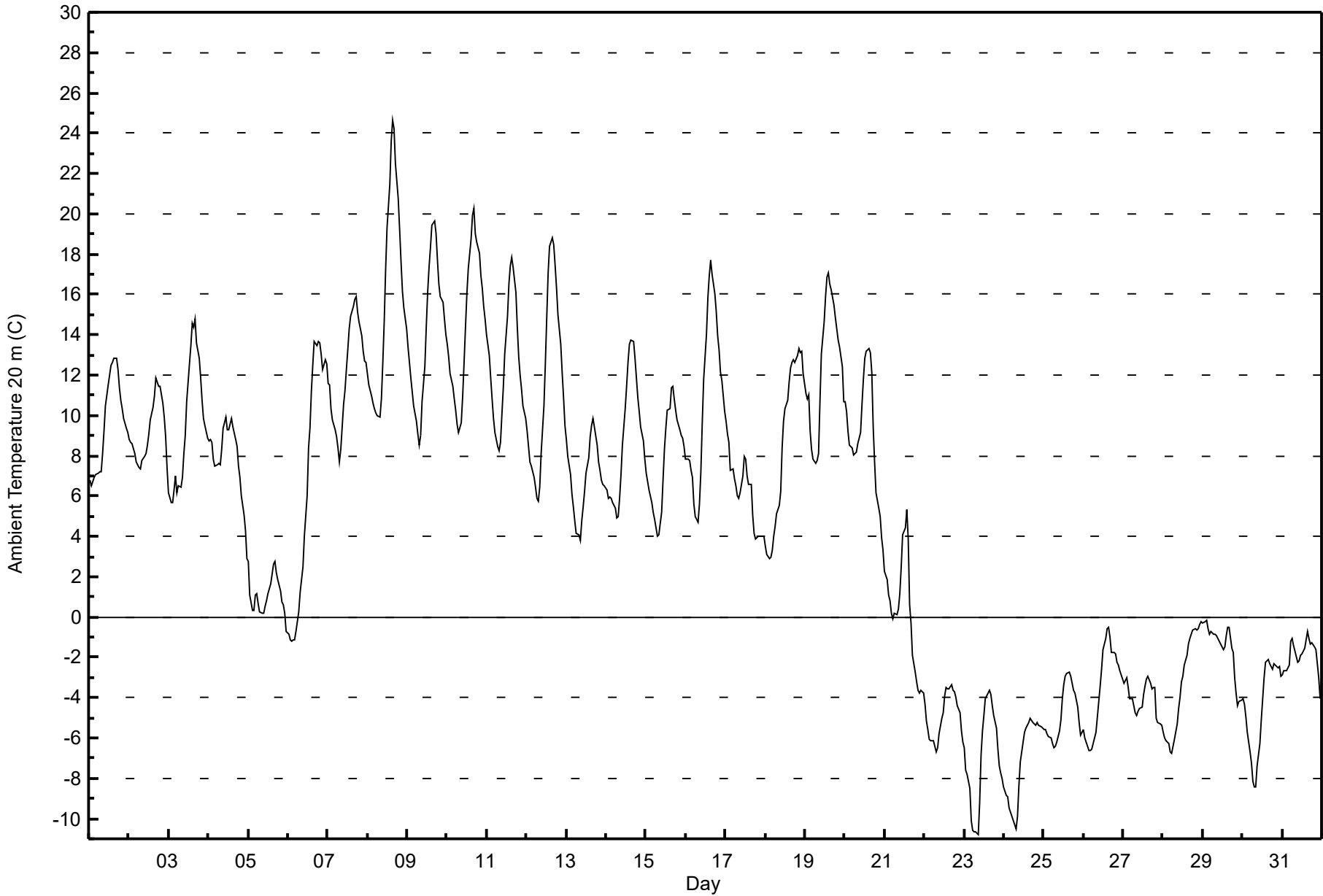
Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	266	35.75	35.75
0 - 10	279	37.50	73.25
10 - 20	192	25.81	99.06
> 20	7	0.94	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Maximum Value: 24.6 C on Oct 8 16:00		Maximum Daily Average: 15.8 C on Oct 8		Hours in Service: 744																						
Minimum Value: -10.8 C on Oct 23 09:00		Minimum Daily Average: -7.2 C on Oct 24		Hours of Data: 744																						
Maximum Diurnal Average: 8.3 C at hour 16		Minimum Diurnal Average: 2.0 C at hour 8		Hours of Missing Data: 0																						
Monthly Average: 4.92 C		Percentiles: P ₁ = -9.9 P ₁₀ = -5.5 Q ₁ = -2.4 Median = 6.5 Q ₃ = 10.8 P ₉₀ = 14.3 P ₉₉ = 19.8		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-Oct	6.8	6.5	6.7	6.9	7.1	7.1	7.2	7.2	8.1	9.2	10.5	11.5	12.0	12.5	12.6	12.9	12.9	12.3	11.4	10.8	10.3	9.9	9.4	9.1	9.6	12.9
2-Oct	8.8	8.6	8.6	8.1	7.7	7.5	7.4	7.3	7.8	8.0	8.1	8.6	9.1	9.8	10.4	10.9	11.9	11.7	11.5	11.5	10.6	9.9	8.9	7.4	9.2	11.9
3-Oct	6.2	5.7	5.7	6.3	7.0	6.2	6.5	6.5	6.9	8.1	9.0	10.7	12.6	13.4	14.6	14.3	14.8	13.6	12.8	11.8	10.8	9.9	9.5	8.9	9.7	14.8
4-Oct	8.7	8.8	8.7	7.8	7.5	7.5	7.6	7.6	8.3	9.3	9.9	9.3	9.3	9.6	9.8	9.4	8.8	8.5	7.5	7.0	6.0	5.1	4.3	2.9	7.9	9.9
5-Oct	2.7	1.1	0.4	0.3	1.1	1.2	0.7	0.3	0.2	0.2	0.5	0.8	1.1	1.6	2.1	2.6	2.7	2.2	1.9	1.3	0.7	0.6	0.2	-0.7	1.1	2.7
6-Oct	-0.9	-1.2	-1.2	-1.1	-1.1	-0.7	0.3	1.3	1.8	2.5	4.0	6.0	8.4	9.4	11.2	12.5	13.7	13.4	13.7	13.6	13.1	12.3	12.8	12.5	6.5	13.7
7-Oct	11.6	11.5	10.3	9.8	9.3	9.0	8.4	7.7	8.3	10.5	11.3	12.2	13.2	14.3	14.9	15.4	15.7	15.9	15.1	14.6	14.0	13.2	12.7	12.6	12.1	15.9
8-Oct	12.1	11.5	10.9	10.6	10.3	10.1	10.0	9.9	10.8	12.6	14.6	17.2	19.3	21.5	23.6	24.6	24.2	22.5	20.8	19.2	17.6	16.2	15.3	14.3	15.8	24.6
9-Oct	13.4	12.6	11.9	11.1	10.5	9.7	9.1	8.6	9.0	10.7	12.5	14.3	16.1	17.3	18.3	19.4	19.6	19.0	17.7	16.5	15.9	15.6	14.8	14.0	14.1	19.6
10-Oct	13.5	12.9	12.1	11.5	10.8	10.3	9.5	9.2	9.6	10.9	12.6	14.4	16.0	17.3	18.7	19.9	20.3	19.1	18.6	18.0	16.9	16.3	15.4	14.8	14.5	20.3
11-Oct	14.0	13.0	11.8	10.8	9.9	9.1	8.5	8.2	8.7	10.1	11.4	13.1	14.9	16.5	17.4	17.8	17.4	16.1	14.3	12.9	12.0	11.3	10.5	9.9	12.5	17.8
12-Oct	9.2	8.5	7.7	7.5	6.9	6.4	5.9	5.8	6.5	8.1	10.4	12.6	14.9	17.1	18.4	18.8	18.5	17.4	16.3	15.0	13.6	12.1	10.9	9.5	11.6	18.8
13-Oct	8.8	8.0	7.0	6.1	5.4	4.8	4.1	4.1	3.8	4.8	5.5	6.2	7.1	7.9	9.0	9.5	9.9	9.4	8.6	7.7	7.3	6.8	6.6	6.5	6.9	9.9
14-Oct	6.3	5.9	5.9	5.9	5.7	5.4	4.9	5.0	5.9	7.1	8.5	10.3	11.4	12.7	13.5	13.8	13.6	12.8	11.9	10.9	10.2	9.4	8.7	7.8	8.9	13.8
15-Oct	7.2	6.7	6.3	5.7	5.2	4.9	4.4	4.0	4.1	5.2	6.8	8.3	9.4	10.3	10.4	11.4	11.5	10.8	10.2	9.8	9.3	9.0	8.9	8.4	7.8	11.5
16-Oct	7.8	7.8	7.7	7.3	7.0	5.6	5.0	4.7	5.6	7.2	9.6	11.8	14.0	15.8	16.9	17.7	17.0	16.0	15.2	13.9	13.3	12.1	11.7	10.2	10.9	17.7
17-Oct	9.7	9.1	8.7	7.2	7.4	6.9	6.5	6.0	5.9	6.2	7.0	7.9	7.8	7.0	6.6	6.6	5.0	4.1	3.9	4.0	4.0	4.0	4.0	4.0	6.2	9.7
18-Oct	3.6	3.1	2.9	3.0	3.3	4.0	4.5	5.2	5.6	6.2	8.4	9.7	10.3	10.7	11.6	12.3	12.6	12.7	12.6	12.9	13.3	13.1	13.2	12.1	8.6	13.3
19-Oct	11.1	10.8	11.0	9.2	8.3	7.8	7.6	7.8	8.1	10.7	13.1	14.6	15.9	16.9	17.1	16.5	16.2	15.5	14.9	14.3	13.8	13.4	12.4	10.7	12.4	17.1
20-Oct	10.7	10.2	9.3	8.5	8.4	8.1	8.1	8.2	8.6	9.2	10.6	11.8	12.8	13.2	13.3	13.1	12.1	9.4	7.7	6.1	5.4	5.0	3.9	3.3	9.0	13.3
21-Oct	2.3	1.9	1.1	0.8	0.2	-0.1	0.2	0.1	0.4	1.2	2.5	4.1	4.4	5.4	3.8	0.6	-0.3	-1.9	-2.8	-3.2	-3.6	-3.8	-3.7	-3.8	0.2	5.4
22-Oct	-4.3	-5.2	-5.6	-6.0	-6.1	-6.1	-6.4	-6.7	-6.5	-5.8	-5.0	-4.7	-3.9	-3.5	-3.5	-3.6	-3.4	-3.6	-3.7	-4.0	-4.4	-4.8	-5.7	-6.2	-4.9	-3.4
23-Oct	-6.5	-7.6	-7.8	-8.5	-10.1	-10.6	-10.6	-10.6	-10.8	-9.2	-6.8	-5.6	-4.9	-4.1	-3.8	-3.6	-3.9	-4.4	-4.9	-5.5	-6.6	-7.4	-7.8	-8.0	-7.1	-3.6
24-Oct	-8.4	-8.8	-8.9	-9.5	-9.7	-9.9	-10.3	-10.5	-9.9	-8.4	-7.2	-6.2	-5.7	-5.5	-5.3	-5.2	-5.0	-5.2	-5.3	-5.4	-5.3	-5.4	-5.5	-5.5	-7.2	-5.0
25-Oct	-5.6	-5.6	-5.8	-5.9	-6.0	-6.3	-6.5	-6.4	-6.2	-5.7	-5.1	-4.0	-3.4	-3.0	-2.8	-2.7	-3.0	-3.3	-3.6	-3.8	-4.5	-5.2	-5.9	-5.7	-4.8	-2.7
26-Oct	-5.6	-6.0	-6.4	-6.6	-6.6	-6.6	-6.3	-5.7	-4.9	-4.2	-3.4	-2.6	-1.6	-1.1	-0.6	-0.5	-1.0	-1.7	-1.8	-1.8	-2.3	-2.4	-2.7	-2.9	-3.5	-0.5
27-Oct	-3.3	-3.1	-3.0	-3.5	-4.0	-4.0	-4.4	-4.8	-4.9	-4.7	-4.5	-4.5	-3.9	-3.5	-3.1	-3.0	-3.3	-3.6	-3.5	-3.5	-5.1	-5.2	-5.3	-5.4	-4.0	-3.0
28-Oct	-5.7	-6.0	-6.2	-6.3	-6.7	-6.8	-6.4	-6.1	-5.3	-4.6	-4.0	-3.2	-3.0	-2.4	-1.9	-1.3	-1.1	-0.8	-0.7	-0.6	-0.6	-0.6	-0.4	-0.3	-3.4	-0.3
29-Oct	-0.3	-0.2	-0.2	-0.5	-0.9	-0.7	-0.8	-0.9	-0.9	-1.1	-1.2	-1.4	-1.6	-1.5	-0.9	-0.5	-0.5	-1.5	-1.7	-3.0	-3.8	-4.4	-4.2	-4.1	-1.5	-0.2
30-Oct	-4.0	-4.3	-5.0	-5.7	-6.7	-7.3	-8.1	-8.5	-8.4	-7.4	-6.3	-5.1	-4.1	-3.0	-2.3	-2.1	-2.3	-2.5	-2.6	-2.3	-2.4	-2.5	-2.5	-2.9	-4.5	-2.1
31-Oct	-2.9	-2.7	-2.6	-2.5	-2.4	-1.2	-1.1	-1.4	-2.0	-2.2	-2.2	-1.9	-1.8	-1.6	-1.1	-0.7	-1.1	-1.3	-1.3	-1.5	-1.6	-2.3	-3.0	-4.0	-1.9	-0.7
																								Diurnal Average		
																								Diurnal Maximum		





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

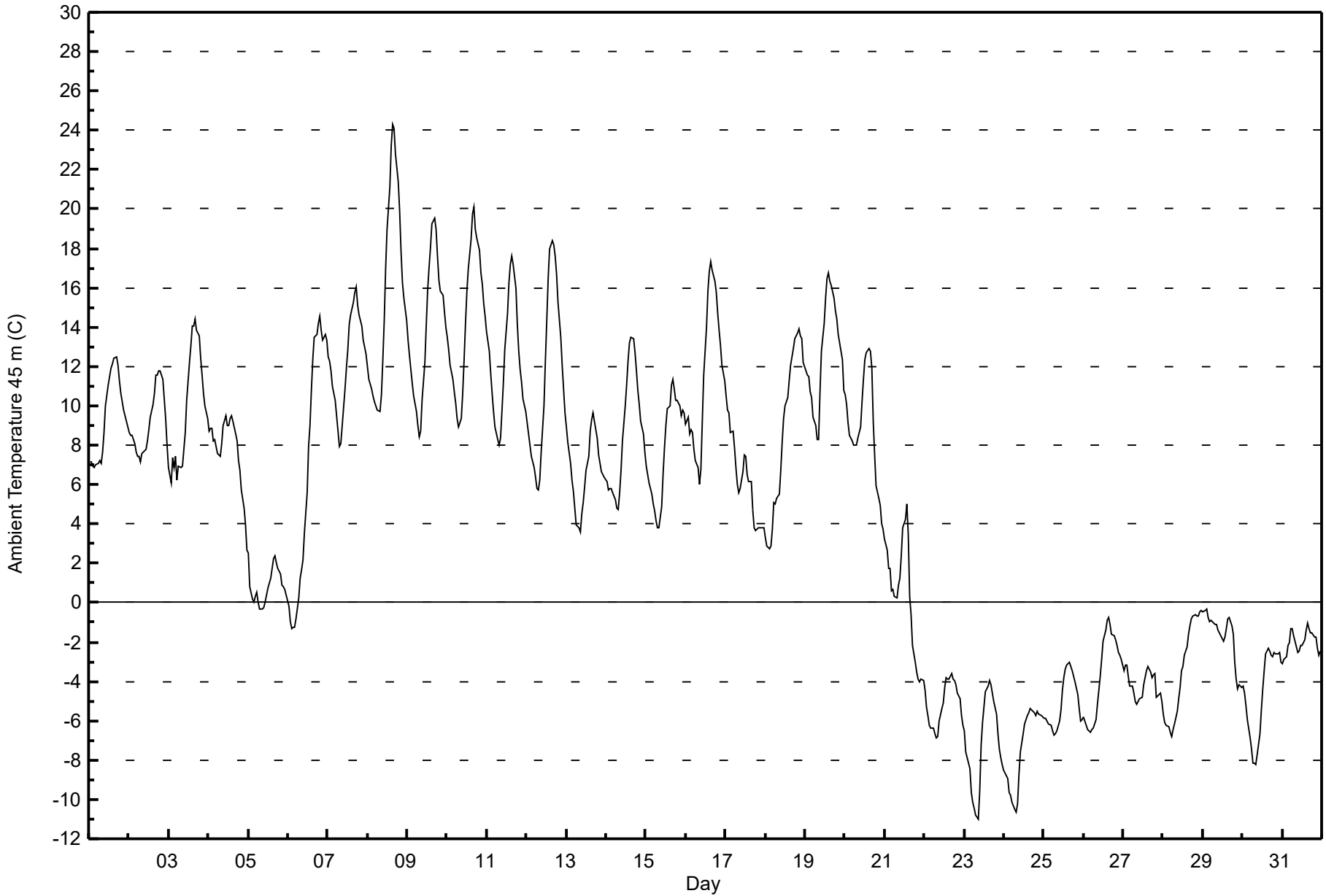
Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	256	34.41	34.41
0 - 10	270	36.29	70.70
10 - 20	211	28.36	99.06
> 20	7	0.94	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Maximum Value: 24.3 C on Oct 8 16:00 Maximum Daily Average: 15.8 C on Oct 8																				Hours in Service: 744 Hours of Data: 744						
Minimum Value: -11.0 C on Oct 23 09:00 Minimum Daily Average: -7.4 C on Oct 24 Maximum Diurnal Average: 8.0 C at hour 16 Minimum Diurnal Average: 2.0 C at hour 8 Monthly Average: 4.87 C Percentiles: P ₁ = -10.0 P ₁₀ = -5.8 Q ₁ = -2.5 Median = 6.7 Q ₃ = 10.8 P ₉₀ = 14.2 P ₉₉ = 19.8																				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-Oct	7.2	7.1	7.0	6.8	7.0	7.0	7.2	7.1	7.6	8.6	10.0	11.0	11.5	11.9	12.1	12.4	12.5	12.1	11.2	10.7	10.2	9.8	9.2	8.9	9.4	12.5
2-Oct	8.7	8.5	8.5	8.1	7.6	7.4	7.4	7.2	7.6	7.7	7.8	8.2	8.8	9.4	10.0	10.6	11.6	11.6	11.7	11.8	11.4	10.4	9.4	8.0	9.1	11.8
3-Oct	6.8	6.1	7.4	6.9	7.5	6.2	6.9	6.8	6.9	7.8	8.6	10.3	12.2	13.1	14.1	14.0	14.4	13.8	13.5	12.4	11.6	10.7	10.0	9.3	9.9	14.4
4-Oct	8.7	8.8	8.8	8.2	8.3	7.6	7.5	7.4	8.1	9.0	9.5	9.0	9.0	9.4	9.5	9.2	8.6	8.2	7.2	6.7	5.8	4.8	4.0	2.6	7.7	9.5
5-Oct	2.5	0.8	0.2	0.0	0.3	0.6	0.0	-0.3	-0.3	-0.3	0.0	0.4	0.7	1.2	1.7	2.3	2.4	2.0	1.7	1.4	0.9	0.8	0.7	0.4	0.8	2.5
6-Oct	-0.2	-1.0	-1.3	-1.2	-1.3	-0.8	0.2	1.2	1.7	2.1	3.5	5.6	7.9	9.0	10.8	12.3	13.5	13.7	14.2	14.5	13.8	13.4	13.6	13.3	6.6	14.5
7-Oct	12.5	12.2	11.8	11.0	10.3	9.5	8.7	7.9	8.1	9.9	10.8	12.0	12.9	14.2	14.7	15.2	15.8	16.0	15.1	14.7	14.0	13.3	13.0	12.6	12.3	16.0
8-Oct	12.0	11.3	10.8	10.5	10.2	10.0	9.8	9.7	10.5	12.3	14.3	17.0	19.0	21.1	23.2	24.3	24.1	22.8	21.4	19.9	17.8	16.3	15.5	14.4	15.8	24.3
9-Oct	13.3	12.6	11.8	11.1	10.5	9.7	9.0	8.4	8.7	10.3	12.2	14.1	15.9	17.1	18.1	19.3	19.5	19.0	17.6	16.4	15.8	15.6	14.7	14.0	13.9	19.5
10-Oct	13.5	12.8	12.1	11.3	10.7	10.2	9.4	9.0	9.3	10.6	12.4	14.2	15.8	17.0	18.5	19.8	20.1	19.0	18.5	17.9	16.8	16.2	15.2	14.6	14.4	20.1
11-Oct	13.8	12.7	11.6	10.6	9.7	8.9	8.3	8.0	8.4	9.7	11.1	12.9	14.7	16.2	17.2	17.6	17.2	15.9	14.2	12.8	11.8	11.2	10.3	9.7	12.3	17.6
12-Oct	9.1	8.6	8.0	7.4	6.9	6.3	5.8	5.7	6.2	7.7	10.0	12.3	14.4	16.5	17.9	18.4	18.2	17.6	16.7	15.2	13.5	12.0	10.9	9.7	11.5	18.4
13-Oct	9.0	8.2	7.0	6.2	5.7	4.8	3.9	3.8	3.6	4.5	5.1	5.9	6.8	7.5	8.7	9.3	9.7	9.2	8.4	7.5	7.1	6.7	6.5	6.4	6.7	9.7
14-Oct	6.2	5.7	5.8	5.8	5.6	5.2	4.8	4.8	5.6	6.8	8.2	10.0	11.1	12.3	13.2	13.5	13.4	12.7	11.8	10.8	10.1	9.2	8.5	7.6	8.7	13.5
15-Oct	7.0	6.5	6.1	5.5	5.0	4.6	4.2	3.8	3.8	4.9	6.5	7.9	9.0	9.9	10.0	11.1	11.4	10.8	10.3	10.3	10.0	9.5	9.8	9.7	7.8	11.4
16-Oct	9.1	9.5	8.6	8.8	8.6	7.8	7.2	6.8	6.0	6.8	9.2	11.6	14.0	15.8	16.8	17.3	16.9	16.3	15.7	14.7	13.8	13.1	12.0	11.3	11.6	17.3
17-Oct	10.5	9.8	9.6	8.7	8.7	7.9	6.9	6.0	5.6	5.8	6.6	7.5	7.4	6.5	6.1	6.1	4.7	3.8	3.6	3.7	3.8	3.8	3.8	3.8	6.3	10.5
18-Oct	3.3	2.9	2.7	2.9	3.7	5.1	5.0	5.3	5.5	6.7	8.2	9.4	10.0	10.4	11.3	12.1	12.5	12.9	13.4	13.7	13.9	13.6	13.4	12.2	8.7	13.9
19-Oct	11.8	11.5	11.5	10.7	10.4	9.4	9.0	8.3	8.3	10.7	12.8	14.2	15.5	16.5	16.8	16.3	16.1	15.4	14.8	14.4	13.6	13.2	12.3	10.8	12.7	16.8
20-Oct	10.5	10.1	9.1	8.5	8.3	8.0	8.0	8.0	8.4	8.9	10.2	11.3	12.4	12.7	12.9	12.8	11.9	9.2	7.5	6.0	5.3	5.0	4.0	3.7	8.9	12.9
21-Oct	3.2	2.6	1.8	1.8	0.6	0.7	0.3	0.2	0.9	1.3	2.4	3.8	4.2	5.0	3.4	0.3	-0.6	-2.2	-3.1	-3.5	-3.9	-4.0	-3.9	-3.9	0.3	5.0
22-Oct	-4.5	-5.3	-5.8	-6.3	-6.4	-6.4	-6.7	-6.9	-6.8	-6.0	-5.4	-5.1	-4.3	-3.8	-3.9	-3.9	-3.6	-3.9	-4.0	-4.2	-4.6	-4.9	-5.7	-6.3	-5.2	-3.6
23-Oct	-6.6	-7.6	-7.9	-8.5	-9.6	-10.2	-10.5	-10.8	-11.0	-9.6	-7.2	-6.1	-5.3	-4.5	-4.2	-4.0	-4.2	-4.6	-5.0	-5.6	-6.7	-7.5	-7.9	-8.2	-7.2	-4.0
24-Oct	-8.5	-8.8	-8.9	-9.6	-9.8	-10.1	-10.5	-10.6	-10.2	-8.7	-7.6	-6.7	-6.1	-5.9	-5.7	-5.6	-5.4	-5.5	-5.6	-5.7	-5.5	-5.7	-5.7	-5.8	-7.4	-5.4
25-Oct	-5.9	-5.9	-6.0	-6.2	-6.3	-6.5	-6.7	-6.7	-6.5	-6.0	-5.5	-4.4	-3.8	-3.4	-3.2	-3.0	-3.2	-3.2	-3.4	-3.8	-4.0	-4.7	-5.4	-5.9	-5.1	-3.0
26-Oct	-5.8	-6.0	-6.4	-6.5	-6.6	-6.5	-6.4	-5.9	-5.2	-4.5	-3.7	-2.9	-1.9	-1.4	-0.9	-0.8	-1.1	-1.6	-1.7	-1.9	-2.1	-2.5	-2.7	-2.9	-3.7	-0.8
27-Oct	-3.4	-3.2	-3.2	-3.7	-4.3	-4.3	-4.6	-5.0	-5.2	-5.0	-4.9	-4.8	-4.2	-3.8	-3.4	-3.3	-3.6	-3.8	-3.7	-3.6	-4.8	-4.7	-4.6	-5.0	-4.2	-3.2
28-Oct	-5.7	-6.1	-6.2	-6.3	-6.6	-6.8	-6.5	-6.2	-5.5	-4.9	-4.3	-3.5	-3.3	-2.7	-2.2	-1.6	-1.2	-0.8	-0.7	-0.6	-0.7	-0.7	-0.5	-0.4	-3.5	-0.4
29-Oct	-0.5	-0.4	-0.3	-0.7	-1.0	-0.9	-1.0	-1.1	-1.1	-1.4	-1.5	-1.7	-1.9	-1.8	-1.3	-0.8	-0.8	-1.2	-1.6	-3.0	-3.9	-4.4	-4.2	-4.3	-1.7	-0.3
30-Oct	-4.3	-4.6	-5.3	-6.0	-6.9	-7.4	-8.1	-8.2	-8.2	-7.7	-6.7	-5.4	-4.4	-3.4	-2.6	-2.3	-2.5	-2.6	-2.7	-2.5	-2.6	-2.6	-2.5	-3.0	-4.7	-2.3
31-Oct	-3.1	-2.9	-2.7	-2.2	-2.0	-1.3	-1.3	-1.7	-2.2	-2.5	-2.5	-2.2	-2.1	-1.9	-1.4	-1.0	-1.3	-1.5	-1.6	-1.8	-1.7	-2.3	-2.7	-2.4	-2.0	-1.0
																								Diurnal Average		
																								Diurnal Maximum		





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

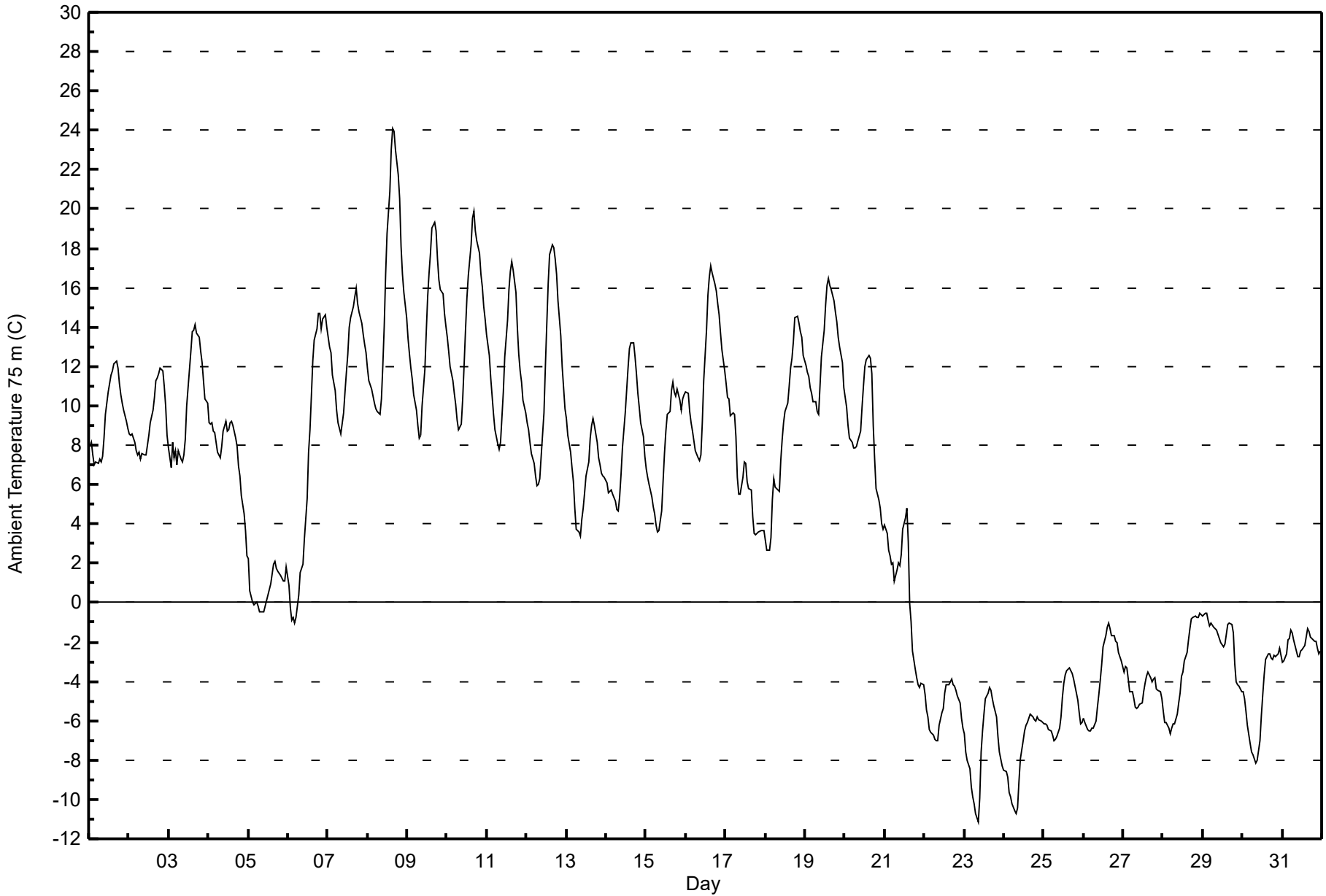
Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	258	34.68	34.68
0 - 10	269	36.16	70.83
10 - 20	210	28.23	99.06
> 20	7	0.94	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Maximum Value: 24.1 C on Oct 8 16:00		Maximum Daily Average: 15.7 C on Oct 8		Hours in Service: 744																																												
Minimum Value: -11.1 C on Oct 23 09:00		Minimum Daily Average: -7.6 C on Oct 24		Hours of Data: 744																																												
Maximum Diurnal Average: 7.7 C at hour 17		Minimum Diurnal Average: 2.1 C at hour 8		Hours of Missing Data: 0																																												
Monthly Average: 4.84 C		Percentiles: P ₁ = -9.9 P ₁₀ = -6.0 Q ₁ = -2.6 Median = 6.8 Q ₃ = 10.8 P ₉₀ = 14.4 P ₉₉ = 19.7		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-Oct	7.9	8.2	7.5	7.0	7.1	7.1	7.3	7.1	7.5	8.3	9.6	10.7	11.2	11.6	11.8	12.1	12.2	11.9	11.1	10.6	10.2	9.8	9.2	8.8	9.4	12.2																						
2-Oct	8.6	8.5	8.6	8.1	7.7	7.5	7.7	7.3	7.6	7.5	7.5	8.0	8.5	9.1	9.8	10.4	11.3	11.4	11.6	11.9	11.8	11.0	10.0	8.5	9.2	11.9																						
3-Oct	7.9	6.9	8.1	7.4	7.7	7.0	7.7	7.3	7.1	7.5	8.3	10.0	11.9	12.8	13.8	13.8	14.1	13.7	13.5	12.8	12.2	11.3	10.3	10.1	10.1	14.1																						
4-Oct	9.1	9.1	9.1	8.7	8.6	7.6	7.5	7.4	7.9	8.7	9.2	8.7	8.8	9.1	9.2	9.0	8.3	7.9	7.0	6.4	5.5	4.5	3.7	2.4	7.6	9.2																						
5-Oct	2.3	0.6	0.0	-0.1	0.0	0.1	-0.2	-0.4	-0.5	-0.5	-0.2	0.1	0.4	0.9	1.4	2.0	2.1	1.8	1.6	1.4	1.2	1.1	1.1	1.8	0.8	2.3																						
6-Oct	0.9	-0.3	-0.9	-0.7	-1.0	-0.7	0.4	1.5	1.7	1.9	3.2	5.3	7.7	8.8	10.5	12.3	13.4	13.9	14.7	14.7	13.9	14.4	14.6	14.0	6.8	14.7																						
7-Oct	13.5	13.0	12.7	11.5	10.8	9.8	9.2	8.9	8.6	9.7	10.7	11.7	12.6	14.0	14.5	15.0	15.6	15.9	15.2	14.7	14.2	13.6	13.1	12.7	12.5	15.9																						
8-Oct	11.9	11.3	10.8	10.5	10.1	9.9	9.7	9.6	10.4	12.1	14.1	16.7	18.7	20.9	23.0	24.1	24.0	23.0	21.7	20.6	18.1	16.7	15.8	14.5	15.7	24.1																						
9-Oct	13.4	12.7	11.9	11.3	10.6	9.8	9.0	8.3	8.5	10.0	11.8	13.8	15.6	16.8	17.8	19.0	19.3	18.9	17.5	16.4	15.9	15.7	14.7	14.0	13.9	19.3																						
10-Oct	13.5	12.8	12.0	11.3	10.7	10.1	9.3	8.8	9.1	10.3	12.1	13.8	15.5	16.7	18.2	19.5	19.9	18.9	18.4	17.7	16.7	16.0	15.0	14.4	14.2	19.9																						
11-Oct	13.6	12.5	11.4	10.5	9.6	8.8	8.1	7.8	8.1	9.4	10.7	12.5	14.4	15.9	16.8	17.3	16.9	15.8	14.0	12.6	11.8	11.2	10.3	9.6	12.1	17.3																						
12-Oct	9.2	8.8	8.1	7.6	7.0	6.4	6.0	6.0	6.3	7.4	9.6	12.0	14.1	16.2	17.7	18.2	18.0	17.5	16.7	15.4	13.6	12.0	10.9	9.9	11.4	18.2																						
13-Oct	9.3	8.5	7.6	6.8	6.2	4.8	3.7	3.6	3.4	4.3	4.8	5.6	6.4	7.2	8.3	9.0	9.4	9.0	8.2	7.4	7.0	6.6	6.4	6.3	6.7	9.4																						
14-Oct	6.1	5.6	5.7	5.7	5.5	5.1	4.7	4.7	5.4	6.5	7.9	9.6	10.8	11.9	12.9	13.2	13.2	12.5	11.6	10.7	9.9	9.1	8.4	7.5	8.5	13.2																						
15-Oct	6.8	6.4	6.0	5.4	4.9	4.5	4.0	3.6	3.6	4.7	6.2	7.6	8.7	9.6	9.7	10.8	11.2	10.7	10.5	10.8	10.3	9.8	10.4	10.6	7.8	11.2																						
16-Oct	10.7	10.7	9.7	9.2	8.7	8.2	7.7	7.3	7.2	7.5	9.1	11.3	13.8	15.6	16.6	17.1	16.7	16.2	15.9	15.2	14.6	13.7	12.8	11.8	12.0	17.1																						
17-Oct	11.2	10.4	10.4	9.5	9.7	9.6	8.5	6.4	5.5	5.5	6.3	7.2	7.1	6.2	5.8	5.8	4.4	3.5	3.5	3.5	3.6	3.6	3.6	3.6	6.4	11.2																						
18-Oct	3.1	2.7	2.7	3.3	5.2	6.3	5.9	5.8	5.7	7.2	8.3	9.2	9.7	10.1	11.0	11.9	12.4	13.3	14.5	14.5	14.2	13.8	13.5	12.5	9.0	14.5																						
19-Oct	12.1	11.7	11.5	10.9	10.7	10.2	10.2	9.7	9.6	11.0	12.5	13.8	15.1	16.1	16.5	16.1	15.9	15.3	14.8	14.3	13.5	13.0	12.2	10.9	12.8	16.5																						
20-Oct	10.4	9.9	9.0	8.4	8.1	7.9	7.8	7.9	8.2	8.7	9.9	11.0	12.0	12.3	12.6	12.4	11.7	9.0	7.3	5.8	5.2	4.8	4.0	3.7	8.7	12.6																						
21-Oct	3.9	3.5	2.7	2.4	1.9	2.0	1.1	1.7	2.0	1.9	2.5	3.7	4.3	4.8	3.1	0.0	-1.0	-2.5	-3.4	-3.8	-4.2	-4.3	-4.1	-4.1	0.6	4.8																						
22-Oct	-4.7	-5.5	-5.8	-6.4	-6.6	-6.7	-6.9	-7.0	-7.0	-6.2	-5.6	-5.4	-4.6	-4.2	-4.2	-4.1	-3.9	-4.1	-4.2	-4.5	-4.8	-5.1	-5.9	-6.4	-5.4	-3.9																						
23-Oct	-6.7	-7.6	-8.0	-8.5	-9.3	-9.9	-10.3	-10.7	-11.1	-9.9	-7.6	-6.5	-5.7	-4.8	-4.6	-4.3	-4.5	-4.9	-5.2	-5.8	-6.8	-7.6	-8.0	-8.3	-7.4	-4.3																						
24-Oct	-8.5	-8.6	-8.8	-9.6	-9.9	-10.2	-10.6	-10.7	-10.4	-9.1	-8.0	-7.0	-6.5	-6.3	-6.1	-5.9	-5.7	-5.8	-5.9	-6.0	-5.8	-6.0	-6.0	-6.1	-7.6	-5.7																						
25-Oct	-6.2	-6.1	-6.3	-6.5	-6.5	-6.7	-7.0	-6.9	-6.8	-6.4	-5.8	-4.8	-4.1	-3.7	-3.5	-3.3	-3.5	-3.6	-3.9	-4.3	-4.9	-5.6	-6.2	-6.1	-5.4	-3.3																						
26-Oct	-5.9	-6.1	-6.4	-6.5	-6.5	-6.3	-6.4	-6.0	-5.3	-4.7	-4.0	-3.2	-2.2	-1.7	-1.2	-1.1	-1.3	-1.7	-1.7	-2.0	-2.1	-2.6	-2.8	-3.0	-3.8	-1.1																						
27-Oct	-3.5	-3.3	-3.3	-3.9	-4.5	-4.5	-4.9	-5.3	-5.4	-5.3	-5.2	-5.1	-4.5	-4.1	-3.8	-3.5	-3.8	-4.0	-3.9	-3.8	-4.4	-4.4	-4.5	-4.9	-4.3	-3.3																						
28-Oct	-5.5	-6.1	-6.1	-6.4	-6.6	-6.4	-6.2	-6.1	-5.7	-5.1	-4.6	-3.8	-3.5	-3.0	-2.5	-1.9	-1.3	-0.8	-0.7	-0.7	-0.7	-0.8	-0.6	-0.6	-3.6	-0.6																						
29-Oct	-0.7	-0.5	-0.6	-0.9	-1.2	-1.1	-1.3	-1.3	-1.4	-1.6	-1.8	-2.0	-2.3	-2.1	-1.6	-1.1	-1.0	-1.1	-1.5	-3.1	-4.0	-4.2	-4.2	-4.5	-1.9	-0.5																						
30-Oct	-4.5	-4.9	-5.6	-6.2	-7.1	-7.6	-7.7	-8.0	-8.1	-8.0	-7.0	-5.7	-4.6	-3.7	-2.9	-2.6	-2.6	-2.8	-2.9	-2.7	-2.8	-2.6	-2.3	-2.7	-4.8	-2.3																						
31-Oct	-3.1	-2.9	-2.6	-1.9	-1.8	-1.4	-1.5	-1.9	-2.5	-2.8	-2.7	-2.5	-2.4	-2.2	-1.7	-1.3	-1.5	-1.7	-1.8	-2.0	-2.0	-2.3	-2.6	-2.5	-2.1	-1.3																						
																								4.4	3.9	3.6	3.2	2.9	2.6	2.3	2.1	2.2	2.9	3.9	5.0	6.0	6.8	7.4	7.7	7.7	7.3	6.9	6.4	5.8	5.4	4.9	4.5	Diurnal Average
																								13.6	13.0	12.7	11.5	10.8	10.2	10.2	9.7	10.4	12.1	14.1	16.7	18.7	20.9	23.0	24.1	24.0	23.0	21.7	20.6	18.1	16.7	15.8	14.5	Diurnal Maximum





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

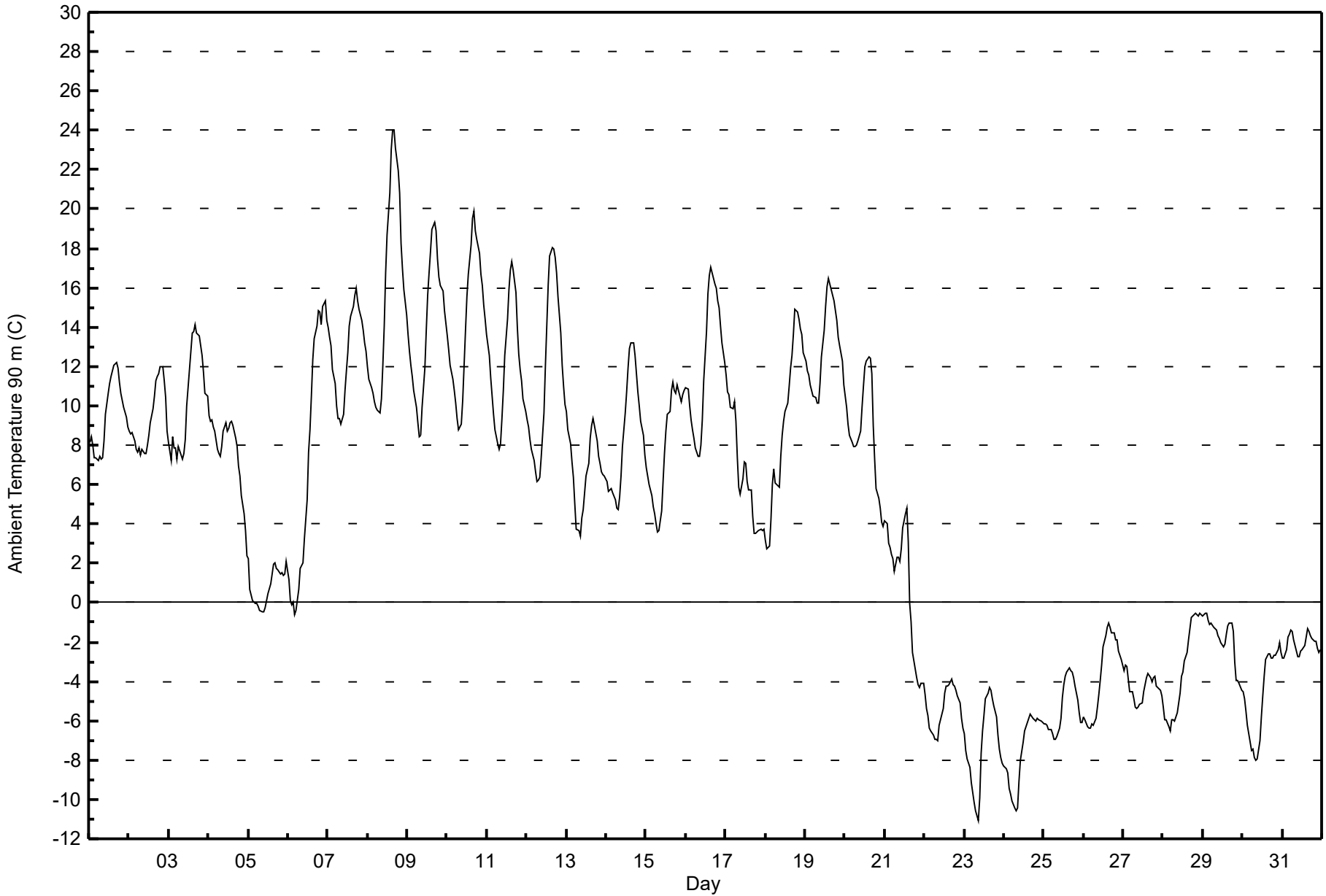
Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	261	35.08	35.08
0 - 10	259	34.81	69.89
10 - 20	217	29.17	99.06
> 20	7	0.94	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Maximum Value: 24.0 C on Oct 8 16:00		Maximum Daily Average: 15.8 C on Oct 8		Hours in Service: 744																																												
Minimum Value: -11.1 C on Oct 23 09:00		Minimum Daily Average: -7.6 C on Oct 24		Hours of Data: 744																																												
Maximum Diurnal Average: 7.7 C at hour 17		Minimum Diurnal Average: 2.3 C at hour 8		Hours of Missing Data: 0																																												
Monthly Average: 4.93 C		Percentiles: P ₁ = -9.9 P ₁₀ = -5.9 Q ₁ = -2.5 Median = 7.1 Q ₃ = 10.9 P ₉₀ = 14.4 P ₉₉ = 19.7		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-Oct	8.1	8.5	8.0	7.3	7.3	7.2	7.4	7.3	7.4	8.2	9.6	10.7	11.1	11.5	11.7	12.0	12.2	11.9	11.2	10.7	10.3	9.9	9.4	9.0	9.5	12.2																						
2-Oct	8.7	8.6	8.6	8.2	7.8	7.7	7.9	7.5	7.8	7.6	7.5	8.0	8.5	9.1	9.8	10.5	11.3	11.5	11.7	12.0	12.0	11.3	10.5	8.7	9.3	12.0																						
3-Oct	8.2	7.3	8.4	7.8	7.9	7.3	7.9	7.5	7.3	7.6	8.3	10.0	11.8	12.8	13.7	13.8	14.1	13.7	13.5	13.1	12.6	11.7	10.6	10.5	10.3	14.1																						
4-Oct	9.5	9.2	9.2	8.9	8.7	7.8	7.6	7.5	8.0	8.7	9.2	8.7	8.8	9.1	9.2	9.0	8.4	7.9	7.0	6.4	5.5	4.5	3.7	2.4	7.7	9.5																						
5-Oct	2.3	0.7	0.1	0.0	0.0	0.0	-0.2	-0.4	-0.4	-0.4	-0.2	0.1	0.4	0.9	1.4	2.0	2.1	1.8	1.7	1.5	1.6	1.4	1.4	2.1	0.8	2.3																						
6-Oct	1.2	0.1	-0.1	0.0	-0.6	-0.4	0.7	1.7	1.9	2.0	3.2	5.2	7.6	8.8	10.5	12.3	13.4	14.1	14.8	14.7	14.1	15.1	15.3	14.4	7.1	15.3																						
7-Oct	14.0	13.5	13.0	11.8	11.1	10.0	9.4	9.3	9.1	9.6	10.8	11.8	12.7	14.1	14.5	15.1	15.6	16.0	15.3	14.9	14.3	13.8	13.2	12.8	12.7	16.0																						
8-Oct	12.0	11.3	10.9	10.6	10.2	9.9	9.8	9.6	10.4	12.1	14.1	16.7	18.7	20.8	23.0	24.0	24.0	23.1	22.0	20.9	18.3	16.9	15.9	14.6	15.8	24.0																						
9-Oct	13.6	12.8	12.1	11.5	10.8	9.9	9.1	8.4	8.5	9.9	11.9	13.9	15.6	16.8	17.8	19.0	19.3	18.9	17.5	16.5	16.1	15.8	14.8	14.2	13.9	19.3																						
10-Oct	13.6	12.9	12.1	11.4	10.7	10.2	9.3	8.8	9.1	10.3	12.0	13.9	15.5	16.7	18.2	19.5	19.9	18.9	18.5	17.8	16.7	16.1	15.1	14.4	14.2	19.9																						
11-Oct	13.6	12.5	11.5	10.5	9.6	8.8	8.1	7.8	8.1	9.4	10.8	12.6	14.4	15.9	16.9	17.3	16.9	15.8	14.0	12.6	11.8	11.3	10.4	9.7	12.1	17.3																						
12-Oct	9.3	9.0	8.3	7.8	7.3	6.7	6.2	6.2	6.4	7.4	9.6	12.0	14.0	16.1	17.6	18.1	18.0	17.5	16.8	15.6	13.7	12.1	11.0	10.1	11.5	18.1																						
13-Oct	9.7	8.8	8.1	7.2	6.4	5.0	3.8	3.7	3.4	4.3	4.8	5.6	6.4	7.1	8.4	9.0	9.4	9.0	8.2	7.4	7.1	6.7	6.5	6.4	6.8	9.7																						
14-Oct	6.2	5.7	5.7	5.8	5.6	5.2	4.8	4.7	5.4	6.5	7.9	9.7	10.7	11.9	12.9	13.2	13.2	12.5	11.7	10.7	10.0	9.2	8.5	7.5	8.5	13.2																						
15-Oct	6.9	6.5	6.0	5.4	4.9	4.5	4.0	3.6	3.7	4.7	6.2	7.6	8.7	9.5	9.7	10.8	11.2	10.8	10.7	11.0	10.5	10.2	10.6	10.8	7.9	11.2																						
16-Oct	10.9	10.9	10.0	9.3	8.8	8.4	7.8	7.4	7.4	8.0	9.3	11.3	13.7	15.7	16.6	17.0	16.7	16.2	16.0	15.4	15.0	14.0	13.2	12.2	12.1	17.0																						
17-Oct	11.5	10.7	10.6	10.0	9.9	10.2	9.2	7.4	5.9	5.5	6.3	7.1	7.1	6.1	5.8	5.7	4.4	3.5	3.5	3.6	3.7	3.7	3.7	3.7	6.6	11.5																						
18-Oct	3.2	2.8	2.9	4.2	6.0	6.8	6.1	6.0	5.9	7.4	8.5	9.2	9.7	10.1	11.0	11.9	12.5	13.6	14.9	14.8	14.4	13.9	13.7	12.7	9.3	14.9																						
19-Oct	12.2	11.8	11.6	11.1	10.8	10.5	10.4	10.1	10.1	11.2	12.5	13.8	15.1	16.1	16.5	16.2	15.9	15.4	14.8	14.3	13.5	13.0	12.3	11.1	12.9	16.5																						
20-Oct	10.5	9.9	9.1	8.5	8.2	8.0	7.9	8.0	8.3	8.7	9.9	11.0	12.0	12.3	12.5	12.4	11.7	9.0	7.3	5.8	5.3	4.8	4.1	3.9	8.7	12.5																						
21-Oct	4.2	4.0	3.1	2.8	2.5	2.2	1.6	2.3	2.3	2.1	2.8	3.8	4.5	4.8	3.1	0.0	-1.0	-2.5	-3.4	-3.8	-4.2	-4.3	-4.1	-4.1	0.8	4.8																						
22-Oct	-4.7	-5.4	-5.7	-6.4	-6.5	-6.7	-6.9	-7.0	-7.0	-6.3	-5.6	-5.4	-4.6	-4.2	-4.2	-4.2	-3.9	-4.1	-4.2	-4.5	-4.7	-5.1	-5.8	-6.4	-5.4	-3.9																						
23-Oct	-6.6	-7.5	-7.9	-8.4	-9.2	-9.6	-10.1	-10.5	-11.1	-10.0	-7.6	-6.5	-5.7	-4.9	-4.6	-4.3	-4.5	-4.8	-5.2	-5.8	-6.8	-7.5	-7.9	-8.2	-7.3	-4.3																						
24-Oct	-8.3	-8.4	-8.7	-9.5	-9.7	-10.1	-10.4	-10.6	-10.4	-9.1	-8.0	-7.1	-6.5	-6.3	-6.1	-5.9	-5.7	-5.8	-5.9	-6.0	-5.8	-6.0	-6.0	-6.1	-7.6	-5.7																						
25-Oct	-6.2	-6.1	-6.2	-6.4	-6.5	-6.7	-7.0	-6.9	-6.8	-6.4	-5.9	-4.8	-4.1	-3.7	-3.5	-3.3	-3.5	-3.6	-3.8	-4.3	-4.9	-5.6	-6.1	-6.1	-5.3	-3.3																						
26-Oct	-5.8	-5.9	-6.3	-6.4	-6.4	-6.2	-6.3	-5.9	-5.3	-4.7	-4.0	-3.2	-2.2	-1.7	-1.2	-1.1	-1.3	-1.6	-1.5	-1.9	-1.9	-2.5	-2.7	-2.9	-3.7	-1.1																						
27-Oct	-3.5	-3.2	-3.2	-3.9	-4.5	-4.5	-4.9	-5.3	-5.4	-5.3	-5.2	-5.1	-4.6	-4.1	-3.8	-3.6	-3.8	-4.0	-3.8	-3.7	-4.3	-4.3	-4.4	-4.7	-4.3	-3.2																						
28-Oct	-5.3	-6.0	-6.0	-6.3	-6.5	-5.9	-6.0	-6.0	-5.6	-5.1	-4.6	-3.8	-3.5	-3.0	-2.5	-1.9	-1.3	-0.7	-0.6	-0.5	-0.6	-0.7	-0.5	-0.6	-3.5	-0.5																						
29-Oct	-0.7	-0.5	-0.6	-0.9	-1.1	-1.1	-1.2	-1.3	-1.4	-1.6	-1.8	-2.0	-2.3	-2.1	-1.6	-1.2	-1.0	-1.1	-1.5	-3.0	-3.9	-4.0	-4.1	-4.5	-1.9	-0.5																						
30-Oct	-4.5	-4.9	-5.5	-6.2	-7.1	-7.5	-7.5	-7.9	-8.0	-7.9	-7.0	-5.8	-4.7	-3.8	-2.9	-2.6	-2.6	-2.8	-2.8	-2.7	-2.7	-2.4	-2.1	-2.5	-4.8	-2.1																						
31-Oct	-2.8	-2.8	-2.4	-1.8	-1.6	-1.4	-1.5	-1.9	-2.4	-2.8	-2.7	-2.5	-2.4	-2.2	-1.7	-1.3	-1.5	-1.7	-1.8	-1.9	-1.9	-2.3	-2.5	-2.4	-2.1	-1.3																						
																								4.5	4.1	3.8	3.4	3.1	2.8	2.5	2.3	2.3	3.0	4.0	5.0	6.0	6.8	7.4	7.7	7.7	7.4	7.0	6.5	6.0	5.5	5.1	4.6	Diurnal Average
																								14.0	13.5	13.0	11.8	11.1	10.5	10.4	10.1	10.4	12.1	14.1	16.7	18.7	20.8	23.0	24.0	24.0	23.1	22.0	20.9	18.3	16.9	15.9	14.6	Diurnal Maximum





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	259	34.81	34.81
0 - 10	256	34.41	69.22
10 - 20	222	29.84	99.06
> 20	7	0.94	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

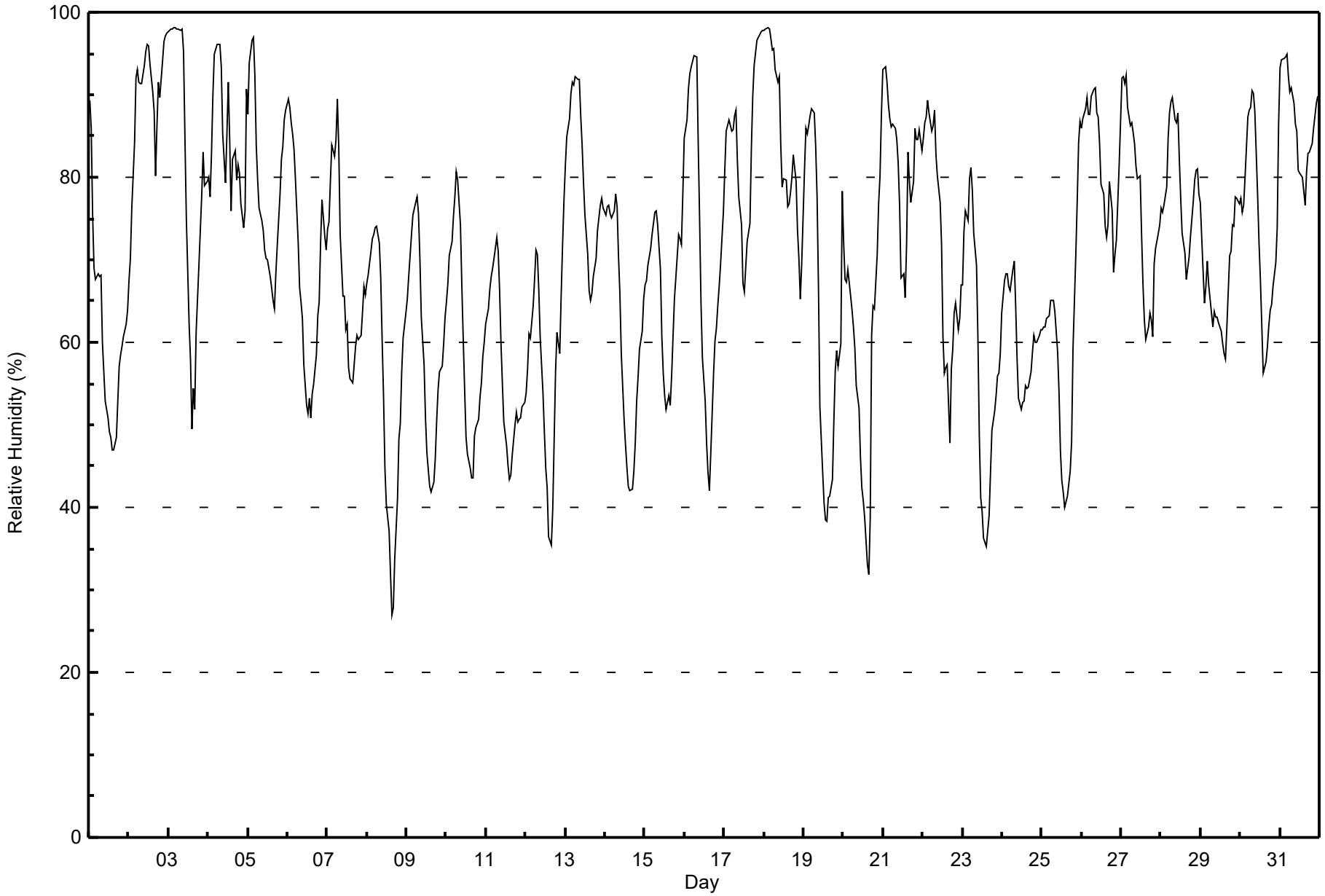
Mannix - October 2023

Maximum Value: 98 % on Oct 3 04:00																		Maximum Daily Average: 89.3 % on Oct 2																		Hours in Service: 744													
Minimum Value: 27 % on Oct 8 16:00																		Minimum Daily Average: 54.8 % on Oct 8																		Hours of Data: 744													
Maximum Diurnal Average: 81.9 % at hour 7																		Minimum Diurnal Average: 55.5 % at hour 15																		Hours of Missing Data: 0													
Monthly Average: 70.5 %																		Percentiles: P ₁ = 36 P ₁₀ = 49 Q ₁ = 60 Median = 71 Q ₃ = 84 P ₉₀ = 91 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-Oct	89	86	75	69	68	68	68	68	60	56	53	51	49	48	47	47	48	53	57	59	60	61	62	64	61.1	89																							
2-Oct	67	70	76	84	92	93	92	91	91	94	95	96	96	94	90	88	80	86	92	90	94	96	97	97	89.3	97																							
3-Oct	98	98	98	98	98	98	98	98	98	95	85	75	62	58	50	54	52	61	69	74	78	83	79	80	80.7	98																							
4-Oct	80	78	83	90	95	96	96	96	93	85	79	85	92	85	76	82	83	80	82	81	77	74	76	91	84.7	96																							
5-Oct	88	94	97	97	92	84	80	76	75	74	71	70	70	68	67	65	64	68	72	78	82	84	87	88	78.7	97																							
6-Oct	89	88	87	85	83	80	72	67	65	63	57	52	51	53	51	54	55	58	63	65	72	77	73	71	68.0	89																							
7-Oct	74	75	80	84	83	85	90	83	73	66	66	62	62	57	56	55	57	60	61	60	61	64	67	66	68.4	90																							
8-Oct	67	68	71	73	73	74	74	72	68	60	54	45	40	37	32	27	28	34	41	48	50	56	61	64	54.8	74																							
9-Oct	65	68	71	73	75	77	78	76	70	63	57	51	47	45	42	42	43	46	51	54	56	57	60	63	59.6	78																							
10-Oct	65	67	70	72	75	78	81	80	74	67	60	54	49	46	45	43	44	49	50	51	53	55	58	60	60.2	81																							
11-Oct	62	64	66	68	69	70	73	71	66	60	55	50	47	45	43	44	46	50	51	50	51	51	52	53	56.6	73																							
12-Oct	54	57	61	61	64	68	71	71	67	61	54	49	45	42	37	35	40	48	56	61	59	66	72	77	57.3	77																							
13-Oct	81	85	87	90	92	91	92	92	92	88	84	79	75	71	66	65	66	68	70	74	75	77	77	76	79.7	92																							
14-Oct	75	76	77	76	75	76	78	76	71	66	59	51	48	45	43	42	42	44	48	53	56	59	61	65	60.9	78																							
15-Oct	67	67	69	71	73	74	76	76	74	69	61	56	54	52	54	52	56	61	65	68	73	73	72	78	66.3	78																							
16-Oct	85	87	91	93	93	94	95	95	84	75	65	58	53	48	44	42	47	56	60	62	64	67	69	76	70.9	95																							
17-Oct	81	86	86	87	86	86	87	88	82	78	74	67	66	69	72	74	83	90	94	95	97	97	98	98	84.2	98																							
18-Oct	98	98	98	98	97	95	96	93	91	92	84	79	80	80	76	77	78	80	83	80	74	70	65	69	84.6	98																							
19-Oct	81	86	85	86	87	88	88	84	78	67	52	44	40	38	38	41	41	43	51	57	59	57	60	78	63.8	88																							
20-Oct	72	68	67	69	66	64	62	59	55	52	46	42	41	39	33	32	39	61	64	64	71	77	80	88	58.7	88																							
21-Oct	93	93	91	89	87	86	87	86	85	82	77	68	68	65	72	83	79	77	80	86	85	85	86	83	82.2	93																							
22-Oct	85	87	87	89	88	86	86	88	83	80	77	72	61	56	57	57	48	57	59	63	65	61	63	67	71.7	89																							
23-Oct	67	73	76	75	80	81	78	73	69	61	49	41	40	36	35	37	39	44	49	52	54	56	59	59	57.5	81																							
24-Oct	64	67	68	68	67	66	69	70	64	58	53	52	53	53	55	54	54	56	59	61	60	60	61	62	60.6	70																							
25-Oct	62	62	62	63	63	65	65	65	64	59	54	47	43	42	40	41	43	44	48	59	71	77	84	87	58.7	87																							
26-Oct	86	87	88	90	88	88	90	91	91	88	87	84	79	78	74	73	74	80	76	68	71	72	77	82	81.7	91																							
27-Oct	92	92	91	92	89	86	87	85	84	81	80	80	73	67	63	60	62	64	63	61	70	71	73	74	76.7	92																							
28-Oct	76	76	77	79	85	88	89	90	87	87	88	82	77	73	71	68	69	70	73	77	80	81	81	78	79.2	90																							
29-Oct	77	69	65	67	70	67	64	62	64	63	63	62	61	60	59	58	62	70	71	74	74	78	77	77	67.2	78																							
30-Oct	77	76	77	80	87	88	89	91	90	88	78	72	67	62	56	58	59	62	64	65	67	70	74	86	74.3	91																							
31-Oct	93	94	94	95	95	92	90	91	89	86	86	81	80	80	78	77	81	83	83	84	86	88	89	90	86.9	95																							
																								77.8	78.8	79.8	81.0	81.8	81.7	81.9	80.7	77.3	73.0	67.8	63.2	60.3	57.8	55.5	55.8	56.9	61.4	64.6	66.8	69.1	70.9	72.5	75.7	Diurnal Average	
																								98	98	98	98	98	98	98	98	98	95	95	96	96	94	90	88	83	90	94	95	97	97	98	98	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Mannix - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

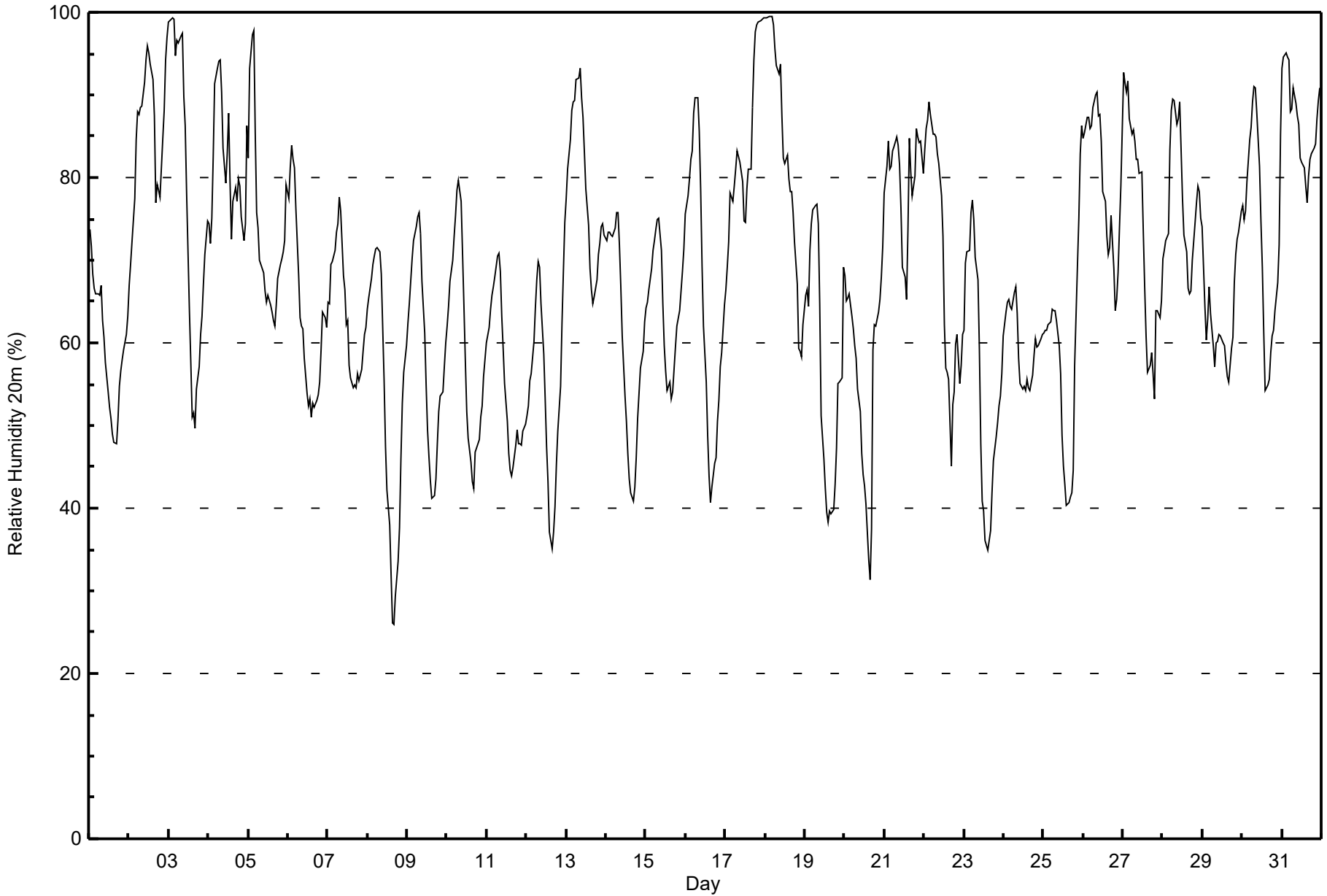
Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	20	2.69	2.69
40 - 60	170	22.85	25.54
60 - 80	330	44.35	69.89
80 - 100	224	30.11	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Maximum Value: 100 % on Oct 18 04:00																			Maximum Daily Average: 86.8 % on Oct 31						Hours in Service: 744	
Minimum Value: 26 % on Oct 8 17:00																			Minimum Daily Average: 52.6 % on Oct 8						Hours of Data: 744	
Maximum Diurnal Average: 78.8 % at hour 7																			Minimum Diurnal Average: 55.0 % at hour 17						Hours of Missing Data: 0	
Monthly Average: 68.1 %																			Percentiles: P ₁ = 35 P ₁₀ = 48 Q ₁ = 57 Median = 68 Q ₃ = 80 P ₉₀ = 89 P ₉₉ = 99						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-Oct	74	72	68	67	66	66	66	67	63	61	58	54	52	51	49	48	48	51	55	57	58	59	61	63	59.6	74
2-Oct	67	70	72	77	85	88	88	88	89	91	94	96	95	94	92	87	77	79	79	78	85	88	94	97	85.4	97
3-Oct	99	99	99	99	95	97	96	97	97	90	86	78	64	58	51	52	50	54	57	61	63	67	71	75	77.3	99
4-Oct	74	72	75	83	91	93	94	94	90	84	79	83	88	80	73	77	79	77	80	79	75	72	74	86	81.4	94
5-Oct	82	93	97	98	85	76	74	70	69	69	66	65	66	65	64	63	62	65	68	69	70	71	72	79	73.3	98
6-Oct	77	81	84	82	81	76	68	63	62	62	58	54	52	53	51	53	52	53	54	55	59	64	63	62	63.3	84
7-Oct	65	65	69	70	71	73	74	78	76	68	66	62	63	57	56	55	55	55	56	55	57	59	61	62	63.7	78
8-Oct	64	65	68	69	71	71	72	71	68	62	55	47	42	38	32	26	26	29	33	38	46	53	56	60	52.6	72
9-Oct	62	65	67	70	72	74	75	76	73	67	61	55	50	46	43	41	41	44	48	52	54	54	57	60	58.7	76
10-Oct	62	64	67	70	73	75	79	80	77	71	64	58	52	48	46	43	42	47	47	48	51	52	56	58	59.6	80
11-Oct	60	62	64	66	67	68	71	71	69	63	59	55	51	47	45	44	45	48	49	48	48	48	49	50	56.0	71
12-Oct	51	52	55	56	60	64	68	70	69	65	59	53	48	43	37	35	37	40	45	49	55	62	69	75	54.9	75
13-Oct	78	81	84	88	89	89	92	92	93	90	87	83	79	74	69	66	65	66	68	71	72	74	74	73	79.0	93
14-Oct	72	73	73	73	74	74	76	76	72	67	61	54	50	47	43	42	41	43	46	51	54	57	59	63	60.0	76
15-Oct	64	65	66	69	71	72	74	75	75	71	65	60	57	54	55	53	54	57	60	62	64	66	69	71	64.6	75
16-Oct	76	78	80	82	83	88	90	90	86	79	69	62	55	49	44	41	43	45	46	51	53	57	59	65	65.3	90
17-Oct	67	69	72	78	77	79	81	83	83	82	80	75	75	79	81	81	89	94	98	99	99	99	99	99	84.0	99
18-Oct	99	99	99	100	100	98	96	94	93	94	87	82	82	83	80	78	78	76	72	67	59	59	58	62	83.1	100
19-Oct	66	66	64	71	74	76	77	77	74	65	51	46	42	40	38	40	39	40	43	47	55	55	56	69	57.2	77
20-Oct	68	65	65	66	63	62	60	58	54	52	47	44	43	40	34	31	37	59	62	62	64	65	68	72	55.9	72
21-Oct	78	81	84	81	81	83	84	85	84	81	76	69	68	65	74	85	81	78	80	86	85	84	84	81	80.0	86
22-Oct	83	86	87	89	88	85	85	85	83	82	78	73	62	57	56	56	45	53	54	60	61	55	57	61	70.0	89
23-Oct	62	70	71	71	76	77	75	70	68	59	48	41	40	36	35	36	37	42	46	49	50	52	54	56	55.0	77
24-Oct	61	64	65	65	64	64	66	67	64	58	55	54	55	54	56	55	54	56	58	61	60	60	61	61	59.8	67
25-Oct	61	62	61	62	63	64	64	64	63	60	56	49	45	43	40	41	41	42	45	57	69	75	83	86	58.2	86
26-Oct	85	85	87	87	86	86	88	90	90	88	88	84	78	77	73	71	71	75	69	64	65	69	74	79	79.6	90
27-Oct	93	91	90	92	87	85	86	84	82	82	80	81	74	67	61	56	57	59	56	53	64	64	63	65	73.9	93
28-Oct	70	71	72	73	83	88	90	89	86	87	89	83	78	73	71	67	66	66	70	75	77	79	78	75	77.4	90
29-Oct	74	64	60	63	67	64	60	57	60	60	61	61	60	60	58	56	55	59	61	67	71	72	73	76	63.3	76
30-Oct	77	75	76	80	85	86	89	91	91	88	81	75	69	61	54	55	56	59	61	62	64	67	72	85	73.2	91
31-Oct	93	95	95	95	94	88	88	91	89	87	87	82	82	81	79	77	80	82	83	84	84	87	89	91	86.8	95
	73.1	74.3	75.6	77.2	78.1	78.5	78.8	78.8	77.2	73.6	69.5	65.1	61.7	58.7	56.1	55.1	55.0	57.8	59.6	61.8	64.2	66.0	68.2	71.5	Diurnal Average	
	99	99	99	100	100	98	96	97	97	94	94	96	95	94	92	87	89	94	98	99	99	99	99	99	Diurnal Maximum	





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	23	3.09	3.09
40 - 60	208	27.96	31.05
60 - 80	331	44.49	75.54
80 - 100	182	24.46	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



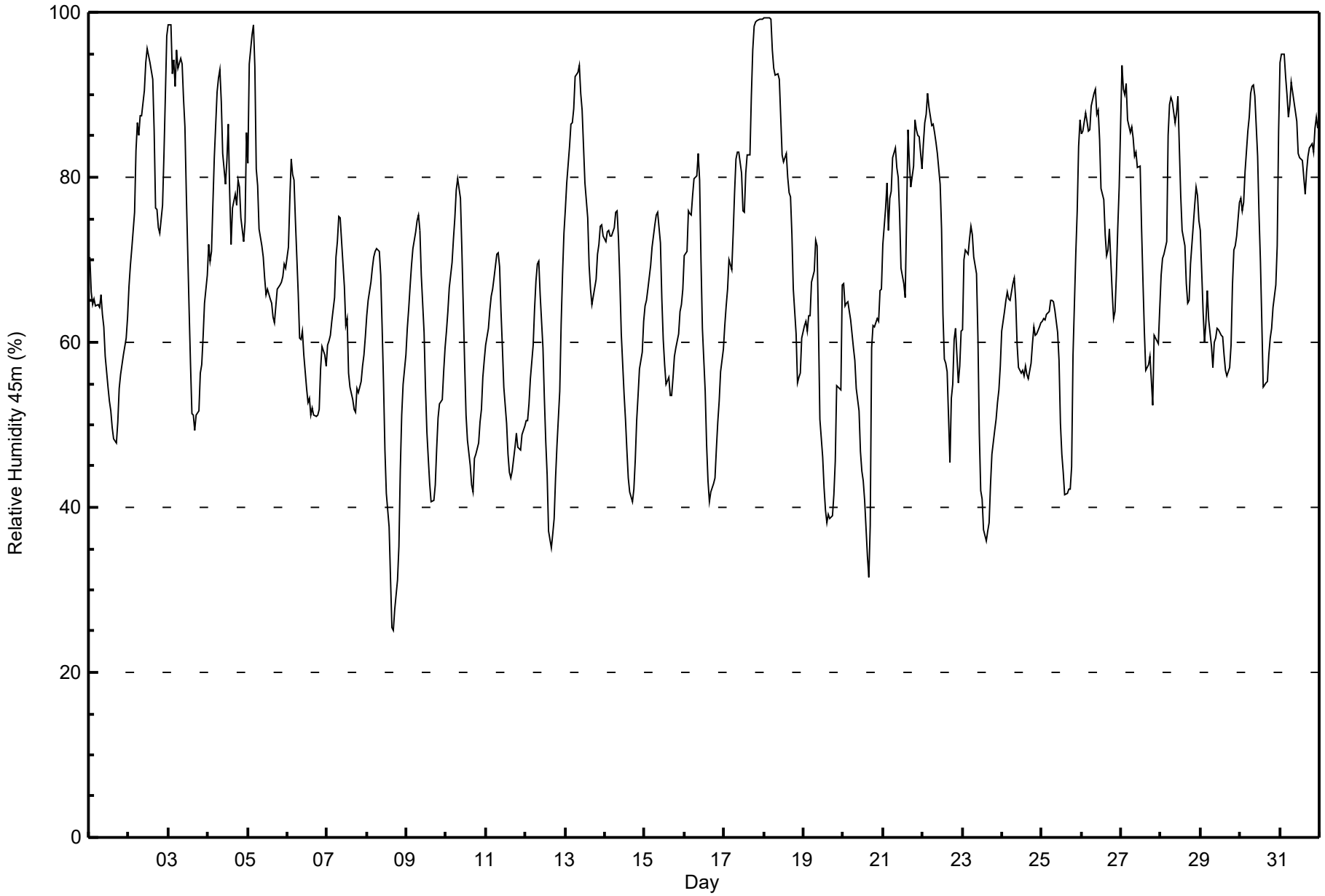
Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity 45m (RH45m) - %

Mannix - October 2023

Maximum Value: 99 % on Oct 18 04:00											Maximum Daily Average: 86.5 % on Oct 31											Hours in Service: 744				
Minimum Value: 25 % on Oct 8 17:00											Minimum Daily Average: 51.9 % on Oct 8											Hours of Data: 744				
Maximum Diurnal Average: 78.1 % at hour 8											Minimum Diurnal Average: 54.8 % at hour 17											Hours of Missing Data: 0				
Monthly Average: 67.4 %											Percentiles: P ₁ = 35 P ₁₀ = 47 Q ₁ = 57 Median = 66 Q ₃ = 79 P ₉₀ = 88 P ₉₉ = 99											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-Oct	70	66	65	65	64	65	64	66	63	62	58	55	53	52	50	48	48	50	54	56	57	58	61	63	58.9	70
2-Oct	67	69	71	76	83	87	85	88	88	91	94	96	95	94	92	86	76	76	74	73	77	83	90	97	83.5	97
3-Oct	98	99	93	94	91	95	93	94	94	90	86	78	64	57	51	51	49	51	52	56	57	61	65	68	74.5	99
4-Oct	72	70	71	77	82	90	92	93	89	83	79	82	87	78	72	76	78	77	80	79	75	72	75	85	79.7	93
5-Oct	82	94	97	98	93	81	79	74	72	70	68	66	66	65	65	63	62	64	66	67	67	68	69	69	73.6	98
6-Oct	71	77	82	80	80	75	66	61	60	61	58	54	53	53	51	52	51	51	51	52	57	59	59	57	61.4	82
7-Oct	60	60	61	63	65	70	72	75	75	69	67	62	63	56	55	53	52	52	54	54	55	57	58	61	61.2	75
8-Oct	63	65	67	69	70	71	71	71	68	62	55	47	42	38	31	25	25	28	31	35	45	51	55	58	51.9	71
9-Oct	62	64	67	69	71	73	75	75	74	68	61	54	49	46	43	41	41	43	47	51	53	53	56	59	58.1	75
10-Oct	61	64	67	70	73	75	79	80	77	71	64	57	51	48	45	43	42	46	46	48	50	52	56	58	59.3	80
11-Oct	60	62	64	66	66	68	71	71	69	64	59	55	50	46	44	43	44	47	49	47	47	47	49	50	55.8	71
12-Oct	51	51	53	56	60	64	68	69	70	66	59	53	48	44	37	35	37	39	44	47	54	62	68	73	54.4	73
13-Oct	76	79	84	86	87	88	92	93	94	90	88	84	79	75	69	66	65	66	68	71	72	74	74	73	78.9	94
14-Oct	72	73	74	73	73	74	76	76	73	67	61	54	51	47	44	42	41	42	46	51	54	57	59	63	60.0	76
15-Oct	64	65	66	69	72	73	74	75	76	72	65	60	57	55	56	53	53	56	58	59	61	64	65	67	64.0	76
16-Oct	71	71	76	76	75	78	80	80	83	80	70	62	54	48	43	41	42	43	44	47	50	53	56	59	61.7	83
17-Oct	62	64	66	70	69	73	78	82	83	83	81	76	76	80	83	83	90	95	98	99	99	99	99	99	82.8	99
18-Oct	99	99	99	99	99	95	93	92	92	92	87	83	82	83	80	78	78	73	66	61	55	56	56	61	81.7	99
19-Oct	62	63	61	63	63	67	69	72	72	62	51	46	42	40	38	39	39	39	42	46	55	55	54	67	54.4	72
20-Oct	67	64	65	65	63	61	59	58	54	52	47	44	43	41	34	31	38	59	62	62	63	63	66	66	55.3	67
21-Oct	72	76	79	74	77	78	82	84	81	80	76	69	67	65	75	86	82	79	81	87	86	85	85	81	78.6	87
22-Oct	84	87	88	90	88	86	86	85	84	83	79	74	63	58	57	56	45	53	55	60	62	55	57	61	70.8	90
23-Oct	62	70	71	71	73	74	73	70	68	61	49	42	41	37	36	37	38	43	46	49	51	53	54	57	55.3	74
24-Oct	61	64	65	66	65	65	67	68	65	60	57	56	57	56	57	56	56	58	60	62	61	61	62	62	61.1	68
25-Oct	62	63	63	63	64	65	65	65	64	61	58	50	46	44	42	42	42	42	45	59	71	76	84	87	59.3	87
26-Oct	85	86	88	87	86	86	89	90	91	88	88	85	79	77	73	70	71	74	66	63	64	68	74	79	79.4	91
27-Oct	94	91	90	91	87	85	86	85	83	83	81	81	74	67	61	57	57	58	55	52	61	60	60	64	73.6	94
28-Oct	68	70	71	72	85	89	90	89	87	88	90	84	78	74	72	67	65	65	69	74	77	79	78	75	77.2	90
29-Oct	74	64	60	62	66	63	59	57	60	60	62	62	61	61	59	57	56	57	60	67	71	72	73	77	63.3	77
30-Oct	77	76	77	81	86	87	90	91	91	90	83	75	70	62	55	55	55	59	61	62	64	67	72	86	73.8	91
31-Oct	94	95	95	92	90	87	89	92	89	88	87	83	82	82	80	78	81	83	83	84	83	86	87	86	86.5	95
71.7											72.9											Diurnal Average				
99											99											Diurnal Maximum				





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Relative Humidity 45m (RH45m) - %
Mannix - October 2023**

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	23	3.09	3.09
40 - 60	212	28.49	31.59
60 - 80	337	45.30	76.88
80 - 100	172	23.12	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

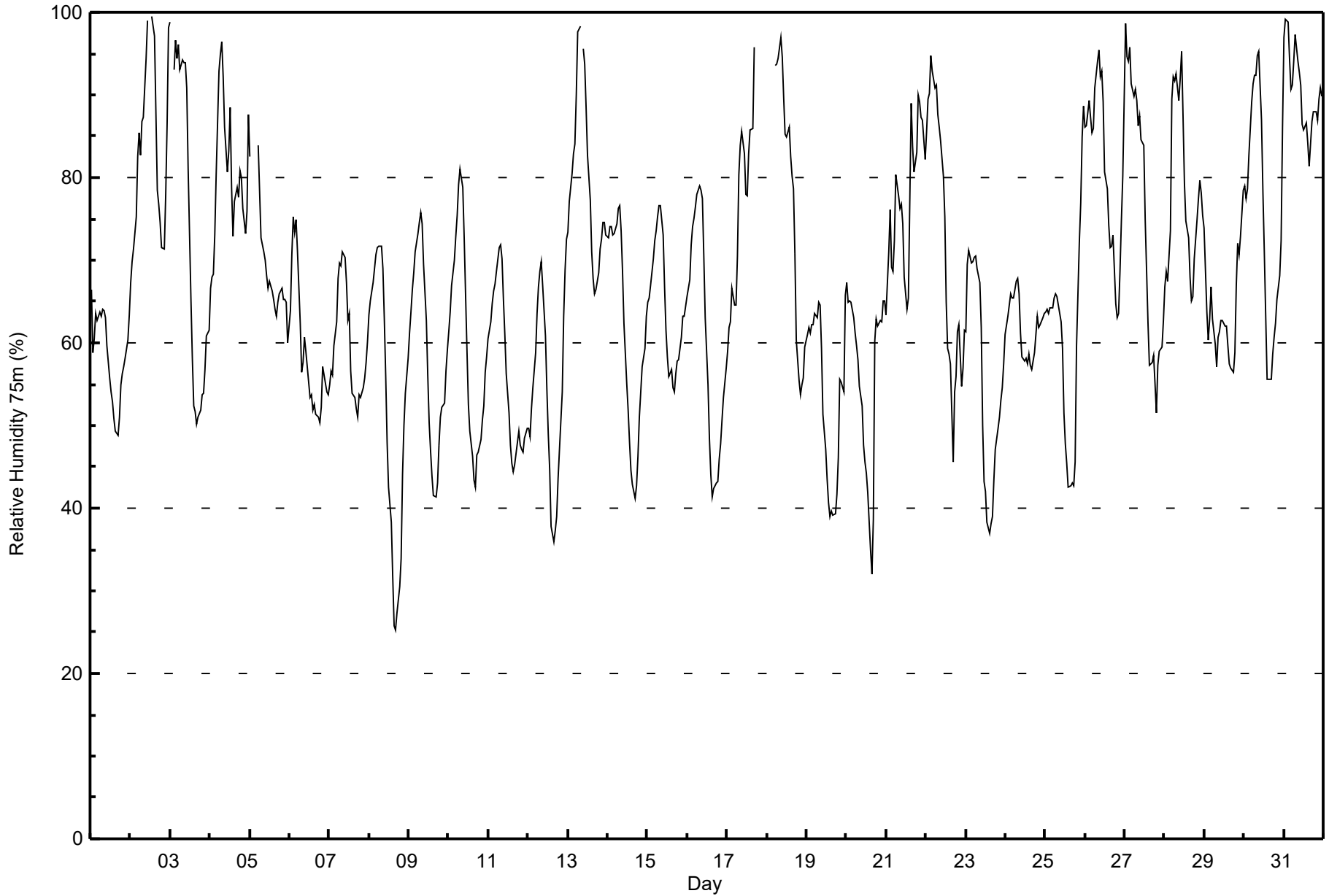


Maximum Value: 99 % on Oct 2 14:00																		Maximum Daily Average: 90.4 % on Oct 31						Hours in Service: 744		
Minimum Value: 25 % on Oct 8 17:00																		Minimum Daily Average: 52.0 % on Oct 8						Hours of Data: 724		
Maximum Diurnal Average: 78.3 % at hour 8																		Minimum Diurnal Average: 55.8 % at hour 17						Hours of Missing Data: 20		
Monthly Average: 67.0 %																		Percentiles: P ₁ = 35 P ₁₀ = 48 Q ₁ = 56 Median = 65 Q ₃ = 77 P ₉₀ = 89 P ₉₉ = 98						Hours of Calibration: 0		
																								Percent Operational Time: 97.3		
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-Oct	66	59	61	64	63	64	63	64	64	63	60	56	54	53	51	49	49	51	55	56	57	58	60	63	58.4	66
2-Oct	67	70	71	75	83	85	83	87	87	94	99	OR	OR	99	97	88	79	77	75	71	71	78	87	98	82.8	99
3-Oct	99	OR	93	97	94	96	93	94	94	94	91	81	65	58	52	52	50	51	52	54	54	57	61	62	73.6	99
4-Oct	67	68	68	73	80	93	95	96	92	86	81	83	89	79	73	79	78	81	80	76	73	76	88	80.4	96	
5-Oct	83	OR	OR	OR	OR	84	78	73	71	70	68	67	67	66	65	64	63	65	66	67	65	65	60	68.6	84	
6-Oct	64	71	75	73	75	71	62	57	58	61	59	55	53	54	52	52	51	51	50	52	57	56	54	54	59.1	75
7-Oct	55	57	56	60	63	68	70	69	71	70	67	63	64	57	54	53	52	51	54	53	55	56	58	60	59.7	71
8-Oct	63	65	67	69	71	71	72	72	69	63	56	48	42	38	32	26	25	27	31	34	44	50	54	58	52.0	72
9-Oct	61	64	66	68	71	73	75	76	74	69	63	56	50	47	44	42	41	43	48	51	52	53	57	59	58.5	76
10-Oct	61	64	67	70	73	75	79	81	79	73	66	59	53	49	46	43	43	46	47	48	51	52	56	58	60.0	81
11-Oct	60	63	65	66	67	69	72	72	70	65	61	56	51	48	45	44	45	48	49	48	47	47	48	50	56.5	72
12-Oct	50	49	52	55	59	64	67	69	70	67	61	54	49	45	38	36	37	39	44	47	54	63	69	73	54.5	73
13-Oct	73	77	81	83	84	90	98	98	OR	96	94	88	83	77	71	68	66	66	69	71	73	75	75	73	79.5	98
14-Oct	73	74	74	73	73	74	76	77	74	69	62	55	52	48	45	43	41	43	46	51	54	57	59	63	60.7	77
15-Oct	65	66	67	70	72	74	75	77	77	73	67	62	58	56	57	55	54	56	58	58	61	63	63	64	64.4	77
16-Oct	66	68	72	74	75	76	78	79	79	77	71	63	55	48	44	41	42	43	43	46	48	51	53	57	60.4	79
17-Oct	59	62	62	67	65	65	71	80	84	86	83	78	78	83	86	86	96	OR	OR	OR	OR	OR	OR	OR	--	96
18-Oct	OR	OR	OR	OR	OR	93	94	94	97	95	90	85	85	86	82	80	79	71	60	55	54	55	56	60	77.4	97
19-Oct	61	62	61	62	62	64	63	65	65	59	51	47	43	41	39	40	39	39	42	46	56	55	54	66	53.4	66
20-Oct	67	65	65	65	63	61	60	58	55	52	48	46	44	42	35	32	39	60	63	62	63	62	65	65	55.7	67
21-Oct	63	71	76	69	69	72	80	78	76	77	74	68	64	65	77	89	84	81	83	90	89	87	87	82	77.2	90
22-Oct	86	89	90	95	93	91	91	88	86	84	80	75	65	59	59	57	46	54	56	61	62	55	57	62	72.6	95
23-Oct	61	69	71	70	70	70	69	67	62	50	43	42	38	37	38	39	43	47	50	51	53	55	57	57	55.2	71
24-Oct	61	63	65	66	65	65	68	68	66	61	58	58	58	57	59	57	59	61	63	62	62	63	64	64	61.9	68
25-Oct	64	64	64	64	64	65	66	66	65	63	59	51	48	45	43	43	43	43	46	60	72	77	85	89	60.3	89
26-Oct	86	86	89	87	86	86	91	94	95	92	93	89	81	79	74	72	72	73	65	63	64	69	75	80	80.8	95
27-Oct	99	95	94	96	91	90	91	89	86	87	85	84	75	69	62	57	58	58	55	52	57	59	59	63	75.5	99
28-Oct	67	69	68	74	89	92	92	92	89	92	95	87	79	75	73	68	65	66	70	75	77	80	78	75	78.7	95
29-Oct	74	64	60	63	67	63	60	57	61	61	63	63	62	62	60	58	57	56	59	67	72	71	73	78	63.7	78
30-Oct	79	77	79	83	89	91	92	92	95	95	87	78	71	63	56	56	56	59	61	62	65	68	72	86	75.5	95
31-Oct	97	99	99	94	91	91	94	97	94	93	91	86	86	87	84	81	84	87	88	88	87	89	91	90	90.4	99
																								Diurnal Average		
																								Diurnal Maximum		
69.9 69.6 71.7 73.2 74.7 77.1 78.0 78.3 76.9 75.8 72.0 66.2 62.2 60.4 57.8 56.4 55.8 56.1 57.4 59.4 61.7 63.2 65.5 68.6 99 99 99 97 94 96 98 98 97 96 99 89 89 99 97 89 96 87 88 90 89 89 91 98																										
OR - Out of Range																										



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	22	3.04	3.04
40 - 60	220	30.39	33.43
60 - 80	325	44.89	78.31
80 - 100	157	21.69	100.00

Total Number of Valid Hours: 724

Total Number of Hours: 744



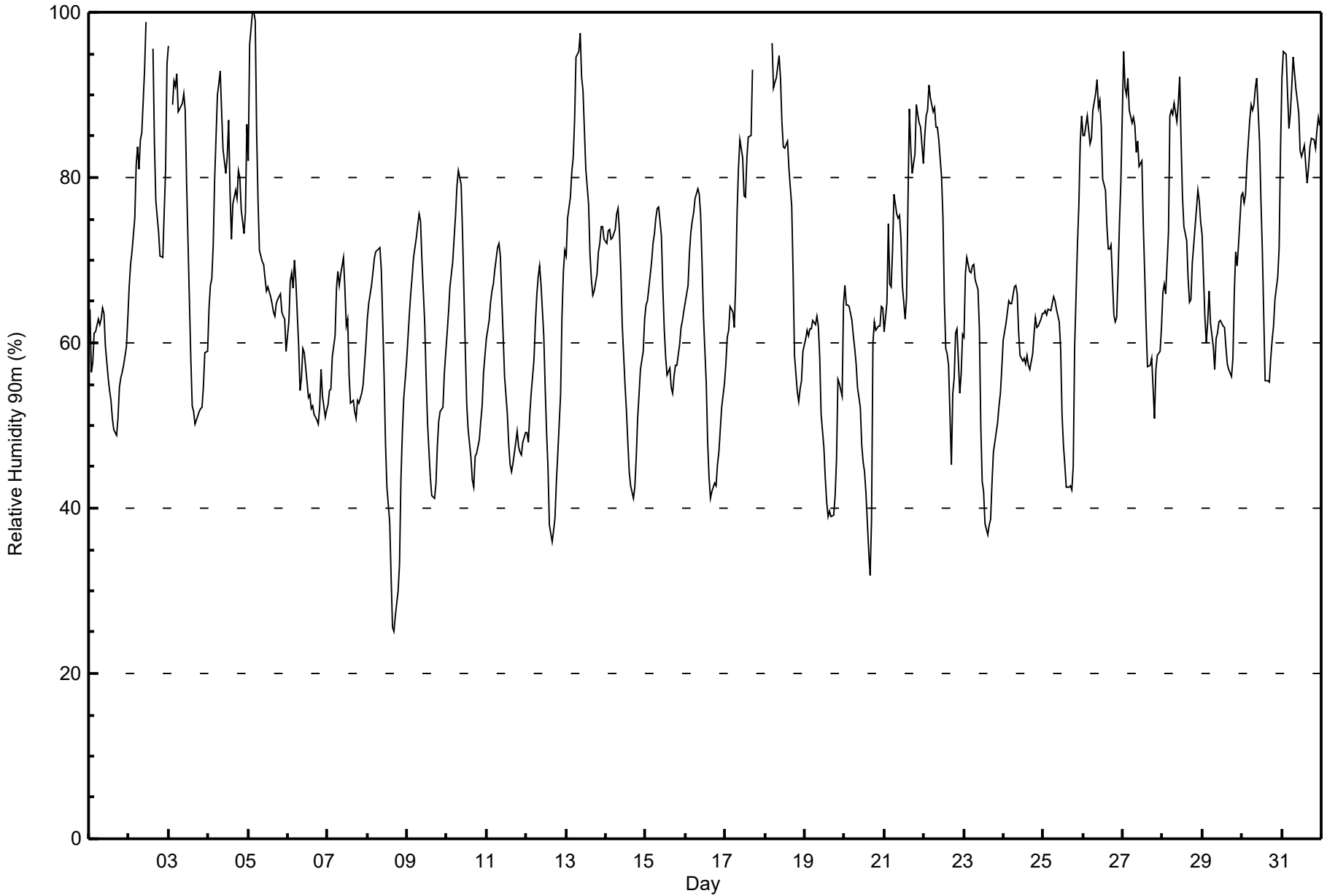
Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity 90m (RH90m) - %

Mannix - October 2023

Maximum Value: 100 % on Oct 5 03:00																		Maximum Daily Average: 87.0 % on Oct 31						Hours in Service: 744		
Minimum Value: 25 % on Oct 8 17:00																		Minimum Daily Average: 51.6 % on Oct 8						Hours of Data: 729		
Maximum Diurnal Average: 76.5 % at hour 8																		Minimum Diurnal Average: 55.4 % at hour 17						Hours of Missing Data: 15		
Monthly Average: 66.2 %																		Percentiles: P ₁ = 35 P ₁₀ = 47 Q ₁ = 56 Median = 65 Q ₃ = 77 P ₉₀ = 88 P ₉₉ = 96						Hours of Calibration: 0		
																								Percent Operational Time: 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-Oct	64	56	58	61	61	63	62	63	64	63	60	56	54	53	51	49	49	51	55	56	56	57	59	63	57.7	64
2-Oct	67	69	71	75	81	84	81	85	85	93	99	OR	OR	OR	96	84	77	75	73	71	70	76	81	94	80.4	99
3-Oct	96	OR	89	92	91	93	88	89	89	90	88	79	65	58	52	52	50	51	52	52	52	55	59	59	71.3	96
4-Oct	64	67	68	72	80	90	91	93	88	83	81	83	87	78	73	77	78	78	81	80	76	73	76	86	79.2	93
5-Oct	82	96	100	100	99	85	77	71	70	69	68	66	67	66	65	64	63	65	65	66	64	63	63	59	73.1	100
6-Oct	63	67	68	67	70	68	60	54	56	59	59	55	53	54	52	52	51	51	50	52	57	53	51	52	57.3	70
7-Oct	53	54	54	58	61	67	69	67	68	70	67	62	63	56	53	53	52	51	53	53	54	55	57	60	58.7	70
8-Oct	63	65	67	68	70	71	71	71	69	63	56	48	43	38	32	26	25	27	30	33	43	49	53	58	51.6	71
9-Oct	61	63	66	68	70	73	74	76	75	70	62	56	50	47	44	41	41	43	47	51	52	52	56	59	58.2	76
10-Oct	61	64	67	70	73	75	79	81	79	73	66	59	53	49	46	43	42	46	47	48	51	52	56	58	60.0	81
11-Oct	61	63	65	66	67	69	72	72	70	65	61	56	51	48	45	44	45	48	49	48	47	46	48	49	56.5	72
12-Oct	49	48	51	54	58	62	66	68	69	67	61	55	49	45	38	36	37	39	43	47	54	63	69	71	54.1	71
13-Oct	71	75	78	81	82	87	95	95	98	92	91	86	81	77	71	68	66	66	68	71	72	74	74	73	78.7	98
14-Oct	72	74	74	73	73	74	76	76	74	69	62	55	52	48	44	43	41	43	46	51	54	57	59	63	60.4	76
15-Oct	65	65	67	70	72	73	75	76	76	73	67	62	58	56	57	55	54	56	57	57	60	62	63	64	64.1	76
16-Oct	65	67	71	73	75	76	77	79	78	75	70	63	55	48	44	41	42	43	43	45	47	49	52	55	59.7	79
17-Oct	57	61	61	64	64	62	67	76	81	85	82	78	78	82	85	85	93	OR	OR	OR	OR	OR	OR	OR	--	93
18-Oct	OR	OR	OR	OR	96	91	91	92	95	92	87	84	84	84	81	79	77	68	59	54	53	54	55	59	76.8	96
19-Oct	60	61	61	62	62	63	62	63	62	58	51	47	44	41	39	40	39	39	41	46	56	55	54	65	52.9	65
20-Oct	67	65	65	64	63	61	59	57	55	52	48	46	44	42	35	32	39	60	63	61	62	62	64	64	55.4	67
21-Oct	61	65	74	67	67	71	78	76	75	75	73	67	63	65	77	88	84	80	83	89	88	87	86	82	75.9	89
22-Oct	85	88	88	91	90	88	88	86	86	85	80	75	65	59	59	57	45	54	56	61	62	54	56	61	71.6	91
23-Oct	61	68	70	69	68	69	69	68	66	62	50	43	42	38	37	38	39	43	47	49	50	52	54	57	54.6	70
24-Oct	60	62	64	65	65	65	67	67	66	61	58	58	58	57	59	57	59	61	63	62	62	63	64	64	61.6	67
25-Oct	64	64	63	64	64	65	66	65	64	63	59	51	48	45	42	43	43	42	45	60	72	77	84	87	60.0	87
26-Oct	85	85	87	86	84	85	88	90	92	89	89	86	80	79	74	71	71	72	63	63	63	68	74	80	79.4	92
27-Oct	95	91	90	92	88	87	87	86	83	84	81	82	74	69	62	57	57	58	55	51	57	58	59	62	73.6	95
28-Oct	66	67	66	73	88	88	88	89	87	89	92	84	78	74	72	68	65	65	70	74	76	78	77	75	77.1	92
29-Oct	73	63	60	63	66	62	59	57	60	61	63	63	62	62	59	57	57	56	58	66	71	69	72	78	63.3	78
30-Oct	78	77	78	82	87	89	88	89	91	92	84	77	71	63	55	55	55	58	60	62	65	68	72	84	74.2	92
31-Oct	92	95	95	90	86	88	91	95	91	89	88	83	83	84	82	79	81	84	85	85	84	86	87	86	87.0	95
																								Diurnal Average		
																								Diurnal Maximum		
68.7 69.2 71.2 72.7 74.9 75.5 76.2 76.5 76.2 74.6 71.0 65.5 61.8 58.9 57.4 56.0 55.4 55.7 56.8 58.8 60.9 62.3 64.5 67.5																										
96 96 100 100 99 93 95 95 98 93 99 86 87 84 96 88 93 84 85 89 88 87 87 94																										
OR - Out of Range																										





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	22	3.02	3.02
40 - 60	232	31.82	34.84
60 - 80	323	44.31	79.15
80 - 100	150	20.58	99.73

Total Number of Valid Hours: 729

Total Number of Hours: 744



Maximum Speed: 34 km/h on Oct 20 09:00	Maximum Daily Speed Average: 21.8 km/h on Oct 14	Hours in Service: 744
Minimum Speed Value: 1 km/h on Oct 3 03:00	Minimum Daily Speed Average: 1.6 km/h on Oct 31	Hours of Data: 740
Maximum Diurnal Speed Average: 5.9 km/h at hour 6	Minimum Diurnal Speed Average: 3.2 km/h at hour 16	Hours of Missing Data: 4
Monthly Average Velocity: 4.2 km/h 187.8 deg	Percentiles: P ₁ = 2 P ₁₀ = 6 Q ₁ = 9 Median = 13 Q ₃ = 18 P ₉₀ = 22 P ₉₉ = 28	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-Oct	SSE10	SSE10	SSE12	SSE13	SSE16	SSE14	SSE13	SSE11	SSE14	SSE15	SSE15	SSE16	SSE21	SSE20	SSE24	SSE23	SSE20	SSE16	SE16	SSE15	SSE15	SSE17	SSE15	SSE16	SSE15.7	SSE24
2-Oct	SSE13	SSE13	SSE10	SSE10	SE12	SE13	SSE12	SE13	SE13	SSE14	SSE14	SSE14	SSE13	SSE10	SSE7	S5	SW5	SSE5	SSE7	SSE7	SSE7	S5	S4	S4	SSE9.3	SSE14
3-Oct	SSE4	SW5	ENE1	SE2	SW3	S8	SSE7	SSE3	S4	WSW3	WSW5	SW7	WNW7	WNW10	WNW9	NW3	SW10	SSW8	S10	S10	SSW9	SSE11	SSE14	SSE13	SSW4.8	SSE14
4-Oct	SE9	SE8	SSE10	S10	S8	WSW7	W9	WNW8	WNW10	WNW13	WNW19	WNW20	WNW14	NW21	NW16	WNW24	WNW26	WNW30	WNW29	WNW28	WNW33	WNW28	WNW26	WNW23	WNW14.4	WNW33
5-Oct	WNW25	WNW20	UO	UO	UO	UO	WNW26	WNW28	WNW25	WNW26	WNW26	WNW28	WNW26	WNW25	WNW23	NW20	WNW19	WNW14	W11	SW9	SW9	S3	SSE7	SSW6	WNW17.0	WNW28
6-Oct	SSE6	SSE8	SSE10	SSE12	SSE12	SSE15	SSE14	SE17	SSE12	SSE14	SSE16	SSE16	SSE15	SSE15	SSE13	SSE8	S7	SSE6	SE6	SSE8	SSW7	W16	W19	W17	S9.1	W19
7-Oct	W17	W17	W14	W11	WNW8	WNW4	W4	SW3	SSW4	SSE3	ESE5	E6	E6	SE8	SE6	SE8	SE9	SE13	SE15	SE16	SE17	SE17	SE15	SE16	SSE4.6	SE17
8-Oct	SE18	SE19	SE19	SE20	SE23	SE24	SE23	SE23	SE22	SE27	SE17	SE19	SE20	SSE18	SSE19	SSE20	S18	S15	S15	SSE13	SE19	SE16	SE16	SE20	SE18.9	SE27
9-Oct	SE18	SE17	SE18	SE18	SE16	SE17	SE17	SE16	SE15	SE11	SE15	SE16	SE16	SE17	SE20	SE18	SE20	SE18	SE19	SE22	SE20	SE21	SE21	SE20	SE17.7	SE22
10-Oct	SE19	SE17	SE17	SE18	SE18	SE17	SE17	SE18	SE18	SE21	SE17	SE18	SE23	SE22	SE19	SE20	SE19	SE17	SE19	SE22	SE23	SE22	SE24	SE25	SE19.6	SE25
11-Oct	SE21	SE22	SE22	SE22	SE21	SE21	SE19	SE21	SE22	SE21	SE19	SE18	SE17	SE17	SE22	SE21	SE19	SE17	SE19	SE19	SE17	SE20	SE20	SE20	SE19.8	SE22
12-Oct	SE17	SE13	SE13	SE14	SE12	SE13	SE13	SE13	SE13	SE12	SSE12	SE12	SSE11	SSE9	SSE15	SSE14	SSE10	SSE8	SSE12	SSE13	SE15	SE14	SE15	SE15	SSE12.8	SE17
13-Oct	SE13	SE13	SE13	SE12	SSE13	SSE16	SSE13	SE12	SE15	SE15	SSE15	SE16	SSE17	SSE18	SE18	SE19	SE18	SE17	SE17	SE20	SE18	SE21	SE18	SE17	SE15.8	SE21
14-Oct	SE19	SE18	SE19	SE19	SE22	SE22	SE20	SE21	SE22	SE22	SE27	SE25	SE23	SE26	SE27	SE26	SSE24	SSE22	SSE23	SE21	SSE22	SE19	SE20	SE20	SE21.8	SE27
15-Oct	SE18	SE17	SE17	SE18	SE18	SE18	SE16	SE16	SE11	SE14	SE14	SSE15	SSE14	SSE15	SSE13	SSE10	SSE8	SSE10	SSE11	SSE9	SSE10	SSE11	S10	SSE10	SSE13.1	SE18
16-Oct	SSE12	S12	S8	SSE10	SSE9	SSE11	SSE10	SSE10	SSE8	SSE8	SSE9	SE8	SE8	SE9	SE6	SSE4	ESE4	SSE7	S5	SSE5	SE4	SSE4	ESE2	NE5	SSE6.9	SSE12
17-Oct	S2	WNW4	N5	NW4	N8	WNW4	NNW4	N6	N10	N9	NNW9	NNW10	NNW14	NNW14	NW13	NNW11	NNW12	NNW10	N9	NNW6	N4	NNE2	SSE4	SE6	NNW6.3	NNW14
18-Oct	S8	SSE9	SSE9	SSE9	SSE12	SSE12	SSE11	SSE16	SE15	SSE12	SSE11	SSE14	SSE15	SSE16	SSE17	SSE18	SSE14	SSE15	S13	SSW12	SW8	SW11	WSW12	S5	SSE11.0	SSE18
19-Oct	S7	S9	S9	SSE11	SSE12	SSE11	SSE12	SSE9	SSE9	SSW6	WSW16	WSW18	WSW18	WSW20	WSW20	SW15	SW17	SSW12	SW10	W5	WSW17	WSW24	W25	SW15	SW10.4	W25
20-Oct	WSW19	W25	W28	W18	W14	W19	W15	W20	W34	W33	WNW22	WNW26	WNW25	NW21	NW23	NW21	NNW15	NNE14	NNE16	NNE11	NNE6	NNE7	NE4	SSW4	WNW14.0	W34
21-Oct	SSW6	SSE7	SE11	S10	SSE11	SSE12	S7	SSE12	SSE14	SSE14	SSE14	SSE6	ESE3	N7	N23	N31	N27	N25	N26	N22	N21	N16	NNW13	N15	NNE5.1	N31
22-Oct	N17	NNE11	NNE11	NE8	NNE9	NNE8	N8	NNE8	N4	NW2	NW5	NNW6	NW7	NNW9	N11	N11	N6	N7	NNW8	W6	WNW9	NNW14	NW14	NW14	NNW7.3	N17
23-Oct	WNW13	W11	WNW13	W13	WSW11	WSW11	W12	W14	W14	W20	WNW21	WNW25	WNW26	WNW25	WNW24	WNW22	W23	WNW18	WNW16	W16	W15	WSW15	W18	W16	W16.8	WNW26
24-Oct	W15	W14	W15	W16	W15	W15	W13	WSW12	W15	W19	W19	W20	W23	W21	W21	WSW18	W19	W18	W17	W18	W21	W21	W19	W18	W17.5	W23
25-Oct	W20	W18	W17	WSW13	WSW12	WSW11	WSW10	WSW9	WSW9	WSW11	WSW11	W12	WSW14	W17	W18	W15	WSW11	WSW10	W10	NW17	WNW15	W11	W12	W13	W12.7	W20
26-Oct	W14	W14	W15	WSW11	W13	WSW10	WSW8	W10	W16	W13	W16	W17	W17	W14	WSW15	WSW15	WSW11	WSW9	W11	W16	W13	WSW11	WSW10	WSW11	W12.7	W17
27-Oct	WSW10	W12	W11	N15	N15	N13	N13	N14	N12	N7	NNW9	NNW6	NW9	NW8	NW11	NNW10	WNW15	WNW11	NNW8	NNW6	WSW9	WSW6	SW5	S8	NW7.2	N15
28-Oct	S11	S10	SSW8	WSW7	W9	W8	W8	WSW8	W11	WNW10	NW11	NW9	NNW10	NNW10	NNW10	WNW7	W10	W13	W16	W16	WNW14	W14	WNW13	WNW14	W8.4	W16
29-Oct	WNW12	WNW15	NW20	WNW10	W13	WNW17	WNW18	NW16	WNW15	NW18	NW15	NNW12	NNW12	NNW8	WNW8	WNW7	WSW4	WSW4	N3	NE6	NE8	NNE7	N13	NNE16	NW9.4	WNW20
30-Oct	NNE14	NNE17	NNE12	NNE10	N7	NNE8	NE7	W4	SW6	S7	SSE10	SSE12	SSE11	SSE13	S14	S10	SSE14	SSE14	SSE14	SSE13	SSE12	SSE11	SSE12	SSE12	SE5.1	NNE17
31-Oct	SSE11	SSE10	SSE7	SSE5	WSW3	NNW8	NNW9	NNW12	NNW14	NNW12	NNW11	NNW11	NNE8	ENE2	ESE2	SSW2	ESE3	E3	ENE5	E4	SW1	WSW3	SW8	SW8	NNW1.6	NNW14

S4.9	S5.1	S4.8	SSE5.6	SSE5.7	SSE5.9	S4.4	S4.3	S4.3	SSW4.4	SSW4.2	SSW3.6	SSW3.8	SSW3.7	SSW3.4	SSW3.2	SSW4.1	SSW3.7	S3.3	S3.7	S4.4	SSW4.4	SSW4.5	S4.6	Diurnal Average
WNW25	W25	W28	SE22	SE23	SE24	WNW26	WNW28	W34	W33	SE27	WNW28	WNW26	SE26	SE27	N31	N27	WNW30	WNW29	WNW28	WNW33	WNW28	WNW26	SE25	Diurnal Maximum

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



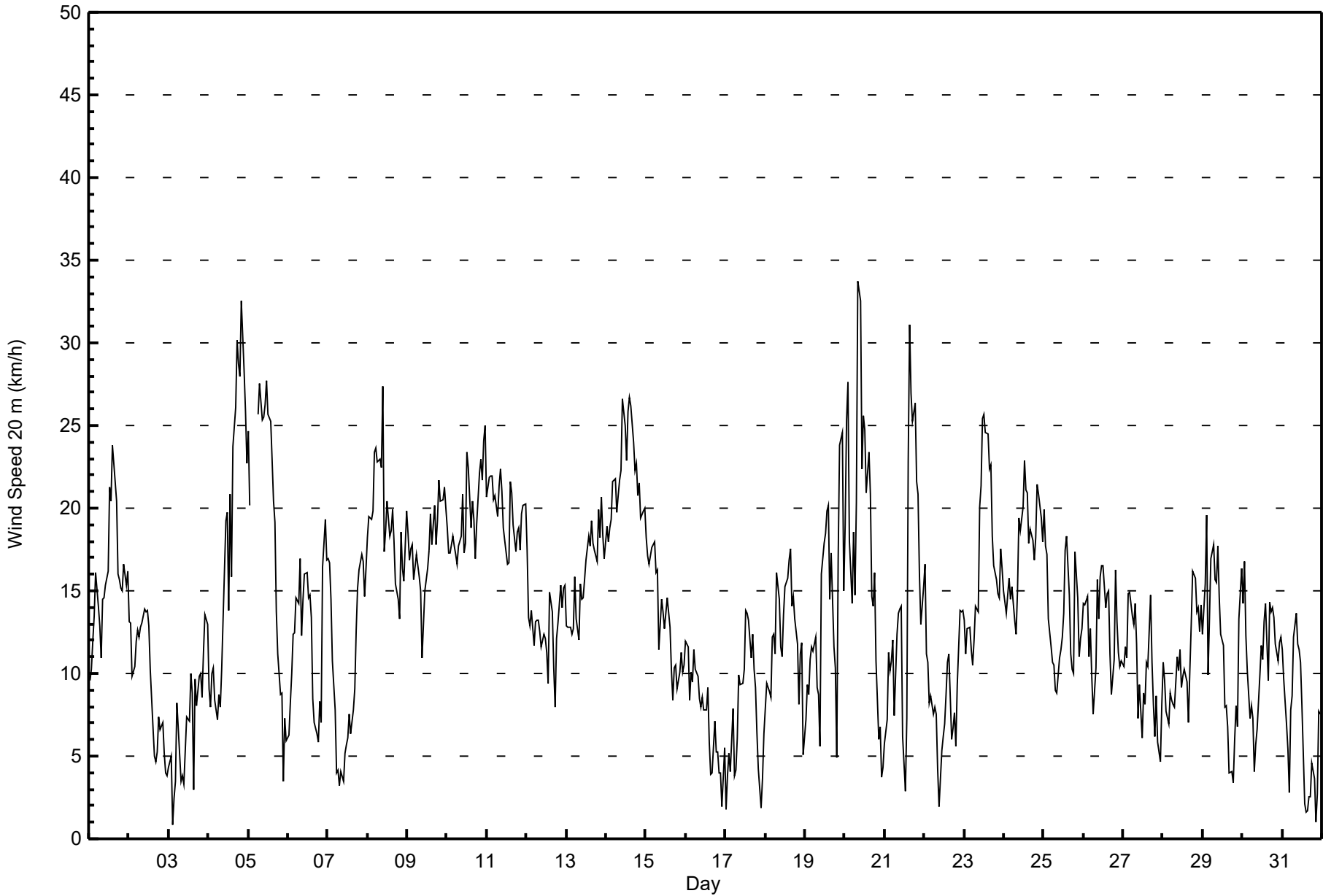
Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Speed 20 m (WS20m) - km/h

Mannix - October 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 9 km/h on Oct 21 17:00 Minimum Value: 1 km/h on Oct 2 20:00 Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 2 Median = 3 Q ₃ = 5 P ₉₀ = 6 P ₉₉ = 8																	Hours in Service: 744 Hours of Data: 740 Hours of Missing Data: 4 Hours of Calibration: 0 Percent Operational Time: 99.5								
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Oct	1	1	3	4	4	3	3	3	5	5	5	7	7	6	7	7	5	5	4	4	3	3	4	4	7
2-Oct	3	3	2	2	3	3	2	3	3	3	3	3	4	3	2	2	2	2	1	1	2	2	2	2	4
3-Oct	2	2	1	2	2	2	2	1	2	2	2	3	4	3	4	3	4	2	2	2	2	1	3	2	4
4-Oct	3	3	2	2	2	2	1	3	3	4	5	7	4	7	6	6	7	8	7	7	8	7	6	6	8
5-Oct	6	6	UO	UO	UO	UO	7	7	7	7	7	7	7	7	6	5	6	5	2	2	2	1	2	1	7
6-Oct	2	2	2	3	3	3	3	4	4	4	4	4	5	4	4	3	2	2	2	2	2	3	2	3	5
7-Oct	2	1	1	2	2	2	1	1	2	2	2	2	2	2	2	3	2	3	3	4	4	4	4	4	4
8-Oct	4	4	4	5	5	6	5	6	6	6	5	6	6	5	6	5	5	4	3	2	5	5	4	5	6
9-Oct	5	4	4	4	3	4	3	4	4	5	4	5	6	6	5	6	5	4	5	5	5	5	5	5	6
10-Oct	4	4	5	4	4	4	4	5	5	6	5	6	7	6	6	6	7	5	5	5	6	6	6	6	7
11-Oct	6	6	6	5	5	6	5	5	6	6	5	5	5	5	6	6	6	5	5	5	4	5	5	5	6
12-Oct	4	2	2	3	3	4	3	3	3	3	4	4	3	4	4	4	3	2	2	2	4	3	3	3	4
13-Oct	2	2	3	3	3	4	4	4	4	4	4	4	5	5	5	5	5	4	4	5	5	5	5	4	5
14-Oct	5	5	5	5	5	6	5	6	6	6	7	7	7	7	7	7	6	6	7	5	5	5	5	5	7
15-Oct	5	4	5	4	4	4	4	5	3	4	4	4	4	4	3	3	2	2	2	2	2	1	2	5	
16-Oct	2	2	2	2	1	1	2	2	2	2	2	3	2	3	2	2	2	1	1	2	1	2	1	2	3
17-Oct	1	2	2	2	2	2	2	3	3	3	3	3	4	4	4	3	3	3	3	2	2	2	1	3	4
18-Oct	3	3	2	2	3	2	2	4	4	2	3	4	4	4	4	4	4	3	3	3	2	2	3	2	4
19-Oct	1	2	3	1	2	2	2	3	3	3	7	5	4	5	5	4	5	4	4	2	6	6	8	3	8
20-Oct	4	5	4	3	4	4	5	3	6	7	7	7	6	6	7	6	5	3	4	5	1	1	3	2	7
21-Oct	2	3	3	2	2	2	2	3	3	3	4	3	2	4	9	8	9	8	8	7	6	5	4	5	9
22-Oct	5	4	3	2	2	2	1	2	2	1	4	3	3	3	3	3	2	2	3	2	3	3	3	3	5
23-Oct	3	2	3	3	2	2	2	3	3	4	5	6	6	6	6	6	5	5	4	3	2	3	3	2	6
24-Oct	2	2	2	2	3	2	2	2	3	4	4	4	5	4	5	4	4	3	4	4	4	4	3	3	5
25-Oct	3	4	3	3	3	2	2	2	2	2	2	3	3	4	3	3	3	3	4	5	4	2	2	2	5
26-Oct	2	2	2	2	2	3	2	3	3	2	3	3	4	3	4	3	3	2	2	2	2	2	2	2	4
27-Oct	2	2	2	7	5	5	5	4	3	3	3	2	3	3	4	4	4	3	2	2	2	1	1	1	7
28-Oct	2	3	2	1	1	1	1	2	2	3	3	3	3	3	3	2	2	2	2	2	3	2	3	4	4
29-Oct	3	4	5	3	2	4	5	5	5	4	4	4	4	3	3	2	2	2	1	2	3	2	4	4	5
30-Oct	4	4	3	3	2	3	3	2	1	3	3	3	3	4	5	3	3	3	3	3	3	2	2	3	5
31-Oct	3	4	2	2	2	3	3	4	4	4	3	3	2	2	1	1	2	2	2	2	1	2	2	1	4
Diurnal Maximum																								6	
UO - Unstable Operation																									





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	64	8.65	8.65
6 - 11	220	29.73	38.38
12 - 19	329	44.46	82.84
20 - 28	121	16.35	99.19
29 - 38	6	0.81	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
Mannix - October 2023

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	4	1	2	3	2	6	2	9	9	3	6	6	3	3	4	1	64
6 - 11	13	12	4	0	2	0	15	60	18	7	10	25	14	13	5	22	220
12 - 19	9	6	0	0	0	0	108	82	6	2	3	14	60	19	8	12	329
20 - 28	6	0	0	0	0	0	56	10	0	0	0	3	13	29	4	0	121
29 - 38	1	0	0	0	0	0	0	0	0	0	0	0	2	3	0	0	6
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	33	19	6	3	4	6	181	161	33	12	19	48	92	67	21	35	740

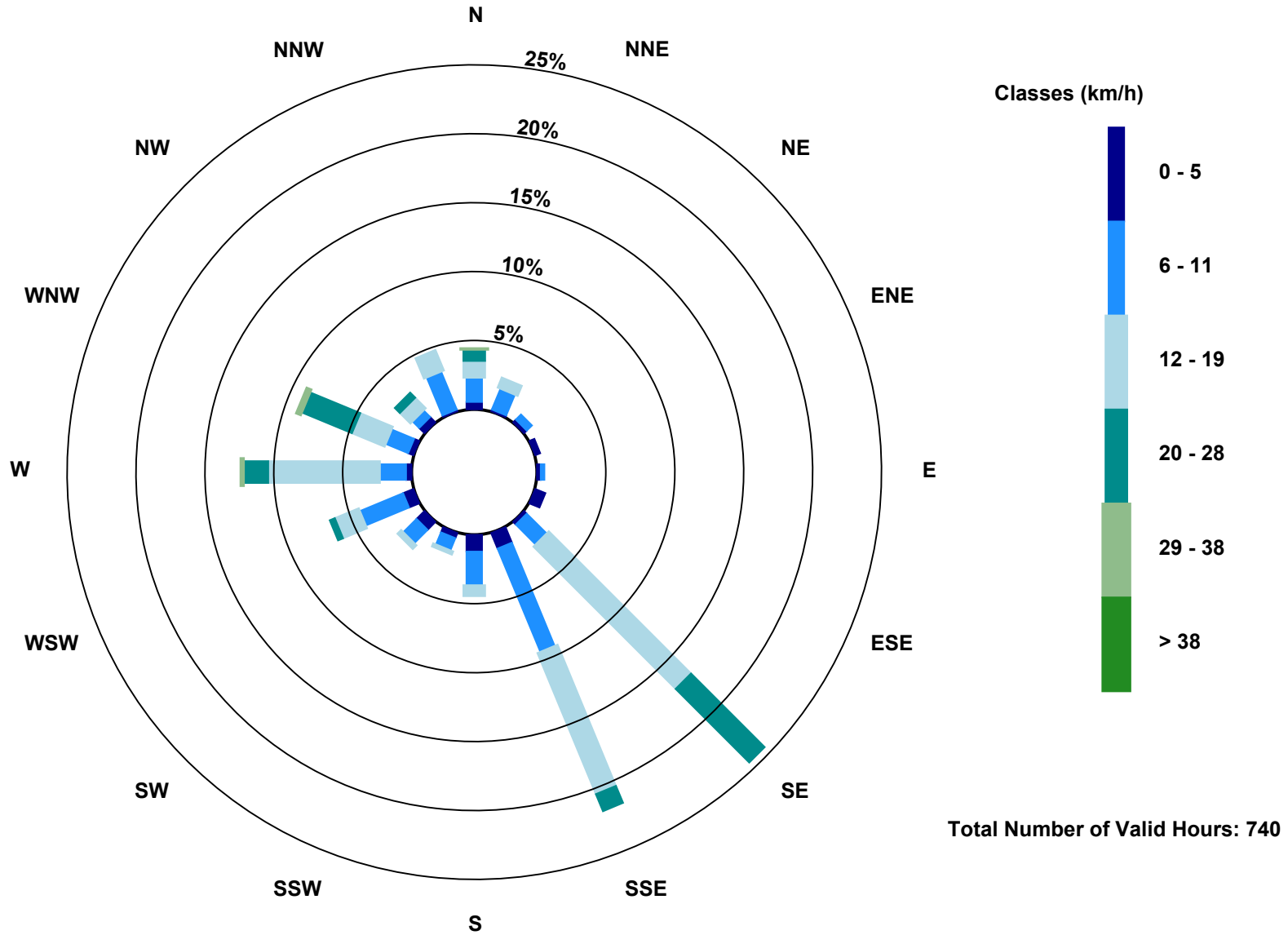
Total Number of Valid Hours: 740

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

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





Maximum Speed: 41 km/h on Oct 4 21:00	Maximum Daily Speed Average: 28.6 km/h on Oct 14	Hours in Service: 744
Minimum Speed Value: 1 km/h on Oct 31 21:00	Minimum Daily Speed Average: 2.5 km/h on Oct 31	Hours of Data: 736
Maximum Diurnal Speed Average: 7.5 km/h at hour 6	Minimum Diurnal Speed Average: 3.9 km/h at hour 16	Hours of Missing Data: 8
Monthly Average Velocity: 5.6 km/h 182.1 deg	Percentiles: P ₁ = 2 P ₁₀ = 8 Q ₁ = 13 Median = 19 Q ₃ = 23 P ₉₀ = 27 P ₉₉ = 37	Percent Operational Time: 98.9

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Oct	SSE16	SSE17	SSE18	SSE20	SSE24	SSE21	SSE20	SSE16	SSE18	SSE18	SSE20	SSE21	SSE27	SSE27	SSE29	SSE28	SSE26	SSE22	SE23	SE22	SE22	SSE23	SSE22	SE23	SSE21.8	SSE29
2-Oct	SE19	SSE19	SE15	SE16	SE18	SE19	SE19	SE18	SE19	SSE19	SSE18	SSE17	SSE16	SSE12	SSE8	S7	SW7	SSE5	SSE10	SSE10	SSE12	SSE10	SSE6	S7	SSE13.2	SE19
3-Oct	SSE9	SSW7	NW6	E3	SW4	S14	S10	SSW5	SSW5	WSW4	WSW6	SW9	W9WNW13WNW11	WNW5	SW13	SSW14	S17	S19	SSW18	SSE17	SSE21	SSE20		SSW7.9	SSE21	
4-Oct	SE15	SE12	SE15	SSE16	S14WSW13	W14WNW13WNW15WNW17WNW25WNW27WNW19WNW30	NW23WNW32WNW36WNW39WNW37WNW36WNW41WNW37WNW34WNW31																	WNW19.3	WNW41	
5-Oct	WNW34WNW28	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	WNW37	
6-Oct	S11	SSE13	SSE15	SSE17	SSE18	SSE20	SSE21	SE24	SSE17	SSE19	SSE19	SSE18	SSE18	SSE17	SSE12	S11	SSE11	SSE10	S11	SW13	W25	W27	W25	S12.6	W27	
7-Oct	W25	W23	W22	W19WNW15	NW8	W6	WSW6	SW6	SSE5	ESE5	E6	E7	SE9	SE9	SE10	SE14	SE17	SE19	SE22	SE25	SE24	SE21	SE24	SSE5.7	SE25	
8-Oct	SE25	SE26	SE27	SE27	SE32	SE32	SE30	SE30	SE29	SE34	SE22	SE22	SE25	SE23	SE23	SSE26	SSE26	S27	S25	SSE22	SE25	SE24	SE22	SE25	SE25.5	SE34
9-Oct	SE25	SE23	SE24	SE23	SE22	SE22	SE21	SE21	SE18	SE13	SE18	SE18	ESE19	ESE20	SE23	ESE20	SE25	SE22	SE24	SE27	SE27	SE26	SE26	SE26	SE22.2	SE27
10-Oct	SE24	SE23	SE22	SE23	SE23	SE22	SE22	SE23	SE22	SE24	ESE19	ESE19	SE27	SE26	SE22	SE23	ESE22	SE21	SE25	SE28	SE29	SE29	SE31	SE32	SE24.2	SE32
11-Oct	SE27	SE27	SE26	SE26	SE25	SE26	SE24	SE26	SE27	SE25	SE22	SE21	SE19	ESE19	SE25	SE24	SE23	ESE20	SE23	SE24	SE23	SE26	SE27	SE26	SE24.2	SE27
12-Oct	SE24	SE20	SE20	SE20	SE18	SE19	SE19	SE19	SE16	SE13	SSE15	SE14	SSE14	SSE12	SSE19	SSE17	SSE14	SSE12	SSE19	SSE20	SE22	SE20	SE22	SE22	SE17.7	SE24
13-Oct	SE20	SE20	SE20	SE20	SE22	SSE24	SSE19	SE16	SE17	SE18	SE18	SE19	SE21	SSE22	SE21	SE22	SE22	SE23	SE21	SE26	SE24	SE27	SE25	SE23	SE20.9	SE27
14-Oct	SE25	SE24	SE26	SE28	SE30	SE30	SE28	SE28	SE27	SE28	SE33	SE30	SE28	SE32	SE33	SE33	SE32	SE30	SE30	SE29	SE29	SE26	SE26	SE26	SE28.6	SE33
15-Oct	SE23	SE23	SE22	SE23	SE23	SE24	SE21	SE21	SE16	SE19	SE16	SSE15	SSE16	SSE17	SSE15	SSE13	SSE12	SSE16	SSE16	SSE15	SSE16	SSE17	S14	SSE15	SE17.2	SE24
16-Oct	SSE18	S19	S14	S10	S8	SSE13	S12	SSE12	SSE11	SSE9	SSE10	SE9	SE8	SE9	SE6	SSE5	ESE5	SSE10	S9	SSE11	SE7	SSE10	SE4	NE5	SSE9.1	S19
17-Oct	SE4	W1	N7	N7	NNE15	NNW6	NNW9	N10	N14	N12	NNW12	NNW13	NNW17	NW16	NW16	NNW14	NNW16	NNW13	N12	NNW8	NNW5	N2	SSE4	SE7	NNW8.4	NNW17
18-Oct	SSE10	SSE12	SE11	SSE12	SSE20	SE20	SE18	SE23	SE20	SE18	SE16	SSE17	SSE19	SSE20	SSE21	SSE23	SE20	SSE22	S25	SSW22	SW16	SW19WSW19	SSW8		SSE15.2	S25
19-Oct	SW9	SSW10	SSW11	S12	S14	SSE16	SSE19	SSE14	SSE13	SSW9WSW20WSW21WSW21WSW24	SW25	SW20	SW24	SSW18	SW16	W9WSW23WSW30	W30	SW22						SW15.1	WSW30	
20-Oct	WSW26WSW31	W32	W22WSW19	W24WSW19WSW25	W40	W38WNW28WNW32WNW32	NW27	NW31	NW28	NNW19	NNE18	NNE21	NNE15	NNE8	NNE9	ENE6	SSE5							WNW17.3	WSW40	
21-Oct	SSE11	SE12	SE18	SSE18	SSE18	SE20	S14	SSE19	SE21	SE21	SSE20	SSE9	SE4	N10	N30	N40	N36	N34	N35	N29	N27	NNW22	NNW18	N21	NNE6.5	N40
22-Oct	N22	N16	NNE16	NNE12	NNE12	NNE9	N9	NNE9	N5	NW2	WNW6	NNW8	NW8	NW11	N13	N14	N7	NNW8	NNW11	W7WNW13	NW19	NW19	NW19		NNW9.7	N22
23-Oct	WNW19	W15WNW19	W18	W19	W17	W18	W19	W17	W23WNW25WNW32	W30WNW30WNW30WNW28	W27WNW24WNW22	W19	W19WSW21	W22	W20	WSW20	W21	W25	W23	W22	W20			W21.8	WNW32	
24-Oct	W20	W19	W19	W20	W19	W19	W18WSW17WSW18	W21	W22	W32	W26WSW25WSW24WSW21	W22	W20WSW20	W21	W25	W23	W22	W20							W20.9	W26
25-Oct	W23	W20	W20WSW17WSW16WSW14WSW13WSW11WSW11WSW12WSW13WSW14WSW16WSW20	W21WSW17WSW15WSW15	W14WNW23WNW19	W14	W16	W15																	W15.6	WNW23
26-Oct	W18	W19	W19	W17	W19	W15WSW12	W15	W19	W16	W18	W19	W19	W17WSW18WSW19WSW16WSW14	W16	W22	W18WSW17WSW16WSW16								W17.1	W22	
27-Oct	WSW15	W16	W15NNW21	N20	N18	N18	N19	NNW16	NNW10	NNW12	NNW8	NW11	NW10	NW13	NW14	WNW19WNW15	NNW12	NNW10	WSW12	WSW9	SSW7	S12		NW9.9	NNW21	
28-Oct	S17	S16	S13WSW10	W14	W13	W13	W12	W15WNW13	NW15	NW12	NNW13	NW14	NNW12	WNW9	W14	W18	W22	W21	W19	W19WNW19WNW20				W11.8	W22	
29-Oct	WNW17WNW21WNW26WNW15	W17WNW22WNW24	NW22WNW21WNW23	NW19	NNW16	NNW15	NW10WNW10	WNW8	WSW5	WSW8	N5	NE8	NE10	NNE11	N19	N22								NW12.6	WNW26	
30-Oct	N19	NNE22	NNE16	NNE14	N10	NNE11	NNE11	W2	SW8	S9	SSE12	SSE14	SE13	SE16	SSE19	S14	SSE19	SSE19	SSE20	SSE18	SSE16	SSE16	SSE17	SSE17	SE6.9	NNE22
31-Oct	SSE16	SSE14	SSE10	S6	W8	NNW12	NNW12	NNW17	NNW19	NNW16	NNW15	NNW14	NNE10	ENE2	SE2	SSW2	E2	NE4	ENE5	ENE4	E1	WNW1	SW10	SSW13	NNW2.5	NNW19

S7.0	S7.0	S6.4	SSE7.0	SSE7.3	SSE7.5	SSE6.7	SSE6.4	S5.9	S6.0	SSW5.1	SSW4.4	SSW4.6	SSW4.4	SSW3.9	SSW3.9	SSW5.2	S5.3	S5.1	S5.5	S6.2	S6.1	SSW6.0	S6.4		Diurnal Average
WNW34	WSW31	W32	SE28	SE32	SE32	SE30	SE30	WSW40	W38WNW35	WNW37	WNW35	WNW33	SE33	N40	N36	WNW39	WNW37	WNW36	WNW41	WNW37	WNW34	SE32			Diurnal Maximum

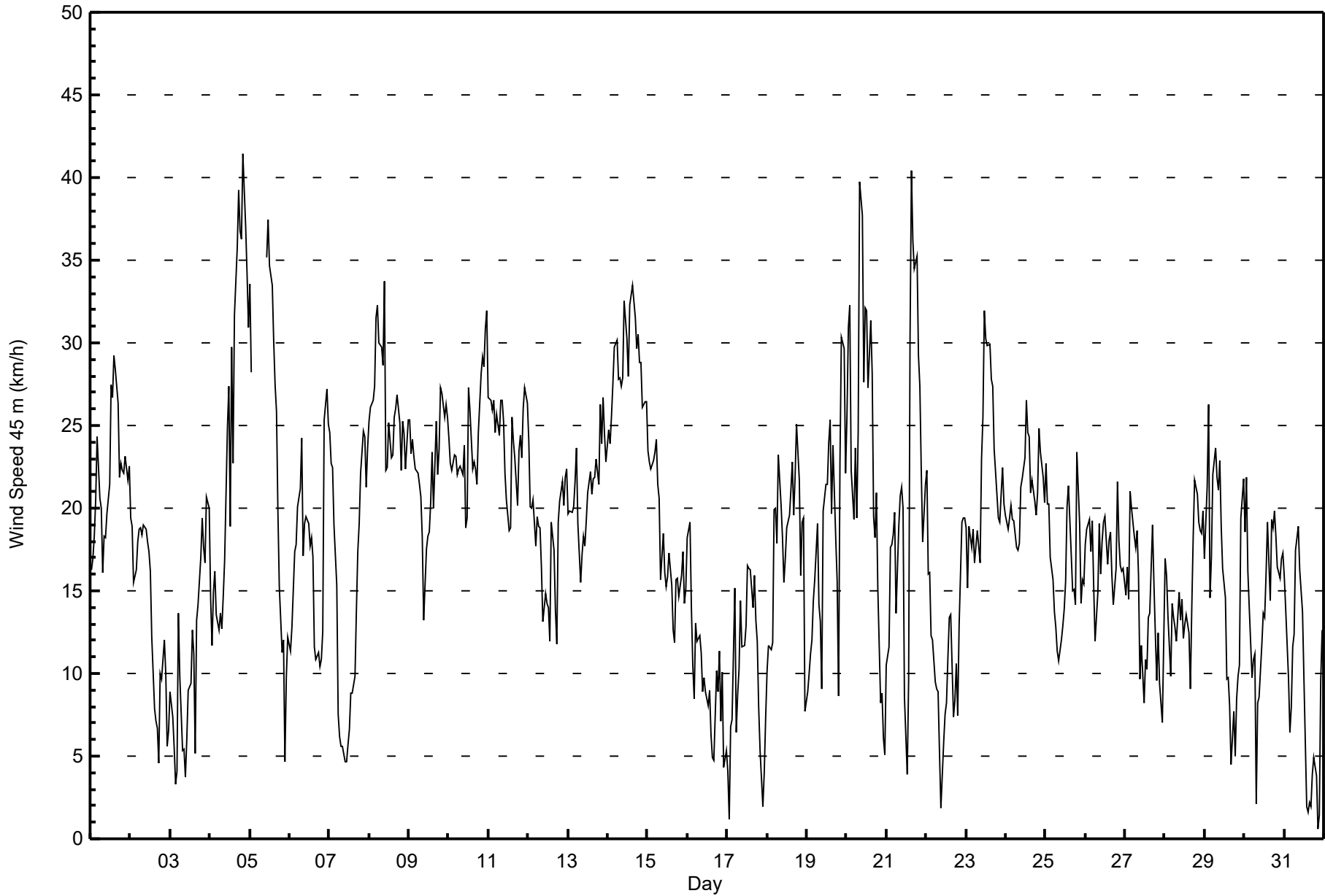
UO - Unstable Operation
All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 10 km/h on Oct 21 15:00 Minimum Value: 1 km/h on Oct 30 09:00 Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 2 Median = 3 Q ₃ = 4 P ₉₀ = 6 P ₉₉ = 8														Hours in Service: 744 Hours of Data: 736 Hours of Missing Data: 8 Hours of Calibration: 0 Percent Operational Time: 98.9													
Day	Hourly Period Ending At (MST)																								Daily Maximum		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Oct	1	1	2	4	4	3	2	3	4	4	5	6	6	6	6	6	5	5	4	4	3	3	4	4	6		
2-Oct	4	3	3	2	3	3	2	3	3	3	3	3	3	3	1	1	2	1	1	1	2	2	2	1	4		
3-Oct	2	3	4	2	2	3	4	1	1	2	2	2	4	3	4	4	4	1	3	1	2	1	2	2	4		
4-Oct	3	3	2	1	1	2	1	2	2	4	5	6	4	6	5	5	6	8	6	6	7	7	5	5	8		
5-Oct	5	5	UO	UO	UO	UO	UO	UO	UO	UO	6	6	5	6	5	5	6	5	2	2	2	2	1	1	6		
6-Oct	3	2	2	3	3	3	3	4	4	3	4	4	4	3	4	3	2	2	2	1	2	4	2	2	4		
7-Oct	3	2	2	2	4	3	2	1	1	2	2	2	2	2	2	3	2	2	3	4	4	4	3	3	4		
8-Oct	3	4	4	5	5	6	5	6	6	6	5	6	6	5	6	4	4	3	3	2	4	4	3	5	6		
9-Oct	4	4	4	4	3	3	3	4	4	5	4	5	5	6	5	6	5	4	5	5	5	5	5	5	6		
10-Oct	4	4	5	4	3	4	4	5	5	5	6	6	7	6	6	6	8	5	5	5	5	5	6	5	8		
11-Oct	5	6	5	5	5	6	5	5	5	6	5	4	5	5	6	6	7	7	5	5	5	5	4	4	7		
12-Oct	4	2	2	3	3	4	3	3	3	3	4	3	3	4	4	4	3	2	2	3	3	3	2	2	4		
13-Oct	2	2	2	2	3	4	5	4	4	3	4	4	4	4	5	5	4	4	5	5	5	5	5	4	5		
14-Oct	5	5	5	5	6	5	5	6	6	5	6	7	7	6	8	8	6	6	7	5	5	5	5	5	8		
15-Oct	5	4	4	3	3	4	4	5	3	3	3	3	3	3	3	3	3	2	1	2	1	1	2	3	5		
16-Oct	2	1	3	1	2	3	2	2	2	1	2	2	3	2	2	2	2	1	1	2	2	2	2	1	3		
17-Oct	1	2	2	4	3	2	2	3	3	2	3	3	3	3	3	3	3	3	3	2	1	2	1	3	4		
18-Oct	2	2	2	2	2	2	2	3	4	2	3	3	3	4	4	4	4	4	2	2	2	3	3	4	4		
19-Oct	1	2	2	1	1	1	2	4	3	3	7	5	4	5	5	4	5	4	5	2	7	6	7	3	7		
20-Oct	4	5	4	4	4	4	5	3	6	6	8	6	5	6	6	6	6	4	4	5	2	1	3	2	8		
21-Oct	2	3	3	1	2	3	2	3	3	3	5	4	3	5	10	8	9	8	8	6	6	5	4	6	10		
22-Oct	5	4	3	3	2	2	1	1	3	1	4	3	2	3	2	3	3	2	2	3	4	3	2	2	5		
23-Oct	2	2	3	2	1	1	2	3	3	4	5	6	5	6	5	5	4	5	4	3	2	3	2	2	6		
24-Oct	2	1	2	2	2	2	2	2	3	3	3	4	4	4	4	4	3	3	3	3	4	3	3	3	4		
25-Oct	3	4	3	2	3	2	2	2	3	3	2	3	4	3	3	3	3	3	4	5	3	2	2	2	5		
26-Oct	2	2	2	2	2	3	2	3	2	2	2	3	3	2	4	3	3	2	2	3	2	2	2	1	4		
27-Oct	2	2	2	8	6	5	5	4	3	3	2	3	3	2	3	4	3	3	3	3	2	1	2	2	8		
28-Oct	2	3	2	1	1	1	1	2	2	2	2	2	3	3	3	2	2	2	2	2	3	2	2	3	3		
29-Oct	3	4	4	4	2	4	4	5	5	4	3	3	4	3	3	2	2	2	1	2	3	3	4	4	5		
30-Oct	4	5	3	3	2	3	3	3	1	2	3	3	3	3	4	3	3	3	3	2	2	1	1	3	5		
31-Oct	3	5	1	2	3	3	4	4	4	3	3	3	3	2	1	1	2	2	2	2	1	2	3	1	5		
														Diurnal Maximum													
UO - Unstable Operation																											





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	35	4.76	4.76
6 - 11	106	14.40	19.16
12 - 19	289	39.27	58.42
20 - 28	248	33.70	92.12
29 - 38	54	7.34	99.46
> 38	4	0.54	100.00

Total Number of Valid Hours: 736

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Wind Speed 45 m (WS45m) - km/h
Mannix - October 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	3	0	2	3	3	2	4	5	0	4	1	2	2	2	1	1	35
6 - 11	7	8	2	1	2	0	10	18	12	6	6	8	5	5	7	9	106
12 - 19	11	8	0	0	0	4	41	74	16	5	5	29	47	16	11	22	289
20 - 28	5	2	0	0	0	5	128	30	3	1	4	13	32	19	4	2	248
29 - 38	5	0	0	0	0	0	22	1	0	0	0	2	4	19	1	0	54
> 38	1	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	4
Totals	32	18	4	4	5	11	205	128	31	16	16	55	90	63	24	34	736

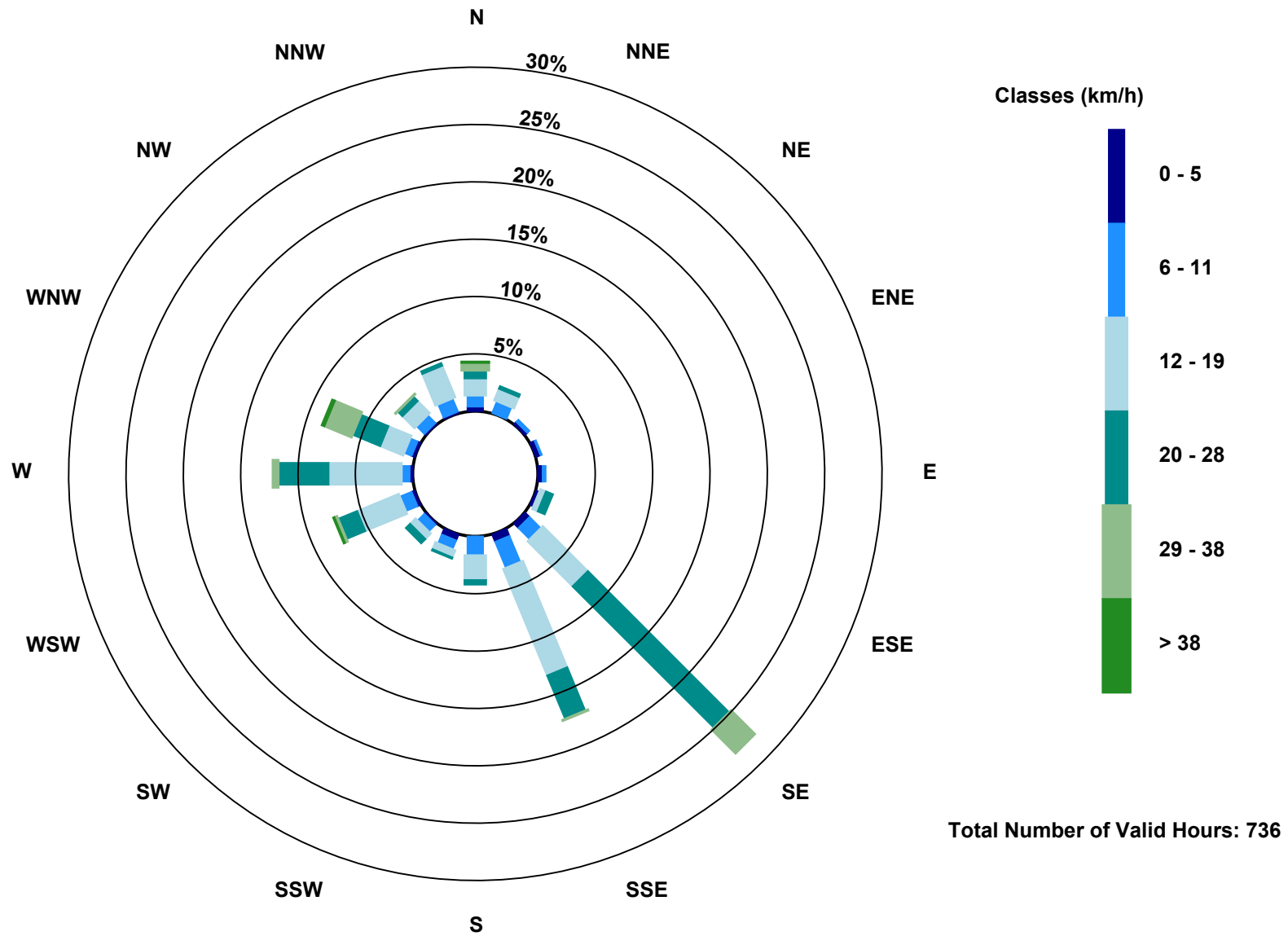
Total Number of Valid Hours: 736

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

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





Maximum Speed: 44 km/h on Oct 21 16:00	Maximum Daily Speed Average: 32.6 km/h on Oct 14	Hours in Service: 744
Minimum Speed Value: 1 km/h on Oct 31 17:00	Minimum Daily Speed Average: 3.4 km/h on Oct 31	Hours of Data: 737
Maximum Diurnal Speed Average: 7.9 km/h at hour 1	Minimum Diurnal Speed Average: 4.3 km/h at hour 15	Hours of Missing Data: 7
Monthly Average Velocity: 6.1 km/h 193.6 deg	Percentiles: P ₁ = 3 P ₁₀ = 9 Q ₁ = 14 Median = 21 Q ₃ = 25 P ₉₀ = 30 P ₉₉ = 40	Percent Operational Time: 99.1

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Oct	SSE22	SSE22	SSE24	SSE27	SSE31	SSE26	SSE26	SSE21	SSE20	SSE19	SSE21	SSE23	SSE29	SSE29	SSE31	SSE30	SSE29	SSE26	SE28	SSE29	SSE29	SSE30	SSE28	SSE29	SSE26.0	SSE31
2-Oct	SSE25	SSE24	SE20	SE20	SE21	SE24	SE25	SE25	SE25	SSE23	SSE20	SSE19	SSE18	SSE13	SSE8	SSW8	SW7	S4	SSE9	S10	S10	S12	S10	S8	SSE15.6	SSE25
3-Oct	SSE6	SSW8	WNW8	ENE3	SSW4	S16	SSW12	SW9	SW7	WSW3	WSW6	SW9	W10	WNW13	WNW12	WNW6	SW15	SSW15	S18	SSW25	SSW24	S20	S23	S23	SSW9.6	SSW25
4-Oct	SSE18	SE10	SE11	SSE13	SW14	W17	W18	WNW17	WNW17	WNW18	WNW26	WNW30	WNW22	NW33	NW25	WNW34	WNW39	WNW43	WNW40	WNW39	WNW44	WNW40	WNW37	WNW33	WNW22.0	WNW44
5-Oct	WNW37	WNW32	UO	UO	UO	UO	UO	UO	UO	WNW38	WNW37	WNW40	WNW37	WNW35	WNW32	WNW29	WNW27	WNW22	W18	W13	WSW14	SW7	SSW11	SSW15	---	WNW40
6-Oct	SSW12	S13	S19	S22	SSE23	SSE26	SSE28	SE31	SSE22	SSE23	SSE21	SSE20	SSE19	SSE19	S14	S14	SSE13	S12	SSW11	WSW15	W34	W35	W32	S15.0	W35	
7-Oct	W32	W29	W29	W24	WNW22	NNW10	WNW6	W7	SW6	S5	SE5	ESE5	E6	SE8	SE11	SE9	SE13	SE16	SE16	SE23	SE28	SE29	SE25	SE28	S5.8	W32
8-Oct	SE28	SE29	SE30	SE28	SE34	SE35	SE34	SE31	SE27	SE33	SE24	SE22	SE27	SE25	SSE25	SSE28	S31	S34	S33	SSE30	SE27	SE29	SE24	SE26	SE28.1	SE35
9-Oct	SE30	SE24	SE26	SE19	SE22	SE17	SE17	SE21	SE18	SE13	SE17	SE15	SE15	SE16	SE18	ESE15	SE21	SE18	SE18	SE22	SE25	SE23	SE21	SE21	SE19.7	SE30
10-Oct	SE20	SE18	SE17	SE21	SE21	SE18	SE23	SE24	SE20	SE19	ESE15	ESE15	SE24	SE23	SE19	SE17	SE19	SE18	SE22	SE28	SE29	SE29	SE31	SE35	SE21.8	SE35
11-Oct	SE25	SE21	SE20	SE19	SE18	SE21	SE21	SE21	SE24	SE24	SE22	SE17	SE16	ESE15	SE22	SE20	SE21	ESE16	SE22	SE23	SE21	SE23	SE30	SE30	SE21.2	SE30
12-Oct	SE29	SE26	SE23	SE23	SE21	SE25	SE20	SE19	SE18	SE14	SSE16	SSE15	SSE15	SSE13	SSE21	SSE19	SSE16	S13	SSE23	SSE27	SE26	SE25	SE26	SE25	SE20.3	SE29
13-Oct	SE23	SE24	SE25	SE26	SSE29	SSE30	SSE23	SE17	SE12	SE21	SE19	SE20	SSE22	SSE23	SE19	SE19	SE20	SE25	SE21	SE29	SE25	SE27	SE25	SE25	SE22.6	SSE30
14-Oct	SE25	SE25	SE30	SE35	SE36	SE37	SE35	SE33	SE30	SE29	SE33	SE31	SE30	SE35	SE36	SSE36	SSE35	SSE36	SE35	SE35	SE35	SE32	SE31	SE29	SE32.6	SE37
15-Oct	SE26	SE28	SE25	SE24	SE27	SE27	SE21	SE21	SE20	SE21	SE17	SSE16	SE16	SSE18	SE16	SE13	SE14	SSE19	SSE21	S18	S21	S20	SSW15	SSW11	SSE18.6	SE28
16-Oct	S15	SSW16	SW14	SW11	SW9	SSW10	SSW11	SSW9	SSW10	S9	SSE10	SSE9	SSE8	SE7	SE6	S5	SE5	S11	S10	SSE14	SE9	SE11	ESE5	E7	S8.1	SSW16
17-Oct	SE5	NE3	NNE5	NNE6	NNE16	NE10	N10	N15	N18	N12	NNW12	NNW13	NNW17	NNW16	NW17	NNW15	NNW17	NNW15	N13	N9	NNW6	NNE2	S4	SE7	N9.1	N18
18-Oct	S11	SSE13	SE14	SSE19	SE28	SE26	SE21	SE28	SE21	SE22	SE21	SSE19	SSE21	SSE22	SSE24	SSE27	SSE25	S28	SSW32	SW29	SW22	WSW25	WSW26	SW13	SSE18.1	SSW32
19-Oct	WSW13	SW12	SW14	SW12	SSW14	SSW14	S18	S18	S12	SW13	WSW22	WSW23	WSW23	WSW26	WSW28	SW23	SW27	SSW22	SW20	W11	WSW28	WSW34	W33	SW27	SW18.7	WSW34
20-Oct	WSW30	WSW35	W36	W26	WSW23	W28	W24	W28	W44	W41	WNW29	WNW34	WNW34	NW29	NW35	NW32	NNW23	NNE21	NNE23	NNE19	NE10	NE10	ENE7	SE7	WNW18.8	W44
21-Oct	SSE15	SSE14	SE20	SSE21	SSE25	SSE25	SSE18	SE26	SE27	SSE29	SSE27	SSE12	SSE6	N11	N33	N44	N41	N39	N39	N33	N30	N25	NNW21	N25	NE6.9	N44
22-Oct	N26	N20	NNE21	NNE17	NNE16	NNE11	NNE9	NNE9	N5	NW2	NW6	NNW8	NW8	NW11	N14	N14	N8	NNW9	NNW12	W8	WNW16	NNW22	NW22	NW22	NNW11.1	N26
23-Oct	WNW22	WNW18	WNW23	WNW21	W22	W20	W22	W22	W19	W24	WNW27	WNW33	WNW32	WNW31	WNW31	WNW29	W29	WNW26	WNW25	WNW22	W23	W25	W26	W25	WNW24.4	WNW33
24-Oct	W24	W24	W24	W24	W24	W23	W21	W22	W20	W22	W22	W24	W27	W26	WSW26	WSW23	W23	W22	W22	W23	W27	W25	W23	W22	W23.4	W27
25-Oct	W25	W22	W22	W19	W19	WSW17	WSW15	WSW14	WSW13	WSW13	WSW14	WSW14	WSW16	WSW21	W22	WSW18	WSW17	WSW19	W18	NW26	WNW21	W17	W19	W18	W17.6	NW26
26-Oct	W21	W23	W24	W22	W24	W20	WSW17	W20	W22	W18	W19	W20	W20	W17	WSW19	WSW20	WSW19	WSW18	W21	W25	W22	WSW21	WSW21	W20	W20.3	W25
27-Oct	W18	W20	W17	N24	N23	N21	N20	N21	N18	N10	NNW12	NNW9	NW11	NW11	NW14	NW15	WNW20	WNW17	NNW15	NNW11	WSW13	W11	SW8	S15	NW11.3	N24
28-Oct	S23	S20	SSW15	W12	W17	W17	W17	W16	WNW18	WNW14	NW15	NW14	NNW16	NNW15	NNW14	WNW10	W16	W22	W26	W25	W23	WNW22	WNW22	WNW23	W14.2	W26
29-Oct	WNW20	WNW24	NW29	WNW17	W20	WNW25	WNW26	NW25	WNW23	WNW25	NW20	NNW17	NNW15	NNW10	WNW10	WNW8	W5	W10	N6	NE11	NE10	NNE15	N25	N26	NW14.3	NW29
30-Oct	NNE21	NNE25	NNE19	NNE16	N11	NNE14	NNE13	E1	SW7	S9	SSE13	SSE15	SSE14	SSE17	S21	S17	SSE23	SSE23	SSE24	SSE22	S20	S19	S21	SSE21	SSE8.0	NNE25
31-Oct	SSE20	SSE18	S11	SW5	W14	NNW14	N15	N20	N22	NNW19	NNW17	NNW16	N11	NE2	SE1	SW2	ENE1	NE5	ENE5	ENE4	ENE1	NNE3	SW6	SSW12	NNW3.4	NNW22

S7.9	SSW7.5	S6.8	S6.8	S7.7	S7.7	S7.1	SSE6.5	S5.9	SSW6.0	SSW5.7	SW4.8	SW5.1	SW4.8	SSW4.3	SW4.4	SSW5.8	SSW6.0	SSW5.8	SSW6.2	SSW7.2	SSW7.2	SSW7.1	S7.1	Diurnal Average
WNW37	WSW35	W36	SE35	SE36	SE37	SE35	SE33	W44	W41	WNW37	WNW40	WNW37	WNW35	SE35	N44	N41	WNW43	WNW40	WNW39	WNW44	WNW40	WNW37	SE35	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

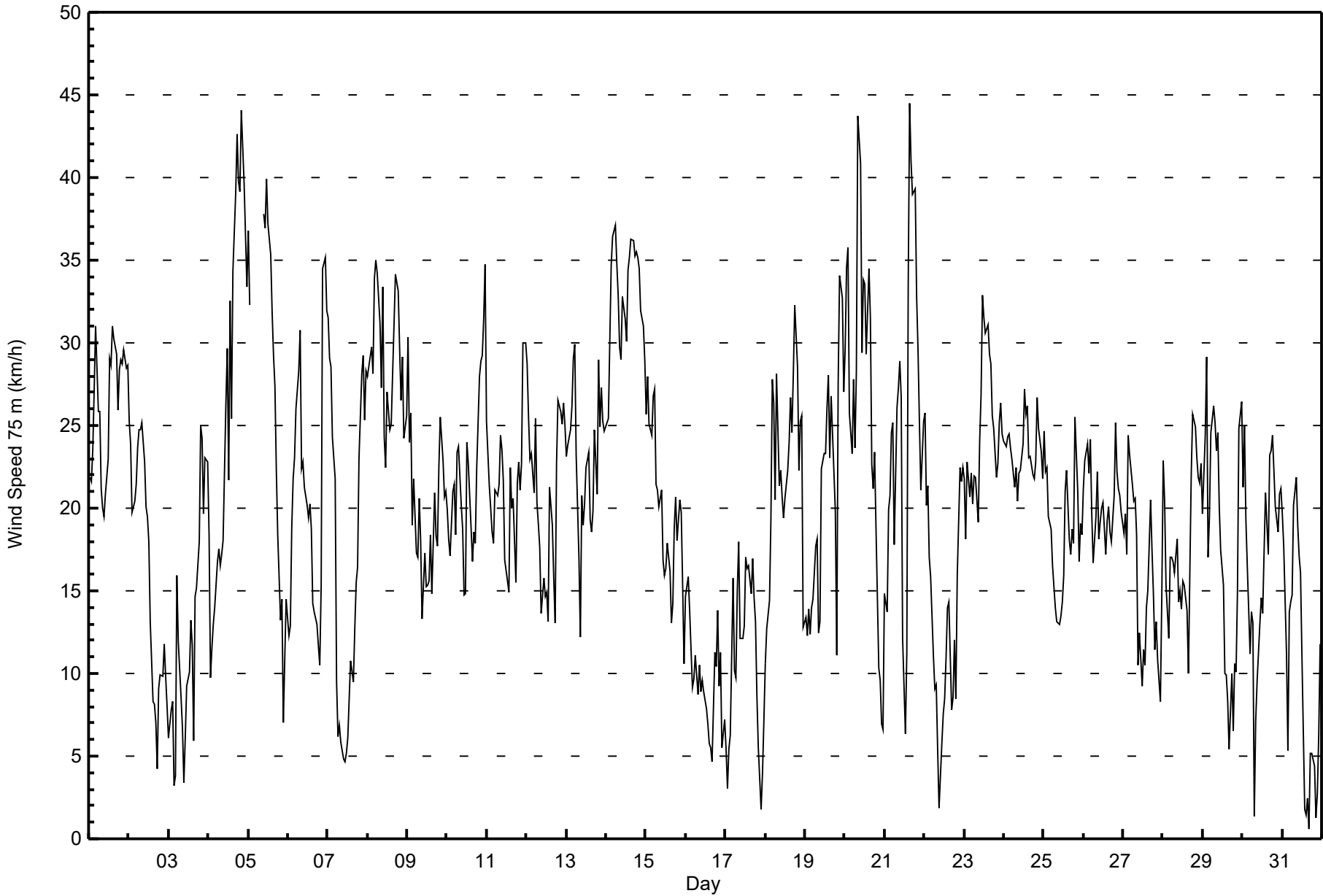
Wind Speed 75 m (WS75m) - km/h
Mannix - October 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 10 km/h on Oct 21 15:00 Minimum Value: 1 km/h on Oct 28 05:00 Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 2 Median = 3 Q ₃ = 5 P ₉₀ = 7 P ₉₉ = 8														Hours in Service: 744 Hours of Data: 737 Hours of Missing Data: 7 Hours of Calibration: 0 Percent Operational Time: 99.1											
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Oct	1	1	2	3	3	3	2	3	4	4	5	6	6	6	6	6	4	4	3	3	3	3	4	4	6
2-Oct	4	3	2	1	2	2	2	3	2	3	2	2	3	3	1	1	2	1	1	1	2	1	2	1	4
3-Oct	3	4	4	2	2	4	3	1	1	2	2	2	4	3	4	4	5	2	4	1	2	1	1	1	5
4-Oct	2	4	2	2	2	2	1	2	3	4	5	6	3	6	5	5	7	6	6	7	7	5	5	5	7
5-Oct	4	4	UO	UO	UO	UO	UO	UO	UO	6	6	5	5	6	4	4	6	5	2	2	1	2	1	1	6
6-Oct	2	2	2	2	3	3	3	3	4	3	3	4	4	3	3	3	3	1	1	2	3	5	2	2	5
7-Oct	3	2	2	2	5	5	3	2	1	2	2	2	2	3	2	4	4	3	6	6	5	4	4	3	6
8-Oct	5	5	4	7	6	7	6	8	9	8	6	7	7	5	6	4	4	3	3	2	7	4	5	8	9
9-Oct	4	5	5	6	6	6	6	6	6	5	5	5	6	6	7	6	8	7	7	9	8	8	8	8	9
10-Oct	7	6	7	7	6	6	6	6	7	7	6	6	9	9	8	7	8	7	9	8	8	8	8	6	9
11-Oct	8	8	8	7	7	8	7	8	8	8	6	6	6	6	8	8	9	7	8	7	7	7	6	5	9
12-Oct	4	2	2	5	4	4	5	5	4	4	4	4	3	4	5	4	3	3	2	3	3	3	2	2	5
13-Oct	2	1	1	1	2	4	5	5	5	4	5	4	4	4	6	7	6	5	7	6	7	7	7	6	7
14-Oct	7	7	5	5	5	4	5	5	7	7	8	7	8	7	8	8	6	6	7	5	5	5	5	6	8
15-Oct	6	4	6	4	3	4	6	6	3	4	4	3	3	3	2	2	3	2	1	1	1	1	3	2	6
16-Oct	2	2	2	2	2	2	2	1	1	2	2	2	3	3	2	2	2	2	1	1	4	2	2	2	4
17-Oct	3	3	2	4	1	3	3	4	2	2	3	3	3	3	2	3	2	2	2	2	1	2	1	3	4
18-Oct	2	2	3	2	2	3	3	3	5	3	3	3	3	3	3	3	4	4	2	2	3	3	3	4	5
19-Oct	2	3	2	2	2	1	3	4	2	3	6	5	4	5	5	4	5	5	5	3	7	5	7	4	7
20-Oct	4	5	4	4	4	4	5	3	6	7	8	6	5	5	6	5	7	4	4	5	2	1	2	2	8
21-Oct	2	2	4	2	2	3	2	2	3	2	6	5	4	5	10	7	8	8	8	6	6	5	5	7	10
22-Oct	5	5	2	3	2	2	2	1	3	1	4	3	2	3	2	3	2	2	2	3	4	3	2	2	5
23-Oct	2	2	2	2	1	1	2	2	2	4	5	5	4	6	4	5	4	5	4	3	2	2	2	2	6
24-Oct	1	1	1	2	2	2	2	2	2	3	3	3	4	4	4	4	3	3	3	3	4	4	3	3	4
25-Oct	3	3	3	2	2	2	2	2	3	3	2	3	4	3	3	3	2	3	4	5	3	2	2	2	5
26-Oct	2	3	2	2	2	3	2	2	3	2	3	3	3	2	3	3	3	2	2	3	2	2	1	1	3
27-Oct	2	2	2	9	5	5	5	4	3	3	2	3	3	2	4	3	3	3	3	3	2	2	1	3	9
28-Oct	2	3	2	1	1	1	1	2	2	2	2	3	3	3	3	2	2	2	2	2	3	2	2	3	3
29-Oct	4	4	4	4	2	3	4	5	5	4	3	3	4	3	3	2	2	1	1	3	3	5	4	4	5
30-Oct	4	4	3	2	2	1	2	3	2	2	3	3	3	3	4	4	3	3	2	2	2	1	2	1	4
31-Oct	2	4	2	1	4	3	5	4	3	4	3	3	3	2	1	1	2	1	2	2	1	2	2	2	5
Diurnal Maximum																									
UO - Unstable Operation																									



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	29	3.93	3.93
6 - 11	93	12.62	16.55
12 - 19	206	27.95	44.50
20 - 28	296	40.16	84.67
29 - 38	100	13.57	98.24
> 38	13	1.76	100.00

Total Number of Valid Hours: 737

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Wind Speed 75 m (WS75m) - km/h
Mannix - October 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	3	5	1	2	4	0	4	1	2	1	1	0	1	0	29
6 - 11	8	4	5	1	2	0	10	8	10	9	10	2	5	7	5	7	93
12 - 19	7	9	0	0	0	5	37	35	17	10	8	19	23	11	4	21	206
20 - 28	12	5	0	0	0	0	101	50	12	3	5	15	60	23	6	4	296
29 - 38	3	0	0	0	0	0	37	18	3	1	1	3	9	20	5	0	100
> 38	4	0	0	0	0	0	0	0	0	0	0	0	2	7	0	0	13
Totals	35	21	8	6	3	7	189	111	46	24	26	40	100	68	21	32	737

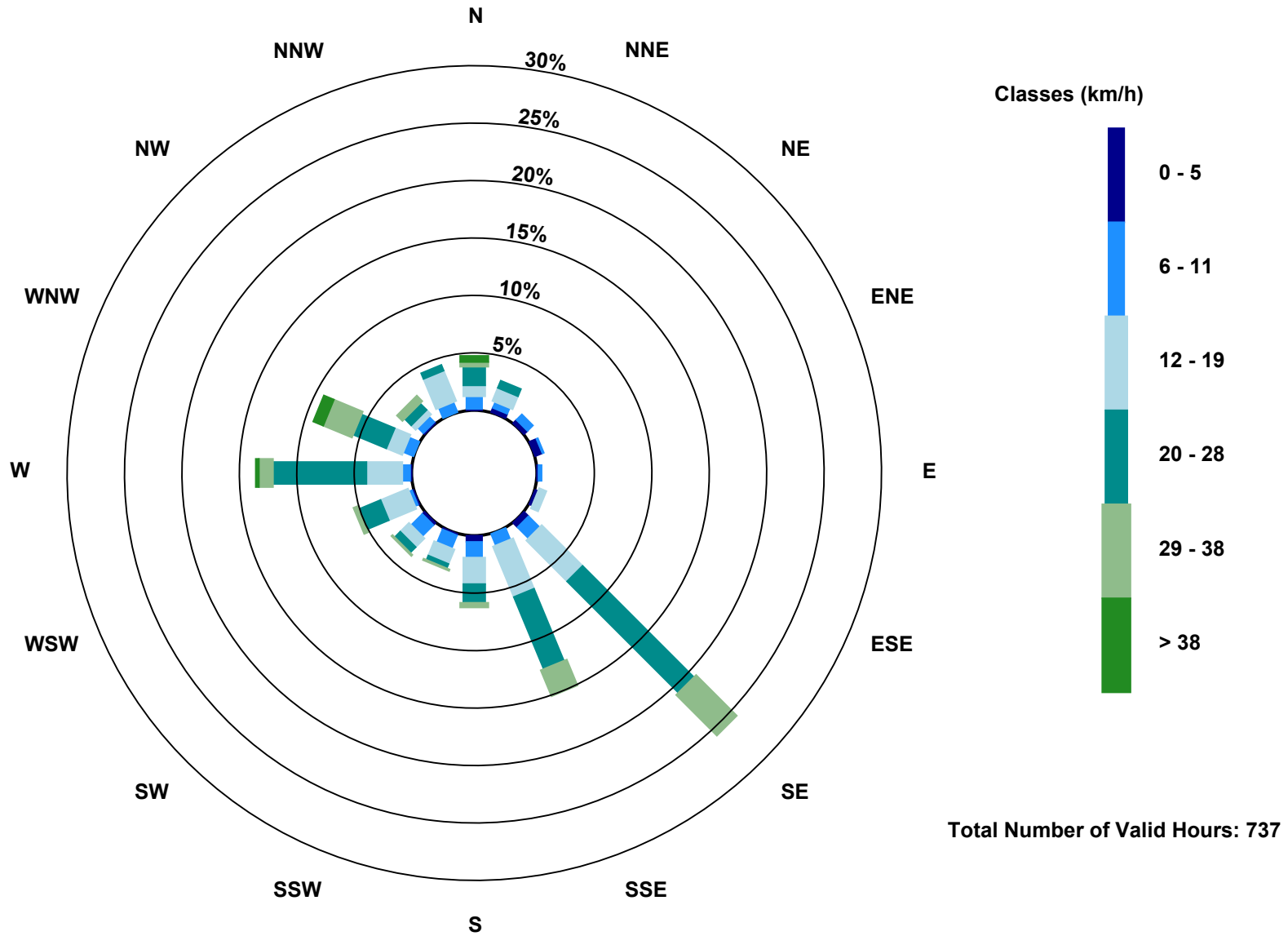
Total Number of Valid Hours: 737

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

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





Maximum Speed: 45 km/h on Oct 4 21:00	Maximum Daily Speed Average: 33.7 km/h on Oct 14	Hours in Service: 744
Minimum Speed Value: 1 km/h on Oct 31 17:00	Minimum Daily Speed Average: 4.2 km/h on Oct 31	Hours of Data: 740
Maximum Diurnal Speed Average: 7.7 km/h at hour 1	Minimum Diurnal Speed Average: 4.2 km/h at hour 15	Hours of Missing Data: 4
Monthly Average Velocity: 5.9 km/h 197.0 deg	Percentiles: P ₁ = 3 P ₁₀ = 9 Q ₁ = 15 Median = 22 Q ₃ = 27 P ₉₀ = 32 P ₉₉ = 41	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-Oct	SSE22	S21	SSE24	SSE29	SSE33	SSE27	S27	SSE22	SSE20	SSE19	SSE20	SSE23	SSE29	SSE28	SSE31	SSE30	SSE29	SSE26	SE30	SSE31	SSE31	SSE32	SSE31	SSE31	SSE26.7	SSE33
2-Oct	SSE27	SSE25	SE20	SE20	SE22	SE24	SE26	SE26	SSE26	SSE24	SSE20	SSE20	SSE18	S13	S8	SSW8	SW7	SSW4	S8	S9	S8	S10	S10	S7	SSE15.6	SSE27
3-Oct	S3	SW7	WNW9	ENE3	SSW4	S14	SSW12	WSW10	WSW7	W3	WSW6	WSW9	W11	WNW13	WNW12	WNW6	SW15	SSW15	S17	SSW27	SSW27	SSW21	S23	S22	SW9.8	SSW27
4-Oct	SSE17	SSE8	SE9	S10	SW14	W19	WNW19	WNW19	WNW19	WNW19	WNW27	WNW31	WNW23	NW34	NW27	WNW35	WNW40	WNW44	WNW41	WNW40	WNW45	WNW41	WNW38	WNW34	WNW23.6	WNW45
5-Oct	WNW38	WNW34	UO	UO	UO	UO	WNW41	WNW44	WNW38	WNW39	WNW38	WNW41	WNW38	WNW36	WNW33	WNW30	WNW28	WNW23	W19	W14	W16	WSW8	SW11	SW13	WNW27.8	WNW44
6-Oct	SSW12	SSW13	S18	S23	SSE24	SSE28	SSE31	SE32	SSE24	SSE24	SSE21	SSE20	SSE19	SSE20	SSE19	S15	S14	S13	SSW11	SW10	WSW17	W38	W38	WNW34	S15.3	W38
7-Oct	W34	W32	W31	W27	WNW24	NW11	WNW6	WNW5	WSW5	S5	SE6	ESE6	E6	SE9	SE11	SE10	SE13	SE16	SE18	SE26	SE30	SE31	SE27	SE29	S5.6	W34
8-Oct	SE30	SE30	SE32	SE30	SE36	SE38	SE37	SE34	SE31	SE35	SE25	SE23	SE27	SE25	SSE25	SSE28	S32	S36	S35	SSE31	SE28	SE31	SE26	SE28	SE29.4	SE38
9-Oct	SE31	SE26	SE28	SE21	SE22	ESE19	ESE19	SE22	SE19	SE14	SE18	SE17	ESE17	ESE18	ESE21	ESE19	SE23	ESE22	ESE22	SE26	SE29	SE26	ESE25	SE25	SE22.0	SE31
10-Oct	ESE22	ESE20	ESE21	SE22	SE22	SE21	SE24	SE25	SE23	SE22	ESE18	ESE18	SE26	SE25	SE21	ESE21	ESE22	ESE20	SE26	SE30	SE31	SE32	SE33	SE36	SE24.1	SE36
11-Oct	SE28	ESE25	ESE25	ESE23	ESE22	ESE24	SE24	ESE25	SE26	SE25	SE22	SE18	SE18	ESE18	SE24	SE22	SE23	ESE19	SE24	SE24	SE24	SE26	SE32	SE32	SE23.8	SE32
12-Oct	SE30	SE26	SE24	SE25	SE22	SE28	SE22	SE22	SE19	SE15	SSE16	SSE15	SSE15	SSE13	SSE21	SSE19	SSE16	S13	SSE23	SSE28	SE27	SE25	SE26	SE25	SE20.9	SE30
13-Oct	SE24	SE24	SE26	SE28	SSE31	SSE31	SSE24	SE18	ESE15	SE22	SE19	SE20	SE22	SSE23	SE20	SE21	SE21	SE26	SE23	SE31	SE27	SE30	SE28	SE27	SE23.8	SSE31
14-Oct	SE28	SE27	SE32	SE36	SE38	SE38	SE36	SE35	SE31	SE30	SE33	SE32	SE31	SE35	SE36	SE37	SSE37	SSE36	SSE36	SSE36	SE36	SE33	SE33	SE31	SE33.7	SE38
15-Oct	SE28	SE29	SE27	SE26	SE28	SE29	SE23	SE23	SE21	SE22	SE17	SSE16	SSE16	SSE18	SSE16	SSE13	SSE14	SSE19	S21	SSW19	S20	SSW18	SW16	SSW9	SSE18.5	SE29
16-Oct	SSW13	SSW15	SW14	SW13	SW10	SSW9	SW11	SSW8	SSW10	S7	S9	SSE9	SSE8	SE7	SE6	S5	SE5	S11	SSW10	SSE14	SE11	SE12	ESE8	E7	S7.6	SSW15
17-Oct	SE7	ENE4	NE5	NNE4	NNE14	NE11	N8	N16	N20	N12	NNW13	NNW13	NNW17	NNW17	NW17	NNW16	NNW18	NNW15	N14	N9	NNW6	NNE2	S4	SE8	N9.1	N20
18-Oct	S10	SSE13	SE16	SE23	SSE30	SE28	SE23	SE30	SE23	SE24	SE22	SSE20	SSE21	SSE23	SSE24	SSE27	SSE26	S30	SSW33	SW31	WSW25	WSW28	WSW28	WSW15	SSE18.7	SSW33
19-Oct	WSW15	WSW14	SW15	SW13	SW14	SSW14	SSW16	SSW18	SSW12	SW15	WSW23	WSW23	WSW24	WSW26	WSW29	SW24	SW28	SSW23	SW21	W12	WSW29	WSW35	W34	SW29	SW19.9	WSW35
20-Oct	WSW31	W36	W37	W27	W25	W30	W25	W30	W45	W42	WNW30	WNW34	WNW34	NW30	NW36	NW33	NNW24	NNE22	NNE24	NNE20	NE11	NE10	ENE8	SSE7	WNW19.8	W45
21-Oct	SSE15	SSE14	SE20	SE21	SSE26	SSE26	SSE20	SSE27	SSE28	SSE31	SSE29	S13	SSE7	N12	N34	N45	N42	N40	N40	N34	N30	N26	NNW23	N27	NE6.3	N45
22-Oct	N27	N22	NNE22	NNE19	NNE17	NNE12	NNE9	NNE9	N5	NW2	NW6	NNW8	NW9	NW11	N14	N15	N8	NNW9	NNW12	W9	WNW18	NW24	NW23	NW24	NNW11.8	N27
23-Oct	WNW23	WNW20	WNW25	WNW22	WNW23	WNW22	WNW23	WNW23	W20	W25	WNW27	WNW33	WNW32	WNW31	WNW32	WNW30	W29	WNW27	WNW26	WNW23	W24	W26	W28	W26	WNW25.6	WNW33
24-Oct	W26	W26	W26	W26	W25	W24	W23	W24	W21	W22	W22	W24	W27	W25	WSW26	WSW23	W23	W22	W22	W24	W28	W26	W24	W22	W24.2	W28
25-Oct	W25	W23	W23	W20	W20	WSW17	WSW16	WSW15	WSW14	WSW13	WSW14	WSW14	WSW16	WSW21	W22	WSW18	WSW18	WSW20	W20	NW26	WNW22	W18	W20	W20	W18.3	NW26
26-Oct	W23	W25	W26	W24	W26	W22	W18	W21	W24	W19	W20	W20	W21	W17	WSW19	WSW20	WSW19	WSW20	W23	W27	WNW24	WSW23	WSW22	W21	W21.5	WNW27
27-Oct	W20	W21	W18	N25	N24	N22	N22	N21	N20	N11	NNW13	NNW10	NW12	NW11	NW15	NW16	WNW21	WNW18	NNW16	NNW12	WSW12	W11	SW8	SSW15	NW12.2	NNW25
28-Oct	S24	S21	SSW15	W13	WNW18	W18	W18	W18	WNW20	WNW15	NW15	NW15	NNW17	NW16	NNW15	WNW11	W17	W24	WNW27	WNW27	WNW25	WNW23	WNW23	WNW24	WNW15.5	WNW27
29-Oct	WNW21	WNW26	NW31	WNW18	W21	WNW26	WNW28	NW26	WNW25	WNW25	NW21	NNW18	NNW16	NW10	WNW10	WNW9	W6	W11	N8	NE11	NE10	NNE18	N27	N28	NW15.4	NW31
30-Oct	N22	NNE26	NNE20	NNE17	N12	NNE14	NNE12	ENE2	SSW7	S10	SSE13	SSE14	SSE13	SSE17	S21	S18	SSE24	SSE25	SSE25	SSE23	S21	S19	S21	S21	SSE7.7	NNE26
31-Oct	S20	S18	S11	WSW6	W16	NNW16	N16	NNW21	NNW23	NNW20	NNW18	NNW17	N12	NE2	SE1	SW3	NNW1	NE6	NE5	NE5	ENE2	NE4	SW5	SSW11	NNW4.2	NNW23

SSW7.7	SSW7.4	S6.6	S6.6	S7.6	S7.5	S6.1	S5.4	SSW5.2	SSW6.0	SSW5.7	SW4.9	SW5.1	SW4.7	SW4.2	SW4.4	SSW5.8	SSW6.0	SSW5.8	SSW6.1	SSW7.1	SSW7.1	SSW7.1	SSW6.9	Diurnal Average
WNW38	WSW36	W37	SE36	SE38	SE38	WNW41	WNW44	W45	W42	WNW38	WNW41	WNW38	WNW36	NW36	N45	N42	WNW44	WNW41	WNW40	WNW45	WNW41	W38	SE36	Diurnal Maximum

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

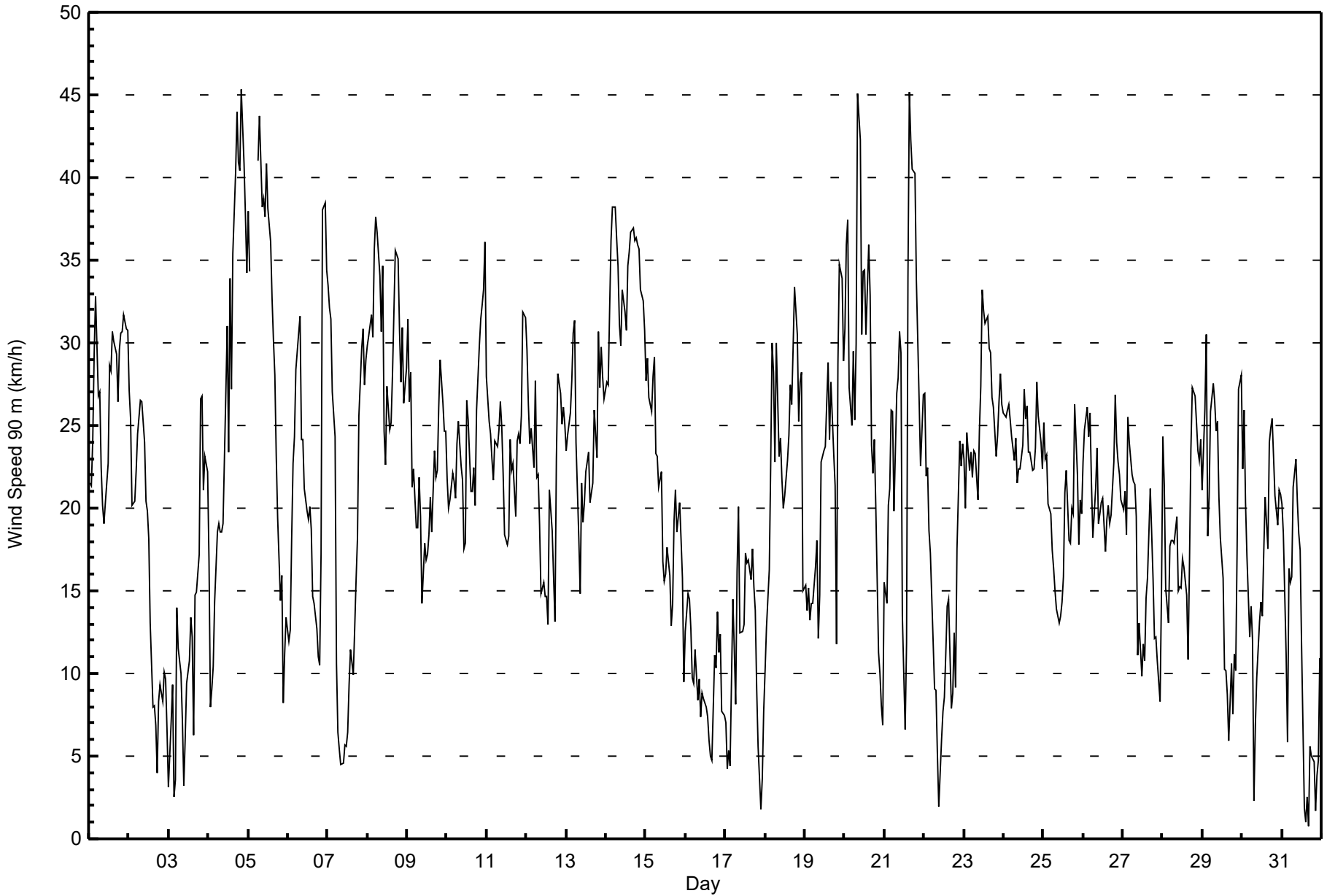
Wind Speed 90 m (WS90m) - km/h
Mannix - October 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 10 km/h on Oct 21 15:00 Minimum Value: 1 km/h on Oct 31 00:00 Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 2 Median = 3 Q ₃ = 4 P ₉₀ = 6 P ₉₉ = 7																		Hours in Service: 744 Hours of Data: 740 Hours of Missing Data: 4 Hours of Calibration: 0 Percent Operational Time: 99.5							
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Oct	1	1	2	3	2	3	2	3	4	4	4	5	6	5	6	5	4	3	3	3	3	3	3	3	6
2-Oct	3	3	2	1	2	2	2	2	2	3	3	2	3	3	1	2	2	1	1	1	1	1	1	2	3
3-Oct	2	5	4	2	2	4	2	1	1	2	2	4	3	4	4	5	2	4	2	2	1	1	2	5	
4-Oct	2	4	2	1	3	2	1	2	2	3	5	5	3	6	5	5	7	6	6	6	7	5	5	7	
5-Oct	4	4	UO	UO	UO	UO	6	5	5	5	6	5	5	6	4	4	5	5	2	2	1	2	2	6	
6-Oct	2	2	1	2	3	3	2	3	4	3	3	3	4	3	3	3	3	1	1	3	3	5	1	5	
7-Oct	2	2	2	2	5	6	2	2	2	2	2	2	2	2	2	3	3	2	4	4	3	3	3	6	
8-Oct	3	4	3	5	5	5	4	6	7	6	5	6	6	5	5	4	4	3	3	2	6	4	3	7	
9-Oct	3	4	4	5	5	5	4	4	4	5	4	4	5	5	5	5	5	5	6	6	6	6	6	6	
10-Oct	5	4	5	5	5	5	5	5	5	5	5	5	7	6	6	5	7	5	6	6	6	6	6	7	
11-Oct	6	6	5	5	5	6	5	6	6	6	5	5	5	5	5	6	7	6	6	6	5	5	4	7	
12-Oct	4	2	2	4	3	2	4	4	4	4	4	3	3	3	4	4	3	3	2	3	2	2	2	4	
13-Oct	2	2	1	1	2	3	5	4	3	3	4	4	4	4	5	5	5	4	6	5	6	5	5	6	
14-Oct	5	5	4	4	5	4	4	4	5	5	6	6	6	6	7	7	6	5	6	4	4	4	4	7	
15-Oct	5	3	4	3	2	3	4	4	3	4	3	3	3	2	2	2	3	2	1	1	1	2	3	5	
16-Oct	2	1	2	2	2	2	2	1	1	2	2	2	3	2	2	2	2	2	1	1	3	2	2	3	
17-Oct	2	3	2	4	1	3	3	4	3	2	3	3	3	3	2	3	2	2	2	2	2	2	1	4	
18-Oct	1	2	4	2	2	3	2	3	4	2	2	3	3	3	3	3	4	3	2	2	3	3	3	4	
19-Oct	2	3	3	2	2	2	3	4	2	3	6	4	3	5	5	3	5	5	5	3	7	5	7	7	
20-Oct	4	5	4	4	4	4	5	3	6	7	8	5	5	5	6	4	7	4	4	5	2	1	1	8	
21-Oct	2	1	4	3	2	2	3	1	2	2	6	5	4	4	10	7	8	8	8	6	6	5	5	10	
22-Oct	5	4	2	3	2	2	2	1	3	2	4	3	3	3	2	3	2	2	2	3	5	3	2	5	
23-Oct	2	3	2	2	1	1	2	2	2	4	5	5	4	6	4	5	4	5	4	3	2	2	2	6	
24-Oct	1	1	1	1	2	2	2	2	3	3	3	3	4	4	3	3	3	3	3	3	4	3	3	4	
25-Oct	3	3	2	2	2	2	2	1	2	3	2	3	4	3	3	3	2	3	4	5	3	2	1	5	
26-Oct	2	3	2	2	2	3	2	2	3	2	3	3	3	2	3	3	3	2	2	3	2	2	1	3	
27-Oct	2	2	2	9	5	5	6	4	3	3	2	3	3	2	4	3	3	3	2	3	2	2	2	9	
28-Oct	2	3	2	2	1	1	1	2	2	2	2	3	2	3	3	2	2	1	1	2	2	2	2	3	
29-Oct	4	4	4	4	2	3	4	6	5	4	3	3	4	3	3	2	2	1	1	3	3	5	3	6	
30-Oct	4	4	3	2	2	1	2	3	2	2	3	3	3	3	4	4	3	2	2	2	2	1	1	4	
31-Oct	2	4	2	3	4	3	5	3	3	3	3	3	3	2	1	1	2	1	2	2	1	2	2	5	
Diurnal Maximum																									
UO - Unstable Operation																									



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	27	3.65	3.65
6 - 11	90	12.16	15.81
12 - 19	174	23.51	39.32
20 - 28	311	42.03	81.35
29 - 38	122	16.49	97.84
> 38	16	2.16	100.00

Total Number of Valid Hours: 740

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Wind Speed 90 m (WS90m) - km/h
Mannix - October 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	2	5	4	0	0	2	0	4	2	2	1	1	1	1	1	27
6 - 11	5	3	5	1	2	2	10	5	14	10	6	6	5	6	6	4	90
12 - 19	9	8	0	0	0	10	16	26	12	14	10	17	16	11	6	19	174
20 - 28	13	6	0	0	0	16	88	47	14	4	3	15	58	34	7	6	311
29 - 38	3	0	0	0	0	0	49	22	4	1	2	5	10	21	5	0	122
> 38	4	0	0	0	0	0	0	0	0	0	0	0	2	10	0	0	16
Totals	35	19	10	5	2	28	165	100	48	31	23	44	92	83	25	30	740

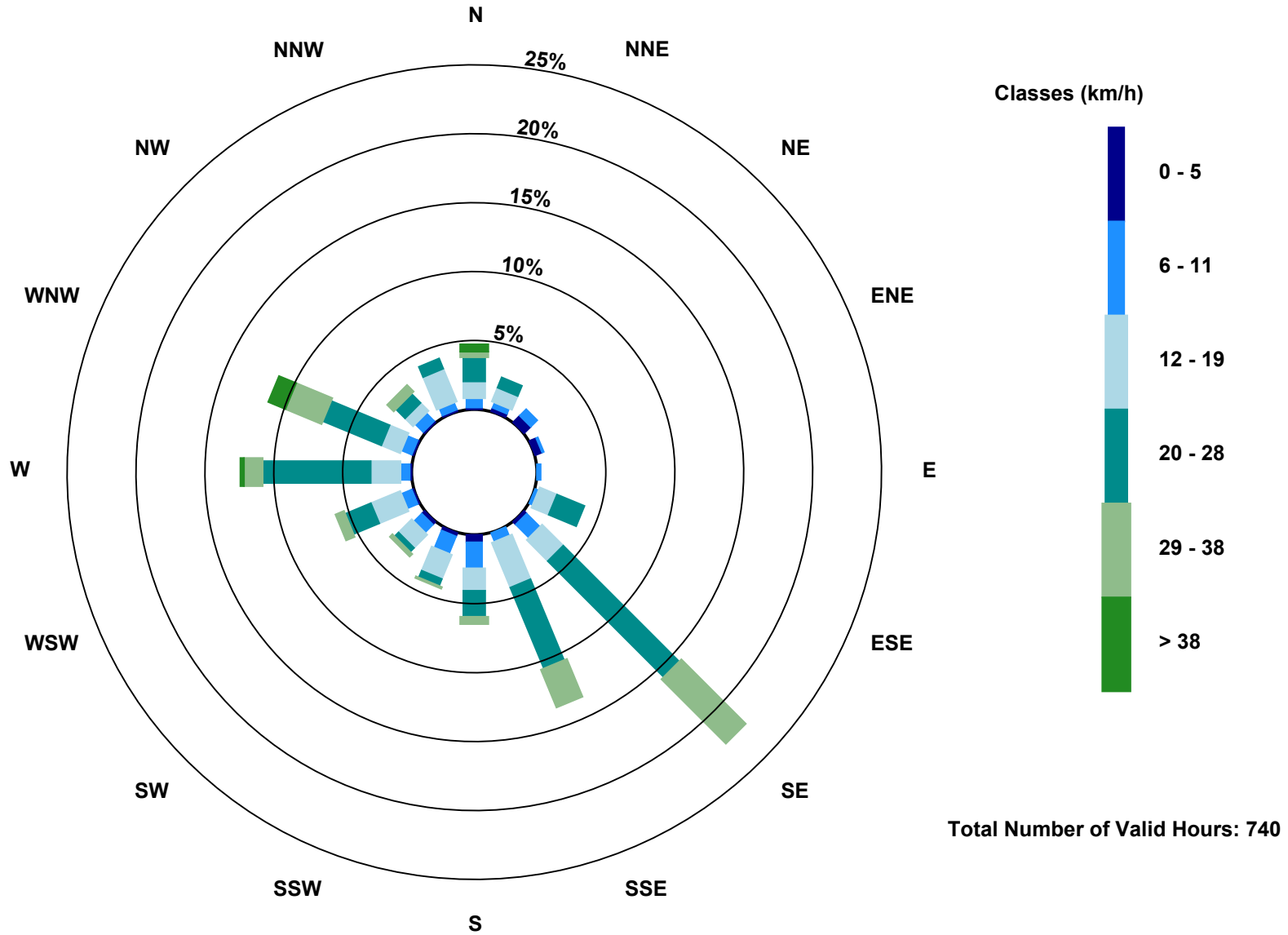
Total Number of Valid Hours: 740

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

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





Wood Buffalo Environmental Association
Summary of Hour Averages

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

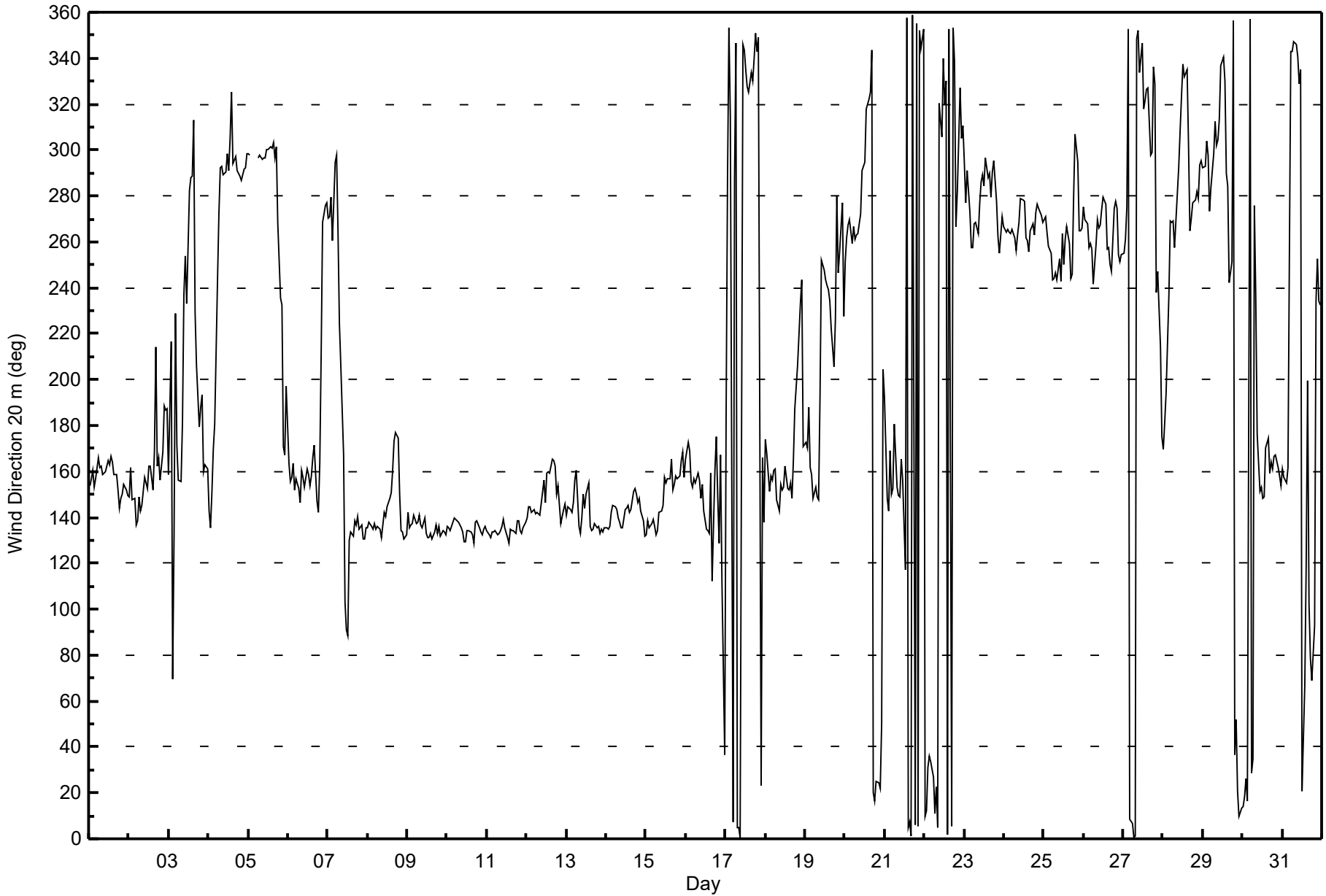
Direction of Maximum Speed: 264 deg on Oct 20 09:00																						Hours in Service: 744			
Direction of Maximum Daily Speed Average: 142.3 deg on Oct 14																						Hours of Data: 740			
Direction of Minimum Speed: 69 deg on Oct 3 03:00											Direction of Minimum Daily Speed Average: 1.6 deg on Oct 31											Hours of Missing Data: 4			
Monthly Average Direction: 187.8 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-Oct	154	157	161	153	157	166	161	162	158	159	160	165	163	167	164	159	158	152	144	148	150	155	152	149	157.6
2-Oct	149	162	148	148	137	139	149	143	145	157	155	152	162	163	152	169	214	162	166	156	168	188	187	187	155.7
3-Oct	158	217	69	132	229	172	156	156	181	237	254	233	282	288	289	313	230	206	179	188	194	160	163	161	199.9
4-Oct	143	135	151	169	180	243	272	292	293	289	290	298	291	305	325	294	297	291	290	288	287	292	293	298	287.9
5-Oct	299	298	UO	UO	UO	UO	297	298	296	297	297	300	300	302	301	304	297	301	269	236	233	171	167	197	292.7
6-Oct	163	156	157	164	152	157	153	146	161	157	153	161	158	154	158	166	172	147	142	163	212	269	276	277	170.6
7-Oct	270	271	279	260	295	298	265	224	206	167	103	91	88	130	134	132	138	137	140	135	136	131	131	135	159.0
8-Oct	136	138	136	135	137	135	136	135	131	137	142	140	145	148	151	160	174	177	174	150	134	133	131	132	142.5
9-Oct	142	136	136	138	141	138	138	141	137	135	140	133	131	131	133	130	134	137	133	136	132	134	134	132	135.4
10-Oct	136	136	134	138	140	139	139	138	135	133	129	129	134	134	133	132	129	138	138	135	134	133	135	136	134.8
11-Oct	134	132	131	134	133	134	132	133	134	136	139	135	131	129	135	134	134	133	139	138	134	133	135	138	134.3
12-Oct	140	145	145	142	143	142	142	142	141	146	156	146	159	160	159	165	164	162	150	154	137	140	144	146	148.0
13-Oct	141	144	143	142	147	156	161	136	133	140	150	144	150	155	136	134	135	137	136	136	133	135	133	135	140.9
14-Oct	136	135	136	142	145	145	143	140	138	135	136	143	144	145	142	144	151	152	150	146	148	143	139	132	142.3
15-Oct	132	139	135	138	139	136	132	134	142	143	145	157	155	157	157	166	152	154	158	157	158	165	169	157	146.9
16-Oct	165	173	169	155	153	157	155	159	156	149	154	143	135	134	133	160	112	160	175	149	129	167	113	37	151.7
17-Oct	185	287	353	315	7	287	347	5	5	0	346	344	335	328	325	334	330	340	351	343	349	23	166	138	341.5
18-Oct	174	168	151	158	156	160	161	147	143	154	152	153	162	152	152	155	148	165	187	206	220	233	243	171	165.8
19-Oct	173	170	188	162	159	148	153	149	148	192	252	248	244	241	239	235	222	206	226	280	247	256	277	228	222.4
20-Oct	251	262	267	269	259	267	261	263	264	272	291	293	295	318	322	325	344	20	17	25	24	22	50	205	291.1
21-Oct	192	148	143	169	150	153	181	153	150	149	165	156	117	357	5	7	1	359	6	355	6	352	344	353	24.6
22-Oct	10	12	31	36	33	27	11	22	5	320	306	340	320	330	2	353	5	353	339	266	282	327	305	311	348.0
23-Oct	295	277	291	273	257	258	268	269	263	277	286	289	284	297	288	290	279	290	296	277	263	255	263	271	279.4
24-Oct	267	264	266	264	264	265	262	256	263	269	279	278	278	262	261	256	265	268	263	272	276	275	271	268	267.7
25-Oct	270	271	264	258	255	243	244	246	244	252	243	263	250	261	266	260	244	246	279	307	295	265	265	266	262.6
26-Oct	275	270	268	257	259	257	242	259	270	266	267	274	279	276	257	258	250	247	274	278	275	254	251	255	264.8
27-Oct	255	261	275	353	8	7	1	1	349	352	334	347	318	321	326	327	298	299	336	329	238	247	214	175	322.3
28-Oct	170	181	194	237	269	268	269	258	280	292	308	323	337	332	335	303	265	270	277	278	282	279	294	296	280.5
29-Oct	292	293	304	297	273	283	299	312	302	304	314	337	340	330	290	284	242	252	357	37	52	21	10	14	314.2
30-Oct	14	18	26	17	357	29	35	276	236	176	151	153	148	149	170	175	159	164	161	167	167	162	158	154	142.8
31-Oct	161	157	155	162	255	343	343	347	346	341	329	335	21	67	120	199	103	79	69	93	234	252	234	232	340.4
182.2 187.0 176.7 168.2 166.7 167.6 176.5 171.9 186.7 194.6 206.7 209.5 206.9 207.5 203.2 203.8 203.2 193.5 184.9 185.1 190.5 194.6 197.0 179.4																									
Diurnal Average																									
UO - Unstable Operation																									
All monthly, daily, and diurnal averages have been calculated using vector methods																									



Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 84 deg on Oct 3 03:00			Hours of Data:	740
Minimum Value: 4 deg on Oct 6 23:00			Hours of Missing Data:	4
Percentiles: P ₁ = 5 P ₁₀ = 8 Q ₁ = 9 Median = 11 Q ₃ = 14 P ₉₀ = 23 P ₉₉ = 62			Hours of Calibration:	0
			Percent Operational Time:	99.5

Day	Hourly Period Ending At (MST)																								Daily Maximum		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Oct	7	5	11	9	10	8	8	10	12	14	16	22	17	17	12	13	12	11	10	10	9	8	9	10	22		
2-Oct	12	9	10	10	9	9	9	9	10	10	9	9	10	13	12	24	20	14	6	8	24	34	12	40	40		
3-Oct	23	43	84	64	49	19	15	20	28	42	21	17	37	20	25	72	21	12	10	11	11	6	7	7	84		
4-Oct	12	10	9	7	14	14	10	13	12	12	11	11	14	16	11	11	10	11	10	9	11	11	11	11	16		
5-Oct	11	15	UO	UO	UO	UO	11	11	11	11	12	11	11	12	12	11	12	12	9	17	7	34	12	17	34		
6-Oct	20	9	9	11	10	9	10	10	14	10	10	14	14	11	13	27	27	8	13	21	16	10	4	9	27		
7-Oct	6	5	6	8	32	28	16	20	13	44	30	26	21	8	10	11	9	7	7	8	9	7	7	8	44		
8-Oct	8	8	8	8	7	8	7	8	8	8	10	12	12	12	12	10	11	11	9	8	8	8	8	8	12		
9-Oct	9	8	8	8	8	7	7	10	9	12	10	13	15	14	10	11	9	8	9	9	8	8	8	7	15		
10-Oct	8	8	8	8	8	8	9	9	9	8	14	14	10	9	9	9	14	10	10	8	8	8	7	7	14		
11-Oct	8	8	8	8	8	9	8	8	8	10	11	9	14	14	9	9	11	11	10	10	8	7	8	8	14		
12-Oct	8	8	8	9	9	10	9	9	10	12	14	15	18	22	17	16	12	17	7	7	9	8	8	7	22		
13-Oct	8	8	8	8	9	10	13	10	8	9	12	12	10	12	11	8	9	8	9	8	8	8	8	8	13		
14-Oct	8	8	9	10	9	9	10	9	9	9	8	12	12	11	11	11	11	10	10	9	9	9	9	8	12		
15-Oct	8	8	8	7	7	8	8	9	10	11	11	16	12	13	13	15	9	9	8	8	6	5	8	6	16		
16-Oct	8	5	10	8	5	6	7	7	10	9	13	17	11	9	17	53	25	18	24	23	20	53	45	17	53		
17-Oct	44	53	29	40	8	31	31	17	13	14	18	17	14	18	14	15	13	15	14	24	34	72	35	29	72		
18-Oct	20	16	16	12	8	9	12	9	11	7	11	12	10	10	10	8	11	10	11	13	12	12	10	36	36		
19-Oct	12	19	17	6	5	5	5	14	12	31	12	14	15	12	12	11	11	16	19	24	12	12	16	12	31		
20-Oct	12	9	7	9	12	9	13	8	8	10	14	11	12	16	14	14	25	10	11	13	8	13	45	22	45		
21-Oct	29	17	9	10	8	7	18	10	11	8	24	39	70	35	16	12	14	15	14	14	16	17	13	14	70		
22-Oct	14	13	12	14	13	14	11	12	27	64	56	37	24	21	16	14	22	15	15	42	43	17	8	10	64		
23-Oct	12	11	10	12	8	9	9	11	9	10	13	12	13	15	12	14	11	12	10	11	8	8	8	7	15		
24-Oct	6	6	7	8	8	8	9	9	9	9	14	14	14	11	11	11	11	9	9	10	9	8	8	9	14		
25-Oct	7	9	7	9	11	9	8	9	12	13	13	18	15	12	13	12	11	9	14	12	14	8	7	7	18		
26-Oct	6	6	5	9	10	11	10	13	8	8	9	10	10	10	13	9	10	10	9	8	7	10	9	11	13		
27-Oct	10	9	10	34	14	14	16	13	14	22	16	23	18	19	16	20	13	11	24	38	9	12	26	10	38		
28-Oct	11	15	13	18	11	9	10	12	12	17	11	18	16	15	18	22	8	10	7	6	8	7	10	10	22		
29-Oct	11	10	13	19	7	10	11	12	12	11	12	17	16	21	25	15	20	47	57	17	21	28	11	10	57		
30-Oct	12	11	11	14	13	15	12	49	14	21	12	13	16	11	14	13	8	9	8	8	8	7	7	7	49		
31-Oct	12	14	9	22	66	21	14	13	13	15	14	15	25	60	56	59	37	54	25	42	72	56	14	7	72		
	44	53	84	64	66	31	31	49	28	64	56	39	70	60	56	72	37	54	57	42	72	72	45	40			
Diurnal Maximum																											

UO - Unstable Operation





Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction 45 m (WD45m) - deg

Mannix - October 2023

Direction of Maximum Speed: 282 deg on Oct 4 21:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 137.8 deg on Oct 14	Hours of Data: 736
Direction of Minimum Speed: 81 deg on Oct 31 21:00	Hours of Missing Data: 8
Direction of Minimum Daily Speed Average: 2.5 deg on Oct 31	Percent Operational Time: 98.9
Monthly Average Direction: 182.1 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-Oct	150	152	153	149	153	162	159	159	154	155	157	159	159	163	159	154	154	148	141	144	146	149	148	146	153.1
2-Oct	146	154	141	141	131	133	143	139	142	153	150	148	156	160	152	177	214	166	158	162	167	167	152	169	150.4
3-Oct	155	192	307	95	217	171	173	194	197	239	248	231	278	284	284	301	225	205	178	189	199	167	162	161	198.5
4-Oct	141	132	142	162	189	253	273	288	291	286	286	294	287	301	320	289	293	287	285	283	282	287	287	294	282.9
5-Oct	295	292	UO	UO	UO	UO	UO	UO	UO	UO	292	295	295	297	296	298	292	297	268	247	239	199	179	200	--
6-Oct	173	160	155	163	150	152	148	141	154	153	151	156	155	152	155	168	172	147	155	177	225	266	269	275	171.0
7-Oct	267	268	273	262	282	316	272	240	219	168	112	87	83	126	133	126	129	128	130	129	133	129	128	131	161.3
8-Oct	130	131	130	128	131	129	130	129	126	131	137	136	141	144	146	156	168	171	169	147	129	128	126	127	137.8
9-Oct	137	128	129	128	132	128	129	133	130	132	133	126	122	123	126	121	126	127	125	128	126	127	126	126	127.7
10-Oct	128	127	125	130	131	130	132	132	128	126	121	121	128	127	126	124	122	128	130	130	128	127	129	132	127.7
11-Oct	128	126	125	125	125	126	125	126	128	130	133	127	125	121	128	127	126	123	130	131	126	126	130	132	127.1
12-Oct	135	141	136	135	137	136	134	132	134	137	153	145	156	159	156	161	161	164	147	148	133	137	138	139	142.6
13-Oct	133	136	137	137	145	153	159	131	125	136	144	139	145	148	130	126	128	132	129	131	128	128	128	130	135.6
14-Oct	129	129	132	139	140	140	139	136	134	131	131	138	140	140	136	139	146	146	145	143	144	140	135	129	137.8
15-Oct	129	135	130	131	132	130	127	128	140	137	140	153	151	153	152	162	152	149	155	163	167	168	184	161	144.5
16-Oct	166	179	177	180	185	166	175	168	163	149	153	144	134	128	129	164	115	160	181	149	124	147	128	49	158.3
17-Oct	142	268	8	4	16	348	342	356	0	357	341	340	331	324	321	330	329	337	350	343	345	10	164	129	344.7
18-Oct	168	165	145	151	147	141	143	137	133	139	145	148	158	147	148	150	144	164	184	210	229	235	241	206	162.6
19-Oct	217	200	211	188	182	162	159	157	150	208	247	243	238	237	236	229	218	204	223	271	243	252	273	225	222.5
20-Oct	248	257	263	265	257	263	258	257	259	268	285	288	291	313	317	321	338	17	12	18	26	29	60	163	287.9
21-Oct	161	144	135	153	151	146	171	147	142	143	159	157	130	352	1	2	358	356	2	353	1	348	343	351	32.7
22-Oct	5	9	23	30	28	25	11	22	4	318	298	334	315	323	357	350	360	346	336	265	286	323	304	308	344.4
23-Oct	294	280	288	277	267	267	273	269	262	272	282	284	280	291	283	285	274	284	291	276	262	256	260	269	277.0
24-Oct	266	266	265	262	260	262	260	256	258	264	273	272	273	257	255	249	261	262	258	267	272	269	268	265	263.6
25-Oct	266	268	261	256	253	244	243	245	242	246	239	258	247	256	261	254	241	244	272	303	290	263	263	264	259.5
26-Oct	271	267	266	260	259	265	248	259	267	263	263	270	275	272	253	253	249	247	270	275	273	251	249	255	262.3
27-Oct	256	260	273	347	5	4	357	358	345	348	332	337	314	316	323	321	295	296	331	330	240	252	213	180	317.5
28-Oct	173	176	187	245	271	266	268	266	280	292	304	317	332	325	329	298	263	269	274	275	277	277	293	293	276.3
29-Oct	290	290	300	294	272	282	294	309	298	300	311	332	335	325	286	283	258	245	3	42	50	22	5	9	311.2
30-Oct	9	14	20	14	357	19	28	280	228	181	149	152	145	144	167	172	156	158	156	163	165	162	159	153	140.7
31-Oct	158	157	161	177	268	337	341	343	343	339	329	333	12	58	130	205	88	56	58	71	81	288	226	213	329.4

176.5	180.4	170.7	163.3	166.1	162.0	164.9	159.3	171.2	176.8	203.1	211.2	206.1	208.6	202.7	205.4	200.2	190.2	180.1	181.2	188.1	189.3	192.2	176.8
Diurnal Average																							

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

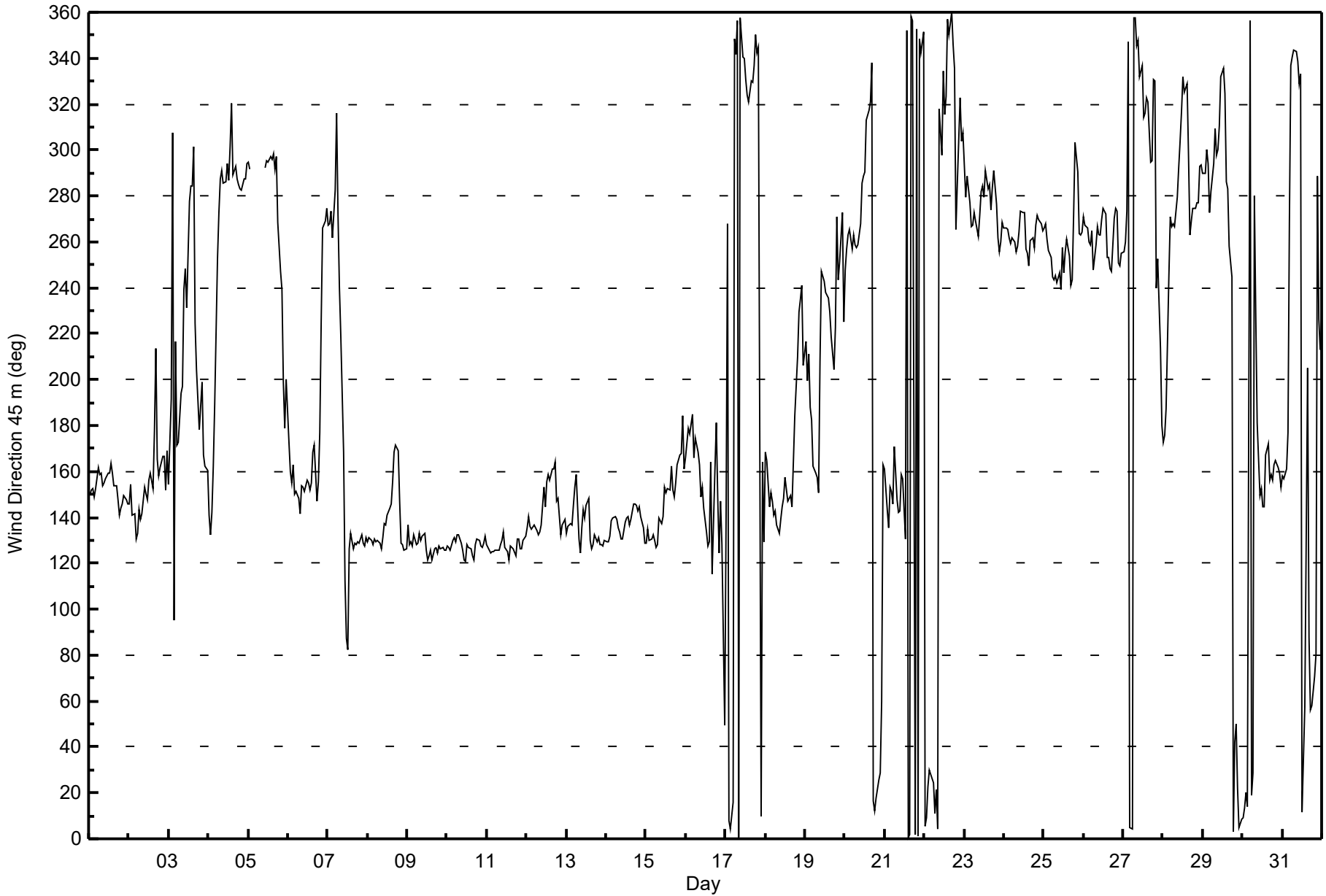


Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 88 deg on Oct 31 21:00			Hours of Data:	736
Minimum Value: 3 deg on Oct 7 02:00			Hours of Missing Data:	8
			Hours of Calibration:	0
Percentiles: P ₁ = 3 P ₁₀ = 5 Q ₁ = 6 Median = 8 Q ₃ = 11 P ₉₀ = 19 P ₉₉ = 64			Percent Operational Time:	98.9

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Oct	3	4	8	7	6	5	5	7	9	10	14	17	13	13	10	11	10	8	7	7	7	6	7	7	17
2-Oct	8	6	7	5	5	6	5	6	7	7	7	6	8	9	11	21	14	14	6	8	6	7	19	29	29
3-Oct	17	42	52	52	40	10	15	16	21	41	18	12	32	17	20	54	13	7	9	9	4	8	4	5	54
4-Oct	9	7	6	7	16	12	5	8	8	8	9	8	8	11	12	8	7	7	8	8	7	8	8	7	16
5-Oct	7	6	UO	UO	UO	UO	UO	UO	UO	UO	7	7	8	9	8	8	8	8	6	17	6	36	13	11	36
6-Oct	17	10	5	9	6	6	7	7	11	7	8	11	11	9	9	24	20	3	10	21	13	3	3	5	24
7-Oct	5	3	4	7	22	16	16	18	16	31	27	28	23	6	8	10	4	3	5	5	6	5	4	4	31
8-Oct	5	5	4	5	5	5	5	6	6	6	9	10	10	9	10	8	7	5	5	5	6	4	4	6	10
9-Oct	6	5	5	5	5	5	5	8	7	9	8	11	14	11	7	10	6	7	7	7	5	5	6	5	14
10-Oct	5	5	6	6	5	6	7	7	7	6	12	12	9	8	8	8	11	9	8	6	5	5	5	5	12
11-Oct	6	7	6	6	6	6	6	6	6	7	8	8	12	12	7	8	9	11	8	8	5	4	5	6	12
12-Oct	6	6	5	5	6	7	6	6	7	9	11	13	15	17	14	13	10	18	4	5	7	6	4	3	18
13-Oct	4	5	5	4	6	7	11	8	6	7	9	10	8	10	10	7	6	6	7	6	6	6	6	6	11
14-Oct	6	6	7	7	8	7	7	7	8	7	6	9	11	9	9	9	8	8	7	7	7	7	7	6	11
15-Oct	6	7	5	5	5	5	5	7	8	9	9	12	10	10	10	10	10	6	4	7	3	3	9	8	12
16-Oct	11	4	5	13	11	8	9	8	10	9	10	17	12	9	15	42	28	23	26	9	14	9	20	18	42
17-Oct	17	77	25	27	4	14	12	9	7	9	13	13	10	13	11	11	9	10	11	24	32	69	32	26	77
18-Oct	14	14	14	9	4	6	7	5	8	9	9	10	8	8	8	6	8	8	6	13	6	6	6	25	25
19-Oct	11	19	14	8	11	8	4	13	8	25	9	10	12	10	9	8	8	12	15	16	9	10	15	9	25
20-Oct	10	7	6	7	9	7	9	6	6	9	12	9	9	14	10	10	26	7	8	9	10	12	22	19	26
21-Oct	12	5	8	11	4	5	14	7	7	6	20	33	68	26	13	9	11	11	10	11	12	13	11	10	68
22-Oct	10	9	9	10	9	11	9	9	23	80	53	29	18	16	14	12	19	12	10	38	40	13	5	7	80
23-Oct	10	8	6	7	4	4	5	10	6	7	11	10	11	13	9	12	9	10	8	10	6	5	6	5	13
24-Oct	4	4	5	5	5	5	5	6	7	8	11	12	11	9	8	8	9	8	7	8	7	6	7	7	12
25-Oct	6	8	6	6	7	7	6	7	10	10	10	15	11	10	12	10	8	6	13	9	12	6	5	5	15
26-Oct	4	4	4	5	6	7	7	8	6	6	7	8	7	8	10	7	6	7	6	6	6	7	5	8	10
27-Oct	7	5	9	32	11	10	12	10	11	13	12	18	12	16	12	17	10	7	21	34	4	11	30	7	34
28-Oct	7	8	10	18	5	3	5	6	7	14	7	14	13	12	12	20	5	7	5	4	5	5	7	8	20
29-Oct	9	8	11	16	5	8	8	9	9	9	9	14	13	18	21	13	19	19	55	13	12	21	7	7	55
30-Oct	9	9	8	10	11	11	11	70	6	23	10	11	14	8	10	9	7	6	6	6	5	4	4	5	70
31-Oct	9	11	8	33	24	17	11	8	9	12	11	11	23	66	59	58	59	27	20	36	88	68	27	3	88
	17	77	52	52	40	17	16	70	23	80	53	33	68	66	59	58	59	27	55	38	88	69	32	29	

Diurnal Maximum

UO - Unstable Operation





Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction 75 m (WD75m) - deg

Mannix - October 2023

Direction of Maximum Speed: 5 deg on Oct 21 16:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 141.5 deg on Oct 14	Hours of Data: 737
Direction of Minimum Speed: 60 deg on Oct 31 17:00	Hours of Missing Data: 7
Direction of Minimum Daily Speed Average: 3.4 deg on Oct 31	Percent Operational Time: 99.1
Monthly Average Direction: 193.6 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-Oct	159	168	158	153	157	164	167	163	157	158	161	161	162	166	161	156	156	150	145	148	150	152	152	150	157.0
2-Oct	150	156	143	144	136	137	145	143	146	157	155	152	160	166	163	192	220	187	168	177	176	169	173	178	154.9
3-Oct	168	209	299	72	209	182	199	228	230	247	249	234	278	286	286	299	227	209	181	198	207	189	175	175	210.4
4-Oct	153	146	144	168	215	262	280	292	297	290	289	297	291	305	323	292	296	290	288	286	285	290	290	296	286.6
5-Oct	298	295	UO	UO	UO	UO	UO	UO	UO	295	295	298	298	299	299	301	294	300	273	263	257	229	206	212	--
6-Oct	195	182	170	176	161	156	153	145	156	157	156	159	161	159	162	180	179	165	186	203	244	268	272	280	182.2
7-Oct	274	273	273	269	282	328	286	281	236	180	136	104	91	135	143	131	132	132	130	133	136	137	136	137	178.5
8-Oct	134	134	135	133	135	134	135	134	131	135	140	140	144	146	149	159	171	173	172	154	135	135	134	133	142.9
9-Oct	139	133	133	129	132	129	129	133	134	137	135	127	124	125	128	123	129	127	126	129	131	130	128	129	130.5
10-Oct	129	129	127	131	132	130	133	134	132	129	123	123	132	131	130	125	124	128	131	133	132	132	133	136	130.7
11-Oct	132	128	127	126	126	128	129	128	131	133	136	130	129	123	131	130	129	123	131	132	130	130	134	136	130.2
12-Oct	139	143	137	135	136	137	134	133	133	137	158	151	159	160	158	164	165	173	150	151	137	140	140	138	144.7
13-Oct	137	139	139	143	153	157	165	136	126	139	145	143	147	150	134	129	132	135	133	136	133	133	133	134	140.3
14-Oct	134	134	137	142	143	143	142	139	137	136	136	142	143	143	140	142	148	149	148	146	148	144	140	135	141.5
15-Oct	135	139	135	135	135	134	132	133	143	139	144	155	152	155	154	164	158	152	165	182	181	183	212	192	151.0
16-Oct	186	202	215	216	217	198	208	201	193	169	165	156	147	133	137	171	129	170	190	153	128	136	111	80	174.8
17-Oct	131	41	26	27	21	38	358	3	6	1	345	347	337	329	326	334	335	343	356	351	348	23	172	130	354.9
18-Oct	170	166	145	148	145	142	134	135	134	141	143	151	160	151	152	153	147	172	196	223	236	240	244	232	167.0
19-Oct	238	229	228	215	206	195	183	187	186	228	249	243	240	238	237	230	220	209	226	270	245	253	276	231	231.4
20-Oct	251	258	265	268	258	264	261	259	261	270	287	291	294	317	320	325	342	21	16	21	35	43	76	160	290.2
21-Oct	166	155	144	148	154	149	159	145	146	147	161	166	155	356	4	5	1	0	4	357	4	353	348	357	48.4
22-Oct	6	10	20	32	32	29	18	32	3	322	304	340	318	324	359	354	4	347	340	267	294	327	311	313	348.7
23-Oct	300	290	295	287	279	279	281	279	271	274	284	286	282	294	286	288	277	286	294	282	266	260	264	272	281.7
24-Oct	271	272	271	267	263	265	265	260	261	267	274	274	275	259	256	251	263	264	261	270	275	273	271	269	266.6
25-Oct	270	273	267	262	260	253	248	251	247	245	241	258	249	257	263	255	243	247	273	306	293	268	267	268	262.8
26-Oct	274	271	270	266	265	273	258	263	270	267	266	273	278	274	254	255	251	254	273	280	280	254	254	262	266.4
27-Oct	262	263	279	351	8	7	1	2	351	351	335	336	318	319	325	323	299	299	334	337	251	260	215	191	320.7
28-Oct	180	180	201	261	278	276	276	277	286	300	308	320	336	327	331	300	269	275	280	280	280	285	299	300	281.1
29-Oct	295	294	304	297	279	287	298	314	301	303	315	335	338	327	291	290	273	259	356	50	53	27	8	11	316.1
30-Oct	12	17	22	18	2	18	33	88	216	185	156	160	150	149	170	175	160	160	161	166	170	174	173	168	146.7
31-Oct	168	168	180	223	279	339	349	349	349	345	336	339	10	54	131	217	60	51	59	64	66	31	224	203	335.6

188.8 194.5 185.7 173.7 176.2 169.8 174.8 168.4 183.0 194.0 206.3 219.2 213.8 217.0 212.8 218.8 208.3 201.2 195.4 191.9 199.6 200.0 203.7 189.5

Diurnal Average

UO - Unstable Operation

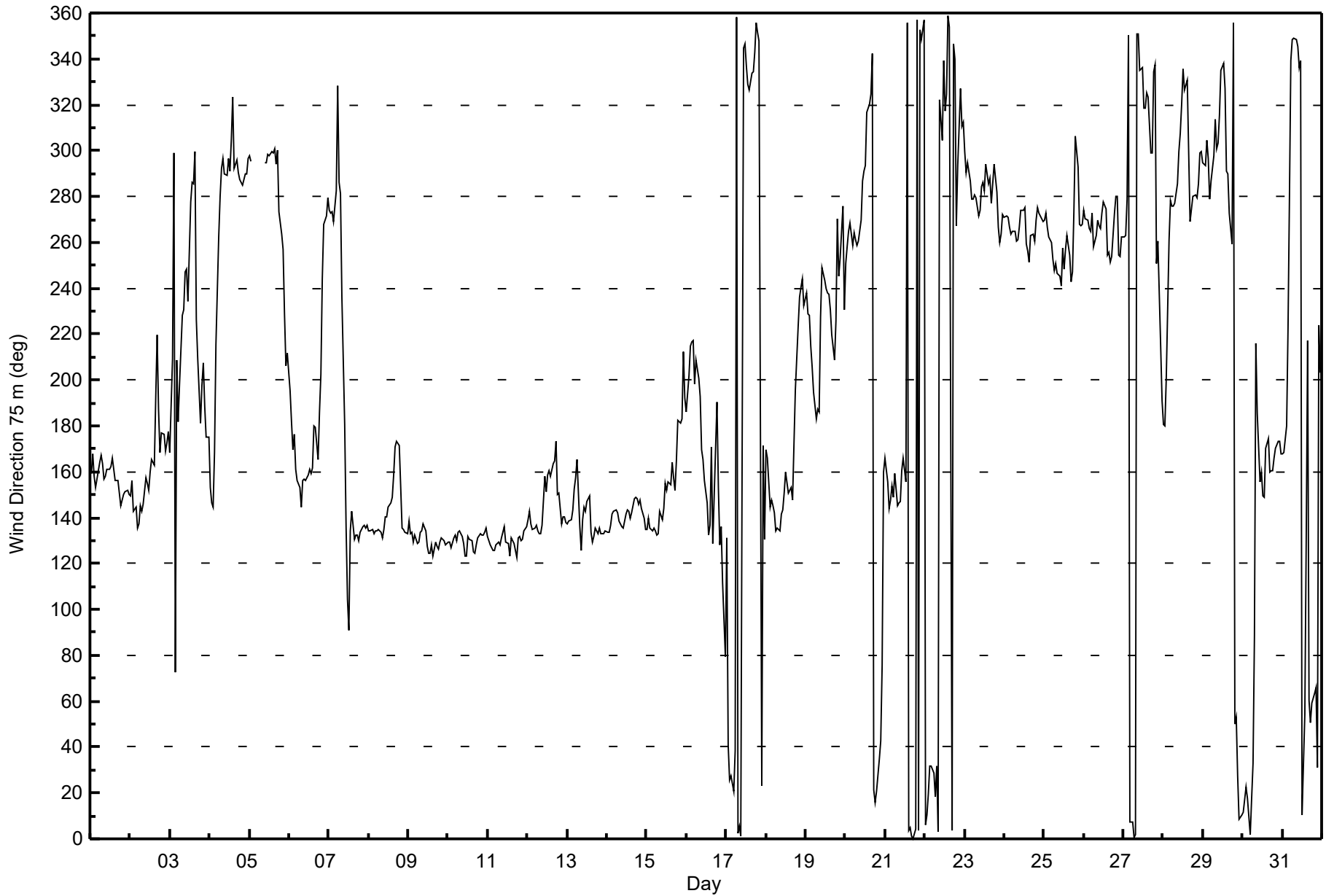
All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0										Hours in Service: 744															
Maximum Value: 102 deg on Oct 31 17:00										Hours of Data: 737															
Minimum Value: 1 deg on Oct 28 06:00										Hours of Missing Data: 7															
Percentiles: P ₁ = 2 P ₁₀ = 4 Q ₁ = 6 Median = 8 Q ₃ = 11 P ₉₀ = 17 P ₉₉ = 57										Hours of Calibration: 0															
										Percent Operational Time: 99.1															
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Oct	3	7	6	4	4	3	4	6	8	10	13	16	12	12	10	9	8	7	5	5	5	4	5	5	16
2-Oct	6	4	5	3	3	4	3	3	5	6	5	5	6	9	13	17	15	16	5	9	6	5	9	11	17
3-Oct	21	45	35	53	32	8	10	12	11	53	17	12	33	15	19	37	12	6	10	9	2	9	4	7	53
4-Oct	10	13	6	11	15	11	4	7	6	7	8	7	7	11	11	7	7	6	7	7	6	7	8	6	15
5-Oct	6	6	UO	UO	UO	UO	UO	UO	UO	7	7	6	7	8	7	7	8	7	4	13	8	24	15	5	24
6-Oct	12	15	7	8	5	4	5	5	8	6	7	9	9	9	8	21	14	7	6	17	12	3	4	4	21
7-Oct	5	2	3	5	15	15	17	16	21	30	22	26	24	10	7	14	8	5	8	6	4	4	4	3	30
8-Oct	3	4	3	5	4	3	4	5	7	6	7	9	8	8	10	7	5	4	4	6	6	2	5	6	10
9-Oct	4	4	4	7	5	8	8	7	8	10	9	12	14	12	10	11	8	9	10	9	6	7	8	8	14
10-Oct	7	7	9	7	6	8	6	7	8	9	13	13	10	9	9	11	13	10	10	6	6	6	5	4	13
11-Oct	7	9	9	10	10	9	8	8	7	7	7	9	12	13	8	9	11	13	9	8	6	6	4	4	13
12-Oct	4	4	4	4	4	4	4	5	6	8	10	12	11	14	12	11	10	19	3	3	4	4	2	2	19
13-Oct	3	3	3	3	4	5	10	9	11	6	9	9	7	8	9	9	8	6	9	5	6	5	6	6	11
14-Oct	6	6	5	5	5	5	5	5	6	6	5	8	8	7	7	7	7	6	5	5	5	5	5	5	8
15-Oct	6	5	4	4	3	3	6	7	6	7	8	10	8	9	9	8	9	5	7	6	3	5	10	18	18
16-Oct	12	5	10	9	11	10	8	11	12	10	10	18	15	14	19	35	26	22	17	8	13	5	19	17	35
17-Oct	18	69	26	33	5	16	12	6	5	8	10	12	9	12	9	11	7	9	10	23	30	86	33	22	86
18-Oct	13	13	11	6	3	4	3	3	6	8	6	8	7	7	6	5	7	9	7	10	4	4	4	10	13
19-Oct	6	12	12	9	14	9	8	11	14	12	8	9	11	8	8	7	6	10	13	16	7	10	15	7	16
20-Oct	8	6	7	7	8	6	8	6	5	8	11	8	8	14	9	8	26	6	7	7	11	13	17	15	26
21-Oct	8	6	12	6	3	7	11	7	5	5	18	25	39	17	10	7	9	9	8	8	11	11	10	9	39
22-Oct	8	8	6	6	6	9	9	12	37	75	49	26	16	15	13	10	19	12	8	35	37	11	6	6	75
23-Oct	9	7	5	6	5	2	4	8	5	7	11	9	10	12	9	11	8	9	7	10	5	4	4	5	12
24-Oct	2	2	4	3	4	4	4	4	6	8	10	11	11	8	7	7	8	7	6	8	7	6	7	8	11
25-Oct	6	8	5	5	6	7	5	5	7	8	9	15	10	9	11	9	7	6	13	8	12	5	4	4	15
26-Oct	4	3	3	4	6	5	5	6	6	6	7	7	7	8	9	6	4	8	5	5	6	5	3	6	9
27-Oct	6	4	10	30	9	8	11	9	9	11	10	16	12	15	11	15	9	7	20	31	5	10	24	6	31
28-Oct	5	5	16	16	4	1	3	3	4	12	7	13	11	10	12	18	5	5	5	3	4	5	5	6	18
29-Oct	8	7	11	15	5	8	8	9	9	8	8	12	11	17	23	13	20	11	43	12	13	13	6	5	43
30-Oct	7	7	6	7	12	8	13	77	10	22	9	11	13	7	9	7	7	5	4	6	4	3	3	4	77
31-Oct	7	9	9	34	12	17	10	6	7	9	9	9	21	74	63	47	102	15	17	19	55	59	45	5	102
Diurnal Maximum																									
UO - Unstable Operation																									

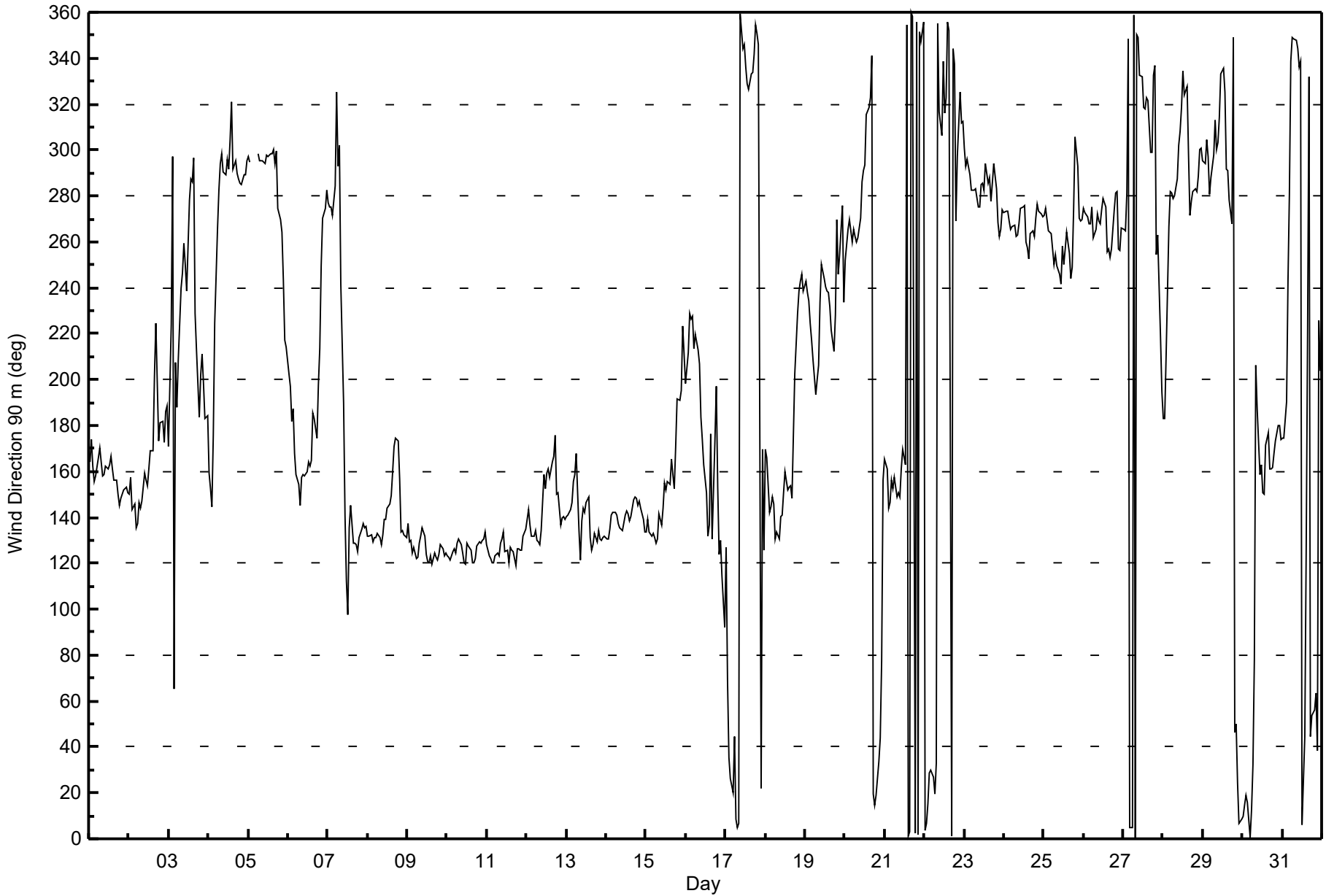




Summary of Hour Standard Deviations

Mannix - October 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0										Hours in Service: 744															
Maximum Value: 93 deg on Oct 31 17:00										Hours of Data: 740															
Minimum Value: 1 deg on Oct 3 21:00										Hours of Missing Data: 4															
Percentiles: P ₁ = 2 P ₁₀ = 4 Q ₁ = 5 Median = 7 Q ₃ = 10 P ₉₀ = 16 P ₉₉ = 56										Hours of Calibration: 0															
										Percent Operational Time: 99.5															
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Oct	3	8	6	3	5	2	3	6	8	10	13	16	12	12	10	10	7	7	4	4	4	4	4	5	16
2-Oct	6	4	5	2	3	4	3	2	5	6	5	5	6	9	13	16	15	17	5	7	5	6	8	13	17
3-Oct	38	52	23	59	29	9	10	12	10	58	17	13	30	14	18	24	12	5	11	8	1	8	5	8	59
4-Oct	12	21	9	16	13	10	4	7	6	7	6	6	11	10	6	6	6	6	7	6	5	7	7	6	21
5-Oct	6	6	UO	UO	UO	UO	5	6	6	7	7	6	7	8	7	6	7	7	4	11	8	20	12	6	20
6-Oct	9	15	10	9	6	4	5	6	7	5	7	9	9	10	8	20	12	7	6	16	10	4	4	5	20
7-Oct	4	2	3	5	12	16	10	17	24	28	19	22	22	9	6	13	7	4	7	5	4	4	4	3	28
8-Oct	3	3	3	4	4	3	3	5	6	6	7	9	8	8	10	7	5	3	3	7	7	2	4	5	10
9-Oct	4	3	3	5	5	6	6	7	8	10	9	11	12	9	8	9	6	7	7	7	5	6	6	5	12
10-Oct	5	6	7	6	6	7	5	6	7	8	10	11	9	8	9	9	10	8	9	6	5	5	5	4	11
11-Oct	6	7	7	6	7	6	6	6	6	7	8	9	10	10	7	8	9	10	8	7	5	4	4	4	10
12-Oct	5	3	4	3	3	3	4	4	5	7	11	12	11	13	11	11	10	20	3	2	5	3	2	2	20
13-Oct	2	3	2	2	4	5	9	10	7	5	8	9	7	8	9	8	7	5	8	5	6	5	6	6	10
14-Oct	5	6	5	5	5	4	4	5	6	6	5	8	8	8	8	8	7	7	6	5	5	5	5	4	8
15-Oct	5	5	4	3	2	2	4	6	6	7	9	10	8	9	8	8	10	5	10	7	4	6	10	21	21
16-Oct	12	6	10	8	9	10	7	11	10	12	11	20	17	16	20	37	24	23	13	11	9	5	14	18	37
17-Oct	16	35	20	45	3	22	21	5	4	10	10	12	9	11	9	10	6	8	10	21	28	84	36	20	84
18-Oct	13	13	10	5	3	5	2	3	6	8	5	8	7	7	6	5	7	11	7	9	4	4	4	8	13
19-Oct	6	10	11	9	14	8	11	10	14	10	8	8	10	7	8	7	6	10	12	15	7	9	14	7	15
20-Oct	8	6	6	6	8	6	8	6	5	8	10	8	8	13	7	7	26	5	6	6	10	13	16	17	26
21-Oct	7	4	10	5	4	6	8	7	5	4	16	21	40	15	9	6	8	9	7	8	10	10	9	8	40
22-Oct	7	7	5	6	4	9	9	15	39	69	47	24	15	15	13	10	16	12	7	32	34	10	6	5	69
23-Oct	8	6	4	5	4	2	4	6	5	6	10	9	9	11	9	11	8	8	7	9	5	3	4	4	11
24-Oct	2	2	3	3	3	4	4	4	5	8	9	11	10	7	7	8	7	6	7	6	6	6	6	7	11
25-Oct	5	7	5	5	6	7	5	5	7	8	8	14	10	9	10	9	6	6	13	7	11	4	3	4	14
26-Oct	3	3	3	3	5	5	5	5	5	6	6	6	6	7	8	6	5	8	5	5	6	4	3	6	8
27-Oct	5	4	10	29	8	8	11	8	8	10	9	15	12	14	10	14	8	6	19	28	7	11	23	7	29
28-Oct	4	4	17	14	4	2	3	3	4	10	7	12	10	10	11	17	5	4	5	3	4	5	5	6	17
29-Oct	8	6	10	14	5	7	7	8	8	7	7	11	10	16	21	12	19	11	34	11	13	9	5	4	34
30-Oct	7	6	5	5	11	6	14	71	14	20	9	13	13	7	9	6	7	4	4	5	5	3	4	4	71
31-Oct	6	9	12	28	11	16	10	5	7	9	9	8	20	71	73	43	93	12	19	17	40	26	50	6	93
Diurnal Maximum																									
UO - Unstable Operation																									





Maximum Value: 1.5 km/h on Oct 14 13:00																				Maximum Daily Average: 1.1 km/h on Oct 14					Hours in Service:	744
Minimum Value: -1.7 km/h on Oct 21 16:00																				Minimum Daily Average: -0.5 km/h on Oct 5					Hours of Data:	740
Maximum Diurnal Average: 0.3 km/h at hour 4																				Minimum Diurnal Average: 0.1 km/h at hour 19					Hours of Missing Data:	4
Monthly Average: 0.22 km/h																				Percentiles: P ₁ = -0.9 P ₁₀ = -0.5 Q ₁ = -0.2 Median = 0.2 Q ₃ = 0.7 P ₉₀ = 0.9 P ₉₉ = 1.2					Hours of Calibration:	0
																									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-Oct	0.6	0.6	0.5	0.7	0.8	0.6	0.7	0.5	0.8	0.9	0.7	0.9	1.0	0.9	1.0	1.1	1.2	0.9	0.9	0.9	0.8	1.0	0.8	0.9	0.8	1.2
2-Oct	0.8	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.8	0.8	0.7	0.7	0.5	0.4	0.3	0.1	0.3	0.4	0.3	0.3	0.0	0.1	0.1	0.5	0.8
3-Oct	0.2	0.1	0.1	0.2	0.0	0.4	0.3	0.1	0.1	0.1	0.0	0.1	0.1	-0.3	-0.1	-0.1	0.2	0.0	0.2	0.1	0.2	0.6	0.7	0.8	0.2	0.8
4-Oct	0.6	0.7	0.6	0.3	0.2	-0.1	-0.1	-0.2	-0.2	-0.3	-0.4	-0.6	-0.3	-0.8	-0.5	-0.8	-0.8	-0.9	-0.9	-0.5	-0.9	-0.8	-0.5	-0.9	-0.3	0.7
5-Oct	-1.0	-0.3	UO	UO	UO	UO	-0.5	-0.8	-0.8	-0.8	-0.9	-1.1	-0.8	-0.9	-0.8	-0.7	-0.5	-0.5	0.0	-0.1	-0.1	0.1	0.2	0.0	-0.5	0.2
6-Oct	0.2	0.4	0.7	0.5	0.7	0.8	0.9	0.8	0.6	0.9	0.8	0.8	0.7	0.9	0.8	0.4	0.4	0.3	0.3	0.2	0.0	-0.2	-0.2	-0.2	0.5	0.9
7-Oct	-0.1	0.0	-0.1	-0.1	-0.2	-0.2	0.0	0.0	-0.1	0.3	0.5	0.4	0.3	0.3	0.5	0.4	0.6	0.6	0.6	0.9	0.8	1.0	0.9	0.8	0.3	1.0
8-Oct	1.0	0.9	0.8	1.0	1.0	1.2	1.1	1.1	1.0	0.9	0.9	1.0	1.0	1.0	1.1	0.4	0.4	0.4	0.6	0.8	0.9	0.9	0.9	0.9	0.9	1.2
9-Oct	0.7	0.7	0.8	0.7	0.6	0.6	0.6	0.6	0.5	0.5	0.6	0.9	1.1	1.3	1.0	1.2	0.7	0.6	0.6	0.8	0.9	0.8	0.8	0.7	0.8	1.3
10-Oct	0.8	0.8	0.8	0.7	0.5	0.5	0.7	0.7	0.7	0.7	1.2	1.1	0.7	1.1	0.8	1.0	0.9	0.6	0.7	0.8	0.8	0.9	1.2	0.9	0.8	1.2
11-Oct	0.8	0.9	0.7	0.9	0.7	1.0	0.8	0.8	0.7	0.8	0.6	0.8	0.7	1.2	0.9	1.0	1.0	1.3	0.6	0.8	0.7	0.8	0.8	0.9	0.8	1.3
12-Oct	0.8	0.7	0.6	0.6	0.5	0.5	0.7	0.6	0.5	0.6	0.5	0.7	0.5	0.8	0.7	0.6	0.5	0.3	0.7	0.7	0.8	0.8	0.7	0.7	0.6	0.8
13-Oct	0.5	0.7	0.7	0.6	0.7	0.8	0.7	0.8	0.8	0.5	1.0	0.8	0.9	1.0	0.7	0.8	0.6	0.8	0.6	0.8	0.8	1.0	1.0	0.8	0.8	1.0
14-Oct	0.9	0.8	0.9	1.1	1.2	1.1	1.2	1.0	0.8	0.9	0.9	1.2	1.5	1.3	1.2	1.2	1.4	1.4	1.2	1.2	1.2	1.0	1.0	0.9	1.1	1.5
15-Oct	0.8	0.8	0.7	0.7	0.6	0.9	0.7	0.8	0.7	0.6	0.6	0.6	0.7	0.7	0.6	0.6	0.5	0.6	0.6	0.5	0.6	0.5	0.2	0.5	0.6	0.9
16-Oct	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.6	0.5	0.2	0.3	0.1	0.3	0.3	0.3	0.1	0.3	0.0	0.3	0.1	0.0	0.3	0.6
17-Oct	0.0	0.0	-0.2	-0.1	-0.4	-0.1	-0.2	-0.2	-0.3	-0.3	-0.3	0.0	-0.5	-0.5	-0.4	-0.1	-0.5	-0.3	-0.5	-0.1	0.0	0.1	0.2	0.4	-0.2	0.4
18-Oct	0.2	0.2	0.3	0.4	0.7	0.4	0.5	0.7	0.5	0.5	0.6	0.7	0.8	0.9	0.9	0.9	0.8	0.8	0.2	0.1	0.0	0.0	-0.1	0.1	0.5	0.9
19-Oct	0.1	0.1	0.1	0.3	0.4	0.4	0.7	0.6	0.4	0.3	0.0	0.0	0.0	0.1	0.0	-0.1	0.0	0.1	-0.1	0.0	-0.2	-0.2	-0.3	0.0	0.1	0.7
20-Oct	-0.2	-0.1	-0.2	0.0	-0.2	-0.1	0.0	-0.2	-0.5	-0.3	-0.4	-0.5	-0.4	-0.7	-0.9	-0.8	-0.8	-0.5	-0.7	-0.2	-0.1	-0.2	0.0	0.0	-0.3	0.0
21-Oct	0.1	0.4	0.5	0.3	0.6	0.6	0.1	0.6	0.6	0.8	0.7	0.4	0.2	-0.2	-0.9	-1.7	-1.0	-0.8	-0.9	-0.8	-0.8	-0.5	-0.5	-0.7	-0.1	0.8
22-Oct	-0.6	-0.5	-0.1	0.0	-0.1	-0.1	-0.4	-0.2	-0.1	0.0	-0.1	-0.1	-0.2	-0.2	-0.5	-0.6	-0.3	-0.3	-0.3	-0.1	-0.3	-0.6	-0.5	-0.5	-0.3	0.0
23-Oct	-0.3	0.0	-0.1	-0.1	-0.2	-0.2	-0.1	-0.1	-0.2	0.0	-0.4	-0.3	-0.3	-0.6	-0.6	-0.4	-0.4	-0.5	-0.6	-0.2	-0.1	0.0	-0.1	0.0	-0.2	0.0
24-Oct	0.1	0.0	0.0	-0.1	-0.1	-0.3	-0.1	0.0	-0.2	-0.2	-0.2	-0.3	-0.2	-0.2	-0.2	-0.3	-0.1	-0.1	-0.1	-0.2	-0.3	-0.2	-0.3	-0.2	-0.2	0.1
25-Oct	-0.2	-0.2	-0.3	-0.2	-0.2	-0.2	-0.2	-0.2	0.0	0.0	0.1	-0.1	-0.2	0.0	-0.1	-0.2	0.0	-0.2	-0.2	-0.4	-0.3	-0.2	-0.1	0.0	-0.2	0.1
26-Oct	-0.1	-0.1	0.0	-0.1	-0.2	-0.2	-0.2	-0.1	-0.2	-0.1	-0.2	-0.2	-0.1	-0.1	-0.1	0.0	-0.1	-0.1	-0.1	-0.2	-0.1	-0.2	-0.2	-0.1	-0.1	0.0
27-Oct	-0.1	-0.1	0.0	-0.5	-0.5	-0.5	-0.5	-0.7	-0.5	0.0	-0.3	-0.1	-0.2	-0.3	-0.4	-0.3	-0.5	-0.1	-0.3	-0.3	0.0	0.0	0.1	0.2	-0.2	0.2
28-Oct	0.4	0.2	0.0	-0.2	-0.2	-0.1	-0.2	-0.3	-0.2	0.0	-0.3	-0.3	-0.4	-0.4	-0.3	-0.1	0.0	-0.1	-0.2	-0.2	-0.2	-0.1	-0.2	-0.3	-0.2	0.4
29-Oct	-0.3	-0.2	-0.5	-0.2	-0.1	-0.4	-0.6	-0.5	-0.3	-0.7	-0.4	-0.4	-0.5	-0.3	0.0	-0.1	-0.1	0.0	-0.1	-0.1	0.0	-0.2	-0.6	-0.9	-0.3	0.0
30-Oct	-0.5	-0.5	-0.3	-0.2	-0.4	0.0	-0.1	-0.1	-0.1	0.3	0.7	0.7	0.8	0.9	0.6	0.3	0.7	0.7	0.9	0.6	0.5	0.6	0.6	0.7	0.3	0.9
31-Oct	0.5	0.6	0.4	0.3	0.0	-0.3	-0.3	-0.4	-0.6	-0.3	-0.7	-0.4	-0.1	0.1	0.3	0.3	0.2	0.2	0.4	0.3	0.0	0.0	0.0	0.1	0.0	0.6
																								Diurnal Average		
																								Diurnal Maximum		
UO - Unstable Operation																										



Summary of Hour Standard Deviations

Mannix - October 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 4.0 km/h on Oct 21 16:00 Minimum Value: 0.2 km/h on Oct 2 23:00 Percentiles: P ₁ = 0.3 P ₁₀ = 0.6 Q ₁ = 1.0 Median = 1.5 Q ₃ = 2.0 P ₉₀ = 2.5 P ₉₉ = 3.3																					Hours in Service: 744 Hours of Data: 740 Hours of Missing Data: 4 Hours of Calibration: 0 Percent Operational Time: 99.5				
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Oct	0.6	0.6	1.0	1.5	1.7	1.2	1.2	1.2	1.6	1.8	2.1	2.2	2.5	2.7	2.6	2.5	2.2	1.7	1.9	1.9	1.7	1.7	1.7	1.9	2.7
2-Oct	1.7	1.3	1.1	1.1	1.4	1.5	1.2	1.5	1.6	1.4	1.4	1.4	1.3	0.8	0.8	0.8	0.3	0.4	0.3	0.3	0.3	0.2	0.3	1.7	
3-Oct	0.3	0.6	0.3	0.4	0.5	0.9	0.7	0.4	0.6	0.8	1.1	1.2	1.6	1.5	1.6	0.8	1.3	0.9	0.9	0.9	0.7	0.5	1.0	1.1	1.6
4-Oct	1.2	1.0	0.9	0.7	0.7	0.9	0.8	1.1	1.4	1.7	2.4	2.6	1.7	2.9	2.5	2.7	3.3	3.4	3.1	3.2	3.4	3.3	2.9	2.8	3.4
5-Oct	2.9	2.7	UO	UO	UO	UO	3.0	3.2	3.1	3.1	3.0	3.2	3.2	2.9	2.6	2.5	2.4	1.8	0.9	0.5	0.5	0.3	0.4	0.5	3.2
6-Oct	0.4	0.8	1.1	1.1	1.3	1.4	1.6	1.9	1.4	1.6	1.8	1.9	1.8	1.6	1.6	1.3	1.0	0.5	0.4	0.6	0.4	0.6	0.6	0.9	1.9
7-Oct	0.6	0.4	0.5	0.7	0.8	0.5	0.3	0.3	0.6	1.0	1.1	1.1	1.2	0.8	0.9	0.9	1.0	1.2	1.3	1.7	1.8	1.7	1.5	1.7	1.8
8-Oct	2.0	2.0	2.1	2.2	2.6	2.6	2.5	2.6	2.6	2.8	2.2	2.2	2.4	2.2	2.2	2.0	2.2	2.0	1.5	1.1	1.9	1.9	1.7	2.1	2.8
9-Oct	2.0	1.9	1.9	1.9	1.7	1.7	1.6	1.7	1.8	1.5	1.7	2.0	2.1	2.3	2.4	2.3	2.3	2.2	2.1	2.4	2.1	2.1	2.2	2.0	2.4
10-Oct	2.1	1.9	1.9	2.0	1.9	1.8	2.0	2.1	2.2	2.3	2.4	2.3	2.5	2.6	2.4	2.6	2.7	2.1	2.4	2.5	2.3	2.4	2.5	2.4	2.7
11-Oct	2.5	2.4	2.3	2.4	2.4	2.5	2.3	2.4	2.4	2.4	2.2	2.1	2.0	2.4	2.5	2.4	2.3	2.5	2.3	2.3	2.0	2.1	2.1	2.2	2.5
12-Oct	2.0	1.2	1.2	1.6	1.4	1.7	1.6	1.5	1.6	1.5	1.6	1.6	1.8	1.8	2.0	1.6	1.1	0.7	0.9	1.1	1.7	1.6	1.4	1.3	2.0
13-Oct	1.3	1.3	1.4	1.3	1.4	1.6	1.7	1.5	1.7	1.6	1.8	1.8	1.8	2.0	2.1	2.2	2.1	2.0	1.9	2.3	1.9	2.2	2.1	1.9	2.3
14-Oct	2.2	2.1	2.2	2.5	2.8	2.6	2.6	2.6	2.7	2.4	2.7	2.8	2.7	3.0	3.1	3.0	2.8	2.6	2.5	2.5	2.5	2.3	2.3	2.1	3.1
15-Oct	2.1	2.0	1.8	1.8	1.8	2.0	1.8	1.8	1.4	1.8	1.8	1.6	1.5	1.6	1.4	1.3	0.7	0.8	0.6	0.5	0.5	0.7	0.5	0.6	2.1
16-Oct	0.7	0.7	0.5	0.5	0.4	0.6	0.5	0.6	0.8	1.0	1.3	1.3	1.2	1.2	1.1	1.1	0.6	0.5	0.4	0.4	0.6	0.6	0.5	0.3	1.3
17-Oct	0.3	0.2	0.3	0.3	0.6	0.5	0.5	0.9	1.6	1.6	1.6	1.9	1.9	2.0	2.0	1.8	1.7	1.5	1.3	1.0	0.7	0.7	0.6	1.0	2.0
18-Oct	1.1	1.3	1.1	0.9	1.0	0.9	0.9	1.8	1.7	0.9	1.3	1.6	1.5	1.8	1.9	1.9	1.6	1.3	1.5	1.3	0.8	1.0	1.4	0.6	1.9
19-Oct	0.4	0.8	0.8	0.4	0.6	0.7	0.7	0.9	0.9	1.1	2.1	2.2	2.3	2.5	2.2	1.6	1.9	1.8	1.4	0.6	2.3	2.8	2.2	1.4	2.8
20-Oct	2.2	2.4	1.9	1.3	1.8	1.7	1.8	1.7	3.0	2.7	2.6	2.9	2.9	2.8	3.1	2.8	2.1	1.6	1.9	1.6	0.5	0.3	0.5	0.4	3.1
21-Oct	0.4	0.5	1.1	0.8	1.0	1.1	0.9	1.2	1.4	1.5	1.6	1.1	0.7	1.4	3.3	4.0	4.0	3.9	3.6	3.3	2.9	2.4	2.0	2.5	4.0
22-Oct	2.4	1.7	1.6	1.3	1.3	1.0	0.7	0.6	0.7	0.9	1.3	1.4	1.6	1.6	1.5	1.4	0.9	0.7	1.1	0.8	1.5	1.7	1.3	1.4	2.4
23-Oct	1.3	0.9	1.4	1.2	1.1	1.0	0.9	1.1	1.2	1.8	2.4	2.8	2.4	2.6	2.5	2.3	2.0	1.9	1.6	1.4	1.2	1.5	1.5	1.1	2.8
24-Oct	1.0	0.8	0.9	1.1	1.3	1.0	1.2	1.4	1.4	1.7	1.8	2.0	2.2	2.1	2.1	2.0	1.7	1.6	1.7	1.6	1.9	1.7	1.5	1.4	2.2
25-Oct	1.5	1.4	1.4	1.4	1.3	1.1	1.1	1.1	1.1	1.4	1.6	1.7	1.7	1.9	1.8	1.5	1.4	1.3	1.1	2.0	1.5	0.8	0.9	0.9	2.0
26-Oct	0.9	0.9	0.8	1.1	1.2	0.9	0.9	1.2	1.3	1.1	1.4	1.5	1.5	1.3	1.7	1.6	1.3	0.7	0.8	1.2	0.6	1.1	1.2	0.9	1.7
27-Oct	1.1	1.0	0.8	2.5	2.1	2.1	2.1	2.1	1.7	1.4	1.3	1.1	1.5	1.4	1.5	1.5	1.5	1.3	1.1	0.9	0.6	0.4	0.3	0.5	2.5
28-Oct	1.0	1.2	1.1	0.6	0.7	0.8	0.7	0.7	1.2	1.2	1.3	1.3	1.5	1.6	1.6	1.0	0.8	0.9	1.1	1.0	1.1	1.0	1.3	1.6	1.6
29-Oct	1.3	1.7	2.1	1.1	0.9	1.6	1.9	1.9	1.9	2.0	1.7	1.9	1.7	1.4	1.3	0.9	0.4	0.5	0.4	0.5	1.0	0.7	1.7	2.1	2.1
30-Oct	1.9	2.1	1.7	1.4	0.7	1.0	0.9	0.3	0.4	1.2	1.4	1.5	1.6	1.6	1.7	1.4	1.3	1.4	1.4	1.3	1.1	0.9	1.0	1.1	2.1
31-Oct	1.2	1.1	0.6	0.6	0.7	1.2	1.3	1.9	2.0	1.9	1.7	1.5	1.2	0.8	0.7	0.7	0.4	0.6	0.7	0.7	0.3	0.4	0.5	0.5	2.0
2.9 2.7 2.3 2.5 2.8 2.6 3.0 3.2 3.1 3.1 3.0 3.2 3.2 3.0 3.3 4.0 4.0 3.9 3.6 3.3 3.4 3.3 2.9 2.8																									
Diurnal Maximum																									
UO - Unstable Operation																									



Summary of Hour Averages

Mannix - October 2023

Maximum Value: 1.5 km/h on Oct 14 13:00		Maximum Daily Average: 1.0 km/h on Oct 14		Hours in Service: 744																						
Minimum Value: -1.3 km/h on Oct 4 17:00		Minimum Daily Average: -0.6 km/h on Oct 24		Hours of Data: 736																						
Maximum Diurnal Average: 0.1 km/h at hour 12		Minimum Diurnal Average: -0.1 km/h at hour 19		Hours of Missing Data: 8																						
Monthly Average: 0.04 km/h		Percentiles: P ₁ = -1.0 P ₁₀ = -0.6 Q ₁ = -0.4 Median = 0.0 Q ₃ = 0.5 P ₉₀ = 0.8 P ₉₉ = 1.2		Hours of Calibration: 0																						
				Percent Operational Time: 98.9																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Oct	0.5	0.4	0.4	0.7	0.9	0.5	0.5	0.5	0.7	0.9	0.8	1.1	1.2	1.1	0.9	1.1	1.1	0.7	0.9	0.9	0.9	1.0	0.9	0.8	0.8	1.2
2-Oct	0.7	0.5	0.4	0.6	0.8	0.5	0.6	0.6	0.7	0.8	0.7	0.7	0.4	0.5	0.2	0.1	-0.1	0.0	0.2	0.1	0.1	-0.1	0.1	0.0	0.4	0.8
3-Oct	0.2	0.0	-0.2	0.1	-0.1	0.1	-0.1	-0.2	-0.2	-0.1	-0.1	-0.1	0.1	-0.5	-0.2	-0.3	-0.2	-0.4	0.0	-0.2	-0.4	0.3	0.5	0.7	-0.1	0.7
4-Oct	0.6	1.0	0.5	0.1	-0.2	-0.5	-0.4	-0.4	-0.4	-0.5	-0.7	-0.7	-0.5	-0.8	-0.2	-1.1	-1.3	-1.2	-1.0	-0.8	-1.2	-0.9	-0.5	-1.0	-0.5	1.0
5-Oct	-1.0	-0.6	UO	UO	UO	UO	UO	UO	UO	UO	-1.0	-1.1	-0.5	-0.8	-0.8	-0.5	-0.5	-0.4	-0.4	-0.5	-0.1	0.0	-0.3	--	0.0	0.0
6-Oct	0.0	0.3	0.7	0.3	0.7	1.0	0.9	0.8	0.4	0.9	0.7	0.7	0.9	0.7	0.9	0.3	0.2	0.2	0.2	-0.1	-0.4	-0.8	-0.9	-0.7	0.3	1.0
7-Oct	-0.6	-0.5	-0.5	-0.5	-0.6	-0.3	-0.2	-0.1	-0.3	0.3	0.4	0.3	0.4	-0.1	0.2	0.3	0.3	0.3	0.1	0.8	0.6	1.0	0.8	0.8	0.1	1.0
8-Oct	0.5	0.7	0.6	0.8	0.8	1.0	1.0	0.8	0.5	0.5	0.7	0.8	0.8	0.9	0.9	1.0	0.4	0.2	0.1	0.7	0.8	0.9	0.8	0.7	0.7	1.0
9-Oct	0.7	0.5	0.6	0.5	0.5	0.3	0.3	0.2	0.3	0.0	0.0	0.8	1.1	1.2	0.5	1.5	0.2	0.1	-0.1	0.3	0.7	0.5	0.3	0.6	0.5	1.5
10-Oct	0.6	0.5	0.2	0.4	0.1	0.0	0.4	0.2	0.2	-0.2	1.3	1.0	0.2	0.4	0.3	0.6	1.0	0.4	0.1	0.4	0.6	0.6	0.8	0.6	0.5	1.3
11-Oct	0.6	0.3	0.2	0.3	0.4	0.3	0.2	0.3	0.3	0.1	0.0	0.2	0.3	1.2	0.5	0.6	0.8	1.4	0.1	0.1	0.2	0.4	0.6	0.5	0.4	1.4
12-Oct	0.7	0.6	0.5	0.3	0.3	0.4	0.5	0.5	0.3	0.4	0.2	0.3	0.4	0.9	0.5	0.5	0.4	0.1	0.5	0.6	0.7	0.6	0.6	0.6	0.5	0.9
13-Oct	0.5	0.7	0.6	0.5	0.9	1.0	0.6	0.7	0.1	0.2	0.9	0.6	0.5	0.9	0.2	0.2	0.1	0.6	0.1	0.5	0.5	0.7	0.7	0.6	0.5	1.0
14-Oct	0.8	0.7	0.8	1.0	1.1	1.0	1.1	0.8	0.9	0.7	0.3	1.0	1.5	1.2	1.0	1.1	1.4	1.3	1.1	1.1	1.2	1.0	0.8	0.7	1.0	1.5
15-Oct	0.5	0.6	0.7	0.4	0.5	0.8	0.5	0.4	0.6	0.5	0.3	0.6	0.7	0.7	0.3	0.5	0.3	0.5	0.3	0.2	0.3	0.1	-0.3	0.2	0.4	0.8
16-Oct	0.1	0.1	0.0	-0.1	-0.2	-0.2	-0.2	-0.1	0.0	0.0	0.4	0.3	0.2	-0.2	-0.2	0.2	0.2	0.1	0.0	0.3	0.2	0.6	-0.1	0.0	0.1	0.6
17-Oct	0.0	-0.1	-0.1	-0.1	-0.1	-0.2	-0.3	-0.4	-0.3	-0.4	-0.2	0.3	-0.7	-0.5	-0.6	0.2	-0.6	-0.4	-0.3	-0.1	-0.1	0.1	0.1	0.6	-0.2	0.6
18-Oct	0.1	0.1	0.1	0.3	0.7	0.6	0.4	0.6	0.2	0.4	0.3	0.6	0.8	0.7	0.8	0.7	0.7	0.3	-0.2	-0.6	-0.4	-0.6	-0.6	-0.2	0.2	0.8
19-Oct	-0.3	-0.3	-0.4	-0.2	-0.2	0.2	0.5	0.4	0.3	-0.1	-0.6	-0.5	-0.5	-0.7	-0.7	-0.5	-0.8	-0.4	-0.4	-0.3	-0.8	-0.8	-0.6	-0.7	-0.4	0.5
20-Oct	-0.9	-0.8	-0.7	-0.6	-0.5	-0.4	-0.3	-0.6	-1.1	-0.7	-0.5	-0.7	-0.5	-0.5	-1.0	-0.8	-0.6	-0.1	-0.3	0.0	-0.2	-0.1	0.1	0.0	-0.5	0.1
21-Oct	0.2	0.3	0.4	0.3	0.4	0.5	0.0	0.5	0.5	0.8	0.6	0.3	0.1	-0.3	-0.2	-1.0	0.0	0.0	-0.1	-0.1	-0.4	-0.4	-0.8	-0.2	0.1	0.8
22-Oct	-0.2	-0.2	0.1	0.0	-0.1	0.0	-0.2	-0.1	-0.1	-0.1	-0.2	-0.3	-0.3	-0.3	-0.4	-0.6	-0.4	-0.4	-0.4	-0.4	-0.6	-0.7	-0.6	-0.6	-0.3	0.1
23-Oct	-0.5	-0.3	-0.5	-0.3	-0.6	-0.6	-0.5	-0.5	-0.6	-0.4	-0.5	-0.6	-0.6	-0.8	-1.2	-0.7	-0.7	-0.7	-0.6	-0.5	-0.6	-0.6	-0.6	-0.5	-0.6	-0.3
24-Oct	-0.4	-0.5	-0.5	-0.7	-0.5	-0.7	-0.6	-0.6	-0.6	-0.6	-0.5	-0.7	-0.8	-1.0	-0.7	-0.8	-0.5	-0.5	-0.6	-0.6	-0.6	-0.5	-0.5	-0.5	-0.6	-0.4
25-Oct	-0.5	-0.4	-0.7	-0.6	-0.6	-0.6	-0.6	-0.5	-0.3	0.0	-0.1	-0.1	-0.7	-0.4	-0.5	-0.6	-0.6	-0.6	-0.5	-0.6	-0.5	-0.4	-0.4	-0.3	-0.5	0.0
26-Oct	-0.4	-0.4	-0.5	-0.6	-0.6	-0.6	-0.6	-0.3	-0.4	-0.5	-0.4	-0.5	-0.4	-0.3	-0.5	-0.6	-0.6	-0.5	-0.4	-0.6	-0.5	-0.5	-0.6	-0.5	-0.5	-0.3
27-Oct	-0.5	-0.4	-0.4	-0.6	0.0	0.2	-0.2	-0.5	-0.6	0.1	-0.2	0.1	-0.3	-0.3	-0.4	-0.3	-0.7	-0.3	-0.4	-0.4	-0.5	-0.4	-0.1	-0.1	-0.3	0.2
28-Oct	0.2	0.2	-0.2	-0.4	-0.5	-0.4	-0.4	-0.7	-0.5	-0.3	-0.5	-0.4	-0.6	-0.4	-0.5	-0.3	-0.3	-0.5	-0.7	-0.6	-0.7	-0.5	-0.4	-0.6	-0.4	0.2
29-Oct	-0.6	-0.5	-0.8	-0.4	-0.4	-0.7	-0.5	-0.5	-0.4	-0.8	-0.4	-0.5	-0.7	-0.4	-0.2	-0.2	-0.2	-0.2	-0.3	-0.1	-0.1	0.1	-0.1	-0.4	-0.6	0.1
30-Oct	-0.4	-0.2	0.0	0.0	-0.4	0.0	0.0	-0.1	-0.2	0.1	0.3	0.7	0.8	0.8	0.5	0.4	0.6	0.6	0.8	0.5	0.3	0.4	0.5	0.6	0.3	0.8
31-Oct	0.4	0.5	0.2	0.1	-0.3	-0.4	-0.5	-0.4	-0.8	-0.4	-0.7	-0.5	0.0	-0.1	0.2	0.2	0.1	0.2	0.4	0.3	0.0	-0.2	-0.2	-0.2	-0.1	0.5
																								Diurnal Average		
																								Diurnal Maximum		
UO - Unstable Operation																										



Summary of Hour Standard Deviations

Mannix - October 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 4.2 km/h on Oct 21 18:00		Hours in Service: 744 Hours of Data: 736 Hours of Missing Data: 8 Hours of Calibration: 0 Percent Operational Time: 98.9																							
Minimum Value: 0.1 km/h on Oct 7 08:00																									
Percentiles: $P_1 = 0.2$ $P_{10} = 0.5$ $Q_1 = 0.9$ Median = 1.6 $Q_3 = 2.2$ $P_{90} = 2.8$ $P_{99} = 3.6$																									
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-Oct	0.5	0.6	1.0	1.6	1.6	1.0	1.0	1.1	1.8	2.3	2.6	2.7	3.1	2.9	2.8	2.8	2.5	1.9	2.3	2.3	2.1	1.8	2.1	2.3	3.1
2-Oct	2.0	1.3	1.0	1.0	1.3	1.4	1.3	1.6	1.8	1.7	1.5	1.6	1.4	1.5	0.9	0.8	0.9	0.3	0.2	0.2	0.3	0.2	0.2	0.3	2.0
3-Oct	0.4	0.5	0.4	0.4	0.5	0.7	0.5	0.4	0.6	1.0	1.3	1.6	2.0	1.6	1.9	0.8	1.4	0.4	0.3	0.6	0.4	0.4	0.7	0.8	2.0
4-Oct	1.1	1.1	0.9	0.4	0.6	0.8	0.6	1.0	1.1	1.5	2.3	2.4	1.7	2.7	2.7	2.6	3.1	3.3	3.2	3.3	3.3	3.3	3.0	2.4	3.3
5-Oct	2.5	2.3	UO	UO	UO	UO	UO	UO	UO	UO	2.7	3.0	3.0	2.8	2.5	2.4	2.2	1.5	0.8	0.4	0.4	0.3	0.3	0.4	3.0
6-Oct	0.4	0.7	1.0	0.9	1.3	1.4	1.7	2.0	1.6	1.7	2.1	2.4	2.1	1.7	1.8	1.4	1.1	0.4	0.4	0.7	0.5	0.7	0.7	0.8	2.4
7-Oct	0.6	0.5	0.5	0.4	0.8	0.4	0.4	0.1	0.5	1.2	1.2	1.1	1.3	0.8	0.9	1.1	1.0	0.8	1.4	1.9	1.8	1.7	1.3	1.7	1.9
8-Oct	1.7	1.9	1.8	2.2	2.4	2.5	2.6	2.8	2.8	3.1	2.5	2.7	3.0	2.9	2.6	2.1	2.1	1.6	1.1	0.9	1.5	1.6	1.3	2.0	3.1
9-Oct	2.3	1.6	1.7	1.7	1.6	1.6	1.4	2.1	2.1	2.0	2.0	2.5	2.8	3.1	2.6	3.1	2.4	2.4	2.4	2.4	2.0	2.1	2.3	1.8	3.1
10-Oct	2.0	1.8	2.0	2.0	1.9	1.9	2.2	2.5	2.6	2.4	3.1	2.8	3.1	2.9	2.7	3.1	3.2	2.7	2.9	2.6	2.3	2.4	2.6	2.5	3.2
11-Oct	2.5	2.6	2.7	2.4	2.5	2.5	2.2	2.6	2.5	2.9	2.5	2.4	2.5	3.0	2.7	2.6	2.6	3.2	2.8	2.6	2.0	1.7	1.9	2.2	3.2
12-Oct	2.1	1.1	0.9	1.6	1.5	2.1	1.7	1.5	1.9	1.9	2.0	1.9	2.2	2.0	2.4	2.0	1.2	0.6	0.7	1.2	1.6	1.6	1.3	1.1	2.4
13-Oct	1.0	1.0	1.2	1.2	1.3	1.7	1.9	1.8	2.2	1.9	2.3	2.1	2.3	2.6	2.3	2.4	2.1	2.1	2.1	2.5	2.1	2.2	2.2	2.1	2.6
14-Oct	2.3	2.3	2.5	2.9	3.3	2.9	3.1	2.8	3.0	2.6	3.0	3.5	3.6	3.6	3.8	3.8	3.4	3.1	3.0	3.0	3.0	2.7	2.5	2.3	3.8
15-Oct	2.2	2.3	1.9	1.5	1.7	1.8	1.8	1.8	1.7	2.2	2.2	2.0	2.0	1.9	1.5	1.4	0.6	0.7	0.7	0.5	0.4	0.4	0.6	0.8	2.3
16-Oct	0.6	0.5	0.6	0.7	0.6	0.5	0.5	0.5	0.6	0.9	1.3	1.5	1.2	1.4	1.3	1.3	0.8	0.5	0.3	0.3	0.9	0.5	0.7	0.3	1.5
17-Oct	0.3	0.3	0.2	0.4	0.3	0.5	0.4	0.8	1.6	1.6	1.9	2.4	2.4	2.6	2.3	2.4	1.8	1.7	1.3	1.1	0.9	1.0	0.7	1.2	2.6
18-Oct	1.0	1.0	1.0	0.9	0.8	0.6	0.7	1.7	1.6	0.9	1.5	1.9	1.8	2.0	2.2	2.0	1.8	1.2	0.9	1.0	0.9	1.1	1.5	0.8	2.2
19-Oct	0.6	1.2	1.2	0.8	0.7	0.6	0.7	0.8	0.9	1.4	2.5	2.8	2.6	2.8	2.5	1.8	1.9	1.8	1.5	1.0	2.8	2.9	2.5	1.4	2.9
20-Oct	2.5	2.8	2.3	1.6	2.1	2.0	2.1	1.9	3.2	3.0	2.9	3.1	3.2	3.0	3.3	2.9	2.3	1.6	2.0	1.7	0.6	0.3	0.4	0.3	3.3
21-Oct	0.2	0.3	0.8	0.5	0.8	0.7	0.7	1.1	1.1	1.3	1.8	1.4	0.8	1.5	2.9	3.6	4.2	4.2	3.8	3.8	3.0	2.7	2.4	2.7	4.2
22-Oct	2.8	2.0	1.5	1.4	1.4	1.3	0.8	0.7	0.7	1.1	1.6	1.7	2.1	2.1	1.6	1.5	1.0	0.7	1.0	0.9	1.8	1.9	1.2	1.4	2.8
23-Oct	1.3	1.1	1.4	1.2	0.6	0.5	0.7	1.0	1.2	2.3	2.8	3.2	2.8	3.1	2.6	2.6	2.2	2.0	1.8	1.4	1.2	1.5	1.6	1.1	3.2
24-Oct	0.8	0.6	0.8	1.1	1.1	1.1	1.1	1.4	1.6	2.1	2.0	2.3	2.4	2.2	2.5	2.2	2.1	2.0	1.9	2.0	2.2	1.9	1.8	1.7	2.5
25-Oct	1.7	1.6	1.4	1.4	1.3	1.1	1.1	1.1	1.3	1.8	2.2	2.0	2.1	2.2	1.9	1.6	1.4	1.1	1.1	2.1	1.4	0.8	0.8	0.9	2.2
26-Oct	0.9	0.9	0.9	1.0	1.0	0.6	0.9	1.1	1.5	1.3	1.6	1.5	1.4	1.3	1.8	1.6	1.1	0.7	0.9	1.3	0.6	1.0	0.9	0.7	1.8
27-Oct	0.8	0.9	0.7	2.4	2.3	2.4	2.2	2.2	1.9	1.6	1.5	1.4	1.9	1.7	1.8	1.8	1.5	1.3	1.1	0.8	0.4	0.6	0.3	0.4	2.4
28-Oct	1.0	0.9	0.8	0.5	0.4	0.4	0.4	0.6	1.0	1.1	1.2	1.4	1.7	1.9	1.7	1.1	0.5	0.8	1.0	1.0	1.1	1.0	1.2	1.7	1.9
29-Oct	1.4	1.8	2.3	1.1	0.9	1.6	2.0	2.0	2.0	2.0	1.9	2.1	1.9	1.8	1.3	1.1	0.3	0.5	0.5	0.7	0.8	0.7	1.9	2.0	2.3
30-Oct	1.9	2.1	1.7	1.4	0.9	1.1	0.9	0.3	0.2	1.2	1.7	1.9	1.9	1.9	1.7	1.4	1.3	1.4	1.5	1.3	1.0	0.7	0.8	0.9	2.1
31-Oct	1.0	1.2	0.5	0.4	0.7	1.3	1.3	1.8	1.9	2.2	2.0	1.7	1.4	0.9	0.8	0.8	0.5	0.7	0.9	0.8	0.4	0.5	0.4	0.1	2.2
Diurnal Maximum																									
UO - Unstable Operation																									



Maximum Value: 1.3 km/h on Oct 9 16:00		Maximum Daily Average: 0.6 km/h on Oct 1		Hours in Service: 744																						
Minimum Value: -1.1 km/h on Oct 14 11:00		Minimum Daily Average: -0.5 km/h on Oct 11		Hours of Data: 737																						
Maximum Diurnal Average: 0.3 km/h at hour 12		Minimum Diurnal Average: -0.1 km/h at hour 9		Hours of Missing Data: 7																						
Monthly Average: 0.09 km/h		Percentiles: P ₁ = -0.9 P ₁₀ = -0.5 Q ₁ = -0.1 Median = 0.1 Q ₃ = 0.3 P ₉₀ = 0.5 P ₉₉ = 1.0		Hours of Calibration: 0																						
				Percent Operational Time: 99.1																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Oct	0.5	0.3	0.3	0.4	0.8	0.5	0.4	0.6	0.4	0.6	0.4	1.1	1.1	1.1	0.8	0.8	0.8	0.3	0.0	0.3	0.4	0.5	0.6	0.4	0.6	1.1
2-Oct	0.4	0.4	0.0	0.1	0.1	-0.1	0.0	-0.2	0.1	0.8	0.7	0.5	0.5	0.6	0.4	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.3	0.2	0.2	0.8
3-Oct	0.2	0.1	0.2	0.2	0.1	0.2	-0.1	0.0	0.0	0.1	0.2	0.2	0.6	0.1	0.3	0.0	0.2	-0.2	0.2	-0.3	-0.3	0.2	0.3	0.6	0.1	0.6
4-Oct	0.4	0.6	0.2	0.2	-0.1	0.2	0.2	0.4	0.6	0.3	0.4	0.3	0.4	0.4	0.5	0.1	0.1	0.3	0.3	0.5	0.3	0.8	0.9	0.3	0.4	0.9
5-Oct	0.3	0.2	UO	UO	UO	UO	UO	UO	UO	0.3	0.5	0.2	0.8	0.6	0.4	0.6	0.5	0.4	0.1	0.0	0.0	0.1	0.0	0.0	--	0.8
6-Oct	0.1	0.2	0.7	0.2	0.7	0.8	0.6	-0.1	0.4	0.7	0.6	0.6	1.0	0.7	0.8	0.6	0.3	0.3	0.2	0.0	0.0	-0.1	-0.1	0.2	0.4	1.0
7-Oct	0.2	0.1	0.3	0.2	0.1	0.0	0.2	0.2	0.1	0.2	0.4	0.2	0.3	-0.2	0.0	-0.2	-0.6	-0.7	-0.6	-0.3	-0.5	-0.2	-0.2	-0.5	-0.1	0.4
8-Oct	-0.6	-0.3	-0.4	-0.4	-0.3	-0.3	-0.4	-0.5	-0.8	-0.5	0.2	0.1	0.0	0.1	0.4	1.0	0.4	0.3	0.2	0.5	-0.2	-0.2	-0.4	-0.4	-0.1	1.0
9-Oct	-0.3	-0.3	-0.2	-0.2	-0.1	-0.4	-0.5	-0.5	-0.6	-0.5	-1.0	0.2	0.8	0.7	-0.3	1.3	-0.8	-0.9	-0.8	-0.6	-0.5	-0.6	-0.6	-0.4	-0.3	1.3
10-Oct	-0.3	-0.3	-0.7	-0.3	-0.7	-0.8	-0.5	-0.7	-0.8	-1.0	0.9	0.8	-0.8	-0.6	-0.6	0.1	0.5	-0.5	-0.9	-0.7	-0.7	-0.6	-0.6	-0.8	-0.4	0.9
11-Oct	-0.6	-0.8	-0.7	-0.6	-0.6	-0.7	-0.8	-0.7	-0.9	-1.0	-1.0	-0.6	-0.5	0.8	-0.6	-0.2	0.2	0.9	-0.7	-0.9	-0.7	-0.5	-0.5	-0.5	-0.5	0.9
12-Oct	-0.2	-0.2	-0.2	-0.4	-0.4	-0.4	0.0	-0.1	-0.2	0.1	0.3	0.3	0.3	1.2	0.3	0.5	0.6	0.3	0.2	0.2	-0.3	-0.3	-0.3	-0.3	0.1	1.2
13-Oct	-0.3	-0.1	-0.1	0.0	0.7	0.9	0.7	0.1	-0.4	-0.4	0.4	-0.1	-0.2	0.4	-0.9	-0.6	-0.8	-0.6	-0.8	-0.7	-0.6	-0.3	-0.4	-0.2	-0.2	0.9
14-Oct	-0.1	-0.3	-0.4	-0.2	0.1	-0.2	-0.1	-0.3	-0.1	-0.6	-1.1	-0.1	0.3	-0.1	0.2	-0.2	0.4	0.5	0.1	-0.1	0.2	0.0	-0.3	-0.5	-0.1	0.5
15-Oct	-0.5	-0.2	-0.5	-0.4	-0.3	-0.2	-0.5	-0.5	0.0	0.0	0.0	0.6	0.5	0.7	0.3	0.7	0.3	0.3	0.3	0.2	0.4	0.2	-0.2	0.1	0.1	0.7
16-Oct	0.1	-0.1	-0.1	-0.1	0.0	-0.1	-0.1	-0.1	-0.1	0.0	0.3	0.4	0.2	-0.4	-0.6	0.4	0.1	0.1	0.1	0.5	0.1	0.2	0.1	0.1	0.0	0.5
17-Oct	0.2	0.3	0.2	0.2	0.1	0.3	0.1	0.0	0.1	-0.1	0.3	0.9	-0.3	-0.1	-0.1	0.4	-0.2	-0.1	0.1	0.3	0.2	0.2	0.1	0.8	0.2	0.9
18-Oct	0.2	0.2	0.0	0.4	0.2	-0.2	-0.2	-0.4	-0.5	-0.1	-0.1	0.3	0.6	0.3	0.4	0.5	0.2	0.3	-0.4	-0.3	0.1	0.0	0.1	0.1	0.1	0.6
19-Oct	0.1	0.0	-0.1	-0.1	-0.1	0.0	0.4	0.3	0.2	0.2	0.1	0.1	0.4	0.1	0.0	-0.1	-0.3	-0.1	-0.1	0.1	-0.1	-0.1	0.4	-0.3	0.0	0.4
20-Oct	-0.1	0.2	0.2	0.0	0.2	0.6	0.5	0.1	0.1	0.4	0.4	0.6	0.9	0.5	-0.2	-0.3	-0.1	0.1	-0.1	0.1	0.0	0.1	0.2	0.1	0.2	0.9
21-Oct	0.4	0.4	0.0	0.1	0.4	0.4	0.3	0.2	-0.1	0.1	0.7	0.3	0.2	-0.1	0.4	-0.5	0.7	0.6	0.6	0.7	0.3	0.1	-0.2	0.7	0.3	0.7
22-Oct	0.1	0.2	0.2	0.1	0.0	0.2	0.0	0.1	0.1	0.1	0.2	0.0	-0.1	0.3	-0.1	-0.3	-0.2	-0.2	-0.2	0.2	0.0	0.0	0.1	0.1	0.0	0.3
23-Oct	0.3	0.4	0.5	0.4	0.1	0.1	0.3	0.2	0.1	0.5	0.5	0.8	0.4	0.6	-0.2	0.6	0.3	0.3	0.4	0.3	0.1	0.1	0.2	0.2	0.3	0.8
24-Oct	0.3	0.1	0.1	-0.1	0.2	-0.1	0.2	0.1	0.2	0.1	0.3	0.0	0.1	-0.3	0.0	-0.1	0.2	0.2	0.1	0.0	0.4	0.3	0.2	0.2	0.1	0.4
25-Oct	0.2	0.3	0.1	0.1	0.1	-0.1	-0.1	-0.1	0.0	0.3	0.3	0.7	-0.1	0.4	0.2	0.2	-0.2	-0.1	0.2	0.4	0.5	0.1	0.1	0.1	0.2	0.7
26-Oct	0.2	0.3	0.2	0.1	0.1	0.0	0.1	0.4	0.2	0.1	0.3	0.2	0.2	0.4	0.2	0.0	0.0	0.2	0.1	0.2	0.2	0.0	0.0	0.1	0.2	0.4
27-Oct	0.0	0.1	0.2	0.1	0.3	1.2	0.2	-0.1	0.1	0.5	0.0	0.5	0.0	0.3	0.1	0.4	0.1	0.5	0.0	0.1	0.0	-0.1	0.1	-0.1	0.2	1.2
28-Oct	0.2	0.3	-0.1	0.0	0.1	0.3	0.2	-0.2	0.0	0.3	0.1	0.1	-0.4	0.2	-0.1	0.2	0.3	0.1	0.1	0.1	-0.1	0.1	0.4	0.3	0.1	0.4
29-Oct	0.2	0.4	0.5	0.2	0.2	0.2	0.6	0.2	0.5	0.3	0.3	-0.2	-0.4	0.0	0.4	0.4	0.0	0.0	0.1	-0.1	0.1	0.0	-0.2	-0.4	0.1	0.6
30-Oct	-0.1	0.0	0.1	0.3	-0.1	0.1	0.2	0.1	0.1	0.3	0.2	0.8	0.5	0.5	0.6	0.7	0.6	0.7	0.7	0.5	0.3	0.3	0.2	0.4	0.3	0.8
31-Oct	0.4	0.4	0.2	0.2	0.3	0.1	0.0	0.1	-0.3	0.1	-0.3	-0.4	0.2	0.1	0.3	0.3	0.3	0.4	0.2	0.4	0.2	0.2	0.1	-0.1	0.1	0.4
																								Diurnal Average		
																								Diurnal Maximum		
0.1 0.1 0.0 0.0 0.1 0.1 0.1 0.0 -0.1 0.1 0.2 0.3 0.3 0.3 0.1 0.2 0.1 0.1 0.0 0.1 0.0 0.0 0.0 0.0 0.5 0.6 0.7 0.4 0.8 1.2 0.7 0.6 0.6 0.8 0.9 1.1 1.1 1.2 0.8 1.3 0.8 0.9 0.7 0.7 0.5 0.8 0.9 0.8																										
UO - Unstable Operation																										



Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

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

Mannix - October 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 4.1 km/h on Oct 21 17:00		Hours in Service: 744 Hours of Data: 737 Hours of Missing Data: 7 Hours of Calibration: 0 Percent Operational Time: 99.1																							
Minimum Value: 0.1 km/h on Nov 1 00:00																									
Percentiles: P ₁ = 0.2 P ₁₀ = 0.5 Q ₁ = 0.8 Median = 1.5 Q ₃ = 2.1 P ₉₀ = 2.7 P ₉₉ = 3.6																									
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-Oct	0.3	0.5	0.6	1.1	1.1	0.7	0.7	0.8	1.8	2.3	2.7	2.9	3.1	3.0	3.1	2.8	2.5	1.6	1.7	1.8	1.7	1.5	1.7	1.9	3.1
2-Oct	1.8	1.0	0.6	0.4	0.8	0.8	0.5	1.0	1.2	1.6	1.2	1.3	1.3	1.4	1.0	0.7	1.0	0.3	0.2	0.2	0.3	0.2	0.3	0.3	1.8
3-Oct	0.3	0.4	0.4	0.7	0.6	0.5	0.5	0.5	0.4	1.1	1.4	1.7	2.3	1.8	2.2	0.8	1.5	0.3	0.3	0.4	0.2	0.4	0.6	0.8	2.3
4-Oct	0.8	1.2	0.8	0.5	0.8	0.8	0.6	0.9	1.0	1.5	2.3	2.4	1.7	2.7	2.9	2.6	3.0	3.3	3.4	3.2	3.2	3.4	3.0	2.2	3.4
5-Oct	2.5	2.4	UO	UO	UO	UO	UO	UO	UO	2.9	2.9	2.9	3.3	3.1	2.7	2.5	2.3	1.4	0.8	0.4	0.3	0.4	0.4	0.3	3.3
6-Oct	0.6	0.6	0.5	0.7	0.9	1.2	1.3	1.6	1.7	1.7	1.9	2.4	2.2	1.6	1.8	1.7	1.1	0.4	0.5	0.8	0.7	0.5	0.6	0.8	2.4
7-Oct	0.5	0.6	0.7	0.6	0.8	0.3	0.4	0.2	0.5	1.0	1.0	1.1	1.3	0.9	0.8	1.5	1.3	1.0	1.8	2.0	1.7	1.6	1.4	1.3	2.0
8-Oct	1.5	1.6	1.5	1.9	2.1	1.9	2.1	2.5	2.6	2.8	2.5	2.7	2.9	2.8	2.6	2.1	1.7	1.4	0.9	0.7	1.2	1.1	1.2	1.8	2.9
9-Oct	1.7	1.5	1.4	1.7	1.6	1.8	1.7	1.9	2.1	2.2	2.1	3.0	3.2	3.3	2.7	3.5	2.2	2.4	2.4	2.3	2.0	2.2	2.3	2.0	3.5
10-Oct	1.9	1.8	2.1	1.9	1.8	2.0	1.9	2.2	2.5	2.5	3.6	3.4	3.0	2.9	2.6	3.1	3.5	2.8	2.8	2.3	2.0	2.4	2.3	2.3	3.6
11-Oct	2.3	2.6	2.5	2.4	2.5	2.4	2.1	2.3	2.4	2.6	2.4	2.7	2.7	3.6	2.6	2.6	2.8	3.6	2.7	2.5	1.9	1.7	1.7	1.9	3.6
12-Oct	1.7	0.8	0.8	1.2	1.1	1.7	1.3	1.3	1.5	1.7	2.0	2.1	2.3	2.4	2.4	2.1	1.2	0.7	0.6	0.8	1.2	1.1	0.7	0.6	2.4
13-Oct	0.5	0.6	0.6	0.4	0.9	1.3	1.9	1.8	2.3	1.6	2.3	2.1	2.1	2.4	2.5	2.4	2.1	1.9	2.2	2.2	2.1	2.1	2.2	2.1	2.5
14-Oct	2.1	2.1	2.2	2.4	2.7	2.3	2.3	2.2	2.8	2.6	2.6	3.5	3.6	3.5	3.7	3.6	3.1	3.0	2.7	2.6	2.6	2.3	2.0	1.9	3.7
15-Oct	2.1	2.0	1.7	1.4	1.3	1.4	1.6	1.7	1.3	1.8	2.1	2.0	2.1	2.0	1.5	1.5	0.5	0.5	0.6	0.4	0.4	0.5	0.7	1.1	2.1
16-Oct	0.9	0.5	0.7	0.9	0.7	0.6	0.6	0.5	0.4	0.6	0.9	1.4	1.2	1.6	1.5	1.6	0.9	0.6	0.3	0.3	1.2	0.7	1.2	0.5	1.6
17-Oct	0.7	0.5	0.3	0.3	0.2	0.5	0.4	0.6	1.0	1.2	2.0	2.5	2.5	2.6	2.3	2.3	1.6	1.4	1.2	1.2	0.9	1.1	0.7	1.6	2.6
18-Oct	0.9	0.9	1.0	0.8	0.4	0.4	0.9	1.2	1.3	0.9	1.1	1.6	1.7	1.7	1.9	1.6	1.5	1.1	0.7	0.8	1.1	1.2	1.5	1.0	1.9
19-Oct	1.0	1.5	1.5	1.2	1.0	0.9	0.9	1.0	1.2	1.5	2.5	2.6	2.7	2.8	2.4	1.8	1.8	1.9	1.8	1.2	2.6	2.8	2.6	1.4	2.8
20-Oct	2.6	3.0	2.6	1.7	2.3	2.2	2.2	2.0	3.2	3.3	2.9	3.3	3.4	3.1	2.8	2.6	1.9	1.3	1.9	1.4	0.5	0.4	0.7	0.4	3.4
21-Oct	0.2	0.2	0.7	0.5	0.5	0.5	0.5	0.6	0.7	0.9	1.4	1.3	0.9	1.3	2.7	3.4	4.1	4.0	3.8	3.9	3.2	2.9	2.6	3.0	4.1
22-Oct	2.7	1.9	1.0	1.0	1.2	1.4	0.9	0.4	0.5	1.1	1.7	1.8	2.5	2.4	1.7	1.5	1.2	0.7	0.8	1.0	1.7	1.7	1.3	1.3	2.7
23-Oct	1.3	1.3	1.2	1.2	0.6	0.3	0.7	0.8	1.1	2.3	2.9	3.3	3.1	3.3	2.7	2.8	2.2	2.0	1.8	1.4	1.2	1.1	1.3	1.0	3.3
24-Oct	0.6	0.5	0.6	0.9	1.0	0.8	1.0	1.0	1.5	2.2	2.1	2.6	2.6	2.2	2.4	2.2	2.0	2.1	2.0	1.9	2.2	1.9	1.9	1.8	2.6
25-Oct	1.5	1.7	1.2	1.2	1.0	0.8	1.1	0.9	1.3	1.8	2.1	2.1	2.3	2.4	2.1	1.7	1.4	1.0	1.3	1.9	1.4	0.7	0.7	0.8	2.4
26-Oct	0.9	0.8	0.9	0.9	0.7	0.5	0.8	0.9	1.5	1.3	1.6	1.5	1.5	1.4	1.7	1.5	0.9	0.7	1.0	1.2	0.5	0.7	0.5	0.5	1.7
27-Oct	0.8	0.9	0.7	2.1	2.2	2.4	2.2	2.2	1.7	1.6	1.4	1.5	2.0	2.1	1.8	1.8	1.5	1.3	0.9	0.8	0.5	0.8	0.4	0.4	2.4
28-Oct	0.9	0.8	0.6	0.6	0.3	0.2	0.2	0.5	0.8	1.1	1.2	1.5	1.6	2.0	2.0	1.1	0.6	0.7	0.9	0.9	1.0	0.9	1.2	1.8	2.0
29-Oct	1.5	1.7	2.3	1.1	0.9	1.7	2.0	1.7	2.0	2.0	2.0	2.1	1.8	1.8	1.5	1.1	0.4	0.5	0.5	0.6	0.5	0.7	1.7	1.6	2.3
30-Oct	1.9	1.9	1.3	1.1	1.1	1.0	0.5	0.5	0.2	1.1	1.5	1.8	1.8	1.7	1.7	1.4	1.0	1.3	1.2	1.1	0.8	0.5	0.4	0.5	1.9
31-Oct	0.6	1.0	0.4	0.4	0.7	1.4	1.3	1.6	1.8	2.0	1.9	1.6	1.3	1.0	0.9	0.9	0.6	0.8	0.8	0.8	0.5	0.6	0.4	0.1	2.0
Diurnal Maximum																									
2.7 3.0 2.6 2.4 2.7 2.4 2.3 2.5 3.2 3.3 3.6 3.5 3.6 3.6 3.7 3.6 4.1 4.0 3.8 3.9 3.2 3.4 3.0 3.0																									
UO - Unstable Operation																									



Maximum Value: 2.2 km/h on Oct 27 06:00 Maximum Daily Average: 0.6 km/h on Oct 21																						Hours in Service: 744 Hours of Data: 740					
Minimum Value: -1.5 km/h on Oct 11 02:00 Minimum Daily Average: -0.8 km/h on Oct 11 Maximum Diurnal Average: 0.1 km/h at hour 12 Minimum Diurnal Average: -0.2 km/h at hour 19 Monthly Average: -0.09 km/h Percentiles: P ₁ = -1.4 P ₁₀ = -0.7 Q ₁ = -0.4 Median = -0.1 Q ₃ = 0.2 P ₉₀ = 0.5 P ₉₉ = 1.3																						Hours of Missing Data: 4 Hours of Calibration: 0 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-Oct	-0.1	-0.4	-0.2	0.1	0.2	-0.2	-0.3	0.0	0.1	0.2	0.0	0.9	0.7	0.6	0.3	0.4	0.2	0.1	0.2	0.3	0.3	0.4	0.3	0.2	0.2	0.9	
2-Oct	0.3	0.0	0.3	0.3	0.8	0.7	0.2	0.2	0.4	0.3	0.2	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	0.8
3-Oct	0.0	-0.2	0.1	0.1	-0.1	-0.3	-0.5	-0.3	-0.3	-0.1	-0.1	-0.2	0.3	-0.2	-0.1	-0.3	-0.3	-0.6	-0.3	-1.0	-1.0	-0.5	-0.4	-0.1	-0.3	0.3	0.3
4-Oct	0.1	0.5	0.1	-0.3	-0.6	-0.2	-0.1	0.2	0.3	-0.1	0.0	0.0	0.0	0.1	0.5	-0.3	-0.3	-0.3	-0.4	-0.3	-0.4	0.3	0.3	0.0	0.0	0.5	0.5
5-Oct	-0.1	-0.4	UO	UO	UO	UO	-1.0	-0.2	-0.2	-0.1	0.1	-0.4	0.3	0.3	-0.1	0.2	0.1	0.1	-0.2	-0.3	-0.4	-0.2	-0.3	-0.4	-0.2	0.3	0.3
6-Oct	-0.4	-0.3	0.2	-0.5	0.0	0.3	0.3	0.3	0.0	0.2	0.2	0.1	0.6	0.4	0.3	0.2	-0.1	-0.2	-0.3	-0.4	-0.4	-0.8	-0.8	-0.4	-0.1	0.6	0.6
7-Oct	-0.4	-0.5	-0.2	-0.3	-0.3	0.0	0.1	0.0	-0.1	0.0	0.3	0.2	0.3	-0.2	0.0	-0.1	-0.7	-1.0	-0.9	0.0	0.2	0.5	0.5	0.3	-0.1	0.5	0.5
8-Oct	-0.2	0.1	0.1	-0.4	0.1	0.1	0.4	-0.2	-0.9	-0.1	0.5	0.3	0.2	0.1	0.3	0.4	-0.4	-0.4	-0.5	0.1	0.1	0.6	0.2	-0.2	0.0	0.6	0.6
9-Oct	0.6	-0.3	0.0	-0.9	-0.3	-1.0	-1.2	-0.7	-0.8	-0.5	-1.1	0.4	0.8	0.5	-0.8	1.0	-1.5	-1.4	-1.4	-1.4	-0.8	-1.1	-1.4	-1.1	-0.6	1.0	1.0
10-Oct	-1.0	-1.2	-1.4	-0.7	-1.0	-1.3	-0.4	-0.7	-1.0	-1.4	0.9	0.7	-0.7	-0.7	-0.7	-0.2	0.3	-0.7	-1.0	-0.8	-0.7	-0.5	-0.4	-0.1	-0.6	0.9	0.9
11-Oct	-0.6	-1.5	-1.5	-1.4	-1.1	-1.4	-1.5	-1.4	-1.0	-0.9	-1.1	-0.7	-0.7	0.5	-0.8	-0.4	-0.1	0.7	-1.0	-1.3	-1.3	-1.3	0.0	0.2	-0.8	0.7	0.7
12-Oct	0.5	0.2	0.4	-0.1	0.1	0.3	0.2	0.0	-0.3	0.1	0.0	0.1	-0.1	1.0	-0.1	0.0	0.3	0.0	0.0	0.1	0.4	0.6	0.4	0.5	0.2	1.0	1.0
13-Oct	0.3	0.6	0.4	0.4	0.3	0.5	0.2	0.3	-0.9	-0.1	0.4	-0.1	-0.3	0.2	-0.9	-0.8	-0.8	-0.2	-0.8	0.0	-0.4	-0.2	0.0	0.3	-0.1	0.6	0.6
14-Oct	0.1	0.1	0.3	0.7	0.8	0.5	0.7	0.6	0.4	0.0	-0.6	0.1	0.5	0.1	0.3	0.1	0.5	0.4	0.2	0.1	0.2	0.4	0.3	0.1	0.3	0.8	0.8
15-Oct	0.0	0.4	0.0	-0.1	0.3	0.2	-0.6	-0.4	0.3	0.4	0.0	0.4	0.2	0.5	0.0	0.4	0.0	0.1	-0.2	-0.4	-0.4	-0.5	-0.7	-0.3	0.0	0.5	0.5
16-Oct	-0.4	-0.5	-0.5	-0.5	-0.3	-0.5	-0.5	-0.4	-0.5	-0.4	-0.1	0.2	0.1	-0.7	-0.7	0.1	0.0	-0.2	-0.2	0.2	0.0	0.0	0.0	0.1	-0.2	0.2	0.2
17-Oct	0.1	0.2	0.2	0.2	0.4	0.5	0.2	0.4	0.7	0.1	0.4	1.1	-0.2	-0.2	-0.2	0.4	-0.1	0.1	0.3	0.4	0.1	0.0	-0.1	0.8	0.3	1.1	1.1
18-Oct	-0.2	-0.2	0.2	0.8	0.6	0.2	0.1	0.4	-0.4	0.1	0.3	0.2	0.1	0.1	0.1	0.3	0.2	-0.4	-1.3	-1.0	-0.6	-0.7	-0.6	-0.4	-0.1	0.8	0.8
19-Oct	-0.3	-0.4	-0.6	-0.5	-0.6	-0.6	-0.3	-0.3	-0.2	-0.3	-0.6	-0.6	-0.3	-0.7	-0.8	-0.8	-1.0	-0.8	-0.8	-0.1	-1.0	-0.9	-0.2	-1.1	-0.6	-0.1	-0.1
20-Oct	-0.7	-0.7	-0.7	-0.5	-0.4	0.0	-0.1	-0.5	-0.8	-0.5	0.0	0.1	0.3	0.6	-0.1	-0.1	0.2	0.7	0.6	0.7	0.2	0.3	0.2	0.0	-0.1	0.7	0.7
21-Oct	0.0	0.0	0.4	0.2	0.0	0.3	0.2	0.5	0.0	0.3	0.2	-0.1	0.0	0.1	1.4	0.9	2.2	1.8	1.8	1.7	1.4	0.8	0.2	1.3	0.6	2.2	2.2
22-Oct	1.0	0.8	0.8	0.6	0.5	0.3	0.1	0.3	0.1	-0.2	0.0	-0.1	-0.3	0.3	0.2	-0.2	-0.3	-0.2	-0.3	-0.1	-0.1	0.1	0.0	0.0	0.1	1.0	1.0
23-Oct	0.1	0.1	0.3	0.0	-0.3	-0.3	-0.2	-0.2	-0.3	-0.1	0.1	0.2	-0.2	0.1	-0.9	0.1	-0.4	-0.1	0.1	-0.2	-0.5	-0.5	-0.4	-0.3	-0.2	0.3	0.3
24-Oct	-0.2	-0.4	-0.4	-0.7	-0.3	-0.6	-0.2	-0.5	-0.1	-0.5	-0.2	-0.6	-0.4	-0.9	-0.6	-0.7	-0.4	-0.4	-0.4	-0.5	-0.2	-0.3	-0.3	-0.2	-0.4	-0.1	-0.1
25-Oct	-0.4	-0.2	-0.4	-0.3	-0.3	-0.5	-0.6	-0.4	-0.4	-0.1	-0.2	0.4	-0.6	-0.1	-0.4	-0.2	-0.7	-0.6	-0.2	0.3	0.1	-0.3	-0.3	-0.4	-0.3	0.4	0.4
26-Oct	-0.3	-0.2	-0.3	-0.4	-0.4	-0.4	-0.3	0.0	-0.3	-0.4	-0.2	-0.3	-0.4	-0.1	-0.3	-0.6	-0.4	-0.2	-0.3	-0.3	-0.3	-0.5	-0.5	-0.3	-0.3	0.0	0.0
27-Oct	-0.4	-0.3	-0.2	0.7	1.2	2.2	0.8	0.3	0.5	0.6	0.0	0.5	0.0	0.1	0.0	0.4	-0.3	0.2	0.1	0.2	-0.3	-0.4	-0.2	-0.5	0.2	2.2	2.2
28-Oct	-0.4	-0.2	-0.6	-0.3	-0.3	-0.1	-0.3	-0.7	-0.4	0.1	-0.1	0.0	-0.4	0.1	0.0	0.0	-0.1	-0.3	-0.5	-0.4	-0.6	-0.3	0.1	0.1	-0.2	0.1	0.1
29-Oct	-0.1	0.0	0.2	0.0	-0.2	-0.2	0.2	0.2	0.2	0.1	0.2	0.0	-0.3	-0.2	0.1	0.2	-0.2	-0.2	0.1	0.1	0.2	0.4	0.6	0.3	0.1	0.6	0.6
30-Oct	0.6	0.7	0.6	0.8	0.0	0.4	0.5	0.1	-0.1	0.0	0.0	0.4	0.4	0.4	0.1	0.2	0.0	0.1	0.1	-0.1	-0.2	-0.2	-0.3	-0.1	0.2	0.8	0.8
31-Oct	-0.2	-0.2	-0.2	-0.1	0.0	0.2	0.3	0.6	0.1	0.4	-0.3	-0.4	0.5	0.0	0.2	0.2	0.3	0.4	0.2	0.5	0.0	0.1	-0.1	-0.4	0.1	0.6	0.6
																								Diurnal Average			
																								Diurnal Maximum			
UO - Unstable Operation																											



Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

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

Mannix - October 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 4.3 km/h on Oct 21 17:00 Minimum Value: 0.1 km/h on Oct 21 02:00 Percentiles: P ₁ = 0.2 P ₁₀ = 0.5 Q ₁ = 0.8 Median = 1.4 Q ₃ = 2.2 P ₉₀ = 2.8 P ₉₉ = 3.8																					Hours in Service: 744 Hours of Data: 740 Hours of Missing Data: 4 Hours of Calibration: 0 Percent Operational Time: 99.5				
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Oct	0.2	0.6	0.6	0.9	0.9	0.5	0.6	0.6	1.9	2.5	3.0	3.0	3.3	3.3	3.2	3.0	2.5	1.6	1.7	1.7	1.6	1.4	1.7	1.8	3.3
2-Oct	1.6	1.0	0.8	0.4	0.6	0.7	0.4	0.7	1.0	1.5	1.1	1.3	1.2	1.5	1.1	0.6	1.0	0.2	0.2	0.2	0.3	0.2	0.2	0.3	1.6
3-Oct	0.4	0.4	0.4	0.5	0.7	0.6	0.6	0.5	0.4	0.9	1.5	1.7	2.4	1.9	2.3	0.9	1.7	0.3	0.3	0.3	0.2	0.4	0.7	0.8	2.4
4-Oct	0.8	1.3	0.9	0.6	0.9	0.8	0.6	0.9	0.9	1.5	2.4	2.4	1.7	2.7	2.8	2.6	3.1	3.3	3.4	3.2	3.2	3.5	3.1	2.4	3.5
5-Oct	2.4	2.4	UO	UO	UO	UO	3.1	2.9	2.8	2.9	3.0	2.7	3.3	3.1	2.8	2.4	2.4	1.4	0.7	0.4	0.3	0.4	0.4	0.3	3.3
6-Oct	0.7	0.7	0.4	0.6	0.8	1.1	1.0	1.8	1.8	1.6	2.0	2.4	2.3	1.7	1.9	1.8	1.2	0.3	0.5	1.0	0.7	0.4	0.5	0.7	2.4
7-Oct	0.4	0.7	0.7	0.6	0.8	0.3	0.5	0.2	0.5	1.0	1.0	1.0	1.1	0.9	0.8	1.5	1.3	1.0	1.9	1.9	1.7	1.6	1.4	1.3	1.9
8-Oct	1.2	1.3	1.1	1.7	1.8	1.7	1.8	2.3	2.4	2.6	2.5	2.9	3.1	2.9	2.8	2.2	1.7	1.4	0.9	0.6	1.2	0.7	0.9	1.7	3.1
9-Oct	1.5	1.1	1.0	1.5	1.4	1.8	1.8	1.8	2.0	2.2	2.2	3.2	3.5	3.5	2.8	3.7	2.2	2.5	2.7	2.4	1.7	2.1	2.2	2.0	3.7
10-Oct	1.8	1.8	2.2	1.9	1.7	2.0	1.9	2.3	2.5	2.6	3.8	3.6	3.0	3.0	2.8	3.3	3.8	3.0	3.0	2.3	1.9	2.2	2.2	2.2	3.8
11-Oct	2.4	2.7	2.6	2.5	2.6	2.4	2.0	2.4	2.4	2.6	2.5	2.8	2.8	3.7	2.7	2.8	2.8	3.8	2.8	2.4	1.7	1.5	1.4	1.8	3.8
12-Oct	1.8	0.9	0.7	0.9	0.8	1.2	1.0	0.9	1.2	1.6	2.1	2.2	2.5	2.6	2.7	2.2	1.3	0.7	0.6	0.7	1.1	1.2	0.9	0.8	2.7
13-Oct	0.6	0.7	0.6	0.4	0.8	1.1	2.0	1.9	2.3	1.5	2.3	2.2	2.1	2.4	2.6	2.6	2.1	1.9	2.3	2.1	1.9	2.0	2.2	2.0	2.6
14-Oct	2.2	2.1	2.0	2.3	2.6	2.1	2.2	2.1	2.8	2.7	2.6	3.5	3.8	3.5	3.8	3.7	3.1	3.2	2.7	2.6	2.6	2.3	1.9	1.8	3.8
15-Oct	2.1	1.9	1.5	1.2	0.9	1.0	1.4	1.5	1.1	1.7	2.2	2.2	2.3	2.2	1.6	1.6	0.4	0.4	0.6	0.4	0.4	0.6	0.8	1.2	2.3
16-Oct	1.0	0.6	0.9	0.9	0.7	0.6	0.6	0.6	0.4	0.5	0.9	1.4	1.4	1.7	1.6	1.8	0.9	0.6	0.3	0.3	1.1	0.8	1.1	0.5	1.8
17-Oct	0.7	0.6	0.4	0.3	0.3	0.6	0.4	0.6	1.0	1.1	2.0	2.5	2.5	2.7	2.3	2.4	1.5	1.4	1.2	1.2	1.0	1.1	0.8	1.7	2.7
18-Oct	0.9	0.9	0.9	0.7	0.4	0.4	0.6	0.8	1.3	0.7	1.1	1.7	1.8	1.7	2.0	1.6	1.4	1.0	0.6	0.8	1.2	1.2	1.4	1.1	2.0
19-Oct	1.2	1.6	1.6	1.3	1.2	1.0	0.9	1.2	1.3	1.6	2.5	2.7	2.8	2.9	2.4	1.8	1.9	2.0	1.9	1.3	2.6	2.8	2.6	1.5	2.9
20-Oct	2.7	3.1	2.5	1.8	2.3	2.2	2.2	2.0	2.9	3.2	3.1	3.4	3.4	3.3	2.8	2.4	1.8	1.4	1.9	1.4	0.5	0.5	0.5	0.5	3.4
21-Oct	0.2	0.1	0.6	0.3	0.4	0.4	0.4	0.6	0.6	0.8	1.3	1.3	0.9	1.3	2.7	3.5	4.3	4.2	4.0	4.1	3.4	3.1	2.7	3.2	4.3
22-Oct	2.9	2.0	0.9	0.9	1.1	1.4	0.9	0.3	0.5	1.1	1.8	1.9	2.9	2.6	1.8	1.6	1.4	0.8	0.8	1.1	1.7	1.7	1.3	1.3	2.9
23-Oct	1.3	1.3	1.2	1.2	0.6	0.3	0.7	0.8	1.0	2.2	3.0	3.4	3.1	3.5	2.8	3.0	2.1	2.0	1.8	1.4	1.1	1.0	1.2	0.9	3.5
24-Oct	0.5	0.5	0.6	0.7	0.9	0.8	0.9	0.8	1.3	2.2	2.1	2.6	2.7	2.2	2.4	2.1	2.0	2.0	1.9	2.0	2.2	1.8	1.8	1.6	2.7
25-Oct	1.5	1.6	1.1	1.1	0.9	0.7	1.0	0.8	1.3	1.8	2.0	2.3	2.4	2.4	2.2	1.8	1.4	1.1	1.2	2.0	1.4	0.7	0.7	0.8	2.4
26-Oct	0.8	0.6	0.8	0.9	0.7	0.5	0.7	0.8	1.4	1.3	1.6	1.6	1.5	1.4	1.7	1.4	0.9	0.7	1.0	1.1	0.5	0.6	0.4	0.4	1.7
27-Oct	0.7	0.9	0.7	2.1	2.5	2.6	2.3	2.3	1.8	1.5	1.4	1.6	2.1	2.3	1.8	1.7	1.6	1.3	0.9	0.9	0.5	0.8	0.4	0.4	2.6
28-Oct	0.9	0.8	0.6	0.5	0.3	0.1	0.2	0.5	0.7	1.1	1.2	1.5	1.4	1.9	2.1	1.2	0.6	0.6	0.8	0.7	1.0	0.9	1.2	1.8	2.1
29-Oct	1.4	1.6	2.3	1.1	0.9	1.7	2.1	1.7	1.9	2.0	2.0	2.1	1.8	2.0	1.7	1.2	0.4	0.4	0.6	0.6	0.5	0.7	1.6	1.5	2.3
30-Oct	2.0	1.8	1.1	0.9	1.2	1.0	0.4	0.5	0.2	1.1	1.4	2.1	1.9	1.8	1.8	1.4	0.9	1.2	1.1	1.1	0.8	0.6	0.4	0.3	2.1
31-Oct	0.5	1.0	0.4	0.5	0.7	1.5	1.3	1.6	1.8	2.0	2.0	1.5	1.3	1.1	1.0	0.9	0.6	0.8	0.7	0.7	0.6	0.7	0.4	0.1	2.0
Diurnal Maximum																									
UO - Unstable Operation																									



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS06
PATRICIA MCINNES
OCTOBER 2023

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

November 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - PATRICIA McINNES (AMS06)
OCTOBER 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	38.1	0	6.9	0
TRS (ppb) Average	707	36	37	99.87	2	0	0.9	0
THC (ppm) Average	708	35	36	99.87	3.4	-	2.4	-
NMHC(ppm) Average	708	35	36	99.87	0.07	-	0.036	-
CH4(ppm) Average	708	35	36	99.87	3.4	-	2.4	-
O3 (ppb) Average	708	36	36	100	45.6	0	32.8	-
NO2 (ppb) Average	707	36	37	99.87	28.1	0	11.5	-
NO (ppb) Average	707	36	37	99.87	75.7	-	10.9	-
NOX (ppb) Average	707	36	37	99.87	103.8	-	22.5	-
NH3 (ppb) Average	635	42	109	90.99	0	0	0	-
PM2.5 (ug/m3) Average	743	1	1	100	33.9	0	16.4	0
Temperature 2 m (C) Average	744	0	0	100	25	-	15.2	-
Relative Humidity (%) Average	744	0	0	100	98.5	-	87.6	-
Wind Speed 10 m (km/h) Average	744	0	0	100	31	-	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 - PATRICIA McINNES (AMS06)
OCTOBER 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	0.5	2	-	0	0	0.1	0.2	0.3	0.6	38.1
TRS (ppb) Average	707	0.32	0.2	-	0.2	0.2	0.3	0.3	0.3	0.4	2
THC (ppm) Average	708	2.07	0.1	-	2	2	2	2	2.1	2.1	3.4
NMHC(ppm) Average	708	0.019	0.012	-	0	0	0	0	0	0	0.07
CH4(ppm) Average	708	2.05	0.1	-	1.9	2	2	2	2.1	2.1	3.4
O3 (ppb) Average	708	23.79	8.6	-	2.7	10.8	18.6	25.4	29.7	34	45.6
NO2 (ppb) Average	707	2.93	4.2	-	0	0	0.3	1.4	3.8	7.6	28.1
NO (ppb) Average	707	1.38	4.5	-	0	0	0.1	0.4	1	2.5	75.7
NOX (ppb) Average	707	4.3	8	-	0	0.1	0.5	1.9	4.6	9.9	103.8
NH3 (ppb) Average	635	0	0	-	0	0	0	0	0	0	0
PM2.5 (ug/m3) Average	743	5.99	4.3	-	0.4	2.1	3.6	5	6.8	10.6	33.9
Temperature 2 m (C) Average	744	4.49	7.9	-	-12.3	-5.9	-2.2	5.6	10.5	14.2	25
Relative Humidity (%) Average	744	69.35	15.7	-	24.7	47.7	58.8	70.7	81.8	88.7	98.5
Wind Speed 10 m (km/h) Average	744	11.7	6	-	0	4	7	11	15	19	31
Wind Direction 10 m (deg) Average	744	-	-	-	-	-	-	-	-	-	-

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

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2, NH3,NO2, THC/NMHC/CH4, TRS	02 Oct 2023 14:00	02 Oct 2023 14:00	1	Maintenance - sample manifold cleaned
NH3	01 Oct 2023 03:00	31 Oct 2023 04:00	66	Stabilization after daily span



Wood Buffalo Environmental Association

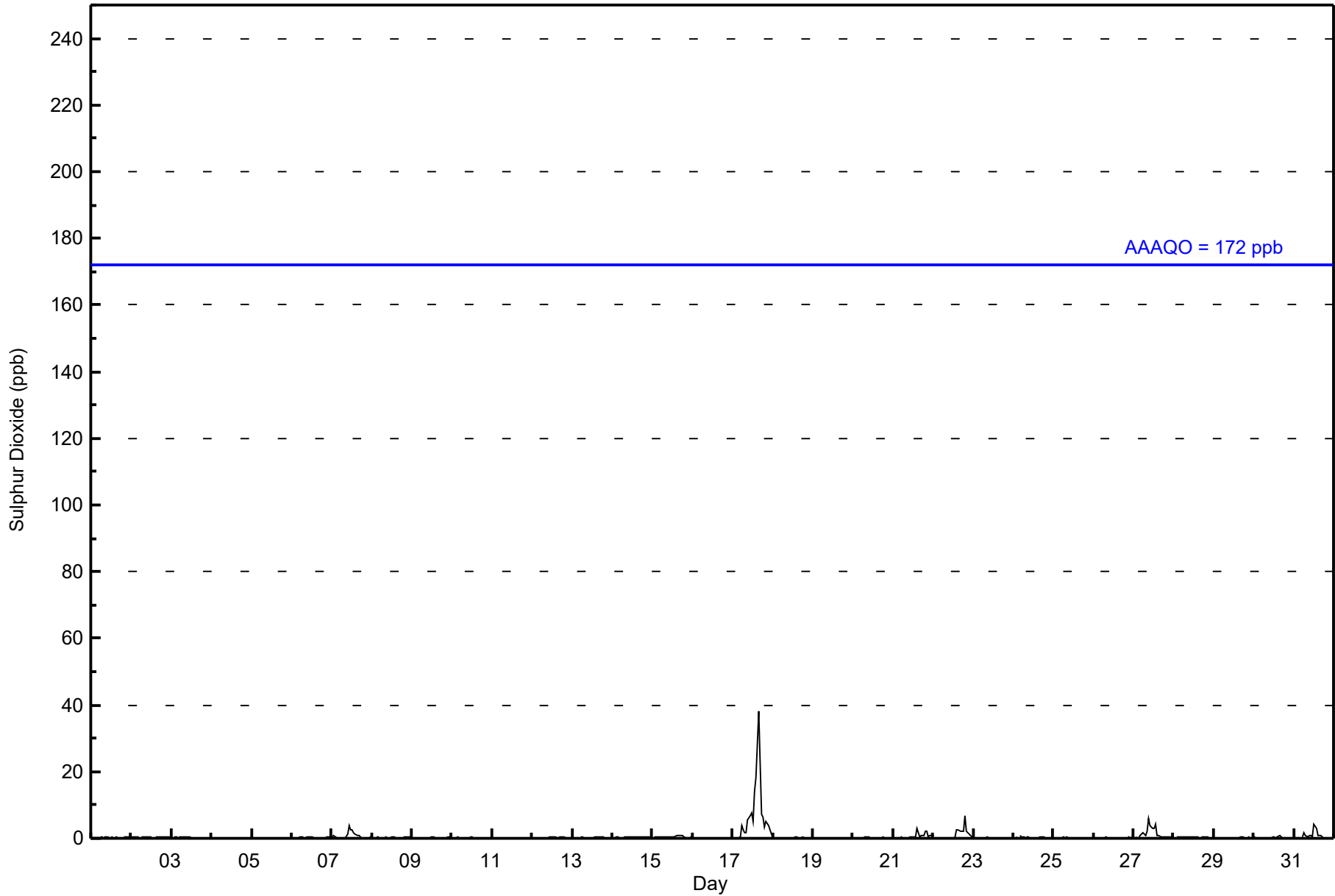
Summary of Hour Averages

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

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 38.1 ppb on Oct 17 16:00	Maximum Daily Average: 6.9 ppb on Oct 17		Hours of Data:	708
Minimum Value: 0.0 ppb on Oct 4 06:00	Minimum Daily Average: 0.0 ppb on Oct 5		Hours of Missing Data:	36
Maximum Diurnal Average: 1.6 ppb at hour 16	Minimum Diurnal Average: 0.1 ppb at hour 4		Hours of Calibration:	35
Monthly Average: 0.50 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.2 Q ₃ = 0.3 P ₉₀ = 0.6 P ₉₉ = 6.6		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-Oct	0.1	0.0	0.0	0.1	Z	0.4	0.3	0.2	0.3	0.5	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.3	0.2	0.3	0.2	0.2	0.5																						
2-Oct	0.2	0.3	0.4	0.3	0.3	Z	0.3	0.3	0.3	0.4	0.4	0.3	0.3	M	0.3	0.2	0.2	0.3	0.3	0.3	0.2	0.3	0.2	0.3	0.3	0.4																						
3-Oct	Z	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.2	0.3																						
4-Oct	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	0.0	0.0	0.0	0.0	0.1																						
5-Oct	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	0.1	0.0	0.1																						
6-Oct	0.0	0.1	0.1	Z	0.1	0.3	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.4	0.1	0.2	0.4																						
7-Oct	0.6	0.7	0.5	0.2	Z	0.1	0.2	0.1	0.1	1.3	4.0	2.3	2.4	1.5	1.4	0.9	0.7	0.4	0.2	0.1	0.0	0.0	0.2	0.2	0.8	4.0																						
8-Oct	0.2	0.0	0.1	0.3	0.3	Z	0.2	0.1	0.2	0.1	0.2	0.2	0.5	0.3	0.2	0.1	0.1	0.1	0.2	0.3	0.3	0.5	0.3	0.2	0.2	0.5																						
9-Oct	Z	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.4	0.4	0.2	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.4																						
10-Oct	0.2	Z	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	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.2																						
11-Oct	0.1	0.2	Z	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2																						
12-Oct	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.3	0.5	0.3	0.3	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.5																						
13-Oct	0.1	0.1	0.1	0.1	Z	0.4	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.3	0.3	0.5	0.3	0.4	0.3	0.1	0.0	0.0	0.1	0.1	0.2	0.5																						
14-Oct	0.2	0.2	0.3	0.2	0.3	Z	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.3	0.4	0.5	0.5	0.5	0.4	0.3	0.3	0.4	0.3	0.3	0.3	0.5																						
15-Oct	Z	0.4	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.8	0.8	0.6	0.7	0.6	0.5	0.1	0.2	0.1	0.2	0.4	0.8																						
16-Oct	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.2	0.1	0.0	0.1	0.0	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2																						
17-Oct	0.2	0.1	Z	0.1	0.3	3.7	2.6	1.8	1.8	5.6	6.7	7.5	5.0	13.8	18.2	38.1	22.4	7.1	6.3	3.4	5.2	3.8	2.5	1.4	6.9	38.1																						
18-Oct	0.4	0.2	0.0	Z	0.1	0.2	0.1	0.0	0.1	0.1	0.2	0.2	0.1	0.2	0.3	0.1	0.1	0.2	0.3	0.1	0.0	0.1	0.0	0.0	0.1	0.4																						
19-Oct	0.1	0.1	0.0	0.0	Z	0.0	0.1	0.0	0.1	C	C	C	C	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1																						
20-Oct	0.0	0.0	0.1	0.1	0.0	Z	0.2	0.5	0.6	0.3	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.4	0.2	0.1	0.1	0.1	0.0	0.1	0.6																						
21-Oct	Z	0.2	0.1	0.1	0.2	0.2	0.1	0.0	0.1	0.2	0.3	0.2	0.2	0.3	3.1	1.8	0.4	0.9	0.9	2.0	2.2	0.3	1.0	1.0	0.7	3.1																						
22-Oct	0.8	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	2.4	2.5	2.3	1.9	2.2	6.8	2.0	1.3	0.7	0.3	1.0	6.8																						
23-Oct	0.2	0.1	Z	0.1	0.1	0.1	0.1	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	0.1	0.2																						
24-Oct	0.1	0.1	0.2	Z	0.7	0.6	0.3	0.2	0.4	0.5	0.1	0.1	0.1	0.0	0.1	0.2	0.2	0.3	0.4	0.2	0.2	0.1	0.0	0.1	0.2	0.7																						
25-Oct	0.2	0.2	0.1	0.1	Z	0.5	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.5																						
26-Oct	0.1	0.0	0.1	0.0	0.0	Z	0.2	0.3	0.2	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.2	0.2	0.2	0.1	0.3	0.2	0.2	0.1	0.3																						
27-Oct	Z	0.4	0.2	0.1	0.9	1.8	1.3	0.8	2.0	5.8	3.7	3.0	3.0	4.4	0.7	0.6	0.3	0.3	0.2	0.3	0.3	0.3	0.4	0.3	1.4	5.8																						
28-Oct	0.3	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	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	0.2	0.3	0.4																						
29-Oct	0.2	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.2	0.1	0.1	0.0	0.1	0.3	0.3	0.0	0.0	0.0	0.2	0.1	0.4	0.1	0.4																						
30-Oct	0.4	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.4	0.3	0.2	0.4	0.7	0.6	0.2	0.1	0.2	0.0	0.0	0.0	0.2	0.2	0.7																						
31-Oct	0.1	0.1	0.1	0.1	Z	0.3	1.6	0.9	0.3	0.8	0.9	0.5	4.4	3.2	0.7	0.9	0.8	0.4	0.2	0.1	0.0	0.1	0.1	0.1	0.7	4.4																						
																								0.2	0.2	0.2	0.1	0.2	0.4	0.3	0.2	0.3	0.6	0.7	0.6	0.7	0.9	1.0	1.6	1.0	0.5	0.5	0.5	0.4	0.3	0.3	0.2	Diurnal Average
																								0.8	0.7	0.5	0.4	0.9	3.7	2.6	1.8	2.0	5.8	6.7	7.5	5.0	13.8	18.2	38.1	22.4	7.1	6.3	6.8	5.2	3.8	2.5	1.4	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
Patricia McInnes - October 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	704	99.44	99.44
11 - 20	2	0.28	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
Patricia McInnes - October 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	45	10	1	2	6	89	121	34	43	43	41	42	73	83	42	29	704
11 - 20	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2
21 - 60	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	47	10	1	2	6	89	121	34	43	43	41	42	73	83	42	31	708

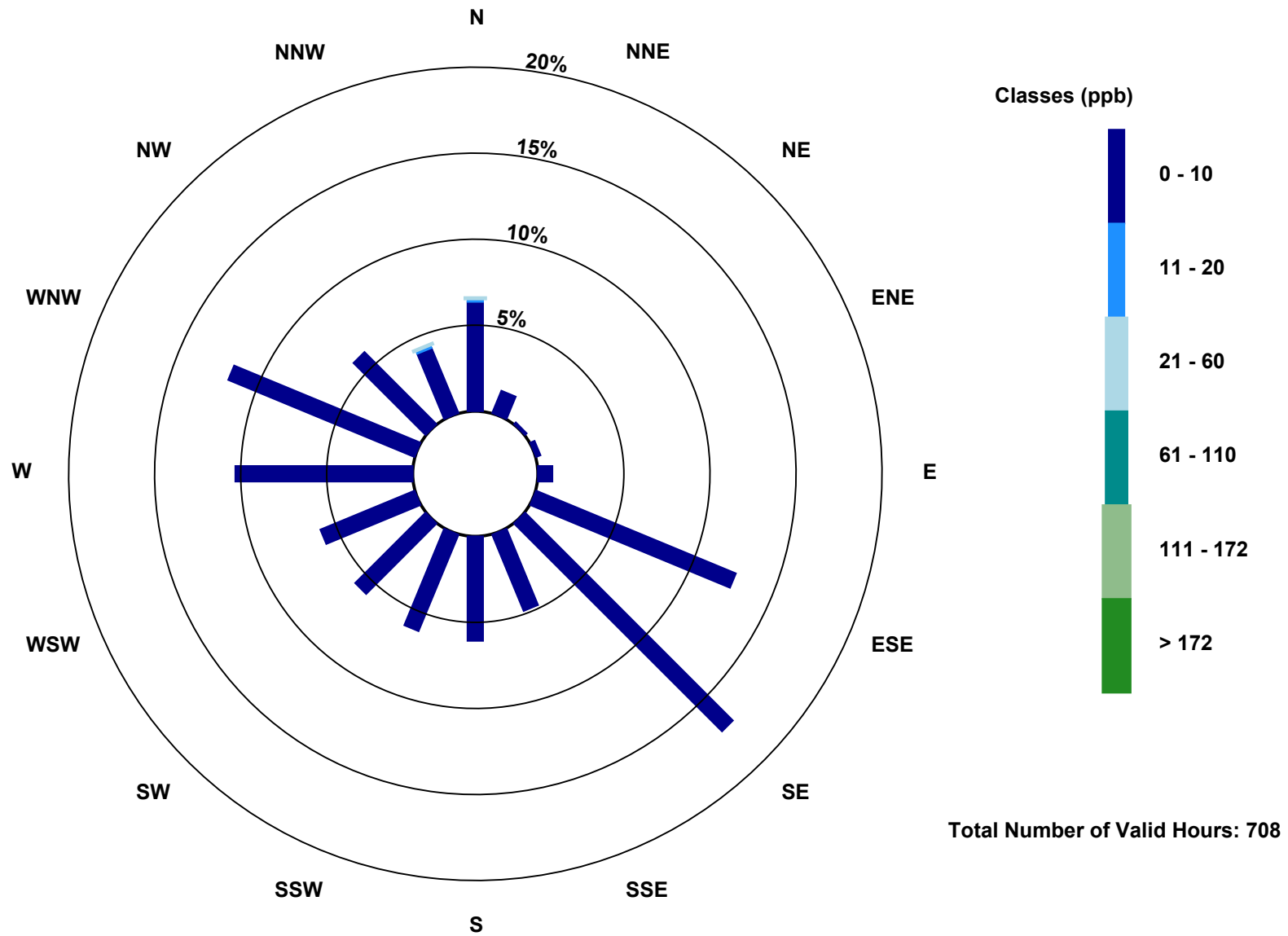
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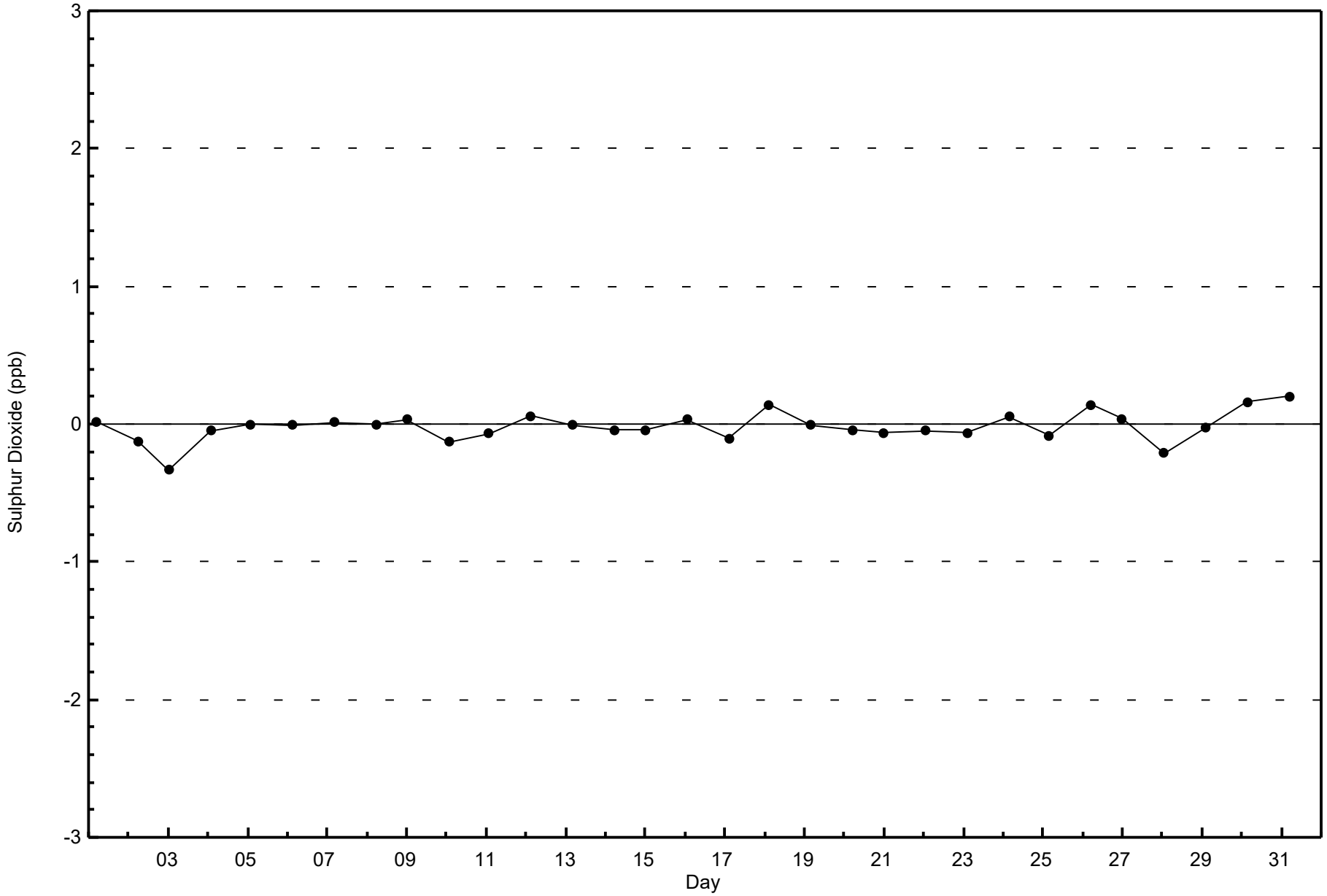
Total Number of Hours: 744

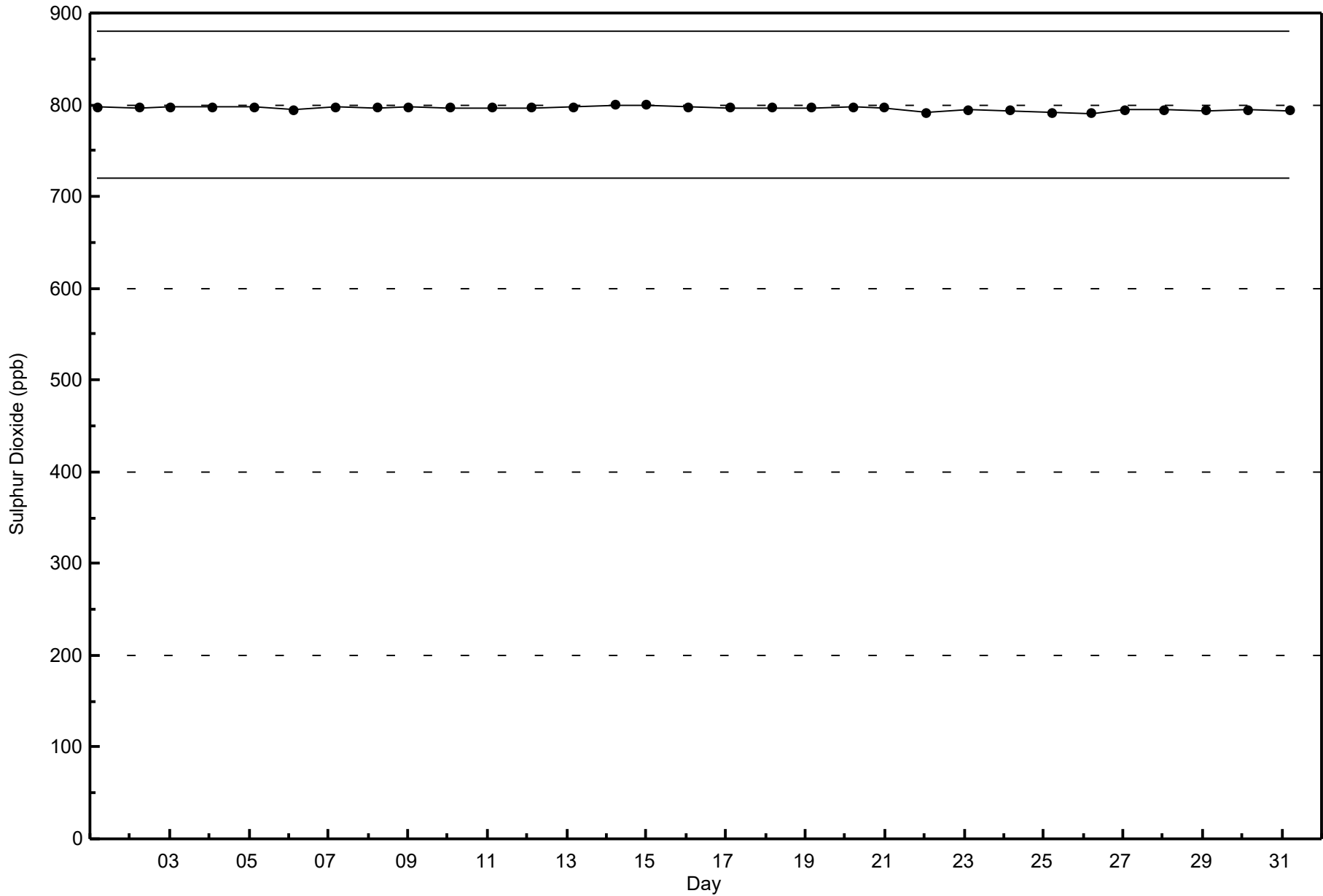


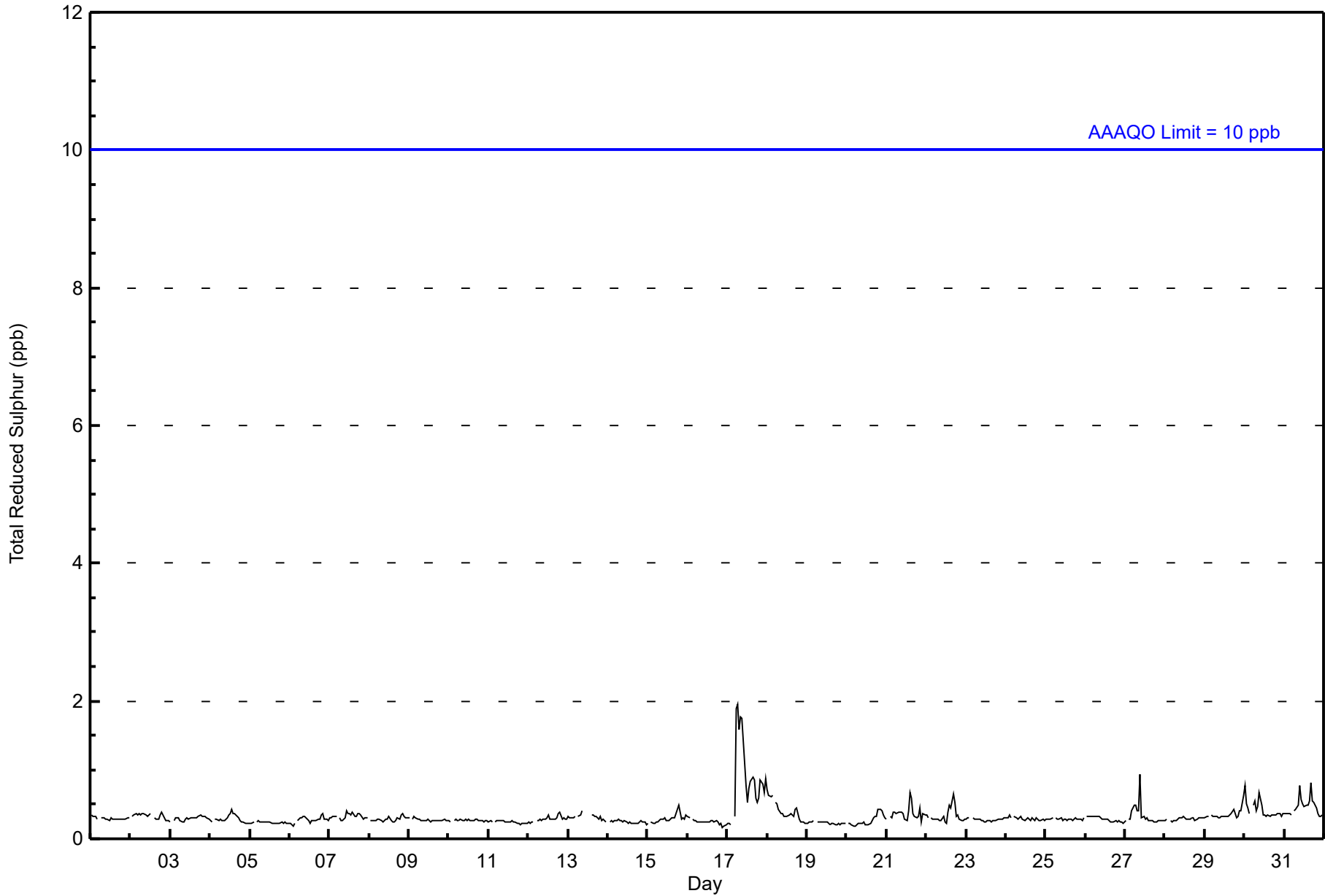
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Sulphur Dioxide (SO₂) - ppb
Patricia McInnes











**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	46	11	1	2	6	86	119	34	45	41	43	43	77	82	40	31	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	46	11	1	2	6	86	119	34	45	41	43	43	77	82	40	31	707

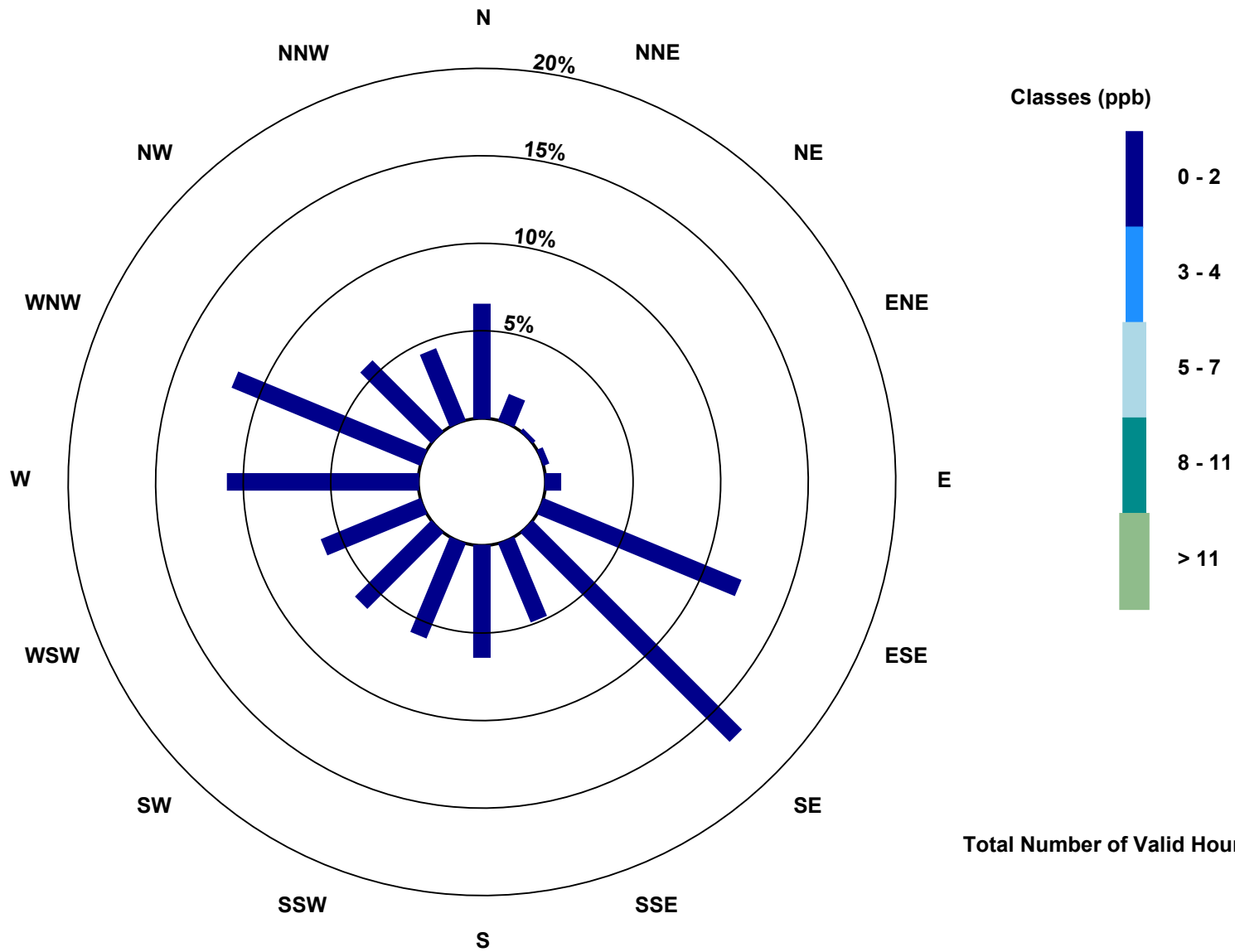
Total Number of Valid Hours: 707

Total Number of Hours: 744

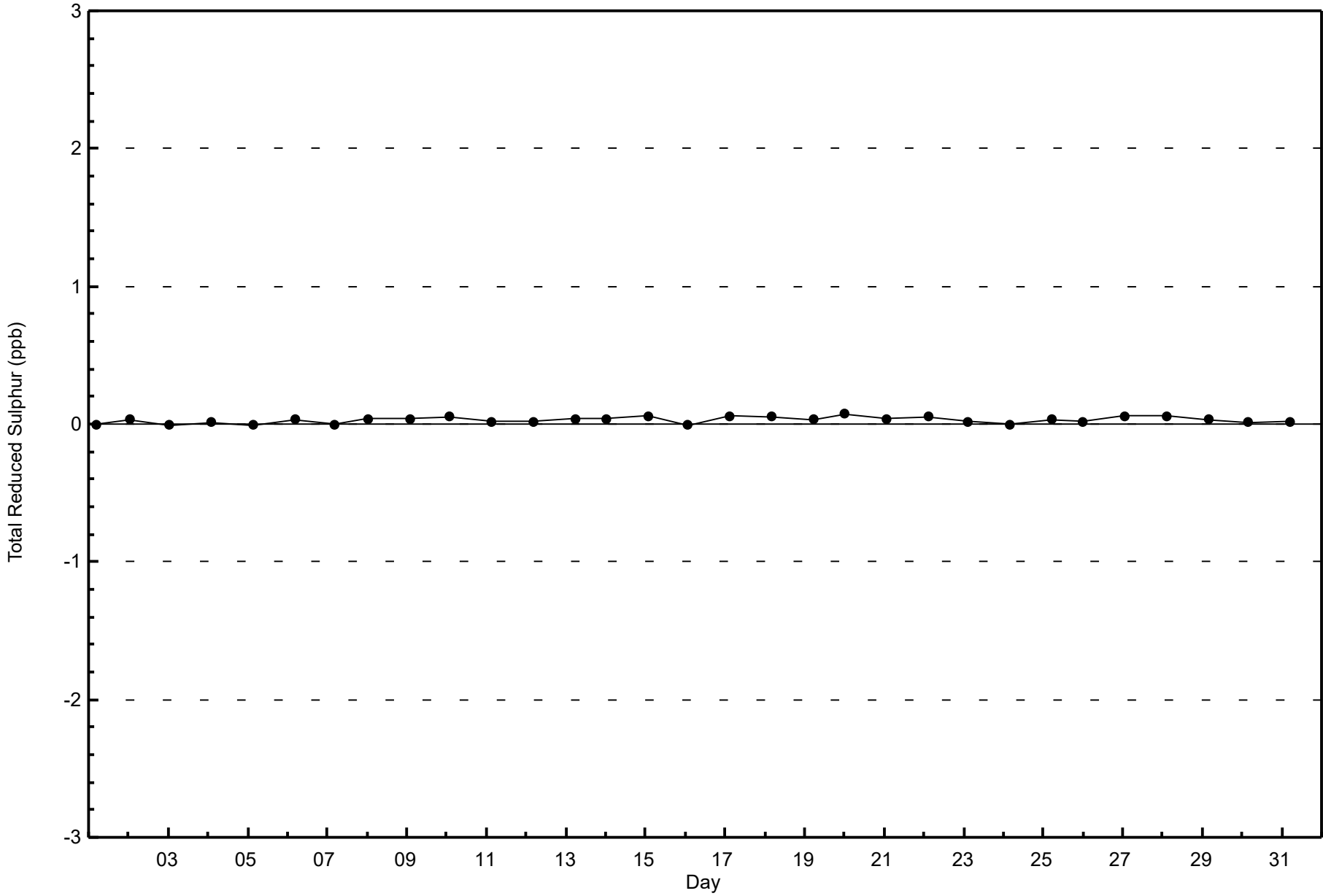


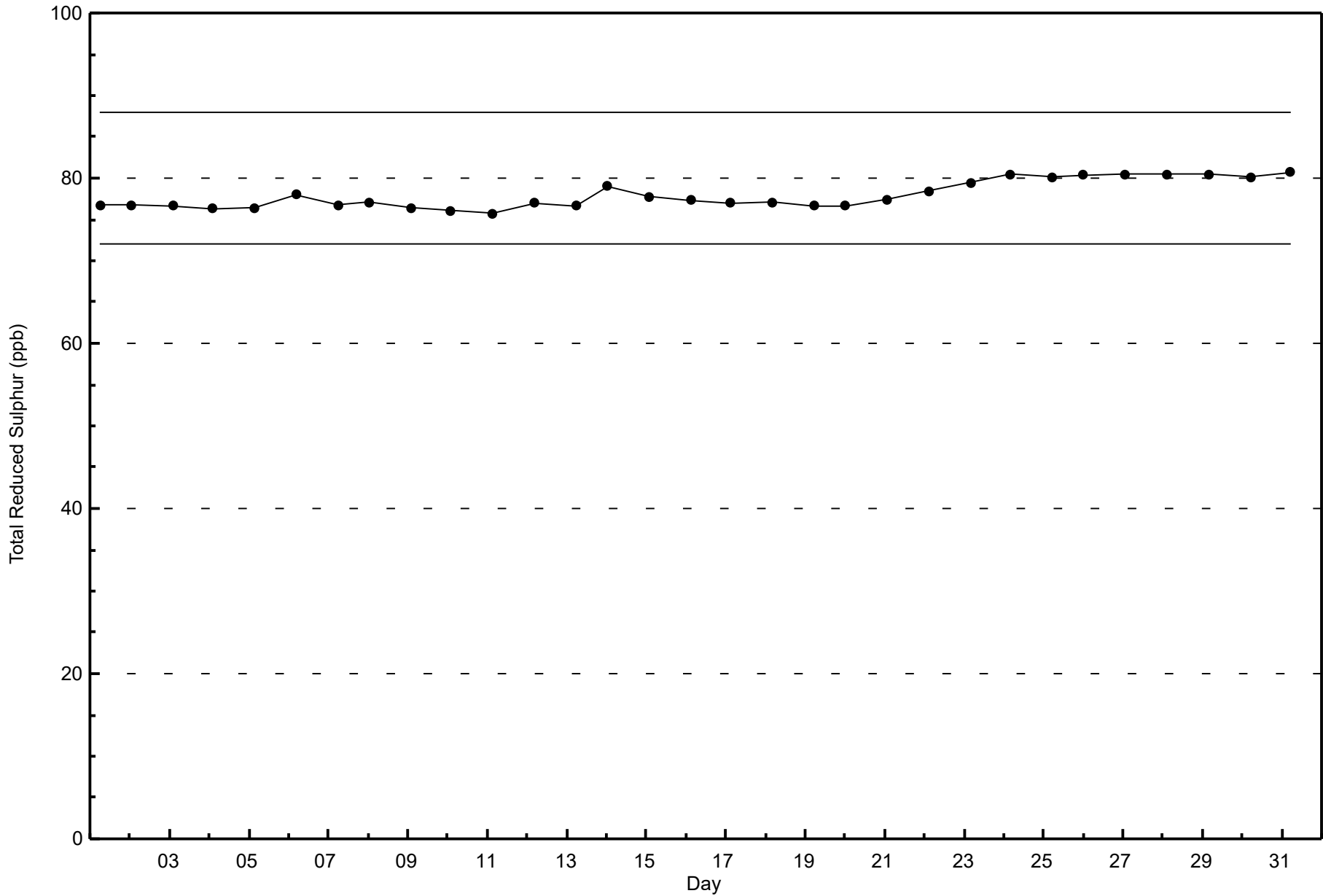
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Total Reduced Sulphur (TRS) - ppb
Patricia McInnes



Total Number of Valid Hours: 707

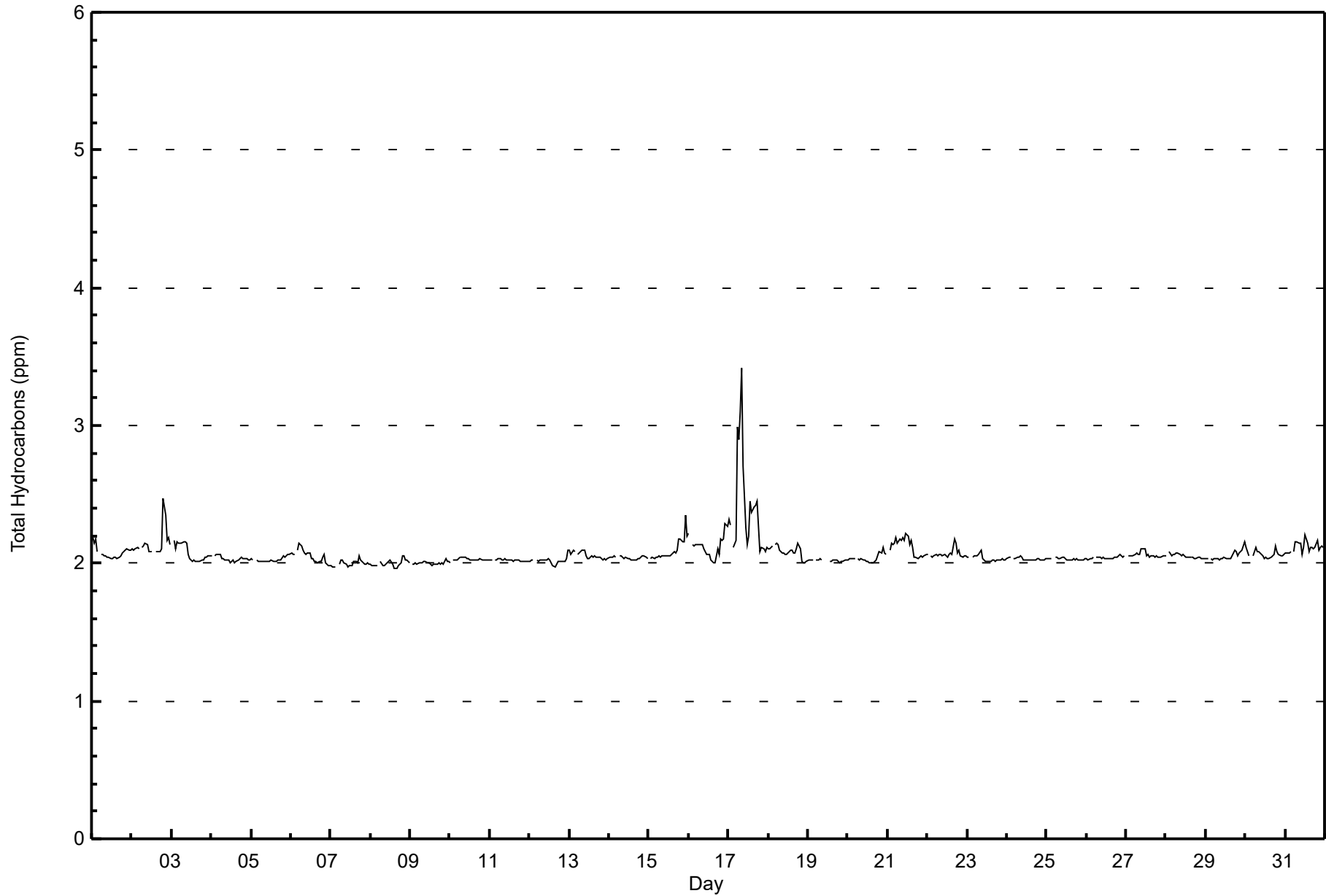






Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	412	58.19	58.19
2.1 - 3.0	294	41.53	99.72
3.1 - 10.0	2	0.28	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
Patricia McInnes - October 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	1	0	0	2	80	64	9	22	13	20	32	53	72	33	4	412
2.1 - 3.0	39	9	1	2	4	9	57	25	21	30	21	10	20	11	9	26	294
3.1 - 10.0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	47	10	1	2	6	89	121	34	43	43	41	42	73	83	42	31	708

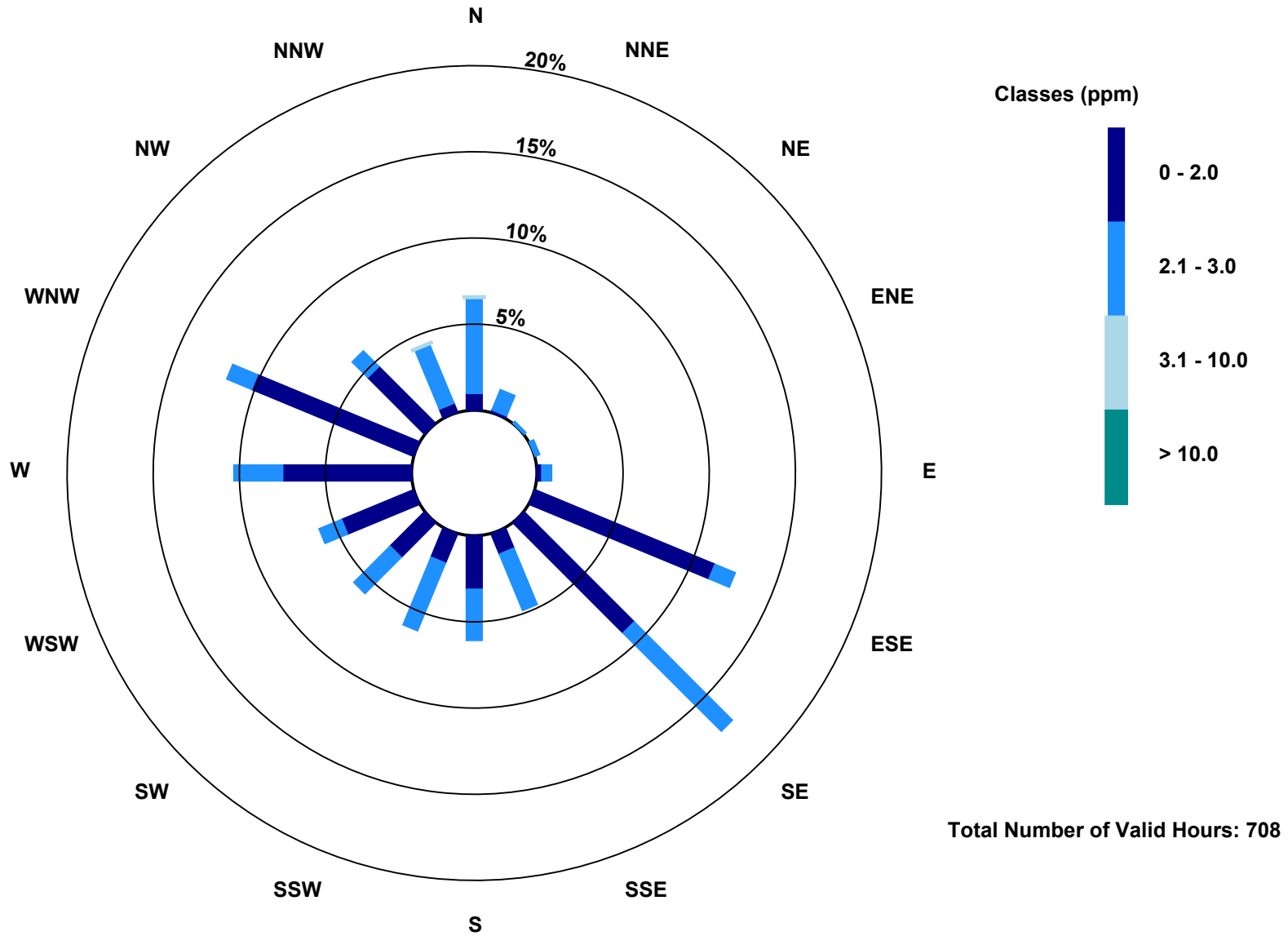
Total Number of Valid Hours: 708

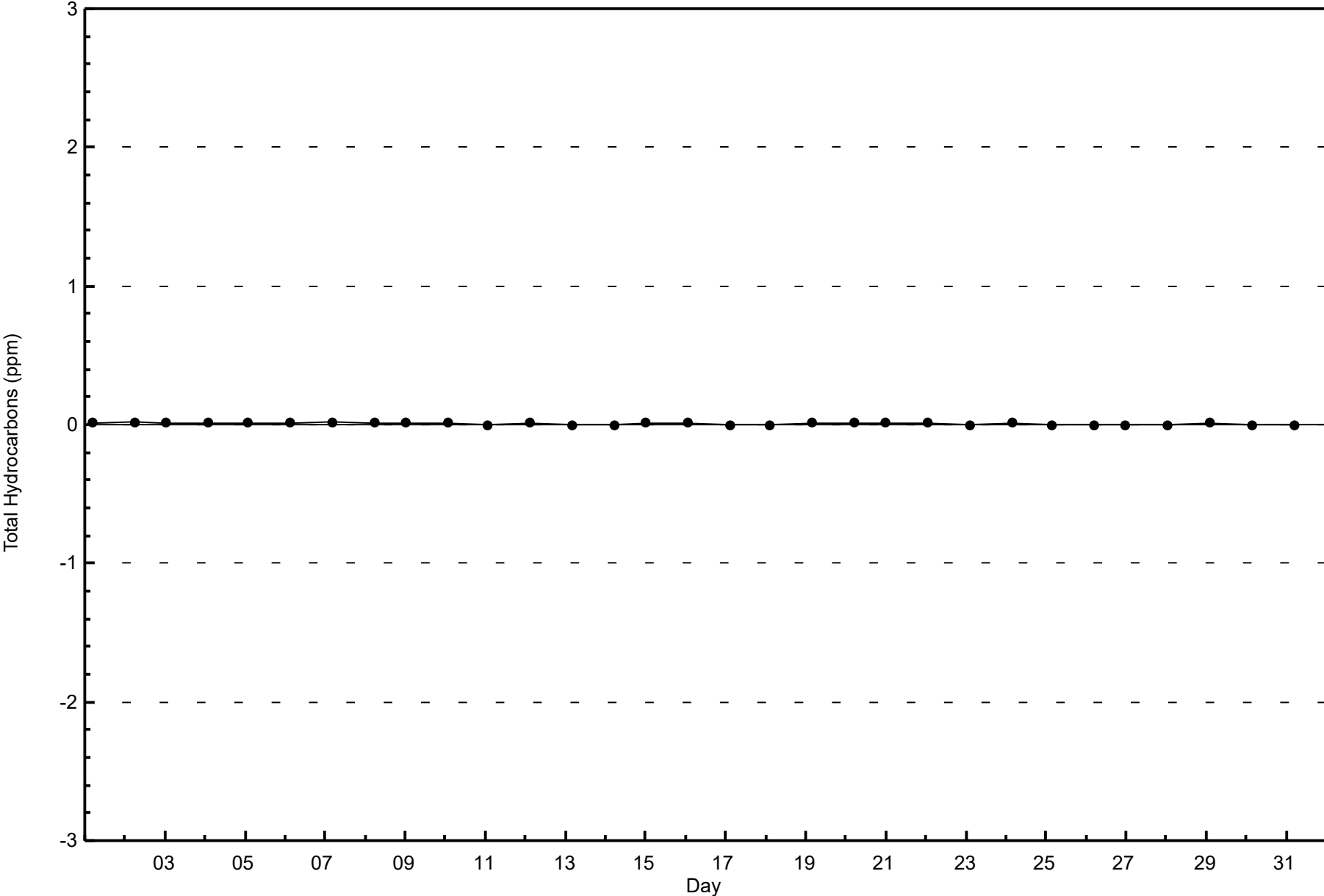
Total Number of Hours: 744

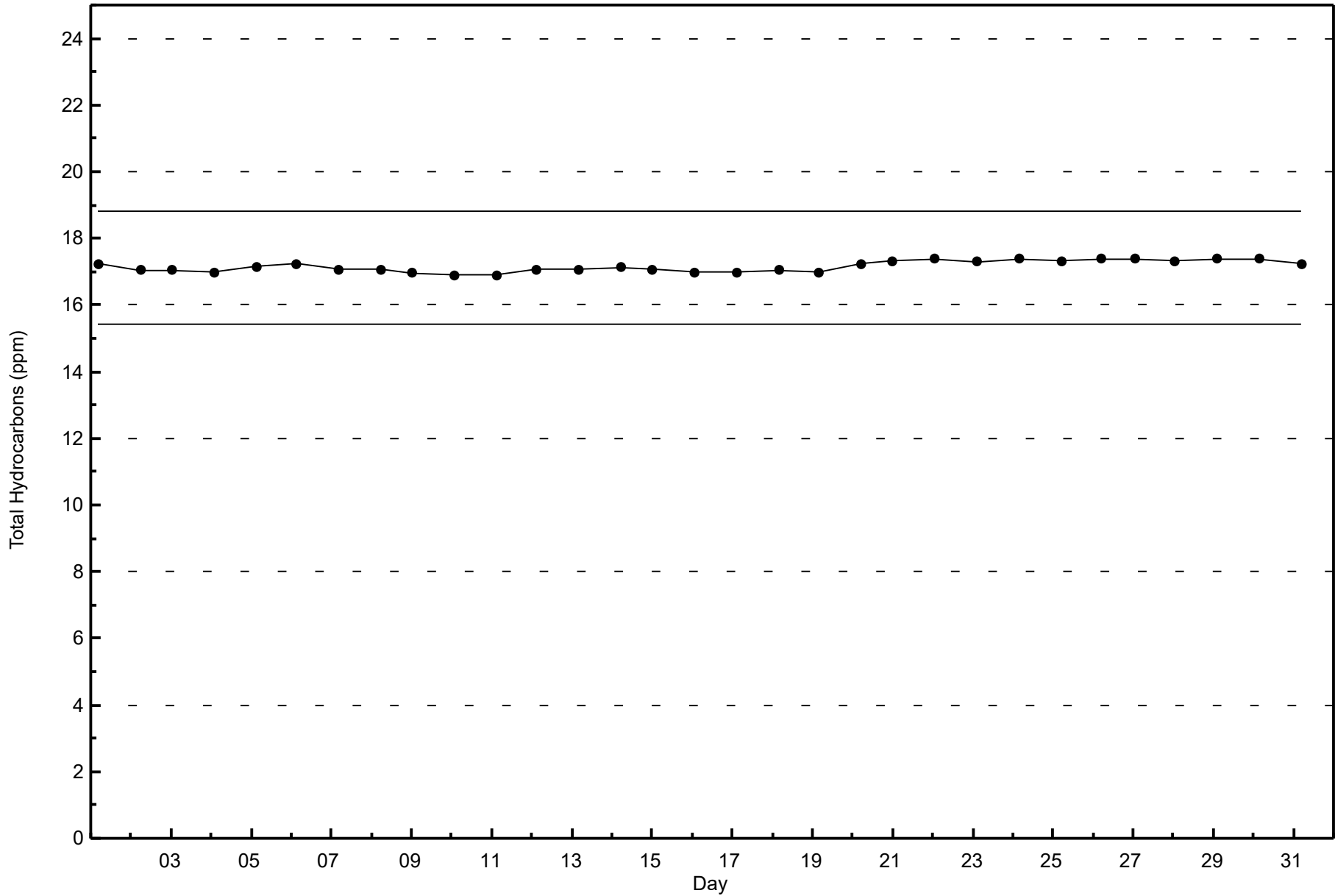


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Total Hydrocarbons (THC) - ppm
Patricia McInnes





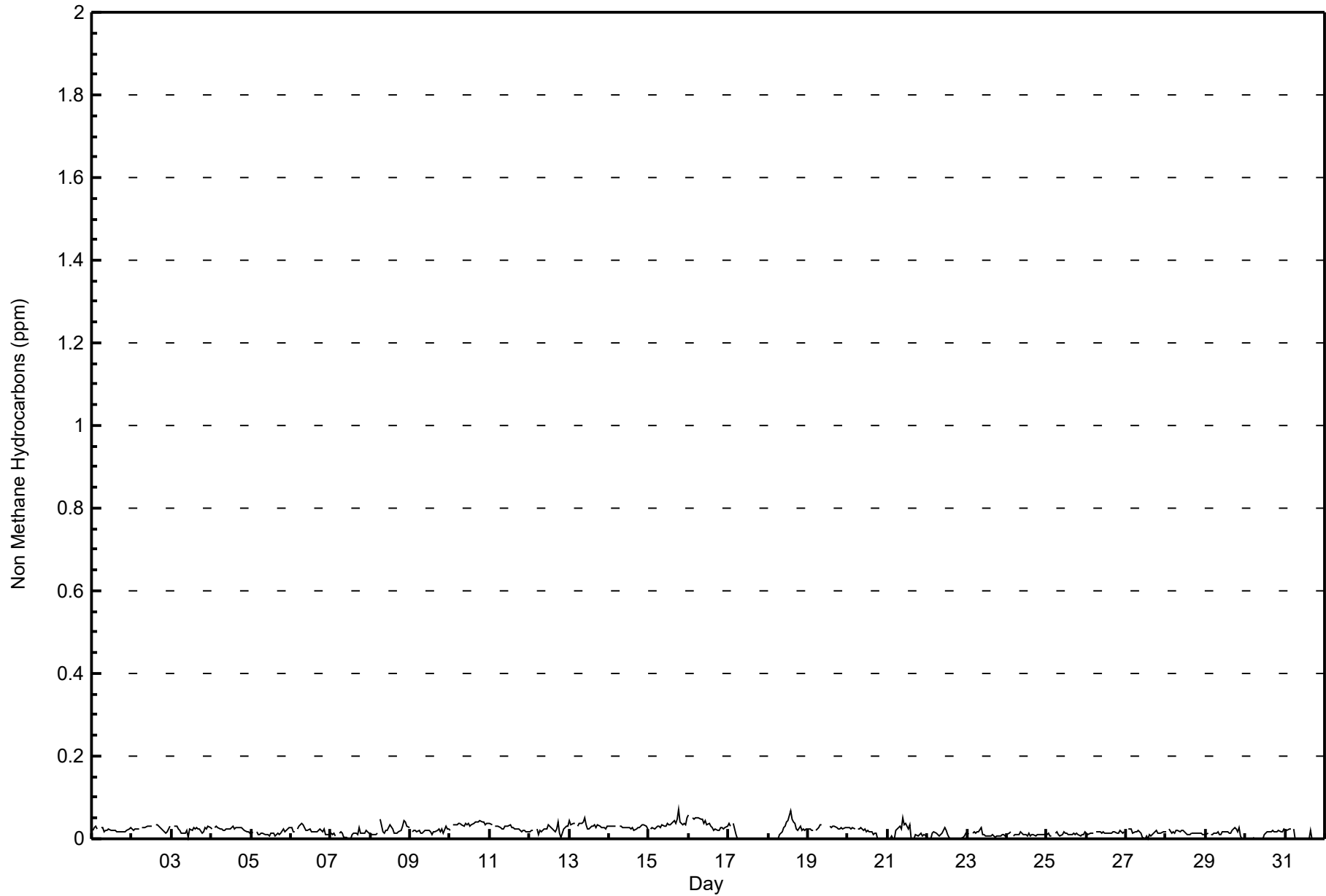




Summary of Hour Averages

Patricia McInnes - October 2023

Maximum Value: 0.070 ppm on Oct 15 19:00		Maximum Daily Average: 0.036 ppm on Oct 10		Hours in Service:	744																						
Minimum Value: 0.000 ppm on Oct 7 11:00		Minimum Daily Average: 0.005 ppm on Oct 17		Hours of Data:	708																						
Maximum Diurnal Average: 0.022 ppm at hour 4		Minimum Diurnal Average: 0.017 ppm at hour 20		Hours of Missing Data:	36																						
Monthly Average: 0.019 ppm		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.0 P ₉₉ = 0.1		Hours of Calibration:	35																						
				Percent Operational Time:	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-Oct	0.020	0.028	0.029	0.024	Z	0.028	0.026	0.018	0.020	0.021	0.022	0.020	0.019	0.020	0.022	0.015	0.018	0.017	0.018	0.018	0.018	0.021	0.025	0.026	0.021	0.029	
2-Oct	0.022	0.022	0.024	0.024	0.024	Z	0.026	0.027	0.027	0.029	0.031	0.031	0.030	M	0.035	0.034	0.032	0.028	0.024	0.019	0.012	0.015	0.023	0.029	0.026	0.035	
3-Oct	Z	0.032	0.030	0.030	0.024	0.021	0.013	0.014	0.013	0.021	0.005	0.024	0.021	0.026	0.024	0.029	0.025	0.024	0.014	0.018	0.026	0.023	0.031	0.028	0.022	0.032	
4-Oct	0.024	Z	0.026	0.032	0.027	0.025	0.022	0.020	0.019	0.024	0.024	0.023	0.026	0.030	0.025	0.026	0.026	0.026	0.028	0.024	0.020	0.018	0.017	0.013	0.024	0.032	
5-Oct	0.020	0.013	Z	0.016	0.009	0.012	0.014	0.012	0.009	0.012	0.011	0.008	0.014	0.012	0.008	0.010	0.013	0.010	0.014	0.023	0.016	0.021	0.024	0.026	0.014	0.026	
6-Oct	0.028	0.018	0.016	Z	0.024	0.030	0.039	0.034	0.026	0.020	0.021	0.024	0.016	0.019	0.017	0.018	0.018	0.024	0.019	0.016	0.022	0.011	0.009	0.010	0.021	0.039	
7-Oct	0.012	0.010	0.013	0.008	Z	0.012	0.016	0.014	0.004	0.004	0.000	0.000	0.000	0.011	0.015	0.014	0.011	0.027	0.015	0.013	0.013	0.019	0.017	0.014	0.012	0.027	
8-Oct	0.013	0.011	0.011	0.010	0.013	Z	0.047	0.015	0.013	0.021	0.022	0.026	0.034	0.025	0.015	0.015	0.015	0.016	0.020	0.030	0.045	0.039	0.030	0.026	0.022	0.047	
9-Oct	Z	0.017	0.019	0.020	0.016	0.020	0.015	0.015	0.017	0.020	0.021	0.021	0.018	0.011	0.018	0.017	0.022	0.024	0.019	0.022	0.014	0.032	0.025	0.024	0.019	0.032	
10-Oct	0.021	Z	0.034	0.032	0.035	0.037	0.038	0.035	0.031	0.036	0.035	0.037	0.032	0.034	0.038	0.041	0.040	0.041	0.044	0.042	0.039	0.035	0.039	0.039	0.036	0.044	
11-Oct	0.037	0.034	Z	0.031	0.031	0.030	0.028	0.023	0.025	0.030	0.030	0.029	0.032	0.026	0.026	0.024	0.025	0.025	0.022	0.015	0.021	0.019	0.018	0.018	0.026	0.037	
12-Oct	0.018	0.021	0.019	Z	0.023	0.011	0.019	0.018	0.019	0.024	0.023	0.034	0.030	0.027	0.023	0.018	0.025	0.039	0.013	0.002	0.023	0.027	0.031	0.030	0.023	0.039	
13-Oct	0.043	0.035	0.039	0.036	Z	0.030	0.037	0.038	0.042	0.051	0.032	0.023	0.024	0.029	0.029	0.033	0.028	0.035	0.031	0.027	0.027	0.027	0.024	0.029	0.033	0.051	
14-Oct	0.029	0.030	0.031	0.031	0.029	Z	0.031	0.029	0.027	0.027	0.029	0.028	0.026	0.024	0.026	0.020	0.024	0.027	0.027	0.030	0.034	0.035	0.030	0.023	0.028	0.035	
15-Oct	Z	0.025	0.027	0.024	0.026	0.029	0.030	0.028	0.033	0.032	0.032	0.037	0.033	0.034	0.041	0.042	0.038	0.048	0.070	0.042	0.035	0.036	0.034	0.050	0.036	0.070	
16-Oct	0.056	Z	0.050	0.049	0.050	0.049	0.051	0.047	0.047	0.038	0.043	0.035	0.037	0.030	0.028	0.022	0.023	0.020	0.021	0.027	0.026	0.023	0.027	0.031	0.036	0.056	
17-Oct	0.037	0.032	Z	0.039	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.039	
18-Oct	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.009	0.018	0.029	0.030	0.039	0.043	0.067	0.046	0.041	0.037	0.023	0.021	0.031	0.021	0.025	0.020	0.023	0.023	0.067	
19-Oct	0.023	0.023	0.021	0.020	Z	0.021	0.027	0.033	0.032	C	C	C	C	0.030	0.026	0.029	0.029	0.026	0.022	0.023	0.027	0.024	0.027	0.028	0.026	0.033	
20-Oct	0.028	0.028	0.024	0.027	0.025	Z	0.025	0.023	0.027	0.021	0.024	0.018	0.022	0.017	0.017	0.011	0.013	0.014	0.000	0.000	0.000	0.000	0.000	0.016	0.028		
21-Oct	Z	0.000	0.006	0.001	0.000	0.022	0.025	0.029	0.024	0.051	0.032	0.037	0.024	0.034	0.000	0.000	0.000	0.011	0.008	0.010	0.014	0.008	0.012	0.007	0.015	0.051	
22-Oct	0.000	Z	0.000	0.012	0.015	0.014	0.009	0.008	0.009	0.013	0.028	0.019	0.009	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.008	0.013	0.007	0.028	
23-Oct	0.011	0.013	Z	0.013	0.017	0.013	0.017	0.016	0.027	0.010	0.010	0.006	0.006	0.006	0.009	0.008	0.005	0.008	0.008	0.008	0.008	0.011	0.009	0.007	0.011	0.027	
24-Oct	0.010	0.012	0.017	Z	0.007	0.011	0.011	0.010	0.017	0.013	0.009	0.009	0.007	0.012	0.007	0.010	0.011	0.007	0.012	0.011	0.010	0.010	0.010	0.012	0.011	0.017	
25-Oct	0.011	0.014	0.008	0.007	Z	0.013	0.015	0.011	0.007	0.012	0.016	0.014	0.012	0.011	0.011	0.012	0.012	0.009	0.012	0.011	0.008	0.011	0.011	0.016	0.012	0.016	
26-Oct	0.015	0.009	0.014	0.014	0.015	Z	0.017	0.017	0.018	0.014	0.017	0.014	0.015	0.015	0.015	0.014	0.015	0.018	0.015	0.014	0.021	0.017	0.012	0.018	0.015	0.021	
27-Oct	Z	0.024	0.024	0.025	0.015	0.018	0.015	0.020	0.018	0.013	0.003	0.000	0.006	0.001	0.009	0.006	0.014	0.016	0.019	0.013	0.013	0.014	0.017	0.017	0.014	0.025	
28-Oct	0.017	Z	0.023	0.013	0.016	0.015	0.019	0.020	0.018	0.019	0.021	0.017	0.014	0.012	0.011	0.014	0.014	0.014	0.013	0.014	0.015	0.015	0.010	0.012	0.015	0.023	
29-Oct	0.011	0.014	Z	0.012	0.011	0.013	0.014	0.016	0.011	0.011	0.017	0.018	0.016	0.015	0.013	0.013	0.019	0.029	0.025	0.016	0.026	0.007	0.000	0.000	0.014	0.029	
30-Oct	0.000	0.000	0.001	Z	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.009	0.015	0.016	0.016	0.018	0.022	0.018	0.016	0.017	0.019	0.018	0.017	0.024	0.010	0.024
31-Oct	0.020	0.021	0.024	0.025	Z	0.023	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.025	
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerospan		C - Calibration				M - Maintenance																					





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	88	12.43	12.43
0.006 - 0.05	617	87.15	99.58
0.06 - 0.1	3	0.42	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
Patricia McInnes - October 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	27	3	0	0	1	1	3	5	6	5	1	2	7	6	1	20	88
0.006 - 0.05	20	7	1	2	5	88	117	28	36	38	40	40	66	77	41	11	617
0.06 - 0.1	0	0	0	0	0	0	1	1	1	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	0	0
Totals	47	10	1	2	6	89	121	34	43	43	41	42	73	83	42	31	708

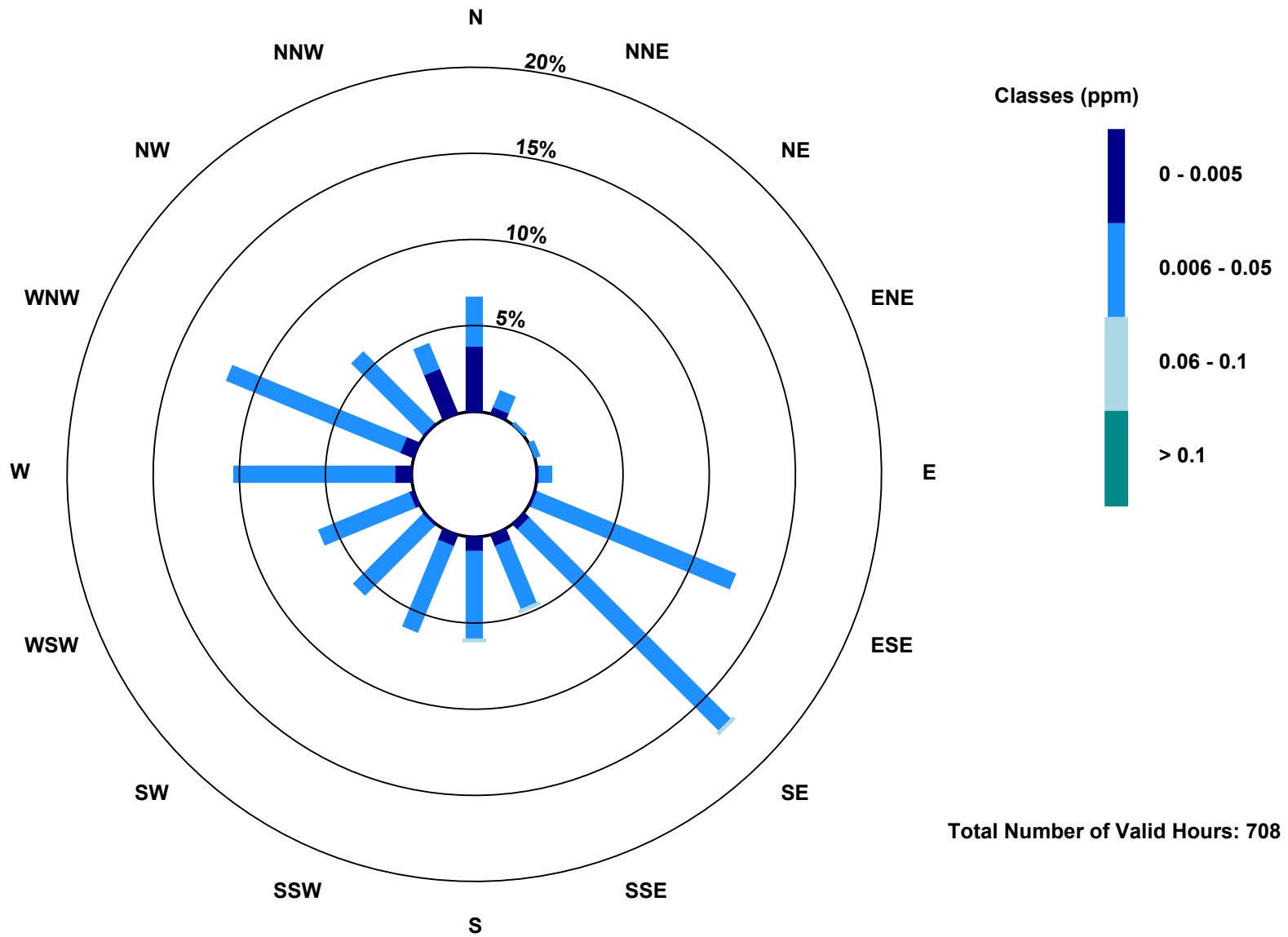
Total Number of Valid Hours: 708

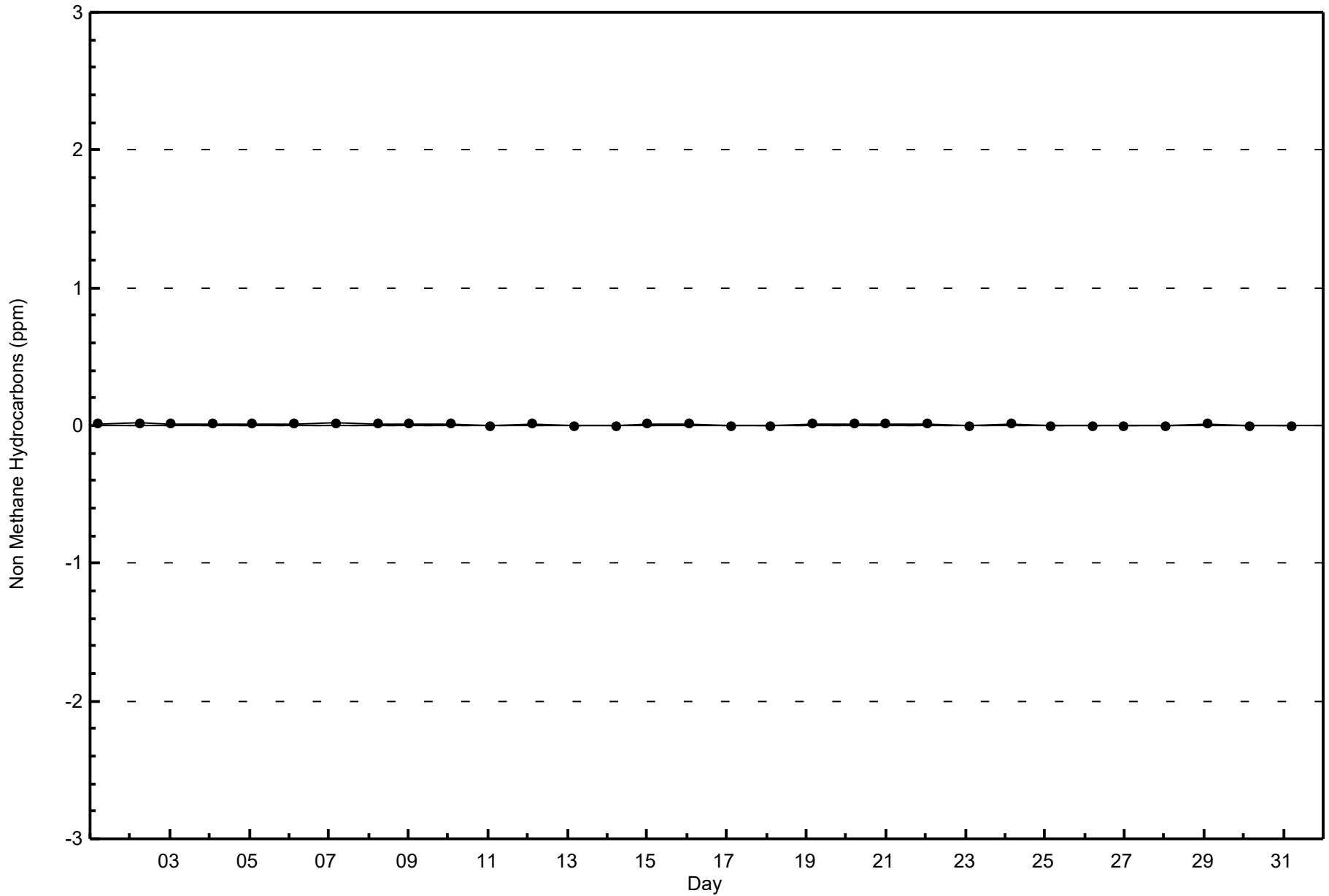
Total Number of Hours: 744

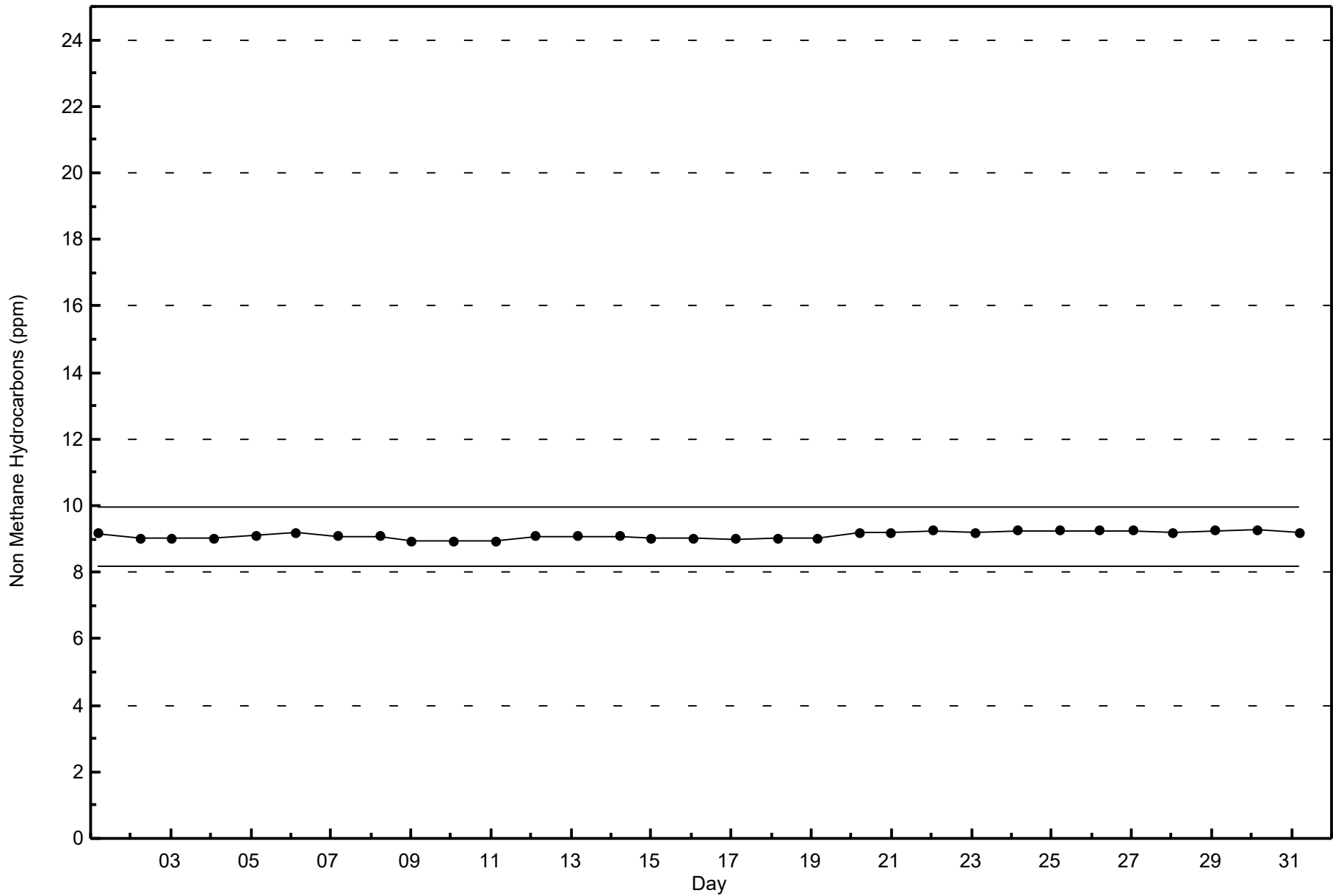


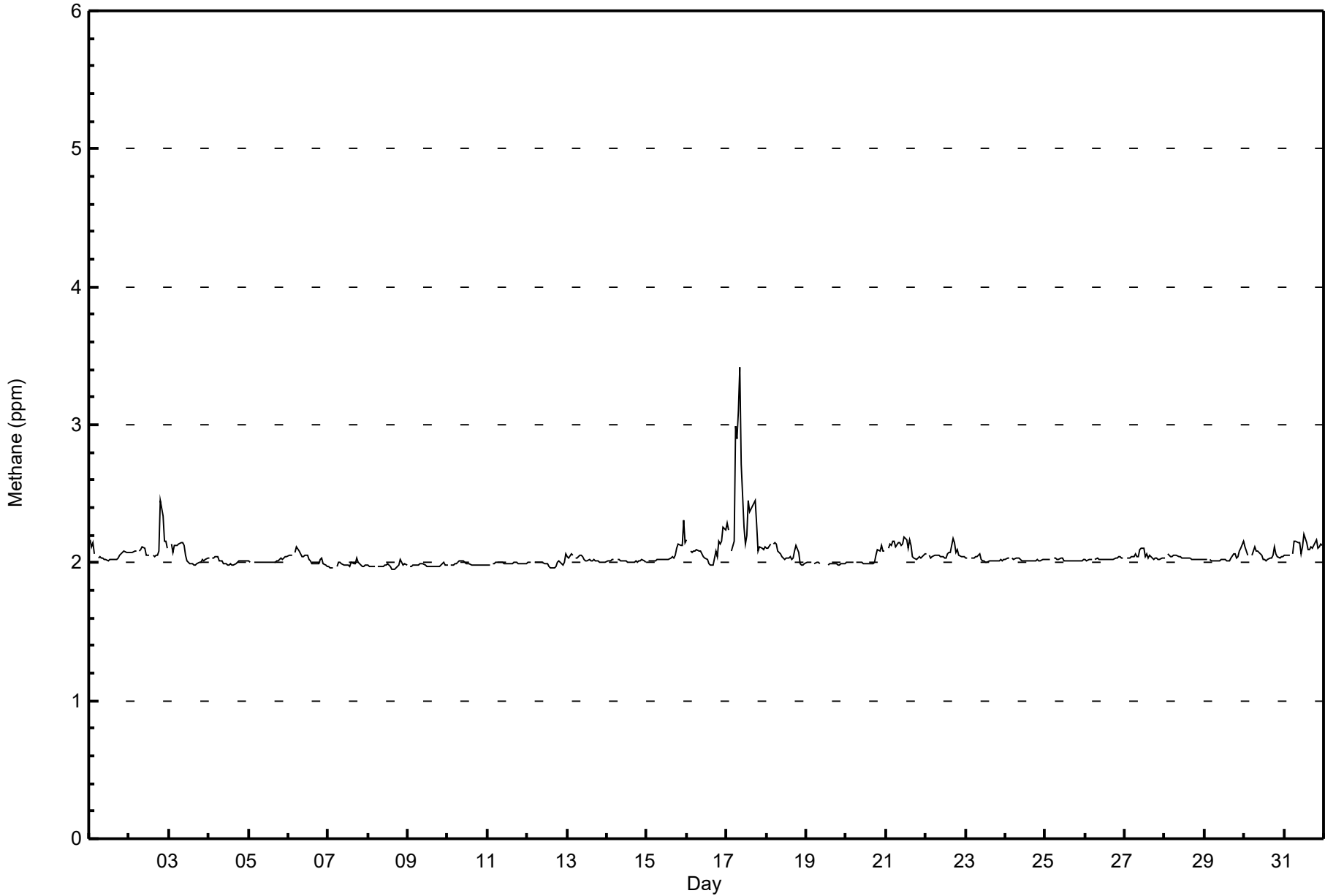
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Non Methane Hydrocarbons (NMHC) - ppm
Patricia McInnes











Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Patricia McInnes - October 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	516	72.88	72.88
2.1 - 3.0	190	26.84	99.72
3.1 - 10.0	2	0.28	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
Patricia McInnes - October 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	4	1	1	3	83	90	16	27	25	30	36	62	78	38	8	516
2.1 - 3.0	32	6	0	1	3	6	31	18	16	18	11	6	11	5	4	22	190
3.1 - 10.0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	47	10	1	2	6	89	121	34	43	43	41	42	73	83	42	31	708

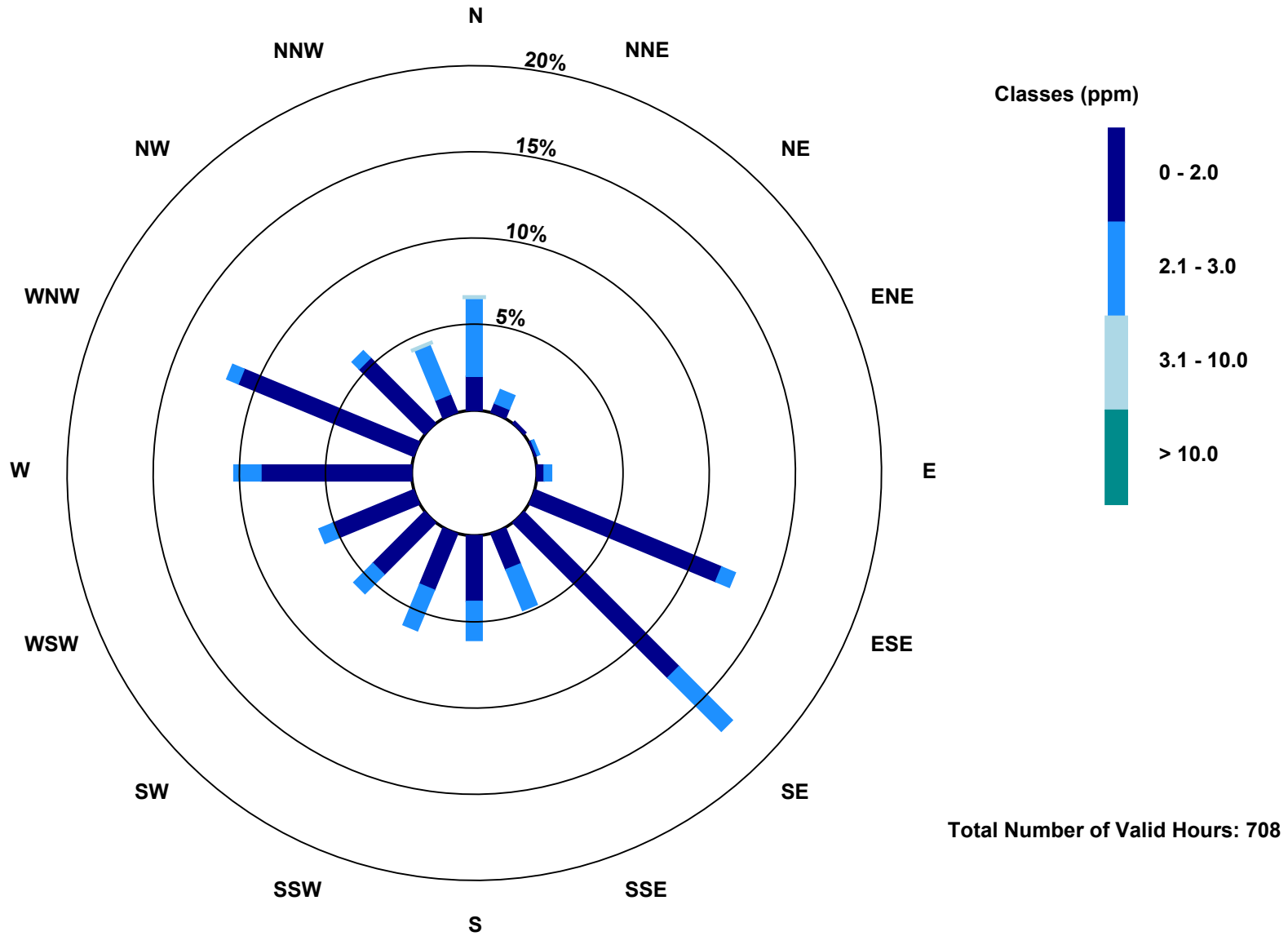
Total Number of Valid Hours: 708

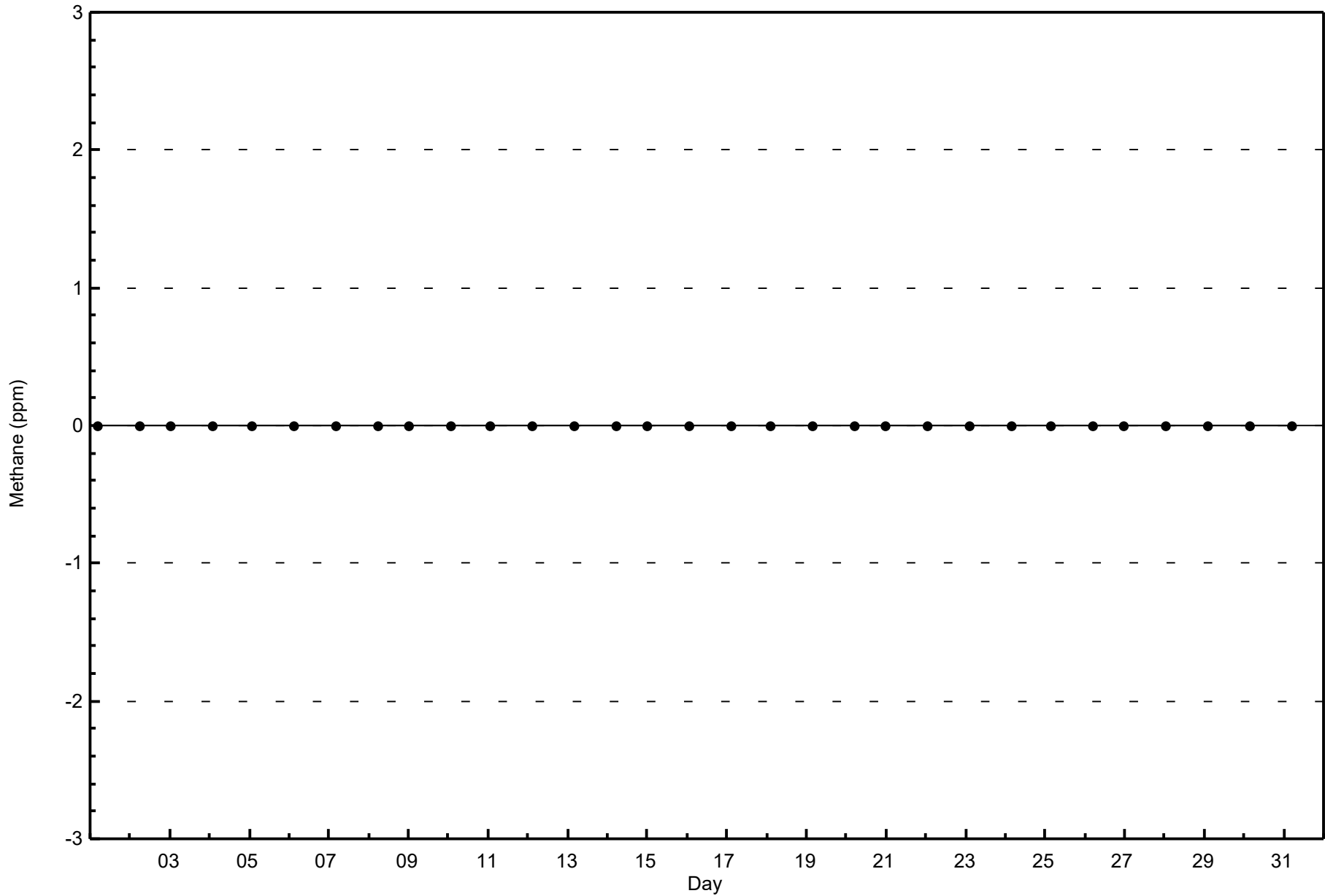
Total Number of Hours: 744

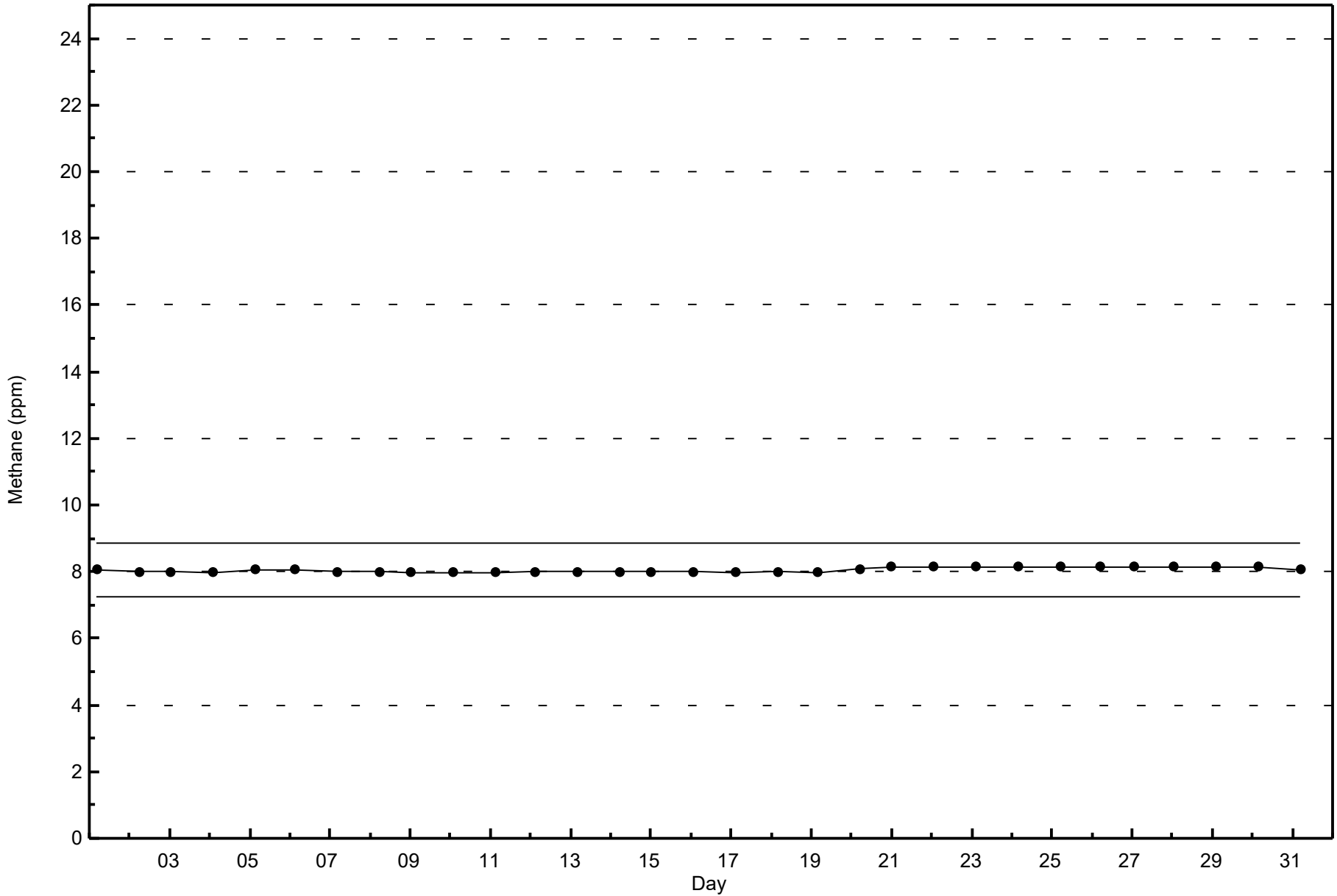


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Methane (CH₄) - ppm
Patricia McInnes









Wood Buffalo Environmental Association

Summary of Hour Averages

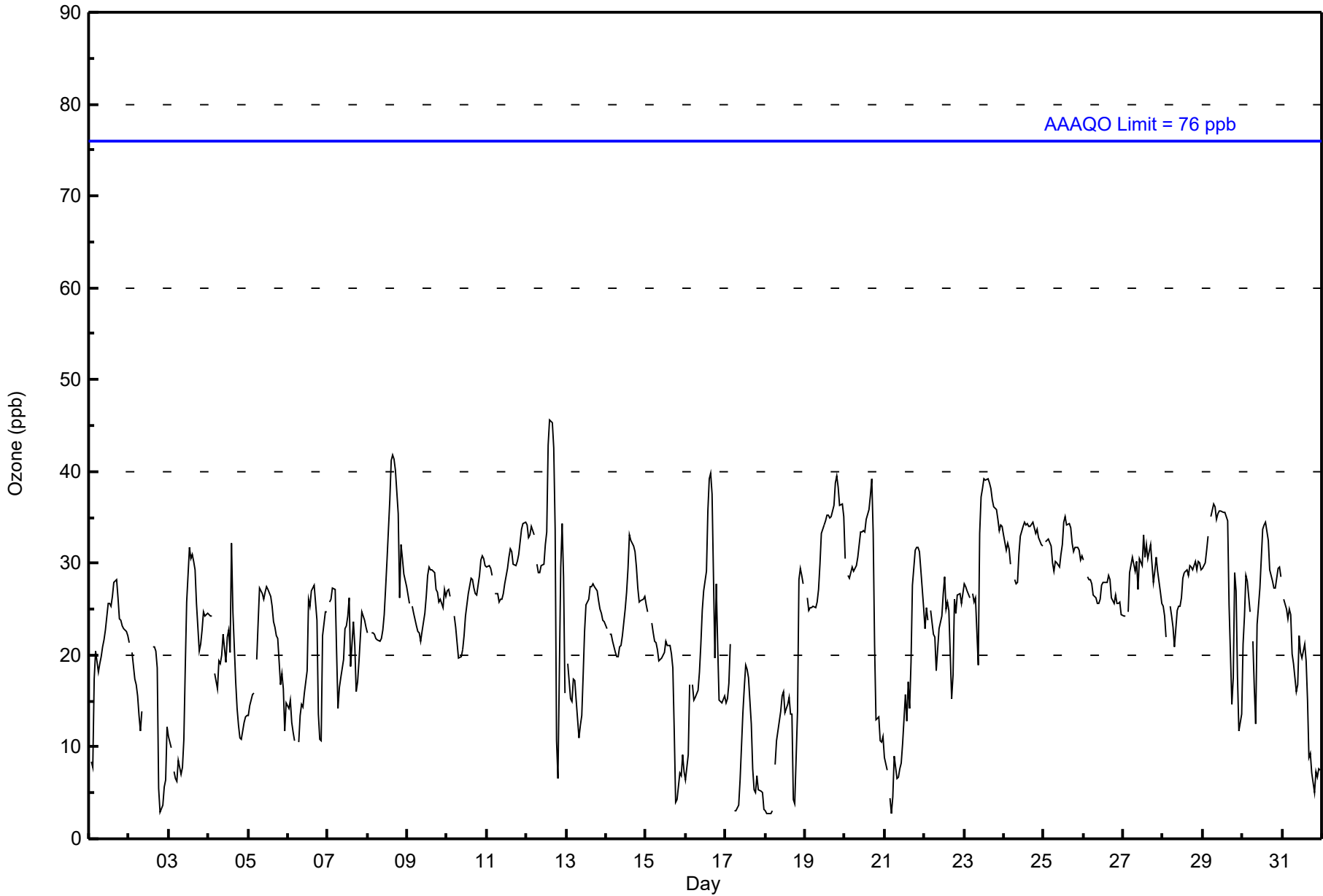
Ozone (O₃) - ppb

Patricia McInnes - October 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 45.6 ppb on Oct 12 15:00	Maximum Daily Average: 32.8 ppb on Oct 23		Hours of Data:	708
Minimum Value: 2.7 ppb on Oct 18 03:00	Minimum Daily Average: 10.0 ppb on Oct 17		Hours of Missing Data:	36
Maximum Diurnal Average: 29.4 ppb at hour 15	Minimum Diurnal Average: 20.3 ppb at hour 8		Hours of Calibration:	36
Monthly Average: 23.79 ppb	Percentiles: P ₁ = 3.1 P ₁₀ = 10.8 Q ₁ = 18.6 Median = 25.4 Q ₃ = 29.7 P ₉₀ = 34.0 P ₉₉ = 40.1		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-Oct	Z	8.3	7.7	17.4	20.4	18.2	19.0	19.8	20.9	21.6	22.8	25.6	25.6	25.4	26.4	28.0	28.2	26.2	23.9	23.8	23.2	22.9	22.6	22.2	21.7	28.2																							
2-Oct	21.4	Z	20.3	17.4	16.8	15.5	13.5	11.8	13.9	C	C	C	C	C	20.8	20.9	20.5	18.6	5.5	2.9	3.7	5.7	6.4	12.2	13.8	21.4																							
3-Oct	11.2	9.9	Z	7.3	6.5	6.3	8.6	7.1	7.8	10.9	18.6	25.8	31.7	30.5	30.9	30.2	29.2	25.6	20.5	21.1	22.8	24.7	24.2	24.6	19.0	31.7																							
4-Oct	24.5	24.2	24.3	Z	17.9	16.3	19.4	19.1	20.0	22.3	19.2	22.0	22.8	20.2	32.1	24.7	17.1	14.1	12.4	10.9	10.8	12.7	13.2	13.4	18.9	32.1																							
5-Oct	13.4	14.5	15.7	15.8	Z	19.6	23.6	27.3	26.6	26.1	26.8	27.5	27.2	26.4	25.3	23.7	23.1	22.2	21.8	16.8	18.0	16.3	11.7	14.8	21.0	27.5																							
6-Oct	14.2	15.1	12.6	11.7	10.7	Z	10.5	13.4	14.6	14.3	15.9	18.4	26.1	25.4	27.0	27.3	27.7	23.9	13.5	10.9	10.6	22.1	24.7	24.7	18.0	27.7																							
7-Oct	Z	25.8	26.0	27.3	27.1	20.4	14.1	16.5	17.5	19.5	22.9	23.2	24.3	26.2	18.8	23.6	21.1	16.1	17.0	19.3	24.7	24.3	23.8	23.1	21.8	27.3																							
8-Oct	22.5	Z	22.5	22.4	22.3	21.7	21.6	21.6	21.8	22.8	24.5	27.3	30.3	36.9	41.1	41.8	41.4	40.1	35.4	26.2	32.0	30.6	28.8	27.5	28.8	41.8																							
9-Oct	26.5	25.7	Z	25.3	24.6	23.2	22.6	22.4	21.5	22.6	24.6	26.4	28.6	29.6	29.3	29.3	29.0	27.1	26.8	25.8	26.1	25.2	27.1	26.4	25.9	29.6																							
10-Oct	27.0	27.1	26.3	Z	24.2	23.0	21.4	19.7	19.8	20.6	22.1	24.3	25.5	26.7	28.4	28.3	27.3	26.7	26.5	28.6	30.3	30.9	30.5	29.7	25.9	30.9																							
11-Oct	29.5	29.7	29.4	28.7	Z	26.8	26.7	25.8	26.0	26.0	26.7	27.7	29.5	30.7	31.6	31.3	29.9	29.8	30.2	30.9	32.4	33.7	34.4	34.4	29.6	34.4																							
12-Oct	34.2	32.8	33.1	34.0	33.1	Z	29.8	29.0	29.0	29.7	29.8	32.0	33.4	42.8	45.6	45.3	42.6	33.8	10.7	6.6	29.6	34.3	28.5	15.8	31.1	45.6																							
13-Oct	Z	19.0	15.3	14.9	17.4	17.3	15.1	11.0	12.3	13.4	17.9	22.6	25.5	26.1	27.4	27.5	27.7	27.5	27.0	25.9	25.1	24.6	23.9	23.7	21.2	27.7																							
14-Oct	22.9	Z	22.2	22.2	21.5	20.3	19.8	19.8	20.9	21.1	22.1	25.1	26.8	29.4	33.1	32.4	31.9	31.2	29.6	27.3	25.8	25.9	26.1	26.4	25.4	33.1																							
15-Oct	25.5	24.7	Z	23.5	22.5	21.6	21.3	20.6	19.3	19.7	20.0	20.2	21.5	21.1	21.0	20.2	18.6	11.7	4.0	4.3	7.2	6.9	9.2	7.4	17.0	25.5																							
16-Oct	6.5	9.2	16.8	Z	16.8	15.1	15.4	16.1	18.1	21.2	24.8	27.0	29.1	35.7	39.3	39.8	37.5	19.6	27.7	21.1	15.1	15.0	14.7	15.5	21.6	39.8																							
17-Oct	14.8	15.2	17.0	21.2	Z	3.1	3.0	3.4	3.6	6.4	13.8	16.4	18.8	18.4	17.5	12.6	7.6	5.4	5.0	6.9	5.3	5.2	5.1	3.1	10.0	21.2																							
18-Oct	3.0	2.8	2.7	2.7	3.1	Z	8.1	10.7	12.9	13.9	15.5	16.0	13.8	14.6	15.4	13.6	13.6	4.2	3.8	13.9	28.2	29.4	28.7	27.7	13.0	29.4																							
19-Oct	Z	26.3	24.9	25.1	25.2	25.3	25.2	25.8	27.1	29.8	33.2	34.2	34.7	35.2	35.2	35.0	35.1	36.3	38.7	39.5	38.4	36.3	36.5	35.1	32.1	39.5																							
20-Oct	30.5	Z	28.6	28.4	29.7	29.2	29.4	29.8	30.7	33.4	33.5	33.5	33.4	34.7	35.8	37.4	39.2	33.2	21.0	12.9	13.2	10.7	10.5	11.1	27.4	39.2																							
21-Oct	8.8	7.4	Z	4.5	2.7	4.5	9.0	6.5	6.6	7.7	8.2	10.3	15.7	12.8	17.2	14.2	19.3	27.7	31.4	31.7	31.7	31.3	29.3	25.2	15.8	31.7																							
22-Oct	22.9	25.2	23.8	Z	24.8	22.3	21.9	18.3	20.7	22.9	24.3	26.6	28.5	25.0	25.8	24.9	15.2	17.9	26.0	24.6	26.5	26.7	25.6	26.7	23.8	28.5																							
23-Oct	27.8	27.5	27.1	26.3	Z	26.6	25.8	26.2	19.0	33.2	37.3	38.2	39.1	39.0	39.3	38.8	38.1	36.9	36.2	35.9	34.9	33.5	34.1	33.9	32.8	39.3																							
24-Oct	33.0	31.5	32.2	31.5	30.0	Z	28.2	27.7	27.9	30.9	32.9	34.1	34.4	34.1	34.4	34.0	34.1	34.4	33.9	33.2	33.7	32.9	32.0	31.9	32.3	34.4																							
25-Oct	Z	32.4	32.5	32.6	31.9	30.0	29.1	30.2	30.1	29.6	31.0	32.1	34.5	35.1	34.2	34.3	33.9	32.2	31.2	31.7	31.8	31.4	30.3	30.8	31.9	35.1																							
26-Oct	30.4	Z	28.5	28.2	28.3	27.8	26.6	26.3	25.7	25.7	26.1	27.7	27.9	27.9	28.6	28.2	26.3	25.7	26.6	25.7	25.7	25.7	24.4	27.0	30.4	30.4																							
27-Oct	24.2	24.3	Z	24.7	29.0	30.6	29.9	29.2	30.1	27.2	30.6	29.7	33.1	30.7	32.0	30.6	32.1	29.9	28.0	29.1	30.7	29.1	26.9	25.6	29.0	33.1																							
28-Oct	25.3	24.2	22.0	Z	25.4	24.3	23.1	20.9	24.9	25.4	25.3	26.3	28.3	28.9	29.3	28.6	29.8	29.6	29.3	30.3	29.3	30.1	30.0	29.3	27.0	30.3																							
29-Oct	29.5	30.1	31.4	32.9	Z	35.1	36.5	36.1	34.8	35.4	35.6	35.7	35.6	35.5	35.1	34.7	25.4	14.6	17.6	28.9	27.0	17.7	11.7	13.6	29.2	36.5																							
30-Oct	21.2	24.3	28.6	28.1	24.7	Z	21.5	16.5	12.5	23.4	27.3	30.5	33.7	34.1	34.5	32.5	29.3	28.8	28.0	27.3	27.3	29.4	29.6	28.5	27.0	34.5																							
31-Oct	Z	26.1	25.1	23.9	25.0	24.5	20.1	19.0	16.1	16.8	22.1	20.3	19.7	21.2	19.4	15.1	8.8	9.3	7.2	5.1	7.3	6.7	7.6	7.4	16.3	26.1																							
																								22.0	21.7	22.9	22.2	21.6	21.1	20.6	20.3	20.4	22.4	24.5	26.2	28.0	28.7	29.4	28.7	27.2	24.5	22.4	21.9	23.5	23.6	23.0	22.5	Diurnal Average	
																								34.2	32.8	33.1	34.0	33.1	35.1	36.5	36.1	34.8	35.4	37.3	38.2	39.1	42.8	45.6	45.3	42.6	40.1	38.7	39.5	38.4	36.3	36.5	35.1	Diurnal Maximum	

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ozone (O₃) - ppb
Patricia McInnes - October 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	213	30.08	30.08
21 - 50	495	69.92	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
Patricia McInnes - October 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	3	0	1	5	13	41	20	14	23	18	5	10	17	6	18	213
21 - 50	25	8	1	1	1	75	77	14	27	21	26	39	66	63	37	14	495
51 - 82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	44	11	1	2	6	88	118	34	41	44	44	44	76	80	43	32	708

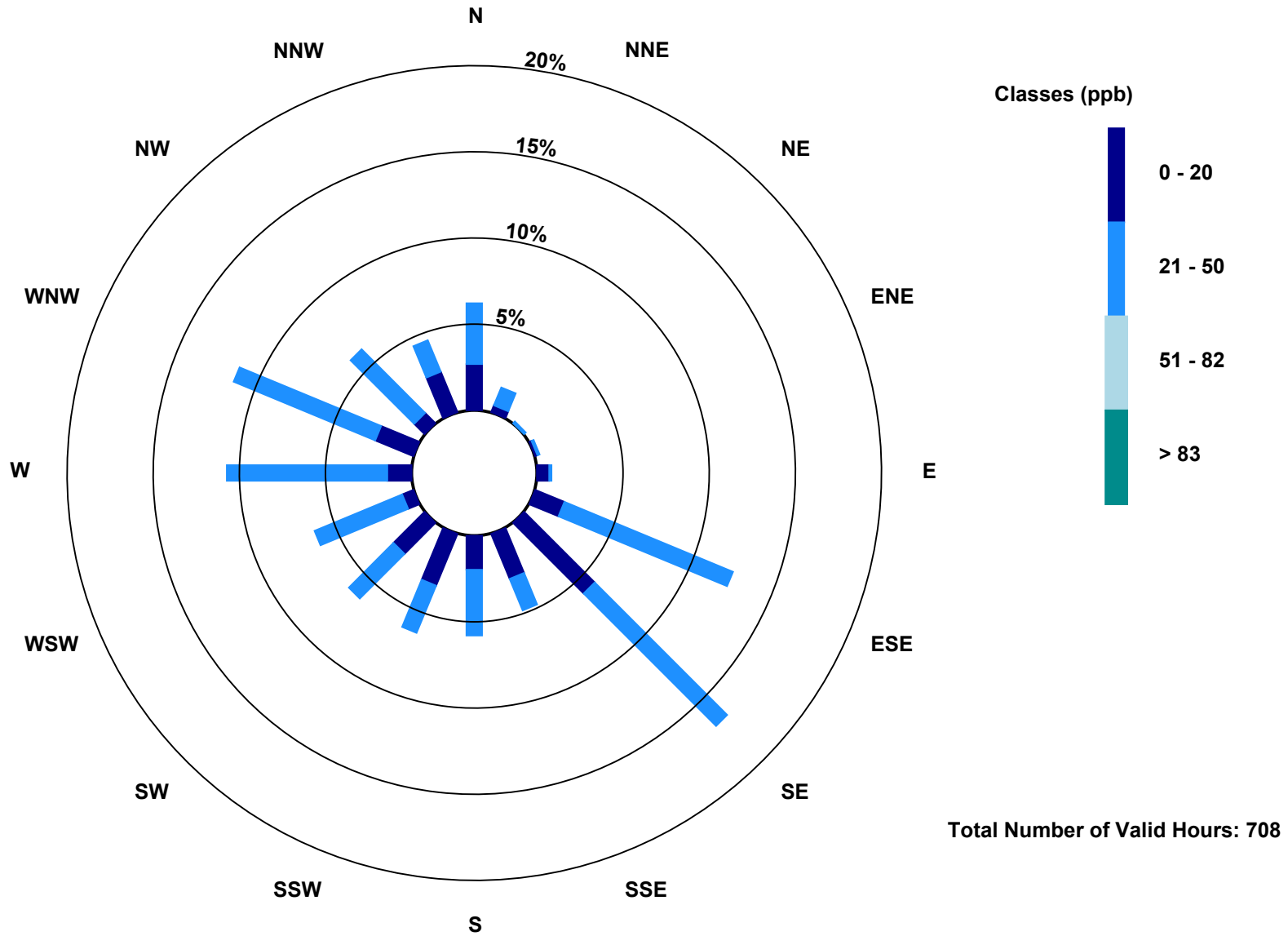
Total Number of Valid Hours: 708

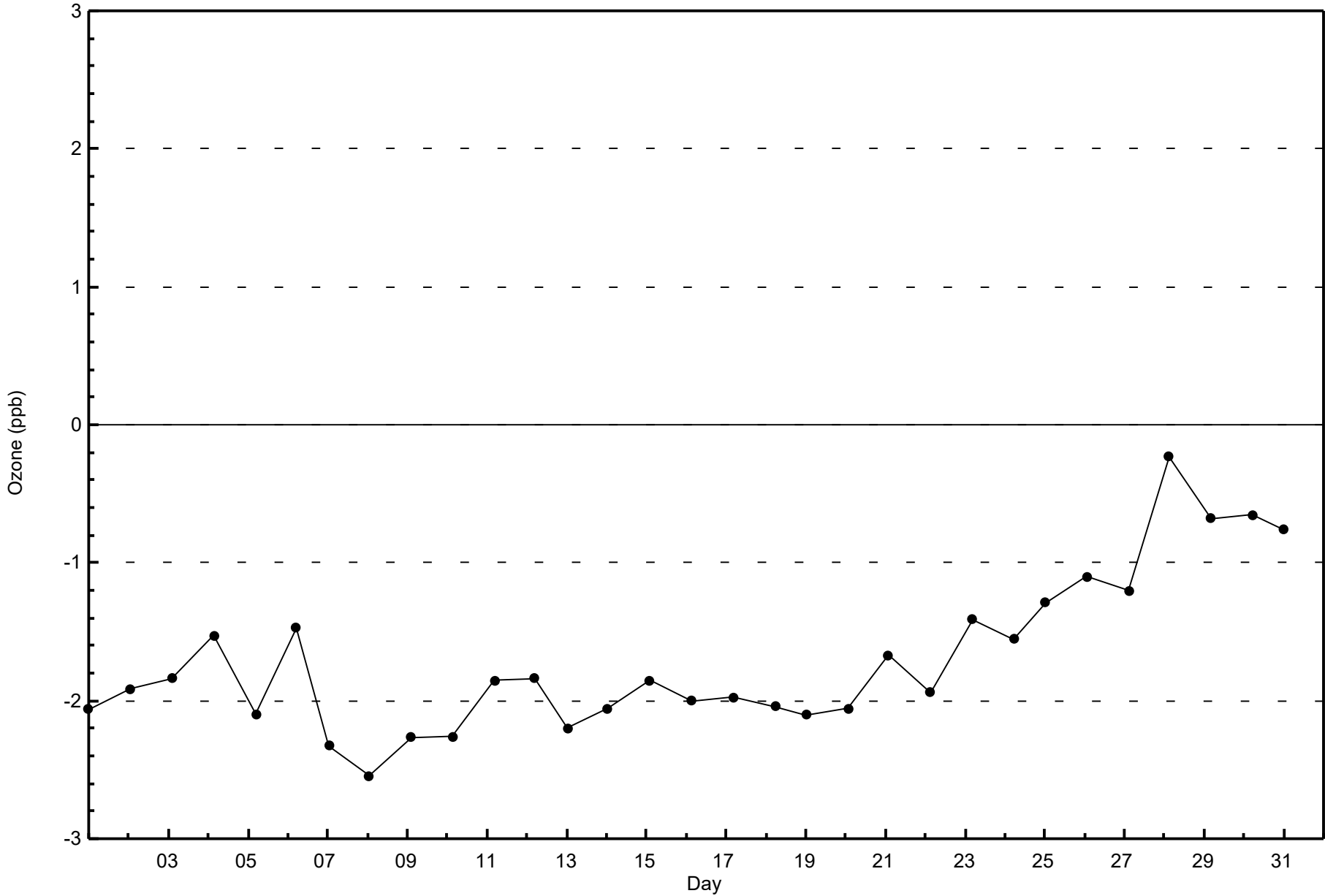
Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

Ozone (O₃) - ppb
Patricia McInnes

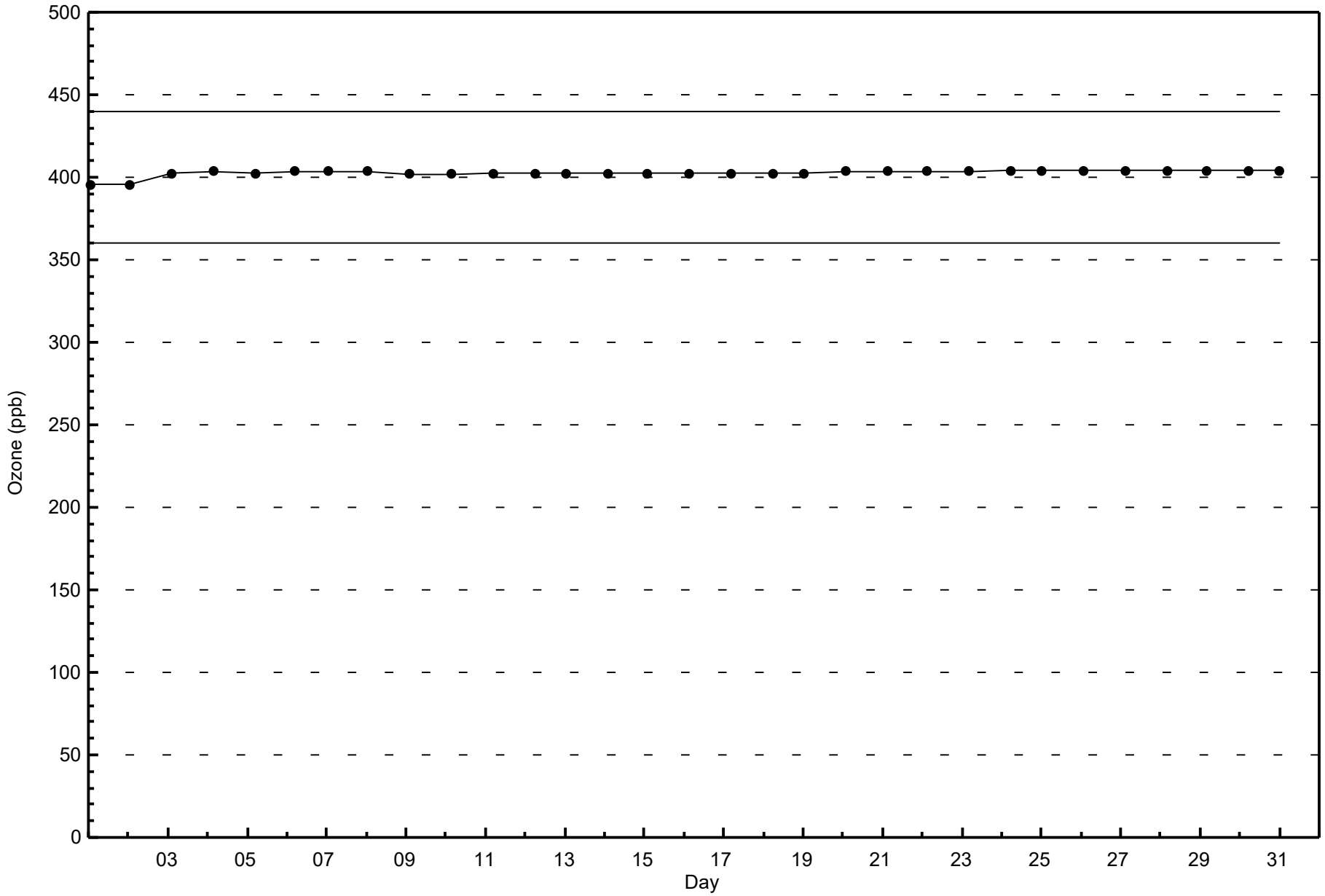






Wood Buffalo Environmental Association
Span Responses

Ozone (O₃) - ppb
Patricia McInnes - October 2023



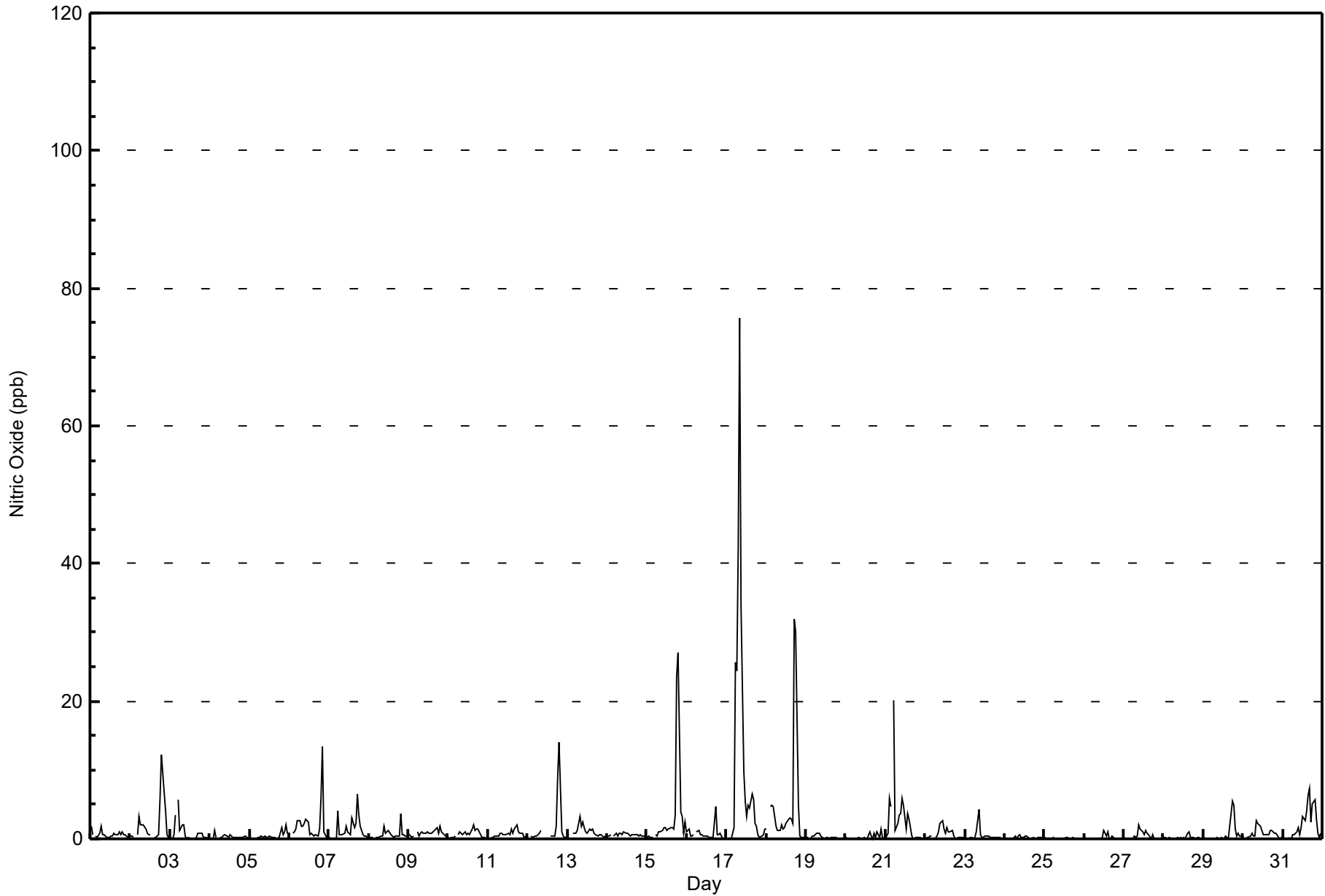


Maximum Value: 75.7 ppb on Oct 17 09:00																				Maximum Daily Average: 10.9 ppb on Oct 17					Hours in Service: 744	
Minimum Value: 0.0 ppb on Oct 3 14:00																				Minimum Daily Average: 0.1 ppb on Oct 25					Hours of Data: 707	
Maximum Diurnal Average: 3.4 ppb at hour 9																				Minimum Diurnal Average: 0.2 ppb at hour 2					Hours of Missing Data: 37	
Monthly Average: 1.38 ppb																				Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.4 Q ₃ = 1.0 P ₉₀ = 2.5 P ₉₉ = 24.4					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-Oct	1.8	0.5	Z	0.5	0.2	0.9	1.7	0.7	0.6	0.5	0.3	0.3	0.3	0.4	0.9	0.6	0.6	1.0	0.6	0.9	0.7	0.5	0.2	0.3	0.7	1.8
2-Oct	0.3	0.4	0.3	Z	0.6	3.2	2.0	2.0	2.0	1.3	0.8	0.7	0.6	M	0.2	0.3	0.5	0.6	5.7	12.2	6.6	4.0	0.5	0.1	2.0	12.2
3-Oct	0.3	0.1	0.6	3.4	Z	5.7	1.2	2.0	1.9	0.5	0.1	0.2	0.0	0.0	0.0	0.2	0.7	0.8	0.7	0.3	0.2	0.2	0.1	0.8	5.7	
4-Oct	0.0	0.0	0.1	1.3	0.3	Z	0.3	0.2	0.4	0.6	0.5	0.3	0.6	0.3	0.2	0.3	0.1	0.1	0.2	0.1	0.2	0.4	0.3	0.1	0.3	1.3
5-Oct	Z	0.0	0.1	0.0	0.1	0.2	0.1	0.4	0.1	0.4	0.2	0.1	0.4	0.3	0.2	0.3	0.1	0.1	0.2	1.7	0.6	0.9	2.1	0.7	0.4	2.1
6-Oct	0.7	Z	0.9	1.0	1.5	2.6	2.6	1.8	1.8	2.2	2.8	2.4	0.6	0.8	0.7	0.4	0.5	0.5	1.4	6.0	13.4	1.1	0.1	0.1	2.0	13.4
7-Oct	0.1	0.1	Z	0.1	0.1	4.1	0.7	0.6	0.7	0.8	1.8	1.1	0.8	0.6	3.0	1.6	2.2	6.6	3.4	1.8	0.6	0.4	0.4	0.3	1.4	6.6
8-Oct	0.2	0.2	0.2	Z	0.2	0.3	0.2	0.4	0.4	1.8	0.8	0.9	1.1	0.6	0.4	0.2	0.4	0.4	0.4	3.6	0.6	0.7	0.5	0.4	0.6	3.6
9-Oct	0.6	0.4	0.2	0.3	Z	1.0	0.4	0.8	0.9	0.7	0.7	0.9	0.9	0.7	0.9	1.1	1.5	1.6	0.8	1.9	0.9	0.6	0.4	0.3	0.8	1.9
10-Oct	0.1	0.0	0.2	0.2	0.4	Z	0.6	0.9	0.6	0.8	0.9	0.7	0.8	0.7	1.3	1.9	1.1	1.5	1.4	0.7	0.3	0.3	0.1	0.1	0.7	1.9
11-Oct	Z	0.1	0.1	0.2	0.3	0.5	0.4	0.7	0.7	0.7	0.6	0.7	0.8	0.6	1.4	0.9	1.4	2.1	1.0	0.9	0.8	0.8	0.2	0.3	0.7	2.1
12-Oct	0.4	Z	0.4	0.3	0.5	0.4	0.6	0.8	1.1	C	C	C	C	C	0.3	0.4	0.4	1.8	8.8	14.0	1.0	0.4	0.3	0.2	1.8	14.0
13-Oct	0.4	0.7	Z	0.8	0.7	0.7	1.2	3.2	1.7	2.5	1.7	1.0	0.9	1.4	1.3	1.4	0.8	0.7	0.5	0.7	0.5	0.4	0.3	0.3	1.0	3.2
14-Oct	0.5	0.4	0.5	Z	0.4	0.8	0.4	0.8	0.8	0.7	1.0	0.8	0.8	0.7	0.5	0.5	0.6	0.5	0.6	0.5	0.5	0.4	0.4	0.2	0.6	1.0
15-Oct	0.2	0.3	0.3	0.3	Z	0.6	0.4	0.9	1.1	1.3	1.6	1.7	1.3	1.5	1.6	1.7	1.5	3.5	23.5	27.1	3.9	3.2	0.8	2.5	3.5	27.1
16-Oct	1.1	1.4	0.3	0.4	0.6	Z	1.0	1.1	0.6	0.5	0.4	0.4	0.3	0.1	0.1	0.2	0.3	4.7	0.6	0.7	0.9	0.4	0.1	0.0	0.7	4.7
17-Oct	Z	0.0	0.0	0.0	1.7	25.7	24.4	42.2	75.7	33.7	9.8	5.6	3.3	4.9	4.5	6.6	5.8	2.1	1.9	0.6	0.2	0.4	0.5	1.4	10.9	75.7
18-Oct	1.3	Z	4.7	4.9	4.7	3.3	1.9	1.2	1.2	2.0	1.5	1.7	2.2	2.8	3.1	2.9	2.2	31.9	30.1	4.9	0.4	0.1	0.3	0.2	4.8	31.9
19-Oct	0.2	0.3	Z	0.1	0.5	0.4	0.8	0.8	0.8	0.4	0.2	0.1	0.2	0.2	0.0	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.2	0.8
20-Oct	0.1	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.2	0.0	0.0	1.1	0.5	0.0	0.8	0.3	0.9	0.3	1.5	0.2	0.0	0.3	1.5
21-Oct	0.1	0.9	5.9	4.6	Z	20.1	1.1	2.2	3.5	3.7	6.0	4.9	1.5	3.6	2.8	1.7	0.3	0.1	0.1	0.2	0.2	0.1	0.0	0.1	2.8	20.1
22-Oct	0.1	0.1	0.1	0.3	0.3	Z	0.2	0.5	1.0	2.2	2.6	1.5	0.9	1.6	1.0	1.1	1.3	0.3	0.1	0.1	0.2	0.2	0.1	0.1	0.7	2.6
23-Oct	Z	0.1	0.1	0.1	0.1	0.1	0.2	1.1	4.2	0.7	0.2	0.3	0.5	0.5	0.3	0.3	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.0	0.4	4.2
24-Oct	0.0	Z	0.0	0.0	0.0	0.1	0.3	0.1	0.5	0.6	0.3	0.2	0.4	0.5	0.2	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.6
25-Oct	0.2	0.1	Z	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.2
26-Oct	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.1	0.4	1.0	0.0	0.1	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.1	1.1
27-Oct	0.0	0.0	0.0	0.0	Z	0.2	0.4	0.1	0.5	2.0	1.5	1.1	0.5	1.2	0.7	0.6	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.4	2.0
28-Oct	0.1	0.1	0.0	0.2	0.0	Z	0.0	0.0	0.2	0.0	0.1	0.1	0.1	0.0	0.7	1.0	0.2	0.3	0.1	0.0	0.3	0.1	0.0	0.1	0.2	1.0
29-Oct	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.4	0.2	0.1	1.8	5.5	4.9	1.5	0.4	0.9	0.5	0.3	0.7	5.5
30-Oct	0.2	Z	0.2	0.2	0.5	0.7	0.4	0.4	2.5	2.2	1.8	1.1	0.6	0.6	0.6	0.6	1.2	1.1	1.0	0.9	0.8	0.2	0.1	0.2	0.8	2.5
31-Oct	0.2	0.2	Z	0.2	0.1	0.1	0.6	0.5	1.0	1.6	0.7	1.6	3.2	2.6	4.0	6.4	7.2	2.5	5.1	5.6	2.8	0.9	0.2	0.9	2.1	7.2
																								Diurnal Average		
																								Diurnal Maximum		
0.4 0.2 0.6 0.8 0.5 2.8 1.4 2.1 3.4 2.2 1.3 1.0 0.8 1.0 1.1 1.1 1.1 1.1 2.3 3.0 2.9 1.2 0.6 0.3 0.3 1.8 1.4 5.9 4.9 4.7 25.7 24.4 42.2 75.7 33.7 9.8 5.6 3.3 4.9 4.5 6.6 7.2 31.9 30.1 27.1 13.4 4.0 2.1 2.5																										
Z - zerospan C - Calibration M - Maintenance																										



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	698	98.73	98.73
21 - 40	7	0.99	99.72
41 - 80	2	0.28	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Patricia McInnes - October 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	40	12	1	2	6	84	121	30	44	39	45	43	78	81	42	30	698
21 - 40	2	0	0	0	0	1	0	3	0	0	0	0	0	0	0	1	7
11 - 80	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	43	12	1	2	6	85	121	33	44	39	45	43	78	81	42	32	707

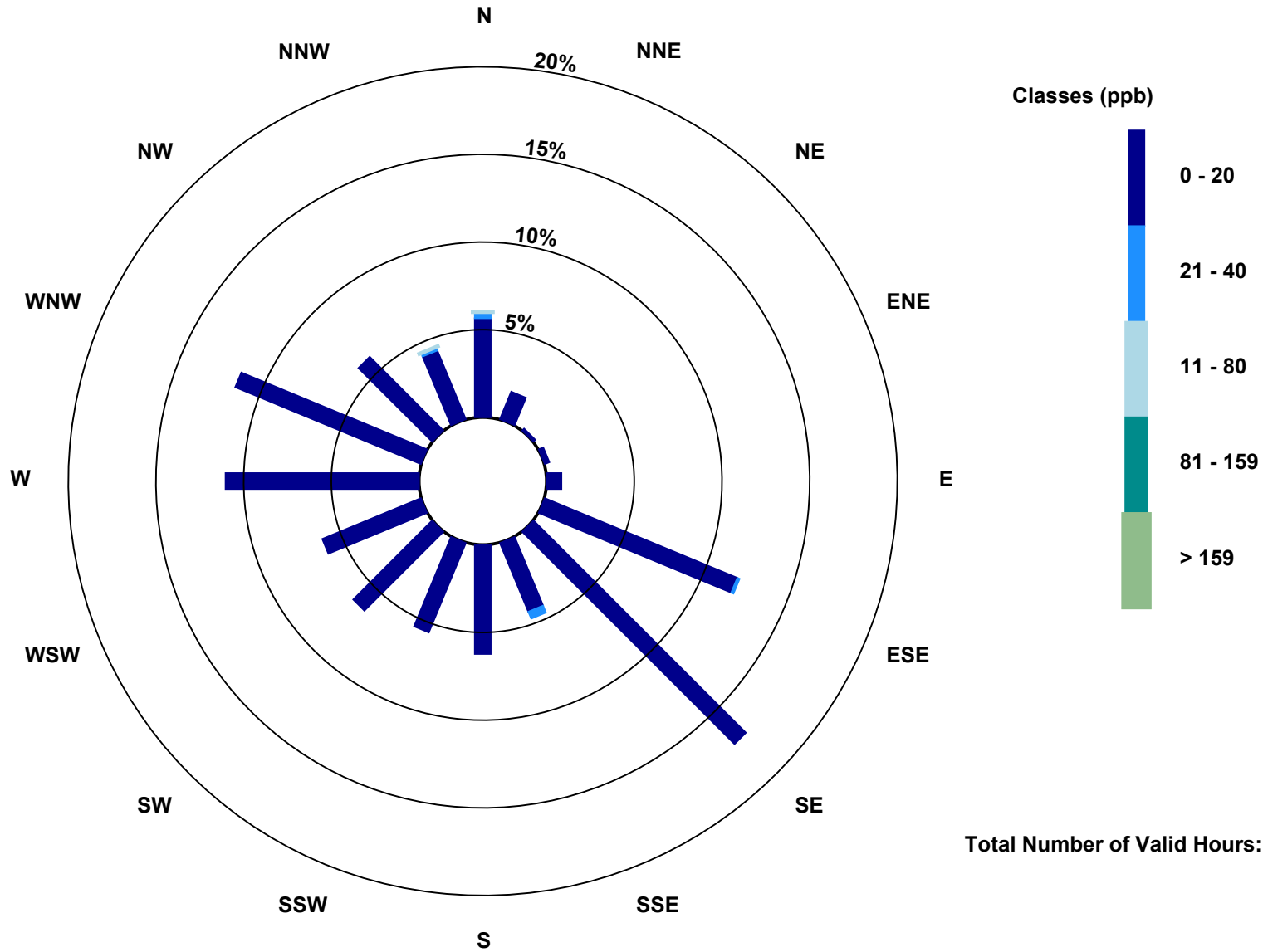
Total Number of Valid Hours: 707

Total Number of Hours: 744

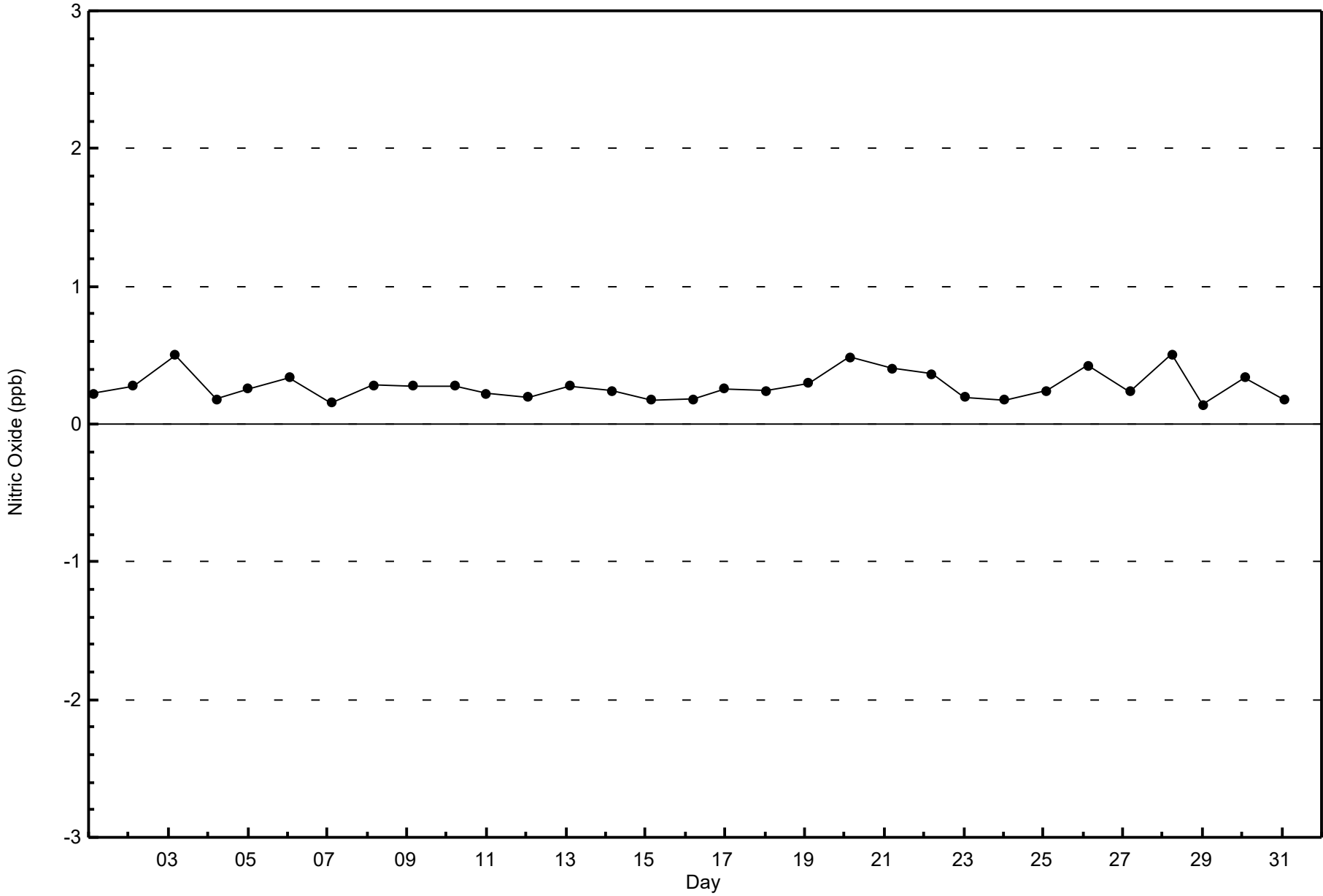


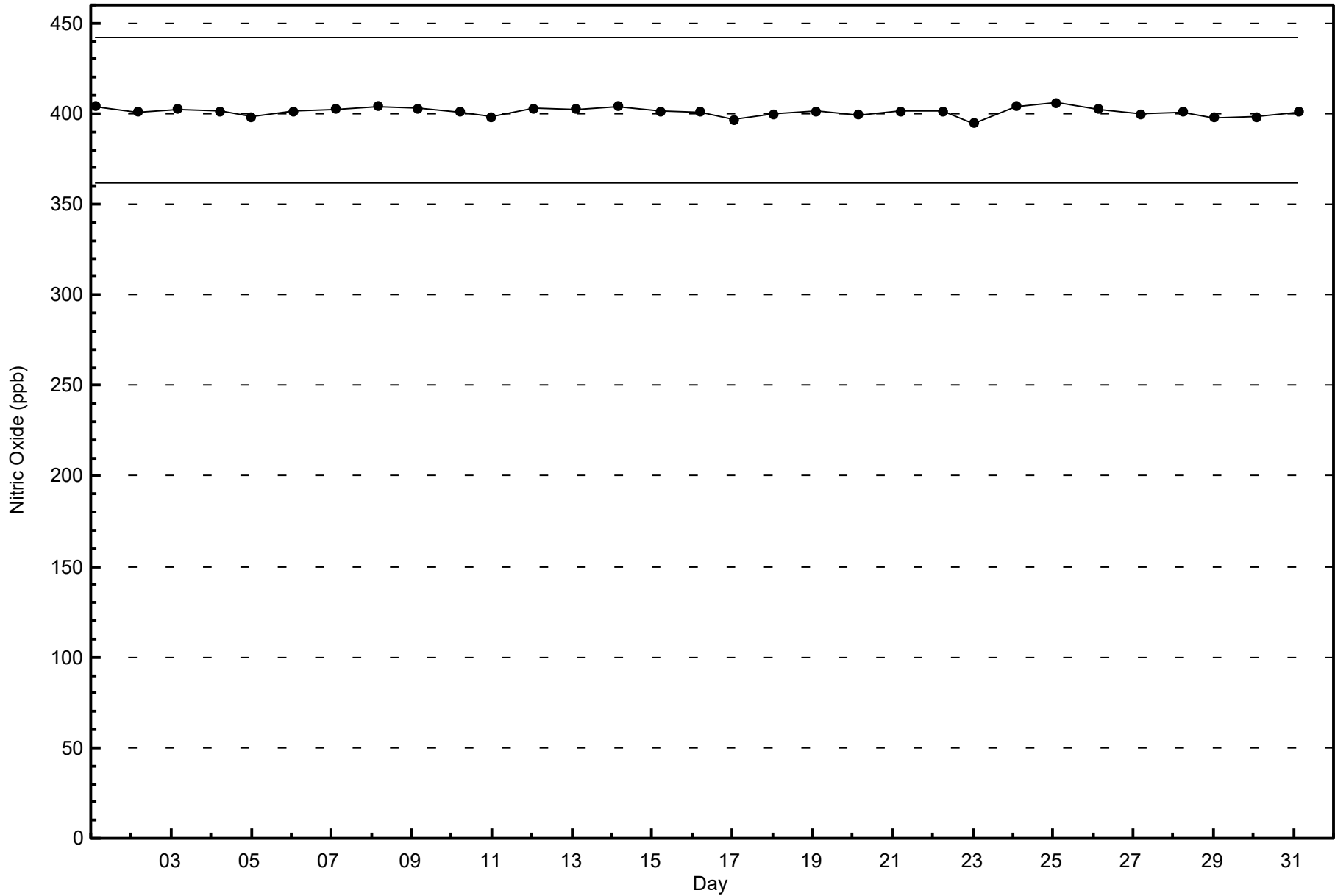
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitric Oxide (NO) - ppb
Patricia McInnes



Total Number of Valid Hours: 707







Wood Buffalo Environmental Association
Summary of Hour Averages

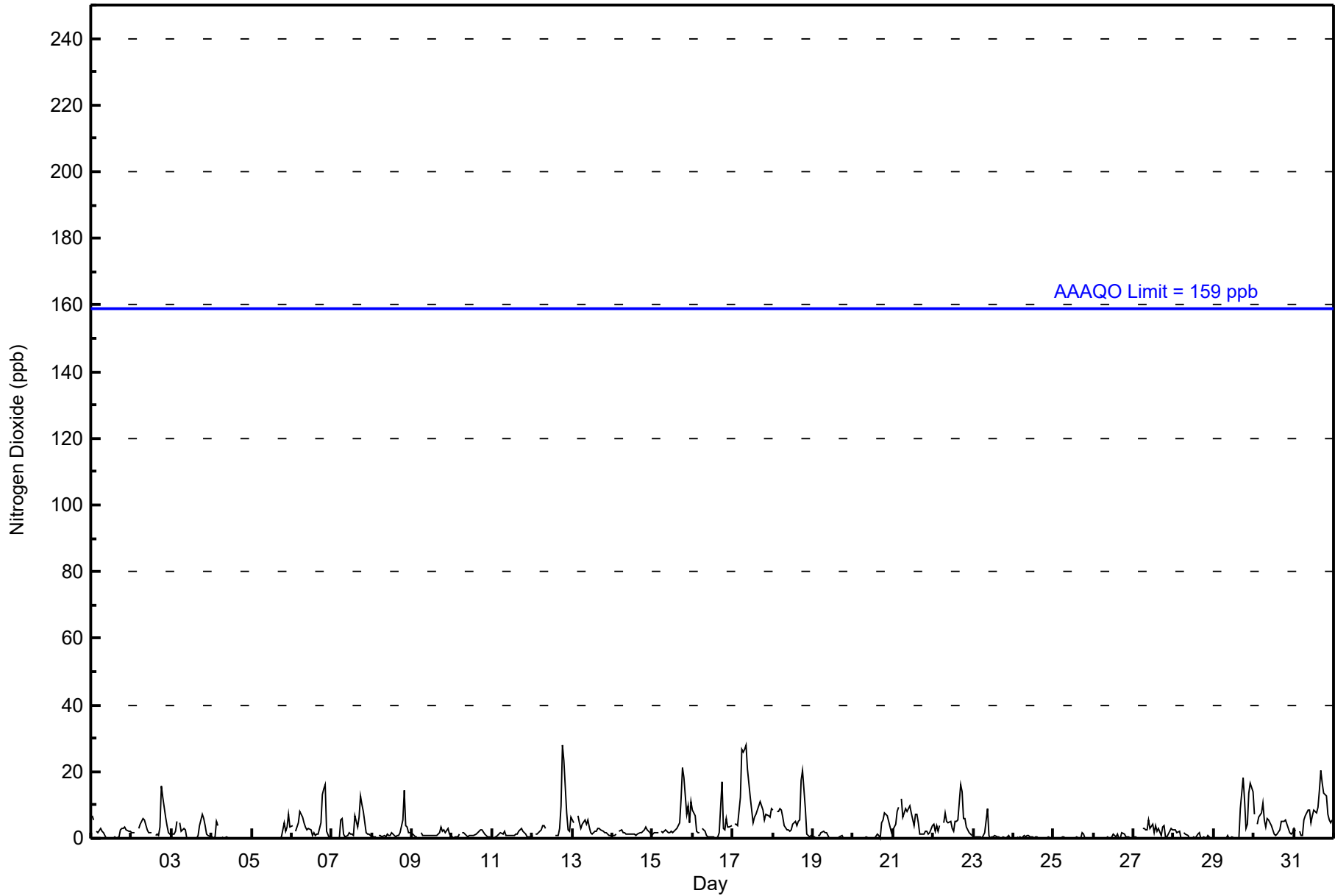
Nitrogen Dioxide (NO₂) - ppb
Patricia McInnes - October 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 28.1 ppb on Oct 12 19:00 Maximum Daily Average: 11.5 ppb on Oct 17		Hours in Service: 744 Hours of Data: 707 Hours of Missing Data: 37 Hours of Calibration: 36 Percent Operational Time: 99.9																									
Minimum Value: 0.0 ppb on Oct 1 11:00 Maximum Diurnal Average: 6.4 ppb at hour 19 Monthly Average: 2.93 ppb		Minimum Daily Average: 0.3 ppb on Oct 24 Minimum Diurnal Average: 1.4 ppb at hour 13 Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.3 Median = 1.4 Q ₃ = 3.8 P ₉₀ = 7.6 P ₉₉ = 20.7																									
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-Oct	6.7	5.6	Z	2.1	1.8	2.9	2.3	1.7	0.7	0.1	0.0	0.0	0.0	0.1	0.3	0.2	0.3	2.4	2.9	3.0	3.2	2.6	2.0	2.0	1.9	6.7	
2-Oct	1.9	1.7	1.8	Z	2.9	4.4	4.9	5.9	5.3	2.4	1.6	1.6	1.6	M	0.8	1.1	1.0	3.2	15.7	12.1	6.3	4.0	1.5	1.2	3.8	15.7	
3-Oct	1.3	1.1	2.3	5.1	Z	4.6	2.1	3.1	2.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	1.0	3.9	7.0	5.8	3.7	1.2	0.8	0.6	2.0	7.0	
4-Oct	0.4	0.1	0.4	4.9	3.7	Z	0.4	0.0	0.0	0.0	0.3	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	0.5	4.9	
5-Oct	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	0.5	4.6	2.0	3.4	7.0	3.5	0.9	7.0	
6-Oct	3.9	Z	2.0	3.2	4.8	8.1	6.5	4.6	3.2	2.7	2.9	2.5	0.9	1.7	1.0	1.2	1.4	4.7	13.1	14.8	16.0	2.1	0.0	0.0	4.4	16.0	
7-Oct	0.0	0.1	Z	0.0	0.0	5.6	6.0	1.3	0.3	0.7	1.7	1.3	1.4	0.9	6.7	3.5	6.3	12.5	10.2	8.1	1.9	1.4	1.2	0.8	3.1	12.5	
8-Oct	0.7	0.3	0.4	Z	0.8	0.8	0.6	0.7	0.6	1.4	0.7	0.9	1.7	0.9	0.4	0.7	1.0	1.8	5.3	14.6	4.0	3.2	1.8	1.5	1.9	14.6	
9-Oct	1.4	0.7	0.4	0.5	Z	1.6	0.9	0.8	0.9	0.7	0.7	0.7	1.0	0.8	0.7	1.0	1.8	3.2	2.0	2.7	1.7	3.0	1.2	1.0	1.3	3.2	
10-Oct	0.4	0.1	0.3	0.4	1.2	Z	1.6	1.6	0.8	0.4	0.9	0.7	0.8	0.9	1.2	1.6	2.1	2.4	2.4	1.3	0.8	0.6	0.4	0.4	1.0	2.4	
11-Oct	Z	0.6	0.6	0.7	1.1	1.5	1.3	2.2	1.0	0.9	0.7	0.8	0.9	0.8	1.2	1.2	2.0	3.0	2.2	1.5	1.1	0.6	0.4	0.6	1.2	3.0	
12-Oct	0.7	Z	1.3	1.1	2.0	2.5	3.7	3.8	3.0	C	C	C	C	C	0.8	0.9	2.8	9.9	28.1	23.5	7.5	2.4	2.3	6.2	5.7	28.1	
13-Oct	5.4	4.6	Z	6.9	4.8	3.0	4.2	5.6	4.2	5.6	3.4	1.5	1.3	2.0	2.1	2.8	2.9	2.7	2.3	1.8	1.5	1.1	0.9	0.9	3.1	6.9	
14-Oct	0.9	1.0	1.2	Z	2.0	2.6	1.9	1.9	1.4	1.2	1.1	1.1	1.1	1.1	1.0	1.4	1.5	1.9	2.2	2.7	3.2	2.4	1.6	0.9	1.6	3.2	
15-Oct	1.1	1.5	1.5	1.6	Z	2.3	1.9	2.0	2.4	1.9	1.9	2.0	1.5	2.1	3.0	3.7	4.7	11.8	21.1	18.3	7.3	9.9	4.7	11.0	5.2	21.1	
16-Oct	8.6	6.7	2.0	1.9	1.9	Z	3.0	2.3	0.9	0.6	0.4	0.3	0.3	0.1	0.1	0.3	1.7	17.1	3.1	2.6	5.9	3.3	3.2	3.9	3.1	17.1	
17-Oct	Z	4.1	4.4	3.8	12.3	26.5	26.0	26.6	28.1	20.7	12.3	8.4	4.6	6.5	7.3	9.6	11.1	9.7	8.4	5.4	7.2	6.9	6.5	9.0	11.5	28.1	
18-Oct	8.5	Z	8.2	8.2	9.0	8.4	6.2	3.7	2.4	2.6	2.0	2.4	4.4	5.2	4.0	4.9	5.6	17.3	20.3	8.8	1.3	0.7	0.6	0.7	5.9	20.3	
19-Oct	0.6	0.3	Z	0.9	0.9	1.5	2.2	1.7	1.6	0.7	0.0	0.0	0.0	0.0	0.0	0.1	0.6	0.7	0.2	0.0	0.0	0.0	0.0	0.3	0.5	2.2	
20-Oct	0.1	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	1.2	0.7	0.2	4.5	5.3	7.8	6.9	5.1	3.5	1.9	1.6	7.8	
21-Oct	2.7	4.4	8.1	9.3	Z	11.8	6.4	9.1	8.2	9.1	9.9	7.8	3.7	7.2	7.0	4.8	1.3	1.3	1.3	2.3	2.3	1.1	1.7	3.9	5.4	11.8	
22-Oct	4.4	2.1	3.9	2.3	3.8	Z	4.7	7.6	4.9	4.8	5.0	3.1	2.1	5.0	5.2	5.6	15.9	14.1	5.8	6.1	3.2	1.9	1.3	1.0	4.9	15.9	
23-Oct	Z	0.3	0.3	0.3	0.4	0.1	0.8	1.7	8.9	0.9	0.2	0.3	0.5	0.7	0.4	0.3	0.2	0.2	0.5	0.2	0.3	0.7	0.2	0.1	0.8	8.9	
24-Oct	0.2	Z	0.4	0.2	0.3	0.2	0.7	0.3	0.9	0.8	0.3	0.3	0.2	0.4	0.3	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.1	0.1	0.3	0.9
25-Oct	0.1	0.1	Z	0.1	0.1	0.4	0.6	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.4	0.1	0.1	1.7	1.2	0.2	0.2	0.2	0.0	0.0	0.3	1.7	
26-Oct	0.0	0.0	0.0	Z	0.1	0.0	0.2	0.2	0.4	0.1	0.2	0.5	1.2	0.4	1.1	0.0	0.1	1.9	1.4	0.3	0.4	0.4	0.2	0.2	0.4	1.9	
27-Oct	0.3	0.3	0.1	0.1	Z	3.1	2.9	2.7	2.7	5.7	3.1	4.3	1.5	3.8	2.1	3.0	1.0	3.6	3.8	0.5	0.6	1.4	3.0	2.6	2.3	5.7	
28-Oct	2.6	2.6	1.7	2.2	0.0	Z	1.7	1.4	0.8	0.2	0.2	0.2	0.6	0.2	1.1	1.8	0.1	0.2	0.5	0.1	1.0	0.3	0.1	0.2	0.9	2.6	
29-Oct	Z	0.2	0.1	0.2	0.0	0.1	0.0	0.0	0.7	0.1	0.2	0.3	0.2	0.1	0.1	0.0	8.8	18.2	11.3	3.1	4.2	13.5	16.4	13.9	4.0	18.2	
30-Oct	7.4	Z	4.4	6.2	7.8	10.8	5.4	3.2	6.1	5.3	4.0	2.5	1.1	0.9	1.2	2.5	5.2	5.0	5.1	5.4	4.4	1.9	1.4	1.7	4.3	10.8	
31-Oct	3.1	2.3	Z	2.3	0.9	0.8	5.4	6.7	8.4	8.3	4.5	6.8	8.5	7.7	9.4	14.4	20.4	16.5	13.6	12.6	7.2	5.3	4.6	5.5	7.6	20.4	
2.4 1.6 1.8 2.5 2.4 4.0 3.4 3.3 3.3 2.6 1.9 1.7 1.4 1.7 1.9 2.2 3.3 5.7 6.4 5.5 3.4 2.6 2.2 2.4																								Diurnal Average			
8.6 6.7 8.2 9.3 12.3 26.5 26.0 26.6 28.1 20.7 12.3 8.4 8.5 7.7 9.4 14.4 20.4 18.2 28.1 23.5 16.0 13.5 16.4 13.9																								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 - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Patricia McInnes - October 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 Dioxide (NO₂) - ppb
Patricia McInnes - October 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	40	12	1	2	6	85	121	30	44	39	45	43	78	81	42	30	699
21 - 40	3	0	0	0	0	0	0	3	0	0	0	0	0	0	0	2	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	12	1	2	6	85	121	33	44	39	45	43	78	81	42	32	707

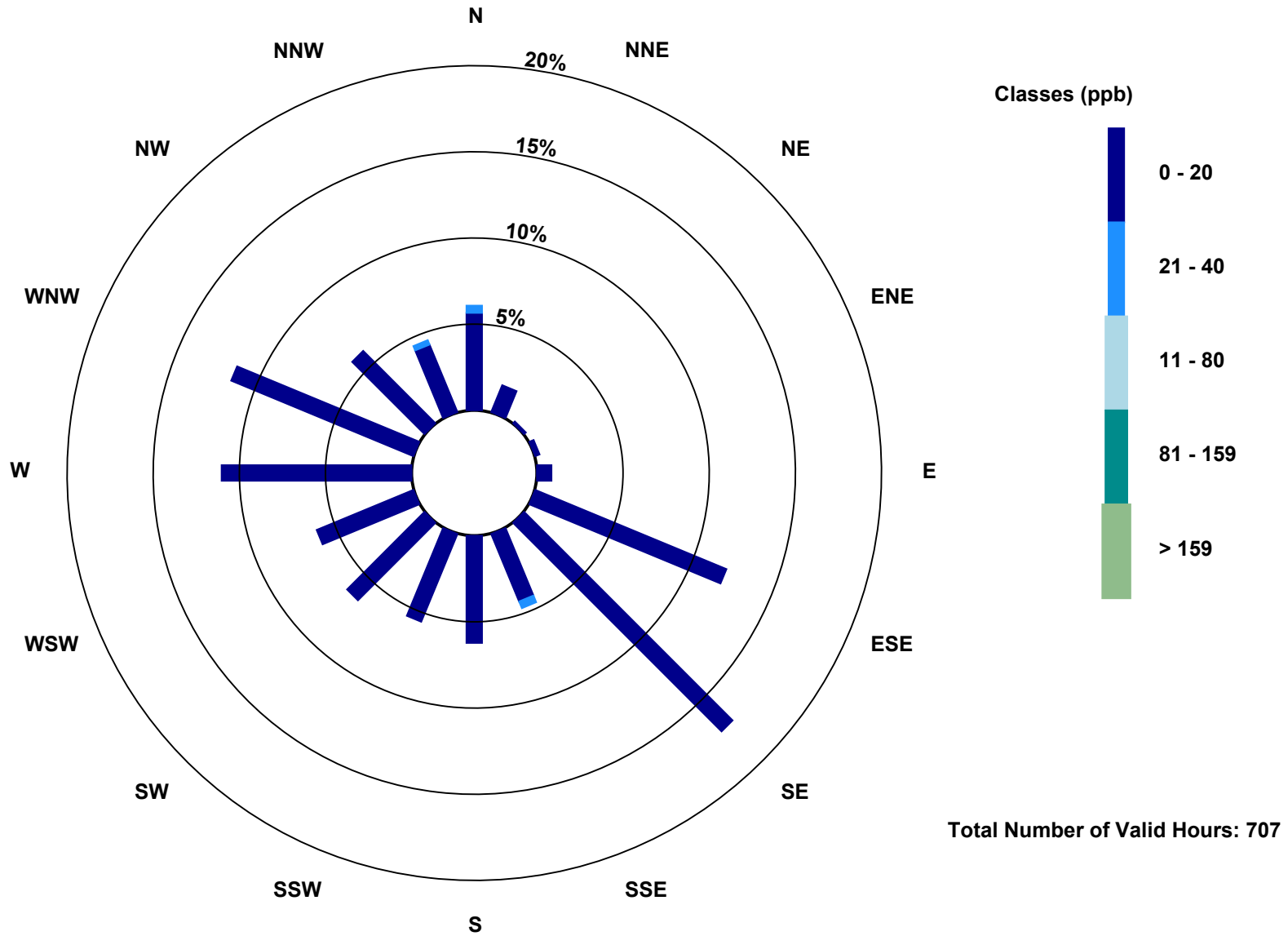
Total Number of Valid Hours: 707

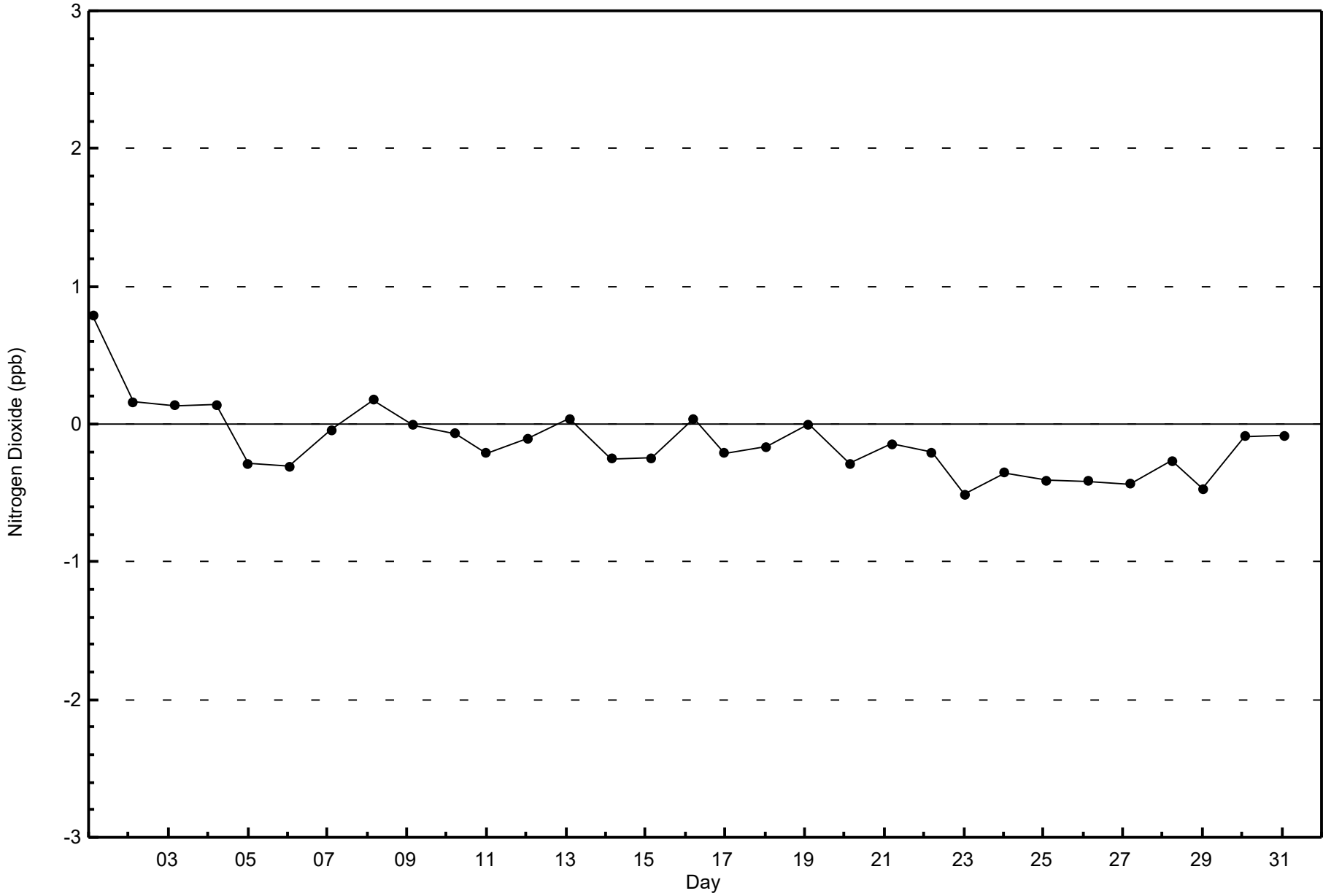
Total Number of Hours: 744

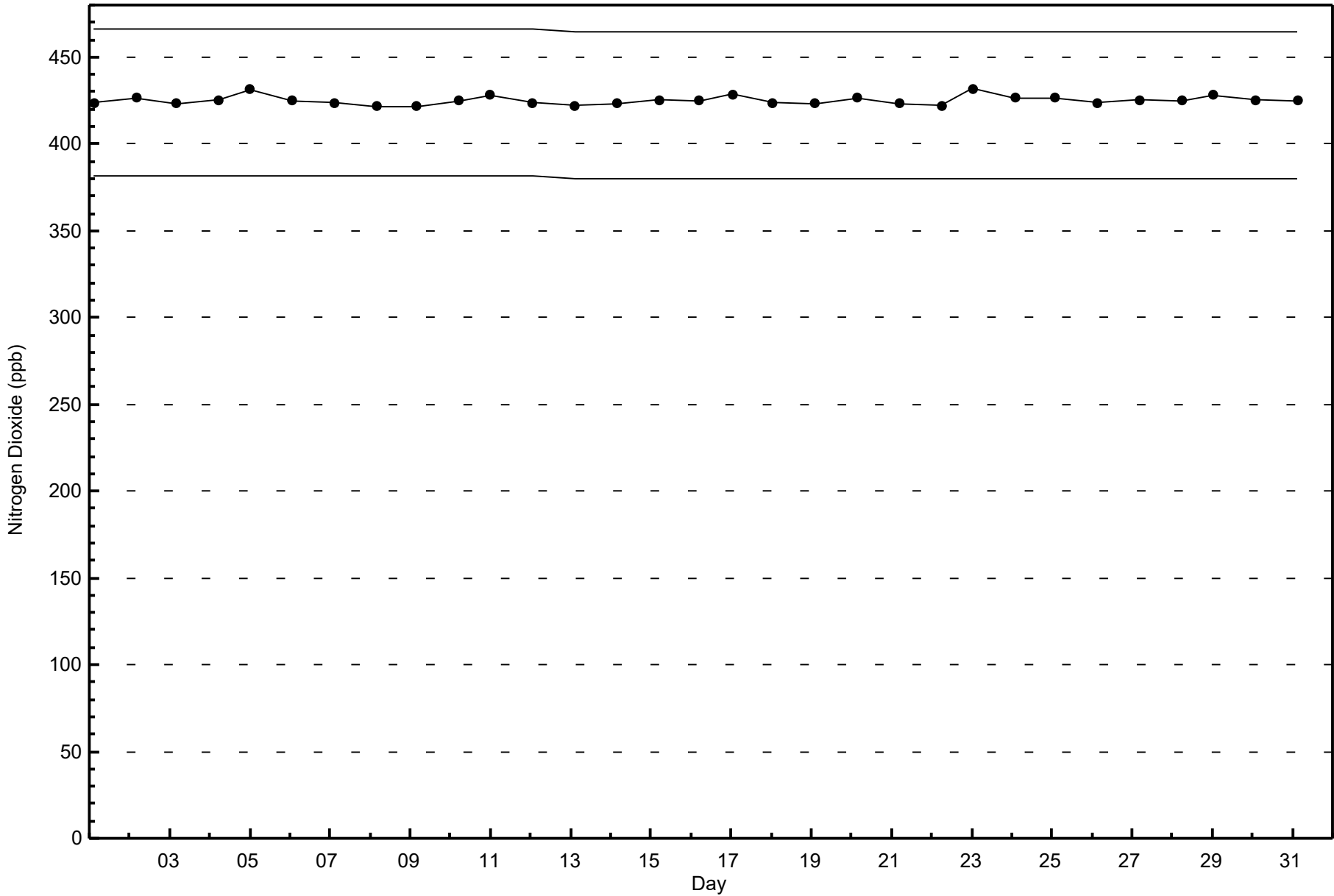


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitrogen Dioxide (NO₂) - ppb
Patricia McInnes









Wood Buffalo Environmental Association
Summary of Hour Averages

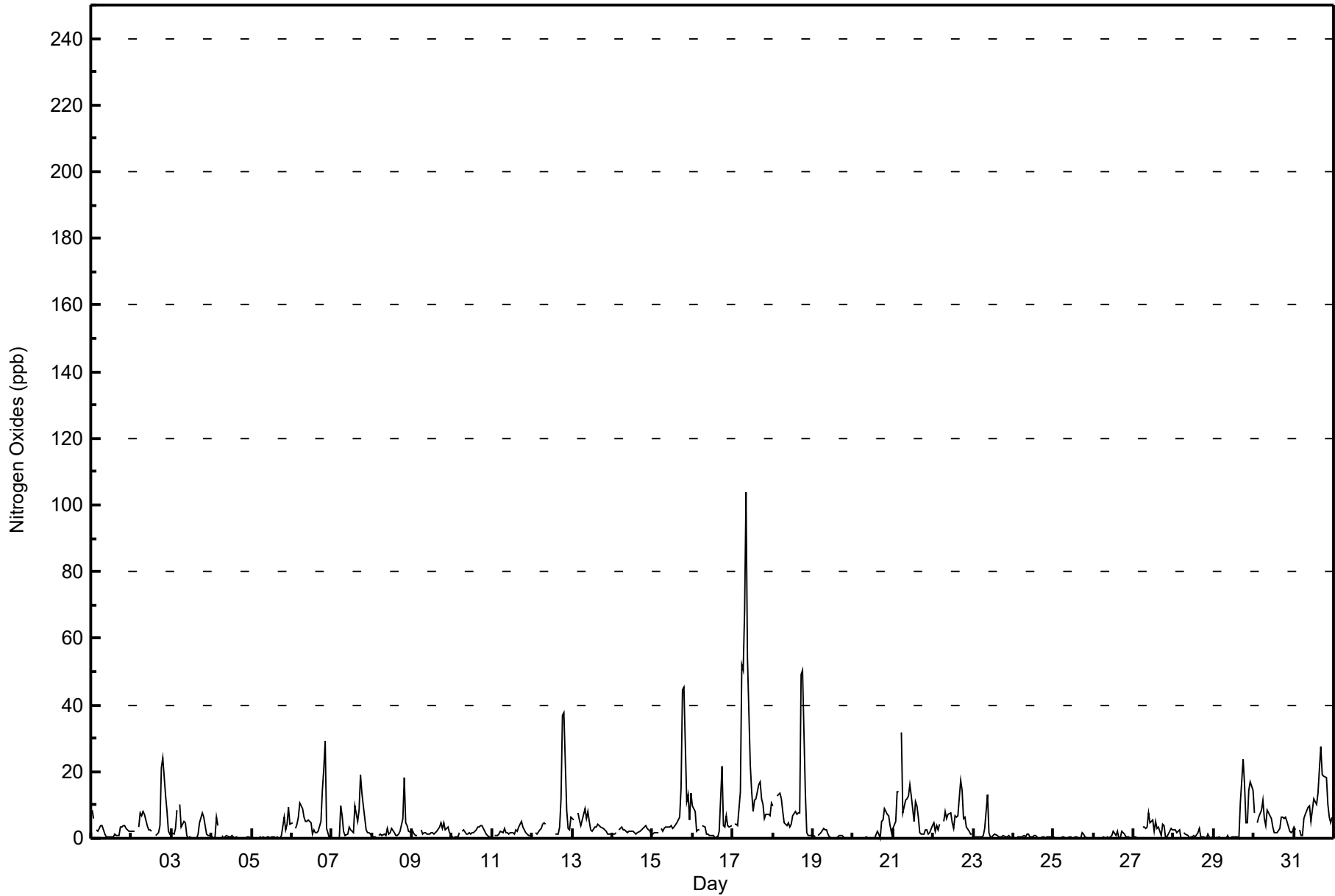
Nitrogen Oxides (NO_x) - ppb
Patricia McInnes - October 2023

Maximum Value: 103.8 ppb on Oct 17 09:00																				Maximum Daily Average: 22.5 ppb on Oct 17					Hours in Service: 744	
Minimum Value: 0.0 ppb on Oct 3 14:00																				Minimum Daily Average: 0.3 ppb on Oct 25					Hours of Data: 707	
Maximum Diurnal Average: 9.4 ppb at hour 19																				Minimum Diurnal Average: 1.8 ppb at hour 2					Hours of Missing Data: 37	
Monthly Average: 4.30 ppb																				Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.5 Median = 1.9 Q ₃ = 4.6 P ₉₀ = 9.9 P ₉₉ = 45.4					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-Oct	8.5	6.1	Z	2.6	2.0	3.8	4.0	2.4	1.3	0.6	0.3	0.3	0.3	0.5	1.2	0.8	0.9	3.4	3.5	3.9	3.9	3.1	2.2	2.3	2.5	8.5
2-Oct	2.2	2.1	2.1	Z	3.5	7.6	6.9	7.9	7.3	3.7	2.4	2.3	2.2	M	1.0	1.4	1.5	3.8	21.4	24.3	12.9	8.0	2.0	1.3	5.8	24.3
3-Oct	1.6	1.2	2.9	8.5	Z	10.3	3.3	5.1	4.5	0.6	0.1	0.2	0.0	0.0	0.0	1.2	4.6	7.8	6.5	4.0	1.4	1.0	0.7	2.8	10.3	
4-Oct	0.4	0.1	0.5	6.2	4.0	Z	0.7	0.2	0.4	0.9	0.5	0.3	0.8	0.3	0.2	0.3	0.1	0.1	0.2	0.1	0.2	0.4	0.3	0.1	0.7	6.2
5-Oct	Z	0.0	0.1	0.0	0.1	0.2	0.1	0.4	0.1	0.4	0.2	0.1	0.4	0.3	0.2	0.3	0.1	0.1	0.7	6.3	2.6	4.3	9.1	4.2	1.3	9.1
6-Oct	4.6	Z	2.9	4.2	6.3	10.7	9.1	6.4	5.0	4.9	5.7	4.9	1.5	2.5	1.7	1.6	1.9	5.2	14.5	20.8	29.4	3.2	0.1	0.1	6.4	29.4
7-Oct	0.1	0.2	Z	0.1	0.1	9.7	6.7	1.9	1.0	1.5	3.5	2.4	2.2	1.5	9.7	5.1	8.5	19.1	13.6	9.9	2.5	1.8	1.6	1.1	4.5	19.1
8-Oct	0.9	0.5	0.6	Z	1.0	1.1	0.8	1.1	1.0	3.2	1.5	1.8	2.8	1.5	0.8	0.9	1.4	2.2	5.7	18.2	4.6	3.9	2.3	1.9	2.6	18.2
9-Oct	2.0	1.1	0.6	0.8	Z	2.6	1.3	1.6	1.8	1.4	1.4	1.6	1.9	1.5	1.6	2.1	3.3	4.8	2.8	4.6	2.6	3.6	1.6	1.3	2.1	4.8
10-Oct	0.5	0.1	0.5	0.6	1.6	Z	2.2	2.5	1.4	1.2	1.8	1.4	1.6	1.6	2.5	3.5	3.2	3.9	3.8	2.0	1.1	0.9	0.5	0.5	1.7	3.9
11-Oct	Z	0.7	0.7	0.9	1.4	2.0	1.7	2.9	1.7	1.6	1.3	1.5	1.7	1.4	2.6	2.1	3.4	5.1	3.2	2.4	1.9	1.4	0.6	0.9	1.9	5.1
12-Oct	1.1	Z	1.7	1.4	2.5	2.9	4.3	4.6	4.1	C	C	C	C	C	1.1	1.3	3.2	11.7	36.9	37.5	8.5	2.8	2.6	6.4	7.5	37.5
13-Oct	5.8	5.3	Z	7.7	5.5	3.7	5.4	8.8	5.9	8.1	5.1	2.5	2.2	3.4	3.4	4.2	3.7	3.4	2.8	2.5	2.0	1.5	1.2	1.2	4.1	8.8
14-Oct	1.4	1.4	1.7	Z	2.4	3.4	2.3	2.7	2.2	1.9	2.1	1.9	1.9	1.8	1.5	1.9	2.1	2.4	2.8	3.2	3.7	2.8	2.0	1.1	2.2	3.7
15-Oct	1.3	1.8	1.8	1.9	Z	2.9	2.3	2.9	3.5	3.2	3.5	3.7	2.8	3.6	4.6	5.4	6.2	15.3	44.6	45.4	11.2	13.1	5.5	13.5	8.7	45.4
16-Oct	9.7	8.1	2.3	2.3	2.5	Z	4.0	3.4	1.5	1.1	0.8	0.7	0.6	0.2	0.2	0.5	2.0	21.8	3.7	3.3	6.8	3.7	3.3	3.9	3.8	21.8
17-Oct	Z	4.1	4.4	3.8	14.0	52.2	50.4	68.8	103.8	54.4	22.1	14.0	7.9	11.4	11.8	16.2	16.9	11.8	10.3	6.0	7.4	7.3	7.0	10.4	22.5	103.8
18-Oct	9.8	Z	12.9	13.1	13.7	11.7	8.1	4.9	3.6	4.6	3.5	4.1	6.6	8.0	7.1	7.8	7.8	49.2	50.4	13.7	1.7	0.8	0.9	0.9	10.6	50.4
19-Oct	0.8	0.6	Z	1.0	1.4	1.9	3.0	2.5	2.4	1.1	0.2	0.1	0.2	0.2	0.0	0.3	0.8	0.9	0.3	0.0	0.0	0.0	0.0	0.4	0.8	3.0
20-Oct	0.2	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.2	0.0	0.0	2.3	1.2	0.2	5.3	5.6	8.7	7.2	6.6	3.7	1.9	8.7
21-Oct	2.8	5.3	14.0	13.9	Z	31.9	7.5	11.3	11.7	12.8	15.9	12.7	5.2	10.8	9.8	6.5	1.6	1.4	1.4	2.5	2.5	1.2	1.7	4.0	8.2	31.9
22-Oct	4.5	2.2	4.0	2.6	4.1	Z	4.9	8.1	5.9	7.0	7.6	4.6	3.0	6.6	6.2	6.7	17.2	14.4	5.9	6.2	3.4	2.1	1.4	1.1	5.6	17.2
23-Oct	Z	0.4	0.4	0.4	0.5	0.2	1.0	2.8	13.1	1.6	0.4	0.6	1.0	1.2	0.7	0.6	0.4	0.3	0.7	0.4	0.5	0.9	0.3	0.1	1.2	13.1
24-Oct	0.2	Z	0.4	0.2	0.3	0.3	1.0	0.4	1.4	1.4	0.6	0.5	0.6	0.9	0.5	0.0	0.1	0.2	0.2	0.2	0.3	0.5	0.3	0.3	0.5	1.4
25-Oct	0.3	0.2	Z	0.2	0.1	0.5	0.6	0.1	0.1	0.3	0.3	0.1	0.1	0.3	0.5	0.1	0.1	1.8	1.3	0.2	0.2	0.2	0.0	0.0	0.3	1.8
26-Oct	0.0	0.0	0.0	Z	0.1	0.0	0.2	0.2	0.4	0.1	0.2	0.8	2.3	0.8	2.1	0.0	0.2	2.2	1.5	0.3	0.4	0.4	0.2	0.2	0.5	2.3
27-Oct	0.3	0.3	0.1	0.1	Z	3.3	3.3	2.8	3.2	7.7	4.6	5.4	2.0	5.0	2.8	3.6	1.0	4.3	3.8	0.5	0.6	1.4	3.0	2.6	2.7	7.7
28-Oct	2.7	2.7	1.7	2.4	0.0	Z	1.7	1.4	1.0	0.2	0.3	0.3	0.7	0.2	1.8	2.8	0.3	0.5	0.6	0.1	1.3	0.4	0.1	0.3	1.0	2.8
29-Oct	Z	0.2	0.1	0.2	0.0	0.1	0.0	0.0	0.8	0.1	0.2	0.4	0.2	0.5	0.3	0.1	10.6	23.7	16.2	4.6	4.6	14.4	16.9	14.2	4.7	23.7
30-Oct	7.6	Z	4.6	6.4	8.3	11.5	5.8	3.6	8.6	7.5	5.8	3.6	1.7	1.5	1.8	3.1	6.4	6.1	6.1	6.3	5.2	2.1	1.5	1.9	5.1	11.5
31-Oct	3.3	2.5	Z	2.5	1.0	0.9	6.0	7.2	9.4	9.9	5.2	8.4	11.7	10.3	13.4	20.8	27.6	19.0	18.7	18.2	10.0	6.2	4.8	6.4	9.7	27.6
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan C - Calibration M - Maintenance																										



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	686	97.03	97.03
21 - 40	12	1.70	98.73
41 - 80	8	1.13	99.86
81 - 159	1	0.14	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744



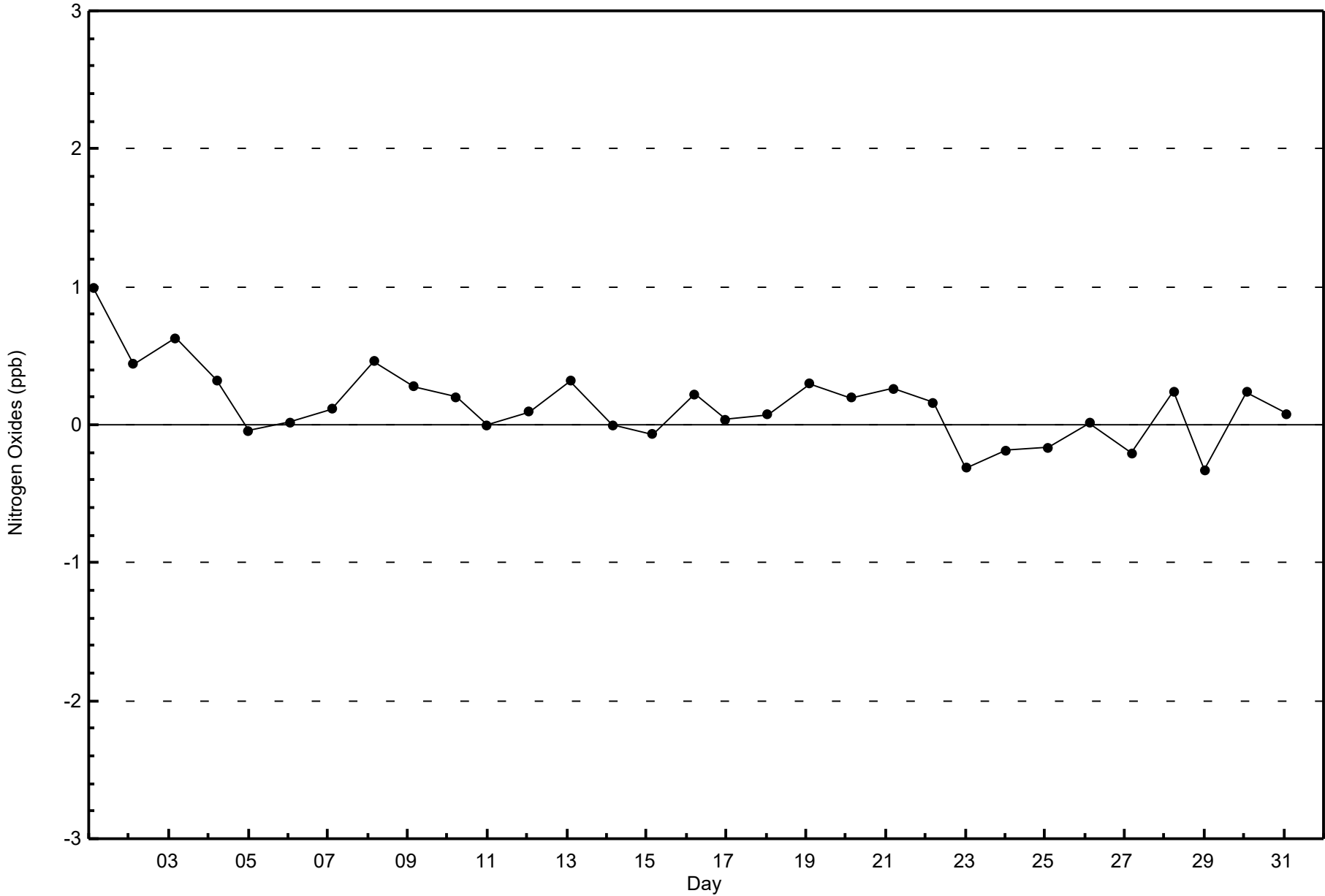
**Wood Buffalo Environmental Association
Frequency Distribution**

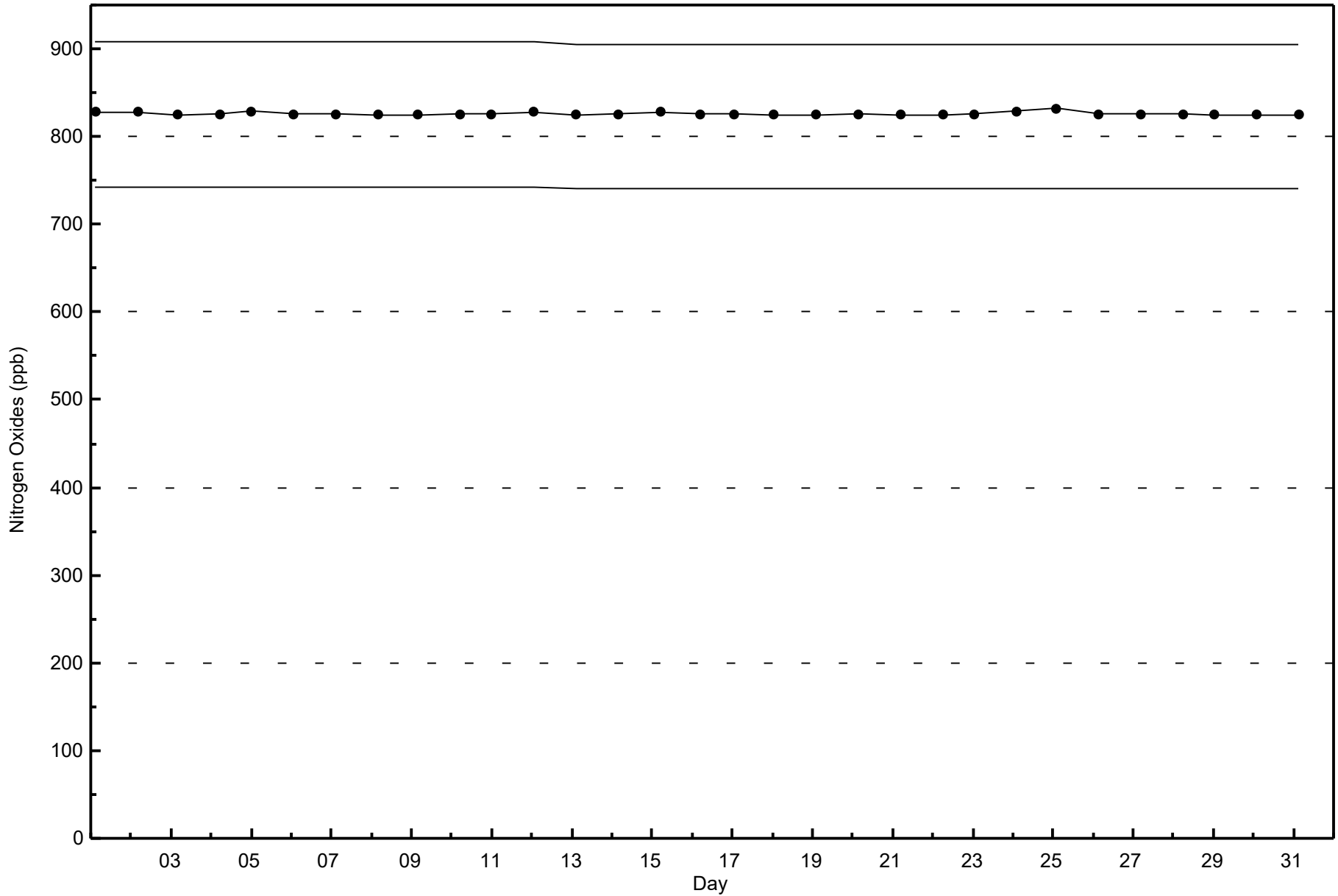
**Nitrogen Oxides (NO_x) - ppb
Patricia McInnes - October 2023**

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	12	1	2	4	84	119	26	44	37	45	43	77	81	42	30	686
21 - 40	1	0	0	0	2	0	2	4	0	2	0	0	1	0	0	0	12
11 - 80	3	0	0	0	0	1	0	3	0	0	0	0	0	0	0	1	8
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	43	12	1	2	6	85	121	33	44	39	45	43	78	81	42	32	707

Total Number of Valid Hours: 707

Total Number of Hours: 744

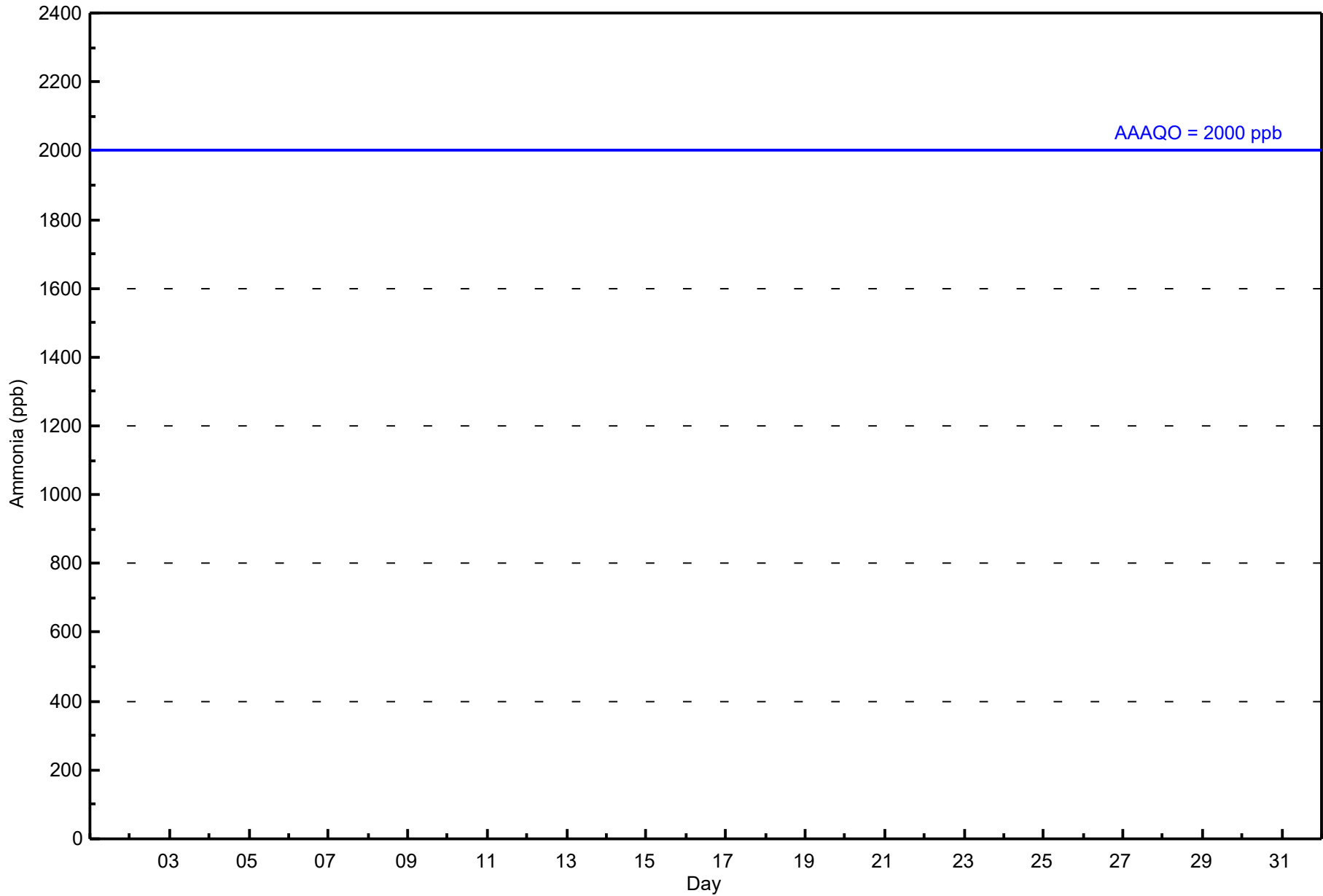






Wood Buffalo Environmental Association
Hourly Averages

Ammonia (NH₃) - ppb
Patricia McInnes - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ammonia (NH₃) - ppb
Patricia McInnes - October 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 5	635	100.00	100.00
6 - 10	0	0.00	100.00
11 - 15	0	0.00	100.00
16 - 20	0	0.00	100.00
21 - 25	0	0.00	100.00
> 26	0	0.00	100.00

Total Number of Valid Hours: 635

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Ammonia (NH₃) - ppb
Patricia McInnes - October 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	39	11	1	2	6	83	106	32	41	26	39	41	65	71	42	30	635
6 - 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	39	11	1	2	6	83	106	32	41	26	39	41	65	71	42	30	635

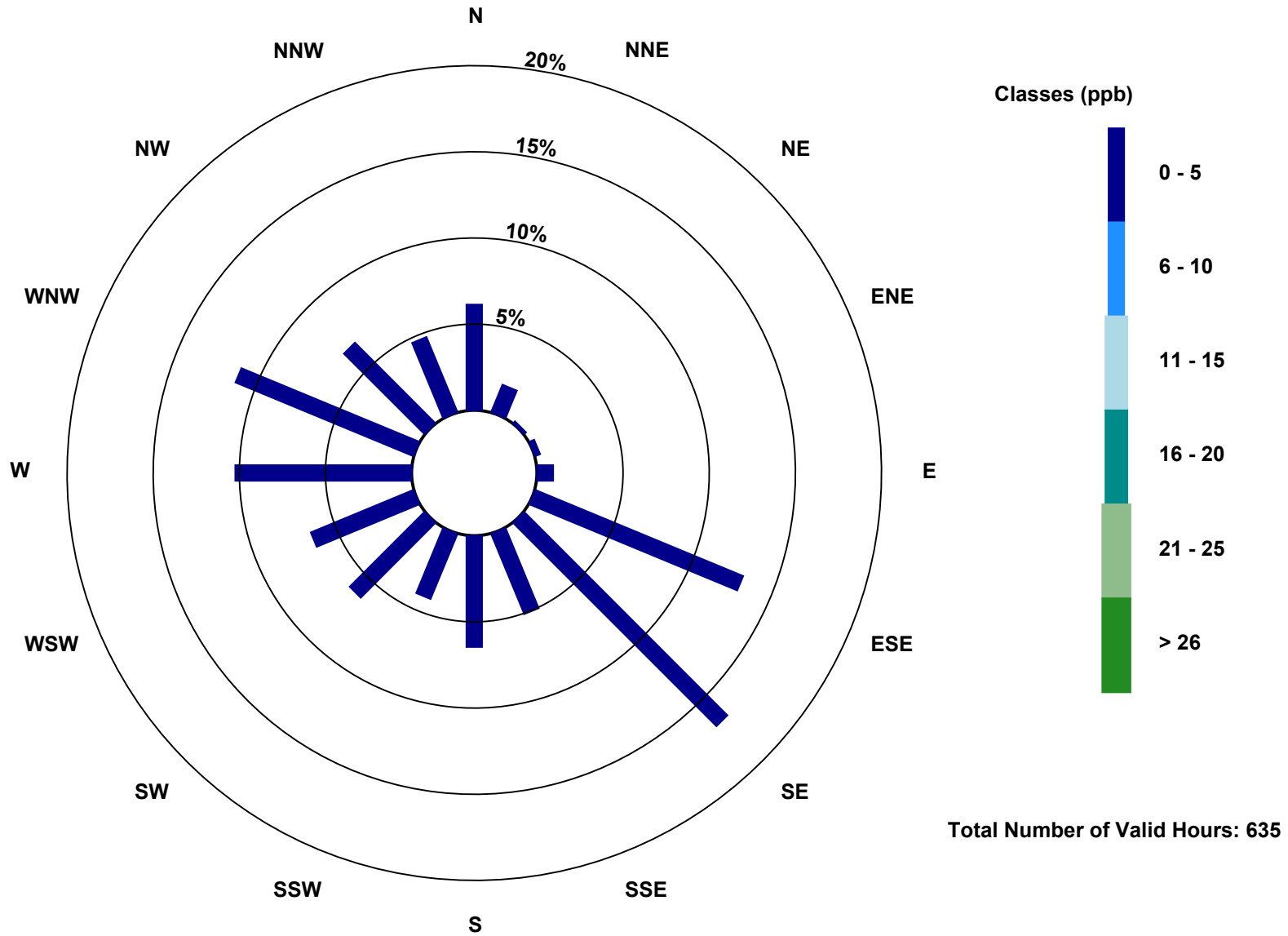
Total Number of Valid Hours: 635

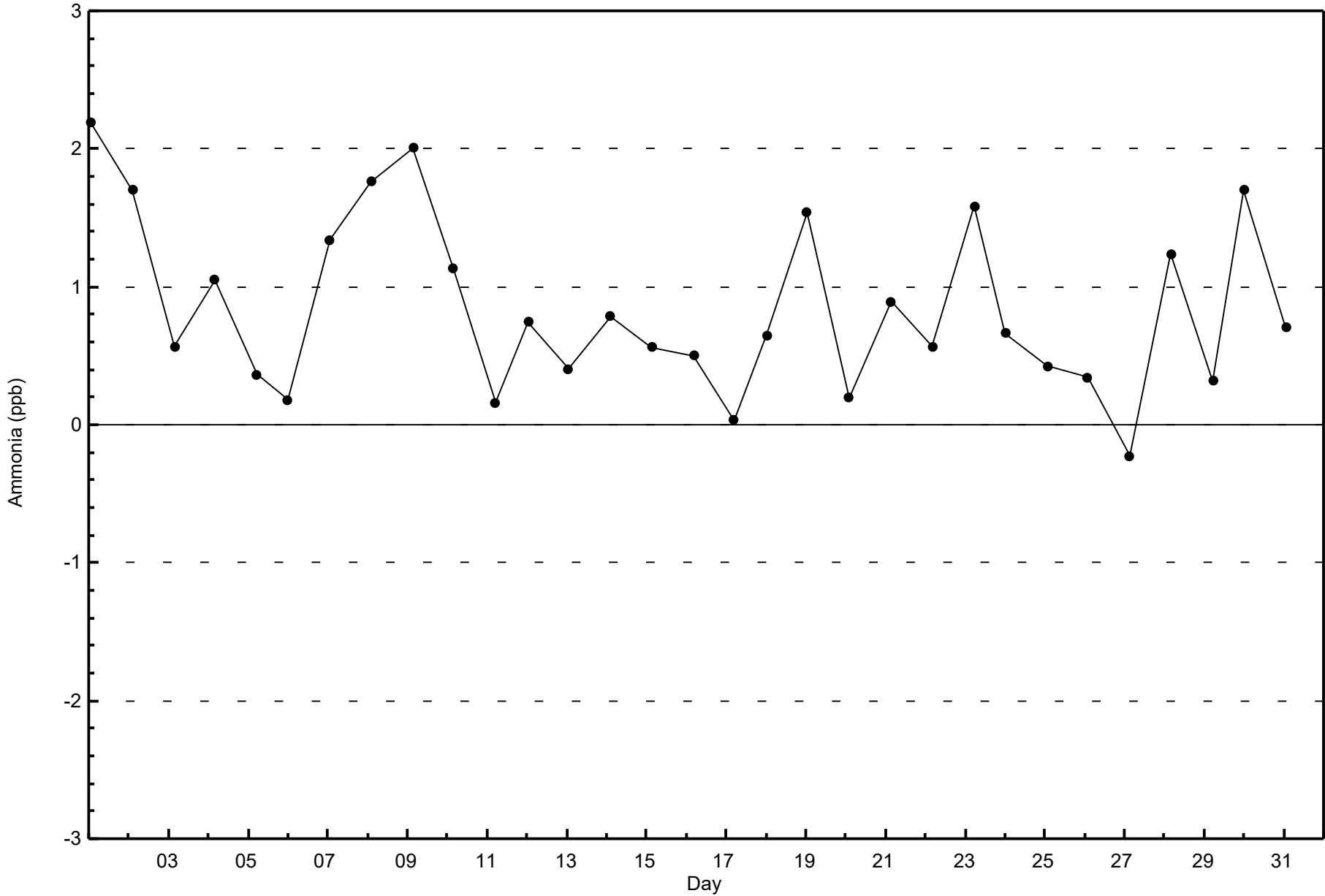
Total Number of Hours: 744

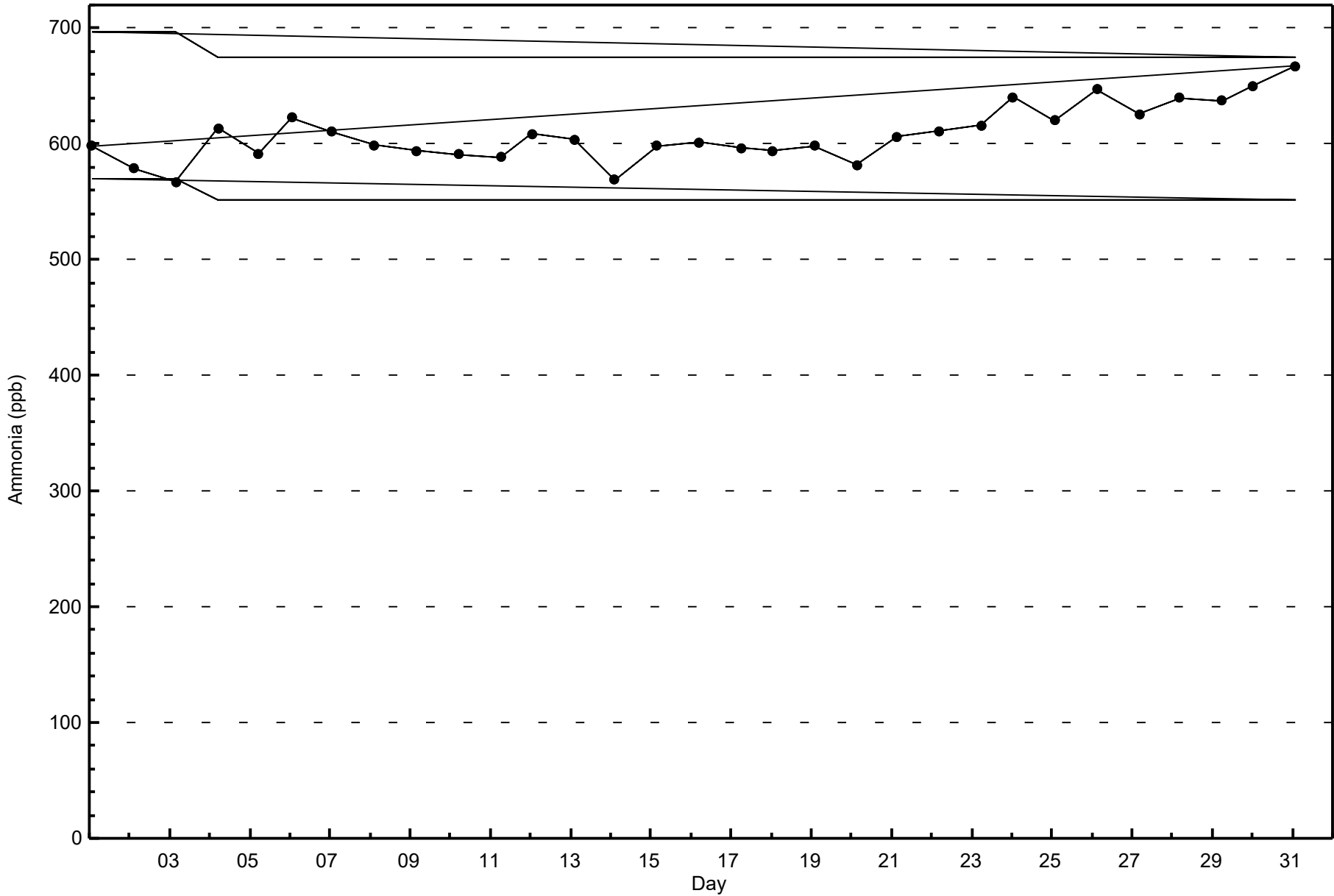


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Ammonia (NH₃) - ppb
Patricia McInnes









Wood Buffalo Environmental Association

Summary of Hour Averages

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

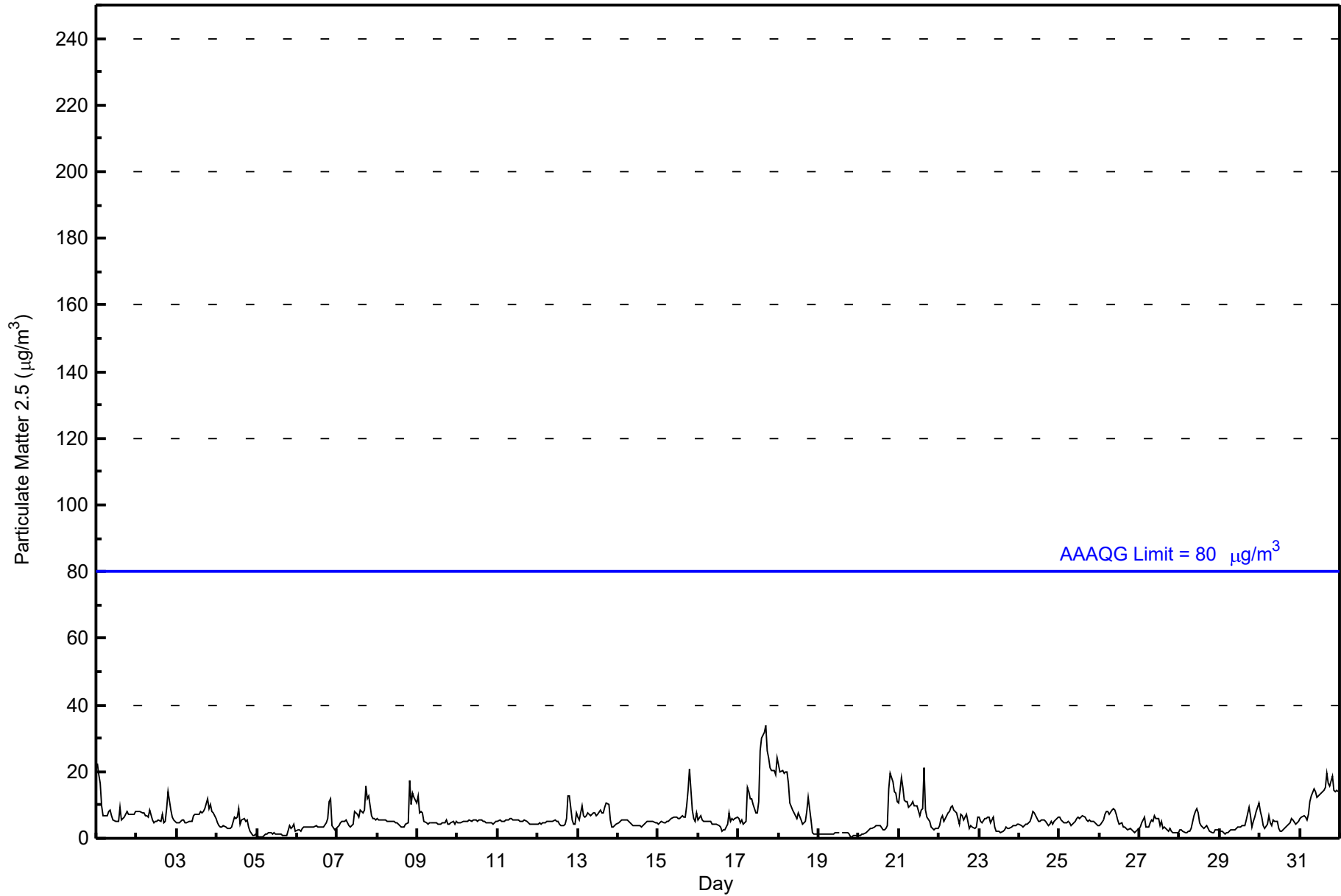
Patricia McInnes - October 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 33.9 µg/m ³ on Oct 17 17:00	Maximum Daily Average: 16.4 µg/m ³ on Oct 17		Hours of Data:	743
Minimum Value: 0.4 µg/m ³ on Oct 5 02:00	Minimum Daily Average: 1.3 µg/m ³ on Oct 19		Hours of Missing Data:	1
Maximum Diurnal Average: 7.8 µg/m ³ at hour 20	Minimum Diurnal Average: 5.2 µg/m ³ at hour 13		Hours of Calibration:	1
Monthly Average: 5.99 µg/m ³	Percentiles: P ₁ = 0.8 P ₁₀ = 2.1 Q ₁ = 3.6 Median = 5.0 Q ₃ = 6.8 P ₉₀ = 10.6 P ₉₉ = 22.3		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-Oct	22.4	19.2	16.6	9.7	7.0	6.7	7.0	8.1	8.5	6.8	5.4	5.1	5.0	4.9	9.2	5.6	6.2	7.0	8.1	7.4	7.3	7.1	7.3	7.9	8.6	22.4																						
2-Oct	8.0	7.9	8.0	7.8	7.5	6.9	6.6	6.4	8.5	5.4	4.9	4.9	5.1	5.4	5.3	7.2	4.9	5.2	8.7	14.2	8.6	6.5	5.7	5.2	6.9	14.2																						
3-Oct	4.8	4.8	5.1	5.6	5.5	4.8	4.6	5.0	5.0	5.1	6.7	7.1	7.3	7.3	7.9	7.5	7.9	8.7	11.8	9.0	10.3	8.1	7.7	6.1	6.8	11.8																						
4-Oct	4.8	3.9	3.4	3.6	3.7	3.5	3.2	3.1	3.1	3.5	6.3	5.8	6.5	8.7	4.1	5.5	6.1	5.3	5.3	3.5	2.2	0.9	0.9	1.1	4.1	8.7																						
5-Oct	1.0	0.4	0.4	0.5	0.7	1.1	1.1	1.6	1.5	1.5	1.7	1.2	1.4	1.2	1.2	0.9	0.8	0.8	0.9	3.7	3.1	3.5	4.0	2.2	1.5	4.0																						
6-Oct	2.5	2.4	2.2	2.9	3.3	3.5	3.3	3.3	3.3	3.2	3.4	3.6	3.4	3.6	3.4	3.3	3.2	4.7	5.9	11.0	11.7	3.7	2.6	3.0	4.0	11.7																						
7-Oct	3.6	3.8	4.5	5.0	5.0	5.5	4.8	3.7	3.4	4.4	7.8	7.6	7.0	6.5	8.6	7.5	8.5	15.8	12.0	12.9	6.7	6.0	6.1	5.3	6.8	15.8																						
8-Oct	5.8	5.6	5.6	5.3	5.5	5.4	5.2	5.0	5.0	5.0	5.1	4.9	4.7	3.9	3.3	3.2	3.4	4.1	4.7	17.3	10.0	13.7	12.3	10.4	6.4	17.3																						
9-Oct	12.7	7.5	7.9	7.7	5.3	4.6	4.4	4.5	4.7	4.8	4.7	4.6	4.4	4.2	4.2	4.6	4.6	5.7	4.3	4.3	4.5	5.0	4.4	5.0	5.3	12.7																						
10-Oct	4.6	4.6	4.7	4.9	5.1	5.2	5.1	5.5	5.3	5.4	5.3	5.3	5.2	5.3	5.4	5.0	5.2	4.9	4.7	4.5	4.5	4.4	4.8	4.9	5.0	5.5																						
11-Oct	5.3	5.4	5.1	5.2	5.3	5.3	5.7	5.9	5.8	5.7	5.6	5.3	5.5	5.1	5.1	5.2	5.4	5.0	4.6	4.2	4.2	4.2	4.2	4.3	5.1	5.9																						
12-Oct	4.3	4.5	4.4	4.7	4.8	4.9	5.0	5.0	4.9	5.0	5.5	5.3	5.1	4.1	3.6	3.8	4.4	5.8	12.6	12.8	5.7	4.1	4.3	7.8	5.5	12.8																						
13-Oct	6.3	5.3	9.8	7.0	6.3	6.9	7.5	6.9	7.0	7.7	7.5	6.7	7.1	8.6	7.8	7.8	9.4	10.4	10.3	5.5	3.6	3.4	3.8	4.2	7.0	10.4																						
14-Oct	4.5	4.9	5.5	5.5	5.6	5.5	5.1	4.8	4.3	4.0	3.8	3.8	3.7	3.6	3.6	3.8	4.8	5.0	5.2	5.0	5.2	5.0	4.7	4.7	4.6	5.6																						
15-Oct	4.2	4.5	5.2	4.5	4.7	5.0	5.2	5.4	5.9	6.2	6.4	6.5	6.0	5.9	6.9	6.5	6.3	9.9	14.5	20.7	8.3	6.0	5.2	7.6	7.0	20.7																						
16-Oct	5.6	6.8	5.4	5.3	5.2	5.1	5.1	4.9	4.4	4.2	4.2	4.4	4.0	3.2	2.3	2.5	2.4	4.2	7.8	4.9	5.9	5.4	6.0	6.4	4.8	7.8																						
17-Oct	5.8	4.8	5.4	4.1	5.2	15.4	13.9	11.9	12.0	10.3	7.8	7.6	11.1	26.2	30.1	31.8	33.9	26.2	24.3	21.1	20.5	20.2	19.2	24.0	16.4	33.9																						
18-Oct	22.1	19.8	20.2	19.6	19.7	19.7	16.7	10.7	8.5	7.6	6.7	6.1	7.6	5.5	4.4	4.8	4.9	8.2	12.2	5.4	1.8	1.4	1.4	1.2	9.8	22.1																						
19-Oct	1.1	1.1	1.2	1.4	1.5	1.3	1.4	1.4	1.3	1.4	1.5	1.6	1.5	C	1.5	1.7	1.7	1.6	1.2	0.5	0.5	0.7	1.0	0.9	1.3	1.7																						
20-Oct	0.8	0.9	1.1	1.3	1.7	2.0	2.4	2.9	3.1	3.5	3.6	3.7	3.8	3.7	2.7	2.7	3.1	3.8	14.9	19.4	17.1	13.8	13.4	11.1	5.7	19.4																						
21-Oct	10.5	18.3	15.2	11.3	11.1	11.2	9.3	10.3	11.0	9.6	9.7	9.6	6.8	8.4	8.9	21.4	8.4	6.3	4.9	3.3	3.1	2.6	2.9	3.1	9.0	21.4																						
22-Oct	3.7	5.8	6.6	5.1	5.9	7.7	8.1	9.4	9.8	8.3	7.5	6.0	4.4	7.4	6.9	5.4	7.0	5.3	2.9	4.0	3.2	2.9	3.6	6.2	6.0	9.8																						
23-Oct	6.4	4.9	4.8	5.7	5.9	6.5	6.2	4.8	6.3	3.6	2.3	2.3	2.1	1.6	2.1	2.7	3.3	3.0	3.1	3.4	3.7	3.9	3.9	4.2	4.0	6.5																						
24-Oct	4.2	4.0	3.6	3.7	4.0	4.4	5.2	6.4	7.9	7.8	6.6	5.3	5.1	5.7	5.4	5.0	4.0	4.2	4.9	4.4	5.0	6.1	6.6	5.2	7.9	6.6																						
25-Oct	6.2	5.3	4.9	4.6	4.6	4.9	4.7	4.0	4.0	5.2	6.1	6.5	6.0	6.3	6.8	6.4	5.7	5.2	5.4	5.1	4.9	4.5	4.1	3.9	5.2	6.8																						
26-Oct	3.8	4.0	5.4	7.4	8.1	7.9	7.4	8.4	9.1	8.6	7.3	5.5	4.4	4.5	3.4	3.2	2.8	2.8	3.1	2.5	2.0	1.7	2.0	2.6	4.9	9.1																						
27-Oct	3.5	4.5	5.5	6.5	3.5	3.3	4.8	5.6	5.0	6.9	5.9	6.1	3.7	4.9	2.9	3.3	2.4	2.1	2.8	2.0	1.6	1.7	1.9	1.8	3.8	6.9																						
28-Oct	2.7	2.4	2.1	1.8	1.8	2.0	2.2	2.9	6.7	7.9	8.8	7.6	4.7	3.7	3.1	3.5	3.8	3.0	2.3	1.6	1.9	2.6	2.4	2.3	3.5	8.8																						
29-Oct	2.3	2.2	1.8	1.4	1.6	1.9	2.5	2.4	2.4	2.5	3.0	3.5	3.5	3.7	3.8	3.6	5.4	9.3	6.8	3.5	4.9	6.5	8.0	10.6	4.0	10.6																						
30-Oct	7.9	6.3	4.0	2.9	4.3	6.8	4.8	4.0	5.5	5.3	5.1	3.1	2.2	2.3	2.4	3.3	4.0	4.3	4.6	6.0	5.4	4.4	4.7	5.1	4.5	7.9																						
31-Oct	6.1	6.2	6.8	6.2	5.6	7.2	10.9	12.7	15.0	14.0	12.4	12.9	13.2	14.1	14.6	15.2	19.5	16.6	15.8	18.7	14.5	13.9	14.3	14.0	12.5	19.5																						
																								6.0	5.9	5.9	5.4	5.3	5.9	5.8	5.7	6.1	5.8	5.8	5.5	5.2	6.0	5.8	6.3	6.3	6.6	7.4	7.8	6.2	5.6	5.6	5.9	Diurnal Average
																								22.4	19.8	20.2	19.6	19.7	19.7	16.7	12.7	15.0	14.0	12.4	12.9	13.2	26.2	30.1	31.8	33.9	26.2	24.3	21.1	20.5	20.2	19.2	24.0	Diurnal Maximum

C - Calibration

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	455	61.24	61.24
6 - 15	256	34.45	95.69
16 - 25	27	3.63	99.33
26 - 80	5	0.67	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Patricia McInnes - October 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	16	5	0	0	0	69	62	10	25	27	40	36	52	65	35	13	455
6 - 15	24	7	1	2	5	21	60	20	20	16	6	7	27	19	8	13	256
16 - 25	5	0	0	0	1	1	6	5	1	2	0	1	1	1	0	3	27
26 - 80	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	5
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	47	12	1	2	6	91	128	35	46	45	46	44	80	85	43	32	743

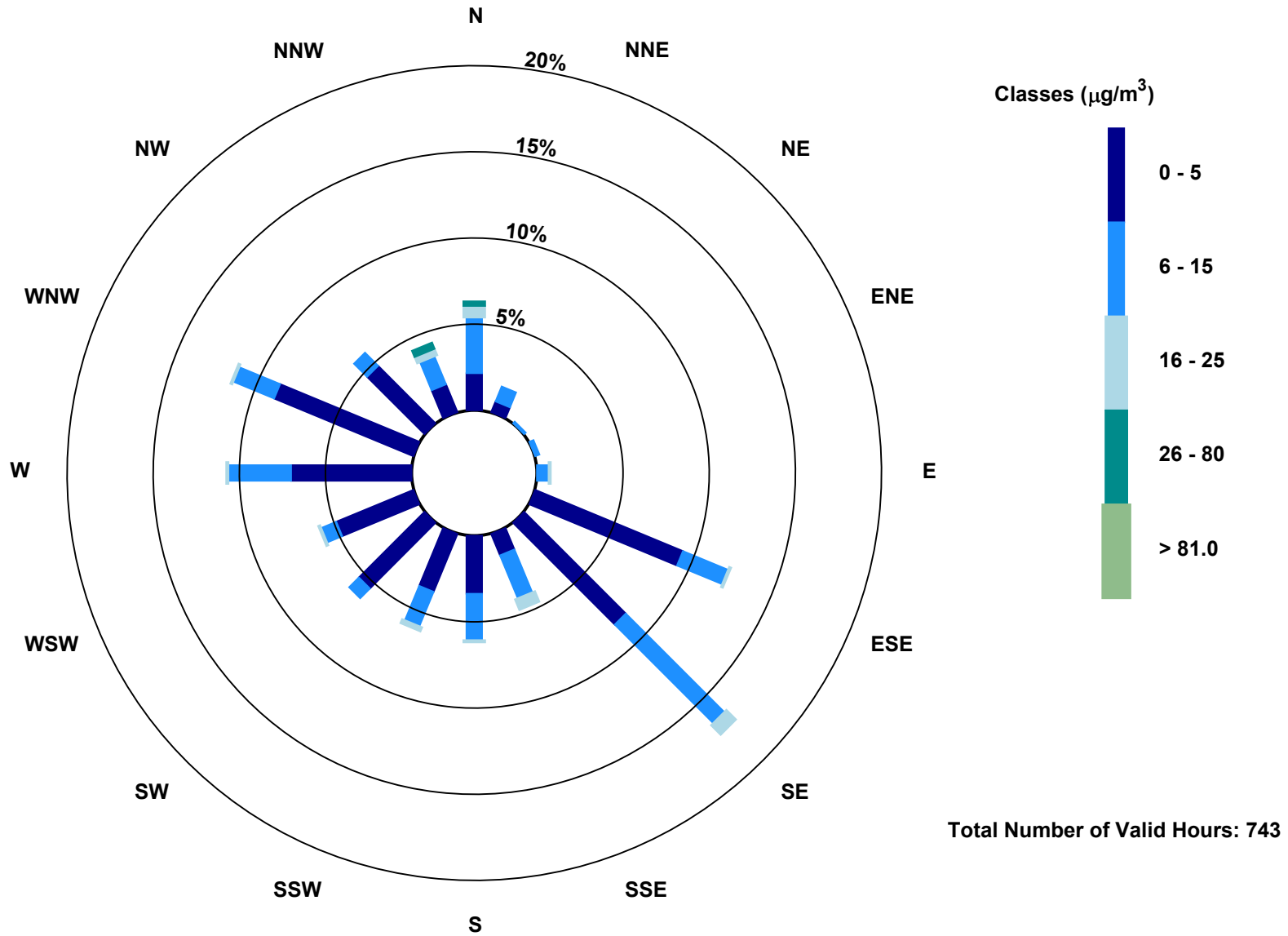
Total Number of Valid Hours: 743

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 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

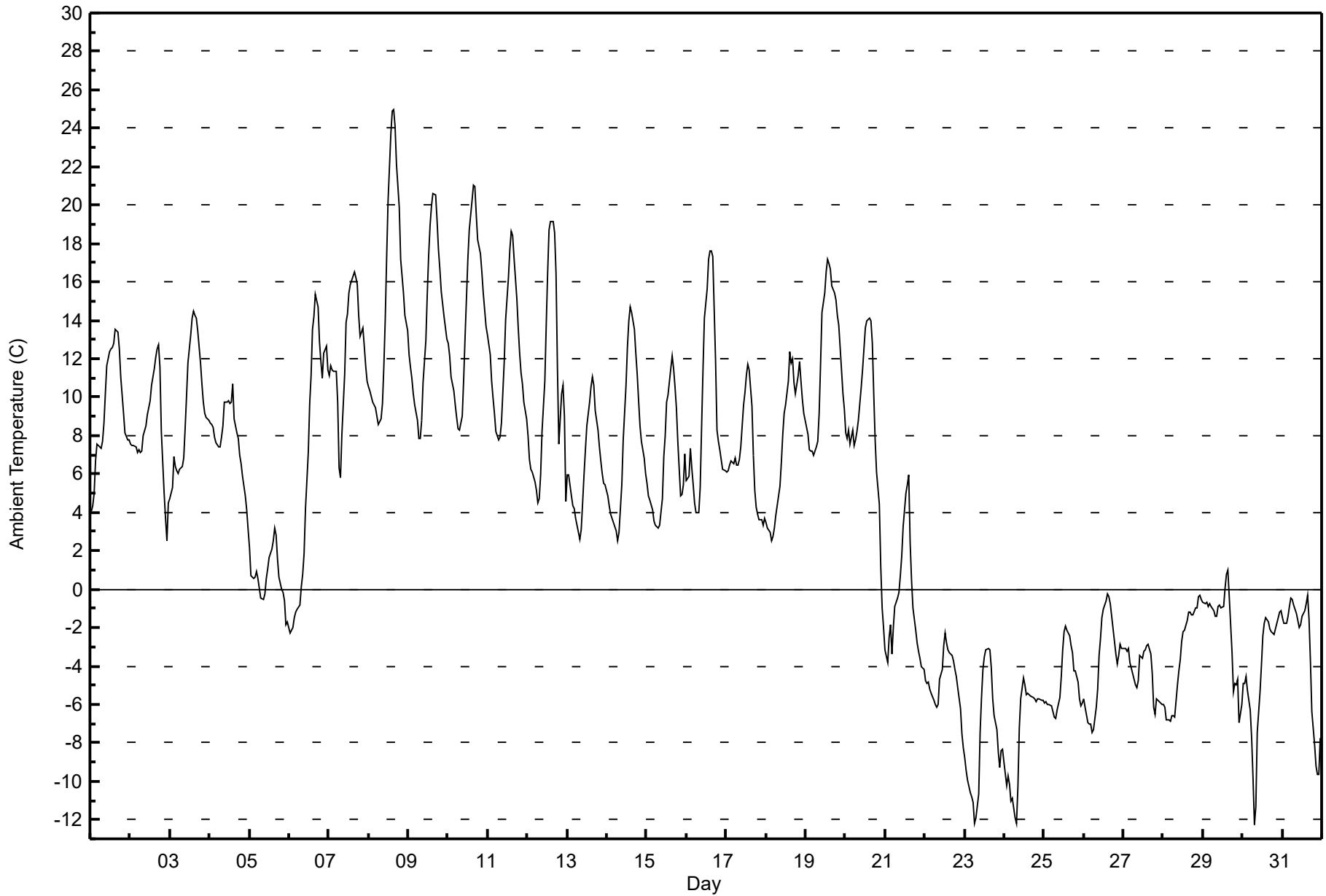
Patricia McInnes - October 2023

Maximum Value: 25.0 C on Oct 8 16:00 Maximum Daily Average: 15.2 C on Oct 8																					Hours in Service: 744 Hours of Data: 744					
Minimum Value: -12.3 C on Oct 30 08:00 Minimum Daily Average: -7.7 C on Oct 23 Maximum Diurnal Average: 9.0 C at hour 15 Minimum Diurnal Average: 1.3 C at hour 7 Monthly Average: 4.49 C Percentiles: P ₁ = -11.0 P ₁₀ = -5.9 Q ₁ = -2.2 Median = 5.6 Q ₃ = 10.5 P ₉₀ = 14.2 P ₉₉ = 20.6																					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-Oct	4.0	4.3	5.0	6.7	7.6	7.4	7.3	7.7	8.7	10.2	11.6	12.4	12.5	12.6	12.8	13.5	13.4	12.5	11.0	10.1	9.2	8.2	7.8	7.8	9.3	13.5
2-Oct	7.6	7.5	7.5	7.4	7.1	7.3	7.1	7.2	8.0	8.5	9.1	9.4	9.8	10.6	11.5	12.1	12.5	12.7	11.6	8.2	5.0	3.7	2.6	4.5	8.3	12.7
3-Oct	4.7	5.3	6.9	6.4	6.1	6.0	6.3	6.4	6.9	8.4	10.1	11.8	13.3	14.1	14.5	14.3	14.1	13.4	11.8	10.7	9.7	9.1	8.9	8.8	9.5	14.5
4-Oct	8.6	8.6	8.5	7.9	7.6	7.4	7.4	7.9	8.5	9.7	9.7	9.8	9.6	9.7	10.7	8.9	8.1	7.8	7.0	6.5	5.9	4.8	4.1	3.1	7.8	10.7
5-Oct	2.2	0.7	0.6	0.6	0.9	0.6	0.1	-0.4	-0.5	-0.3	0.6	1.1	1.7	2.1	2.5	3.2	2.8	1.5	0.7	0.0	-0.2	-0.6	-1.8	-1.7	0.7	3.2
6-Oct	-2.3	-2.1	-2.0	-1.5	-1.2	-1.1	-0.8	0.2	0.8	1.9	4.2	7.1	9.7	11.1	13.5	14.2	15.4	14.7	12.9	11.8	11.0	12.3	12.6	11.4	6.4	15.4
7-Oct	11.2	11.6	11.4	11.3	11.3	9.7	6.3	5.8	8.1	11.2	13.9	14.3	15.4	15.9	16.1	16.5	16.3	15.9	14.2	13.2	13.6	12.7	11.6	10.9	12.4	16.5
8-Oct	10.5	10.3	9.8	9.6	9.5	9.0	8.6	8.9	9.7	11.6	14.1	17.3	20.2	23.7	24.9	25.0	24.1	22.1	19.9	17.2	16.3	15.4	14.3	13.5	15.2	25.0
9-Oct	12.2	11.5	10.9	10.2	9.6	8.8	7.8	7.8	8.8	10.8	12.9	15.4	17.4	18.9	19.9	20.6	20.5	19.2	17.7	16.7	15.5	14.2	13.6	13.0	13.9	20.6
10-Oct	12.8	12.1	11.1	10.3	9.6	8.9	8.3	8.3	9.0	10.9	13.1	15.1	17.2	18.7	20.2	21.0	21.0	19.5	18.2	17.5	16.5	15.4	14.5	13.7	14.3	21.0
11-Oct	13.2	12.2	10.8	9.9	9.2	8.2	7.8	7.9	8.6	10.3	11.9	14.0	16.2	17.7	18.6	18.4	17.3	15.1	13.6	12.3	11.3	10.7	9.8	8.8	12.2	18.6
12-Oct	8.0	6.8	6.2	6.1	5.6	5.1	4.5	4.7	6.0	8.2	10.8	13.7	16.4	18.7	19.1	19.1	18.5	16.5	11.6	7.6	10.1	10.6	9.0	4.5	10.3	19.1
13-Oct	6.0	5.9	4.8	4.4	4.2	3.7	3.3	2.6	3.1	4.5	5.9	7.3	8.5	9.7	10.5	11.0	10.6	9.3	8.3	7.4	6.7	6.0	5.5	5.4	6.4	11.0
14-Oct	4.9	4.4	3.9	3.7	3.5	3.0	2.5	3.0	4.2	5.4	7.8	10.6	12.6	14.0	14.7	14.4	13.5	12.3	11.2	9.8	8.5	7.7	6.8	6.0	7.8	14.7
15-Oct	5.5	4.9	4.6	4.1	3.6	3.3	3.2	3.2	3.3	4.7	6.9	8.0	9.7	10.1	11.5	12.1	11.5	10.5	9.4	7.7	4.9	4.9	5.5	7.1	6.7	12.1
16-Oct	5.7	5.8	7.4	6.3	5.4	4.5	4.0	4.0	5.3	8.4	11.4	14.1	15.6	17.2	17.6	17.6	17.3	11.8	8.3	7.7	7.3	6.7	6.3	6.2	9.2	17.6
17-Oct	6.1	6.2	6.4	6.6	6.5	6.8	6.5	6.5	6.8	7.4	9.6	10.2	11.1	11.7	11.4	9.5	7.0	5.1	4.3	3.9	3.6	3.6	3.3	3.7	6.8	11.7
18-Oct	3.5	3.2	2.9	2.5	2.7	3.1	3.9	4.4	5.3	6.6	8.1	9.2	9.6	10.9	12.4	11.7	12.0	10.8	10.2	11.1	11.9	10.9	9.9	9.2	7.7	12.4
19-Oct	8.5	8.1	7.3	7.2	7.2	7.0	7.4	7.7	9.2	11.7	14.4	15.5	16.5	17.2	16.9	16.6	15.8	15.4	15.1	14.3	13.7	12.6	10.2	9.4	11.9	17.2
20-Oct	8.1	7.9	8.3	7.6	8.3	7.5	7.8	8.2	8.8	10.5	11.4	12.5	13.6	14.0	14.1	13.9	12.8	10.2	7.8	6.1	4.4	1.2	-1.0	-2.0	8.4	14.1
21-Oct	-3.2	-3.8	-2.5	-1.9	-3.4	-2.0	-0.9	-0.5	-0.2	0.7	1.7	3.2	5.0	5.4	6.0	2.5	0.5	-1.0	-2.2	-2.8	-3.2	-3.6	-4.0	-4.2	-0.6	6.0
22-Oct	-4.7	-4.9	-4.9	-5.2	-5.4	-5.8	-6.0	-6.2	-6.0	-4.7	-4.2	-3.0	-2.3	-2.8	-3.2	-3.3	-3.5	-3.7	-4.2	-4.5	-5.1	-6.2	-7.6	-8.3	-4.8	-2.3
23-Oct	-8.8	-9.4	-9.9	-10.6	-10.8	-11.1	-12.2	-11.9	-10.7	-7.4	-5.7	-4.2	-3.5	-3.2	-3.1	-3.2	-4.1	-5.7	-6.6	-7.3	-8.5	-9.3	-8.4	-8.4	-7.7	-3.1
24-Oct	-9.0	-10.2	-9.7	-10.2	-11.0	-10.9	-11.9	-12.2	-10.3	-7.2	-5.7	-4.6	-5.0	-5.5	-5.4	-5.5	-5.6	-5.7	-5.7	-5.8	-5.7	-5.7	-5.8	-5.8	-7.5	-4.6
25-Oct	-5.9	-5.9	-6.0	-6.0	-6.1	-6.4	-6.6	-6.7	-6.3	-5.6	-4.5	-3.2	-2.2	-1.9	-2.1	-2.4	-2.9	-3.3	-4.3	-4.2	-4.9	-5.7	-6.1	-5.9	-4.8	-1.9
26-Oct	-5.7	-6.2	-7.0	-7.0	-7.1	-7.5	-7.3	-6.2	-5.2	-3.4	-2.6	-1.5	-1.0	-0.6	-0.2	-0.4	-0.7	-1.4	-2.7	-3.4	-3.9	-3.4	-2.9	-3.1	-3.8	-0.2
27-Oct	-3.1	-3.1	-3.3	-3.1	-3.8	-4.4	-4.7	-5.0	-5.1	-4.8	-3.5	-3.6	-3.2	-3.2	-2.9	-2.9	-3.4	-4.4	-6.1	-6.5	-5.7	-5.8	-5.9	-6.0	-4.3	-2.9
28-Oct	-6.0	-6.2	-6.8	-6.8	-6.8	-6.6	-6.6	-6.7	-5.0	-4.2	-3.7	-2.7	-2.2	-2.2	-1.7	-1.2	-1.2	-1.3	-1.3	-1.0	-0.9	-0.4	-0.3	-0.5	-3.4	-0.3
29-Oct	-0.7	-0.7	-0.6	-0.9	-0.8	-0.9	-1.1	-1.4	-1.4	-0.9	-0.8	-1.0	-0.9	0.0	0.8	1.0	-0.4	-3.3	-5.3	-4.9	-5.0	-4.7	-7.0	-6.0	-2.0	1.0
30-Oct	-4.9	-4.9	-4.6	-5.3	-6.3	-7.8	-9.8	-12.3	-11.3	-7.5	-5.4	-4.0	-2.4	-1.8	-1.5	-1.7	-2.0	-2.2	-2.3	-2.4	-2.1	-1.5	-1.2	-1.1	-4.4	-1.1
31-Oct	-1.5	-1.7	-1.8	-1.4	-0.9	-0.5	-0.5	-0.9	-1.3	-1.6	-2.0	-1.8	-1.4	-1.1	-0.7	-0.3	-1.5	-3.8	-6.3	-8.1	-9.2	-9.6	-9.7	-7.8	-3.1	-0.3
2.8 2.5 2.4 2.2 2.0 1.7 1.3 1.3 2.1 3.7 5.2 6.5 7.7 8.4 9.0 8.9 8.4 7.1 5.7 4.8 4.2 3.7 3.1 2.8																								Diurnal Average		
13.2 12.2 11.4 11.3 11.3 9.7 8.6 8.9 9.7 11.7 14.4 17.3 20.2 23.7 24.9 25.0 24.1 22.1 19.9 17.5 16.5 15.4 14.5 13.7																								Diurnal Maximum		



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	270	36.29	36.29
0 - 10	273	36.69	72.98
10 - 20	190	25.54	98.52
> 20	11	1.48	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

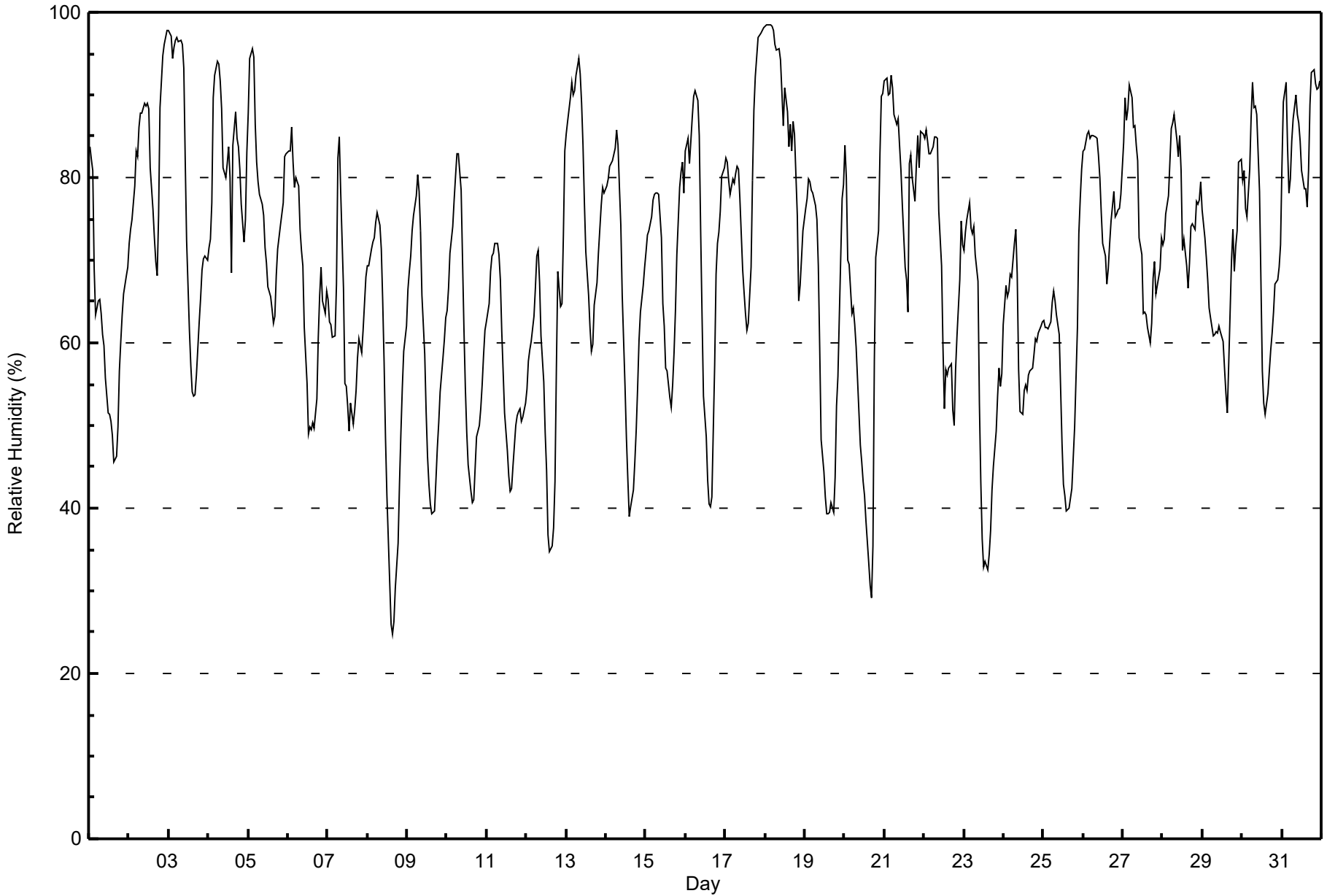
Patricia McInnes - October 2023

Maximum Value: 98.5 % on Oct 18 03:00																						Hours in Service: 744																											
Maximum Daily Average: 87.6 % on Oct 18																						Hours of Data: 744																											
Minimum Value: 24.7 % on Oct 8 16:00																						Hours of Missing Data: 0																											
Maximum Diurnal Average: 80.8 % at hour 7																						Hours of Calibration: 0																											
Minimum Daily Average: 54.4 % on Oct 8																						Percent Operational Time: 100.0																											
Minimum Diurnal Average: 53.0 % at hour 15																																																	
Monthly Average: 69.35 %																																																	
Percentiles: P₁ = 32.7 P₁₀ = 47.7 Q₁ = 58.8 Median = 70.7 Q₃ = 81.8 P₉₀ = 88.7 P₉₉ = 97.8																																																	
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-Oct	83.7	82.2	80.8	69.0	63.5	65.2	65.3	63.6	61.0	59.7	55.8	51.4	51.4	50.5	48.8	45.5	46.3	49.9	56.6	60.1	63.4	65.9	68.1	69.2	61.5	83.7																							
2-Oct	72.0	73.7	74.9	79.0	83.2	82.5	86.1	87.8	87.7	89.0	88.6	89.0	88.3	81.2	76.0	72.7	69.9	68.1	75.4	88.5	94.8	96.2	96.9	97.8	83.3	97.8																							
3-Oct	97.8	97.0	94.4	95.8	96.7	97.0	96.5	96.7	96.1	93.2	82.2	72.3	61.5	57.4	54.1	53.5	53.7	56.1	62.6	65.5	68.8	70.1	70.5	69.9	77.5	97.8																							
4-Oct	71.5	72.6	77.0	89.7	92.4	94.1	93.7	91.6	88.4	81.2	80.0	81.8	83.8	80.0	68.4	83.9	88.0	84.8	83.7	80.9	76.8	72.2	74.9	83.0	82.3	94.1																							
5-Oct	87.8	94.4	95.6	94.6	86.4	81.8	79.5	77.9	76.9	75.4	71.6	69.7	66.8	65.6	64.1	62.4	63.3	68.1	71.3	74.3	75.7	77.0	82.5	82.9	76.9	95.6																							
6-Oct	83.2	83.3	86.2	81.8	78.8	80.0	79.0	73.7	71.2	69.3	61.8	55.1	49.0	49.8	49.5	50.4	49.6	53.2	60.7	65.8	69.1	65.0	63.6	66.2	66.5	86.2																							
7-Oct	65.3	62.6	62.1	60.6	60.8	67.1	82.3	85.0	78.3	66.7	55.1	54.7	52.3	49.3	52.8	50.1	51.8	54.3	58.1	60.5	58.8	61.6	64.8	68.0	61.8	85.0																							
8-Oct	69.3	69.4	71.4	72.2	72.8	74.6	75.7	74.3	71.4	65.1	57.6	48.5	41.6	31.0	25.9	24.7	26.3	30.4	35.7	43.1	49.1	54.5	59.1	62.1	54.4	75.7																							
9-Oct	66.4	68.6	70.5	73.5	75.5	77.8	80.3	78.2	73.6	65.8	58.7	51.7	46.3	42.9	40.5	39.3	39.7	43.4	47.3	50.4	54.0	58.2	60.4	63.0	59.4	80.3																							
10-Oct	63.9	66.6	70.8	74.1	77.4	80.1	82.8	82.9	78.5	69.9	61.6	54.6	49.1	45.3	42.0	40.6	41.0	44.8	48.6	49.9	52.0	55.0	58.5	61.5	60.5	82.9																							
11-Oct	62.5	64.8	68.7	70.5	70.9	72.0	72.1	70.7	67.6	61.4	56.4	51.5	46.9	43.8	42.0	42.4	45.1	50.0	51.2	51.7	52.0	50.6	51.0	52.6	57.0	72.1																							
12-Oct	54.5	57.9	59.2	60.2	63.3	66.7	70.5	71.2	67.3	60.9	55.3	49.2	44.6	36.7	34.8	35.4	37.6	43.2	56.9	68.6	64.3	64.8	73.1	83.3	57.5	83.3																							
13-Oct	85.3	86.8	89.7	91.5	90.0	90.6	92.4	94.4	92.6	89.0	83.9	77.0	71.0	65.8	61.9	59.0	59.8	64.5	67.4	70.9	73.7	76.6	78.8	78.2	78.8	94.4																							
14-Oct	79.0	79.8	81.3	81.8	82.1	83.6	85.7	83.9	78.8	74.2	65.8	54.7	48.4	43.6	39.0	40.1	42.2	45.5	49.5	54.6	60.3	63.8	67.0	69.2	64.8	85.7																							
15-Oct	71.0	73.1	73.6	75.3	77.3	78.0	78.2	78.2	77.9	72.7	64.8	60.2	57.0	56.7	53.3	52.2	54.9	58.8	63.8	70.7	78.9	80.7	81.9	78.1	69.6	81.9																							
16-Oct	83.3	84.8	81.7	84.4	87.3	89.8	90.5	89.4	85.1	73.6	63.3	53.6	48.6	43.4	40.5	40.2	41.4	57.3	68.4	72.1	73.4	76.0	80.1	81.2	70.4	90.5																							
17-Oct	82.3	81.8	79.7	78.0	79.8	79.3	80.4	81.3	81.0	77.5	68.9	66.2	63.6	61.6	62.3	69.2	79.7	88.2	92.3	94.6	96.9	97.4	97.8	98.1	80.7	98.1																							
18-Oct	98.3	98.4	98.5	98.5	98.3	97.7	96.1	95.3	95.7	94.2	90.3	86.2	90.8	88.1	83.7	86.5	83.3	86.7	85.2	75.4	65.1	66.9	70.1	73.5	87.6	98.5																							
19-Oct	76.3	77.4	79.9	79.5	78.5	78.2	76.6	74.9	69.3	59.2	48.2	44.4	41.3	39.3	39.4	39.5	40.7	39.4	43.7	52.3	55.9	63.3	77.5	79.2	60.6	79.9																							
20-Oct	84.0	80.0	69.9	69.5	63.6	64.3	62.2	59.5	55.6	47.7	45.5	43.3	41.5	38.4	33.4	30.6	29.2	35.5	57.8	70.3	73.5	83.0	89.8	90.1	59.1	90.1																							
21-Oct	91.7	92.0	90.0	90.1	92.3	90.8	87.7	86.4	87.1	83.8	80.9	76.6	69.2	67.7	63.7	81.8	82.7	79.9	77.1	81.6	85.1	81.2	85.6	85.3	82.9	92.3																							
22-Oct	84.8	85.7	84.4	82.9	82.9	83.8	84.9	85.0	84.7	75.9	69.3	59.5	52.0	56.7	56.1	56.9	57.4	51.9	50.0	56.8	60.9	67.6	74.8	71.9	69.9	85.7																							
23-Oct	71.2	73.4	74.8	76.9	73.8	73.1	74.0	70.7	67.4	52.7	43.2	36.4	32.9	33.5	32.5	34.4	37.4	42.1	45.0	49.3	53.5	56.9	54.8	56.3	54.9	76.9																							
24-Oct	62.2	66.9	65.5	66.3	68.3	67.9	72.0	73.7	68.3	56.7	51.7	51.4	54.3	54.9	54.3	56.0	56.6	57.0	58.7	60.6	60.2	61.2	62.0	62.5	61.2	73.7																							
25-Oct	62.7	61.9	61.9	61.7	62.6	64.9	66.3	65.1	63.5	61.1	54.4	47.8	42.9	41.5	39.7	40.1	41.2	42.3	46.2	49.8	61.8	73.2	77.5	81.0	57.1	81.0																							
26-Oct	83.1	83.3	85.3	85.6	84.7	85.1	85.0	84.9	84.8	82.8	80.0	75.8	72.0	70.6	67.2	68.9	72.0	74.8	78.3	75.3	75.5	76.0	76.2	78.0	78.6	85.6																							
27-Oct	84.2	89.7	86.9	88.3	91.2	89.7	86.2	86.2	84.0	82.1	72.8	70.7	63.6	63.7	63.4	61.9	60.1	62.5	67.8	69.8	65.9	67.0	69.0	72.7	75.0	91.2																							
28-Oct	71.8	72.5	75.6	77.8	81.9	85.9	86.7	87.6	84.6	82.6	85.1	80.8	71.2	72.6	69.2	66.7	69.7	74.1	74.4	73.7	77.0	76.8	77.3	79.5	77.3	87.6																							
29-Oct	76.1	72.7	70.4	67.6	64.3	63.1	60.8	61.0	61.4	61.2	62.0	61.3	60.1	56.9	53.9	51.6	57.4	70.0	73.7	68.6	71.6	73.5	81.9	82.1	66.0	82.1																							
30-Oct	79.6	80.9	76.3	75.2	81.0	87.3	91.6	88.4	88.6	87.7	78.4	67.4	56.7	52.8	51.3	53.8	56.6	59.2	61.1	63.7	67.2	67.6	69.1	71.9	71.4	91.6																							
31-Oct	81.4	89.2	91.6	83.7	78.1	79.8	84.4	87.1	90.1	87.7	86.6	84.5	80.8	78.6	78.6	76.4	80.9	88.7	92.8	93.1	91.4	90.7	90.8	91.7	85.8	93.1																							
																								77.0	78.2	78.3	78.6	78.7	79.7	80.8	80.2	78.0	72.9	67.1	62.2	58.0	55.5	53.0	53.8	55.3	58.9	63.3	66.5	68.6	70.7	73.7	75.5	Diurnal Average	
																								98.3	98.4	98.5	98.5	98.3	97.7	96.5	96.7	96.1	94.2	90.3	89.0	90.8	88.1	83.7	86.5	88.0	88.7	92.8	94.6	96.9	97.4	97.8	98.1	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Patricia McInnes - October 2023

Maximum Speed: 31 km/h on Oct 4 22:00	Maximum Daily Speed Average: 18.1 km/h on Oct 14	Hours in Service: 744
Minimum Speed Value: 0 km/h on Oct 16 20:00	Minimum Daily Speed Average: 3.0 km/h on Oct 31	Hours of Data: 744
Maximum Diurnal Speed Average: 3.0 km/h at hour 2	Minimum Diurnal Speed Average: 1.6 km/h at hour 12	Hours of Missing Data: 0
Monthly Average Velocity: 2.2 km/h 224.9 deg	Percentiles: P ₁ = 2 P ₁₀ = 4 Q ₁ = 7 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-Oct	SE2	SSE2	S2	S6	S7	SSW6	S7	SSE9	SSE11	S13	S14	SSE18	S17	S19	SSE18	S17	SSE17	SSE12	SE11	SE10	SE9	SE10	SE9	SE9	SSE10.2	S19			
2-Oct	SE7	SE8	SE8	SE6	SE8	SE9	SE7	SE8	SSE9	S8	S9	S9	S9	SSW11	SW11	SW8	WSW7	SSW3	SE4	E3	NW2	WSW4	SW4	SW5	S5.1	SSW11			
3-Oct	SW5	WNW4	NNE3	ESE4	S4	SW4	SSW5	SSW4	SSW4	SW6	W7	W7	W8WNW14	W15WSW11	SW6	SSW6	SSW5	SSW6	SSW6	SSW7	SSW6	SSW7	SSW6	SSW7	SW5.0	W15			
4-Oct	SW8	SW10	SW7	SE2	SSW4	SW3	W6WNW10WNW12	NW15WNW22WNW20WNW20WNW20	NW23WNW19WNW23WNW26WNW23WNW23WNW28WNW31	NW26	NW20	WNW17	NW19	NW17WNW12WNW18WNW21	NW20WNW22WNW19WNW19WNW23	NW25	NW28	NW25	NW24	NW19	NW18WNW11	WNW6	SW7	WSW7	SSW4	SW4	SW6	WNW15.5	WNW31
5-Oct	WNW17	NW19	NW17WNW12WNW18WNW21	NW20WNW22WNW19WNW19WNW23	NW25	NW28	NW25	NW24	NW19	NW18WNW11	WNW6	SW7	WSW7	SSW4	SW4	SW6	WNW15.3	NW28											
6-Oct	SSW5	SSW7	SSW5	S5	SE7	SE8	SE7	SE10	SE11	SE9	SE8	SSE10	SSW14	S9	SSW15	SW13	SW12	SSW6	SW4	SSW4	SSW5	W14	W17	W16	SSW6.3	W17			
7-Oct	W14	W15	W15WNW13	W10	NW3	SW5	SW6	SSW7	SSW7	S6	S6	S5	S4	E4	E6	ESE4	E6	ESE8	ESE7	SE13	SE10	SE11	ESE11	S3.0	W15				
8-Oct	ESE12	ESE16	ESE15	ESE18	SE18	SE18	SE18	ESE16	ESE20	ESE21	SE20	ESE19	ESE18	SSE15	SSE20	S19	S16	S13	S9	SE8	SE11	SE10	SE12	SE12	SE14.5	ESE21			
9-Oct	SE9	SE12	SE13	SE13	SE13	SE14	SE14	SE16	SE11	ESE12	ESE14	ESE15	ESE16	ESE18	ESE18	ESE17	ESE16	ESE12	SE15	ESE13	ESE11	ESE8	ESE10	ESE12	ESE13.4	ESE18			
10-Oct	ESE14	SE17	ESE15	ESE14	ESE13	SE12	SE12	SE14	ESE19	ESE17	ESE18	ESE20	ESE18	ESE19	ESE19	ESE19	ESE17	ESE16	ESE15	SE17	SE18	SE20	SE20	SE19	ESE16.7	SE20			
11-Oct	ESE18	ESE15	ESE11	ESE14	ESE16	SE16	ESE18	ESE19	ESE17	ESE16	ESE16	ESE14	ESE15	ESE17	ESE17	ESE18	ESE18	ESE15	ESE15	ESE14	SE16	ESE17	ESE15	ESE14	ESE15.8	ESE19			
12-Oct	SE13	SE8	SE10	SE13	SE12	SE11	SE10	SE11	SE9	SE8	ESE7	ESE8	ESE9	SSE10	S13	SSW14	S10	S6	SSE4	SSE5	SE9	ESE11	SE8	SE4	SE8.6	SSW14			
13-Oct	SE8	SE7	SE8	SSE7	SSE10	S10	SSE9	ESE9	ESE10	SE9	SE10	SE13	SE14	ESE15	ESE17	SE17	SE17	SE18	SE15	SE15	ESE15	ESE14	ESE16	ESE19	SE12.1	ESE19			
14-Oct	ESE18	SE16	SE16	SE18	SE18	SE18	SE15	ESE17	SE23	SE23	ESE21	SE22	SE19	SE19	SSE22	SE23	SE22	SE19	SE17	SE16	SE13	SE13	SE14	ESE15	SE18.1	SE23			
15-Oct	ESE14	SE12	SE14	SE13	SE13	SE14	SE13	SE14	SE10	SE12	SE10	ESE10	SE13	SE10	SSE8	SE7	SE8	SSE5	SSE4	SSE4	SSW4	SSW5	SE2	SSE7	SE9.0	ESE14			
16-Oct	S4	SSW6	SW10	SW9	SW12	SSW8	SSW9	SSW9	SW11	SW9	SW11	SSW10	SSW12	SW10	SW10	SW9	SW3	SSE1	W3	N0	ESE3	W2	N2	ENE1	SW6.2	SW12			
17-Oct	N3	NNE1	NNW3	NNW4	N7	N9	N7	N9	NNW10	NNW10	N12	N13	NNW14	NNW14	N13	N14	NNW13	NNW13	N11	NNW9	NNW5	NNW3	W1	ESE7	N8.0	N14			
18-Oct	SE5	S5	SE6	SE6	SSE6	SSE7	SE10	SE12	SE12	SE11	SE14	SE11	SE7	SE8	ESE10	ESE9	SE9	ESE4	SSE5	SW7WSW12WSW10WSW11	SW11			SSE6.2	SE14				
19-Oct	SW11	SW13	SSW11	SW11	SW12	SW13	SW11	SW11	SW9	SW10WSW18WSW22WSW20WSW21WSW19WSW19	SW16	SW16WSW18WSW18WSW21	W23	W16WSW12	WSW14.9	W23													
20-Oct	WSW15	W20	W20	W19	W22	W22	W20	W20	W25	W29WNW30	NW27	NW28	NW29	NW25	NW19	NW17	NW10	NNW10	N10	N7	W2	WSW4	W4	WNW16.1	WNW30				
21-Oct	SW2	SSW4	SE5	S4	SSE4	SE5	S5	S4	S6	SE6	SSE7	SSE7	S2	NNE6	N17	N28	N29	N30	N28	N24	N22	N20	NNW14	N12	N7.3	N30			
22-Oct	N10	NNE13	NNE15	N14	NNE10	N7	N7	NNW4	NW7	NNE2	ENE4	NE5	NNE3	N11	N11	NNW13	NNW13	NNW8	WNW6	NW7	W7	WNW9WNW10	NW10	NNW7.2	NNE15				
23-Oct	NW10WNW11WNW11WNW10WNW11	W12	W8	WNW8	S3WNW15WNW24WNW24WNW25WNW23WNW25WNW21WNW18WNW12WNW11	W12WSW11WSW11WNW14WNW15	WNW13.8	WNW25																					
24-Oct	W10WSW11WNW13	W13	W15	W14WSW11WSW10	W11	W15WNW17	NW18WNW20WNW20	W21	W18	W18	W16	W16	W17	W15	W18	W15	WSW9WSW10WNW13WNW11	W8	W8	W9				W15.0	W21				
25-Oct	WNW14WNW15WNW13	W12	W10	WSW9WSW10WSW11WSW12WSW13WSW12	W13	W16	W17	W15	W11	WSW9WSW10WNW13WNW11	W8	W8	W9											W11.5	W17				
26-Oct	W9	W10	W10WNW12	W12	W12	W15	W12	W10WNW13WNW15WNW15	NW17WNW14WNW15	W13	W12	WSW9WSW10	W12	WSW9	W10	W10	W9								W11.4	NW17			
27-Oct	W7	W11WNW10WNW11	N16	N12	N12	N10	N12	N9	N10	N13	NNW15	N11	N9	NNW9	NW9	NNW9	W5	WSW9	WSW9	WSW8	SW7	SSW7		NW7.2	N16				
28-Oct	S7	S7	SSW7	WSW7	W6	WSW5	WSW7	W2WNW12	NW12	NW13	NNW17	NNW14	NW14	NW14	NW10	W8	W11	W11	W13WNW12WNW14WNW14WNW11					WNW8.2	NNW17				
29-Oct	WNW9WNW11WNW13	NW7WNW12WNW12WNW15	NW11	WNW8	NW9	NNW15	NW14	NW12	NNW9	NW8	NW8	NNW3	W2	W5	NW8	NW6	NNE7	NNW7	NNW7					NW8.3	NNW15				
30-Oct	NNW9	N8	NNE12	NNE9	N7	N6	NNW5	WNW4	SSW3	SSW6	S9	S10	S12	S13	S13	S12	SSE10	SSE10	SSE10	SSE9	S8	SSW9	SSW11	S8	S3.8	S13			
31-Oct	S6	SSW7	SSW7	WSW6	W11	NW10	NNW13	NNW10	N11	N11	N10	NNW10	N9	NNE7	E4	E5	SSE3	WSW3	WNW1	N2	W4	W4	W4	SW3	NW3.0	NNW13			

SSW2.3 SW3.0 SW2.1SSW2.0SSW2.5SSW2.5SSW2.4 S2.2 S2.6SSW2.2WSW2.1 W1.6 W2.7 W2.8WSW2.9WSW2.6 SW2.1 SW1.7 SW2.0WSW2.1 SW2.6WSW2.8 SW2.6SSW2.5	Diurnal Average
ESE18 W20 W20 W19 W22 W22 W20WNW22 W25 W29WNW30 NW27 NW28 NW29 NW25 N28 N29 N30 N28 N24WNW28WNW31 NW26 NW20	Diurnal Maximum

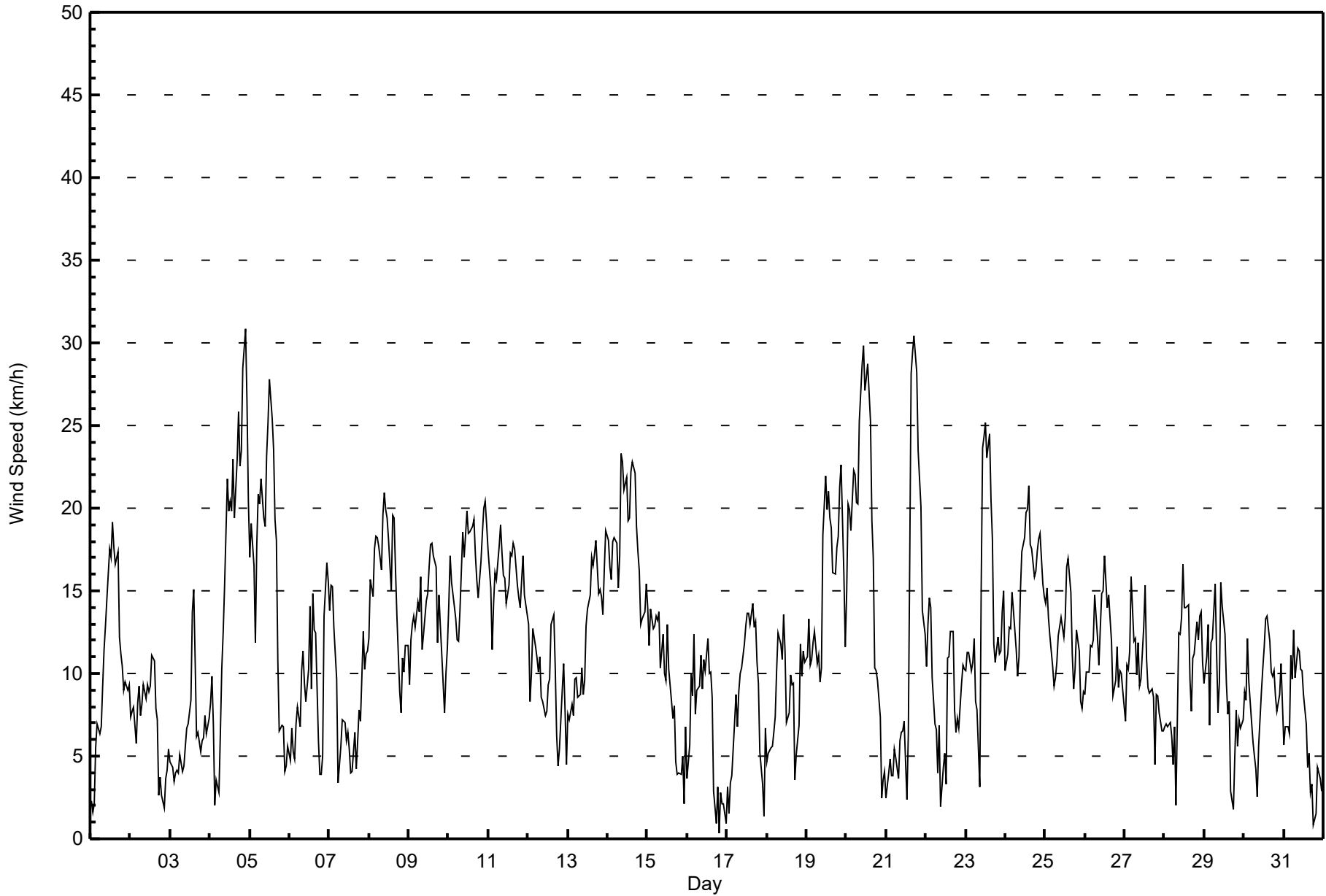
All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

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

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	103	13.84	13.84
6 - 11	295	39.65	53.49
12 - 19	277	37.23	90.73
20 - 28	63	8.47	99.19
29 - 38	6	0.81	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

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

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	4	4	1	2	4	4	8	10	11	16	11	4	11	4	2	7	103
6 - 11	24	5	0	0	2	17	56	18	22	25	27	25	25	21	15	13	295
12 - 19	12	3	0	0	0	66	56	5	13	4	8	12	34	38	14	12	277
20 - 28	5	0	0	0	0	4	8	2	0	0	0	4	9	20	11	0	63
29 - 38	2	0	0	0	0	0	0	0	0	0	0	0	1	2	1	0	6
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	47	12	1	2	6	91	128	35	46	45	46	45	80	85	43	32	744

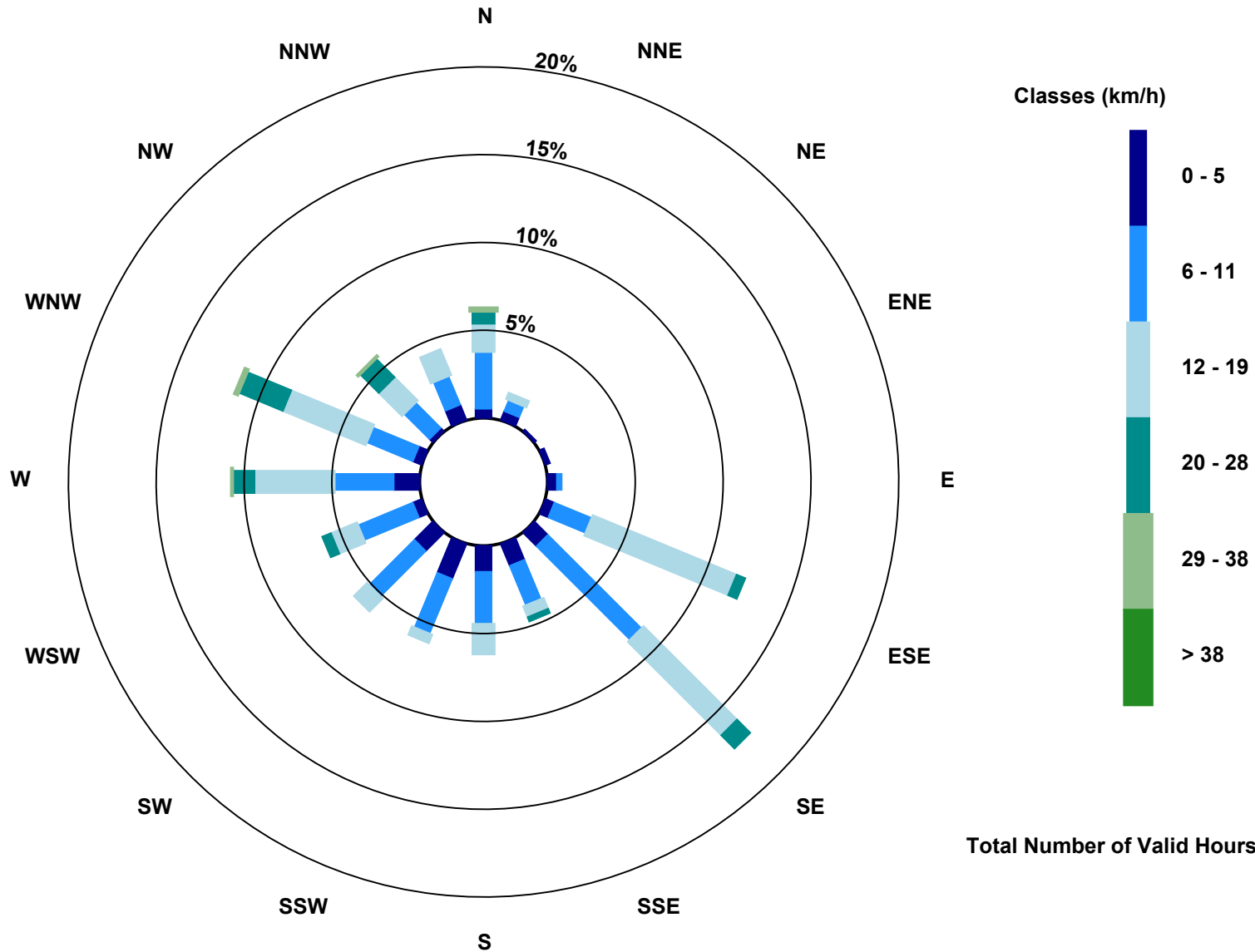
Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

Wind Speed (WS) - km/h
Patricia McInnes





Wood Buffalo Environmental Association
Summary of Hour Averages

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

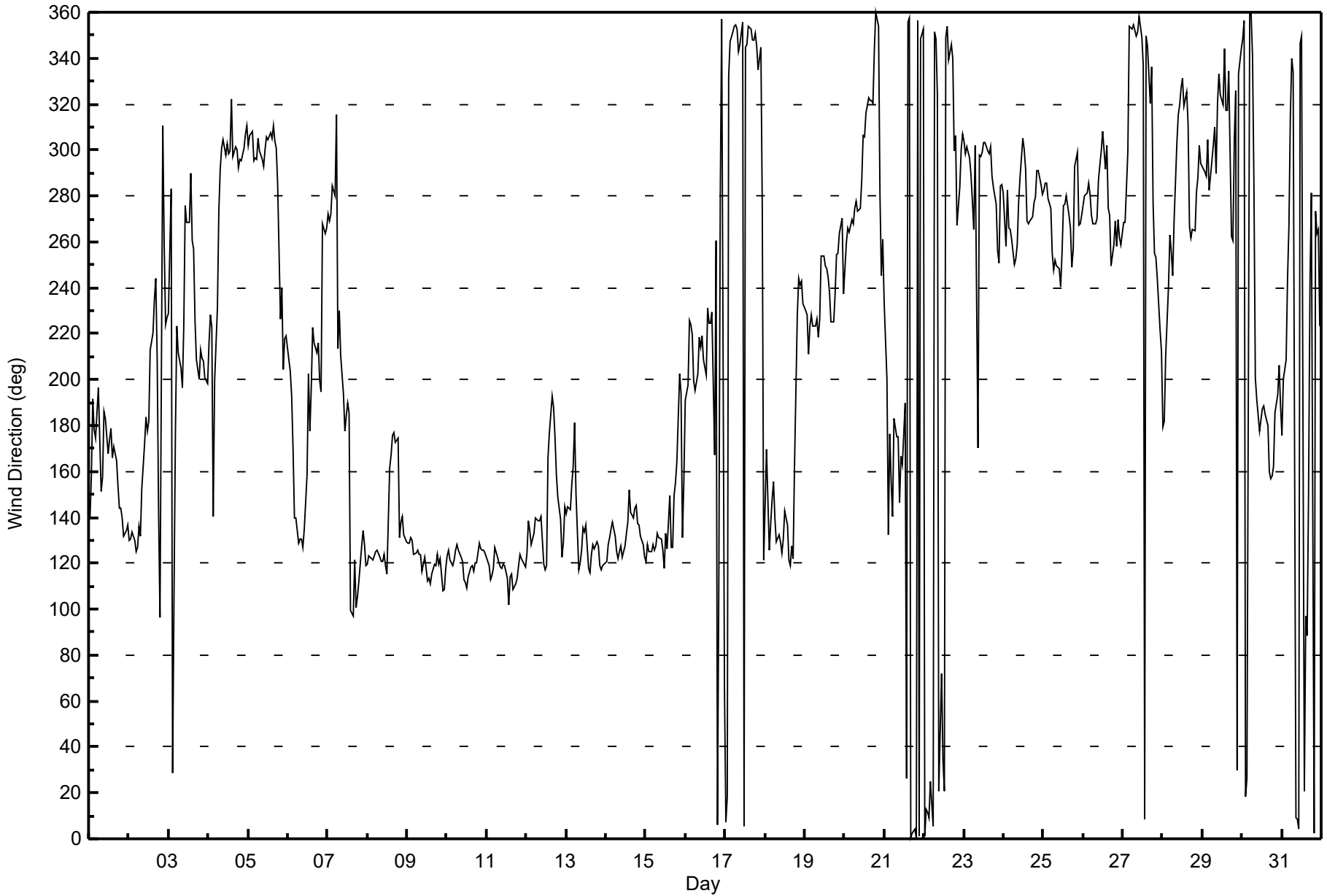
Direction of Maximum Speed: 301 deg on Oct 4 22:00																						Hours in Service: 744			
Direction of Maximum Daily Speed Average: 132.9 deg on Oct 14																						Hours of Data: 744			
Direction of Minimum Speed: 6 deg on Oct 16 20:00											Direction of Minimum Daily Speed Average: 3.0 deg on Oct 31											Hours of Missing Data: 0			
Monthly Average Direction: 224.9 deg																						Percent Operational Time: 100.0			
Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Oct	139	158	191	178	174	196	174	151	158	186	183	168	174	179	166	171	165	154	144	144	140	132	134	137	163.5
2-Oct	130	131	133	130	125	127	136	132	153	172	184	178	182	213	220	235	244	208	142	97	311	258	224	227	171.6
3-Oct	229	283	28	106	176	223	212	205	197	224	276	269	268	290	261	257	226	208	200	213	209	208	200	198	235.3
4-Oct	216	228	223	140	199	231	273	292	301	305	298	303	298	300	322	297	301	300	293	296	295	301	307	311	296.1
5-Oct	302	306	308	295	296	296	305	299	296	293	300	306	305	308	305	311	304	301	285	226	240	204	218	219	297.9
6-Oct	209	204	193	169	139	140	129	130	131	127	135	158	203	178	197	223	216	212	216	199	194	268	264	266	193.6
7-Oct	272	269	272	284	280	315	214	230	211	194	177	185	190	186	99	97	122	101	105	112	128	134	128	119	190.0
8-Oct	119	123	122	122	124	125	126	123	121	121	124	119	115	162	167	176	177	173	175	131	138	140	133	130	135.3
9-Oct	129	129	131	130	124	124	126	124	124	117	122	118	112	114	111	115	120	119	124	119	122	108	109	118	120.2
10-Oct	123	125	121	119	122	126	128	126	123	121	113	112	109	114	118	119	116	120	120	129	126	126	125	125	120.9
11-Oct	123	119	113	115	118	127	123	120	119	118	119	119	114	102	114	115	109	111	113	119	124	122	121	118	117.4
12-Oct	124	138	134	128	133	140	139	138	139	140	119	117	119	166	177	193	188	175	159	149	139	123	129	145	143.8
13-Oct	141	144	144	154	162	181	150	117	120	126	136	133	137	118	116	124	128	126	129	127	119	117	119	120	129.9
14-Oct	121	128	131	135	138	132	125	122	125	127	123	127	133	138	152	142	140	144	145	137	137	132	128	123	132.9
15-Oct	121	128	125	125	128	126	127	133	131	131	125	118	133	126	149	127	127	150	155	164	203	194	131	155	132.6
16-Oct	191	198	226	224	220	199	196	203	219	214	219	209	202	231	224	225	230	167	260	6	116	279	357	66	214.9
17-Oct	8	18	332	347	352	354	354	352	343	346	356	6	344	346	354	353	348	348	351	345	335	345	274	121	351.4
18-Oct	145	170	126	137	147	156	140	129	132	129	125	131	143	137	121	119	128	122	162	228	244	241	243	233	153.5
19-Oct	230	228	211	223	228	224	223	226	218	227	254	254	249	248	244	238	225	225	237	255	255	263	271	237	240.6
20-Oct	248	259	266	265	269	268	275	277	274	275	287	307	306	316	323	322	322	321	343	360	354	281	245	261	291.0
21-Oct	234	200	132	176	155	141	183	175	175	146	167	163	190	26	356	357	1	3	4	0	356	1	348	353	3.7
22-Oct	1	13	12	9	25	6	351	348	324	21	72	34	21	349	354	339	346	340	299	306	267	284	300	307	345.9
23-Oct	304	298	302	296	289	278	266	302	170	298	297	299	303	303	300	298	301	289	284	277	256	251	285	285	291.8
24-Oct	281	258	282	266	265	261	250	253	259	277	288	305	300	292	269	268	269	271	277	279	291	291	285	281	277.6
25-Oct	283	285	286	279	275	255	248	252	250	249	240	255	276	276	280	271	266	249	257	293	299	268	268	272	269.1
26-Oct	276	280	281	285	281	271	268	268	271	287	293	300	308	292	302	275	272	249	258	269	258	270	262	259	278.6
27-Oct	268	269	284	300	354	353	354	352	350	352	358	349	337	9	350	345	320	336	277	255	253	244	221	212	323.7
28-Oct	179	182	210	240	263	255	245	269	303	316	320	327	331	319	325	311	266	261	265	265	282	288	302	294	289.9
29-Oct	293	291	289	305	282	288	302	310	290	320	333	324	320	344	317	317	334	262	260	304	326	30	333	344	311.3
30-Oct	348	356	18	26	359	359	340	285	200	192	178	182	188	189	185	180	160	157	158	162	185	194	207	189	181.2
31-Oct	176	200	208	244	268	315	340	334	9	9	5	347	350	21	97	89	150	240	282	3	274	263	265	223	324.9
200.3 216.0 217.8 199.2 209.4 204.8 202.2 183.9 182.9 206.1 242.5 259.1 265.2 270.4 254.0 246.8 232.4 224.2 219.9 239.5 233.1 238.0 235.3 205.8																									
Diurnal Average																									
All monthly, daily, and diurnal averages have been calculated using vector methods																									



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 88 deg on Oct 7 06:00 Minimum Value: 6 deg on Oct 13 02:00 Percentiles: P ₁ = 7 P ₁₀ = 10 Q ₁ = 11 Median = 14 Q ₃ = 17 P ₉₀ = 25 P ₉₉ = 71														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-Oct	48	71	66	32	16	16	24	14	17	19	21	20	19	16	19	20	15	15	11	13	14	11	11	12	71
2-Oct	11	11	12	18	13	12	14	11	16	18	16	15	21	17	14	21	14	35	11	39	70	22	14	17	70
3-Oct	39	43	59	45	25	43	27	33	26	17	21	34	31	22	21	16	34	16	14	11	13	12	14	14	59
4-Oct	18	13	18	58	19	33	11	10	10	11	11	12	11	11	14	11	10	10	11	10	11	10	10	11	58
5-Oct	11	11	11	14	10	11	11	10	10	10	11	11	11	13	12	14	10	11	28	12	15	25	30	13	30
6-Oct	22	13	16	19	16	10	14	13	14	15	19	27	18	24	22	17	17	16	11	29	24	17	9	8	29
7-Oct	9	8	9	10	10	88	21	16	15	19	29	22	27	33	31	14	13	12	9	19	12	13	12	13	88
8-Oct	13	12	12	11	12	12	13	13	13	13	14	14	12	32	15	16	14	13	12	23	14	12	13	13	32
9-Oct	12	12	12	12	12	12	11	13	14	15	15	16	17	16	16	15	12	13	11	13	11	11	11	10	17
10-Oct	12	12	13	12	12	14	15	15	14	15	14	14	16	17	15	13	13	12	12	13	12	12	11	12	17
11-Oct	13	14	13	13	12	12	10	11	15	17	17	18	19	14	16	14	13	13	13	12	12	11	12	11	19
12-Oct	12	14	11	12	13	14	13	13	15	18	19	22	19	40	23	18	14	11	17	15	14	10	17	16	40
13-Oct	6	6	7	7	14	16	24	12	10	16	16	17	20	17	16	15	14	12	13	13	12	12	11	11	24
14-Oct	11	12	13	12	13	12	12	12	12	12	13	14	16	19	16	14	13	12	13	12	11	11	12	12	19
15-Oct	11	12	12	12	12	12	12	13	15	14	15	17	18	16	20	22	14	18	18	16	11	10	44	11	44
16-Oct	17	10	12	10	11	14	13	14	13	15	17	19	17	25	23	22	34	40	9	80	26	60	47	72	80
17-Oct	17	81	45	26	21	14	12	15	11	12	16	15	16	19	16	15	13	13	14	17	30	37	77	20	81
18-Oct	22	29	18	16	15	16	19	13	14	15	14	14	14	17	15	16	14	18	25	12	9	9	9	8	29
19-Oct	8	9	11	11	10	10	9	9	12	16	16	12	15	14	12	13	13	11	13	11	10	11	22	18	22
20-Oct	11	9	10	10	10	11	10	10	10	12	12	13	12	12	12	11	10	9	12	14	12	43	24	21	43
21-Oct	28	25	36	36	17	13	30	24	19	13	20	17	69	31	19	17	18	16	17	17	16	15	13	15	69
22-Oct	15	14	14	14	15	24	22	28	13	77	61	50	68	25	17	11	14	14	21	11	15	11	6	8	77
23-Oct	7	7	8	8	9	9	19	13	57	41	12	12	15	14	13	12	11	9	8	10	7	6	11	9	57
24-Oct	19	15	9	11	10	9	8	9	19	14	15	17	13	17	12	10	12	12	12	11	10	10	10	10	19
25-Oct	11	10	9	11	10	11	8	8	9	11	14	25	20	16	13	13	10	10	14	12	10	13	10	10	25
26-Oct	11	9	10	9	9	9	9	11	14	12	12	14	12	14	14	13	11	17	13	7	7	9	9	8	17
27-Oct	14	9	12	11	16	13	14	13	14	16	19	22	13	18	19	19	11	16	39	7	7	11	9	13	39
28-Oct	14	15	13	15	11	14	8	71	10	11	11	11	13	13	13	15	11	13	13	9	11	10	10	12	71
29-Oct	15	10	13	16	11	13	10	12	11	22	11	19	20	29	39	15	59	64	22	16	36	21	17	13	64
30-Oct	14	21	13	10	17	16	17	19	17	21	19	17	18	17	15	13	14	12	12	12	15	13	14	16	21
31-Oct	26	23	24	16	16	20	10	9	17	15	16	13	16	32	20	19	33	20	74	53	12	11	23	30	74
	48	81	66	58	25	88	30	71	57	77	61	50	69	40	39	22	59	64	74	80	70	60	77	72	
	Diurnal Maximum																								





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS07 ATHABASCA VALLEY OCTOBER 2023

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

November 29, 2023

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

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	709	35	35	100	15.2	0	3.5	0
TRS (ppb) Average	707	37	37	100	1.8	0	0.8	0
THC (ppm) Average	704	35	40	99.33	3.4	-	2.4	-
NMHC (ppm) Average	704	35	40	99.33	0.433	-	0.079	-
CH4(ppm) Average	704	35	40	99.33	3	-	2.3	-
O3 (ppb) Average	709	35	35	100	44.4	0	31.9	-
NO2 (ppb) Average	707	37	37	100	29.2	0	11.9	-
NO (ppb) Average	707	37	37	100	61.6	-	11.4	-
NOX (ppb) Average	707	37	37	100	81.4	-	22.1	-
PM2.5 (ug/m3) Average	743	1	1	100	38.3	0	17.7	0
CO(ppm) Average	681	34	63	96.1	0.9	0	0.3	-
Temperature 2 m (C) Average	744	0	0	100	26.2	-	15.9	-
Relative Humidity (%) Average	744	0	0	100	96.5	-	91.1	-
Barometric Pressure (inHg) Average	744	0	0	100	29.5	-	29.4	-
Wind Speed 10 m (km/h) Average	744	0	0	100	31	-	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 - ATHABASCA VALLEY (AMS07)
OCTOBER 2023

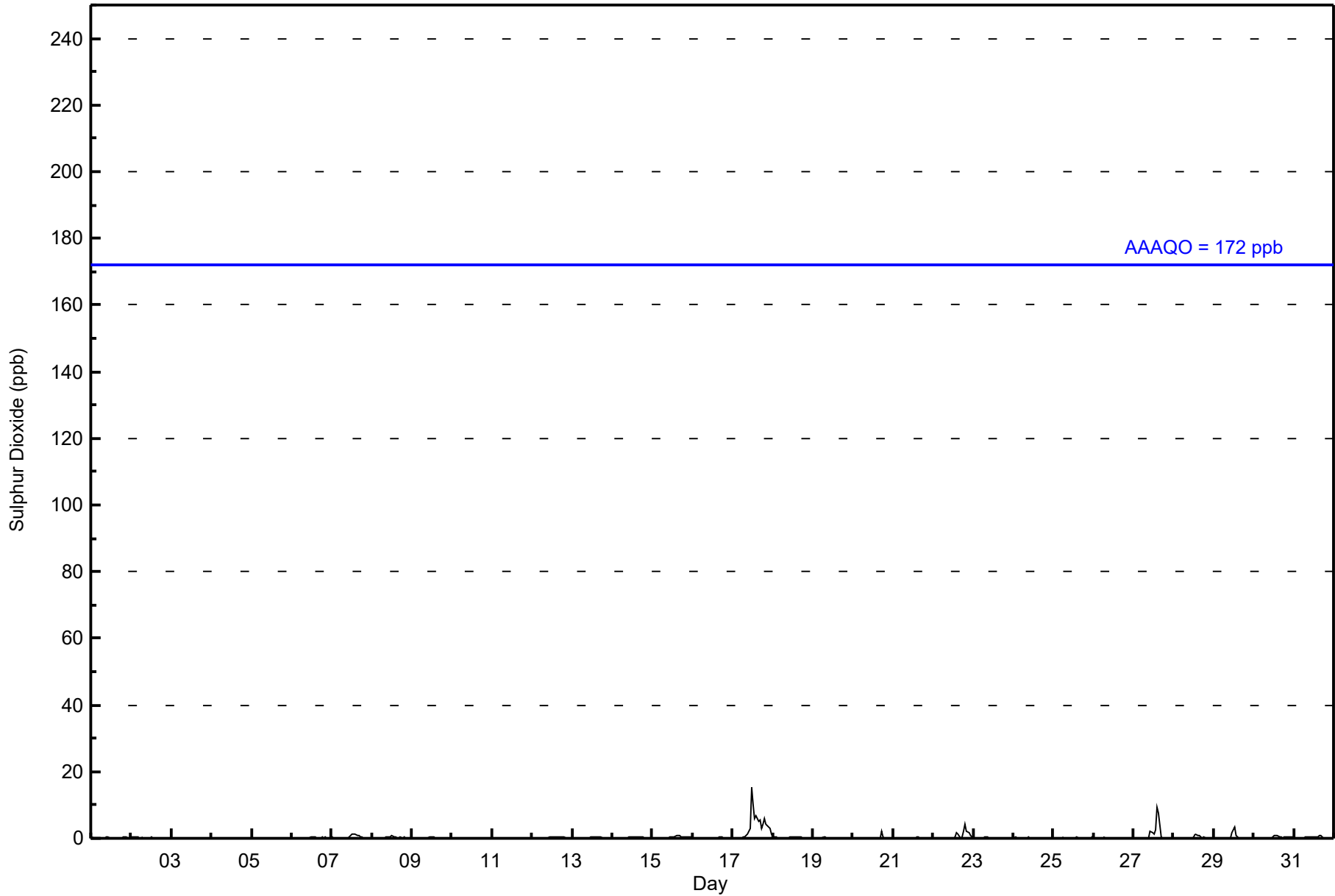
MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	709	0.33	1	-	0	0	0.1	0.1	0.2	0.5	15.2
TRS (ppb) Average	707	0.21	0.2	-	0.1	0.1	0.1	0.2	0.2	0.3	1.8
THC (ppm) Average	704	2.06	0.1	-	2	2	2	2	2.1	2.2	3.4
NMHC (ppm) Average	704	0.004	0.031	-	0	0	0	0	0	0	0.433
CH4(ppm) Average	704	2.06	0.1	-	2	2	2	2	2.1	2.2	3
O3 (ppb) Average	709	21.56	9.2	-	3.9	8.1	13.7	23	28.6	33	44.4
NO2 (ppb) Average	707	5.66	4.7	-	0.4	1.4	2.3	4.2	7.6	12.2	29.2
NO (ppb) Average	707	2.43	5.1	-	0	0.1	0.4	1.1	2.3	5.1	61.6
NOX (ppb) Average	707	8.09	8.8	-	0.4	1.6	3	5.5	10.4	16.6	81.4
PM2.5 (ug/m3) Average	743	7.6	4.9	-	0.6	3.4	4.7	6.5	8.6	12.6	38.3
CO(ppm) Average	681	0.18	0.1	-	0.1	0.1	0.1	0.2	0.2	0.3	0.9
Temperature 2 m (C) Average	744	5.25	7.6	-	-11.1	-4.5	-1.5	5.8	10.9	15	26.2
Relative Humidity (%) Average	744	67.88	16	-	23	45.7	56.3	69.4	80.4	89	96.5
Barometric Pressure (inHg) Average	744	29.07	0.3	-	28.5	28.7	28.8	29.1	29.3	29.3	29.5
Wind Speed 10 m (km/h) Average	744	10.5	6	-	0	4	6	10	14	19	31
Wind Direction 10 m (deg) Average	744	-	-	-	-	-	-	-	-	-	-

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

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
THC/NMHC/CH4	05 Oct 2023 13:00	05 Oct 2023 15:00	3	Unstable Operations - flatline in analyzer output signal
THC/NMHC/CH4	09 Oct 2023 05:00	09 Oct 2023 06:00	2	Unstable Operations - flatline in analyzer output signal
CO	04 Oct 2023 05:00	05 Oct 2023 09:00	29	Unstable Operations - flatline in analyzer output signal





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

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

Total Number of Valid Hours: 709

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Athabasca Valley - October 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	18	10	5	6	8	64	248	44	19	36	30	38	45	55	32	50	708
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	18	10	5	6	8	64	248	44	19	36	30	38	45	55	32	51	709

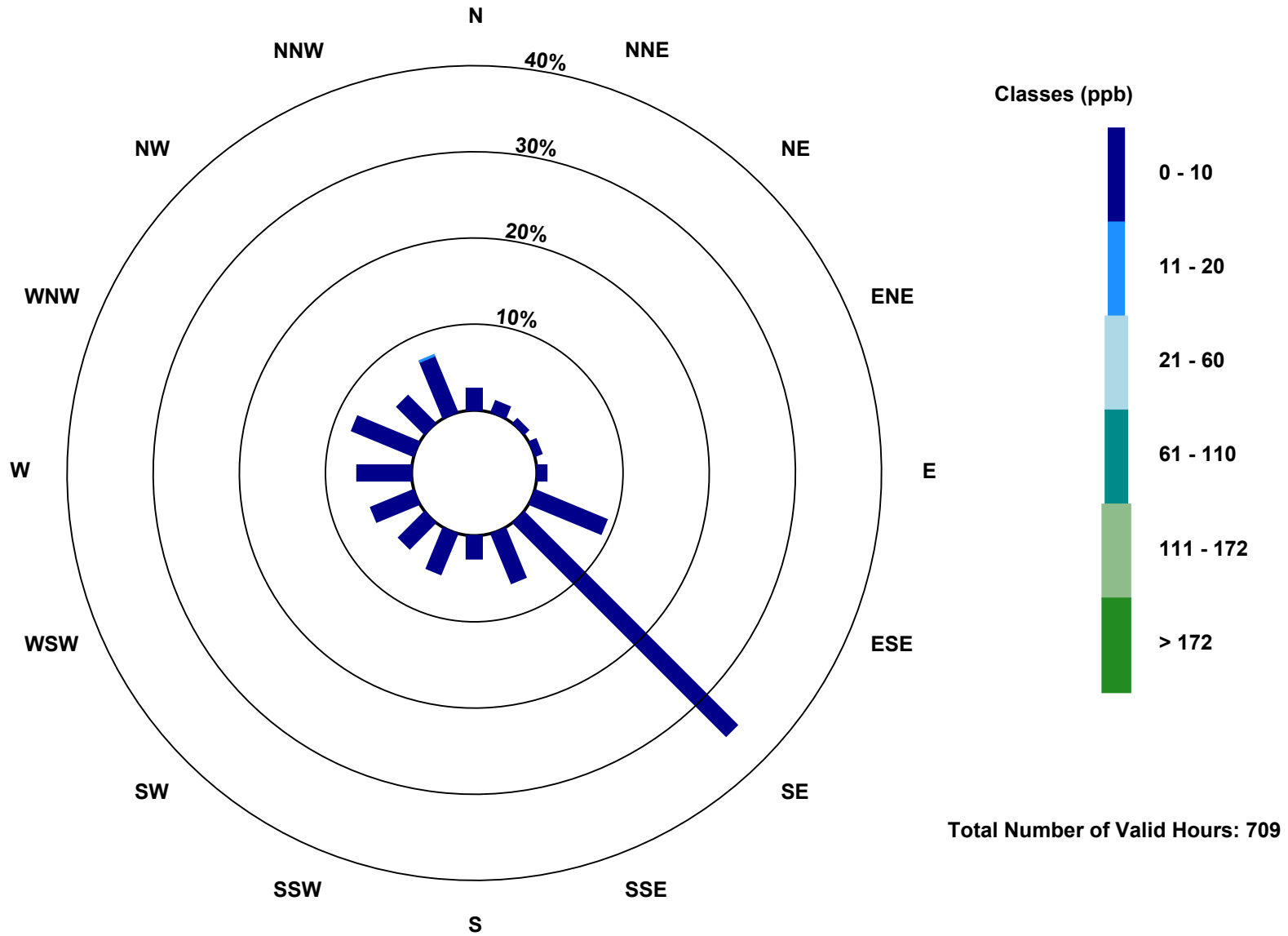
Total Number of Valid Hours: 709

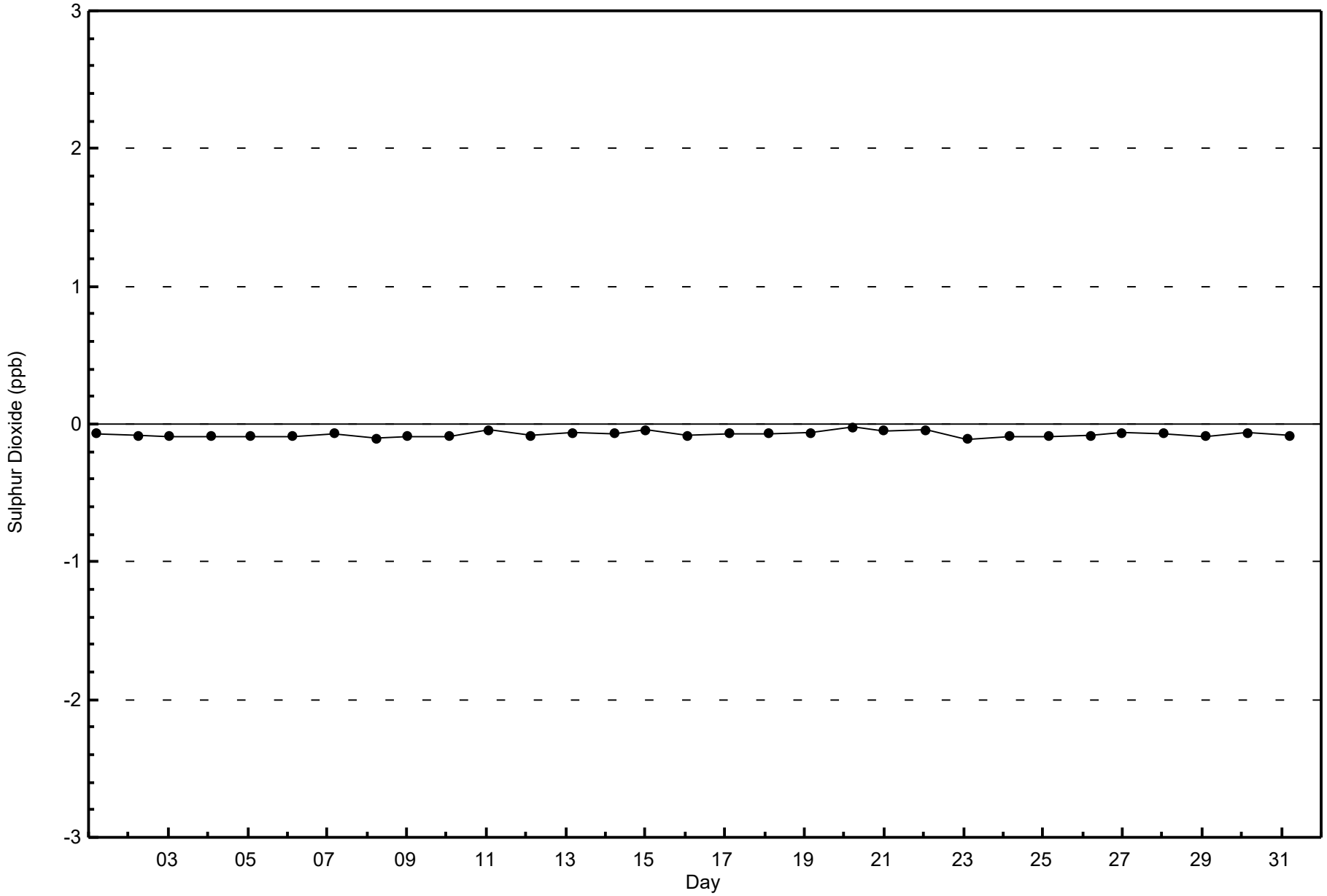
Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

Sulphur Dioxide (SO₂) - ppb
Athabasca Valley

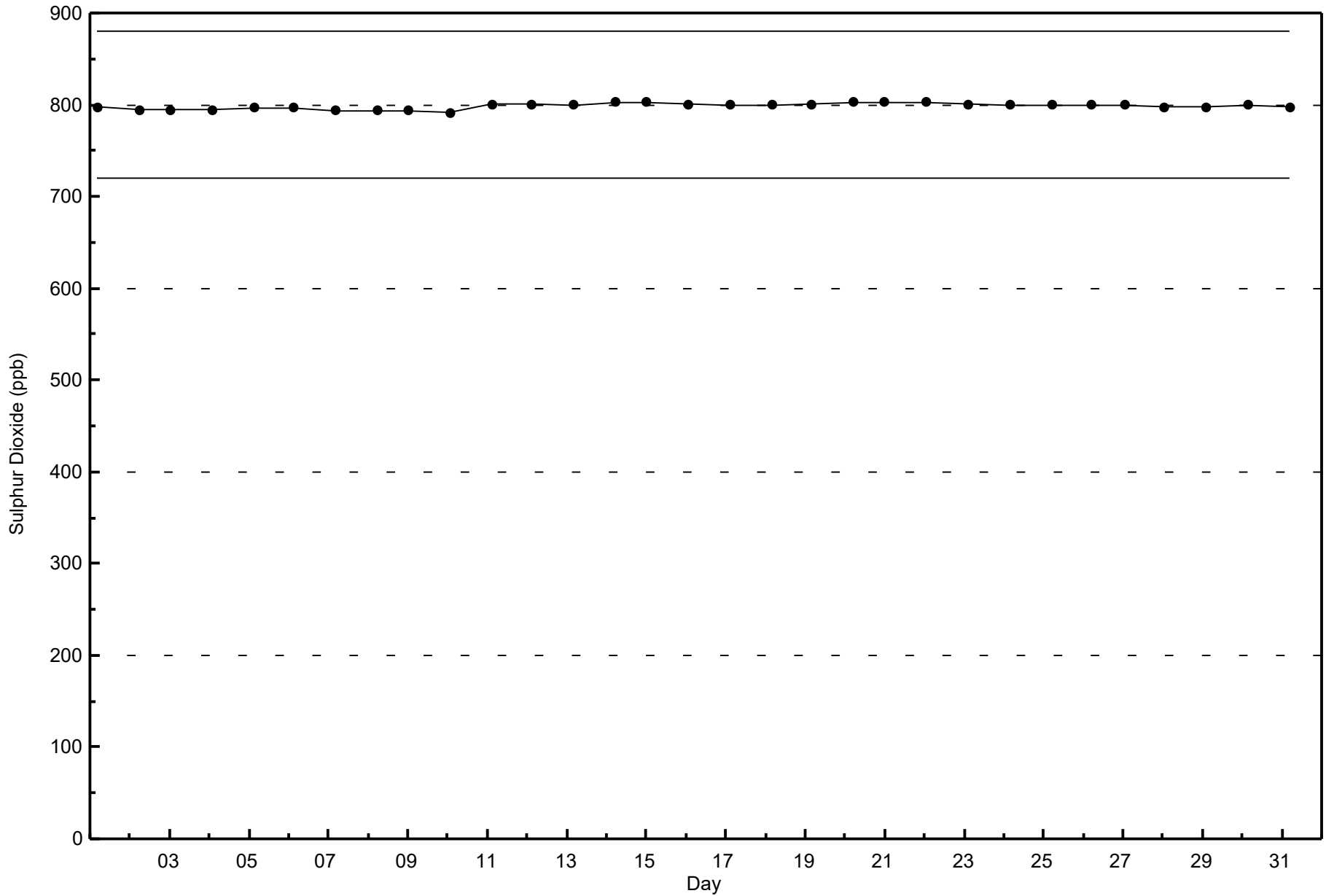


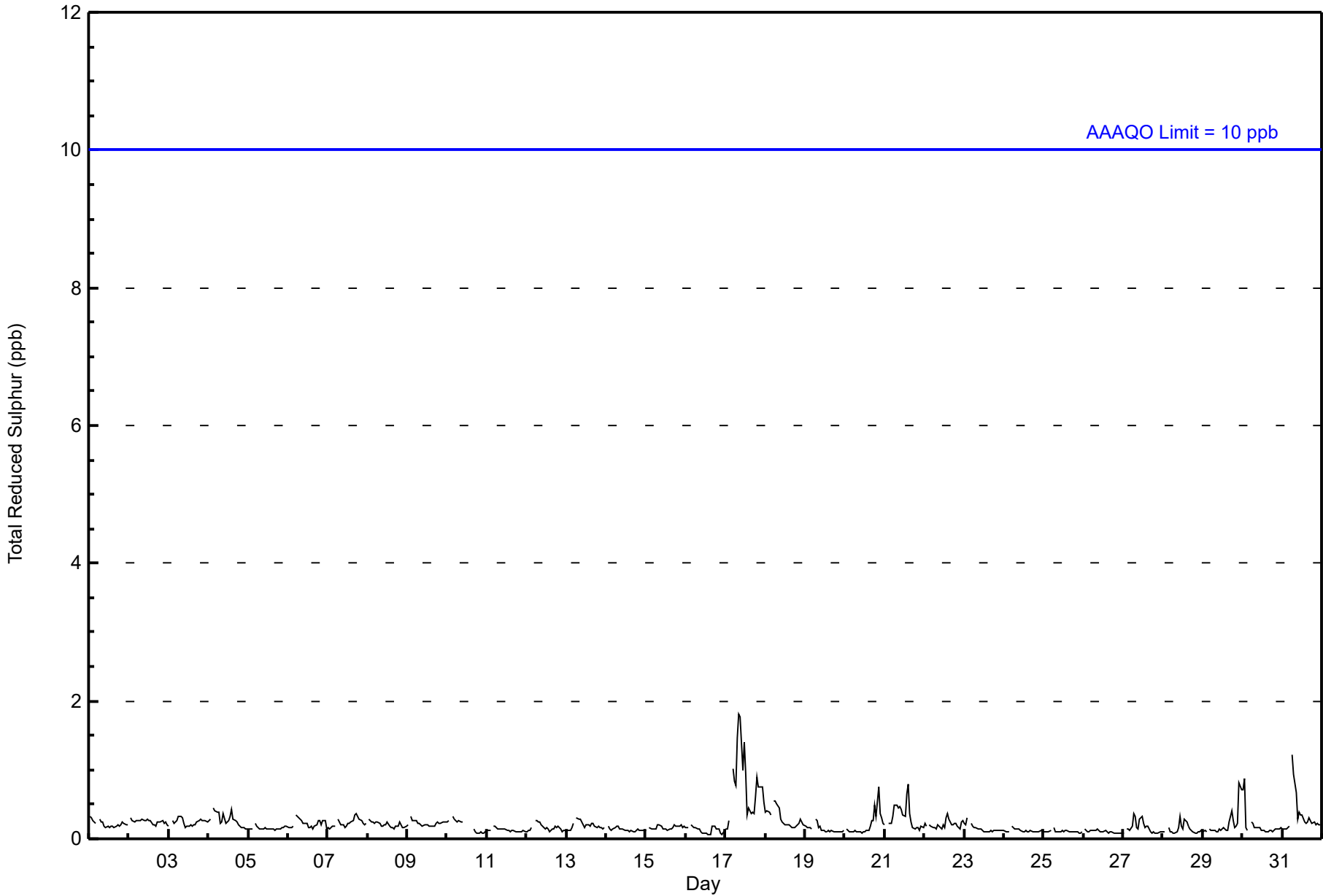




Wood Buffalo Environmental Association
Span Responses

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







**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Athabasca Valley - October 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
Athabasca Valley - October 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	9	5	6	7	62	246	44	18	38	30	38	46	55	33	51	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	19	9	5	6	7	62	246	44	18	38	30	38	46	55	33	51	707

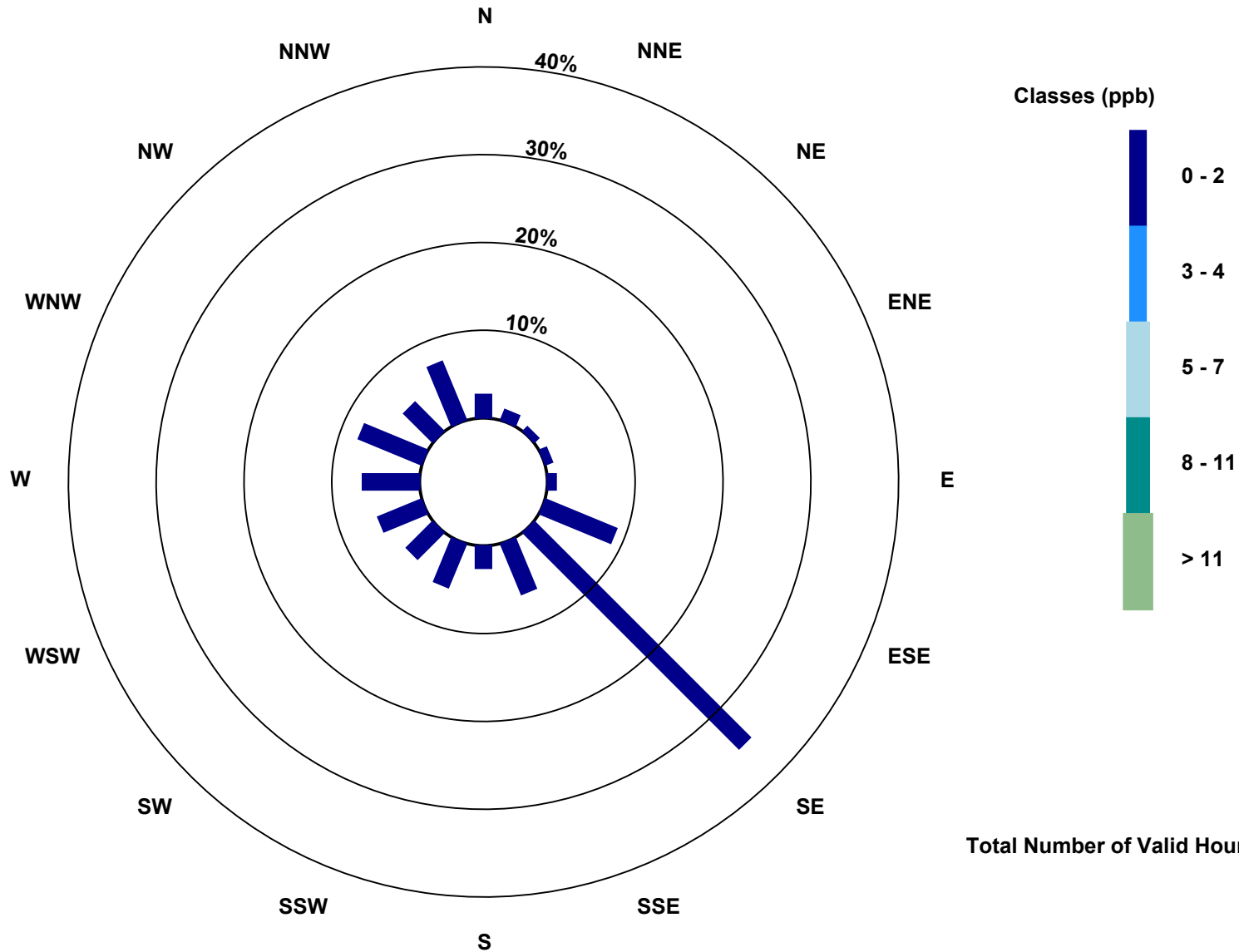
Total Number of Valid Hours: 707

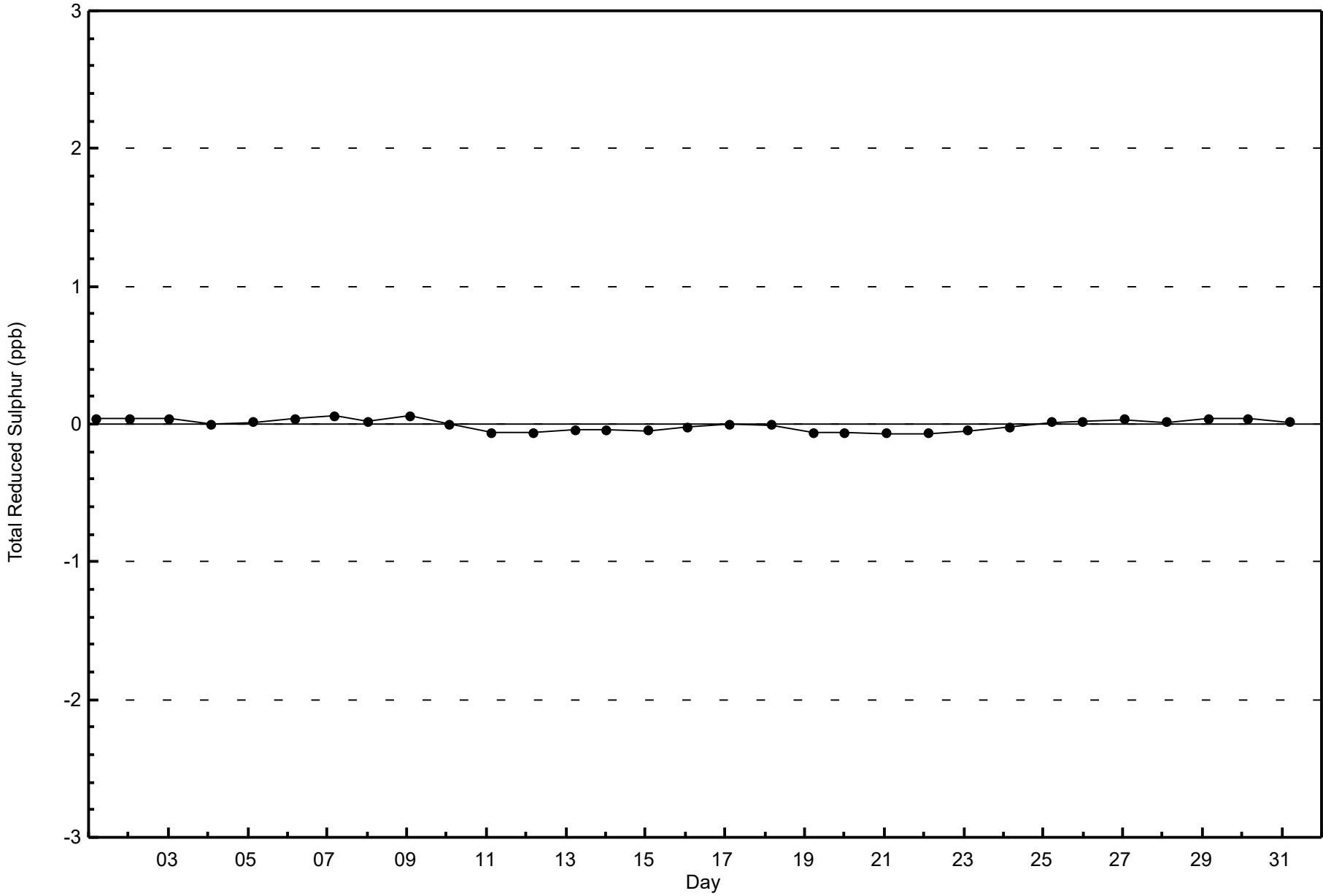
Total Number of Hours: 744

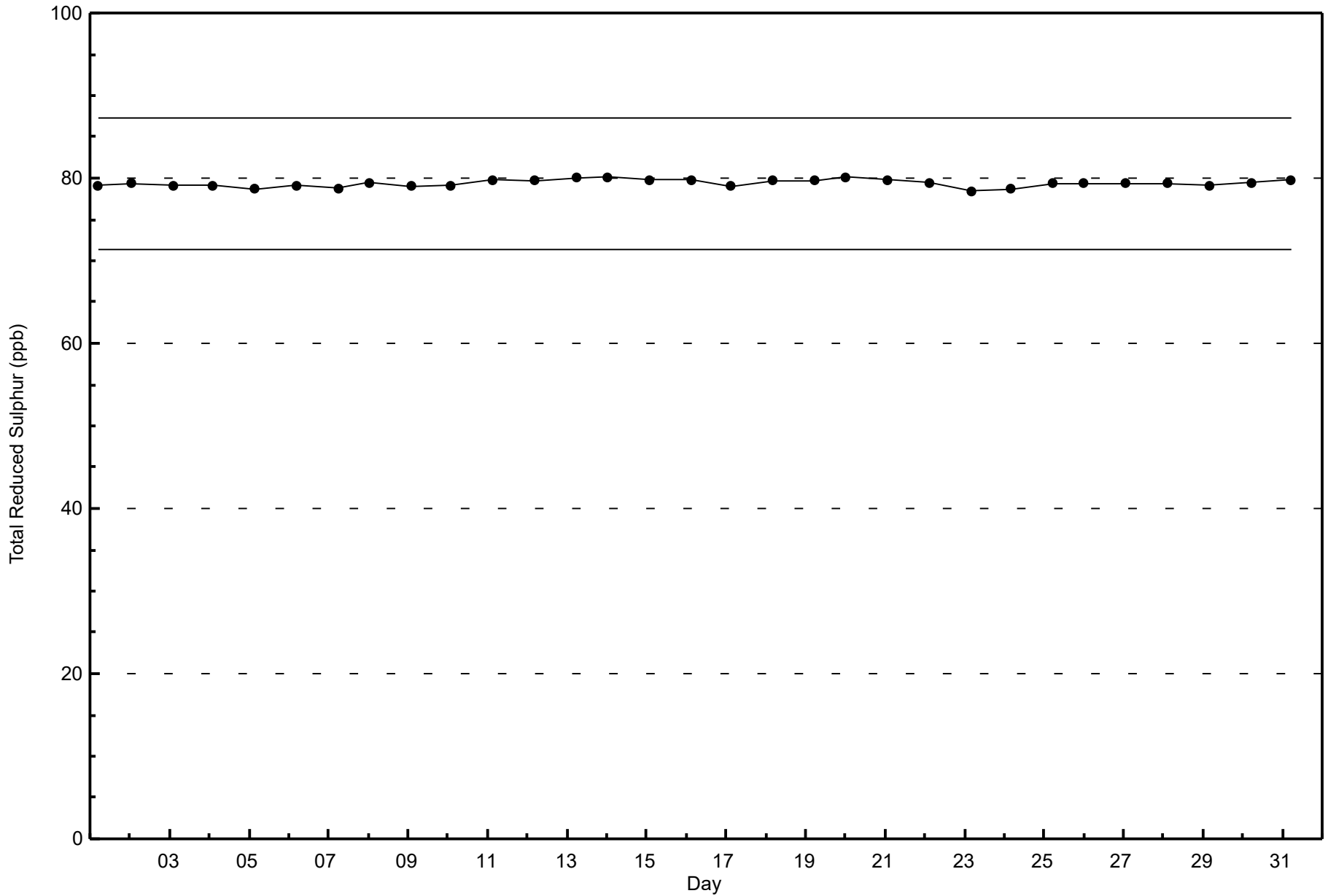


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Total Reduced Sulphur (TRS) - ppb
Athabasca Valley



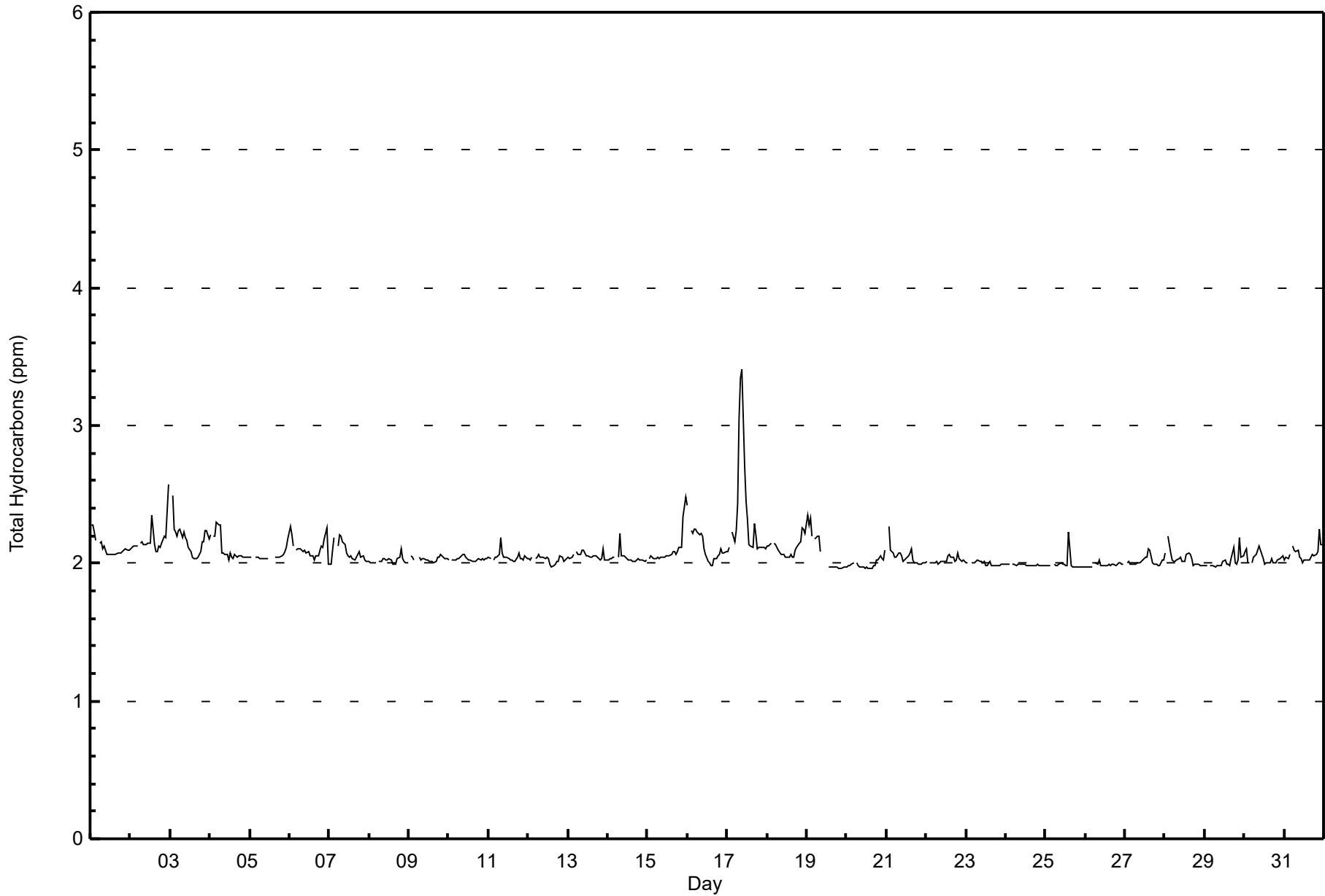






Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	433	61.51	61.51
2.1 - 3.0	268	38.07	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**

**Total Hydrocarbons (THC) - ppm
Athabasca Valley - October 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	8	5	3	3	28	113	19	17	26	25	37	41	43	26	25	433
2.1 - 3.0	4	2	0	3	5	35	134	25	2	10	5	1	4	9	6	23	268
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	18	10	5	6	8	63	247	44	19	36	30	38	45	52	32	51	704

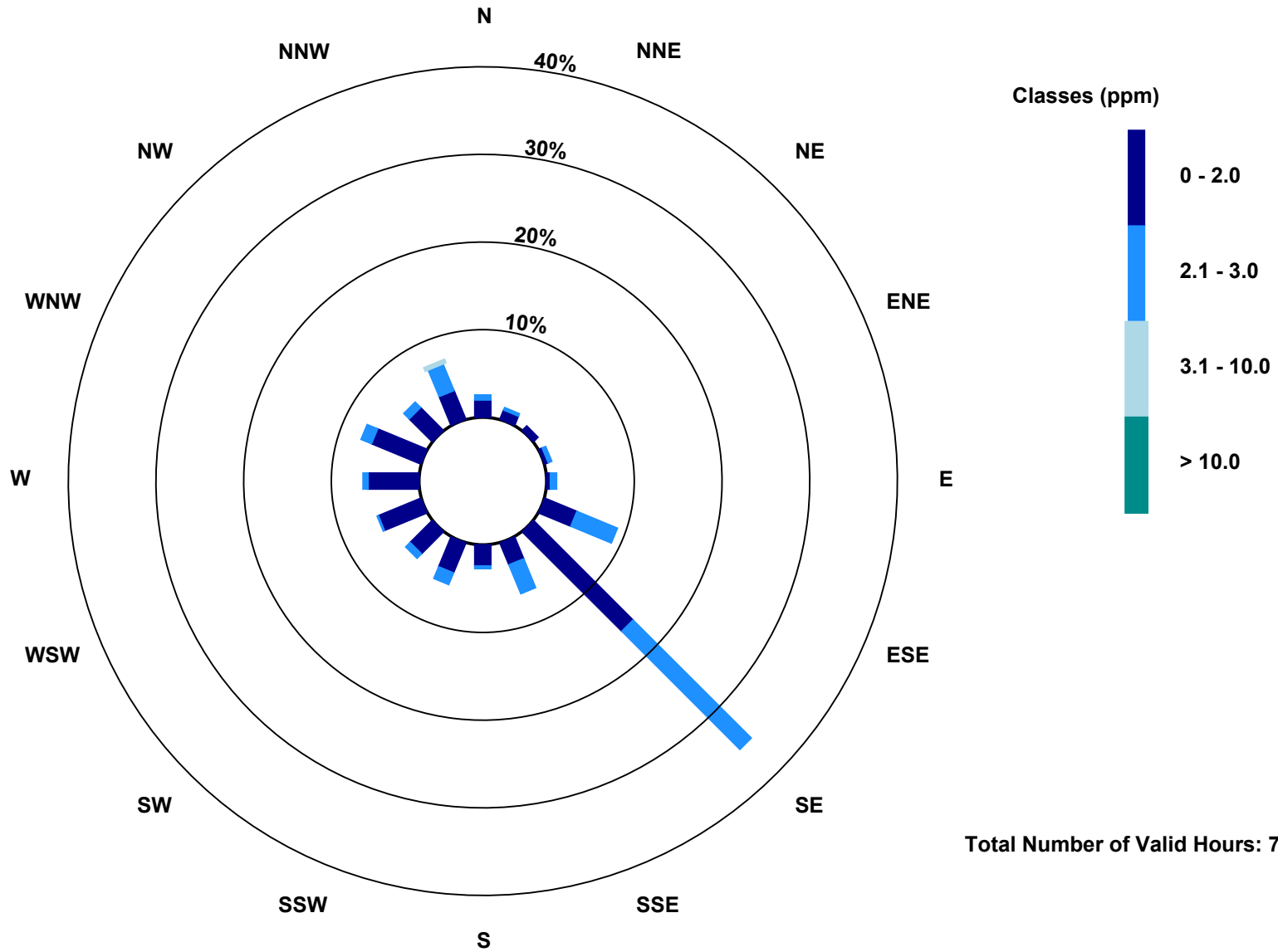
Total Number of Valid Hours: 704

Total Number of Hours: 744

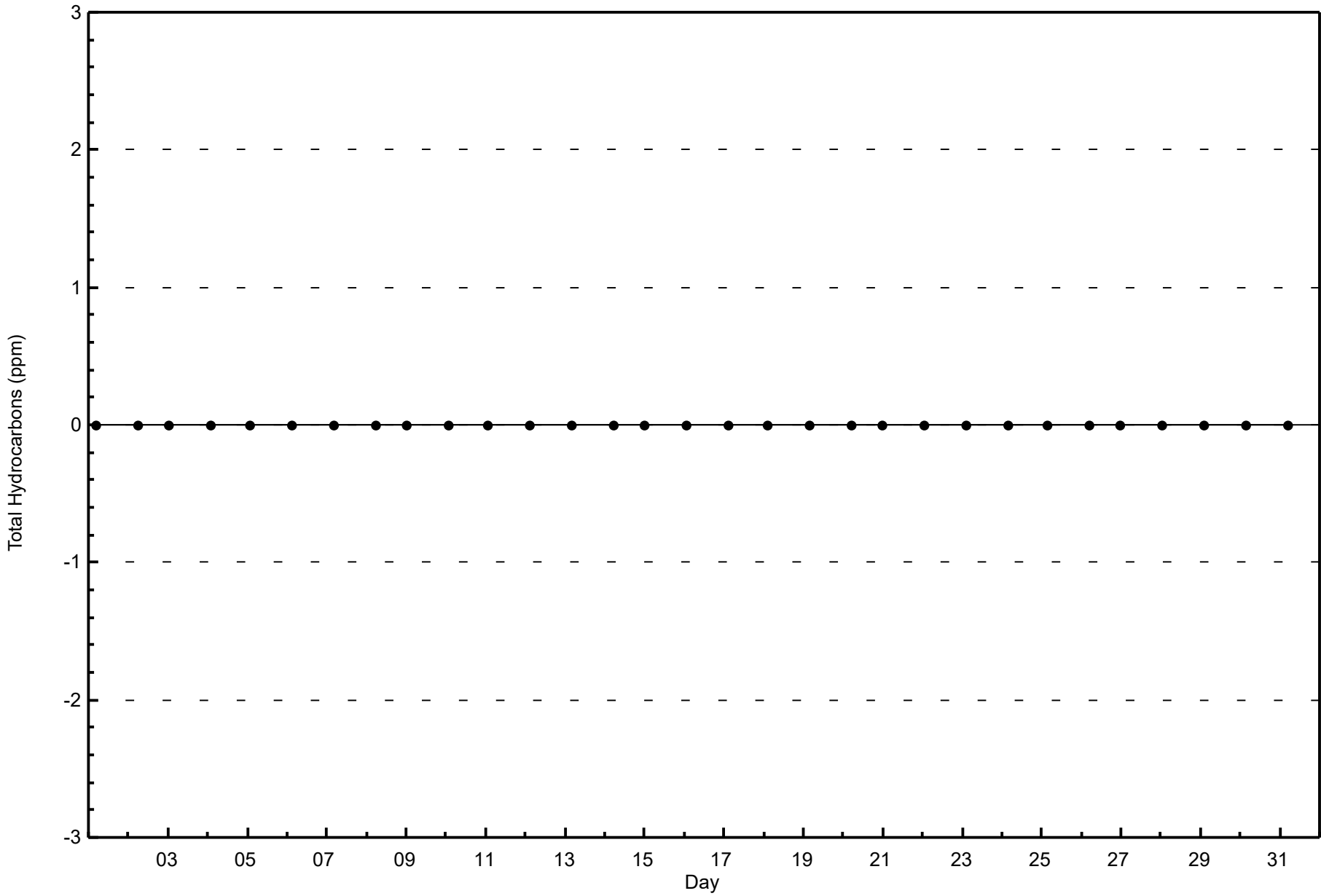


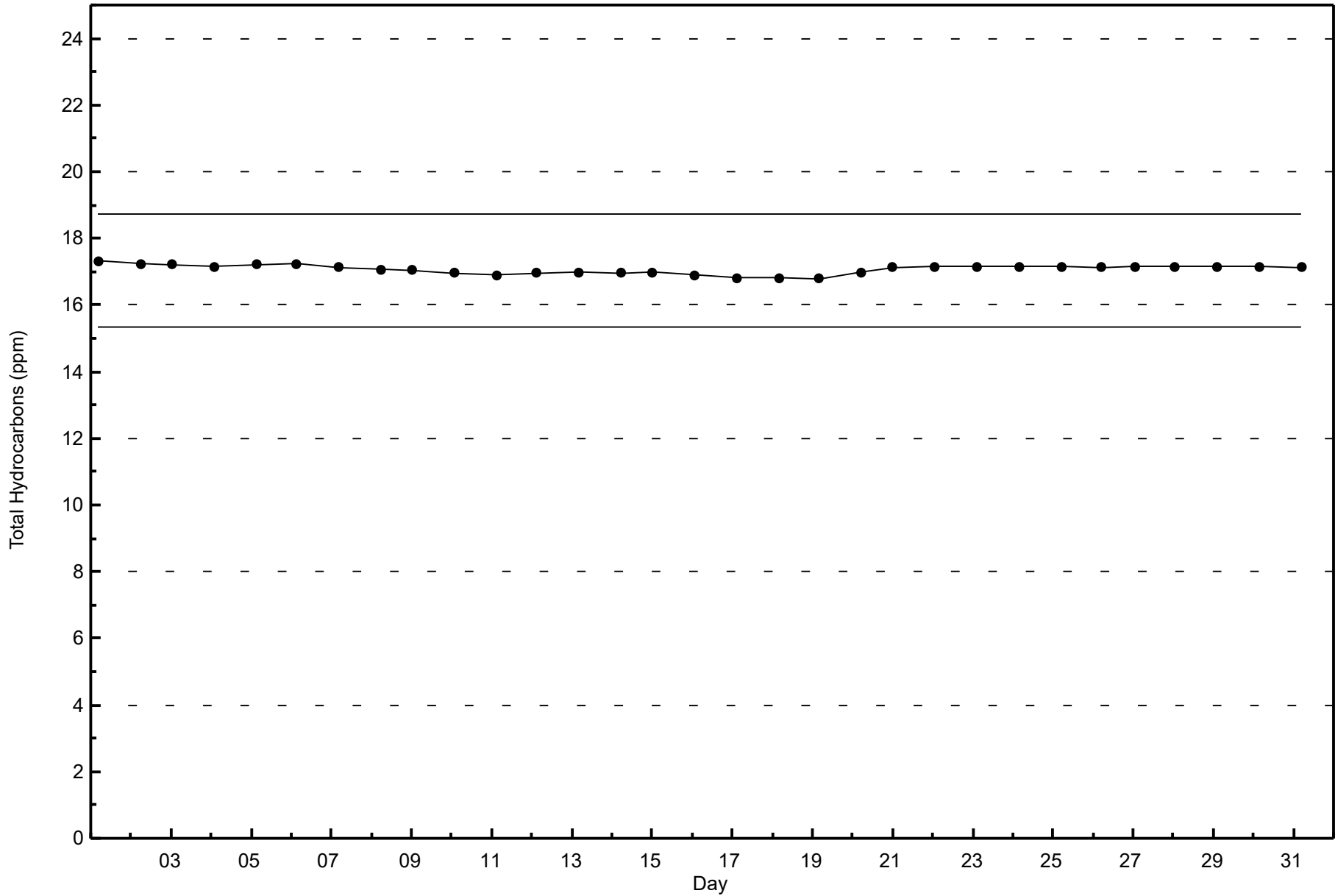
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Total Hydrocarbons (THC) - ppm
Athabasca Valley



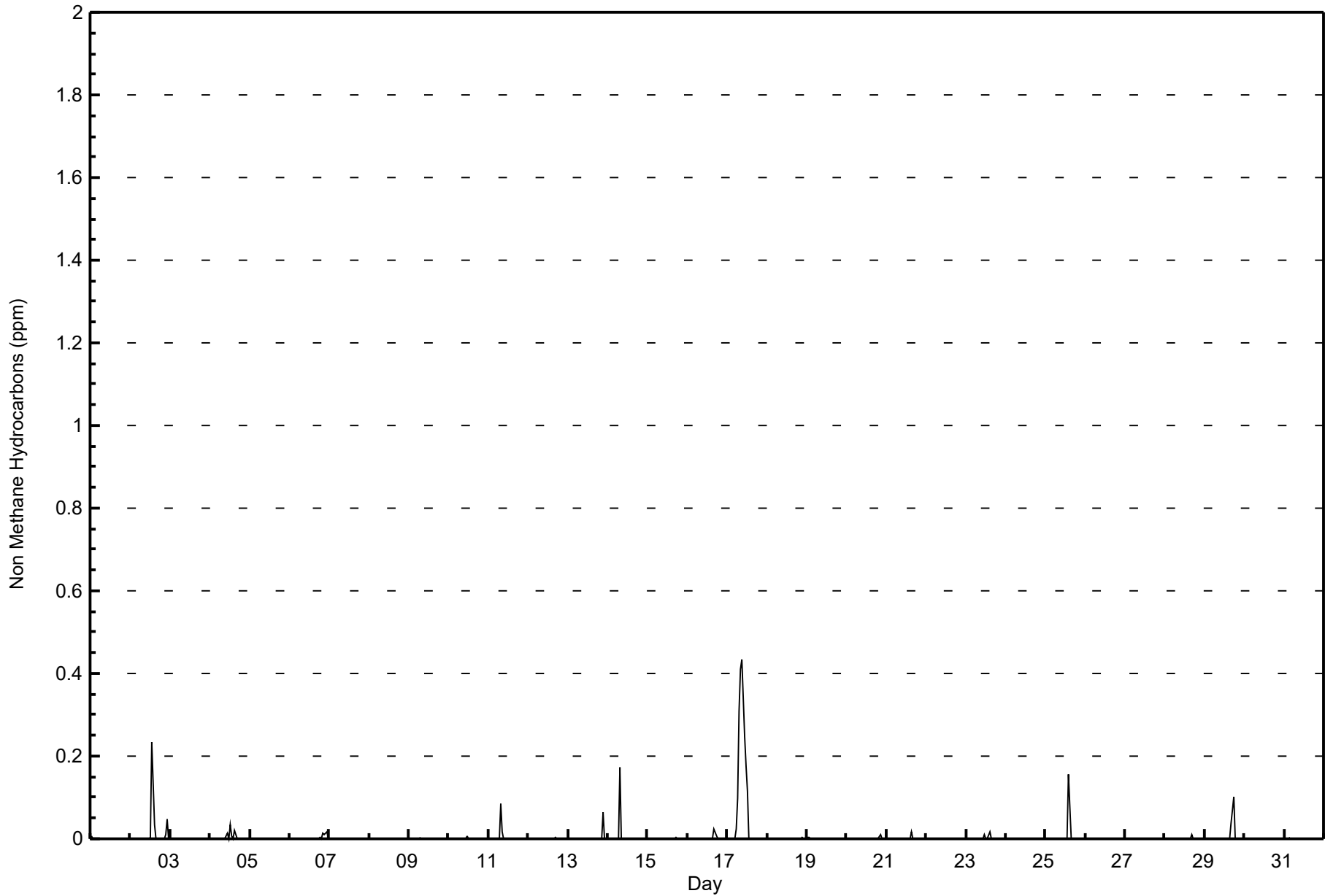
Total Number of Valid Hours: 704







Maximum Value: 0.433 ppm on Oct 17 10:00 Maximum Daily Average: 0.079 ppm on Oct 17																				Hours in Service: 744 Hours of Data: 704 Hours of Missing Data: 40 Hours of Calibration: 35 Percent Operational Time: 99.3													
Minimum Value: 0.000 ppm on Oct 1 02:00 Minimum Daily Average: 0.000 ppm on Oct 5 Maximum Diurnal Average: 0.018 ppm at hour 8 Minimum Diurnal Average: 0.000 ppm at hour 5 Monthly Average: 0.004 ppm Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.0 P ₉₉ = 0.2																																	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24									
1-Oct	0.007	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	0.007
2-Oct	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.233	0.036	0.000	0.000	0.000	0.000	0.000	0.000	0.011	0.048	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.014	0.233	
3-Oct	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001		
4-Oct	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.013	0.000	0.035	0.006	0.000	0.019	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.035		
5-Oct	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	UO	UO	UO	0.000	0.000	0.000	0.000	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-Oct	0.001	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.013	0.011	0.017	0.000	0.000	0.000	0.000	0.002	0.017			
7-Oct	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			
8-Oct	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			
9-Oct	Z	0.000	0.000	0.000	UO	UO	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
10-Oct	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
11-Oct	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.086	0.017	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.086			
12-Oct	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	0.003	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			
13-Oct	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	0.001	0.000	0.000	0.000	0.065	0.000	0.000	0.000	0.000	0.000	0.003	0.065				
14-Oct	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.173	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.173				
15-Oct	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	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
16-Oct	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	0.023	0.006	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.023				
17-Oct	0.000	0.000	Z	0.000	0.000	0.022	0.097	0.308	0.411	0.433	0.246	0.178	0.114	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.079	0.433				
18-Oct	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	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000				
19-Oct	0.004	0.005	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	C	C	C	C	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
20-Oct	0.000	0.001	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	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000				
21-Oct	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	0.017	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.017				
22-Oct	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			
23-Oct	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.012	0.000	0.000	0.017	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	0.001				
24-Oct	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			
25-Oct	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	0.155	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.155					
26-Oct	0.000	0.001	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	0.001			
27-Oct	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			
28-Oct	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	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.011			
29-Oct	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	0.038	0.103	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.103					
30-Oct	0.000	0.000	0.001	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001			
31-Oct	0.000	0.000	0.000	0.002	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	0.002				
																								Diurnal Average									
																								Diurnal Maximum									
Z - zerospan C - Calibration UO - Unstable Operation																																	





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	670	95.17	95.17
0.006 - 0.05	21	2.98	98.15
0.06 - 0.1	5	0.71	98.86
> 0.1	8	1.14	100.00

Total Number of Valid Hours: 704

Total Number of Hours: 744



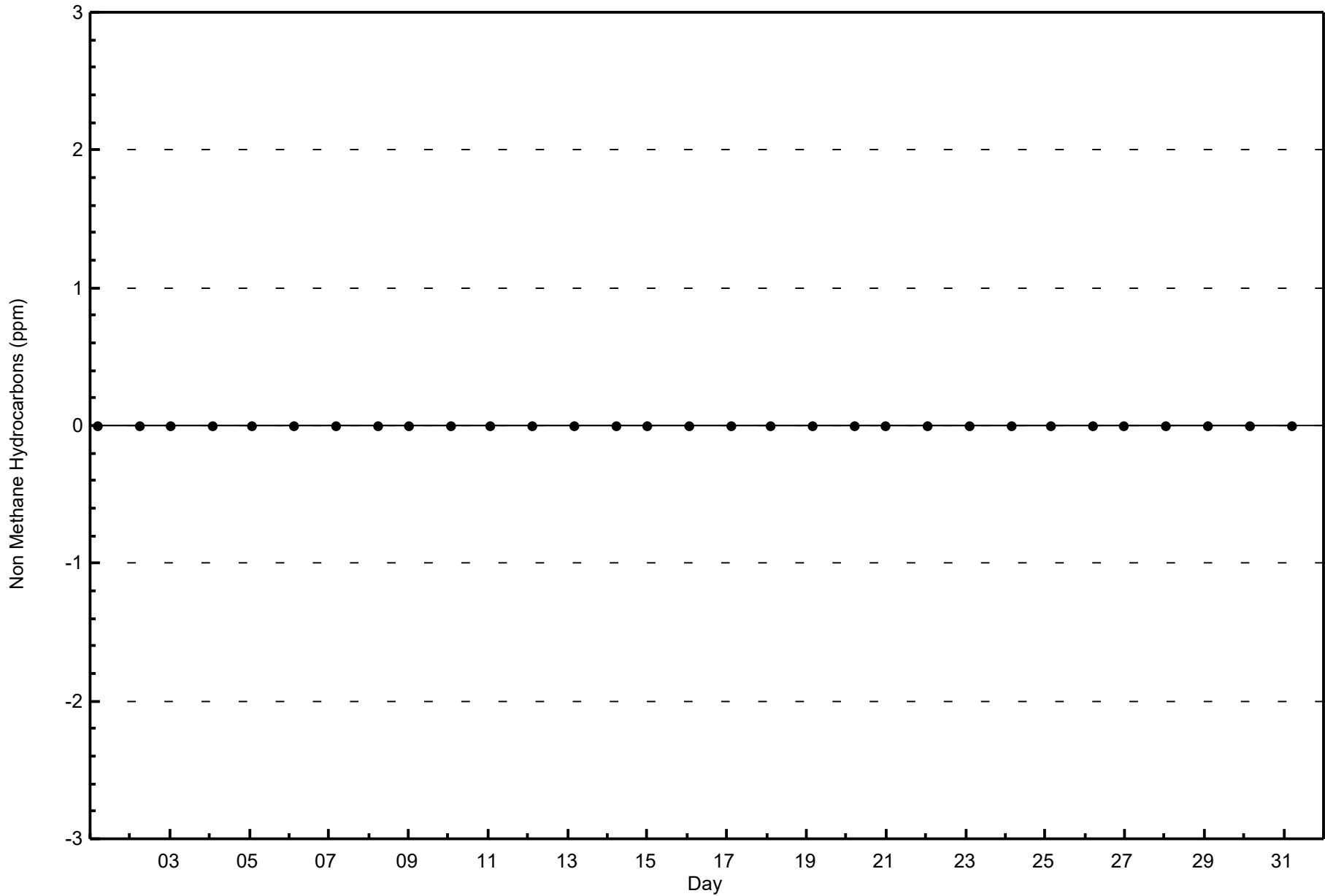
**Wood Buffalo Environmental Association
Frequency Distribution**

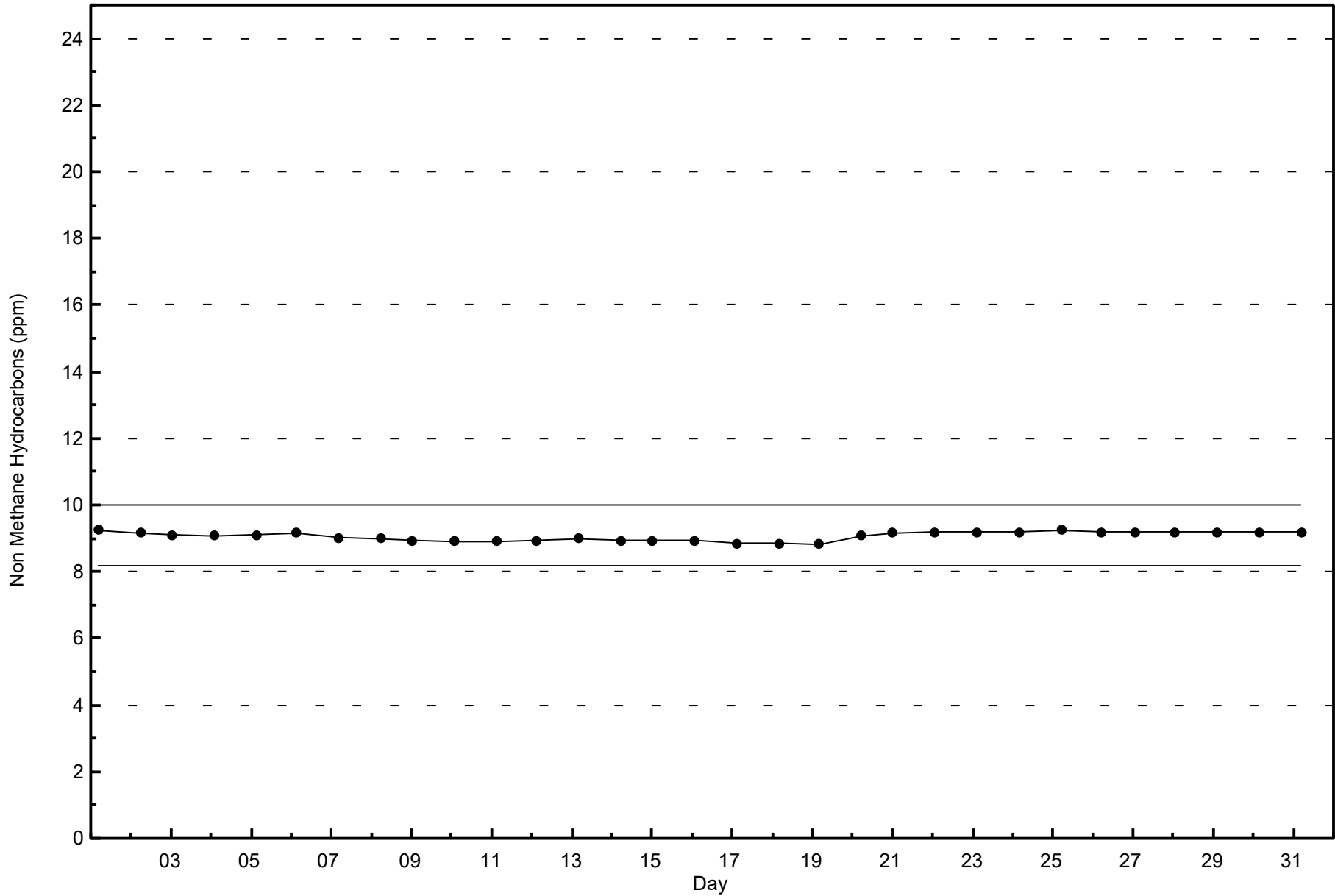
**Non Methane Hydrocarbons (NMHC) - ppm
Athabasca Valley - October 2023**

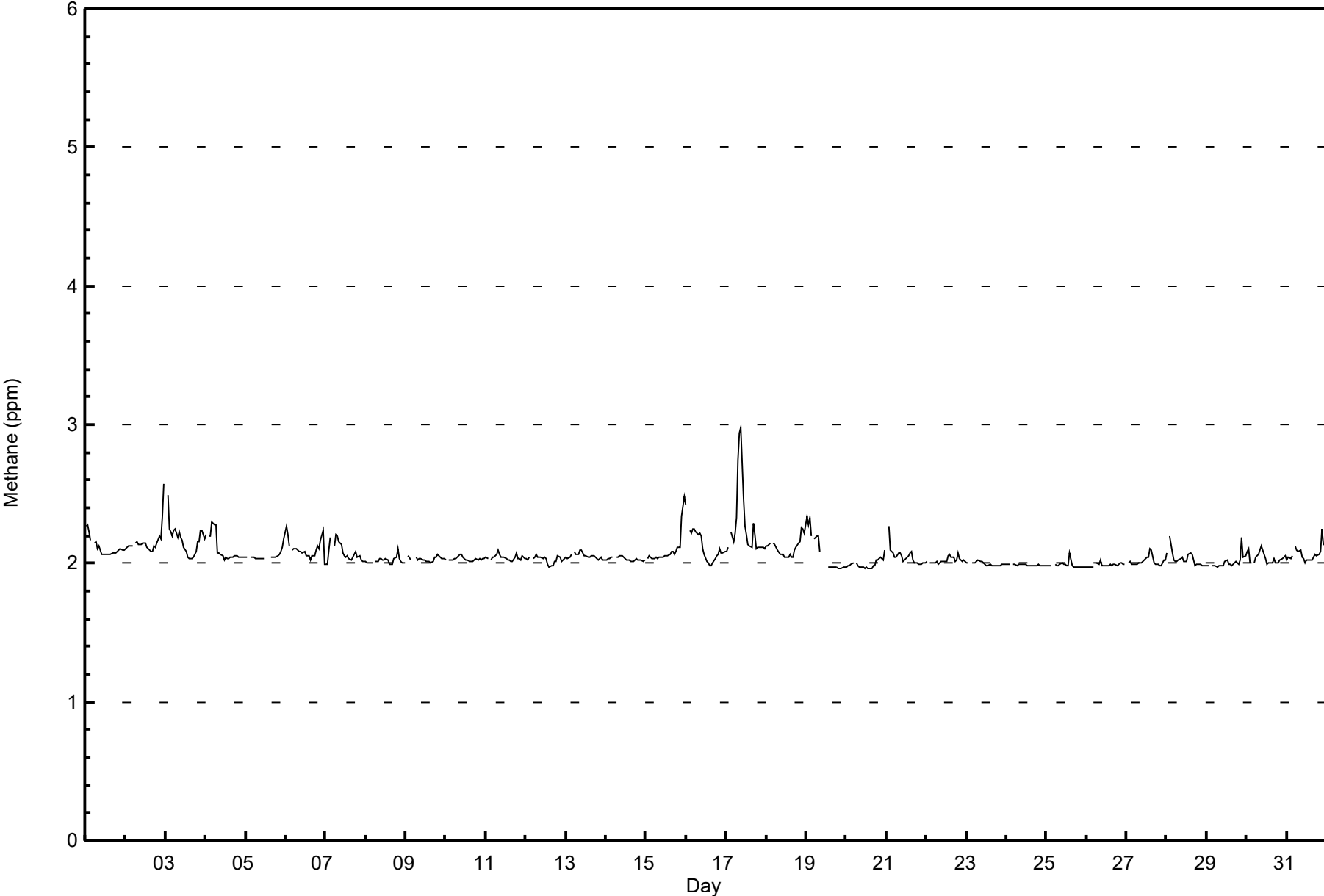
Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	16	10	5	6	8	60	240	43	18	35	29	37	43	45	32	43	670
0.006 - 0.05	1	0	0	0	0	1	6	0	1	1	1	1	0	7	0	2	21
0.06 - 0.1	1	0	0	0	0	2	0	0	0	0	0	0	1	0	0	1	5
> 0.1	0	0	0	0	0	0	1	1	0	0	0	0	1	0	0	5	8
Totals	18	10	5	6	8	63	247	44	19	36	30	38	45	52	32	51	704

Total Number of Valid Hours: 704

Total Number of Hours: 744









Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Athabasca Valley - October 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	439	62.36	62.36
2.1 - 3.0	265	37.64	100.00
3.1 - 10.0	0	0.00	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
Athabasca Valley - October 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	15	8	5	3	3	29	114	19	17	26	25	37	42	45	26	25	439
2.1 - 3.0	3	2	0	3	5	34	133	25	2	10	5	1	3	7	6	26	265
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	18	10	5	6	8	63	247	44	19	36	30	38	45	52	32	51	704

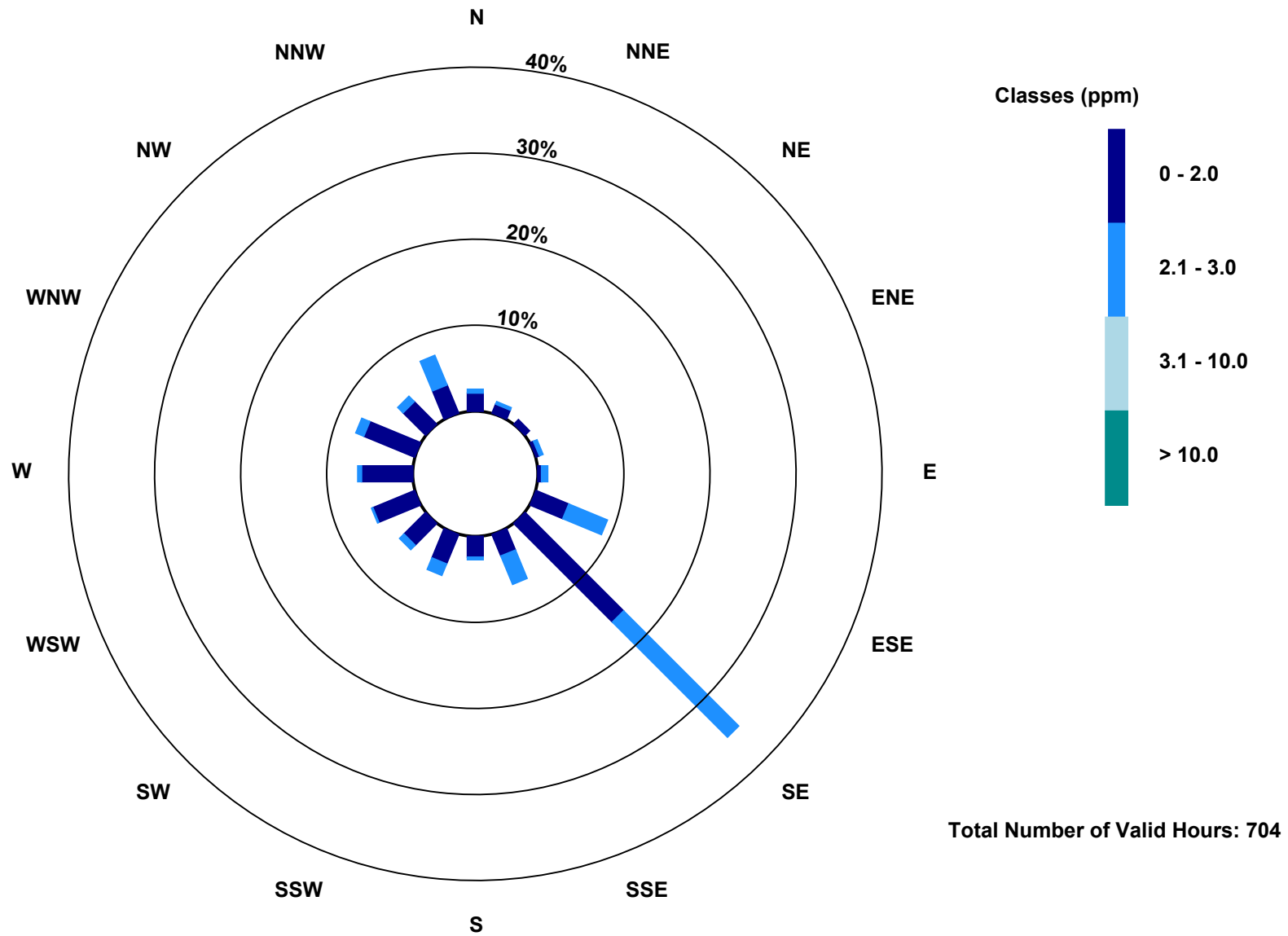
Total Number of Valid Hours: 704

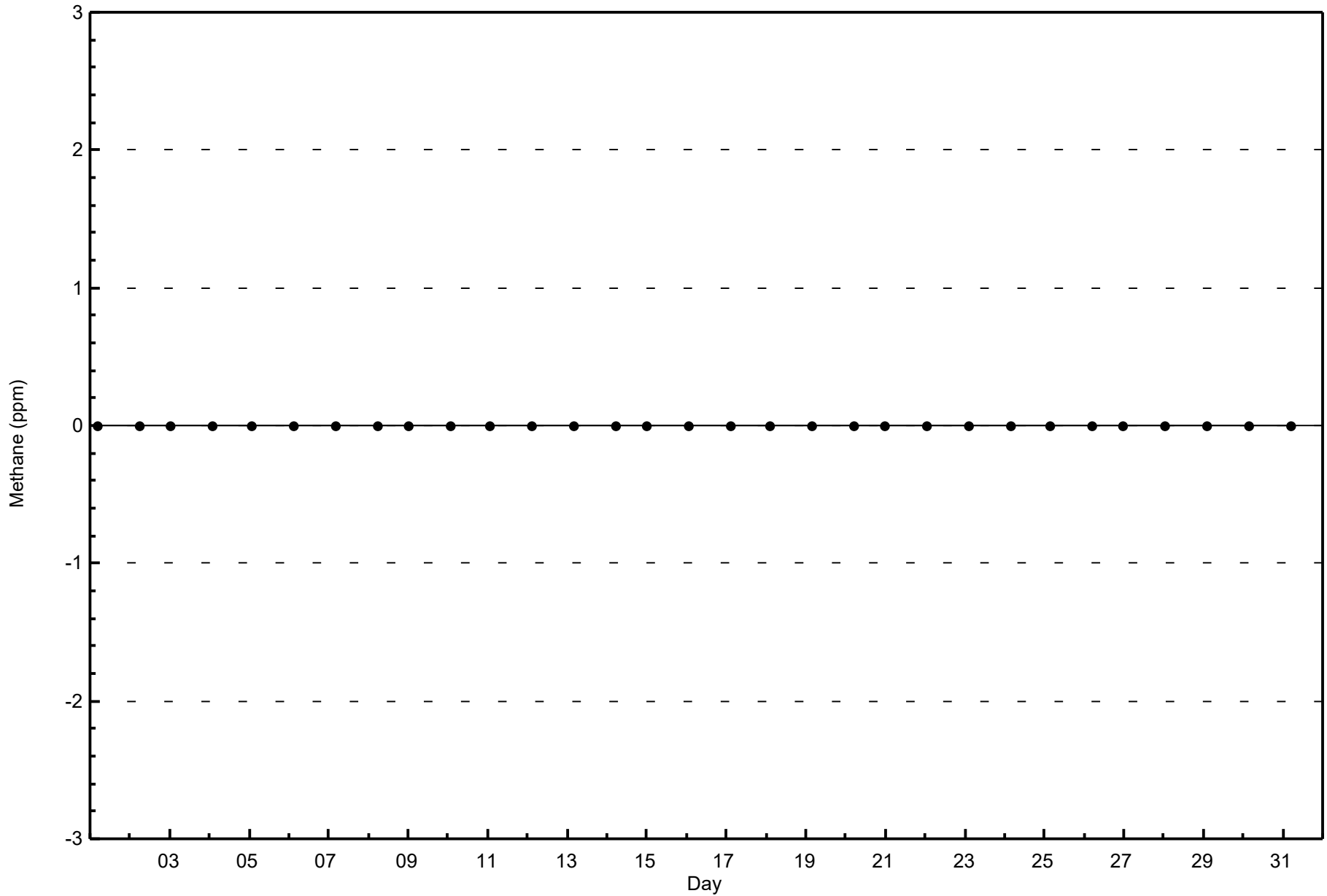
Total Number of Hours: 744

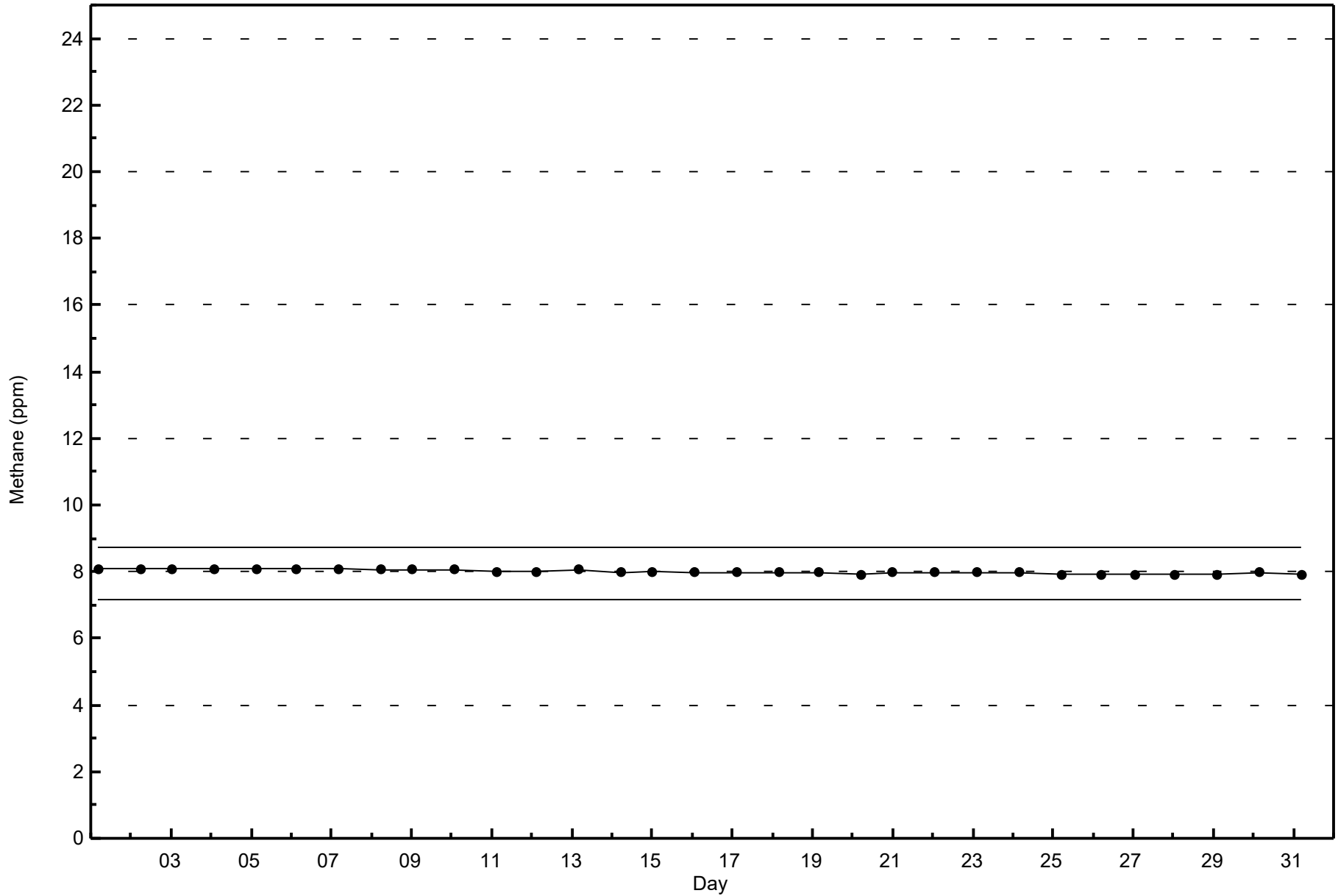


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Methane (CH₄) - ppm
Athabasca Valley









Wood Buffalo Environmental Association

Summary of Hour Averages

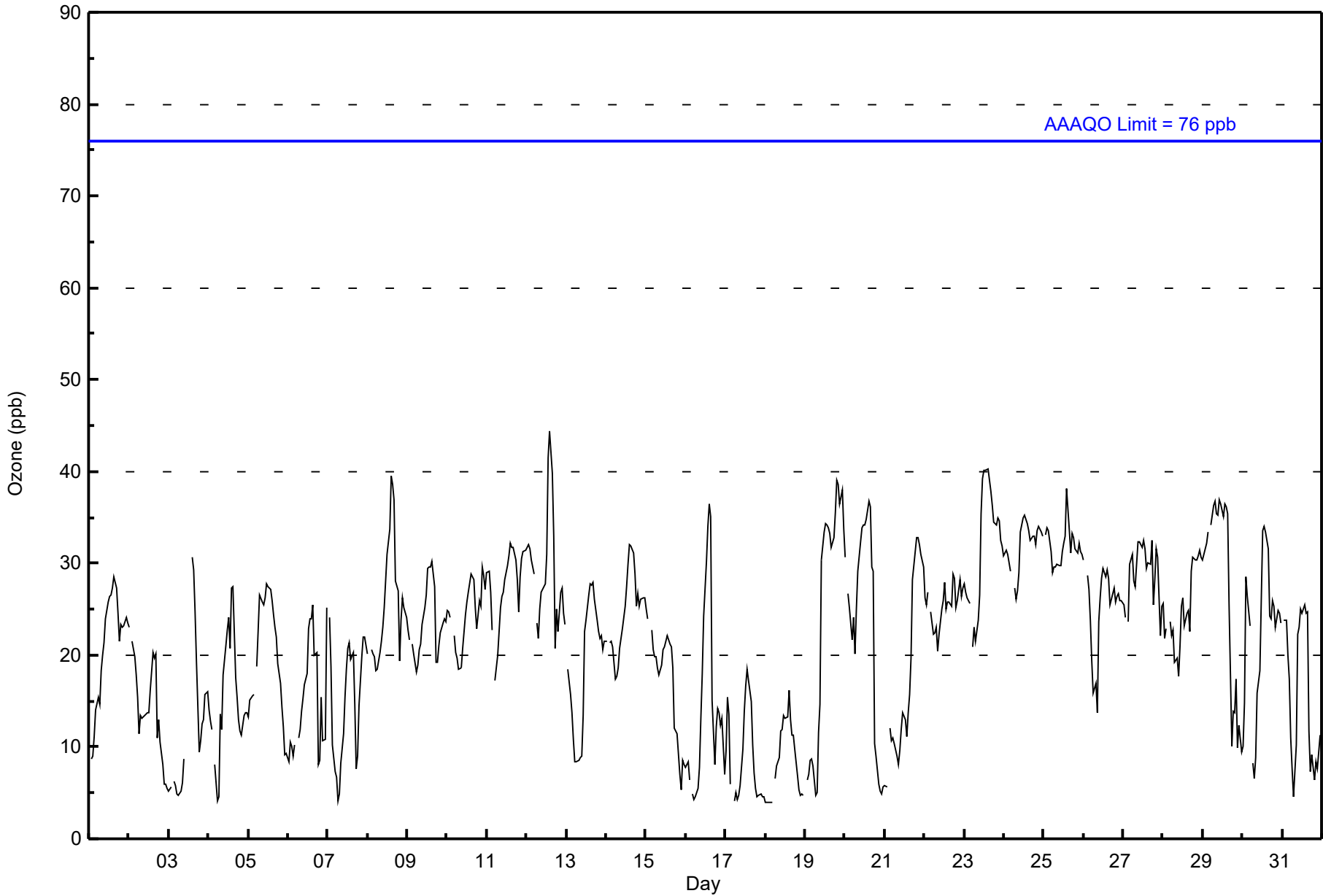
Ozone (O₃) - ppb

Athabasca Valley - October 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 44.4 ppb on Oct 12 15:00	Maximum Daily Average: 31.9 ppb on Oct 23		Hours of Data:	709
Minimum Value: 3.9 ppb on Oct 18 04:00	Minimum Daily Average: 8.5 ppb on Oct 18		Hours of Missing Data:	35
Maximum Diurnal Average: 29.1 ppb at hour 15	Minimum Diurnal Average: 15.9 ppb at hour 7		Hours of Calibration:	35
Monthly Average: 21.56 ppb	Percentiles: P ₁ = 4.2 P ₁₀ = 8.1 Q ₁ = 13.7 Median = 23.0 Q ₃ = 28.6 P ₉₀ = 33.0 P ₉₉ = 39.1		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-Oct	Z	8.8	9.1	11.2	14.0	15.4	14.6	18.3	20.0	21.4	24.0	25.8	26.4	26.5	27.4	28.5	27.2	24.5	21.6	23.4	23.1	23.2	24.1	23.5	20.9	28.5																							
2-Oct	23.1	Z	21.5	19.9	17.8	15.3	11.5	13.5	13.1	13.4	13.6	13.7	13.8	16.2	20.3	19.6	20.1	10.9	12.9	10.5	8.1	5.9	6.0	5.5	14.2	23.1																							
3-Oct	5.1	5.6	Z	6.3	5.8	4.9	4.7	5.2	6.1	8.7	C	C	C	C	30.6	29.3	24.7	19.2	9.5	10.7	12.5	12.9	15.8	16.0	12.3	30.6																							
4-Oct	14.1	12.8	11.9	Z	8.1	4.1	4.5	13.6	11.9	17.8	21.0	22.8	24.2	20.7	27.4	27.4	17.5	15.3	13.0	11.8	11.3	13.4	13.7	13.7	15.3	27.4																							
5-Oct	13.3	15.1	15.5	15.8	Z	18.8	22.6	26.6	25.8	25.5	26.3	27.8	27.5	27.1	25.9	24.3	23.0	22.0	19.1	17.0	14.3	12.3	9.2	9.3	20.2	27.8																							
6-Oct	8.3	10.6	10.1	9.0	10.2	Z	11.0	11.9	13.9	15.3	16.8	17.9	22.9	24.0	24.0	25.5	20.0	20.3	8.1	8.5	15.3	10.7	10.8	25.2	15.2	25.5																							
7-Oct	Z	24.2	18.8	10.2	7.3	6.8	4.1	4.9	8.2	11.4	15.3	18.4	20.8	21.4	19.5	20.3	14.7	7.7	8.9	14.5	19.8	22.0	21.9	21.0	14.9	24.2																							
8-Oct	20.2	Z	20.6	20.1	19.8	18.2	18.5	20.2	21.5	23.1	25.2	28.0	30.9	33.8	39.6	38.6	36.9	28.1	27.0	19.4	23.8	26.2	25.1	24.1	25.6	39.6																							
9-Oct	22.8	21.6	Z	21.2	20.1	18.2	19.0	20.6	21.2	23.3	25.1	26.5	29.4	29.5	29.6	30.2	27.5	19.2	19.3	21.1	22.4	23.5	23.9	23.7	23.4	30.2																							
10-Oct	24.8	24.8	24.1	Z	22.1	20.2	19.6	18.4	18.6	20.7	22.6	24.4	25.8	26.9	28.8	28.5	28.3	25.1	22.9	25.9	25.3	29.6	28.6	27.1	24.5	29.6																							
11-Oct	28.9	29.2	26.9	22.7	Z	17.3	20.0	22.5	25.1	26.4	26.9	28.2	29.8	30.8	32.1	31.7	31.8	30.3	28.2	24.7	28.5	30.5	31.3	31.4	27.6	32.1																							
12-Oct	31.8	32.0	31.6	30.4	28.8	Z	23.5	21.8	25.1	26.8	27.4	27.8	30.9	41.5	44.4	39.8	32.9	20.7	25.0	22.6	26.8	27.3	24.6	23.4	29.0	44.4																							
13-Oct	Z	18.5	15.7	13.8	10.9	8.3	8.4	8.6	8.9	9.0	13.5	22.6	23.8	26.5	27.7	27.6	27.9	26.1	23.9	22.6	21.7	22.1	20.6	21.6	18.7	27.9																							
14-Oct	21.5	Z	21.4	21.4	20.8	17.5	17.7	18.6	20.8	21.8	22.9	25.3	27.4	29.9	32.1	31.8	31.1	28.8	25.3	26.7	25.3	26.1	26.2	26.2	24.6	32.1																							
15-Oct	25.0	23.9	Z	22.8	20.6	19.8	19.8	18.7	17.8	18.8	20.5	20.9	21.6	22.1	21.2	20.9	18.6	12.1	11.8	11.5	7.0	5.4	8.5	8.1	17.3	25.0																							
16-Oct	7.8	8.4	6.4	Z	4.9	4.3	4.6	5.4	7.8	13.1	18.0	24.3	30.2	34.1	36.5	35.1	15.0	8.1	12.2	14.2	13.7	12.4	13.2	7.1	14.6	36.5																							
17-Oct	9.6	15.4	13.5	6.0	Z	4.1	5.1	4.3	4.7	5.8	9.7	13.9	16.6	18.5	17.3	15.0	10.2	7.1	5.5	4.6	4.7	4.8	4.5	4.5	8.9	18.5																							
18-Oct	4.0	3.9	4.0	3.9	4.0	Z	6.6	7.9	8.9	11.7	12.0	13.4	13.1	13.3	16.2	13.0	11.4	11.3	9.8	6.8	5.3	4.7	4.9	4.7	8.5	16.2																							
19-Oct	Z	6.4	7.1	8.6	8.8	7.9	4.7	5.0	11.6	14.6	30.4	33.4	34.3	34.2	33.9	33.2	31.8	32.8	35.5	39.1	38.7	36.5	37.9	33.7	24.3	39.1																							
20-Oct	30.6	Z	26.7	25.2	21.7	24.2	20.2	25.1	29.1	32.4	33.9	34.1	34.1	34.8	36.8	36.2	29.6	29.2	10.3	9.1	5.9	5.1	4.9	5.7	23.7	36.8																							
21-Oct	5.7	5.6	Z	12.1	10.6	11.0	10.4	9.1	8.0	9.6	11.9	13.8	12.9	11.2	13.8	15.8	19.6	28.3	31.3	32.8	32.8	32.0	31.0	29.6	17.3	32.8																							
22-Oct	26.3	25.5	26.8	Z	24.7	22.2	22.4	23.0	20.5	22.2	24.9	26.0	28.0	25.1	25.8	25.8	25.3	28.8	28.3	25.1	26.0	28.3	26.4	27.3	25.4	28.8																							
23-Oct	27.8	26.9	26.3	25.6	Z	20.9	23.1	21.6	23.8	26.6	35.4	39.1	40.1	40.1	40.3	39.1	37.8	36.2	34.4	34.1	35.0	34.7	32.4	31.9	31.9	40.3																							
24-Oct	30.8	31.5	31.0	30.1	29.1	Z	27.4	26.1	27.0	29.1	33.4	35.0	35.2	34.8	34.3	33.6	32.5	33.0	33.0	32.0	33.6	34.0	33.4	32.9	31.9	35.2																							
25-Oct	Z	33.1	33.8	33.5	31.2	29.0	29.5	29.7	29.9	29.7	29.7	31.3	32.2	33.0	38.2	33.6	31.1	33.2	32.9	31.5	31.2	32.1	31.3	30.9	31.8	38.2																							
26-Oct	30.4	Z	28.6	27.2	23.8	19.4	15.8	16.9	13.7	23.6	26.2	28.4	29.5	28.6	29.4	28.4	25.4	26.1	27.3	25.7	26.3	26.6	26.0	25.9	25.2	30.4																							
27-Oct	25.5	24.1	Z	23.7	29.9	31.0	28.0	27.4	29.9	32.4	32.3	31.7	32.5	31.6	29.5	30.0	29.9	32.4	25.5	28.2	31.5	30.6	22.1	25.3	28.9	32.5																							
28-Oct	25.7	21.7	22.8	Z	23.6	22.1	22.7	19.2	19.7	17.6	21.0	25.3	26.3	23.1	24.5	24.9	22.6	29.2	30.6	30.4	30.4	30.9	31.4	30.7	25.1	31.4																							
29-Oct	30.3	31.6	32.1	33.5	Z	34.2	36.3	36.8	35.4	35.2	36.9	36.4	35.1	36.4	36.2	35.4	25.5	10.1	13.9	13.7	17.4	10.0	12.3	9.5	27.6	36.9																							
30-Oct	10.0	14.8	28.6	26.4	23.1	Z	8.3	6.5	8.8	15.8	18.3	26.0	33.5	34.0	33.5	31.6	24.3	24.0	25.9	25.4	23.0	24.9	24.5	23.4	22.4	34.0																							
31-Oct	Z	23.8	23.8	20.0	17.4	11.0	7.6	4.6	10.3	22.2	23.0	25.1	24.5	25.5	24.6	24.7	11.7	7.3	9.2	6.4	8.4	7.6	9.4	11.3	15.6	25.5																							
																								20.1	19.2	20.7	19.3	17.7	16.4	15.9	16.5	17.6	20.2	23.3	25.6	27.1	27.8	29.1	28.4	24.7	22.2	20.7	20.3	20.9	20.9	20.5	20.4	Diurnal Average	
																								31.8	33.1	33.8	33.5	31.2	34.2	36.3	36.8	35.4	35.2	36.9	39.1	40.1	41.5	44.4	39.8	37.8	36.2	35.5	39.1	38.7	36.5	37.9	33.7	Diurnal Maximum	

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ozone (O₃) - ppb
Athabasca Valley - October 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	283	39.92	39.92
21 - 50	426	60.08	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Ozone (O₃) - ppb
Athabasca Valley - October 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	7	4	0	5	5	29	136	21	7	11	6	2	6	12	9	23	283
21 - 50	12	5	5	1	3	36	112	23	12	24	23	37	38	43	24	28	426
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	19	9	5	6	8	65	248	44	19	35	29	39	44	55	33	51	709

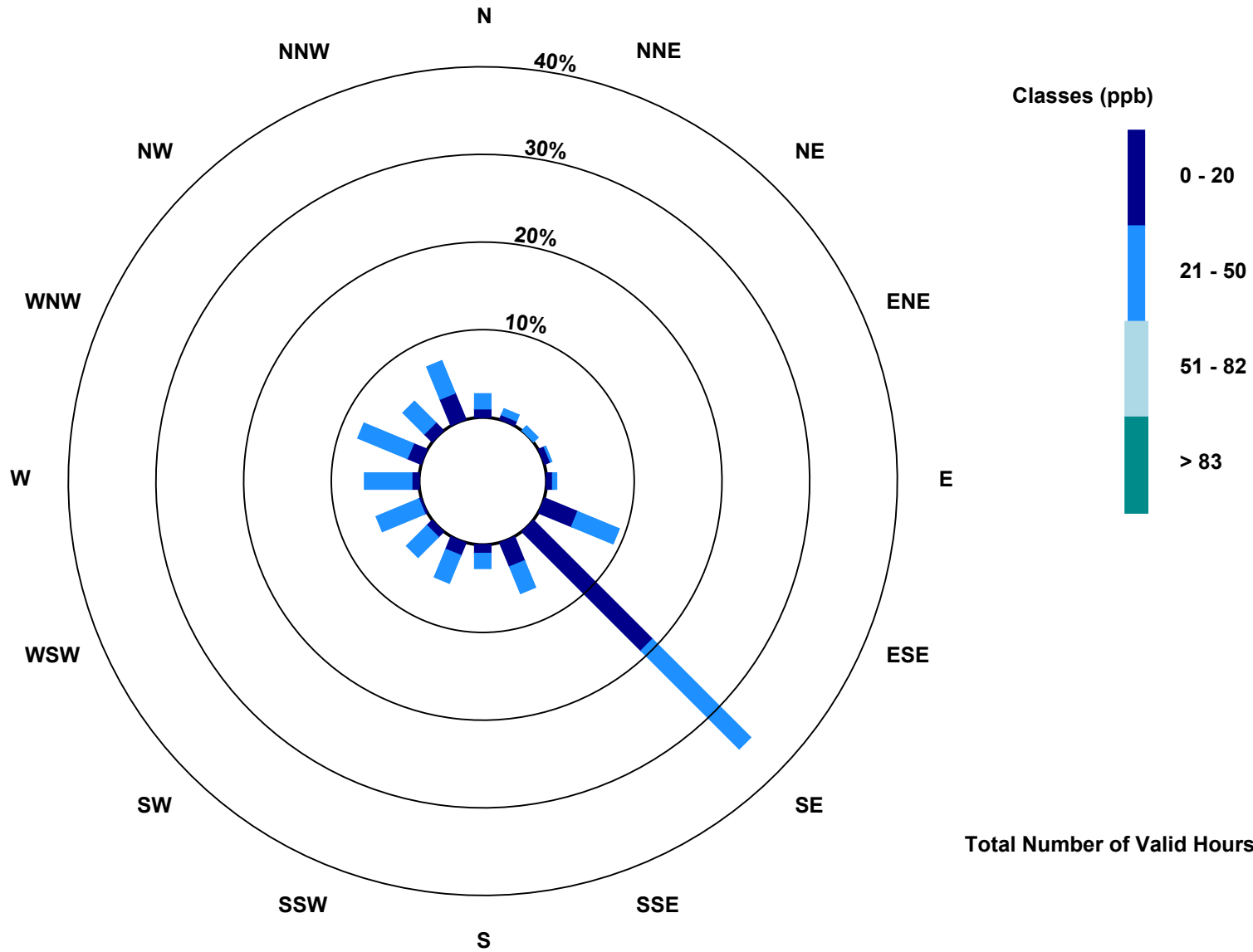
Total Number of Valid Hours: 709

Total Number of Hours: 744

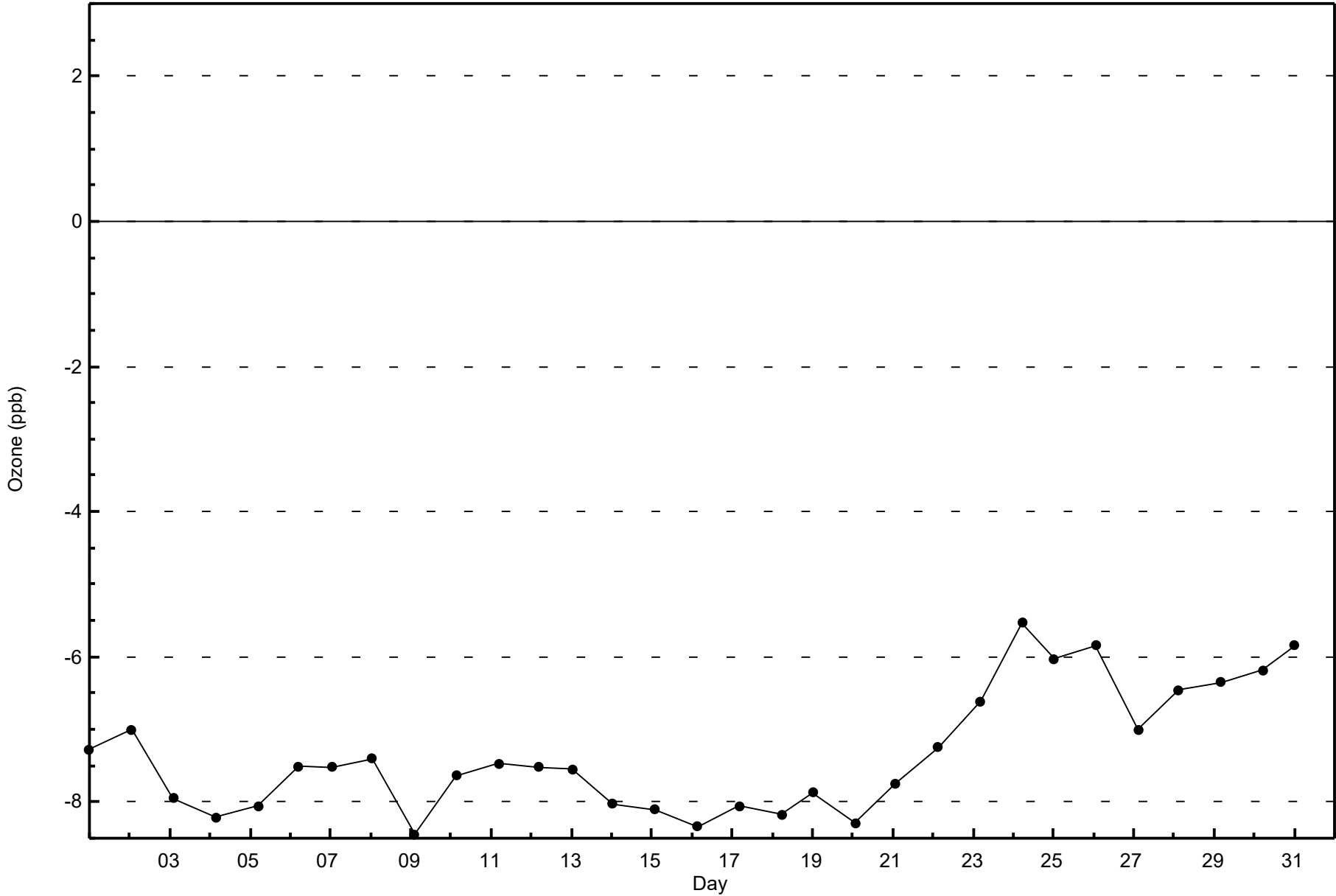


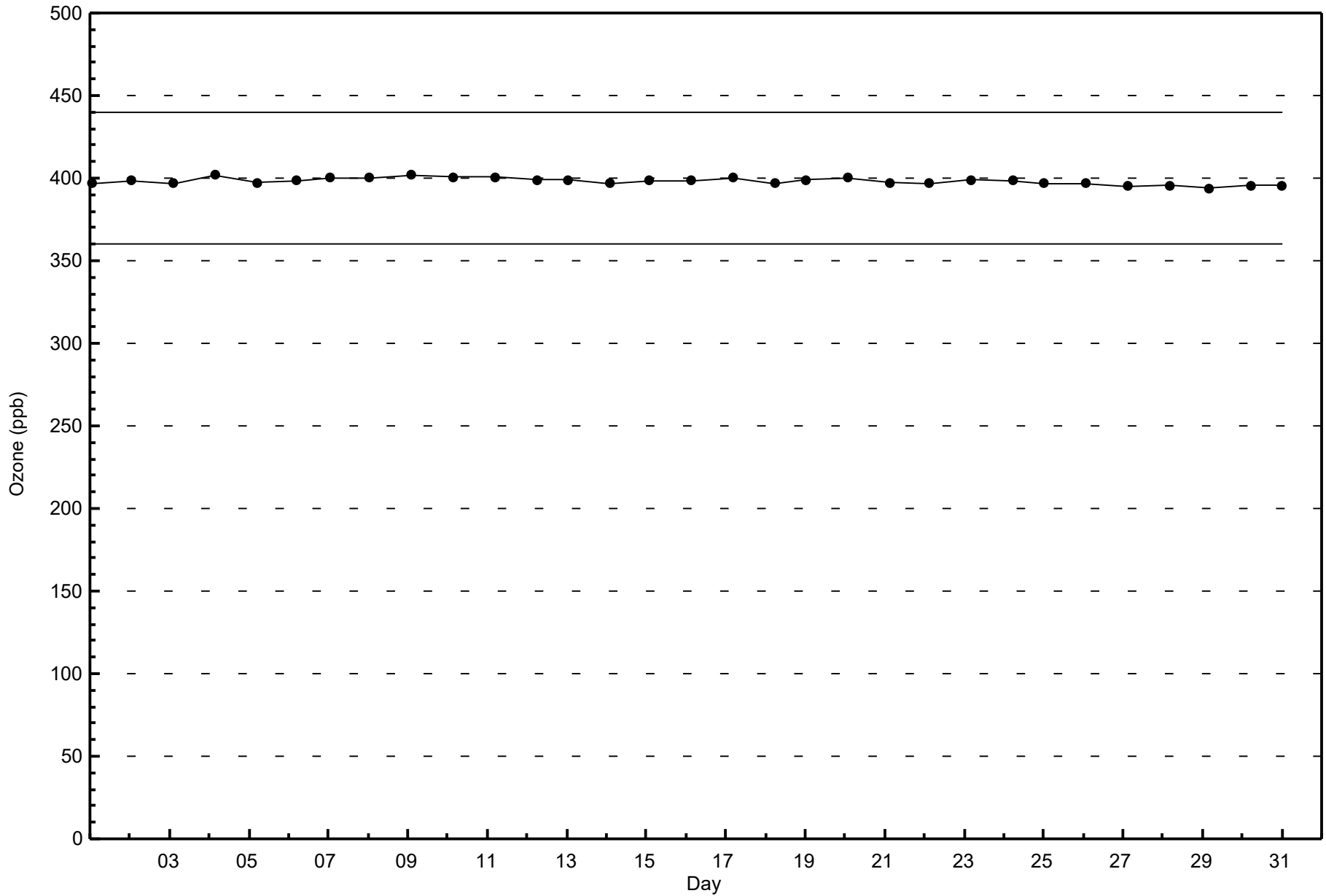
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Ozone (O₃) - ppb
Athabasca Valley



Total Number of Valid Hours: 709



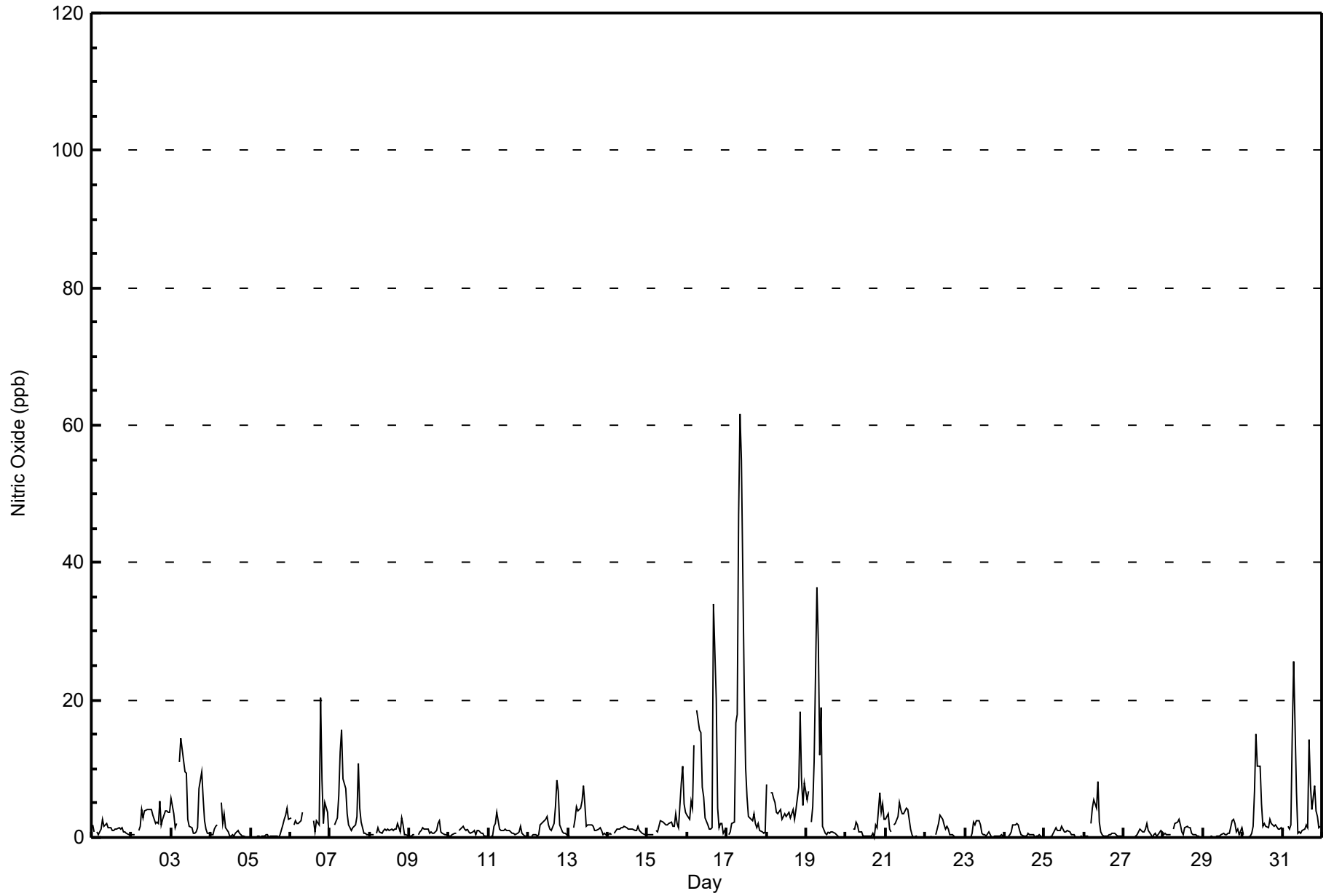




Wood Buffalo Environmental Association
Summary of Hour Averages

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

Maximum Value: 61.6 ppb on Oct 17 09:00																				Maximum Daily Average: 11.4 ppb on Oct 17					Hours in Service: 744				
Minimum Value: 0.0 ppb on Oct 7 01:00																				Minimum Daily Average: 0.5 ppb on Oct 27					Hours of Data: 707				
Maximum Diurnal Average: 6.3 ppb at hour 8																				Minimum Diurnal Average: 0.9 ppb at hour 2					Hours of Missing Data: 37				
Monthly Average: 2.43 ppb																				Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.4 Median = 1.1 Q ₃ = 2.3 P ₉₀ = 5.1 P ₉₉ = 21.6					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-Oct	1.7	0.8	Z	0.7	0.3	1.2	2.7	1.7	1.9	2.0	1.4	1.4	1.0	0.9	1.2	1.2	1.5	1.3	1.4	0.9	0.7	0.6	0.4	0.4	1.2	2.7			
2-Oct	0.3	0.4	0.4	Z	0.9	1.6	4.2	2.8	3.9	4.0	4.1	4.0	4.1	3.2	2.0	2.2	2.0	5.3	1.8	2.7	3.9	3.8	3.6	3.7	2.8	5.3			
3-Oct	5.8	3.4	1.4	2.0	Z	11.0	14.4	11.2	9.5	9.3	2.6	1.6	1.4	0.5	0.6	0.7	1.5	7.0	9.5	5.7	2.4	1.3	0.6	0.6	4.5	14.4			
4-Oct	0.5	0.5	1.3	1.5	1.8	Z	5.1	2.1	3.4	1.4	0.9	0.3	0.3	0.5	0.3	0.7	1.0	0.5	0.4	0.3	0.2	0.1	0.0	0.0	1.0	5.1			
5-Oct	Z	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.3	0.4	0.3	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.4	1.9	2.7	3.3	4.2	2.6	0.8	4.2			
6-Oct	2.9	Z	1.9	2.4	2.1	2.1	2.4	3.6	C	C	C	C	C	C	2.5	0.9	2.5	1.8	20.3	8.4	1.9	5.0	3.7	0.0	--	20.3			
7-Oct	0.0	0.0	Z	1.9	2.8	6.1	12.4	15.7	8.6	7.1	3.5	1.9	1.5	1.0	1.4	1.8	3.1	10.8	4.3	2.2	0.6	0.7	0.5	0.3	3.8	15.7			
8-Oct	0.3	0.4	0.3	Z	0.7	1.5	0.9	0.7	1.0	1.2	1.0	1.2	1.1	1.2	1.0	1.2	1.3	2.0	0.8	2.8	1.7	0.5	0.4	0.3	1.0	2.8			
9-Oct	0.2	0.3	0.4	0.5	Z	0.3	0.8	0.9	1.5	1.2	1.1	1.2	0.6	0.7	0.5	0.5	1.1	1.9	2.3	0.8	0.5	0.4	0.4	0.3	0.8	2.3			
10-Oct	0.2	0.3	0.3	0.6	0.5	Z	0.9	1.2	1.7	1.3	1.1	1.1	0.8	0.7	0.8	0.9	0.5	1.0	1.1	0.7	0.7	0.3	0.2	0.1	0.7	1.7			
11-Oct	Z	0.1	0.2	1.6	2.0	3.7	1.2	0.9	1.1	1.0	1.1	1.0	1.0	0.8	0.7	0.6	0.5	0.6	0.7	1.5	0.6	0.5	0.3	0.2	1.0	3.7			
12-Oct	0.2	Z	0.3	0.4	0.5	0.3	0.4	1.9	2.0	2.3	2.7	3.1	1.7	1.2	1.1	2.0	4.4	8.4	6.6	1.8	0.8	0.6	0.5	0.4	1.9	8.4			
13-Oct	0.4	0.2	Z	1.4	2.6	4.4	3.9	4.2	5.4	7.5	4.8	1.7	1.8	1.8	1.9	1.6	1.0	1.1	1.1	1.4	1.0	0.5	0.7	0.5	2.2	7.5			
14-Oct	0.4	0.5	0.5	Z	0.7	1.2	1.2	1.2	1.3	1.4	1.7	1.4	1.2	1.1	1.3	1.3	1.0	1.0	1.7	1.0	0.8	0.6	0.4	0.3	1.0	1.7			
15-Oct	0.3	0.4	0.3	0.4	Z	1.0	0.8	1.5	2.5	2.2	2.1	1.9	1.8	2.0	2.2	1.7	1.6	3.4	1.9	1.4	8.0	10.4	4.8	3.6	2.5	10.4			
16-Oct	3.2	2.7	5.4	4.2	13.5	Z	18.4	15.8	15.2	7.4	5.9	2.8	1.8	1.2	1.2	1.4	34.0	20.2	4.2	1.5	2.0	1.9	0.7	1.4	7.2	34.0			
17-Oct	Z	0.4	0.7	2.1	2.3	16.6	17.9	47.1	61.6	54.9	21.7	10.2	5.9	3.1	2.8	2.5	3.4	2.1	1.4	2.0	1.0	0.7	0.7	0.7	11.4	61.6			
18-Oct	7.7	Z	6.6	6.6	5.7	5.2	3.7	3.4	4.0	2.6	3.0	3.4	3.1	3.7	2.9	3.5	4.2	2.6	4.1	7.3	18.2	8.3	4.7	7.9	5.3	18.2			
19-Oct	5.5	6.7	Z	2.3	4.5	11.0	36.5	28.5	12.0	19.0	1.7	0.6	0.5	0.8	0.6	0.9	0.9	0.6	0.3	0.1	0.1	0.1	0.1	0.1	5.8	36.5			
20-Oct	0.1	0.1	0.1	Z	1.2	1.3	2.3	1.9	0.8	0.7	0.3	0.2	0.2	0.2	0.3	0.3	0.6	0.1	1.7	1.3	6.5	3.6	4.8	2.6	1.4	6.5			
21-Oct	2.6	3.5	1.3	0.9	Z	1.8	2.0	3.1	5.0	4.0	3.4	3.5	4.2	4.1	2.6	1.3	0.5	0.1	0.1	0.1	0.1	0.0	0.0	0.0	1.9	5.0			
22-Oct	0.0	0.0	0.1	0.1	0.1	Z	0.4	1.2	2.0	3.3	2.7	1.8	1.2	1.7	1.1	0.4	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.7	3.3			
23-Oct	Z	0.0	0.0	0.1	0.7	2.2	1.7	2.4	2.4	1.8	0.6	0.4	0.3	0.1	0.9	0.3	0.1	0.0	0.2	0.3	0.3	0.2	0.5	0.3	0.7	2.4			
24-Oct	0.2	Z	0.2	0.3	0.8	1.9	1.8	2.0	1.9	1.0	0.4	0.2	0.2	0.2	0.5	0.5	0.3	0.1	0.3	0.3	0.4	0.1	0.1	0.1	0.6	2.0			
25-Oct	0.1	0.0	Z	0.1	0.1	0.6	0.9	1.4	1.0	1.0	1.7	1.2	0.8	0.7	1.0	0.8	0.4	0.4	0.3	0.0	0.0	0.0	0.2	0.1	0.6	1.7			
26-Oct	0.1	0.3	0.1	Z	2.1	4.2	5.6	4.2	8.0	2.3	0.8	0.4	0.2	0.3	0.2	0.3	0.4	0.7	0.7	0.3	0.2	0.2	0.2	0.1	1.4	8.0			
27-Oct	0.1	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.4	0.8	1.1	0.8	0.8	1.2	2.1	1.0	0.3	0.0	0.4	0.6	0.3	0.4	1.0	0.7	0.5	2.1			
28-Oct	0.5	0.5	0.5	0.4	0.4	Z	1.1	2.0	2.3	2.6	1.8	0.7	0.4	1.5	1.6	1.3	1.5	0.6	0.4	0.3	0.2	0.1	0.0	0.0	0.9	2.6			
29-Oct	Z	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.2	0.2	0.2	0.3	0.6	0.4	0.4	0.6	0.5	2.4	2.7	1.9	0.8	1.2	0.4	1.4	0.6	2.7			
30-Oct	0.4	Z	0.0	0.0	0.1	0.6	1.6	6.8	15.1	10.3	10.4	4.9	1.7	2.1	1.6	1.5	2.6	2.0	1.8	1.7	1.8	1.2	1.2	1.5	3.1	15.1			
31-Oct	1.1	1.1	Z	1.7	1.3	1.7	15.1	25.7	6.7	0.6	0.7	0.7	1.1	1.2	1.9	1.5	14.2	7.8	4.2	7.5	3.9	3.1	1.5	1.5	4.6	25.7			
1.3 0.9 0.9 1.2 1.8 3.1 5.2 6.3 6.1 5.2 2.8 1.8 1.4 1.3 1.3 1.1 2.8 2.8 2.5 1.9 2.0 1.6 1.2 1.0																								Diurnal Average					
7.7 6.7 6.6 6.6 13.5 16.6 36.5 47.1 61.6 54.9 21.7 10.2 5.9 4.1 2.9 3.5 34.0 20.2 20.3 8.4 18.2 10.4 4.8 7.9																								Diurnal Maximum					
Z - zerospan C - Calibration																													





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	699	98.87	98.87
21 - 40	5	0.71	99.58
41 - 80	3	0.42	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
Athabasca Valley - October 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	11	4	5	8	66	241	45	16	37	30	40	46	55	31	44	699
21 - 40	0	0	0	0	0	1	1	0	1	0	0	0	0	0	1	1	5
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	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	20	11	4	5	8	67	242	45	17	37	30	40	46	55	32	48	707

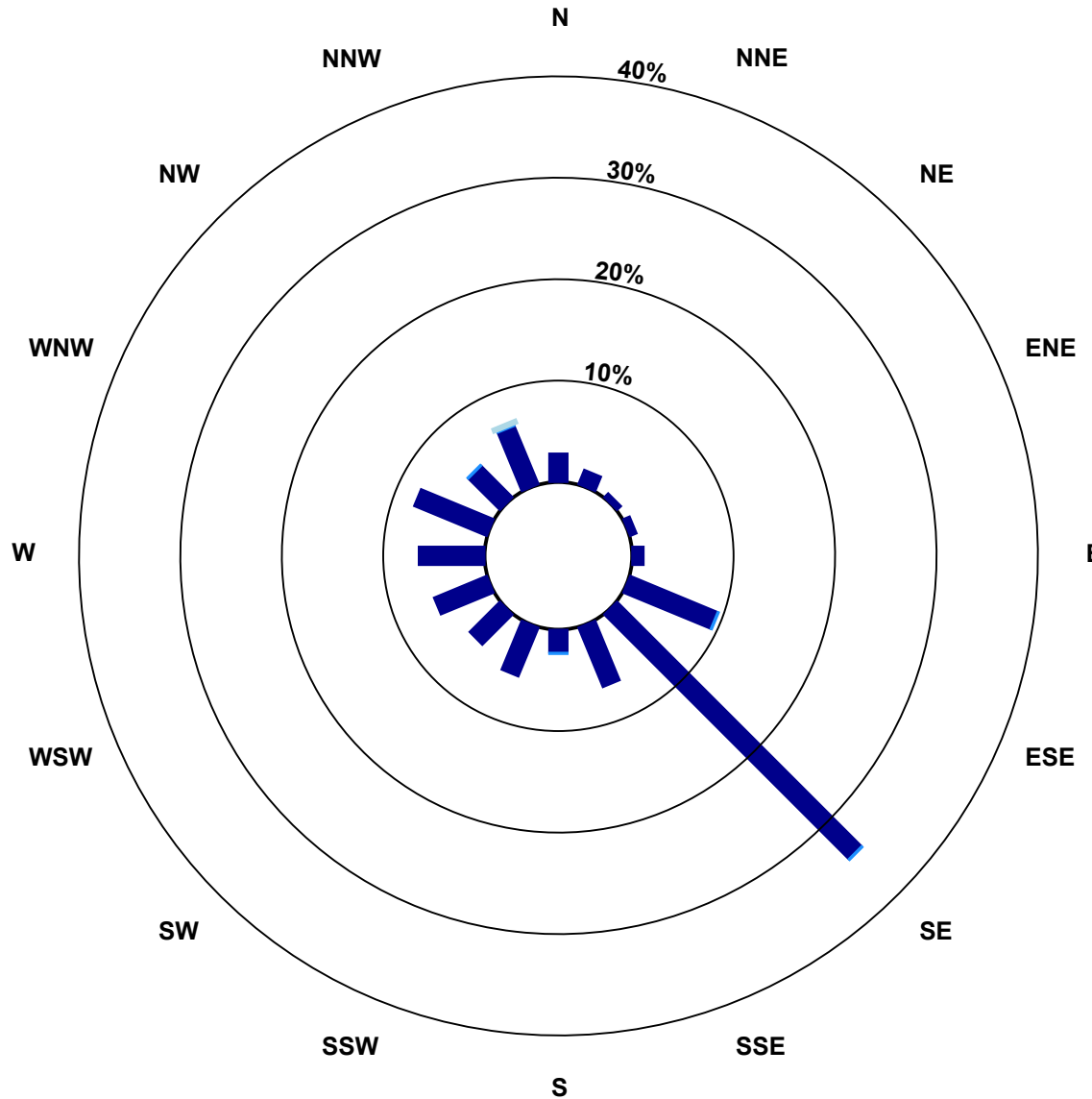
Total Number of Valid Hours: 707

Total Number of Hours: 744

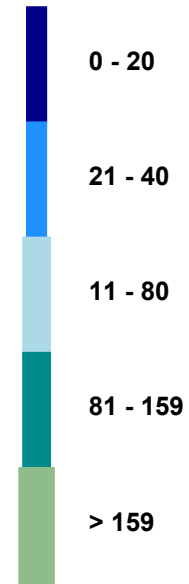


Wood Buffalo Environmental Association
Wind Rose Oct 2023

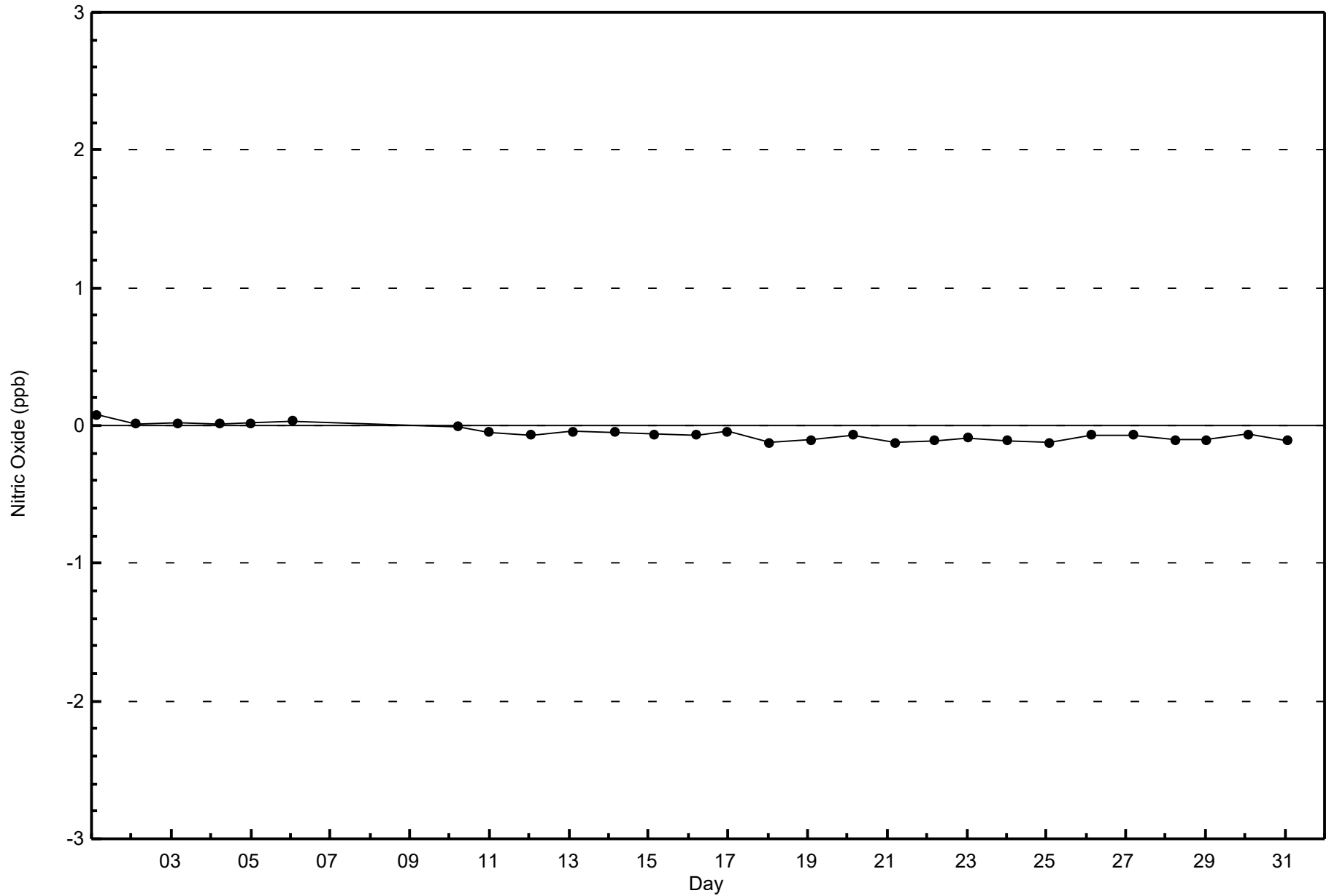
Nitric Oxide (NO) - ppb
Athabasca Valley

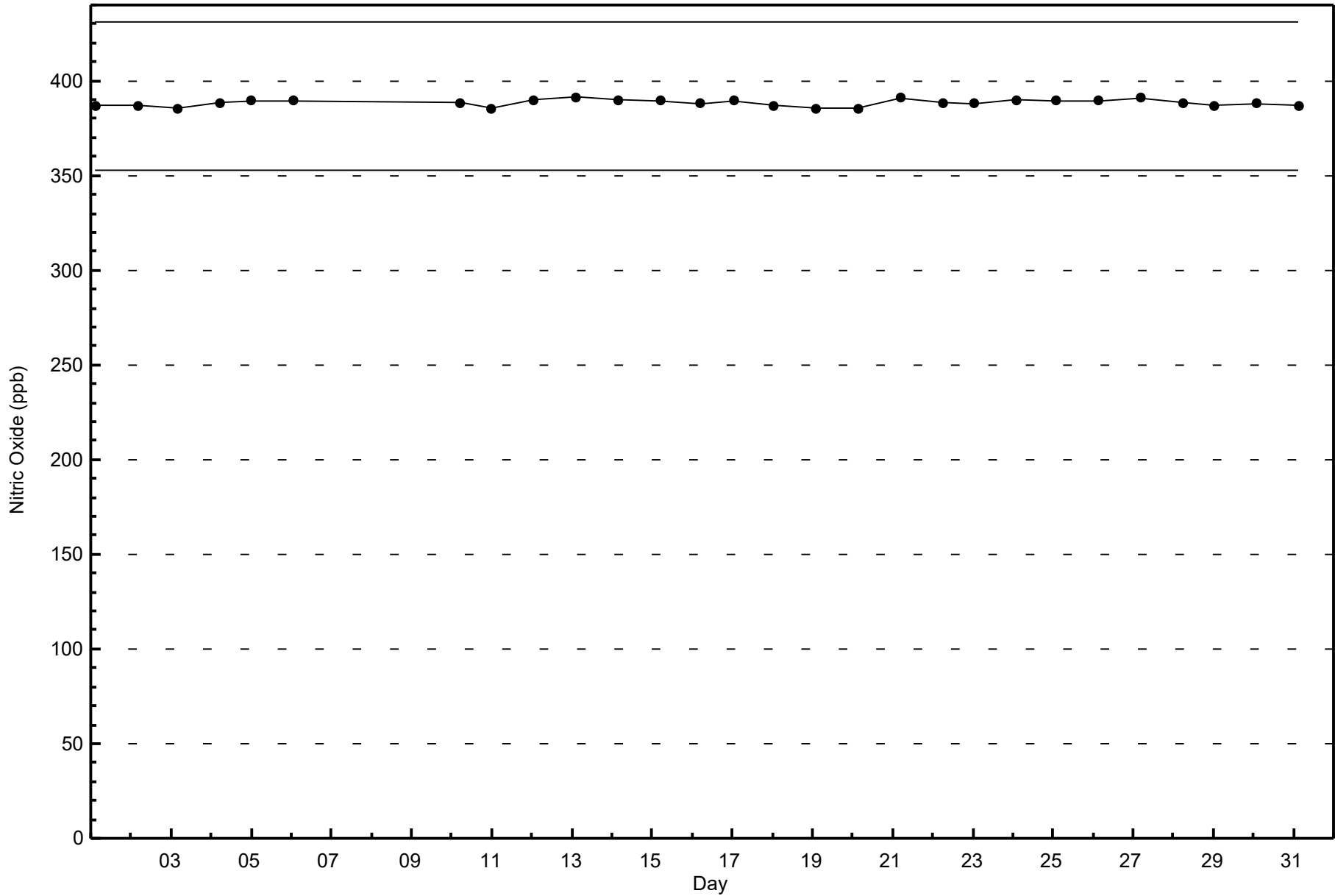


Classes (ppb)



Total Number of Valid Hours: 707







Wood Buffalo Environmental Association
Summary of Hour Averages

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

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 29.2 ppb on Oct 16 18:00	Maximum Daily Average: 11.9 ppb on Oct 31		Hours of Data:	707
Minimum Value: 0.4 ppb on Oct 4 21:00	Minimum Daily Average: 2.1 ppb on Oct 24		Hours of Missing Data:	37
Maximum Diurnal Average: 9.3 ppb at hour 18	Minimum Diurnal Average: 2.9 ppb at hour 13		Hours of Calibration:	37
Monthly Average: 5.66 ppb	Percentiles: P ₁ = 0.5 P ₁₀ = 1.4 Q ₁ = 2.3 Median = 4.2 Q ₃ = 7.6 P ₉₀ = 12.2 P ₉₉ = 21.5		Percent Operational Time:	100.0

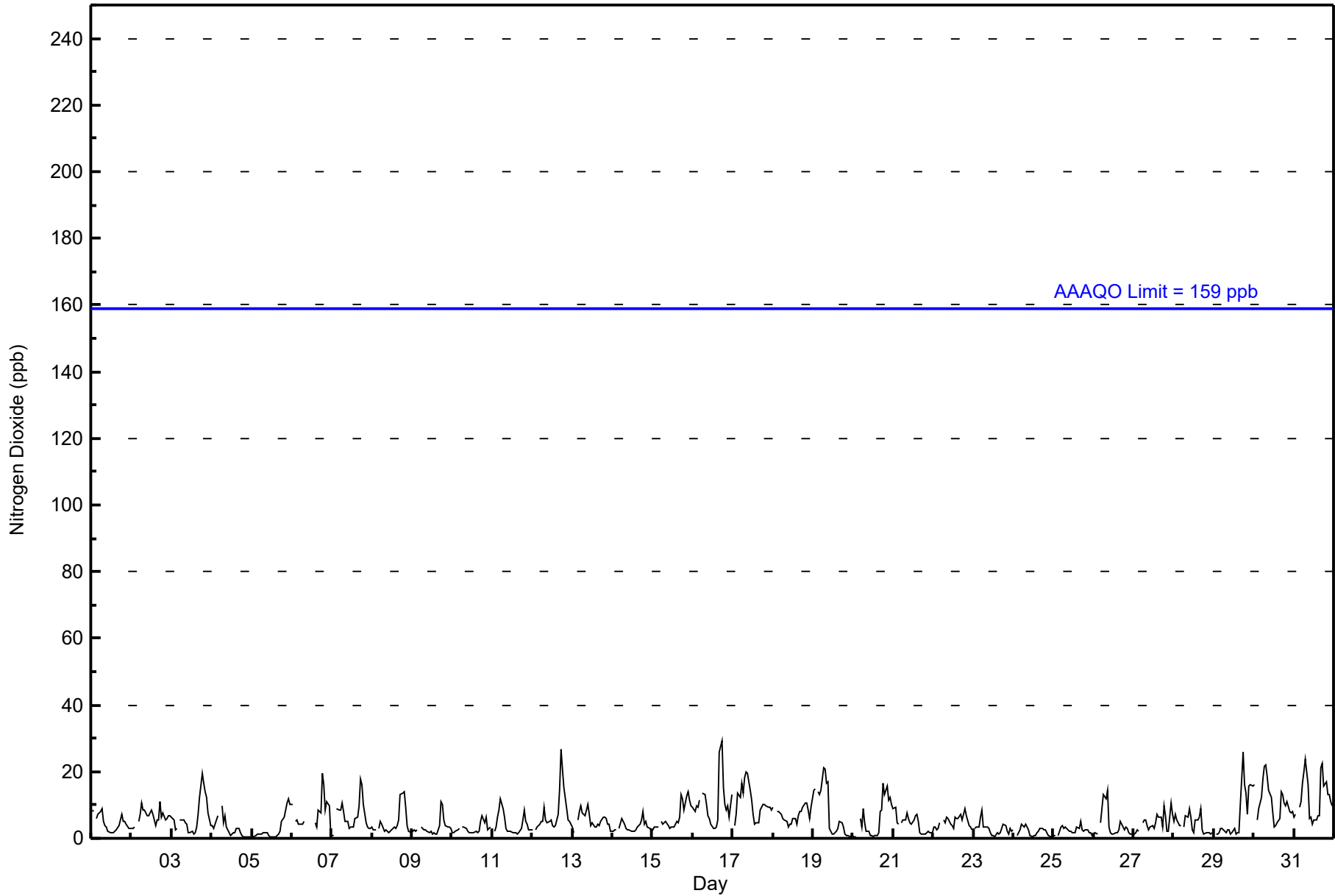
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Oct	8.5	8.2	Z	6.0	7.3	7.9	9.1	5.2	3.7	3.3	2.3	1.9	1.9	1.9	2.3	2.4	3.7	5.7	7.4	5.1	5.1	4.3	2.9	3.1	4.7	9.1																						
2-Oct	3.1	3.0	3.2	Z	5.2	7.2	10.6	8.3	8.3	6.9	6.7	7.7	8.5	7.4	4.0	5.7	5.4	11.1	6.4	7.6	5.3	5.8	6.6	6.9	6.6	11.1																						
3-Oct	6.5	5.4	2.7	2.8	Z	5.7	5.3	5.3	4.7	4.2	1.8	1.8	2.0	1.3	1.7	3.2	7.0	12.2	19.6	16.4	14.1	12.2	7.5	4.0	6.4	19.6																						
4-Oct	3.8	3.0	4.2	5.3	6.9	Z	9.8	4.8	6.7	3.6	1.9	0.7	1.1	1.7	1.6	2.8	3.1	1.6	0.9	0.6	0.4	0.4	0.4	0.4	2.9	9.8																						
5-Oct	Z	0.5	0.7	1.1	1.3	1.2	1.1	1.6	1.9	1.7	1.0	0.5	0.5	0.5	0.6	0.8	1.3	2.0	5.0	6.2	8.5	10.6	11.9	10.2	3.1	11.9																						
6-Oct	10.0	Z	5.1	5.6	4.1	4.2	4.2	4.9	C	C	C	C	C	C	4.5	3.5	8.3	7.5	19.4	16.3	8.5	10.9	9.6	0.8	--	19.4																						
7-Oct	1.0	0.7	Z	8.9	8.3	8.5	10.6	8.0	5.1	4.9	3.1	3.6	3.6	3.6	5.9	6.4	9.6	18.0	15.9	10.0	4.5	3.4	2.9	2.9	6.5	18.0																						
8-Oct	3.2	2.7	2.6	Z	3.1	4.9	4.1	2.3	2.4	2.0	1.8	2.1	2.4	3.4	2.8	3.8	5.4	13.2	13.5	13.8	9.3	3.8	2.3	1.8	4.6	13.8																						
9-Oct	2.2	2.4	2.3	2.7	Z	3.5	3.0	2.5	2.5	2.0	1.8	2.1	1.4	1.7	1.4	1.4	3.9	11.0	10.2	5.7	4.0	3.4	3.2	3.0	3.4	11.0																						
10-Oct	1.9	1.9	2.1	2.4	3.1	Z	3.6	3.3	2.8	2.0	1.8	1.7	1.6	1.5	2.1	1.9	2.1	4.9	6.9	4.7	6.2	2.7	2.9	3.2	2.9	6.9																						
11-Oct	Z	2.1	3.2	6.4	8.4	11.7	8.8	6.2	3.1	2.0	2.2	2.0	1.9	1.5	1.5	1.4	1.5	3.1	5.4	8.6	5.2	4.2	2.7	2.6	4.2	11.7																						
12-Oct	2.5	Z	2.7	3.2	4.1	5.1	5.0	9.2	5.6	4.6	5.0	5.5	4.0	3.3	3.7	7.1	14.8	26.5	20.6	15.1	9.1	5.3	5.0	4.1	7.4	26.5																						
13-Oct	3.6	1.9	Z	5.7	8.2	9.9	7.5	6.7	8.6	10.1	7.1	4.0	4.8	3.2	3.6	4.2	4.0	5.2	6.2	6.2	6.0	4.1	4.1	2.3	5.5	10.1																						
14-Oct	2.1	2.4	2.4	Z	2.9	6.0	5.2	4.4	2.8	2.7	2.4	2.1	2.3	2.2	2.7	3.2	4.3	5.6	8.0	4.4	5.0	3.2	2.8	2.1	3.5	8.0																						
15-Oct	2.6	3.2	3.5	3.5	Z	5.2	4.3	4.8	5.2	3.8	2.9	3.3	3.2	3.4	4.9	4.7	6.5	13.2	11.9	8.5	12.6	13.8	11.3	9.9	6.4	13.8																						
16-Oct	9.5	8.0	9.8	9.5	11.6	Z	13.5	13.2	10.1	6.9	6.0	4.2	3.0	2.8	3.2	5.4	25.7	29.2	15.2	10.2	8.4	9.7	6.2	13.0	10.2	29.2																						
17-Oct	Z	3.7	7.1	13.4	12.3	16.5	13.5	18.4	19.8	19.6	14.4	11.3	7.3	4.4	4.7	4.8	8.4	9.3	10.0	10.2	9.6	9.2	9.4	8.5	10.7	19.8																						
18-Oct	9.4	Z	8.2	8.0	7.8	7.4	6.1	5.4	5.1	3.5	4.2	4.4	6.0	6.1	4.1	6.9	8.2	7.9	9.2	10.8	10.4	8.4	5.9	9.4	7.1	10.8																						
19-Oct	14.3	14.9	Z	13.9	13.0	14.3	21.1	20.8	16.4	17.1	2.9	1.4	1.3	1.9	2.3	3.0	5.1	4.8	3.6	1.2	0.7	0.7	0.6	1.2	7.7	21.1																						
20-Oct	0.5	0.5	0.6	Z	5.8	3.6	9.1	4.5	2.3	2.0	1.0	0.8	0.6	0.8	1.0	1.8	7.9	8.3	16.4	13.2	15.5	11.6	12.1	10.0	5.6	16.4																						
21-Oct	9.1	9.5	4.6	4.4	Z	4.5	5.4	5.7	7.8	5.9	4.5	4.1	5.7	6.9	7.1	5.0	1.5	1.3	1.4	1.4	1.7	2.0	1.6	1.5	4.5	9.5																						
22-Oct	3.2	3.6	2.6	2.8	4.8	Z	5.3	4.6	6.2	6.1	4.2	3.7	3.0	6.3	6.1	5.8	7.1	5.5	7.0	8.7	6.7	3.7	3.2	2.4	4.9	8.7																						
23-Oct	Z	3.0	3.2	3.4	6.5	8.3	3.5	3.5	3.5	2.9	1.6	1.0	0.8	0.6	1.6	1.3	1.9	3.0	4.2	3.7	2.2	1.3	2.8	2.1	2.9	8.3																						
24-Oct	2.7	Z	1.0	1.9	2.4	4.2	3.4	4.4	3.3	2.6	1.0	0.6	0.8	0.9	1.8	2.0	3.0	2.9	2.6	2.5	1.5	0.8	0.6	0.6	2.1	4.4																						
25-Oct	0.7	0.9	Z	1.0	3.3	3.9	3.0	3.3	2.8	2.1	2.3	1.6	1.6	1.8	3.2	2.9	5.2	2.6	2.3	2.7	2.7	1.7	1.6	1.0	2.4	5.2																						
26-Oct	0.9	1.7	1.3	Z	4.7	9.0	13.0	11.7	14.5	3.4	1.7	1.2	1.1	1.6	1.5	2.4	4.9	4.3	2.5	3.6	2.8	1.7	1.3	1.2	4.0	14.5																						
27-Oct	1.4	1.6	2.4	2.2	Z	4.6	5.5	5.7	4.0	2.6	3.4	3.7	3.1	4.5	7.2	6.3	6.2	3.4	9.7	6.7	2.1	2.0	10.6	7.4	4.6	10.6																						
28-Oct	4.9	7.2	5.4	4.0	3.8	Z	3.3	6.7	6.2	8.8	6.5	2.5	1.8	5.4	5.7	6.2	9.0	2.7	1.3	1.7	1.6	1.5	1.2	1.5	4.3	9.0																						
29-Oct	Z	1.2	1.3	1.7	3.1	2.9	2.1	1.8	2.7	2.6	1.1	1.8	2.9	1.3	1.5	1.9	10.2	25.9	16.3	13.7	7.1	15.5	16.0	15.8	6.5	25.9																						
30-Oct	16.2	Z	5.7	9.0	12.1	17.6	21.5	22.1	18.5	14.3	12.3	7.5	3.2	3.9	4.6	6.1	13.8	13.1	10.5	9.7	11.2	8.1	7.8	8.0	11.2	22.1																						
31-Oct	6.2	7.4	Z	9.4	10.9	16.4	20.0	23.6	16.0	5.9	6.4	4.4	5.7	5.5	6.7	6.9	21.2	22.3	15.8	17.1	13.2	13.0	11.1	9.6	11.9	23.6																						
																								5.0	3.9	3.5	5.3	6.3	7.5	7.8	7.5	6.8	5.3	3.8	3.1	2.9	3.0	3.4	3.9	7.1	9.3	9.2	7.9	6.5	5.8	5.4	4.9	Diurnal Average
																								16.2	14.9	9.8	13.9	13.0	17.6	21.5	23.6	19.8	19.6	14.4	11.3	8.5	7.4	7.2	7.1	25.7	29.2	20.6	17.1	15.5	15.5	16.0	15.8	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
Athabasca Valley - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Dioxide (NO₂) - ppb
Athabasca Valley - October 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 Dioxide (NO₂) - ppb
Athabasca Valley - October 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	11	4	4	8	65	240	44	15	37	28	40	45	55	31	48	695
21 - 40	0	0	0	1	0	2	2	1	2	0	2	0	1	0	1	0	12
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	20	11	4	5	8	67	242	45	17	37	30	40	46	55	32	48	707

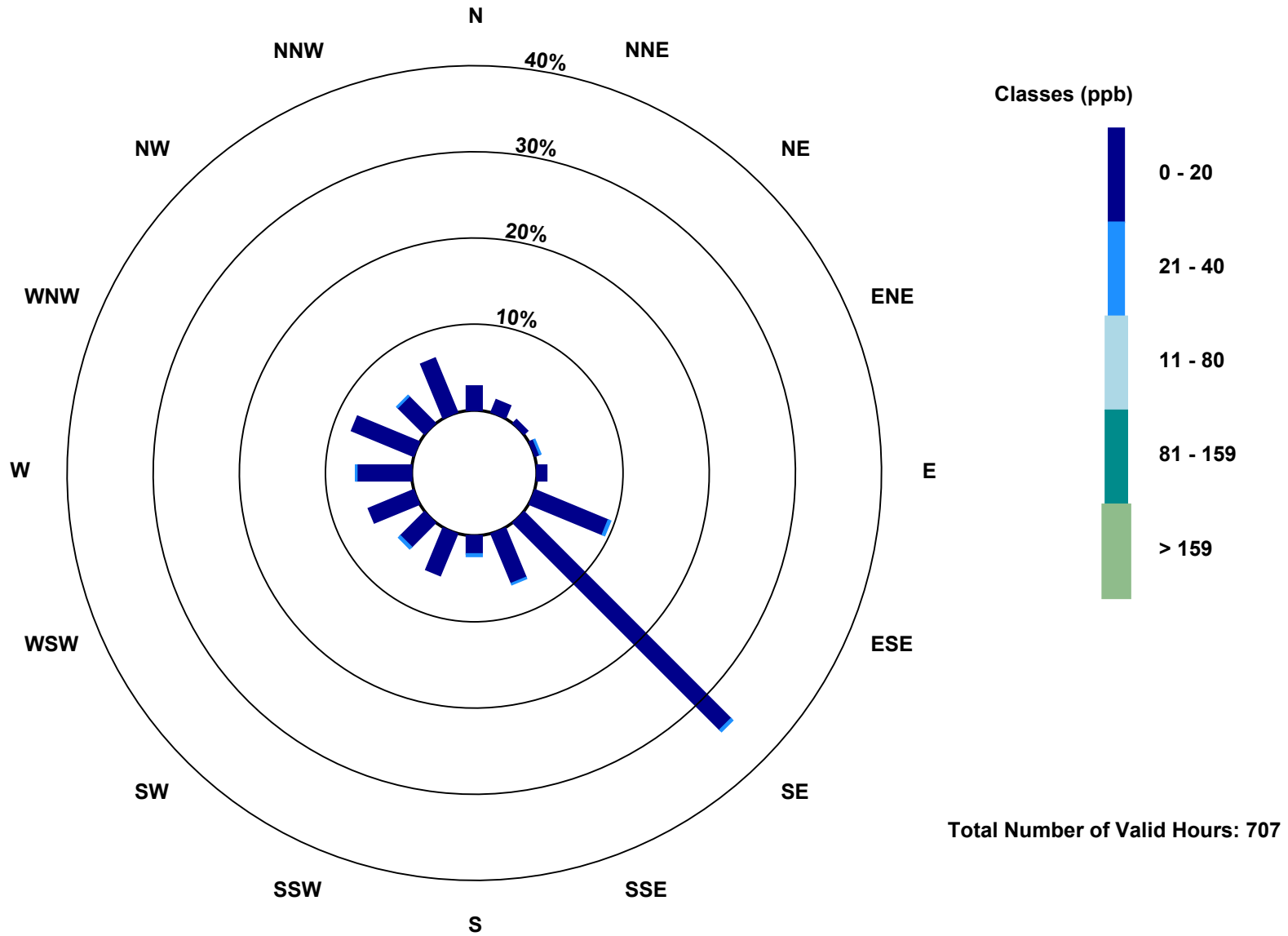
Total Number of Valid Hours: 707

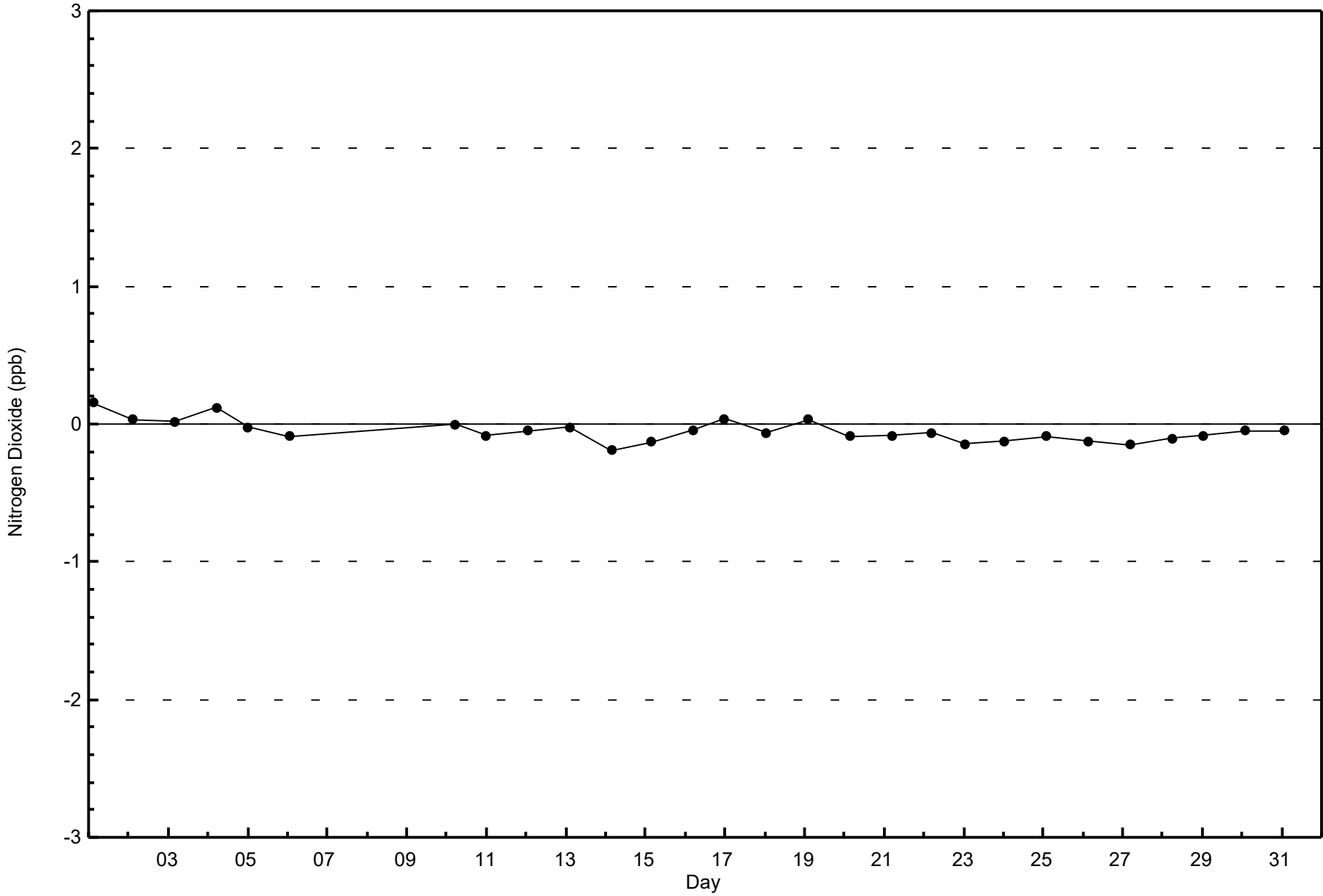
Total Number of Hours: 744

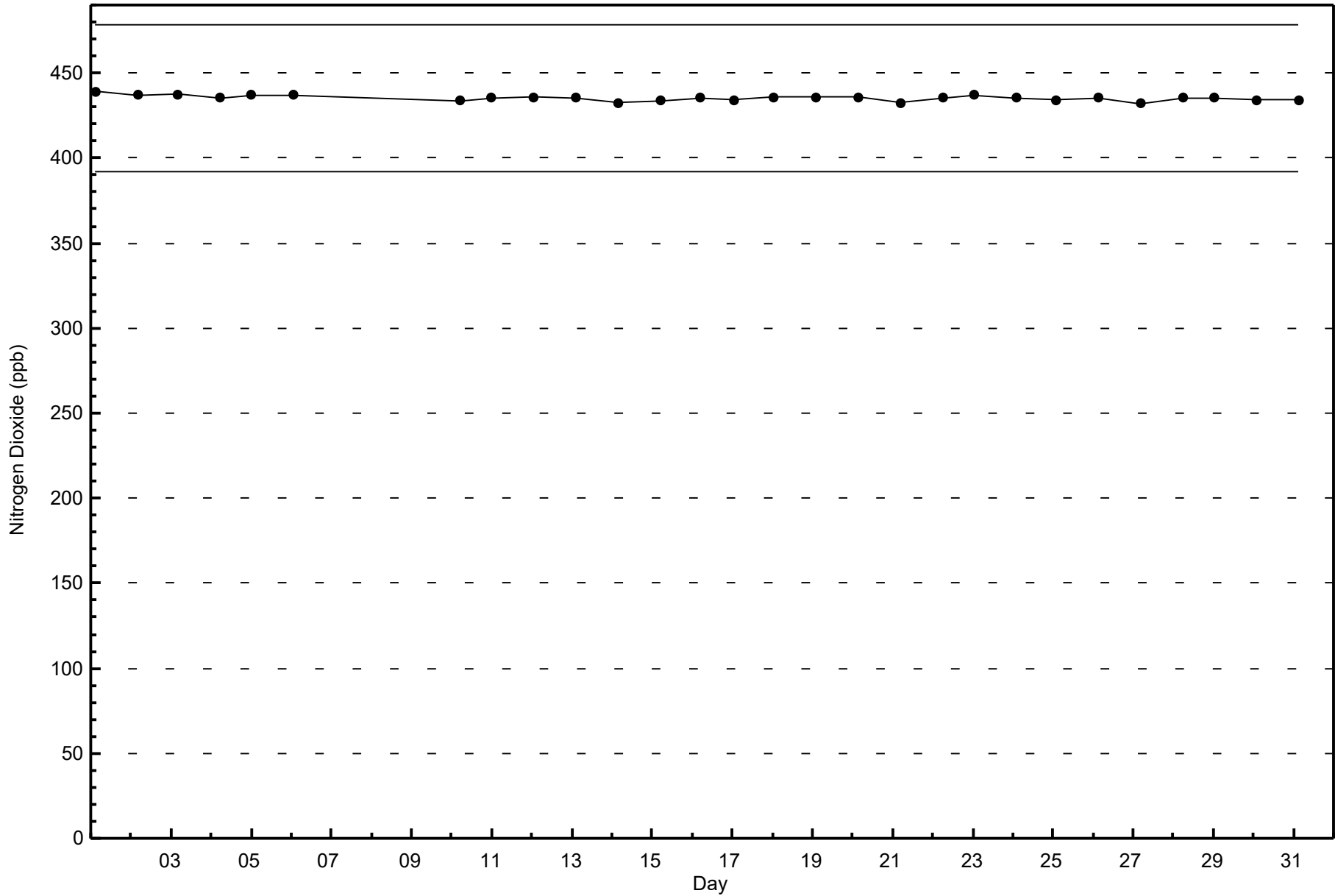


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitrogen Dioxide (NO₂) - ppb
Athabasca Valley









Wood Buffalo Environmental Association
Summary of Hour Averages

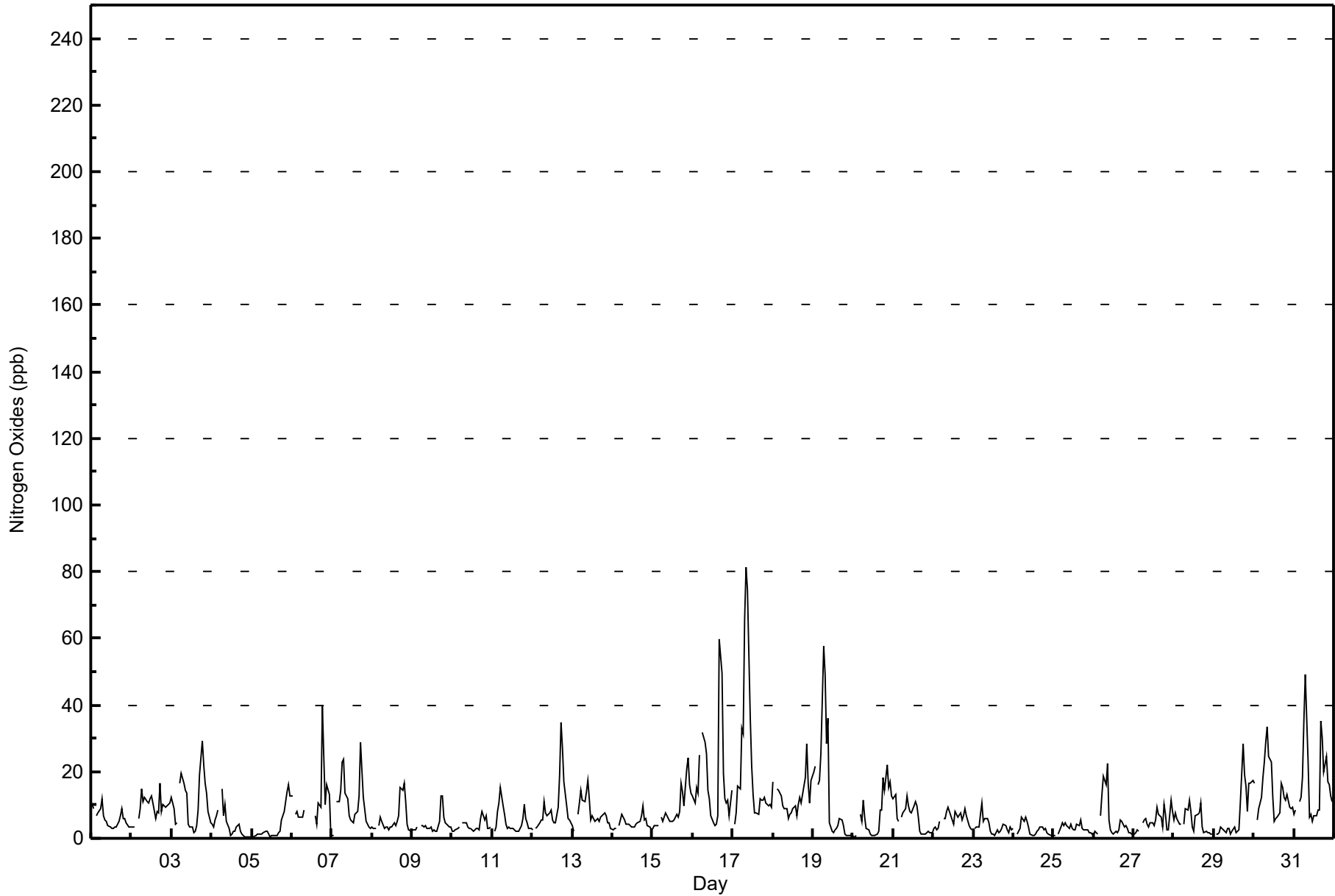
Nitrogen Oxides (NO_x) - ppb
Athabasca Valley - October 2023

Maximum Value: 81.4 ppb on Oct 17 09:00		Maximum Daily Average: 22.1 ppb on Oct 17		Hours in Service: 744																																													
Minimum Value: 0.4 ppb on Oct 5 00:00		Minimum Daily Average: 2.7 ppb on Oct 24		Hours of Data: 707																																													
Maximum Diurnal Average: 13.8 ppb at hour 8		Minimum Diurnal Average: 4.3 ppb at hour 13		Hours of Missing Data: 37																																													
Monthly Average: 8.09 ppb		Percentiles: P ₁ = 0.6 P ₁₀ = 1.6 Q ₁ = 3.0 Median = 5.5 Q ₃ = 10.4 P ₉₀ = 16.6 P ₉₉ = 48.7		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-Oct	10.2	9.0	Z	6.7	7.6	9.1	11.8	6.9	5.6	5.3	3.7	3.3	2.9	2.8	3.5	3.6	5.2	7.0	8.8	6.0	5.8	4.9	3.3	3.5	5.9	11.8																							
2-Oct	3.4	3.4	3.6	Z	6.1	8.8	14.8	11.1	12.2	10.9	10.8	11.7	12.6	10.6	6.0	7.9	7.4	16.4	8.2	10.3	9.2	9.6	10.2	10.6	9.4	16.4																							
3-Oct	12.3	8.8	4.1	4.8	Z	16.7	19.7	16.5	14.2	13.5	4.4	3.4	3.4	1.8	2.3	3.9	8.5	19.2	29.1	22.1	16.5	13.5	8.1	4.6	10.9	29.1																							
4-Oct	4.3	3.5	5.5	6.8	8.7	Z	14.9	6.9	10.1	5.0	2.8	1.0	1.4	2.2	1.9	3.5	4.1	2.1	1.3	0.9	0.6	0.5	0.4	0.4	3.9	14.9																							
5-Oct	Z	0.5	0.7	1.1	1.4	1.3	1.1	1.7	2.2	2.1	1.3	0.6	0.7	0.7	0.8	1.0	1.5	2.1	5.4	8.1	11.2	13.9	16.1	12.8	3.8	16.1																							
6-Oct	12.9	Z	7.0	8.0	6.2	6.3	6.6	8.5	C	C	C	C	C	C	7.0	4.4	10.8	9.3	39.7	24.7	10.4	15.9	13.3	0.8	--	39.7																							
7-Oct	1.0	0.7	Z	10.8	11.1	14.6	23.0	23.7	13.7	12.0	6.6	5.5	5.1	4.6	7.3	8.2	12.7	28.8	20.2	12.2	5.1	4.1	3.4	3.2	10.3	28.8																							
8-Oct	3.5	3.1	2.9	Z	3.8	6.4	5.0	3.0	3.4	3.2	2.8	3.3	3.5	4.6	3.8	5.0	6.7	15.2	14.3	16.6	11.0	4.3	2.7	2.1	5.7	16.6																							
9-Oct	2.4	2.7	2.7	3.2	Z	3.8	3.8	3.4	4.0	3.2	2.9	3.3	2.0	2.4	1.9	1.9	5.0	12.9	12.5	6.5	4.5	3.8	3.6	3.3	4.2	12.9																							
10-Oct	2.1	2.2	2.4	3.0	3.6	Z	4.5	4.5	4.5	3.3	2.9	2.8	2.4	2.2	2.9	2.8	2.6	5.9	8.0	5.4	6.9	3.0	3.1	3.3	3.7	8.0																							
11-Oct	Z	2.2	3.4	8.0	10.4	15.4	10.0	7.1	4.2	3.0	3.3	3.0	2.9	2.3	2.2	2.0	2.0	3.7	6.1	10.1	5.8	4.7	3.0	2.8	5.1	15.4																							
12-Oct	2.7	Z	3.0	3.6	4.6	5.4	5.4	11.1	7.6	6.9	7.7	8.6	5.7	4.5	4.8	9.1	19.2	34.9	27.2	16.9	9.9	5.9	5.5	4.5	9.3	34.9																							
13-Oct	4.0	2.1	Z	7.1	10.8	14.3	11.4	10.9	14.0	17.6	11.9	5.7	6.6	5.0	5.5	5.8	5.0	6.3	7.3	7.6	7.0	4.6	4.8	2.8	7.7	17.6																							
14-Oct	2.5	2.9	2.9	Z	3.6	7.2	6.4	5.6	4.1	4.1	4.1	3.5	3.5	3.3	4.0	4.5	5.3	6.6	9.7	5.4	5.8	3.8	3.2	2.4	4.5	9.7																							
15-Oct	2.9	3.6	3.8	3.9	Z	6.2	5.1	6.3	7.7	6.0	5.0	5.2	5.0	5.4	7.1	6.4	8.1	16.6	13.8	9.9	20.6	24.2	16.1	13.5	8.8	24.2																							
16-Oct	12.7	10.7	15.2	13.7	25.1	Z	31.9	29.0	25.3	14.3	11.9	7.0	4.8	4.0	4.4	6.8	59.7	49.4	19.4	11.7	10.4	11.6	6.9	14.4	17.4	59.7																							
17-Oct	Z	4.1	7.8	15.5	14.6	33.1	31.4	65.5	81.4	74.5	36.1	21.5	13.2	7.5	7.5	7.3	11.8	11.4	11.4	12.2	10.6	9.9	10.1	9.2	22.1	81.4																							
18-Oct	17.1	Z	14.8	14.6	13.5	12.6	9.8	8.8	9.1	6.1	7.2	7.8	9.1	9.8	7.0	10.4	12.4	10.5	13.3	18.1	28.6	16.7	10.6	17.3	12.4	28.6																							
19-Oct	19.8	21.6	Z	16.2	17.5	25.3	57.6	49.3	28.4	36.1	4.6	2.0	1.8	2.7	2.9	3.9	6.0	5.4	3.9	1.3	0.8	0.8	0.7	1.3	13.5	57.6																							
20-Oct	0.6	0.6	0.7	Z	7.0	4.9	11.4	6.4	3.1	2.7	1.3	1.0	0.8	1.0	1.3	2.1	8.5	8.4	18.1	14.5	22.0	15.2	16.9	12.6	7.0	22.0																							
21-Oct	11.7	13.0	5.9	5.3	Z	6.3	7.4	8.8	12.8	9.9	7.9	7.6	9.9	11.0	9.7	6.3	2.0	1.4	1.5	1.5	1.8	2.0	1.6	1.5	6.4	13.0																							
22-Oct	3.2	3.6	2.7	2.9	4.9	Z	5.7	5.8	8.2	9.4	6.9	5.5	4.2	8.0	7.2	6.2	7.5	5.7	7.0	8.7	6.7	3.7	3.2	2.4	5.6	9.4																							
23-Oct	Z	3.0	3.2	3.5	7.2	10.5	5.2	5.9	5.9	4.7	2.2	1.4	1.1	0.7	2.5	1.6	2.0	3.0	4.4	4.0	2.5	1.5	3.3	2.4	3.5	10.5																							
24-Oct	2.9	Z	1.2	2.2	3.2	6.1	5.2	6.4	5.2	3.6	1.4	0.8	1.0	1.1	2.3	2.5	3.5	3.2	2.7	2.8	1.8	1.2	0.7	0.7	2.7	6.4																							
25-Oct	0.8	0.9	Z	1.1	3.4	4.5	3.9	4.7	3.8	3.1	4.0	2.8	2.4	2.5	4.2	3.7	5.6	3.0	2.6	2.7	2.7	1.7	1.8	1.1	2.9	5.6																							
26-Oct	1.0	2.0	1.4	Z	6.8	13.2	18.6	15.9	22.5	5.7	2.5	1.6	1.3	1.9	1.7	2.7	5.3	5.0	3.2	3.9	3.0	1.9	1.5	1.3	5.4	22.5																							
27-Oct	1.5	1.6	2.4	2.2	Z	4.6	5.5	5.8	4.4	3.4	4.5	4.5	3.9	5.7	9.3	7.3	6.5	3.4	10.1	7.3	2.4	2.4	11.6	8.1	5.2	11.6																							
28-Oct	5.4	7.7	5.9	4.4	4.2	Z	4.4	8.7	8.5	11.4	8.3	3.2	2.2	6.9	7.3	7.5	10.5	3.3	1.7	2.0	1.8	1.6	1.2	1.5	5.2	11.4																							
29-Oct	Z	1.2	1.3	1.7	3.2	3.0	2.1	1.8	2.9	2.8	1.3	2.1	3.5	1.7	1.9	2.5	10.7	28.3	19.0	15.6	7.9	16.7	16.4	17.2	7.2	28.3																							
30-Oct	16.6	Z	5.7	9.0	12.2	18.2	23.1	28.9	33.6	24.6	22.7	12.4	4.9	6.0	6.2	7.6	16.4	15.1	12.3	11.4	13.0	9.3	9.0	9.5	14.2	33.6																							
31-Oct	7.3	8.5	Z	11.1	12.2	18.1	35.1	49.3	22.7	6.5	7.1	5.1	6.8	6.7	8.6	8.4	35.4	30.1	20.0	24.6	17.1	16.1	12.6	11.1	16.5	49.3																							
																								6.3	4.7	4.4	6.6	8.2	10.6	13.0	13.8	12.8	10.5	6.7	4.9	4.3	4.3	4.7	5.1	9.9	12.0	11.7	9.8	8.5	7.4	6.6	5.9	Diurnal Average	
																								19.8	21.6	15.2	16.2	25.1	33.1	57.6	65.5	81.4	74.5	36.1	21.5	13.2	11.0	9.7	10.4	59.7	49.4	39.7	24.7	28.6	24.2	16.9	17.3	Diurnal Maximum	
Z - zerospan																								C - Calibration																									



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	662	93.64	93.64
21 - 40	37	5.23	98.87
41 - 80	7	0.99	99.86
81 - 159	0	0.00	99.86
> 159	0	0.00	99.86

Total Number of Valid Hours: 707

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Athabasca Valley - October 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	11	4	4	7	60	229	39	15	37	27	40	45	55	31	40	662
21 - 40	2	0	0	1	1	6	12	6	1	0	2	0	1	0	0	5	37
11 - 80	0	0	0	0	0	1	1	0	1	0	1	0	0	0	1	2	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	20	11	4	5	8	67	242	45	17	37	30	40	46	55	32	47	706

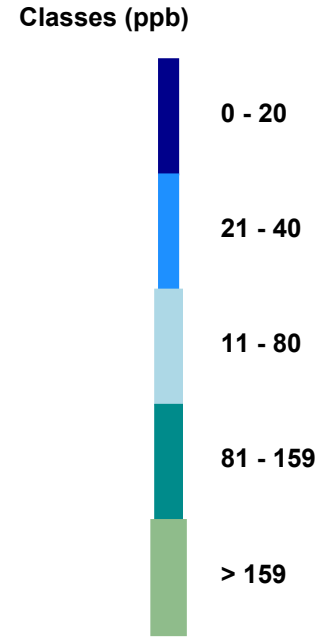
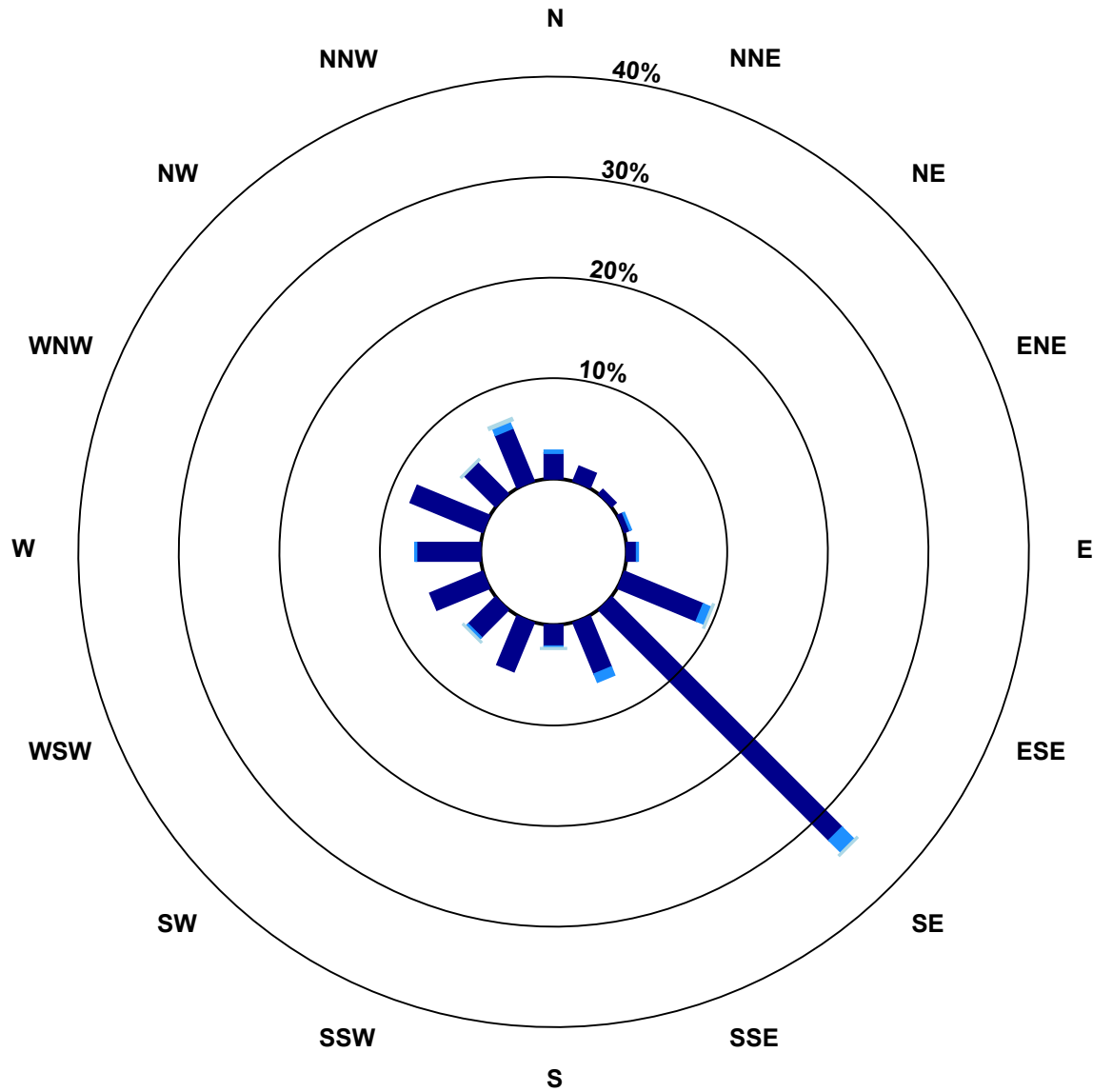
Total Number of Valid Hours: 707

Total Number of Hours: 744

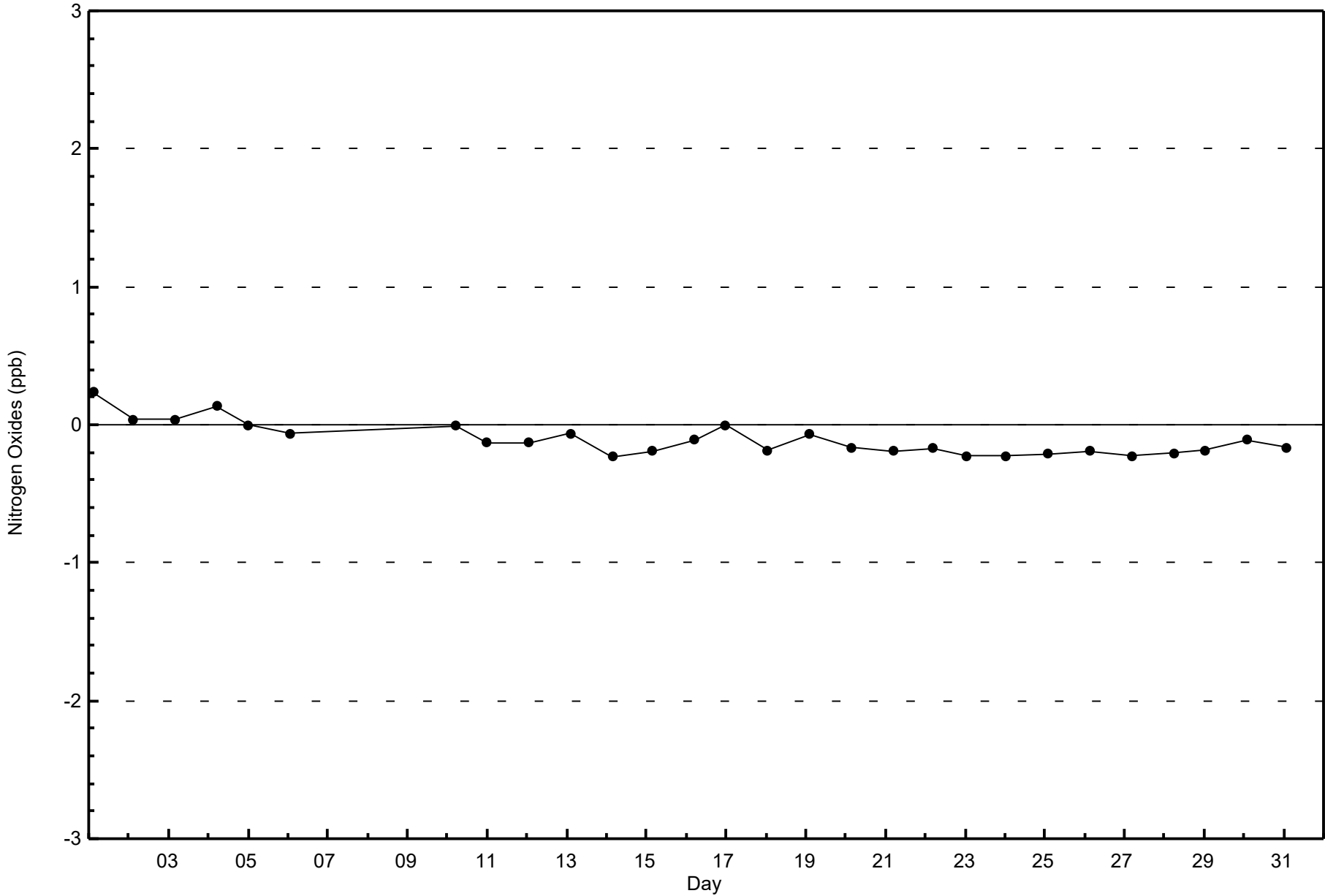


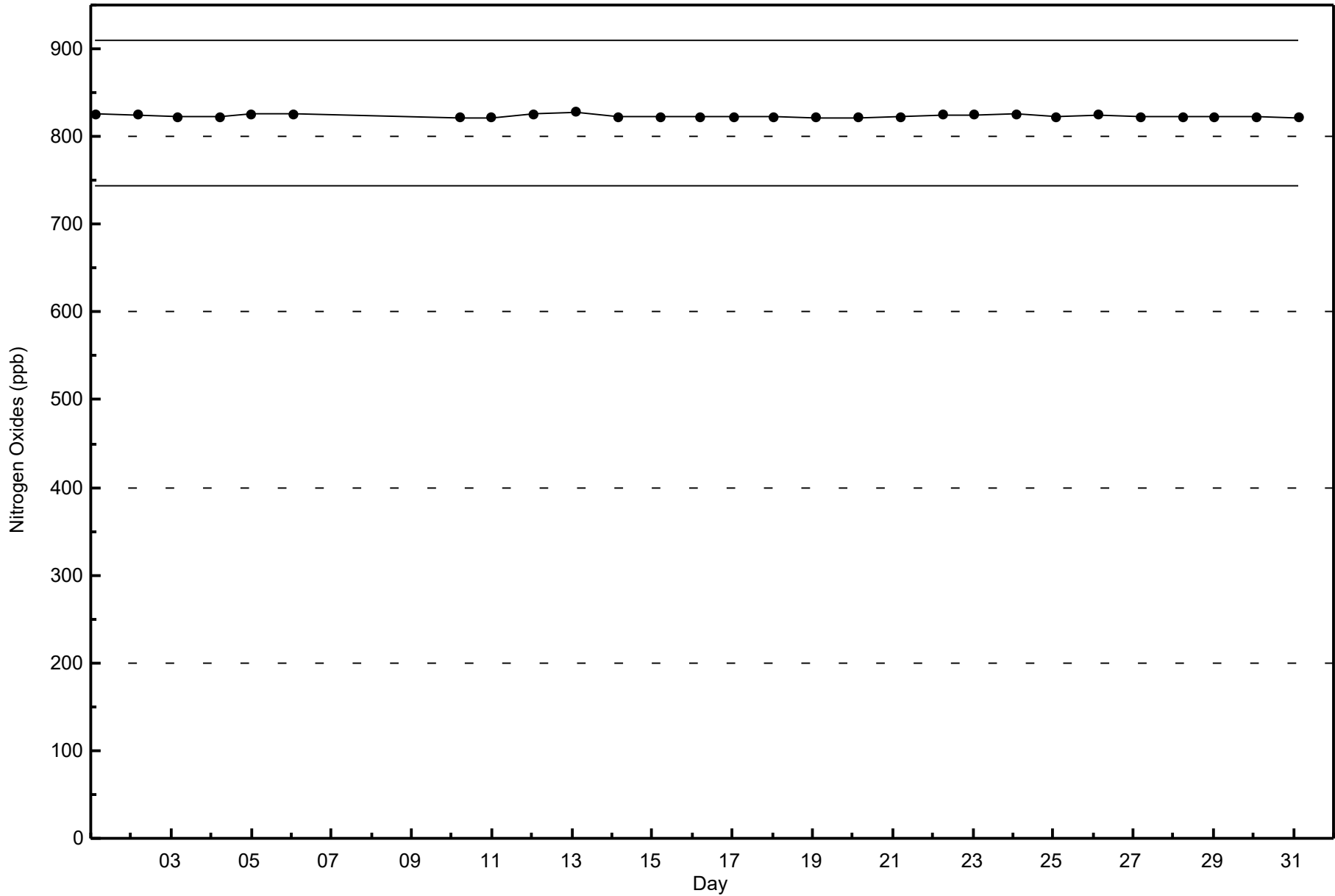
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitrogen Oxides (NO_x) - ppb
Athabasca Valley



Total Number of Valid Hours: 707







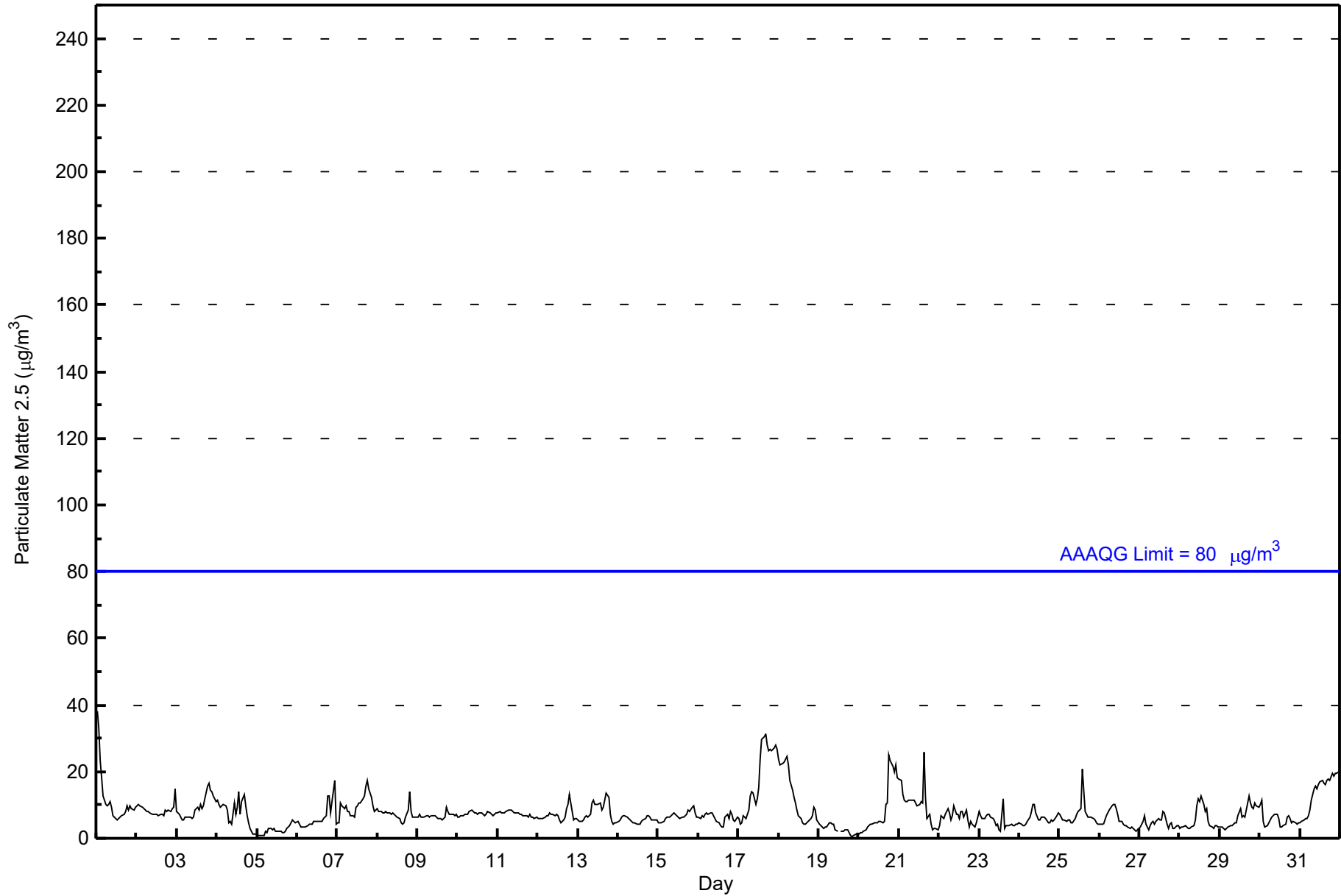
Wood Buffalo Environmental Association

Summary of Hour Averages

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

Athabasca Valley - October 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		744																																									
Maximum Value: 38.3 µg/m ³ on Oct 1 01:00		Maximum Daily Average: 17.7 µg/m ³ on Oct 17				Hours of Data:		743																																									
Minimum Value: 0.6 µg/m ³ on Oct 19 21:00		Minimum Daily Average: 2.5 µg/m ³ on Oct 5				Hours of Missing Data:		1																																									
Maximum Diurnal Average: 8.9 µg/m ³ at hour 19		Minimum Diurnal Average: 6.7 µg/m ³ at hour 5				Hours of Calibration:		1																																									
Monthly Average: 7.60 µg/m ³		Percentiles: P ₁ = 1.1 P ₁₀ = 3.4 Q ₁ = 4.7 Median = 6.5 Q ₃ = 8.6 P ₉₀ = 12.6 P ₉₉ = 26.9				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-Oct	38.3	33.1	23.4	18.2	12.7	10.1	9.6	10.2	11.1	9.3	6.7	6.1	5.6	6.1	6.4	6.7	7.3	8.2	9.7	8.5	9.5	8.9	8.6	9.1	11.8	38.3																							
2-Oct	9.8	10.2	9.9	9.4	9.0	8.5	8.2	7.9	7.5	7.4	7.4	7.3	7.3	7.0	7.3	7.0	6.8	8.6	7.9	8.6	8.0	8.7	9.2	14.8	8.5	14.8																							
3-Oct	8.2	7.1	6.2	5.7	5.4	6.6	6.5	6.2	6.2	6.1	6.4	8.4	9.3	8.5	10.3	9.0	9.8	11.7	15.8	16.6	14.3	13.8	12.8	11.0	9.2	16.6																							
4-Oct	11.2	10.2	9.3	9.8	10.2	9.8	8.4	4.7	5.0	4.4	10.7	7.3	9.2	13.8	7.4	10.8	13.0	9.7	6.6	4.5	3.1	1.3	1.3	1.3	7.6	13.8																							
5-Oct	1.2	0.7	0.7	0.9	1.0	1.9	1.5	2.8	2.9	2.7	3.1	2.2	2.3	2.3	2.1	1.8	1.8	2.0	2.9	3.8	4.8	5.3	5.2	4.5	2.5	5.3																							
6-Oct	5.2	4.3	3.6	3.6	3.5	3.5	3.8	4.2	4.3	4.4	4.9	5.2	5.1	5.3	5.2	5.0	6.1	6.6	12.7	12.8	7.7	11.0	17.5	4.3	6.2	17.5																							
7-Oct	4.9	4.9	10.8	9.7	8.7	9.9	8.0	8.2	6.8	6.9	6.3	9.3	9.8	10.5	10.8	11.7	12.6	15.5	17.6	14.9	12.4	9.6	8.1	8.4	9.8	17.6																							
8-Oct	8.7	8.3	8.0	7.8	7.8	8.0	7.8	7.5	7.4	7.4	7.2	6.8	6.5	6.1	4.5	4.4	4.9	6.4	8.6	13.8	7.9	6.5	6.2	6.3	7.3	13.8																							
9-Oct	6.5	7.0	6.5	6.3	6.3	6.7	6.6	6.3	6.7	6.8	6.7	6.5	6.0	6.0	5.9	5.6	6.5	9.3	7.9	7.3	7.1	7.0	6.7	7.0	6.7	9.3																							
10-Oct	6.3	6.5	6.6	6.9	7.0	7.1	7.0	7.9	8.4	7.9	7.7	7.5	7.3	7.6	7.7	7.1	6.7	7.1	8.1	7.7	7.0	6.7	7.3	7.6	7.3	8.4																							
11-Oct	7.5	7.9	7.8	7.5	7.5	7.9	8.4	8.7	8.3	7.9	7.6	7.5	7.5	7.0	7.3	6.9	6.7	6.8	6.5	7.0	6.4	6.3	6.0	6.3	7.3	8.7																							
12-Oct	5.9	6.0	6.0	6.1	6.3	6.7	6.8	7.6	7.3	7.1	6.9	7.0	6.7	5.5	4.6	5.5	6.1	8.7	10.2	12.9	8.3	5.6	6.0	5.8	6.9	12.9																							
13-Oct	5.4	5.2	5.2	5.7	6.3	6.8	6.2	7.3	10.6	11.3	10.2	10.3	10.3	10.6	8.5	9.5	11.6	13.6	12.4	7.1	5.0	4.4	4.5	4.8	8.0	13.6																							
14-Oct	5.2	5.7	6.3	6.7	6.6	6.4	5.9	5.5	5.1	4.9	4.5	4.4	4.4	4.3	5.0	5.4	6.0	6.9	6.8	6.4	5.7	5.5	5.7	5.4	5.6	6.9																							
15-Oct	4.6	4.5	4.7	5.2	5.7	6.2	6.3	6.6	6.8	7.6	7.0	6.8	6.4	5.9	6.3	6.2	6.7	7.2	8.6	8.0	9.2	9.9	7.7	6.5	6.7	9.9																							
16-Oct	6.4	5.9	6.8	6.5	7.0	7.8	7.4	7.5	7.6	6.8	6.0	5.2	4.7	4.0	3.4	3.3	6.5	7.3	5.8	7.9	7.4	5.5	5.2	6.2	6.2	7.9																							
17-Oct	5.8	4.4	4.7	6.7	5.9	7.0	8.3	12.9	14.2	13.4	10.3	11.7	15.1	23.5	29.8	30.6	31.4	27.9	26.2	26.7	26.1	27.0	28.1	26.7	17.7	31.4																							
18-Oct	23.7	21.9	22.6	22.8	23.9	24.4	21.9	17.5	14.5	12.2	10.7	8.6	6.8	5.8	4.5	4.2	4.3	4.6	5.1	6.0	6.9	9.2	8.3	5.4	12.3	24.4																							
19-Oct	4.4	4.0	3.3	3.0	3.5	3.5	4.5	4.5	4.2	4.4	2.5	2.1	C	2.2	2.1	2.3	2.5	2.6	1.9	0.8	0.6	0.9	1.3	1.3	2.7	4.5																							
20-Oct	1.1	1.5	1.6	1.9	2.6	3.3	3.9	4.1	4.1	4.8	4.6	4.8	5.1	5.2	4.5	5.2	10.2	10.4	25.1	23.5	21.5	20.0	21.9	18.3	8.7	25.1																							
21-Oct	17.8	17.5	13.1	11.6	11.2	11.1	11.2	11.4	11.5	11.3	10.4	9.9	10.3	11.1	10.7	25.8	12.4	6.0	7.1	4.2	2.7	2.8	3.0	2.6	10.3	25.8																							
22-Oct	3.8	6.7	6.4	5.9	7.1	8.9	7.5	5.6	6.6	9.7	7.0	7.1	6.0	8.1	8.1	6.4	8.5	5.4	3.4	5.1	4.0	3.6	4.5	6.4	6.3	9.7																							
23-Oct	8.0	6.9	5.7	6.0	6.9	7.3	7.1	6.3	5.7	5.1	3.7	4.2	2.3	2.0	11.7	2.9	3.8	3.8	3.9	4.3	3.9	3.9	4.1	4.4	5.2	11.7																							
24-Oct	4.7	4.3	3.9	4.0	4.4	5.0	6.2	8.1	10.2	10.3	7.6	5.6	6.3	6.2	6.3	6.1	4.8	4.6	5.6	5.2	5.6	5.2	5.6	6.9	7.5	6.0	10.3																						
25-Oct	7.2	6.2	5.6	5.4	5.1	5.6	5.4	4.7	4.6	5.9	7.2	8.2	8.5	8.7	20.7	8.1	7.2	6.3	6.3	6.2	5.7	5.5	4.9	4.4	6.8	20.7																							
26-Oct	4.1	4.1	4.2	5.5	6.8	7.6	8.4	9.5	10.1	10.0	9.0	7.0	5.3	5.3	4.3	3.8	4.0	3.5	3.1	3.5	3.0	2.4	2.3	2.6	5.4	10.1																							
27-Oct	3.5	4.3	5.3	6.8	4.4	2.7	3.7	4.6	5.0	4.2	4.9	5.8	5.6	5.7	8.0	7.6	4.0	2.8	4.1	4.5	3.2	2.8	3.9	3.7	4.6	8.0																							
28-Oct	2.9	3.3	3.2	3.6	3.3	3.1	3.1	3.4	3.6	5.4	10.0	12.0	11.2	12.5	10.0	8.0	8.8	5.0	3.9	3.2	3.1	3.6	3.7	3.5	5.6	12.5																							
29-Oct	3.5	3.5	3.1	2.5	2.8	3.4	4.0	4.0	4.4	4.7	4.5	6.6	8.7	6.3	6.7	6.3	8.3	12.8	10.6	9.5	8.7	10.4	9.6	9.3	6.4	12.8																							
30-Oct	10.3	11.5	4.9	3.4	3.9	4.6	5.6	6.3	6.9	7.0	7.2	6.0	3.6	3.4	3.7	4.4	6.3	6.8	5.9	4.8	5.2	4.8	4.4	4.5	5.7	11.5																							
31-Oct	4.9	5.1	5.6	5.8	5.8	6.8	8.3	11.2	14.7	15.6	15.0	16.1	17.0	17.2	16.5	16.0	17.4	17.6	17.4	19.4	18.8	19.5	19.4	19.7	13.8	19.7																							
																								7.8	7.5	6.9	6.8	6.7	7.0	7.0	7.2	7.5	7.5	7.2	7.2	7.3	7.5	8.1	7.9	8.2	8.3	8.9	8.9	7.8	7.7	7.9	7.4	Diurnal Average	
																								38.3	33.1	23.4	22.8	23.9	24.4	21.9	17.5	14.7	15.6	15.0	16.1	17.0	23.5	29.8	30.6	31.4	27.9	26.2	26.7	26.1	27.0	28.1	26.7	Diurnal Maximum	
C - Calibration																																																	
Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 µg/m ³ 24-hr 29 µg/m ³																																																	





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Athabasca Valley - October 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	251	33.78	33.78
6 - 15	440	59.22	93.00
16 - 25	39	5.25	98.25
26 - 80	13	1.75	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Athabasca Valley - October 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	4	0	1	0	11	49	13	10	22	21	27	25	36	13	15	251
6 - 15	13	7	4	4	6	52	204	28	7	14	7	11	21	19	18	25	440
16 - 25	3	0	1	1	1	4	8	5	2	3	3	1	2	0	0	5	39
26 - 80	0	0	0	0	1	1	1	1	0	0	0	0	0	1	2	6	13
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	20	11	5	6	8	68	262	47	19	39	31	39	48	56	33	51	743

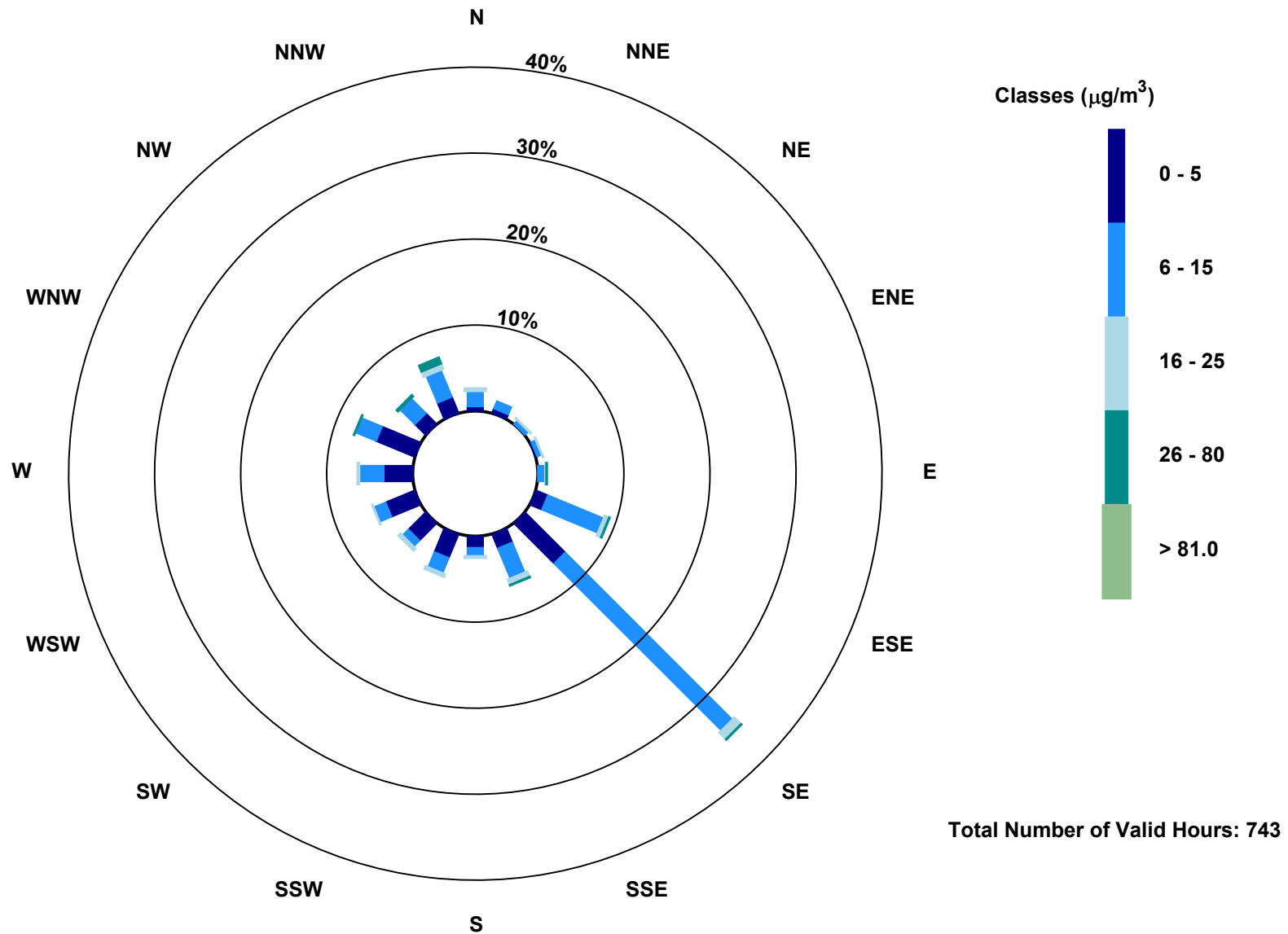
Total Number of Valid Hours: 743

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

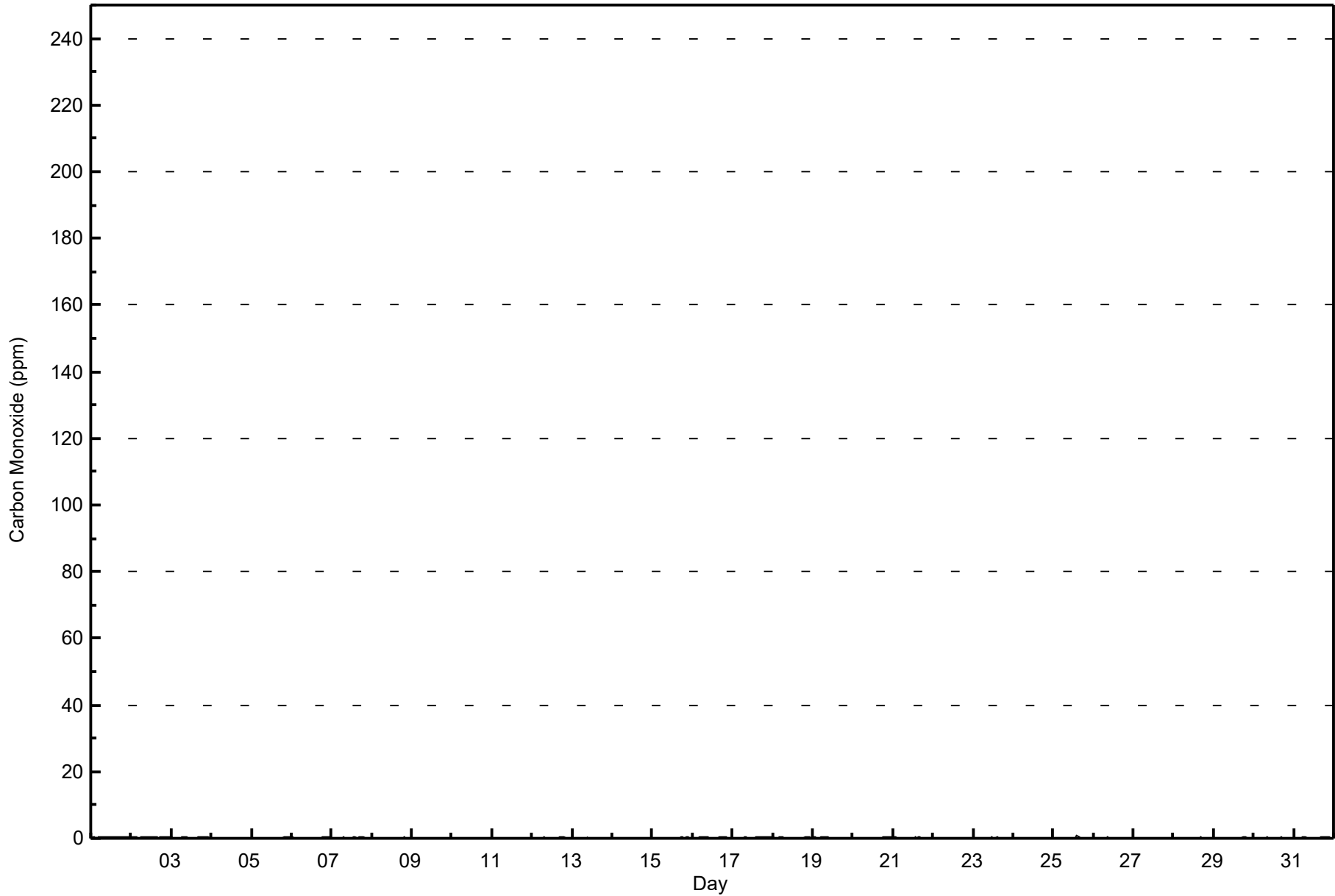
Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Athabasca Valley





Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.3	672	98.68	98.68
0.4 - 0.5	8	1.17	99.85
0.6 - 0.7	0	0.00	99.85
0.8 - 1.4	1	0.15	100.00
1.5 - 10	0	0.00	100.00
> 10	0	0.00	100.00

Total Number of Valid Hours: 681

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Carbon Monoxide (CO) - ppm
Athabasca Valley - October 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	19	10	5	6	8	61	237	46	17	37	29	40	43	37	28	49	672
0.4 - 0.5	0	0	0	0	0	1	3	1	1	0	1	0	0	0	1	0	8
0.6 - 0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.8 - 1.4	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
1.5 - 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	19	10	5	6	8	62	240	47	18	37	30	40	44	37	29	49	681

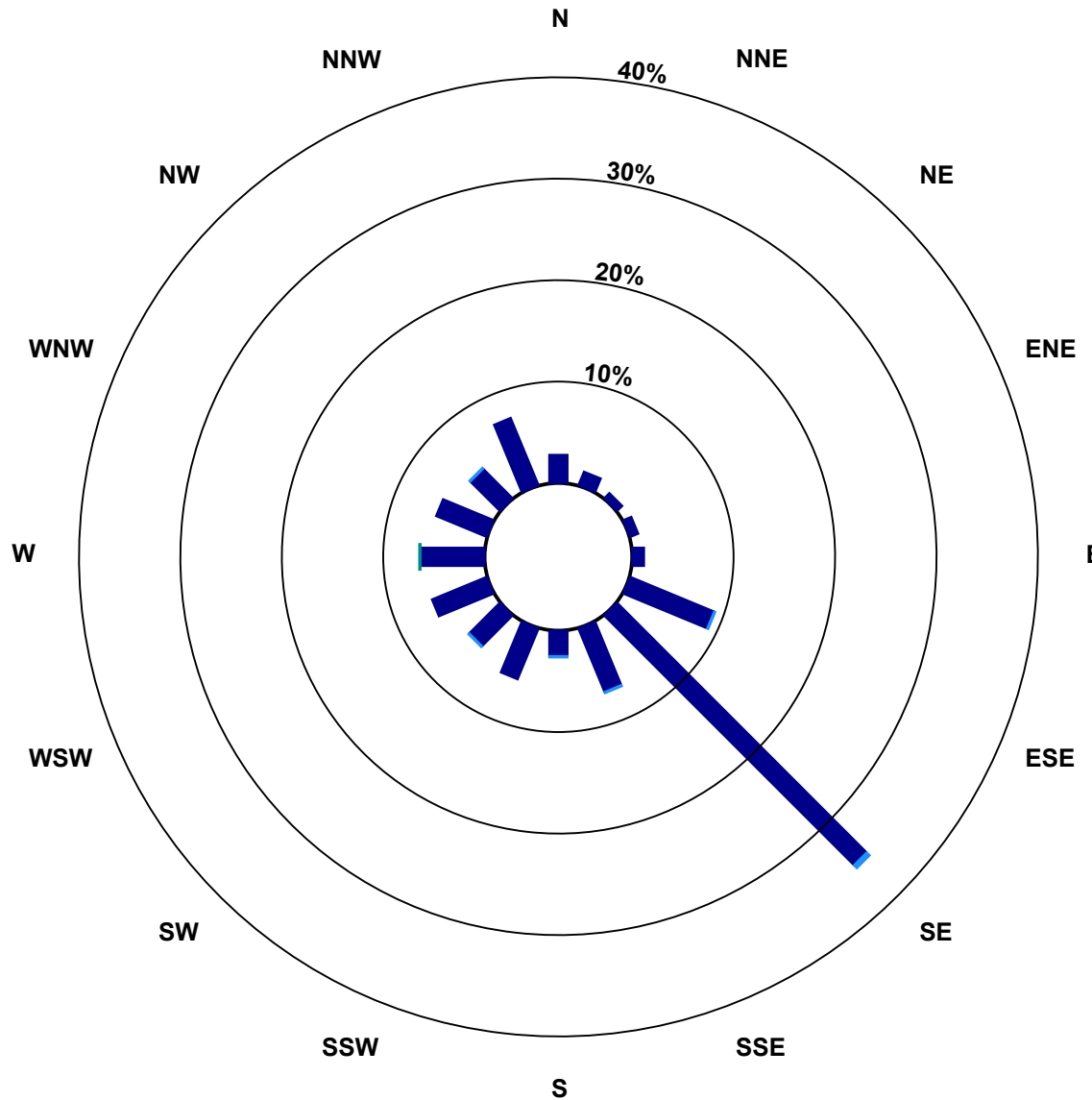
Total Number of Valid Hours: 681

Total Number of Hours: 744

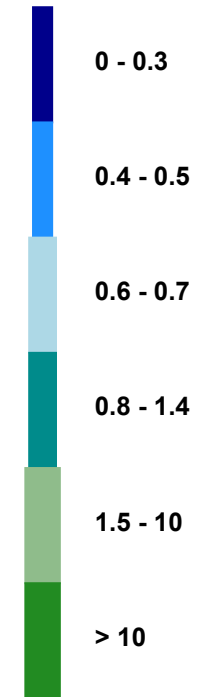


Wood Buffalo Environmental Association
Wind Rose Oct 2023

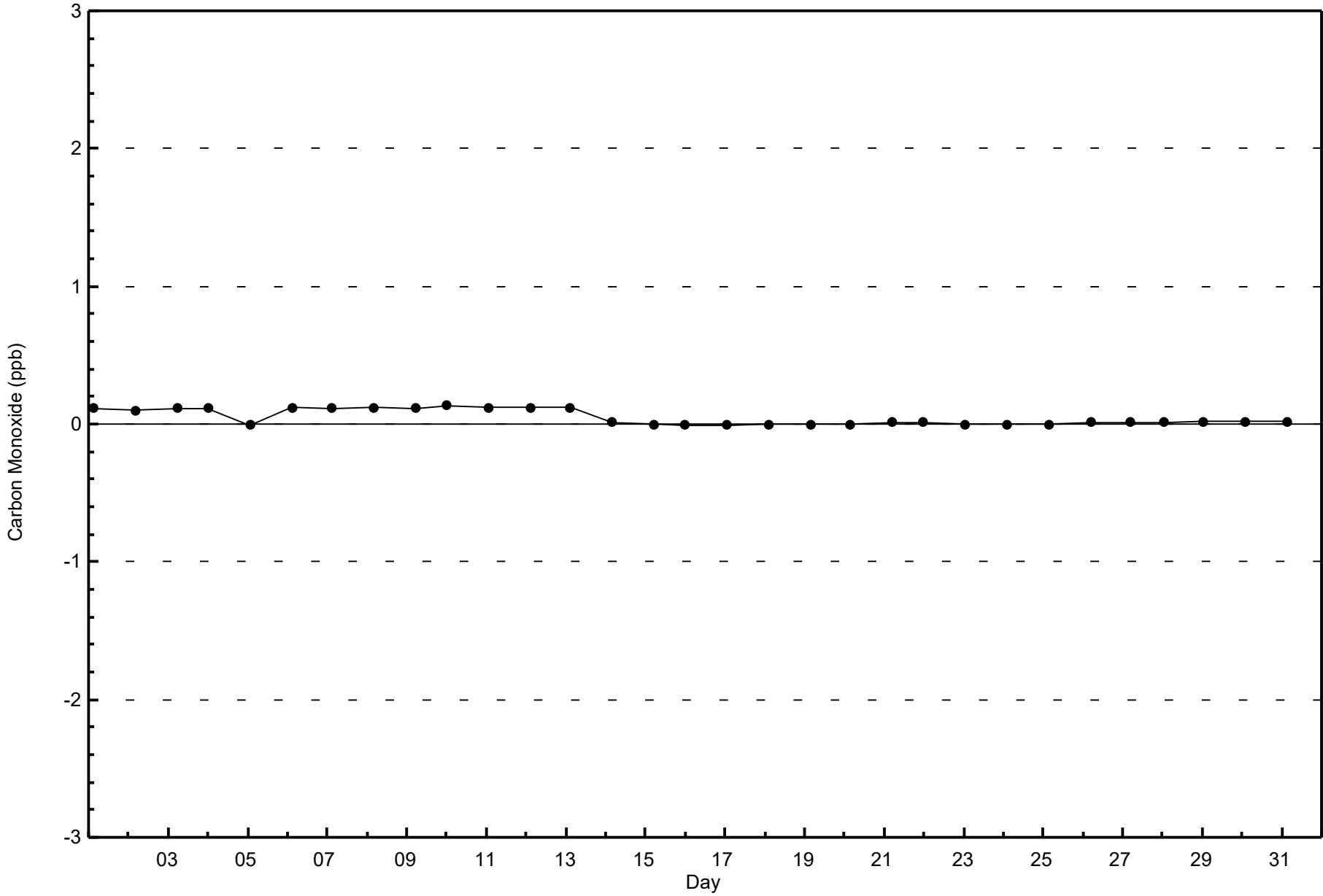
Carbon Monoxide (CO) - ppm
Athabasca Valley

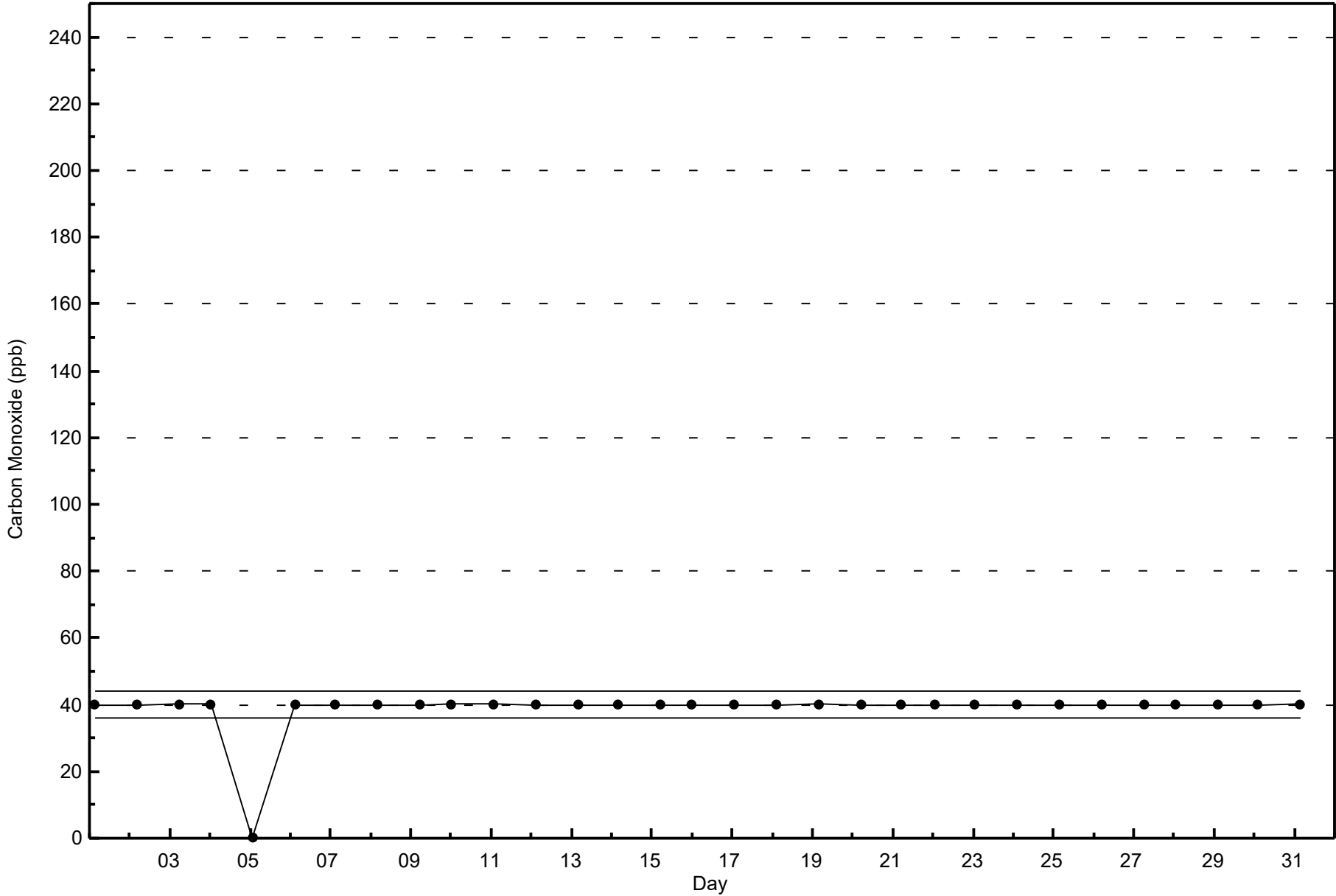


Classes (ppm)



Total Number of Valid Hours: 681







Wood Buffalo Environmental Association
Summary of Hour Averages

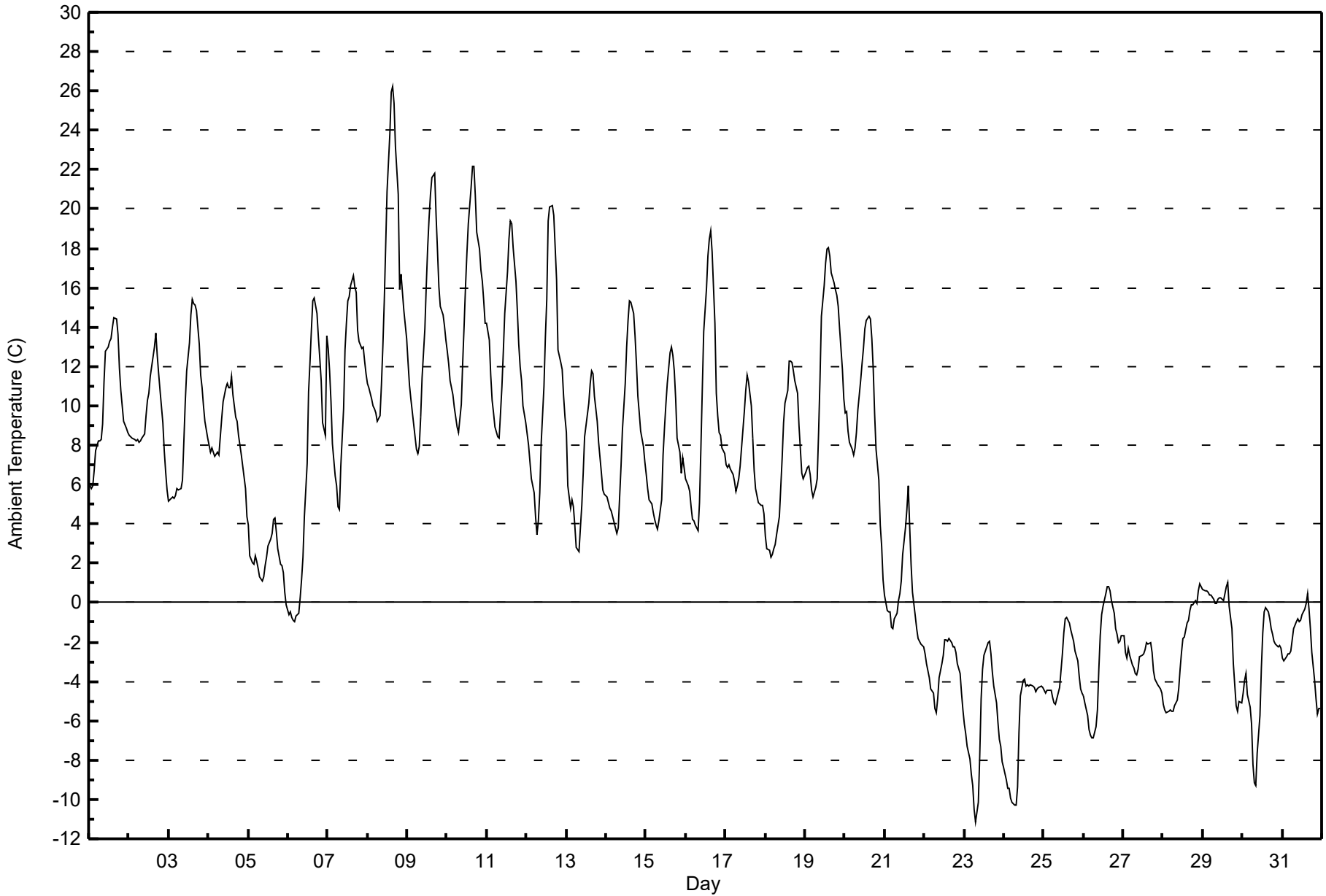
Ambient Temperature (AT) - C
Athabasca Valley - October 2023

Maximum Value: 26.2 C on Oct 8 16:00		Maximum Daily Average: 15.9 C on Oct 8		Hours in Service: 744																																												
Minimum Value: -11.1 C on Oct 23 08:00		Minimum Daily Average: -6.4 C on Oct 24		Hours of Data: 744																																												
Maximum Diurnal Average: 9.9 C at hour 16		Minimum Diurnal Average: 1.7 C at hour 7		Hours of Missing Data: 0																																												
Monthly Average: 5.25 C		Percentiles: P ₁ = -9.4 P ₁₀ = -4.5 Q ₁ = -1.5 Median = 5.8 Q ₃ = 10.9 P ₉₀ = 15.0 P ₉₉ = 21.7		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-Oct	5.9	5.8	6.0	6.7	7.7	8.2	8.2	8.3	9.1	11.2	12.8	13.0	13.3	13.4	14.0	14.5	14.4	13.6	12.0	10.8	10.0	9.2	8.9	8.7	10.2	14.5																						
2-Oct	8.5	8.4	8.3	8.3	8.2	8.3	8.1	8.2	8.3	8.6	9.5	10.3	10.7	11.5	12.5	13.0	13.7	12.6	11.7	10.8	9.1	7.7	6.7	5.7	9.5	13.7																						
3-Oct	5.2	5.3	5.3	5.3	5.5	5.8	5.7	5.8	6.3	8.2	10.2	11.8	13.2	14.6	15.4	15.2	15.1	14.8	13.1	11.6	10.9	10.0	9.2	8.4	9.7	15.4																						
4-Oct	8.0	7.7	7.8	7.7	7.4	7.7	7.5	8.4	9.3	10.2	10.9	11.1	10.9	10.9	11.5	10.5	9.4	9.2	8.5	8.0	7.5	6.4	5.8	4.3	8.6	11.5																						
5-Oct	3.9	2.4	2.0	2.0	2.4	2.1	1.7	1.3	1.1	1.3	1.9	2.3	2.9	3.2	3.6	4.2	4.3	3.6	2.7	2.0	1.9	1.6	0.5	-0.1	2.3	4.3																						
6-Oct	-0.6	-0.5	-0.7	-0.9	-1.0	-0.7	-0.5	0.3	1.2	2.3	4.4	7.1	10.7	12.2	13.8	15.3	15.5	14.7	13.5	12.4	11.3	9.1	8.5	13.5	6.7	15.5																						
7-Oct	12.9	11.7	10.2	8.1	6.4	5.9	4.9	4.7	6.9	9.9	12.8	14.2	15.3	15.5	16.1	16.6	16.1	15.7	13.9	13.3	12.9	13.0	12.3	11.6	11.7	16.6																						
8-Oct	11.2	11.0	10.3	10.0	9.9	9.6	9.2	9.5	11.0	13.0	15.3	18.1	20.9	23.8	26.0	26.2	25.3	23.1	20.8	15.9	16.7	15.8	14.8	13.4	15.9	26.2																						
9-Oct	12.2	11.0	10.3	9.7	9.1	7.8	7.6	7.9	9.4	11.5	13.9	16.1	18.0	19.5	20.7	21.6	21.8	19.7	17.9	16.0	15.1	14.6	14.1	13.3	14.1	21.8																						
10-Oct	12.8	12.1	11.3	10.6	10.0	9.4	8.9	8.6	10.1	12.2	14.1	16.1	17.7	19.3	21.1	22.2	22.1	20.7	18.8	18.0	16.9	16.3	15.3	14.2	14.9	22.2																						
11-Oct	14.2	13.3	11.5	10.3	9.7	8.9	8.4	8.4	9.6	11.0	12.7	14.7	16.8	18.5	19.4	19.2	18.0	16.4	14.8	13.1	12.0	11.3	10.0	9.2	13.0	19.4																						
12-Oct	8.6	8.0	7.2	6.3	5.6	4.4	3.4	4.2	5.6	8.1	11.0	13.5	15.4	19.4	20.1	20.2	19.7	18.0	16.4	12.8	12.2	11.9	10.5	9.4	11.3	20.2																						
13-Oct	8.6	5.9	4.8	5.2	4.8	4.0	2.8	2.6	3.8	5.0	6.6	8.5	9.0	10.2	11.2	11.8	11.6	10.5	9.2	8.2	7.3	6.6	5.7	5.5	7.1	11.8																						
14-Oct	5.4	5.1	4.8	4.7	4.3	3.8	3.5	3.8	5.4	6.9	8.8	11.1	13.0	14.4	15.3	15.2	14.7	13.5	12.2	10.5	9.6	8.7	7.9	7.2	8.7	15.3																						
15-Oct	6.5	5.8	5.2	5.0	4.6	4.2	3.9	3.7	4.1	5.3	7.5	8.8	10.1	11.2	12.7	13.0	12.6	11.8	10.3	8.3	7.7	6.6	7.3	6.9	7.6	13.0																						
16-Oct	6.3	5.9	5.6	4.9	4.3	4.2	3.9	3.7	5.1	7.8	10.8	13.8	16.0	17.6	18.5	18.9	17.9	14.2	10.6	9.5	8.7	8.5	7.9	7.6	9.7	18.9																						
17-Oct	7.0	6.8	7.0	6.8	6.5	6.2	5.7	5.9	6.3	6.9	8.8	9.7	10.8	11.6	11.2	10.0	8.4	6.7	5.8	5.4	5.1	5.0	4.9	4.5	7.2	11.6																						
18-Oct	3.4	2.7	2.7	2.3	2.4	2.7	2.9	3.5	4.3	5.9	7.4	9.1	10.1	10.8	12.3	12.3	12.2	11.7	11.3	10.6	9.0	7.8	6.6	6.3	7.1	12.3																						
19-Oct	6.7	6.9	6.9	6.5	5.7	5.3	5.8	6.3	8.6	11.4	14.5	16.1	17.2	18.0	18.0	17.6	16.8	16.3	15.9	15.6	15.1	13.9	11.8	10.4	12.0	18.0																						
20-Oct	9.6	9.7	8.7	8.2	7.8	7.5	7.8	8.7	9.8	11.3	12.1	12.9	13.9	14.4	14.5	14.4	13.4	11.8	9.5	7.8	6.2	4.0	2.9	1.2	9.5	14.5																						
21-Oct	0.4	-0.4	-0.5	-0.5	-1.2	-1.3	-0.8	-0.5	0.1	0.5	1.1	2.4	3.8	4.8	6.0	3.9	1.9	0.5	-0.7	-1.3	-1.8	-2.0	-2.1	-2.2	0.4	6.0																						
22-Oct	-2.6	-3.1	-3.5	-3.8	-4.4	-4.6	-5.4	-5.6	-4.9	-3.8	-3.1	-2.7	-1.9	-1.9	-1.9	-1.8	-2.0	-2.2	-2.2	-2.6	-3.1	-3.6	-4.6	-5.4	-3.4	-1.8																						
23-Oct	-6.2	-6.6	-7.3	-8.0	-8.7	-9.3	-10.5	-11.1	-10.2	-7.8	-4.9	-3.4	-2.6	-2.5	-2.0	-2.0	-2.6	-3.5	-4.3	-5.1	-6.1	-6.9	-7.3	-8.1	-6.1	-2.0																						
24-Oct	-8.3	-9.0	-9.4	-9.4	-9.9	-10.1	-10.3	-10.3	-9.3	-6.6	-4.8	-4.0	-3.9	-4.2	-4.1	-4.2	-4.2	-4.3	-4.3	-4.5	-4.4	-4.3	-4.2	-4.3	-6.4	-3.9																						
25-Oct	-4.4	-4.6	-4.4	-4.4	-4.5	-4.8	-5.1	-5.2	-4.9	-4.3	-3.4	-2.6	-1.6	-0.8	-0.8	-1.0	-1.4	-1.7	-2.0	-2.5	-3.0	-3.7	-4.3	-4.6	-3.3	-0.8																						
26-Oct	-4.8	-5.1	-5.7	-6.4	-6.7	-6.9	-6.9	-6.3	-5.5	-3.4	-1.7	-0.6	-0.2	0.5	0.8	0.8	0.6	0.1	-0.5	-1.3	-1.6	-2.0	-2.0	-1.7	-2.8	0.8																						
27-Oct	-1.7	-2.6	-2.9	-2.3	-2.7	-3.2	-3.3	-3.6	-3.7	-3.4	-2.8	-2.6	-2.6	-2.4	-2.1	-2.1	-2.0	-2.5	-3.5	-3.9	-4.0	-4.2	-4.4	-4.6	-3.0	-1.7																						
28-Oct	-5.2	-5.5	-5.6	-5.5	-5.4	-5.5	-5.5	-5.3	-5.0	-4.4	-3.4	-2.5	-1.8	-1.7	-1.1	-0.9	-0.4	-0.1	-0.1	0.1	0.0	0.6	0.9	0.8	-2.6	0.9																						
29-Oct	0.7	0.6	0.6	0.5	0.4	0.4	0.2	0.0	-0.1	0.2	0.2	0.2	0.1	0.5	0.8	1.1	-0.2	-1.3	-3.1	-4.2	-5.2	-5.5	-5.0	-5.1	-1.0	1.1																						
30-Oct	-4.6	-4.0	-3.6	-4.7	-5.3	-6.2	-8.2	-9.2	-9.3	-7.7	-5.7	-3.3	-1.5	-0.5	-0.3	-0.5	-0.8	-1.3	-1.6	-2.0	-2.1	-2.2	-2.2	-2.3	-3.7	-0.3																						
31-Oct	-2.8	-2.9	-2.8	-2.6	-2.6	-2.5	-1.9	-1.3	-0.9	-0.8	-1.0	-0.9	-0.6	-0.4	-0.1	0.4	-0.3	-1.3	-2.6	-4.0	-4.9	-5.6	-5.4	-5.4	-2.2	0.4																						
																								3.8	3.3	2.9	2.6	2.3	2.0	1.7	1.8	2.6	4.1	5.7	7.0	8.2	9.1	9.8	9.9	9.4	8.4	7.2	6.1	5.4	4.8	4.2	3.8	Diurnal Average
																								14.2	13.3	11.5	10.6	10.0	9.6	9.2	9.5	11.0	13.0	15.3	18.1	20.9	23.8	26.0	26.2	25.3	23.1	20.8	18.0	16.9	16.3	15.3	14.2	Diurnal Maximum



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	237	31.85	31.85
0 - 10	289	38.84	70.70
10 - 20	202	27.15	97.85
> 20	16	2.15	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

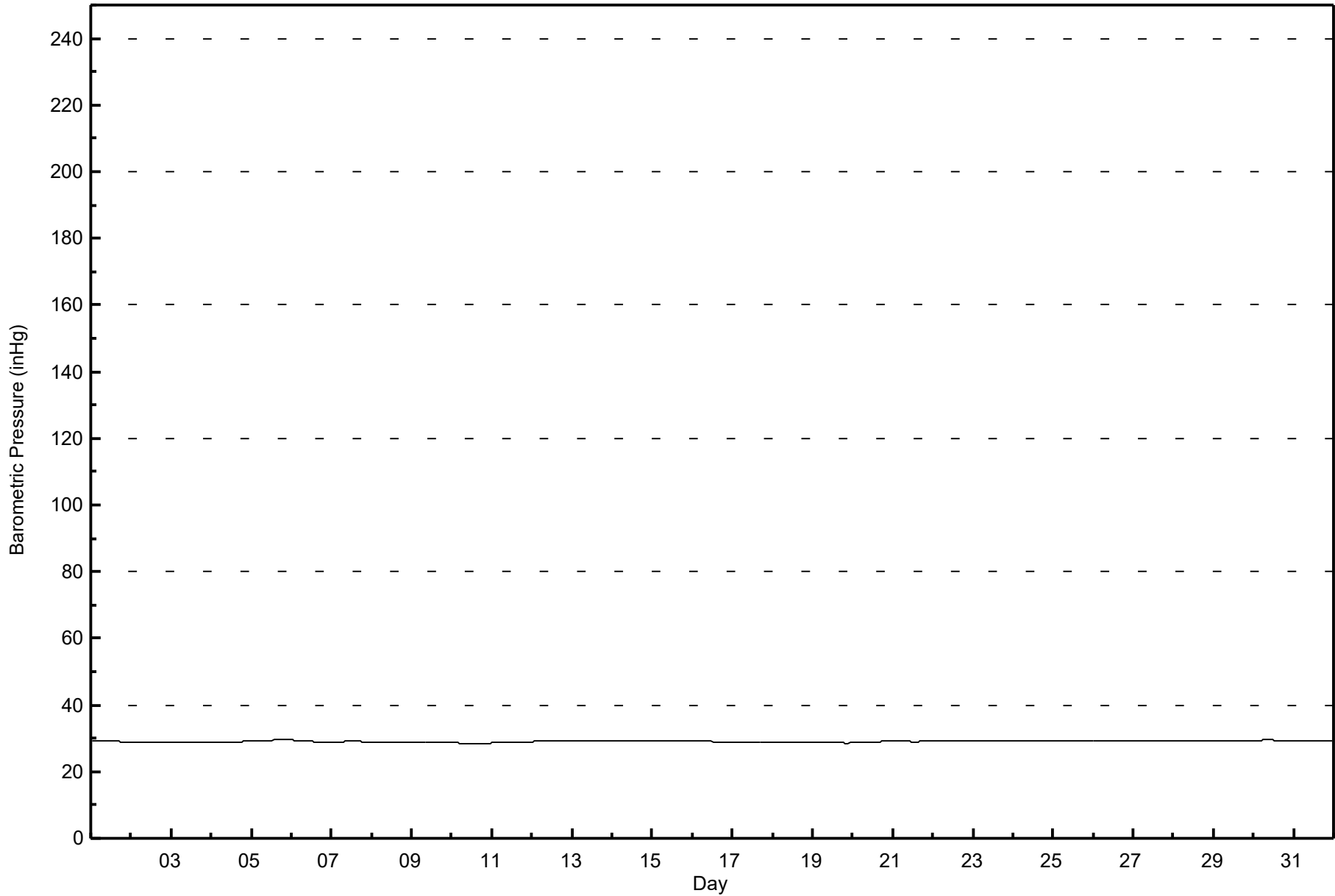


Maximum Value: 29.5 inHg on Oct 5 18:00		Maximum Daily Average: 29.4 inHg on Oct 5		Hours in Service: 744																							
Minimum Value: 28.5 inHg on Oct 10 16:00		Minimum Daily Average: 28.6 inHg on Oct 10		Hours of Data: 744																							
Maximum Diurnal Average: 29.1 inHg at hour 9		Minimum Diurnal Average: 29.1 inHg at hour 17		Hours of Missing Data: 0																							
Monthly Average: 29.07 inHg		Percentiles: P ₁ = 28.6 P ₁₀ = 28.7 Q ₁ = 28.8 Median = 29.1 Q ₃ = 29.3 P ₉₀ = 29.3 P ₉₉ = 29.5		Hours of Calibration: 0																							
				Percent Operational Time: 100.0																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Oct	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	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	29.1	29.3	
2-Oct	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	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.9
3-Oct	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	28.8	28.8	28.8	28.8	28.8	28.8	28.7	28.7	28.7	28.8	28.9	
4-Oct	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	28.9	28.9	28.9	29.0	29.0	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.1	
5-Oct	29.1	29.2	29.2	29.2	29.3	29.3	29.3	29.3	29.3	29.4	29.4	29.4	29.4	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.4	29.5	
6-Oct	29.5	29.4	29.4	29.4	29.4	29.3	29.3	29.2	29.2	29.2	29.1	29.1	29.1	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.1	29.5	
7-Oct	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	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.1	
8-Oct	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.9	29.0	
9-Oct	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	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.7	28.8	
10-Oct	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	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.6	28.6	28.6	28.6	28.6	
11-Oct	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	28.8	28.9	28.9	28.9	28.9	29.0	29.0	28.8	29.0	
12-Oct	29.0	29.0	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	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.2	29.3	
13-Oct	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.4	29.4	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.2	29.2	29.2	29.3	29.4	
14-Oct	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	
15-Oct	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	29.1	29.2	
16-Oct	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	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.8	29.0	29.1	
17-Oct	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	
18-Oct	28.9	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.7	28.7	28.7	28.7	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.7	28.9	
19-Oct	28.6	28.6	28.7	28.7	28.7	28.7	28.6	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	28.7	
20-Oct	28.6	28.6	28.7	28.7	28.7	28.7	28.8	28.8	28.8	28.8	28.8	28.9	28.9	29.0	29.0	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.1	29.2	28.9	29.2	
21-Oct	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	29.1	29.1	29.1	29.2	29.2	29.2	29.2	29.2	29.2	29.1	29.2	
22-Oct	29.2	29.3	29.3	29.2	29.3	29.3	29.2	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	29.3	29.3	29.3	29.2	29.3	
23-Oct	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	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	
24-Oct	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	
25-Oct	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	
26-Oct	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	
27-Oct	29.3	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	29.3	29.4	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.4	
28-Oct	29.3	29.3	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.3	29.3	29.3	29.3	29.3	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.3	29.4	
29-Oct	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.4	
30-Oct	29.4	29.4	29.4	29.4	29.4	29.4	29.5	29.5	29.5	29.5	29.5	29.5	29.4	29.4	29.4	29.3	29.3	29.3	29.3	29.3	29.2	29.2	29.2	29.2	29.4	29.5	
31-Oct	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	
29.1																								Diurnal Average			
29.5																								Diurnal Maximum			



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

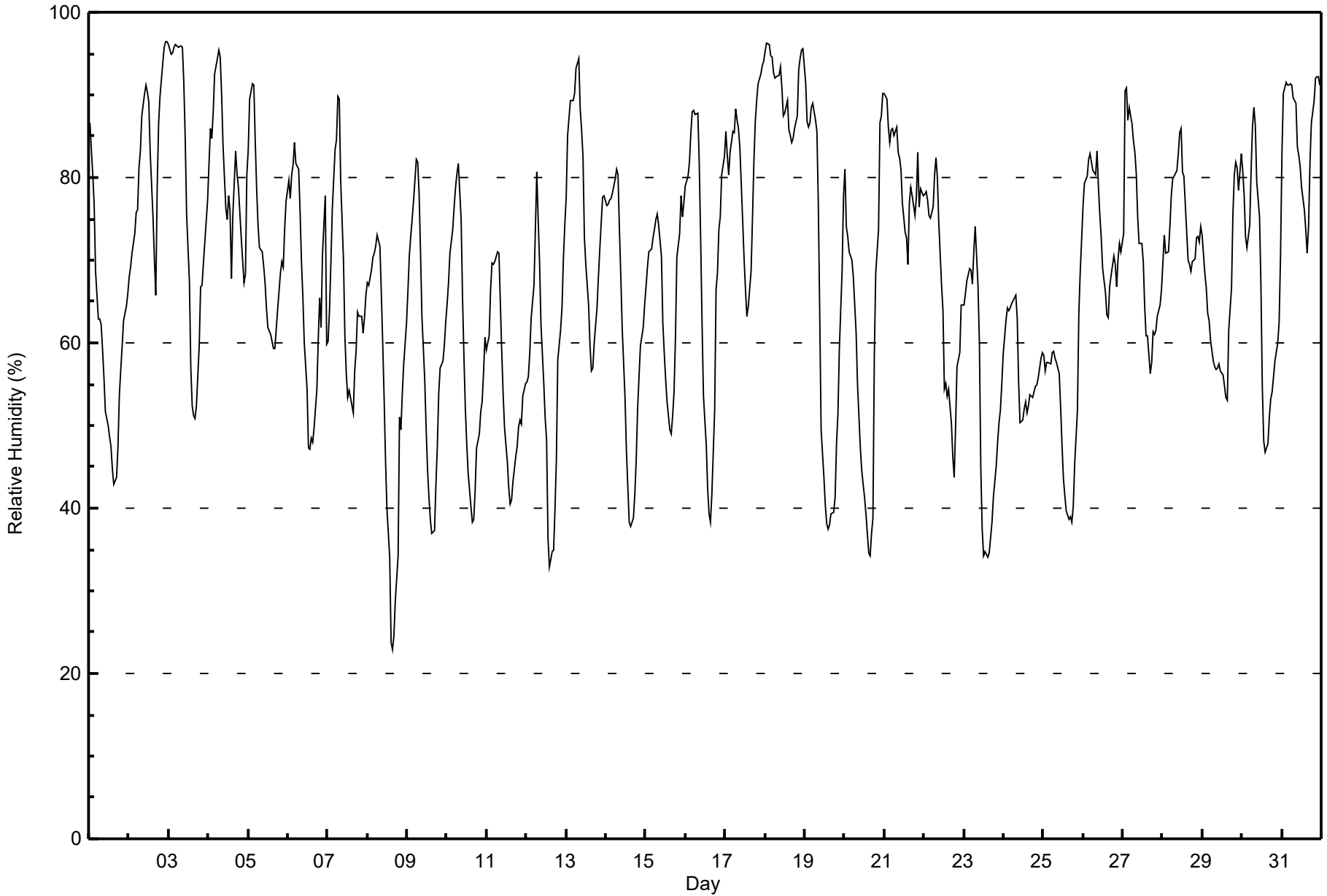
Athabasca Valley - October 2023

Maximum Value: 96.5 % on Oct 2 23:00 Maximum Daily Average: 91.1 % on Oct 18																						Hours in Service: 744				
Minimum Value: 23.0 % on Oct 8 16:00 Minimum Daily Average: 52.5 % on Oct 25																						Hours of Data: 744				
Maximum Diurnal Average: 79.9 % at hour 7 Minimum Diurnal Average: 51.7 % at hour 16																						Hours of Missing Data: 0				
Monthly Average: 67.88 % Percentiles: P₁ = 34.2 P₁₀ = 45.7 Q₁ = 56.3 Median = 69.4 Q₃ = 80.4 P₉₀ = 89.0 P₉₉ = 95.9																						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-Oct	86.7	83.4	80.3	76.8	68.6	62.8	62.9	62.3	59.2	55.7	51.7	49.9	48.7	47.5	44.8	42.8	43.8	47.5	53.8	56.8	59.6	62.7	64.4	66.0	59.9	86.7
2-Oct	67.9	69.1	70.8	73.2	75.8	76.0	81.1	83.2	87.5	90.1	91.2	90.3	89.2	83.1	75.2	70.2	65.8	78.8	86.5	89.8	93.9	95.8	96.5	96.5	82.4	96.5
3-Oct	96.2	95.0	95.0	95.8	96.1	96.0	95.7	95.9	95.8	91.5	84.8	75.5	67.5	56.9	52.3	51.2	50.9	52.4	59.6	66.7	66.9	69.6	72.1	77.3	77.4	96.2
4-Oct	81.7	85.9	84.7	88.0	92.6	94.4	95.5	94.6	90.0	83.9	76.3	74.8	77.8	75.9	67.7	75.5	83.1	80.6	78.8	75.8	72.7	67.3	68.3	80.3	81.1	95.5
5-Oct	83.5	89.4	91.4	91.2	84.4	78.6	74.2	71.5	70.9	69.3	67.3	64.3	61.9	61.0	60.2	59.3	59.4	61.8	64.1	68.5	69.9	69.1	73.7	77.1	71.7	91.4
6-Oct	79.7	77.4	80.4	81.5	84.2	81.8	81.0	76.0	69.9	65.6	60.0	54.3	47.2	47.2	48.5	48.0	49.7	54.4	60.6	65.4	61.8	70.6	77.8	59.8	65.9	84.2
7-Oct	60.2	64.0	69.6	76.2	83.4	84.5	89.8	89.5	79.7	70.0	60.8	56.3	53.3	54.3	53.4	51.6	56.5	59.0	63.7	63.1	63.3	61.1	63.0	65.7	66.3	89.8
8-Oct	67.3	66.9	68.8	70.4	70.8	71.7	73.1	71.7	66.1	60.0	53.4	46.0	39.9	34.0	23.7	23.0	24.5	28.8	34.2	51.0	49.6	54.0	57.5	62.4	52.9	73.1
9-Oct	66.3	70.6	72.9	74.9	77.1	82.2	81.9	77.9	71.0	63.3	55.6	49.7	44.8	41.3	38.6	37.0	37.2	42.9	47.4	53.8	56.9	57.8	59.6	62.5	59.3	82.2
10-Oct	64.7	67.3	70.8	73.7	76.4	78.7	80.6	81.7	74.9	65.4	58.3	52.0	47.8	44.2	40.2	38.4	38.6	42.1	47.4	49.0	51.7	52.9	56.4	60.6	58.9	81.7
11-Oct	59.2	60.8	66.2	69.7	69.5	69.8	70.9	70.9	64.7	58.7	53.8	49.7	45.6	42.3	40.5	40.9	43.1	46.3	47.4	49.8	50.8	50.1	53.6	55.0	55.4	70.9
12-Oct	55.2	55.9	58.8	63.0	67.0	73.7	80.7	74.9	69.7	62.2	55.1	50.8	48.2	36.5	32.9	34.8	34.9	39.9	46.0	58.0	61.6	64.3	70.2	74.3	57.0	80.7
13-Oct	77.6	85.2	89.3	89.2	89.3	90.2	93.2	94.4	88.3	85.7	82.5	72.7	69.6	64.5	59.6	56.6	56.9	60.0	64.3	67.9	71.4	74.5	77.7	77.8	76.6	94.4
14-Oct	76.6	76.7	77.3	77.5	78.1	79.8	81.0	80.3	73.7	67.9	61.8	53.3	47.0	42.6	38.4	37.9	38.8	41.7	46.0	52.0	56.0	59.7	61.9	64.6	61.3	81.0
15-Oct	66.8	69.1	71.0	71.4	72.6	73.7	74.9	75.7	74.2	70.5	62.4	58.9	55.6	52.8	49.4	49.0	51.3	54.1	60.6	70.3	73.2	77.8	75.3	76.9	66.1	77.8
16-Oct	79.1	80.2	81.8	85.4	88.0	88.1	87.7	87.7	81.6	72.6	62.4	53.6	47.6	42.4	39.4	38.3	41.7	51.8	66.4	68.4	73.7	75.2	80.4	82.5	69.0	88.1
17-Oct	85.5	82.7	80.3	83.1	85.6	85.4	88.3	87.0	86.0	83.5	74.7	70.2	66.5	63.2	64.4	68.7	75.1	81.9	86.8	89.3	91.4	92.5	93.5	94.1	81.6	94.1
18-Oct	95.3	96.2	96.2	94.8	94.6	92.8	92.0	92.2	92.3	93.4	90.9	87.4	87.7	89.4	85.7	85.1	84.3	84.7	86.0	87.5	93.1	94.4	95.5	95.7	91.1	96.2
19-Oct	91.3	86.9	86.2	86.6	88.5	89.0	87.0	85.6	76.7	63.6	49.5	43.7	40.3	38.1	37.5	38.0	39.2	39.5	41.4	47.8	51.3	59.2	68.8	77.9	63.1	91.3
20-Oct	81.0	74.0	72.8	71.0	70.0	67.9	64.6	61.1	54.9	47.2	44.5	42.9	41.3	39.4	34.6	34.2	36.9	38.8	58.6	68.4	73.7	86.6	87.4	90.2	60.1	90.2
21-Oct	90.2	89.5	86.1	84.2	85.8	86.0	85.1	86.0	83.1	82.4	81.0	76.9	73.3	72.7	69.4	77.0	78.9	77.8	75.4	77.6	83.0	76.5	78.7	77.9	80.6	90.2
22-Oct	77.9	78.3	77.3	75.4	75.1	76.5	80.3	82.3	80.0	74.5	66.9	63.8	54.3	55.1	53.6	54.5	50.3	46.2	43.7	49.8	57.0	58.7	64.6	64.6	65.0	82.3
23-Oct	64.5	65.9	67.5	69.0	68.8	67.1	71.0	74.1	66.9	60.0	45.0	37.4	34.2	34.8	34.1	34.6	36.4	38.4	41.3	45.0	48.0	50.3	51.8	55.1	52.6	74.1
24-Oct	58.7	62.7	64.2	63.9	64.3	64.7	65.4	65.8	63.0	55.3	50.3	50.7	52.1	52.9	51.6	52.4	53.6	53.3	54.1	54.8	55.0	55.7	58.2	58.8	57.6	65.8
25-Oct	58.5	56.7	57.7	57.7	57.4	58.8	58.9	58.1	57.6	56.3	52.2	47.7	43.6	41.5	39.6	38.7	39.0	38.3	40.2	45.2	51.9	63.6	68.7	72.5	52.5	72.5
26-Oct	76.6	79.4	80.2	82.2	82.8	81.9	80.8	80.4	83.2	78.7	75.4	72.7	69.0	66.1	63.5	63.1	66.7	68.2	70.6	69.5	66.8	70.2	72.1	71.0	73.8	83.2
27-Oct	73.2	90.6	90.9	86.9	88.4	86.4	84.3	83.1	80.5	75.2	72.0	72.0	69.8	64.4	60.8	60.8	56.3	57.5	61.4	61.0	61.6	63.2	64.6	66.5	72.1	90.9
28-Oct	69.7	73.1	70.8	71.0	74.0	77.8	79.8	80.2	80.9	82.8	85.4	86.0	80.7	80.1	73.4	70.0	69.4	68.7	69.8	70.1	72.8	73.0	72.2	74.0	75.2	86.0
29-Oct	73.1	68.4	66.6	63.6	62.7	60.3	57.8	57.0	56.8	56.9	57.5	56.6	56.1	54.8	53.4	53.0	61.5	66.7	75.5	80.3	81.9	81.1	78.5	82.9	65.1	82.9
30-Oct	80.8	78.0	72.9	71.6	74.3	80.9	86.3	88.4	86.3	79.5	75.2	66.9	54.5	48.1	46.8	47.8	51.0	53.2	54.1	56.0	57.9	59.9	62.5	70.6	66.8	88.4
31-Oct	82.8	90.1	91.5	91.2	91.1	91.4	91.1	89.7	89.0	83.8	82.8	81.4	78.8	76.1	73.8	70.8	74.0	81.7	86.6	89.4	92.0	92.2	92.2	91.2	85.6	92.2
																								Diurnal Average		
																								Diurnal Maximum		



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Athabasca Valley - October 2023

Maximum Speed: 31 km/h on Oct 5 14:00	Maximum Daily Speed Average: 16.4 km/h on Oct 5	Hours in Service: 744
Minimum Speed Value: 0 km/h on Oct 13 03:00	Minimum Daily Speed Average: 0.6 km/h on Oct 31	Hours of Data: 744
Maximum Diurnal Speed Average: 4.4 km/h at hour 4	Minimum Diurnal Speed Average: 1.5 km/h at hour 12	Hours of Missing Data: 0
Monthly Average Velocity: 2.3 km/h 188.5 deg	Percentiles: $P_1 = 1$ $P_{10} = 4$ $Q_1 = 6$ Median = 10 $Q_3 = 14$ $P_{90} = 19$ $P_{99} = 29$	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-Oct	SE4	ESE4	ESE4	ESE5	ESE4	SE3	SE5	SE8	ESE10	SSE10	SSE13	SE18	SSE16	SSE20	SSE17	SSE15	SSE15	SE13	SE14	SE15	SE15	SE12	SE12	SE14	SE10.8	SSE20
2-Oct	SE14	SE15	SE13	SE12	SE13	SE10	SE8	SE10	SE10	SE11	SE9	SE8	SE8	SSE7	SW7	SSW5	SSW5	SE8	SE9	SE8	ESE4	SE2	SE3	ESE3	SE7.8	SE15
3-Oct	SE3	SE5	ESE6	SE7	SE7	SE5	SE6	SE8	SE8	SSE4	SSW5	SW6	SSW7	W11	W16	W12	WSW6	S6	SSE4	SSE6	SE6	SE7	SE9	SE10	S4.2	W16
4-Oct	ESE8	ESE8	SE9	SE7	ESE5	SE4	SE2	SW6	WNN4	NNW6	WNN20	WNN25	WNN23	WNN20	NW23	WNN21	WNN23	WNN28	W29	WNN26	WNN31	NW27	NW22	NW13	WNN12.2	WNN31
5-Oct	WNN16	WNN23	WNN16	WNN12	WNN19	WNN23	WNN27	WNN24	W24	W23	WNN22	WNN28	WNN30	WNN31	WNN28	NW22	WNN22	WNN15	W8	SSW5	SE3	SSE6	SSE5	SE5	WNN16.4	WNN31
6-Oct	SE6	SE6	SE8	SE9	SE11	SE12	SE10	SE16	SE18	SE16	SE13	SE11	S7	SE9	SSE9	SW7	SE3	SE2	SE4	SE5	SE8	SE4	SSW2	W22	SSE7.4	WSW22
7-Oct	W11	SW10	SE4	SE5	ESE7	SE6	SE4	ESE5	SE7	ESE6	E5	ENE2	ENE4	NW2	NW2	NNE1	NW2	ESE1	ESE2	SE6	ESE9	SE9	SE10	SE7	SE3.3	W11
8-Oct	SSE6	SE8	SE8	SE10	SE12	SE12	SSE7	SE10	ESE15	ESE18	SE21	ESE21	ESE17	SE12	S20	S14	S13	SSE11	SE10	ESE7	SSE8	SSE7	SE11	SE10	SE11.2	ESE21
9-Oct	SE7	SE9	SE10	SE11	SE9	ESE5	ESE9	SE12	SE13	SE14	SE13	SE12	ESE15	SE15	ESE17	ESE20	ESE11	SE6	SE6	SE7	SE9	SE10	SE9	SE11	SE10.8	ESE20
10-Oct	SE13	SE12	SE12	SE13	SE12	SE11	SE12	SE12	SE11	ESE13	ESE15	ESE15	ESE18	ESE16	SE16	ESE15	ESE15	SE12	SE10	SE10	SSE8	SE11	SE9	SE7	SE12.2	ESE18
11-Oct	SE10	SE9	SSE6	S6	SSE6	S6	SE5	ESE6	SE17	ESE19	SE15	SE16	ESE14	ESE12	ESE12	ESE14	ESE16	ESE14	SE9	SE6	SE9	SE9	ESE6	ESE8	SE10.1	ESE19
12-Oct	SE9	SE11	SE13	SE15	SE12	ESE5	ESE5	SE8	SE12	SE10	SE8	WNN1	NW4	S11	S13	S9	SSE10	SSE7	SE9	ESE3	SE8	SSE8	SSE8	SE9	SSE7.9	SE15
13-Oct	SE10	SSW4	ENE0	SE8	SE8	SE8	SE11	SE10	SE9	SE7	SE8	SE12	ESE13	ESE13	SE16	SE16	SE18	SE13	SE11	SE12	SE9	ESE10	SE11	SE15	SE10.3	SE18
14-Oct	SE17	SE18	SE16	SE16	SE16	SE13	SE13	SE14	SE18	SE18	ESE20	ESE22	SE19	SE21	SE21	SE21	SE19	SE15	SE12	SE13	SE13	SE14	ESE14	SE16.4	ESE22	
15-Oct	ESE11	ESE8	ESE8	SE11	SE15	SE13	SE11	SE13	SE14	SE13	SE11	SE10	SE12	SE11	SE7	ESE12	ESE9	SE6	SE6	ESE5	SE2	SSE3	SE7	SE7	SE9.2	SE15
16-Oct	SE7	SE8	SE6	SE5	SE6	SE6	SE8	SE8	SE6	SE6	SSE6	SSW7	SSW11	SSW10	SW9	SW6	S2	SW2	SSE1	ENE2	E3	SSW1	NW1	NNW2	SSE3.9	SSW11
17-Oct	NNW1	SE2	N3	NNE2	N2	NNW4	N3	NNW7	NNW9	NNW10	NNW11	NNW15	NNW12	NNW13	NNW13	NNW14	NNW14	NNW15	NNW14	NW11	WNN7	NW4	SSE1	E8	NNW7.2	NNW15
18-Oct	SSE8	SSE7	SE7	SE8	SE9	SE7	SE9	SE13	SE14	SE12	SE9	SE13	SE12	SE12	SE12	SE12	SE14	ESE11	SE13	SE7	ESE3	SE4	SSE3	SSE4	SE9.1	SE14
19-Oct	SE4	SE4	SE4	SE5	SE5	SE5	SE6	ESE4	ESE6	SSE6	SW13	W18	WSW18	WSW16	WSW15	WSW15	SW10	SW8	SW8	WSW15	WSW20	WSW21	W23	SW9	SW8.0	W23
20-Oct	WSW14	WSW24	WSW18	S6	S7	SSW10	S5	SW12	WSW24	W29	WNN25	NW28	NW30	NW30	NW26	NW19	NW13	NW12	NNW8	N8	N5	W2	SW3	SSE2	WNN11.2	NW30
21-Oct	SE2	SE5	SE9	SE6	SE7	SE9	SE6	ESE5	SE5	SE8	SE11	SE11	SE7	N2	NNW11	NNW26	N25	N27	N24	NNW22	NNW20	NNW20	NNW18	NNW16	N6.1	N27
22-Oct	N14	N14	N13	NNE10	NNE7	NE5	NE5	E4	NE3	NNE5	NE2	NW6	WNN5	NNW12	NNW10	NW15	N13	N7	WNN9	WNN13	WNN8	W15	NW10	NW11	NNW7.1	W15
23-Oct	NW7	WNN6	NW5	W5	SW4	SSW4	SSW11	SW11	SSW9	SSW5	NW17	WNN27	WNN29	WNN29	WNN26	WNN23	WNN21	WNN15	W15	WSW16	WSW18	WSW18	SW6	SSW7	W11.5	WNN29
24-Oct	SSW9	SW11	SSW8	SSW9	SSW11	SSW10	SSW10	SSW9	SW7	W9	W18	WNN19	WNN22	W25	W23	W21	W17	W10	WSW1	NNW3	WNN10	W22	W21	W11.4	W25	
25-Oct	W13	NW3	W16	W18	W16	WSW13	WSW14	WSW15	WSW14	SW12	SSW13	WSW11	WSW12	W20	W18	W13	WSW12	WSW14	W14	WNN11	WSW6	SW11	SW8	WSW12.2	W20	
26-Oct	SW8	SSW6	SW9	SSW7	SSW9	SSW6	SSE5	S5	SSE4	SSW9	W10	WNN12	NW15	WNN14	WNN14	W13	W11	WSW11	WSW12	WSW14	WSW16	SW11	SSW7	SW10	WSW7.9	WSW16
27-Oct	WSW9	SSE2	SSE1	WSW5	NNW13	NNW11	NNW13	NNW11	NNW13	NNW12	NNW11	NNW11	N10	N9	NNW9	NW8	WNN10	NW13	W5	SW7	SW8	SSW7	SE5	SSE6	NW5.6	NNW13
28-Oct	SE7	SSE6	SSE6	SSE4	SSW4	SSW6	SSW7	SSW4	SSW4	N3	NW7	NNW6	NNW6	NNW6	N5	NNW2	WSW6	WSW14	WSW19	WSW16	WSW15	W17	W16	W15	WSW5.5	WSW19
29-Oct	W14	W16	W15	W11	W12	W16	WNN16	WNN17	W11	WNN9	NNW16	NW16	NW15	NW10	N8	N6	NW5	W2	W1	WSW2	NNE2	NE4	NNW5	WNN3	WNN8.4	WNN17
30-Oct	W2	NNW6	NNE10	NNE7	NNE6	NNE4	ENE3	ESE3	E5	ESE7	SE7	E6	S7	S10	SSE12	SSE11	SE10	SE12	SE13	SE13	SE11	SE10	SE11	SE11	SE5.4	SE13
31-Oct	SE11	SE10	SE9	SE7	SE6	E3	NNW3	NW2	NNW6	N9	NNW11	NNW11	NNW7	N6	NE3	E2	S3	SW1	WSW3	SW3	SSW2	ENE1	SSW4	S4	ENE0.6	NNW11

SSE3.4	S3.5	SSE3.4	SSE4.4	SSE4.3	SSE3.6	SSE3.3	SSE4.1	SSE4.3	SSE3.6	SSW1.6	W1.5	W2.2	W2.7	WSW3.4	WSW2.8	WSW2.1	SW2.3	SW2.6	SW2.5	SSW2.7	SSW2.6	SSW2.3	S2.9	Diurnal Average	
SE17	WSW24	WSW18	W18	WNN19	WNN23	WNN27	WNN24	W24	W29	WNN25	WNN28	WNN30	WNN31	WNN28	NNW26	N25	WNN28	W29	WNN26	WNN31	NW27	W23	WSW22	Diurnal Maximum	

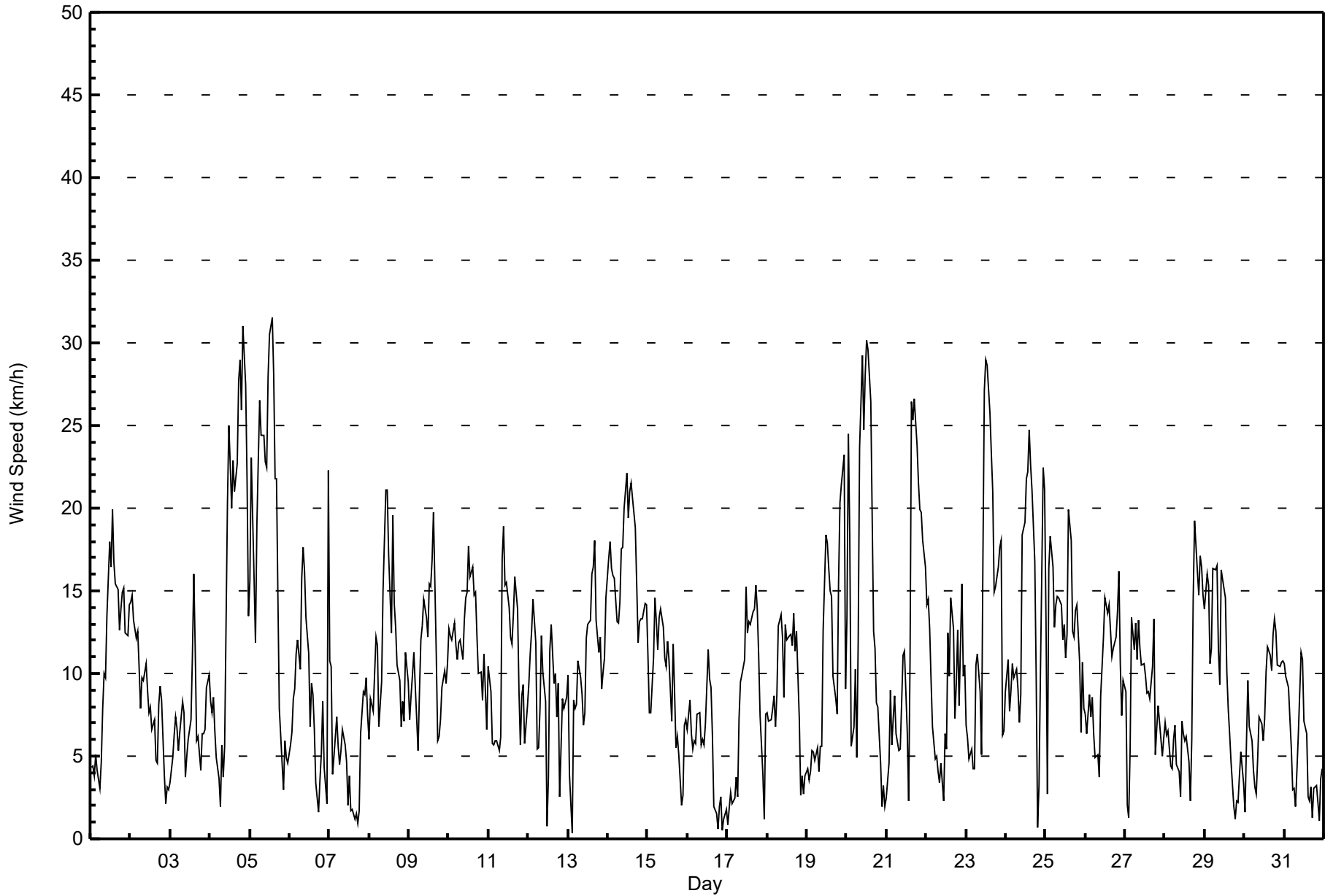
All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 10 km/h on Oct 23 11:00 Minimum Value: 1 km/h on Oct 31 08:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 2 Q ₃ = 3 P ₉₀ = 5 P ₉₉ = 7																		Hours in Service: 744 Hours of Data: 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-Oct	1	1	2	2	2	3	2	2	2	2	4	5	4	5	5	4	4	3	3	3	3	3	3	3	5
2-Oct	3	3	2	2	3	2	2	2	3	2	2	2	2	2	3	2	1	2	2	1	1	1	1	1	3
3-Oct	1	1	2	2	2	1	1	2	1	2	2	2	6	4	5	2	2	1	1	2	1	2	2	2	6
4-Oct	2	2	1	2	1	1	1	1	2	3	6	5	5	3	6	5	6	6	5	4	6	7	5	6	7
5-Oct	6	5	5	3	4	4	5	4	4	3	5	5	5	6	5	5	4	4	2	3	1	1	1	1	6
6-Oct	2	1	2	2	3	3	3	4	3	3	4	2	2	3	4	5	1	1	2	3	3	1	3	3	5
7-Oct	7	3	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	7
8-Oct	2	2	2	2	2	2	2	3	4	4	5	5	5	4	5	4	3	2	2	2	3	2	3	2	5
9-Oct	2	2	3	2	3	2	3	3	4	3	3	3	4	4	5	5	4	2	2	2	2	2	2	2	5
10-Oct	2	2	2	2	2	3	3	3	3	4	5	4	5	4	5	4	4	3	3	2	2	3	3	2	5
11-Oct	3	3	3	1	2	2	2	3	7	5	4	4	4	4	3	4	4	5	2	2	2	3	2	2	7
12-Oct	2	2	2	2	4	2	2	2	3	2	2	1	2	3	4	3	2	1	2	1	3	2	2	2	4
13-Oct	2	1	1	3	2	2	2	2	2	1	2	4	3	4	4	4	4	3	3	3	3	3	2	3	4
14-Oct	3	4	4	4	4	3	3	3	4	4	5	5	5	5	6	5	5	4	3	3	3	3	3	3	6
15-Oct	3	2	2	2	2	2	2	3	3	3	3	2	3	2	2	3	2	2	1	1	1	1	2	2	3
16-Oct	2	2	1	2	2	2	1	1	1	1	2	3	2	2	2	2	1	1	1	2	1	1	1	1	3
17-Oct	1	1	1	1	1	1	1	2	2	2	2	3	3	3	3	3	3	2	2	2	2	2	2	2	3
18-Oct	2	2	2	2	2	2	3	2	3	3	5	2	2	2	2	3	3	2	2	3	1	1	1	1	5
19-Oct	1	1	1	2	2	2	1	1	3	2	4	5	5	4	6	4	4	2	3	5	5	5	6	3	6
20-Oct	6	4	5	2	2	2	2	4	4	6	7	6	6	5	6	5	3	3	2	2	2	1	1	1	7
21-Oct	1	2	2	2	2	2	2	2	1	2	2	3	3	2	6	8	7	7	7	6	5	5	4	4	8
22-Oct	4	4	4	3	2	2	1	1	1	2	2	2	3	3	2	3	4	3	2	2	2	3	2	2	4
23-Oct	2	3	2	2	2	2	3	2	1	2	10	5	5	4	5	5	5	2	2	2	2	3	3	2	10
24-Oct	3	3	2	3	3	2	2	3	3	5	4	4	4	4	5	4	4	4	4	2	3	5	3	3	5
25-Oct	6	2	5	2	2	2	2	2	2	3	3	3	3	3	5	4	3	2	2	2	2	2	2	1	6
26-Oct	1	1	2	2	2	2	1	1	2	2	3	3	3	3	4	3	3	2	2	2	2	2	3	2	4
27-Oct	2	1	1	1	5	2	2	2	2	3	2	2	2	2	2	2	2	3	2	2	3	2	1	1	5
28-Oct	1	1	1	1	2	2	1	1	2	2	1	1	2	1	3	1	4	3	3	2	3	3	2	2	4
29-Oct	2	2	3	2	3	2	2	3	2	2	3	4	3	3	2	1	2	1	1	1	1	2	1	1	4
30-Oct	1	1	2	2	2	1	1	1	1	2	2	2	3	3	3	2	2	2	2	2	2	2	2	2	3
31-Oct	2	2	2	1	1	1	1	1	3	2	2	2	2	2	1	1	1	1	1	1	1	1	2	2	3
Diurnal Maximum																									





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	153	20.56	20.56
6 - 11	308	41.40	61.96
12 - 19	214	28.76	90.73
20 - 28	60	8.06	98.79
29 - 38	9	1.21	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 - October 2023**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	7	6	5	6	6	19	34	15	5	14	5	4	5	6	9	7	153
6 - 11	6	5	0	0	2	21	138	25	10	24	23	6	9	8	7	24	308
12 - 19	4	0	0	0	0	24	86	6	3	1	3	25	23	13	10	16	214
20 - 28	3	0	0	0	0	4	4	1	1	0	0	5	9	24	5	4	60
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	2	5	2	0	9
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	20	11	5	6	8	68	262	47	19	39	31	40	48	56	33	51	744

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

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

Direction of Maximum Speed: 302 deg on Oct 5 14:00																				Hours in Service: 744							
Direction of Maximum Daily Speed Average: 290.3 deg on Oct 5																				Hours of Data: 744							
Direction of Minimum Speed: 66 deg on Oct 13 03:00										Direction of Minimum Daily Speed Average: 0.6 deg on Oct 31										Hours of Missing Data: 0							
Monthly Average Direction: 188.5 deg																								Percent Operational Time: 100.0			
Day	Hourly Period Ending At (MST)																								Daily Average		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Oct	125	112	108	115	121	140	137	137	122	150	164	145	163	165	157	161	152	140	136	133	132	131	135	135	143.5		
2-Oct	133	136	136	134	133	134	140	128	134	137	134	138	145	153	224	211	209	142	131	129	123	145	142	113	140.3		
3-Oct	137	127	121	124	132	126	130	130	129	165	203	227	205	266	262	264	238	180	168	151	140	128	140	132	169.3		
4-Oct	112	106	137	128	117	138	137	227	290	330	297	303	299	294	324	293	291	288	281	284	289	307	315	310	296.0		
5-Oct	294	296	296	293	285	282	295	288	278	277	293	301	298	302	297	304	295	288	273	213	141	155	147	138	290.3		
6-Oct	136	135	139	142	135	133	133	133	134	134	134	137	182	141	163	220	124	127	140	135	132	129	200	259	146.6		
7-Oct	259	234	146	129	123	124	139	112	127	112	87	72	65	314	312	32	314	121	119	138	120	129	133	131	133.2		
8-Oct	148	138	133	129	131	131	149	127	120	121	124	122	122	139	179	185	179	162	132	122	151	164	133	135	139.5		
9-Oct	140	139	139	138	134	112	119	135	138	130	128	126	117	125	122	122	123	137	139	127	124	134	144	135	129.4		
10-Oct	127	133	134	132	133	134	135	131	133	123	122	117	119	119	127	118	118	124	134	146	156	135	135	145	128.7		
11-Oct	128	132	148	172	149	171	128	122	124	121	126	127	120	114	112	110	114	123	126	141	134	138	115	120	126.1		
12-Oct	135	132	135	141	140	115	116	143	137	142	144	293	305	182	190	174	167	147	137	103	138	153	155	146	147.6		
13-Oct	138	207	66	143	142	135	137	132	133	139	137	136	123	113	126	124	124	127	136	139	126	123	127	124	130.7		
14-Oct	126	131	134	131	135	139	133	128	124	124	123	123	129	127	139	142	139	141	141	136	136	125	126	119	131.1		
15-Oct	120	121	117	126	133	134	129	136	137	140	142	127	129	126	135	120	120	136	126	119	144	157	132	140	130.3		
16-Oct	137	141	139	131	132	135	138	136	126	129	165	194	212	209	214	222	179	226	159	61	100	207	322	334	162.9		
17-Oct	341	124	359	12	353	348	11	332	329	338	341	341	344	340	342	345	330	327	332	317	288	312	151	95	337.3		
18-Oct	152	147	139	132	137	137	133	138	132	127	128	132	136	133	124	127	133	123	137	133	107	129	150	152	133.3		
19-Oct	145	145	135	141	131	138	138	116	109	166	223	261	257	237	252	238	217	217	221	254	253	258	266	231	233.7		
20-Oct	237	244	240	186	172	208	178	235	257	267	291	304	307	314	318	319	318	317	334	357	358	271	230	153	283.8		
21-Oct	146	125	128	129	135	131	127	115	129	136	136	134	129	8	342	345	353	349	354	348	341	346	343	348	9.5		
22-Oct	350	349	356	18	30	47	54	86	52	22	46	310	296	331	345	325	353	4	303	298	288	269	313	322	337.4		
23-Oct	325	282	309	267	227	201	211	218	208	201	307	300	303	302	293	298	298	282	271	258	246	244	216	194	276.6		
24-Oct	193	219	207	205	204	203	207	204	216	270	279	300	300	291	264	261	264	261	270	246	328	284	278	274	260.7		
25-Oct	280	322	277	270	267	250	238	240	240	241	230	210	238	253	274	273	272	245	253	280	287	257	234	227	256.1		
26-Oct	224	204	218	206	208	203	162	169	165	212	279	298	307	288	294	277	266	251	242	257	257	234	209	229	249.2		
27-Oct	242	165	168	247	343	338	330	328	331	339	341	344	359	349	343	323	300	312	281	221	217	209	137	163	317.4		
28-Oct	144	156	147	167	207	204	205	212	207	354	326	336	341	332	350	332	245	243	239	242	243	264	277	278	250.9		
29-Oct	280	272	270	275	262	268	289	291	273	285	330	307	322	321	349	356	304	281	261	251	31	34	346	294	295.4		
30-Oct	277	328	19	19	12	12	59	118	94	123	127	91	174	173	164	167	143	137	137	138	136	126	128	134	128.7		
31-Oct	135	136	130	134	125	84	347	319	348	349	333	331	345	350	55	101	179	224	244	236	201	78	192	180	59.6		
164.7	169.3	156.9	150.6	151.4	161.6	159.3	161.5	154.7	156.0	196.2	263.6	267.7	262.0	255.5	256.4	239.5	231.4	214.4	215.4	208.9	208.1	193.7	177.6				
Diurnal Average																											
All monthly, daily, and diurnal averages have been calculated using vector methods																											



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

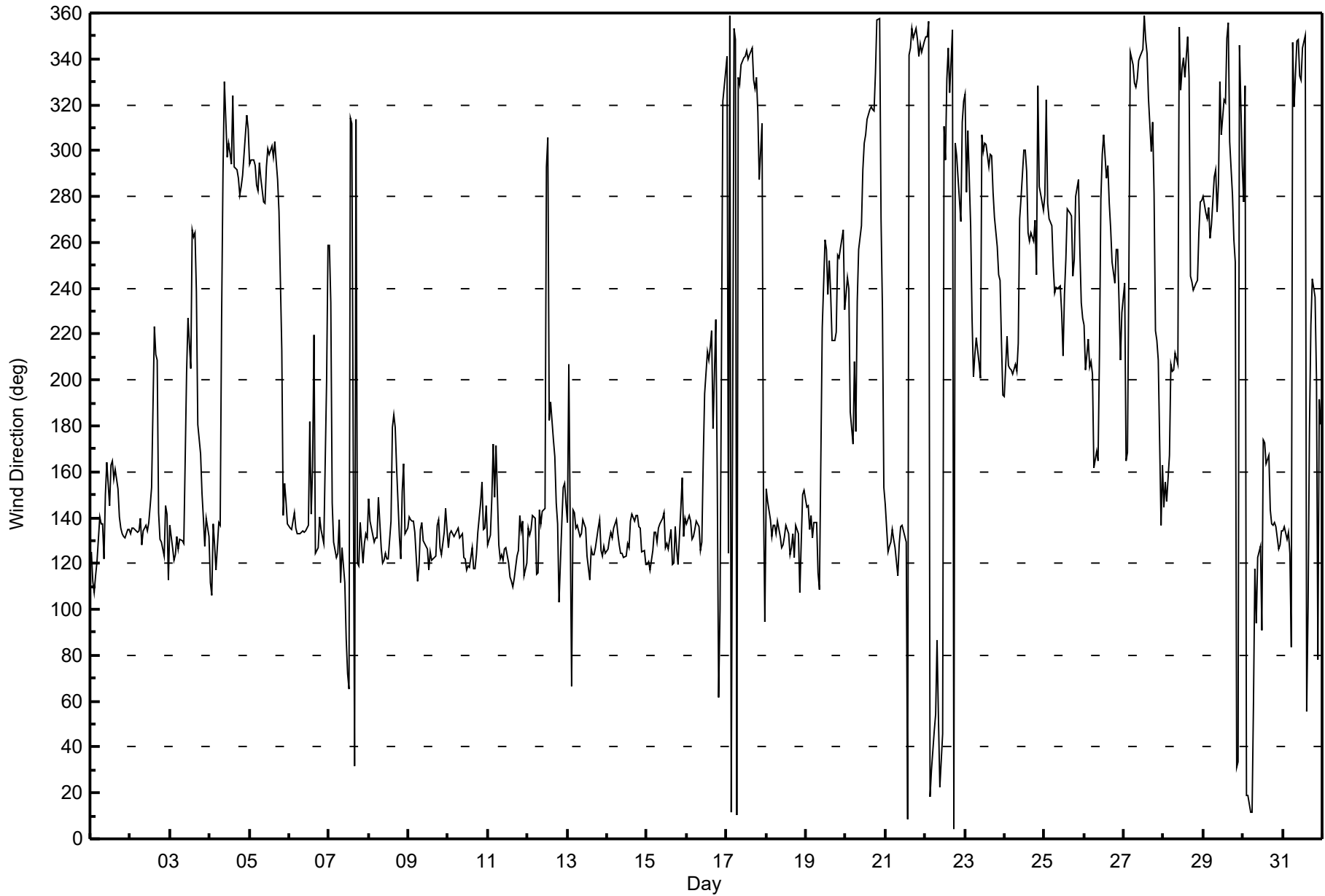
Wind Direction (WD) - deg
Athabasca Valley - October 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 113 deg on Oct 24 20:00 Minimum Value: 8 deg on Oct 28 19:00 Percentiles: P ₁ = 8 P ₁₀ = 11 Q ₁ = 14 Median = 17 Q ₃ = 26 P ₉₀ = 45 P ₉₉ = 86																			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-Oct	34	42	37	31	62	49	34	28	15	21	22	18	17	17	19	20	16	17	12	13	13	16	15	12	62
2-Oct	11	12	11	13	12	13	17	14	15	13	13	14	18	25	50	21	23	14	11	12	38	55	36	39	55
3-Oct	39	28	34	22	33	25	19	20	11	47	58	34	20	42	15	19	16	19	22	13	15	16	18	17	58
4-Oct	20	17	10	18	20	30	49	12	40	21	15	11	11	12	14	14	12	11	10	12	14	14	16	14	49
5-Oct	15	10	15	14	14	11	11	15	10	10	13	13	12	12	13	12	13	14	32	52	37	16	21	20	52
6-Oct	22	24	15	12	13	13	16	12	12	12	14	17	35	25	43	37	45	72	45	34	21	33	84	9	84
7-Oct	35	29	68	40	19	30	38	31	16	30	34	67	36	50	22	58	43	82	98	22	15	20	17	20	98
8-Oct	26	17	19	12	11	14	25	21	14	14	14	13	15	27	15	16	14	16	15	23	23	31	16	19	31
9-Oct	19	15	14	14	22	32	23	17	18	17	15	18	18	19	17	14	16	20	26	19	17	14	15	12	32
10-Oct	10	11	12	11	13	15	14	16	20	20	19	20	17	17	17	18	18	14	17	18	21	18	18	25	25
11-Oct	17	20	38	26	31	27	30	47	16	14	15	16	19	22	22	20	19	15	17	27	16	17	28	19	47
12-Oct	17	14	12	9	14	31	24	17	13	16	21	95	56	31	20	30	13	18	11	48	33	21	15	16	95
13-Oct	13	38	97	17	17	18	12	16	16	13	18	20	18	20	17	16	13	15	16	15	17	14	13	13	97
14-Oct	13	14	15	16	16	15	15	15	13	14	14	14	16	15	18	16	17	14	16	16	15	13	15	14	18
15-Oct	13	19	20	13	11	11	13	13	13	13	18	16	16	15	21	13	15	24	14	30	63	73	26	17	73
16-Oct	14	10	13	26	29	21	11	11	16	20	34	46	13	12	11	15	41	70	79	29	44	92	52	26	92
17-Oct	50	52	25	57	28	23	50	13	9	12	14	13	17	18	15	18	17	9	9	14	22	45	80	22	80
18-Oct	17	25	25	21	17	29	25	15	14	18	43	12	11	12	14	13	13	16	9	35	54	32	41	32	54
19-Oct	26	30	22	28	22	21	10	29	34	33	23	16	15	16	16	14	32	21	30	14	12	13	22	30	34
20-Oct	17	10	13	44	30	32	41	24	12	11	18	12	13	14	12	16	13	12	20	17	24	50	59	64	64
21-Oct	60	27	22	31	19	16	23	28	28	15	15	16	33	82	22	18	19	20	20	18	16	17	17	17	82
22-Oct	19	18	20	22	19	24	16	16	35	43	80	35	37	17	22	10	22	34	14	16	22	10	15	18	80
23-Oct	25	40	41	40	45	67	29	10	9	58	76	13	13	15	19	13	14	11	10	10	10	45	45	76	
24-Oct	23	21	16	17	18	13	13	18	26	73	14	17	15	16	13	12	13	14	26	113	75	43	8	8	113
25-Oct	33	78	14	8	9	11	10	10	10	11	20	13	33	26	16	11	14	10	9	12	13	34	8	10	78
26-Oct	10	18	11	17	12	21	19	19	49	13	32	18	16	16	18	18	13	16	11	11	9	19	50	17	50
27-Oct	14	64	81	23	27	15	8	10	9	18	17	16	18	20	19	22	11	11	37	16	11	22	17	18	81
28-Oct	15	20	22	24	60	12	15	16	60	58	10	16	23	18	40	57	62	11	8	9	9	12	11	12	62
29-Oct	14	8	11	8	11	9	11	11	16	21	14	16	16	22	24	25	27	52	94	49	64	49	14	48	94
30-Oct	81	19	16	27	28	24	42	49	22	19	19	30	45	23	18	14	16	13	13	12	13	12	11	10	81
31-Oct	12	11	16	13	19	48	30	58	22	19	10	8	18	22	52	35	35	89	34	48	64	87	66	27	89
	81	78	97	57	62	67	50	58	60	73	80	95	56	82	52	58	62	89	98	113	75	92	84	64	
	Diurnal Maximum																								



Wood Buffalo Environmental Association
Hourly Averages

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





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS08 FORT CHIPEWYAN OCTOBER 2023

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

November 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT CHIPEWYAN (AMS08)
OCTOBER 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	685	34	59	96.64	8.1	0	1.5	0
TRS (ppb) Average	706	35	38	99.6	0.9	0	0.5	0
O3(ppb) Average	707	34	37	99.6	38.2	0	32.8	-
NO2(ppb) Average	704	36	40	99.46	11.5	0	3.5	-
NO(ppb) Average	704	36	40	99.46	3.6	-	1.9	-
NOX(ppb) Average	704	36	40	99.46	11.9	-	4.9	-
PM2.5(ug/m3) Average	739	2	5	99.6	189.7	12	71.7	3
CO(ppm) Average	706	33	38	99.33	0.8	0	0.3	-
CO2(ppm) Average	706	33	38	99.33	470.6	-	448.3	-
Temperature 2 m (C) Average	744	0	0	100	19.4	-	13.5	-
Relative Humidity (%) Average	744	0	0	100	99.8	-	92	-
Wind Speed 10 m (km/h) Average	742	0	2	99.73	41	-	26	-
Wind Direction 10 m (deg) Average	742	0	2	99.73	-	-	-	-
PC(mm) Total	743	0	1	99.87	1	-	2.9	-
Leaf Wetness (% of range) Average	744	0	0	100	84.4	-	42.5	-
Global Solar Radiation (W/m2) Average	744	0	0	100	447.8	-	121.6	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT CHIPEWYAN (AMS08)
OCTOBER 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	685	0.28	0.6	-	0	0	0	0.1	0.2	0.8	8.1
TRS (ppb) Average	706	0.19	0.1	-	0.1	0.1	0.1	0.2	0.2	0.3	0.9
O3(ppb) Average	707	23.14	6.4	-	5.2	13.9	19.3	23.4	27.4	32.1	38.2
NO2(ppb) Average	704	1.07	1.6	-	0	0.2	0.3	0.5	1	2.6	11.5
NO(ppb) Average	704	0.61	0.8	-	0	0	0	0.1	1.5	2	3.6
NOX(ppb) Average	704	1.67	1.9	-	0	0.2	0.3	0.8	2.5	3.5	11.9
PM2.5(ug/m3) Average	739	15.54	19.9	-	1.4	5	6.3	8.6	15.7	33.6	189.7
CO(ppm) Average	706	0.07	0.1	-	0	0	0	0	0.1	0.2	0.8
CO2(ppm) Average	706	431.63	7.9	-	418.6	422.8	425.9	430.7	435.8	441.7	470.6
Temperature 2 m (C) Average	744	3.68	7.2	-	-12.6	-5.9	-3.2	5.5	9.2	12.9	19.4
Relative Humidity (%) Average	744	77.29	13.1	-	42.2	58.8	67.3	78.7	88.6	92.7	99.8
Wind Speed 10 m (km/h) Average	742	15.2	7	-	1	7	10	15	20	24	41
Wind Direction 10 m (deg) Average	742	-	-	-	-	-	-	-	-	-	-
Precipitation (mm) Total	743	-	-	10.06	-	-	-	-	-	-	-
Leaf Wetness (% of range) Average	744	6.06	13.7	-	0.9	1.2	1.4	1.6	2.1	11.4	84.4
Global Solar Radiation (W/m2) Average	744	64.85	113	-	0	0	0	0.1	79.4	272.5	447.8

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

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
CO, CO2, SO2, O3, PM2.5, TRS	01 Oct 2023 15:00	01 Oct 2023 15:00	1	Station power failure
CO, CO2, SO2, O3, PM2.5, TRS	07 Oct 2023 17:00	07 Oct 2023 17:00	1	Station power failure
SO2, O3, NO2, PM2.5, TRS	29 Oct 2023 00:00	29 Oct 2023 00:00	1	Station power failure
NO2	01 Oct 2023 15:00	01 Oct 2023 16:00	2	Station power failure
NO2	07 Oct 2023 17:00	07 Oct 2023 17:00	1	Station power failure
CO, CO2	29 Oct 2023 00:00	29 Oct 2023 01:00	2	Station power failure
SO2	11 Oct 2023 15:00	12 Oct 2023 03:00	13	Unstable Operation - sample line disconnected
SO2	12 Oct 2023 05:00	12 Oct 2023 13:00	9	Unstable Operation - sample line disconnected
CO, CO2	09 Oct 2023 06:00	09 Oct 2023 06:00	1	DAS Failure - data not recorded
Wind Speed, Wind Direction	16 Oct 2023 22:00	16 Oct 2023 22:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	27 Oct 2023 23:00	27 Oct 2023 23:00	1	Flat line in sensor output signal
Precipitation	29 Oct 2023 00:00	29 Oct 2023 00:00	1	Flat line in sensor output signal



Wood Buffalo Environmental Association
Summary of Hour Averages

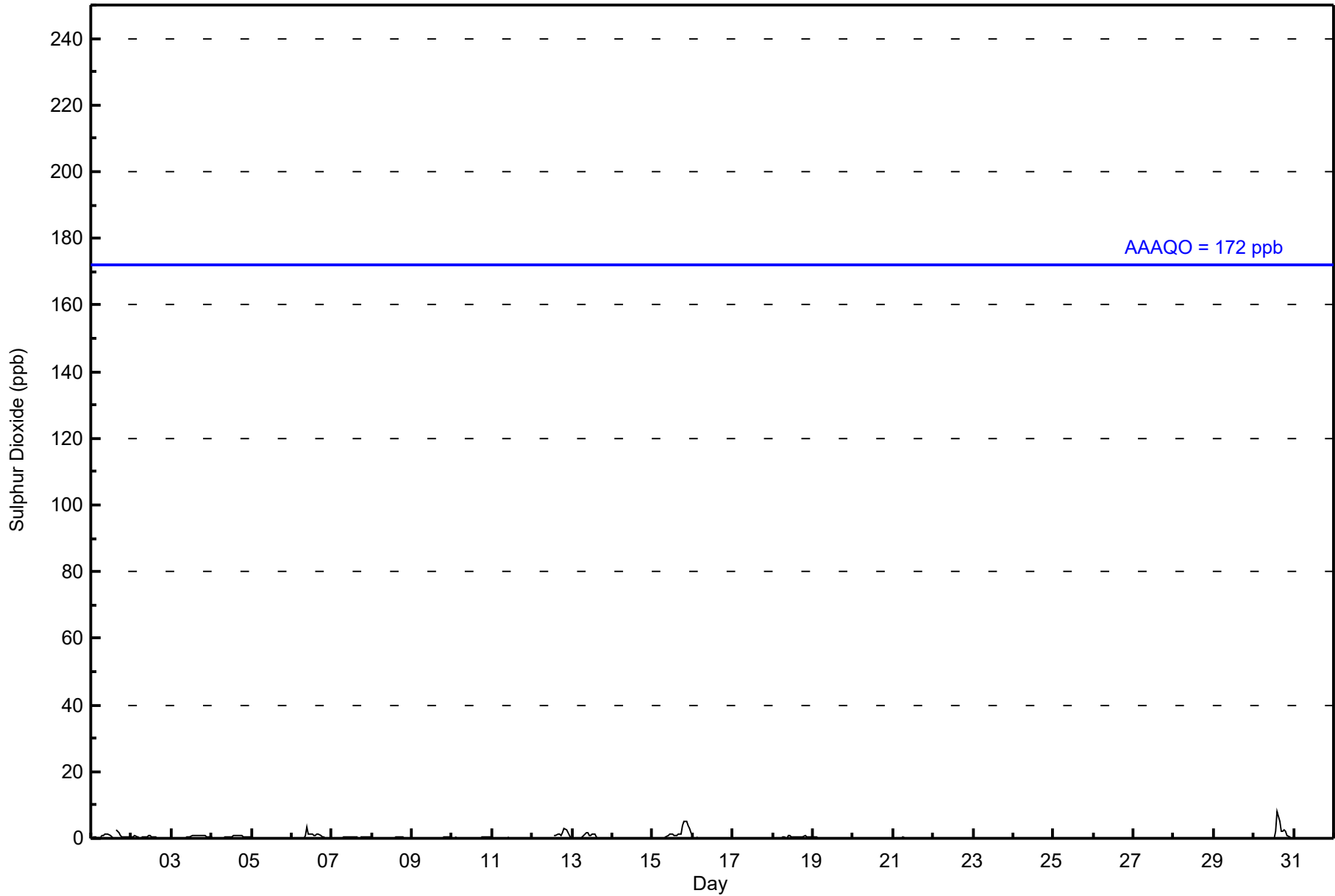
Sulphur Dioxide (SO₂) - ppb
Fort Chipewyan - October 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 8.1 ppb on Oct 30 15:00 Maximum Daily Average: 1.5 ppb on Oct 15		Hours in Service: 744 Hours of Data: 685 Hours of Missing Data: 59 Hours of Calibration: 34 Percent Operational Time: 96.6																									
Minimum Value: 0.0 ppb on Oct 5 07:00 Maximum Diurnal Average: 0.5 ppb at hour 15 Monthly Average: 0.28 ppb		Minimum Daily Average: 0.0 ppb on Oct 25 Minimum Diurnal Average: 0.1 ppb at hour 5 Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.2 P ₉₀ = 0.8 P ₉₉ = 3.2																									
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-Oct	0.2	0.3	0.3	0.5	Z	0.5	0.7	1.0	1.4	1.3	1.1	1.0	0.6	0.2	PF	2.5	1.5	0.9	0.4	0.2	0.2	0.2	0.2	0.3	0.7	2.5	
2-Oct	0.4	0.6	0.7	0.6	0.6	Z	0.5	0.4	0.6	0.6	0.8	0.8	0.6	0.4	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.8
3-Oct	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.5	0.6	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.7	0.6	0.6	0.5	0.5	0.5	0.8	0.8
4-Oct	0.4	Z	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.5	0.6	0.8	0.8	0.8	0.7	0.6	0.5	0.4	0.3	0.3	0.2	0.4	0.8	0.8
5-Oct	0.2	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	0.0	0.2	0.2
6-Oct	0.0	0.0	0.0	Z	0.1	0.0	0.0	0.1	0.8	3.6	1.2	1.2	1.1	0.8	0.7	1.3	1.1	0.8	0.6	0.5	0.2	0.1	0.1	0.1	0.6	3.6	3.6
7-Oct	0.1	0.1	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	PF	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3
8-Oct	0.2	0.2	0.2	0.2	0.1	Z	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.6	0.3	0.1	0.1	0.1	0.1	0.2	0.2	0.6	0.6
9-Oct	Z	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	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
10-Oct	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	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.3
11-Oct	0.1	0.2	Z	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	C	C	C	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	0.2	0.2
12-Oct	UO	UO	UO	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	0.9	1.0	1.3	1.3	0.8	1.7	3.1	2.6	1.7	0.7	0.1	--	3.1
13-Oct	0.1	0.1	0.1	0.1	Z	0.2	0.6	1.1	1.5	1.7	0.9	0.8	1.3	1.4	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.7	1.7
14-Oct	0.0	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1
15-Oct	Z	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.3	0.9	1.4	1.3	1.1	0.9	0.9	1.2	1.4	1.2	3.9	4.9	5.1	4.0	2.8	1.5	1.5	5.1	5.1
16-Oct	0.8	Z	0.4	0.2	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.8
17-Oct	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	0.0	0.0	0.1
18-Oct	0.0	0.0	0.0	Z	0.0	0.1	0.5	0.3	0.2	0.8	0.6	0.5	0.5	0.6	0.6	0.4	0.3	0.3	0.5	0.9	0.4	0.5	0.5	0.5	0.4	0.9	0.9
19-Oct	0.4	0.3	0.2	0.2	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.4	0.4
20-Oct	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	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
21-Oct	Z	0.0	0.0	0.0	0.0	0.1	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	0.4
22-Oct	0.0	Z	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
23-Oct	0.0	0.0	Z	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.1
24-Oct	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	0.0	0.0	0.0	0.0
25-Oct	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
26-Oct	0.0	0.0	0.0	0.0	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	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1
27-Oct	Z	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	0.0	0.0	0.0	0.0	0.1
28-Oct	0.0	Z	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
29-Oct	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	0.1	0.1	0.1	0.1
30-Oct	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	2.1	8.1	4.9	2.0	2.0	2.5	2.1	0.8	0.3	0.2	0.1	1.1	8.1	8.1
31-Oct	0.0	0.1	0.0	0.0	Z	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerospan C - Calibration 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 - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	685	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: 685

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Fort Chipewyan - October 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	8	4	7	40	48	39	79	56	21	25	30	94	138	53	30	683
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	8	4	7	40	48	39	79	56	21	25	30	94	138	53	30	683

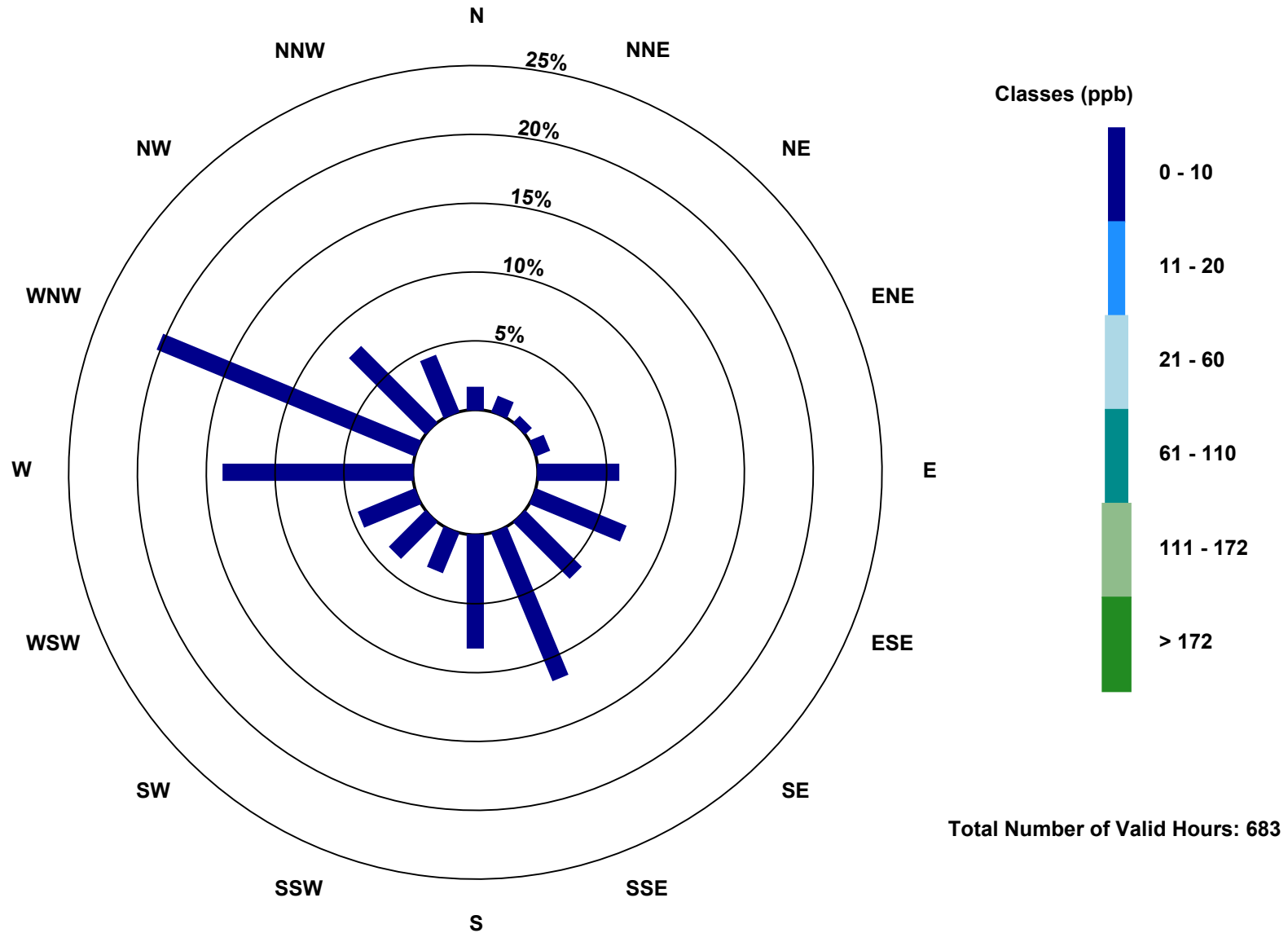
Total Number of Valid Hours: 683

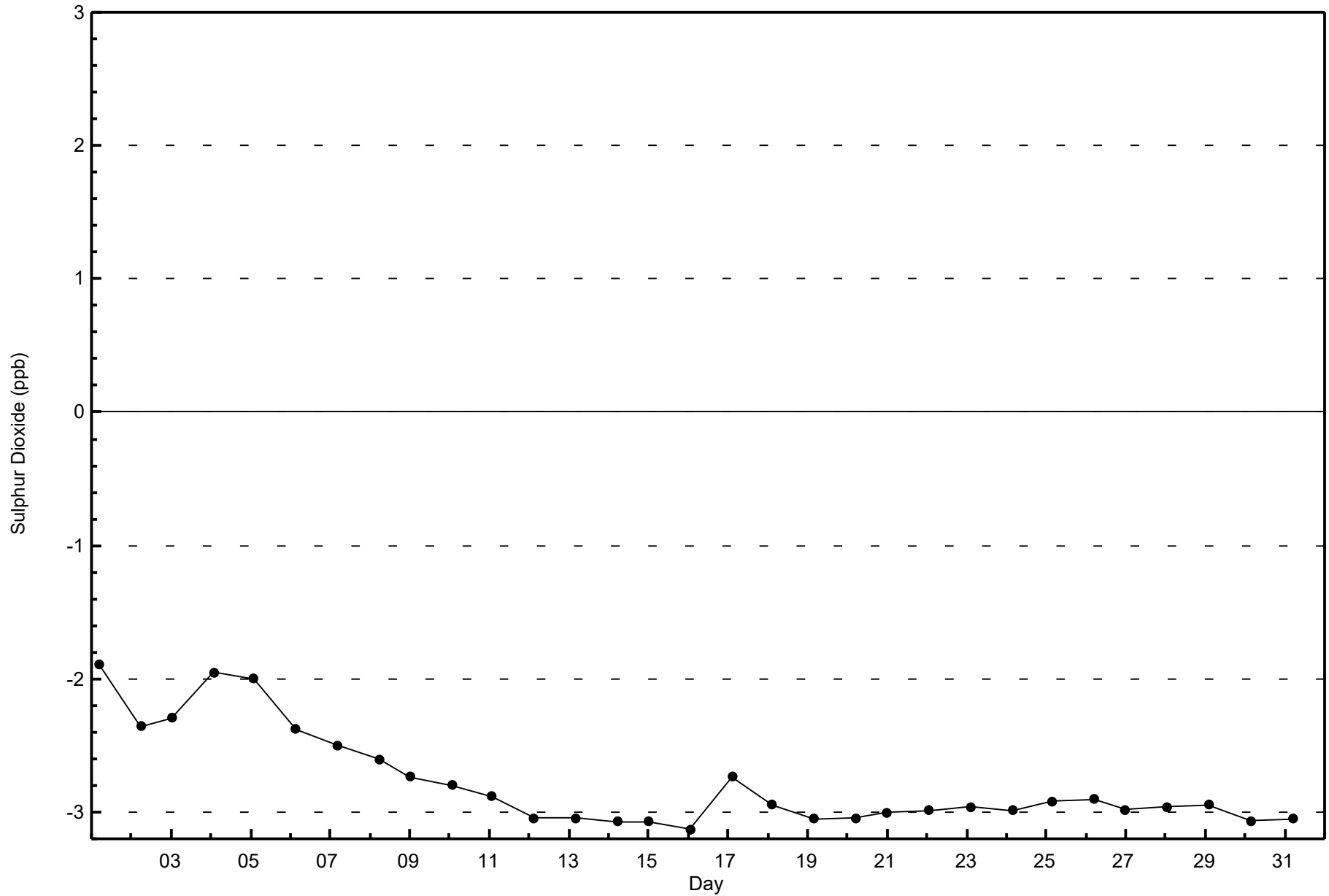
Total Number of Hours: 744

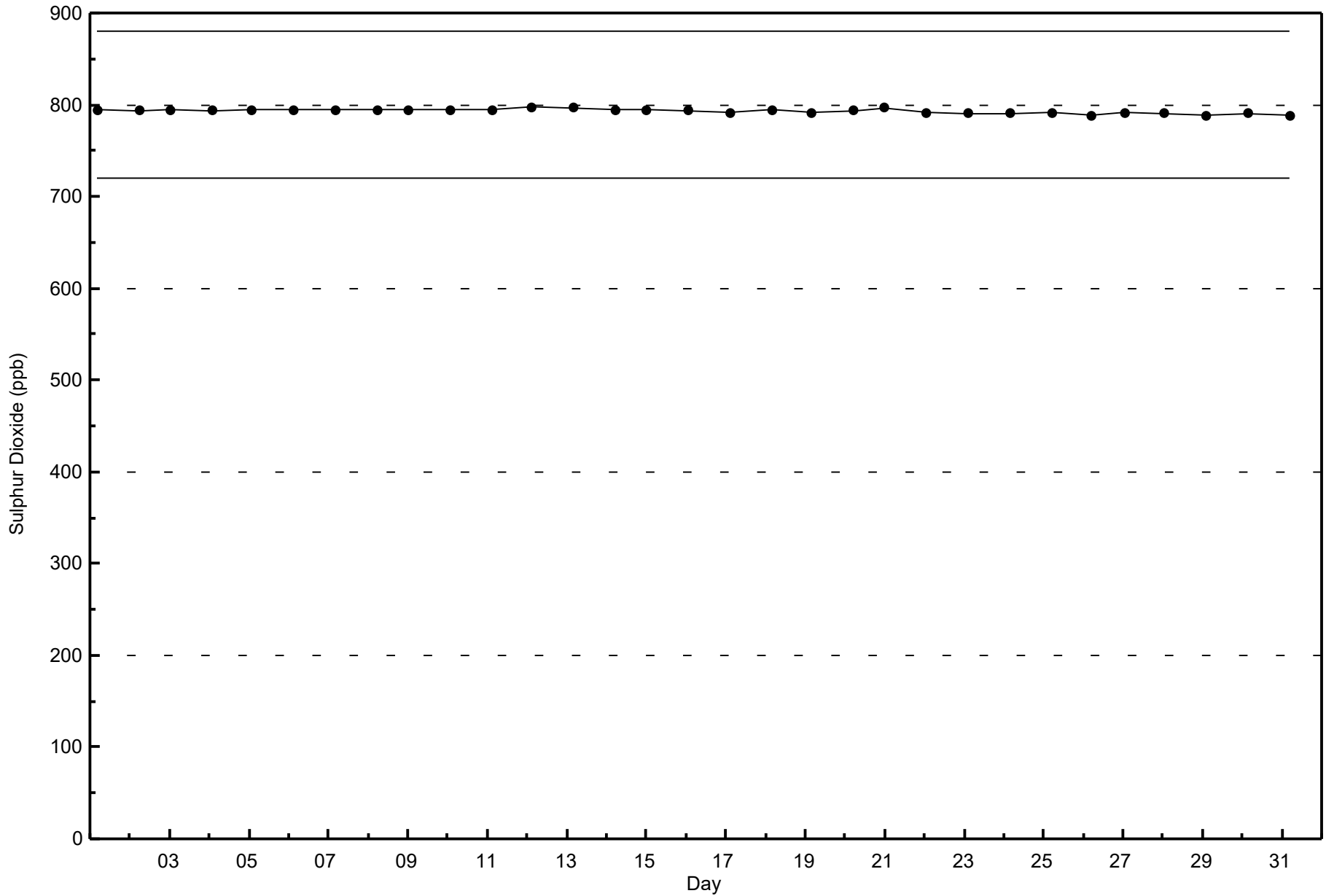


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Sulphur Dioxide (SO₂) - ppb
Fort Chipewyan



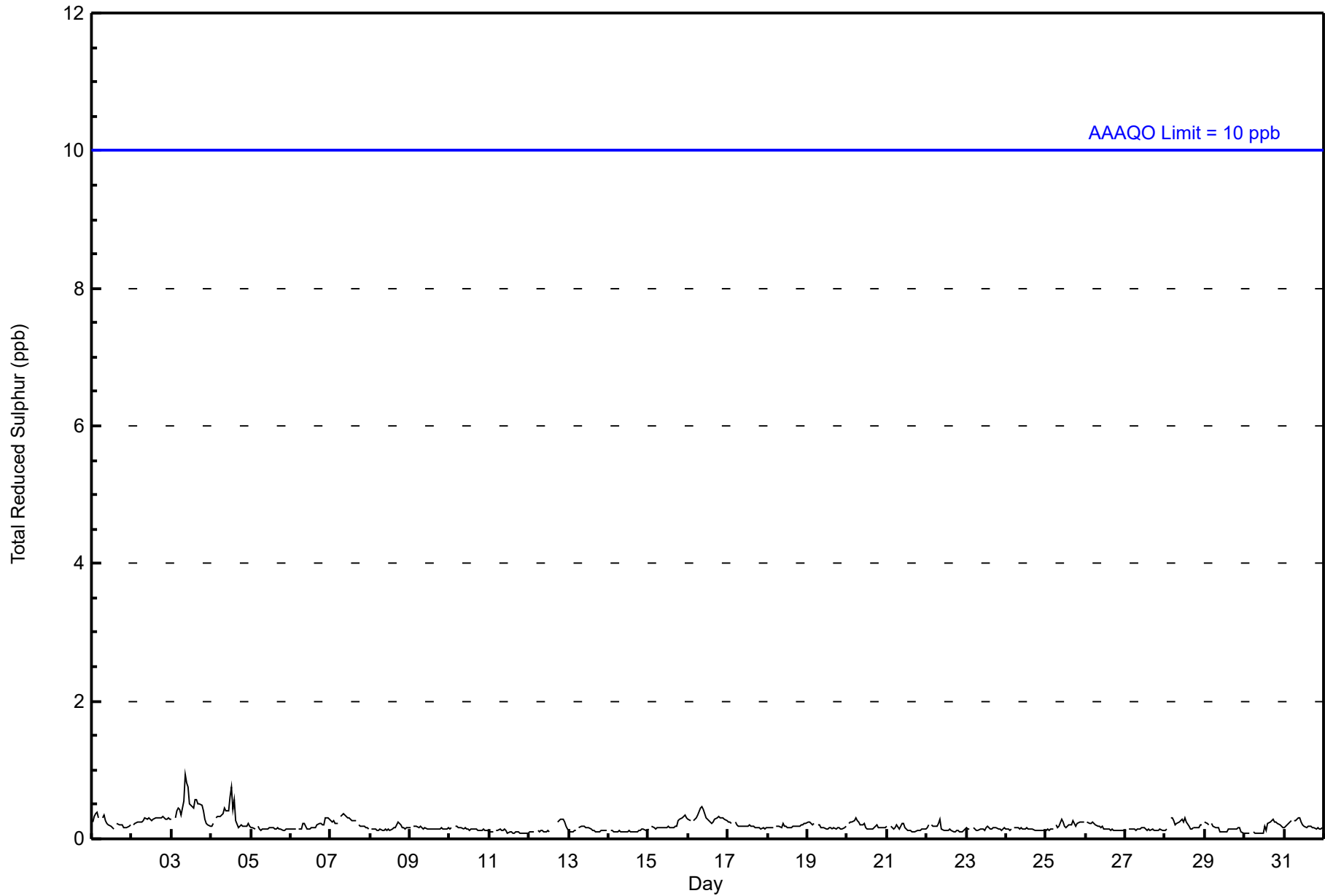






Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	706	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Fort Chipewyan - October 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	10	8	4	7	39	52	51	83	58	21	25	31	93	136	55	31	704
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	10	8	4	7	39	52	51	83	58	21	25	31	93	136	55	31	704

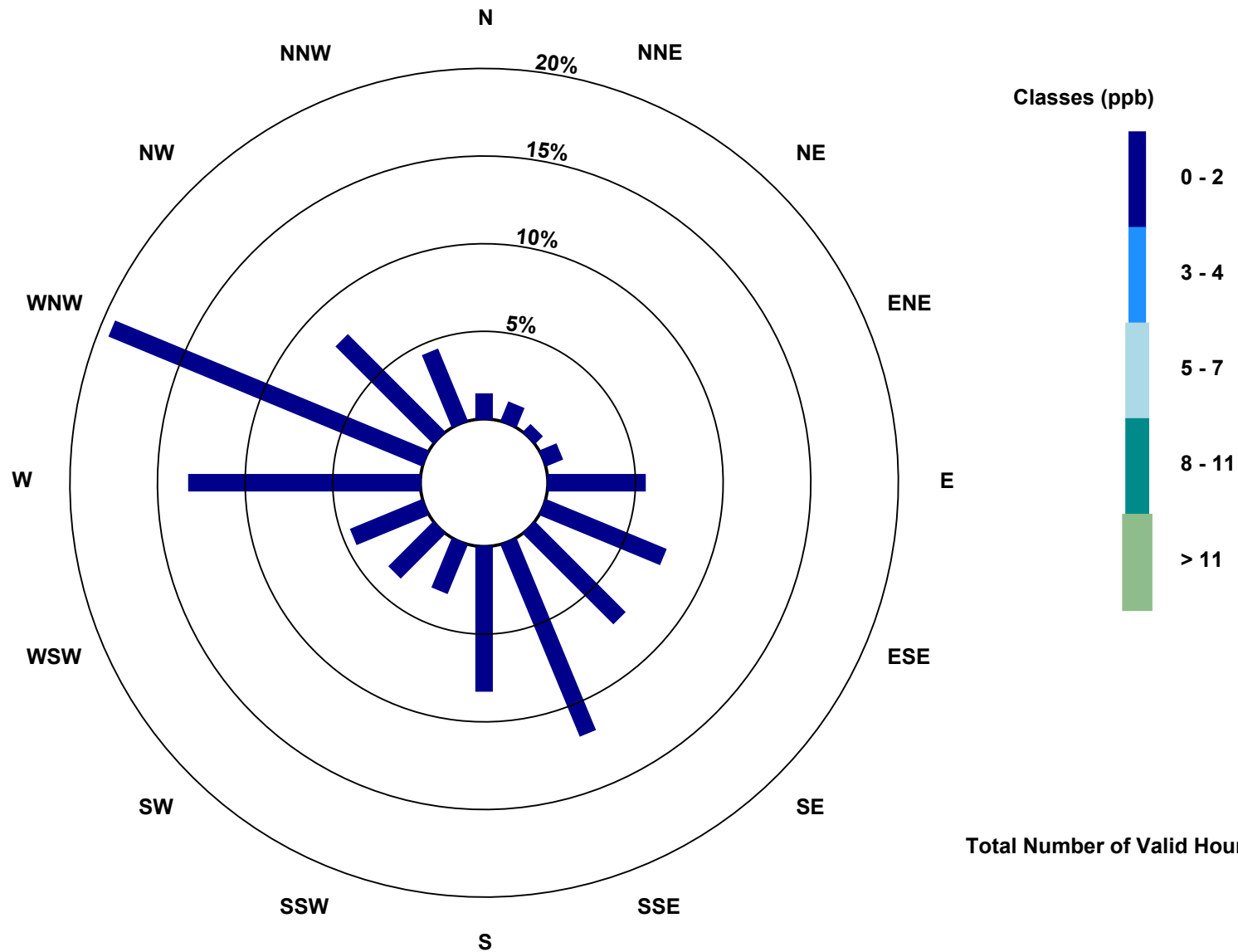
Total Number of Valid Hours: 704

Total Number of Hours: 744

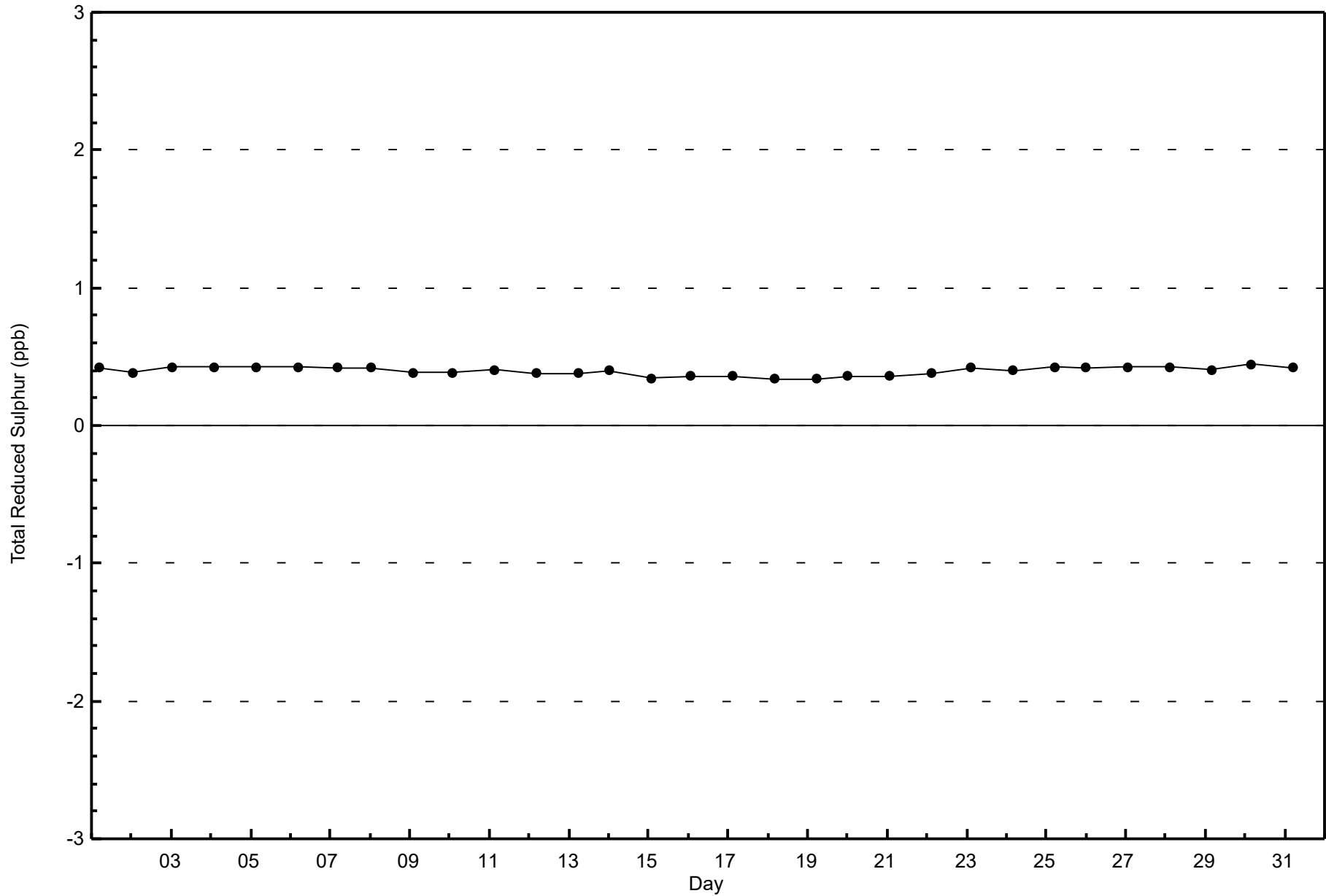


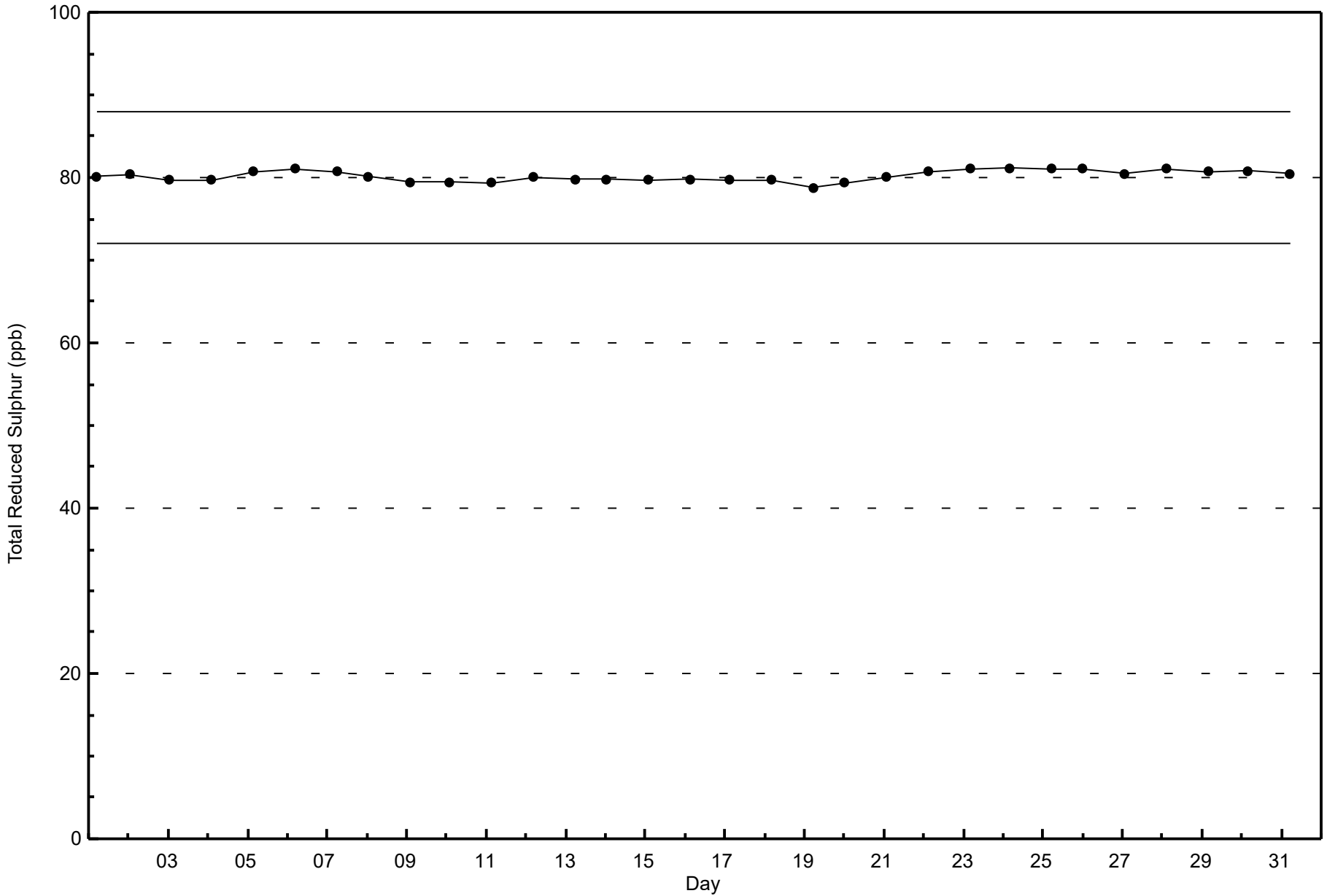
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Total Reduced Sulphur (TRS) - ppb
Fort Chipewyan



Total Number of Valid Hours: 704





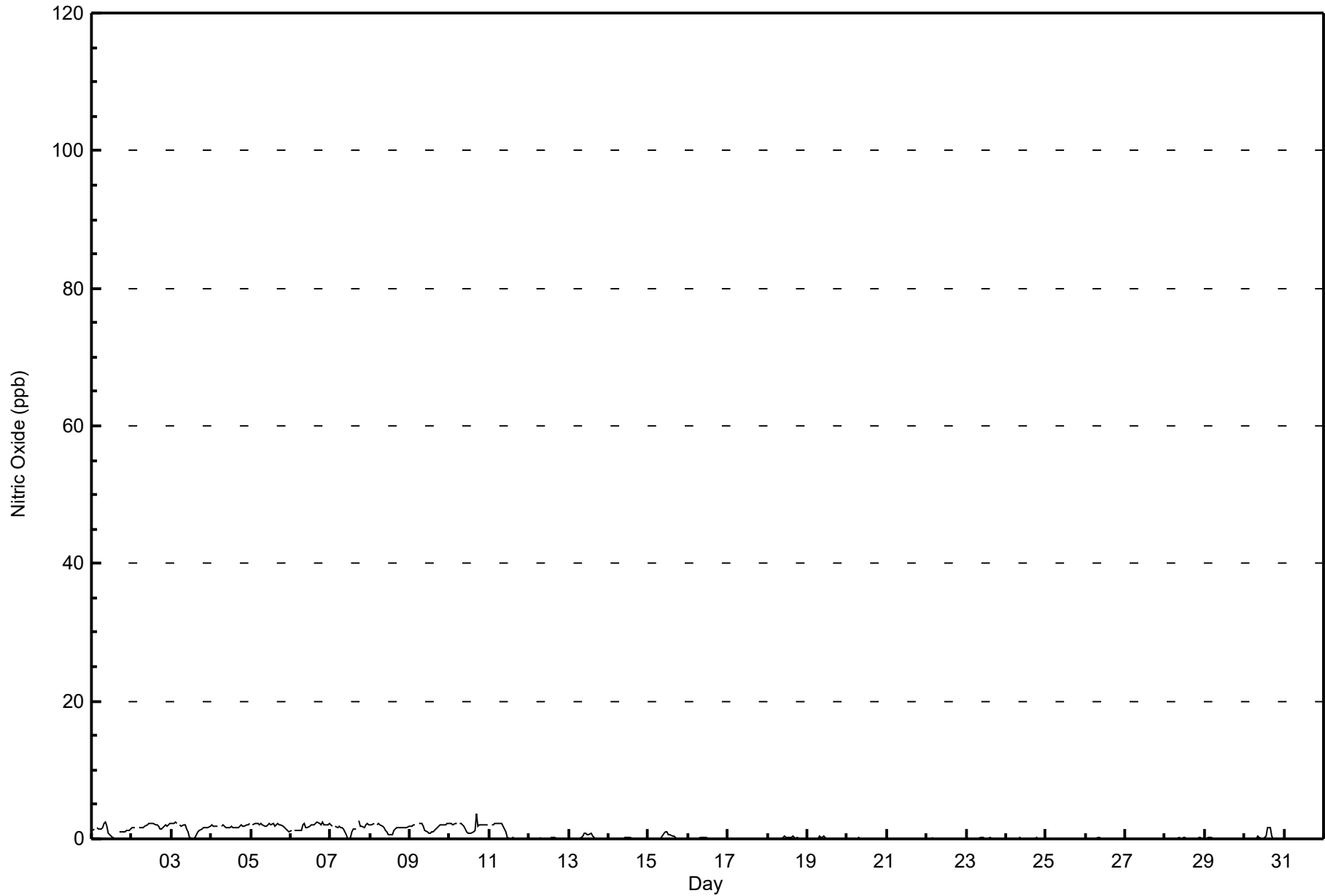


Maximum Value: 3.6 ppb on Oct 10 17:00		Maximum Daily Average: 1.9 ppb on Oct 5		Hours in Service: 744																																											
Minimum Value: 0.0 ppb on Oct 3 13:00		Minimum Daily Average: 0.0 ppb on Oct 21		Hours of Data: 704																																											
Maximum Diurnal Average: 0.8 ppb at hour 8		Minimum Diurnal Average: 0.4 ppb at hour 13		Hours of Missing Data: 40																																											
Monthly Average: 0.61 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 1.5 P ₉₀ = 2.0 P ₉₉ = 2.3		Hours of Calibration: 36																																											
				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-Oct	1.3	1.4	Z	1.7	1.4	1.5	1.5	2.2	2.4	1.8	0.7	0.5	0.1	0.2	PF	PF	1.0	1.0	1.0	1.0	1.1	1.1	1.2	1.5	1.2	2.4																					
2-Oct	1.6	1.6	1.6	Z	1.6	1.6	1.6	1.6	1.8	2.1	2.2	2.2	2.2	2.2	2.0	2.1	1.8	1.5	1.4	1.6	1.9	1.8	2.0	2.3	1.9	2.3																					
3-Oct	2.2	2.3	2.4	2.3	Z	2.0	1.8	2.1	2.0	1.5	1.0	0.2	0.0	0.0	0.3	0.5	1.0	1.2	1.4	1.7	1.7	1.7	1.9	1.4	2.4																						
4-Oct	2.0	1.9	1.9	1.9	1.9	Z	1.9	1.9	1.9	1.7	1.6	1.6	1.8	1.7	1.7	1.6	1.7	2.1	1.9	1.9	2.0	2.1	2.2	1.8	2.2																						
5-Oct	Z	2.1	2.2	2.3	2.2	2.0	2.2	2.0	1.8	1.8	2.1	2.1	2.1	2.1	1.7	2.0	2.2	2.1	2.1	1.8	1.6	1.4	1.1	1.1	1.9	2.3																					
6-Oct	1.1	Z	1.2	1.2	1.3	1.2	1.2	1.9	2.2	1.7	1.6	1.8	2.0	2.1	2.1	2.3	2.5	2.3	2.1	2.4	2.0	2.0	2.1	2.3	1.9	2.5																					
7-Oct	2.0	1.9	Z	1.9	1.6	1.9	1.6	1.7	1.4	0.5	0.0	0.0	0.1	1.1	1.4	1.5	PF	2.6	1.9	1.8	1.7	1.9	2.2	2.0	1.5	2.6																					
8-Oct	2.0	2.1	2.1	Z	2.0	2.2	2.1	1.9	1.6	1.2	1.0	0.7	0.6	0.7	1.3	1.4	1.7	1.6	1.6	1.6	1.6	1.6	1.7	1.8	1.6	2.2																					
9-Oct	1.8	1.9	2.0	2.1	Z	2.1	2.2	2.3	1.8	1.3	0.9	0.8	0.8	0.9	1.1	1.3	1.6	1.9	2.1	2.1	2.1	2.1	2.2	2.2	1.7	2.3																					
10-Oct	2.2	2.2	2.1	2.2	2.2	Z	2.3	2.2	1.8	1.4	1.0	0.7	0.7	0.8	1.0	1.2	3.6	1.9	2.0	2.0	2.0	2.0	2.0	2.0	1.8	3.6																					
11-Oct	Z	2.0	2.1	2.1	2.2	2.3	2.3	2.3	1.7	1.4	1.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.9	2.3																					
12-Oct	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.2	C	C	C	C	C	0.1	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2																					
13-Oct	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.2	0.5	0.8	0.8	0.7	0.6	0.9	0.4	0.3	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.9																					
14-Oct	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	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	0.2																					
15-Oct	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.2	0.7	0.9	1.0	0.6	0.5	0.4	0.3	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.0																					
16-Oct	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2																					
17-Oct	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1																					
18-Oct	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.2	0.3	0.3	0.3	0.1	0.0	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.3																					
19-Oct	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.3	0.2	0.3	0.5	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5																					
20-Oct	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1																					
21-Oct	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																					
22-Oct	0.0	0.1	0.0	0.0	0.1	Z	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1																					
23-Oct	Z	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2																					
24-Oct	0.1	Z	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1																					
25-Oct	0.0	0.0	Z	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																					
26-Oct	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.1	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	0.1																					
27-Oct	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	0.1	0.0	0.0	0.1																					
28-Oct	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.3	0.1	0.0	PF	0.1																					
29-Oct	Z	0.2	0.1	0.1	0.1	0.1	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	0.0	0.0	0.0	0.1	0.2																					
30-Oct	0.0	Z	0.1	0.0	0.0	0.0	0.1	0.0	0.3	0.3	0.1	0.1	0.3	0.4	1.6	1.6	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.6																					
31-Oct	0.0	0.1	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1																					
																								Diurnal Average																							
																								Diurnal Maximum																							
0.6		0.8		0.7		0.7		0.7		0.7		0.7		0.8		0.8		0.6		0.6		0.5		0.4		0.5		0.5		0.6		0.6		0.6		0.6		0.6		0.6		0.6		0.6		0.6	
2.2		2.3		2.4		2.3		2.2		2.3		2.3		2.3		2.4		2.1		2.2		2.2		2.2		2.1		2.3		3.6		2.6		2.1		2.4		2.1		2.1		2.2		2.3			
Z - zerospan			C - Calibration			PF - Power Failure																																									



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	704	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: 704

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Nitric Oxide (NO) - ppb
Fort Chipewyan - October 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	4	6	39	54	48	85	57	21	24	31	94	133	57	29	702
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	8	4	6	39	54	48	85	57	21	24	31	94	133	57	29	702

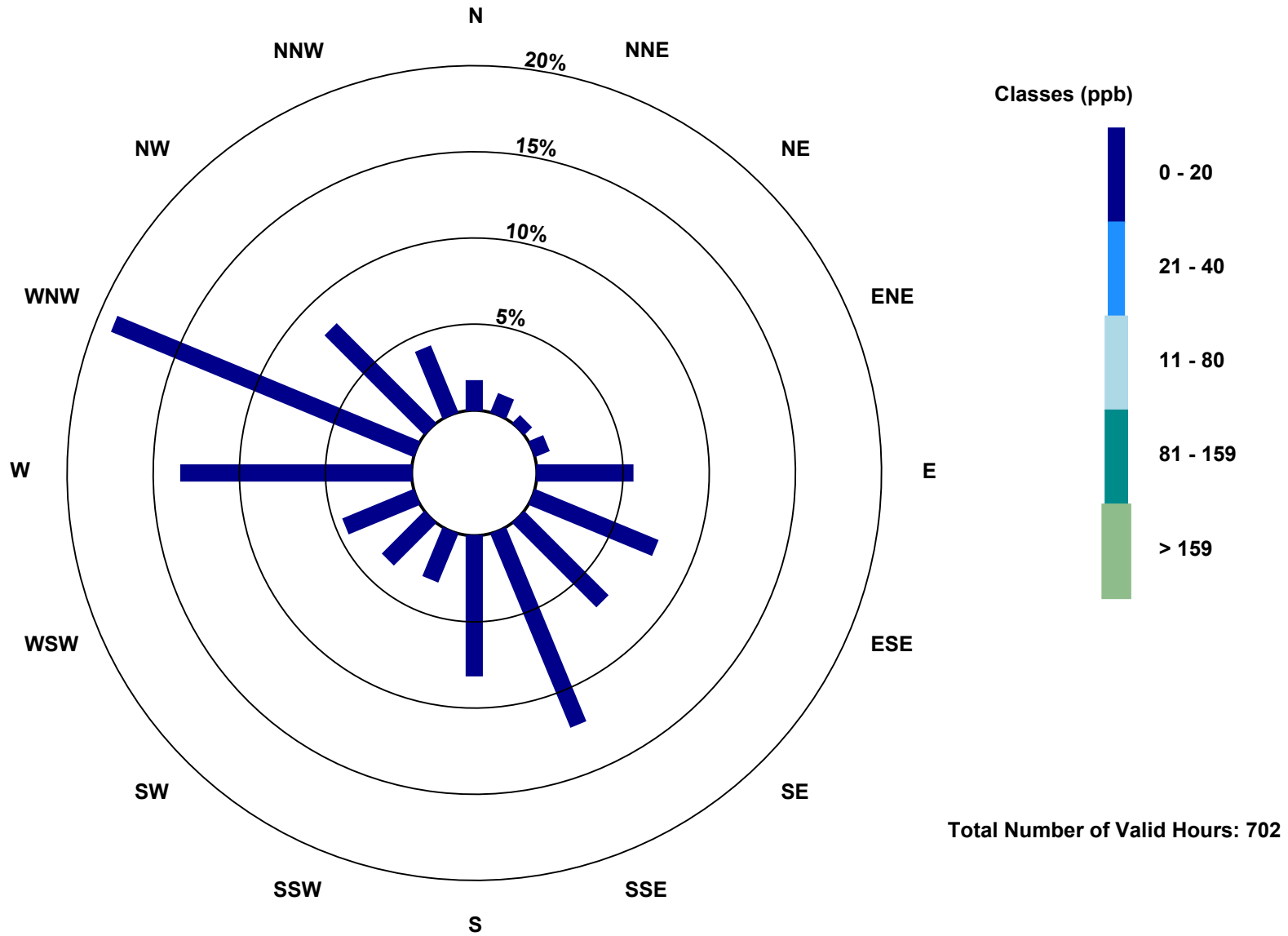
Total Number of Valid Hours: 702

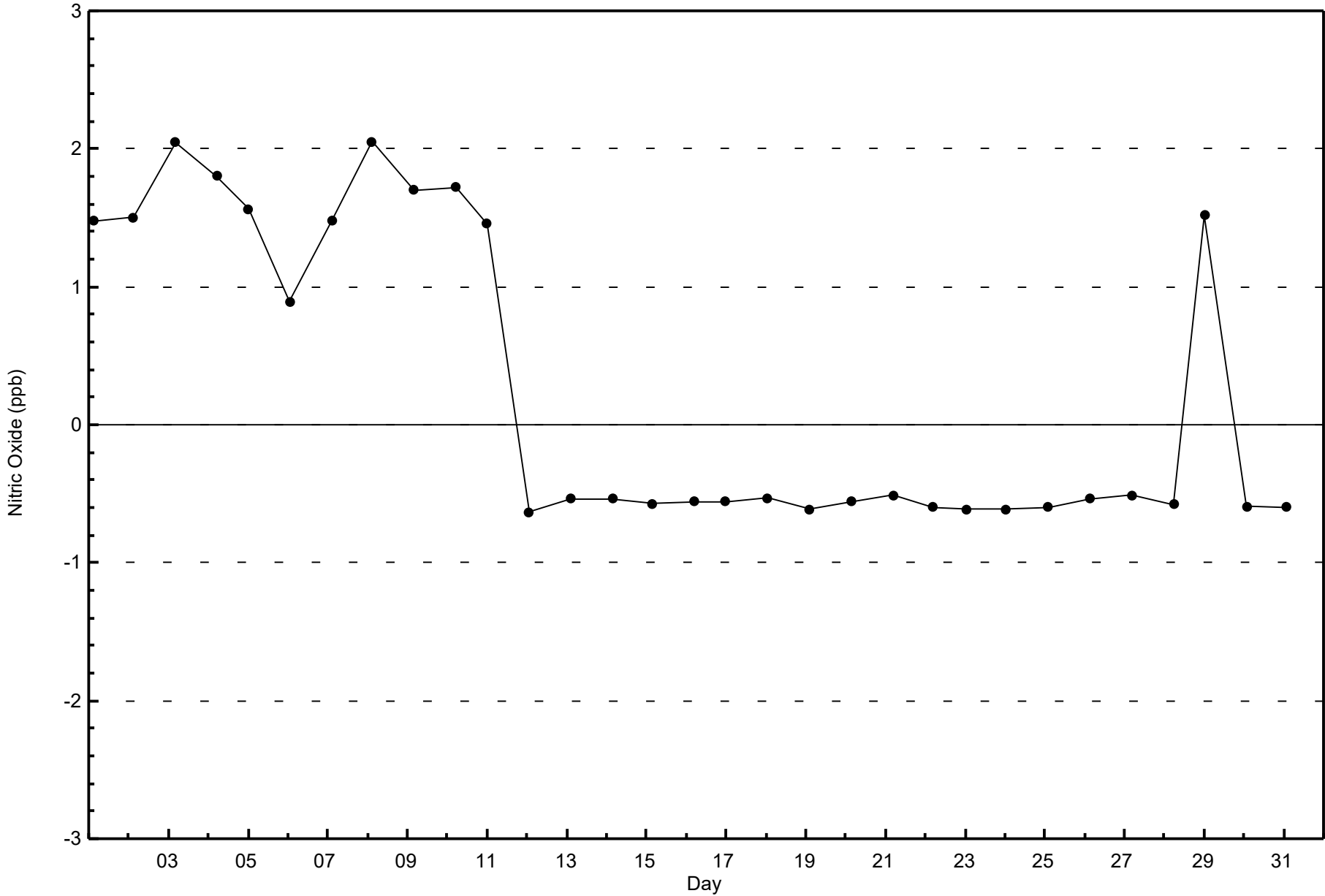
Total Number of Hours: 744

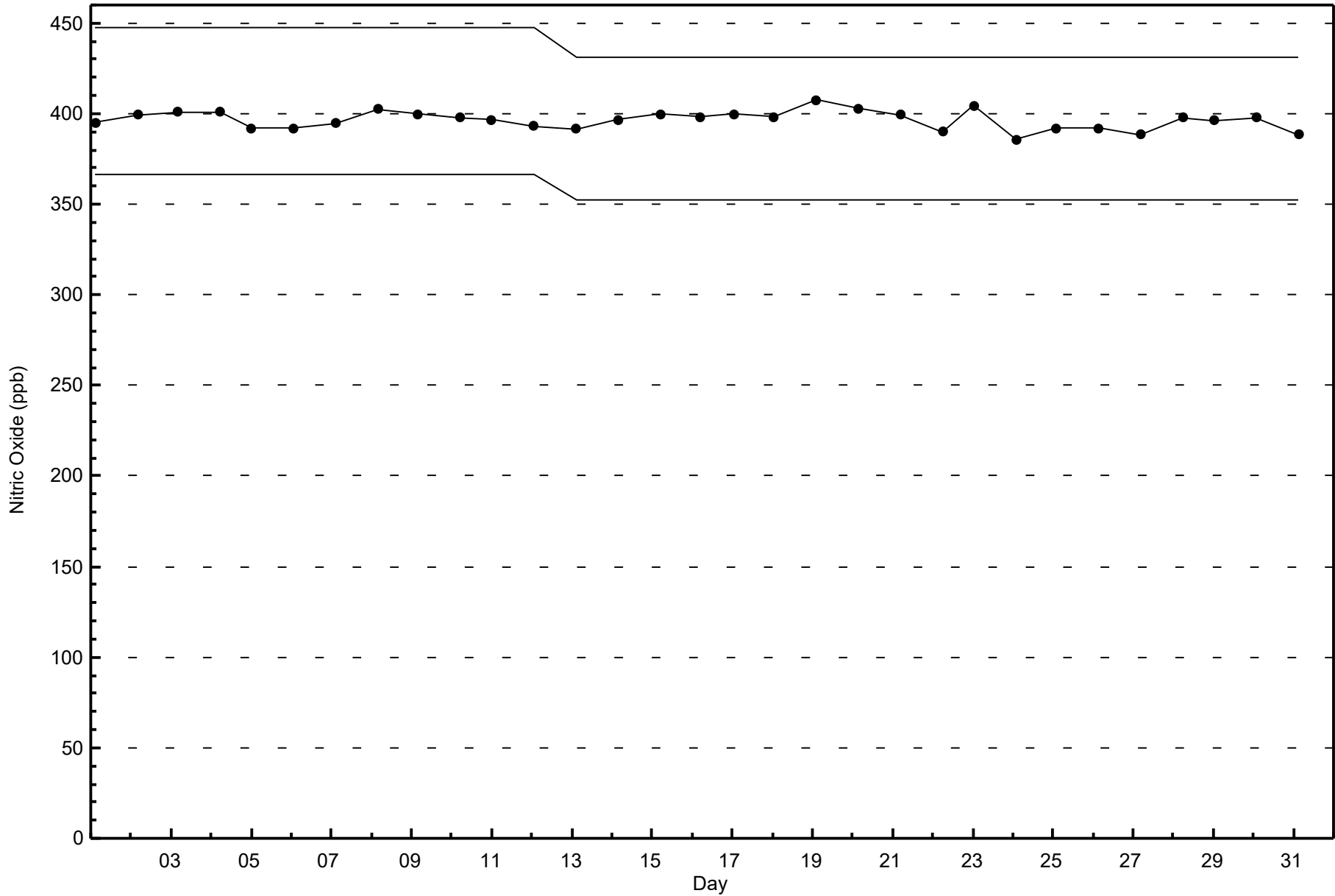


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitric Oxide (NO) - ppb
Fort Chipewyan









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

Fort Chipewyan - October 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 11.5 ppb on Oct 30 17:00	Maximum Daily Average: 3.5 ppb on Oct 15		Hours of Data:	704
Minimum Value: 0.0 ppb on Oct 29 11:00	Minimum Daily Average: 0.2 ppb on Oct 29		Hours of Missing Data:	40
Maximum Diurnal Average: 1.6 ppb at hour 17	Minimum Diurnal Average: 0.7 ppb at hour 12		Hours of Calibration:	36
Monthly Average: 1.07 ppb	Percentiles: P ₁ = 0.1 P ₁₀ = 0.2 Q ₁ = 0.3 Median = 0.5 Q ₃ = 1.0 P ₉₀ = 2.6 P ₉₉ = 8.6		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-Oct	1.3	4.9	Z	8.0	3.8	3.7	4.6	4.1	3.2	1.8	1.3	1.4	0.9	0.9	PF	PF	1.6	1.6	1.4	1.3	1.1	1.3	1.3	1.3	2.4	8.0	
2-Oct	1.9	1.8	1.9	Z	2.1	2.2	2.2	2.6	2.7	3.0	3.6	3.6	3.6	4.0	4.5	4.3	4.1	3.9	3.9	2.9	2.1	1.8	1.5	1.3	2.8	4.5	
3-Oct	1.2	1.2	1.0	1.0	Z	0.9	0.6	1.0	0.9	1.3	0.9	0.6	0.3	0.3	0.4	0.5	1.0	0.8	1.1	0.8	0.3	0.7	1.0	1.3	0.8	1.3	
4-Oct	1.0	0.4	0.6	0.6	0.7	Z	0.6	0.7	1.0	0.7	0.8	0.7	1.0	0.5	0.4	0.2	0.2	0.1	0.4	0.1	0.1	0.1	0.3	0.2	0.5	1.0	
5-Oct	Z	0.2	0.1	0.2	0.2	Z	0.2	0.2	0.3	0.2	0.1	0.2	0.2	0.3	0.3	0.4	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.3	
6-Oct	0.2	Z	0.2	0.2	0.1	0.2	1.7	7.7	6.0	3.1	1.5	2.0	2.3	2.0	2.1	4.1	6.9	7.4	8.7	7.3	2.7	1.2	1.1	1.6	3.1	8.7	
7-Oct	1.0	0.5	Z	0.9	0.8	1.5	0.8	1.1	0.3	0.3	0.4	0.3	0.5	1.0	1.3	1.2	PF	0.6	0.4	0.3	0.4	0.5	0.3	0.3	0.7	1.5	
8-Oct	0.3	0.3	0.4	Z	0.5	0.4	0.4	0.4	0.4	0.5	0.4	0.5	0.5	0.6	1.6	3.3	5.5	7.2	3.3	0.5	0.5	0.5	0.5	0.6	1.3	7.2	
9-Oct	0.6	0.6	0.6	0.6	Z	0.7	0.7	0.7	0.5	0.7	0.8	0.7	0.6	0.8	0.6	0.6	0.7	0.7	0.6	0.6	0.5	0.5	0.5	0.6	0.6	0.8	
10-Oct	0.6	0.6	0.7	0.6	0.7	Z	0.8	0.7	0.6	0.8	0.7	0.7	0.7	0.7	0.8	0.7	3.5	1.1	0.8	1.0	0.7	0.7	0.7	0.7	0.9	3.5	
11-Oct	Z	0.7	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.8	0.6	0.6	0.7	0.9	0.7	0.8	1.0	1.0	0.5	0.5	0.4	0.3	0.3	0.6	1.0	
12-Oct	0.3	Z	0.5	0.5	0.9	0.9	1.0	1.2	C	C	C	C	C	1.5	1.6	2.0	1.9	1.8	4.2	6.6	7.4	5.6	3.0	0.7	2.3	7.4	
13-Oct	0.6	0.5	Z	0.9	0.9	1.1	1.8	2.3	1.9	1.7	1.4	1.3	1.5	1.9	1.2	0.9	0.8	0.5	0.4	0.4	0.4	0.4	0.4	0.5	1.0	2.3	
14-Oct	0.4	0.4	0.5	Z	0.6	0.6	0.5	0.5	0.5	0.5	0.6	0.5	0.6	0.6	0.5	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6
15-Oct	0.6	0.6	0.7	0.8	Z	1.0	1.0	1.2	1.3	1.9	1.9	1.9	2.1	1.6	1.8	2.6	3.7	3.5	7.2	9.2	9.5	9.5	9.0	7.4	3.5	9.5	
16-Oct	7.0	7.7	8.6	7.6	3.3	Z	1.7	1.8	1.2	1.0	1.0	0.7	0.7	0.7	0.7	0.7	0.7	1.0	0.9	2.1	1.2	2.3	1.9	1.4	2.4	8.6	
17-Oct	Z	2.6	0.8	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.6	0.7	0.7	0.6	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.4	2.6	
18-Oct	0.2	Z	0.3	0.3	0.3	0.5	1.1	1.0	0.9	1.6	1.9	1.8	1.5	1.5	1.7	2.0	1.5	1.5	2.3	3.1	2.6	2.9	3.3	3.7	1.6	3.7	
19-Oct	3.5	3.2	Z	3.0	3.5	2.7	2.2	1.6	1.3	1.5	1.4	0.3	0.3	0.4	0.4	0.3	0.5	0.6	1.3	2.3	0.5	0.3	0.4	0.4	1.4	3.5	
20-Oct	0.3	0.4	0.5	Z	0.4	0.4	0.4	1.1	0.6	0.5	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.5	0.4	0.2	0.8	0.7	0.1	0.4	1.1	
21-Oct	0.1	0.1	0.1	0.1	Z	1.6	3.1	1.2	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.3	0.4	3.1	
22-Oct	0.2	0.4	0.9	0.4	0.7	Z	0.5	0.5	0.4	0.2	0.1	0.2	0.2	0.2	0.2	0.3	0.4	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.9	
23-Oct	Z	0.4	0.4	0.3	0.3	0.2	0.2	0.3	0.4	0.5	0.4	0.2	0.2	0.3	0.4	0.2	0.2	0.3	0.2	0.1	0.2	0.1	0.1	0.1	0.3	0.5	
24-Oct	0.1	Z	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	0.3	0.1	0.2	0.2	0.2	0.2	0.2	0.4	
25-Oct	0.2	0.2	Z	0.3	0.3	0.2	0.7	0.3	0.2	0.3	0.3	0.2	0.2	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.7	
26-Oct	0.3	0.3	0.3	Z	0.3	0.2	0.4	0.6	0.4	0.5	0.4	0.3	0.2	0.3	0.2	0.2	0.3	0.4	0.2	0.3	0.3	0.2	0.3	0.3	0.3	0.6	
27-Oct	0.2	0.2	0.2	0.2	Z	0.3	0.2	0.4	0.2	0.4	0.5	0.4	0.3	0.3	0.4	0.3	0.5	0.3	0.3	0.7	0.6	1.0	0.2	0.4	0.4	1.0	
28-Oct	0.2	0.2	0.3	0.3	0.5	Z	0.4	0.3	0.5	0.3	0.3	0.4	0.4	0.2	0.2	0.2	0.2	0.3	0.4	0.2	0.2	0.2	0.2	PF	0.3	0.5	
29-Oct	Z	0.2	0.3	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.0	0.1	0.2	0.3	
30-Oct	0.0	Z	0.5	0.1	0.1	0.3	0.6	0.3	1.6	0.9	0.0	0.0	0.1	1.0	6.5	10.0	11.5	7.5	5.9	5.9	5.0	4.0	2.7	2.0	2.9	11.5	
31-Oct	1.2	0.8	Z	0.6	0.5	0.4	0.5	0.4	0.4	0.5	0.4	0.2	0.2	0.3	0.2	0.3	0.2	0.3	0.4	0.3	0.2	0.2	0.2	0.2	0.4	1.2	

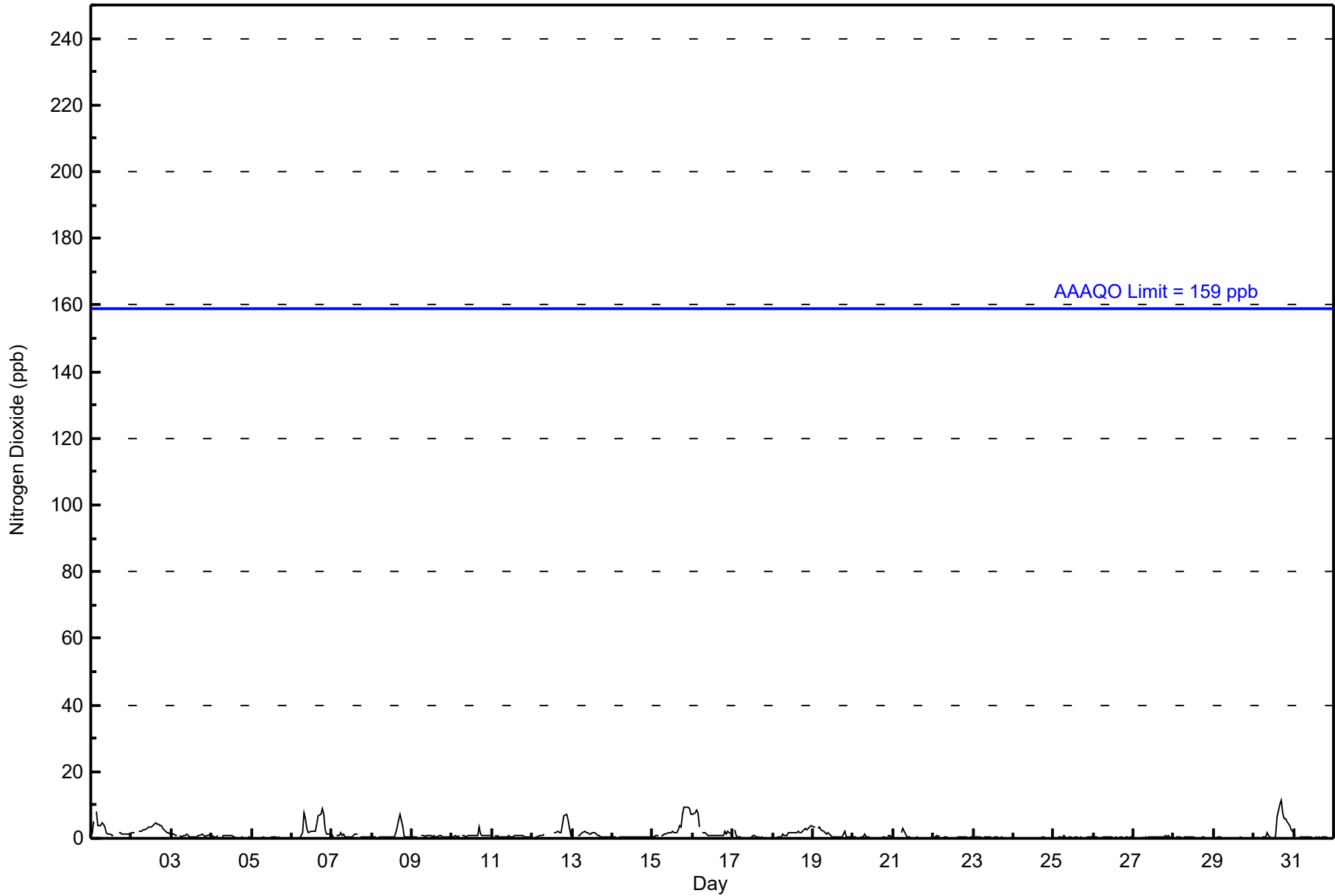
0.9	1.1	0.8	1.1	0.9	0.8	1.0	1.1	1.0	0.9	0.8	0.7	0.7	0.8	1.0	1.2	1.6	1.4	1.5	1.6	1.3	1.2	1.0	0.9	Diurnal Average	
7.0	7.7	8.6	8.0	3.8	3.7	4.6	7.7	6.0	3.1	3.6	3.6	3.6	4.0	6.5	10.0	11.5	7.5	8.7	9.2	9.5	9.5	9.0	7.4	Diurnal Maximum	

Z - zerospan C - Calibration 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 - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	704	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: 704

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Fort Chipewyan - October 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	4	6	39	54	48	85	57	21	24	31	94	133	57	29	702
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	12	8	4	6	39	54	48	85	57	21	24	31	94	133	57	29	702

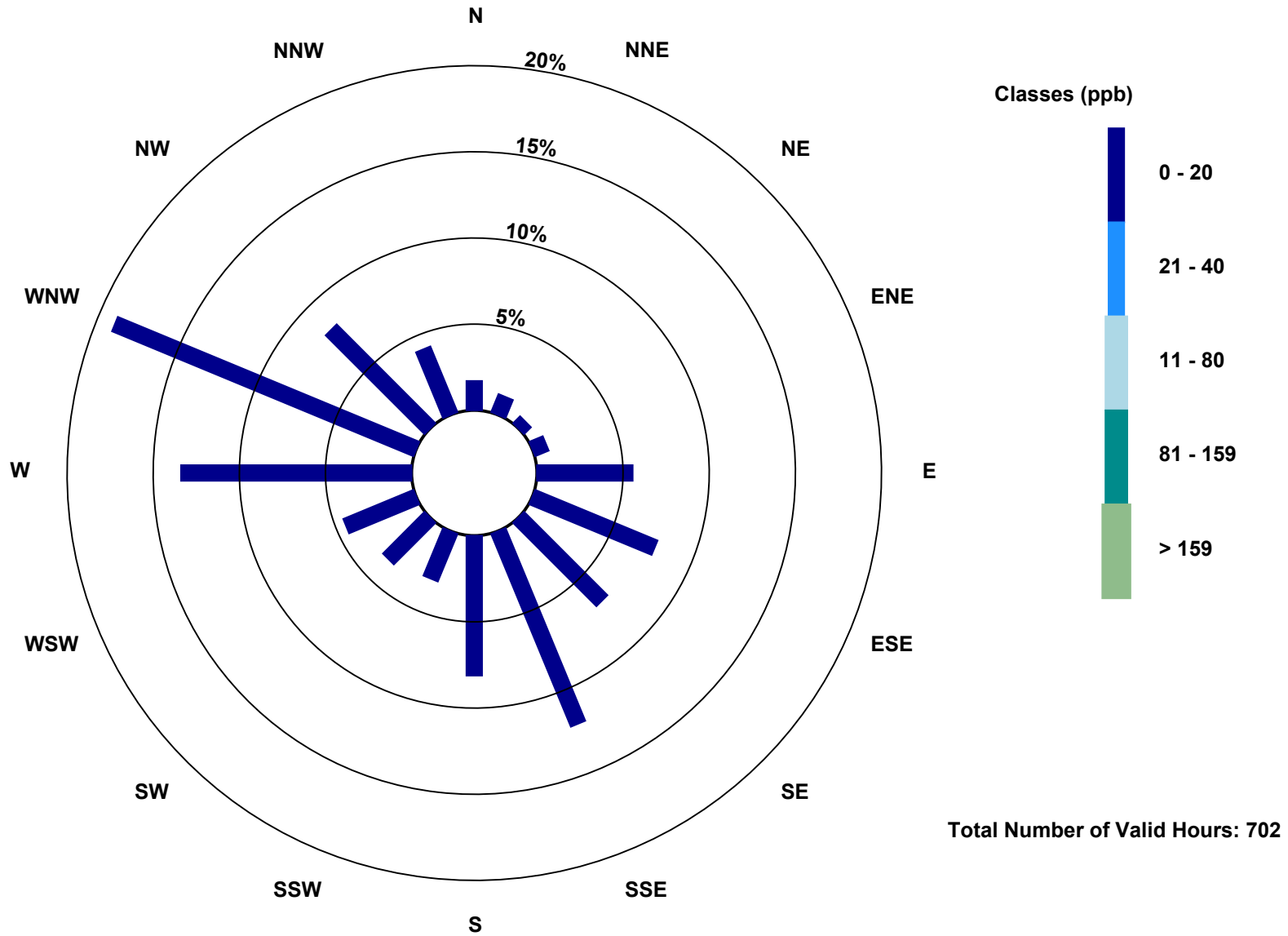
Total Number of Valid Hours: 702

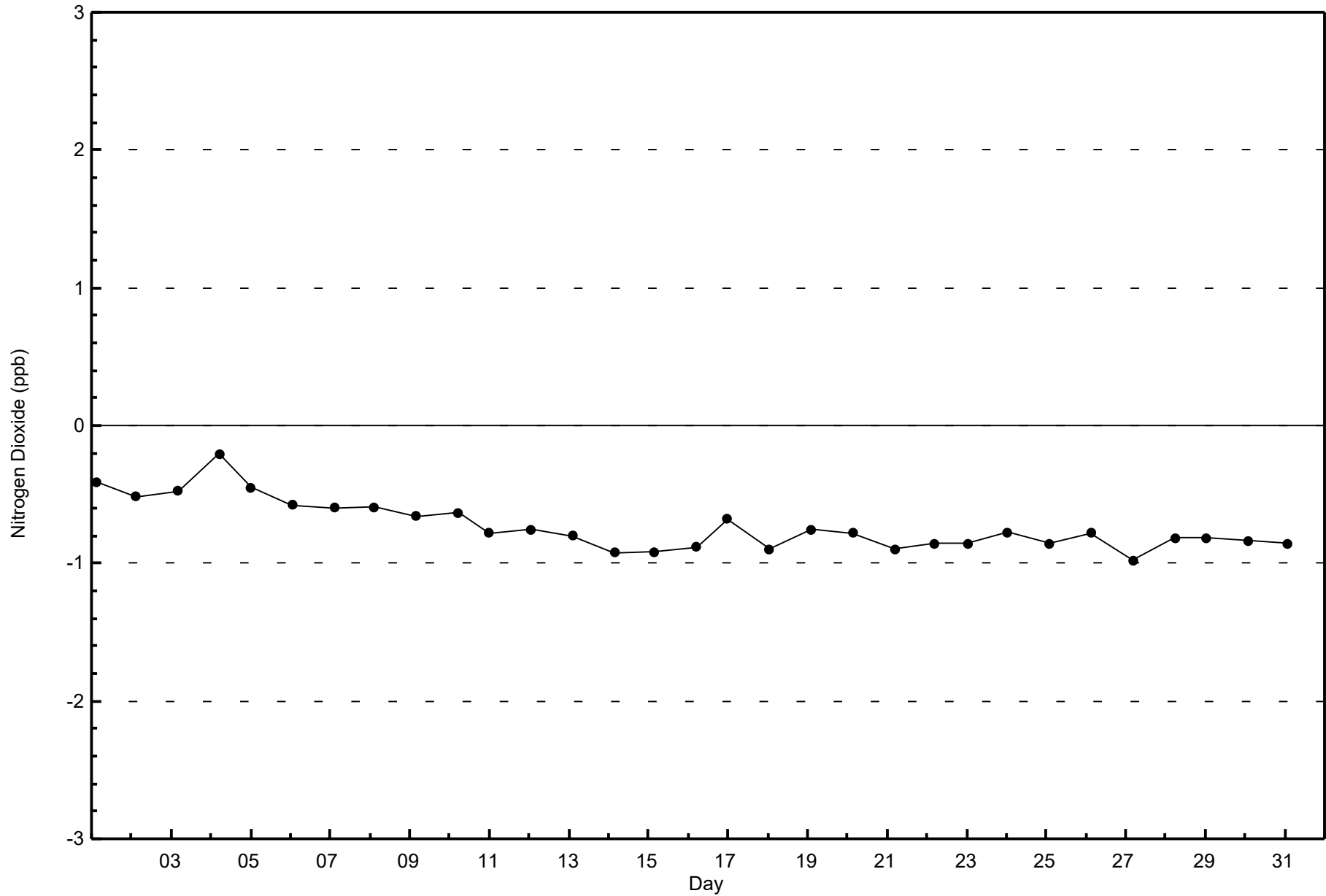
Total Number of Hours: 744

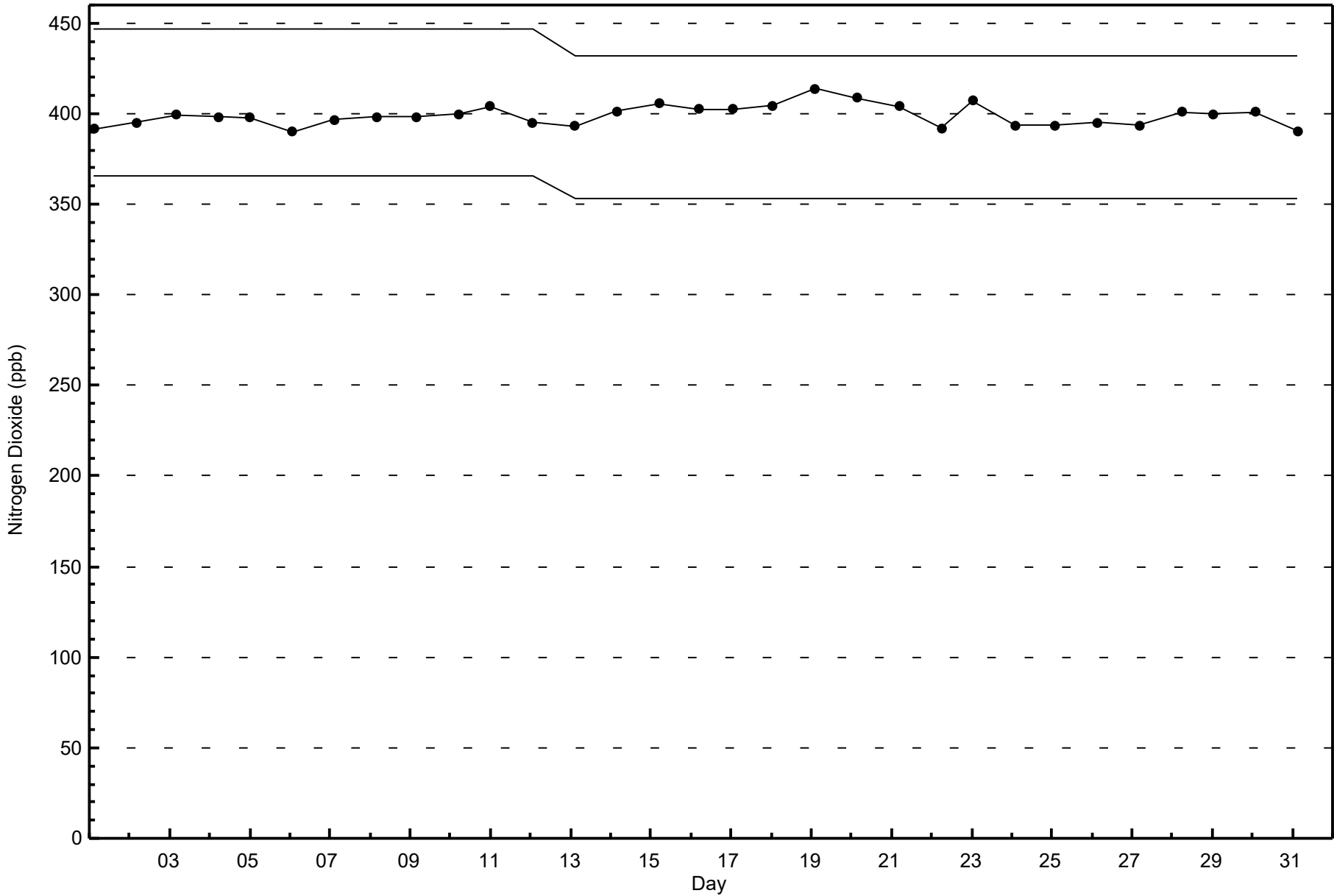


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitrogen Dioxide (NO₂) - ppb
Fort Chipewyan









Wood Buffalo Environmental Association
Summary of Hour Averages

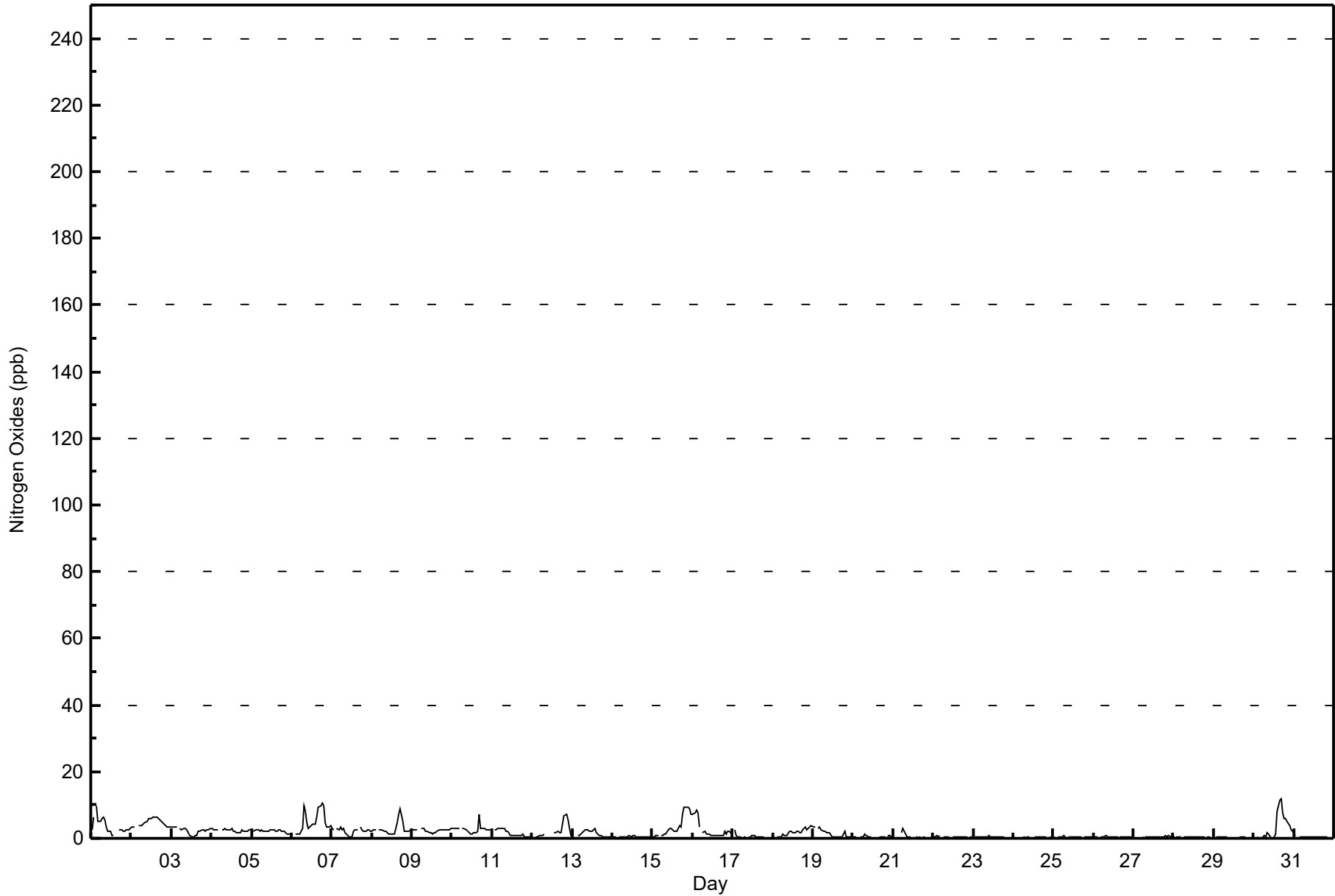
Nitrogen Oxides (NO_x) - ppb
Fort Chipewyan - October 2023

Maximum Value: 11.9 ppb on Oct 30 17:00		Maximum Daily Average: 4.9 ppb on Oct 6		Hours in Service: 744																						
Minimum Value: 0.0 ppb on Oct 30 01:00		Minimum Daily Average: 0.2 ppb on Oct 29		Hours of Data: 704																						
Maximum Diurnal Average: 2.2 ppb at hour 17		Minimum Diurnal Average: 1.1 ppb at hour 13		Hours of Missing Data: 40																						
Monthly Average: 1.67 ppb		Percentiles: P ₁ = 0.1 P ₁₀ = 0.2 Q ₁ = 0.3 Median = 0.8 Q ₃ = 2.5 P ₉₀ = 3.5 P ₉₉ = 9.5		Hours of Calibration: 36																						
				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-Oct	2.6	6.3	Z	9.7	5.2	5.2	6.1	6.3	5.6	3.6	2.0	1.9	1.0	1.1	PF	PF	2.6	2.6	2.4	2.3	2.2	2.4	2.5	2.8	3.6	9.7
2-Oct	3.5	3.4	3.5	Z	3.7	3.8	3.8	4.2	4.5	5.1	5.8	5.8	5.8	6.2	6.5	6.4	5.9	5.4	5.3	4.5	4.0	3.6	3.5	3.6	4.7	6.5
3-Oct	3.4	3.5	3.4	3.3	Z	2.9	2.4	3.1	2.9	2.8	1.9	0.8	0.3	0.3	0.7	1.0	2.0	2.0	2.5	2.5	2.0	2.4	2.7	3.2	2.3	3.5
4-Oct	3.0	2.3	2.5	2.5	2.6	Z	2.5	2.6	2.9	2.4	2.4	2.3	2.8	2.2	2.1	1.9	1.8	1.8	2.5	2.0	2.0	2.1	2.4	2.4	2.4	3.0
5-Oct	Z	2.3	2.3	2.5	2.4	2.2	2.4	2.3	2.0	1.9	2.3	2.3	2.4	2.4	2.0	2.2	2.5	2.3	2.3	2.0	1.7	1.5	1.2	1.3	2.1	2.5
6-Oct	1.3	Z	1.4	1.4	1.4	1.4	2.9	9.6	8.2	4.8	3.1	3.8	4.3	4.1	4.2	6.4	9.4	9.7	10.8	9.7	4.7	3.2	3.2	3.9	4.9	10.8
7-Oct	3.0	2.4	Z	2.8	2.4	3.4	2.4	2.8	1.7	0.8	0.4	0.3	0.6	2.1	2.7	2.7	PF	3.2	2.3	2.1	2.1	2.4	2.5	2.3	2.2	3.4
8-Oct	2.3	2.4	2.5	Z	2.5	2.6	2.5	2.3	2.0	1.7	1.4	1.2	1.1	1.3	2.9	4.7	7.2	8.8	4.9	2.1	2.1	2.1	2.2	2.4	2.8	8.8
9-Oct	2.4	2.5	2.6	2.7	Z	2.8	2.9	3.0	2.3	2.0	1.7	1.5	1.4	1.7	1.7	1.9	2.3	2.6	2.7	2.7	2.6	2.6	2.7	2.8	2.4	3.0
10-Oct	2.8	2.8	2.8	2.8	2.9	Z	3.1	2.9	2.4	2.2	1.7	1.4	1.4	1.5	1.8	1.9	7.1	3.0	2.8	3.0	2.7	2.7	2.7	2.7	2.6	7.1
11-Oct	Z	2.7	2.7	2.8	2.8	2.9	2.9	2.9	2.3	2.0	1.9	0.7	0.7	0.8	1.0	0.8	0.9	1.0	1.1	0.5	0.5	0.4	0.3	0.3	1.5	2.9
12-Oct	0.3	Z	0.5	0.5	0.9	0.9	1.0	1.4	C	C	C	C	C	1.6	1.8	2.2	1.9	1.8	4.2	6.6	7.4	5.6	3.0	0.7	2.3	7.4
13-Oct	0.6	0.5	Z	0.9	0.9	1.1	1.8	2.5	2.4	2.5	2.2	2.0	2.1	2.8	1.6	1.2	0.8	0.6	0.4	0.4	0.4	0.4	0.5	1.3	2.8	
14-Oct	0.4	0.4	0.5	Z	0.6	0.6	0.5	0.5	0.5	0.6	0.8	0.6	0.8	0.7	0.5	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.8
15-Oct	0.6	0.6	0.7	0.8	Z	1.0	1.0	1.2	1.5	2.6	2.8	2.9	2.7	2.1	2.2	2.9	4.0	3.6	7.2	9.2	9.5	9.5	9.0	7.4	3.7	9.5
16-Oct	7.0	7.7	8.6	7.6	3.3	Z	1.7	1.9	1.4	1.1	1.1	0.9	0.8	0.8	0.7	0.7	0.7	1.0	0.9	2.1	1.2	2.3	1.9	1.4	2.5	8.6
17-Oct	Z	2.6	0.8	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.6	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.4	2.6
18-Oct	0.2	Z	0.3	0.3	0.3	0.5	1.1	1.0	1.0	1.8	2.2	2.1	1.7	1.8	2.0	2.3	1.6	1.5	2.5	3.2	2.7	2.9	3.3	3.7	1.7	3.7
19-Oct	3.5	3.2	Z	3.0	3.5	2.7	2.2	1.9	1.5	1.8	1.9	0.4	0.4	0.4	0.4	0.3	0.5	0.6	1.3	2.3	0.5	0.3	0.4	0.4	1.5	3.5
20-Oct	0.3	0.4	0.5	Z	0.4	0.4	0.4	1.2	0.7	0.5	0.2	0.1	0.2	0.1	0.1	0.1	0.3	0.2	0.5	0.4	0.2	0.8	0.7	0.1	0.4	1.2
21-Oct	0.1	0.1	0.1	0.1	Z	1.6	3.1	1.2	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.3	0.4	3.1
22-Oct	0.2	0.5	0.9	0.4	0.8	Z	0.5	0.5	0.4	0.2	0.2	0.2	0.3	0.2	0.2	0.3	0.4	0.4	0.3	0.3	0.3	0.2	0.3	0.3	0.4	0.9
23-Oct	Z	0.4	0.4	0.3	0.3	0.3	0.2	0.4	0.6	0.7	0.5	0.3	0.3	0.4	0.5	0.3	0.3	0.4	0.2	0.1	0.2	0.1	0.1	0.1	0.3	0.7
24-Oct	0.2	Z	0.2	0.1	0.1	0.2	0.3	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.5	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.5
25-Oct	0.2	0.2	Z	0.3	0.3	0.2	0.7	0.3	0.2	0.4	0.3	0.2	0.2	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.7
26-Oct	0.3	0.3	0.3	Z	0.3	0.2	0.4	0.7	0.5	0.5	0.4	0.4	0.2	0.3	0.2	0.2	0.3	0.4	0.2	0.3	0.3	0.2	0.3	0.3	0.3	0.7
27-Oct	0.2	0.2	0.2	0.2	Z	0.3	0.2	0.4	0.2	0.4	0.5	0.4	0.3	0.3	0.4	0.3	0.5	0.3	0.3	0.7	0.6	1.0	0.3	0.4	0.4	1.0
28-Oct	0.2	0.2	0.3	0.3	0.5	Z	0.5	0.3	0.6	0.4	0.4	0.5	0.6	0.3	0.3	0.2	0.2	0.3	0.5	0.2	0.5	0.3	0.2	PF	0.4	0.6
29-Oct	Z	0.4	0.4	0.4	0.4	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.0	0.1	0.2	0.4
30-Oct	0.0	Z	0.6	0.1	0.1	0.3	0.7	0.3	1.9	1.2	0.1	0.1	0.4	1.4	8.1	11.6	11.9	7.5	5.9	5.9	5.0	4.0	2.7	2.0	3.1	11.9
31-Oct	1.2	0.9	Z	0.6	0.5	0.4	0.5	0.4	0.4	0.5	0.5	0.3	0.3	0.4	0.2	0.3	0.2	0.3	0.4	0.3	0.2	0.2	0.2	0.2	0.4	1.2
																								Diurnal Average		
																								Diurnal Maximum		
																								7.0 7.7 8.6 9.7 5.2 5.2 6.1 9.6 8.2 5.1 5.8 5.8 5.8 6.2 8.1 11.6 11.9 9.7 10.8 9.7 9.5 9.5 9.0 7.4		
Z - zerospan C - Calibration PF - Power Failure																										



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	704	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: 704

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Fort Chipewyan - October 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	4	6	39	54	48	85	57	21	24	31	94	133	57	29	702
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	12	8	4	6	39	54	48	85	57	21	24	31	94	133	57	29	702

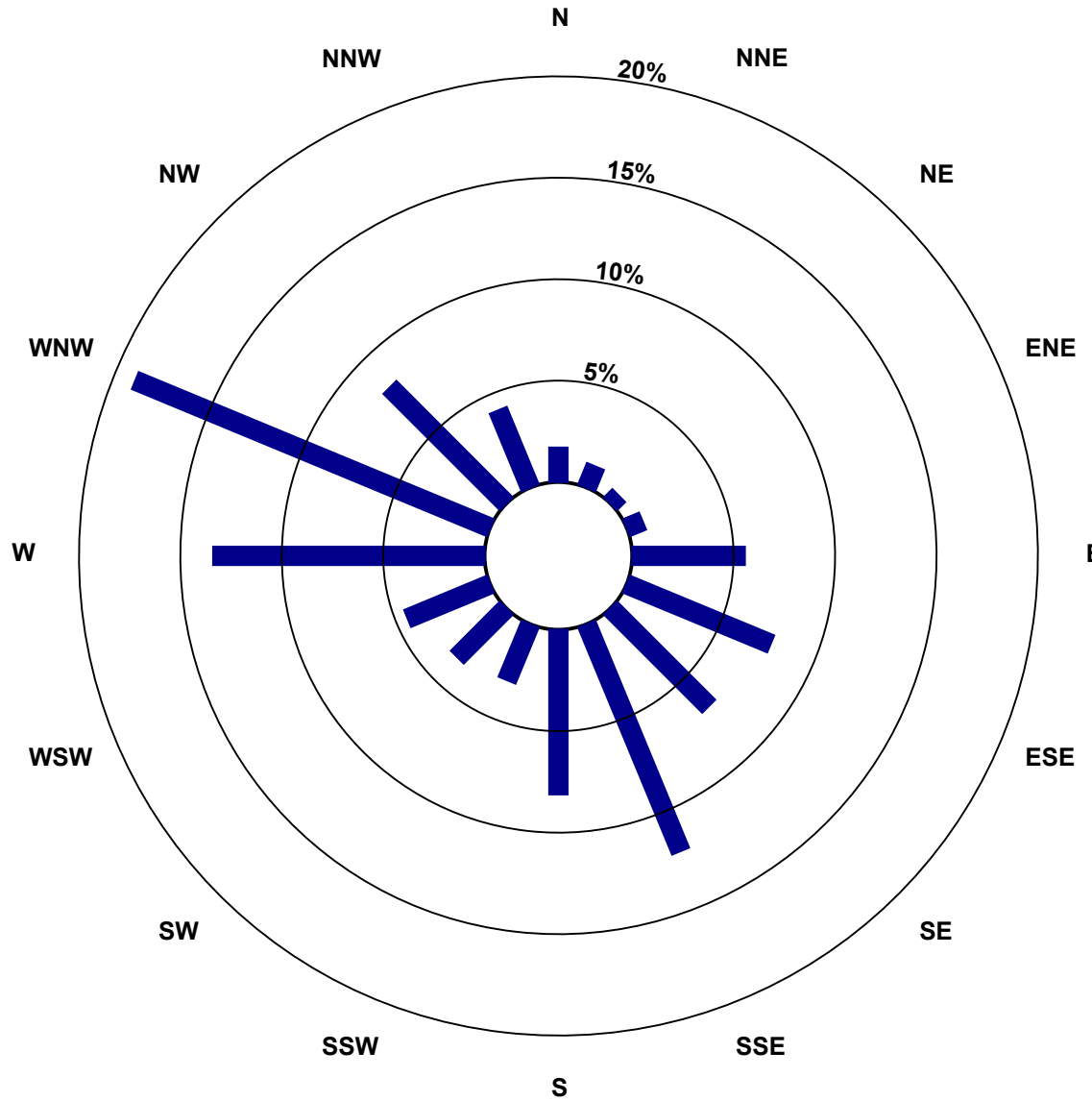
Total Number of Valid Hours: 702

Total Number of Hours: 744

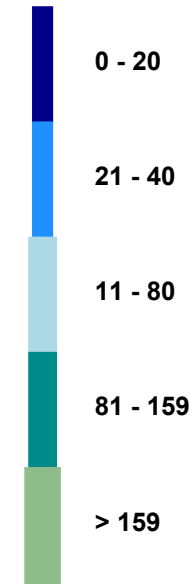


Wood Buffalo Environmental Association
Wind Rose Oct 2023

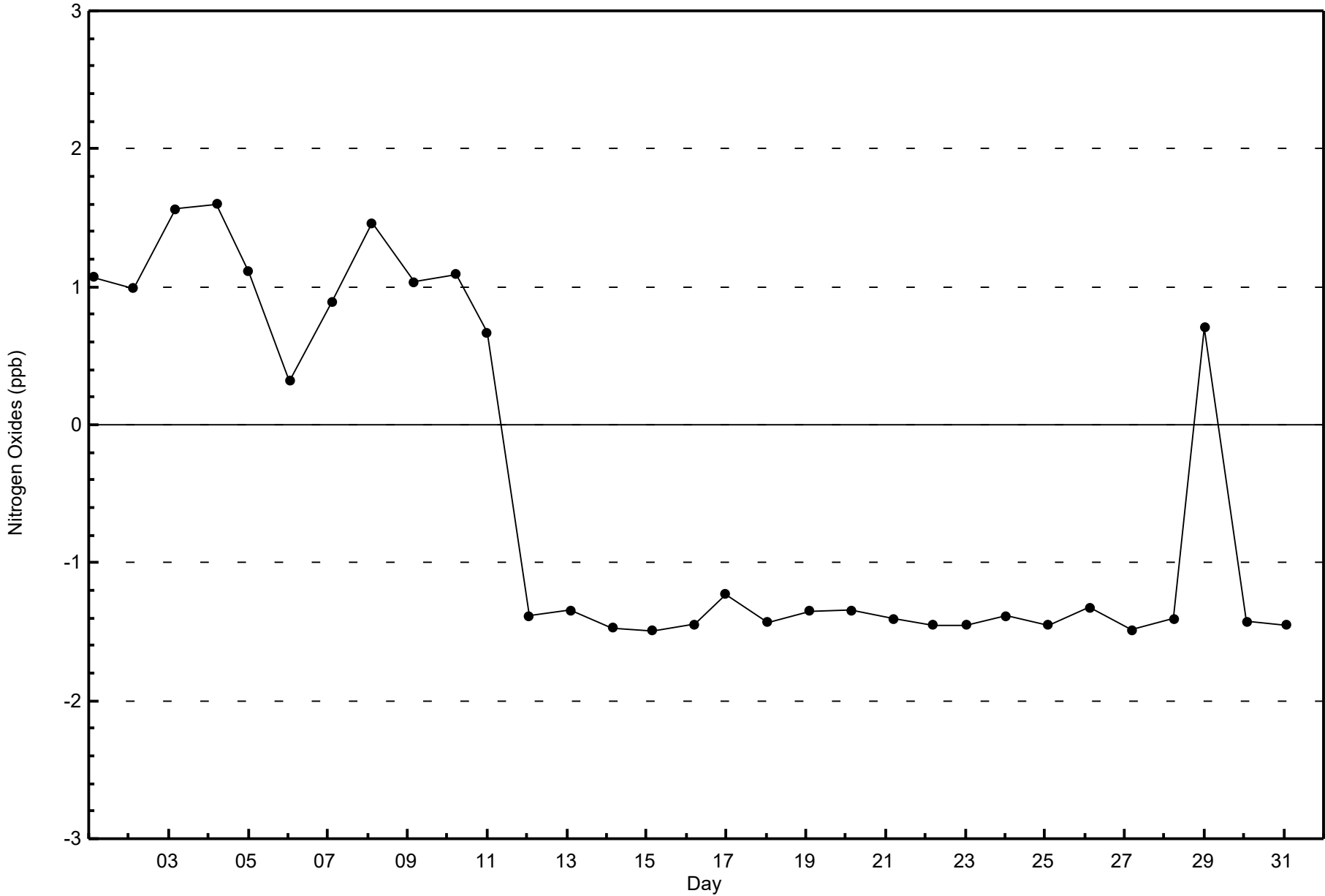
Nitrogen Oxides (NO_x) - ppb
Fort Chipewyan

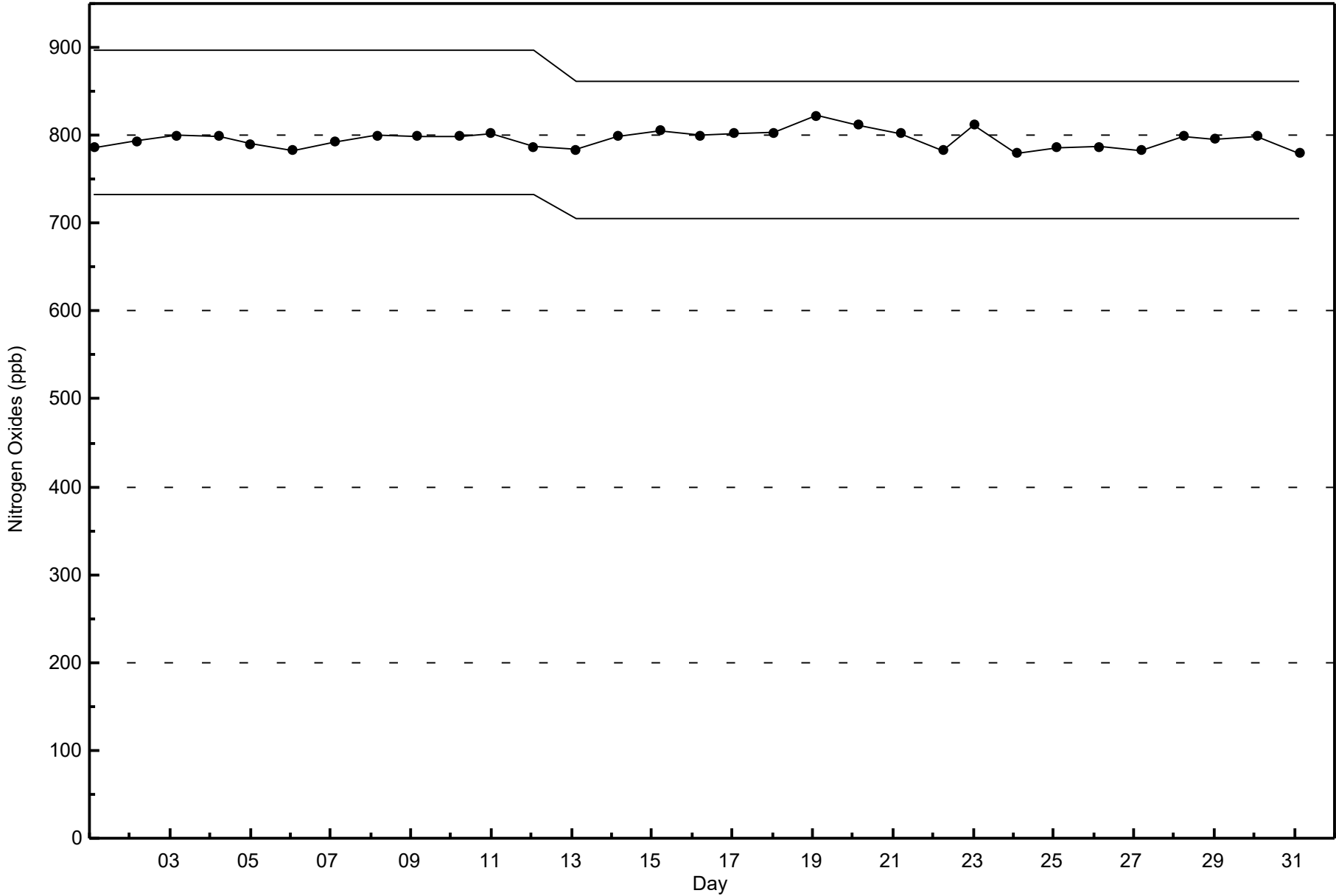


Classes (ppb)



Total Number of Valid Hours: 702







Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 38.2 ppb on Oct 12 15:00	Maximum Daily Average: 32.8 ppb on Oct 23		Hours of Data:	707
Minimum Value: 5.2 ppb on Oct 19 06:00	Minimum Daily Average: 15.4 ppb on Oct 18		Hours of Missing Data:	37
Maximum Diurnal Average: 25.5 ppb at hour 16	Minimum Diurnal Average: 20.4 ppb at hour 6		Hours of Calibration:	34
Monthly Average: 23.14 ppb	Percentiles: P ₁ = 8.3 P ₁₀ = 13.9 Q ₁ = 19.3 Median = 23.4 Q ₃ = 27.4 P ₉₀ = 32.1 P ₉₉ = 35.3		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-Oct	Z	8.1	7.1	6.0	9.5	10.2	11.5	12.8	15.6	18.5	22.6	27.1	28.9	30.2	PF	31.4	30.0	27.5	26.3	24.8	24.6	23.7	22.5	21.4	20.0	31.4	
2-Oct	20.4	Z	22.3	20.6	19.6	19.1	18.4	17.2	16.9	16.9	15.8	15.0	14.2	13.5	12.7	13.7	14.4	14.4	14.7	15.7	16.5	15.5	16.6	15.5	16.5	22.3	
3-Oct	13.9	12.2	Z	11.7	12.0	12.5	11.0	9.8	10.4	12.3	13.1	16.3	18.3	21.7	22.2	22.7	23.0	22.0	20.8	22.1	20.8	21.1	19.6	19.3	16.9	23.0	
4-Oct	20.1	22.2	18.6	Z	18.7	15.7	16.6	17.4	17.4	18.3	19.2	16.0	11.8	13.5	10.1	19.1	24.8	23.1	17.2	17.8	19.1	19.4	11.3	12.9	17.4	24.8	
5-Oct	16.3	20.1	21.2	21.7	Z	23.3	24.8	24.5	24.5	24.1	23.2	22.9	22.8	23.2	22.9	23.7	23.7	23.6	23.4	23.1	22.9	23.1	20.3	19.8	22.6	24.8	
6-Oct	20.0	17.5	19.0	19.1	18.2	Z	15.7	10.8	14.1	18.0	20.6	21.0	20.1	19.4	19.0	17.4	14.8	13.0	10.8	11.9	15.2	15.8	15.4	15.0	16.6	21.0	
7-Oct	Z	15.9	14.3	11.7	11.5	11.5	12.1	11.5	13.3	13.9	15.5	16.3	16.3	17.0	17.7	17.6	PF	17.8	18.2	17.7	17.0	17.1	18.8	20.1	15.6	20.1	
8-Oct	20.1	Z	20.7	22.7	22.5	21.8	21.6	22.1	22.8	23.8	24.7	27.1	27.8	29.7	30.4	29.3	26.9	25.5	25.8	23.0	23.1	23.7	24.1	24.1	24.5	30.4	
9-Oct	23.6	23.1	Z	21.9	21.4	21.1	20.7	20.4	19.8	22.4	23.8	24.9	24.5	24.2	24.9	25.1	24.5	24.5	22.8	22.5	21.7	21.9	22.5	23.1	22.8	25.1	
10-Oct	24.6	25.0	24.5	Z	22.3	21.8	20.9	20.4	18.9	19.0	20.3	20.6	22.3	23.6	24.1	24.1	22.1	24.7	25.2	25.5	26.9	28.4	27.9	27.8	23.5	28.4	
11-Oct	27.0	26.7	26.8	26.0	Z	25.0	24.5	24.0	C	C	C	25.3	26.7	28.4	29.4	31.1	29.7	30.8	33.3	32.1	30.2	30.3	30.4	30.5	28.4	33.3	
12-Oct	31.3	30.6	31.0	32.2	31.6	Z	30.2	29.8	30.3	31.3	32.1	33.0	35.7	38.2	38.2	38.0	38.2	37.5	33.1	27.9	24.2	24.9	28.1	29.9	32.1	38.2	
13-Oct	Z	25.2	23.5	22.1	20.5	19.5	18.8	18.4	18.3	18.5	19.4	22.0	24.0	23.5	22.8	19.5	21.0	20.5	23.0	24.0	23.0	23.3	22.7	21.7	21.5	25.2	
14-Oct	20.7	Z	20.6	20.3	21.6	21.6	20.9	21.3	21.8	21.5	22.1	25.3	28.9	30.2	30.0	29.9	29.5	27.6	26.5	26.0	26.5	26.2	25.8	25.2	24.8	30.2	
15-Oct	24.4	23.8	Z	23.5	23.2	22.5	22.0	21.5	21.1	20.5	21.3	21.5	21.5	22.6	23.3	23.1	21.4	20.0	14.9	11.9	10.7	9.1	8.6	9.9	19.2	24.4	
16-Oct	9.9	9.0	7.2	Z	13.4	13.8	13.6	13.2	14.7	17.8	19.8	21.1	23.4	24.5	25.5	26.0	25.7	25.5	26.0	23.4	24.8	23.4	22.2	23.6	19.4	26.0	
17-Oct	19.4	20.0	16.7	14.1	Z	8.5	8.3	9.2	11.3	13.1	13.9	15.1	15.9	16.7	17.3	18.2	19.3	19.5	20.0	21.1	22.2	23.2	23.1	23.4	16.9	23.4	
18-Oct	23.7	22.7	20.2	17.3	16.6	Z	12.6	11.9	12.7	12.5	13.1	14.5	16.6	17.4	17.1	17.1	17.3	16.6	15.2	14.3	13.7	11.8	9.6	9.5	15.4	23.7	
19-Oct	Z	9.0	8.5	7.8	7.8	5.2	9.5	11.6	14.2	13.9	18.2	25.9	27.3	26.4	25.7	27.6	26.7	25.0	23.8	22.1	25.1	25.7	26.0	25.0	19.1	27.6	
20-Oct	24.1	Z	20.7	21.6	23.4	23.9	23.4	21.8	22.9	21.9	13.7	15.5	18.0	19.3	22.8	25.1	24.1	23.3	22.8	22.4	21.3	20.9	19.0	21.6	21.5	25.1	
21-Oct	19.5	19.5	Z	18.3	17.4	16.3	14.0	14.9	17.5	15.8	15.1	18.8	24.4	24.3	23.8	26.9	25.7	25.7	24.6	24.7	25.6	25.5	25.1	24.7	21.2	26.9	
22-Oct	23.5	22.6	20.8	Z	19.0	19.2	20.7	21.0	21.9	23.0	26.6	27.3	27.8	29.9	31.8	33.6	35.3	35.4	35.0	33.6	33.3	34.1	34.1	34.2	28.0	35.4	
23-Oct	33.8	33.3	32.7	32.6	Z	32.8	32.5	32.1	31.7	32.2	32.9	32.9	33.3	33.6	33.9	33.8	33.4	33.4	33.0	32.6	32.2	32.2	32.2	32.4	32.1	32.8	33.9
24-Oct	31.9	32.1	32.2	31.5	30.8	Z	31.8	31.0	30.2	30.5	30.6	30.5	30.2	31.4	32.7	32.4	32.6	32.3	32.2	32.3	32.0	32.7	33.1	33.3	31.7	33.3	
25-Oct	Z	33.6	33.6	33.4	33.5	33.6	33.6	33.9	32.4	30.2	30.4	32.7	32.0	30.1	28.0	27.3	26.4	28.3	27.4	25.5	24.8	24.8	24.7	23.9	29.7	33.9	
26-Oct	25.5	Z	24.8	24.2	23.4	22.7	22.7	22.5	23.6	25.6	27.2	28.6	27.9	25.8	24.8	24.8	23.3	24.2	24.5	24.4	24.0	25.0	26.4	26.6	24.9	28.6	
27-Oct	30.9	30.9	Z	30.4	29.2	28.4	26.6	25.3	24.8	23.6	26.4	28.0	30.0	29.9	30.1	30.9	30.0	29.5	28.7	28.1	27.3	28.3	30.3	28.3	28.5	30.9	
28-Oct	28.3	23.9	25.0	Z	23.1	23.7	24.2	23.9	22.0	21.1	22.4	23.7	24.6	26.2	27.8	27.3	26.1	25.0	23.8	23.6	24.7	25.9	26.8	PF	24.7	28.3	
29-Oct	26.6	27.9	28.9	29.3	Z	31.2	30.9	29.6	28.7	29.0	32.2	32.6	31.7	31.2	30.9	30.5	30.1	31.3	31.2	32.5	33.3	32.2	34.0	32.7	30.8	34.0	
30-Oct	31.7	30.8	28.8	29.2	30.5	Z	26.9	26.8	24.6	25.7	26.7	31.5	32.6	32.9	28.0	23.8	21.1	24.2	25.3	24.1	24.2	24.5	25.5	25.0	27.1	32.9	
31-Oct	Z	23.2	21.9	23.3	23.8	24.4	25.1	26.8	27.3	25.7	22.3	22.0	21.5	21.0	20.7	20.7	21.2	21.4	21.6	22.9	25.0	25.2	25.4	24.8	23.4	27.3	

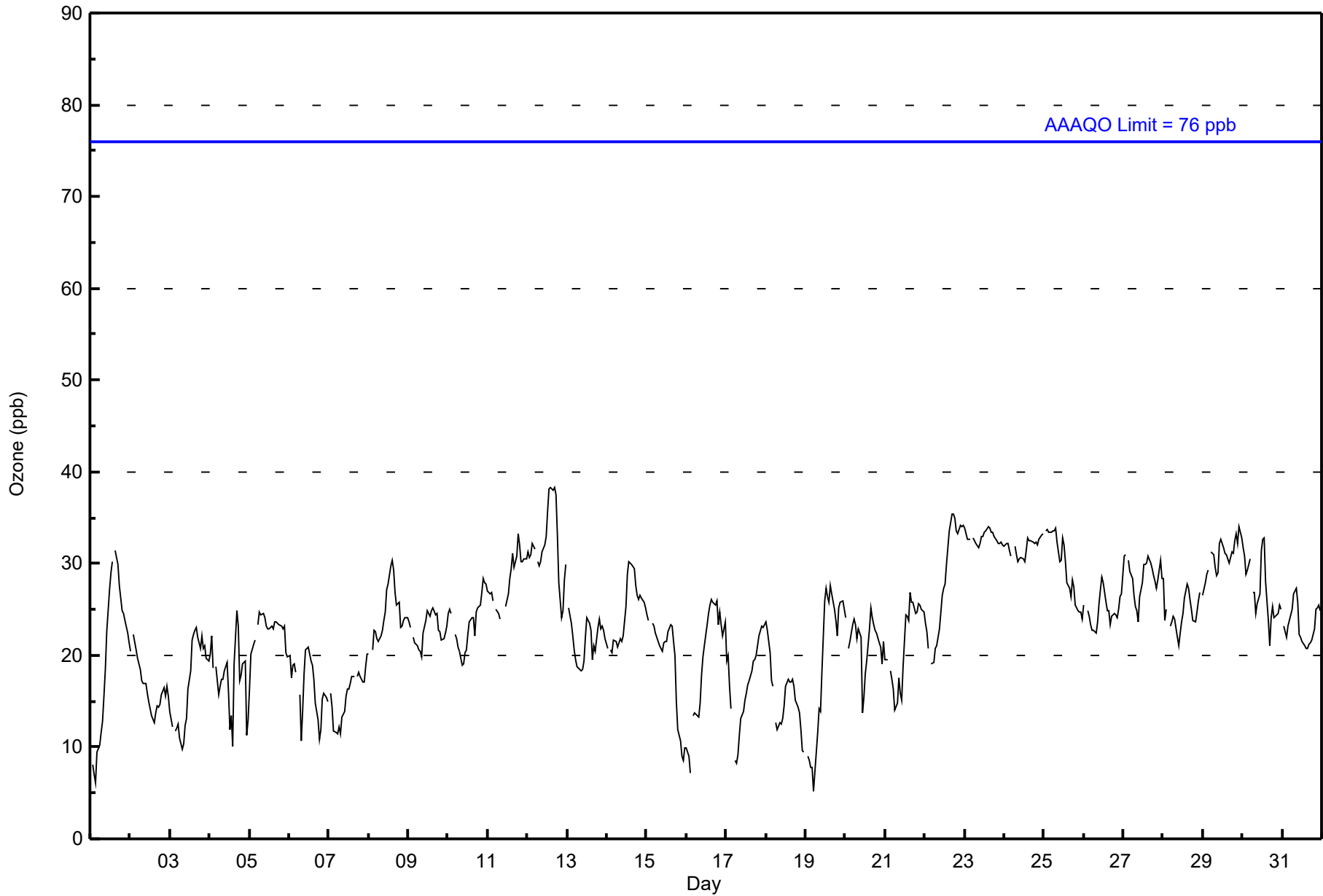
23.6	22.7	22.0	22.0	20.9	20.4	20.8	20.6	20.9	21.4	22.2	23.7	24.5	25.1	25.0	25.5	25.4	24.9	24.2	23.7	23.7	23.8	23.6	23.5	Diurnal Average	
33.8	33.6	33.6	33.4	33.5	33.6	33.6	33.9	32.4	32.2	32.9	33.0	35.7	38.2	38.2	38.0	38.2	37.5	35.0	33.6	33.3	34.1	34.1	34.2	Diurnal Maximum	

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



Wood Buffalo Environmental Association
Hourly Averages

Ozone (O₃) - ppb
Fort Chipewyan - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ozone (O₃) - ppb
Fort Chipewyan - October 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	212	29.99	29.99
21 - 50	495	70.01	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Ozone (O₃) - ppb
Fort Chipewyan - October 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	7	2	6	14	11	15	27	17	10	19	12	23	21	13	7	212
21 - 50	4	1	2	1	24	41	34	60	42	10	7	18	72	113	44	20	493
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	12	8	4	7	38	52	49	87	59	20	26	30	95	134	57	27	705

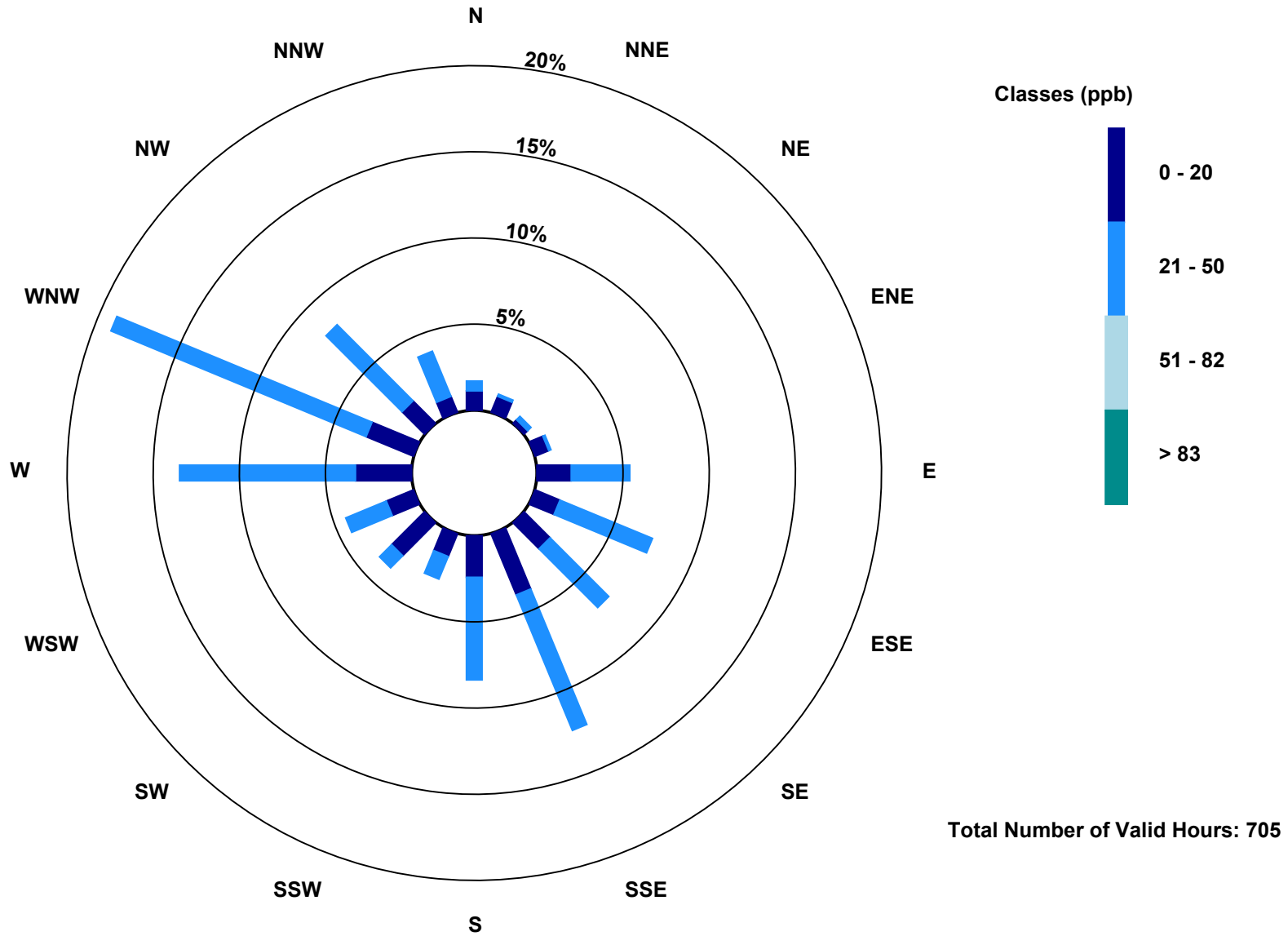
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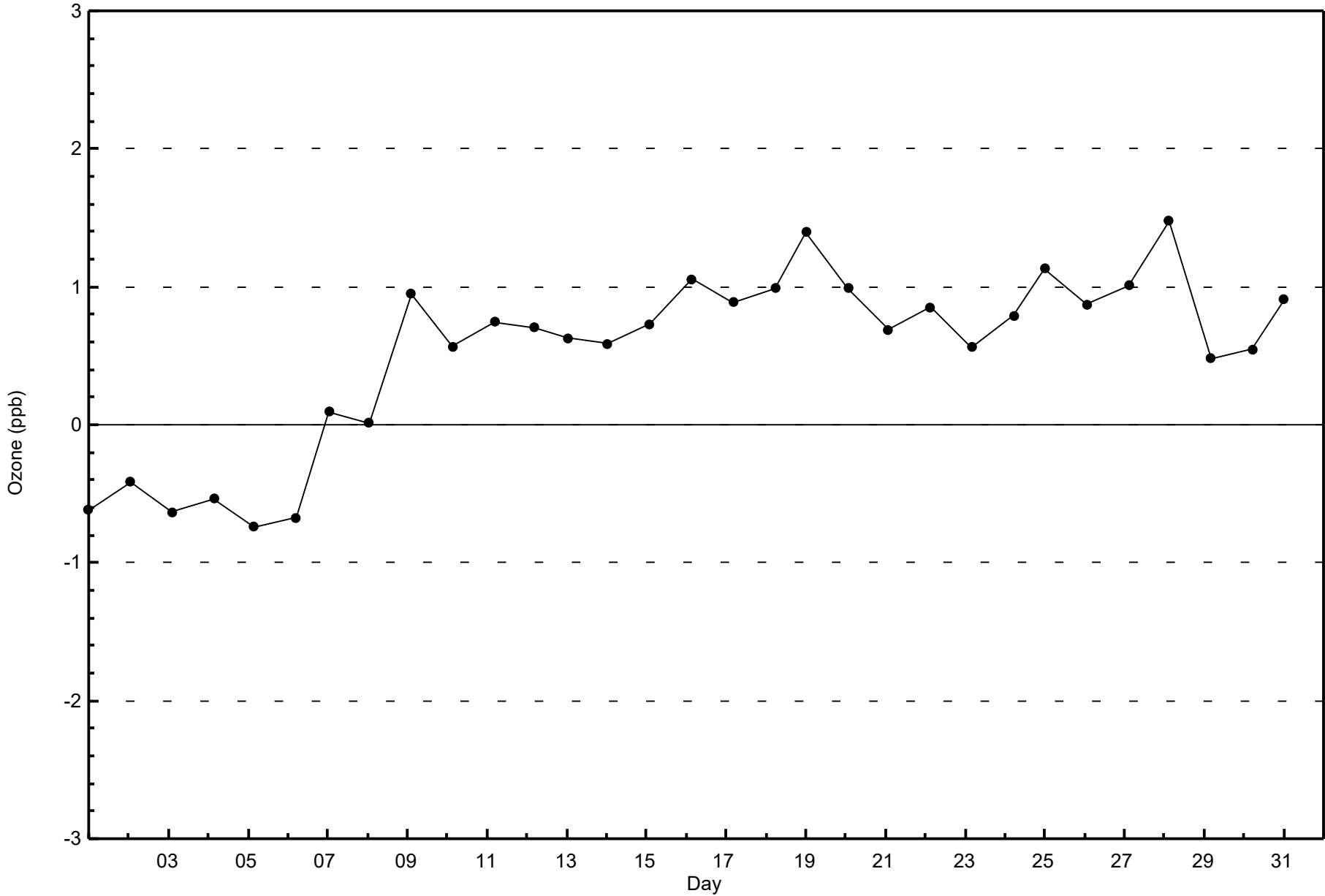
Total Number of Hours: 744

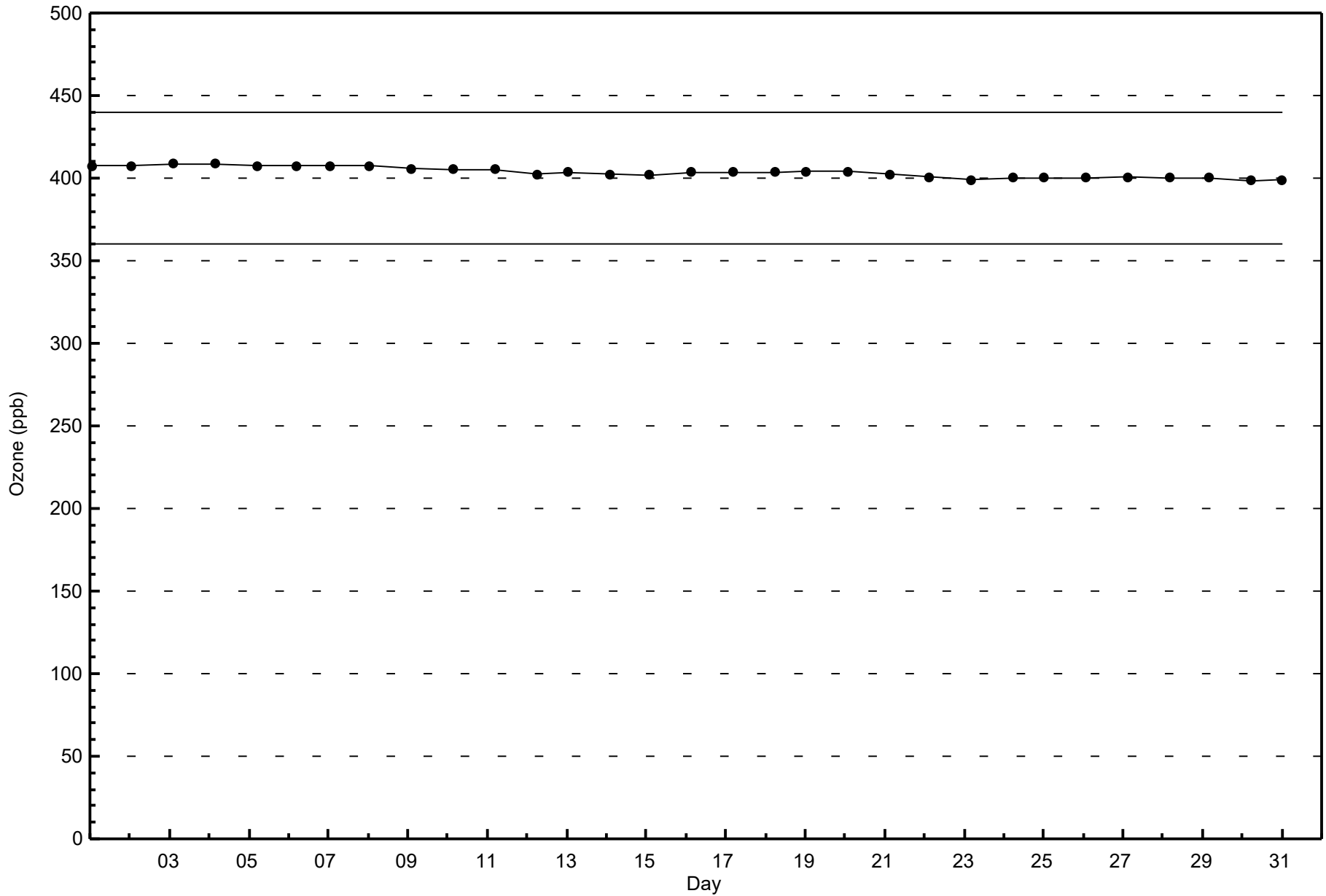


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Ozone (O₃) - ppb
Fort Chipewyan









Wood Buffalo Environmental Association

Summary of Hour Averages

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

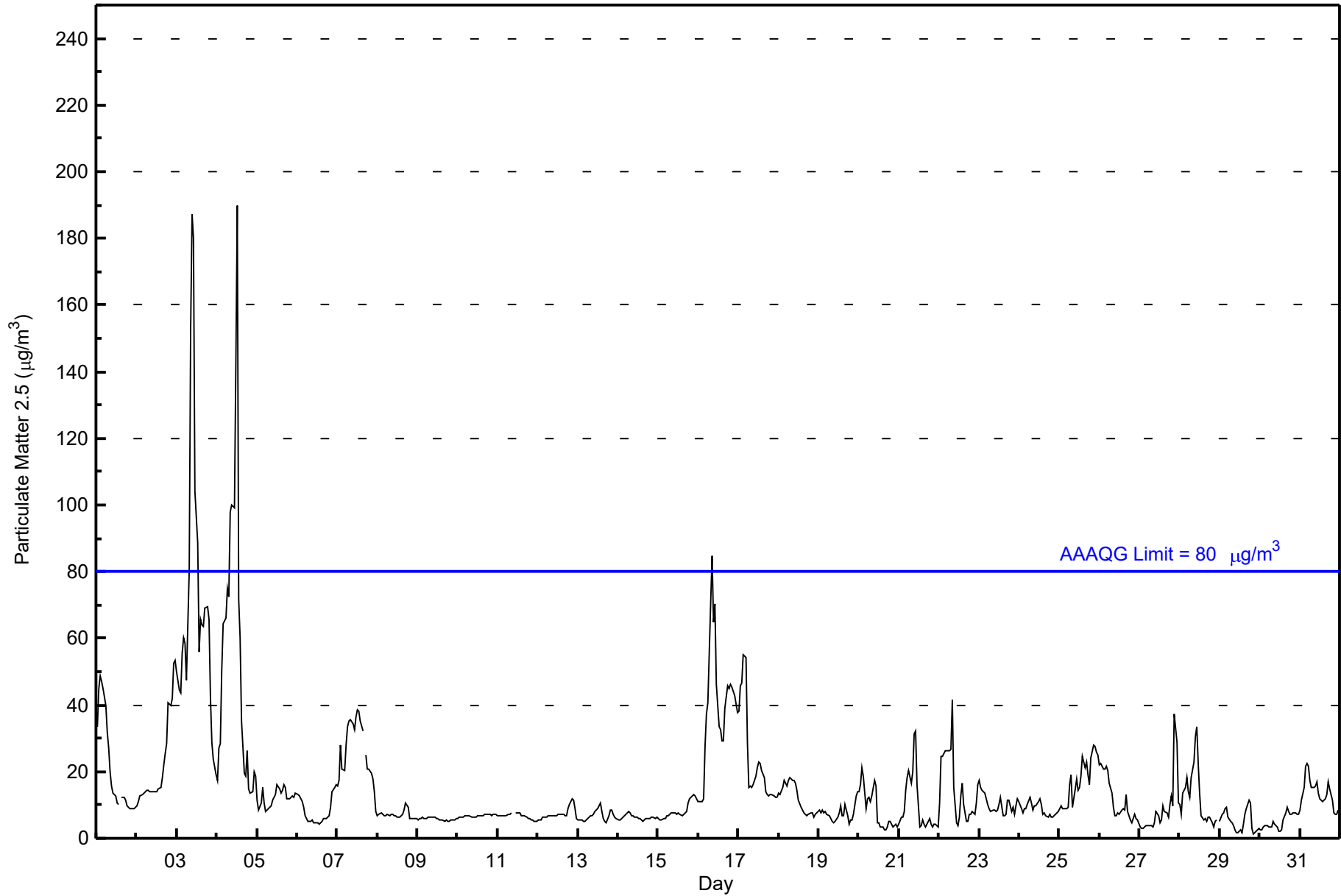
Fort Chipewyan - October 2023

Number of Exceedences (AAAQO):	1-hr: 12	24-hr: 3	Hours in Service:	744
Maximum Value: 189.7 µg/m ³ on Oct 4 13:00	Maximum Daily Average: 71.7 µg/m ³ on Oct 3		Hours of Data:	739
Minimum Value: 1.4 µg/m ³ on Oct 29 21:00	Minimum Daily Average: 5.0 µg/m ³ on Oct 30		Hours of Missing Data:	5
Maximum Diurnal Average: 22.7 µg/m ³ at hour 10	Minimum Diurnal Average: 12.1 µg/m ³ at hour 21		Hours of Calibration:	2
Monthly Average: 15.54 µg/m ³	Percentiles: P ₁ = 2.3 P ₁₀ = 5.0 Q ₁ = 6.3 Median = 8.6 Q ₃ = 15.7 P ₉₀ = 33.6 P ₉₉ = 98.7		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-Oct	33.6	44.9	48.8	47.1	44.7	39.8	31.6	27.3	19.9	15.8	13.5	12.5	10.7	10.2	PF	12.4	12.1	11.6	9.8	9.3	8.9	8.9	8.8	9.3	21.4	48.8
2-Oct	9.9	10.9	12.9	13.3	13.4	13.9	14.3	14.5	14.1	13.9	14.2	13.8	14.1	14.7	15.4	18.2	22.1	25.6	28.6	40.8	39.9	42.0	52.4	53.2	21.9	53.2
3-Oct	50.1	44.6	43.6	55.6	60.4	58.3	47.3	80.5	152.4	187.2	180.1	104.1	88.7	55.9	65.8	63.9	63.5	68.9	69.5	65.7	42.4	28.9	23.8	18.9	71.7	187.2
4-Oct	17.5	27.2	28.5	50.5	64.4	66.2	75.1	72.5	97.9	99.8	99.2	142.8	189.7	71.7	60.3	35.2	19.3	18.6	26.2	14.7	13.4	13.9	20.1	18.8	56.0	189.7
5-Oct	11.2	8.5	10.7	15.4	10.6	8.1	8.6	8.8	10.0	11.4	12.2	12.9	16.0	14.8	13.7	14.5	15.9	15.1	12.0	11.8	12.4	12.7	12.5	13.4	12.2	16.0
6-Oct	13.0	12.8	11.8	10.8	9.5	7.0	5.2	5.1	5.1	5.5	4.7	4.6	4.5	4.4	4.5	5.3	6.1	5.9	6.3	6.8	9.2	14.0	15.3	16.2	8.1	16.2
7-Oct	15.6	17.4	28.0	20.6	20.3	28.1	33.4	35.2	35.7	34.4	32.6	36.3	38.4	38.1	35.0	32.3	PF	25.0	20.8	20.7	19.3	18.0	13.9	7.9	26.4	38.4
8-Oct	6.7	7.3	7.4	7.1	6.6	6.9	7.1	6.8	7.0	7.0	6.8	6.8	6.3	6.3	6.9	7.3	8.6	10.4	9.2	6.1	5.9	5.8	5.8	5.8	7.0	10.4
9-Oct	5.7	5.9	6.0	6.2	6.1	6.1	6.5	6.3	6.3	6.1	6.2	6.0	6.1	5.7	5.5	5.3	5.3	5.5	5.2	5.2	5.5	5.6	5.7	5.8	5.8	6.5
10-Oct	6.0	6.2	6.3	6.5	6.7	6.7	6.6	6.7	6.5	6.4	6.4	6.4	6.6	6.7	6.7	6.8	7.2	7.3	7.1	7.1	6.7	7.0	7.3	7.0	6.7	7.3
11-Oct	6.8	6.7	6.9	6.7	6.8	6.8	7.0	7.3	7.5	C	C	7.7	7.4	7.5	6.7	6.6	6.6	6.4	6.1	5.9	5.4	5.7	5.0	5.1	6.6	7.7
12-Oct	5.3	5.3	5.6	6.2	6.3	6.5	6.6	6.8	6.6	6.9	6.8	6.9	7.1	7.1	7.2	7.0	6.9	6.8	8.8	10.3	11.7	11.3	8.8	5.8	7.3	11.7
13-Oct	5.5	5.7	5.4	5.2	5.1	5.4	5.9	6.6	6.8	7.3	8.0	8.3	9.1	10.6	8.1	5.9	5.0	4.5	6.6	8.5	8.5	7.2	6.4	6.1	6.7	10.6
14-Oct	5.7	5.3	5.8	6.2	6.9	7.6	7.8	7.7	7.0	6.7	6.2	6.4	5.9	5.8	5.5	5.2	5.8	6.1	5.9	5.8	6.3	6.5	6.1	6.3	6.3	7.8
15-Oct	5.9	5.5	5.7	5.8	6.1	6.7	6.8	7.0	7.4	7.8	7.6	7.4	7.4	7.0	7.0	7.1	7.8	8.2	10.4	11.9	12.5	13.3	12.9	12.0	8.2	13.3
16-Oct	11.0	10.9	11.0	11.9	27.7	37.4	40.8	70.7	84.8	65.0	70.5	46.1	33.6	32.6	29.4	29.0	39.1	45.7	45.0	46.1	45.5	44.2	42.9	37.5	39.9	84.8
17-Oct	38.0	45.8	46.5	54.9	54.3	29.0	15.4	15.5	15.1	16.1	18.8	21.0	22.9	22.5	20.4	18.3	14.2	12.9	12.8	13.2	13.1	12.7	12.2	12.4	23.3	54.9
18-Oct	13.4	12.9	15.1	17.5	16.4	15.6	17.5	18.0	17.4	17.5	16.5	14.6	11.2	9.3	8.3	7.5	7.2	6.8	7.3	7.5	7.6	6.5	7.0	7.8	11.9	18.0
19-Oct	8.6	7.8	8.3	7.7	7.8	7.4	7.0	5.9	5.0	4.6	4.9	6.4	7.5	9.8	6.8	6.9	10.0	6.7	4.3	5.5	5.6	7.1	12.7	14.0	7.4	14.0
20-Oct	14.0	16.3	21.1	18.6	9.0	11.8	12.1	10.9	12.6	17.2	15.6	4.5	4.6	3.5	3.2	2.5	2.4	3.3	5.0	5.2	3.5	3.8	4.3	3.4	8.7	21.1
21-Oct	4.3	6.2	6.5	8.0	14.4	18.4	20.2	16.4	19.9	31.5	32.4	15.9	3.2	3.7	5.5	4.3	3.2	4.3	5.9	4.0	3.4	4.2	4.2	3.4	10.2	32.4
22-Oct	10.7	24.4	24.4	25.4	26.3	26.3	26.1	26.7	41.6	15.3	4.6	4.0	6.5	12.7	16.6	10.2	5.2	5.2	7.1	7.1	7.9	7.2	10.4	16.2	15.3	41.6
23-Oct	17.6	15.4	14.6	13.6	11.8	10.2	9.1	8.1	8.3	8.5	8.2	8.6	10.3	12.5	6.7	6.8	7.2	11.4	11.2	8.1	9.4	7.0	9.6	11.9	10.3	17.6
24-Oct	10.9	9.1	7.7	8.9	9.1	10.3	12.1	10.6	8.6	9.9	9.9	11.2	11.9	10.1	7.4	7.6	6.8	6.4	7.1	6.4	6.4	6.9	7.7	8.1	8.8	12.1
25-Oct	8.8	9.6	8.7	8.7	8.9	9.5	16.3	19.0	9.5	14.8	17.7	14.2	15.0	18.7	24.4	21.4	22.7	18.9	16.1	24.2	28.2	27.7	26.0	25.1	17.3	28.2
26-Oct	22.1	22.4	20.6	20.7	21.7	20.2	16.6	13.4	9.4	6.8	6.8	7.7	7.3	8.5	8.8	8.3	12.9	8.2	5.7	4.7	6.0	7.2	5.8	5.7	11.6	22.4
27-Oct	3.2	2.9	3.2	3.4	3.7	4.0	3.9	3.8	3.4	4.7	7.9	6.9	4.7	5.3	9.6	7.9	7.7	6.2	10.1	12.7	9.8	37.1	28.9	10.4	8.4	37.1
28-Oct	10.3	7.3	13.4	15.4	18.2	13.8	12.5	18.3	22.9	30.3	33.4	22.6	13.5	6.6	5.4	5.7	5.3	6.2	6.2	4.7	3.3	5.2	5.6	PF	12.4	33.4
29-Oct	5.3	7.4	7.5	8.8	9.3	6.1	5.3	4.5	3.7	2.7	1.5	1.8	2.4	1.9	4.4	7.4	8.8	11.5	10.8	2.8	1.4	1.8	2.2	2.8	5.1	11.5
30-Oct	2.7	2.5	3.4	4.0	3.6	3.4	3.5	3.4	5.2	4.3	3.2	2.2	2.1	2.5	5.3	7.8	9.2	8.0	7.3	7.4	7.8	7.6	7.1	7.1	5.0	9.2
31-Oct	8.6	11.3	15.2	21.5	22.6	21.8	17.2	15.1	15.4	15.8	17.1	13.7	11.9	11.1	11.5	11.8	13.2	16.9	14.9	11.4	7.6	7.4	7.3	8.6	13.7	22.6

12.5	13.8	14.9	16.5	17.4	16.7	16.3	18.0	21.7	22.7	22.5	18.9	18.9	14.1	14.1	12.8	12.3	13.0	13.2	13.0	12.1	12.7	12.9	12.2	Diurnal Average
50.1	45.8	48.8	55.6	64.4	66.2	75.1	80.5	152.4	187.2	180.1	142.8	189.7	71.7	65.8	63.9	63.5	68.9	69.5	65.7	45.5	44.2	52.4	53.2	Diurnal Maximum

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	111	15.02	15.02
6 - 15	439	59.40	74.42
16 - 25	84	11.37	85.79
26 - 80	94	12.72	98.51
> 81.0	11	1.49	100.00

Total Number of Valid Hours: 739

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Fort Chipewyan - October 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	0	0	0	6	2	12	12	8	4	3	3	5	15	17	20	111
6 - 15	1	0	0	1	27	48	33	72	49	15	16	12	47	94	22	2	439
16 - 25	3	5	1	3	2	5	4	1	1	1	0	4	22	15	12	5	84
26 - 80	4	3	3	3	5	1	2	7	2	1	8	12	19	11	7	4	92
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	4	7	0	0	11
Totals	12	8	4	7	40	56	51	92	60	21	27	31	97	142	58	31	737

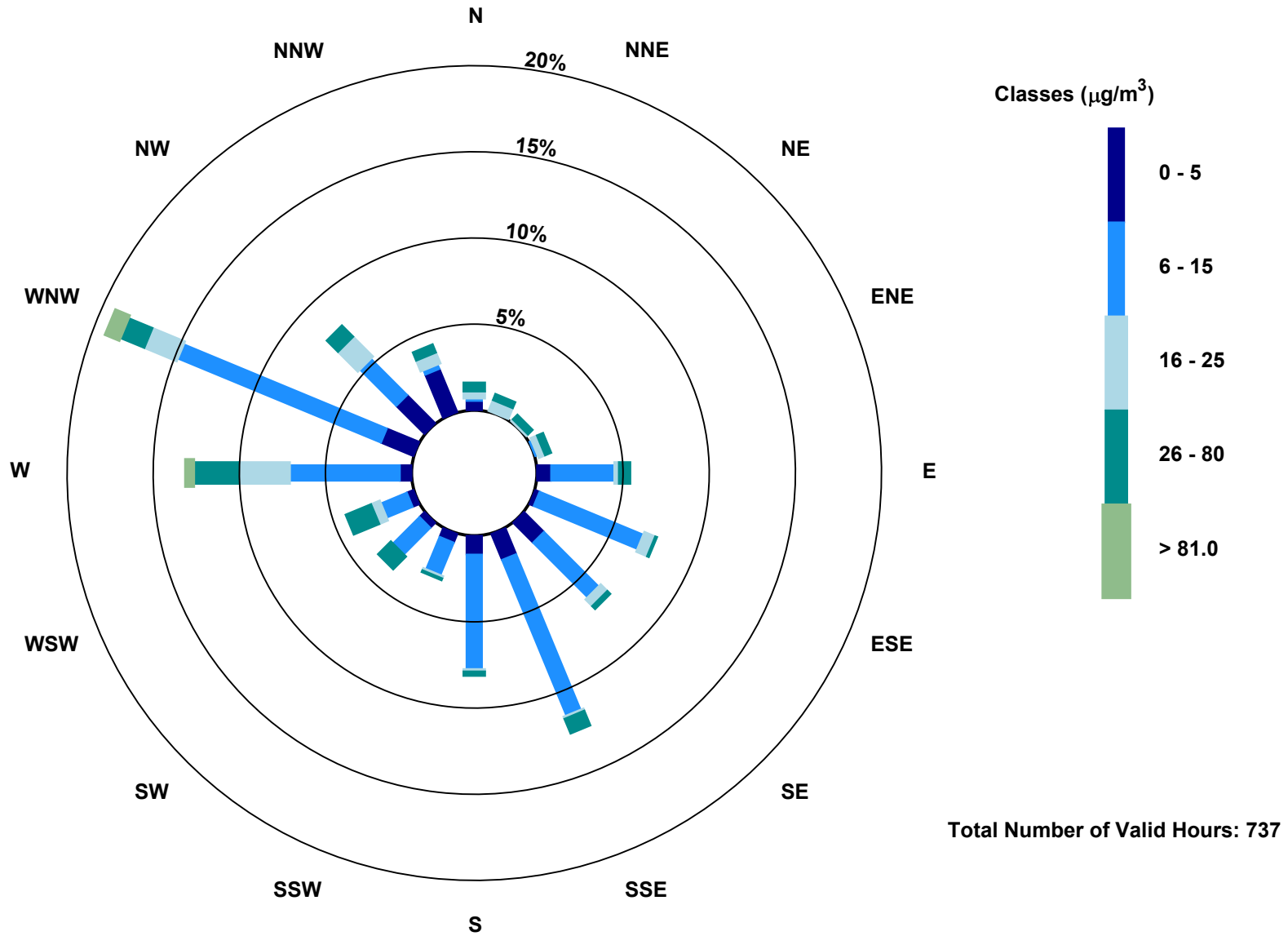
Total Number of Valid Hours: 737

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

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





Wood Buffalo Environmental Association
Summary of Hour Averages

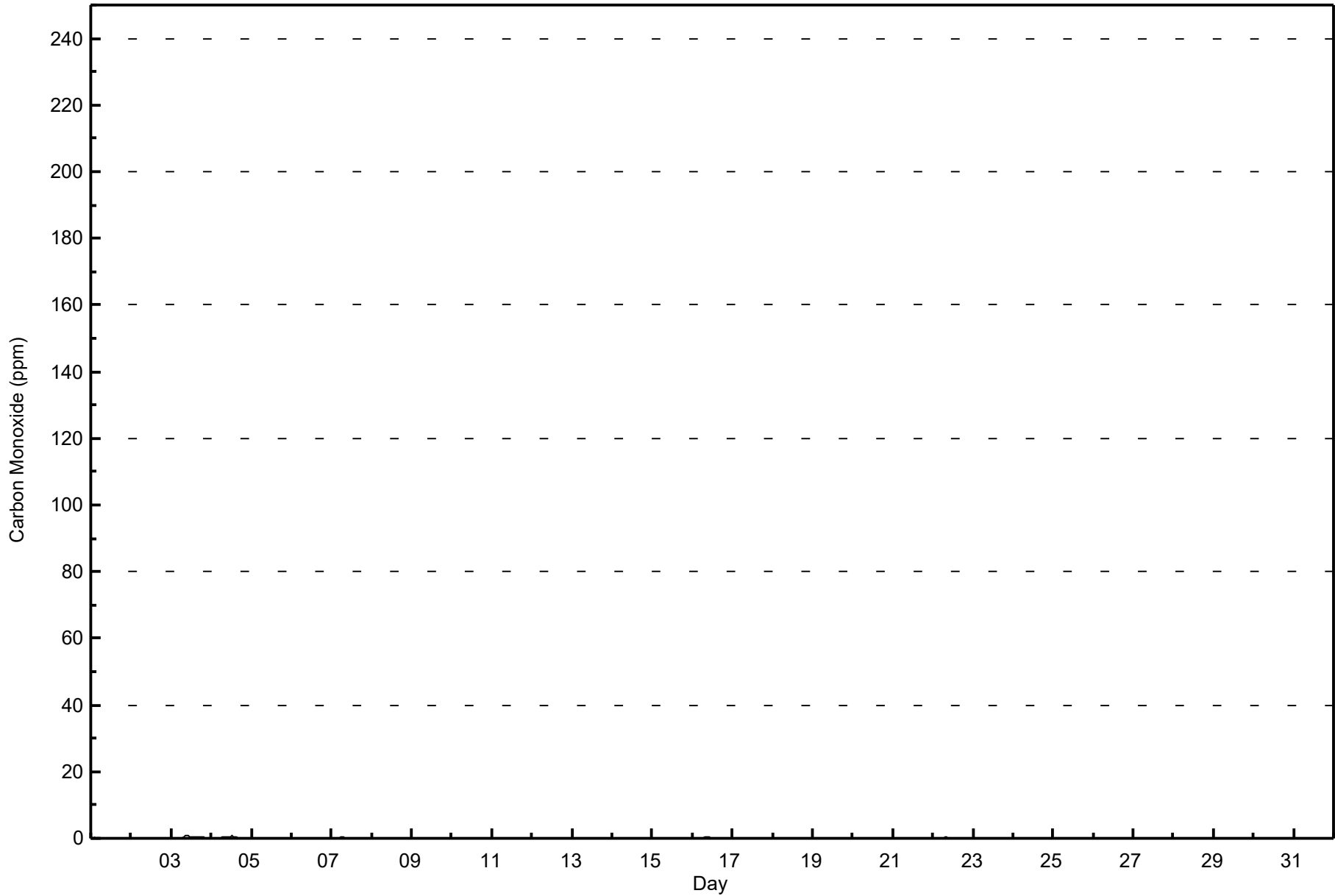
Carbon Monoxide (CO) - ppm
Fort Chipewyan - October 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 744																744							
Maximum Value: 0.8 ppm on Oct 3 10:00		Maximum Daily Average: 0.3 ppm on Oct 3																Hours of Data: 706											
Minimum Value: 0.0 ppm on Oct 1 16:00		Minimum Daily Average: 0.0 ppm on Oct 8																Hours of Missing Data: 38											
Maximum Diurnal Average: 0.1 ppm at hour 10		Minimum Diurnal Average: 0.1 ppm at hour 21																Hours of Calibration: 33											
Monthly Average: 0.07 ppm		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.1 P ₉₀ = 0.2 P ₉₉ = 0.4																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-Oct	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	PF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.0	0.2
2-Oct	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	0.1	0.1	0.1	0.1	0.2	0.2	0.0	0.0	0.2	0.0	0.2
3-Oct	0.2	0.2	0.2	0.2	0.2	Z	0.1	0.4	0.7	0.8	0.8	0.5	0.4	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.1	0.1	0.0	0.0	0.3	0.8	0.0	0.3	0.8
4-Oct	Z	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.6	0.8	0.3	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.8	0.0	0.2	0.8
5-Oct	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
6-Oct	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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
7-Oct	0.1	0.1	0.2	Z	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	PF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2
8-Oct	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	0.0	0.0
9-Oct	0.0	0.0	0.0	0.0	0.0	DF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	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	0.0	0.0
11-Oct	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	0.0
12-Oct	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13-Oct	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	0.0	0.0
14-Oct	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	0.0	0.0
15-Oct	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	0.0	0.0
16-Oct	Z	0.0	0.0	0.0	0.1	0.1	0.1	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3
17-Oct	0.1	Z	0.1	0.1	0.1	0.1	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	0.0	0.0	0.0	0.0	0.1
18-Oct	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19-Oct	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	0.0	0.0
20-Oct	0.0	0.1	0.1	0.1	Z	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
21-Oct	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.0	0.1	0.1	0.2	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	0.1	0.1	0.1	0.2
22-Oct	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	0.2	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
23-Oct	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	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	0.1	0.1	0.1	0.2
24-Oct	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
25-Oct	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2
26-Oct	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	0.0	0.1	0.1	0.1
27-Oct	0.0	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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
28-Oct	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.2	0.1	0.2
29-Oct	PF	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	0.0
30-Oct	0.0	0.1	Z	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	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
31-Oct	0.0	0.0	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	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
																								Diurnal Average					
																								Diurnal Maximum					
																								0.1					
																								0.2					
Z - zerospan																								C - Calibration		DF - DAS Failure		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 - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.3	697	98.73	98.73
0.4 - 0.5	4	0.57	99.29
0.6 - 0.7	2	0.28	99.58
0.8 - 1.4	3	0.42	100.00
1.5 - 10	0	0.00	100.00
> 10	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Carbon Monoxide (CO) - ppm
Fort Chipewyan - October 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	11	5	4	7	40	55	48	89	56	20	25	30	90	132	54	29	695
0.4 - 0.5	0	0	0	0	0	0	0	0	0	0	0	0	3	0	1	0	4
0.6 - 0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
0.8 - 1.4	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	3
1.5 - 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	11	5	4	7	40	55	48	89	56	20	25	30	94	136	55	29	704

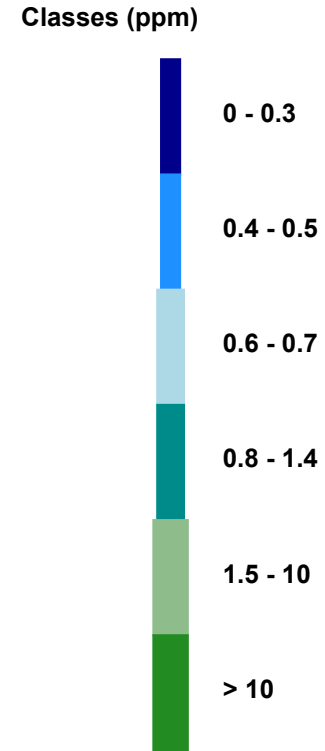
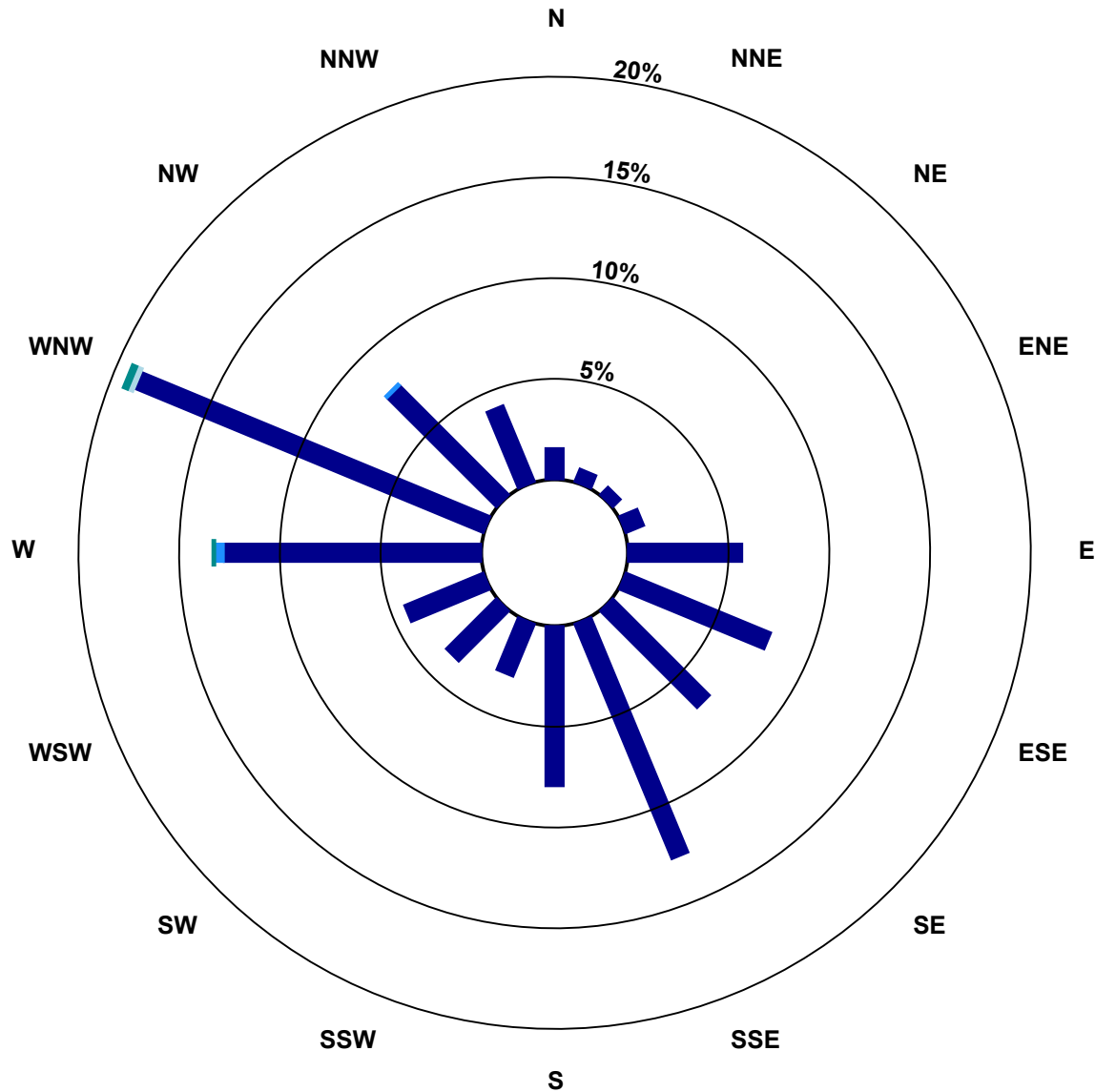
Total Number of Valid Hours: 704

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

Carbon Monoxide (CO) - ppm
Fort Chipewyan



Total Number of Valid Hours: 704



Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 470.6 ppm on Oct 3 07:00	Maximum Daily Average: 448.3 ppm on Oct 3		Hours of Data:	706
Minimum Value: 418.6 ppm on Oct 5 16:00	Minimum Daily Average: 420.5 ppm on Oct 5		Hours of Missing Data:	38
Maximum Diurnal Average: 434.8 ppm at hour 7	Minimum Diurnal Average: 429.2 ppm at hour 14		Hours of Calibration:	33
Monthly Average: 431.63 ppm	Percentiles: P ₁ = 419.4 P ₁₀ = 422.8 Q ₁ = 425.9 Median = 430.7 Q ₃ = 435.8 P ₉₀ = 441.7 P ₉₉ = 458.4		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-Oct	432.2	435.3	437.6	Z	439.2	439.0	438.0	437.9	435.6	433.4	431.1	427.9	425.8	425.6	PF	431.0	428.7	427.8	427.9	429.0	429.5	430.0	431.0	431.3	432.0	439.2
2-Oct	431.7	432.2	432.6	433.5	Z	436.7	438.4	440.7	441.0	440.9	442.9	443.2	443.1	443.4	443.8	443.2	442.8	442.8	443.0	446.4	445.3	447.6	447.5	448.6	441.4	448.6
3-Oct	450.4	456.3	461.2	462.5	464.2	Z	470.6	469.3	464.5	453.5	448.1	441.1	438.1	436.4	439.1	438.3	436.4	437.1	439.6	439.7	440.5	439.9	441.6	441.7	448.3	470.6
4-Oct	Z	440.3	448.1	443.8	446.1	458.4	452.2	446.3	441.7	438.9	437.4	441.8	443.6	435.7	438.9	432.0	427.9	428.2	430.3	429.6	428.4	427.6	429.1	426.1	437.9	458.4
5-Oct	424.2	Z	421.9	421.8	421.3	421.1	420.9	420.9	420.6	420.3	420.0	419.8	419.3	419.0	418.8	418.6	418.7	419.0	419.2	419.4	419.7	419.8	422.7	424.1	420.5	424.2
6-Oct	423.8	426.7	Z	424.8	425.6	425.9	426.6	429.6	429.5	430.2	428.7	429.4	429.9	429.0	428.8	431.4	434.6	435.4	436.6	436.5	436.0	437.7	438.9	440.2	431.1	440.2
7-Oct	440.6	439.0	442.9	Z	447.5	446.9	442.6	441.7	435.4	433.2	430.9	430.8	430.5	430.2	429.7	429.5	PF	432.3	429.6	428.3	428.5	428.8	429.2	430.8	434.5	447.5
8-Oct	432.4	432.8	432.7	431.5	Z	432.0	432.0	431.9	431.7	431.5	431.2	430.9	430.7	430.7	431.4	432.3	434.2	436.1	434.4	431.9	431.7	431.1	431.2	431.5	432.1	436.1
9-Oct	432.1	433.0	434.0	434.9	435.5	DF	437.3	437.1	437.3	436.0	435.1	434.3	432.9	431.8	430.9	430.3	429.9	430.1	432.1	432.8	433.5	433.5	434.2	435.3	433.6	437.3
10-Oct	Z	434.2	434.6	435.7	436.3	436.8	436.9	437.0	437.2	436.5	435.7	434.6	433.5	432.7	432.5	432.0	432.1	432.0	432.2	432.5	432.5	432.0	432.1	432.1	434.1	437.2
11-Oct	432.1	Z	432.5	433.4	433.6	433.9	434.4	434.4	434.2	432.7	432.3	431.6	430.9	431.5	431.6	431.2	431.0	431.0	431.3	432.7	432.8	432.0	432.4	433.0	432.5	434.4
12-Oct	432.9	434.2	Z	432.4	432.9	433.4	434.1	434.3	434.4	434.8	434.3	434.1	433.4	432.6	432.2	431.8	431.4	431.4	433.5	435.8	438.1	438.0	436.2	434.8	434.0	438.1
13-Oct	433.4	433.0	433.8	Z	435.1	436.0	436.8	437.8	437.9	437.6	436.2	434.1	432.7	428.6	428.8	431.6	430.2	428.8	427.0	426.1	427.5	427.6	427.9	428.6	432.1	437.9
14-Oct	429.0	428.7	428.1	428.4	Z	427.9	428.4	427.8	427.6	427.3	426.3	425.2	424.9	424.6	424.3	424.0	424.1	424.6	425.2	425.5	425.9	426.1	426.3	426.7	426.4	429.0
15-Oct	427.4	428.0	428.8	429.3	429.6	Z	430.2	430.6	430.8	431.0	430.9	430.7	430.5	429.6	429.0	429.4	430.3	430.2	433.8	437.2	438.6	440.5	441.1	441.0	432.1	441.1
16-Oct	Z	440.5	443.6	444.9	442.2	443.2	443.8	445.9	446.7	443.0	440.3	439.1	437.5	437.2	436.7	436.4	437.1	437.7	437.3	439.6	438.1	439.6	440.3	440.7	440.5	446.7
17-Oct	454.7	Z	443.8	444.7	445.0	444.3	442.0	440.1	437.4	436.1	435.4	434.9	C	C	C	433.0	432.6	432.5	432.0	431.5	431.2	431.0	431.2	430.9	437.2	454.7
18-Oct	430.6	431.1	Z	434.6	435.1	435.8	438.9	441.0	440.8	443.1	443.6	443.0	441.7	441.3	440.8	440.6	439.9	440.2	441.7	442.4	443.2	444.8	448.3	447.9	440.4	448.3
19-Oct	449.5	449.7	450.6	Z	453.1	458.8	457.1	457.2	451.8	451.9	445.1	436.8	435.2	435.2	435.2	433.0	434.3	435.7	438.3	439.3	438.5	435.5	436.1	438.1	443.3	458.8
20-Oct	438.1	440.1	442.8	440.8	Z	438.0	437.2	437.7	436.9	436.4	438.2	435.8	434.2	432.2	429.5	427.5	427.1	427.1	427.8	429.4	430.0	430.6	434.1	431.9	434.1	442.8
21-Oct	433.8	431.3	431.2	431.4	433.1	Z	436.4	435.5	433.1	433.4	432.8	429.6	426.7	426.5	426.4	425.9	426.0	426.1	426.6	426.6	426.5	426.6	426.8	427.0	429.5	436.4
22-Oct	Z	428.1	429.5	430.7	432.6	432.8	434.8	434.2	431.3	430.8	427.5	426.9	427.1	426.5	426.1	425.1	424.6	424.8	424.7	425.4	425.6	425.5	425.7	425.7	428.1	434.8
23-Oct	425.9	Z	425.9	425.8	425.6	425.5	425.6	426.0	426.1	426.0	425.7	425.8	425.6	426.2	425.9	426.0	426.4	426.7	426.0	425.6	425.4	425.1	425.1	425.2	425.8	426.7
24-Oct	425.3	425.2	Z	425.5	425.9	425.8	425.6	426.1	423.9	423.1	423.1	422.9	423.1	422.3	421.7	421.8	421.7	421.7	421.7	421.6	421.7	421.8	421.8	421.9	423.3	426.1
25-Oct	421.9	422.0	422.1	Z	422.5	422.5	422.7	423.0	423.5	424.5	424.5	423.7	423.9	424.8	426.3	426.7	427.5	426.1	425.9	426.6	427.2	427.3	427.5	427.8	424.8	427.8
26-Oct	426.6	426.1	425.9	426.0	Z	425.8	425.2	424.8	424.7	424.1	423.7	423.3	423.7	424.6	424.9	425.0	425.9	426.0	425.6	425.5	426.0	425.6	425.2	424.9	425.2	426.6
27-Oct	422.6	422.7	422.2	422.4	422.8	Z	424.0	425.3	425.6	426.4	423.4	422.4	421.6	421.7	421.8	421.7	422.0	422.2	422.8	423.8	425.1	426.4	423.8	424.9	423.4	426.4
28-Oct	Z	430.8	429.4	429.5	430.2	429.7	429.8	429.6	430.6	430.2	428.0	427.1	426.0	425.0	424.2	424.6	425.5	425.5	425.5	425.6	424.5	423.1	422.7	PF	427.1	430.8
29-Oct	PF	Z	425.4	425.0	425.2	424.1	423.6	423.3	423.2	422.7	421.7	421.7	422.1	422.5	422.9	423.3	423.8	423.8	423.9	422.8	422.3	421.9	420.7	420.8	423.0	425.4
30-Oct	421.0	420.9	Z	421.4	420.6	421.1	423.7	422.8	425.5	427.3	426.5	421.4	421.2	422.4	425.6	427.3	427.6	427.6	427.3	428.2	428.3	428.5	428.5	428.8	424.9	428.8
31-Oct	429.2	430.1	430.9	Z	429.6	429.0	428.0	427.0	426.2	426.7	427.1	426.9	426.9	427.0	427.3	427.5	427.5	427.8	428.1	427.9	426.9	427.0	427.2	427.7	427.8	430.9

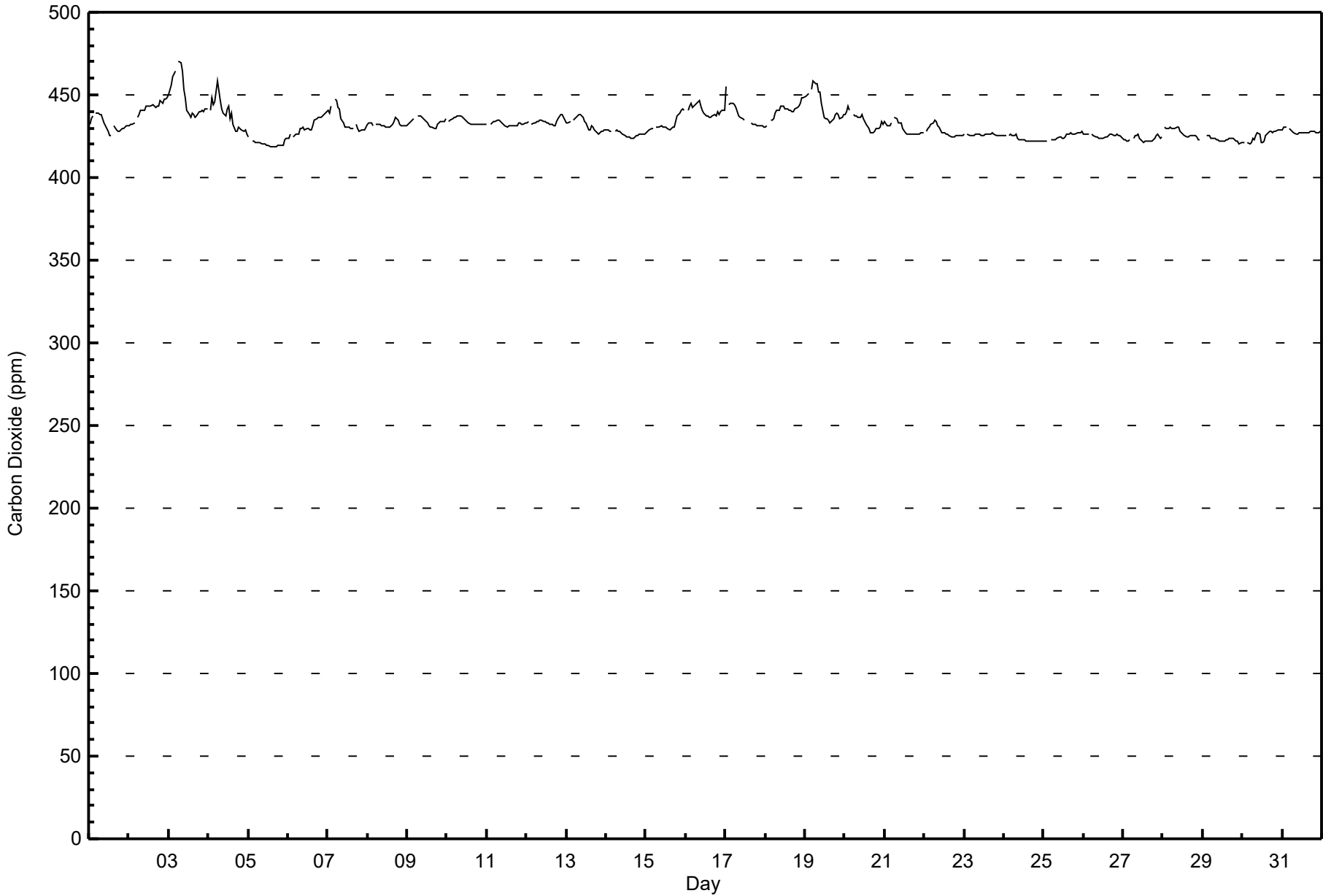
432.1	432.8	434.3	432.6	434.2	434.0	434.8	434.7	433.8	433.0	431.9	430.7	429.9	429.2	429.5	429.4	429.4	429.6	430.0	430.5	430.6	430.7	431.2	431.7	Diurnal Average	
454.7	456.3	461.2	462.5	464.2	458.8	470.6	469.3	464.5	453.5	448.1	443.2	443.6	443.4	443.8	443.2	442.8	442.8	443.0	446.4	445.3	447.6	448.3	448.6	Diurnal Maximum	

Z - zerospan C - Calibration DF - DAS Failure PF - Power Failure



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
400 - 420	13	1.84	1.84
420 - 440	604	85.55	87.39
440 - 460	83	11.76	99.15
460 - 480	6	0.85	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 - October 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
400 - 420	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0	0	13
420 - 440	9	3	4	6	39	51	41	86	51	14	11	21	76	112	53	25	602
440 - 460	2	2	0	1	1	4	7	3	5	6	11	8	17	10	2	4	83
460 - 480	0	0	0	0	0	0	0	0	0	0	3	1	1	1	0	0	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	11	5	4	7	40	55	48	89	56	20	25	30	94	136	55	29	704

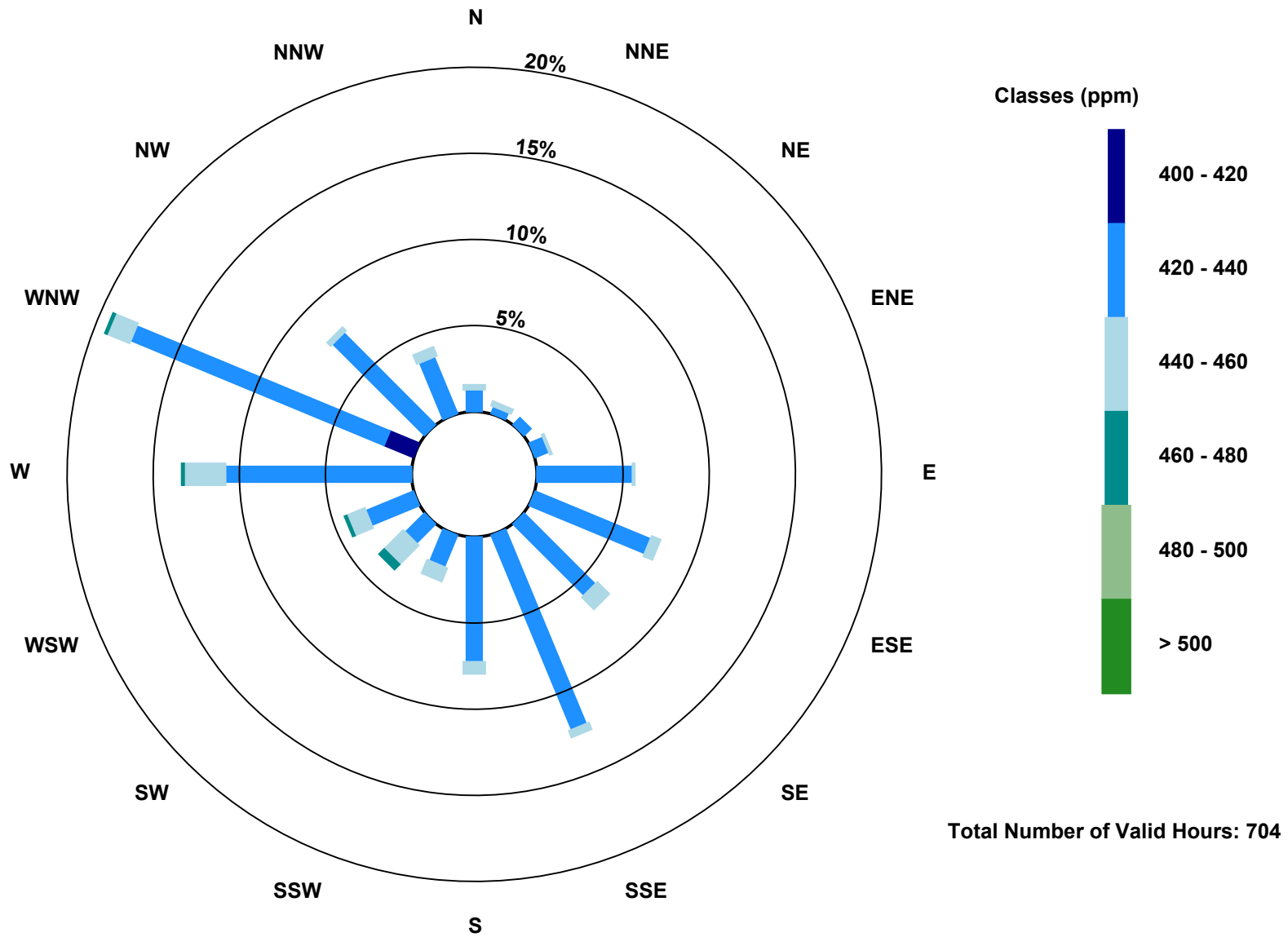
Total Number of Valid Hours: 704

Total Number of Hours: 744



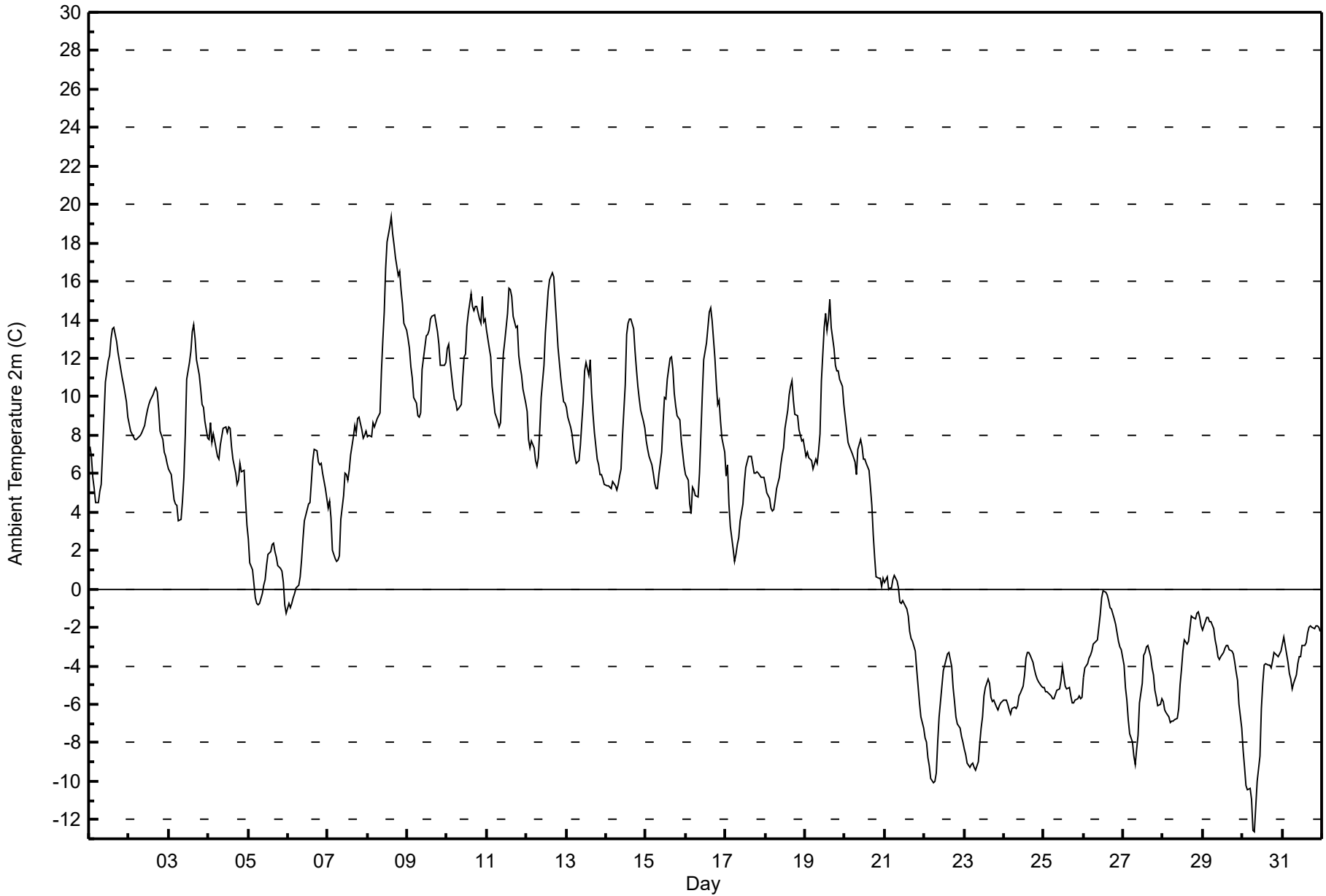
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Carbon Dioxide (CO₂) - ppm
Fort Chipewyan





Maximum Value: 19.4 C on Oct 8 15:00 Maximum Daily Average: 13.5 C on Oct 8																				Hours in Service: 744 Hours of Data: 744						
Minimum Value: -12.6 C on Oct 30 08:00 Minimum Daily Average: -7.1 C on Oct 23 Maximum Diurnal Average: 6.3 C at hour 15 Minimum Diurnal Average: 1.3 C at hour 7 Monthly Average: 3.68 C Percentiles: P ₁ = -10.1 P ₁₀ = -5.9 Q ₁ = -3.2 Median = 5.5 Q ₃ = 9.2 P ₉₀ = 12.9 P ₉₉ = 16.5																				Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Oct	7.4	6.9	5.8	5.2	4.5	4.5	5.1	5.5	7.1	8.9	10.7	11.8	12.1	13.0	13.5	13.6	12.9	12.3	11.8	11.4	11.0	10.6	9.7	8.9	9.3	13.6
2-Oct	8.6	8.2	8.0	7.8	7.8	7.8	7.9	8.0	8.1	8.5	8.9	9.3	9.6	9.8	10.1	10.3	10.5	10.3	9.4	8.2	7.8	7.1	6.9	6.6	8.6	10.5
3-Oct	6.2	6.0	5.3	4.6	4.4	4.4	3.5	3.6	4.5	5.8	8.0	10.9	11.8	12.3	13.4	13.7	13.0	11.9	11.1	10.4	9.6	9.4	8.7	7.9	8.4	13.7
4-Oct	7.8	8.6	7.6	8.1	7.7	6.9	6.7	7.5	7.9	8.4	8.5	8.1	8.4	8.4	7.4	6.7	6.0	5.4	5.7	6.5	6.1	6.2	4.7	3.3	7.0	8.6
5-Oct	2.6	1.3	1.0	0.3	-0.4	-0.8	-0.8	-0.8	-0.3	0.2	0.5	1.2	1.8	2.0	2.3	2.4	2.0	1.6	1.2	1.1	0.9	0.3	-0.8	-1.2	0.7	2.6
6-Oct	-0.7	-1.0	-0.7	-0.5	-0.2	0.0	0.2	0.6	1.5	2.6	3.6	4.1	4.5	4.5	5.6	6.7	7.3	7.2	6.6	6.4	6.6	6.0	5.2	4.7	3.4	7.3
7-Oct	4.2	4.5	3.7	2.0	1.6	1.4	1.5	1.7	3.6	4.8	6.1	6.0	5.7	6.2	6.9	7.9	8.5	8.1	8.8	9.0	8.3	7.9	8.0	8.2	5.6	9.0
8-Oct	7.9	8.0	7.9	8.7	8.4	8.6	8.9	9.2	11.4	12.9	14.4	16.6	18.1	18.8	19.4	18.5	17.9	17.2	16.3	16.5	15.6	14.9	13.8	13.4	13.5	19.4
9-Oct	13.0	12.5	11.6	11.0	10.0	9.6	9.0	8.9	9.2	11.4	12.6	13.1	13.2	13.4	14.1	14.2	14.3	13.8	13.4	12.7	11.7	11.6	11.6	11.8	12.0	14.3
10-Oct	12.5	12.8	11.9	10.4	9.9	9.7	9.3	9.4	9.6	11.0	12.0	12.2	13.7	14.3	15.4	14.7	14.5	14.7	14.7	14.1	13.9	15.2	13.9	14.1	12.7	15.4
11-Oct	13.5	12.5	12.1	10.6	9.9	9.2	8.7	8.4	8.7	10.7	12.2	12.9	14.3	15.6	15.6	15.2	14.2	13.6	13.7	12.1	11.5	11.2	10.4	9.6	11.9	15.6
12-Oct	9.2	7.8	7.3	7.7	7.3	6.7	6.4	6.9	8.3	9.9	11.6	13.3	14.4	15.5	16.1	16.4	16.2	15.0	13.8	12.5	11.0	10.3	9.7	9.7	11.0	16.4
13-Oct	9.4	8.9	8.4	8.1	7.4	6.9	6.5	6.7	7.5	8.7	9.8	11.4	11.8	11.1	11.9	10.2	9.1	8.1	6.7	6.4	5.9	6.0	5.7	5.4	8.2	11.9
14-Oct	5.4	5.3	5.3	5.2	5.6	5.4	5.2	5.4	5.8	6.3	7.9	10.6	13.2	13.9	14.1	14.0	13.5	12.4	11.4	10.5	9.9	9.3	8.7	8.3	8.9	14.1
15-Oct	7.7	7.3	6.9	6.4	6.0	5.5	5.2	5.2	6.0	7.1	8.6	10.0	9.9	10.9	12.0	12.0	11.4	10.2	9.6	9.0	8.8	7.7	7.0	6.4	8.2	12.0
16-Oct	6.0	5.6	4.4	3.9	5.3	5.2	4.8	4.8	6.0	8.1	10.1	11.9	12.8	13.6	14.4	14.6	13.9	12.0	10.7	9.6	9.8	8.7	7.9	7.1	8.8	14.6
17-Oct	5.9	6.5	4.5	3.2	2.1	1.4	1.8	2.3	2.7	3.5	4.4	5.5	6.3	6.6	6.9	6.9	6.5	6.0	6.0	6.1	6.0	5.8	5.8	5.8	4.9	6.9
18-Oct	5.4	5.0	4.7	4.2	4.1	4.1	4.6	5.2	5.8	6.5	6.9	7.3	8.3	9.3	10.1	10.5	10.8	9.8	9.1	9.0	8.3	8.0	7.7	7.8	7.2	10.8
19-Oct	6.9	7.1	6.9	6.7	6.7	6.2	6.7	6.5	7.2	8.1	10.8	13.6	14.3	13.5	14.0	15.1	13.6	12.5	11.7	11.3	11.3	10.9	10.6	9.6	10.1	15.1
20-Oct	8.9	8.3	7.7	7.4	7.0	6.8	6.6	5.9	7.2	7.8	7.4	6.7	6.8	6.5	6.2	5.3	4.3	2.8	1.7	0.6	0.5	0.6	0.1	0.6	5.2	8.9
21-Oct	0.3	0.6	0.0	0.0	0.1	0.5	0.7	0.4	0.0	-0.7	-0.7	-0.6	-0.9	-1.0	-1.4	-2.2	-2.6	-2.7	-3.2	-4.2	-5.0	-5.9	-6.7	-7.3	-1.8	0.7
22-Oct	-7.7	-8.0	-8.8	-9.2	-9.9	-10.1	-10.0	-9.6	-8.0	-6.6	-5.0	-4.3	-4.0	-3.7	-3.3	-3.3	-4.0	-5.1	-5.9	-6.7	-7.0	-7.3	-7.7	-8.0	-6.8	-3.3
23-Oct	-8.3	-8.7	-9.1	-9.2	-9.1	-9.0	-9.3	-9.4	-9.0	-8.0	-7.3	-6.7	-5.6	-5.2	-4.7	-4.9	-5.7	-5.8	-5.8	-6.2	-6.3	-6.1	-5.9	-5.9	-7.1	-4.7
24-Oct	-5.8	-5.8	-6.0	-6.3	-6.5	-6.2	-6.1	-6.2	-6.1	-5.6	-5.4	-5.1	-4.4	-3.6	-3.3	-3.3	-3.4	-3.8	-4.2	-4.5	-4.7	-4.8	-5.1	-5.1	-5.1	-3.3
25-Oct	-5.2	-5.3	-5.4	-5.4	-5.6	-5.7	-5.7	-5.5	-5.2	-5.2	-4.7	-4.1	-4.6	-5.1	-5.2	-5.1	-5.6	-5.9	-5.9	-5.8	-5.7	-5.6	-5.7	-5.6	-5.4	-4.1
26-Oct	-4.6	-4.1	-3.9	-3.6	-3.4	-3.2	-2.9	-2.7	-2.6	-2.0	-1.3	-0.4	-0.1	-0.2	-0.3	-0.6	-0.9	-1.0	-1.5	-1.9	-2.3	-2.7	-3.0	-3.2	-2.2	-0.1
27-Oct	-3.9	-5.1	-5.8	-6.8	-7.6	-8.0	-8.7	-9.1	-8.3	-7.6	-5.9	-4.9	-3.5	-3.3	-3.0	-2.9	-3.5	-4.1	-4.4	-5.3	-5.7	-6.1	-6.0	-5.7	-5.6	-2.9
28-Oct	-5.8	-6.3	-6.4	-6.7	-7.0	-6.8	-6.9	-6.8	-6.8	-6.2	-5.0	-4.2	-3.2	-2.7	-2.9	-2.8	-2.1	-1.4	-1.5	-1.5	-1.3	-1.2	-1.5	-1.9	-4.1	-1.2
29-Oct	-2.1	-1.7	-1.5	-1.5	-1.7	-1.7	-2.1	-2.7	-3.0	-3.5	-3.6	-3.5	-3.3	-3.1	-2.9	-2.9	-3.1	-3.3	-3.4	-3.8	-4.3	-4.8	-6.0	-7.3	-3.2	-1.5
30-Oct	-8.4	-9.3	-10.2	-10.4	-10.4	-11.0	-12.6	-12.6	-11.3	-10.0	-8.7	-6.2	-4.9	-4.0	-3.9	-4.0	-4.0	-4.1	-3.8	-3.3	-3.4	-3.5	-3.4	-3.3	-6.9	-3.3
31-Oct	-2.8	-2.5	-3.4	-3.8	-4.4	-4.7	-5.2	-4.9	-4.4	-3.9	-3.5	-3.6	-3.0	-2.9	-2.8	-2.3	-2.0	-1.9	-2.0	-2.1	-1.9	-1.9	-2.0	-2.2	-3.1	-1.9
3.0 2.8 2.2 1.9 1.6 1.4 1.3 1.3 2.0 3.0 4.0 4.9 5.6 6.0 6.3 6.3 5.9 5.3 4.9 4.5 4.1 3.8 3.3 3.0																								Diurnal Average		
13.5 12.8 12.1 11.0 10.0 9.7 9.3 9.4 11.4 12.9 14.4 16.6 18.1 18.8 19.4 18.5 17.9 17.2 16.3 16.5 15.6 15.2 13.9 14.1																								Diurnal Maximum		





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	267	35.89	35.89
0 - 10	324	43.55	79.44
10 - 20	153	20.56	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

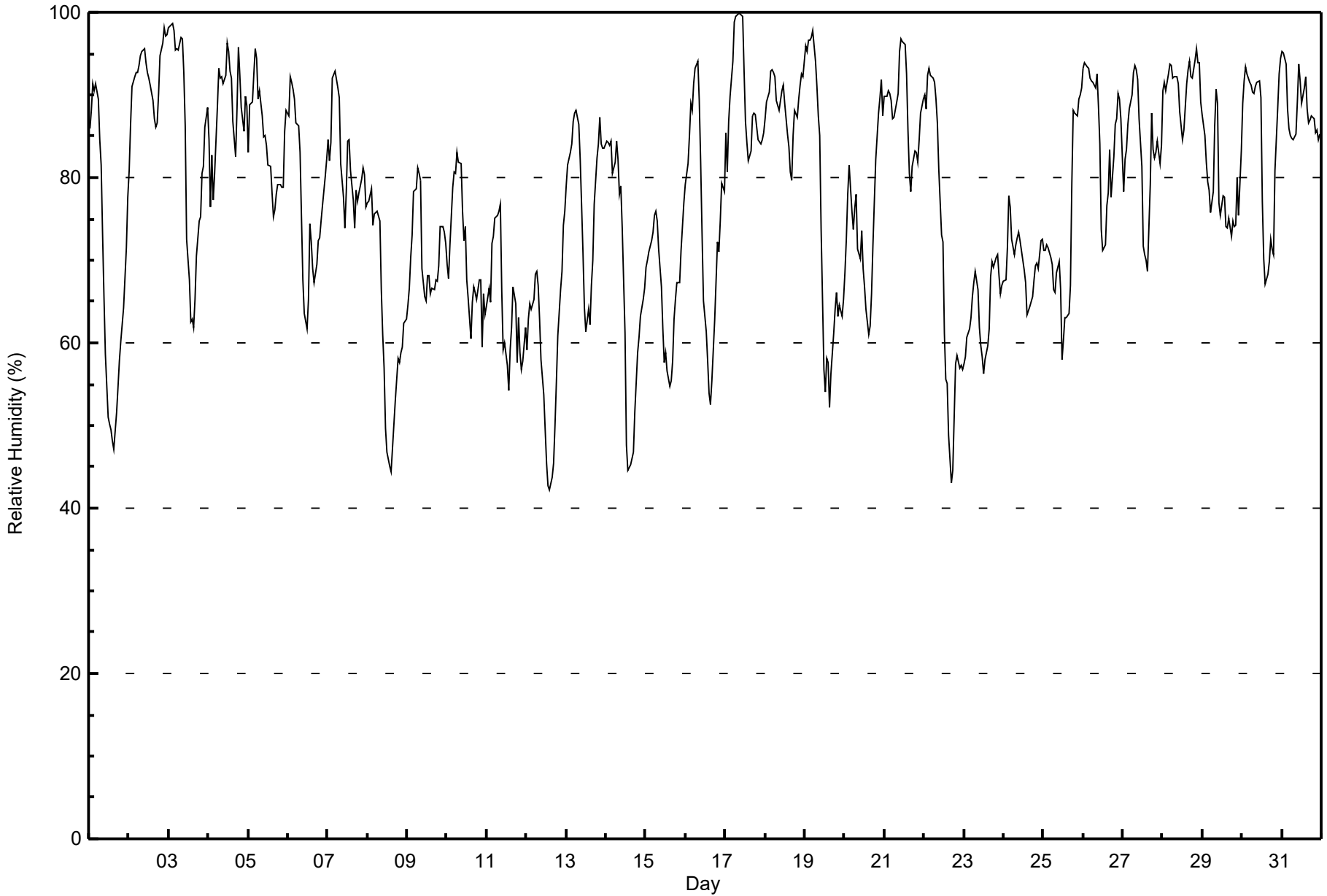
Relative Humidity (RH) - %
Fort Chipewyan - October 2023

Maximum Value: 99.8 % on Oct 17 10:00 Maximum Daily Average: 92.0 % on Oct 2																						Hours in Service: 744 Hours of Data: 744				
Minimum Value: 42.2 % on Oct 12 15:00 Minimum Daily Average: 59.0 % on Oct 12 Maximum Diurnal Average: 85.0 % at hour 7 Minimum Diurnal Average: 67.0 % at hour 16 Monthly Average: 77.29 % Percentiles: P ₁ = 45.0 P ₁₀ = 58.8 Q ₁ = 67.3 Median = 78.7 Q ₃ = 88.6 P ₉₀ = 92.7 P ₉₉ = 98.3																						Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Oct	86.0	88.1	91.4	90.5	91.4	89.6	84.5	81.5	73.2	65.6	58.6	51.1	50.2	49.5	48.1	47.2	51.6	54.6	57.8	60.3	62.1	64.3	71.6	77.5	68.6	91.4
2-Oct	80.8	86.5	91.1	92.2	92.7	92.7	93.6	94.8	95.2	95.6	93.9	92.8	92.1	91.1	89.2	87.2	86.1	86.6	90.2	94.8	96.4	98.2	97.2	97.3	92.0	98.2
3-Oct	98.2	98.5	98.6	97.8	95.5	95.6	95.5	97.0	96.7	92.7	86.2	72.5	67.6	62.6	62.8	61.8	65.3	70.5	74.7	75.2	80.6	81.3	86.1	88.5	83.4	98.6
4-Oct	84.6	76.4	82.8	77.2	80.5	88.6	93.3	92.0	92.1	91.3	92.4	96.2	95.3	92.9	92.0	86.8	82.5	88.5	95.8	92.3	88.4	85.6	89.8	88.7	88.6	96.2
5-Oct	83.0	88.8	89.1	92.6	95.6	94.4	89.5	90.6	87.5	85.0	85.2	83.8	81.5	81.4	78.2	75.3	76.2	77.9	79.1	79.1	78.8	78.8	85.6	88.2	84.4	95.6
6-Oct	87.4	92.1	91.5	90.7	89.4	86.7	86.3	83.0	75.3	67.7	63.5	61.6	65.3	74.3	72.1	68.9	67.2	69.5	72.4	72.7	74.8	76.6	80.2	82.1	77.1	92.1
7-Oct	84.6	82.1	84.3	92.0	92.8	91.8	90.8	89.6	81.7	77.7	73.8	78.3	84.4	84.7	80.9	77.2	73.8	78.5	77.2	78.2	79.9	81.1	80.3	76.5	82.2	92.8
8-Oct	76.9	77.1	78.7	74.2	75.5	75.7	75.9	74.7	66.4	61.0	56.9	49.7	46.9	45.1	44.5	47.3	50.2	53.0	58.2	57.6	58.8	59.5	62.3	62.9	62.0	78.7
9-Oct	64.5	66.6	70.4	73.0	78.4	78.6	81.2	80.4	79.6	69.0	65.6	65.1	68.1	68.1	65.9	66.6	66.5	67.7	67.5	69.3	74.1	74.1	73.5	72.1	71.1	81.2
10-Oct	69.5	67.8	71.9	78.7	80.7	80.6	83.1	81.8	81.7	76.0	72.4	74.1	67.6	65.4	60.6	64.9	66.8	66.1	65.3	67.7	67.7	59.5	66.0	63.3	70.8	83.1
11-Oct	64.5	66.6	64.9	72.0	72.9	75.1	75.4	75.9	76.8	66.3	59.1	59.9	57.3	54.3	59.2	61.9	66.8	64.7	57.6	63.1	58.8	56.8	57.8	61.9	64.6	76.8
12-Oct	59.2	62.8	64.8	64.0	65.3	68.3	68.7	67.0	62.8	58.0	53.6	49.5	45.5	42.6	42.2	43.7	45.5	50.1	55.2	60.8	66.4	68.6	74.2	76.0	59.0	76.0
13-Oct	79.1	81.5	83.1	84.1	86.7	87.8	88.1	86.4	82.2	76.6	70.9	64.2	61.3	64.1	62.1	66.9	69.9	76.8	82.4	84.0	87.3	84.1	83.5	83.6	78.2	88.1
14-Oct	84.4	84.2	83.9	84.4	80.5	81.9	84.4	82.3	78.0	79.0	73.8	61.1	47.6	44.5	45.0	45.3	46.9	51.6	55.3	58.9	60.7	63.2	65.3	66.7	67.0	84.4
15-Oct	69.2	70.0	71.0	72.3	73.4	75.4	75.9	74.7	71.4	66.8	61.7	57.6	58.8	56.6	54.7	55.4	57.8	62.8	65.2	67.3	67.4	71.2	74.1	76.9	67.0	76.9
16-Oct	79.2	81.7	85.0	89.0	88.2	91.4	93.2	94.1	89.3	81.8	73.3	65.1	61.3	57.8	54.0	52.6	55.4	62.7	67.4	72.3	71.1	74.7	79.3	78.3	74.9	94.1
17-Oct	85.4	80.7	86.8	89.9	94.0	98.8	99.4	99.7	99.8	99.8	99.6	92.9	86.8	84.3	82.1	83.3	87.4	87.9	87.7	86.2	84.6	84.2	84.6	85.5	89.6	99.8
18-Oct	87.1	89.1	90.4	92.8	93.0	92.6	92.2	89.3	88.2	89.3	90.5	91.3	89.0	85.3	83.8	80.7	79.7	85.1	88.1	87.2	89.5	91.2	92.5	92.1	88.7	93.0
19-Oct	95.9	95.3	96.7	96.6	96.9	97.8	94.0	91.0	87.4	85.1	73.7	56.7	54.1	58.1	57.7	52.2	56.2	61.3	64.1	66.1	63.2	64.6	63.2	65.2	74.7	97.8
20-Oct	68.5	72.5	77.9	81.6	76.0	73.7	76.3	77.9	71.3	70.1	73.5	69.0	66.8	64.1	61.0	62.0	66.0	71.8	77.1	82.3	87.7	89.7	91.8	87.5	74.8	91.8
21-Oct	89.8	89.9	90.5	90.1	89.3	87.1	87.2	89.1	90.1	95.3	96.7	96.5	96.2	92.5	85.8	80.6	78.3	81.3	83.2	83.0	81.8	84.6	87.8	89.6	88.2	96.7
22-Oct	90.0	88.3	92.5	93.3	92.4	92.0	91.6	89.5	86.6	81.0	73.1	72.1	61.2	55.5	55.2	48.8	43.0	44.6	51.0	57.5	58.5	57.0	57.3	56.8	70.4	93.3
23-Oct	57.4	58.4	60.7	61.7	63.0	65.6	67.4	68.6	66.5	61.9	59.6	58.4	56.3	58.0	59.7	61.6	68.0	69.9	69.1	70.3	70.7	68.1	66.0	67.0	63.9	70.7
24-Oct	67.5	67.7	71.5	77.8	76.4	72.5	70.7	71.9	72.8	73.3	72.4	70.1	68.8	67.2	63.5	64.0	64.5	65.5	67.6	69.3	69.7	69.1	72.3	72.5	69.9	77.8
25-Oct	71.2	71.2	71.8	71.5	70.3	69.5	66.4	66.2	68.5	69.9	66.4	58.0	60.3	63.0	63.1	63.5	66.9	79.4	88.2	87.8	87.5	89.5	89.9	90.8	72.9	90.8
26-Oct	93.2	93.9	93.4	93.3	92.0	91.7	91.5	90.9	92.6	88.7	84.0	73.7	71.2	71.9	76.7	78.2	83.5	77.6	82.5	86.4	87.1	90.2	89.4	87.1	85.9	93.9
27-Oct	78.3	82.1	83.5	86.4	88.3	90.0	92.7	93.5	93.0	91.8	87.2	81.3	71.7	70.7	70.1	68.6	79.2	87.8	83.4	82.4	83.0	84.3	81.7	83.8	83.1	93.5
28-Oct	90.5	91.5	90.6	92.5	93.7	93.6	92.1	92.2	92.2	91.3	88.0	86.3	84.6	85.8	91.4	93.0	94.1	92.2	92.1	94.2	95.6	93.8	93.8	89.2	91.4	95.6
29-Oct	87.7	85.1	81.9	79.5	78.4	75.8	78.3	86.3	90.6	89.0	76.9	75.4	77.8	77.6	74.1	73.9	75.1	73.0	74.8	74.0	74.2	80.0	75.4	83.3	79.1	90.6
30-Oct	88.9	91.7	93.4	92.6	91.6	91.2	90.3	90.1	91.0	91.6	91.6	89.7	77.1	70.1	67.2	68.3	69.9	72.6	71.4	70.7	80.8	88.5	92.5	94.3	84.0	94.3
31-Oct	95.3	95.1	93.7	88.3	85.9	85.0	84.8	84.6	85.2	89.1	93.8	91.7	88.9	90.8	92.1	88.2	86.7	87.0	87.4	87.2	85.5	85.7	84.6	85.3	88.4	95.3
80.6 81.4 83.1 84.3 84.5 84.9 85.0 84.7 82.8 79.9 76.4 72.4 69.7 68.7 67.6 67.0 68.6 71.6 73.8 75.4 76.5 77.4 79.0 79.7																								Diurnal Average		
98.2 98.5 98.6 97.8 96.9 98.8 99.4 99.7 99.8 99.8 99.6 96.5 96.2 92.9 92.1 93.0 94.1 92.2 95.8 94.8 96.4 98.2 97.2 97.3																								Diurnal Maximum		



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

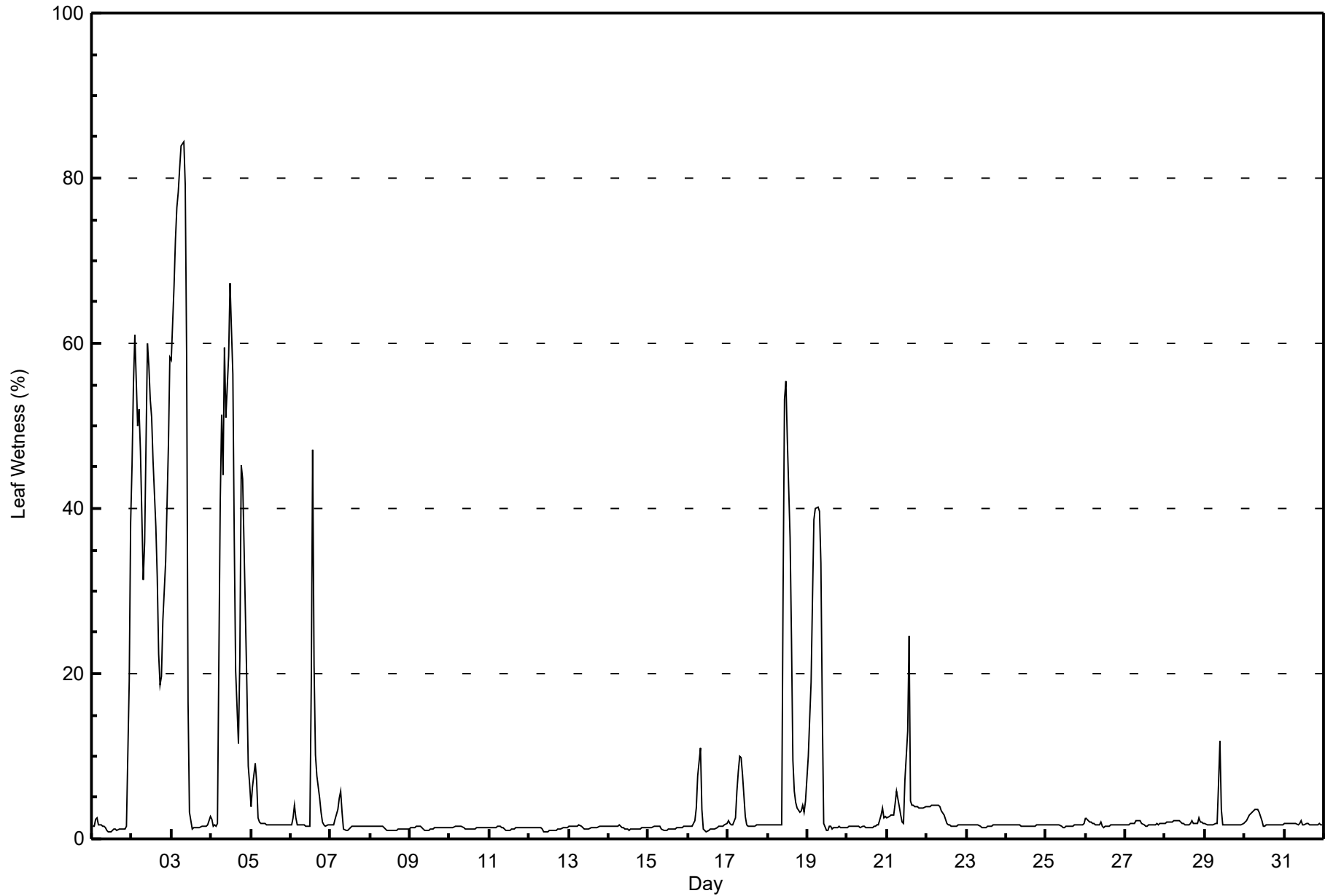
Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	85	11.42	11.42
60 - 80	302	40.59	52.02
80 - 100	357	47.98	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Maximum Value: 84.4 % on Oct 3 08:00																				Maximum Daily Average: 42.5 % on Oct 2					Hours in Service: 744	
Minimum Value: 0.9 % on Oct 1 12:00																				Minimum Daily Average: 1.2 % on Oct 12					Hours of Data: 744	
Maximum Diurnal Average: 9.2 % at hour 7																				Minimum Diurnal Average: 2.9 % at hour 17					Hours of Missing Data: 0	
Monthly Average: 6.06 %																				Percentiles: P ₁ = 1.0 P ₁₀ = 1.2 Q ₁ = 1.4 Median = 1.6 Q ₃ = 2.1 P ₉₀ = 11.4 P ₉₉ = 67.2					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-Oct	1.5	1.5	2.3	2.6	1.6	1.6	1.6	1.5	1.4	1.1	0.9	0.9	1.0	1.1	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.6	19.1	38.4	3.7	38.4
2-Oct	45.2	55.1	61.0	50.0	52.0	47.0	39.2	31.4	36.0	60.1	57.3	53.2	51.0	45.7	37.8	31.8	22.4	18.6	19.6	26.4	33.6	40.4	47.8	58.3	42.5	61.0
3-Oct	58.0	67.0	72.5	76.4	78.3	81.3	83.8	84.4	79.2	58.3	16.6	3.3	1.1	1.3	1.3	1.3	1.4	1.4	1.5	1.5	1.5	1.6	2.7	32.4	84.4	
4-Oct	2.4	1.6	1.6	1.6	1.9	40.9	51.4	44.0	59.5	51.0	58.5	67.3	61.7	56.2	36.5	20.3	11.5	22.0	45.3	43.6	35.4	18.7	8.9	6.6	31.2	67.3
5-Oct	3.9	6.3	9.2	7.0	2.6	2.0	1.9	1.8	1.9	1.7	1.7	1.7	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.7	1.7	1.7	2.6	9.2
6-Oct	1.7	2.5	4.1	2.5	1.8	1.7	1.7	1.7	1.6	1.6	1.5	1.5	18.6	47.2	21.0	10.1	7.6	4.9	3.3	2.1	1.6	1.6	1.6	1.7	6.1	47.2
7-Oct	1.7	1.7	1.8	2.4	3.6	4.9	5.8	3.2	1.2	1.0	1.0	1.2	1.4	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.6	1.6	1.6	1.6	2.0	5.8
8-Oct	1.6	1.6	1.6	1.5	1.5	1.5	1.5	1.5	1.3	1.2	1.1	0.9	1.0	1.0	1.0	1.0	1.1	1.1	1.2	1.2	1.2	1.2	1.3	1.3	1.3	1.6
9-Oct	1.3	1.3	1.4	1.4	1.5	1.5	1.5	1.4	1.2	1.1	1.0	1.0	1.1	1.3	1.3	1.3	1.3	1.3	1.3	1.4	1.4	1.4	1.4	1.4	1.3	1.5
10-Oct	1.4	1.4	1.4	1.5	1.5	1.5	1.5	1.4	1.3	1.2	1.1	1.1	1.2	1.3	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.5
11-Oct	1.3	1.3	1.3	1.4	1.4	1.4	1.5	1.4	1.3	1.2	1.0	1.0	1.0	1.1	1.2	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.5
12-Oct	1.3	1.4	1.4	1.4	1.4	1.4	1.4	1.3	1.1	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.1	1.2	1.2	1.3	1.4	1.4	1.4	1.2	1.4
13-Oct	1.5	1.5	1.5	1.5	1.6	1.6	1.6	1.5	1.3	1.2	1.1	1.1	1.1	1.3	1.3	1.3	1.4	1.4	1.5	1.5	1.6	1.6	1.6	1.6	1.4	1.6
14-Oct	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.5	1.4	1.4	1.3	1.1	1.1	1.1	1.1	1.1	1.1	1.2	1.2	1.3	1.3	1.3	1.3	1.4	1.4	1.6
15-Oct	1.4	1.4	1.4	1.4	1.5	1.5	1.5	1.4	1.3	1.1	1.0	1.0	1.2	1.2	1.2	1.2	1.2	1.3	1.3	1.4	1.4	1.4	1.5	1.5	1.3	1.5
16-Oct	1.5	1.6	1.6	1.8	2.2	3.8	7.7	11.0	3.5	1.2	1.0	0.9	1.0	1.2	1.2	1.2	1.3	1.4	1.5	1.5	1.5	1.6	1.7	1.8	2.3	11.0
17-Oct	2.2	1.9	1.7	1.8	2.6	5.8	8.2	9.9	9.8	7.8	2.7	1.6	1.6	1.5	1.5	1.5	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	3.1	9.9
18-Oct	1.6	1.6	1.6	1.7	1.7	1.7	1.7	1.7	1.6	30.1	53.3	55.5	48.5	36.4	24.0	9.4	5.7	4.4	3.7	3.2	3.3	4.1	3.3	4.5	12.7	55.5
19-Oct	10.0	14.6	19.0	29.2	38.6	40.0	40.3	39.6	33.5	15.6	1.8	0.9	1.0	1.5	1.5	1.2	1.3	1.4	1.4	1.4	1.4	1.4	1.4	1.4	12.5	40.3
20-Oct	1.4	1.5	1.5	1.6	1.6	1.6	1.6	1.5	1.4	1.4	1.5	1.4	1.4	1.4	1.4	1.4	1.5	1.6	1.6	1.7	2.9	3.8	2.6	2.8	1.8	3.8
21-Oct	2.6	2.7	2.9	2.9	2.9	4.2	5.8	4.0	2.9	2.1	1.8	7.2	13.0	24.5	4.5	4.1	4.0	3.9	3.8	3.8	3.8	3.8	3.8	3.8	5.0	24.5
22-Oct	3.9	3.9	4.0	4.0	4.1	4.1	4.1	4.1	3.9	3.3	2.8	2.3	1.9	1.7	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	2.7	4.1
23-Oct	1.6	1.6	1.6	1.7	1.7	1.7	1.7	1.7	1.5	1.4	1.4	1.4	1.4	1.5	1.5	1.6	1.6	1.6	1.6	1.7	1.7	1.6	1.6	1.6	1.6	1.7
24-Oct	1.6	1.6	1.6	1.7	1.7	1.7	1.7	1.7	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.7
25-Oct	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.3	1.3	1.5	1.5	1.5	1.5	1.6	1.6	1.7	1.7	1.7	1.7	1.9	1.6	1.9
26-Oct	2.5	2.4	2.1	2.0	1.9	1.8	1.8	1.8	1.8	2.1	1.6	1.4	1.5	1.5	1.6	1.6	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.8	2.5
27-Oct	1.7	1.8	1.8	1.8	1.9	1.9	2.1	2.2	2.2	2.2	1.9	1.6	1.5	1.6	1.6	1.6	1.7	1.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8	2.2
28-Oct	1.8	2.0	2.0	2.0	2.1	2.2	2.3	2.3	2.2	2.1	1.8	1.8	1.7	1.7	1.8	1.8	2.1	1.8	1.8	1.9	2.6	2.1	2.0	1.9	2.0	2.6
29-Oct	1.8	1.8	1.8	1.7	1.7	1.7	1.9	1.8	6.7	11.8	3.6	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.8	1.9	2.4	11.8
30-Oct	2.1	2.2	2.6	2.9	3.2	3.4	3.5	3.6	3.5	3.2	2.3	1.6	1.5	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.8	1.8	2.3	3.6
31-Oct	1.8	1.8	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.9	2.2	1.8	1.7	1.9	1.9	1.7	1.8	1.8	1.8	1.8	1.8	1.8	1.7	1.8	1.8	2.2
																								Diurnal Average		
																								Diurnal Maximum		





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 0.3	0	0.00	0.00
0.4 - 0.5	0	0.00	0.00
0.6 - 0.7	0	0.00	0.00
0.8 - 1.4	208	27.96	27.96
1.5 - 10	437	58.74	86.69
> 10	78	10.48	97.18

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association

Summary of Hour Averages

Precipitation (PC) - mm

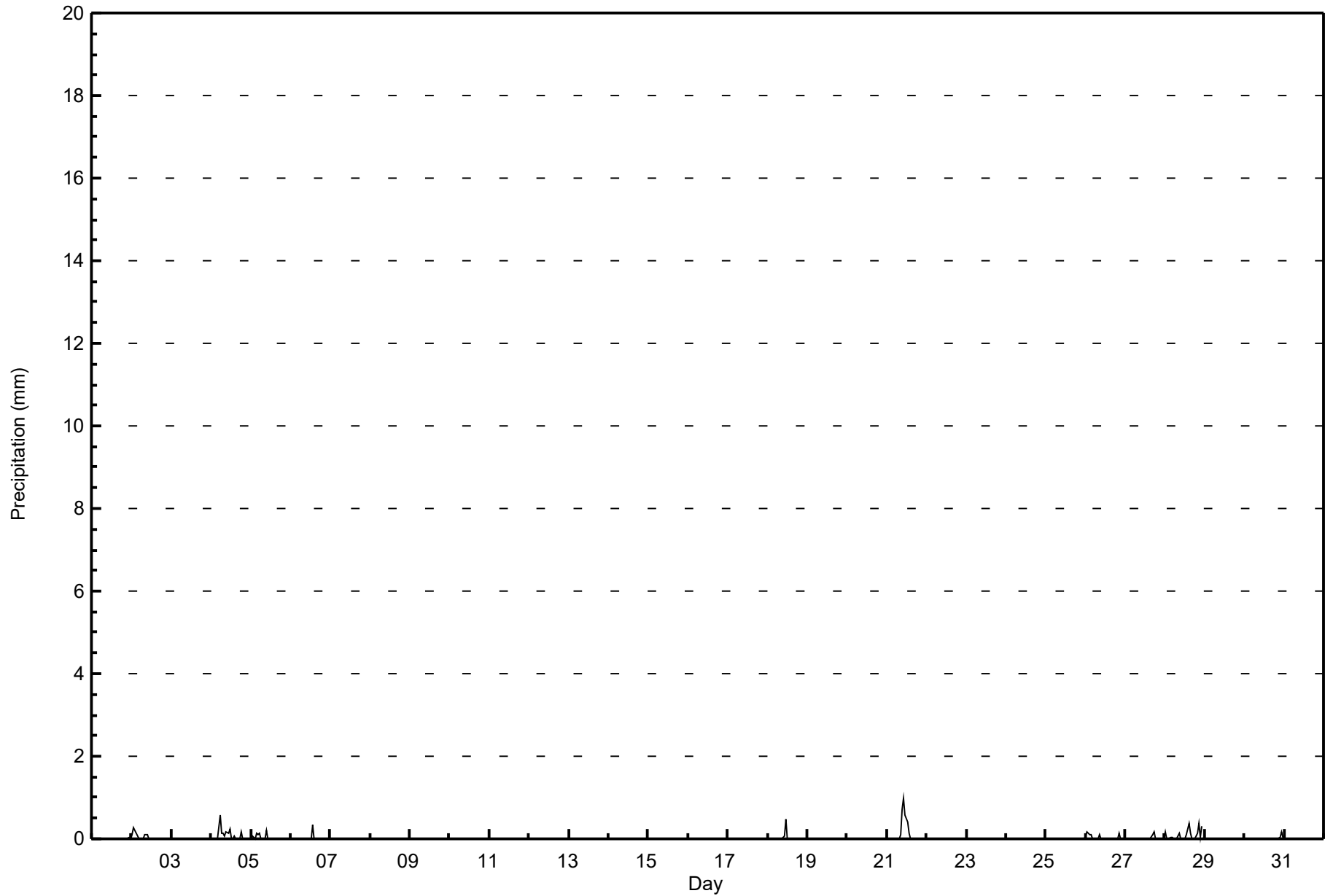
Fort Chipewyan - October 2023

Maximum Value: 1.0 mm on Oct 21 11:00																				Maximum Daily Total: 2.9 mm on Oct 21					Hours in Service: 744																								
Minimum Value: 0.0 mm on Oct 1 01:00																				Minimum Daily Total: 0.0 mm on Oct 3					Hours of Data: 743																								
Maximum Diurnal Total: 1.3 mm at hour 12																				Minimum Diurnal Total: 0.1 mm at hour 24					Hours of Missing Data: 1																								
Monthly Total: 10.06 mm																				Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.0 P ₉₉ = 0.4					Hours of Calibration: 0																								
																									Percent Operational Time: 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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1																							
2-Oct	0.1	0.3	0.2	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.3																						
3-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.6	0.1	0.1	0.1	0.2	0.1	0.2	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.6																						
5-Oct	0.0	0.1	0.0	0.2	0.1	0.1	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	0.7	0.2																						
6-Oct	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4																						
7-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	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	0.6	0.5																						
19-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7	1.0	0.6	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	1.0																						
22-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.7	0.2																							
27-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2																							
28-Oct	0.2	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.4	0.1	0.0	0.0	0.0	0.1	0.4	0.1	0.3	DF	1.8	0.4																								
29-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.1	0.3	0.2	0.2																							
31-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																						
																								0.4	0.5	0.3	0.4	0.2	0.7	0.1	0.1	0.5	1.2	1.2	1.3	0.4	0.6	0.4	0.1	0.1	0.2	0.2	0.1	0.5	0.1	0.5	0.1	Diurnal Average	
																								0.2	0.3	0.2	0.2	0.1	0.6	0.1	0.1	0.1	0.7	1.0	0.6	0.4	0.4	0.4	0.1	0.1	0.2	0.2	0.1	0.4	0.1	0.3	0.1	Diurnal Maximum	
DF - DAS Failure																																																	



Wood Buffalo Environmental Association
Hourly Averages

Precipitation (PC) - mm
Fort Chipewyan - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Precipitation (PC) - mm
Fort Chipewyan - October 2023

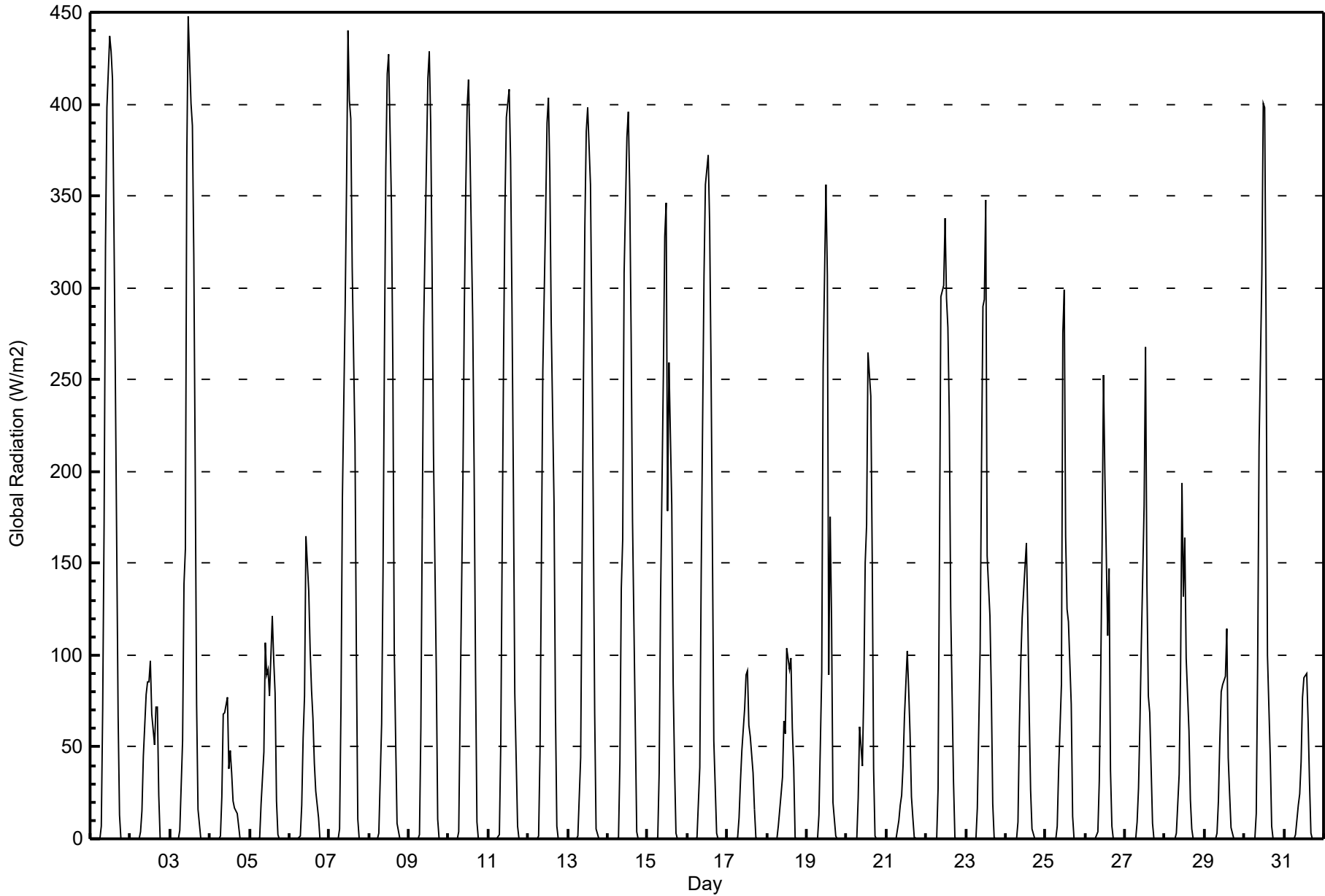
Concentration Ranges (mm)	Number of Hours	%	Cumulative %
0 - 0.3	735	98.92	98.92
0.4 - 0.5	4	0.54	99.46
0.6 - 0.7	3	0.40	99.87
0.8 - 1.4	1	0.13	100.00
1.5 - 10	0	0.00	100.00
> 10	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744



Maximum Value: 447.8 W/m2 on Oct 3 12:00 Maximum Daily Average: 121.6 W/m2 on Oct 1																						Hours in Service: 744 Hours of Data: 744				
Minimum Value: 0.0 W/m2 on Oct 1 01:00 Minimum Daily Average: 17.4 W/m2 on Oct 4 Maximum Diurnal Average: 260.7 W/m2 at hour 12 Minimum Diurnal Average: 0.0 W/m2 at hour 21 Monthly Average: 64.85 W/m2 Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 79.4 P ₉₀ = 272.5 P ₉₉ = 414.1																						Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Oct	0.0	0.0	0.0	0.0	0.0	0.0	6.9	70.6	171.2	322.6	398.5	437.4	428.4	413.6	335.0	252.1	67.5	13.2	0.2	0.0	0.0	0.0	0.0	0.0	121.6	437.4
2-Oct	0.0	0.0	0.0	0.0	0.0	0.0	3.5	15.3	44.8	78.8	85.6	85.1	97.0	67.5	51.3	71.8	71.7	23.6	0.3	0.0	0.0	0.0	0.0	0.0	29.0	97.0
3-Oct	0.0	0.0	0.0	0.0	0.0	0.0	4.6	53.3	139.0	157.7	370.6	447.8	400.1	387.9	317.6	201.9	73.3	15.7	0.2	0.0	0.0	0.0	0.0	0.0	107.1	447.8
4-Oct	0.0	0.0	0.0	0.0	0.0	0.0	1.7	22.7	68.1	69.0	77.1	37.9	48.1	35.6	20.7	16.8	13.8	6.6	0.1	0.0	0.0	0.0	0.0	0.0	17.4	77.1
5-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.9	19.2	47.1	106.4	89.5	92.2	77.6	121.3	97.3	79.4	20.5	2.5	0.0	0.0	0.0	0.0	0.0	0.0	31.4	121.3
6-Oct	0.0	0.0	0.0	0.0	0.0	0.0	1.7	18.5	55.2	77.7	164.7	135.3	103.2	80.6	65.3	41.2	25.7	11.6	0.1	0.0	0.0	0.0	0.0	0.0	32.5	164.7
7-Oct	0.0	0.0	0.0	0.0	0.0	0.0	5.1	72.7	184.4	290.4	358.0	440.4	401.7	392.0	311.1	215.0	99.4	11.0	0.0	0.0	0.0	0.0	0.0	0.0	115.9	440.4
8-Oct	0.0	0.0	0.0	0.0	0.0	0.0	3.0	62.2	145.0	265.0	365.6	416.4	426.9	345.4	257.9	103.5	53.9	8.0	0.0	0.0	0.0	0.0	0.0	0.0	102.2	426.9
9-Oct	0.0	0.0	0.0	0.0	0.0	0.0	2.6	60.4	174.0	279.5	370.0	414.4	428.9	390.0	309.5	210.0	91.6	10.4	0.0	0.0	0.0	0.0	0.0	0.0	114.2	428.9
10-Oct	0.0	0.0	0.0	0.0	0.0	0.0	3.7	69.7	196.0	288.5	351.5	398.4	413.5	375.9	282.6	200.5	91.7	9.2	0.0	0.0	0.0	0.0	0.0	0.0	111.7	413.5
11-Oct	0.0	0.0	0.0	0.0	0.0	0.0	2.2	52.1	157.9	262.1	344.5	393.0	407.7	370.2	290.8	193.3	79.3	6.9	0.0	0.0	0.0	0.0	0.0	0.0	106.7	407.7
12-Oct	0.0	0.0	0.0	0.0	0.0	0.0	1.6	47.3	152.0	254.7	339.1	389.4	403.3	363.1	281.0	182.8	70.9	6.5	0.0	0.0	0.0	0.0	0.0	0.0	103.8	403.3
13-Oct	0.0	0.0	0.0	0.0	0.0	0.0	1.4	44.4	149.2	251.7	334.1	385.3	398.3	356.5	277.9	179.6	68.5	5.3	0.0	0.0	0.0	0.0	0.0	0.0	102.2	398.3
14-Oct	0.0	0.0	0.0	0.0	0.0	0.0	1.1	41.9	136.8	163.0	308.0	382.0	396.0	353.3	274.8	173.1	60.0	4.1	0.0	0.0	0.0	0.0	0.0	0.0	95.6	396.0
15-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.9	35.6	129.6	252.4	327.9	346.5	178.6	259.6	181.8	84.9	38.9	2.8	0.0	0.0	0.0	0.0	0.0	0.0	76.6	346.5
16-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.5	39.0	145.1	226.2	306.4	356.5	372.5	335.6	257.7	159.2	53.4	2.7	0.0	0.0	0.0	0.0	0.0	0.0	94.0	372.5
17-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.4	11.6	31.6	47.9	70.9	89.1	91.6	62.0	55.4	35.7	15.9	0.9	0.0	0.0	0.0	0.0	0.0	0.0	21.4	91.6
18-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.5	24.7	33.5	64.0	57.2	103.7	92.0	98.7	60.2	38.9	1.0	0.0	0.0	0.0	0.0	0.0	0.0	24.2	103.7
19-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.2	12.8	50.8	91.0	257.0	356.4	306.5	89.2	175.5	118.7	19.5	1.2	0.0	0.0	0.0	0.0	0.0	0.0	61.6	356.4
20-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.2	22.1	61.2	39.9	81.2	150.0	170.5	264.8	241.2	153.8	38.1	1.9	0.1	0.0	0.0	0.0	0.0	0.0	51.0	264.8
21-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.5	18.4	23.6	39.4	66.2	101.8	81.4	57.2	23.1	11.5	0.6	0.0	0.0	0.0	0.0	0.0	0.0	18.0	101.8
22-Oct	0.1	0.1	0.1	0.2	0.1	0.1	0.3	27.4	157.0	295.5	301.2	337.6	294.7	278.4	230.7	126.2	31.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	86.7	337.6
23-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.1	16.9	102.9	205.4	289.9	294.0	347.7	153.9	121.5	79.6	19.3	0.6	0.0	0.0	0.0	0.0	0.0	0.0	68.0	347.7
24-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.5	60.4	95.9	120.2	147.7	161.0	120.8	69.7	26.6	5.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	34.1	161.0
25-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.9	37.1	83.7	275.5	299.4	164.8	125.1	118.2	73.6	12.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	49.9	299.4
26-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	31.6	87.2	158.6	252.6	198.2	110.4	147.5	37.6	7.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	43.1	252.6
27-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.5	27.8	62.9	106.2	181.3	267.4	137.7	77.9	68.6	8.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	39.5	267.4
28-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	35.1	91.4	194.1	132.2	164.1	98.1	58.5	21.4	5.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	33.5	194.1
29-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.3	20.7	53.6	80.0	84.0	88.5	114.1	44.1	24.3	5.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.6	114.1
30-Oct	0.1	0.1	0.1	0.0	0.0	0.1	0.1	13.6	94.5	213.6	307.4	400.8	398.3	281.8	99.7	44.4	6.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	77.6	400.8
31-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	18.6	24.2	41.7	76.9	87.9	90.1	64.0	30.1	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.3	90.1
																								Diurnal Average		
																								Diurnal Maximum		





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (W/m²)	Number of Hours	%	Cumulative %
0 - 20	465	62.50	62.50
21 - 100	125	16.80	79.30
101 - 300	95	12.77	92.07
301 - 600	59	7.93	100.00
601 - 900	0	0.00	100.00
> 900	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Maximum Speed: 41 km/h on Oct 8 14:00	Maximum Daily Speed Average: 24.7 km/h on Oct 8	Hours in Service: 744
Minimum Speed Value: 1 km/h on Oct 17 00:00	Minimum Daily Speed Average: 4.8 km/h on Oct 3	Hours of Data: 742
Maximum Diurnal Speed Average: 6.6 km/h at hour 14	Minimum Diurnal Speed Average: 2.3 km/h at hour 6	Hours of Missing Data: 2
Monthly Average Velocity: 3.9 km/h 201.2 deg	Percentiles: P ₁ = 2 P ₁₀ = 7 Q ₁ = 10 Median = 15 Q ₃ = 20 P ₉₀ = 24 P ₉₉ = 32	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-Oct	SSE15	SSE16	S15	SSE18	SSE19	SSE22	SSE24	SSE21	SSE26	S26	S26	S30	S31	S31	S29	S32	S27	SSE23	SSE23	S26	S26	S19	S14	SSE21	S23.0	S32	
2-Oct	SSE23	SSE24	S25	S24	S22	S18	S17	S20	S19	S17	S15	SSW13	SSW10	SW7	WSW5	WSW6	W5	W4	W6	W7	W7	W6	WSW6	W6	S10.6	S25	
3-Oct	WSW6	SW5	SW5	WSW5	SW5	SW6	SW9	W7WNW10	WNW10	W8	W9	W13	WSW13	SW12	SW8	SSW6	SE4	ENE5	E3	S9	SE4	ESE6	SSW3	WSW4.8	WSW13		
4-Oct	W6	NW7	NW6	NNW6	NNE2	WNW8	W9WNW10	WNW8	WNW9	WNW11	WNW11	WNW12	WNW15	NW19	NW21	NNW20	NNW13	WNW13	NW16	NW16	NW16	WNW19	NW21	NW11.7	NW21		
5-Oct	NW22	NW21	NW21	WNW23	WNW22	WNW20	WNW23	WNW25	WNW26	WNW25	WNW23	WNW23	WNW24	WNW26	WNW23	WNW24	WNW25	WNW21	WNW18	WNW15	WNW14	WNW9	W7	W7	WNW20.0	WNW26	
6-Oct	WSW8	SW10	S12	SSE15	S18	SSE16	SE14	SE19	SSE20	SSE21	S27	S27	SSE24	SSE17	SSE17	S17	SSW21	SSW18	SW11	WSW8	WSW13	WNW11	WNW8	WNW9	S12.2	S27	
7-Oct	NW7	NNW8	WNW7	W7	W9	WNW9	WNW8	WNW7	NW6	NNW5	NE5	E19	E21	E21	E20	E19	ENE19	ENE19	ENE25	ENE26	E24	E21	E21	ESE20	ENE9.3	ENE26	
8-Oct	ESE18	ESE21	ESE20	SE20	SE21	SE21	ESE24	ESE24	SE29	SSE35	SSE35	SSE38	SSE39	S41	S34	S28	S25	S20	S24	SSE30	S28	S25	SSE18	SSE18	SSE24.7	S41	
9-Oct	SSE18	SSE16	ESE10	ESE11	ESE15	ESE15	ESE13	E13	E15	SE17	ESE20	ESE22	E23	E23	E21	E20	E20	E21	ESE23	E22	E21	E22	E20	ESE14	ESE17.1	E23	
10-Oct	SE13	SE15	ESE18	E15	E18	E20	E22	E26	E23	ESE21	ESE22	E23	E24	E24	E25	E23	E18	ESE20	ESE26	E25	ESE23	SE20	ESE21	SE23	ESE20.3	ESE26	
11-Oct	SE23	SE25	SE17	ESE16	E16	E17	ESE20	ESE24	ESE24	SE23	SE20	SE20	SE19	SE19	ESE19	ESE25	ESE25	ESE20	ESE25	ESE23	SE19	ESE17	SE12	ESE16	ESE19.7	SE25	
12-Oct	SE21	SE17	SSE12	SSE17	SSE12	SE11	SSE12	SSE10	SSE11	S18	SSE20	SSE23	SSE24	SSE23	SSE22	SSE16	SSE18	SSE18	SSE18	S18	S7	SE6	S12	S17	SSE15.6	SSE24	
13-Oct	S18	S16	SSE16	S20	S17	SE12	SE10	SSE14	SSE18	SSE21	SSE24	SSE22	SSE26	SSE27	SSE23	SSE26	SE26	SE24	SSE22	SE18	ESE17	SE17	SE18	SE14	SSE18.9	SSE27	
14-Oct	SE15	SE17	SE17	SE20	SE22	SE22	ESE22	ESE22	ESE19	E23	ESE23	SE22	SSE28	SSE33	SSE31	SE33	SSE28	SSE24	SSE22	SSE21	SSE26	SSE23	SSE22	SSE25	SE22.4	SSE33	
15-Oct	SSE20	SSE20	SSE20	SSE21	SSE22	S21	SSE25	SSE23	S25	S29	S28	S25	S23	S20	S15	S15	S16	SSE12	SSE11	SSE9	S10	SSW9	SW11	SW12	S17.9	S29	
16-Oct	SW14	SW12	SW13	WSW9	WSW8	W8	W7	WSW7	W9	W15	W12	WSW15	WSW15	W12	WSW12	WSW10	WSW7	WSW4	SW3	ESE2	NE4	UO	NE2	NNE1	WSW7.5	W15	
17-Oct	ENE2	N7	N10	N11	NNW11	NNW10	NNW12	N9	N9	NNE6	NNE7	NNE9	NNE6	NNE4	N3	NE3	E14	ENE15	E13	ESE13	ESE18	ESE19	ESE20	ESE22	ENE6.1	ESE22	
18-Oct	ESE27	ESE25	SE17	SE21	ESE24	ESE20	ESE19	SE15	ESE14	SE16	SE15	SE23	SE20	SSE21	SSE23	SSE20	SSE15	ESE11	ESE9	ESE7	S7	SW8	SW9	WSW4	SE14.4	ESE27	
19-Oct	SSW4	SSW3	SE2	SSW4	SE2	E6	SSW5	SW8	SW12	SW12	SW12	WSW17	WSW19	SW14	SW12	SW15	SSW9	SSW5	SSW5	SSW5	WSW12	W9	W10	WNW13	SW7.6	WSW19	
20-Oct	W10	WNW7	W11	W12	W13	W15	W16	W15	WNW15	NW14	NW21	NW23	NW18	NNW19	NW18	NNW16	NW12	NNW7	WNW7	W7	SSW3	E4	SSW4	SE13	WNW10.0	NW23	
21-Oct	S16	S18	SSE9	SSE11	SW9	WSW6	W7	NNW10	NNW9	N14	N13	N12	N11	NNW11	NNW12	NNW12	NW9	NW9	NW9	NW11	NW11	NW12	NW11	NW10	NW5.4	S18	
22-Oct	NW10	NW10	WNW8	WNW8	WNW7	WNW7	W8	W11	W12	W11	WNW13	WNW17	WNW15	W16	W16	WNW16	WNW14	WNW14	WNW14	WNW14	WNW15	WNW16	WNW17	WNW19	WNW12.6	WNW19	
23-Oct	WNW18	WNW20	WNW19	WNW19	WNW19	WNW19	W20	W20	W22	WNW24	WNW24	WNW24	W24	W22	WNW24	WNW26	WNW22	WNW22	WNW22	WNW20	WNW19	WNW20	WNW21	WNW19	WNW21.0	WNW26	
24-Oct	WNW20	WNW19	WNW20	W17	W13	WNW14	WNW15	W15	W14	W15	W17	W18	W16	W16	WNW18	WNW18	WNW18	WNW14	WNW15	WNW14	WNW14	WNW14	WNW14	WNW12	WNW15.7	WNW20	
25-Oct	WNW11	WNW11	WNW12	WNW12	WNW11	WNW11	W11	W11	W12	WSW13	WSW14	W14	W18	W18	W16	W15	W14	W14	W14	W14	W14	W15	W14	W13	WSW11	W13.2	W18
26-Oct	W13	W16	W16	W16	W21	WNW20	WNW17	WNW14	WNW15	NW12	WNW15	NW14	NW13	WNW14	W17	W14	WSW10	W11	W12	W12	W14	WNW15	WNW14	NW13	WNW14.2	WNW21	
27-Oct	NW12	NW11	NNW11	NW12	NNW9	NNW10	WSW5	WSW6	WSW7	W7	WNW9	WNW9	NW11	WNW12	WNW11	WNW13	WNW12	NW7	NW6	NW7	W6	WNW4	UO	ESE2	NW7.8	WNW13	
28-Oct	S7	SW7	W9	WNW6	WNW6	WNW9	NW8	NW10	NW9	NW11	NW12	NW10	NW11	WNW12	W15	W13	W12	WNW14	WNW12	WNW12	WNW12	WNW15	WNW13	WNW13	WNW9.8	WNW15	
29-Oct	WNW14	WNW15	WNW15	WNW14	WNW14	WNW15	NW13	NW13	NW11	NNW11	NNW11	NNW10	WNW10	WNW13	WNW13	NW10	WNW9	NW7	NW7	NNW11	NNW9	N10	N9	NNW8	NW10.5	WNW15	
30-Oct	NNW11	NNW10	NNW8	NNW10	N9	NNW5	WNW5	WNW3	SSE2	S3	SE7	SSE16	SSE20	S22	S20	SSE17	SSE22	S23	S23	SSW19	SSW18	SSW15	SSW13	WSW9	S7.5	S23	
31-Oct	W9	W11	WNW11	NW12	NW12	NW11	NW11	NW10	NW10	WNW7	W13	WNW17	WNW14	W16	W14	W14	W12	W11	W11	W11	W11	W11	W8	W10	W11	WNW11.1	WNW17

S4.0SSW3.9SSW3.9SSW3.6SSW3.0SSW2.3SSW2.9SSW2.8SSW3.5SSW4.9SSW5.2SSW5.4SSW5.9SSW6.6SSW5.5SSW4.7SSW4.0	S2.9	S3.3	S2.9	SSW3.6	SSW2.8	SSW3.2	SSW3.8																Diurnal Average		
ESE27	SE25	S25	SSE24	ESE24	SE22	SSE25	E26	SE29	SSE35	SSE35	SSE38	SSE39	S41	S34	SE33	SSE28	SSE24	ESE26	SSE30	S28	S25	SSE22	SSE25	Diurnal Maximum	

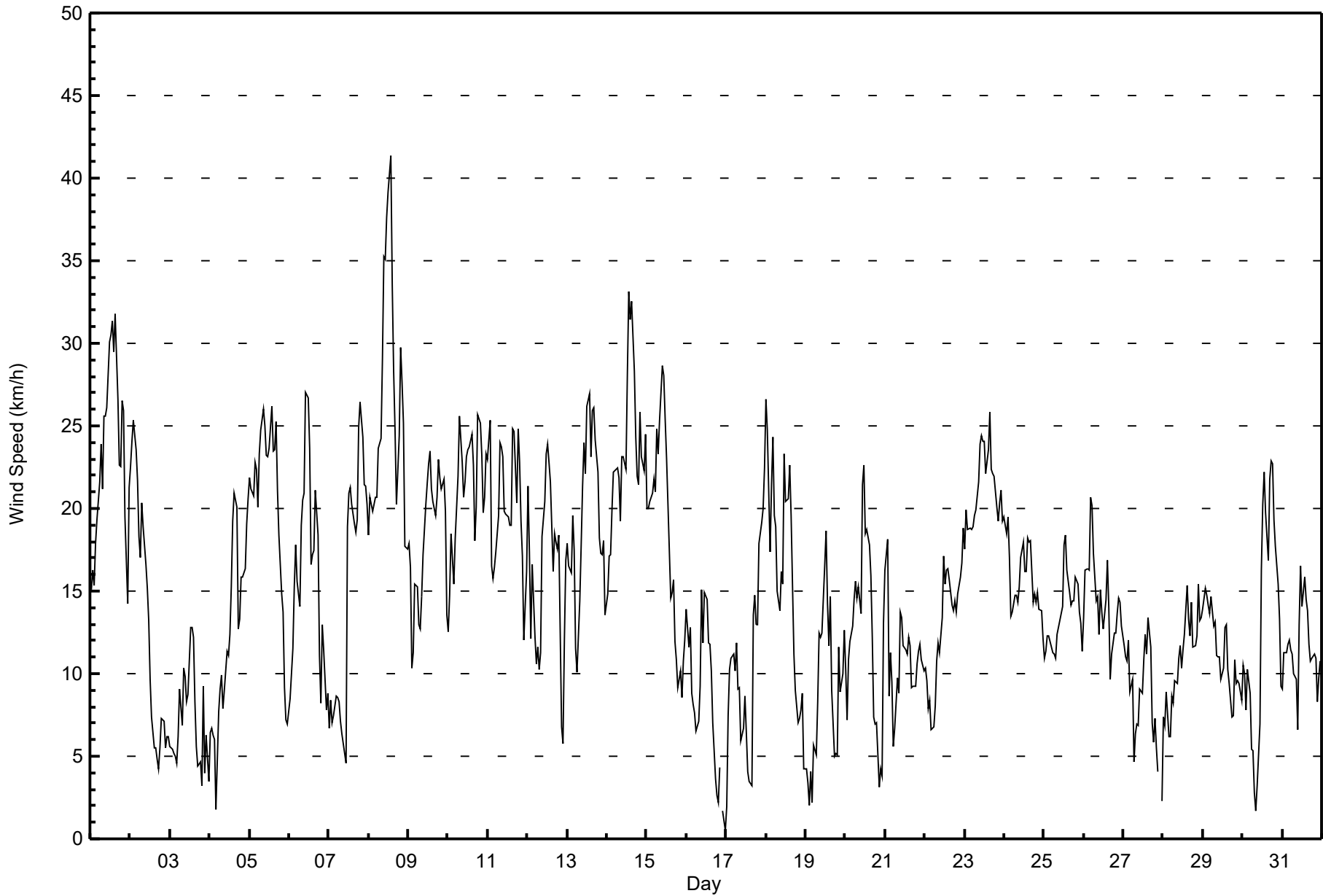
UO - Unstable Operation
All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 8 km/h on Oct 20 11:00 Minimum Value: 0 km/h on Oct 22 06:00 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: 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-Oct	2	2	2	2	3	3	3	3	4	3	4	6	5	5	4	5	4	3	3	3	3	4	2	3	6		
2-Oct	3	3	3	4	3	3	2	3	2	3	3	2	2	1	1	1	1	1	1	2	2	1	1	1	4		
3-Oct	1	1	2	2	1	2	1	1	2	2	3	3	3	3	3	3	1	1	1	2	2	2	1	2	3		
4-Oct	2	2	1	2	1	3	2	2	1	2	2	2	3	4	6	7	7	5	4	4	5	4	6	6	7		
5-Oct	7	7	6	6	6	5	6	6	6	6	5	5	7	4	6	6	6	5	4	4	3	3	1	1	7		
6-Oct	2	2	2	2	2	3	2	4	3	3	4	3	4	3	4	3	3	3	2	2	3	4	1	2	4		
7-Oct	1	2	2	2	1	2	1	2	2	2	2	3	2	2	2	3	2	3	3	3	2	3	2	3	3		
8-Oct	2	2	2	2	2	3	2	2	5	6	6	7	6	7	4	3	3	2	4	4	3	3	4	3	7		
9-Oct	3	4	3	2	1	2	2	2	1	2	2	2	2	2	2	1	1	1	1	2	1	2	2	3	4		
10-Oct	2	3	3	1	2	2	1	2	2	2	2	2	2	2	3	2	3	2	2	2	2	2	3	3	3		
11-Oct	3	5	2	2	1	2	2	2	1	2	4	2	3	2	2	3	3	1	4	3	2	2	2	3	5		
12-Oct	2	4	3	3	2	2	2	2	3	3	3	3	3	4	3	3	3	2	2	2	3	2	2	2	4		
13-Oct	2	2	4	3	3	3	2	4	3	4	4	4	4	6	5	4	4	3	4	3	2	2	3	2	6		
14-Oct	2	2	2	2	2	2	2	2	1	2	2	3	5	6	4	4	4	4	4	4	4	4	4	4	6		
15-Oct	3	3	3	3	3	3	4	4	4	4	4	4	3	4	2	2	3	2	2	1	2	2	2	2	4		
16-Oct	1	3	3	2	2	2	2	1	3	4	4	5	3	3	2	3	2	2	1	1	2	UO	2	2	5		
17-Oct	1	2	3	3	4	5	4	4	3	2	2	3	2	2	1	3	2	2	1	2	2	2	2	2	5		
18-Oct	2	3	3	4	2	2	2	2	2	3	2	4	4	3	4	3	3	2	2	1	1	2	2	2	4		
19-Oct	1	1	1	1	1	1	3	1	1	1	3	4	5	3	3	4	2	2	1	2	2	2	2	2	5		
20-Oct	2	3	2	3	2	3	3	3	3	4	8	8	7	7	7	6	4	2	1	1	2	3	2	4	8		
21-Oct	2	4	2	3	4	2	2	5	3	4	4	4	4	3	4	5	3	3	3	3	3	2	2	2	5		
22-Oct	2	2	1	1	1	0	1	2	2	2	4	5	4	4	4	5	4	4	4	3	3	4	4	4	5		
23-Oct	4	5	4	4	4	4	4	4	5	6	6	6	6	6	6	6	5	5	5	5	5	5	5	5	6		
24-Oct	5	4	5	4	3	3	4	3	3	4	4	4	4	4	5	5	4	4	4	4	4	4	3	3	5		
25-Oct	3	3	3	3	2	2	3	3	3	3	3	3	3	5	4	4	3	4	4	3	3	3	3	2	5		
26-Oct	3	4	4	4	4	4	5	3	3	4	4	4	4	4	4	4	2	3	3	3	4	3	3	3	5		
27-Oct	4	3	3	3	3	3	2	1	2	1	3	3	4	3	4	3	3	2	1	1	1	1	UO	1	4		
28-Oct	1	1	2	1	1	2	2	2	2	3	4	3	3	3	4	3	3	3	3	3	4	4	3	3	4		
29-Oct	3	3	3	3	3	4	4	4	4	4	4	4	3	3	4	3	2	2	3	4	3	3	3	2	4		
30-Oct	2	2	2	2	3	2	3	1	1	1	3	4	3	4	3	3	3	3	3	3	3	2	2	2	4		
31-Oct	2	2	2	3	3	3	3	3	3	2	4	4	4	4	3	3	3	2	2	2	2	2	2	2	4		
																	Diurnal Maximum										
																	7 7 6 6 6 5 6 6 6 6 8 8 7 7 7 7 7 5 5 5 5 5 6 6										
UO - Unstable Operation																											





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	46	6.20	6.20
6 - 11	196	26.42	32.61
12 - 19	284	38.27	70.89
20 - 28	199	26.82	97.71
29 - 38	15	2.02	99.73
> 38	2	0.27	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 Chipewyan - October 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	4	2	2	2	4	1	1	10	4	5	2	3	0	2	46
6 - 11	8	5	0	0	1	6	4	6	5	4	12	16	40	36	32	21	196
12 - 19	3	0	0	4	10	17	23	28	23	6	11	10	51	72	19	7	284
20 - 28	0	0	0	2	27	31	20	50	24	1	0	0	4	32	7	1	199
29 - 38	0	0	0	0	0	0	2	6	7	0	0	0	0	0	0	0	15
> 38	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	2
Totals	12	8	4	8	40	56	53	92	61	21	27	31	97	143	58	31	742

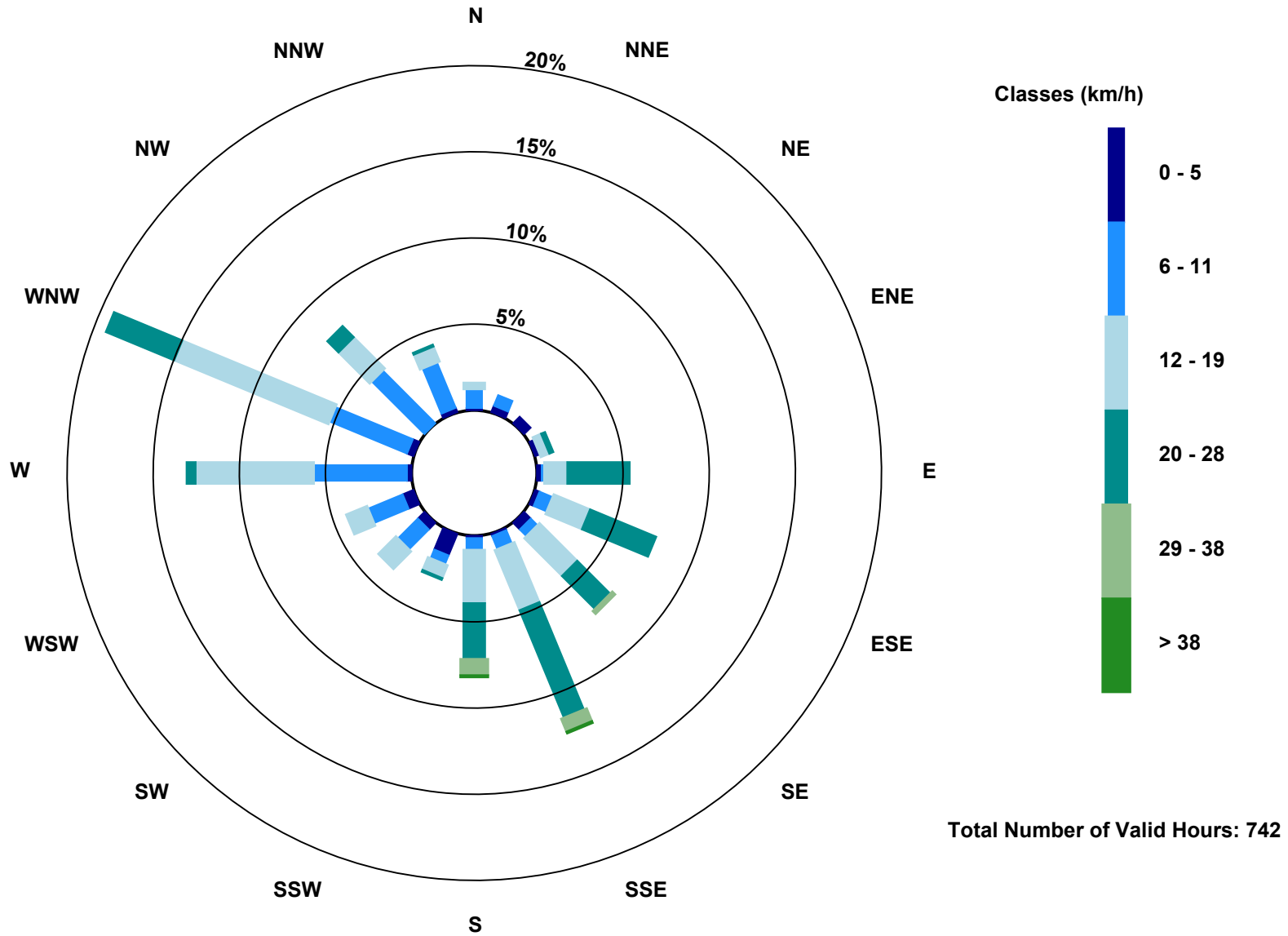
Total Number of Valid Hours: 742

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

Wind Speed (WS) - km/h
Fort Chipewyan





Wood Buffalo Environmental Association
Summary of Hour Averages

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

Direction of Maximum Speed: 173 deg on Oct 8 14:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 154.3 deg on Oct 8	Hours of Data: 742
Direction of Minimum Speed: 30 deg on Oct 17 00:00	Hours of Missing Data: 2
Direction of Minimum Daily Speed Average: 4.8 deg on Oct 3	Percent Operational Time: 99.7
Monthly Average Direction: 201.2 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-Oct	154	168	183	162	155	153	155	155	167	175	180	187	170	173	169	170	172	167	163	173	174	185	175	164	169.4
2-Oct	152	151	172	169	172	176	181	185	179	186	187	195	210	221	247	238	278	269	259	272	273	266	257	263	189.1
3-Oct	247	234	230	240	234	222	231	273	291	295	281	276	260	253	233	234	201	133	77	82	190	126	113	208	241.4
4-Oct	278	323	321	337	32	285	271	299	300	298	286	285	290	294	313	321	331	331	295	311	318	310	300	317	307.3
5-Oct	318	316	311	298	298	296	295	292	290	291	289	289	293	301	298	294	289	286	286	288	283	300	270	265	294.7
6-Oct	248	225	186	160	171	149	146	144	150	162	171	173	167	163	166	185	210	213	229	257	257	295	284	294	183.7
7-Oct	313	332	287	264	273	285	283	295	319	339	48	90	86	83	85	79	73	72	74	78	80	79	91	116	72.8
8-Oct	120	114	113	128	126	129	122	121	146	153	156	165	164	173	175	173	175	171	169	165	171	171	168	157	154.3
9-Oct	151	152	121	123	102	109	112	99	94	128	123	119	92	81	83	84	87	89	111	98	93	92	99	111	104.4
10-Oct	130	142	122	98	95	96	98	100	100	115	119	90	88	90	79	86	87	111	102	96	107	131	117	131	104.0
11-Oct	128	125	136	106	97	95	104	104	108	136	142	126	125	127	118	118	116	108	109	116	127	122	125	122	118.3
12-Oct	131	137	155	165	148	124	152	147	149	173	165	154	147	163	163	158	163	164	162	171	172	124	173	175	156.9
13-Oct	175	172	158	169	172	145	129	162	167	161	162	152	160	165	155	151	139	142	150	136	118	133	139	134	152.9
14-Oct	130	138	145	136	139	130	123	117	109	100	103	129	158	163	150	146	147	148	149	148	153	158	155	162	140.7
15-Oct	154	159	158	163	164	172	166	162	171	173	176	179	173	181	176	171	170	159	161	156	170	201	218	216	171.0
16-Oct	221	222	229	237	258	261	260	258	272	276	278	256	251	259	258	253	254	255	215	108	53	UO	37	30	252.6
17-Oct	71	11	351	355	343	333	344	351	359	13	15	32	28	12	352	43	83	78	82	105	120	119	122	118	57.9
18-Oct	115	120	136	124	107	109	108	124	115	145	142	129	146	161	162	159	149	114	102	119	180	220	224	242	134.4
19-Oct	195	198	136	197	132	83	201	228	222	225	230	244	245	235	219	224	209	201	201	201	256	265	272	285	231.1
20-Oct	281	286	273	266	264	264	269	278	290	306	318	320	314	327	317	332	320	331	285	273	213	85	203	168	295.8
21-Oct	175	172	165	152	214	252	267	339	348	352	352	356	354	347	337	334	323	326	318	319	320	317	317	316	320.4
22-Oct	317	315	301	301	303	285	272	274	279	274	282	285	294	280	269	289	297	303	301	285	286	289	288	290	289.1
23-Oct	290	290	292	292	290	285	279	277	281	287	283	282	277	277	293	291	294	295	298	299	296	288	291	287	288.0
24-Oct	287	289	287	278	277	285	292	274	276	278	276	276	272	278	283	282	296	299	302	297	289	294	303	294	285.7
25-Oct	298	293	289	288	282	282	287	271	265	254	244	266	262	261	267	271	271	275	272	273	272	272	263	258	271.4
26-Oct	270	272	274	274	281	284	288	290	287	306	303	305	307	291	280	275	258	281	263	271	277	287	287	306	284.0
27-Oct	323	321	328	326	329	327	252	251	244	270	300	302	315	296	296	301	299	308	313	304	278	302	UO	116	304.1
28-Oct	174	232	262	284	292	299	314	318	315	318	323	319	305	282	274	268	278	295	297	293	294	295	291	283	291.5
29-Oct	286	290	291	292	288	296	311	307	319	339	335	328	295	287	292	305	300	309	322	340	334	355	4	343	310.2
30-Oct	343	340	335	345	358	336	301	286	151	173	127	168	166	170	169	160	167	170	184	198	205	205	211	239	186.8
31-Oct	265	281	291	316	313	315	311	312	309	297	279	283	286	278	276	279	278	278	273	278	280	274	273	272	286.9

189.9 195.0 212.4 201.0 196.4 202.9 202.3 200.6 203.4 202.3 204.6 199.9 198.7 207.8 211.3 207.2 198.6 183.4 179.8 185.1 201.7 212.3 211.3 205.7
 Diurnal Average

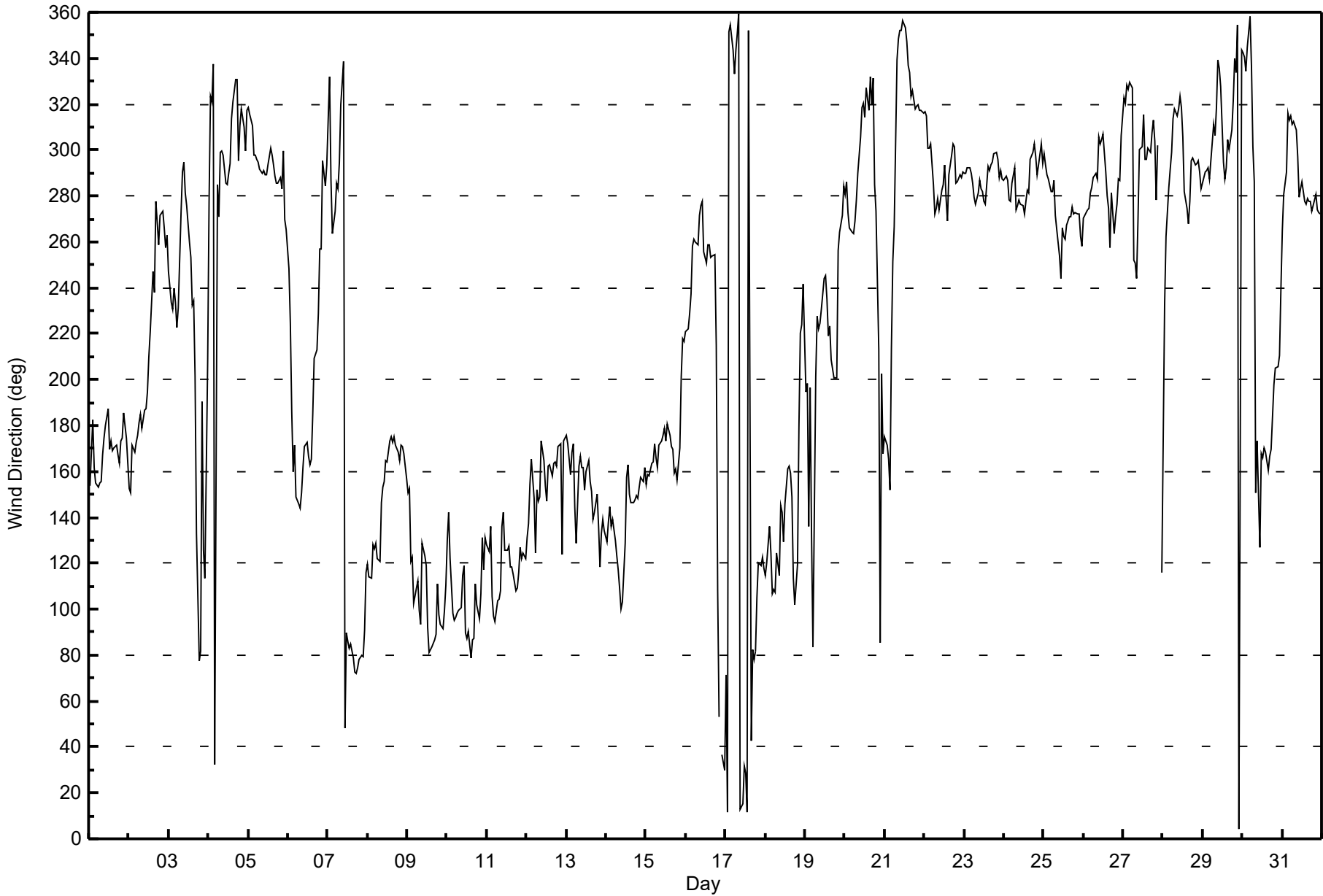
UO - Unstable Operation
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0										Hours in Service: 744															
Maximum Value: 88 deg on Oct 4 05:00										Hours of Data: 742															
Minimum Value: 3 deg on Oct 11 17:00										Hours of Missing Data: 2															
Percentiles: P ₁ = 4 P ₁₀ = 7 Q ₁ = 10 Median = 14 Q ₃ = 17 P ₉₀ = 23 P ₉₉ = 60										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-Oct	8	12	9	12	7	9	8	9	9	9	9	12	12	10	11	10	9	9	9	7	7	9	13	8	13
2-Oct	10	9	8	8	8	7	9	8	8	10	10	13	11	14	21	19	18	13	13	17	11	13	12	14	21
3-Oct	16	11	16	19	17	22	10	17	13	16	21	23	19	19	20	26	14	28	34	64	15	56	13	48	64
4-Oct	24	20	21	25	88	19	11	15	12	16	14	17	14	16	20	21	26	27	16	17	20	18	18	19	88
5-Oct	21	18	17	16	15	15	14	14	14	15	14	14	15	15	16	15	14	15	14	17	14	21	13	13	21
6-Oct	15	11	18	8	11	8	9	8	10	13	8	7	11	10	14	14	9	9	11	24	15	19	15	14	24
7-Oct	21	18	31	28	12	11	9	24	23	35	53	5	5	5	5	8	9	9	8	5	6	6	10	11	53
8-Oct	8	8	7	8	7	8	7	10	11	9	10	10	10	8	7	6	6	7	6	8	6	6	8	10	11
9-Oct	12	21	21	20	6	11	9	14	7	11	6	8	12	4	4	4	4	6	4	7	5	4	7	9	21
10-Oct	10	9	10	12	6	5	5	5	5	10	7	12	14	15	6	6	7	12	5	6	8	8	6	9	15
11-Oct	8	7	10	11	7	7	5	5	5	13	11	8	9	7	6	7	3	6	4	6	7	7	8	8	13
12-Oct	7	9	19	10	12	16	16	15	18	10	9	11	8	10	8	10	7	7	11	6	51	22	14	7	51
13-Oct	7	10	19	9	9	16	18	19	10	9	9	10	11	11	10	10	8	7	9	14	8	9	11	12	19
14-Oct	8	8	7	8	6	7	5	4	6	4	10	15	10	12	9	8	7	8	9	10	10	10	10	9	15
15-Oct	11	10	10	9	9	8	9	10	9	8	10	9	8	9	12	9	11	11	11	19	11	16	15	10	19
16-Oct	9	11	10	12	15	16	14	15	17	15	16	18	18	19	18	16	17	34	12	50	18	UO	84	88	88
17-Oct	65	21	19	27	35	53	35	39	27	25	24	18	25	30	38	63	6	6	7	13	8	11	9	6	65
18-Oct	6	8	13	11	6	7	8	8	11	13	12	10	11	10	9	10	12	19	18	28	17	25	11	24	28
19-Oct	21	33	51	16	40	9	47	11	8	6	13	17	16	13	15	12	16	28	12	32	14	16	13	11	51
20-Oct	14	24	14	14	12	12	13	13	15	20	23	22	22	25	25	23	20	20	22	17	32	67	63	20	67
21-Oct	6	10	14	25	30	36	43	37	24	20	20	24	23	22	24	25	23	22	18	17	17	15	14	12	43
22-Oct	12	11	8	7	9	11	16	12	12	14	15	16	16	16	16	17	15	15	15	12	13	14	14	14	17
23-Oct	14	14	14	15	14	15	14	14	14	15	15	16	16	16	15	15	15	15	15	15	15	14	14	14	16
24-Oct	14	15	15	15	16	15	15	15	14	15	16	15	15	15	15	16	16	15	15	15	14	14	15	14	16
25-Oct	14	14	13	13	13	13	14	14	15	16	17	17	17	16	16	15	15	14	14	14	13	15	16	13	17
26-Oct	15	14	14	14	14	13	15	13	14	19	15	19	20	16	18	19	15	14	15	14	16	13	13	18	20
27-Oct	21	18	19	19	20	18	38	20	14	19	20	19	24	23	20	15	15	17	16	15	8	25	UO	33	38
28-Oct	13	16	15	10	12	14	16	16	14	18	23	19	17	16	14	16	16	16	15	15	19	15	14	13	23
29-Oct	13	14	14	14	14	16	17	17	25	23	25	26	19	15	15	21	16	18	22	25	23	20	20	17	26
30-Oct	12	14	21	17	22	29	40	27	50	35	32	14	10	11	8	11	8	10	8	11	10	9	13	20	50
31-Oct	14	13	16	18	18	17	17	19	21	28	15	14	15	14	14	14	14	14	13	12	13	18	13	14	28
65 33 51 28 88 53 47 39 50 35 53 26 25 30 38 63 26 34 34 64 51 67 84 88																									
Diurnal Maximum																									
UO - Unstable Operation																									





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS09 BARGE LANDING OCTOBER 2023

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

November 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BARGE LANDING (AMS09)
OCTOBER 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	703	35	41	99.19	17.9	0	3.3	0
TRS(ppb) Average	692	36	52	97.85	4.9	0	0.7	0
THC(ppm) Average	700	35	44	98.79	6.4	-	2.7	-
NMHC(ppm) Average	700	35	44	98.79	0.571	-	0.1	-
CH4(ppm) Average	700	35	44	98.79	5.8	-	2.6	-
NO2 (ppb) Average	701	35	43	98.92	30.4	0	13	-
NO (ppb) Average	701	35	43	98.92	174.1	-	27.9	-
NOX (ppb) Average	701	35	43	98.92	203.4	-	40.3	-
PM2.5(ug/m3) Average	738	2	6	99.46	48.8	0	21.8	0
Temperature (C) Average	744	0	0	100	24.9	-	12.9	-
Relative Humidity (%) Average	744	0	0	100	98.8	-	91.3	-
Barometric Pressure (inHg) Average	744	0	0	100	29.4	-	29.3	-
Wind Speed 20 m (km/h) Average	744	0	0	100	30	-	20	-
Wind Direction 20 m (deg) Average	744	0	0	100	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BARGE LANDING (AMS09)
OCTOBER 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	703	0.66	2	-	0	0	0	0.1	0.2	1.7	17.9
TRS(ppb) Average	692	0.37	0.3	-	0.1	0.2	0.2	0.3	0.4	0.7	4.9
THC(ppm) Average	700	2.06	0.3	-	1.9	1.9	1.9	2	2.1	2.2	6.4
NMHC(ppm) Average	700	0.016	0.049	-	0	0	0	0	0	0.1	0.571
CH4(ppm) Average	700	2.04	0.2	-	1.9	1.9	1.9	2	2.1	2.2	5.8
NO2 (ppb) Average	701	7.01	6.7	-	0.1	0.3	1.4	5.5	10.3	15.9	30.4
NO (ppb) Average	701	4.72	12.6	-	0	0	0	0.7	3.6	12.8	174.1
NOX (ppb) Average	701	11.72	16.6	-	0.1	0.3	1.6	7	14.7	29.5	203.4
PM2.5(ug/m3) Average	738	9.6	6.7	-	0.4	3.3	5.2	7.9	12.1	17.2	48.8
Temperature (C) Average	744	4.39	7.6	-	-12.7	-5.2	-2	4.7	9.9	14.2	24.9
Relative Humidity (%) Average	744	72.5	16.3	-	32.6	49.4	60.3	74.5	85.7	93.6	98.8
Barometric Pressure (inHg) Average	744	28.97	0.3	-	28.4	28.6	28.7	29	29.2	29.3	29.4
Wind Speed 20 m (km/h) Average	744	10.3	5	-	0	4	7	10	13	17	30
Wind Direction 20 m (deg) Average	744	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BARGE LANDING (AMS09)
OCTOBER 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL GASEOUS ANALYZERS	02 Oct 2023 10:00	02 Oct 2023 13:00	4	Station power failure
ALL GASEOUS ANALYZERS	19 Oct 2023 12:00	19 Oct 2023 12:00	1	Maintenance - sample manifold cleaned
TRS	05 Oct 2023 11:00	05 Oct 2023 12:00	2	Maintenance - replaced calibration gas cylinder
TRS	08 Oct 2023 07:00	08 Oct 2023 07:00	1	Maintenance - verify daily QA response
TRS	11 Oct 2023 11:00	11 Oct 2023 14:00	4	Maintenance - replaced calibration gas cylinder
TRS	13 Oct 2023 08:00	13 Oct 2023 08:00	1	Maintenance - verify daily QA response
TRS	18 Oct 2023 10:00	18 Oct 2023 12:00	3	Maintenance - WBEA internal audit
THC/ NMHC/ CH4	10 Oct 2023 11:00	10 Oct 2023 12:00	2	Maintenance - replaced support gas cylinder
THC/ NMHC/ CH4	18 Oct 2023 13:00	18 Oct 2023 14:00	2	Maintenance - WBEA internal audit
SO2	18 Oct 2023 12:00	18 Oct 2023 12:00	1	Maintenance - WBEA internal audit
NOX	18 Oct 2023 10:00	18 Oct 2023 12:00	3	Maintenance - WBEA internal audit
PM2.5	02 Oct 2023 10:00	02 Oct 2023 12:00	3	Station power failure
PM2.5	18 Oct 2023 12:00	18 Oct 2023 12:00	1	Maintenance - WBEA internal audit



Wood Buffalo Environmental Association

Summary of Hour Averages

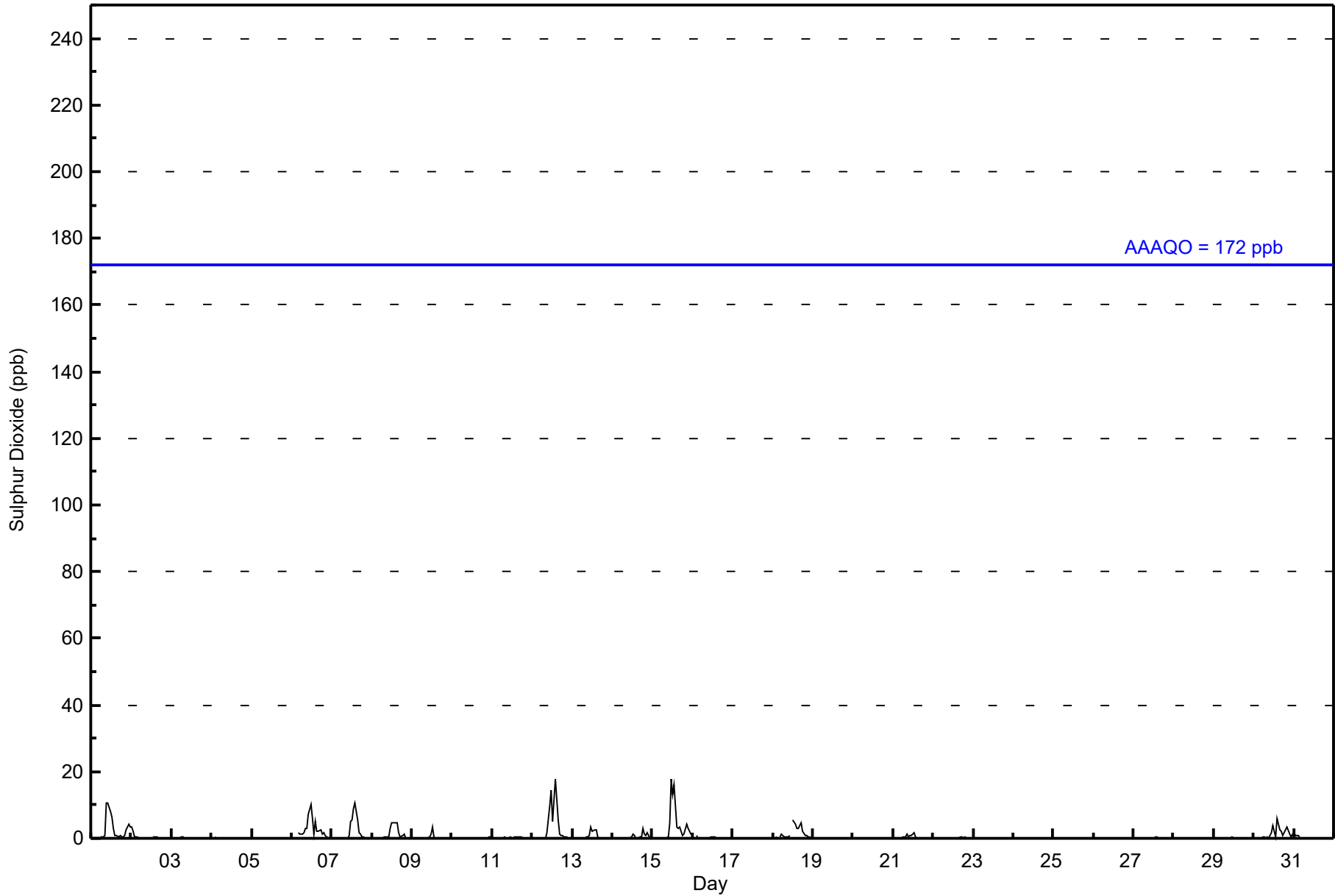
Sulphur Dioxide (SO₂) - ppb Barge Landing - October 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	744																											
Maximum Value: 17.9 ppb on Oct 15 12:00		Maximum Daily Average: 3.3 ppb on Oct 15																	Hours of Data:	703																													
Minimum Value: 0.0 ppb on Oct 1 01:00		Minimum Daily Average: 0.0 ppb on Oct 26																	Hours of Missing Data:	41																													
Maximum Diurnal Average: 2.6 ppb at hour 12		Minimum Diurnal Average: 0.1 ppb at hour 4																	Hours of Calibration:	35																													
Monthly Average: 0.66 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.2 P ₉₀ = 1.7 P ₉₉ = 10.7																	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-Oct	0.0	0.0	0.0	0.0	Z	0.3	0.2	0.2	0.7	10.5	10.7	7.9	6.2	3.0	0.8	0.9	0.5	0.9	0.6	0.2	0.7	2.7	4.1	3.5	2.4	10.7																							
2-Oct	3.3	2.3	0.5	0.2	0.2	Z	0.1	0.0	0.0	PF	PF	PF	PF	0.4	0.4	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.4	3.3																							
3-Oct	Z	0.1	0.0	0.0	0.1	0.1	0.2	0.3	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	0.1	0.1	0.3																							
4-Oct	0.1	Z	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	0.0	0.2																							
5-Oct	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																							
6-Oct	0.1	0.1	0.2	Z	1.8	1.2	1.4	1.6	2.9	3.1	7.1	10.1	5.8	1.2	5.2	2.0	2.3	2.5	1.5	1.5	1.0	0.5	0.2	0.2	2.3	10.1																							
7-Oct	0.1	0.1	0.1	0.1	Z	0.0	0.1	0.1	0.1	0.1	0.9	5.0	5.5	9.0	10.8	5.5	1.6	1.4	0.6	0.3	0.2	0.1	0.0	0.1	1.8	10.8																							
8-Oct	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.4	0.6	0.4	0.3	2.8	4.5	4.6	4.6	4.8	1.7	0.5	1.0	1.3	0.2	0.1	0.0	0.0	1.2	4.8																							
9-Oct	Z	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.5	1.3	3.6	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	3.6																							
10-Oct	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.2																						
11-Oct	0.2	0.2	Z	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3																						
12-Oct	0.0	0.0	0.0	Z	0.2	0.1	0.1	0.1	0.0	1.6	9.7	14.6	5.2	11.6	17.6	5.5	1.1	1.0	0.7	0.4	0.2	0.0	0.1	0.0	3.0	17.6																							
13-Oct	0.0	0.0	0.0	0.0	Z	0.1	0.2	0.2	0.4	0.3	0.9	3.2	2.0	2.4	2.4	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.6	3.2	3.2																							
14-Oct	0.1	0.1	0.2	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.4	1.2	0.8	0.2	0.2	0.2	0.6	3.1	1.3	1.0	1.7	0.2	0.2	0.5	3.1																							
15-Oct	Z	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.3	4.7	17.9	13.1	16.2	3.5	2.9	3.5	2.1	0.8	1.2	4.3	2.8	2.1	1.3	3.3	17.9																							
16-Oct	1.3	Z	0.7	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.5	0.3	0.3	0.2	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.2	1.3																							
17-Oct	0.0	0.0	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	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1																						
18-Oct	0.1	0.2	0.3	Z	0.5	1.4	0.8	0.4	0.3	0.4	0.8	M	5.6	4.2	2.9	2.9	3.7	4.6	2.1	1.0	0.7	0.6	0.3	0.1	1.5	5.6																							
19-Oct	0.1	0.0	0.0	0.0	Z	0.1	0.1	0.1	0.1	0.0	0.2	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	0.2	0.2																						
20-Oct	0.1	0.1	0.0	0.1	0.1	Z	0.0	0.2	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.2																							
21-Oct	Z	0.0	0.0	0.0	0.1	0.0	0.3	0.6	1.2	0.5	0.8	1.0	1.8	0.5	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.8																							
22-Oct	0.0	Z	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.2	0.3	0.2	0.0	0.4	0.0	0.0	0.0	0.0	0.1	0.4																							
23-Oct	0.0	0.0	Z	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																						
24-Oct	0.1	0.1	0.0	Z	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.2																							
25-Oct	0.1	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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																						
26-Oct	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																						
27-Oct	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.4	0.2	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4																						
28-Oct	0.2	Z	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2																							
29-Oct	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.1	0.0	0.0	0.0	0.2	0.1	0.0	0.1	0.1	0.1	0.2	0.1	0.2																							
30-Oct	0.1	0.1	0.1	Z	0.1	0.2	0.4	0.1	0.3	0.2	1.9	3.7	2.3	0.2	5.9	2.7	1.9	0.7	1.9	2.4	3.3	1.4	0.5	1.5	1.4	5.9																							
31-Oct	1.5	0.8	0.7	0.4	Z	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.5																							
																								0.3	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.6	1.4	2.6	1.9	1.8	1.8	0.9	0.6	0.5	0.4	0.3	0.4	0.3	0.3	0.3	Diurnal Average	
																								3.3	2.3	0.7	0.4	1.8	1.4	1.4	1.6	2.9	10.5	10.7	17.9	13.1	16.2	17.6	5.5	3.7	4.6	3.1	2.4	4.3	2.8	4.1	3.5	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
Barge Landing - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Barge Landing - October 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	695	98.86	98.86
11 - 20	8	1.14	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: 703

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Barge Landing - October 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	31	15	6	9	10	22	91	144	70	37	32	57	50	61	27	33	695
11 - 20	0	0	0	0	0	0	0	5	3	0	0	0	0	0	0	0	8
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	31	15	6	9	10	22	91	149	73	37	32	57	50	61	27	33	703

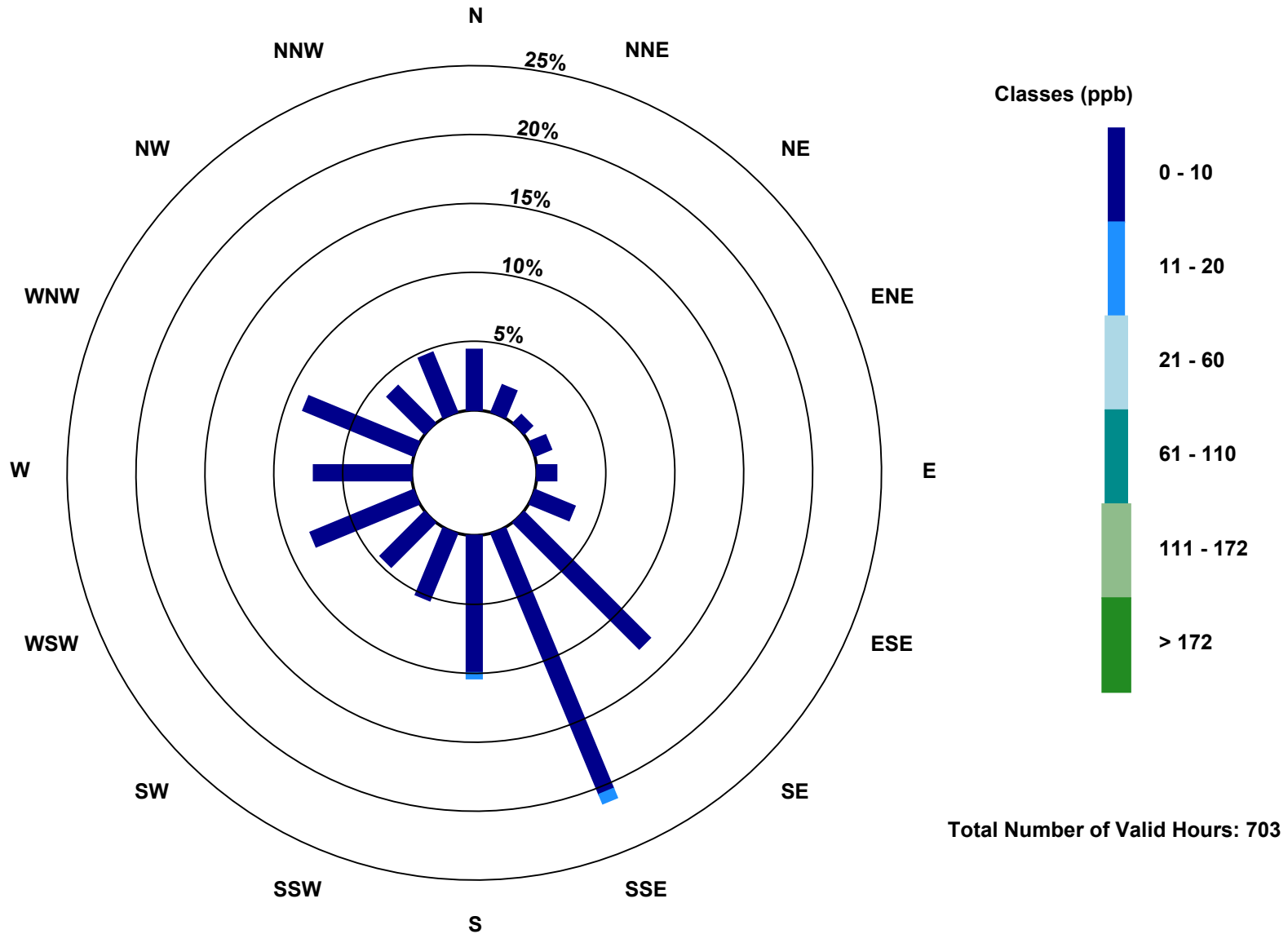
Total Number of Valid Hours: 703

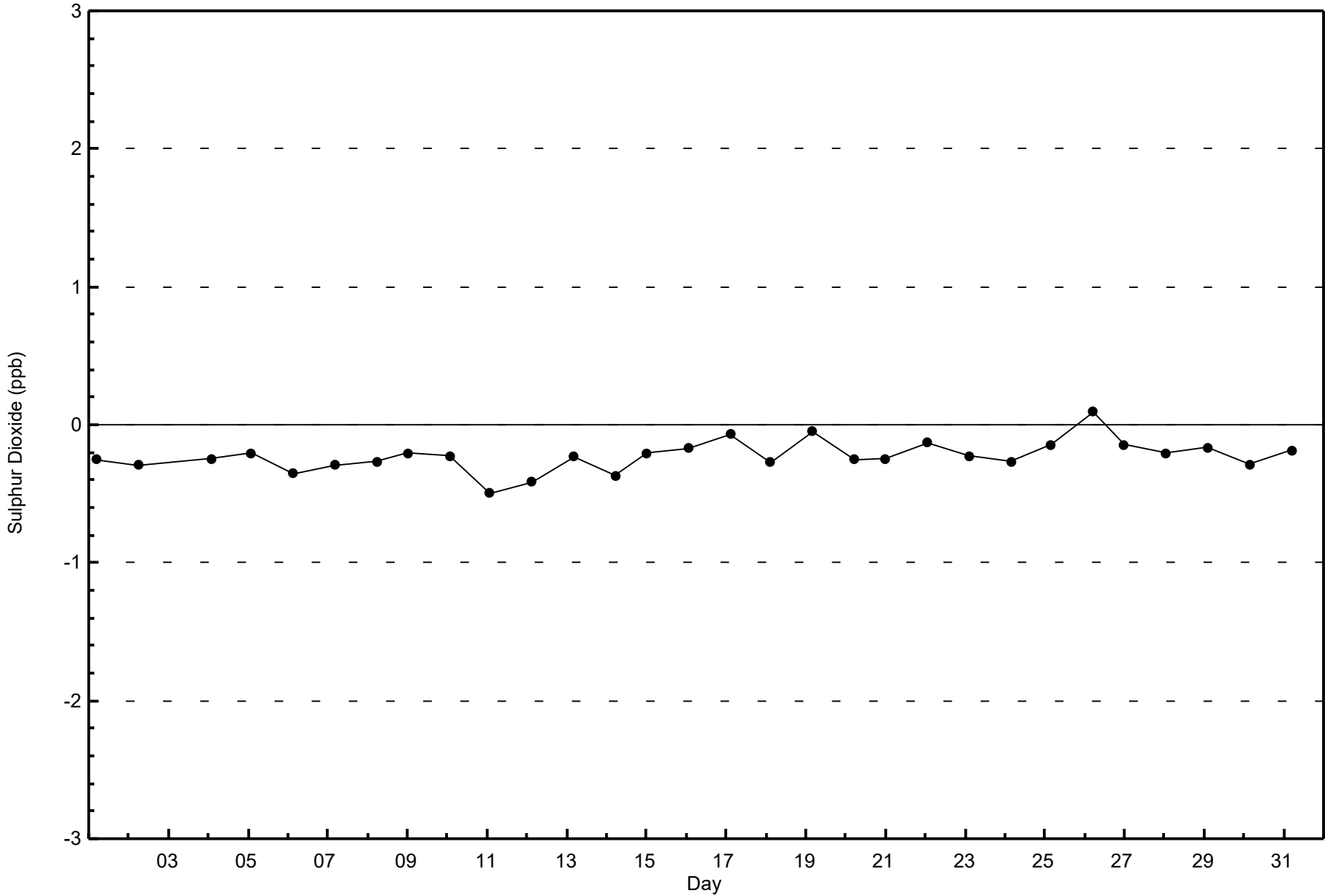
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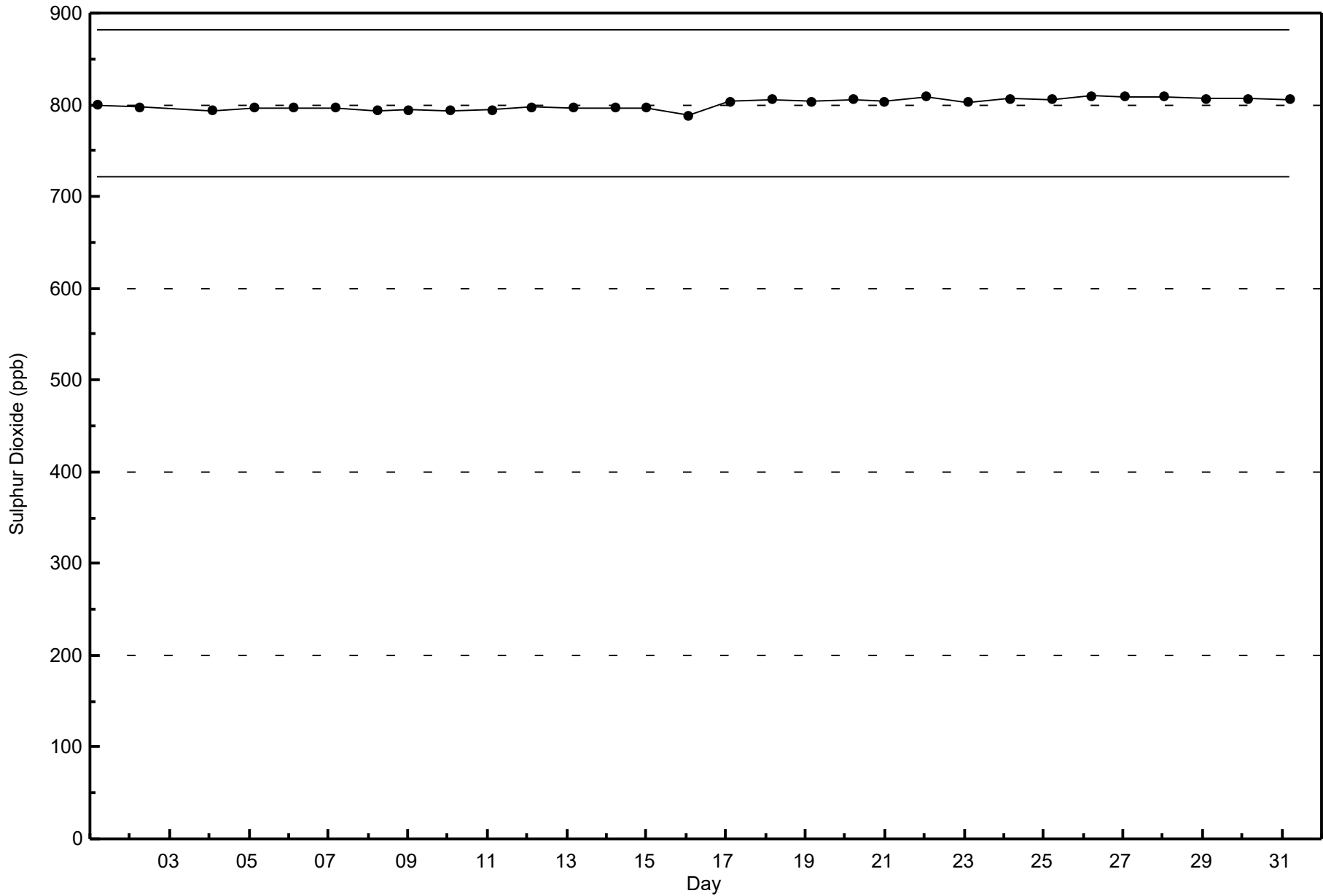


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Sulphur Dioxide (SO₂) - ppb
Barge Landing









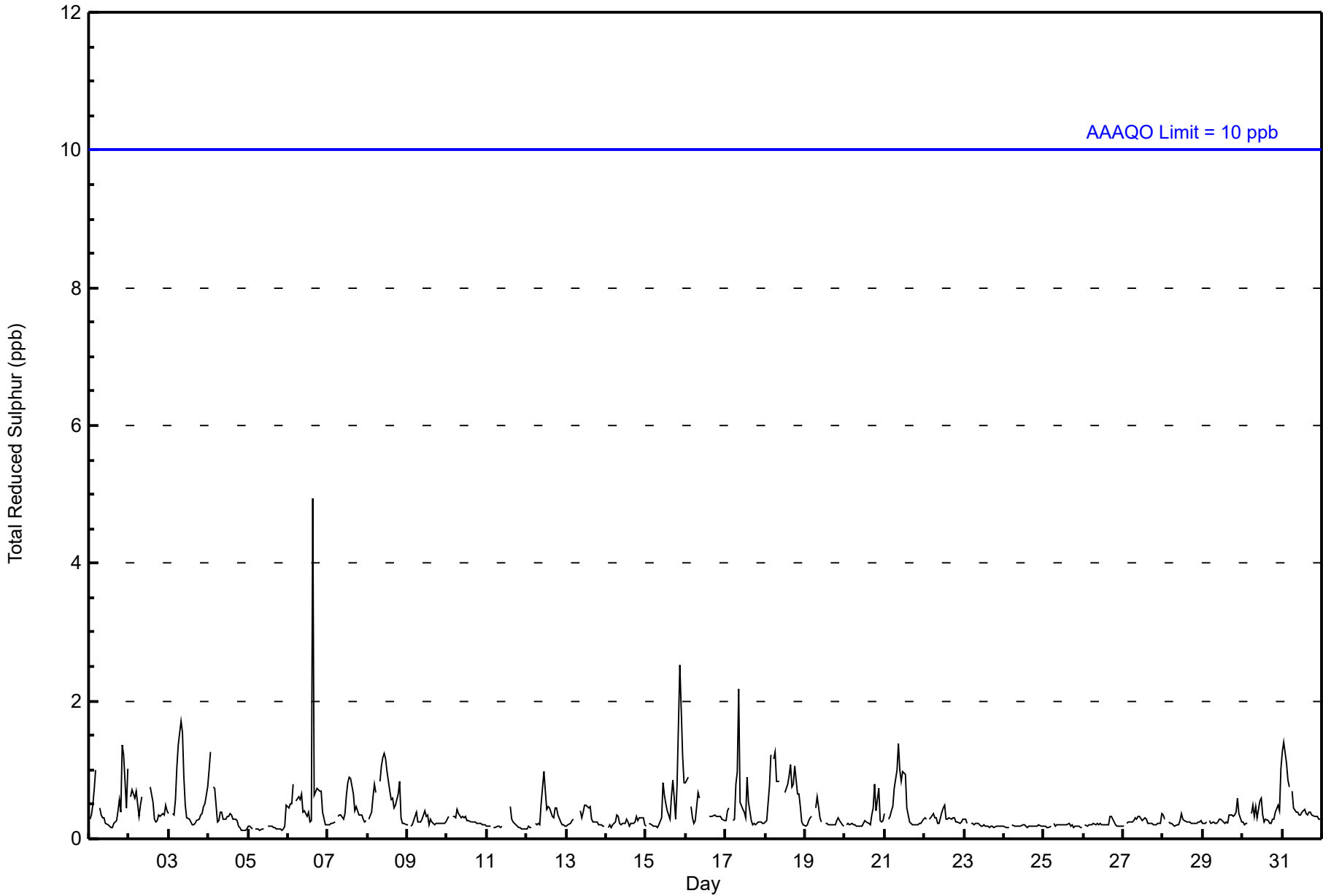
Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

Barge Landing - October 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:														744							
Maximum Value: 4.9 ppb on Oct 6 16:00		Maximum Daily Average: 0.7 ppb on Oct 18														Hours of Data:		692									
Minimum Value: 0.1 ppb on Oct 4 22:00		Minimum Daily Average: 0.2 ppb on Oct 5														Hours of Missing Data:		52									
Maximum Diurnal Average: 0.5 ppb at hour 9		Minimum Diurnal Average: 0.3 ppb at hour 23														Hours of Calibration:		36									
Monthly Average: 0.37 ppb		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 = 1.4														Percent Operational Time:		97.9									
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-Oct	0.3	0.3	0.5	0.7	1.0	Z	0.5	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.6	0.4	1.4	1.2	0.5	1.0	0.5	1.4	
2-Oct	Z	0.6	0.7	0.6	0.7	0.5	0.3	0.5	0.6	PF	PF	PF	PF	0.7	0.5	0.3	0.2	0.3	0.3	0.3	0.4	0.4	0.5	0.4	0.5	0.7	
3-Oct	0.4	Z	0.4	0.4	0.6	1.0	1.4	1.7	1.5	0.9	0.5	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.8	0.6	1.7	
4-Oct	1.0	1.3	Z	0.8	0.7	0.2	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.4	1.3	
5-Oct	0.2	0.2	0.2	Z	0.1	0.1	0.1	0.1	0.1	0.1	M	M	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.5	0.2	0.5	
6-Oct	0.4	0.5	0.5	0.8	Z	0.5	0.6	0.6	0.7	0.4	0.4	0.3	0.4	0.3	0.3	4.9	0.6	0.7	0.7	0.7	0.7	0.4	0.2	0.2	0.7	4.9	
7-Oct	0.2	0.2	0.2	0.2	0.2	Z	0.3	0.3	0.3	0.3	0.4	0.6	0.8	0.9	0.9	0.6	0.4	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.9	
8-Oct	Z	0.3	0.4	0.6	0.8	0.7	M	0.8	1.1	1.2	1.2	1.2	1.0	0.7	0.6	0.6	0.5	0.5	0.7	0.8	0.3	0.2	0.2	0.2	0.7	1.2	
9-Oct	0.2	Z	0.2	0.2	0.3	0.4	0.2	0.2	0.3	0.3	0.4	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	
10-Oct	0.3	0.3	Z	0.3	0.3	0.3	0.4	0.4	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	0.3	0.4	
11-Oct	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	M	M	M	M	0.5	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.5	
12-Oct	0.1	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.5	1.0	0.7	0.4	0.5	0.4	0.3	0.3	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.3	1.0	
13-Oct	0.2	0.2	0.2	0.3	0.3	Z	0.9	M	0.4	0.3	0.4	0.5	0.5	0.4	0.5	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.9	
14-Oct	Z	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.3	
15-Oct	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.8	0.6	0.5	0.4	0.3	0.6	0.8	0.6	0.3	0.8	2.5	1.9	1.2	0.8	0.6	2.5	
16-Oct	0.8	0.9	Z	0.5	0.3	0.2	0.3	0.7	0.6	C	C	C	C	C	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.9	
17-Oct	0.3	0.4	0.4	Z	0.3	0.3	0.8	1.0	2.2	0.5	0.4	0.4	0.3	0.9	0.5	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.5	2.2	
18-Oct	0.2	0.3	0.8	1.2	Z	1.2	1.3	0.8	0.8	M	M	M	0.7	0.8	0.9	1.1	0.8	0.8	1.0	0.6	0.7	0.5	0.2	0.2	0.7	1.3	
19-Oct	0.2	0.2	0.3	0.3	0.3	Z	0.5	0.6	0.5	0.3	0.2	M	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.3	0.6	
20-Oct	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.4	0.8	0.4	0.7	0.3	0.2	0.3	0.3	0.8	
21-Oct	0.4	Z	0.3	0.3	0.4	0.5	0.7	1.0	1.4	1.0	0.8	1.0	0.9	0.5	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.5	1.4	
22-Oct	0.3	0.3	Z	0.3	0.3	0.4	0.3	0.3	0.2	0.2	0.4	0.5	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.5	
23-Oct	0.3	0.3	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	
24-Oct	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	
25-Oct	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	
26-Oct	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	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	
27-Oct	0.2	Z	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.3	0.4	
28-Oct	0.4	0.3	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.4	
29-Oct	0.2	0.2	0.2	Z	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.6	0.4	0.2	0.3	0.6	
30-Oct	0.2	0.2	0.2	0.2	Z	0.4	0.5	0.3	0.5	0.3	0.5	0.6	0.4	0.2	0.3	0.3	0.2	0.2	0.3	0.3	0.4	0.5	0.4	1.0	0.4	1.0	
31-Oct	1.3	1.4	1.1	0.8	0.7	Z	0.7	0.5	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.5	1.4	
																								Diurnal Average		0.3	
																								Diurnal Maximum		1.3	
Z - zerospan		C - Calibration				M - Maintenance				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
Barge Landing - October 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	690	99.71	99.71
3 - 4	1	0.14	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: 692

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Barge Landing - October 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	31	16	6	9	10	22	92	142	71	34	33	56	47	60	27	34	690
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	1	0	0	0	0	0	0	0	1
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	31	16	6	9	10	22	92	143	72	34	33	56	47	60	27	34	692

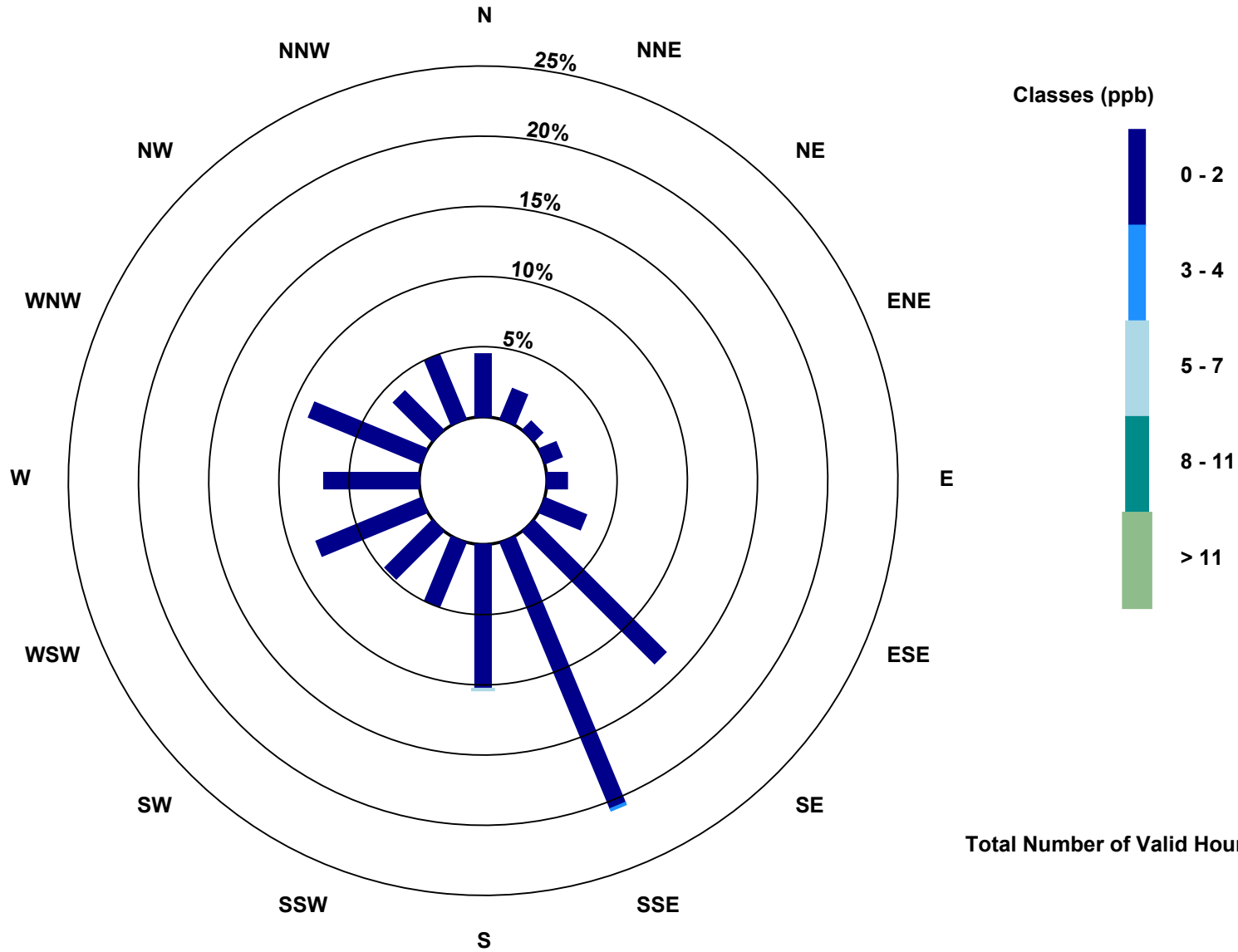
Total Number of Valid Hours: 692

Total Number of Hours: 744

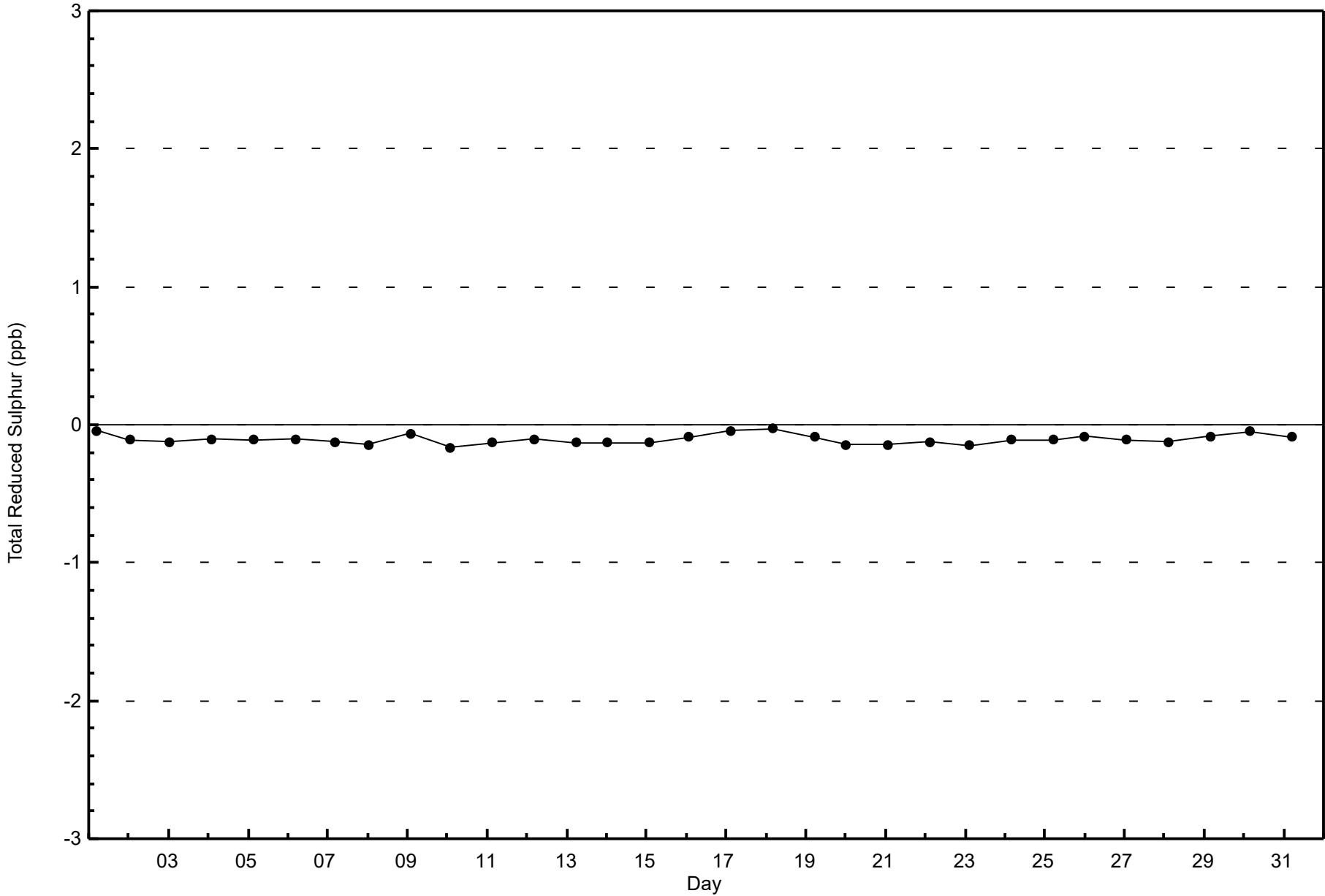


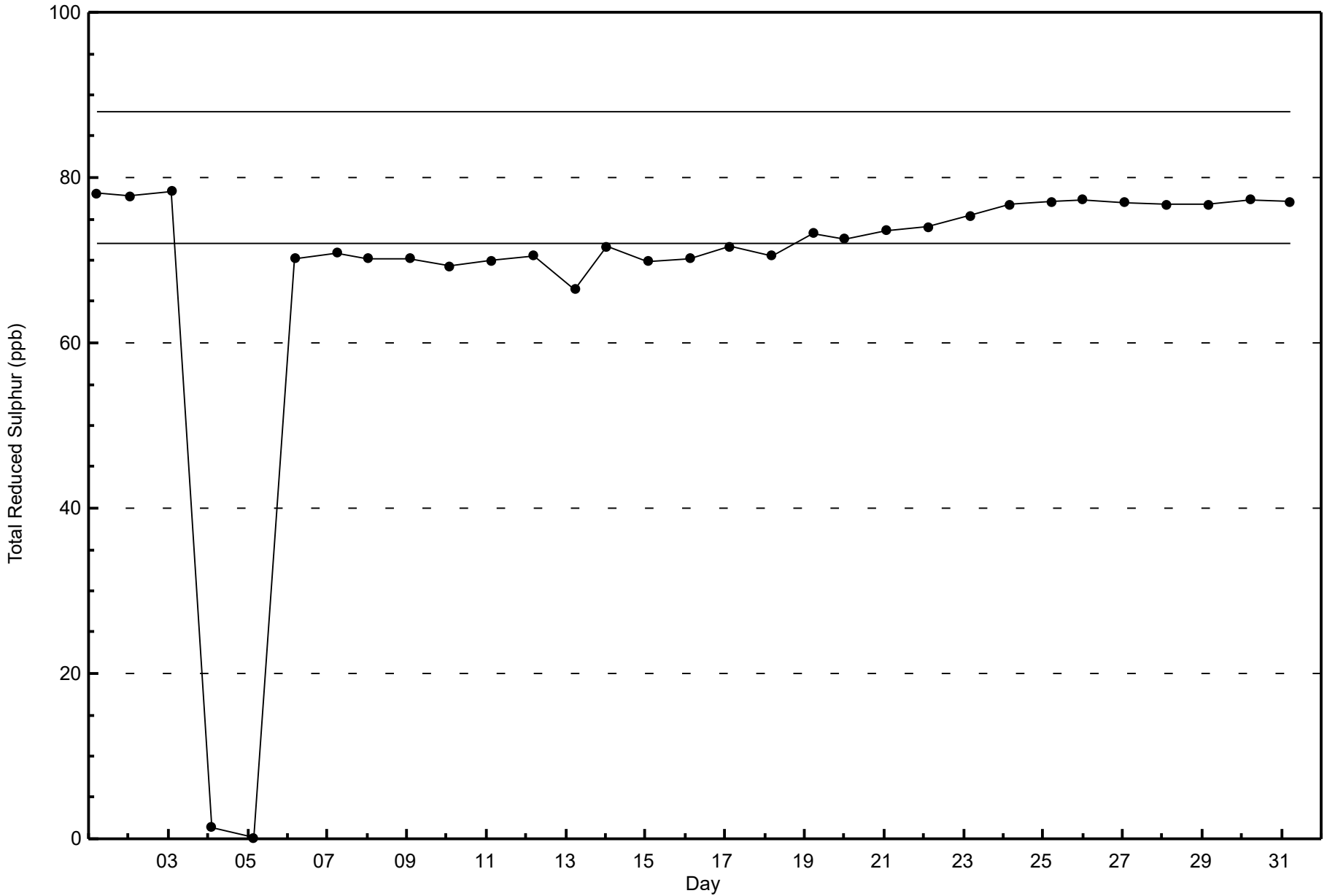
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Total Reduced Sulphur (TRS) - ppb
Barge Landing



Total Number of Valid Hours: 692

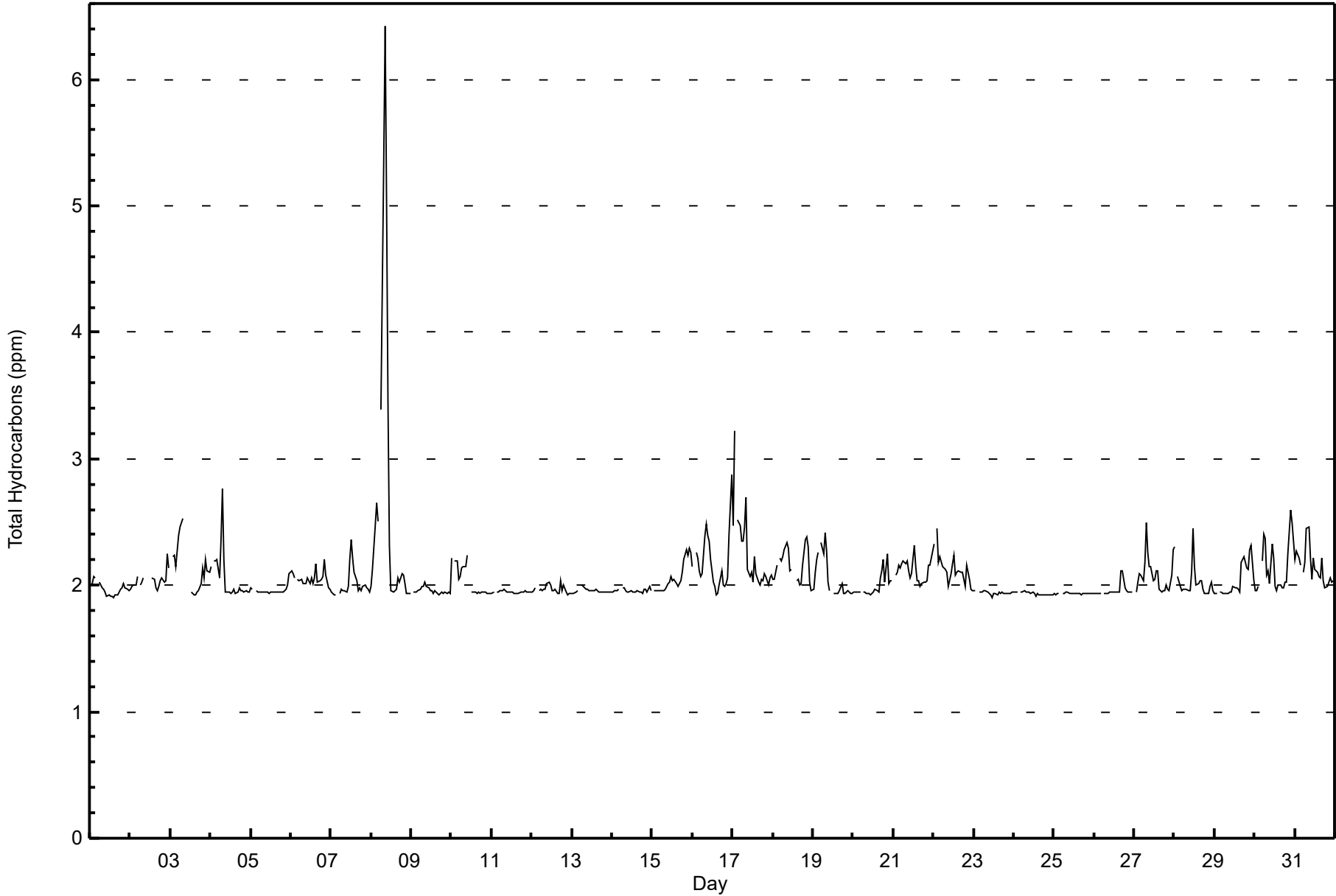






Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Barge Landing - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Barge Landing - October 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	485	69.29	69.29
2.1 - 3.0	209	29.86	99.14
3.1 - 10.0	6	0.86	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 700

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Barge Landing - October 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	15	3	1	2	4	18	80	98	33	20	28	53	45	53	20	12	485
2.1 - 3.0	15	12	4	7	6	4	11	50	40	17	3	3	4	8	7	18	209
3.1 - 10.0	1	0	1	0	0	0	0	0	0	0	0	1	0	0	0	3	6
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	31	15	6	9	10	22	91	148	73	37	32	56	49	61	27	33	700

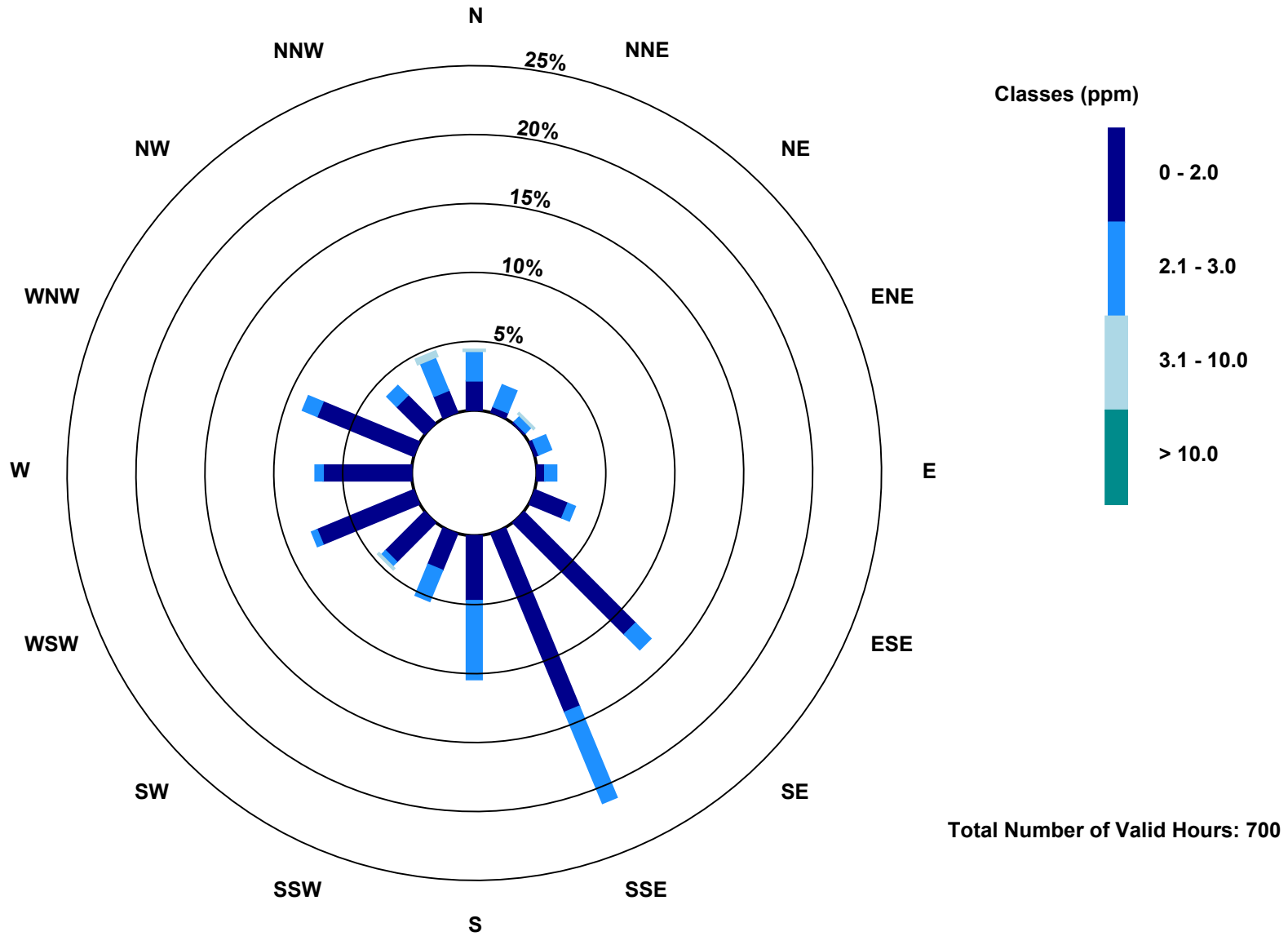
Total Number of Valid Hours: 700

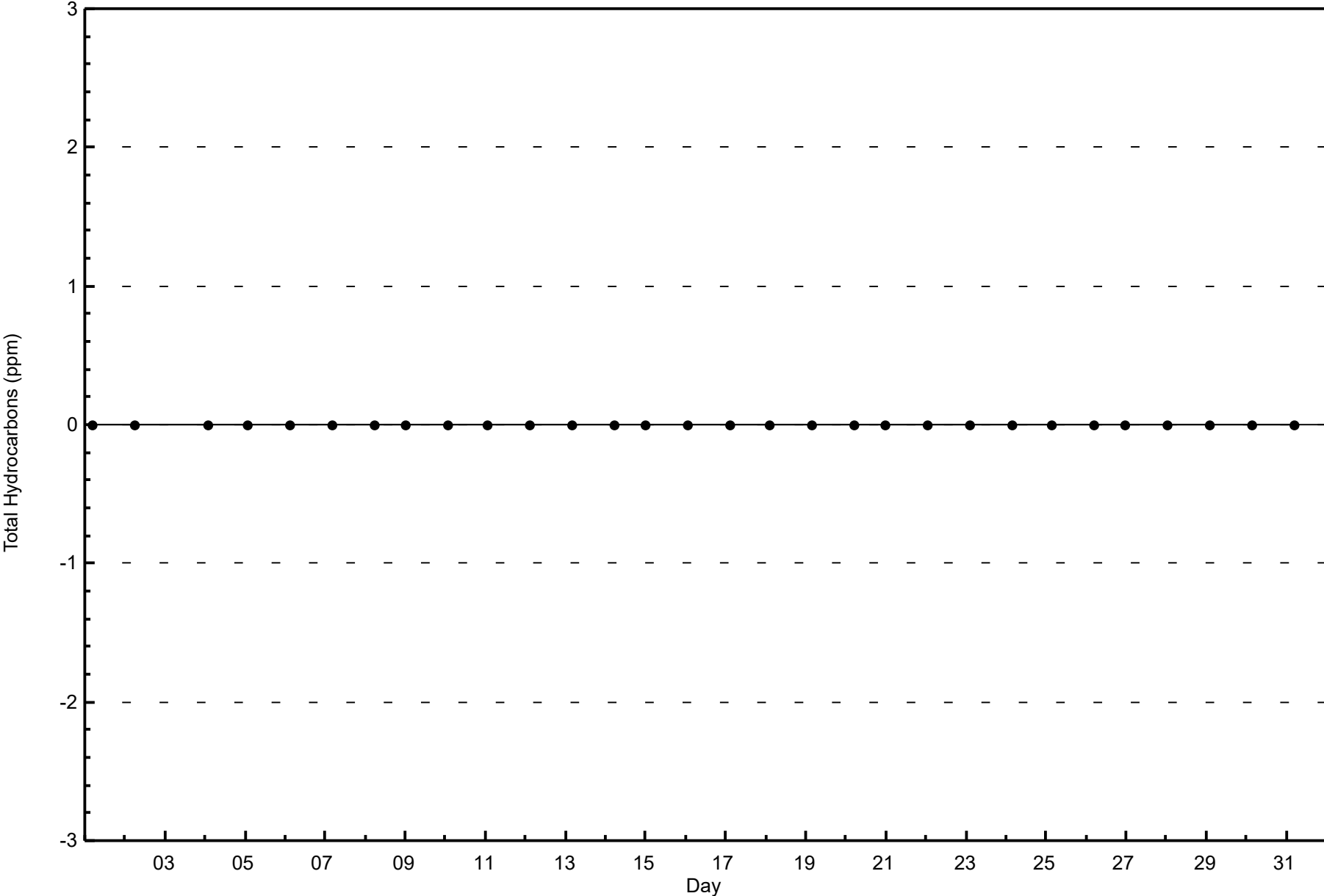
Total Number of Hours: 744

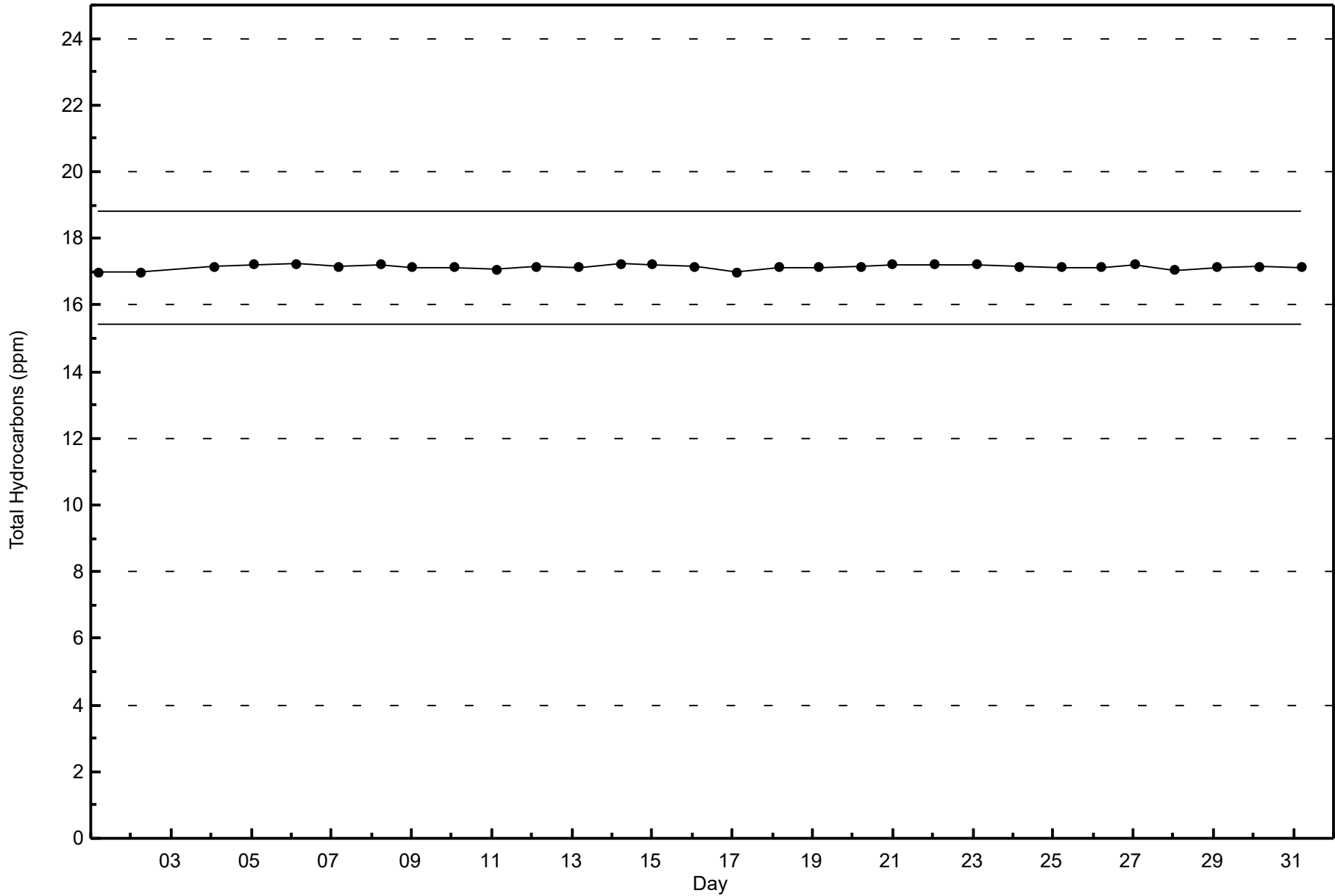


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Total Hydrocarbons (THC) - ppm
Barge Landing





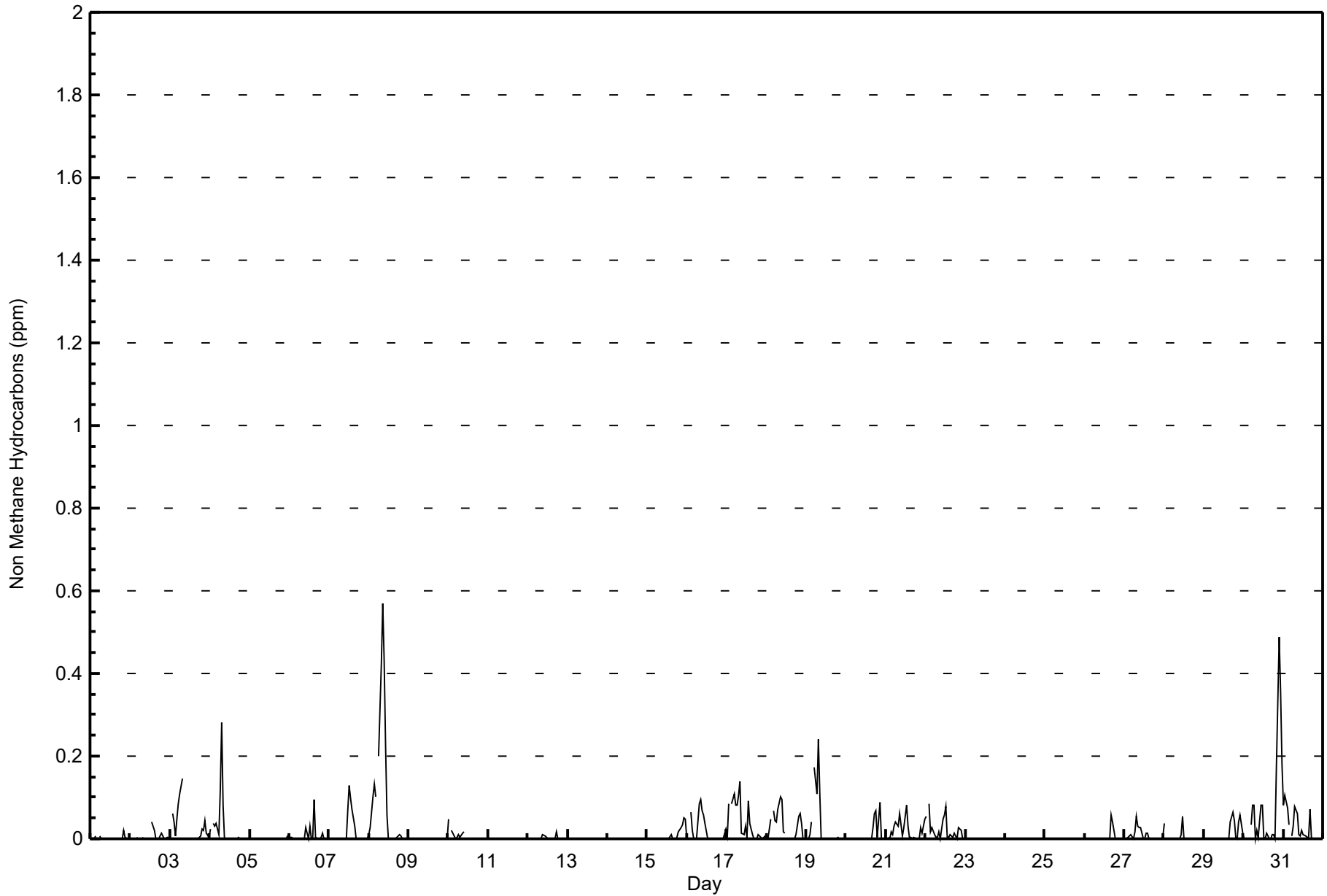




Summary of Hour Averages

Barge Landing - October 2023

Maximum Value: 0.571 ppm on Oct 8 09:00		Maximum Daily Average: 0.100 ppm on Oct 8		Hours in Service: 744																							
Minimum Value: 0.000 ppm on Oct 1 01:00		Minimum Daily Average: 0.000 ppm on Oct 11		Hours of Data: 700																							
Maximum Diurnal Average: 0.049 ppm at hour 8		Minimum Diurnal Average: 0.005 ppm at hour 20		Hours of Missing Data: 44																							
Monthly Average: 0.016 ppm		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.1 P ₉₉ = 0.2		Hours of Calibration: 35																							
				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-Oct	0.000	0.001	0.000	0.006	Z	0.006	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	0.020	0.002	0.000	0.000	0.002	0.020	
2-Oct	0.000	0.000	0.000	0.000	0.004	Z	0.000	0.000	0.004	PF	PF	PF	PF	0.040	0.020	0.000	0.000	0.000	0.006	0.014	0.001	0.000	0.003	0.003	0.005	0.040	
3-Oct	Z	0.061	0.041	0.006	0.046	0.084	0.108	0.145	C	C	C	C	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.024	0.020	0.044	0.015	0.003	0.032	0.145	
4-Oct	0.022	Z	0.036	0.029	0.037	0.009	0.120	0.282	0.082	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.027	0.282	
5-Oct	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	0.007	0.000
6-Oct	0.004	0.002	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.028	0.001	0.030	0.000	0.003	0.097	0.004	0.001	0.000	0.004	0.015	0.000	0.000	0.000	0.008	0.097	
7-Oct	0.000	0.000	0.000	0.000	Z	0.000	0.001	0.000	0.000	0.000	0.002	0.069	0.130	0.098	0.071	0.030	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.017	0.130	
8-Oct	0.009	0.027	0.102	0.133	0.102	Z	0.199	0.423	0.571	0.430	0.228	0.058	0.000	0.000	0.000	0.000	0.002	0.003	0.009	0.007	0.000	0.000	0.000	0.000	0.100	0.571	
9-Oct	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	
10-Oct	0.048	Z	0.019	0.007	0.001	0.004	0.010	0.003	0.013	0.018	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	0.006	0.048	
11-Oct	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	
12-Oct	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.009	0.007	0.003	0.000	0.000	0.000	0.000	0.000	0.017	0.000	0.002	0.000	0.000	0.000	0.000	0.002	0.017	
13-Oct	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	
14-Oct	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	
15-Oct	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	0.012	0.000	0.000	0.002	0.004	0.019	0.029	0.033	0.051	0.048	0.009	0.051	
16-Oct	0.004	Z	0.065	0.019	0.001	0.000	0.000	0.086	0.096	0.069	0.058	0.037	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.025	0.020	0.096		
17-Oct	0.006	0.086	Z	0.086	0.107	0.081	0.082	0.107	0.138	0.015	0.009	0.029	0.004	0.091	0.038	0.012	0.000	0.000	0.000	0.009	0.006	0.000	0.003	0.005	0.040	0.138	
18-Oct	0.000	0.001	0.049	Z	0.068	0.043	0.041	0.072	0.101	0.094	0.016	0.014	M	M	0.000	0.000	0.001	0.000	0.009	0.054	0.060	0.036	0.001	0.000	0.031	0.101	
19-Oct	0.000	0.000	0.010	0.039	Z	0.174	0.110	0.241	0.111	0.000	0.000	M	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.031	0.241	
20-Oct	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	0.028	0.060	0.069	0.003	0.090	0.000	0.000	0.011	0.090		
21-Oct	Z	0.002	0.001	0.016	0.011	0.031	0.041	0.031	0.060	0.035	0.007	0.029	0.082	0.031	0.002	0.004	0.000	0.005	0.000	0.000	0.000	0.028	0.015	0.048	0.021	0.082	
22-Oct	0.055	Z	0.086	0.015	0.028	0.009	0.003	0.005	0.018	0.000	0.049	0.059	0.079	0.005	0.002	0.009	0.005	0.012	0.008	0.000	0.027	0.022	0.000	0.000	0.022	0.086	
23-Oct	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	
24-Oct	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	
25-Oct	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	
26-Oct	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	0.059	0.042	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.059		
27-Oct	Z	0.000	0.005	0.008	0.012	0.001	0.016	0.054	0.029	0.026	0.027	0.000	0.000	0.015	0.015	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.009	0.054	
28-Oct	0.037	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.011	0.055	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.005	0.055	
29-Oct	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	0.041	0.065	0.043	0.003	0.002	0.042	0.056	0.014	0.012	0.065	
30-Oct	0.000	0.000	0.000	Z	0.034	0.080	0.080	0.001	0.019	0.002	0.083	0.083	0.005	0.000	0.012	0.000	0.000	0.011	0.009	0.001	0.172	0.487	0.357	0.181	0.070	0.487	
31-Oct	0.081	0.106	0.074	0.032	Z	0.005	0.032	0.077	0.062	0.011	0.006	0.022	0.012	0.008	0.002	0.005	0.072	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.026	0.106	
																								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
Barge Landing - October 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	513	73.29	73.29
0.006 - 0.05	117	16.71	90.00
0.06 - 0.1	58	8.29	98.29
> 0.1	12	1.71	100.00

Total Number of Valid Hours: 700

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm
Barge Landing - October 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	13	5	1	4	7	19	83	106	30	29	28	54	47	54	21	12	513
0.006 - 0.05	12	4	2	4	1	1	7	32	25	5	1	2	2	6	3	10	117
0.06 - 0.1	5	6	3	1	2	2	1	9	13	3	2	0	0	1	2	8	58
> 0.1	1	0	0	0	0	0	0	1	5	0	1	0	0	0	1	3	12
Totals	31	15	6	9	10	22	91	148	73	37	32	56	49	61	27	33	700

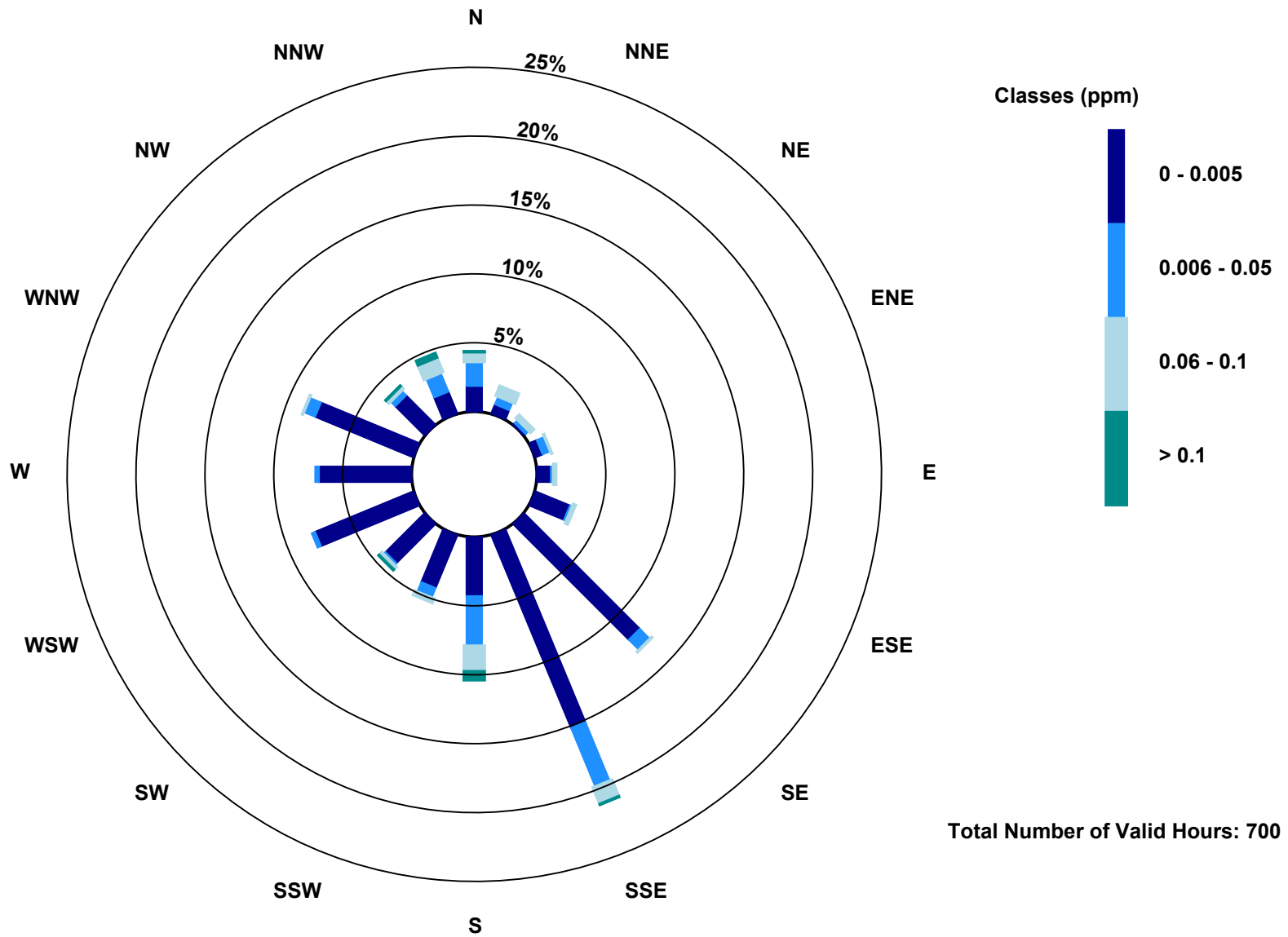
Total Number of Valid Hours: 700

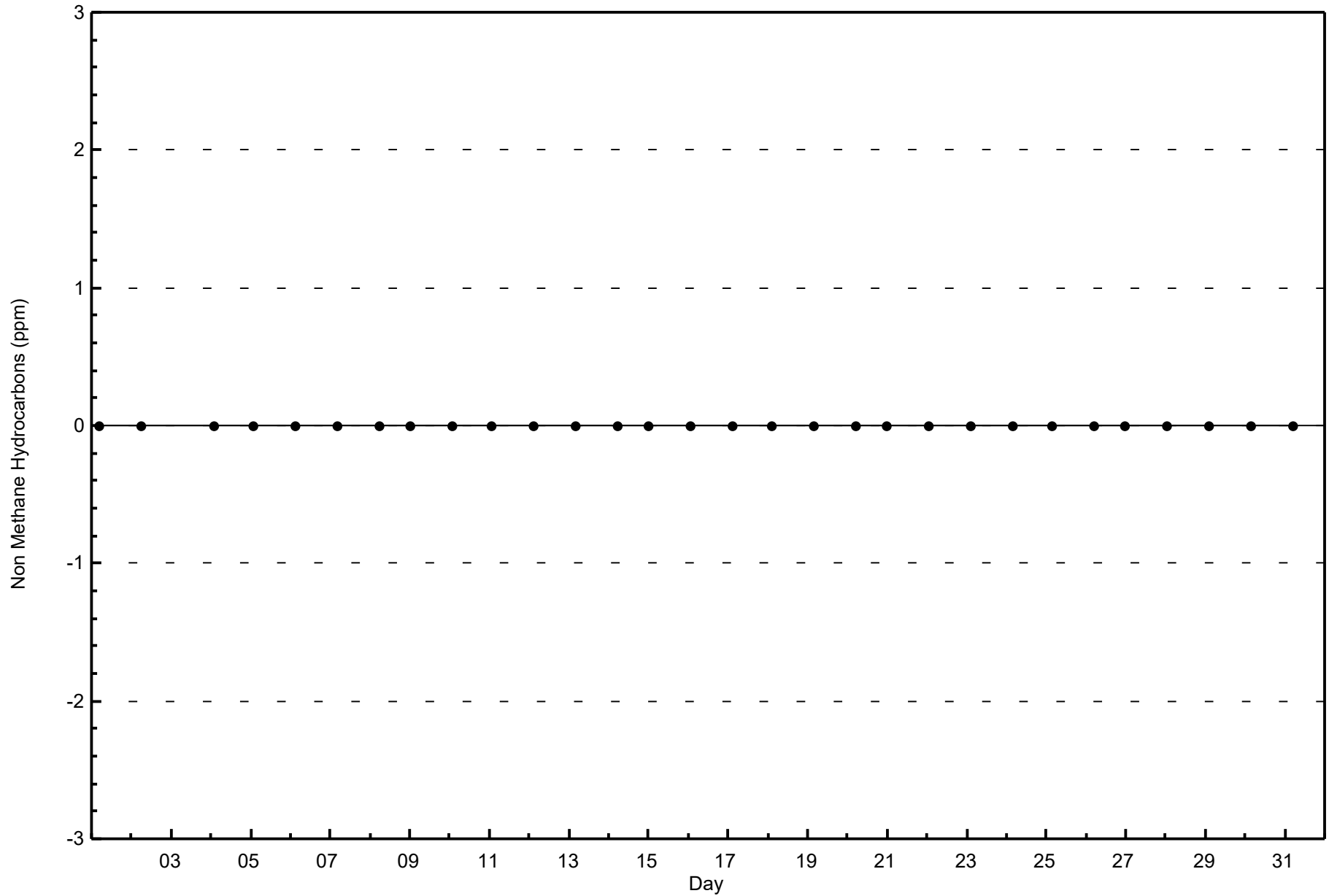
Total Number of Hours: 744

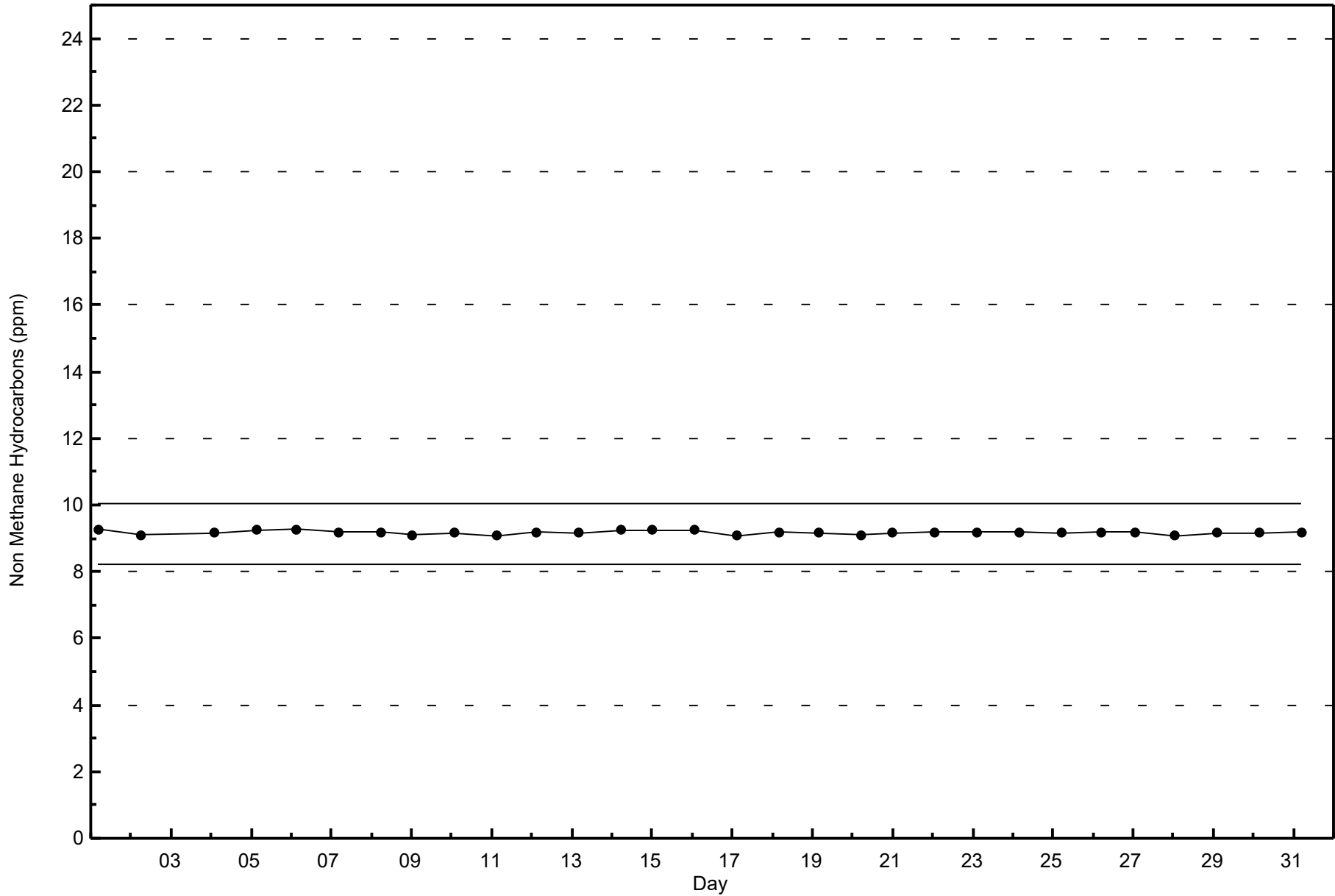


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Non Methane Hydrocarbons (NMHC) - ppm
Barge Landing









Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH₄) - ppm

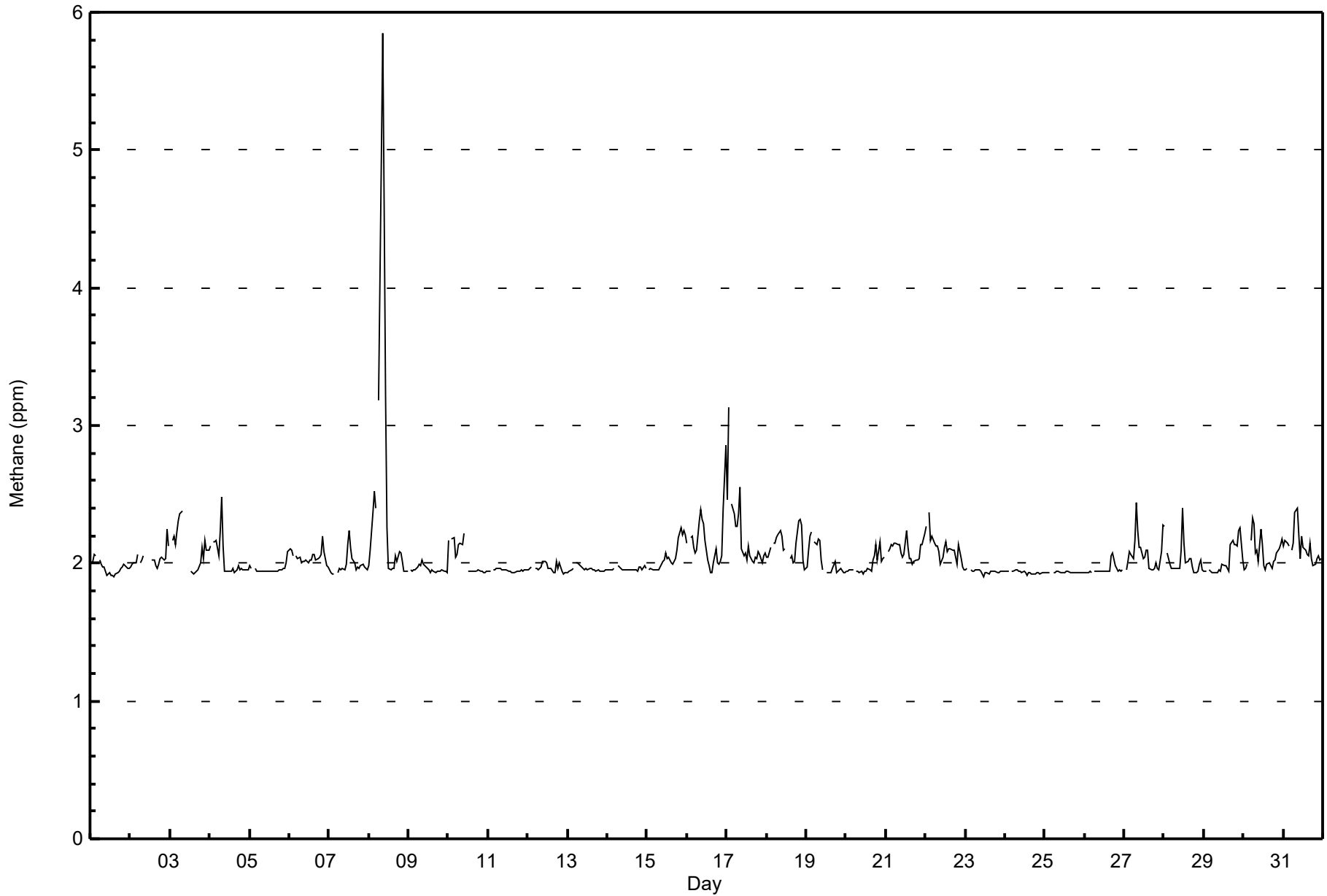
Barge Landing - October 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		744																																																											
Maximum Value: 5.8 ppm on Oct 8 09:00		Maximum Daily Average: 2.6 ppm on Oct 8		Minimum Value: 1.9 ppm on Oct 1 15:00		Minimum Daily Average: 1.9 ppm on Oct 25		Hours of Data: 700																																																											
Maximum Diurnal Average: 2.2 ppm at hour 9		Minimum Diurnal Average: 2.0 ppm at hour 16		Hours of Missing Data: 44		Hours of Calibration: 35		Percent Operational Time: 98.8																																																											
Monthly Average: 2.04 ppm		Percentiles: P ₁ = 1.9 P ₁₀ = 1.9 Q ₁ = 1.9 Median = 2.0 Q ₃ = 2.1 P ₉₀ = 2.2 P ₉₉ = 2.6																																																																	
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-Oct	2.0	2.0	2.1	2.1	Z	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	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-Oct	2.0	2.0	2.0	2.0	2.1	Z	2.0	2.0	2.0	PF	PF	PF	PF	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	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	2.2	2.2																													
3-Oct	Z	2.2	2.2	2.1	2.2	2.3	2.4	2.4	C	C	C	C	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.1	2.0	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	2.4																														
4-Oct	2.1	Z	2.2	2.2	2.2	2.1	2.2	2.5	2.1	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	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.5																														
5-Oct	2.0	2.0	Z	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	1.9	1.9	1.9	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	2.1	2.1																														
6-Oct	2.1	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	2.1	2.0	2.0	2.0	2.1	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.2																														
7-Oct	1.9	1.9	1.9	1.9	Z	1.9	2.0	2.0	2.0	1.9	2.0	2.1	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.2																														
8-Oct	2.0	2.1	2.4	2.5	2.4	Z	3.2	4.9	5.8	4.6	3.2	2.3	2.0	1.9	2.0	2.0	2.1	2.0	2.1	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	1.9	2.6	5.8																														
9-Oct	Z	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	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	1.9	1.9	1.9	1.9	1.9	2.0	2.0																															
10-Oct	2.2	Z	2.2	2.2	2.0	2.1	2.1	2.1	2.1	2.2	M	M	1.9	1.9	1.9	1.9	1.9	1.9	1.9	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	2.2																															
11-Oct	1.9	1.9	Z	1.9	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	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																															
12-Oct	1.9	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	1.9	1.9	1.9	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																															
13-Oct	1.9	1.9	1.9	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0																																
14-Oct	1.9	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	1.9	1.9	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0																															
15-Oct	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	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	2.3	2.3																															
16-Oct	2.1	Z	2.2	2.2	2.1	2.1	2.1	2.3	2.4	2.3	2.3	2.2	2.0	2.0	1.9	1.9	2.0	2.1	2.0	2.0	2.0	2.1	2.4	2.9	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.9	2.9																														
17-Oct	2.5	3.1	Z	2.4	2.4	2.3	2.3	2.4	2.6	2.1	2.1	2.1	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	3.1	3.1																														
18-Oct	2.0	2.0	2.1	Z	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.1	M	M	2.0	2.0	2.0	2.0	2.1	2.3	2.3	2.3	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.3																															
19-Oct	2.0	2.1	2.2	2.2	Z	2.2	2.1	2.2	2.2	2.0	2.0	M	1.9	1.9	1.9	1.9	2.0	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.2																															
20-Oct	1.9	1.9	1.9	1.9	2.0	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	1.9	2.0	2.1	2.1	2.0	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	2.0	2.2	2.2																														
21-Oct	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	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	2.2	2.2																														
22-Oct	2.3	Z	2.4	2.2	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.0	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	2.1	2.4																														
23-Oct	2.0	2.0	Z	1.9	1.9	1.9	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	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																														
24-Oct	1.9	1.9	1.9	Z	1.9	1.9	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	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																														
25-Oct	1.9	1.9	1.9	1.9	Z	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	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	1.9	1.9	1.9	1.9																														
26-Oct	1.9	1.9	1.9	1.9	1.9	Z	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	2.0	2.0	1.9	1.9	1.9	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																														
27-Oct	Z	1.9	2.0	2.1	2.1	2.0	2.2	2.4	2.2	2.1	2.1	2.0	2.0	2.1	2.1	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.1	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4	2.4																														
28-Oct	2.3	Z	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.4	2.1	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4	2.4																														
29-Oct	1.9	1.9	Z	2.0	1.9	1.9	1.9	1.9	1.9	2.0	1.9	2.0	2.0	2.0	2.0	1.9	2.1	2.2	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	2.0	2.0	2.0	2.0	2.3	2.3																														
30-Oct	2.0	2.0	2.0	Z	2.2	2.3	2.3	2.1	2.1	2.0	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.3																														
31-Oct	2.1	2.2	2.1	2.1	Z	2.1	2.2	2.4	2.4	2.2	2.0	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4	2.4																														
																												Diurnal Average		2.0		2.0		2.1		2.1		2.1		2.0		2.0		2.0		2.0		2.0		2.0		2.0		2.0		2.0		2.0		2.0		2.0		2.0		2.0	
																												Diurnal Maximum		2.5		3.1		2.4		2.5		2.4		2.3		3.2		4.9		5.8		4.6		3.2		2.4		2.2		2.1		2.1		2.1		2.2		2.1		2.9	
																												Z - zerspan		C - Calibration		M - Maintenance		PF - Power Failure																																	



Wood Buffalo Environmental Association
Hourly Averages

Methane (CH₄) - ppm
Barge Landing - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Barge Landing - October 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	497	71.00	71.00
2.1 - 3.0	197	28.14	99.14
3.1 - 10.0	6	0.86	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 700

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Methane (CH₄) - ppm
Barge Landing - October 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	15	3	2	2	4	18	80	102	37	20	28	54	45	54	21	12	497
2.1 - 3.0	15	12	3	7	6	4	11	46	36	17	3	2	4	7	6	18	197
3.1 - 10.0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	3	6
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	31	15	6	9	10	22	91	148	73	37	32	56	49	61	27	33	700

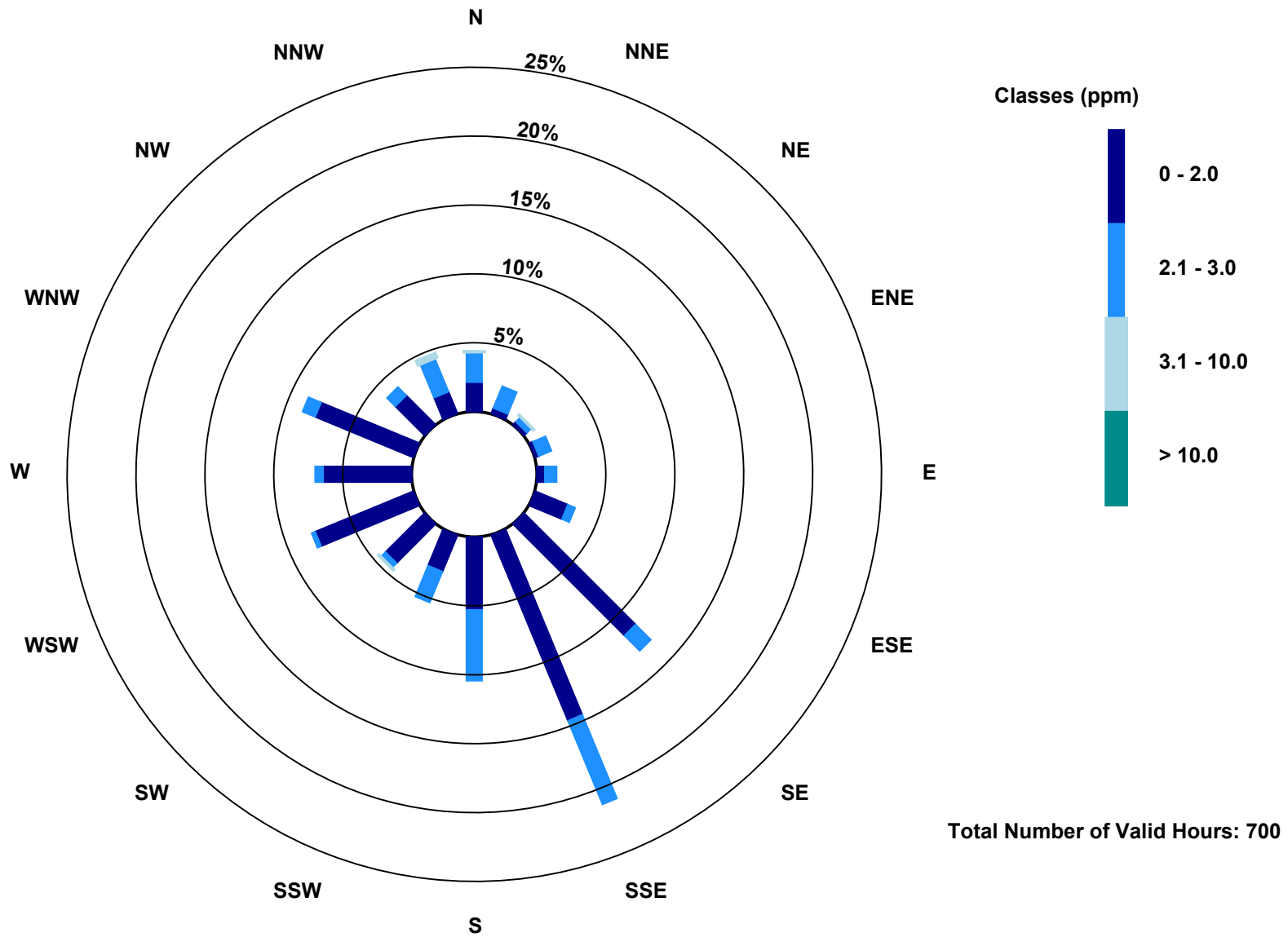
Total Number of Valid Hours: 700

Total Number of Hours: 744

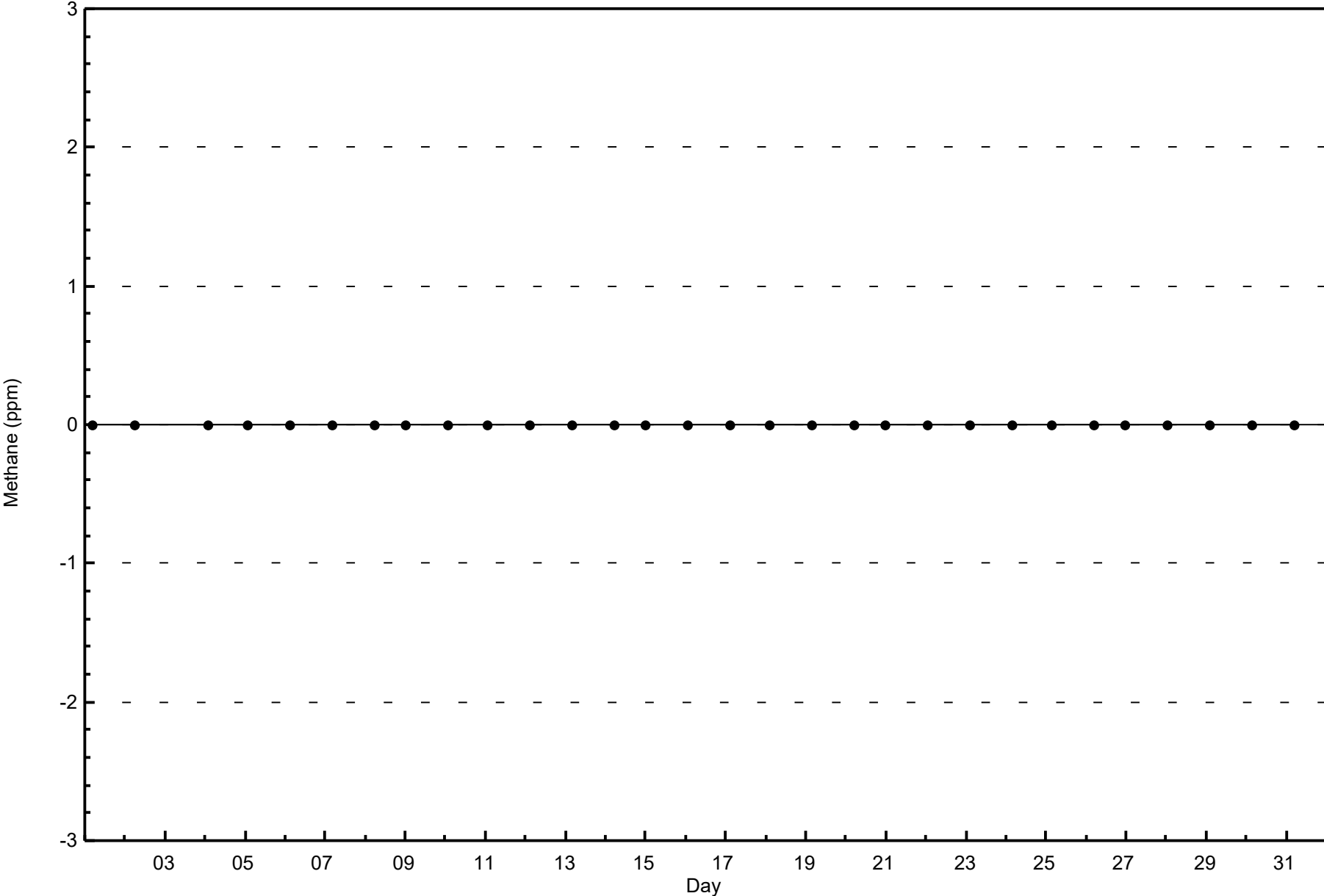


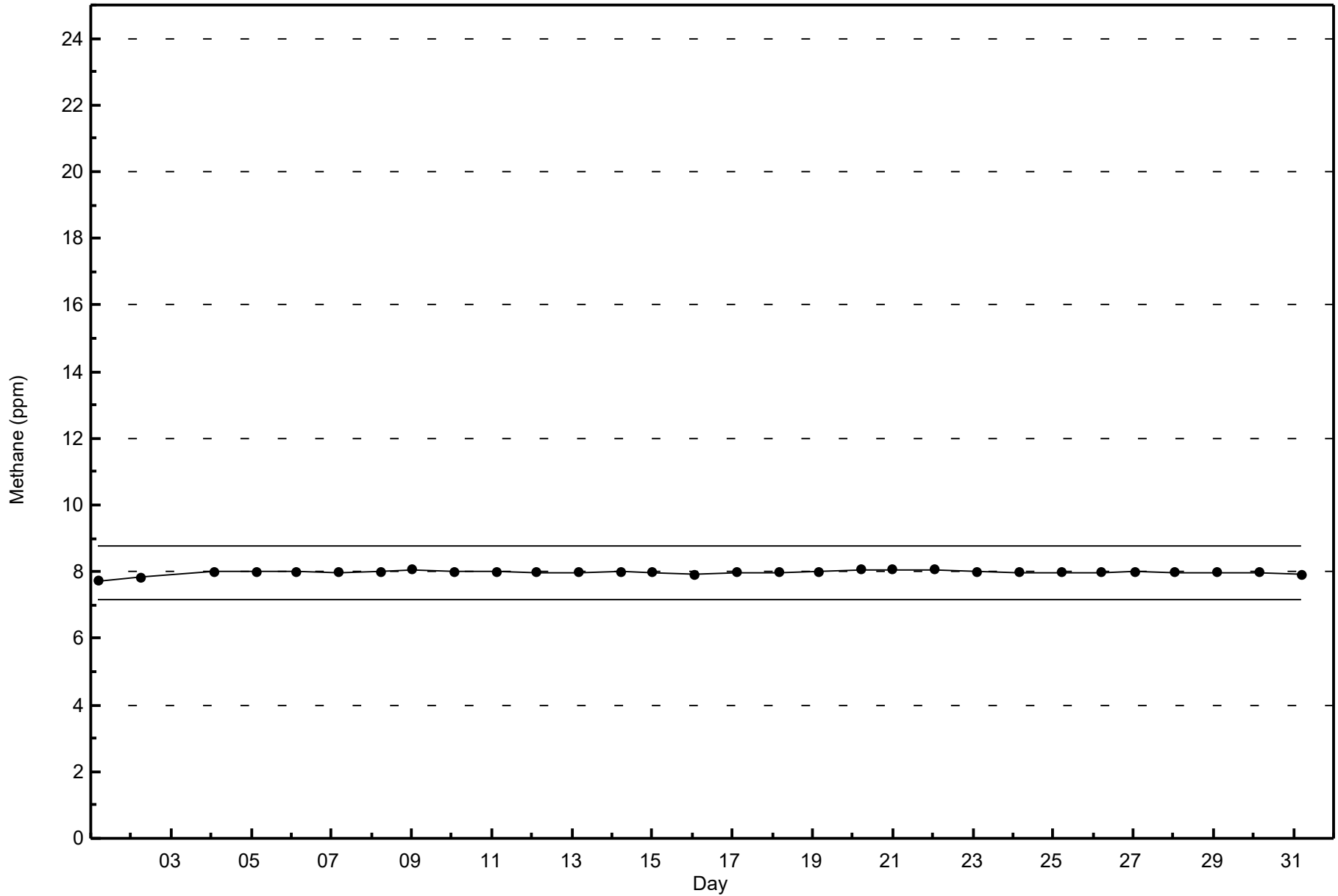
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Methane (CH₄) - ppm
Barge Landing



Total Number of Valid Hours: 700







Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

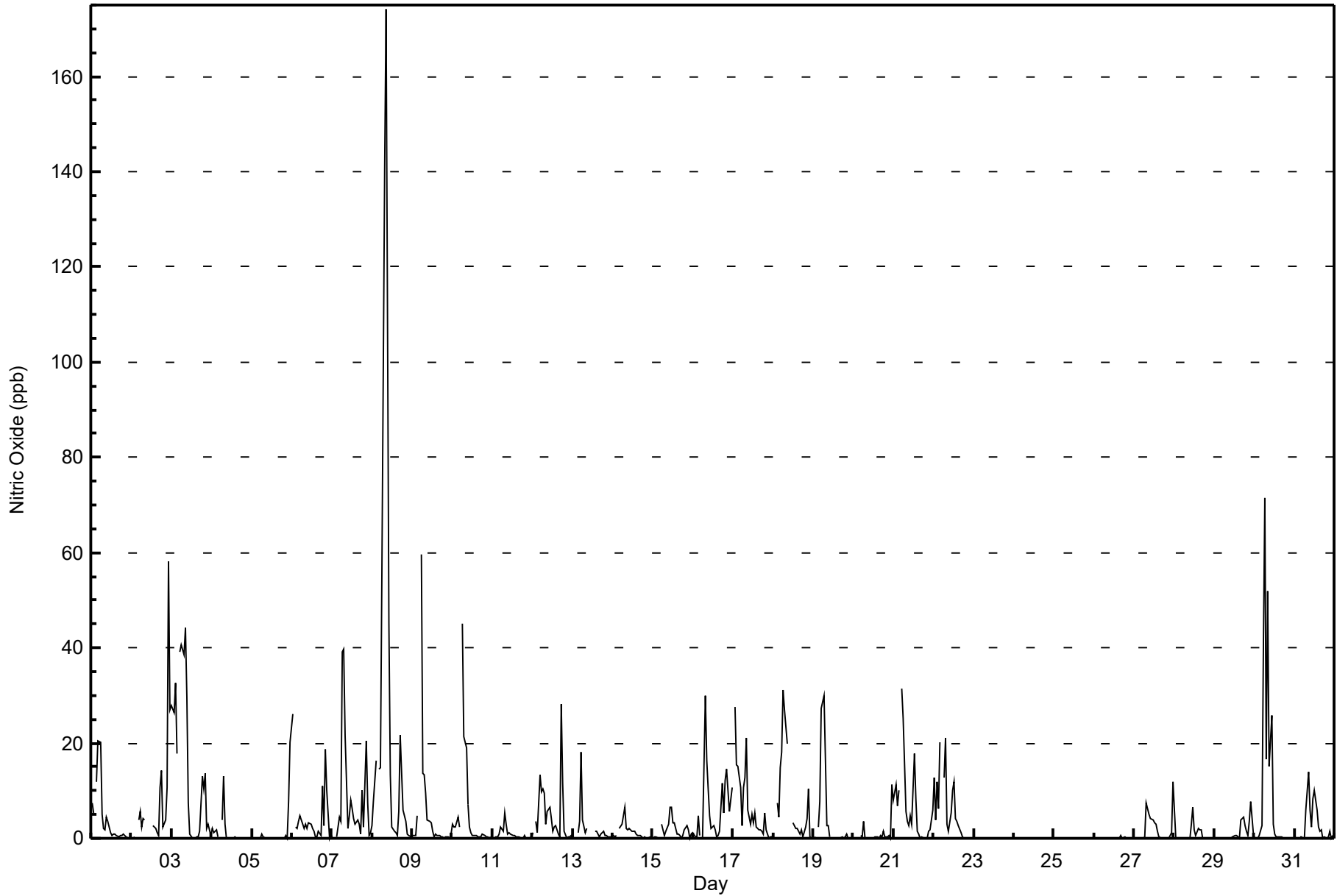
Barge Landing - October 2023

Maximum Value: 174.1 ppb on Oct 8 09:00																				Maximum Daily Average: 27.9 ppb on Oct 8					Hours in Service: 744		
Minimum Value: 0.0 ppb on Oct 4 16:00																				Minimum Daily Average: 0.0 ppb on Oct 24					Hours of Data: 701		
Maximum Diurnal Average: 14.2 ppb at hour 8																				Minimum Diurnal Average: 0.7 ppb at hour 16					Hours of Missing Data: 43		
Monthly Average: 4.72 ppb																				Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.7 Q ₃ = 3.6 P ₉₀ = 12.8 P ₉₉ = 51.8					Hours of Calibration: 35		
																									Percent Operational Time: 98.9		
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Oct	7.3	5.5	Z	11.9	20.5	20.1	5.0	2.0	1.6	4.5	3.4	1.2	0.6	0.9	0.8	0.7	0.4	0.5	0.4	1.0	0.7	0.3	0.1	0.1	3.9	20.5	
2-Oct	0.1	0.1	0.3	Z	4.0	5.5	2.5	4.1	3.9	PF	PF	PF	PF	2.6	2.0	1.1	0.7	10.8	14.1	2.5	3.8	10.8	58.2	27.0	8.1	58.2	
3-Oct	27.9	26.4	32.6	17.9	Z	39.1	40.8	38.4	44.1	29.7	7.3	0.8	0.0	0.0	0.1	0.4	0.4	1.4	13.1	10.4	13.7	1.9	2.9	0.7	15.2	44.1	
4-Oct	2.2	1.0	1.6	1.8	0.2	Z	3.9	13.0	2.8	0.1	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	1.2	13.0	
5-Oct	Z	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	0.0	0.0	0.0	0.0	0.5	0.1	7.8	20.2	1.3	20.2	
6-Oct	26.1	Z	2.3	2.2	3.6	4.6	2.8	2.2	2.9	2.1	3.2	2.9	2.0	1.3	0.3	0.4	1.4	0.5	11.1	2.6	18.6	10.0	0.0	1.0	4.5	26.1	
7-Oct	0.1	0.0	Z	0.3	4.5	3.7	39.0	39.8	21.7	2.0	4.7	8.1	6.2	4.1	3.1	3.8	2.9	0.8	10.1	2.4	20.3	7.5	0.6	1.1	8.1	39.8	
8-Oct	2.6	7.8	16.4	Z	14.5	14.9	54.1	140.6	174.1	110.6	45.1	13.3	2.5	1.4	1.1	0.5	5.6	21.7	5.8	4.8	3.5	0.8	0.6	0.2	27.9	174.1	
9-Oct	0.5	0.6	0.5	4.7	Z	59.7	13.7	13.4	9.6	3.8	3.5	3.3	1.6	0.2	1.0	0.6	0.7	0.4	0.3	0.1	0.4	0.2	0.1	0.7	5.2	59.7	
10-Oct	2.9	2.4	2.5	4.5	2.3	Z	45.0	21.2	18.9	7.0	2.4	1.1	0.6	0.6	0.6	0.3	0.3	0.2	0.7	0.7	0.2	0.3	0.1	0.2	5.0	45.0	
11-Oct	Z	0.2	0.2	0.2	0.9	2.5	1.4	5.4	3.0	0.8	1.2	0.9	0.5	0.7	0.4	0.2	0.3	0.1	0.0	0.5	0.0	0.1	0.1	0.3	0.9	5.4	
12-Oct	1.2	Z	3.5	1.2	13.3	9.9	10.4	9.4	2.9	5.5	6.5	4.1	1.4	2.4	2.8	0.8	0.2	28.1	11.5	1.5	0.1	0.3	0.4	0.5	5.1	28.1	
13-Oct	0.0	0.2	Z	1.1	3.6	18.1	3.9	1.3	2.2	C	C	C	C	1.4	1.6	1.0	0.4	1.0	1.4	0.7	0.6	0.2	0.2	0.3	2.1	18.1	
14-Oct	0.6	0.4	0.5	Z	2.0	3.0	4.8	6.6	2.0	1.9	1.9	1.6	1.3	1.4	0.9	0.7	0.5	0.2	0.1	0.2	0.0	0.1	0.2	0.1	1.4	6.6	
15-Oct	0.1	0.3	0.2	0.1	Z	2.9	1.8	0.7	1.6	3.0	6.6	6.6	3.3	3.3	0.8	0.8	0.6	0.1	0.7	1.8	2.6	1.8	0.0	0.9	1.8	6.6	
16-Oct	1.2	0.2	0.4	4.7	0.6	Z	0.0	30.0	16.2	10.5	4.6	1.9	2.6	1.7	0.2	0.5	1.4	11.6	5.2	12.3	14.5	10.1	5.7	10.7	6.4	30.0	
17-Oct	Z	27.6	15.5	15.2	10.7	2.6	10.6	12.6	21.0	5.8	3.0	5.2	3.3	5.2	2.3	1.7	1.9	1.6	1.0	5.3	1.9	0.0	0.3	0.3	6.7	27.6	
18-Oct	0.5	Z	7.3	4.3	14.8	18.2	31.1	26.9	19.8	M	M	M	3.2	2.1	2.0	1.6	1.0	1.8	0.2	2.4	4.2	10.5	0.3	0.0	7.6	31.1	
19-Oct	0.0	0.2	Z	2.4	7.8	27.2	29.9	16.4	2.8	2.8	0.4	M	0.0	0.0	0.0	0.0	0.1	0.3	0.0	0.4	0.8	0.0	0.0	0.0	4.2	29.9	
20-Oct	0.0	0.0	0.0	Z	0.6	0.2	3.6	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.2	0.0	0.6	0.2	1.4	0.4	0.2	0.5	0.1	11.2	0.9	11.2	
21-Oct	7.9	11.4	6.9	10.1	Z	31.5	25.3	5.5	3.6	2.7	4.8	2.9	17.9	8.2	1.4	0.9	0.1	0.1	0.0	0.0	0.0	1.5	1.9	6.1	6.6	31.5	
22-Oct	12.7	4.0	11.9	6.1	20.2	Z	12.8	21.2	2.9	1.5	5.4	10.1	12.0	4.2	3.5	2.8	1.1	0.2	0.0	0.0	0.1	0.0	0.0	0.0	5.8	21.2	
23-Oct	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
24-Oct	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
25-Oct	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
26-Oct	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	0.5	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0
27-Oct	0.0	0.0	0.0	0.0	Z	0.1	0.4	7.3	6.3	4.9	4.3	3.9	3.3	3.1	1.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	1.3	11.8	2.1	11.8	
28-Oct	5.9	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	2.9	6.4	1.8	0.7	2.0	1.7	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	6.4	
29-Oct	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.5	0.6	0.2	0.0	4.0	4.4	2.6	1.5	0.5	3.5	7.8	0.6	1.2	7.8	
30-Oct	0.0	Z	0.0	0.5	2.8	40.7	71.5	16.6	51.8	15.2	25.7	3.1	0.7	0.3	0.4	0.2	0.3	0.1	0.0	0.0	0.0	0.0	0.1	10.0	71.5		
31-Oct	0.0	0.4	Z	0.2	0.2	0.0	0.0	5.8	13.8	5.9	2.3	8.3	10.1	5.8	2.5	1.6	1.8	0.1	0.2	0.0	0.2	1.5	0.1	0.7	2.7	13.8	
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerospan			C - Calibration			M - Maintenance			PF - Power Failure																		



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Barge Landing - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb
Barge Landing - October 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	662	94.44	94.44
21 - 40	26	3.71	98.15
41 - 80	10	1.43	99.57
81 - 159	2	0.29	99.86
> 159	1	0.14	100.00

Total Number of Valid Hours: 701

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Barge Landing - October 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	14	5	8	9	21	90	126	67	36	33	56	47	62	25	33	662
21 - 40	0	1	1	0	0	2	0	11	8	1	1	1	0	0	0	0	26
11 - 80	1	0	0	1	1	0	3	3	0	0	1	0	0	0	0	0	10
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Totals	31	15	6	9	10	23	93	140	75	37	35	57	47	62	25	36	701

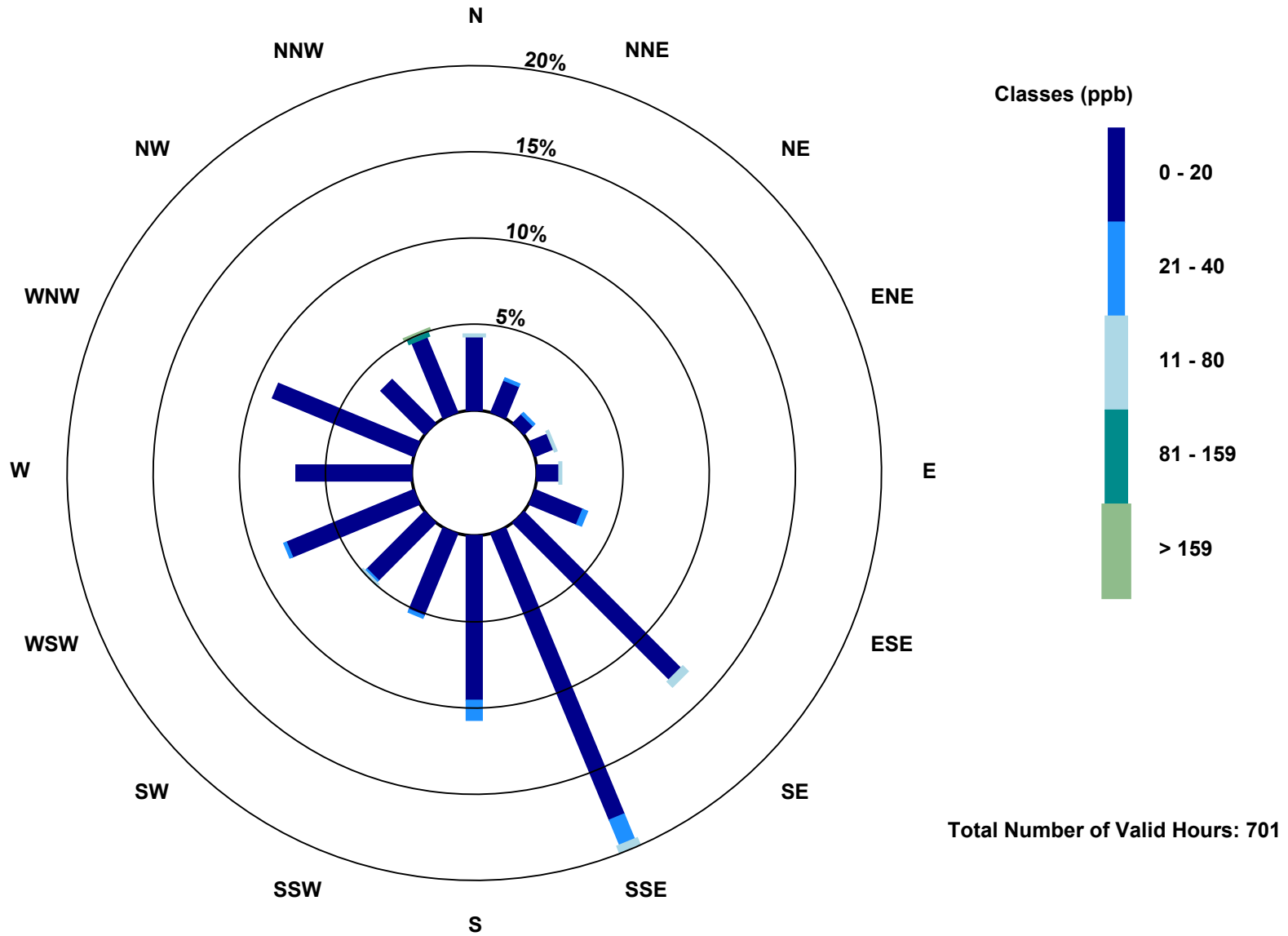
Total Number of Valid Hours: 701

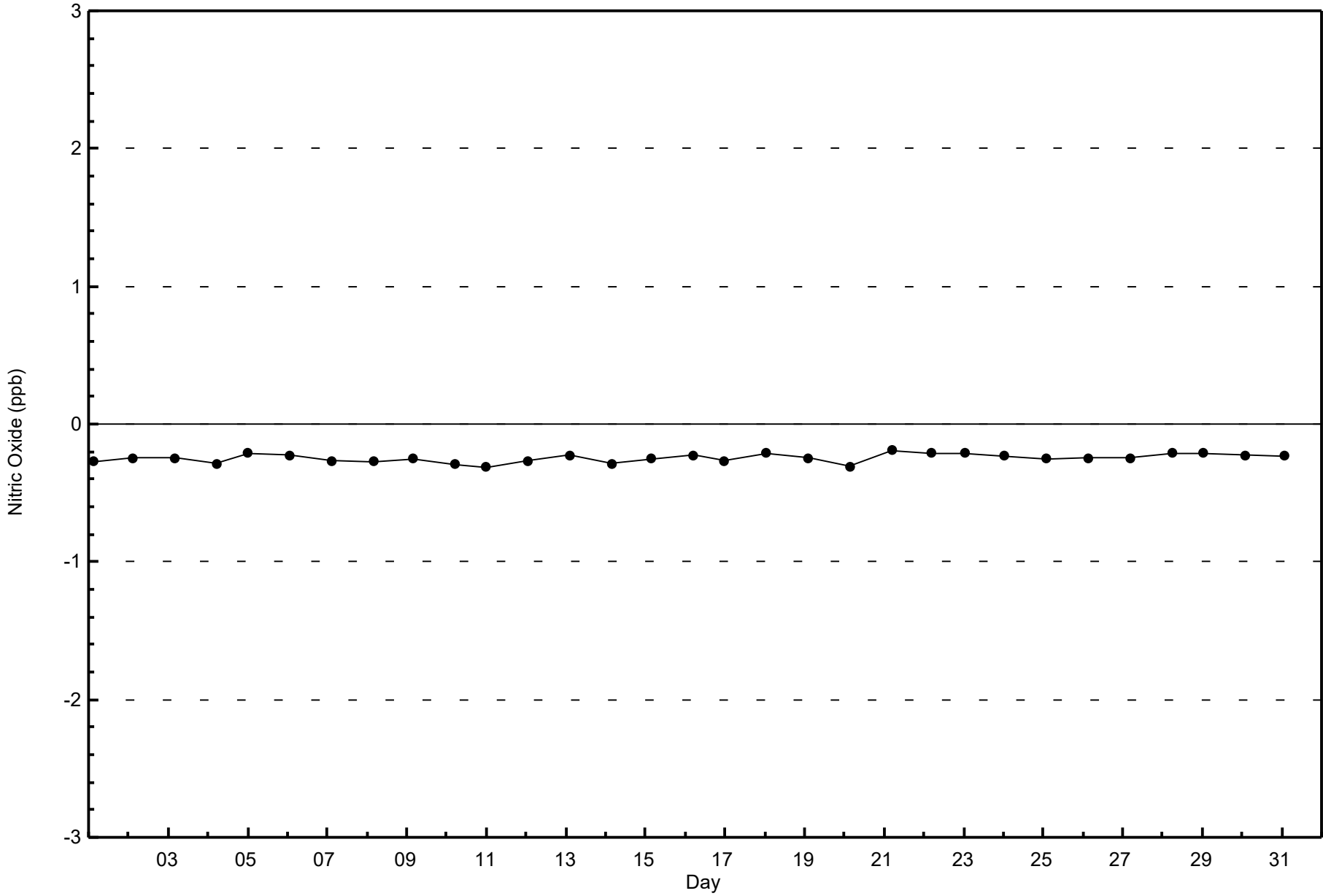
Total Number of Hours: 744

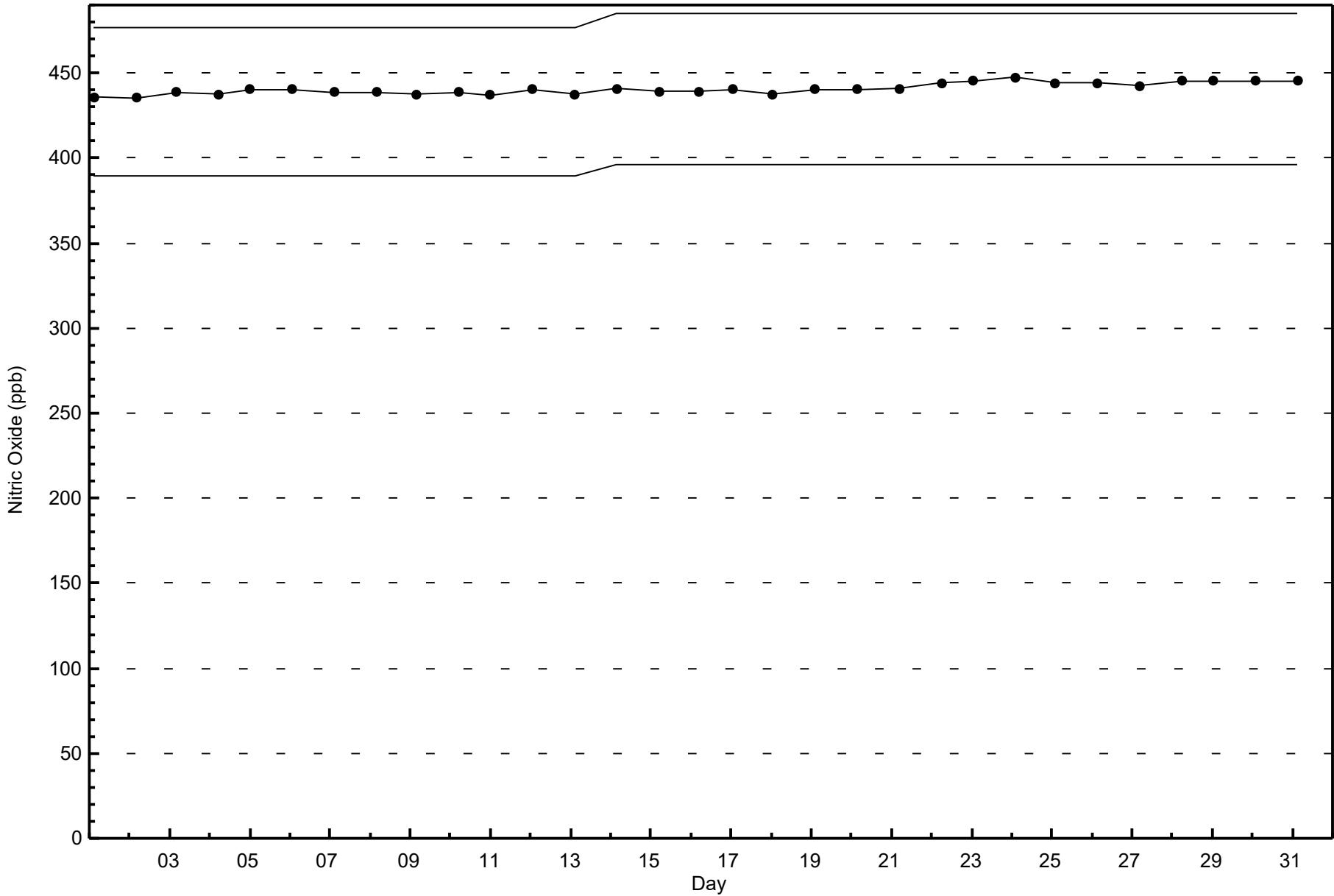


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitric Oxide (NO) - ppb
Barge Landing









Wood Buffalo Environmental Association
Summary of Hour Averages

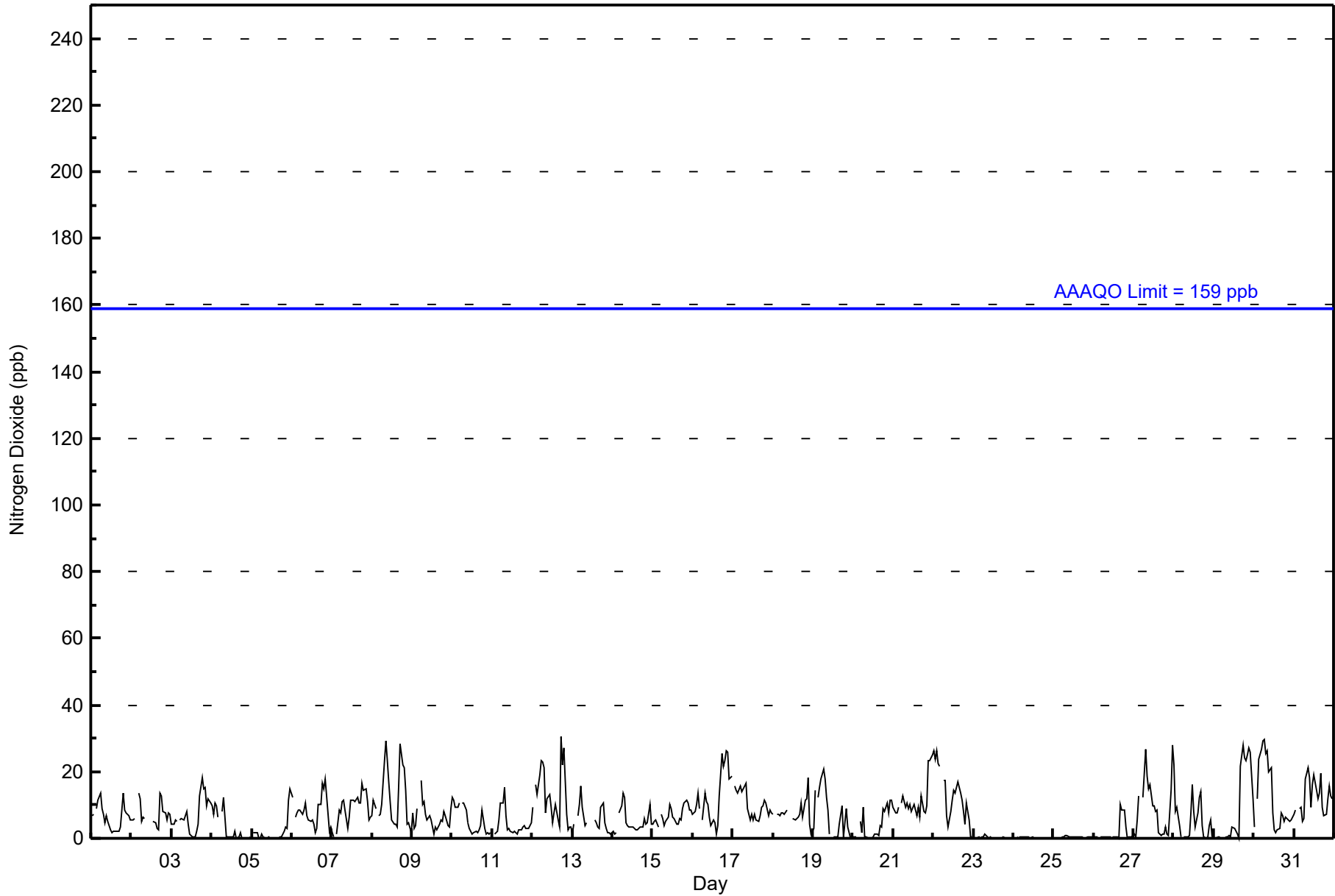
Nitrogen Dioxide (NO₂) - ppb
Barge Landing - October 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	744																											
Maximum Value: 30.4 ppb on Oct 12 18:00		Maximum Daily Average: 13.0 ppb on Oct 22																			Hours of Data:	701																											
Minimum Value: 0.1 ppb on Oct 4 20:00		Minimum Daily Average: 0.2 ppb on Oct 24																			Hours of Missing Data:	43																											
Maximum Diurnal Average: 10.0 ppb at hour 8		Minimum Diurnal Average: 3.9 ppb at hour 16																			Hours of Calibration:	35																											
Monthly Average: 7.01 ppb		Percentiles: P ₁ = 0.1 P ₁₀ = 0.3 Q ₁ = 1.4 Median = 5.5 Q ₃ = 10.3 P ₉₀ = 15.9 P ₉₉ = 27.2																			Percent Operational Time:	98.9																											
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Oct	6.7	7.4	Z	8.9	11.6	13.7	8.7	7.1	4.7	6.6	5.1	2.5	1.9	2.2	2.1	2.0	2.0	3.5	8.6	13.6	8.4	7.5	6.9	5.4	6.4	13.7																							
2-Oct	5.3	5.5	6.1	Z	13.5	11.7	5.0	6.5	5.8	PF	PF	PF	PF	4.9	4.5	2.9	2.7	13.7	12.6	8.0	7.8	5.6	7.5	7.1	7.2	13.7																							
3-Oct	4.1	4.1	5.3	4.9	Z	5.5	5.9	5.3	6.6	8.0	4.3	1.3	0.3	0.3	0.6	2.1	4.1	12.6	18.4	14.8	15.1	9.7	12.0	10.8	6.8	18.4																							
4-Oct	9.7	7.4	10.5	9.6	6.3	Z	8.1	12.4	6.5	0.6	0.3	0.3	0.3	0.6	2.2	0.2	0.4	1.9	0.2	0.1	0.2	0.1	0.1	0.4	3.4	12.4																							
5-Oct	Z	1.7	1.7	1.5	0.1	0.1	1.3	0.6	0.2	0.2	0.3	0.2	0.1	0.2	0.1	0.1	0.1	0.3	0.3	2.2	3.2	3.0	11.3	14.9	1.9	14.9																							
6-Oct	12.3	Z	6.3	7.5	8.3	8.3	7.4	8.3	10.5	6.8	5.5	4.9	5.4	4.1	1.7	3.1	10.0	10.1	16.6	14.9	17.6	12.9	2.2	3.5	8.2	17.6																							
7-Oct	1.7	0.4	Z	1.4	8.6	7.5	11.0	11.5	8.6	2.8	6.3	11.5	11.3	11.5	10.9	12.2	10.8	10.6	16.6	14.3	14.8	11.0	5.4	6.2	9.0	16.6																							
8-Oct	6.6	11.5	9.0	Z	6.8	7.0	10.0	23.1	29.3	23.2	17.0	10.9	5.5	4.2	4.3	3.5	15.4	28.5	22.1	21.3	14.4	4.2	4.7	1.9	12.4	29.3																							
9-Oct	7.5	3.1	3.9	8.8	Z	17.3	10.2	11.2	7.4	5.3	6.6	5.7	3.3	1.1	3.3	2.7	4.4	5.5	5.1	8.0	6.7	3.7	3.3	9.0	6.2	17.3																							
10-Oct	12.3	11.6	9.5	9.4	10.8	Z	10.6	10.5	8.4	4.5	3.0	2.1	1.4	1.6	2.0	1.6	2.5	3.9	8.4	2.8	1.4	1.6	1.1	1.7	5.3	12.3																							
11-Oct	Z	1.4	1.6	2.1	5.7	10.7	10.8	15.3	6.6	2.4	3.0	2.3	1.7	2.1	1.8	1.4	2.6	2.6	3.3	3.9	2.8	2.9	3.1	4.8	4.1	15.3																							
12-Oct	9.2	Z	15.9	13.0	19.0	23.1	22.7	21.3	7.8	12.0	13.1	9.5	4.7	7.8	10.1	5.5	3.5	30.4	22.1	27.1	7.2	2.6	3.3	3.3	12.8	30.4																							
13-Oct	1.2	4.2	Z	6.6	10.1	15.5	9.4	3.8	4.6	C	C	C	C	5.6	4.7	3.5	3.1	9.2	10.4	4.5	3.0	1.6	1.6	1.3	5.5	15.5																							
14-Oct	2.3	1.4	1.6	Z	7.6	9.6	13.7	12.4	4.6	3.8	3.5	3.3	3.2	3.1	2.7	3.5	3.2	3.3	6.0	4.2	4.5	10.0	4.4	5.0	13.7	13.7																							
15-Oct	4.1	4.9	5.3	3.6	Z	7.4	5.8	4.0	5.0	6.3	10.0	8.8	6.2	6.0	4.3	4.4	5.8	5.5	9.0	10.7	11.4	10.7	8.6	8.4	6.8	11.4																							
16-Oct	7.0	8.2	10.0	13.5	8.8	Z	5.4	13.7	11.1	10.1	6.2	3.9	5.3	4.5	1.2	3.8	12.6	25.3	21.7	23.2	26.3	26.0	17.6	18.8	12.4	26.3																							
17-Oct	Z	15.5	14.2	13.7	15.8	14.0	15.0	15.8	16.4	9.0	5.5	7.0	5.4	7.2	5.6	4.9	6.8	9.2	9.7	11.4	10.5	6.6	8.6	7.8	10.2	16.4																							
18-Oct	7.1	Z	7.4	7.4	6.7	7.7	7.7	7.3	8.3	M	M	M	5.9	5.3	6.0	6.2	7.0	10.5	6.5	11.4	11.7	18.4	4.3	1.1	7.7	18.4																							
19-Oct	2.8	14.5	Z	12.4	15.1	17.7	20.7	18.0	12.4	8.4	1.4	M	0.4	0.3	0.3	0.3	4.1	9.6	0.4	4.5	8.9	3.3	0.2	0.6	7.1	20.7																							
20-Oct	0.3	0.4	0.3	Z	5.0	1.9	9.4	0.5	0.3	0.2	0.2	0.2	0.6	1.4	1.1	0.7	3.7	3.5	8.9	8.0	10.5	7.5	11.4	11.5	3.8	11.5																							
21-Oct	9.2	7.8	7.7	9.5	Z	10.8	12.5	9.5	10.4	8.7	10.2	8.1	10.1	8.4	6.6	9.4	6.2	12.6	8.2	7.5	9.7	23.5	23.5	25.0	11.1	25.0																							
22-Oct	26.2	23.9	26.3	22.3	21.5	Z	17.5	17.4	6.6	3.3	8.1	11.4	14.5	13.6	15.4	17.0	13.5	11.6	8.2	4.2	10.8	5.3	0.6	0.4	13.0	26.3																							
23-Oct	Z	0.2	0.2	0.5	0.1	0.3	0.3	1.2	0.5	0.2	0.3	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.3	1.2	0.3																						
24-Oct	0.2	Z	0.3	0.2	0.3	0.3	0.3	0.5	0.4	0.4	0.2	0.3	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.5	0.2																						
25-Oct	0.2	0.2	Z	0.2	0.2	0.3	0.3	0.8	0.8	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.2	0.2	0.3	0.3	0.4	0.3	0.3	0.8	0.3																						
26-Oct	0.3	0.3	0.3	Z	0.3	0.3	0.4	0.4	0.5	0.3	0.3	0.2	0.3	0.5	0.3	0.2	10.3	8.5	8.4	3.2	0.2	0.4	0.3	0.3	1.6	10.3																							
27-Oct	1.1	0.3	5.7	12.5	Z	12.4	19.4	26.9	18.6	14.8	15.9	9.6	9.6	8.0	8.5	1.8	1.0	1.1	1.2	3.6	1.4	0.8	14.4	27.8	9.4	27.8																							
28-Oct	22.0	8.2	9.5	3.7	0.6	Z	0.6	0.5	0.3	0.8	7.7	15.9	8.0	3.5	7.5	12.2	14.1	4.0	0.3	0.2	0.4	3.9	5.4	0.5	5.6	22.0																							
29-Oct	Z	0.2	0.6	0.6	0.1	0.1	0.1	0.3	0.3	1.0	0.3	3.6	2.8	2.1	1.3	0.2	21.6	28.1	24.0	23.3	25.1	27.2	26.0	12.0	8.7	28.1																							
30-Oct	3.2	Z	11.7	23.7	26.9	29.4	29.5	25.5	26.4	20.1	21.1	7.7	2.6	1.6	2.7	2.8	7.8	6.8	5.1	6.3	6.0	5.2	5.5	6.2	12.3	29.5																							
31-Oct	7.3	8.3	Z	8.9	9.3	5.0	6.0	17.9	21.0	18.4	9.3	16.1	19.2	14.2	11.8	13.5	19.3	9.4	6.7	7.4	11.7	15.8	12.7	11.7	12.2	21.0																							
																								6.5	5.9	6.8	7.9	8.4	9.1	9.2	10.0	8.1	6.4	5.9	5.5	4.5	4.1	4.0	3.9	6.4	9.1	8.6	8.6	8.1	7.3	6.9	6.7	Diurnal Average	
																								26.2	23.9	26.3	23.7	26.9	29.4	29.5	26.9	29.3	23.2	21.1	16.1	19.2	14.2	15.4	17.0	21.6	30.4	24.0	27.1	26.3	27.2	26.0	27.8	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
Barge Landing - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Barge Landing - October 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	657	93.72	93.72
21 - 40	44	6.28	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 701

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Barge Landing - October 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	23	13	6	5	8	22	84	134	71	37	35	57	47	62	25	28	657
21 - 40	8	2	0	4	2	1	9	6	4	0	0	0	0	0	0	8	44
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	15	6	9	10	23	93	140	75	37	35	57	47	62	25	36	701

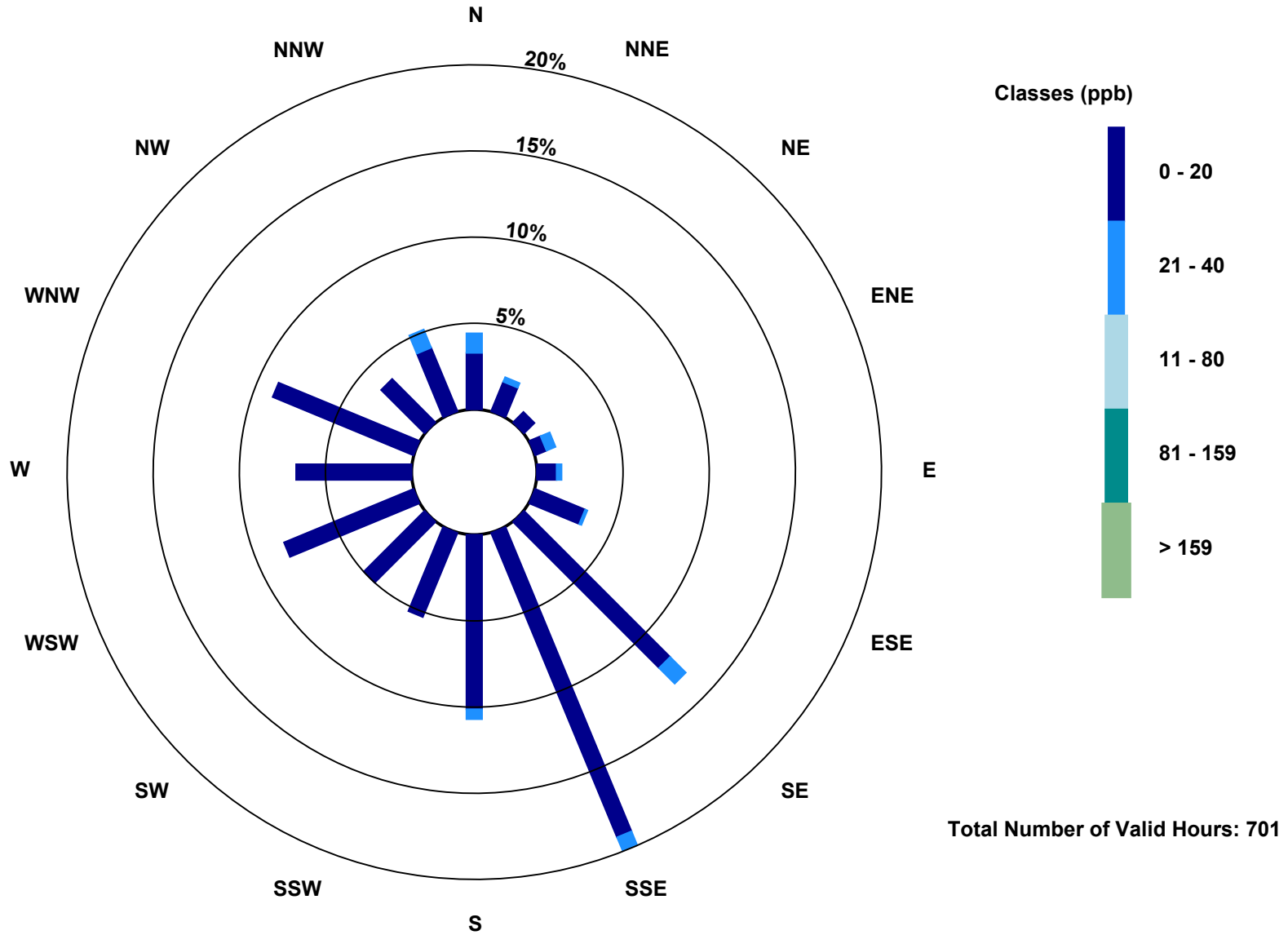
Total Number of Valid Hours: 701

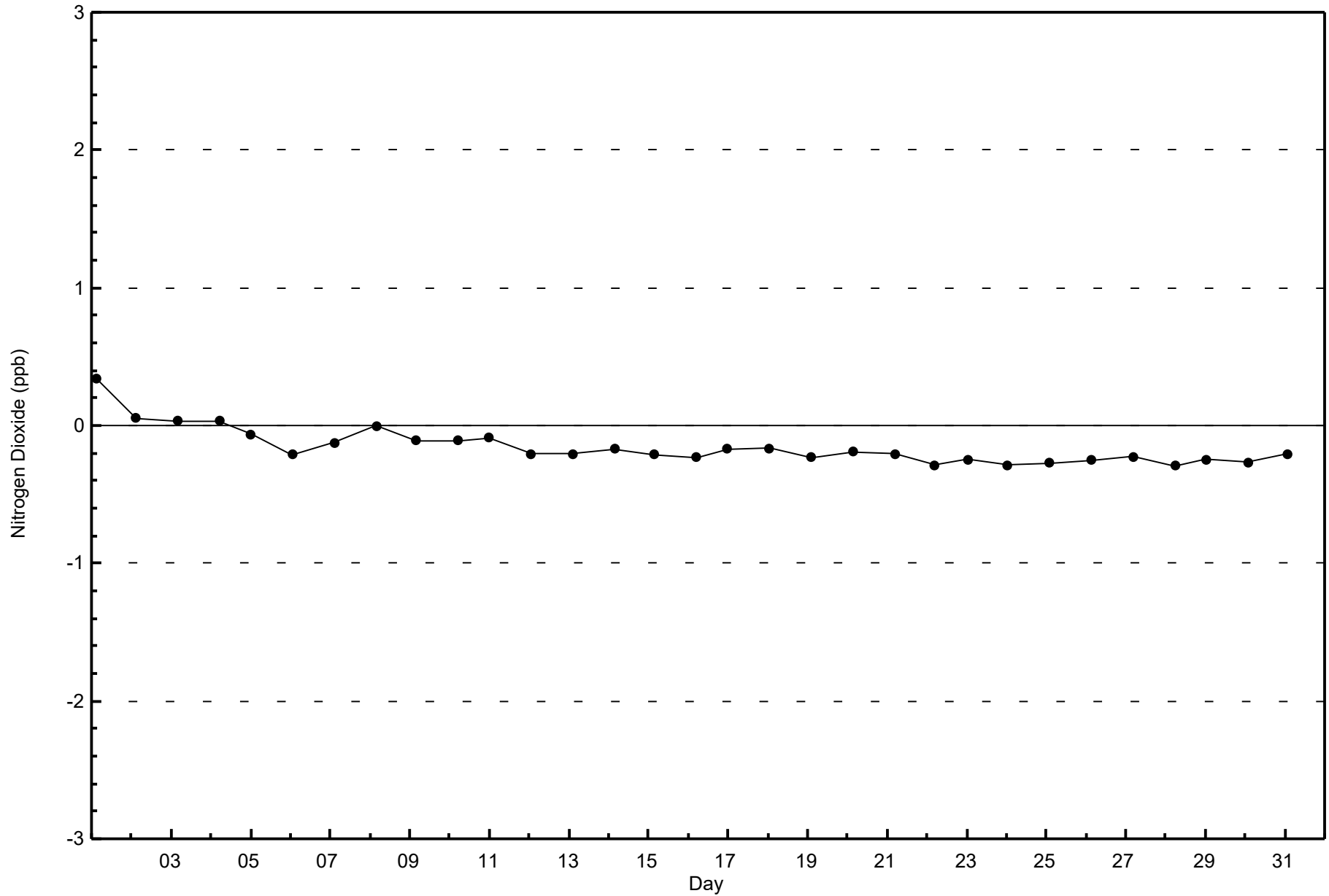
Total Number of Hours: 744

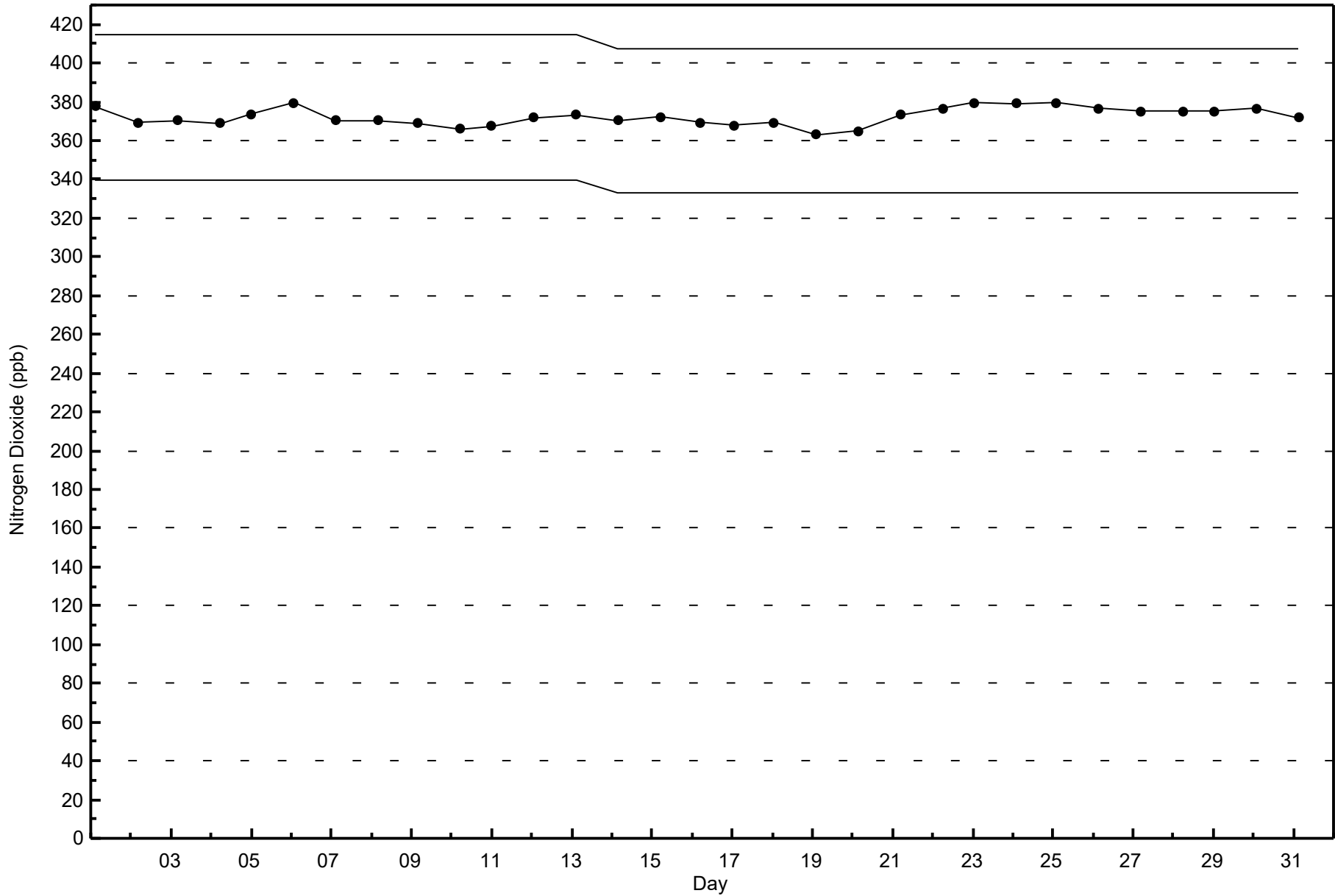


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitrogen Dioxide (NO₂) - ppb
Barge Landing









Wood Buffalo Environmental Association
Summary of Hour Averages

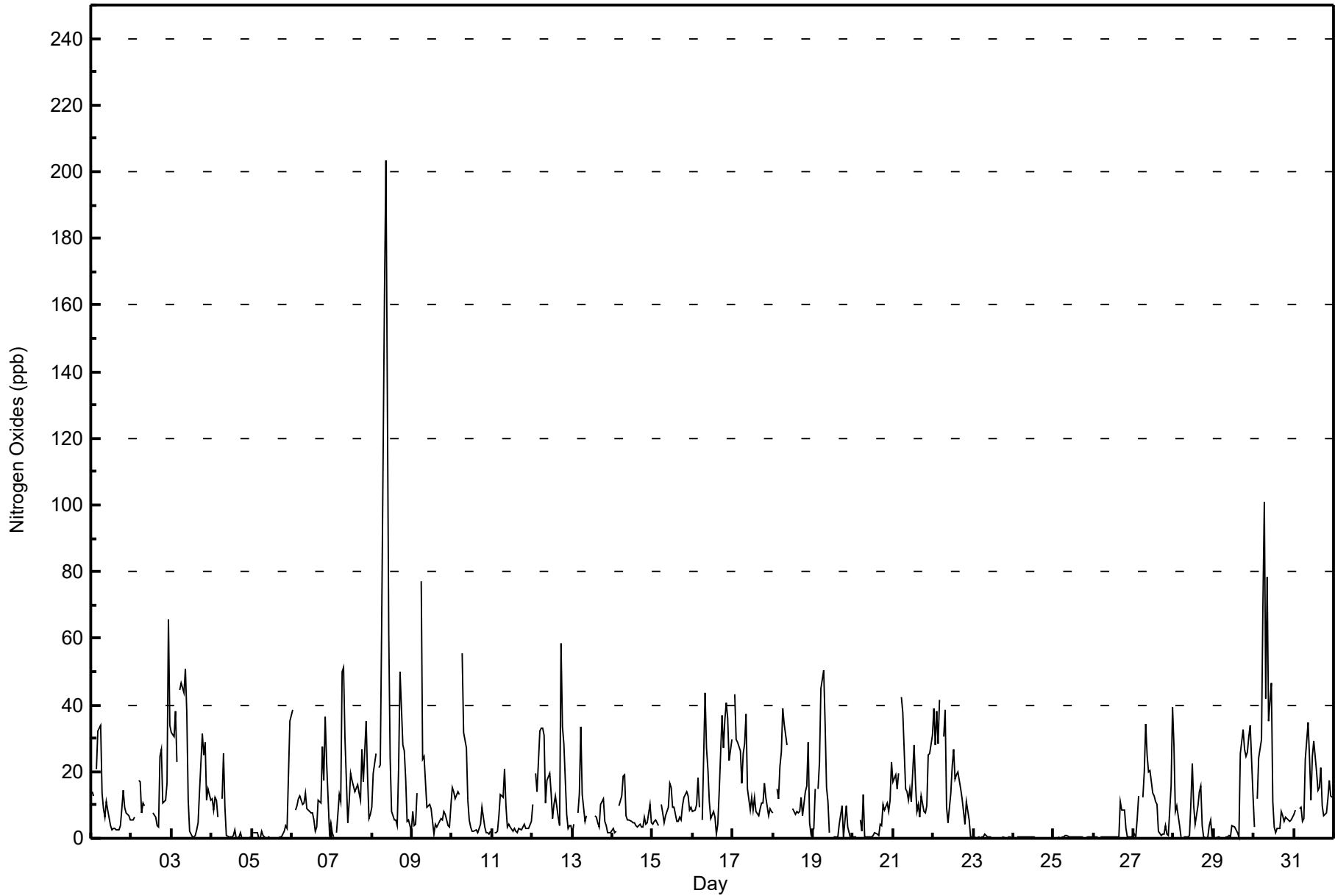
Nitrogen Oxides (NO_x) - ppb
Barge Landing - October 2023

Maximum Value: 203.4 ppb on Oct 8 09:00		Maximum Daily Average: 40.3 ppb on Oct 8		Hours in Service: 744																							
Minimum Value: 0.1 ppb on Oct 4 22:00		Minimum Daily Average: 0.2 ppb on Oct 24		Hours of Data: 701																							
Maximum Diurnal Average: 24.2 ppb at hour 8		Minimum Diurnal Average: 4.7 ppb at hour 16		Hours of Missing Data: 43																							
Monthly Average: 11.72 ppb		Percentiles: P ₁ = 0.1 P ₁₀ = 0.3 Q ₁ = 1.6 Median = 7.0 Q ₃ = 14.7 P ₉₀ = 29.5 P ₉₉ = 65.7		Hours of Calibration: 35																							
				Percent Operational Time: 98.9																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Oct	14.0	12.9	Z	20.8	32.1	33.8	13.7	9.1	6.3	11.1	8.5	3.7	2.5	3.1	2.9	2.7	2.4	4.0	9.0	14.6	9.1	7.8	7.0	5.5	10.3	33.8	
2-Oct	5.4	5.6	6.4	Z	17.5	17.2	7.5	10.6	9.7	PF	PF	PF	PF	7.5	6.5	4.0	3.4	24.5	26.7	10.5	11.6	16.4	65.7	34.1	15.3	65.7	
3-Oct	32.0	30.5	37.9	22.8	Z	44.6	46.7	43.7	50.7	37.7	11.6	2.1	0.3	0.3	0.7	2.5	4.5	14.0	31.5	25.2	28.8	11.6	14.9	11.5	22.0	50.7	
4-Oct	11.9	8.4	12.1	11.4	6.5	Z	12.0	25.4	9.3	0.7	0.3	0.4	0.3	0.7	2.4	0.2	0.4	1.9	0.2	0.1	0.2	0.1	0.1	0.4	4.6	25.4	
5-Oct	Z	1.7	1.7	1.5	0.1	0.1	2.2	1.0	0.2	0.2	0.3	0.2	0.1	0.2	0.1	0.1	0.1	0.3	0.3	2.2	3.7	3.1	19.1	35.1	3.2	35.1	
6-Oct	38.4	Z	8.6	9.7	11.9	12.9	10.2	10.5	13.4	8.9	8.7	7.8	7.4	5.4	2.0	3.5	11.4	10.6	27.7	17.5	36.2	22.9	2.2	4.5	12.7	38.4	
7-Oct	1.8	0.4	Z	1.7	13.1	11.2	50.0	51.3	30.3	4.8	11.0	19.6	17.5	15.6	14.0	16.0	13.7	11.4	26.7	16.7	35.1	18.5	6.0	7.3	17.1	51.3	
8-Oct	9.2	19.3	25.4	Z	21.3	21.9	64.1	163.7	203.4	133.8	62.1	24.2	8.0	5.6	5.4	4.0	21.0	50.2	27.9	26.1	17.9	5.0	5.3	2.1	40.3	203.4	
9-Oct	8.0	3.7	4.4	13.5	Z	77.0	23.9	24.6	17.0	9.1	10.1	9.0	4.9	1.3	4.3	3.3	5.1	5.9	5.4	8.1	7.1	3.9	3.4	9.7	11.4	77.0	
10-Oct	15.2	14.0	12.0	13.9	13.1	Z	55.6	31.7	27.3	11.5	5.4	3.2	2.0	2.2	2.6	1.9	2.8	4.1	9.1	3.5	1.6	1.9	1.2	1.9	10.3	55.6	
11-Oct	Z	1.6	1.8	2.3	6.6	13.2	12.2	20.7	9.6	3.2	4.2	3.2	2.2	2.8	2.2	1.6	2.9	2.7	3.3	4.4	2.8	3.0	3.2	5.1	5.0	20.7	
12-Oct	10.4	Z	19.4	14.2	32.3	33.0	33.1	30.7	10.7	17.5	19.6	13.6	6.1	10.2	12.9	6.3	3.7	58.5	33.6	28.6	7.3	2.9	3.7	3.8	17.9	58.5	
13-Oct	1.2	4.4	Z	7.7	13.7	33.6	13.3	5.1	6.8	C	C	C	C	7.0	6.3	4.5	3.5	10.2	11.8	5.2	3.6	1.8	1.8	1.6	7.5	33.6	
14-Oct	2.9	1.8	2.1	Z	9.6	12.6	18.5	19.0	6.6	5.7	5.4	4.9	4.5	4.5	3.6	3.4	4.0	3.4	6.2	4.2	4.6	10.2	4.5	6.3	6.3	19.0	
15-Oct	4.2	5.2	5.5	3.7	Z	10.3	7.6	4.7	6.6	9.3	16.6	15.4	9.5	9.3	5.1	5.2	6.4	5.6	9.7	12.5	14.0	12.5	8.6	9.3	8.6	16.6	
16-Oct	8.2	8.4	10.4	18.2	9.4	Z	5.4	43.7	27.3	20.6	10.8	5.8	7.9	6.2	1.4	4.3	14.0	36.9	26.9	35.5	40.8	36.1	23.3	29.5	18.7	43.7	
17-Oct	Z	43.1	29.7	28.9	26.5	16.6	25.6	28.4	37.4	14.8	8.5	12.2	8.7	12.4	7.9	6.6	8.7	10.8	10.7	16.7	12.4	6.6	8.9	8.1	17.0	43.1	
18-Oct	7.6	Z	14.7	11.7	21.5	25.9	38.8	34.2	28.1	M	M	M	9.1	7.4	8.0	7.8	8.0	12.3	6.7	13.8	15.9	28.9	4.6	1.1	15.3	38.8	
19-Oct	2.8	14.7	Z	14.8	22.9	44.9	50.6	34.4	15.2	11.2	1.8	M	0.4	0.3	0.3	0.3	4.2	9.9	0.4	4.9	9.7	3.3	0.2	0.6	11.3	50.6	
20-Oct	0.3	0.4	0.3	Z	5.6	2.1	13.0	0.5	0.3	0.2	0.2	0.2	0.7	1.7	1.3	0.7	4.3	3.7	10.3	8.4	10.7	8.0	11.5	22.7	4.7	22.7	
21-Oct	17.1	19.2	14.6	19.6	Z	42.3	37.8	15.0	14.0	11.4	15.0	11.0	28.0	16.6	8.0	10.3	6.3	12.7	8.2	7.5	9.7	25.0	25.4	31.1	17.6	42.3	
22-Oct	38.9	27.9	38.2	28.4	41.7	Z	30.3	38.6	9.5	4.8	13.5	21.5	26.5	17.8	18.9	19.8	14.6	11.8	8.2	4.2	10.9	5.3	0.6	0.4	18.8	41.7	
23-Oct	Z	0.2	0.2	0.5	0.1	0.3	0.3	1.2	0.5	0.2	0.3	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.3	1.2	0.2
24-Oct	0.2	Z	0.3	0.2	0.3	0.3	0.3	0.5	0.4	0.4	0.2	0.3	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.5
25-Oct	0.2	0.2	Z	0.2	0.2	0.3	0.3	0.3	0.8	0.9	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.2	0.2	0.3	0.3	0.4	0.3	0.3	0.3	0.9
26-Oct	0.3	0.3	0.3	Z	0.3	0.3	0.4	0.4	0.5	0.3	0.3	0.2	0.3	0.5	0.3	0.2	10.8	8.6	8.6	3.2	0.2	0.4	0.3	0.3	1.6	10.8	
27-Oct	1.1	0.3	5.7	12.5	Z	12.5	19.8	34.2	24.9	19.7	20.2	13.5	12.9	11.1	10.1	2.0	1.0	1.1	1.2	3.6	1.4	0.8	15.7	39.6	11.5	39.6	
28-Oct	27.9	8.2	9.5	3.7	0.6	Z	0.6	0.5	0.3	0.9	10.6	22.3	9.8	4.2	9.5	13.9	15.8	4.0	0.3	0.2	0.4	3.9	5.4	0.5	6.7	27.9	
29-Oct	Z	0.2	0.6	0.6	0.1	0.1	0.1	0.3	0.3	1.0	0.3	4.0	3.3	2.7	1.5	0.2	25.6	32.5	26.6	24.8	25.6	30.7	33.8	12.6	9.9	33.8	
30-Oct	3.2	Z	11.7	24.2	29.7	70.1	101.0	42.1	78.2	35.3	46.8	10.8	3.3	1.9	3.1	3.0	8.1	6.9	5.1	6.3	6.0	5.2	5.5	6.3	22.3	101.0	
31-Oct	7.3	8.7	Z	9.1	9.5	5.0	6.0	23.7	34.8	24.3	11.6	24.4	29.3	20.0	14.3	15.1	21.1	9.5	6.9	7.4	11.9	17.3	12.8	12.4	14.9	34.8	
		10.4	9.3	10.9	11.4	13.3	20.8	22.6	24.2	22.0	14.3	10.9	8.7	7.1	5.8	5.0	4.7	7.4	11.9	11.2	10.3	11.0	9.3	9.7	9.7	Diurnal Average	
		38.9	43.1	38.2	28.9	41.7	77.0	101.0	163.7	203.4	133.8	62.1	24.4	29.3	20.0	18.9	19.8	25.6	58.5	33.6	35.5	40.8	36.1	65.7	39.6	Diurnal Maximum	
Z - zerospan		C - Calibration			M - Maintenance			PF - Power Failure																			



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Barge Landing - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Barge Landing - October 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	574	81.88	81.88
21 - 40	99	14.12	96.01
41 - 80	24	3.42	99.43
81 - 159	2	0.29	99.71
> 159	2	0.29	100.00

Total Number of Valid Hours: 701

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Barge Landing - October 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	9	4	4	7	17	77	112	55	32	32	56	47	60	23	21	574
21 - 40	12	6	1	4	2	4	12	20	14	5	2	1	0	2	2	12	99
11 - 80	1	0	1	1	0	2	4	8	6	0	1	0	0	0	0	0	24
81 - 159	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	2
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
Totals	31	15	6	9	10	23	93	140	75	37	35	57	47	62	25	36	701

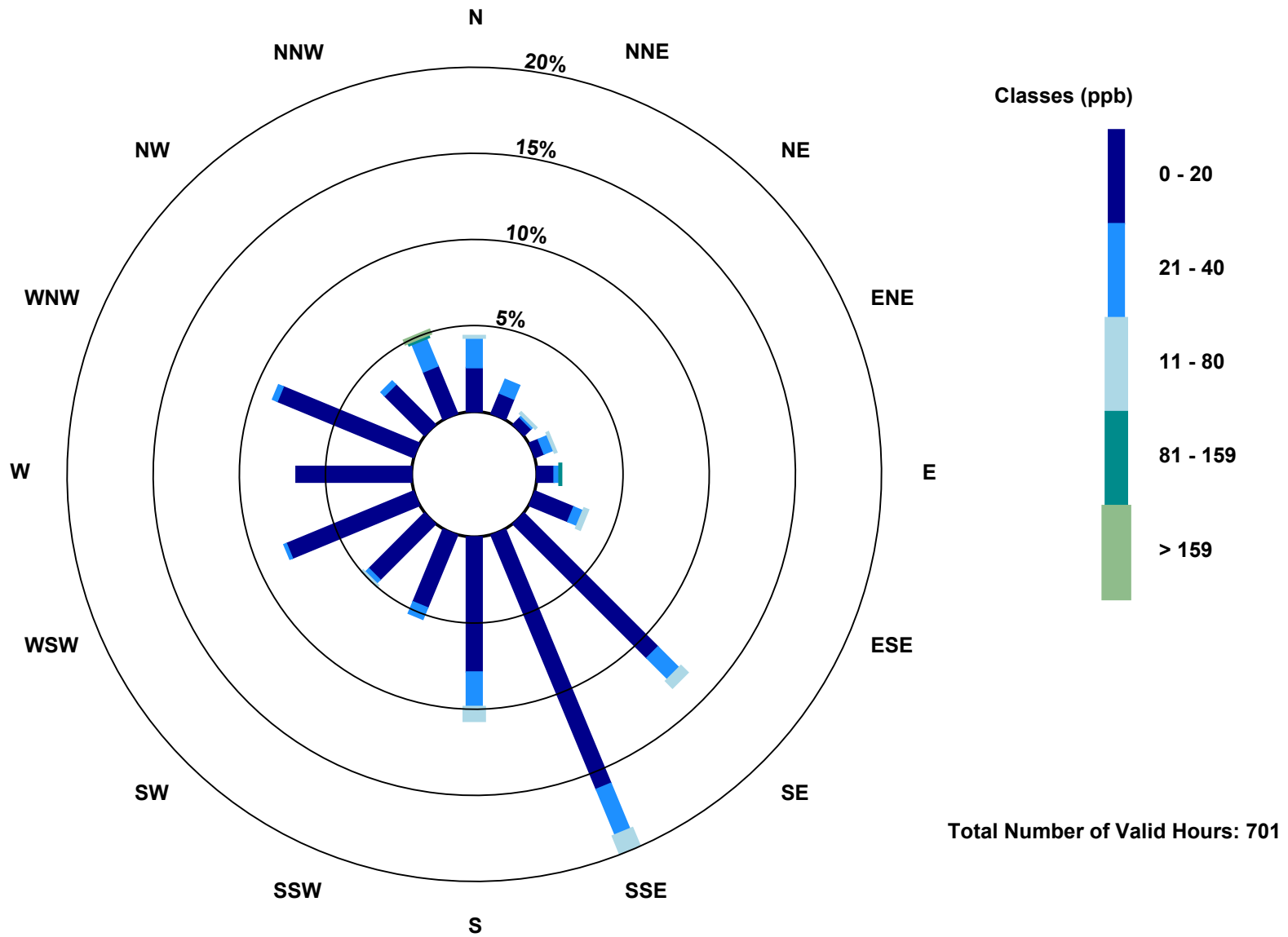
Total Number of Valid Hours: 701

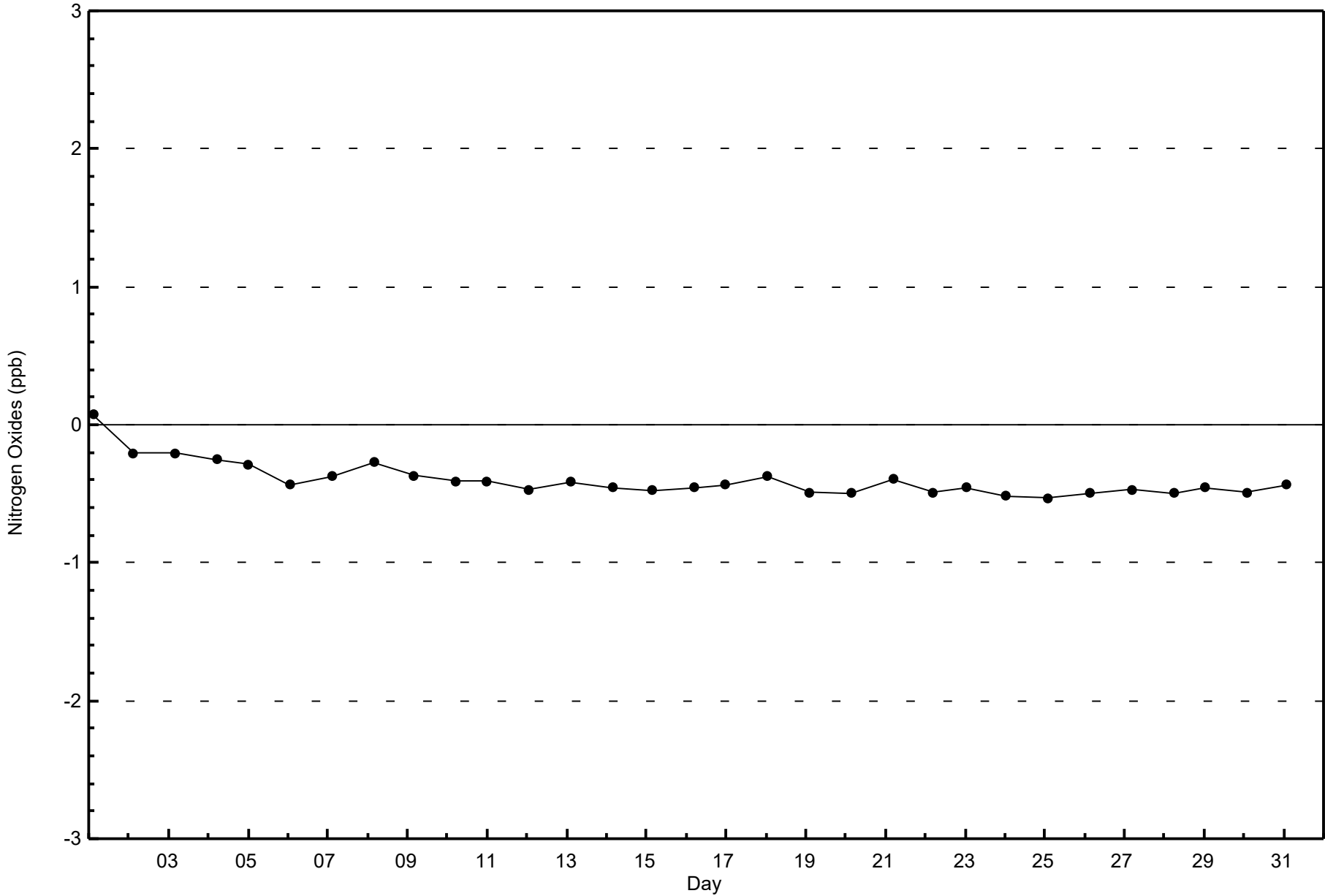
Total Number of Hours: 744

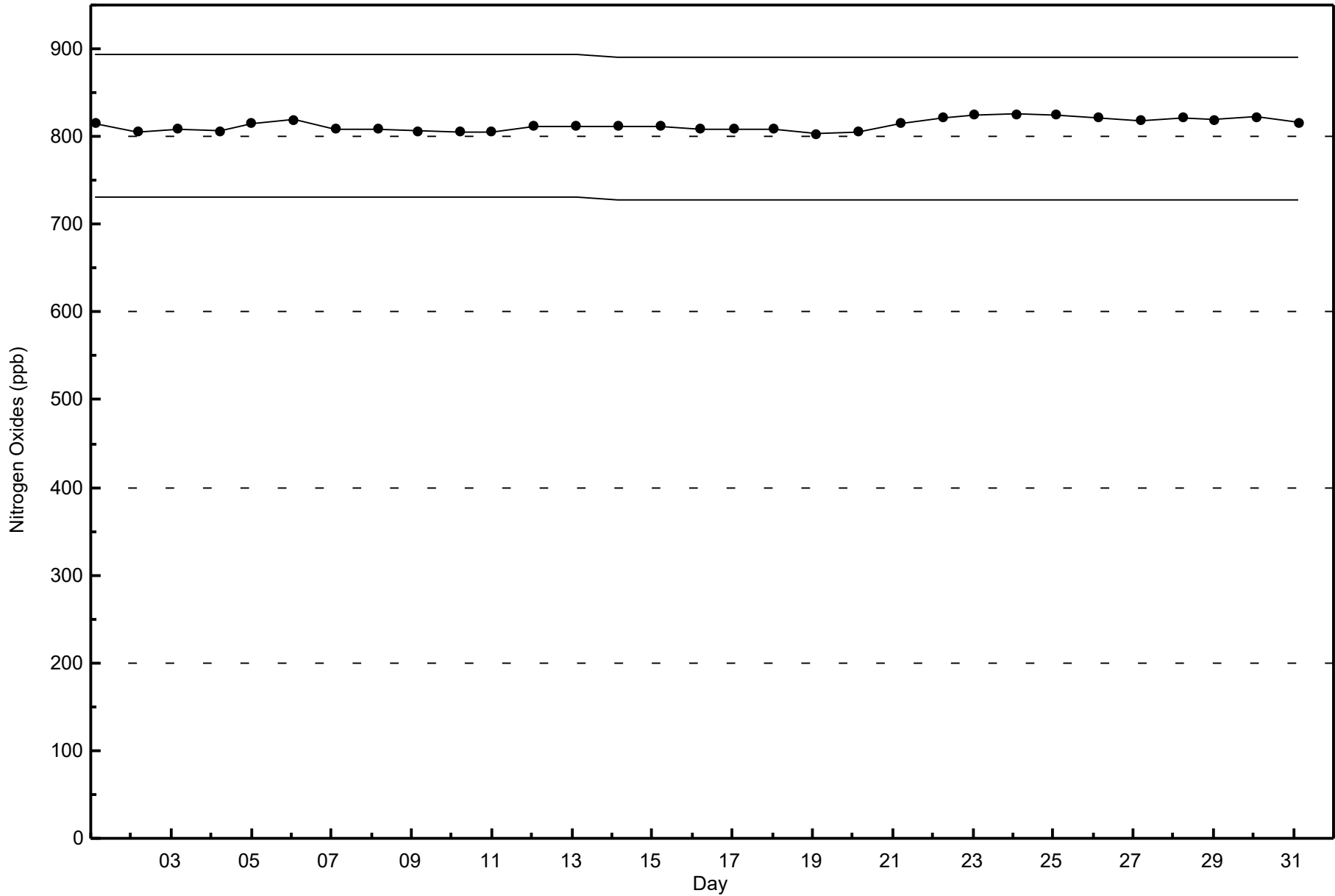


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitrogen Oxides (NO_x) - ppb
Barge Landing





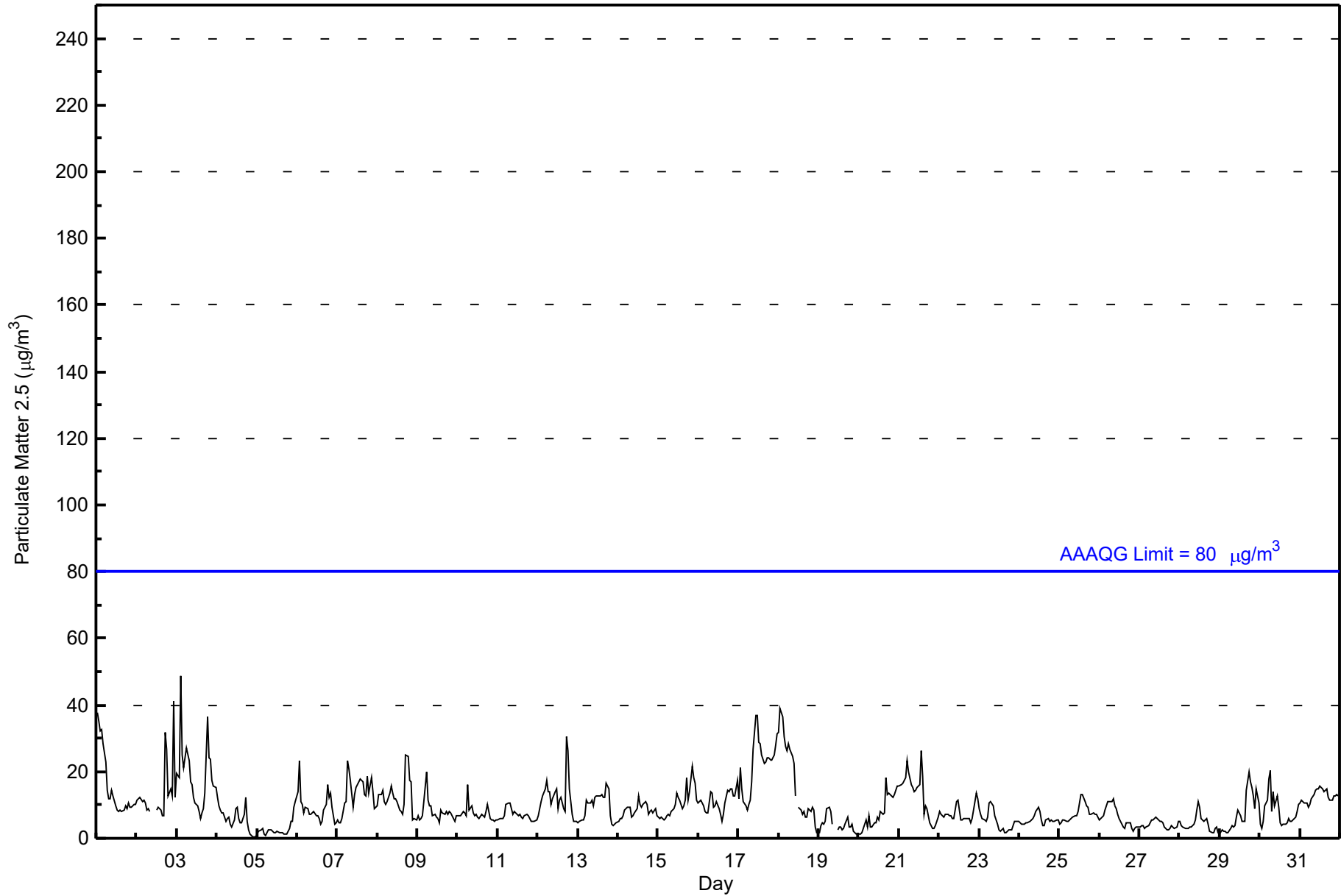




Summary of Hour Averages

Barge Landing - October 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 48.8 µg/m ³ on Oct 3 03:00 Minimum Value: 0.4 µg/m ³ on Oct 4 23:00 Maximum Diurnal Average: 11.7 µg/m ³ at hour 18 Monthly Average: 9.60 µg/m ³		Maximum Daily Average: 21.8 µg/m ³ on Oct 17 Minimum Daily Average: 2.8 µg/m ³ on Oct 5 Minimum Diurnal Average: 7.6 µg/m ³ at hour 16 Percentiles: P ₁ = 1.3 P ₁₀ = 3.3 Q ₁ = 5.2 Median = 7.9 Q ₃ = 12.1 P ₉₀ = 17.2 P ₉₉ = 35.9		Hours in Service: 744 Hours of Data: 738 Hours of Missing Data: 6 Hours of Calibration: 2 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-Oct	37.8	35.2	32.3	32.5	28.3	23.0	14.5	11.8	11.8	14.4	12.9	9.8	8.6	8.0	8.5	8.2	8.4	9.6	9.0	10.7	9.2	9.4	10.3	10.0	15.6	37.8																						
2-Oct	11.2	11.7	12.2	10.9	11.4	10.5	8.6	8.9	8.2	PF	PF	PF	8.4	9.5	8.3	7.0	6.7	31.7	26.6	12.9	15.0	12.8	41.2	12.3	13.6	41.2																						
3-Oct	19.6	18.2	48.8	24.8	21.1	24.0	27.2	23.4	17.0	15.9	12.3	10.5	9.6	8.1	5.9	7.5	8.9	13.5	36.3	24.0	23.7	17.3	15.8	15.1	18.7	48.8																						
4-Oct	12.2	9.8	8.7	7.7	7.6	5.0	5.9	6.4	4.4	3.5	5.7	8.9	9.2	6.0	4.5	4.6	7.2	12.5	5.2	2.5	1.2	0.5	0.4	0.5	5.8	12.5																						
5-Oct	1.3	2.0	2.6	3.0	1.3	1.0	1.6	2.5	2.5	2.3	1.9	1.8	1.9	1.8	1.5	1.5	1.3	1.3	1.4	3.1	4.9	5.0	9.4	11.1	2.8	11.1																						
6-Oct	13.9	23.2	11.0	10.0	7.8	9.1	9.0	7.3	7.4	7.7	7.9	6.9	6.9	6.1	4.1	5.2	8.7	10.2	16.0	12.2	13.5	9.5	4.2	4.8	9.3	23.2																						
7-Oct	5.3	4.5	4.7	6.0	10.6	10.9	23.2	20.8	17.5	9.2	13.3	15.2	16.0	16.7	17.9	16.8	13.3	12.8	18.7	13.4	18.3	14.2	9.1	9.5	13.2	23.2																						
8-Oct	9.6	13.1	13.1	14.3	11.2	10.0	11.1	13.4	15.9	13.5	12.0	12.0	11.1	8.5	8.1	7.2	10.4	24.9	24.4	17.3	16.7	5.7	5.7	5.5	12.3	24.9																						
9-Oct	6.6	5.6	5.8	6.7	10.9	19.8	11.3	9.7	9.6	6.8	7.2	6.4	6.0	4.7	8.7	7.7	7.1	8.0	7.1	8.0	7.6	5.9	5.3	6.6	7.9	19.8																						
10-Oct	6.8	7.0	6.8	8.0	7.4	7.0	16.0	8.3	9.9	7.7	6.8	7.1	6.2	6.0	7.3	6.8	6.4	7.9	10.0	5.7	5.4	5.4	5.2	5.6	7.4	16.0																						
11-Oct	5.7	5.9	5.9	5.9	6.7	10.1	10.6	10.4	8.9	7.3	8.2	7.6	6.8	7.1	6.4	6.1	6.9	7.2	6.7	6.0	5.1	5.0	4.9	5.3	6.9	10.6																						
12-Oct	6.9	8.8	10.9	12.6	15.0	17.5	13.8	14.0	10.2	11.9	14.0	14.8	9.0	11.4	12.2	9.0	8.1	30.5	26.5	14.9	7.3	5.1	5.3	5.0	12.3	30.5																						
13-Oct	4.5	5.0	5.4	5.6	7.0	11.4	10.7	10.4	11.3	9.8	12.2	12.6	12.7	12.8	13.2	12.4	12.2	16.4	14.7	6.8	4.4	4.0	4.3	4.5	9.3	16.4																						
14-Oct	4.9	5.8	6.0	7.0	8.3	9.3	9.2	9.3	6.3	7.0	7.5	8.9	12.7	10.1	9.3	10.1	11.1	10.3	7.2	8.3	8.3	7.6	9.1	6.8	8.4	12.7																						
15-Oct	6.4	5.9	6.2	5.7	5.9	6.8	7.1	6.7	8.0	9.1	10.1	13.6	12.2	11.6	8.9	9.8	11.4	18.2	11.3	14.2	21.5	18.1	16.7	11.3	10.7	21.5																						
16-Oct	10.6	11.5	10.4	9.8	7.8	7.5	7.7	14.0	13.5	9.5	9.9	11.2	8.9	7.0	5.2	7.1	10.5	14.4	14.2	15.0	14.9	12.9	12.6	17.2	11.0	17.2																						
17-Oct	11.8	21.3	14.9	11.1	9.8	8.3	10.1	11.5	16.9	26.6	37.0	37.1	28.6	28.5	25.0	22.6	23.0	24.1	24.0	23.7	23.4	25.1	28.0	31.2	21.8	37.1																						
18-Oct	31.9	39.0	36.3	30.4	27.7	26.2	28.3	26.5	24.5	22.4	12.8	M	9.3	8.7	7.2	8.2	6.1	6.6	8.8	8.1	9.1	8.5	3.5	1.8	17.0	39.0																						
19-Oct	1.9	3.7	4.6	4.2	5.2	8.9	9.3	8.1	4.4	C	C	2.5	3.3	3.3	2.7	2.8	4.1	6.3	3.4	3.4	4.4	2.2	1.2	1.3	4.1	9.3																						
20-Oct	1.5	1.5	1.5	2.8	5.4	3.5	7.0	3.3	3.5	4.5	4.8	6.5	5.7	8.1	7.0	7.8	18.4	13.2	13.5	13.3	12.5	13.1	14.6	15.8	7.9	18.4																						
21-Oct	15.6	16.2	16.5	17.5	18.4	23.3	20.1	16.2	15.2	13.8	14.5	15.3	16.3	26.2	18.8	7.0	9.9	9.1	4.7	3.8	2.9	3.1	3.6	6.3	13.1	26.2																						
22-Oct	8.1	7.2	6.8	6.6	7.2	7.4	6.8	6.9	5.9	5.8	11.1	11.6	8.6	5.5	5.5	5.8	5.8	6.1	5.8	4.6	6.0	11.1	13.4	11.7	7.6	13.4																						
23-Oct	8.9	7.3	6.0	5.4	4.9	6.2	10.4	11.2	9.9	6.9	5.3	4.1	2.7	2.1	2.8	1.8	1.8	2.2	2.3	2.6	3.6	4.9	5.1	5.0	5.1	11.2																						
24-Oct	5.0	4.4	4.2	4.4	4.5	4.6	5.0	5.4	5.9	6.9	8.2	9.3	7.9	5.7	3.6	3.9	5.7	5.9	5.3	5.3	5.1	5.1	5.7	5.4	5.5	9.3																						
25-Oct	4.1	4.7	5.4	5.3	4.9	4.9	5.4	5.9	6.5	6.6	6.6	8.0	10.7	13.2	13.1	11.2	9.8	9.4	7.2	7.4	7.6	7.4	7.4	6.3	7.5	13.2																						
26-Oct	5.5	6.1	6.6	8.5	9.5	11.0	10.9	11.1	11.8	9.8	8.8	7.3	5.9	4.3	3.4	3.2	4.8	4.7	4.5	3.1	2.2	3.1	3.3	3.6	6.4	11.8																						
27-Oct	3.4	3.8	3.9	3.2	3.5	3.7	4.7	5.6	5.4	5.8	6.3	5.5	5.3	5.1	4.6	3.2	2.7	2.6	2.8	4.0	3.3	2.8	3.3	5.1	4.1	6.3																						
28-Oct	5.0	4.0	3.4	2.9	3.1	3.1	3.2	3.5	4.1	5.4	8.4	11.1	9.3	5.9	4.9	5.7	6.1	4.4	2.0	1.6	1.8	3.0	3.4	1.6	4.5	11.1																						
29-Oct	1.4	2.6	2.0	2.1	1.6	1.8	2.9	3.6	3.3	4.0	6.5	8.4	6.8	5.0	5.1	5.2	14.4	19.9	17.1	15.1	12.7	9.1	14.8	10.6	7.3	19.9																						
30-Oct	4.2	2.9	5.3	9.6	11.6	17.8	20.5	7.9	14.0	9.9	12.8	9.2	4.6	3.7	4.2	4.2	4.8	6.0	5.2	5.3	5.4	6.3	8.2	10.3	8.1	20.5																						
31-Oct	10.6	11.6	10.6	10.5	10.5	9.4	10.1	11.7	13.3	14.4	14.8	14.8	15.8	14.7	14.1	14.3	14.7	12.4	11.5	11.6	12.8	12.8	13.2	12.9	12.6	15.8																						
																								9.1	10.0	10.3	9.5	9.6	10.4	11.0	10.2	9.9	9.6	10.3	10.3	9.3	8.9	8.1	7.6	8.7	11.7	11.4	9.3	9.3	8.3	9.3	8.4	Diurnal Average
																								37.8	39.0	48.8	32.5	28.3	26.2	28.3	26.5	24.5	26.6	37.0	37.1	28.6	28.5	25.0	22.6	23.0	31.7	36.3	24.0	23.7	25.1	41.2	31.2	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}) - $\mu\text{g}/\text{m}^3$
Barge Landing - October 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	211	28.59	28.59
6 - 15	431	58.40	86.99
16 - 25	67	9.08	96.07
26 - 80	29	3.93	100.00
> 81.0	0	0.00	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}) - μg/m³
Barge Landing - October 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	11	2	1	0	1	1	22	2	13	11	16	28	40	48	9	6	211
6 - 15	17	7	2	6	5	16	62	127	52	23	16	32	9	15	17	25	431
16 - 25	4	2	3	3	3	6	10	15	8	4	2	0	0	1	1	5	67
26 - 80	1	5	0	0	1	0	5	11	4	0	1	0	1	0	0	0	29
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	33	16	6	9	10	23	99	155	77	38	35	60	50	64	27	36	738

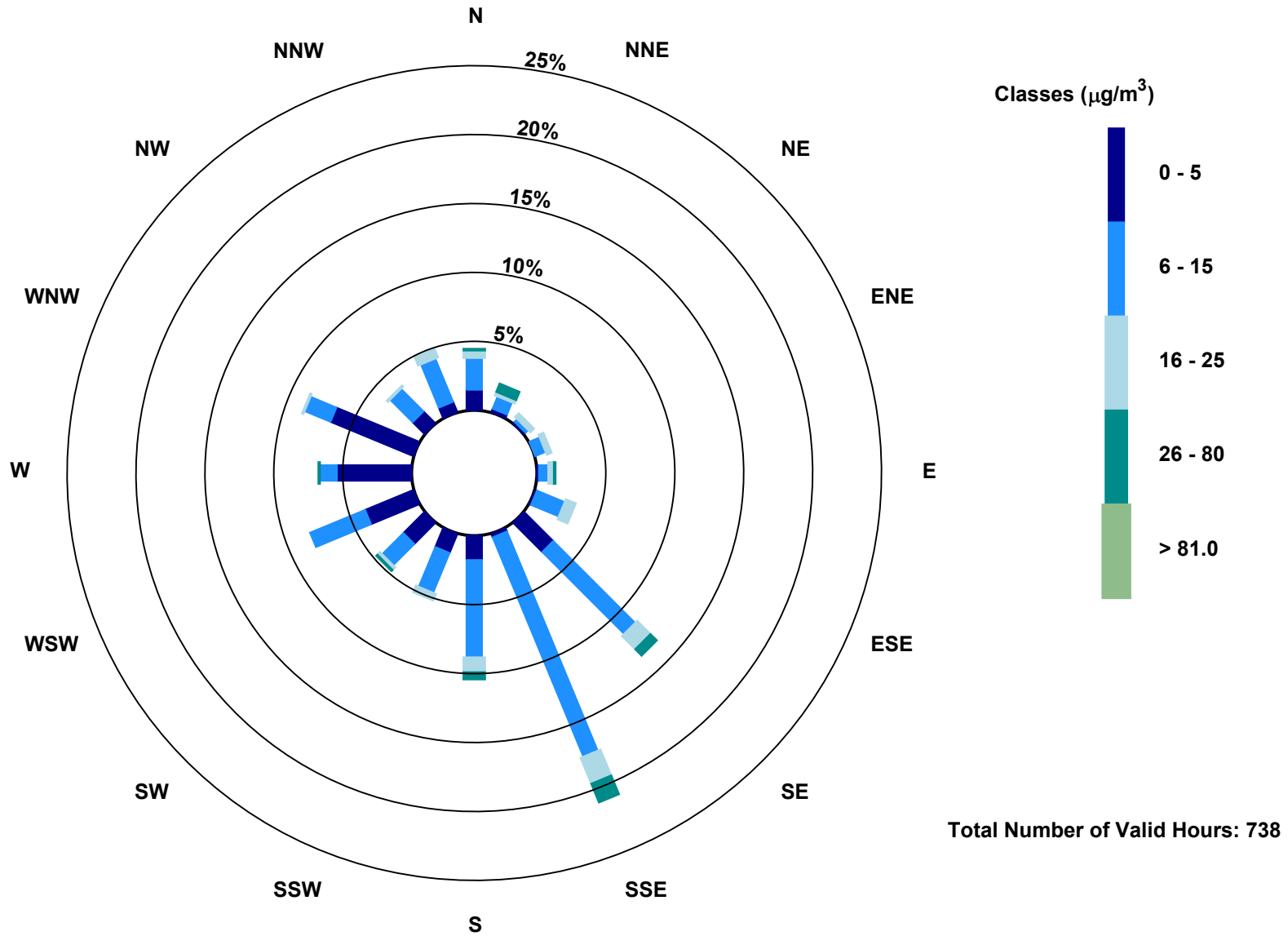
Total Number of Valid Hours: 738

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

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

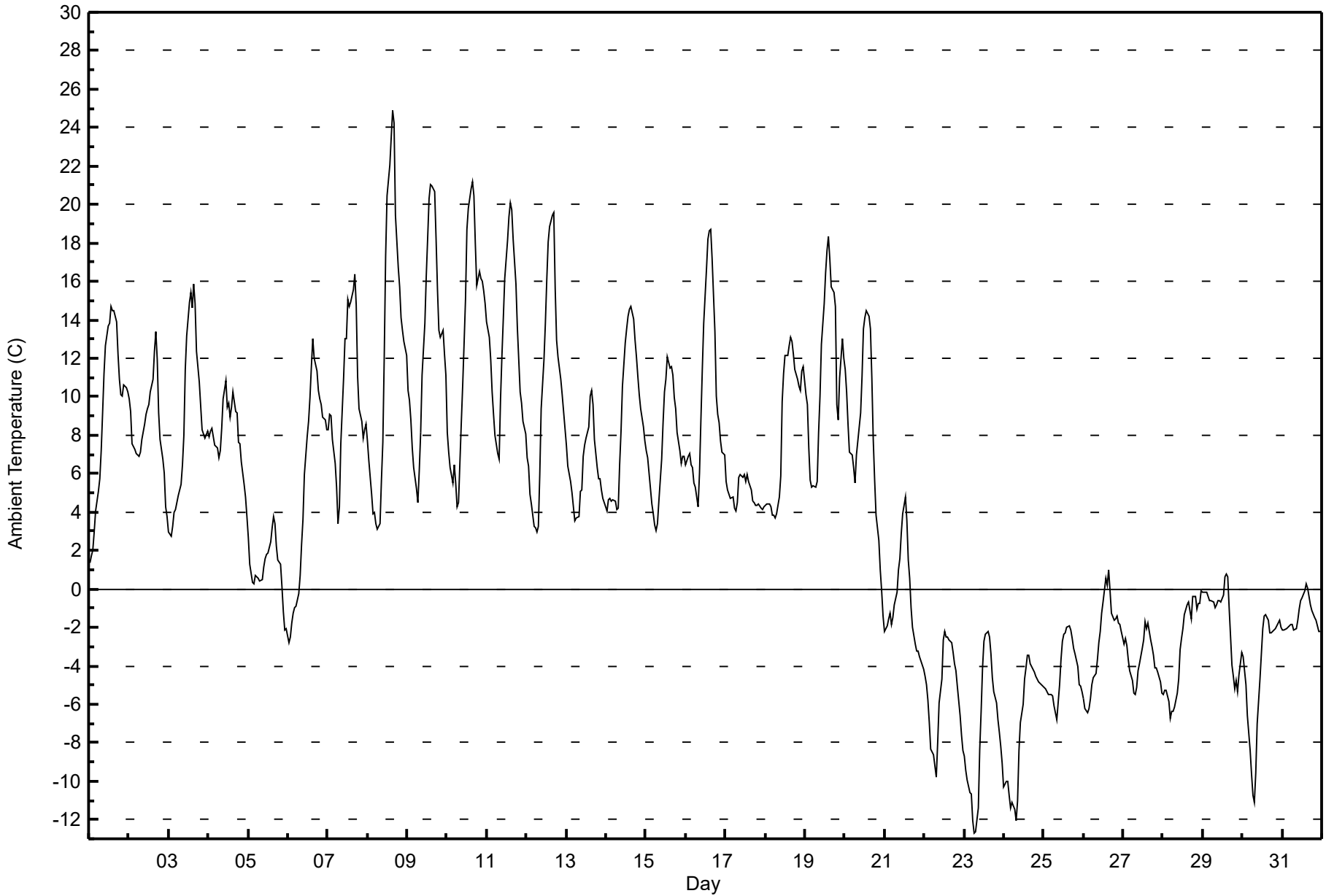




Wood Buffalo Environmental Association
Summary of Hour Averages

Ambient Temperature (AT) - C
Barge Landing - October 2023

Maximum Value: 24.9 C on Oct 8 16:00		Maximum Daily Average: 12.9 C on Oct 10		Hours in Service: 744																							
Minimum Value: -12.7 C on Oct 23 07:00		Minimum Daily Average: -7.4 C on Oct 23		Hours of Data: 744																							
Maximum Diurnal Average: 9.1 C at hour 16		Minimum Diurnal Average: 0.5 C at hour 7		Hours of Missing Data: 0																							
Monthly Average: 4.39 C		Percentiles: P ₁ = -11.1 P ₁₀ = -5.2 Q ₁ = -2.0 Median = 4.7 Q ₃ = 9.9 P ₉₀ = 14.2 P ₉₉ = 20.8		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-Oct	1.3	1.7	2.0	3.0	4.1	5.0	5.7	7.2	9.2	11.2	12.6	13.7	13.9	14.7	14.5	14.5	13.9	12.2	10.9	10.1	10.1	10.6	10.5	10.2	9.3	14.7	
2-Oct	9.9	9.3	7.6	7.2	7.1	6.9	6.9	7.1	7.8	8.6	9.1	9.4	9.6	10.2	10.9	12.3	13.4	11.9	9.2	7.8	6.7	6.0	4.2	3.8	8.5	13.4	
3-Oct	3.0	2.8	3.2	4.0	4.1	4.5	4.9	5.4	6.5	8.0	11.4	13.2	14.9	15.4	14.6	15.9	14.8	12.4	10.8	9.5	8.3	8.0	7.8	8.2	8.8	15.9	
4-Oct	7.9	8.2	8.4	7.9	7.5	7.3	6.8	7.2	8.4	9.9	10.8	9.5	9.6	8.9	9.4	10.3	9.3	9.1	7.6	7.5	6.6	5.4	4.8	3.8	8.0	10.8	
5-Oct	2.7	1.3	0.3	0.3	0.7	0.6	0.5	0.4	0.5	1.1	1.6	1.8	1.9	2.4	3.2	3.8	3.4	2.2	1.5	1.3	0.1	-1.2	-2.2	-2.1	1.1	3.8	
6-Oct	-2.8	-2.5	-1.7	-1.3	-1.0	-0.9	-0.2	0.7	2.3	3.6	5.9	7.9	8.7	10.0	11.5	13.0	12.0	11.3	10.3	9.9	9.6	9.0	8.8	8.3	5.5	13.0	
7-Oct	8.3	9.0	9.0	7.7	6.5	5.3	3.4	4.2	7.5	10.9	13.0	13.0	15.1	14.7	14.9	15.6	16.4	14.8	11.0	9.4	8.7	7.8	8.3	8.6	10.1	16.4	
8-Oct	7.7	6.7	4.9	3.9	4.0	3.4	3.1	3.4	5.6	7.6	12.1	17.3	20.4	22.1	23.5	24.9	24.3	19.4	16.7	15.7	14.1	13.5	12.9	12.2	12.5	24.9	
9-Oct	10.3	9.8	8.8	7.4	6.3	5.2	4.5	6.1	8.2	11.2	13.8	16.3	18.3	20.3	21.1	21.0	20.7	18.2	15.6	13.5	13.1	13.5	12.2	11.2	12.8	21.1	
10-Oct	8.2	7.1	6.3	5.5	6.4	5.5	4.3	4.5	8.7	10.6	12.8	15.1	18.7	19.8	20.8	21.2	20.5	18.0	15.8	16.5	16.1	16.0	15.5	14.8	12.9	21.2	
11-Oct	13.9	13.1	11.9	10.3	9.1	8.0	7.0	6.7	9.9	12.2	14.1	16.2	18.1	19.4	20.1	19.7	18.2	15.9	13.6	12.0	10.2	9.7	8.7	8.1	12.7	20.1	
12-Oct	6.8	6.4	4.9	4.4	3.3	3.2	3.0	3.2	6.0	9.3	11.9	13.8	16.1	18.1	18.8	19.5	19.6	15.6	13.0	12.1	10.9	10.1	9.2	8.3	10.3	19.6	
13-Oct	7.5	6.4	5.6	5.0	4.3	3.5	3.7	3.8	5.1	5.1	6.9	7.5	7.8	8.4	10.0	10.3	9.6	7.7	6.3	5.7	5.7	5.2	4.7	4.5	6.3	10.3	
14-Oct	4.1	4.6	4.7	4.6	4.6	4.5	4.2	4.2	6.5	8.2	10.6	12.8	13.5	14.2	14.6	14.7	14.0	13.0	12.1	11.0	10.1	9.4	8.4	7.7	9.0	14.7	
15-Oct	7.2	6.8	6.0	4.4	3.9	3.3	3.1	3.4	4.6	6.7	8.7	10.2	10.9	12.1	11.5	11.5	11.1	9.9	9.3	8.1	7.2	6.5	6.9	6.9	7.5	12.1	
16-Oct	6.4	6.9	7.1	6.4	6.3	5.5	5.3	4.3	6.0	8.8	11.4	13.8	16.6	18.2	18.6	18.7	17.2	13.4	10.0	9.1	8.6	7.7	7.1	7.0	10.0	18.7	
17-Oct	5.6	5.1	4.9	4.7	4.8	4.2	4.1	4.5	5.8	6.0	5.8	5.9	5.6	6.0	5.6	5.1	4.5	4.5	4.3	4.4	4.4	4.2	4.2	4.3	4.9	6.0	
18-Oct	4.3	4.4	4.4	4.3	3.8	3.8	3.7	3.9	4.8	5.9	9.7	11.2	12.2	12.2	12.7	13.1	12.8	12.2	11.4	10.9	10.5	10.3	11.4	11.6	8.6	13.1	
19-Oct	10.1	9.6	7.3	5.6	5.3	5.3	5.3	5.6	8.1	10.1	12.7	14.8	16.5	17.6	18.3	17.1	15.7	15.5	14.7	9.6	8.8	10.9	13.1	12.0	11.2	18.3	
20-Oct	11.4	10.3	8.6	7.2	6.9	6.3	5.5	7.0	7.7	9.2	11.0	13.6	14.1	14.5	14.2	13.5	11.0	7.8	5.7	3.8	2.6	1.0	-0.1	-1.4	8.0	14.5	
21-Oct	-2.2	-1.9	-1.6	-1.3	-1.8	-1.5	-0.8	-0.2	1.0	1.6	2.9	3.9	4.8	3.6	1.5	0.6	-1.0	-2.0	-2.9	-3.2	-3.3	-3.5	-3.7	-4.1	-0.6	4.8	
22-Oct	-4.6	-5.0	-5.8	-7.0	-8.3	-8.6	-9.2	-9.8	-8.0	-5.9	-4.7	-2.7	-2.2	-2.5	-2.5	-2.6	-2.8	-3.3	-3.9	-4.2	-5.1	-6.6	-7.6	-8.4	-5.5	-2.2	
23-Oct	-8.7	-9.4	-9.9	-10.6	-10.7	-12.1	-12.7	-12.6	-11.4	-8.3	-6.4	-4.1	-2.7	-2.4	-2.2	-2.5	-3.4	-4.7	-5.4	-6.0	-6.8	-7.4	-8.2	-9.1	-7.4	-2.2	
24-Oct	-10.3	-10.0	-10.0	-10.8	-11.4	-11.1	-11.5	-12.1	-11.1	-8.4	-6.9	-6.0	-4.7	-4.1	-3.5	-3.4	-3.9	-4.2	-4.3	-4.5	-4.7	-4.8	-5.0	-5.0	-7.2	-3.4	
25-Oct	-5.1	-5.2	-5.3	-5.5	-5.5	-5.6	-6.1	-6.5	-6.8	-5.0	-3.7	-2.7	-2.3	-2.3	-2.0	-1.9	-2.2	-2.6	-3.1	-3.4	-4.0	-5.0	-5.1	-5.4	-4.3	-1.9	
26-Oct	-5.7	-6.2	-6.5	-6.3	-5.7	-5.0	-4.6	-4.4	-3.7	-2.8	-2.2	-1.3	-0.7	0.5	0.2	1.0	-0.1	-1.2	-1.6	-1.5	-1.4	-1.7	-1.8	-2.2	-2.7	1.0	
27-Oct	-2.9	-2.5	-3.0	-3.7	-4.2	-4.8	-5.4	-5.5	-5.1	-4.2	-3.9	-3.1	-2.7	-1.7	-2.1	-1.8	-2.7	-3.0	-3.5	-4.1	-4.1	-4.3	-4.8	-5.4	-3.7	-1.7	
28-Oct	-5.5	-5.3	-5.2	-5.9	-6.7	-6.3	-6.4	-6.2	-5.4	-4.7	-3.2	-2.6	-2.0	-1.3	-0.8	-0.6	-1.1	-1.5	-0.4	-0.4	-1.0	-0.8	-0.8	-0.1	-3.1	-0.1	
29-Oct	-0.2	-0.2	-0.2	-0.4	-0.6	-0.6	-0.7	-1.0	-0.9	-0.6	-0.6	-0.7	-0.3	0.7	0.7	0.6	-1.0	-3.9	-4.6	-5.2	-4.8	-5.4	-4.4	-3.3	-1.6	0.7	
30-Oct	-3.5	-4.2	-5.0	-6.6	-8.4	-9.7	-10.8	-11.1	-9.6	-7.0	-4.7	-3.4	-2.1	-1.4	-1.3	-1.6	-2.3	-2.3	-2.2	-2.2	-2.1	-1.8	-1.6	-2.0	-4.4	-1.3	
31-Oct	-2.2	-2.2	-2.0	-2.0	-2.0	-1.9	-1.9	-2.2	-2.1	-1.6	-1.1	-0.6	-0.5	-0.1	0.2	0.0	-0.4	-0.8	-1.1	-1.5	-1.6	-1.9	-2.2	-2.2	-1.4	0.2	
		2.7	2.4	1.9	1.4	1.1	0.8	0.5	0.7	2.1	3.8	5.5	6.9	8.0	8.6	8.9	9.1	8.4	6.9	5.7	4.9	4.3	3.9	3.6	3.2	Diurnal Average	
		13.9	13.1	11.9	10.3	9.1	8.0	7.0	7.2	9.9	12.2	14.1	17.3	20.4	22.1	23.5	24.9	24.3	19.4	16.7	16.5	16.1	16.0	15.5	14.8	Diurnal Maximum	





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Barge Landing - October 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	260	34.95	34.95
0 - 10	301	40.46	75.40
10 - 20	170	22.85	98.25
> 20	13	1.75	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association

Summary of Hour Averages

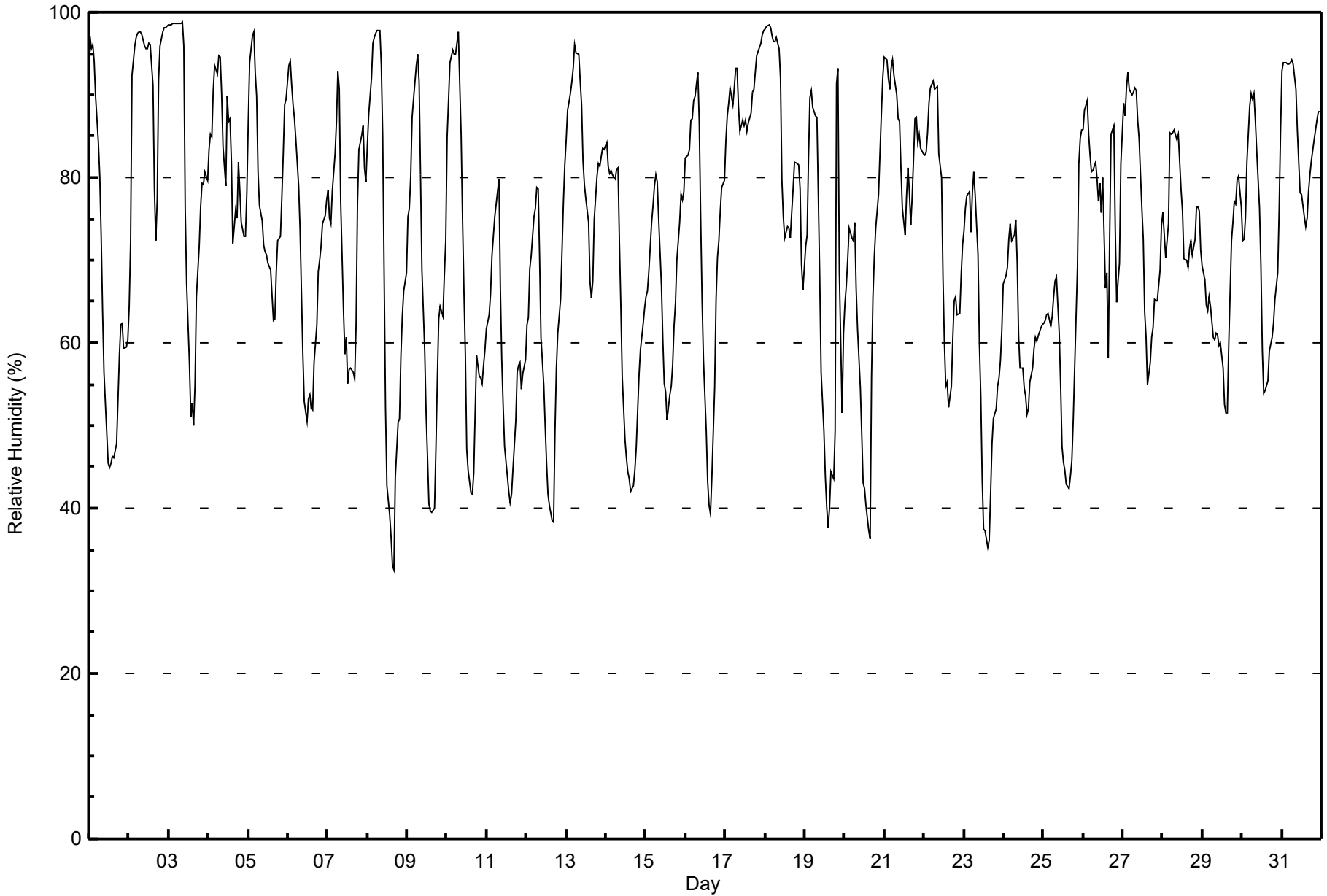
**Relative Humidity (RH) - %
Barge Landing - October 2023**

Maximum Value: 98.8 % on Oct 3 09:00 Maximum Daily Average: 91.3 % on Oct 2																						Hours in Service:	744																								
Minimum Value: 32.6 % on Oct 8 17:00 Minimum Daily Average: 58.2 % on Oct 11																						Hours of Data:	744																								
Maximum Diurnal Average: 86.2 % at hour 7 Minimum Diurnal Average: 54.1 % at hour 16																						Hours of Missing Data:	0																								
Monthly Average: 72.50 % Percentiles: P ₁ = 37.3 P ₁₀ = 49.4 Q ₁ = 60.3 Median = 74.5 Q ₃ = 85.7 P ₉₀ = 93.6 P ₉₉ = 98.5																						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-Oct	97.1	95.6	96.1	94.1	89.9	84.2	80.1	73.0	63.9	56.5	52.7	45.4	45.0	45.5	46.2	46.0	47.8	53.0	58.4	62.1	62.3	59.4	59.5	60.4	65.6	97.1																					
2-Oct	64.4	72.1	92.4	96.0	96.9	97.4	97.6	97.7	97.3	95.9	95.5	95.7	96.3	96.0	91.2	78.6	72.4	77.3	91.8	95.9	97.6	98.1	98.2	98.4	91.3	98.4																					
3-Oct	98.4	98.6	98.7	98.7	98.7	98.7	98.7	98.7	98.8	95.9	76.2	67.2	57.6	51.1	52.8	50.1	55.0	65.7	71.8	76.5	79.4	79.2	80.6	79.7	80.3	98.8																					
4-Oct	83.4	85.2	84.9	90.5	93.5	92.6	94.7	94.5	90.1	83.8	79.1	89.8	86.7	87.1	81.8	72.0	76.2	75.1	81.9	78.5	74.6	72.9	72.9	78.1	83.3	94.7																					
5-Oct	86.6	93.9	97.1	97.7	92.8	89.8	80.6	76.6	74.8	71.9	71.1	70.7	69.7	68.8	65.8	62.8	62.9	68.4	72.5	72.8	77.6	83.0	88.7	89.5	78.6	97.7																					
6-Oct	93.5	94.0	91.2	88.8	87.2	84.5	79.0	73.6	66.0	58.6	53.0	50.6	53.2	53.7	52.0	51.8	57.6	62.2	68.6	70.0	71.8	74.3	75.4	77.2	70.3	94.0																					
7-Oct	78.4	75.1	74.4	78.2	82.9	86.7	92.8	90.7	77.1	63.9	58.7	60.6	55.1	56.8	57.0	56.5	55.5	62.2	76.8	83.4	85.0	86.3	81.2	79.5	73.1	92.8																					
8-Oct	83.8	87.6	92.0	96.2	96.9	97.4	97.8	97.8	93.5	85.1	68.5	52.1	42.8	39.1	36.4	33.0	32.6	43.8	50.4	50.8	58.5	63.3	66.2	68.5	68.1	97.8																					
9-Oct	75.2	76.3	80.3	87.2	89.6	93.6	95.0	91.5	80.4	68.7	58.9	51.4	46.1	40.6	39.6	39.5	40.0	47.2	55.6	62.8	64.3	63.2	68.1	72.3	66.1	95.0																					
10-Oct	85.0	89.4	93.9	95.4	94.9	94.9	96.2	97.6	85.1	74.9	66.4	58.6	47.1	44.6	41.8	41.8	44.2	51.5	58.5	56.0	55.7	55.1	57.2	59.2	68.5	97.6																					
11-Oct	61.8	63.4	66.0	70.4	72.9	75.3	78.4	79.8	66.6	58.0	52.4	47.5	43.9	42.1	40.7	41.7	44.7	50.5	56.5	57.3	57.6	54.4	56.3	57.9	58.2	79.8																					
12-Oct	62.2	63.1	69.0	70.6	75.2	76.3	78.8	78.6	70.5	60.7	54.9	49.9	45.4	41.7	40.4	38.5	38.3	49.4	57.0	61.2	65.3	71.0	77.0	81.5	61.5	81.5																					
13-Oct	84.6	88.1	90.2	91.6	93.2	96.1	95.1	94.9	91.6	88.9	82.0	79.1	77.5	74.7	67.5	65.5	67.4	75.0	80.2	81.7	81.3	82.6	83.6	83.3	83.1	96.1																					
14-Oct	84.2	81.3	80.6	80.9	80.3	79.8	81.0	81.1	72.2	64.6	55.9	48.3	46.1	44.4	43.5	42.0	42.7	44.5	47.3	51.6	56.0	59.2	62.4	64.3	62.3	84.2																					
15-Oct	65.6	66.3	68.7	74.5	76.6	79.0	80.4	79.6	75.1	67.0	60.3	55.1	54.0	50.7	53.6	54.7	57.3	62.1	64.8	70.0	74.5	77.9	77.2	78.3	67.6	80.4																					
16-Oct	82.3	82.6	83.3	86.9	87.1	89.4	89.8	92.8	86.6	75.2	65.3	58.0	49.4	43.2	40.3	39.3	43.7	54.6	65.3	70.3	72.3	75.9	78.8	79.7	70.5	92.8																					
17-Oct	84.4	87.5	89.0	90.9	88.8	90.9	93.3	93.2	88.7	85.7	86.9	86.2	87.0	85.7	86.5	87.8	90.4	90.7	92.6	94.7	95.2	96.2	97.3	97.7	90.3	97.7																					
18-Oct	98.1	98.3	98.4	98.1	97.1	96.5	96.4	97.0	95.5	92.0	79.7	75.2	72.6	74.0	73.9	72.7	75.7	78.6	81.8	81.6	81.6	78.6	69.4	66.5	84.6	98.4																					
19-Oct	71.7	73.1	82.3	89.7	90.5	88.4	87.4	87.3	77.7	68.2	56.4	49.3	43.9	40.1	37.7	40.0	44.5	43.6	49.3	91.4	93.3	68.7	51.6	61.2	66.1	93.3																					
20-Oct	64.7	66.9	70.1	73.9	72.6	72.3	74.6	66.7	61.6	54.5	49.0	43.1	42.3	40.3	37.2	36.3	56.0	65.6	70.5	73.9	78.0	82.9	87.6	92.0	63.9	92.0																					
21-Oct	94.6	94.3	92.1	90.7	93.1	94.3	92.4	89.9	87.0	86.7	81.2	76.2	73.0	77.9	81.2	78.3	74.3	77.6	87.1	87.3	84.3	85.2	83.6	82.9	85.2	94.6																					
22-Oct	82.7	83.0	85.4	89.0	90.8	91.7	90.6	90.9	91.0	82.9	80.1	68.0	60.0	54.8	55.2	52.2	54.8	60.5	65.1	65.6	63.4	63.6	68.3	71.9	73.4	91.7																					
23-Oct	73.6	76.2	77.8	78.3	73.4	78.1	80.7	77.9	70.7	59.9	53.5	43.6	37.5	37.2	35.3	36.2	41.6	47.8	50.9	52.0	54.8	55.8	57.7	61.5	58.8	80.7																					
24-Oct	67.2	68.1	69.2	72.6	74.5	72.4	73.0	74.9	69.7	60.9	56.9	57.0	54.6	53.6	51.3	52.0	55.2	57.0	59.3	60.6	60.2	60.8	61.9	62.2	62.7	74.9																					
25-Oct	62.4	62.8	63.5	63.6	62.1	63.2	65.6	67.5	67.9	61.2	54.8	47.5	45.7	44.6	43.0	42.4	43.9	45.7	50.7	57.0	69.1	81.8	84.8	85.8	59.9	85.8																					
26-Oct	85.7	88.1	89.4	85.3	82.8	80.7	80.8	81.9	79.8	77.1	79.3	75.7	79.9	66.6	68.5	58.2	72.8	85.3	86.2	73.7	65.0	67.4	69.7	81.7	77.6	89.4																					
27-Oct	89.0	87.5	90.9	92.7	90.6	90.0	90.4	90.9	90.5	87.0	84.8	76.2	72.6	63.8	60.7	54.8	57.6	60.6	61.9	65.2	65.1	65.1	68.8	74.3	76.3	92.7																					
28-Oct	75.7	73.1	70.3	74.5	85.4	85.2	85.5	85.7	84.6	85.3	81.8	78.5	75.9	70.2	70.0	69.2	71.4	72.3	70.7	72.5	76.5	76.5	75.9	71.1	76.6	85.7																					
29-Oct	69.3	67.7	64.6	64.0	65.6	64.4	60.7	60.4	61.2	61.1	59.7	60.1	57.0	52.6	51.6	51.5	59.7	72.4	74.6	77.0	76.8	79.6	80.1	76.4	65.3	80.1																					
30-Oct	72.4	72.6	75.3	81.8	88.6	90.2	89.4	90.1	87.0	83.2	76.2	69.3	59.1	54.0	54.3	55.4	59.1	59.8	60.7	62.3	65.3	68.4	76.0	85.3	72.3	90.2																					
31-Oct	92.9	93.9	93.9	93.7	93.8	93.8	94.3	93.7	90.6	85.8	81.9	78.1	78.0	75.2	74.1	75.1	78.3	80.4	82.1	84.6	85.8	86.9	87.9	87.9	86.0	94.3																					
																						79.7	80.8	82.9	85.0	85.7	86.1	86.2	85.4	80.4	74.2	68.2	63.4	59.8	57.1	55.8	54.1	57.2	62.6	67.8	71.0	72.5	73.3	74.3	76.3	Diurnal Average	
																						98.4	98.6	98.7	98.7	98.7	98.7	98.7	98.7	98.8	95.9	95.5	95.7	96.3	96.0	91.2	87.8	90.4	90.7	92.6	95.9	97.6	98.1	98.2	98.4	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Barge Landing - October 2023



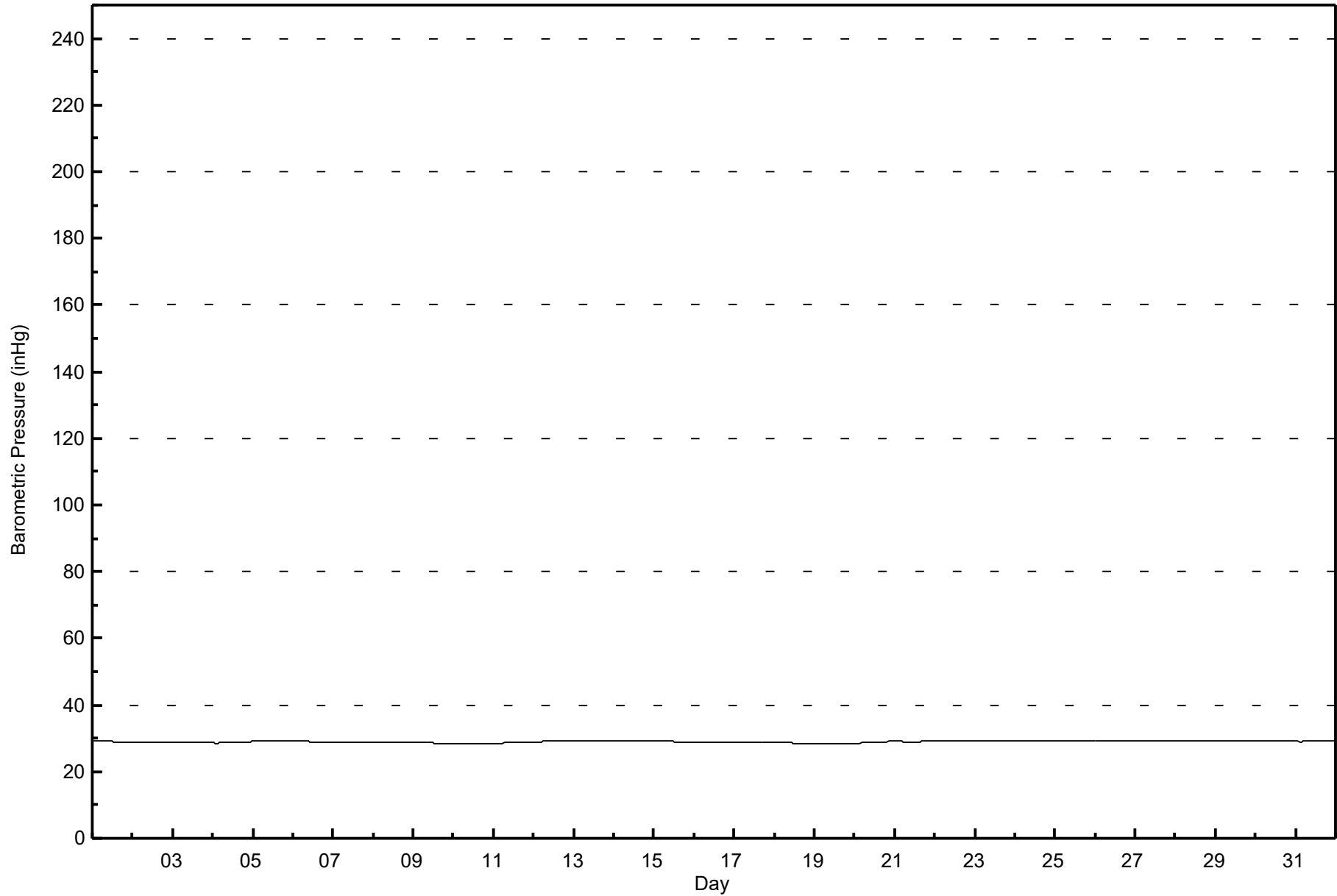


Maximum Value: 29.4 inHg on Oct 5 19:00		Maximum Daily Average: 29.3 inHg on Oct 5		Hours in Service: 744																						
Minimum Value: 28.4 inHg on Oct 10 17:00		Minimum Daily Average: 28.5 inHg on Oct 10		Hours of Data: 744																						
Maximum Diurnal Average: 29.0 inHg at hour 10		Minimum Diurnal Average: 29.0 inHg at hour 17		Hours of Missing Data: 0																						
Monthly Average: 28.97 inHg		Percentiles: P ₁ = 28.5 P ₁₀ = 28.6 Q ₁ = 28.7 Median = 29.0 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-Oct	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.1	29.1	29.1	29.1	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.8	28.8	29.0	29.2	
2-Oct	28.8	28.8	28.8	28.8	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8
3-Oct	28.7	28.7	28.7	28.7	28.7	28.7	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.7	28.7	28.7	28.7	28.7	28.7	28.6	28.6	28.6	28.7	28.8	
4-Oct	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	28.8	28.8	28.8	28.9	28.9	28.9	29.0	29.0	29.0	29.0	29.0	29.0	
5-Oct	29.1	29.1	29.1	29.1	29.2	29.2	29.2	29.2	29.3	29.3	29.3	29.3	29.3	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	
6-Oct	29.4	29.3	29.3	29.3	29.2	29.2	29.2	29.1	29.1	29.1	29.0	29.0	28.9	28.9	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	29.0	29.4	
7-Oct	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	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0	
8-Oct	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8	28.9	
9-Oct	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	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.6	28.7	
10-Oct	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	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.5	28.5	28.5	28.5	28.5	
11-Oct	28.5	28.5	28.5	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	28.8	28.8	28.8	28.9	28.9	28.9	28.7	28.9	
12-Oct	28.9	28.9	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	29.2	29.2	29.2	29.2	29.2	29.2	29.1	29.2	
13-Oct	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.3	29.3	29.3	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.1	29.1	29.1	29.2	29.3	
14-Oct	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	
15-Oct	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	29.0	29.1	
16-Oct	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	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.9	29.0	
17-Oct	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	28.8	28.9	28.9	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.9	
18-Oct	28.8	28.8	28.8	28.8	28.7	28.7	28.7	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	28.6	28.8	
19-Oct	28.5	28.5	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	28.5	28.6	
20-Oct	28.5	28.6	28.6	28.6	28.6	28.6	28.7	28.7	28.7	28.7	28.8	28.8	28.8	28.8	28.9	28.9	28.9	29.0	29.0	29.0	29.0	29.1	29.1	28.8	29.1	
21-Oct	29.1	29.1	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	29.1	29.1	29.1	29.1	29.1	29.1	29.0	29.1	
22-Oct	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	29.2	29.2	29.2	29.1	29.2	
23-Oct	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	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	
24-Oct	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	
25-Oct	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	29.1	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	
26-Oct	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	
27-Oct	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.3	
28-Oct	29.2	29.2	29.1	29.1	29.1	29.1	29.1	29.2	29.2	29.2	29.2	29.2	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	
29-Oct	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	29.3	29.3	
30-Oct	29.3	29.3	29.3	29.3	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.3	29.3	29.3	29.2	29.2	29.2	29.2	29.2	29.1	29.1	29.1	29.1	29.4	
31-Oct	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	
29.0																								Diurnal Average		
29.4																								Diurnal Maximum		



Wood Buffalo Environmental Association
Hourly Averages

Barometric Pressure (BP) - inHg
Barge Landing - October 2023





Maximum Speed: 30 km/h on Oct 21 17:00		Maximum Daily Speed Average: 19.5 km/h on Oct 14		Hours in Service: 744																							
Minimum Speed Value: 0 km/h on Oct 22 08:00		Minimum Daily Speed Average: 1.4 km/h on Oct 31		Hours of Data: 744																							
Maximum Diurnal Speed Average: 5.1 km/h at hour 13		Minimum Diurnal Speed Average: 2.2 km/h at hour 17		Hours of Missing Data: 0																							
Monthly Average Velocity: 3.6 km/h 188.8 deg		Percentiles: P ₁ = 1 P ₁₀ = 4 Q ₁ = 7 Median = 10 Q ₃ = 13 P ₉₀ = 17 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-Oct	SE10	SE9	SSE5	SSE7	SSE8	SSE12	SSE13	SSE13	S12	S16	S18	S17	SSW19	S21	SSE23	SSE21	SSE20	SSE16	SE14	SE13	SE14	SSE15	SSE17	SSE17	SSE14.1	SSE23	
2-Oct	SSE15	SSE13	SSE11	SSE11	SE9	SE10	SE12	SSE10	SSE10	SSE11	SSE11	SSE11	SSE10	SSE8	SSW6	S8	SSW7	SSE6	SSE7	S5	W2	NNW5	SSE2	WSW7	SSE7.5	SSE15	
3-Oct	ESE2	SW5	S7	S4	SE7	ESE6	SE7	S3	SE3	S3	SW6	SW9	WSW8	WSW4	SSW8	S8	SSE10	S11	SSE11	S11	SSE11	SE10	SE9	S5.9	SSE11		
4-Oct	SSE9	SSE13	SSE11	SSE9	WSW3	WNW9	NW9	NW8	WNW5	W6	WNW12	WNW9	WNW14	NNW13	NW9	WNW21	WNW22	NW21	WNW19	WNW16	WNW22	WNW17	WNW17	WNW21	WNW10.0	WNW22	
5-Oct	NW17	WNW14	WNW8	WNW6	WNW14	WNW17	WNW20	WNW20	WNW20	WNW20	WNW20	WNW18	WNW20	WNW19	WNW17	WNW19	WNW19	WNW19	W10	WSW6	SW8	SW4	SW4	S6	SSW7	WNW12.6	WNW20
6-Oct	SSE5	SSE6	SSE9	SSE10	SE10	SSE13	SSE15	SSE15	S12	S12	SSE15	S17	SSE15	S15	SSW15	S11	SSE7	SSW4	SE4	SSW8	SSW7	SSW6	WSW8	W7	S9.2	S17	
7-Oct	WSW6	W12	W10	WNW4	NNW3	WSW6	SSE7	S6	SSW3	WSW2	SE4	S4	E6	SW3	S1	ENE3	ESE4	SE1	E4	E5	ESE9	SE10	SE11	SE9	SSE2.3	W12	
8-Oct	SE10	SSE10	SSE7	SSE6	N2	NNE3	N4	NNW5	NNW7	NNW11	SW2	S13	SSE19	SSE22	SSE16	S8	S7	SSE8	SSE13	SE14	SE15	SE14	SE14	SE13	SSE7.2	SSE22	
9-Oct	SE11	SE15	SSE7	SSE8	SSE6	SE9	SSE11	S7	S4	S8	S10	S9	SE5	SE11	S8	SSE12	SSE10	ESE12	ESE12	SE8	SSE10	SSE10	SSE9	SSE9	SSE8.9	SE15	
10-Oct	S5	S5	S7	SSW6	SSE8	SSE6	SSE6	SSE7	ESE8	S3	W7	WSW5	SE13	SE18	SE12	SE12	ESE14	ESE12	ESE13	SE18	SE20	SE21	SE17	SSE15	SE9.5	SE21	
11-Oct	SE15	SE17	SE12	SE11	SE12	SE11	SE8	ESE7	SSE9	SSE17	SSE14	SE11	SSE10	SE14	SE13	ESE17	ESE18	ESE16	ESE14	SE13	SE12	SE13	SE13	SE13	SE12.6	ESE18	
12-Oct	SSE10	SSE9	SSE6	SE10	SE9	SE10	SE9	SE9	SSE9	SSE10	S13	S11	SSE14	SSE12	SSE10	SSE8	S3	SSE9	SE12	SE12	SE14	SE14	SE14	SE14	SSE10.1	SE14	
13-Oct	SE13	SE10	SE11	SE11	SSE8	SSE10	SSE14	SSE16	SSE14	SE13	SSE14	SSE14	SSE14	SSE14	SSE12	SE15	ESE13	E11	ESE12	SE15	SE14	SE16	SE15	SE16	SE12.6	SE16	
14-Oct	SE13	SE18	SE18	SE16	SE15	SE15	SE15	SE17	SSE16	SSE20	SSE23	SSE24	SSE25	SSE29	SSE26	SSE28	SSE24	SSE22	SSE18	SSE17	SSE16	SSE16	SSE17	SSE17	SSE19.5	SSE29	
15-Oct	SSE18	SSE18	SE12	SE10	SE12	SE12	SE12	SSE9	SSE12	SSE13	SSE14	S13	SSE15	SSE19	S11	SE13	SSE9	SSW6	S10	SSE12	SSE10	S9	SSE6	SSE9	SSE11.2	SSE18	
16-Oct	SSE10	S14	SSW8	SSW10	SSW11	SSW12	SSW11	S8	S9	S11	S11	S12	SSW10	SSW10	SSW9	SSW9	SSE8	SSE10	SE8	SE8	ESE8	NNE2	ENE5	SE5	S7.9	S14	
17-Oct	N5	NE4	NNW8	NNW9	NNW10	NNW6	NNW8	N7	NNE11	NNE18	NNE17	NNE15	NNE16	NNE14	NNE12	N13	N11	N8	NNW9	NNW7	NNW6	NW3	W3	E2	N8.5	NNE18	
18-Oct	SW4	S4	SSE7	SE7	SSE6	S7	SSE5	SSE6	SSE7	SSW3	SSE12	SSE15	S16	SSE16	SSE17	SSE14	SSE16	SSE13	S10	S10	S8	SW10	SW11	SW8	S8.9	SSE17	
19-Oct	SSW7	SSW9	S6	SE8	SE7	S10	S10	S11	SSW11	SSW12	SW14	SW15	SW17	WSW18	WSW18	SW16	SSW11	SSW16	WSW22	ESE6	S11	W13	W17	SW15	SW10.5	WSW22	
20-Oct	WSW16	WSW8	W6	SW5	SSW5	SSW6	SW5	WSW16	WSW21	W20	W9	NW18	NW20	NW17	NW16	NNW16	NE15	NNE13	NE8	NE10	NNE9	ENE8	ESE1	WNW1	WNW6.1	WSW21	
21-Oct	SSW2	ESE6	SE6	S5	SSE6	SSE8	SSE7	SSE10	SSE8	S2	S6	NNW5	NNW8	N21	N24	N26	N30	N25	N22	N21	N13	N11	N13	N12	N7.2	N30	
22-Oct	N12	N13	N11	NNW9	SSE6	SSE6	SSW4	SSE0	W4	SSW3	WNW4	NNE6	NW6	NNW4	ENE2	SSE1	WNW4	W5	WSW5	NW6	NW10	NW10	NW8	NW8	NW3.8	N13	
23-Oct	NW9	WNW8	WNW9	WNW8	W7	SW7	WSW8	WSW6	W7	W10	W11	W15	WNW18	WNW18	WNW19	WNW19	WNW17	WNW13	W11	W13	WSW10	W11	W10	W8	W10.8	WNW19	
24-Oct	WSW7	W10	WSW9	WSW6	SW6	WSW12	WSW9	WSW9	WSW7	WSW9	WSW14	WSW13	WSW15	WSW12	W12	WNW13	WNW13	W12	W11	WNW12	W12	W14	WNW11	WNW10	W10.3	WSW15	
25-Oct	W12	W12	W11	W10	WSW9	WSW9	WSW6	SW4	SW5	WSW6	SW9	SW12	WSW14	WSW14	WSW11	WSW12	WSW12	WSW10	WNW12	NW12	WNW7	SW6	SW7	WSW6	WSW8.8	WSW14	
26-Oct	WSW4	WSW8	SW9	WSW10	W8	WSW8	SW8	SW10	WSW9	WSW9	WSW10	WSW9	SW6	NW6	WSW4	WNW8	NE6	E6	S6	W8	W8	SW7	SW9	SW5	WSW6.0	WSW10	
27-Oct	SW5	W5	NNW10	N12	N9	N8	N7	NNW7	WNW3	WNW1	WNW2	NNW4	NNW5	WNW6	NW7	NW13	WNW8	WNW6	WNW2	NW3	SW9	SW7	SSW7	S9	NW4.0	NW13	
28-Oct	S9	S9	SSW6	WSW6	WSW7	WSW7	WSW5	W5	W4	WNW4	NNW4	NNW4	NW4	N7	NNE4	SE2	SSW3	W9	W10	W9	WNW8	NW7	W7	WNW14	W4.2	WNW14	
29-Oct	W10	W13	WNW13	W9	W10	W13	WNW13	W8	WNW9	NNW12	NNW13	NW12	NW10	NNW8	NW7	NNW5	ENE7	E7	ENE11	E7	NNE4	NNW8	NNW9	N16	NW6.5	N16	
30-Oct	N18	NNE16	N13	N10	NNW8	ENE5	E7	SE2	SSE7	SSE6	S10	S12	S14	SSW14	S14	S13	S12	S13	S12	S11	S11	S11	S11	SSE11	SSE4.9	N18	
31-Oct	SSE10	SSE9	SSE9	S5	NNW3	W4	NNW5	NNW8	N10	N10	NNW8	N7	NE7	ENE5	E4	E2	NNE5	E6	E4	SE1	SW1	SE5	S7	S6	ENE1.4	SSE10	
S3.5 S4.4 S3.1 S3.1 S2.8 S4.1 S3.9 S3.8SSW4.0SSW3.6SSW4.8SSW4.9SSW5.1SSW4.0SSW4.1SSW3.1 S2.2 SSE2.8 SSE3.1 SSE3.2 S3.9 S3.9 S4.3 S4.1																								Diurnal Average			
N18 SE18 SE18 SE16 SE15WNW17WNW20WNW20WSW21WNW20 SSE23 SSE24 SSE25 SSE29 SSE26 SSE28 N30 N25 N22 N21WNW22 SE21WNW17WNW21																								Diurnal Maximum			

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

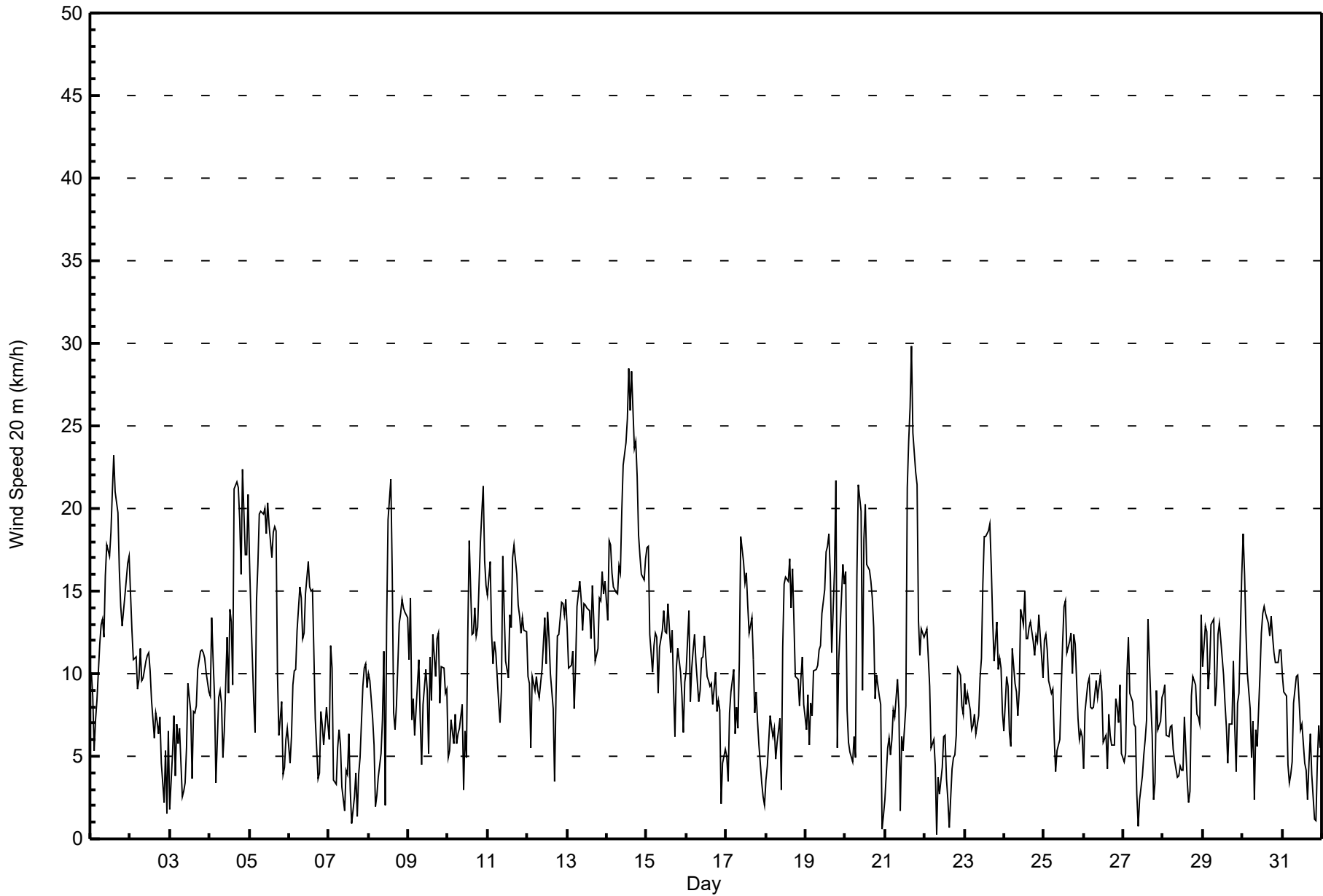
Wind Speed 20 m (WS20m) - km/h
Barge Landing - October 2023

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed 20 m (WS20m) - km/h
Barge Landing - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Wind Speed 20 m (WS20m) - km/h
Barge Landing - October 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	116	15.59	15.59
6 - 11	355	47.72	63.31
12 - 19	235	31.59	94.89
20 - 28	36	4.84	99.73
29 - 38	2	0.27	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
Barge Landing - October 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	3	5	1	5	6	3	10	6	15	8	12	9	8	10	3	12	116
6 - 11	13	3	4	4	4	9	35	81	43	25	18	36	28	17	15	20	355
12 - 19	10	8	1	0	0	11	52	57	19	6	6	13	13	28	7	4	235
20 - 28	6	0	0	0	0	0	2	14	0	0	0	2	1	9	2	0	36
29 - 38	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	33	16	6	9	10	23	99	159	77	39	36	60	50	64	27	36	744

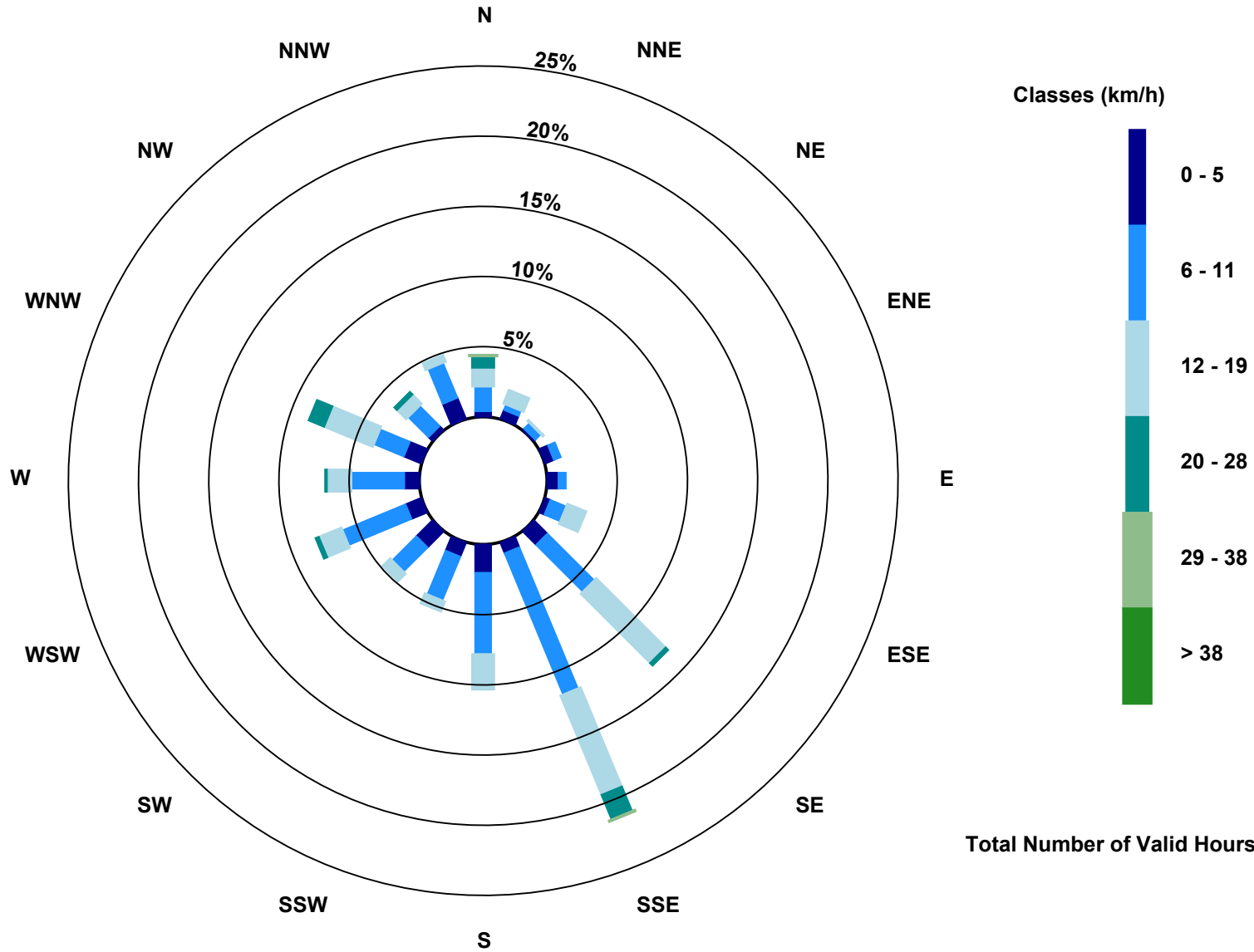
Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

Wind Speed 20 m (WS20m) - km/h
Barge Landing



Total Number of Valid Hours: 744



Direction of Maximum Speed: 355 deg on Oct 21 17:00		Hours in Service:	744
Direction of Maximum Daily Speed Average: 148.0 deg on Oct 14		Hours of Data:	744
Direction of Minimum Speed: 159 deg on Oct 22 08:00		Hours of Missing Data:	0
Direction of Minimum Daily Speed Average: 1.4 deg on Oct 31		Percent Operational Time:	100.0
Monthly Average Direction: 188.8 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-Oct	128	137	161	156	159	150	155	163	171	171	169	186	193	169	163	162	160	153	136	140	146	150	161	157	160.2
2-Oct	160	165	151	148	136	138	145	151	148	161	163	156	156	160	196	186	197	160	156	171	275	334	167	239	161.1
3-Oct	110	220	182	173	139	121	144	174	127	185	222	230	254	250	209	194	189	166	171	166	169	153	144	147	175.6
4-Oct	156	157	167	153	246	290	313	306	294	270	289	301	292	329	312	297	297	305	291	295	291	289	291	298	289.9
5-Oct	304	296	294	283	295	294	296	300	298	298	300	292	286	290	291	289	288	262	239	222	216	219	190	194	286.8
6-Oct	166	153	147	155	136	152	156	159	169	170	165	170	162	185	194	179	160	206	133	197	203	207	249	266	171.9
7-Oct	242	264	276	284	336	257	154	182	208	246	130	188	101	228	184	76	114	134	91	92	122	130	134	141	165.6
8-Oct	146	153	148	151	353	15	353	342	336	340	221	174	162	156	161	191	173	148	156	137	143	144	139	140	151.9
9-Oct	132	135	160	167	163	145	161	174	182	172	170	169	140	135	171	152	148	115	113	129	149	155	157	151	149.5
10-Oct	172	171	169	195	164	167	155	158	118	184	262	258	129	141	139	127	110	106	123	142	146	146	145	147	144.4
11-Oct	139	136	141	134	132	138	134	118	149	156	155	134	150	146	129	118	120	116	117	132	129	135	136	141	134.5
12-Oct	148	153	149	140	131	127	129	138	154	166	171	169	167	163	164	166	187	161	135	131	135	140	142	138	149.0
13-Oct	135	136	138	143	147	149	157	156	150	138	151	158	168	161	157	130	118	101	110	134	141	131	133	132	141.1
14-Oct	139	140	139	140	138	138	140	143	148	147	147	154	159	148	149	148	149	153	156	150	156	155	147	151	148.0
15-Oct	150	149	142	137	139	140	139	153	152	160	162	173	164	166	170	159	167	192	181	160	168	171	162	154	157.4
16-Oct	157	179	195	204	211	204	201	174	173	180	174	179	201	213	208	193	162	163	134	132	119	13	73	132	178.6
17-Oct	7	45	342	334	334	334	333	6	21	17	14	15	13	26	15	10	2	355	347	344	327	308	263	83	2.5
18-Oct	216	174	161	146	151	179	155	157	157	213	168	168	169	158	160	149	157	161	172	173	175	224	232	224	170.9
19-Oct	213	213	175	145	144	169	181	182	196	206	232	236	235	240	237	232	210	213	239	115	169	260	263	229	217.3
20-Oct	251	255	280	236	207	201	227	250	252	271	267	310	304	323	322	336	36	28	42	46	33	60	113	299	301.9
21-Oct	192	120	124	184	159	168	167	158	155	181	174	333	344	5	1	356	355	1	1	1	359	350	349	356	3.9
22-Oct	358	356	352	346	151	156	195	159	261	207	286	20	321	342	71	154	295	276	253	306	320	310	314	305	322.1
23-Oct	307	299	302	296	271	226	250	257	263	275	270	280	285	288	288	293	292	291	281	259	253	259	266	263	278.6
24-Oct	251	261	251	255	234	245	253	238	237	243	256	249	253	251	273	283	284	277	281	285	279	270	282	283	263.3
25-Oct	278	267	270	265	257	245	249	223	217	243	236	220	239	246	244	242	240	254	302	306	292	229	225	237	253.4
26-Oct	240	237	232	248	265	245	231	229	238	252	239	251	236	314	251	291	44	95	177	273	267	229	232	228	245.6
27-Oct	226	270	347	353	351	1	357	344	286	302	296	332	328	300	310	304	296	291	291	316	221	227	196	176	306.1
28-Oct	179	180	204	242	244	244	242	265	268	299	328	348	313	356	24	129	193	259	273	268	294	306	274	291	266.7
29-Oct	281	272	292	277	266	275	293	281	284	333	330	317	314	344	324	343	68	87	61	79	26	343	329	11	318.6
30-Oct	9	13	4	352	344	65	90	139	166	160	169	178	188	195	190	182	169	170	173	175	178	178	171	158	166.3
31-Oct	165	155	155	170	347	273	327	345	357	352	346	11	49	60	96	84	33	80	101	138	218	125	183	190	65.2

179.5 181.0 185.9 183.5 182.4 185.7 183.1 191.2 195.2 207.7 203.2 209.6 209.6 195.3 202.1 202.3 174.2 166.1 165.3 161.8 175.4 183.4 188.7 181.8
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

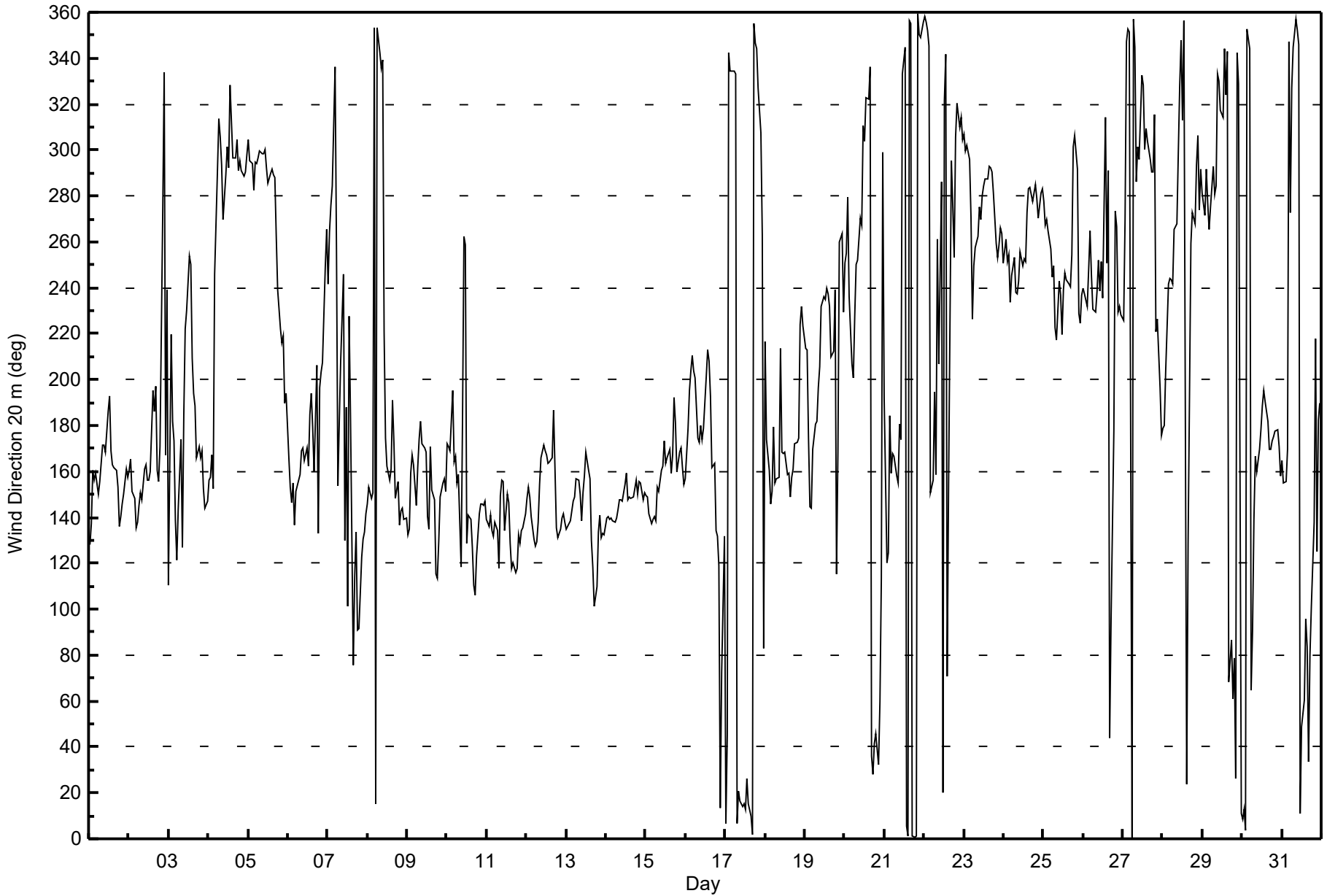
Barge Landing - October 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 96 deg on Oct 22 16:00																	Hours in Service: 744 Hours of Data: 744 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0								
Minimum Value: 3 deg on Oct 1 01:00																									
Percentiles: P ₁ = 6 P ₁₀ = 8 Q ₁ = 12 Median = 16 Q ₃ = 22 P ₉₀ = 35 P ₉₉ = 82																									
Day	Hourly Period Ending At (MST)																							Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23		24
1-Oct	3	32	36	21	23	6	9	12	16	17	17	23	21	18	14	15	15	12	8	8	9	12	11	12	36
2-Oct	13	11	11	8	9	10	10	11	12	13	14	12	12	15	33	26	21	15	9	16	61	9	69	19	69
3-Oct	84	24	17	52	21	13	23	50	24	32	35	20	39	59	27	23	20	4	9	5	7	10	7	9	84
4-Oct	10	11	10	8	62	18	8	9	24	22	16	25	18	21	27	17	16	16	15	16	16	16	16	14	62
5-Oct	14	17	17	26	15	15	16	15	17	17	16	15	16	17	17	17	16	15	32	21	32	18	16	17	32
6-Oct	28	18	13	11	8	9	11	12	13	17	16	17	14	18	18	19	17	48	44	10	23	26	17	30	48
7-Oct	61	15	19	75	86	64	28	15	41	73	38	50	25	60	82	38	36	78	44	42	6	10	6	7	86
8-Oct	12	10	10	11	76	42	28	32	12	12	73	35	17	13	16	28	19	23	8	13	8	7	7	6	76
9-Oct	6	6	29	9	17	9	9	15	35	25	18	29	71	22	26	19	15	18	8	12	10	10	11	8	71
10-Oct	23	18	10	17	10	10	14	20	11	76	18	47	25	17	17	15	11	11	17	10	10	12	14	14	76
11-Oct	13	10	13	12	8	7	11	9	18	14	20	26	29	22	22	15	12	8	8	8	7	7	8	8	29
12-Oct	5	8	17	6	12	5	8	8	13	18	17	26	19	18	23	21	41	11	6	5	10	8	7	6	41
13-Oct	6	5	6	7	11	6	8	11	15	16	15	18	15	17	25	15	13	7	9	8	8	7	7	7	25
14-Oct	10	10	8	8	7	7	7	7	11	12	14	15	16	15	16	13	13	12	13	12	12	11	10	11	16
15-Oct	11	11	11	7	9	6	7	15	11	16	18	21	17	20	17	12	15	10	15	6	8	9	15	9	21
16-Oct	11	12	18	18	11	10	15	16	17	17	18	19	23	26	28	21	13	10	10	6	7	81	32	14	81
17-Oct	22	33	18	8	9	13	15	15	14	12	15	16	15	16	17	18	17	18	16	17	19	35	80	65	80
18-Oct	34	26	12	18	12	13	20	17	15	49	26	15	15	15	13	13	14	15	15	7	10	16	13	17	49
19-Oct	34	16	23	7	17	12	13	12	13	16	20	17	18	17	17	16	14	17	17	45	13	26	28	14	45
20-Oct	14	34	35	37	43	27	53	15	15	17	31	26	20	18	24	15	14	12	19	16	15	22	88	45	88
21-Oct	47	8	11	23	27	15	15	17	20	84	30	52	33	17	17	19	18	19	18	17	16	14	13	15	84
22-Oct	16	15	10	21	39	10	22	92	21	44	44	33	29	56	64	96	14	11	19	30	13	13	15	20	96
23-Oct	19	20	16	34	25	18	19	25	27	26	22	22	18	19	21	18	16	14	16	11	14	15	12	17	34
24-Oct	19	12	15	19	21	14	16	15	19	21	21	17	18	21	19	18	17	18	18	19	18	16	18	22	22
25-Oct	18	18	16	14	14	14	20	46	20	32	20	18	18	16	18	15	13	16	16	15	24	15	16	20	46
26-Oct	24	10	12	13	19	17	13	16	17	19	15	18	25	44	33	23	48	24	35	32	21	13	14	26	48
27-Oct	29	31	24	16	14	12	13	9	55	95	47	42	28	46	29	20	17	19	47	45	8	9	11	8	95
28-Oct	11	16	18	17	13	15	14	17	14	27	21	25	33	22	64	48	31	11	13	13	16	18	22	13	64
29-Oct	15	14	19	14	13	15	18	23	27	21	18	19	26	26	24	29	22	14	13	19	30	13	10	16	30
30-Oct	15	16	15	13	15	39	8	48	8	18	16	20	21	22	19	17	13	12	13	13	14	13	12	11	48
31-Oct	17	13	15	31	60	35	21	13	15	15	17	21	21	33	26	38	17	17	20	65	71	12	17	12	71
																	84 34 36 75 86 64 53 92 55 95 73 52 71 60 82 96 48 78 47 65 71 81 88 65								
Diurnal Maximum																									



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction 20 m (WD20m) - deg
Barge Landing - October 2023





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

**AMS11
LOWER CAMP
OCTOBER 2023**

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

November 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP (AMS11)
OCTOBER 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	131.3	0	25.9	0
H2S (ppb) Average	706	37	38	99.87	19.5	3	3	0
THC (ppm) Average	709	35	35	100	4.2	-	2.4	-
CH4(ppm) Average	709	35	35	100	4.1	-	2.4	-
NMHC(ppm) Average	709	35	35	100	0.106	-	0.024	-
Temperature (C) Average	744	0	0	100	25.2	-	14.6	-
Relative Humidity (%) Average	732	0	12	98.39	100	-	91.2	-
Barometric Pressure (inHg) Average	744	0	0	100	29.6	-	29.5	-
Wind Speed 10 m (km/h) Average	744	0	0	100	29	-	21	-
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 - LOWER CAMP (AMS11)
OCTOBER 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	3.13	10	-	0	0	0.2	0.4	1.4	7.8	131.3
H2S (ppb) Average	706	0.55	1.4	-	0	0	0.1	0.2	0.5	1.1	19.5
THC (ppm) Average	709	2.11	0.2	-	2	2	2	2.1	2.1	2.2	4.2
CH4(ppm) Average	709	2.11	0.2	-	2	2	2	2.1	2.1	2.2	4.1
NMHC(ppm) Average	709	0.003	0.011	-	0	0	0	0	0	0	0.106
Temperature 2 m (C) Average	744	5.06	7.3	-	-10.3	-4.4	-1.4	6	10.4	14	25.2
Relative Humidity (%) Average	732	72.75	15.9	-	27.1	51.4	60.7	74	86	93.4	100
Barometric Pressure (inHg) Average	744	29.16	0.3	-	28.6	28.7	28.9	29.2	29.4	29.4	29.6
Wind Speed 10 m (km/h) Average	744	10.5	6	-	0	3	6	10	15	19	29
Wind Direction 10 m (deg) Average	744	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP (AMS11)
OCTOBER 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
H2S	12 Oct 2023 13:00	12 Oct 2023 13:00	1	Maintenance - sample manifold cleaned
Relative Humidity	03 Oct 2023 00:00	03 Oct 2023 11:00	12	Sensor operated out of range



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb

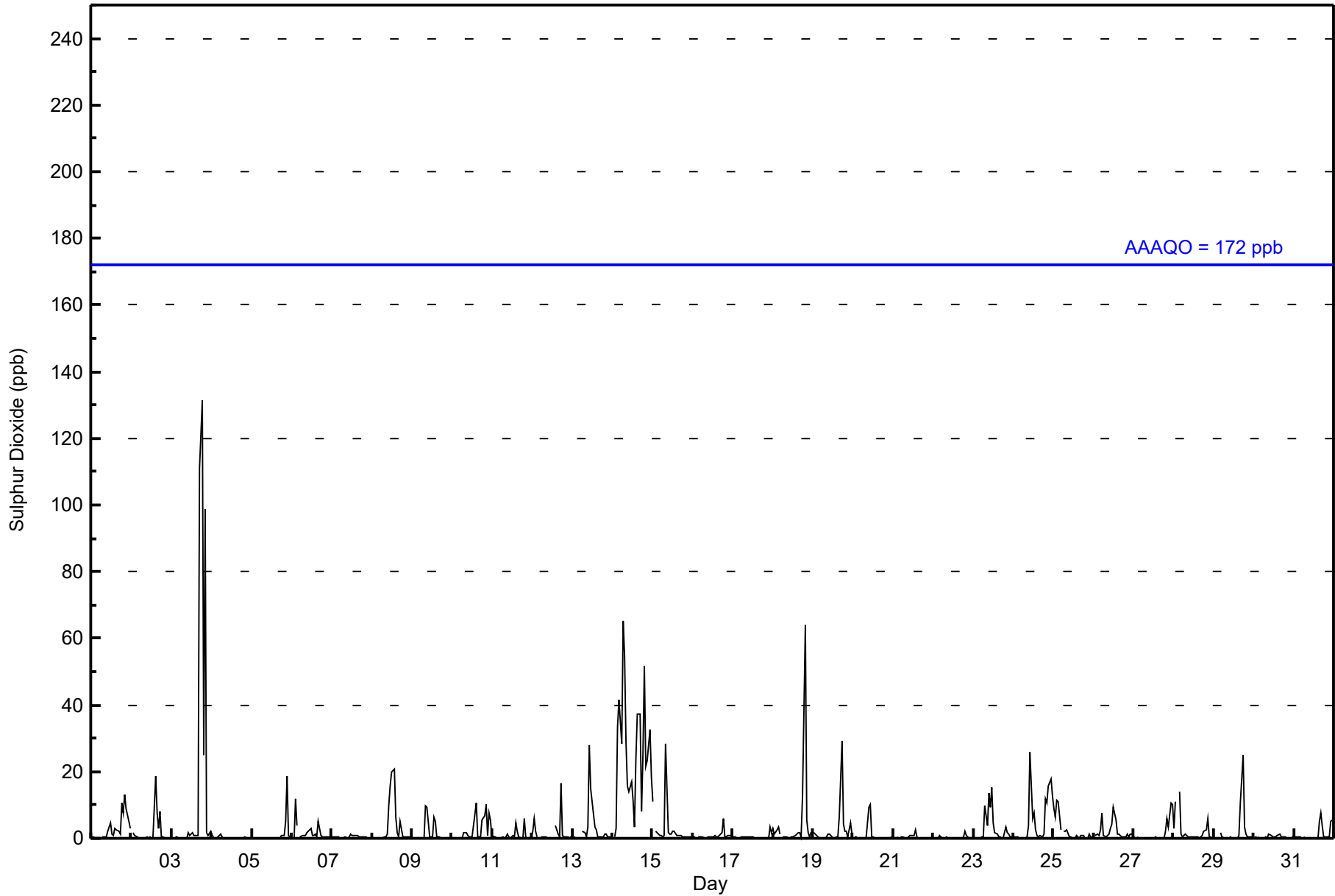
Lower Camp - October 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 744																	Daily Average		Daily Maximum																										
Maximum Value: 131.3 ppb on Oct 3 19:00		Maximum Daily Average: 25.9 ppb on Oct 14		Hours of Data: 709																	1.8		18.5																										
Minimum Value: 0.0 ppb on Oct 2 07:00		Minimum Daily Average: 0.2 ppb on Oct 4		Hours of Missing Data: 35																	16.5		131.3																										
Maximum Diurnal Average: 7.0 ppb at hour 18		Minimum Diurnal Average: 1.3 ppb at hour 2		Hours of Calibration: 35																	0.2		1.3																										
Monthly Average: 3.13 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.2 Median = 0.4 Q ₃ = 1.4 P ₉₀ = 7.8 P ₉₉ = 41.2		Percent Operational Time: 100.0																	1.2		18.5																										
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-Oct	0.3	0.2	0.2	0.1	0.1	Z	0.6	0.3	0.5	0.5	2.0	4.8	1.3	1.0	3.0	2.4	2.2	1.3	10.5	7.7	13.2	8.9	5.2	3.0	3.0	13.2																							
2-Oct	Z	1.6	0.7	0.2	0.1	0.1	0.0	0.1	0.0	0.4	0.2	0.4	0.1	0.2	18.5	7.6	3.1	8.0	0.5	0.2	0.1	0.1	0.0	0.0	1.8	18.5																							
3-Oct	0.1	Z	0.2	0.3	0.2	0.1	0.0	0.0	0.1	0.1	1.7	1.0	1.6	0.9	0.9	0.7	0.8	111.2	131.3	25.1	98.9	1.8	0.7	2.0	16.5	131.3																							
4-Oct	0.8	0.4	Z	0.1	0.6	1.3	0.6	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	0.5	0.0	0.0	0.0	0.2	1.3																							
5-Oct	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	0.9	0.8	5.3	18.5	0.8	0.3	1.2	18.5																						
6-Oct	0.1	0.2	11.9	3.7	Z	0.4	0.7	0.8	0.9	1.5	2.0	2.8	0.9	1.0	1.4	0.5	5.1	0.8	0.5	0.4	0.6	0.3	0.3	0.6	1.6	11.9																							
7-Oct	0.3	0.2	0.3	0.2	0.2	Z	0.0	0.1	0.3	0.2	0.3	1.4	0.8	0.6	0.7	0.7	0.6	0.6	0.4	0.5	0.3	0.2	0.1	0.1	0.4	1.4																							
8-Oct	Z	0.1	0.1	0.0	0.0	0.0	0.0	0.4	0.3	1.3	9.8	15.9	19.9	20.8	6.5	1.5	0.4	5.1	0.6	0.4	0.5	0.4	0.3	0.2	3.7	20.8																							
9-Oct	0.2	Z	0.1	0.1	0.0	0.1	0.0	0.0	9.7	9.2	0.5	0.4	0.5	6.5	5.2	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	1.5	9.7																							
10-Oct	0.1	0.1	Z	0.1	0.1	0.1	0.1	1.9	1.5	1.0	0.4	0.3	0.2	3.9	10.7	0.5	0.3	0.4	5.7	6.7	10.0	1.0	7.7	5.6	2.5	10.7																							
11-Oct	0.8	0.4	0.4	Z	0.2	0.2	0.2	0.2	0.6	1.2	0.2	0.2	0.7	0.3	4.8	2.0	0.3	0.1	0.2	5.7	0.5	0.1	0.1	0.2	0.9	5.7																							
12-Oct	2.0	5.8	2.3	0.5	Z	0.4	0.3	0.3	0.3	0.4	C	C	C	C	3.9	1.5	0.5	16.6	0.9	0.4	0.3	0.5	0.2	0.2	2.0	16.6																							
13-Oct	0.1	0.2	0.1	0.1	0.2	Z	2.0	1.6	0.4	3.2	27.8	14.8	11.0	3.3	2.6	0.4	0.4	0.2	0.3	1.1	1.4	0.5	0.3	0.3	3.1	27.8																							
14-Oct	Z	0.4	2.9	33.4	41.5	28.6	65.4	54.5	28.8	15.8	14.2	17.1	11.3	3.3	23.9	37.4	37.2	8.1	25.1	51.5	21.4	23.2	32.7	18.1	25.9	65.4																							
15-Oct	11.0	Z	2.2	1.4	1.0	0.7	0.5	0.8	28.4	1.7	1.4	1.2	2.1	1.9	0.9	0.8	0.7	0.8	0.6	0.5	0.5	0.6	0.6	0.5	2.6	28.4																							
16-Oct	0.6	0.5	Z	0.4	0.2	0.3	0.2	0.1	0.2	0.2	0.4	0.3	0.5	0.8	0.5	0.4	0.8	1.6	5.8	0.6	0.4	0.8	0.7	0.7	0.7	5.8																							
17-Oct	0.6	0.5	0.4	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.0	0.1	0.1	0.0	0.0	0.0	0.1	3.3	1.5	0.4	3.3																							
18-Oct	3.1	1.2	2.8	3.3	1.3	Z	0.3	0.2	0.2	0.1	0.1	0.5	0.6	0.8	1.1	1.7	1.6	0.6	12.6	64.0	5.3	1.5	0.5	1.9	4.6	64.0																							
19-Oct	1.9	1.4	0.7	0.3	0.1	Z	0.1	0.1	0.6	1.2	1.1	0.3	0.2	0.1	0.2	0.5	6.4	29.1	4.3	2.0	2.2	0.5	4.5	1.2	2.6	29.1																							
20-Oct	Z	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0.1	9.1	10.2	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.4	1.0	10.2																							
21-Oct	0.4	Z	0.2	0.1	0.1	0.5	0.4	0.1	0.1	0.2	0.7	0.7	0.7	2.7	0.5	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	2.7																							
22-Oct	0.0	0.0	Z	0.1	0.7	0.0	0.0	0.0	0.2	0.1	0.2	0.2	0.1	0.0	0.1	0.1	0.0	0.1	0.3	2.0	0.9	0.2	0.1	0.1	0.2	2.0																							
23-Oct	0.1	0.0	0.0	Z	0.0	0.6	0.6	9.9	4.0	13.4	9.3	15.3	4.7	1.7	1.2	0.4	0.6	0.2	0.1	3.4	1.8	1.1	0.4	0.4	3.0	15.3																							
24-Oct	0.4	0.5	0.3	0.3	Z	0.2	0.1	0.1	0.2	3.8	25.9	6.1	7.8	2.7	0.9	0.4	0.9	0.6	1.1	12.0	10.8	15.6	17.7	12.5	5.3	25.9																							
25-Oct	8.8	6.3	11.3	10.9	2.5	Z	2.0	1.9	2.6	0.5	0.3	0.2	0.2	0.1	0.9	0.2	0.7	0.7	1.0	0.2	0.2	1.2	0.5	0.4	2.3	11.3																							
26-Oct	Z	0.7	1.1	0.7	2.7	7.8	0.7	0.4	1.0	1.3	2.9	4.4	9.3	5.4	1.2	1.1	0.9	0.6	0.4	0.6	1.1	0.4	1.3	1.3	2.0	9.3																							
27-Oct	0.4	Z	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.2	0.1	0.0	0.0	0.0	2.2	6.1	3.4	10.5	10.0	1.5	10.5																							
28-Oct	2.8	11.1	Z	14.1	1.4	0.5	0.7	1.3	0.6	0.3	0.3	0.3	0.2	0.3	0.2	0.1	0.2	0.8	2.1	2.4	5.9	0.6	0.3	0.2	2.0	14.1																							
29-Oct	0.2	0.1	0.1	Z	1.7	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.8	10.7	25.2	3.5	1.4	0.5	0.3	0.3	0.3	2.0	25.2																							
30-Oct	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.3	0.1	1.3	0.7	0.4	0.4	0.5	0.7	1.2	0.5	0.5	0.3	0.3	0.2	0.2	0.1	0.3	0.4	1.3																							
31-Oct	0.1	0.5	0.3	0.3	0.4	Z	0.5	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.1	4.9	7.5	3.6	0.6	0.3	0.2	0.3	5.2	5.7	1.3	7.5																							
																								1.4	1.3	1.5	2.7	2.1	1.8	2.5	2.5	2.7	2.2	3.8	3.0	2.5	2.0	2.9	2.2	2.7	7.0	6.8	6.2	6.1	2.7	3.1	2.2	Diurnal Average	
																								11.0	11.1	11.9	33.4	41.5	28.6	65.4	54.5	28.8	15.8	27.8	17.1	19.9	20.8	23.9	37.4	37.2	111.2	131.3	64.0	98.9	23.2	32.7	18.1	Diurnal Maximum	
Z - zerospan C - Calibration																																																	
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb																																																	



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Lower Camp - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Lower Camp - October 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	653	92.10	92.10
11 - 20	31	4.37	96.47
21 - 60	20	2.82	99.29
61 - 110	3	0.42	99.72
111 - 172	2	0.28	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Lower Camp - October 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	12	5	7	8	22	188	87	11	2	6	27	65	60	78	42	33	653
11 - 20	0	0	0	0	0	13	4	2	1	0	1	2	8	0	0	0	31
21 - 60	0	0	0	0	0	14	2	1	1	0	0	1	1	0	0	0	20
61 - 110	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0	3
111 - 172	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	2
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	12	5	7	8	22	216	93	16	5	7	28	68	69	78	42	33	709

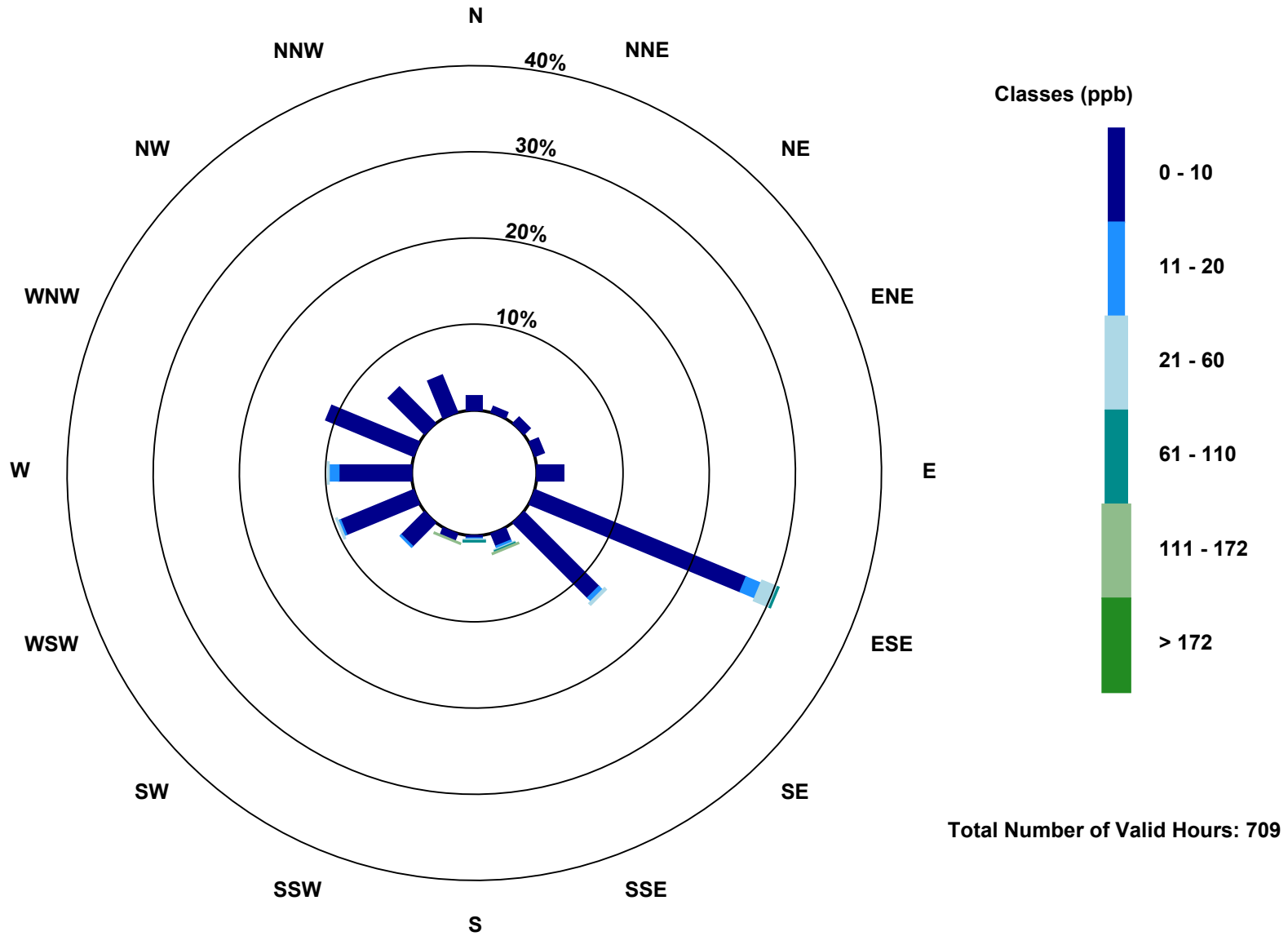
Total Number of Valid Hours: 709

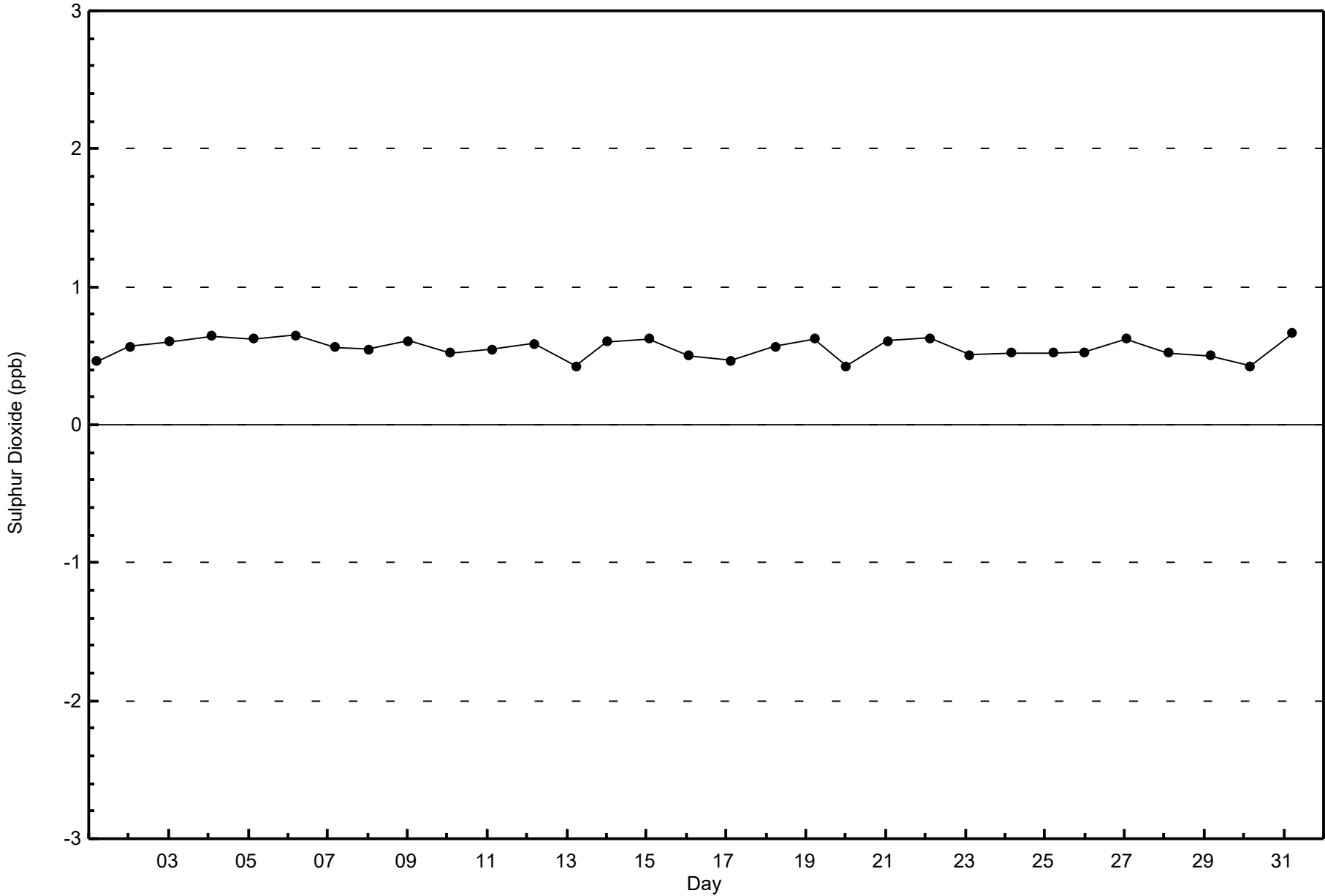
Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

Sulphur Dioxide (SO₂) - ppb
Lower Camp

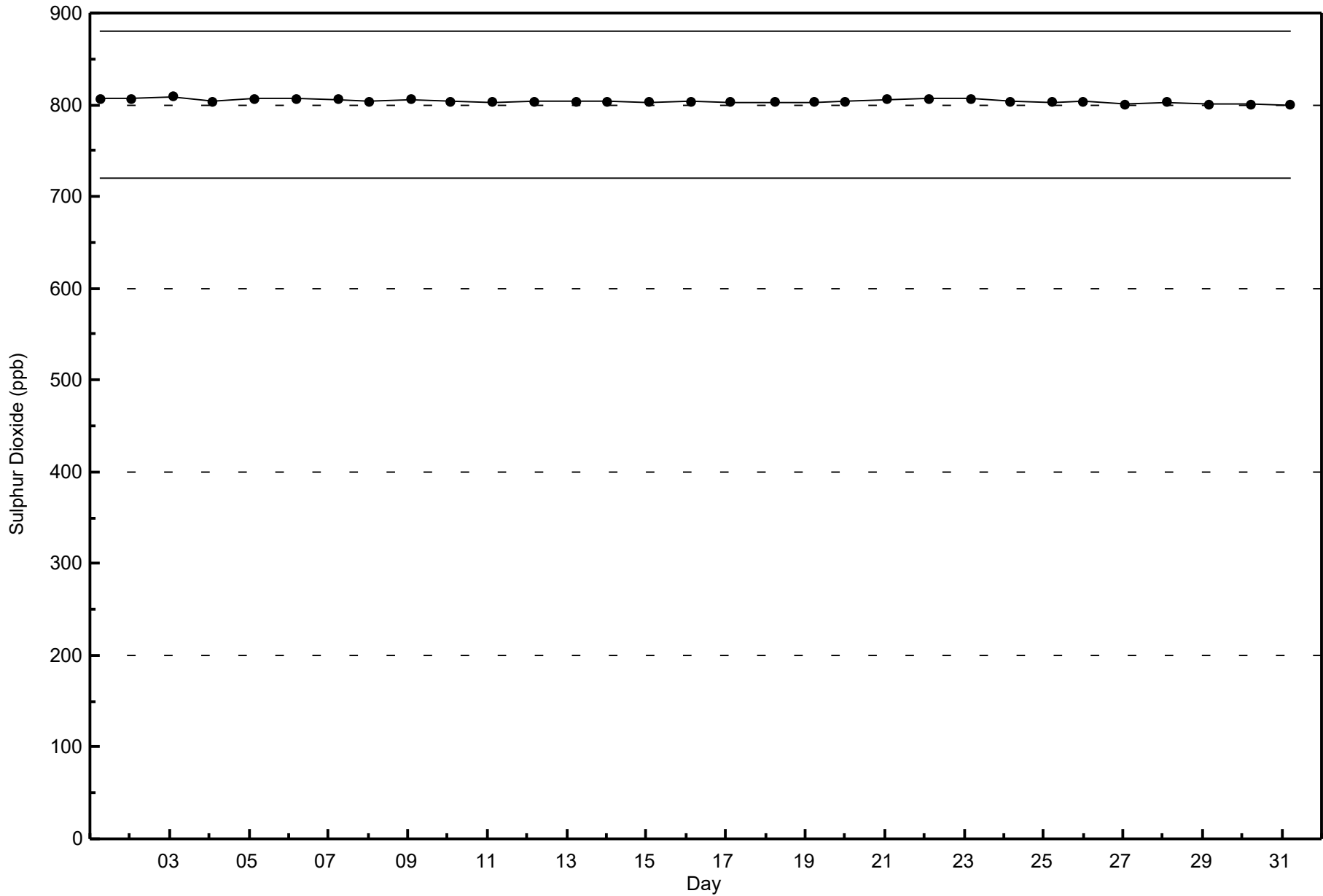






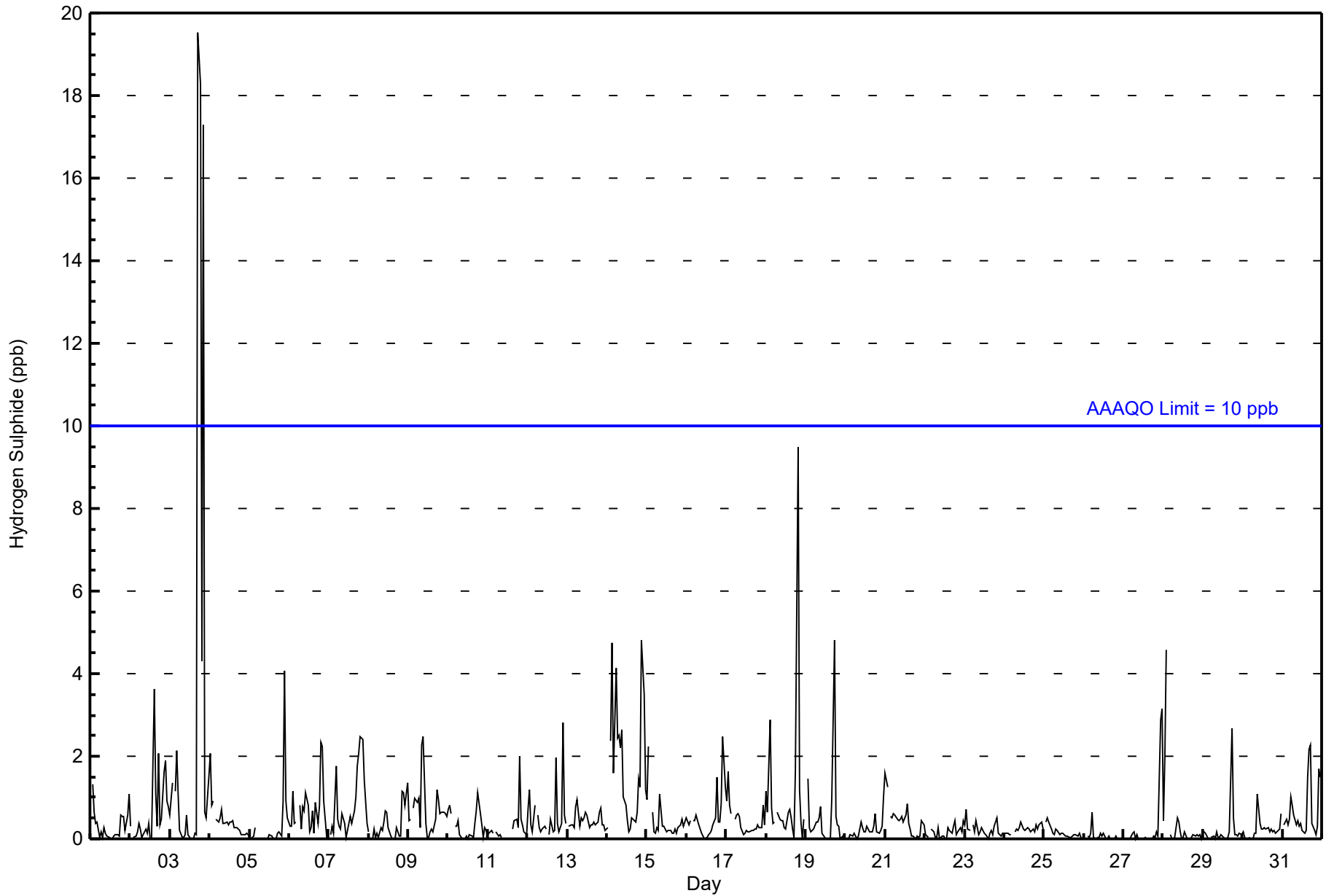
Wood Buffalo Environmental Association
Span Responses

Sulphur Dioxide (SO₂) - ppb
Lower Camp - October 2023





Number of Exceedences (AAAQO):		1-hr: 3	24-hr: 0																		Hours in Service:	744																										
Maximum Value: 19.5 ppb on Oct 3 18:00		Maximum Daily Average: 3.0 ppb on Oct 3																	Hours of Data:	706																												
Minimum Value: 0.0 ppb on Oct 1 14:00		Minimum Daily Average: 0.1 ppb on Oct 26																	Hours of Missing Data:	38																												
Maximum Diurnal Average: 1.3 ppb at hour 18		Minimum Diurnal Average: 0.2 ppb at hour 13																	Hours of Calibration:	37																												
Monthly Average: 0.55 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.2 Q ₃ = 0.5 P ₉₀ = 1.1 P ₉₉ = 4.6																	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-Oct	Z	1.3	0.7	0.4	0.4	0.0	0.2	0.0	0.3	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.6	0.6	0.5	0.2	0.6	1.1	0.3	1.3																							
2-Oct	0.3	Z	0.0	0.1	0.2	0.4	0.2	0.0	0.1	0.2	0.1	0.4	0.0	0.0	3.6	1.1	0.3	2.1	0.3	0.5	1.6	1.9	0.9	0.8	0.7	3.6																						
3-Oct	0.6	1.4	Z	1.1	2.1	1.1	0.2	0.0	0.0	0.1	0.6	0.1	0.0	0.0	0.0	0.1	0.1	19.5	18.3	4.3	17.3	0.6	0.5	1.5	3.0	19.5																						
4-Oct	2.1	0.8	0.9	Z	0.5	0.4	0.5	0.7	0.4	0.4	0.4	0.3	0.4	0.4	0.5	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.4	2.1																						
5-Oct	0.0	0.0	0.1	0.3	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.2	0.1	0.9	4.1	0.9	0.5	0.3	4.1																						
6-Oct	0.3	0.3	1.1	0.4	0.4	Z	0.8	0.2	0.8	0.7	1.1	0.8	0.2	0.3	0.7	0.1	0.9	0.4	0.8	2.4	2.2	0.9	0.1	0.2	0.7	2.4																						
7-Oct	Z	0.1	0.3	0.1	1.8	0.5	0.3	0.3	0.6	0.4	0.0	0.2	0.4	0.5	0.4	0.7	1.0	1.8	2.1	2.5	2.4	1.4	0.9	0.4	0.8	2.5																						
8-Oct	0.2	Z	0.0	0.2	0.0	0.1	0.0	0.3	0.2	0.4	0.7	0.6	0.3	0.1	0.0	0.0	0.0	0.3	0.1	0.1	1.2	1.1	0.8	1.4	0.3	1.4																						
9-Oct	0.4	0.5	Z	0.7	1.0	0.9	1.0	0.3	2.3	2.5	0.4	0.0	0.0	0.2	0.2	0.2	0.5	1.2	1.0	0.6	0.6	0.6	0.6	0.5	0.7	2.5																						
10-Oct	0.7	0.8	0.6	Z	0.3	0.3	0.4	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.4	0.7	1.1	0.6	0.4	0.0	0.3	0.2	0.3	1.1																						
11-Oct	0.1	0.2	0.2	0.1	Z	0.2	0.1	0.1	0.0	C	C	C	C	C	C	0.3	0.4	0.5	0.3	2.0	0.5	0.3	0.2	0.1	--	2.0																						
12-Oct	0.7	1.2	0.3	0.2	0.8	Z	0.6	0.3	0.2	0.2	0.3	0.2	M	0.1	0.5	0.2	0.2	2.0	0.4	0.2	0.4	2.8	0.6	0.4	0.6	2.8																						
13-Oct	Z	0.3	0.3	0.4	0.3	0.8	1.0	0.3	0.5	0.4	0.5	0.7	0.6	0.3	0.3	0.4	0.3	0.4	0.6	0.8	0.3	0.4	0.2	0.5	1.0	1.0																						
14-Oct	0.3	Z	2.4	4.8	1.6	4.1	2.4	2.5	2.2	2.6	1.0	0.8	0.4	0.2	0.2	0.5	0.4	0.4	0.7	1.5	1.2	4.8	3.5	1.2	1.7	4.8																						
15-Oct	1.0	2.2	Z	0.6	0.2	0.1	0.3	0.2	1.1	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.3	0.3	0.5	0.3	0.4	0.4	2.2																						
16-Oct	0.5	0.3	0.4	Z	0.5	0.4	0.6	0.3	0.3	0.2	0.1	0.0	0.0	0.1	0.1	0.2	0.3	0.5	1.5	0.4	0.4	0.9	2.5	1.3	0.5	2.5																						
17-Oct	0.9	1.6	0.8	0.6	Z	0.5	0.6	0.6	0.6	0.3	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.3	0.3	0.8	0.3	0.4	1.6																						
18-Oct	1.2	0.6	2.9	0.7	0.4	0.4	Z	0.6	0.5	0.4	0.4	0.3	0.2	0.6	0.7	0.5	0.3	0.0	1.6	9.5	1.2	0.4	0.0	0.5	1.0	9.5																						
19-Oct	Z	1.5	0.3	0.2	0.2	0.2	0.4	0.4	0.5	0.8	0.1	0.0	0.0	0.0	0.0	0.0	1.0	4.8	0.5	0.3	0.3	0.0	0.1	0.0	0.5	4.8																						
20-Oct	0.0	Z	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.4	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.6	0.2	0.1	0.2	0.3	1.0	0.2	1.0																						
21-Oct	1.6	1.3	Z	0.5	0.5	0.6	0.6	0.5	0.4	0.5	0.6	0.4	0.6	0.8	0.4	0.2	0.1	0.1	0.0	0.1	0.0	0.1	0.5	0.4	0.5	1.6																						
22-Oct	0.1	0.1	0.0	Z	0.2	0.2	0.0	0.0	0.3	0.0	0.1	0.1	0.0	0.0	0.3	0.2	0.1	0.3	0.4	0.1	0.2	0.3	0.2	0.4	0.2	0.4																						
23-Oct	0.3	0.7	0.3	0.2	Z	0.3	0.2	0.4	0.1	0.2	0.3	0.2	0.1	0.1	0.0	0.1	0.2	0.1	0.3	0.5	0.1	0.1	0.1	0.1	0.2	0.7																						
24-Oct	0.1	0.1	0.1	0.1	0.1	Z	0.2	0.2	0.2	0.3	0.4	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.4	0.2	0.2	0.4	0.4																					
25-Oct	Z	0.4	0.5	0.4	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.5																						
26-Oct	0.0	Z	0.1	0.0	0.1	0.6	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.6																						
27-Oct	0.0	0.0	Z	0.0	0.0	0.1	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.1	2.9	3.2	0.3	3.2																						
28-Oct	0.4	2.0	4.6	Z	0.1	0.0	0.0	0.0	0.5	0.4	0.2	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.4	4.6																						
29-Oct	0.2	0.1	0.1	0.0	Z	0.0	0.1	0.0	0.2	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.2	2.7	0.5	0.1	0.1	0.1	0.1	0.1	0.2	2.7																						
30-Oct	0.2	0.0	0.0	0.0	0.0	Z	0.0	0.1	0.1	1.1	0.4	0.2	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.6	0.2	1.1																						
31-Oct	Z	0.3	0.5	0.3	0.5	1.0	0.8	0.6	0.3	0.4	0.3	0.4	0.2	0.2	1.5	2.2	2.3	0.4	0.2	0.1	0.3	1.7	1.5	0.7	2.3																							
																								0.5	0.7	0.7	0.5	0.5	0.5	0.4	0.3	0.4	0.4	0.3	0.2	0.2	0.2	0.3	0.3	0.3	1.3	1.1	0.9	1.1	0.7	0.7	0.6	Diurnal Average
																								2.1	2.2	4.6	4.8	2.1	4.1	2.4	2.5	2.3	2.6	1.1	0.8	0.6	0.8	3.6	1.5	2.2	19.5	18.3	9.5	17.3	4.8	3.5	3.2	Diurnal Maximum
Z - zerospan C - Calibration M - Maintenance																																																
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb																																																





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Lower Camp - October 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	686	97.17	97.17
3 - 4	12	1.70	98.87
5 - 7	4	0.57	99.43
8 - 11	1	0.14	99.58
> 11	3	0.42	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Lower Camp - October 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	6	6	8	22	205	90	13	2	6	27	69	69	75	44	33	686
3 - 4	0	0	0	0	0	6	3	1	1	0	0	0	1	0	0	0	12
5 - 7	0	0	0	0	0	2	0	1	1	0	0	0	0	0	0	0	4
8 - 11	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
> 11	0	0	0	0	0	0	0	2	0	1	0	0	0	0	0	0	3
Totals	11	6	6	8	22	213	93	17	5	7	27	69	70	75	44	33	706

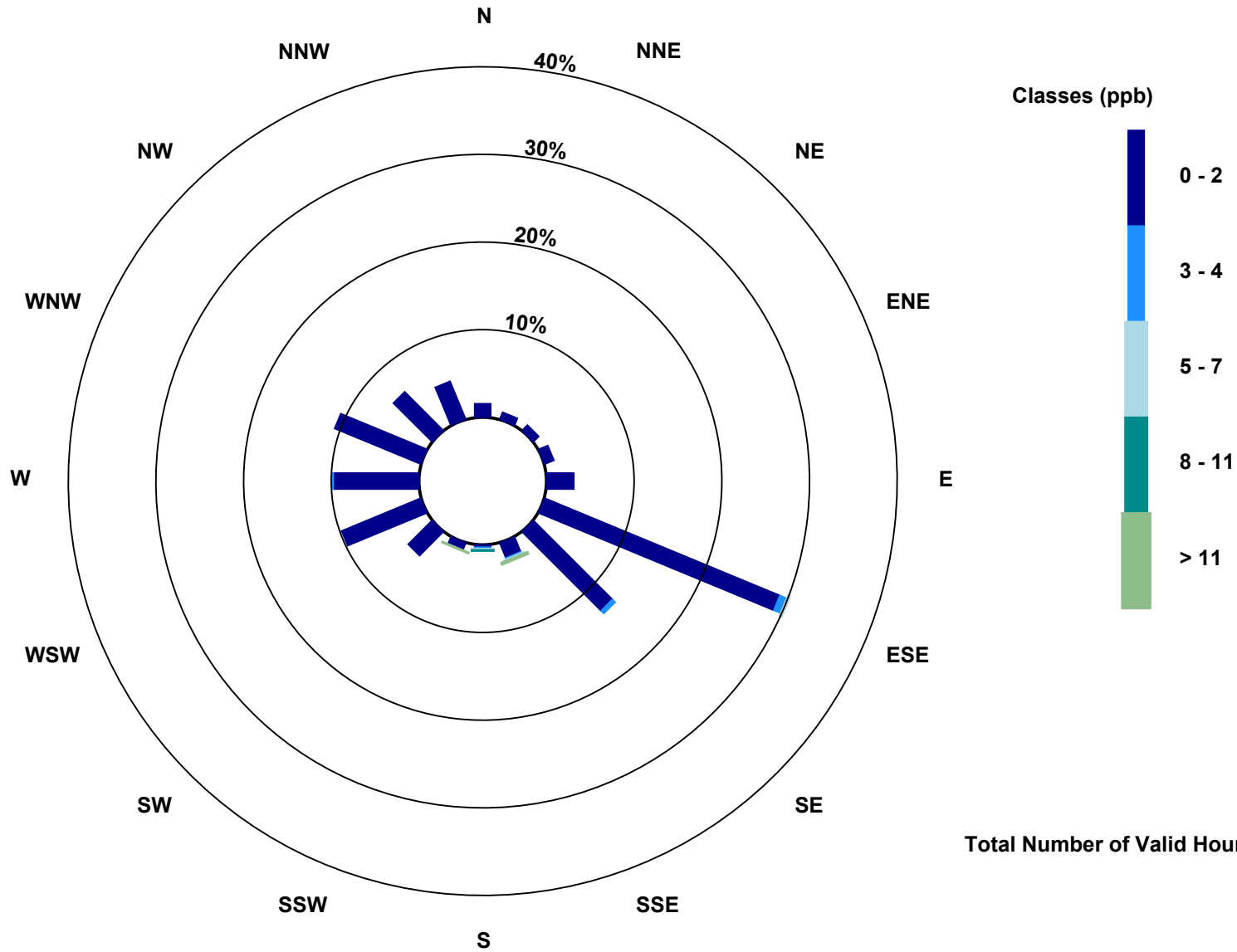
Total Number of Valid Hours: 706

Total Number of Hours: 744

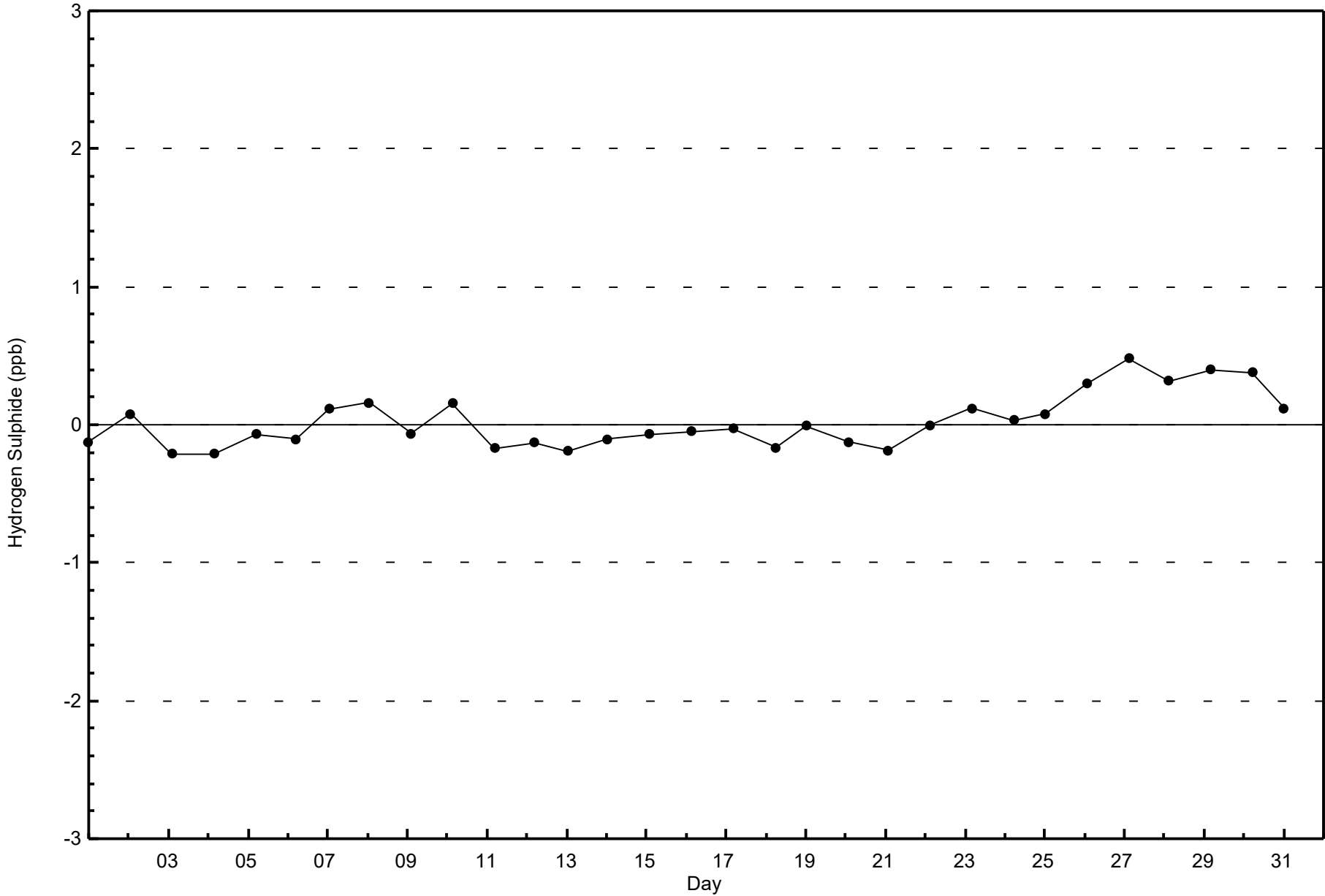


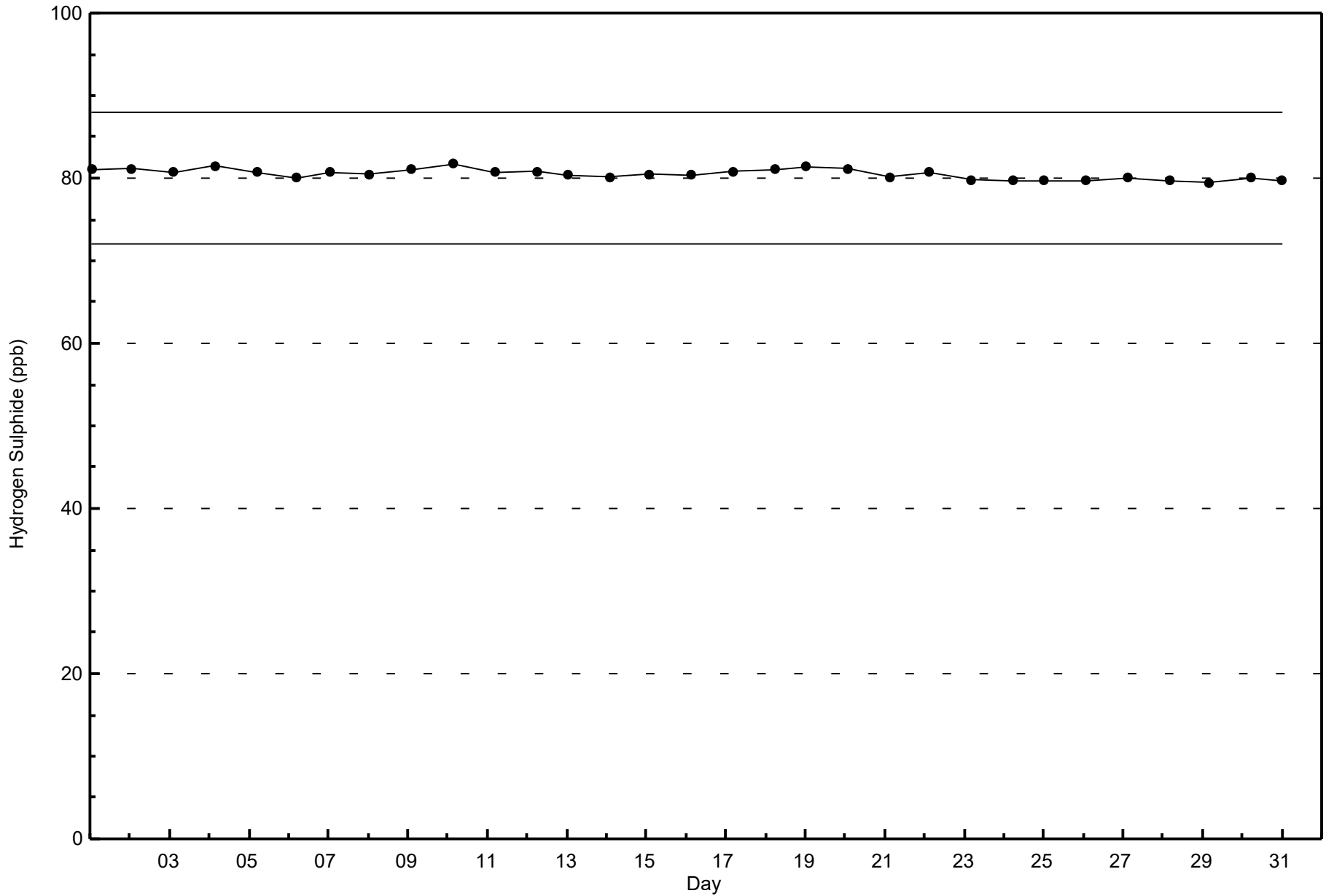
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Hydrogen Sulphide (H₂S) - ppb
Lower Camp



Total Number of Valid Hours: 706







Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

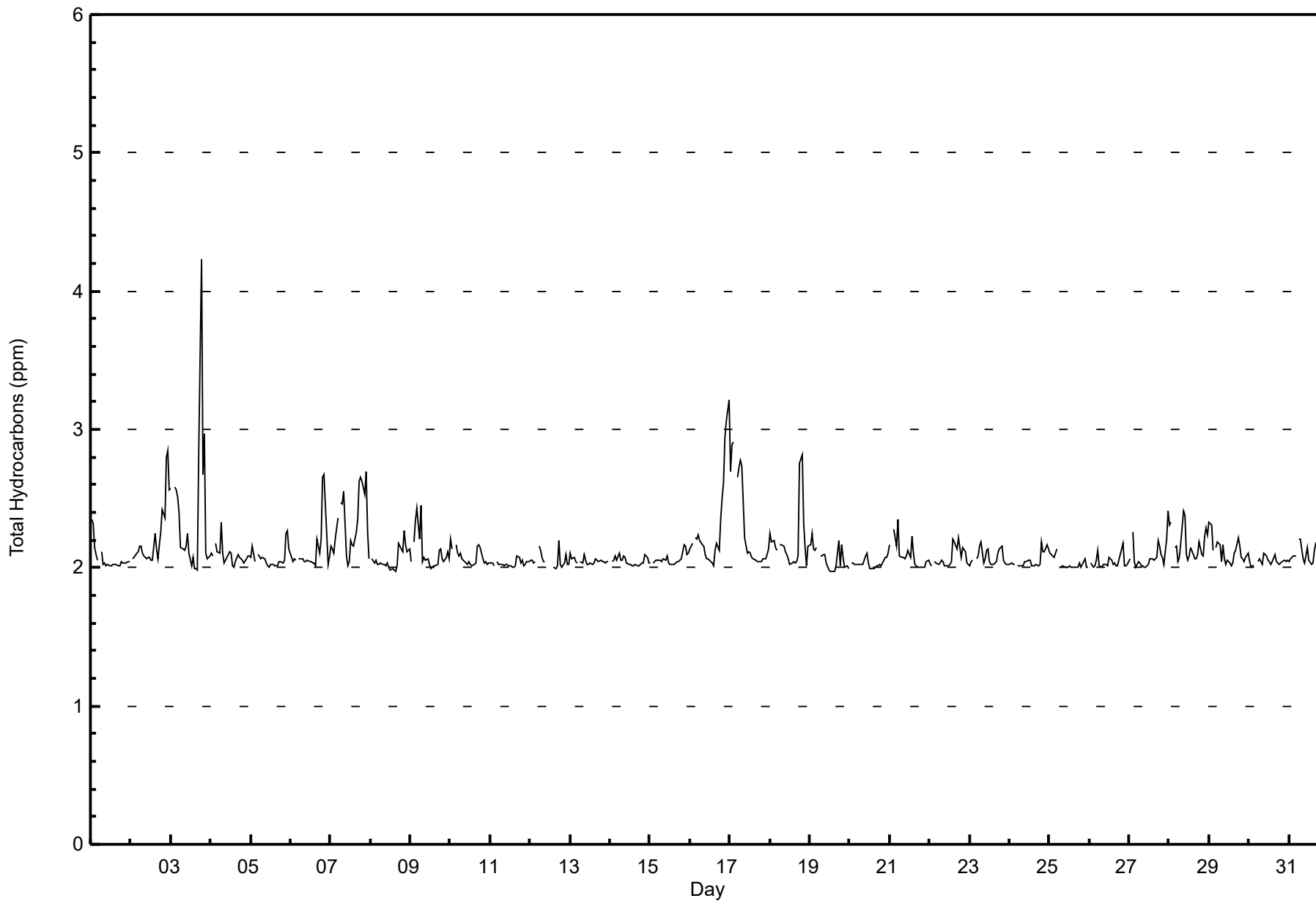
Lower Camp - October 2023

Maximum Value: 4.2 ppm on Oct 3 19:00		Maximum Daily Average: 2.4 ppm on Oct 3		Hours in Service: 744																																													
Minimum Value: 2.0 ppm on Oct 8 16:00		Minimum Daily Average: 2.0 ppm on Oct 11		Hours of Data: 709																																													
Maximum Diurnal Average: 2.2 ppm at hour 19		Minimum Diurnal Average: 2.0 ppm at hour 14		Hours of Missing Data: 35																																													
Monthly Average: 2.11 ppm		Percentiles: P ₁ = 2.0 P ₁₀ = 2.0 Q ₁ = 2.0 Median = 2.1 Q ₃ = 2.1 P ₉₀ = 2.2 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-Oct	2.4	2.3	2.1	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	2.4																								
2-Oct	Z	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.2	2.3	2.4	2.4	2.8	2.9	2.6	2.2	2.9																								
3-Oct	2.6	Z	2.6	2.6	2.5	2.4	2.1	2.1	2.1	2.2	2.2	2.1	2.0	2.1	2.0	2.0	2.0	2.9	4.2	2.7	3.0	2.1	2.1	2.1	2.4	4.2																							
4-Oct	2.1	2.1	Z	2.2	2.1	2.1	2.3	2.1	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.3																							
5-Oct	2.1	2.2	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	2.2	2.3	2.1	2.1	2.3																							
6-Oct	2.1	2.0	2.1	2.1	Z	2.1	2.1	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.2	2.1	2.2	2.7	2.7	2.4	2.0	2.1	2.1	2.7																							
7-Oct	2.2	2.1	2.1	2.2	2.4	Z	2.5	2.5	2.6	2.1	2.0	2.0	2.2	2.2	2.2	2.3	2.3	2.6	2.7	2.6	2.5	2.7	2.3	2.1	2.1	2.3	2.7																						
8-Oct	Z	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	2.2	2.1	2.1	2.3	2.2	2.1	2.1	2.1	2.1	2.3																						
9-Oct	2.0	Z	2.2	2.3	2.4	2.2	2.5	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.5																						
10-Oct	2.2	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	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.2	2.2																						
11-Oct	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	2.1	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1																						
12-Oct	2.1	2.1	2.0	2.0	Z	2.2	2.1	2.1	2.0	2.0	C	C	C	C	2.0	2.0	2.0	2.2	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.2																							
13-Oct	2.1	2.1	2.1	2.0	2.0	Z	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1																						
14-Oct	Z	2.0	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	2.1	2.1	2.0	2.0	2.0	2.1																						
15-Oct	2.0	Z	2.0	2.0	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.2																						
16-Oct	2.1	2.2	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	2.2	2.1	2.4	2.5	2.6	2.9	3.1	3.2	2.3	3.2																							
17-Oct	2.7	2.9	2.9	Z	2.7	2.7	2.8	2.7	2.5	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.3	2.9																						
18-Oct	2.2	2.2	2.2	2.1	2.1	Z	2.2	2.2	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.8	2.8	2.3	2.1	2.0	2.2	2.2	2.2	2.8																						
19-Oct	2.2	2.2	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	2.2	2.0	2.2	2.1	2.0	2.0	2.0	2.1	2.2	2.2																						
20-Oct	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	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																						
21-Oct	2.2	Z	2.3	2.2	2.2	2.3	2.1	2.1	2.1	2.1	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	2.1	2.1	2.1	2.3																						
22-Oct	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	2.2	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.2																						
23-Oct	2.0	2.0	2.1	Z	2.1	2.1	2.2	2.2	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.1	2.0	2.0	2.0	2.1	2.1	2.2																						
24-Oct	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.1	2.1	2.2	2.1	2.1	2.1	2.2																						
25-Oct	2.1	2.1	2.1	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	2.1	2.0	2.0	2.0	2.0	2.1																						
26-Oct	Z	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.0	2.0	2.0	2.0	2.0	2.2																						
27-Oct	2.1	Z	2.3	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	2.2	2.2	2.1	2.1	2.0	2.2	2.4	2.1	2.4																							
28-Oct	2.3	2.3	Z	2.1	2.2	2.0	2.1	2.2	2.4	2.4	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.2	2.3	2.2	2.2	2.2	2.4																						
29-Oct	2.3	2.3	2.1	Z	2.1	2.2	2.2	2.0	2.2	2.1	2.0	2.1	2.0	2.0	2.0	2.1	2.1	2.2	2.2	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.3																						
30-Oct	2.0	2.0	2.0	2.0	Z	2.0	2.1	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.1																						
31-Oct	2.0	2.1	2.1	2.1	2.1	Z	2.2	2.2	2.1	2.0	2.1	2.1	2.1	2.0	2.0	2.1	2.2	2.2	2.0	2.0	2.0	2.1	2.1	2.2	2.1	2.1	2.2																						
																								2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.1	Diurnal Average		
																								2.7	2.9	2.9	2.6	2.7	2.7	2.8	2.7	2.6	2.4	2.2	2.1	2.2	2.2	2.2	2.3	2.3	2.9	4.2	2.8	3.0	2.9	3.1	3.2	Diurnal Maximum	
Z - zerspan		C - Calibration																																															



Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Lower Camp - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Lower Camp - October 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	323	45.56	45.56
2.1 - 3.0	383	54.02	99.58
3.1 - 10.0	3	0.42	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Total Hydrocarbons (THC) - ppm
Lower Camp - October 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	2	2	1	3	94	50	5	1	2	21	54	11	30	22	18	323
2.1 - 3.0	5	3	5	7	19	122	43	10	4	5	7	14	57	47	20	15	383
3.1 - 10.0	0	0	0	0	0	0	0	1	0	0	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	12	5	7	8	22	216	93	16	5	7	28	68	69	78	42	33	709

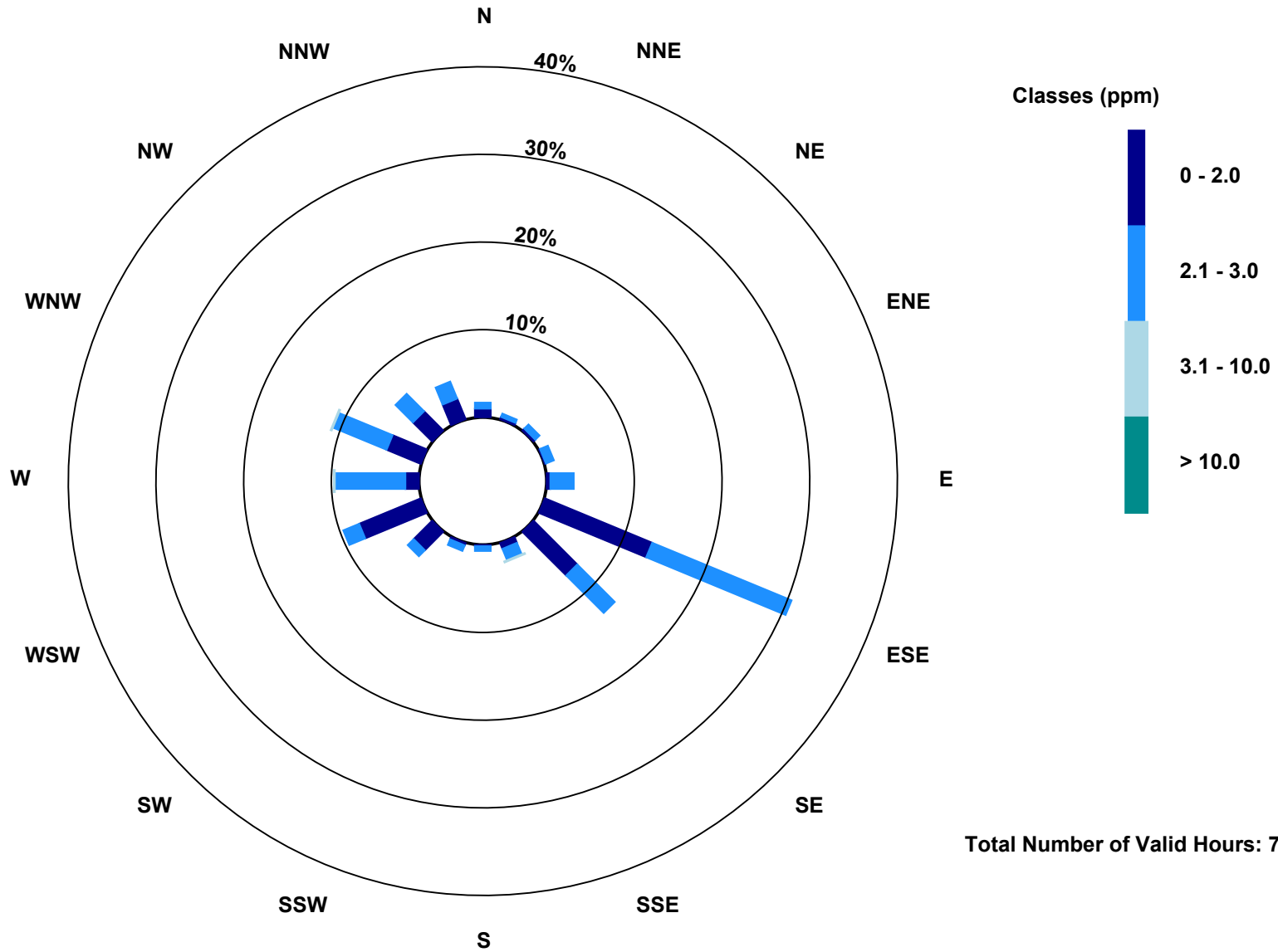
Total Number of Valid Hours: 709

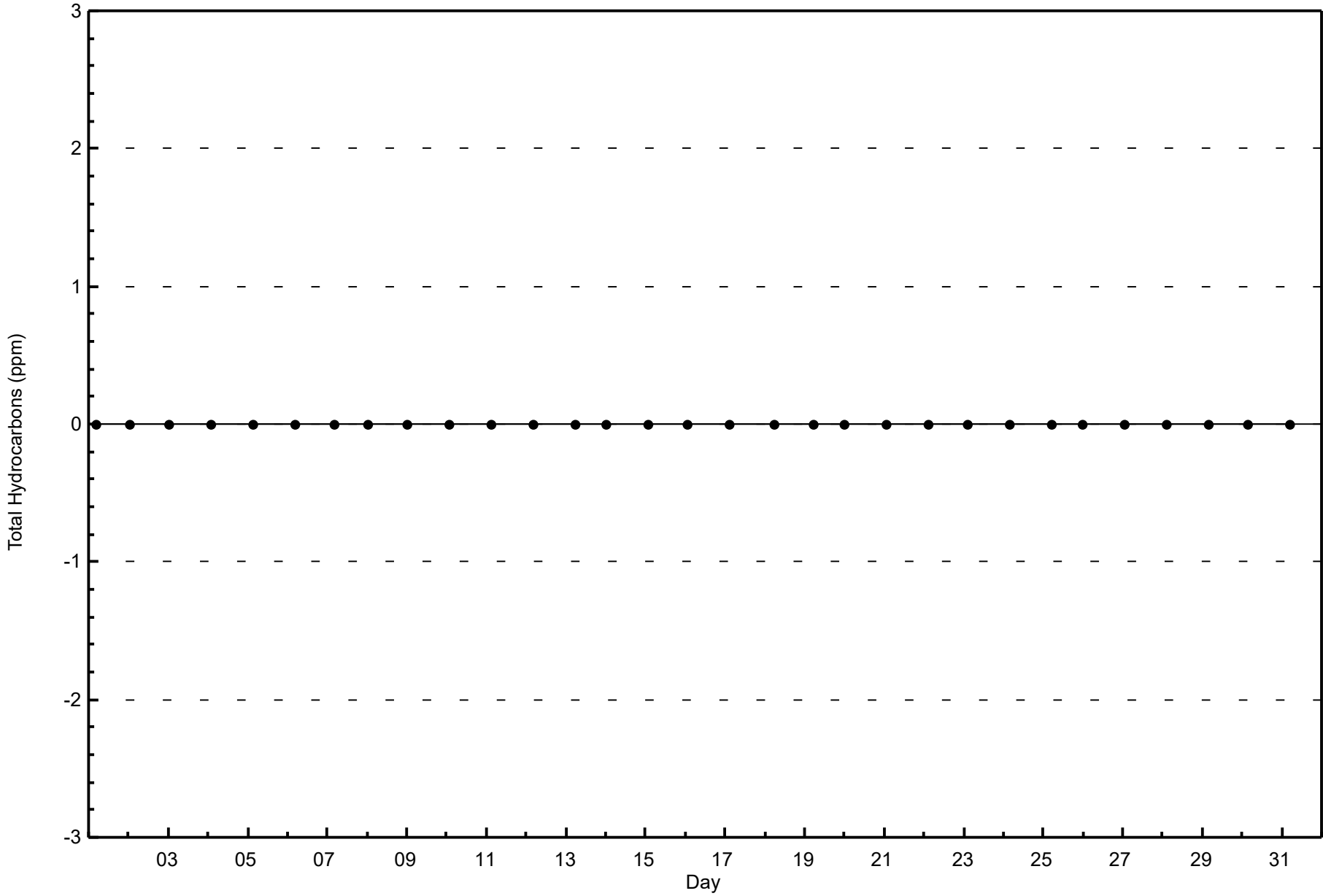
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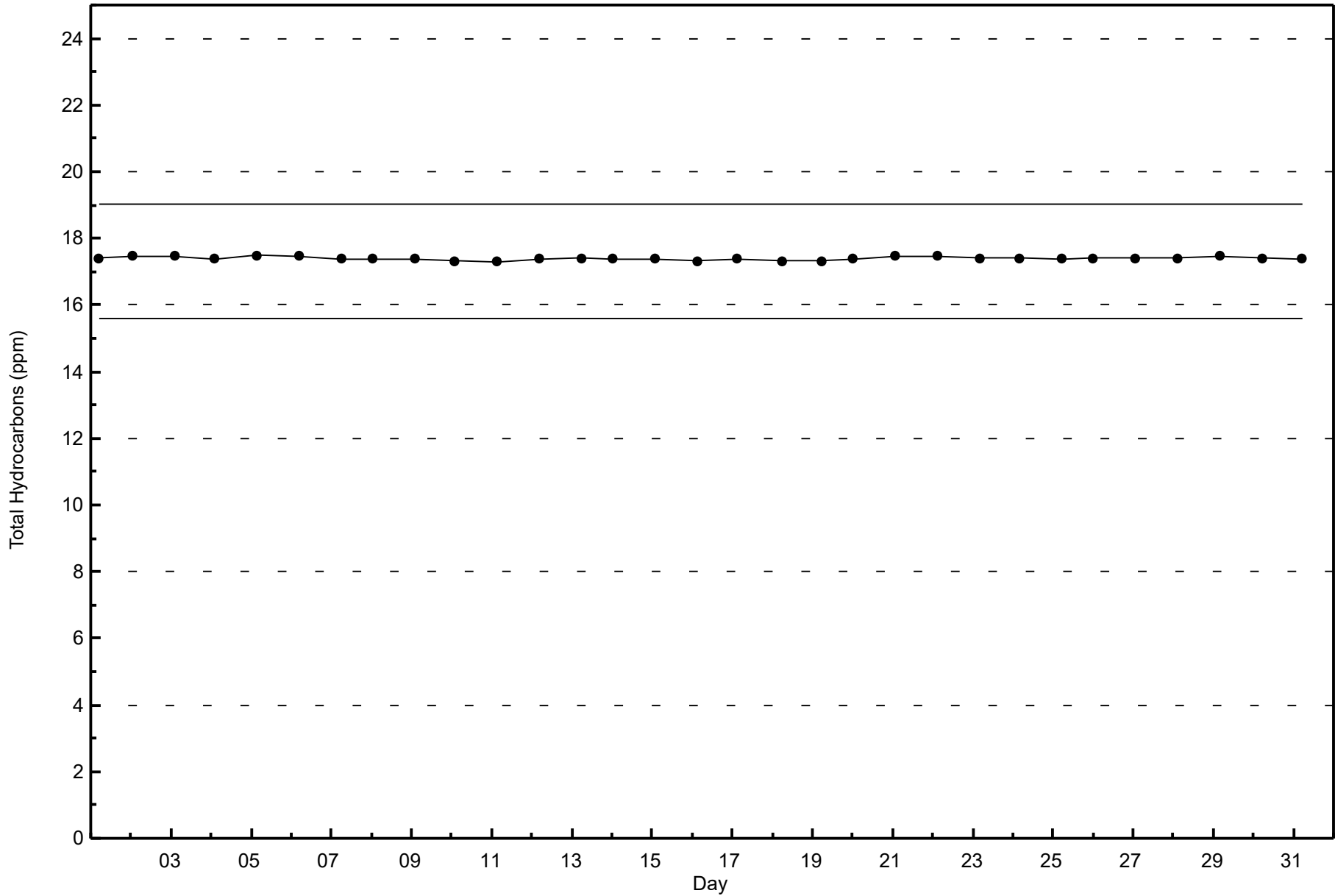


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Total Hydrocarbons (THC) - ppm
Lower Camp









Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH₄) - ppm

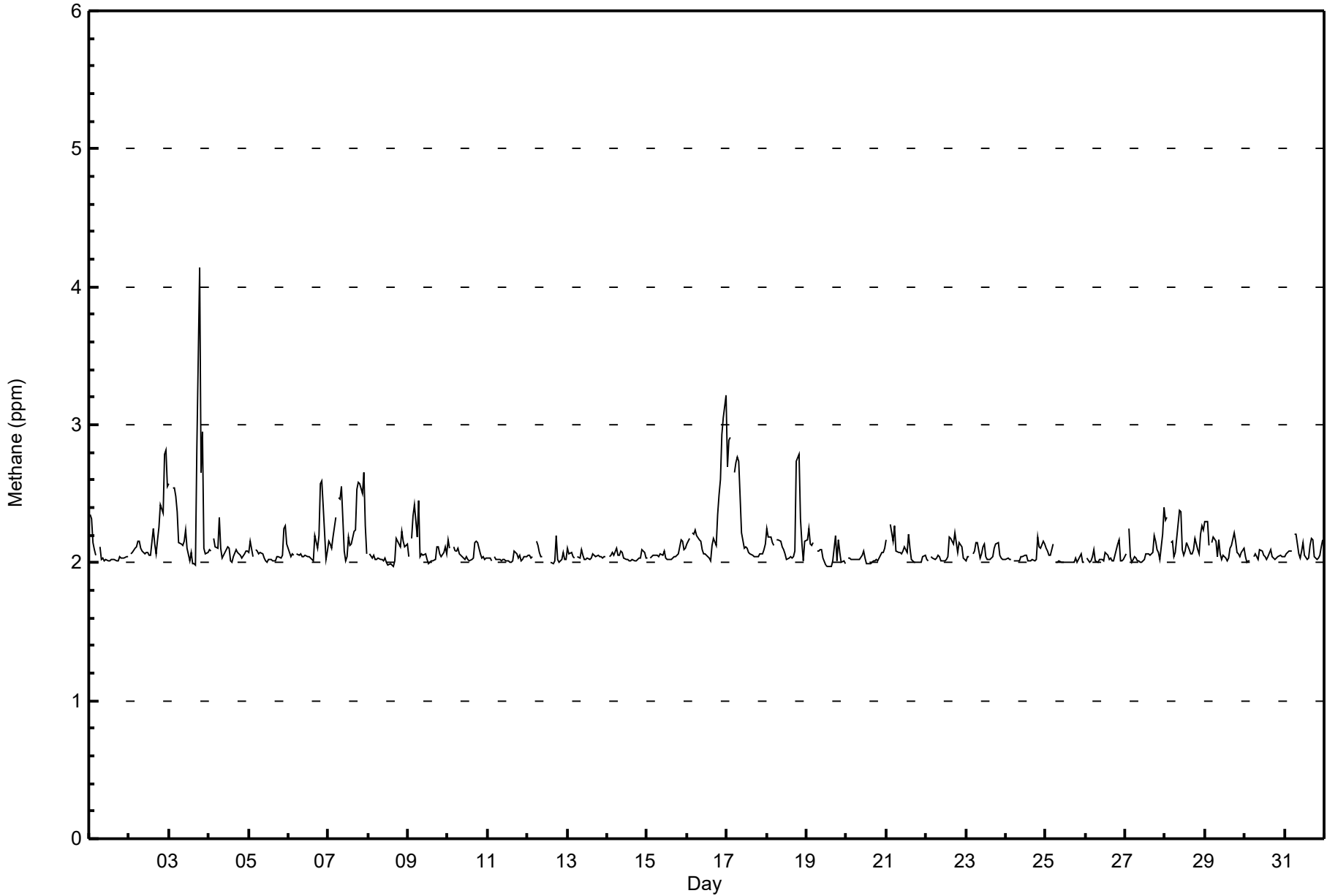
Lower Camp - October 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:														744																													
Maximum Value: 4.1 ppm on Oct 3 19:00		Maximum Daily Average: 2.4 ppm on Oct 3														Hours of Data:		709																															
Minimum Value: 2.0 ppm on Oct 8 16:00		Minimum Daily Average: 2.0 ppm on Oct 25														Hours of Missing Data:		35																															
Maximum Diurnal Average: 2.2 ppm at hour 19		Minimum Diurnal Average: 2.0 ppm at hour 14														Hours of Calibration:		35																															
Monthly Average: 2.11 ppm		Percentiles: P ₁ = 2.0 P ₁₀ = 2.0 Q ₁ = 2.0 Median = 2.1 Q ₃ = 2.1 P ₉₀ = 2.2 P ₉₉ = 2.8														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-Oct	2.4	2.3	2.1	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	2.0	2.1	2.4																							
2-Oct	Z	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.2	2.3	2.4	2.4	2.8	2.8	2.6	2.2	2.8																								
3-Oct	2.6	Z	2.5	2.5	2.5	2.4	2.1	2.1	2.1	2.2	2.2	2.1	2.0	2.1	2.0	2.0	2.0	2.8	4.1	2.7	3.0	2.1	2.1	2.1	2.4	4.1																							
4-Oct	2.1	2.1	Z	2.2	2.1	2.1	2.3	2.1	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.3																							
5-Oct	2.1	2.2	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	2.2	2.3	2.1	2.1	2.3																							
6-Oct	2.1	2.0	2.1	2.1	Z	2.1	2.1	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.2	2.1	2.2	2.6	2.6	2.4	2.0	2.1	2.1	2.6																							
7-Oct	2.2	2.1	2.1	2.2	2.3	Z	2.5	2.5	2.5	2.1	2.0	2.0	2.2	2.1	2.1	2.2	2.2	2.5	2.6	2.6	2.5	2.7	2.3	2.1	2.1	2.7																							
8-Oct	Z	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	2.2	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.2																							
9-Oct	2.0	Z	2.2	2.3	2.4	2.2	2.5	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.5																							
10-Oct	2.2	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	2.1	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.2																							
11-Oct	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	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.1																							
12-Oct	2.1	2.1	2.0	2.0	Z	2.2	2.1	2.1	2.0	2.0	C	C	C	C	2.0	2.0	2.0	2.2	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.2																							
13-Oct	2.1	2.1	2.1	2.0	2.0	Z	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1																							
14-Oct	Z	2.0	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	2.1	2.1	2.0	2.0	2.1																							
15-Oct	2.0	Z	2.0	2.0	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.2																							
16-Oct	2.1	2.2	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	2.2	2.1	2.4	2.5	2.6	2.9	3.0	3.2	2.3	3.2																							
17-Oct	2.7	2.9	2.9	Z	2.7	2.7	2.8	2.7	2.5	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.9																							
18-Oct	2.2	2.2	2.2	2.1	2.1	Z	2.2	2.2	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.7	2.8	2.3	2.1	2.0	2.2	2.2	2.8																							
19-Oct	2.2	2.2	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	2.2	2.0	2.2	2.1	2.0	2.0	2.0	2.1	2.2																							
20-Oct	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.1																							
21-Oct	2.2	Z	2.3	2.2	2.2	2.3	2.1	2.1	2.1	2.1	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	2.1	2.1	2.3																							
22-Oct	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	2.2	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.2																							
23-Oct	2.0	2.0	2.0	Z	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	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1																							
24-Oct	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.1	2.1	2.2	2.1	2.0	2.2																							
25-Oct	2.1	2.1	2.1	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	2.1	2.0	2.0	2.0	2.1																							
26-Oct	Z	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.0	2.0	2.0	2.0	2.2																							
27-Oct	2.1	Z	2.3	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	2.2	2.2	2.1	2.1	2.0	2.2	2.4	2.1	2.4																							
28-Oct	2.3	2.3	Z	2.1	2.2	2.0	2.1	2.2	2.4	2.4	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.2	2.3	2.2	2.2	2.4																							
29-Oct	2.3	2.3	2.1	Z	2.1	2.2	2.2	2.0	2.2	2.1	2.0	2.1	2.0	2.0	2.0	2.1	2.1	2.2	2.2	2.1	2.1	2.0	2.1	2.1	2.1	2.3																							
30-Oct	2.0	2.0	2.0	2.0	Z	2.0	2.1	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.1																							
31-Oct	2.0	2.1	2.1	2.1	2.1	Z	2.2	2.2	2.1	2.0	2.1	2.1	2.1	2.0	2.0	2.1	2.2	2.2	2.0	2.0	2.0	2.1	2.1	2.2	2.1	2.2																							
																								2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.1	Diurnal Average		
																								2.7	2.9	2.9	2.5	2.7	2.7	2.8	2.7	2.5	2.4	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.8	4.1	2.8	3.0	2.9	3.0	3.2	Diurnal Maximum	
Z - zerospan C - Calibration																																																	



Wood Buffalo Environmental Association
Hourly Averages

Methane (CH₄) - ppm
Lower Camp - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Methane (CH₄) - ppm
Lower Camp - October 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	325	45.84	45.84
2.1 - 3.0	382	53.88	99.72
3.1 - 10.0	2	0.28	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Methane (CH₄) - ppm
Lower Camp - October 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	2	2	1	3	94	50	5	1	2	21	54	12	30	23	18	325
2.1 - 3.0	5	3	5	7	19	122	43	10	4	5	7	14	56	48	19	15	382
3.1 - 10.0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	2
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	12	5	7	8	22	216	93	16	5	7	28	68	69	78	42	33	709

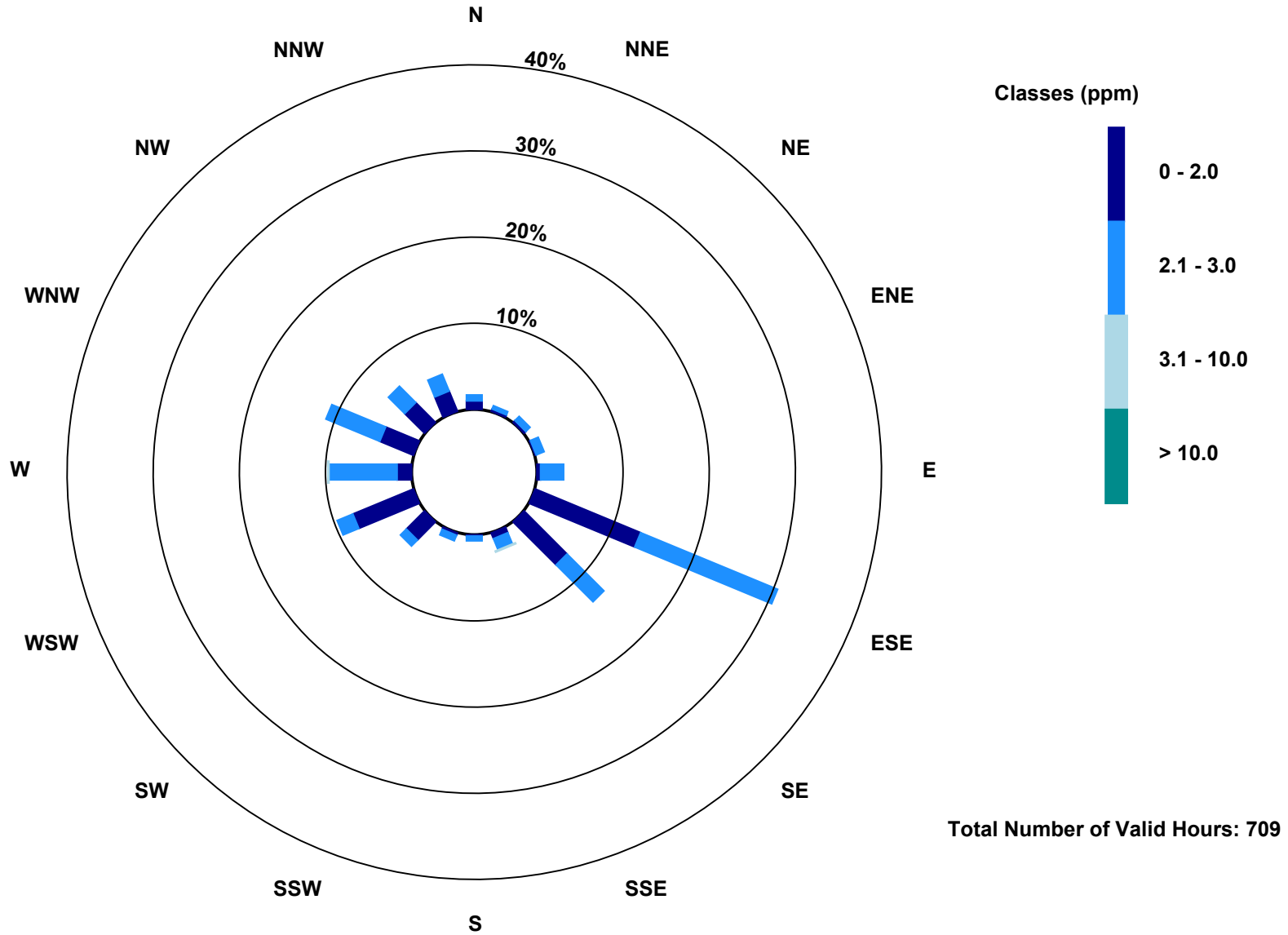
Total Number of Valid Hours: 709

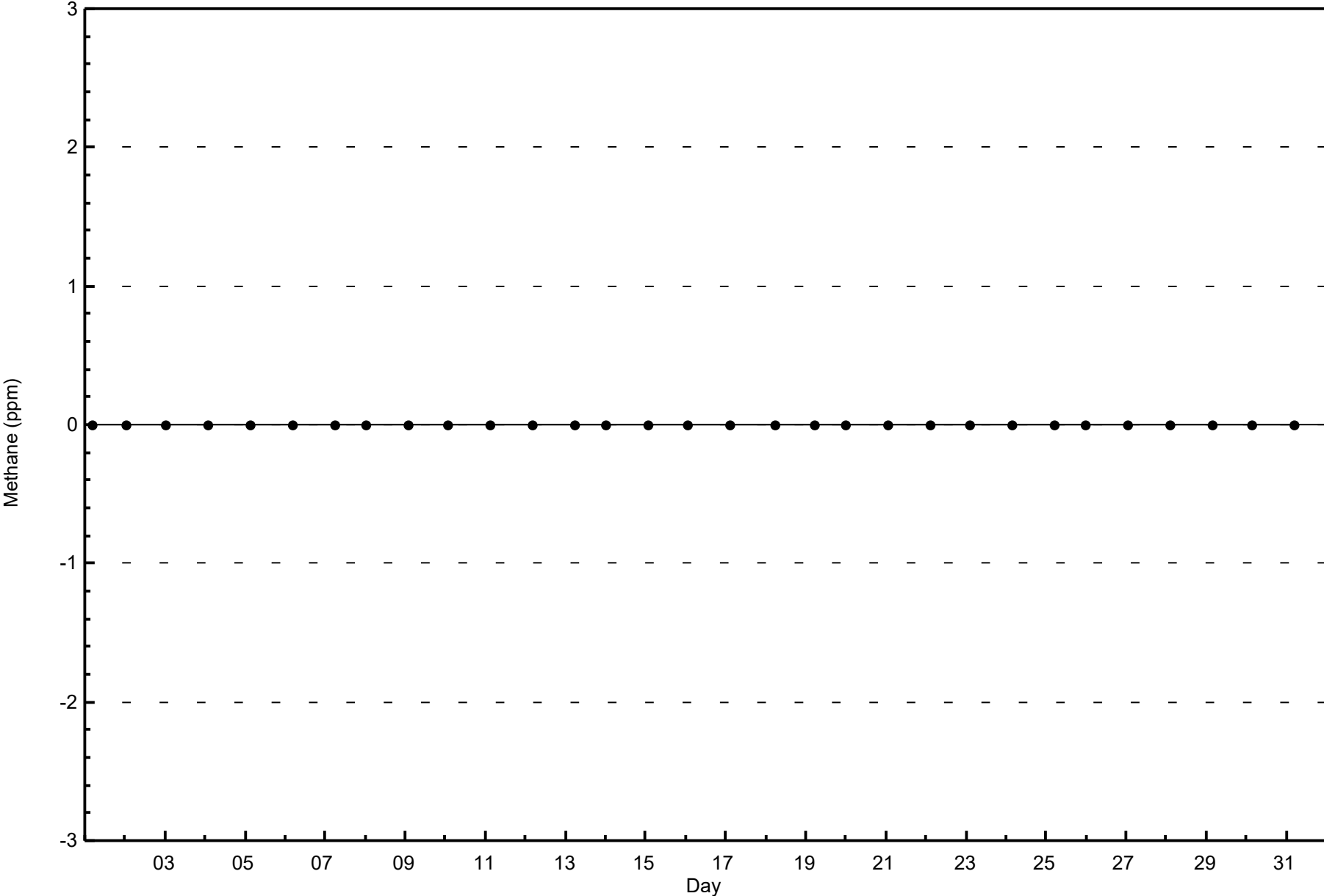
Total Number of Hours: 744

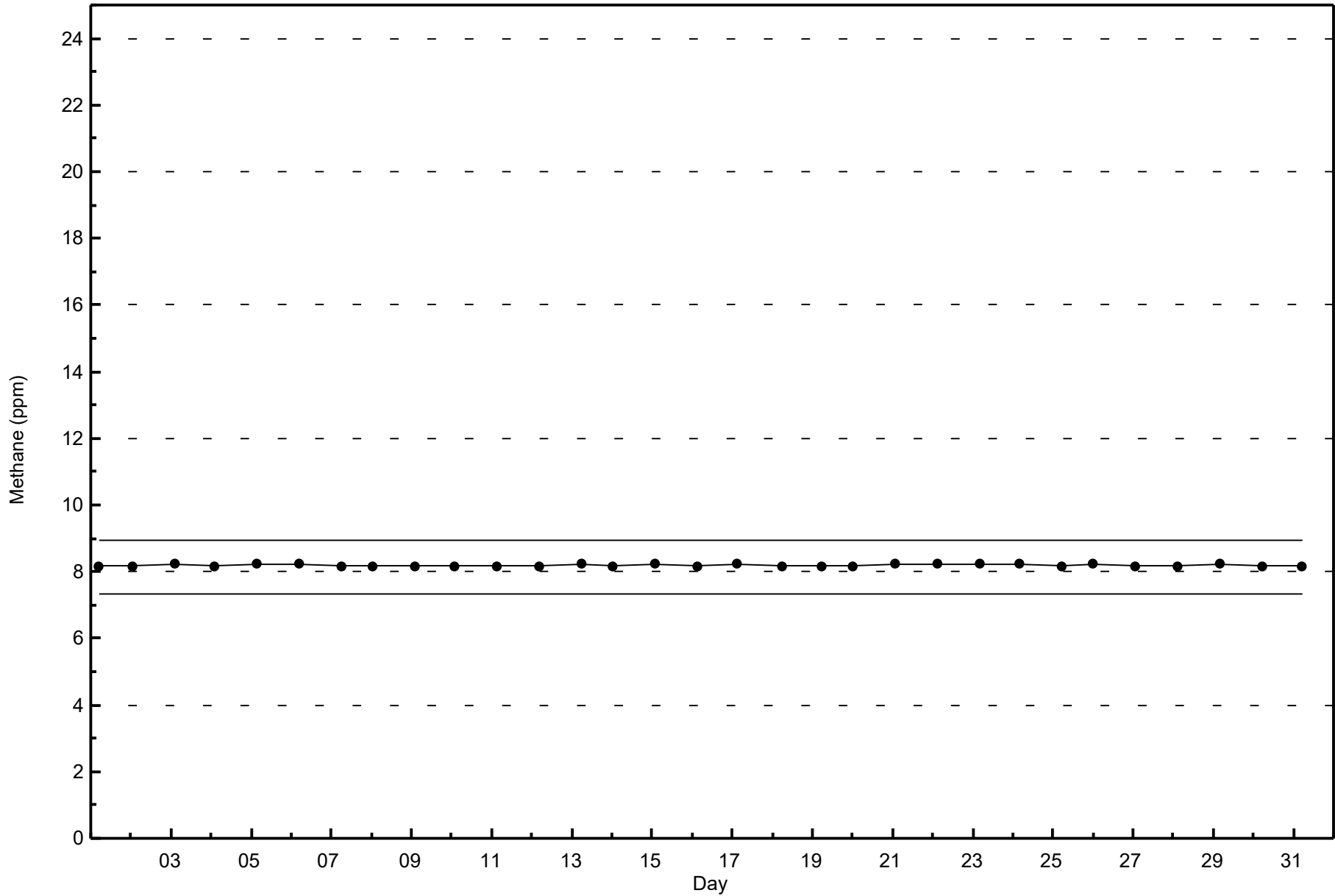


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Methane (CH₄) - ppm
Lower Camp

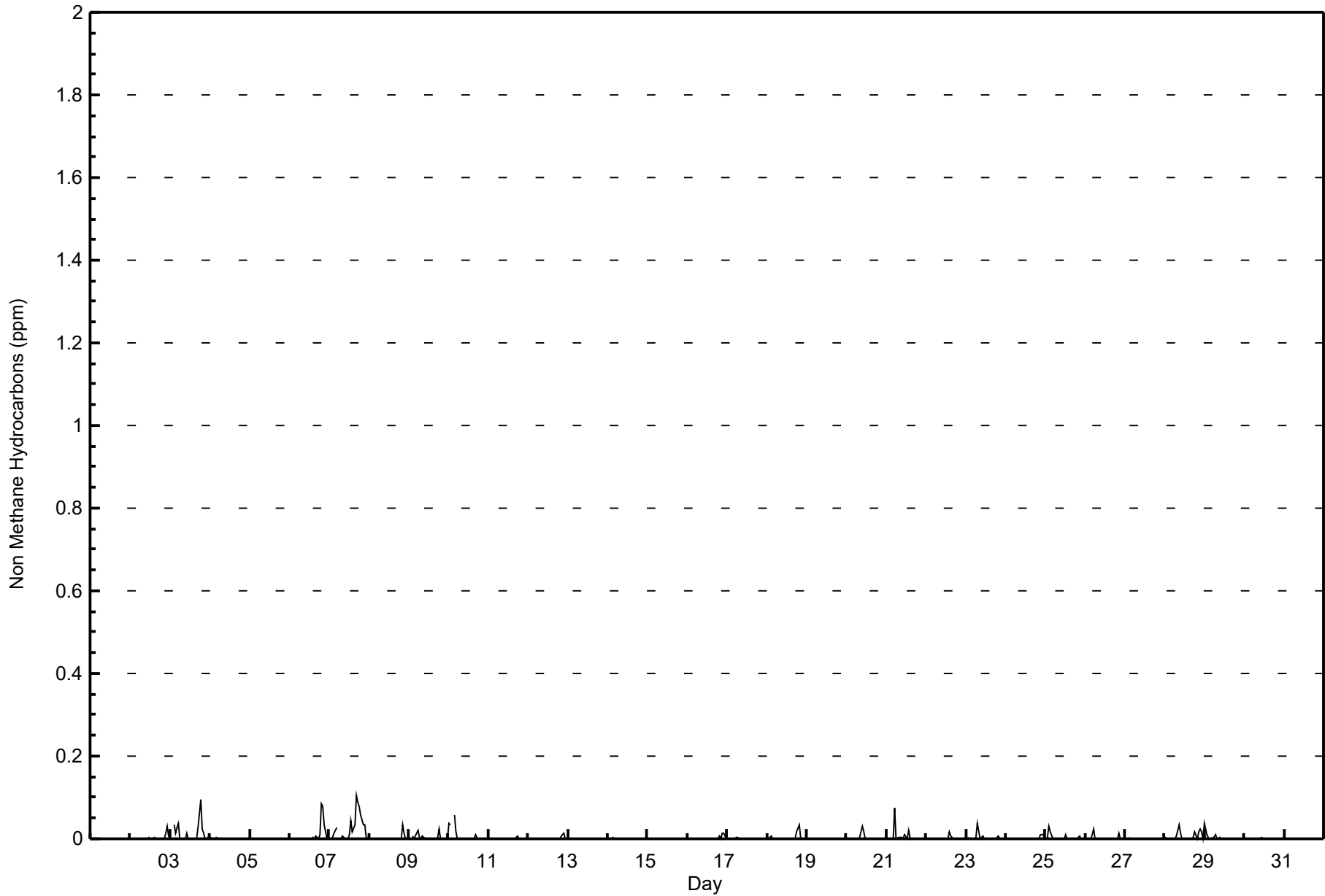








Maximum Value: 0.106 ppm on Oct 7 17:00																				Maximum Daily Average: 0.024 ppm on Oct 7					Hours in Service: 744	
Minimum Value: 0.000 ppm on Oct 1 01:00																				Minimum Daily Average: 0.000 ppm on Oct 5					Hours of Data: 709	
Maximum Diurnal Average: 0.008 ppm at hour 19																				Minimum Diurnal Average: 0.001 ppm at hour 12					Hours of Missing Data: 35	
Monthly Average: 0.003 ppm																				Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.0 P ₉₉ = 0.1					Hours of Calibration: 35	
																									Percent Operational Time: 100.0	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Oct	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	0.001	0.000	0.000	0.001
2-Oct	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.012	0.030	0.007	0.002	0.030
3-Oct	0.001	Z	0.035	0.014	0.027	0.036	0.000	0.000	0.000	0.000	0.013	0.001	0.000	0.000	0.000	0.000	0.000	0.028	0.094	0.022	0.015	0.000	0.000	0.008	0.013	0.094
4-Oct	0.003	0.000	Z	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003
5-Oct	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
6-Oct	0.000	0.000	0.000	0.000	Z	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.007	0.000	0.012	0.084	0.079	0.035	0.000	0.001	0.010	0.084
7-Oct	0.000	0.000	0.002	0.014	0.027	Z	0.000	0.000	0.007	0.000	0.000	0.001	0.011	0.045	0.015	0.034	0.106	0.089	0.077	0.058	0.032	0.036	0.003	0.000	0.024	0.106
8-Oct	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	0.033	0.014	0.000	0.001	0.002	0.033
9-Oct	0.000	Z	0.006	0.000	0.008	0.019	0.002	0.000	0.006	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.023	0.000	0.000	0.000	0.000	0.000	0.003	0.023
10-Oct	0.036	0.035	Z	0.056	0.016	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.010	0.002	0.000	0.001	0.000	0.000	0.000	0.000	0.007	0.056
11-Oct	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	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006
12-Oct	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	C	C	C	C	0.000	0.000	0.000	0.000	0.000	0.000	0.010	0.012	0.000	0.000	0.001	0.012
13-Oct	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
14-Oct	Z	0.000	0.000	0.002	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002
15-Oct	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
16-Oct	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	0.006	0.001	0.013	0.015	0.000	0.002	0.015
17-Oct	0.000	0.000	0.000	Z	0.000	0.002	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002
18-Oct	0.000	0.000	0.008	0.002	0.000	Z	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.016	0.034	0.000	0.000	0.000	0.000	0.003	0.034
19-Oct	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
20-Oct	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.029	0.019	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.029
21-Oct	0.000	Z	0.000	0.000	0.001	0.073	0.000	0.003	0.003	0.002	0.000	0.011	0.001	0.020	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.073
22-Oct	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	0.018	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.018
23-Oct	0.000	0.000	0.003	Z	0.000	0.000	0.005	0.039	0.000	0.003	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.000	0.000	0.000	0.000	0.003	0.039
24-Oct	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	0.001	0.000	0.009	0.009	0.000	0.001	0.009
25-Oct	0.000	0.005	0.029	0.018	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.000	0.000	0.000	0.003	0.029
26-Oct	Z	0.000	0.000	0.000	0.011	0.024	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.015	0.000	0.000	0.000	0.002	0.024
27-Oct	0.000	Z	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.004
28-Oct	0.005	0.000	Z	0.000	0.000	0.000	0.000	0.005	0.032	0.013	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.016	0.001	0.018	0.024	0.016	0.001	0.006	0.032
29-Oct	0.037	0.006	0.003	Z	0.004	0.001	0.010	0.000	0.001	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.037
30-Oct	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.001	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.003
31-Oct	0.000	0.000	0.001	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
																				0.003 0.002 0.003 0.004 0.004 0.007 0.001 0.002 0.002 0.002 0.001 0.001 0.001 0.002 0.001 0.001 0.004 0.004 0.008 0.007 0.007 0.005 0.002 0.001					Diurnal Average	
																				0.037 0.035 0.035 0.056 0.027 0.073 0.010 0.039 0.032 0.029 0.019 0.011 0.011 0.045 0.018 0.034 0.106 0.089 0.094 0.084 0.079 0.036 0.030 0.008					Diurnal Maximum	
Z - zerospan																				C - Calibration						





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Lower Camp - October 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	630	88.86	88.86
0.006 - 0.05	70	9.87	98.73
0.06 - 0.1	9	1.27	100.00
> 0.1	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Lower Camp - October 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	5	6	5	17	196	86	11	4	5	27	64	48	75	38	31	630
0.006 - 0.05	0	0	1	3	4	18	5	3	1	1	1	4	20	3	4	2	70
0.06 - 0.1	0	0	0	0	1	2	2	2	0	1	0	0	1	0	0	0	9
> 0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	12	5	7	8	22	216	93	16	5	7	28	68	69	78	42	33	709

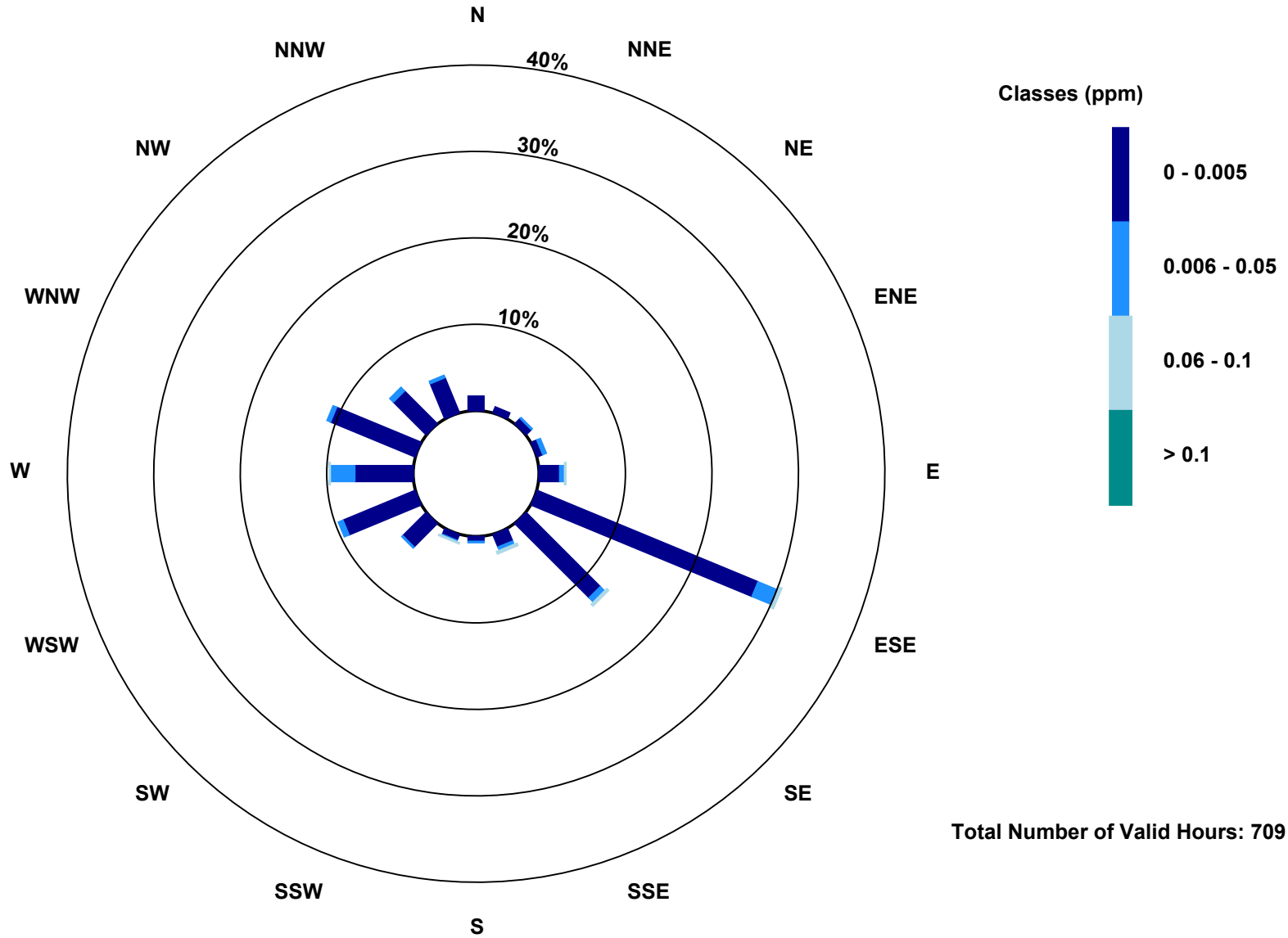
Total Number of Valid Hours: 709

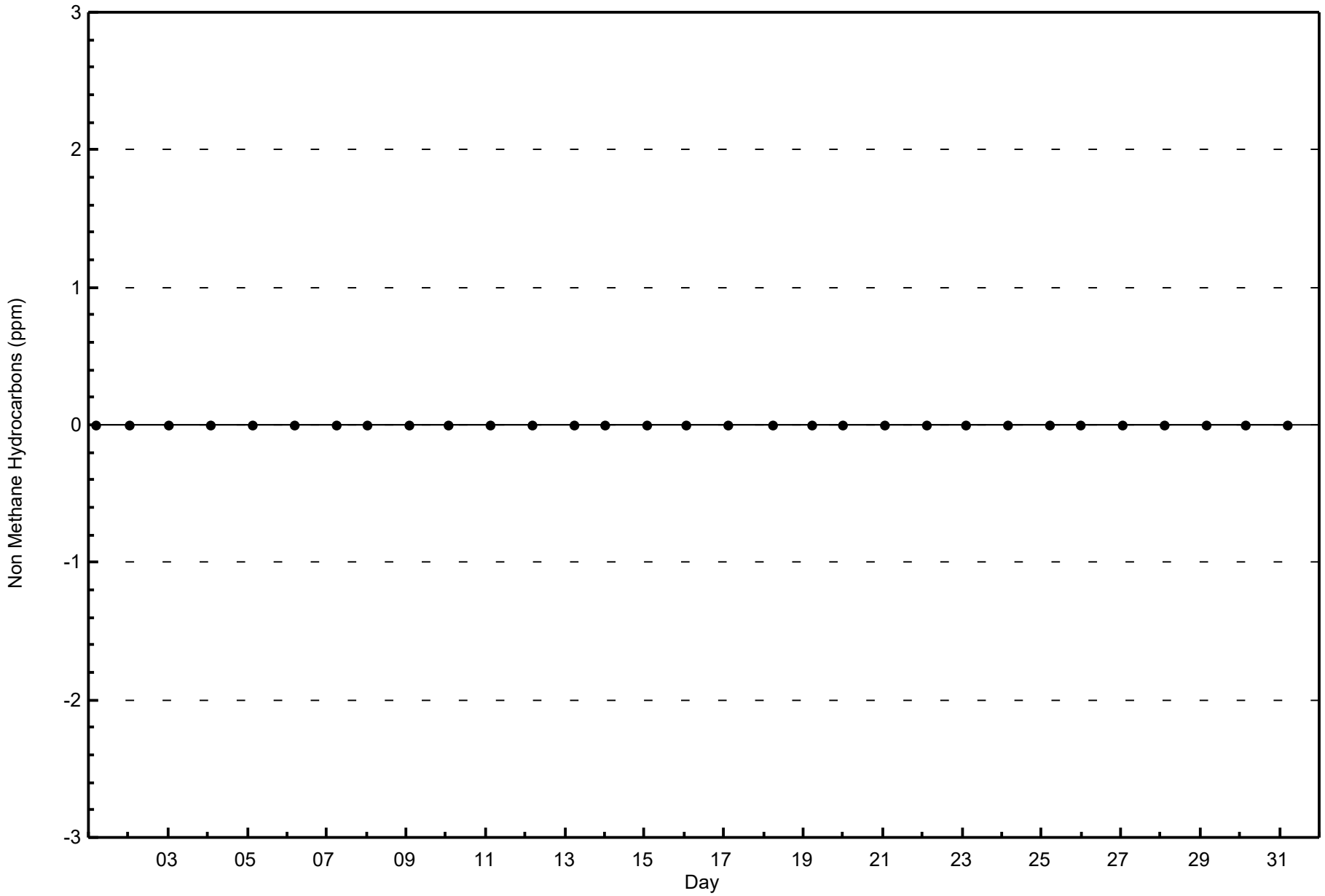
Total Number of Hours: 744

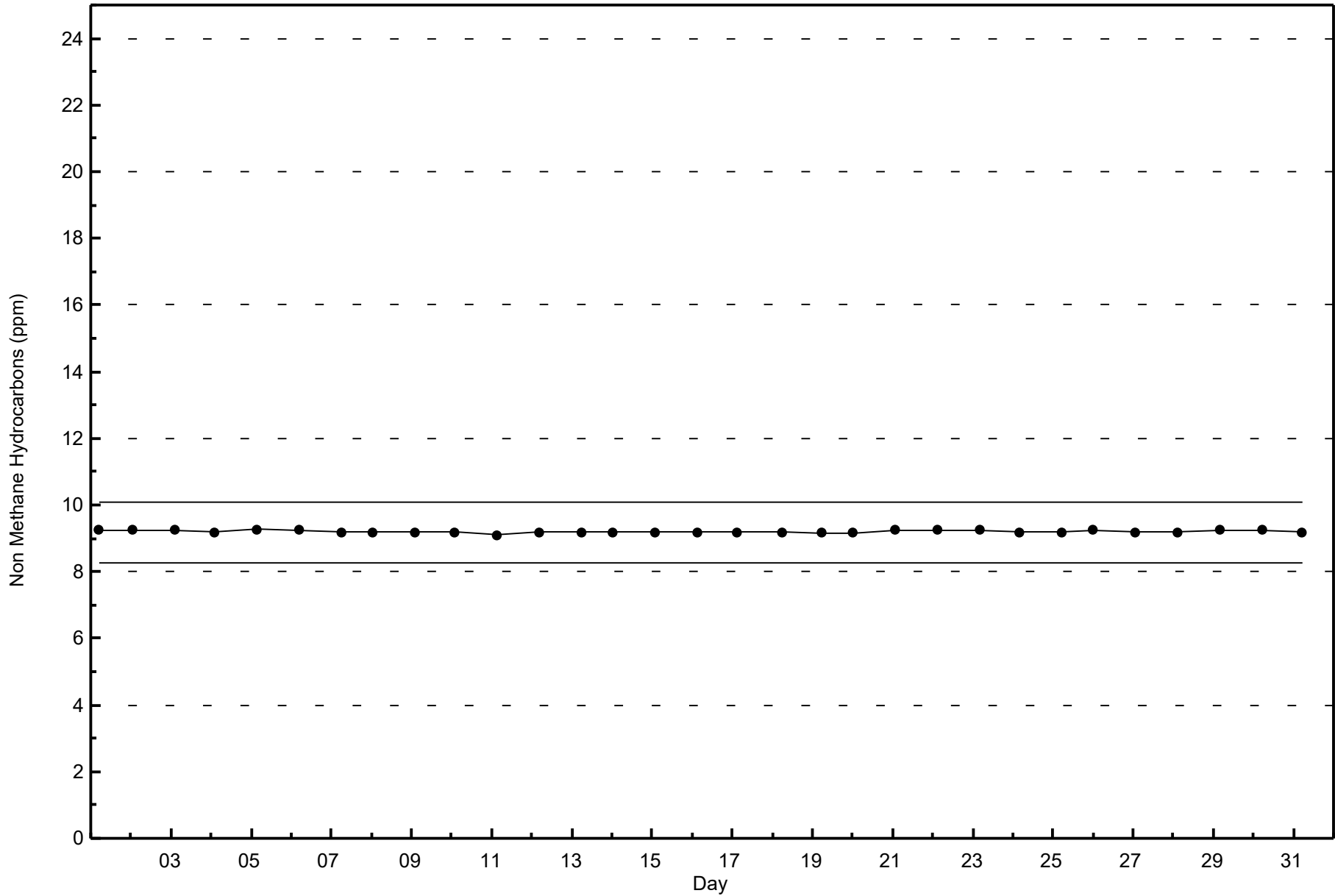


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Non Methane Hydrocarbons (NMHC) - ppm
Lower Camp









Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature (AT) - C

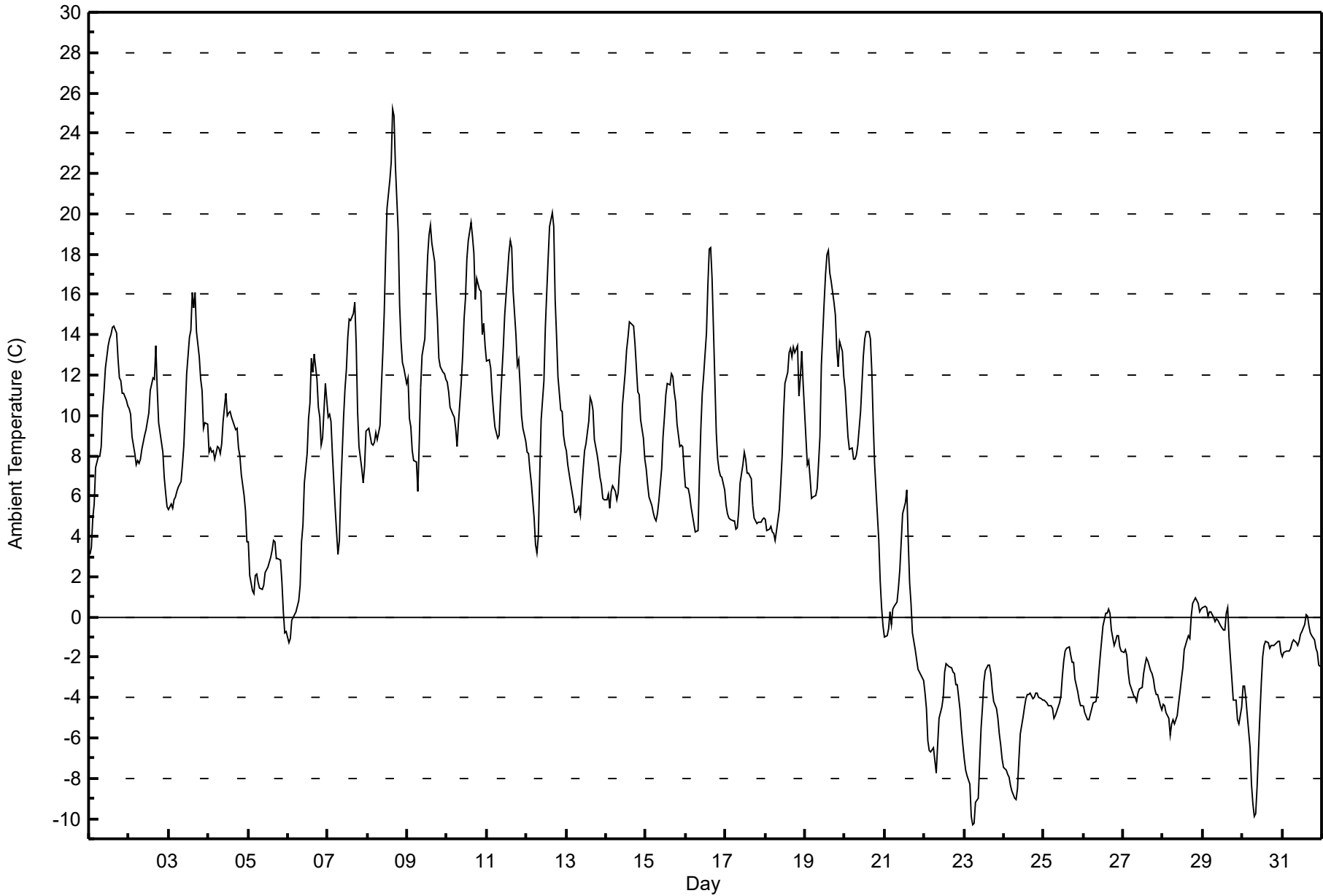
Lower Camp - October 2023

Maximum Value: 25.2 C on Oct 8 16:00 Maximum Daily Average: 14.6 C on Oct 8																				Hours in Service: 744 Hours of Data: 744						
Minimum Value: -10.3 C on Oct 23 06:00 Minimum Daily Average: -6.1 C on Oct 23 Maximum Diurnal Average: 9.0 C at hour 15 Minimum Diurnal Average: 1.9 C at hour 7 Monthly Average: 5.06 C Percentiles: P ₁ = -9.0 P ₁₀ = -4.4 Q ₁ = -1.4 Median = 6.0 Q ₃ = 10.4 P ₉₀ = 14.0 P ₉₉ = 19.5																				Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Oct	3.1	3.5	4.9	5.6	7.4	8.0	8.0	8.5	10.2	11.1	12.3	13.5	13.8	14.0	14.3	14.4	14.1	12.8	11.9	11.7	11.1	11.1	10.7	10.5	10.3	14.4
2-Oct	10.3	10.1	8.9	8.1	7.5	7.7	7.6	7.9	8.3	9.0	9.3	9.7	10.2	11.2	11.8	11.8	13.4	11.3	9.6	9.2	8.2	7.0	6.1	5.5	9.2	13.4
3-Oct	5.3	5.6	5.4	5.8	6.0	6.2	6.4	6.7	7.6	8.5	10.2	12.1	13.9	14.3	16.1	15.3	16.1	14.2	12.9	11.8	11.2	9.3	9.6	9.5	10.0	16.1
4-Oct	8.2	8.4	8.2	8.2	7.9	8.4	8.4	8.1	8.6	9.7	11.1	10.0	10.1	10.2	9.9	9.7	9.3	9.4	8.4	8.0	7.1	6.1	5.3	3.7	8.4	11.1
5-Oct	3.8	2.1	1.3	1.2	2.0	2.1	1.7	1.4	1.4	1.6	2.2	2.4	2.4	3.0	3.3	3.8	3.8	2.9	2.9	2.8	1.7	0.2	-0.8	-0.7	2.0	3.8
6-Oct	-1.2	-1.1	-0.2	-0.1	0.1	0.3	0.8	1.6	3.7	4.6	6.7	8.1	9.9	10.6	12.8	12.1	13.0	11.8	10.4	9.9	8.5	8.9	11.6	10.8	6.4	13.0
7-Oct	9.9	10.0	9.7	8.1	5.4	4.2	3.1	3.8	6.3	9.9	11.3	12.3	13.8	14.8	14.7	15.0	15.6	13.5	10.2	8.4	7.3	6.6	7.5	9.2	9.6	15.6
8-Oct	9.3	9.4	8.6	8.5	8.7	9.1	8.8	9.5	11.4	13.1	15.1	17.9	20.3	21.7	22.5	25.2	24.8	22.3	19.1	15.5	13.7	12.6	12.3	11.6	14.6	25.2
9-Oct	11.8	9.8	9.4	8.2	7.7	7.7	6.2	8.7	11.4	13.0	13.8	16.1	17.9	18.9	19.4	18.5	17.6	16.0	14.7	12.8	12.4	12.1	12.1	11.8	12.8	19.4
10-Oct	11.6	11.1	10.4	10.1	9.9	9.4	8.4	9.7	11.7	12.9	14.8	15.9	17.7	18.7	19.5	18.9	18.1	15.8	16.8	16.3	16.2	14.0	14.6	13.5	14.0	19.5
11-Oct	12.7	12.8	12.3	11.1	10.2	9.5	8.9	9.0	10.7	12.1	13.4	15.0	17.0	18.0	18.7	18.4	16.2	14.0	12.5	12.7	11.5	10.0	9.4	8.7	12.7	18.7
12-Oct	8.2	8.1	7.3	6.7	4.9	3.6	3.2	4.0	7.1	9.8	11.7	14.4	16.1	17.8	19.4	20.0	19.3	15.8	14.0	11.9	10.3	10.2	9.0	8.5	10.9	20.0
13-Oct	8.3	7.6	6.6	6.2	5.8	5.2	5.2	5.5	5.1	6.3	7.4	8.2	8.6	9.7	10.9	10.7	10.3	8.8	8.0	7.5	6.9	6.6	5.9	5.8	7.4	10.9
14-Oct	5.8	6.1	5.4	6.2	6.5	6.2	5.8	6.2	7.4	8.3	10.5	12.1	13.3	13.8	14.7	14.6	14.4	13.5	12.4	11.1	11.0	9.8	8.9	7.8	9.7	14.7
15-Oct	7.3	6.6	5.9	5.6	5.2	4.9	4.7	5.2	5.8	7.3	9.0	9.9	11.1	11.6	11.5	12.1	12.0	11.2	10.7	9.6	8.5	8.5	8.4	7.4	8.3	12.1
16-Oct	6.4	6.4	6.0	5.5	5.1	4.6	4.2	4.3	7.1	9.4	11.1	12.0	14.1	16.5	18.2	18.3	16.8	11.7	9.2	7.8	7.3	7.0	6.9	6.3	9.3	18.3
17-Oct	5.5	5.1	4.9	4.8	4.8	4.8	4.3	4.4	5.3	6.6	7.5	8.2	7.8	7.1	7.2	6.8	5.5	4.9	4.8	4.7	4.7	4.7	4.8	4.9	5.6	8.2
18-Oct	4.9	4.3	4.4	4.5	4.2	4.1	3.8	4.3	5.3	6.6	7.9	10.0	11.6	12.1	13.1	13.3	12.9	13.4	13.1	13.4	11.0	11.9	13.2	11.6	9.0	13.4
19-Oct	8.9	7.5	7.8	6.9	5.9	6.0	6.0	6.4	7.6	9.0	12.5	15.6	17.0	18.0	18.2	17.1	16.7	15.6	15.0	13.3	12.4	13.7	13.2	12.0	11.8	18.2
20-Oct	11.3	10.1	8.9	8.3	8.4	7.8	7.9	8.1	8.5	10.2	11.6	13.0	13.8	14.1	14.1	13.8	12.2	9.7	7.7	6.3	3.8	1.8	0.5	-0.4	8.8	14.1
21-Oct	-1.0	-0.9	-0.6	0.2	-0.4	0.4	0.5	0.8	1.4	2.3	3.7	5.1	5.7	6.3	3.8	1.7	0.6	-0.8	-1.6	-2.1	-2.6	-2.7	-2.9	-3.1	0.6	6.3
22-Oct	-3.8	-4.5	-6.1	-6.6	-6.7	-6.5	-7.1	-7.7	-6.4	-5.1	-4.5	-3.9	-2.7	-2.3	-2.4	-2.5	-2.5	-2.8	-2.8	-3.4	-3.4	-4.6	-5.6	-6.3	-4.6	-2.3
23-Oct	-7.1	-7.6	-7.9	-8.3	-9.9	-10.3	-10.2	-9.2	-9.0	-7.2	-5.5	-4.4	-3.2	-2.6	-2.4	-2.4	-2.8	-3.7	-4.2	-4.5	-5.0	-5.8	-6.4	-7.0	-6.1	-2.4
24-Oct	-7.5	-7.6	-7.8	-7.9	-8.4	-8.6	-9.0	-9.0	-8.5	-7.0	-5.8	-5.0	-4.5	-4.0	-3.8	-3.8	-3.8	-4.0	-4.0	-3.8	-3.8	-4.0	-4.0	-4.1	-5.8	-3.8
25-Oct	-4.1	-4.2	-4.2	-4.4	-4.4	-4.6	-5.0	-4.9	-4.7	-4.2	-3.9	-2.9	-2.2	-1.7	-1.6	-1.5	-1.9	-2.2	-2.3	-3.0	-3.7	-4.1	-4.4	-4.4	-3.5	-1.5
26-Oct	-4.4	-4.8	-5.1	-5.1	-4.8	-4.5	-4.3	-4.2	-3.7	-2.8	-2.0	-1.2	-0.4	0.2	0.2	0.4	0.2	-0.6	-1.4	-1.2	-0.9	-0.9	-1.5	-1.7	-2.3	0.4
27-Oct	-1.7	-1.6	-1.9	-2.7	-3.3	-3.7	-3.9	-4.0	-4.2	-3.8	-3.6	-3.5	-2.8	-2.4	-2.0	-2.2	-2.6	-2.8	-3.1	-3.6	-3.8	-3.9	-4.4	-4.6	-3.2	-1.6
28-Oct	-4.3	-4.4	-4.7	-5.1	-5.8	-5.3	-5.1	-5.3	-4.9	-4.2	-3.7	-3.0	-2.5	-1.6	-1.1	-0.9	-1.0	0.0	0.7	1.0	0.8	0.7	0.3	0.4	-2.5	1.0
29-Oct	0.5	0.5	0.5	0.1	0.2	0.2	0.0	-0.2	-0.1	-0.1	-0.3	-0.4	-0.6	-0.6	0.2	0.4	-1.1	-3.1	-4.1	-4.1	-4.1	-5.1	-5.3	-4.4	-1.3	0.5
30-Oct	-3.4	-3.4	-4.0	-4.9	-6.5	-8.3	-9.2	-9.9	-9.7	-8.4	-4.9	-3.3	-1.9	-1.4	-1.2	-1.3	-1.5	-1.4	-1.4	-1.4	-1.4	-1.2	-1.2	-1.8	-3.9	-1.2
31-Oct	-1.9	-1.8	-1.7	-1.7	-1.7	-1.5	-1.3	-1.1	-1.3	-1.4	-1.2	-0.8	-0.7	-0.3	0.1	0.0	-0.4	-0.8	-0.9	-1.1	-1.5	-1.7	-2.4	-2.4	-1.2	0.1
																								Diurnal Average		
																								Diurnal Maximum		



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Lower Camp - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Lower Camp - October 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	237	31.85	31.85
0 - 10	302	40.59	72.45
10 - 20	198	26.61	99.06
> 20	7	0.94	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

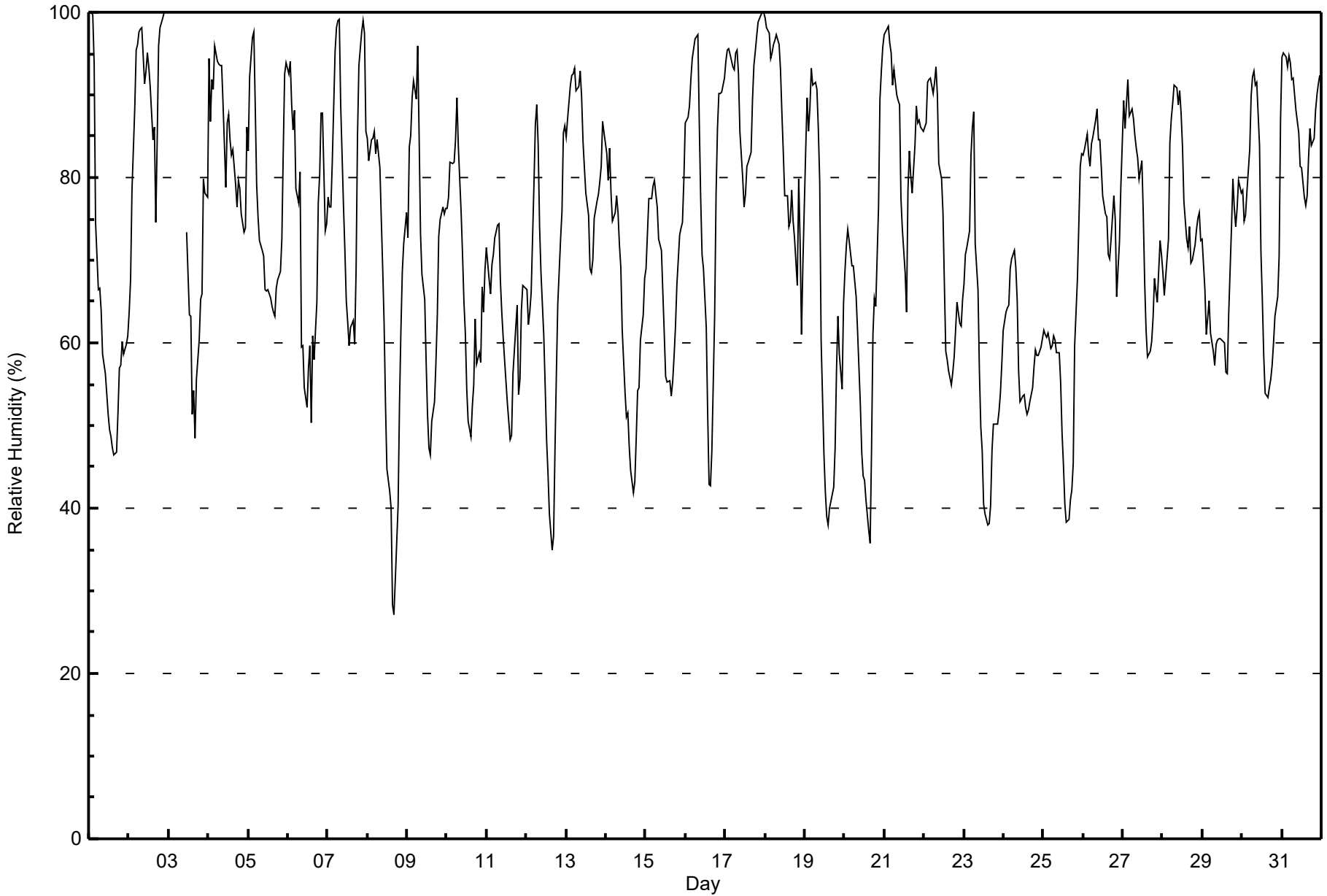
Lower Camp - October 2023

Maximum Value: 100.0 % on Oct 1 01:00		Maximum Daily Average: 91.2 % on Oct 17		Hours in Service: 744																							
Minimum Value: 27.1 % on Oct 8 17:00		Minimum Daily Average: 56.8 % on Oct 25		Hours of Data: 732																							
Maximum Diurnal Average: 84.8 % at hour 7		Minimum Diurnal Average: 57.1 % at hour 16		Hours of Missing Data: 12																							
Monthly Average: 72.75 %		Percentiles: P ₁ = 38.0 P ₁₀ = 51.4 Q ₁ = 60.7 Median = 74.0 Q ₃ = 86.0 P ₉₀ = 93.4 P ₉₉ = 99.5		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-Oct	100.0	100.0	99.6	93.8	74.6	66.5	66.6	64.0	58.7	57.5	56.3	51.3	49.5	48.6	47.2	46.4	46.8	51.5	57.0	57.3	60.1	58.7	59.9	60.9	63.9	100.0	
2-Oct	63.7	67.7	78.5	88.4	95.4	96.1	97.6	97.9	98.1	91.4	92.9	95.1	93.4	91.0	84.7	86.0	74.5	84.6	96.0	98.2	99.3	100.0	100.0	OR	90.0	100.0	
3-Oct	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	73.4	63.4	63.1	51.4	54.3	48.5	55.6	60.4	65.3	66.0	79.9	78.1	77.5	--	79.9	
4-Oct	94.4	86.8	91.9	90.7	95.9	94.0	93.7	93.6	89.0	78.8	86.6	87.7	84.7	83.4	82.7	83.4	79.2	76.5	79.6	78.6	75.7	73.4	73.9	86.1	85.4	95.9	
5-Oct	83.2	92.2	97.0	97.6	88.6	79.1	75.2	72.4	71.2	70.5	66.4	66.2	66.5	65.4	64.5	63.7	63.2	66.6	67.6	68.6	72.6	83.2	92.6	93.8	76.2	97.6	
6-Oct	92.6	94.1	88.9	85.8	88.2	78.6	76.9	80.7	59.4	59.6	54.5	52.2	57.0	59.6	50.4	60.8	57.9	64.9	77.0	80.3	87.8	87.7	73.6	74.3	72.6	94.1	
7-Oct	77.5	76.4	76.4	81.9	95.3	98.1	99.0	99.1	88.9	76.7	71.2	65.1	62.6	59.7	61.9	62.7	59.8	68.9	85.0	93.5	97.7	99.0	97.4	85.6	80.8	99.1	
8-Oct	84.8	82.1	84.6	84.7	85.5	82.9	84.7	81.2	74.9	69.0	62.4	52.6	44.8	42.0	39.9	28.2	27.1	31.4	40.4	52.7	61.5	68.6	72.1	75.7	63.1	85.5	
9-Oct	72.8	83.7	85.0	89.6	91.7	89.6	95.9	85.0	73.1	68.4	65.3	57.8	51.4	47.4	46.5	50.5	52.9	57.6	63.3	72.9	74.9	76.4	75.6	76.3	71.0	95.9	
10-Oct	76.2	77.7	81.9	81.6	81.9	84.7	89.6	83.8	75.7	70.6	64.9	61.1	54.5	50.5	48.6	52.4	54.9	62.8	57.5	58.7	57.6	66.8	63.7	68.8	67.8	89.6	
11-Oct	71.6	67.6	66.0	69.5	70.7	72.7	74.3	74.4	67.7	63.7	60.7	58.0	52.7	50.4	48.4	48.7	56.3	61.9	64.6	53.8	55.6	63.9	66.9	66.5	62.8	74.4	
12-Oct	66.4	62.2	63.8	66.1	79.3	86.5	88.7	84.0	74.0	68.5	60.8	54.7	48.3	44.2	39.4	34.8	36.5	47.2	56.2	64.7	72.5	75.9	85.5	86.2	64.4	88.7	
13-Oct	84.9	87.1	91.1	92.3	92.5	93.3	90.5	91.0	92.9	89.8	84.4	81.3	78.1	75.5	68.9	68.4	70.0	75.1	77.2	78.0	79.5	81.4	86.8	85.5	83.1	93.3	
14-Oct	82.9	79.7	83.6	78.2	74.7	75.8	77.8	75.8	71.9	69.2	61.4	54.1	51.0	51.5	47.5	44.5	41.9	43.2	48.5	54.3	54.5	60.4	63.4	67.8	63.1	83.6	
15-Oct	68.9	73.3	77.4	77.5	79.0	79.6	77.9	76.4	72.5	71.2	66.2	61.2	55.9	55.2	55.4	53.5	55.3	58.3	61.9	66.9	73.0	74.0	74.5	79.7	68.5	79.7	
16-Oct	86.6	87.3	88.7	91.9	94.4	95.6	96.8	97.3	86.7	77.7	70.6	69.0	61.8	51.5	42.9	42.8	46.9	63.4	77.9	85.9	90.2	90.3	90.3	92.0	78.3	97.3	
17-Oct	94.1	95.5	95.6	94.9	93.4	93.0	95.1	95.4	92.6	85.6	80.1	76.4	78.0	81.3	81.9	83.1	89.4	93.6	95.3	97.1	98.9	99.6	99.9	100.0	91.2	100.0	
18-Oct	99.4	98.1	97.4	94.4	95.2	96.1	96.6	97.2	96.0	93.0	87.8	83.0	77.8	77.8	74.0	74.8	78.4	74.7	72.7	67.0	79.8	72.1	61.1	69.6	83.9	99.4	
19-Oct	83.4	89.6	85.7	88.5	93.2	91.2	91.6	90.7	86.0	79.5	60.4	46.6	42.0	39.0	37.9	40.0	40.8	42.5	47.3	56.7	63.2	58.6	54.4	64.8	65.6	93.2	
20-Oct	68.6	71.7	73.7	72.4	69.4	69.4	67.5	65.6	61.5	52.5	46.8	43.8	43.3	41.1	37.2	35.7	47.1	61.0	65.4	64.3	76.4	89.5	93.0	95.7	63.0	95.7	
21-Oct	97.3	97.9	98.3	96.3	95.1	91.2	93.1	90.0	89.4	88.8	77.4	73.7	68.5	63.7	78.4	83.2	80.1	78.2	83.9	88.6	86.6	86.9	86.1	85.7	85.8	98.3	
22-Oct	86.2	86.6	91.5	91.8	92.1	90.2	91.6	93.4	90.0	81.6	79.9	75.8	67.1	58.9	58.0	56.6	54.9	56.4	58.4	61.5	64.9	62.4	62.0	65.3	74.0	93.4	
23-Oct	67.1	70.7	71.5	73.5	82.8	86.1	88.0	72.0	66.5	56.7	49.8	47.0	40.6	39.3	38.0	38.1	40.4	46.9	50.1	50.2	50.2	51.6	53.8	57.4	57.9	88.0	
24-Oct	61.6	63.7	64.3	64.7	69.0	70.2	71.1	69.2	65.1	56.6	53.0	53.5	53.8	52.3	51.4	51.8	53.0	54.7	57.1	59.1	58.5	58.5	59.5	60.5	59.7	71.1	
25-Oct	61.5	61.0	60.7	61.2	59.3	59.6	60.9	60.3	58.8	58.7	55.2	49.1	45.2	40.6	38.3	38.6	41.0	42.1	45.4	59.7	67.7	74.4	81.3	82.9	56.8	82.9	
26-Oct	82.7	83.4	85.2	82.7	81.3	84.1	84.9	86.9	88.4	84.6	84.5	81.3	77.8	75.5	75.3	70.7	70.2	72.6	77.8	74.9	65.6	68.9	72.2	79.0	78.8	88.4	
27-Oct	89.3	86.0	89.0	91.8	87.5	88.2	87.2	85.0	83.6	82.4	79.8	82.0	75.6	67.2	61.5	58.3	59.0	60.2	63.1	67.7	66.2	64.9	72.3	70.7	75.8	91.8	
28-Oct	68.5	65.8	68.0	72.6	84.3	87.1	89.0	91.2	90.8	88.8	90.5	87.8	83.7	77.0	72.5	71.5	74.1	69.6	70.0	71.9	73.7	75.0	75.7	72.4	78.0	91.2	
29-Oct	72.5	66.5	61.0	63.1	65.1	61.2	58.9	57.2	59.7	60.3	60.6	60.5	60.1	60.0	56.5	56.3	63.5	74.0	79.9	76.3	74.1	76.2	79.6	78.1	65.9	79.9	
30-Oct	78.5	74.8	75.5	78.3	83.4	89.8	92.3	92.9	91.2	91.5	83.9	71.0	65.2	58.5	53.9	53.3	54.6	55.7	57.2	60.0	63.1	65.7	70.4	86.9	72.8	92.9	
31-Oct	94.5	95.1	94.5	93.4	94.7	94.0	91.8	92.0	88.2	86.7	85.5	81.4	81.2	77.5	76.6	77.7	82.4	86.0	83.9	84.8	88.1	90.0	91.3	92.4	87.7	95.1	
		80.4	80.8	82.2	83.0	84.5	84.1	84.8	83.2	78.9	74.7	69.7	66.2	62.5	59.7	57.2	57.1	58.1	62.5	67.0	70.0	72.8	75.3	76.4	77.9	Diurnal Average	
		100.0	100.0	99.6	97.6	95.9	98.1	99.0	99.1	98.1	93.0	92.9	95.1	93.4	91.0	84.7	86.0	89.4	93.6	96.0	98.2	99.3	100.0	100.0	100.0	Diurnal Maximum	
OR - Out of Range																											



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Lower Camp - October 2023



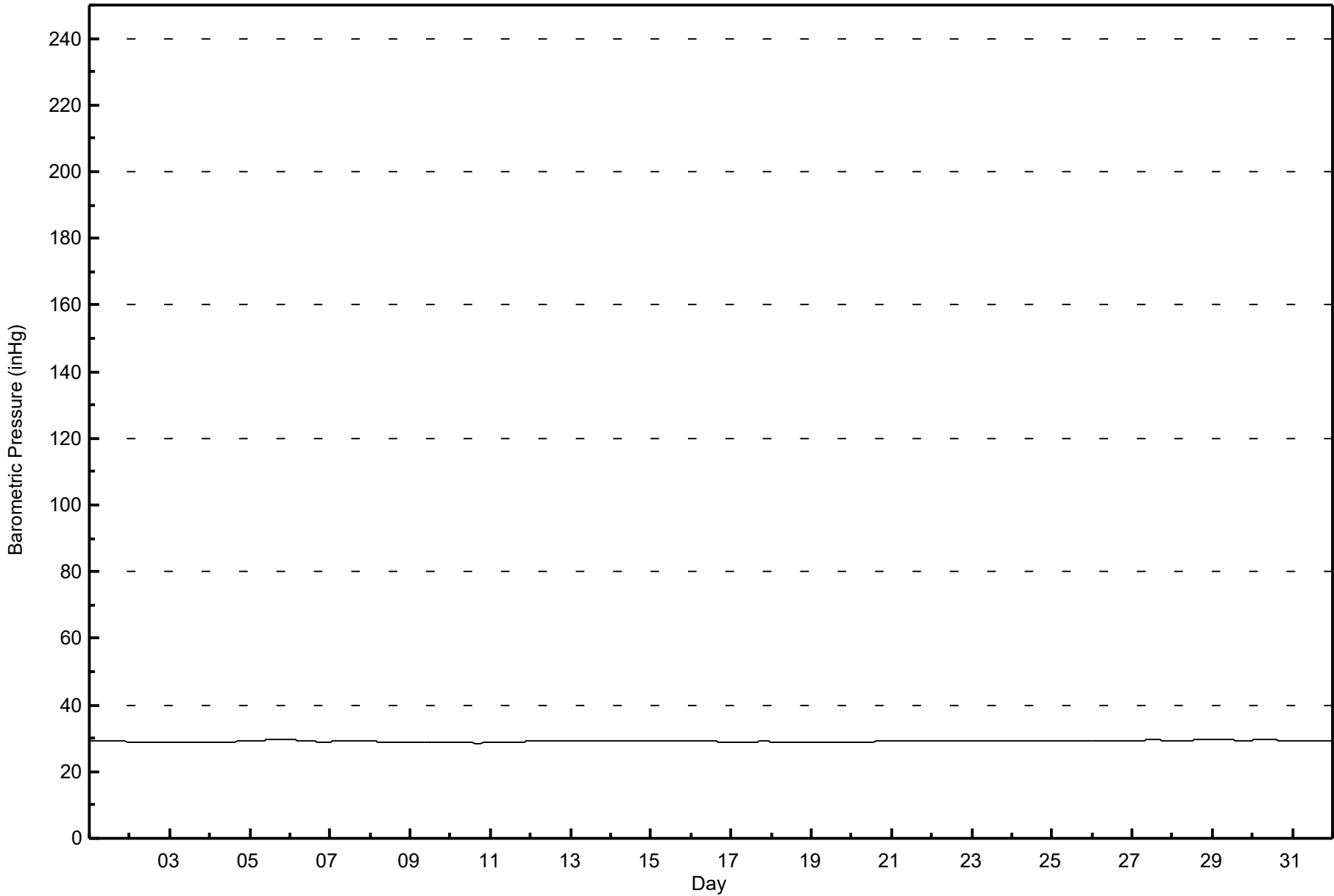


Maximum Value: 29.6 inHg on Oct 5 19:00		Maximum Daily Average: 29.5 inHg on Oct 5		Hours in Service: 744																							
Minimum Value: 28.6 inHg on Oct 10 17:00		Minimum Daily Average: 28.6 inHg on Oct 10		Hours of Data: 744																							
Maximum Diurnal Average: 29.2 inHg at hour 9		Minimum Diurnal Average: 29.1 inHg at hour 17		Hours of Missing Data: 0																							
Monthly Average: 29.16 inHg		Percentiles: P ₁ = 28.6 P ₁₀ = 28.7 Q ₁ = 28.9 Median = 29.2 Q ₃ = 29.4 P ₉₀ = 29.4 P ₉₉ = 29.6		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-Oct	29.4	29.4	29.4	29.4	29.4	29.4	29.3	29.3	29.3	29.3	29.3	29.2	29.2	29.2	29.2	29.1	29.1	29.1	29.1	29.1	29.1	29.0	29.0	29.0	29.2	29.4	
2-Oct	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	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0
3-Oct	28.9	28.9	28.9	28.9	28.9	28.9	28.9	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	28.9	29.0	
4-Oct	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	29.0	29.0	29.0	29.0	29.1	29.1	29.1	29.2	29.2	29.2	29.2	29.0	29.2	
5-Oct	29.3	29.3	29.3	29.3	29.4	29.4	29.4	29.4	29.4	29.5	29.5	29.5	29.5	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.5	29.6	
6-Oct	29.5	29.5	29.5	29.5	29.4	29.4	29.4	29.3	29.3	29.3	29.2	29.2	29.1	29.1	29.1	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.2	29.5	
7-Oct	29.0	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.2	29.2	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.2	
8-Oct	29.1	29.1	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.1	
9-Oct	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	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8	28.9	
10-Oct	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	28.7	28.6	28.7	
11-Oct	28.7	28.7	28.7	28.7	28.8	28.8	28.8	28.8	28.8	28.8	28.9	28.8	28.9	28.8	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.0	29.1	29.1	28.9	29.1	
12-Oct	29.1	29.1	29.1	29.2	29.2	29.2	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.4	29.4	29.4	29.3	29.4	
13-Oct	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.4	29.4	
14-Oct	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	
15-Oct	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	29.2	29.2	29.3	
16-Oct	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	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.1	29.2	
17-Oct	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	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	
18-Oct	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8	29.0	
19-Oct	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	
20-Oct	28.7	28.7	28.8	28.8	28.8	28.8	28.8	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.1	29.1	29.1	29.2	29.2	29.2	29.2	29.2	29.2	29.3	29.0	29.3	
21-Oct	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	29.2	29.2	29.2	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.2	29.3	
22-Oct	29.3	29.4	29.4	29.4	29.4	29.4	29.4	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	29.4	29.4	29.4	29.3	29.4	
23-Oct	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.3	29.3	29.3	29.3	29.3	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	
24-Oct	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	
25-Oct	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.3	29.3	29.3	29.3	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	
26-Oct	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	
27-Oct	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.5	
28-Oct	29.4	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	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.4	29.5	
29-Oct	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.5	
30-Oct	29.5	29.5	29.5	29.5	29.5	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.5	29.5	29.5	29.4	29.4	29.4	29.4	29.3	29.3	29.3	29.3	29.3	29.5	29.6	
31-Oct	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	
29.2																								Diurnal Average			
29.5																								Diurnal Maximum			



Wood Buffalo Environmental Association
Hourly Averages

Barometric Pressure (BP) - inHg
Lower Camp - October 2023





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Speed (WS) - km/h
Lower Camp - October 2023

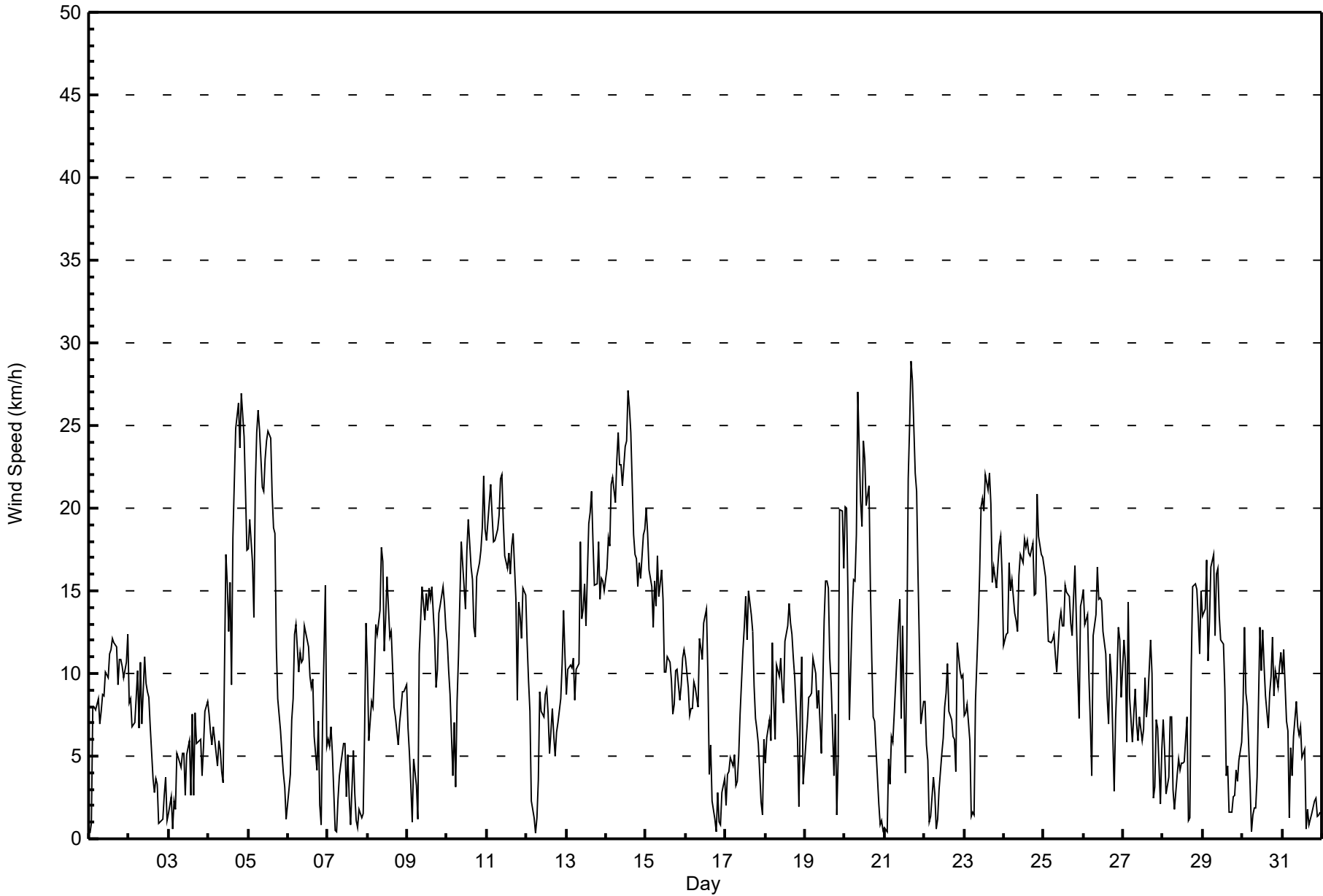
Maximum Speed: 29 km/h on Oct 21 17:00		Maximum Daily Speed Average: 20.5 km/h on Oct 14		Hours in Service: 744																						
Minimum Speed Value: 0 km/h on Oct 1 01:00		Minimum Daily Speed Average: 0.8 km/h on Oct 31		Hours of Data: 744																						
Maximum Diurnal Speed Average: 3.7 km/h at hour 9		Minimum Diurnal Speed Average: 1.2 km/h at hour 14		Hours of Missing Data: 0																						
Monthly Average Velocity: 2.0 km/h 169.7 deg		Percentiles: P ₁ = 1 P ₁₀ = 3 Q ₁ = 6 Median = 10 Q ₃ = 15 P ₉₀ = 19 P ₉₉ = 26		Percent Operational Time: 100.0																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Oct	N0	ESE1	ESE8	ESE8	SE8	SE8	SE7	SE8	SE9	SE9	SE10	SE10	SE11	SSE11	SE12	SE12	SE12	SE9	SE11	SE11	SE10	SE10	SE11	SE12	SE8.9	SE12
2-Oct	SE8	ESE9	ESE7	SE7	SE9	SE10	ESE7	E11	ESE7	SE11	SE9	SE9	SE9	SE7	S4	NE3	SW4	SE3	NE1	WNNW1	WNNW1	W3	WSW4	E1	SE4.8	SE11
3-Oct	NE2	W3	NE1	E2	ENE2	ESE5	ESE5	ESE4	ESE5	ESE5	SE3	WSW5	W6	NE3	W8	NW3	SW8	SSW6	SSE6	SSE6	SSE4	E6	ESE8	SE8	SSE2.2	SE8
4-Oct	ESE8	SE6	SE7	SE6	WSW4	WNNW6	WNNW5	NW4	NW3	W17WNNW15WNNW13WNNW16	NW9	W18WNNW25	W26	W26	W24	W27WNNW24	W21	W17	W11.2	W27						
5-Oct	WNNW18	W19WNNW17WNNW21WNNW25WNNW26WNNW25WNNW21WNNW23WNNW24WNNW25WNNW24WNNW21WNNW19WNNW18WNNW12	WSW9	WSW7	SW5	ESE4	ESE3	E1	WNNW15.7	WNNW26																
6-Oct	ESE3	SE4	ESE7	SE9	ESE12	SE13	ESE10	ESE11	SE11	ESE11	ESE13	SE12	ESE12	ESE10	SE9	ESE10	SE6	SE4	ESE7	SE2	ESE1	WSW7WSW15	WNNW6	SE6.6	WSW15	
7-Oct	W6	WNNW6	W7	WSW5	ENE1	E0	E2	E4	ESE4	ESE6	ESE6	E3	ESE5	SE3	NW1	ESE5	SE3	SSE1	SSW1	W2	W1	W2	ESE7	E13	SE1.4	E13
8-Oct	ESE10	SE6	ESE8	ESE8	ESE10	ESE13	ESE12	ESE14	ESE18	ESE17	ESE11	ESE13	ESE16	ESE12	ESE13	SE10	SSE8	SSE7	SE6	SE7	ESE8	ESE9	ESE9	ESE9	ESE10.4	ESE18
9-Oct	SE7	ESE5	ESE3	NW1	ENE5	E3	ESE1	E11	ESE13	ESE15	ESE13	ESE15	ESE14	ESE15	ESE15	ESE15	ESE12	ESE9	ESE10	ESE14	ESE14	ESE15	ESE14	ESE13	ESE10.4	ESE15
10-Oct	ESE12	ESE10	E9	E4	E7	ENE3	E8	E11	ESE18	ESE17	ESE15	ESE14	ESE17	ESE19	ESE16	ESE16	ESE13	ESE12	ESE16	ESE17	ESE17	ESE19	ESE22	ESE19	ESE13.7	ESE22
11-Oct	ESE18	ESE20	ESE21	ESE20	ESE18	ESE18	ESE19	ESE20	ESE22	ESE22	ESE19	ESE17	ESE16	ESE17	ESE16	ESE18	ESE18	ESE14	ESE8	ESE14	ESE13	ESE12	ESE15	ESE15	ESE17.1	ESE22
12-Oct	ESE12	E10	ESE8	SSE2	NW1	WNNW0	NNE1	ENE4	E9	ESE8	ESE7	ESE9	ESE9	ESE8	SE5	SSE8	SSE6	SE5	SE6	SE7	ESE8	ESE11	ESE14	ESE11	ESE6.6	ESE14
13-Oct	ESE9	ESE10	ESE10	SE10	SE11	SE8	SE10	ESE11	E18	ESE13	ESE14	ESE15	ESE13	ESE19	ESE20	ESE21	ESE18	ESE15	ESE15	ESE18	ESE14	ESE16	ESE16	ESE15	ESE14.1	ESE21
14-Oct	ESE16	ESE18	ESE18	ESE21	ESE22	ESE20	ESE23	ESE25	ESE23	ESE23	ESE21	ESE24	ESE24	ESE27	ESE26	ESE25	SE18	SE17	ESE17	SE15	SE17	ESE16	ESE18	ESE19	ESE20.5	ESE27
15-Oct	ESE20	ESE18	ESE16	ESE15	ESE13	ESE16	ESE14	ESE17	ESE15	ESE16	ESE14	ESE10	SE10	SE11	SE11	SE10	SE8	SE8	SE10	SE10	ESE8	ESE9	ESE11	ESE11	ESE12.5	ESE20
16-Oct	ESE11	ESE9	ESE7	SE8	ESE8	ESE9	ESE9	ESE8	ESE12	ESE11	ESE11	ESE13	ESE14	ESE10	S4	SE6	SE2	S1	SSE0	ESE3	W1	W1	WNNW3	W4	ESE6.1	ESE14
17-Oct	W2	WNNW4	W4	W5	WNNW4	W5	WNNW3	W3	NW5	NW8	NW11	NW13	NW15	NW12	WNNW15	NW14	NW13	NW9	NW7	WNNW7	WNNW6	NW2	NE1	E6	NW6.2	WNNW15
18-Oct	SSE5	SSE6	SE7	ESE6	ESE12	ESE8	ESE6	ESE10	ESE10	ESE11	ESE9	ESE8	SE12	SE13	SE14	SE13	SE12	SE11	SSE10	S6	ESE2	WSW8WSW11	SSW3	SE7.4	SE14	
19-Oct	ESE6	ESE7	SE9	ESE9	ESE9	ESE11	ESE10	ESE8	ESE9	SE7	SSW5WSW13WSW16WSW16	SW15	SW11	SSW9	S4	SW8	WNNW1	SW5WSW20WSW20	SW16	SSW5.9	WSW20					
20-Oct	WSW20WSW20WSW15	WSW7WSW14WSW16WSW16WSW18WSW27	W20WNNW19	W24WNNW23	NW20WNNW21WNNW15NWW11	NW7	WNNW7	NW5	WNNW2	WNNW1	NW1	ENE1	W12.2	WSW27												
21-Oct	ESE1	NNE0	E5	E3	E6	ESE6	ESE8	SE11	ESE13	ESE14	E7	ESE13	ESE4	NW12	NW22	NW25	NW29	NW28	NW22	NW21	NW16	NW12	NW7	NW8	N6.5	NW29
22-Oct	N8	N6	ENE5	SW1	WNNW1	NNE4	NNE3	WSW1	W1	NE3	WNNW5	WNNW6	WNNW8	WNNW9	NW11	NW8	N7	NW6	NW6	W4WNNW12WNNW10WNNW10WNNW10	NW4.9	WNNW12				
23-Oct	NW7	NW8	NW8	NW6	ENE1	NW2	N1	W8	SW13WSW16	W20	W21	W20WNNW22WNNW21WNNW22WNNW20WNNW16WNNW16	W15WSW17WSW18WSW18WSW16	W12.7	WNNW22											
24-Oct	WSW12WSW12WSW12	SW17WSW15	SW16WSW14WSW13WSW13WSW16WSW17	W17	W18WSW18WSW18WSW17WSW17WSW18WSW15	W15	W21	W18	W17	W17	WSW15.6	W21														
25-Oct	WNNW16	W16	W14	W12	W12WSW12	SW12	SW11	SW10	SW13	SW14	SW13	SW13	WSW15WSW15WSW15	SW13WSW12	W15WNNW17WNNW10	W7WSW14WSW14	WSW12.3	WNNW17								
26-Oct	SW15WSW13	SW14WSW10	W7	WSW4WSW12	SW14WSW16WSW15WSW15WSW14	W13WSW11	WSW9	W7	SW11WSW10	WNNW3	WNNW7	W10	SW13	SW12	SW9	WSW10.6	WSW16									
27-Oct	WSW12WSW11	WNNW6	NW14	NW9	NW6	NW8	NW9	NW7	NW6	NW7	N6	NW7	NW10	NW7	WNNW8WNNW12WNNW10	NW2	SW3	SW7	SW7	SE2	SE5	WNNW5.5	NW14			
28-Oct	SE7	SSE5	SSE3	SW4	SW7	WSW7	W3	N2	NW4	NW5	NW4	NW5	WNNW5	WNNW5	WNNW7	NW1	SE1	W10	W15	W15	W15	W13	W11	W15	W5.3	W15
29-Oct	W13	W14WNNW17WNNW11	W13	W16	W17	W12	W16WNNW16	NW13	NW12	NW12	NW9	NW4	NW4	WSW2	W2	W3	W3	N4	NW3	W5	W6	WNNW8.8	W17			
30-Oct	NW8	N13	N9	N8	NW3	NW0	ESE1	WNNW2	NE2	ESE4	ESE13	SE10	ESE13	SE10	SE9	SSE7	SE9	SE10	SE12	SE9	SE10	SE9	SE10	ESE11	ESE4.8	ESE13
31-Oct	ESE10	ESE11	SE7	SE7	NW1	W5	WNNW4	NW6	NW8	NW7	WNNW6	NW7	NNE5	NW5	NW1	SW2	WNNW1	WNNW1	N2	ENE2	W2	SSW1	SSW1	WSW2	NW0.8	ESE11
SSE2.5 SSE2.2 SSE2.4 SE2.2 SSE2.4 SSE2.8 SSE2.5 SE3.0 SE3.7 SSE3.7 SSE1.9 S2.0 S2.0 S1.2 SW1.5 S1.4SSW1.6 SW1.7SSW1.4SSW1.4SSW1.7SSW2.4 S3.0 SSE2.8																								Diurnal Average		
WSW20 ESE20 ESE21 ESE21 ESE22WNNW25WNNW26WNNW25WSW27 ESE23WNNW23WNNW24WNNW25 ESE27 ESE26NWW25 NWW29 NWW28 W26 W24 W27WNNW24 ESE22 ESE19																								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
Lower Camp - October 2023

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Lower Camp - October 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	171	22.98	22.98
6 - 11	269	36.16	59.14
12 - 19	239	32.12	91.26
20 - 28	64	8.60	99.87
29 - 38	1	0.13	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Lower Camp - October 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	6	7	9	11	22	13	7	4	5	6	9	21	21	17	8	171
6 - 11	6	0	0	0	11	83	69	10	1	2	10	12	12	19	22	12	269
12 - 19	1	0	0	0	2	101	15	0	0	0	12	47	29	20	5	7	239
20 - 28	0	0	0	0	0	23	0	0	0	0	0	5	10	20	1	5	64
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	12	6	7	9	24	229	97	17	5	7	28	73	72	80	45	33	744

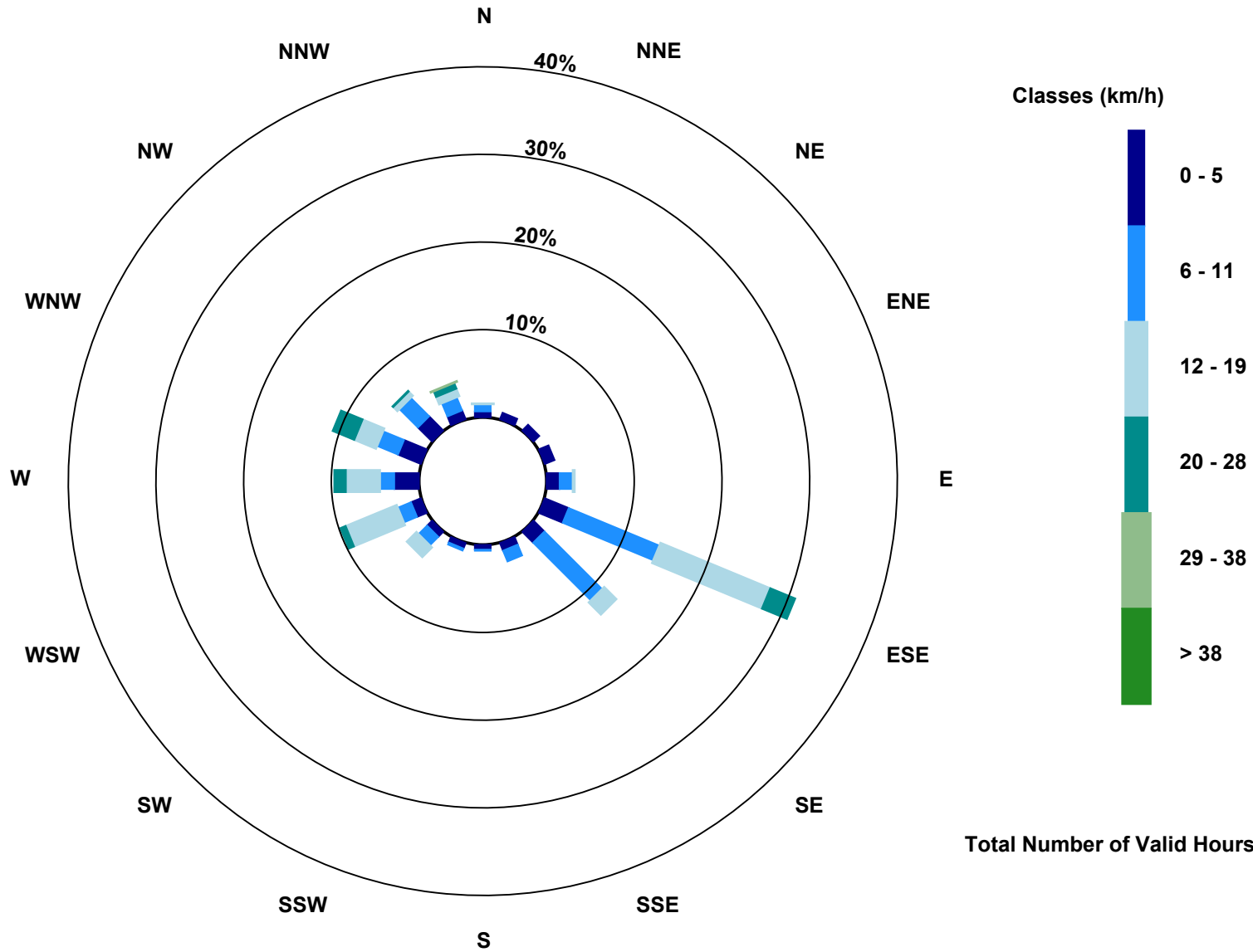
Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

Wind Speed (WS) - km/h
Lower Camp



Total Number of Valid Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Lower Camp - October 2023

Direction of Maximum Speed: 341 deg on Oct 21 17:00		Hours in Service:	744
Direction of Maximum Daily Speed Average: 119.2 deg on Oct 14		Hours of Data:	744
Direction of Minimum Speed: 3 deg on Oct 1 01:00		Hours of Missing Data:	0
Direction of Minimum Daily Speed Average: 0.8 deg on Oct 31		Percent Operational Time:	100.0
Monthly Average Direction: 169.7 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-Oct	3	107	122	109	135	146	145	143	137	143	130	139	144	154	144	144	139	139	130	130	126	129	127	132	135.8
2-Oct	135	122	118	127	127	124	109	100	120	133	132	128	128	128	173	45	230	127	55	286	288	278	258	91	126.9
3-Oct	34	275	56	82	63	110	111	120	114	121	140	242	270	46	261	323	224	192	165	155	159	101	119	127	149.0
4-Oct	122	128	124	126	129	254	282	300	305	308	281	287	290	295	317	278	282	279	279	276	277	284	281	279	280.3
5-Oct	284	281	283	300	285	286	285	283	284	287	290	291	287	289	290	288	288	292	257	251	218	122	104	80	285.1
6-Oct	114	124	118	124	114	127	121	114	129	123	123	125	117	120	128	121	132	126	120	146	115	248	243	287	129.6
7-Oct	279	286	278	249	72	87	99	95	108	120	122	95	116	126	304	120	144	151	204	270	280	264	109	101	127.1
8-Oct	104	127	109	116	111	116	113	112	113	112	115	121	120	123	123	138	147	158	136	125	118	118	119	117	119.5
9-Oct	127	105	104	346	73	93	107	90	111	112	107	112	115	119	117	115	113	107	113	110	111	111	111	105	110.1
10-Oct	114	115	95	90	88	60	94	99	110	115	114	113	115	115	117	113	113	108	115	115	118	113	117	113	111.4
11-Oct	115	117	121	118	117	117	117	116	117	116	107	111	114	116	117	115	109	105	109	119	114	112	106	104	114.1
12-Oct	106	101	113	152	322	290	28	73	91	114	116	115	122	123	138	147	152	145	129	125	119	108	106	103	115.6
13-Oct	122	120	119	128	129	133	127	120	101	110	120	117	120	113	112	107	111	114	111	117	117	114	108	106	115.1
14-Oct	115	116	114	118	122	121	120	119	116	116	118	118	114	116	119	128	129	123	124	125	121	120	118	119.2	
15-Oct	118	115	112	113	109	113	116	118	122	115	111	121	132	125	134	134	138	135	136	124	108	119	118	117	119.6
16-Oct	115	119	120	128	121	119	121	115	114	115	117	118	116	119	183	127	136	184	164	113	263	281	283	268	121.6
17-Oct	277	283	275	269	282	261	289	261	304	305	328	330	334	331	296	304	338	329	316	294	293	307	49	80	312.2
18-Oct	156	155	128	122	120	117	122	118	118	114	119	116	132	130	130	130	128	141	152	183	119	246	253	211	135.7
19-Oct	114	117	126	123	118	122	119	114	117	124	203	240	238	243	235	227	204	177	217	287	214	242	254	216	199.3
20-Oct	238	248	258	245	254	253	246	248	248	261	282	278	292	305	295	301	347	326	302	322	283	287	312	65	272.3
21-Oct	109	24	97	98	90	122	111	127	112	112	91	119	102	326	336	343	341	341	342	338	340	340	318	345	4.4
22-Oct	352	354	74	236	303	24	27	248	266	37	299	302	302	299	344	347	5	313	328	264	295	299	300	303	321.4
23-Oct	317	311	323	325	75	337	4	265	236	251	281	278	276	284	284	284	283	292	289	273	253	247	244	243	274.9
24-Oct	242	246	244	235	242	236	240	248	251	258	255	261	259	254	250	247	256	250	253	279	278	263	264	275	254.4
25-Oct	283	272	262	266	271	244	217	231	228	231	235	235	232	244	251	244	232	239	277	289	289	268	245	240	251.5
26-Oct	236	237	226	247	259	250	246	234	248	245	249	252	260	256	258	271	235	246	299	285	264	236	221	231	246.1
27-Oct	242	252	300	334	331	304	314	338	310	307	316	358	307	330	307	298	284	288	332	218	214	223	144	135	297.6
28-Oct	140	155	158	226	231	245	278	352	307	308	310	334	289	330	331	306	138	263	267	269	269	272	281	276	271.8
29-Oct	276	273	286	285	268	274	278	278	278	282	315	310	320	336	323	318	254	262	267	270	11	338	268	272	288.8
30-Oct	326	359	353	1	321	323	104	299	45	107	109	124	115	129	142	151	142	139	137	136	128	128	127	122	114.7
31-Oct	122	120	129	125	308	267	298	318	321	307	294	305	24	347	333	235	282	295	360	59	265	205	201	246	317.4

161.6	166.5	146.5	144.9	146.8	165.4	158.7	144.0	145.5	146.7	159.3	177.4	175.1	177.9	213.9	186.6	209.3	221.1	206.6	201.3	209.1	201.5	186.6	156.4
Diurnal Average																							

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

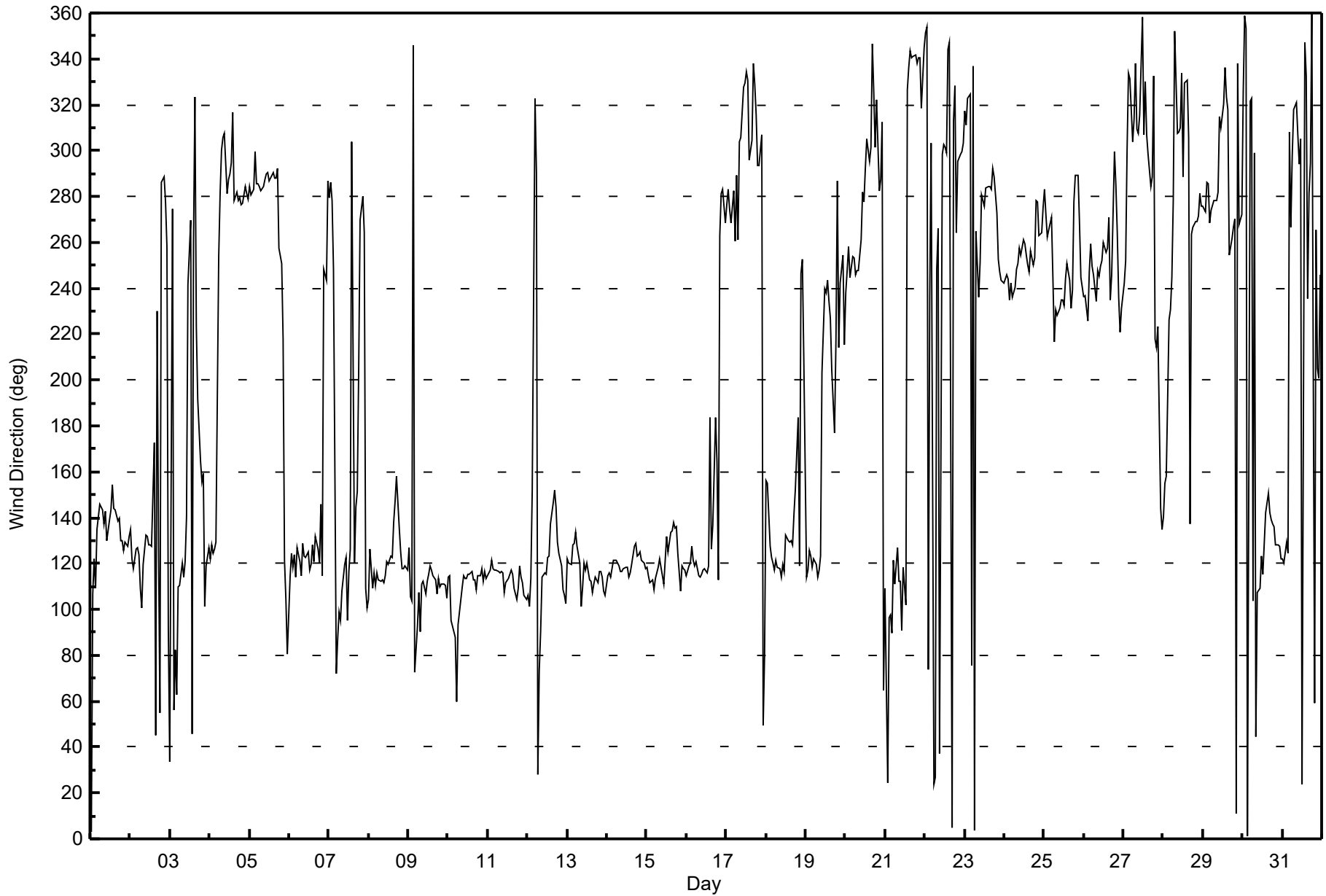
Wind Direction (WD) - deg
Lower Camp - October 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 104 deg on Oct 30 06:00 Minimum Value: 4 deg on Oct 16 13:00 Percentiles: P ₁ = 8 P ₁₀ = 10 Q ₁ = 13 Median = 17 Q ₃ = 30 P ₉₀ = 64 P ₉₉ = 93																			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-Oct	87	93	19	30	28	26	25	28	32	39	33	35	37	39	33	32	29	33	28	25	21	24	24	25	93
2-Oct	36	30	24	23	21	20	36	15	34	24	26	24	25	30	57	93	33	35	79	53	28	30	19	86	93
3-Oct	67	35	89	75	84	38	43	38	26	24	64	41	50	74	60	69	24	22	28	36	75	33	27	39	89
4-Oct	23	18	25	20	39	39	16	15	21	34	15	12	11	14	25	14	10	12	13	12	13	13	14	15	39
5-Oct	12	11	11	12	11	11	11	10	12	13	14	13	12	14	14	14	14	16	14	16	39	28	49	85	85
6-Oct	56	49	25	30	17	16	21	20	24	25	18	20	17	18	23	14	22	35	9	85	86	70	22	39	86
7-Oct	38	34	26	57	91	100	67	37	24	14	27	61	19	64	67	21	47	82	69	63	42	58	30	13	100
8-Oct	20	43	28	19	15	14	12	13	10	11	18	20	16	16	16	29	26	26	20	13	12	11	12	13	43
9-Oct	26	39	92	82	65	81	87	19	14	11	11	10	9	14	11	8	11	16	18	9	8	8	10	10	92
10-Oct	12	12	21	77	34	68	66	28	10	12	10	9	9	11	11	9	9	12	12	15	14	10	10	10	77
11-Oct	10	11	13	11	12	11	11	10	10	9	9	8	9	8	10	11	9	11	15	15	12	11	9	10	15
12-Oct	17	22	27	71	65	39	74	36	20	15	15	14	19	28	59	31	23	31	12	10	9	15	10	19	74
13-Oct	14	11	10	16	16	24	24	18	12	17	17	14	22	10	9	10	10	10	13	10	10	10	10	10	24
14-Oct	10	9	9	11	14	14	12	10	11	10	11	13	11	9	10	13	19	21	18	18	19	12	11	9	21
15-Oct	9	10	10	10	13	10	10	10	16	8	9	23	28	21	23	20	18	18	19	12	14	9	8	6	28
16-Oct	10	14	14	20	14	10	14	11	7	7	8	4	4	14	61	39	47	74	86	47	77	55	32	31	86
17-Oct	69	26	21	17	30	17	41	13	19	14	17	17	16	19	11	18	25	20	21	21	21	61	83	27	83
18-Oct	44	34	33	36	13	37	21	11	10	11	11	10	19	21	19	17	16	18	29	42	69	34	17	59	69
19-Oct	16	18	10	14	9	9	15	13	7	17	73	17	15	14	16	16	24	74	25	98	66	14	13	17	98
20-Oct	13	13	15	60	14	16	14	13	13	15	16	11	14	15	13	14	35	31	19	30	57	77	68	88	88
21-Oct	91	94	72	60	29	29	32	16	15	17	50	16	77	19	20	17	16	17	16	15	16	18	21	23	94
22-Oct	17	26	33	95	74	42	63	88	68	56	62	31	28	27	19	28	14	25	33	43	15	11	12	13	95
23-Oct	14	12	16	28	103	92	90	20	16	13	17	15	17	15	15	13	13	10	11	15	11	12	12	13	103
24-Oct	18	20	16	12	13	12	14	14	18	14	13	22	17	14	13	13	13	14	15	14	12	13	13	13	22
25-Oct	14	13	13	15	16	15	13	13	19	15	14	16	17	17	14	14	16	17	22	10	13	16	11	12	22
26-Oct	11	13	11	26	33	87	14	13	13	12	12	13	15	18	48	38	17	32	51	54	14	12	12	21	87
27-Oct	15	22	27	21	22	22	16	18	20	20	19	24	30	23	29	21	11	16	67	56	14	13	68	23	68
28-Oct	19	39	60	34	13	12	41	60	24	12	22	23	27	30	19	75	84	23	12	11	12	13	13	11	84
29-Oct	11	11	13	11	12	11	11	13	11	12	25	23	22	17	46	34	51	88	32	59	43	51	17	16	88
30-Oct	27	13	15	18	52	104	81	65	79	42	12	22	13	21	27	24	24	25	22	23	16	16	14	13	104
31-Oct	12	12	18	14	71	13	22	22	18	19	17	20	30	27	87	41	59	59	65	75	17	68	70	76	87
Diurnal Maximum																									



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Lower Camp - October 2023





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS13 FORT MCKAY SOUTH OCTOBER 2023

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

November 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT McKAY SOUTH (AMS13)
OCTOBER 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	32.4	0	7.1	0
TRS(ppb) Average	709	35	35	100	5.8	0	1.1	0
THC(ppm) Average	708	35	36	99.87	4.1	-	2.4	-
NMHC(ppm) Average	708	35	36	99.87	0.447	-	0.043	-
CH4(ppm) Average	708	35	36	99.87	3.9	-	2.4	-
O3(ppb) Average	684	34	60	96.51	36.7	0	30.2	-
NO2(ppb) Average	707	36	37	99.87	25.1	0	9.7	-
NO(ppb) Average	707	36	37	99.87	75.9	-	11.9	-
NOX(ppb) Average	707	36	37	99.87	89.6	-	18.8	-
PM2.5(ug/m3) Average	738	1	6	99.33	34.2	0	18.3	0
ET(C) Average	744	0	0	100	25	-	11.7	-
RH(%) Average	744	0	0	100	98.8	-	89.7	-
WS(km/h) Average	743	0	1	99.87	28	-	14	-
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)
OCTOBER 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	1.48	3.9	-	0	0.2	0.3	0.4	0.8	2.5	32.4
TRS(ppb) Average	709	0.54	0.4	-	0.1	0.3	0.3	0.4	0.6	0.9	5.8
THC(ppm) Average	708	2.15	0.2	-	2	2	2.1	2.1	2.2	2.3	4.1
NMHC(ppm) Average	708	0.003	0.023	-	0	0	0	0	0	0	0.447
CH4(ppm) Average	708	2.15	0.2	-	2	2	2.1	2.1	2.2	2.3	3.9
O3(ppb) Average	684	16.57	10.4	-	1.9	2.8	6	16.5	26.1	30.4	36.7
NO2(ppb) Average	707	4.25	4.4	-	0	0.1	0.4	3	6.4	10.7	25.1
NO(ppb) Average	707	2.5	6.7	-	0	0	0	0.2	1.7	6.4	75.9
NOX(ppb) Average	707	6.75	9	-	0	0.1	0.5	3.6	9.6	16.4	89.6
PM2.5(ug/m3) Average	738	7.32	5.1	-	0.3	2.2	4	6.5	9.2	12	34.2
Temperature 2 m (C) Average	744	3.51	7.5	-	-14.3	-5.6	-2.1	3.1	9.3	13.8	25
Relative Humidity (%) Average	744	74.27	17	-	32.6	49.8	60.9	75.8	89.4	95.5	98.8
Wind Speed 10 m (km/h) Average	743	7.3	5	-	0	2	3	7	10	14	28
Wind Direction 10 m (deg) Average	743	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT MCKAY SOUTH (AMS13)
OCTOBER 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
NO2, O3, SO2, THC/NMHC/CH4	12 Oct 2023 09:00	12 Oct 2023 09:00	1	Maintenance - sample manifold cleaned
O3	04 Oct 2023 13:00	04 Oct 2023 22:00	22	Unstable Operation - inconsistent response
O3	06 Oct 2023 10:00	06 Oct 2023 12:00	3	Maintenance - analyzer recalibration
PM2.5	10 Oct 2023 09:00	10 Oct 2023 12:00	4	Unstable Operation - flatline in analyzer output signal
PM2.5	10 Oct 2023 13:00	10 Oct 2023 13:00	1	Maintenance - analyzer rebooted
Wind Speed, Wind Direction	31 Oct 2023 20:00	31 Oct 2023 20:00	1	Flat line in sensor output signal



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb

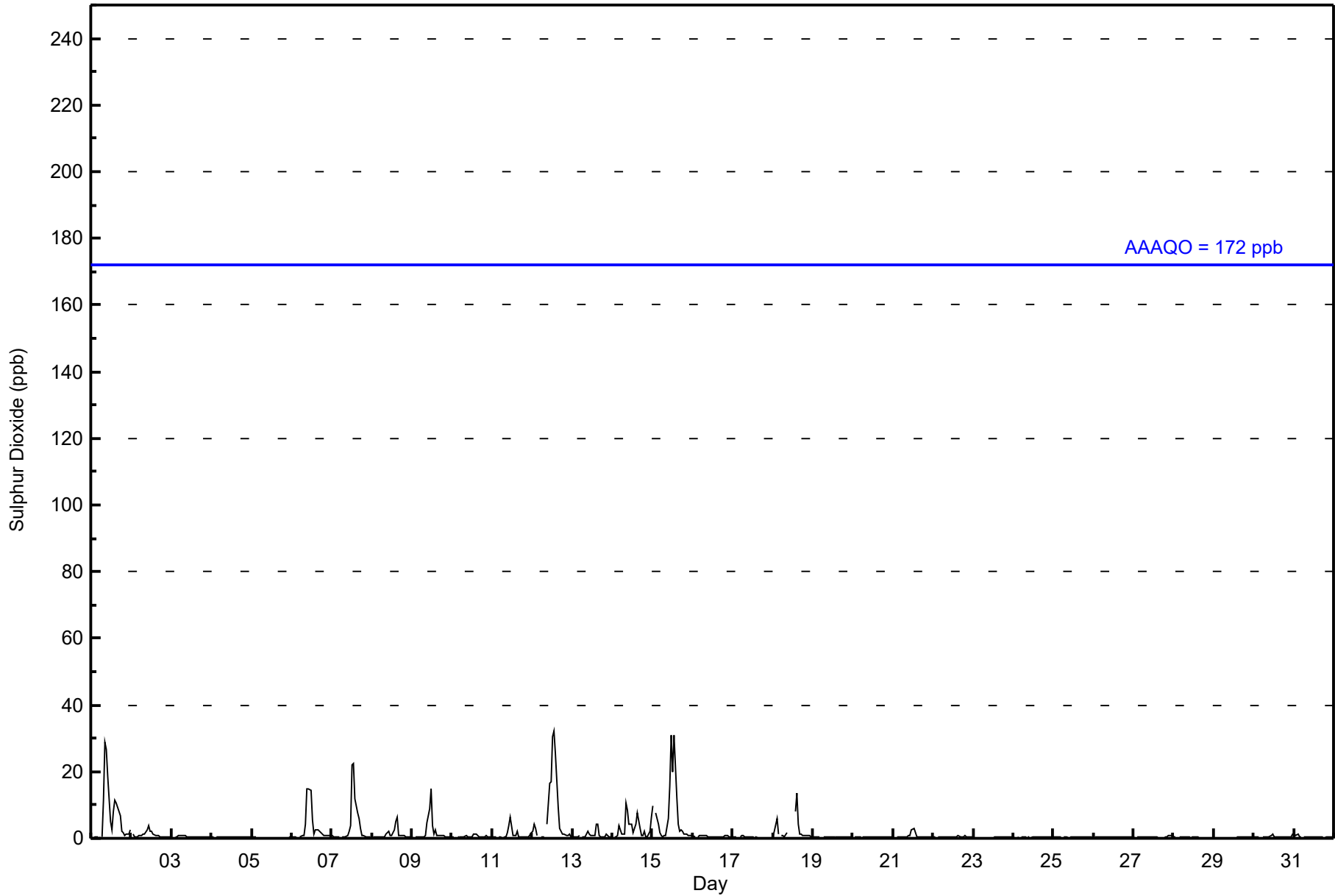
Fort McKay South - October 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 32.4 ppb on Oct 12 14:00	Maximum Daily Average: 7.1 ppb on Oct 12		Hours of Data:	708
Minimum Value: 0.0 ppb on Oct 5 14:00	Minimum Daily Average: 0.1 ppb on Oct 5		Hours of Missing Data:	36
Maximum Diurnal Average: 3.9 ppb at hour 14	Minimum Diurnal Average: 0.4 ppb at hour 7		Hours of Calibration:	35
Monthly Average: 1.48 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.2 Q ₁ = 0.3 Median = 0.4 Q ₃ = 0.8 P ₉₀ = 2.5 P ₉₉ = 22.3		Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Oct	0.2	0.2	0.3	0.4	0.4	Z	0.4	11.7	28.7	26.9	18.7	5.1	2.5	7.9	11.4	10.5	8.1	6.8	2.2	1.8	0.9	1.2	1.3	2.5	6.5	28.7
2-Oct	Z	1.1	0.6	0.5	0.9	0.9	0.9	1.1	1.2	2.7	3.9	2.1	2.0	1.2	0.9	0.8	0.7	0.5	0.5	0.3	0.3	0.4	0.5	0.6	1.1	3.9
3-Oct	0.4	Z	0.2	0.5	0.8	0.7	0.7	0.7	0.7	0.6	0.5	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.4	0.8
4-Oct	0.3	0.5	Z	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.5
5-Oct	0.3	0.2	0.3	Z	0.2	0.2	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	0.1	0.3	0.1	0.3	0.3
6-Oct	0.4	0.4	0.2	0.2	Z	0.5	0.8	0.7	4.3	15.0	14.8	14.4	5.5	1.3	2.4	2.4	2.7	1.6	1.3	1.1	1.0	0.8	0.8	0.7	3.2	15.0
7-Oct	0.7	0.6	0.5	0.4	0.4	Z	0.4	0.3	0.5	1.0	1.9	3.7	21.9	22.3	12.1	7.8	6.1	2.8	1.0	0.7	0.5	0.5	0.4	0.4	3.8	22.3
8-Oct	Z	0.3	0.3	0.2	0.3	0.2	0.3	0.5	1.4	1.5	2.2	0.9	1.0	2.4	5.1	6.5	1.0	0.9	0.8	1.0	0.6	0.5	0.4	0.3	1.3	6.5
9-Oct	0.3	Z	0.3	0.3	0.4	0.4	0.4	0.5	0.7	4.6	8.7	14.8	3.9	1.1	2.4	1.0	0.7	0.8	0.8	0.7	0.6	0.6	0.5	0.5	2.0	14.8
10-Oct	0.4	0.4	Z	0.4	0.3	0.3	0.3	0.3	0.7	0.6	0.6	0.6	0.6	1.2	1.4	0.7	0.6	0.6	0.5	0.5	0.9	0.5	0.5	0.5	0.6	1.4
11-Oct	0.4	0.4	0.4	Z	0.3	0.2	0.2	0.3	0.4	1.6	3.6	6.2	0.8	0.7	0.8	2.1	0.6	0.6	0.5	0.4	0.4	0.4	0.4	1.6	1.0	6.2
12-Oct	2.2	4.2	2.8	0.9	Z	0.4	0.3	0.2	M	4.3	16.5	16.9	30.4	32.4	25.5	9.5	2.9	1.9	1.5	1.1	0.8	0.8	1.1	0.6	7.1	32.4
13-Oct	0.8	0.6	0.5	0.6	0.8	Z	0.4	0.5	1.3	2.1	1.5	1.0	1.0	1.0	4.4	4.2	0.9	0.6	0.5	0.5	1.4	0.7	0.3	0.3	1.1	4.4
14-Oct	Z	0.3	0.3	1.0	3.7	1.4	1.4	1.2	10.6	8.5	4.1	4.3	1.6	3.1	4.1	7.4	2.8	1.0	0.7	2.1	0.6	0.6	1.9	6.2	3.0	10.6
15-Oct	9.6	Z	7.7	4.3	1.6	0.9	0.6	0.6	1.0	6.1	15.7	31.0	20.0	30.9	12.4	4.3	1.9	2.5	2.2	1.5	1.1	0.9	1.0	0.9	6.9	31.0
16-Oct	0.7	0.5	Z	0.4	0.6	0.9	0.8	0.8	0.7	0.6	0.5	0.5	0.6	0.5	0.4	0.5	0.4	0.4	0.4	0.7	0.9	0.7	0.5	0.4	0.6	0.9
17-Oct	0.5	0.6	0.6	Z	0.5	0.7	0.7	0.5	0.5	0.4	0.2	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.3	0.7
18-Oct	0.3	2.1	6.0	1.3	Z	0.9	0.7	0.6	1.7	C	C	C	C	8.1	13.6	4.2	1.1	1.3	1.0	0.8	0.7	0.8	0.7	0.6	2.4	13.6
19-Oct	0.5	0.4	0.5	0.5	0.4	Z	0.4	0.3	0.3	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	0.3	0.3	0.4	0.5
20-Oct	Z	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.3
21-Oct	0.3	Z	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.7	1.0	2.4	3.0	1.8	0.6	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.7	3.0
22-Oct	0.3	0.2	Z	0.3	0.2	0.2	0.2	0.3	0.2	0.3	0.3	0.4	0.4	0.4	0.5	0.7	0.5	0.4	0.4	1.0	0.3	0.3	0.3	0.2	0.4	1.0
23-Oct	0.2	0.1	0.2	Z	0.2	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.2	0.3
24-Oct	0.2	0.2	0.2	0.2	Z	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3
25-Oct	0.3	0.2	0.3	0.2	0.3	Z	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
26-Oct	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4
27-Oct	0.4	Z	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.2	0.2	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.7	0.7	0.6	0.3	0.7
28-Oct	0.3	0.2	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.4
29-Oct	0.1	0.1	0.1	Z	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.2	0.4
30-Oct	0.3	0.3	0.3	0.3	Z	0.3	0.3	0.3	0.3	0.4	0.9	1.3	0.6	0.4	0.5	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.4	1.3	0.5	1.3
31-Oct	1.2	0.6	1.3	0.5	0.4	Z	0.4	0.4	0.3	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.5	0.4	1.3

0.8	0.6	1.0	0.6	0.6	0.4	0.4	0.8	1.9	2.7	3.3	3.6	3.3	3.9	3.3	2.2	1.1	0.9	0.6	0.6	0.5	0.5	0.5	0.7	Diurnal Average	
9.6	4.2	7.7	4.3	3.7	1.4	1.4	11.7	28.7	26.9	18.7	31.0	30.4	32.4	25.5	10.5	8.1	6.8	2.2	2.1	1.4	1.2	1.9	6.2	Diurnal Maximum	

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Fort McKay South - October 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	683	96.47	96.47
11 - 20	16	2.26	98.73
21 - 60	9	1.27	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



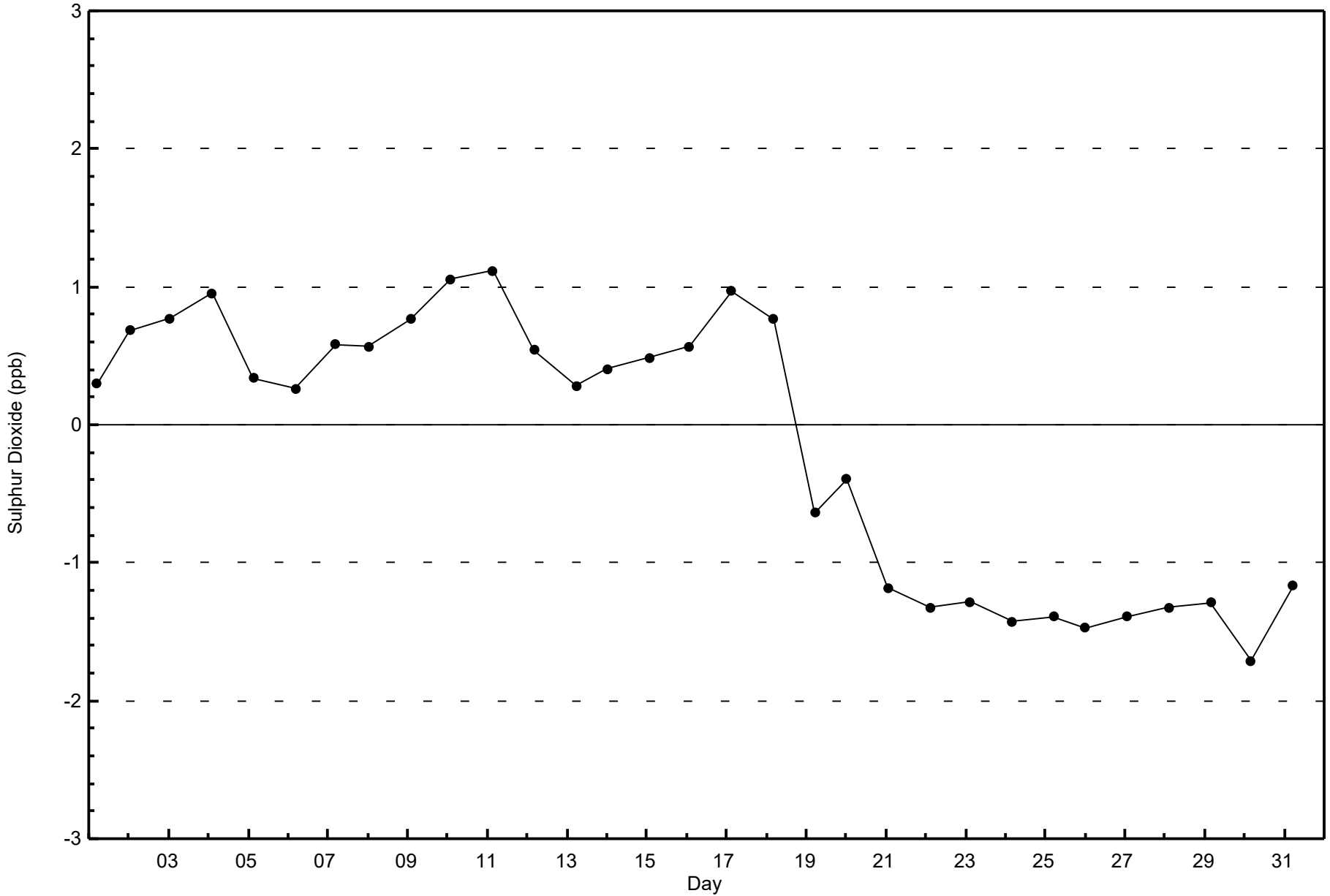
Wood Buffalo Environmental Association
Frequency Distribution

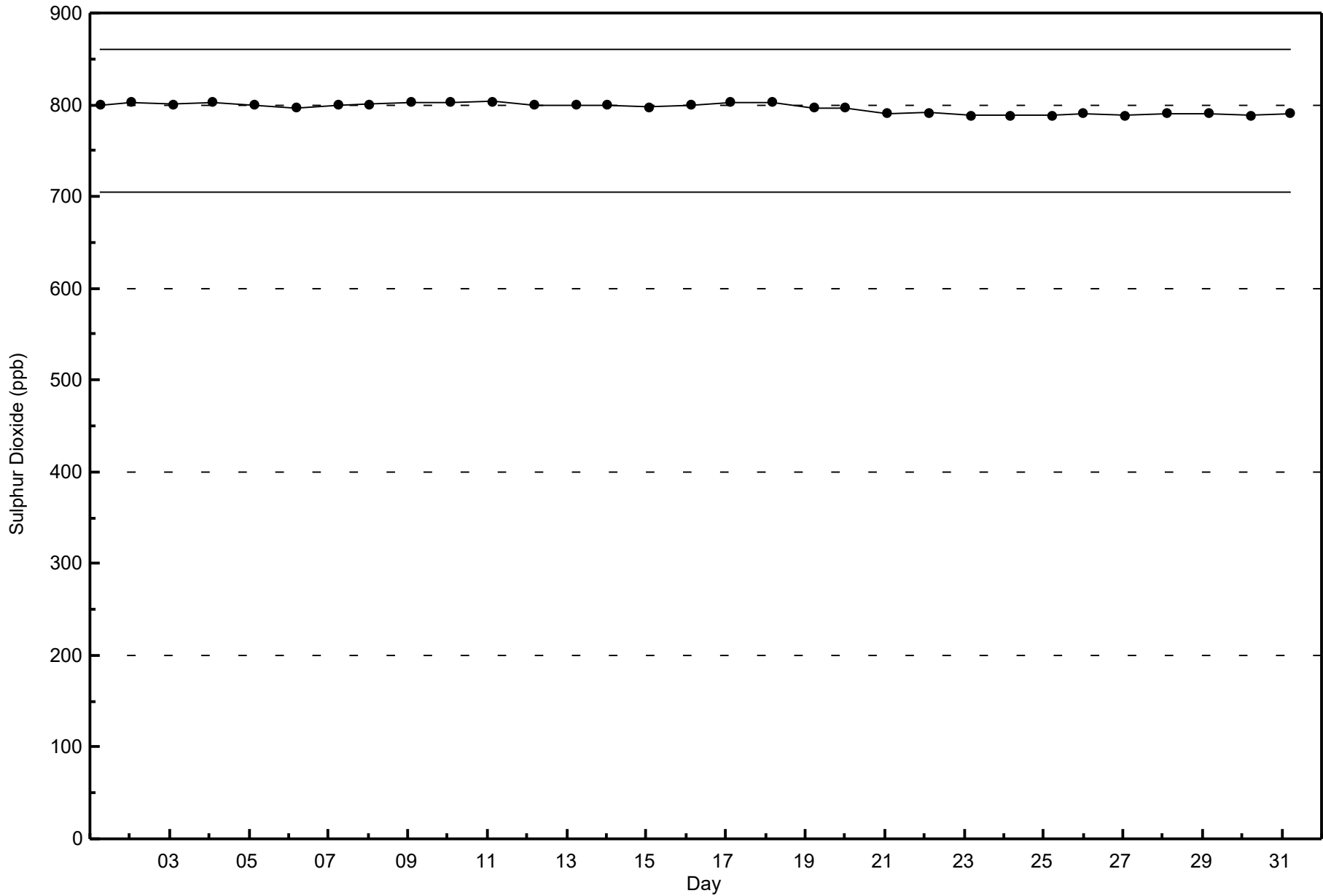
Sulphur Dioxide (SO₂) - ppb
Fort McKay South - October 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	33	15	5	5	5	5	21	91	96	60	39	86	72	45	60	44	682
11 - 20	0	0	0	0	0	0	0	13	3	0	0	0	0	0	0	0	16
21 - 60	0	0	0	0	0	0	1	3	5	0	0	0	0	0	0	0	9
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	33	15	5	5	5	5	22	107	104	60	39	86	72	45	60	44	707

Total Number of Valid Hours: 707

Total Number of Hours: 744







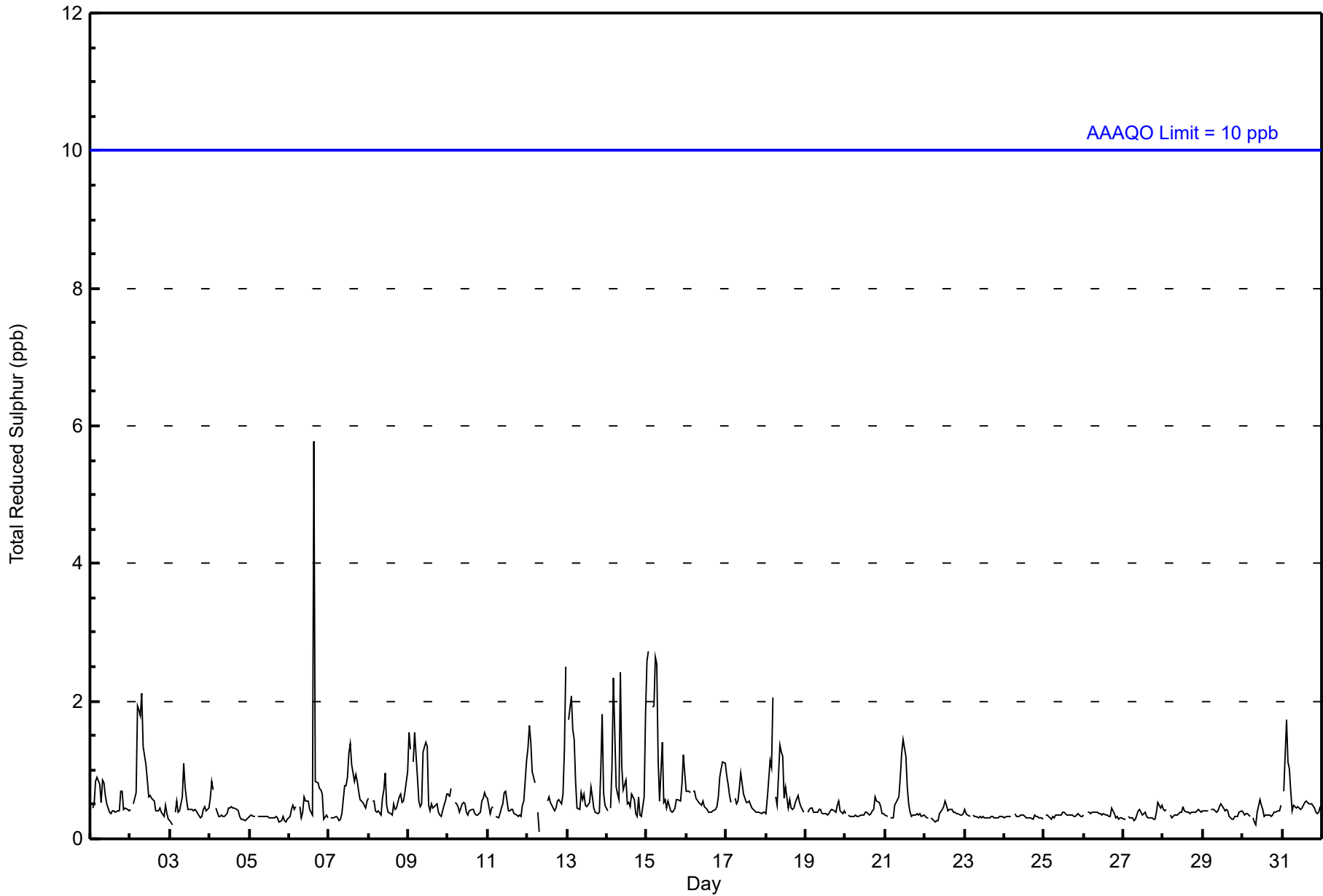
Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

Fort McKay South - October 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																			Hours in Service:		744																										
Maximum Value: 5.8 ppb on Oct 6 16:00		Maximum Daily Average: 1.1 ppb on Oct 15																		Hours of Data:		709																												
Minimum Value: 0.1 ppb on Oct 12 08:00		Minimum Daily Average: 0.3 ppb on Oct 5																		Hours of Missing Data:		35																												
Maximum Diurnal Average: 0.8 ppb at hour 5		Minimum Diurnal Average: 0.4 ppb at hour 18																		Hours of Calibration:		35																												
Monthly Average: 0.54 ppb		Percentiles: $P_1 = 0.3$ $P_{10} = 0.3$ $Q_1 = 0.3$ Median = 0.4 $Q_3 = 0.6$ $P_{90} = 0.9$ $P_{99} = 2.3$																		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-Oct	Z	0.4	0.5	0.8	0.9	0.8	0.5	0.9	0.8	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.7	0.7	0.4	0.4	0.4	0.4	0.6	0.9																								
2-Oct	0.4	Z	0.5	0.7	1.9	1.9	1.8	2.1	1.3	1.1	0.9	0.6	0.6	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.3	0.5	0.4	0.3	0.8	2.1																								
3-Oct	0.3	0.2	Z	0.4	0.5	0.4	0.4	0.6	1.1	0.7	0.6	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.5	0.4	0.4	0.5	1.1																								
4-Oct	0.6	0.8	0.7	Z	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.8																								
5-Oct	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	0.2	0.3	0.3	0.3	0.2	0.3	0.3	0.3																								
6-Oct	0.3	0.4	0.5	0.4	0.5	Z	0.5	0.3	0.4	0.6	0.5	0.5	0.4	0.4	0.3	5.8	0.8	0.8	0.7	0.7	0.6	0.3	0.4	0.3	0.7	5.8																								
7-Oct	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.8	0.8	0.9	1.2	1.4	1.1	0.8	0.9	0.8	0.7	0.6	0.5	0.5	0.4	0.6	0.6	1.4	1.4																								
8-Oct	0.6	Z	0.5	0.6	0.4	0.4	0.4	0.4	0.6	0.7	1.0	0.5	0.4	0.4	0.4	0.5	0.4	0.5	0.6	0.7	0.5	0.6	0.7	1.0	1.0	1.0																								
9-Oct	1.6	1.3	Z	1.1	1.5	0.9	0.5	0.5	0.5	1.3	1.4	1.3	0.5	0.4	0.5	0.4	0.5	0.5	0.4	0.4	0.3	0.5	0.5	0.7	1.6	1.6																								
10-Oct	0.6	0.6	0.7	Z	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.5	0.6	0.7	0.6	0.7																								
11-Oct	0.6	0.4	0.4	0.5	Z	0.3	0.3	0.4	0.4	0.5	0.7	0.7	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.5	0.6	1.1	1.1	1.1																								
12-Oct	1.3	1.7	1.4	1.0	0.8	Z	0.4	0.1	C	C	C	C	0.5	0.6	0.5	0.4	0.4	0.4	0.5	0.6	0.5	0.6	1.3	2.5	2.5	2.5																								
13-Oct	Z	1.7	2.1	1.6	1.4	0.8	0.4	0.4	0.7	0.6	0.6	0.5	0.5	0.8	0.6	0.4	0.4	0.4	0.4	1.0	1.8	0.7	0.5	0.8	2.1																									
14-Oct	0.4	Z	0.4	1.0	2.3	0.8	0.6	0.6	2.4	1.1	0.7	0.8	0.5	0.5	0.7	0.6	0.4	0.3	0.6	0.3	0.3	0.6	1.8	1.8	2.4																									
15-Oct	2.6	2.7	Z	1.9	1.9	2.6	2.6	1.1	0.6	1.4	0.5	0.6	0.4	0.6	0.4	0.4	0.4	0.5	0.6	0.6	0.6	0.8	1.2	1.0	2.7																									
16-Oct	0.7	0.7	0.7	Z	0.7	0.7	0.6	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	0.9	1.0	1.1	1.1	1.1	1.1																								
17-Oct	0.9	0.8	0.6	0.5	Z	0.6	0.5	0.6	0.7	1.0	0.7	0.6	0.5	0.5	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	1.0																								
18-Oct	0.4	0.6	1.1	1.0	2.1	Z	0.6	0.5	1.4	1.3	1.2	0.6	0.7	0.4	0.6	0.5	0.4	0.5	0.5	0.6	0.5	0.5	0.4	0.4	2.1	2.1																								
19-Oct	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	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.6	0.4	0.4	0.4	0.6	0.6																								
20-Oct	0.4	Z	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	0.4	0.6	0.5	0.5	0.4	0.4	0.6	0.6																								
21-Oct	0.3	0.3	Z	0.3	0.3	0.3	0.5	0.6	0.6	0.9	1.2	1.5	1.2	0.7	0.5	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.3	1.5	1.5																								
22-Oct	0.3	0.3	0.3	Z	0.3	0.3	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.5	0.5																								
23-Oct	0.4	0.4	0.3	0.3	Z	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4																								
24-Oct	0.3	0.3	0.3	0.3	0.3	Z	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4																								
25-Oct	Z	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	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.4	0.4																								
26-Oct	0.3	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.4																								
27-Oct	0.3	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.4	0.5	0.5	0.5																								
28-Oct	0.4	0.4	0.4	Z	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5																								
29-Oct	0.4	0.4	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.5																								
30-Oct	0.4	0.3	0.4	0.4	0.3	Z	0.3	0.2	0.2	0.4	0.6	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.6	0.6																								
31-Oct	Z	0.7	1.7	1.1	1.0	0.7	0.4	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.5	1.7	1.7																								
																								Diurnal Average		0.6	0.7	0.6	0.6	0.8	0.6	0.5	0.5	0.6	0.6	0.6	0.6	0.5	0.5	0.4	0.6	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.6	
																								Diurnal Maximum		2.6	2.7	2.1	1.9	2.3	2.6	2.6	2.1	2.4	1.4	1.4	1.5	1.2	1.4	1.1	5.8	0.9	0.8	0.7	0.7	1.0	1.8	1.3	2.5	2.5
Z - zerospan		C - Calibration																																																
Alberta Ambient Air Quality Objectives (AAAQO):		1-hr	10 ppb	24-hr	3 ppb																																													





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Fort McKay South - October 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	703	99.15	99.15
3 - 4	5	0.71	99.86
5 - 7	1	0.14	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Fort McKay South - October 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	33	15	5	5	5	4	22	103	104	60	38	83	72	46	63	44	702
3 - 4	0	0	0	0	0	0	0	1	2	1	1	0	0	0	0	0	5
5 - 7	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	33	15	5	5	5	4	22	104	107	61	39	83	72	46	63	44	708

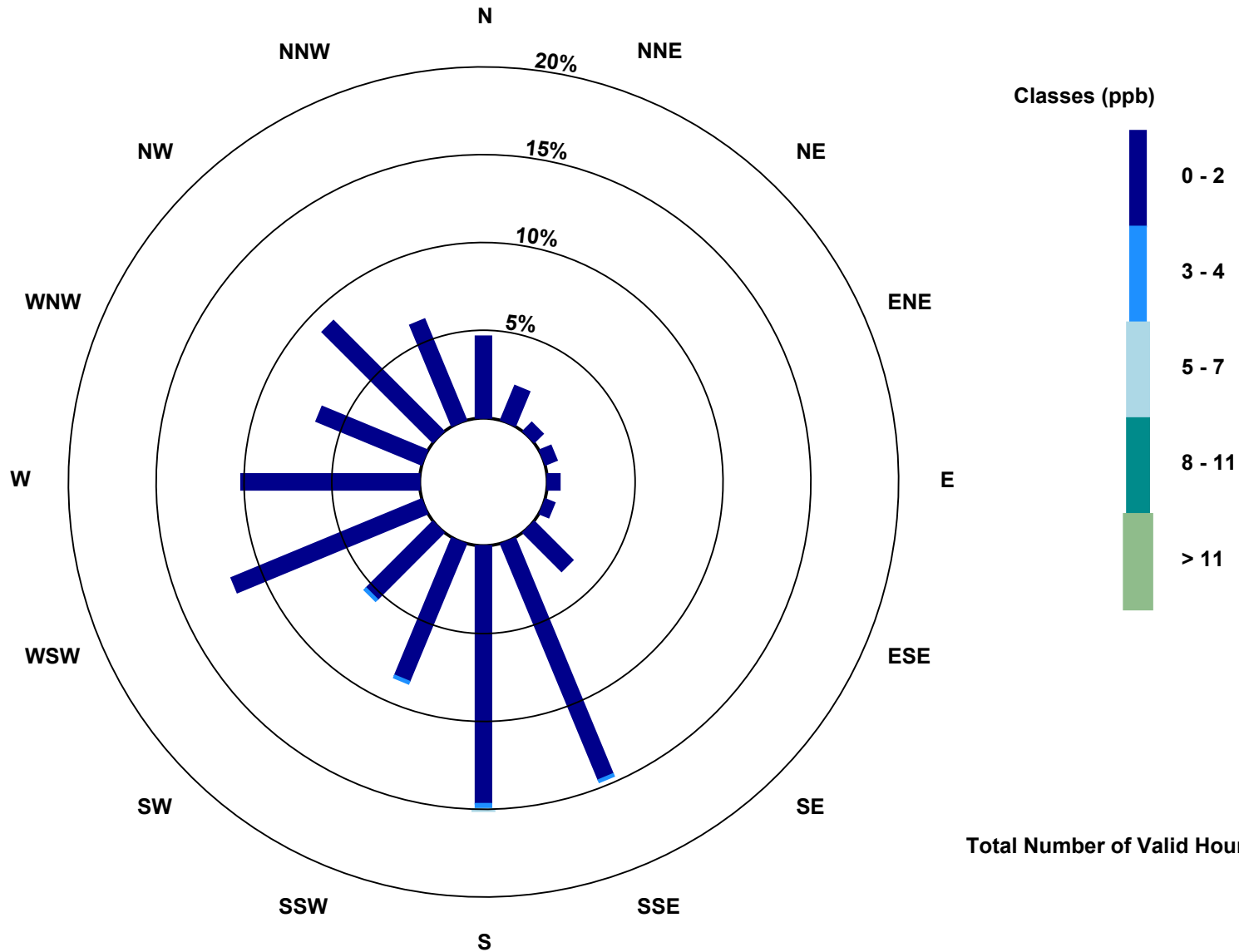
Total Number of Valid Hours: 708

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

Total Reduced Sulphur (TRS) - ppb
Fort McKay South

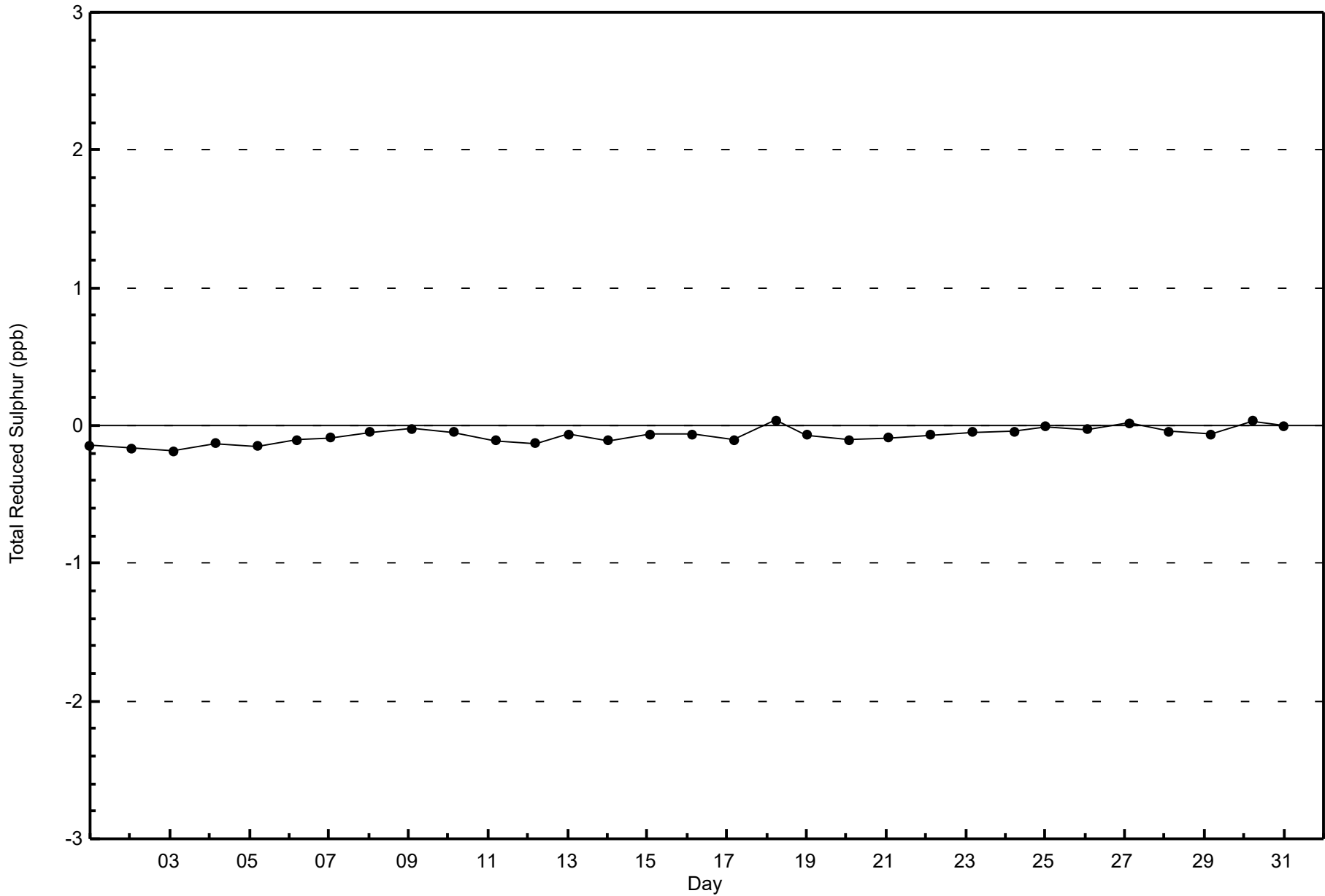


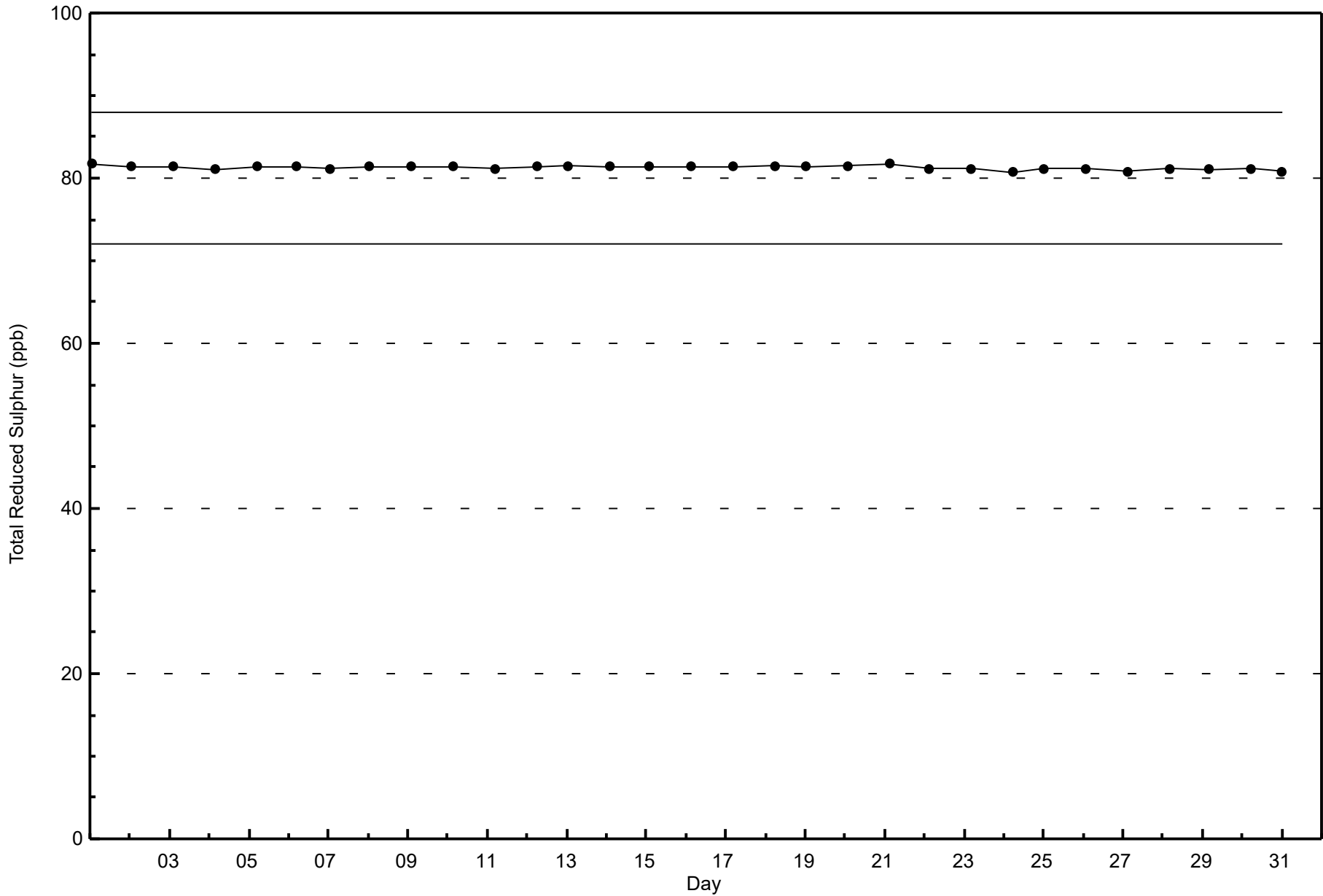
Total Number of Valid Hours: 708



Wood Buffalo Environmental Association
Zero Responses

Total Reduced Sulphur (TRS) - ppb
Fort McKay South - October 2023

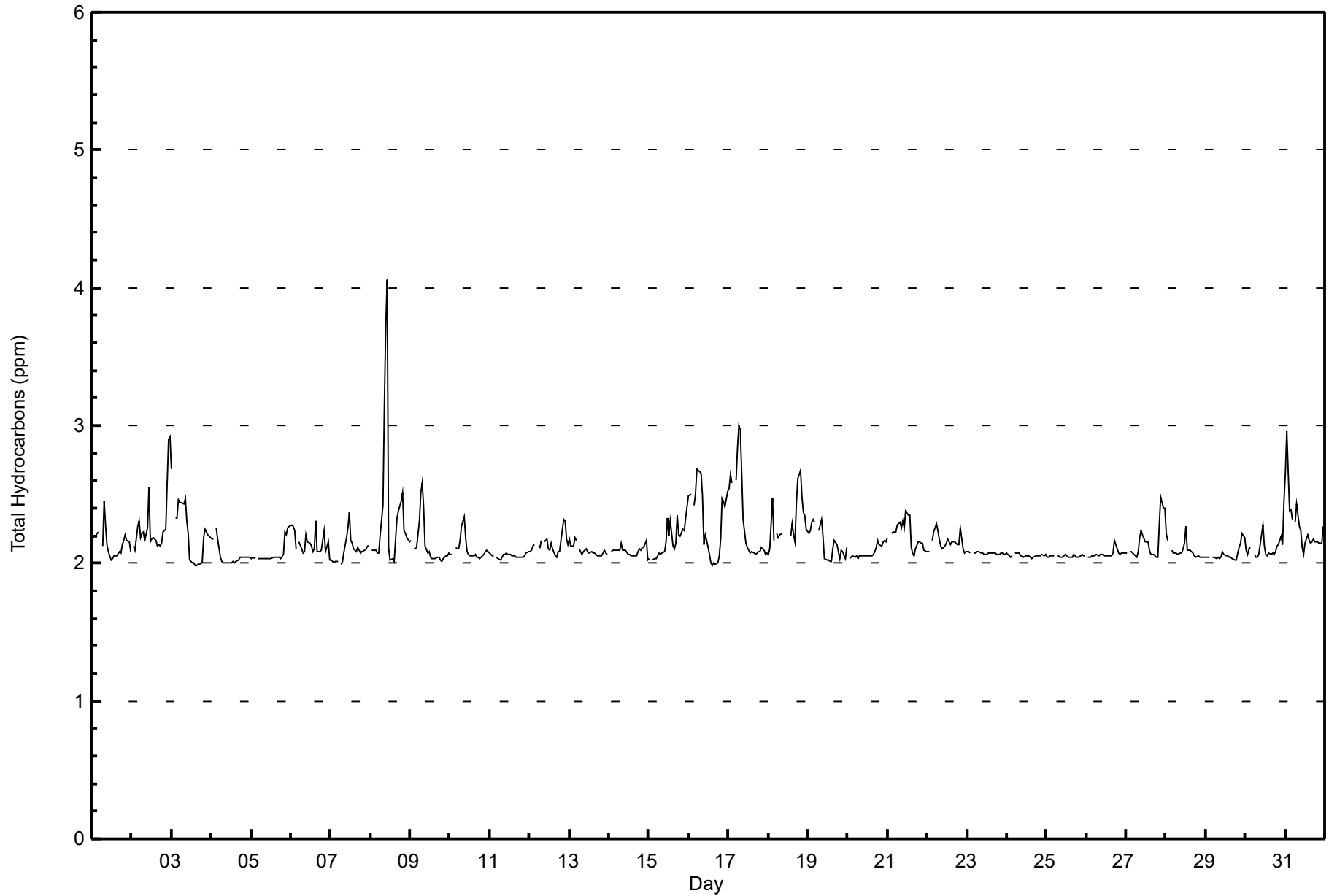






Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Fort McKay South - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Fort McKay South - October 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	151	21.33	21.33
2.1 - 3.0	554	78.25	99.58
3.1 - 10.0	3	0.42	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 - October 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	2	2	8	10	13	6	6	20	27	17	36	4	151
2.1 - 3.0	32	15	5	5	2	3	14	97	91	54	33	66	45	28	24	39	553
3.1 - 10.0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	3
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	33	15	5	5	5	5	22	107	104	60	39	86	72	45	60	44	707

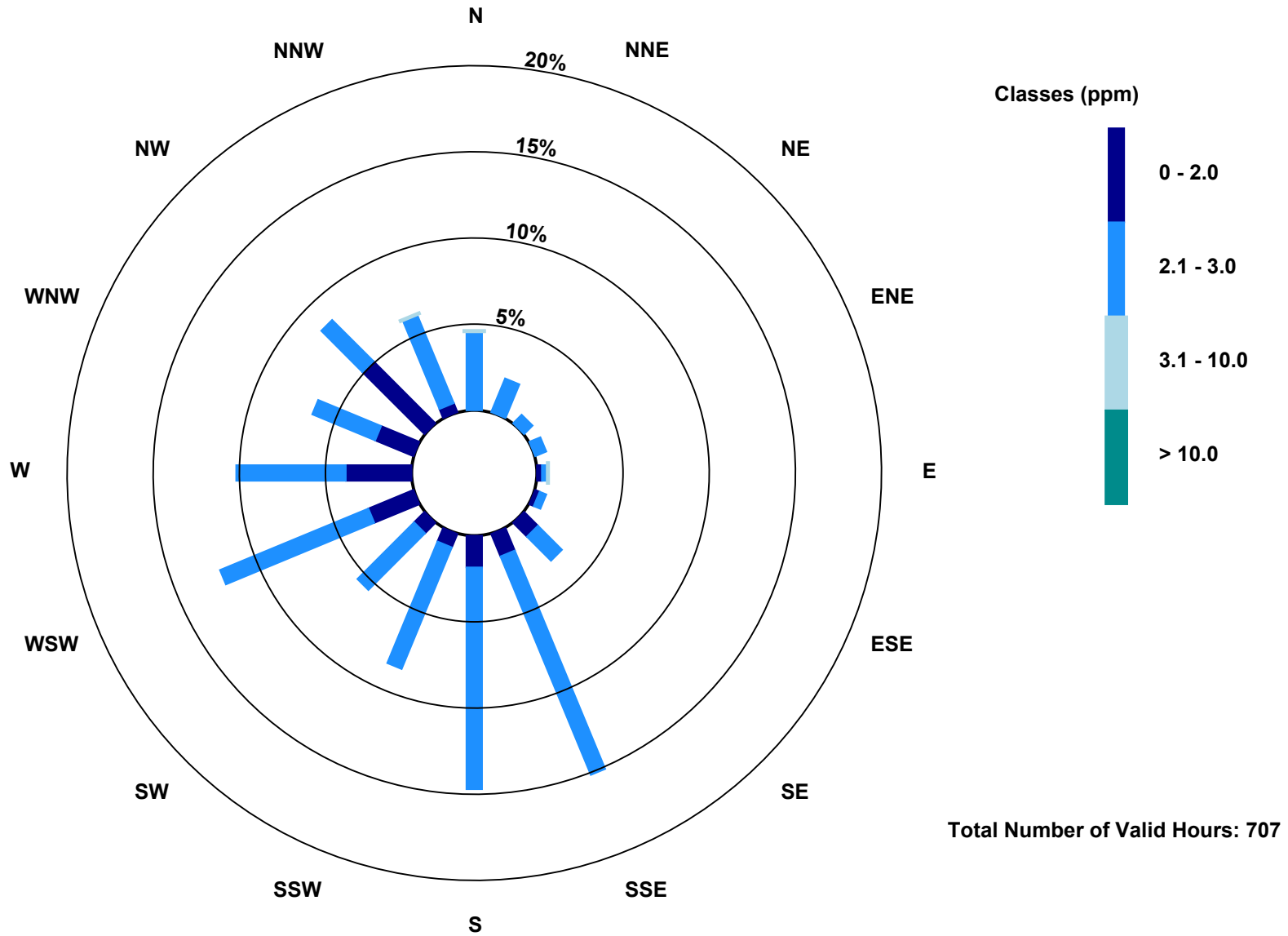
Total Number of Valid Hours: 707

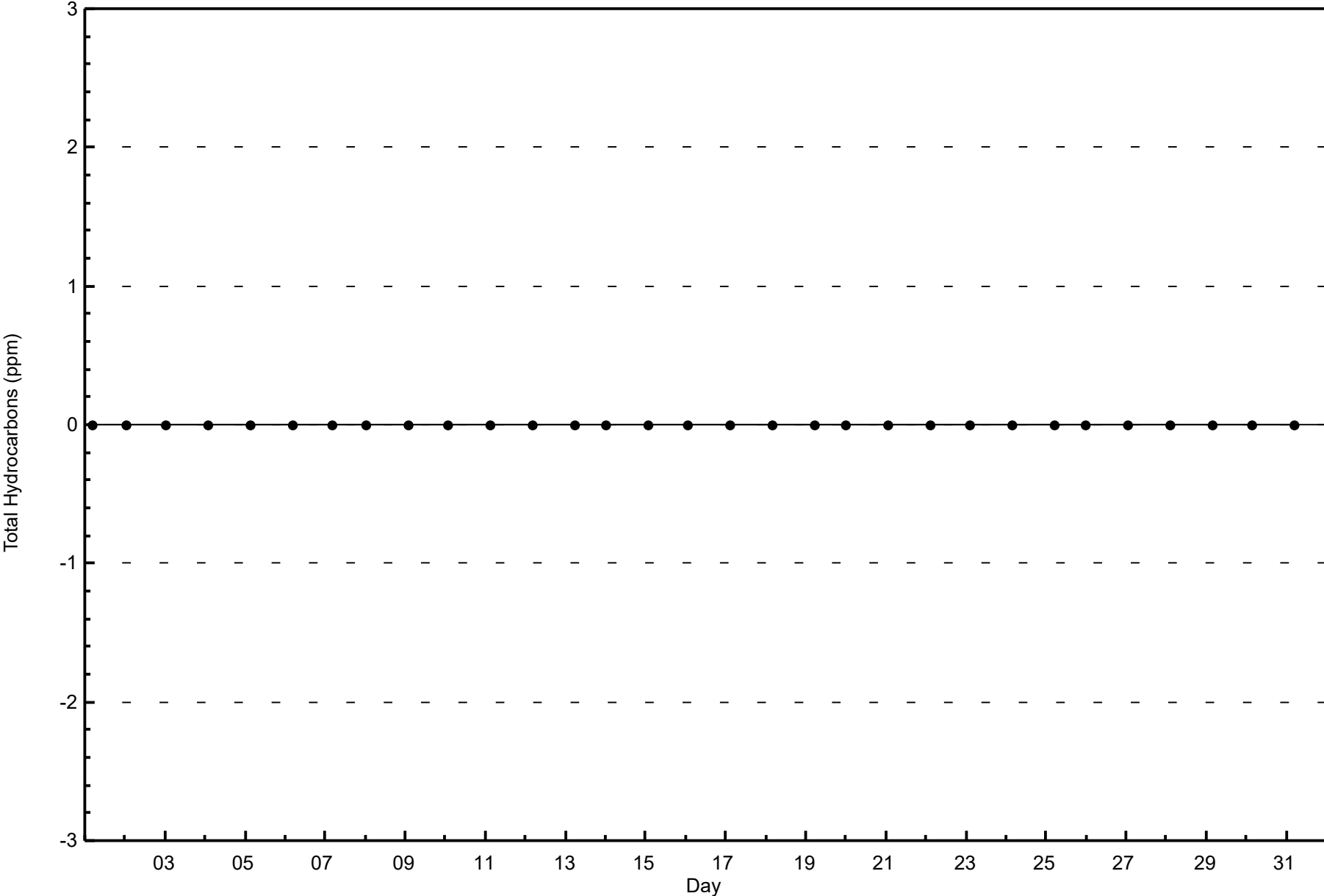
Total Number of Hours: 744

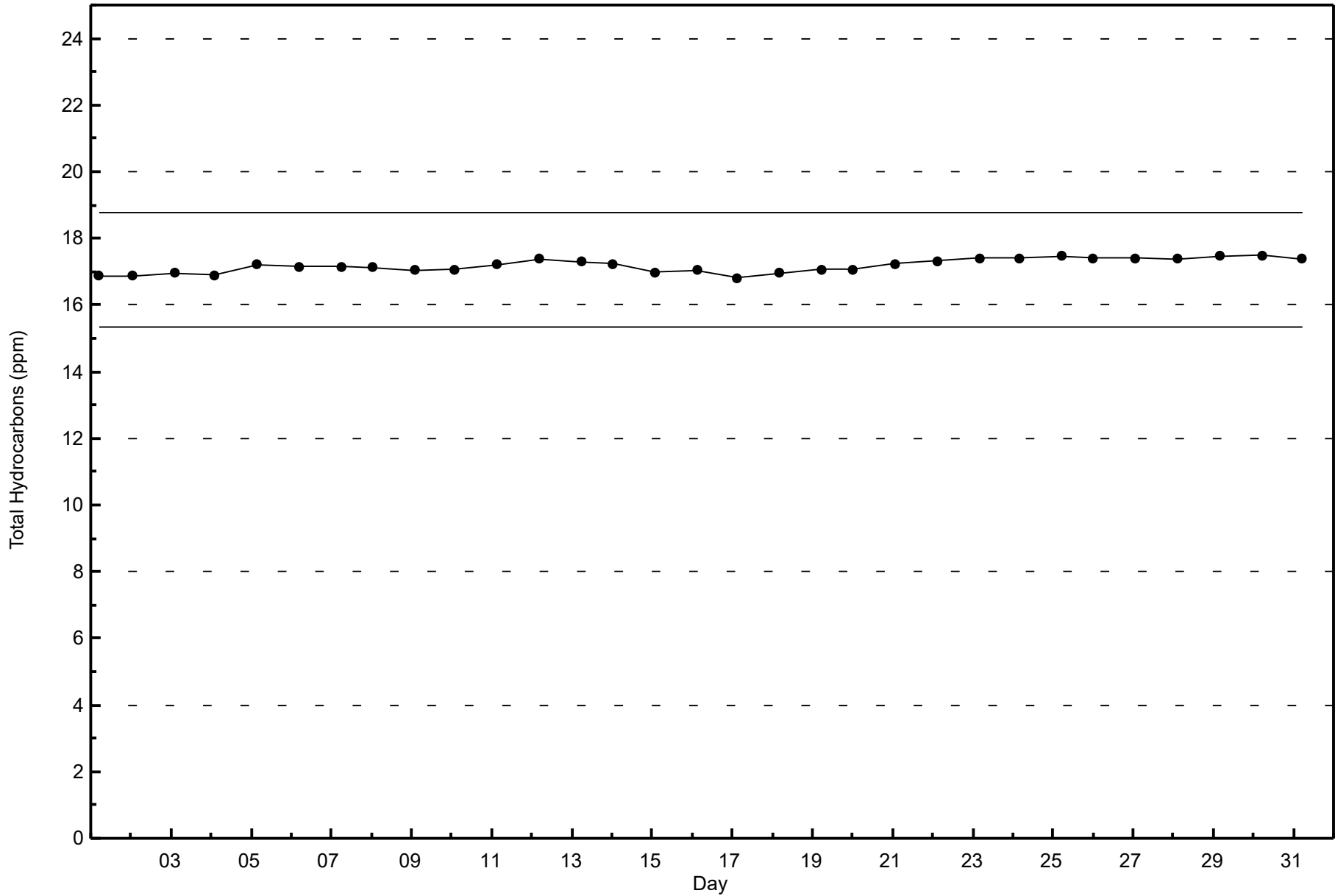


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Total Hydrocarbons (THC) - ppm
Fort McKay South







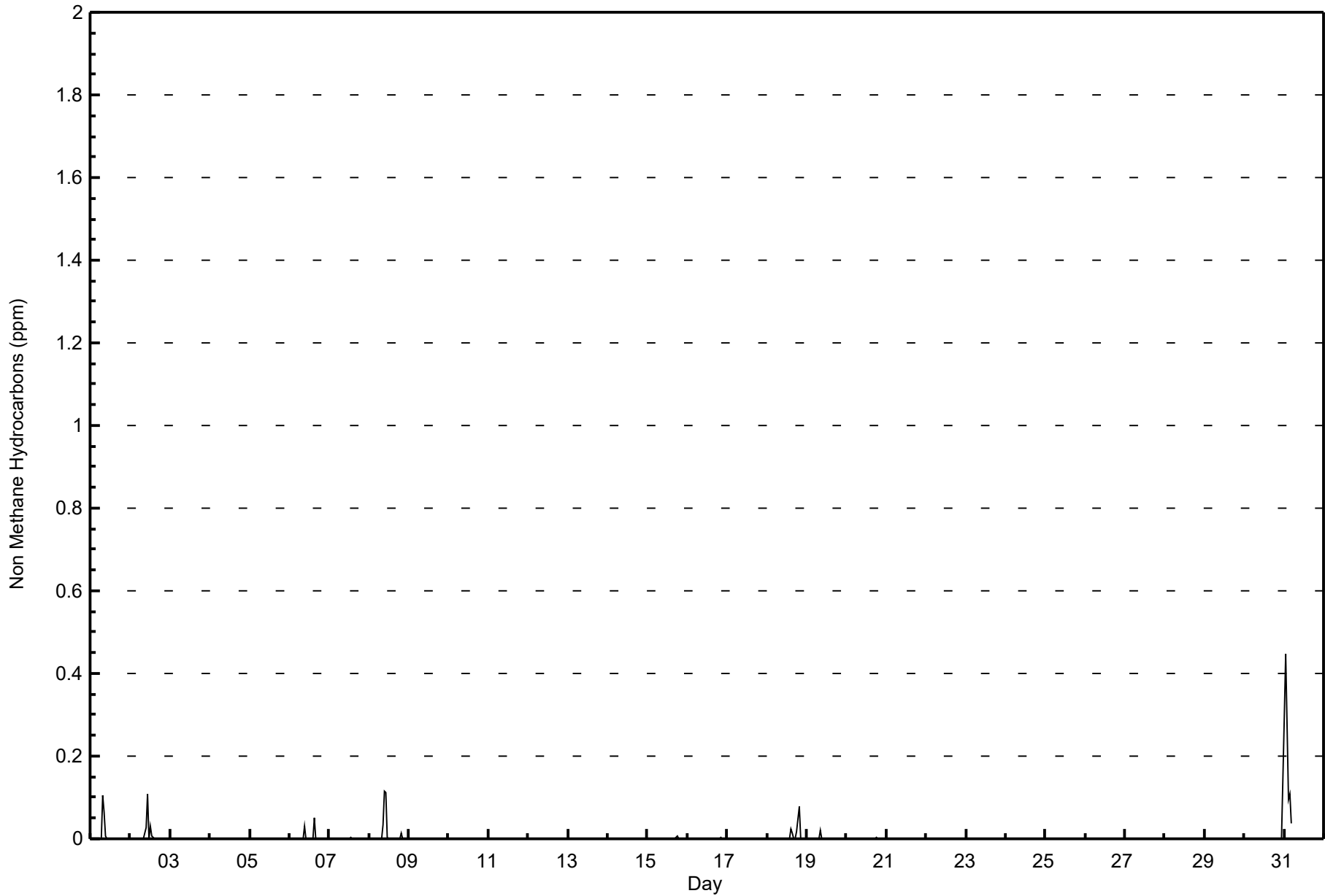


Maximum Value: 0.447 ppm on Oct 31 02:00		Maximum Daily Average: 0.043 ppm on Oct 31		Hours in Service: 744																							
Minimum Value: 0.000 ppm on Oct 1 01:00		Minimum Daily Average: 0.000 ppm on Oct 3		Hours of Data: 708																							
Maximum Diurnal Average: 0.017 ppm at hour 2		Minimum Diurnal Average: 0.000 ppm at hour 6		Hours of Missing Data: 36																							
Monthly Average: 0.003 ppm		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.0 P ₉₉ = 0.1		Hours of Calibration: 35																							
				Percent Operational Time: 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-Oct	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.105	0.063	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.105	
2-Oct	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.028	0.109	0.000	0.032	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.109	
3-Oct	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	
4-Oct	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	
5-Oct	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	
6-Oct	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.031	0.000	0.000	0.000	0.000	0.000	0.051	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.051	
7-Oct	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	
8-Oct	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.035	0.117	0.112	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.015	0.000	0.000	0.000	0.000	0.012	0.117	
9-Oct	0.000	Z	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	0.000	0.000	0.000	0.000	0.000	0.001	
10-Oct	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	
11-Oct	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	
12-Oct	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	M	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
13-Oct	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	
14-Oct	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	
15-Oct	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	
16-Oct	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	0.003	0.000	0.000	0.000	0.000	0.003	
17-Oct	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	
18-Oct	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	C	C	C	C	0.000	0.025	0.013	0.000	0.000	0.018	0.079	0.000	0.000	0.000	0.000	0.007	0.079	
19-Oct	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.019	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.019	
20-Oct	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.002	
21-Oct	0.000	Z	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	
22-Oct	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	
23-Oct	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	
24-Oct	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	
25-Oct	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	
26-Oct	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	
27-Oct	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	
28-Oct	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	
29-Oct	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	
30-Oct	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	0.006	0.144	
31-Oct	0.293	0.447	0.094	0.107	0.038	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	0.043	0.447	
		0.011	0.017	0.004	0.004	0.001	0.000	0.000	0.003	0.004	0.006	0.007	0.000	0.001	0.000	0.001	0.002	0.000	0.000	0.001	0.003	0.000	0.000	0.000	0.005	Diurnal Average	
		0.293	0.447	0.094	0.107	0.038	0.000	0.001	0.105	0.063	0.117	0.112	0.003	0.032	0.007	0.025	0.051	0.000	0.002	0.018	0.079	0.003	0.000	0.000	0.144	Diurnal Maximum	
Z - zerospan		C - Calibration			M - Maintenance																						



Wood Buffalo Environmental Association
Hourly Averages

Non Methane Hydrocarbons (NMHC) - ppm
Fort McKay South - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Fort McKay South - October 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	683	96.47	96.47
0.006 - 0.05	14	1.98	98.45
0.06 - 0.1	9	1.27	99.72
> 0.1	2	0.28	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 - October 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	15	5	5	4	5	22	100	94	56	39	86	72	45	60	43	682
0.006 - 0.05	1	0	0	0	0	0	0	3	7	2	0	0	0	0	0	1	14
0.06 - 0.1	1	0	0	0	1	0	0	2	3	2	0	0	0	0	0	0	9
> 0.1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
Totals	33	15	5	5	5	5	22	107	104	60	39	86	72	45	60	44	707

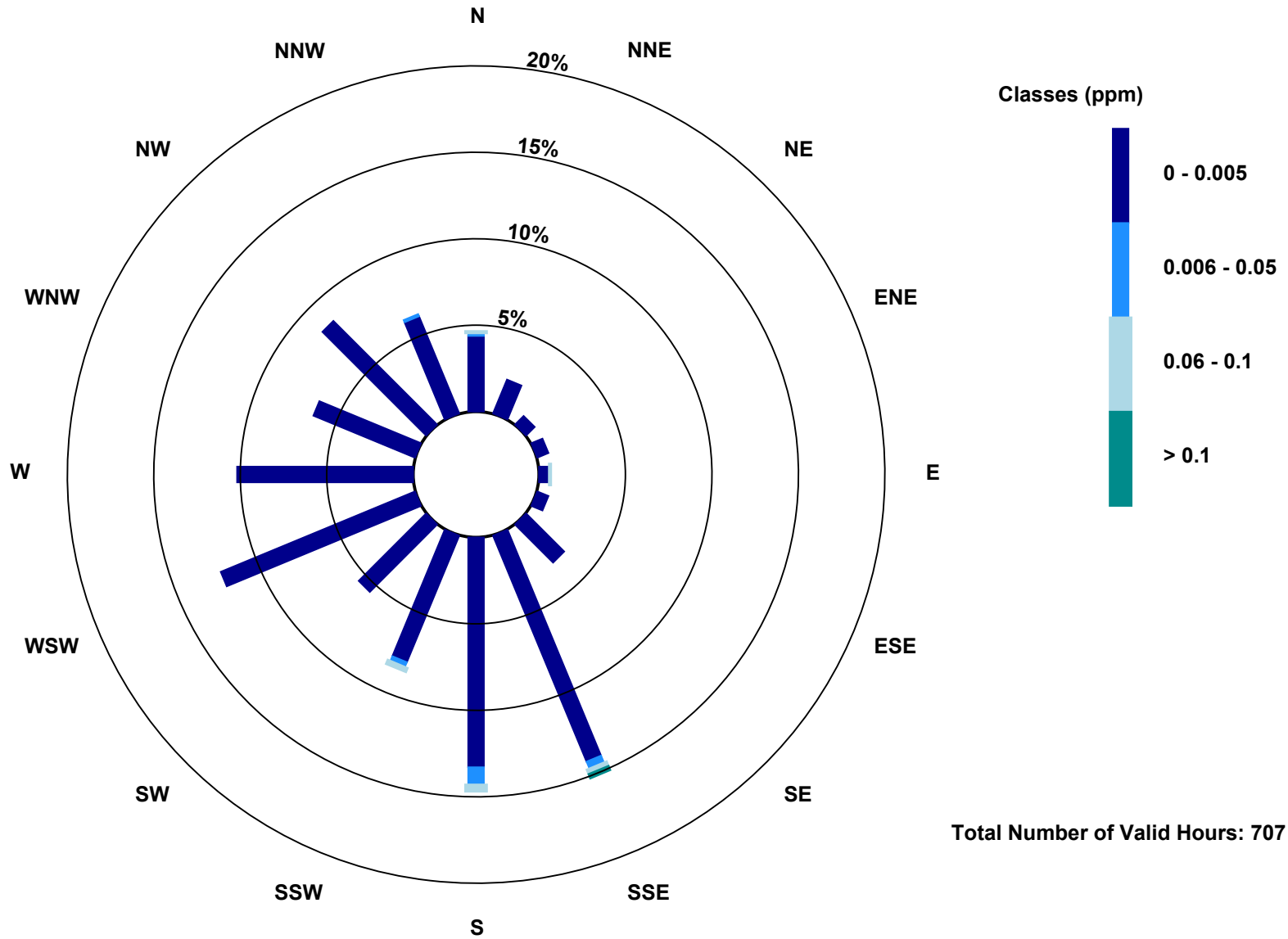
Total Number of Valid Hours: 707

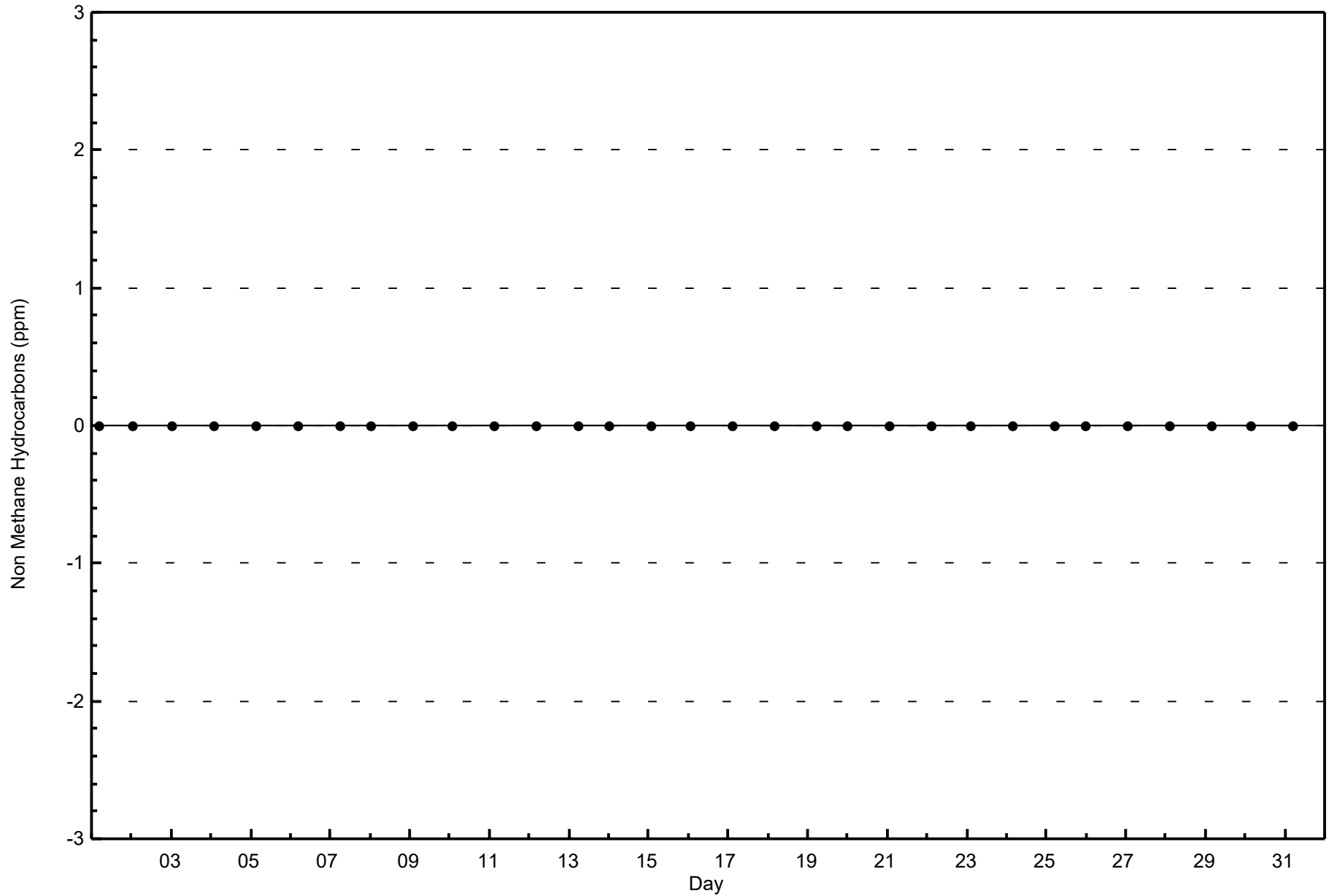
Total Number of Hours: 744

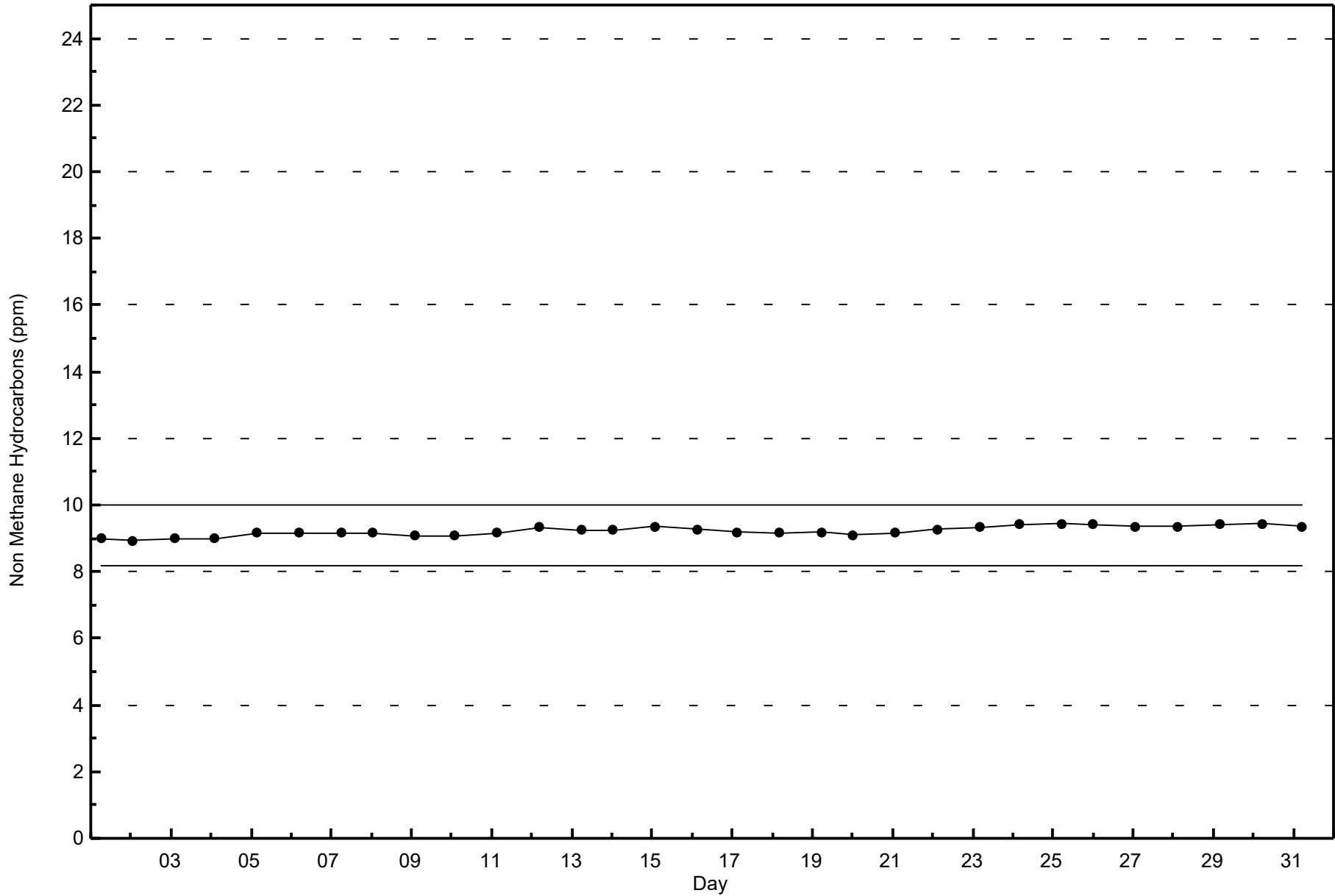


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Non Methane Hydrocarbons (NMHC) - ppm
Fort McKay South

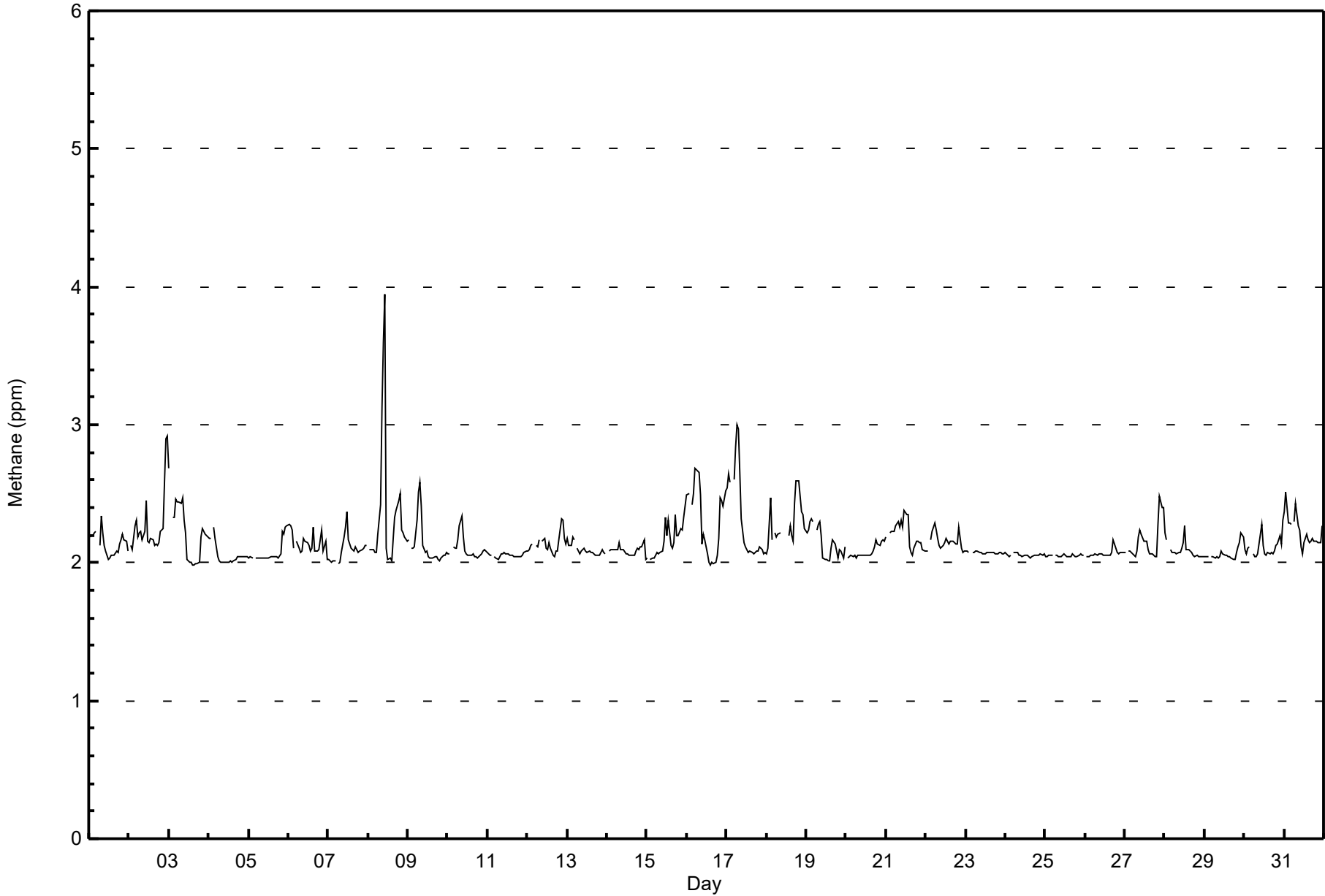








Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 744														744																													
Maximum Value: 3.9 ppm on Oct 8 11:00		Maximum Daily Average: 2.4 ppm on Oct 8														Hours of Data: 708																																	
Minimum Value: 2.0 ppm on Oct 3 16:00		Minimum Daily Average: 2.1 ppm on Oct 4														Hours of Missing Data: 36																																	
Maximum Diurnal Average: 2.2 ppm at hour 8		Minimum Diurnal Average: 2.1 ppm at hour 15														Hours of Calibration: 35																																	
Monthly Average: 2.15 ppm		Percentiles: P ₁ = 2.0 P ₁₀ = 2.0 Q ₁ = 2.1 Median = 2.1 Q ₃ = 2.2 P ₉₀ = 2.3 P ₉₉ = 2.8														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-Oct	2.2	2.2	2.2	2.2	2.2	Z	2.1	2.3	2.2	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.1	2.3	2.9	2.9	2.3	2.9																			
2-Oct	Z	2.1	2.1	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.4	2.2	2.1	2.2	2.2	2.1	2.1	2.1	2.2	2.2	2.3	2.6	2.9	2.9	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.3	2.9																
3-Oct	2.7	Z	2.3	2.3	2.5	2.4	2.4	2.4	2.5	2.3	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.7	2.7																
4-Oct	2.2	2.2	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.3																
5-Oct	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	2.2	2.2	2.3	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3																
6-Oct	2.3	2.3	2.2	2.1	Z	2.2	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.3	2.1	2.1	2.1	2.2	2.2	2.1	2.2	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3																
7-Oct	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.1	2.2	2.3	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	2.1	2.1	2.1	2.1	2.4																
8-Oct	Z	2.1	2.1	2.1	2.1	2.1	2.2	2.4	3.1	3.6	3.9	2.1	2.0	2.0	2.0	2.2	2.3	2.4	2.4	2.5	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4	3.9																
9-Oct	2.2	Z	2.1	2.1	2.1	2.3	2.5	2.6	2.4	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	2.1	2.1	2.1	2.1	2.1	2.6																
10-Oct	2.1	2.1	Z	2.1	2.1	2.1	2.2	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3																
11-Oct	2.1	2.1	2.1	Z	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.0	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	2.1	2.1	2.1																
12-Oct	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.2	M	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.2	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3																
13-Oct	2.2	2.1	2.1	2.2	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2																
14-Oct	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2																
15-Oct	2.0	Z	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.2	2.3	2.1	2.1	2.1	2.1	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.2	2.2	2.4	2.4																
16-Oct	2.5	2.5	Z	2.4	2.5	2.7	2.7	2.6	2.5	2.1	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.5	2.5	2.4	2.5	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.7																
17-Oct	2.5	2.6	2.6	Z	2.6	2.8	3.0	3.0	2.7	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	3.0																
18-Oct	2.1	2.1	2.5	2.2	Z	2.2	2.2	2.2	2.2	C	C	C	C	2.2	2.3	2.2	2.2	2.4	2.6	2.6	2.5	2.4	2.4	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.6																
19-Oct	2.2	2.2	2.3	2.3	2.3	Z	2.2	2.3	2.3	2.2	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.1	2.1	2.0	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3																
20-Oct	Z	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2																
21-Oct	2.2	Z	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.3	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	2.1	2.1	2.1	2.1	2.1	2.4																
22-Oct	2.1	2.1	Z	2.2	2.2	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.2	2.2	2.1	2.1	2.1	2.3	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3																
23-Oct	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1																
24-Oct	2.1	2.1	2.0	2.0	Z	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	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1																
25-Oct	2.0	2.0	2.1	2.1	2.1	Z	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1																
26-Oct	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	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2																
27-Oct	2.1	Z	2.1	2.1	2.1	2.1	2.0	2.1	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	2.3	2.5	2.4	2.4	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.5																
28-Oct	2.2	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	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	2.1	2.1	2.1	2.1	2.1	2.1	2.3																
29-Oct	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2																
30-Oct	2.1	2.1	2.1	2.1	Z	2.1	2.0	2.0	2.1	2.1	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3																
31-Oct	2.4	2.5	2.3	2.3	2.3	Z	2.3	2.4	2.3	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.5																
																								2.2	2.2	2.1	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	2.2	2.2	Diurnal Average	
																								2.7	2.6	2.6	2.4	2.6	2.8	3.0	3.0	3.1	3.6	3.9	2.4	2.4	2.3	2.3	2.3	2.3	2.4	2.6	2.6	2.5	2.6	2.9	2.9	Diurnal Maximum	
Z - zerospan		C - Calibration				M - Maintenance																																											





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Fort McKay South - October 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	151	21.33	21.33
2.1 - 3.0	554	78.25	99.58
3.1 - 10.0	3	0.42	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 - October 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	2	2	8	10	13	6	6	20	27	17	36	4	151
2.1 - 3.0	32	15	5	5	2	3	14	97	91	54	33	66	45	28	24	39	553
3.1 - 10.0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	3
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	33	15	5	5	5	5	22	107	104	60	39	86	72	45	60	44	707

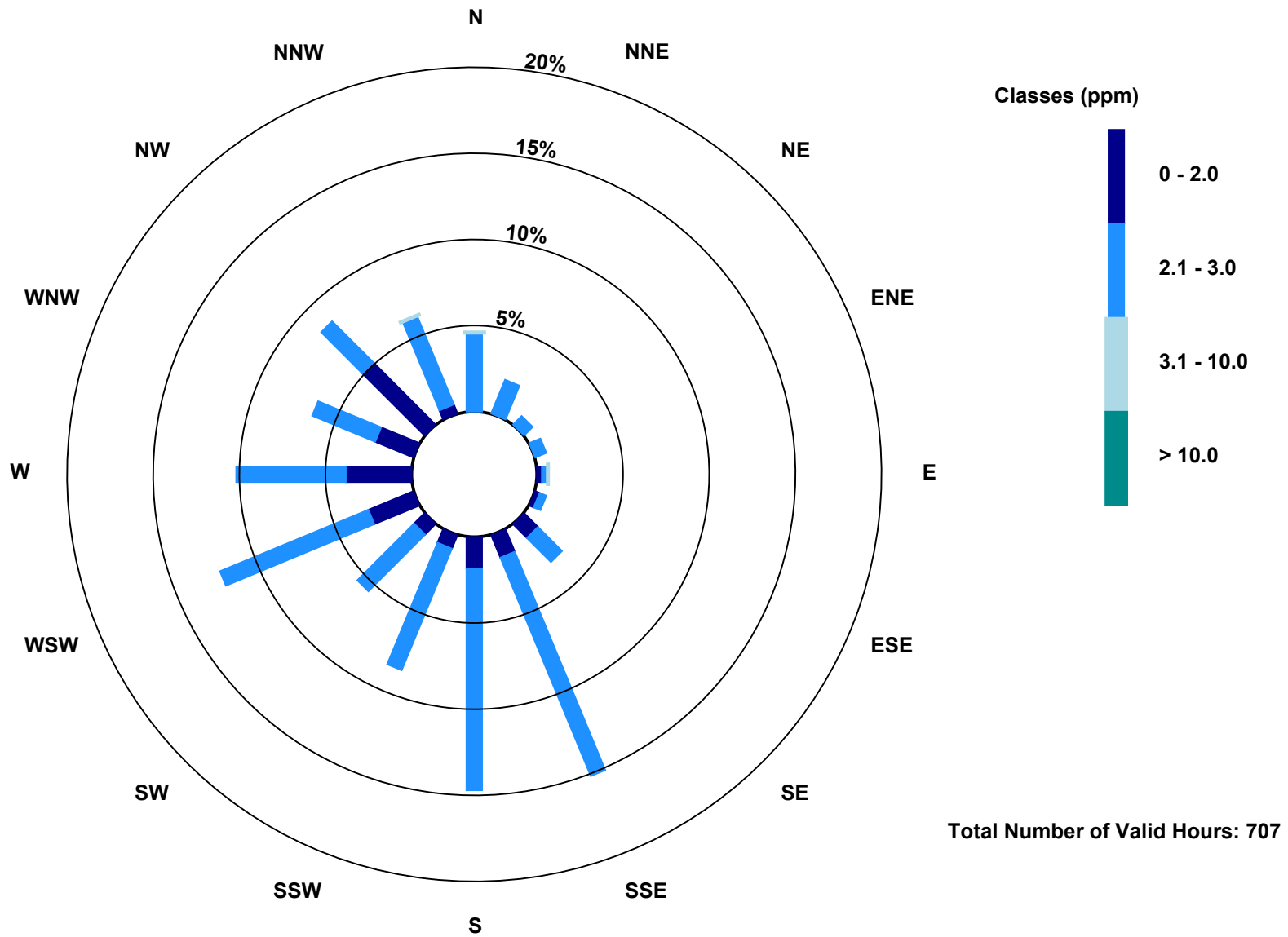
Total Number of Valid Hours: 707

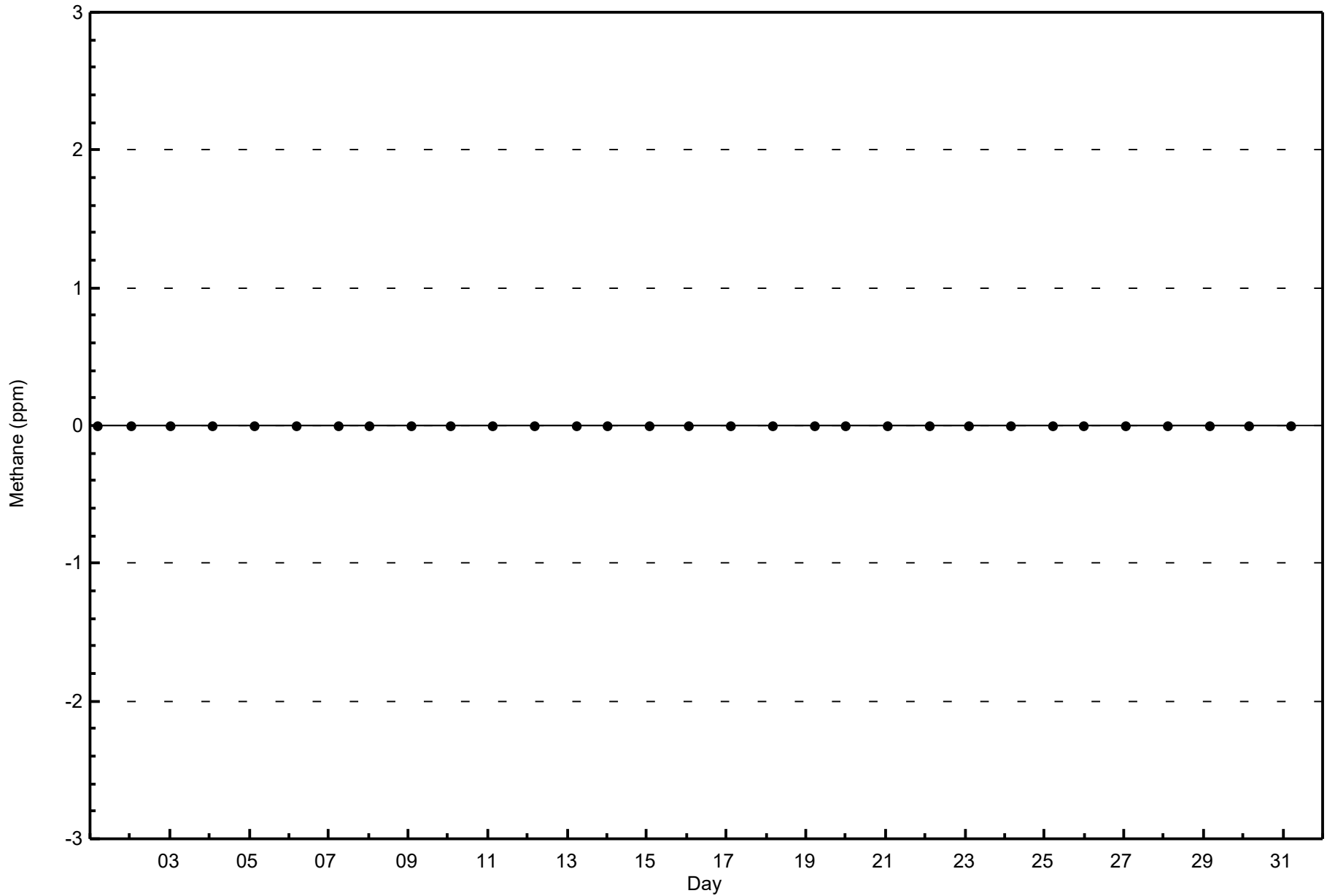
Total Number of Hours: 744

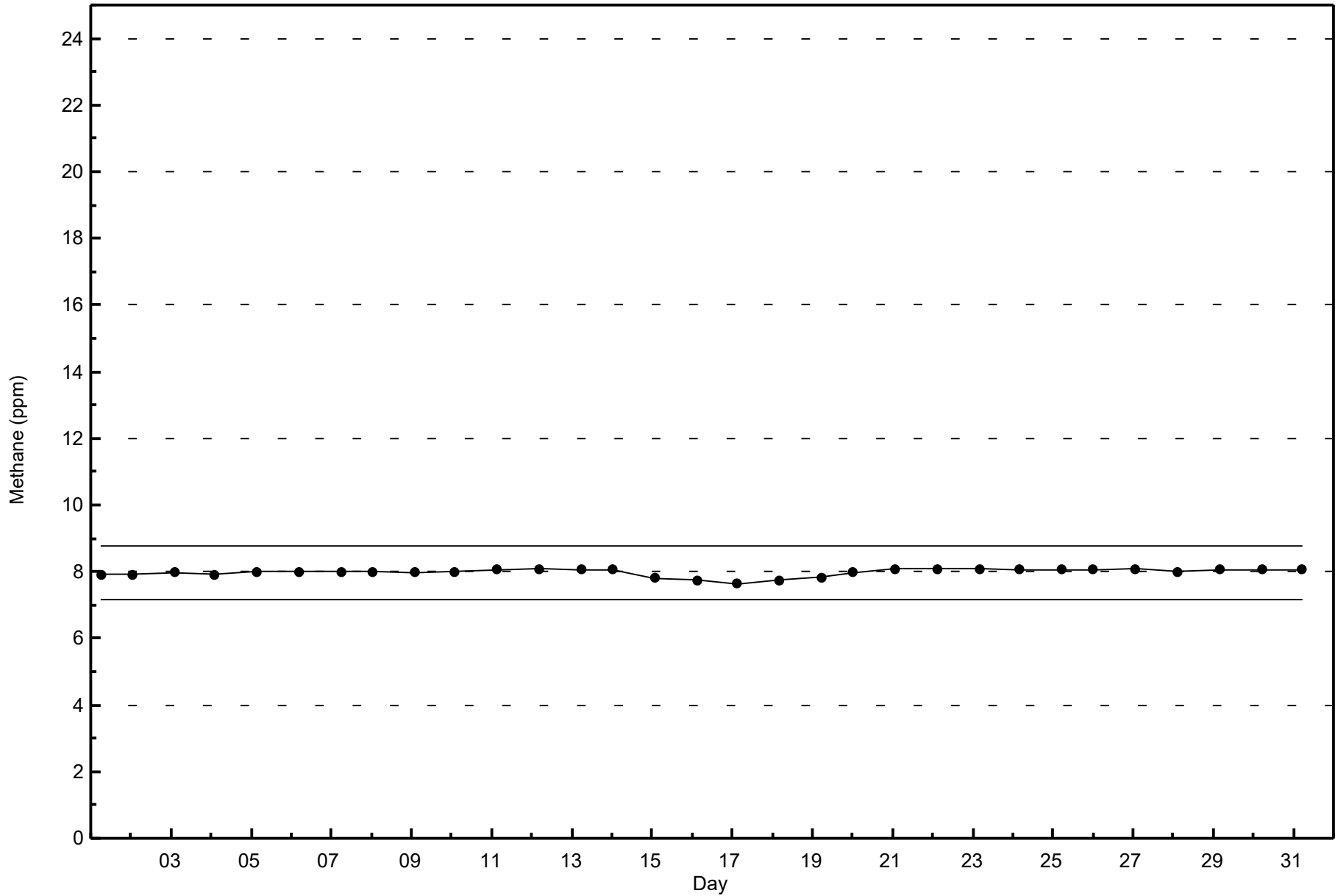


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Methane (CH₄) - ppm
Fort McKay South









Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O₃) - ppb

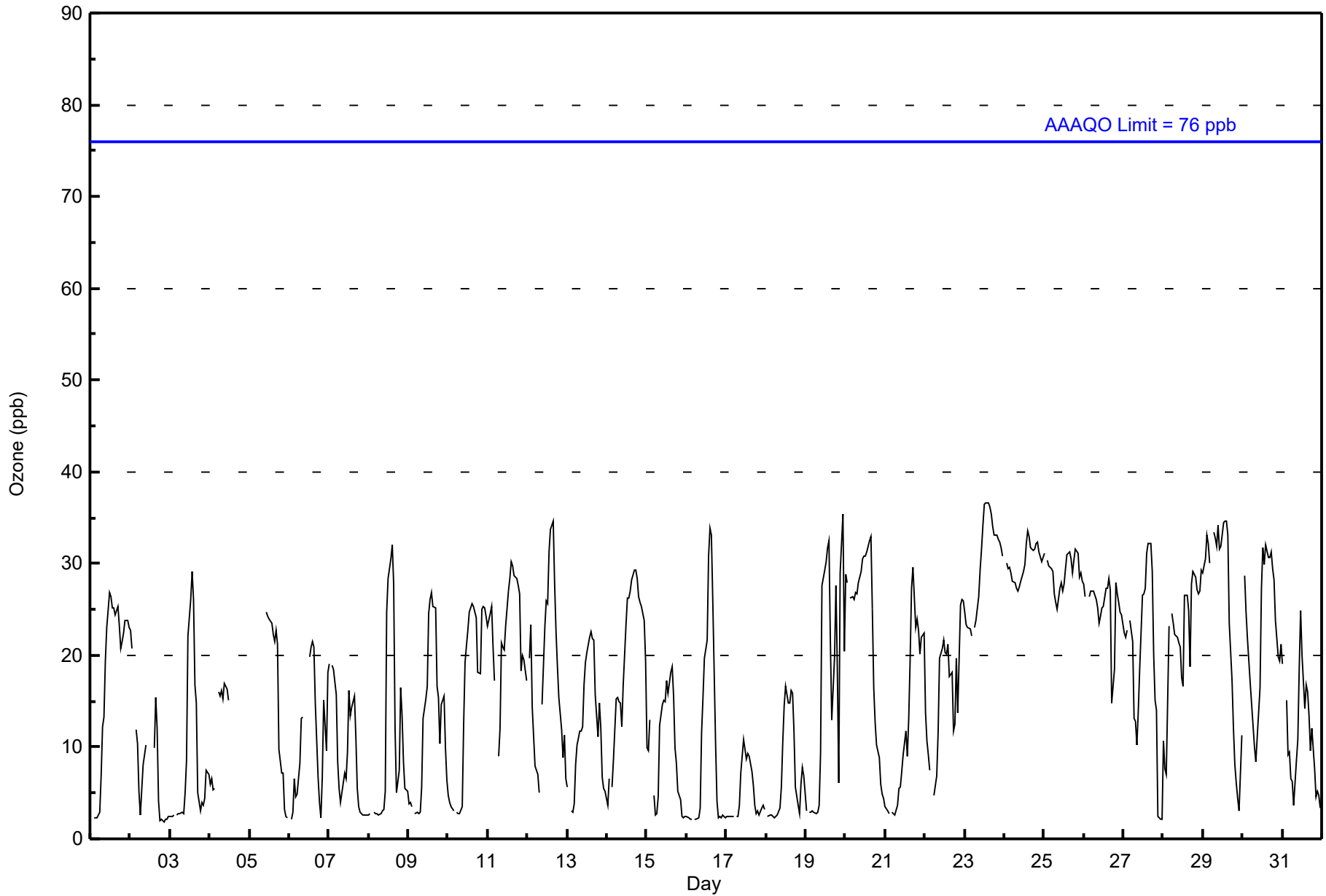
Fort McKay South - October 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 744
Maximum Value: 36.7 ppb on Oct 23 15:00	Maximum Daily Average: 30.2 ppb on Oct 23
Minimum Value: 1.9 ppb on Oct 2 21:00	Hours of Data: 684
Maximum Diurnal Average: 25.4 ppb at hour 15	Hours of Missing Data: 60
Monthly Average: 16.57 ppb	Hours of Calibration: 34
Minimum Daily Average: 4.8 ppb on Oct 17	Percent Operational Time: 96.5
Minimum Diurnal Average: 10.6 ppb at hour 6	
Percentiles: P ₁ = 2.1 P ₁₀ = 2.8 Q ₁ = 6.0 Median = 16.5 Q ₃ = 26.1 P ₉₀ = 30.4 P ₉₉ = 34.6	

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-Oct	2.5	Z	2.3	2.3	2.3	2.9	6.9	12.2	13.3	19.4	23.1	26.9	26.4	25.2	25.2	24.5	25.4	23.2	20.7	21.5	22.4	23.8	23.8	23.1	17.4	26.9		
2-Oct	22.7	20.7	Z	11.8	10.3	5.2	2.7	5.4	8.1	10.3	C	C	C	C	10.0	15.4	12.1	4.2	1.9	2.1	1.9	2.1	2.1	2.5	8.0	22.7		
3-Oct	2.4	2.5	2.6	Z	2.6	2.7	2.7	3.0	2.8	5.0	8.5	22.1	26.1	29.2	26.1	16.8	14.8	5.0	3.1	4.0	3.7	4.5	7.5	7.0	8.9	29.2		
4-Oct	6.0	6.5	5.4	5.5	Z	16.1	15.6	16.2	15.2	16.9	16.4	15.1	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	16.9		
5-Oct	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	24.7	24.2	23.9	23.5	22.3	21.5	22.7	21.3	9.8	7.1	7.2	3.1	2.4	2.4	--	24.7
6-Oct	Z	2.1	3.0	6.5	4.5	4.9	8.2	13.1	13.2	M	M	M	19.8	20.9	21.5	20.9	14.7	6.7	4.0	2.3	6.7	15.1	9.6	18.2	10.8	21.5		
7-Oct	19.1	Z	19.0	18.4	15.7	8.3	5.4	4.0	5.0	7.1	6.5	9.5	16.2	13.4	14.3	15.6	11.0	5.5	3.5	2.9	2.6	2.6	2.7	2.5	9.2	19.1		
8-Oct	2.7	2.8	Z	2.9	2.8	2.8	2.6	2.7	3.1	3.1	5.2	24.7	28.3	30.5	32.0	27.7	11.9	5.0	7.4	16.5	13.4	8.3	5.5	5.2	10.7	32.0		
9-Oct	3.8	4.0	3.5	Z	2.7	2.8	2.7	2.8	5.7	13.1	15.2	16.6	24.5	26.0	26.8	25.3	25.2	16.6	15.4	10.3	14.6	15.6	9.9	6.4	12.6	26.8		
10-Oct	4.8	3.9	3.5	3.1	Z	2.8	2.7	2.8	3.4	12.4	19.2	21.1	22.7	24.8	25.7	25.2	24.6	24.1	18.1	18.0	25.0	25.3	25.1	24.3	15.8	25.7		
11-Oct	23.2	24.6	25.4	20.8	17.2	Z	9.0	12.1	21.3	20.9	20.6	23.2	26.9	28.3	30.1	29.7	28.7	28.4	27.6	26.7	18.3	20.0	19.6	17.3	22.6	30.1		
12-Oct	Z	19.7	23.4	14.3	7.9	7.5	7.1	5.1	M	14.6	23.0	25.9	25.6	31.3	33.8	34.6	27.7	22.5	18.8	15.4	11.9	8.8	11.2	6.6	18.0	34.6		
13-Oct	5.6	Z	3.0	2.9	3.7	8.1	10.3	11.7	11.7	12.2	16.8	19.2	20.4	22.0	22.5	21.9	21.7	15.7	11.2	14.8	12.0	6.7	5.5	5.2	12.4	22.5		
14-Oct	3.6	6.6	Z	5.7	8.6	15.3	15.4	15.0	14.8	12.3	16.7	23.3	26.2	26.3	27.0	28.1	29.2	29.3	28.4	26.4	25.8	25.4	23.7	19.4	19.7	29.3		
15-Oct	9.9	9.6	13.0	Z	4.8	2.7	2.8	4.6	12.4	14.7	15.1	15.0	17.3	15.9	18.2	18.7	15.6	9.9	8.3	5.2	4.3	2.4	2.2	2.4	9.8	18.7		
16-Oct	2.4	2.2	2.1	2.1	Z	2.2	2.1	2.2	3.4	11.6	15.4	19.7	21.7	30.9	33.9	33.1	26.0	10.4	4.2	2.4	2.4	2.3	2.5	2.3	10.3	33.9		
17-Oct	2.5	2.4	2.4	2.5	2.4	Z	2.4	2.5	3.7	7.2	10.9	9.7	8.6	9.3	9.0	7.3	5.8	3.7	2.8	3.1	2.6	3.3	3.7	3.2	4.8	10.9		
18-Oct	Z	2.5	2.6	2.5	2.5	2.3	2.5	2.5	3.4	5.7	10.6	14.5	16.6	14.7	14.8	16.1	15.9	11.7	5.7	3.6	2.8	5.9	7.7	6.8	7.6	16.6		
19-Oct	3.0	Z	2.9	2.8	3.1	2.9	2.8	2.9	3.7	9.4	27.6	29.3	30.2	31.8	32.4	21.7	13.0	19.8	27.6	18.3	6.1	29.0	35.4	20.4	16.4	35.4		
20-Oct	28.9	27.9	Z	26.3	26.3	26.1	26.8	26.7	27.9	29.1	30.5	30.9	30.9	31.3	32.5	32.9	25.0	16.5	12.7	10.3	8.9	6.0	4.9	4.4	22.8	32.9		
21-Oct	3.5	3.1	2.7	Z	2.9	2.8	2.6	3.7	5.5	5.7	7.3	9.2	11.7	8.9	13.1	19.6	27.3	29.7	23.0	24.0	22.7	20.1	22.0	22.4	12.8	29.7		
22-Oct	13.8	10.6	9.1	7.4	Z	4.7	5.7	6.8	11.6	19.7	20.8	21.6	20.3	20.1	21.2	17.7	18.2	11.7	12.5	19.6	13.7	25.4	26.0	26.0	15.8	26.0		
23-Oct	24.7	23.3	23.1	22.9	22.1	Z	23.0	23.9	26.5	29.3	31.6	34.2	36.5	36.7	36.7	36.1	35.5	34.0	33.0	33.1	32.6	32.3	31.7	30.9	30.2	36.7		
24-Oct	Z	30.0	29.4	29.5	28.9	28.1	27.9	27.2	27.1	27.4	28.1	29.1	29.9	32.2	33.6	33.0	31.8	31.4	31.5	32.2	32.4	31.3	30.3	30.6	30.1	33.6		
25-Oct	31.1	Z	30.4	29.7	29.4	29.1	26.7	25.8	25.0	27.4	28.0	27.0	27.7	29.4	31.0	31.2	30.5	29.0	30.3	31.6	31.2	28.6	29.1	28.0	29.0	31.6		
26-Oct	27.8	26.3	Z	26.5	27.0	26.9	27.1	26.1	25.2	23.5	24.2	25.2	25.3	27.4	27.3	28.4	27.2	14.8	18.5	28.0	26.8	25.7	24.8	24.5	25.4	28.4		
27-Oct	22.5	21.9	22.7	Z	23.7	21.5	13.1	12.9	10.2	13.8	18.4	26.6	26.7	27.3	31.1	32.2	32.1	29.1	20.2	15.1	14.0	2.4	2.1	2.1	19.2	32.2		
28-Oct	10.7	7.6	7.0	23.2	Z	24.5	23.5	22.3	21.9	21.3	20.8	17.5	16.6	26.5	26.5	24.9	18.8	27.7	29.1	28.6	27.2	26.7	26.9	29.2	22.1	29.2		
29-Oct	28.9	30.5	33.1	32.1	30.0	Z	33.4	32.9	31.9	34.1	31.5	31.9	34.4	34.6	34.6	33.1	23.5	17.2	12.0	8.1	6.2	4.5	3.1	11.2	24.9	34.6		
30-Oct	Z	28.7	24.7	21.8	16.9	14.7	12.4	10.0	8.4	11.2	16.4	27.4	31.7	30.0	32.1	30.6	30.7	31.3	29.5	28.2	23.9	19.8	19.4	21.2	22.6	32.1		
31-Oct	19.0	Z	15.1	9.2	9.4	6.5	6.3	3.7	8.5	10.8	18.6	24.9	19.9	14.2	16.8	16.1	13.4	9.6	12.0	7.6	4.6	5.1	4.7	3.3	11.3	24.9		

13.0	13.3	12.5	13.3	12.3	10.6	11.1	11.4	12.9	15.5	19.0	22.3	23.9	24.9	25.4	24.7	22.0	18.2	16.1	15.6	14.3	14.4	14.2	13.6			Diurnal Average
31.1	30.5	33.1	32.1	30.0	29.1	33.4	32.9	31.9	34.1	31.6	34.2	36.5	36.7	36.7	36.1	35.5	34.0	33.0	33.1	32.6	32.3	35.4	30.9			Diurnal Maximum

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ozone (O₃) - ppb
Fort McKay South - October 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	398	58.19	58.19
21 - 50	286	41.81	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Ozone (O₃) - ppb
Fort McKay South - October 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	11	2	5	5	4	12	55	73	55	32	39	17	15	25	27	397
21 - 50	11	4	3	0	0	1	9	50	32	5	7	49	52	23	23	17	286
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	15	5	5	5	5	21	105	105	60	39	88	69	38	48	44	683

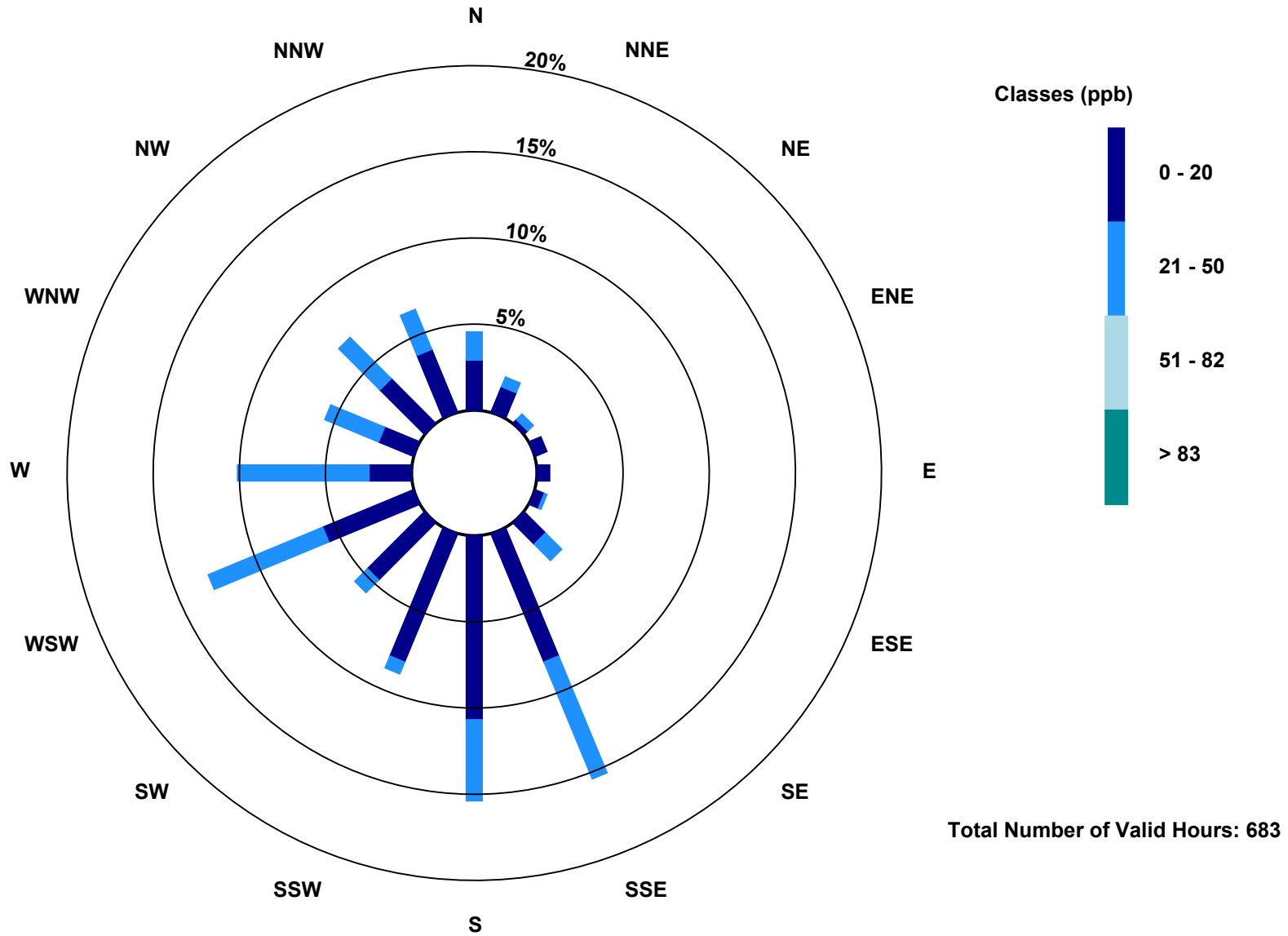
Total Number of Valid Hours: 683

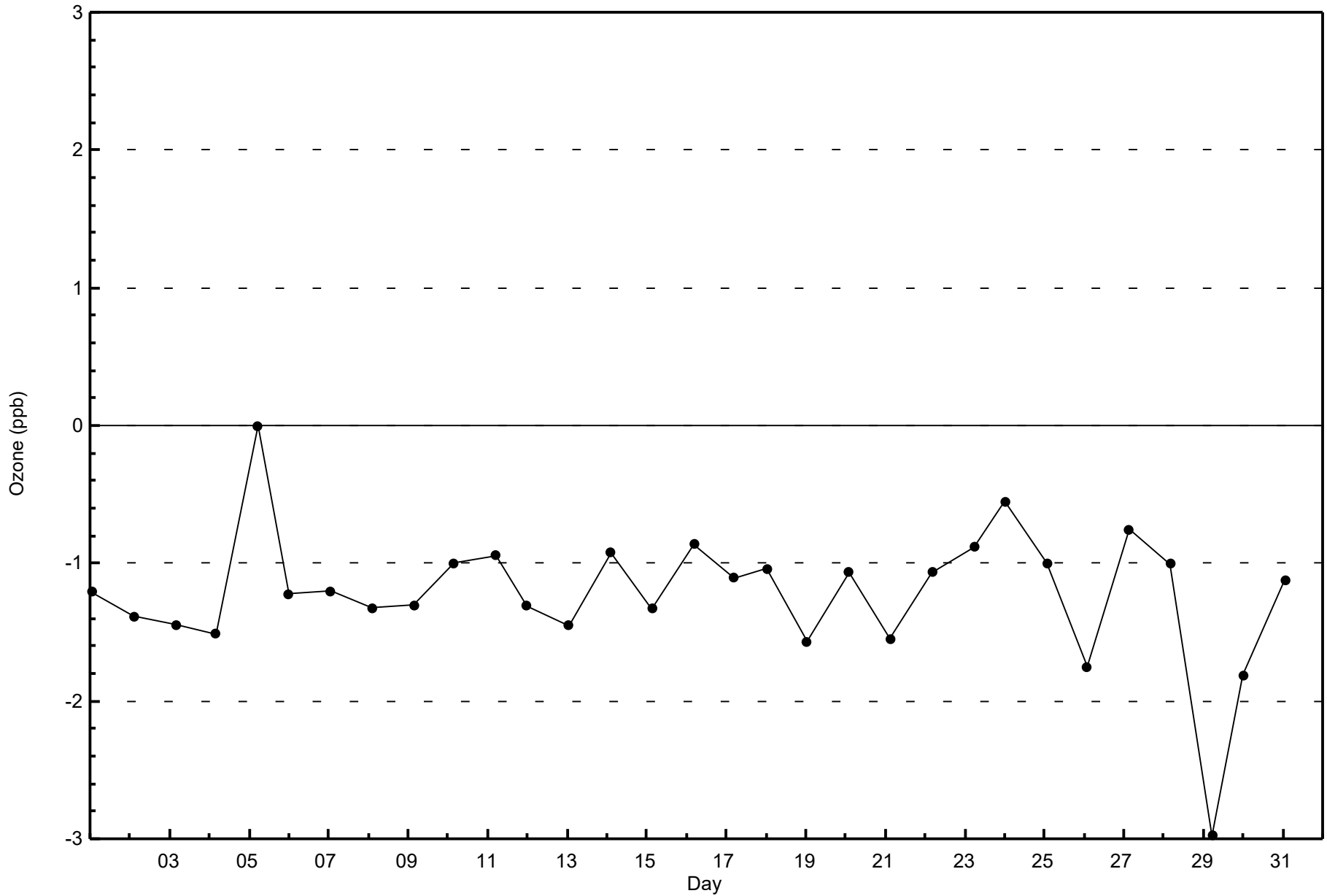
Total Number of Hours: 744

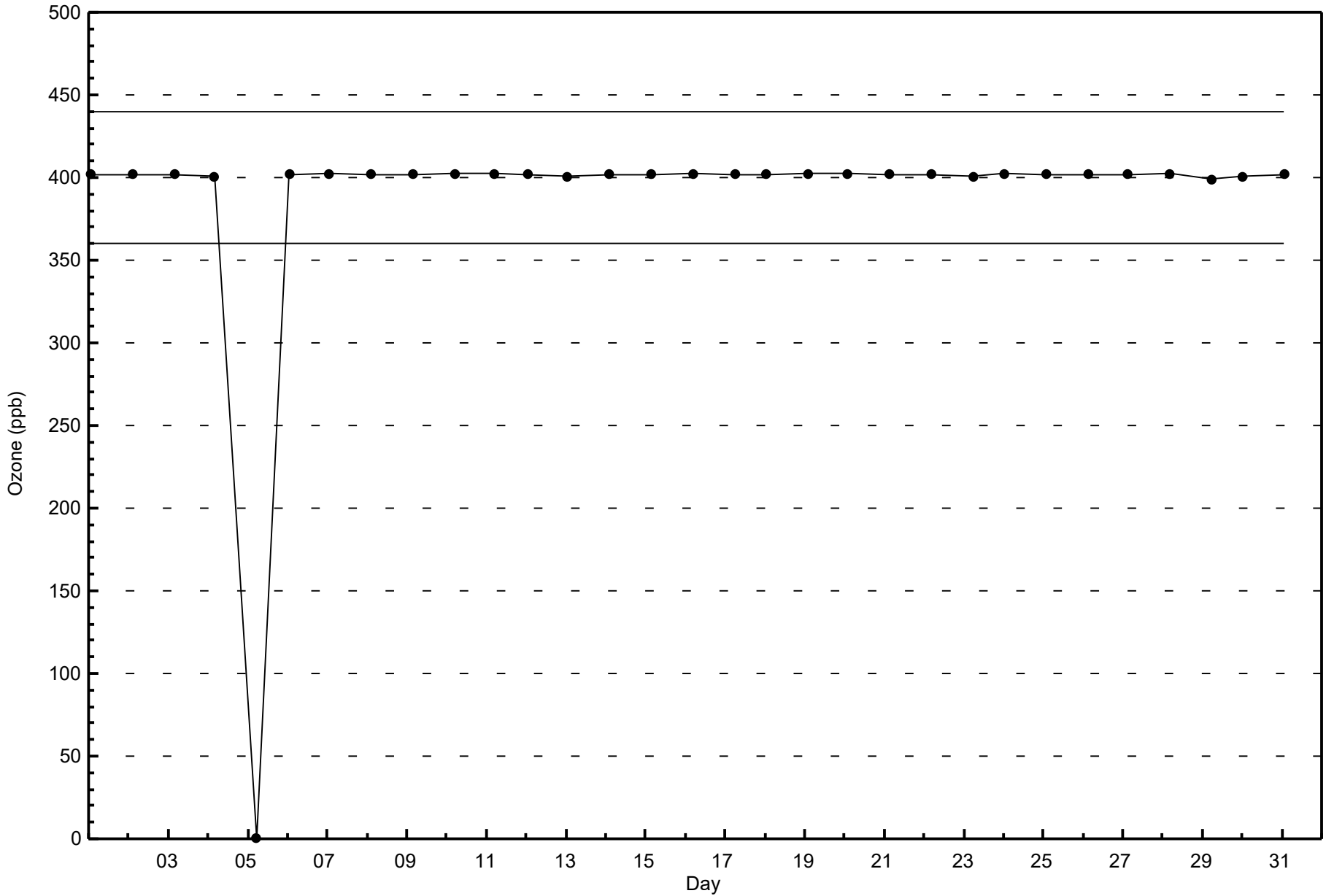


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Ozone (O₃) - ppb
Fort McKay South







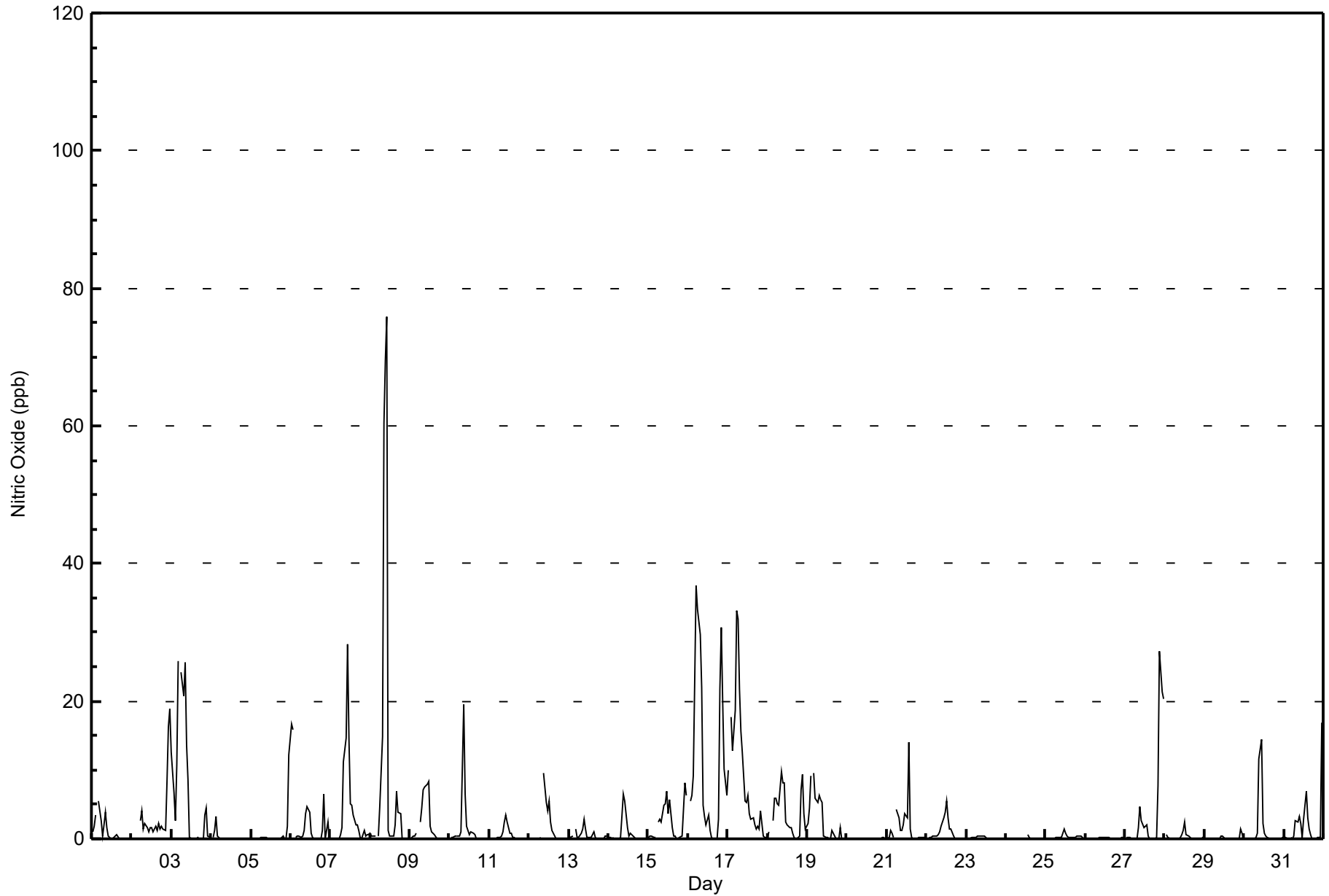


Maximum Value: 75.9 ppb on Oct 8 11:00																				Maximum Daily Average: 11.9 ppb on Oct 16					Hours in Service: 744								
Minimum Value: 0.0 ppb on Oct 1 17:00																				Minimum Daily Average: 0.0 ppb on Oct 20					Hours of Data: 707								
Maximum Diurnal Average: 6.9 ppb at hour 9																				Minimum Diurnal Average: 0.3 ppb at hour 18					Hours of Missing Data: 37								
Monthly Average: 2.50 ppb																				Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.2 Q ₃ = 1.7 P ₉₀ = 6.4 P ₉₉ = 30.6					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-Oct	1.0	1.9	3.4	Z	5.5	2.6	0.4	2.1	3.9	1.7	0.5	0.1	0.0	0.3	0.4	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	5.5							
2-Oct	0.0	0.0	0.1	0.1	Z	2.7	4.1	1.4	2.3	1.6	1.0	1.6	1.7	1.1	1.9	1.1	2.3	1.3	1.8	1.3	1.3	8.4	16.3	18.9	3.1	18.9							
3-Oct	12.7	6.7	2.7	10.8	25.8	Z	24.2	20.7	25.6	13.7	8.5	0.1	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	3.4	4.4	0.4	0.2	7.0	25.8							
4-Oct	Z	0.1	1.3	3.4	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	3.4							
5-Oct	0.0	Z	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.1	0.1	1.8	12.1	0.7	12.1							
6-Oct	16.7	15.9	Z	0.2	0.4	0.4	0.3	0.3	1.2	3.7	4.6	4.0	0.7	0.2	0.0	0.0	0.0	0.0	0.0	1.3	6.5	0.0	2.5	0.0	2.6	16.7							
7-Oct	0.0	0.0	0.0	Z	0.0	0.0	0.7	1.6	11.1	14.7	28.3	14.5	5.1	4.9	3.5	2.0	2.1	1.2	0.1	0.1	1.2	0.5	0.6	0.7	4.0	28.3							
8-Oct	0.9	0.5	0.5	0.4	Z	0.4	4.7	14.9	60.3	69.6	75.9	1.2	0.3	0.4	0.4	2.0	7.0	3.9	3.6	0.0	0.0	0.0	0.0	0.0	10.7	75.9							
9-Oct	0.1	0.2	0.3	0.4	0.8	Z	2.5	4.5	7.2	7.5	7.8	8.3	1.8	0.9	0.8	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.9	8.3							
10-Oct	Z	0.2	0.2	0.4	0.3	0.4	0.4	1.0	19.4	6.6	1.8	1.2	0.6	0.9	0.8	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.5	19.4							
11-Oct	0.0	Z	0.0	0.0	0.1	0.1	0.2	0.5	1.0	2.4	3.4	2.5	0.8	0.7	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	3.4							
12-Oct	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.3	M	9.5	5.4	4.0	5.5	2.5	1.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	9.5							
13-Oct	0.0	0.2	0.4	Z	1.4	0.2	0.2	0.8	1.4	2.9	1.5	0.3	0.2	0.1	0.6	1.0	0.1	0.0	0.0	0.0	0.1	0.3	0.3	0.5	2.9	9.5							
14-Oct	0.2	0.1	0.1	0.1	Z	0.0	0.0	0.3	3.2	6.5	5.5	1.7	0.5	0.8	0.7	0.4	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.9	6.5	9.5							
15-Oct	0.3	0.5	0.4	0.2	0.2	Z	2.4	2.9	2.4	5.0	5.0	6.9	3.7	5.6	1.6	0.5	0.4	0.0	0.0	0.2	0.5	4.3	8.2	6.3	2.5	8.2							
16-Oct	Z	5.5	6.3	9.2	22.8	36.8	33.3	29.8	22.0	4.9	3.4	2.1	3.4	1.2	0.2	0.1	0.0	0.0	2.9	21.7	30.6	20.0	10.2	6.4	11.9	36.8							
17-Oct	9.9	Z	17.7	12.8	18.7	33.1	32.0	21.7	15.7	12.6	5.5	5.3	6.2	3.6	2.8	3.1	1.9	1.5	1.9	1.4	4.1	0.4	0.1	0.2	9.2	33.1							
18-Oct	0.3	1.1	Z	2.6	5.8	5.9	5.0	4.9	9.9	8.2	8.1	2.4	2.0	1.7	1.6	0.8	0.1	0.0	0.0	0.5	7.0	9.3	3.6	1.4	3.6	9.9							
19-Oct	2.3	4.5	9.1	Z	9.5	5.9	5.2	6.2	5.7	5.3	0.4	0.2	0.2	0.1	0.0	1.2	0.9	0.0	0.0	0.0	1.6	0.0	0.0	0.1	2.5	9.5							
20-Oct	0.0	0.0	0.0	0.0	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	0.0	0.2	0.1	0.1	0.0	0.2	0.2						
21-Oct	0.0	0.2	1.2	0.8	0.2	Z	4.2	3.0	1.2	1.3	2.0	3.6	3.1	14.1	1.4	0.2	0.0	0.0	0.1	0.1	0.2	0.3	0.3	0.2	1.6	14.1							
22-Oct	Z	0.1	0.1	0.2	0.3	0.4	0.5	0.6	1.0	1.7	3.0	3.8	5.4	3.0	1.5	1.4	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	5.4							
23-Oct	0.0	Z	0.1	0.1	0.2	0.3	0.3	0.4	0.4	0.5	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5							
24-Oct	0.0	0.0	Z	0.1	0.1	0.0	0.0	0.0	C	C	C	C	C	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6							
25-Oct	0.0	0.0	0.0	Z	0.1	0.1	0.2	0.1	0.2	0.9	1.5	0.8	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.3	0.1	0.3	1.5							
26-Oct	0.0	0.0	0.0	0.0	Z	0.1	0.0	0.0	0.1	0.2	0.3	0.2	0.2	0.2	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.3	0.3						
27-Oct	0.1	0.2	0.2	0.2	0.1	Z	0.0	0.0	1.7	4.6	2.6	1.7	1.8	2.1	0.4	0.0	0.0	0.0	0.1	0.2	7.8	27.3	21.4	20.3	4.0	27.3							
28-Oct	Z	0.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6	1.3	2.5	0.6	0.5	0.2	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.3	2.5							
29-Oct	0.0	Z	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.2	0.1	1.3							
30-Oct	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.2	0.8	11.5	14.4	2.3	0.8	0.5	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	1.4	14.4							
31-Oct	0.1	0.1	0.1	Z	0.1	0.1	0.5	2.7	2.5	3.2	2.2	0.2	2.8	7.0	3.0	1.4	0.5	0.1	0.0	0.1	0.2	0.2	0.2	16.9	1.9	16.9							
																								Diurnal Average									
																								Diurnal Maximum									
1.7 1.5 1.7 1.7 3.6 3.5 3.9 3.9 6.9 6.7 6.5 2.4 1.7 1.7 0.8 0.6 0.5 0.3 0.3 0.9 2.1 2.4 2.2 2.7																																	
16.7 15.9 17.7 12.8 25.8 36.8 33.3 29.8 60.3 69.6 75.9 14.5 6.2 14.1 3.5 3.1 7.0 3.9 3.6 21.7 30.6 27.3 21.4 20.3																																	
Z - zerospan C - Calibration M - Maintenance																																	



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Fort McKay South - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb
Fort McKay South - October 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	687	97.17	97.17
21 - 40	17	2.40	99.58
41 - 80	3	0.42	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
Fort McKay South - October 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	15	5	5	4	4	23	107	105	51	38	82	69	46	61	41	686
21 - 40	0	0	0	0	0	1	0	0	3	7	2	3	0	0	1	0	17
11 - 80	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	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	31	15	5	5	5	5	23	107	108	58	40	85	69	46	62	42	706

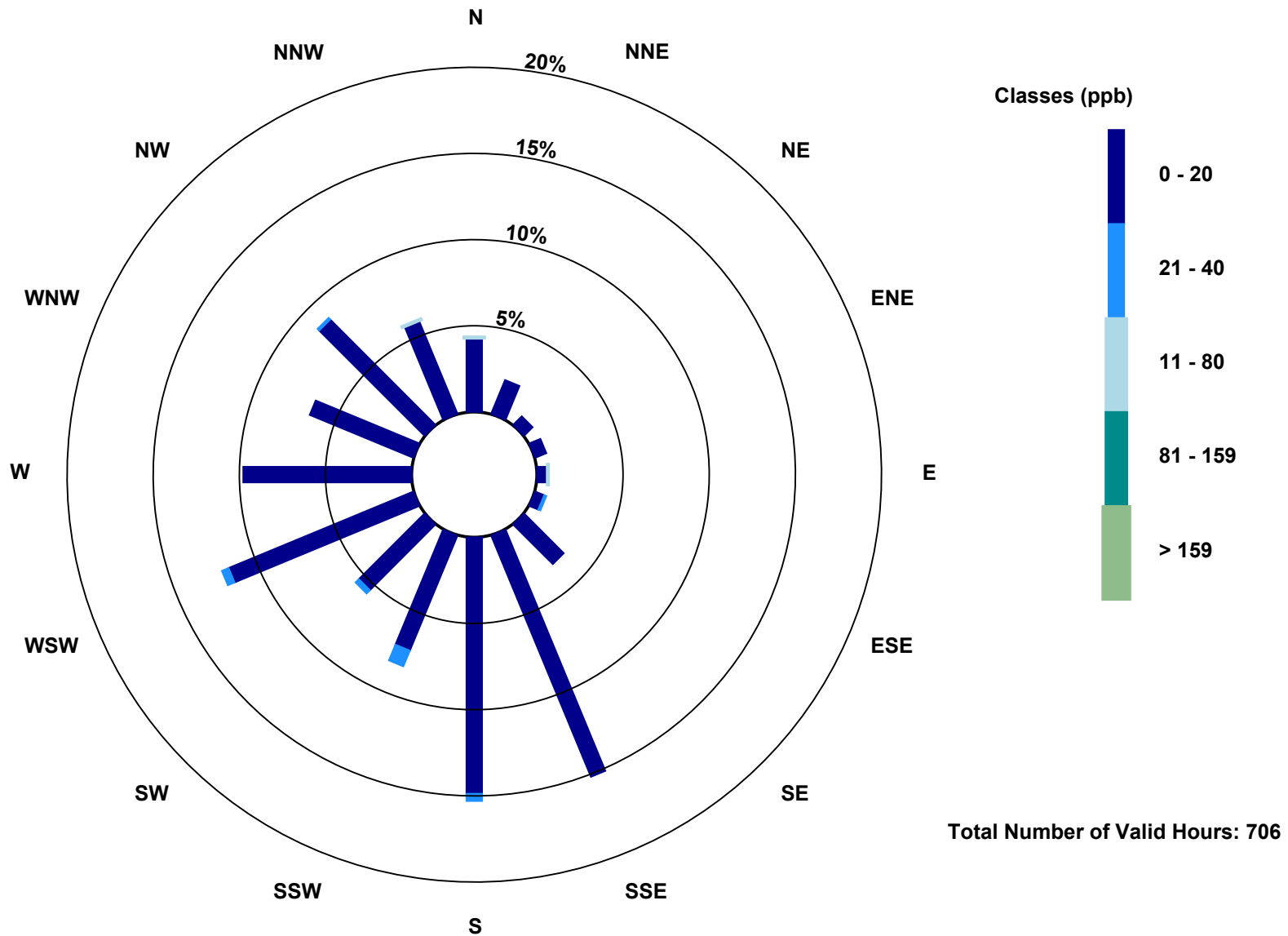
Total Number of Valid Hours: 706

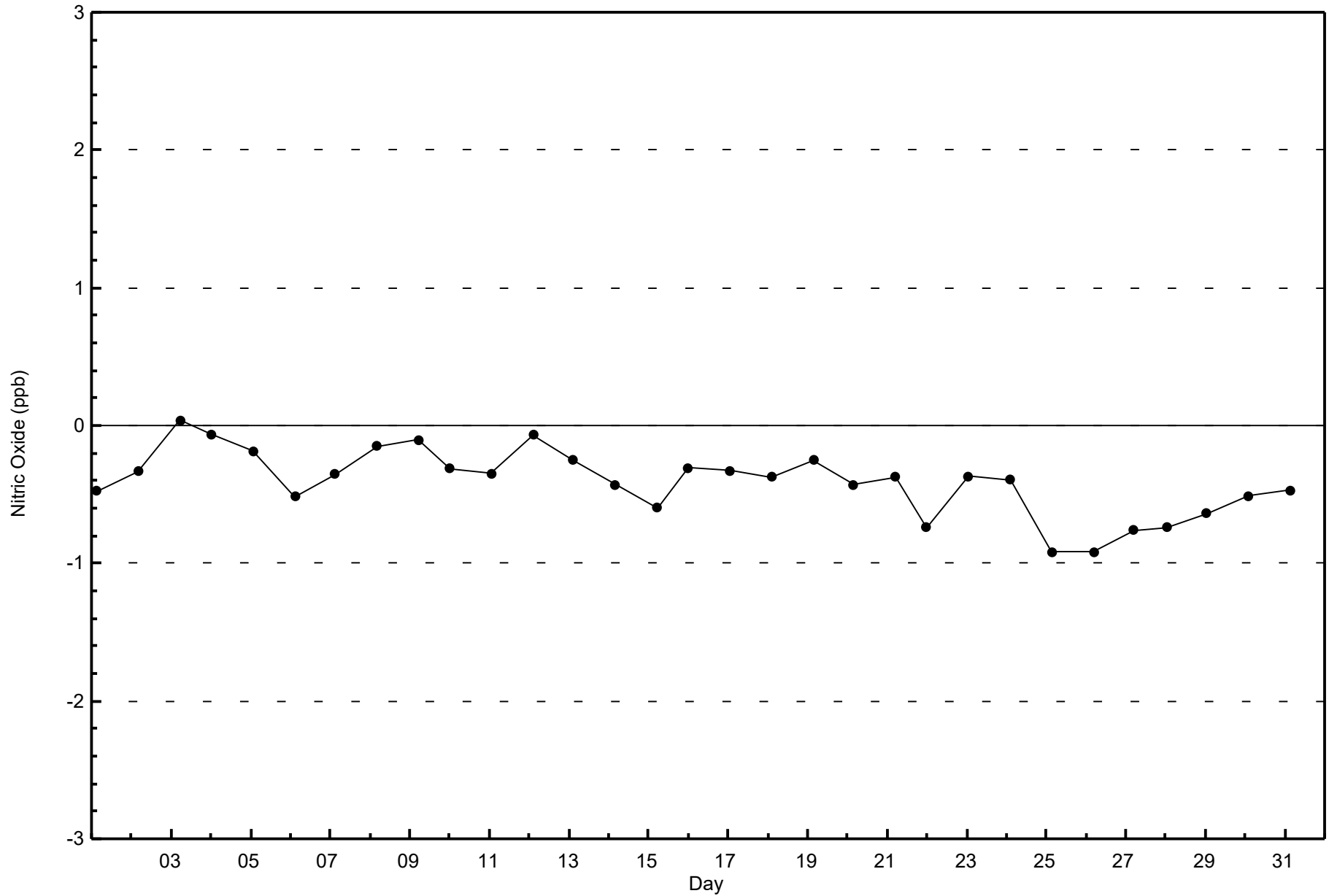
Total Number of Hours: 744

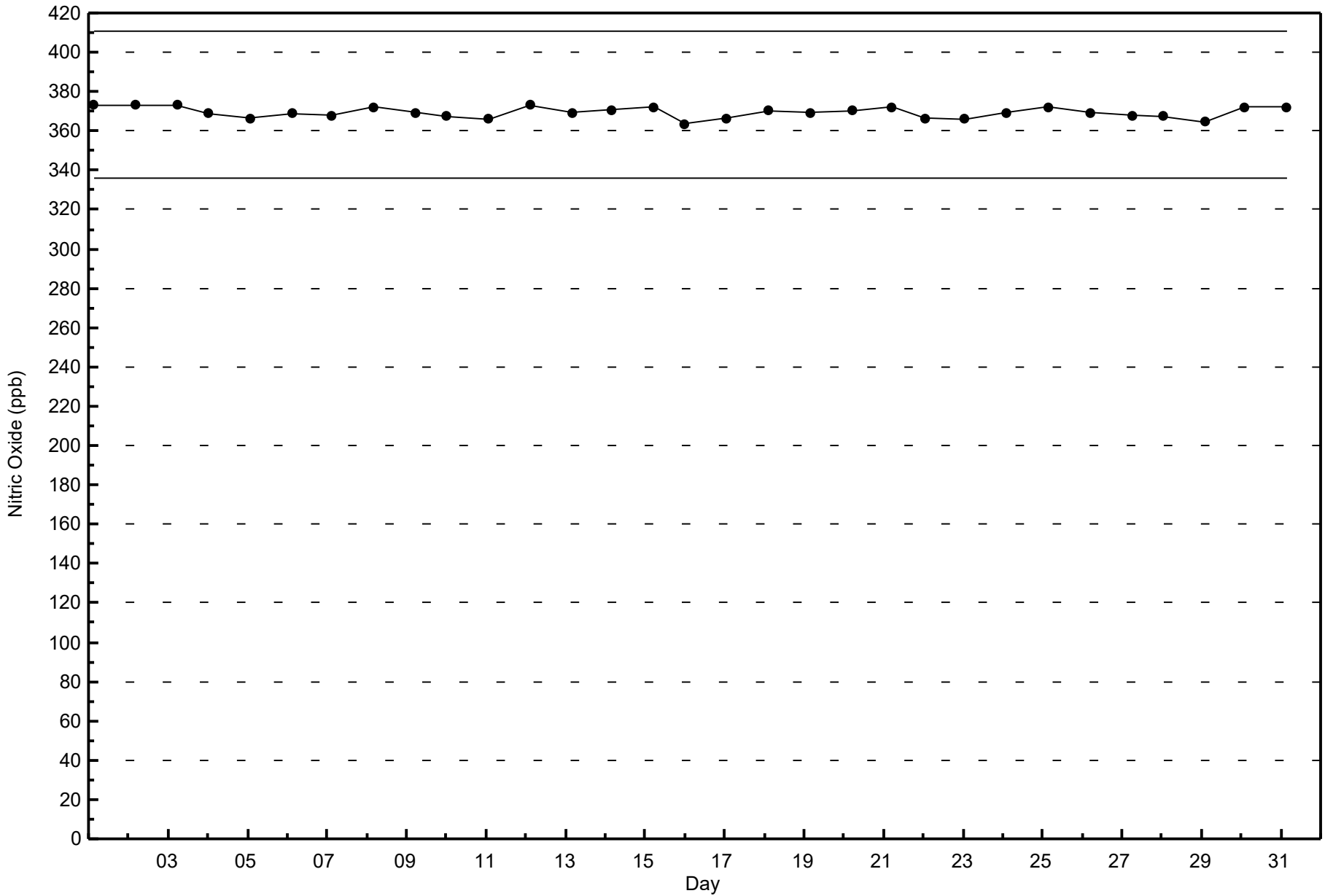


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitric Oxide (NO) - ppb
Fort McKay South









Wood Buffalo Environmental Association
Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb
Fort McKay South - October 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 25.1 ppb on Oct 27 22:00	Maximum Daily Average: 9.7 ppb on Oct 31		Hours of Data:	707
Minimum Value: 0.0 ppb on Oct 4 16:00	Minimum Daily Average: 0.1 ppb on Oct 23		Hours of Missing Data:	37
Maximum Diurnal Average: 5.7 ppb at hour 10	Minimum Diurnal Average: 2.8 ppb at hour 6		Hours of Calibration:	36
Monthly Average: 4.25 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.4 Median = 3.0 Q ₃ = 6.4 P ₉₀ = 10.7 P ₉₉ = 18.0		Percent Operational Time:	99.9

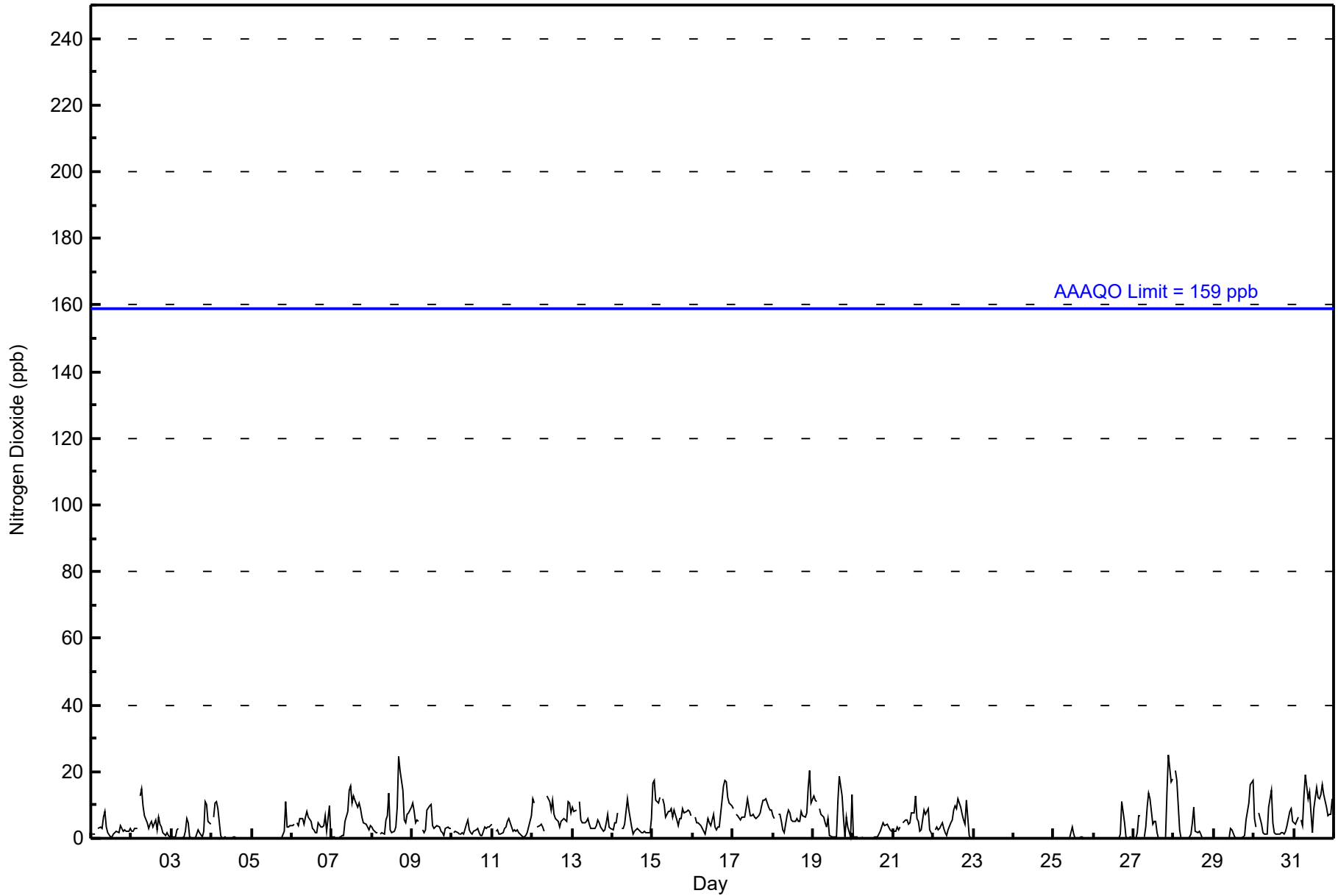
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Oct	1.3	1.3	1.4	Z	2.9	3.5	3.0	6.3	8.1	3.6	1.5	0.5	0.5	1.1	1.5	2.2	1.8	3.9	3.0	2.3	2.4	2.3	2.3	2.9	2.6	8.1																							
2-Oct	2.2	2.3	2.8	3.1	Z	12.5	14.7	9.8	6.7	4.7	2.8	4.1	4.9	3.3	5.7	2.6	6.4	4.3	3.3	1.6	0.9	1.8	0.7	0.5	4.4	14.7																							
3-Oct	0.6	0.4	0.4	2.7	2.8	Z	0.2	0.5	2.2	6.0	4.6	0.6	0.2	0.1	0.1	1.1	2.7	1.5	0.6	2.0	11.1	10.3	5.1	4.1	2.6	11.1																							
4-Oct	Z	6.2	10.4	11.0	9.1	0.9	0.2	0.2	0.3	0.2	0.2	0.2	0.1	0.4	0.4	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	1.7	11.0																							
5-Oct	0.0	Z	0.2	0.2	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	0.0	0.0	2.0	11.2	3.6	3.6	4.0	1.1	11.2																							
6-Oct	3.9	4.3	Z	4.6	4.0	5.8	6.1	4.2	6.5	8.1	6.2	5.1	2.9	2.6	1.9	1.9	4.7	3.3	3.5	3.9	6.9	2.2	9.6	0.6	4.5	9.6																							
7-Oct	0.5	0.3	0.3	Z	0.4	0.3	0.7	1.0	5.1	7.9	14.5	15.5	10.7	12.8	11.3	9.3	10.7	8.9	6.2	4.7	4.4	3.4	2.6	3.9	5.9	15.5																							
8-Oct	3.6	2.7	1.8	1.9	Z	1.4	1.6	1.3	5.6	6.9	13.7	2.4	1.8	2.3	3.3	9.3	24.5	20.5	14.4	5.6	4.6	7.2	7.7	9.3	6.7	24.5																							
9-Oct	10.6	8.0	4.8	5.7	5.0	Z	2.4	1.5	2.7	8.4	9.8	10.1	3.8	2.9	3.2	3.8	3.2	2.2	1.5	1.0	3.0	3.5	3.1	3.0	4.5	10.6																							
10-Oct	Z	1.6	2.0	1.8	1.2	1.1	1.5	1.4	4.3	5.3	2.5	1.8	1.2	2.3	2.7	3.0	1.9	0.8	1.0	3.5	2.8	3.5	3.3	3.8	2.4	5.3																							
11-Oct	4.2	Z	2.3	2.5	1.2	1.1	1.7	3.0	3.6	5.1	6.0	4.5	2.3	2.7	2.1	2.6	1.5	0.7	0.5	0.4	0.9	1.8	3.4	6.7	2.6	6.7																							
12-Oct	11.8	10.8	Z	3.6	3.7	4.2	3.5	2.2	M	12.9	10.9	8.5	11.5	7.3	5.9	4.9	3.4	5.2	5.3	5.8	5.2	11.1	10.8	7.6	7.1	12.9																							
13-Oct	9.5	7.9	8.3	Z	11.2	5.4	4.7	4.5	5.2	5.9	4.2	2.9	2.9	2.9	3.8	5.4	4.7	3.5	2.3	2.4	4.7	7.0	3.6	3.1	5.0	11.2																							
14-Oct	2.6	4.8	4.8	7.8	Z	3.1	2.9	4.4	8.1	11.8	8.5	3.6	1.3	2.0	2.6	2.9	2.0	1.6	1.7	2.0	1.9	1.6	1.9	5.9	3.9	11.8																							
15-Oct	16.4	17.5	11.6	10.7	12.1	Z	11.9	10.0	6.5	7.9	7.9	8.8	6.3	8.6	5.4	4.0	5.8	6.0	9.1	7.6	7.9	8.6	7.9	6.7	8.9	17.5																							
16-Oct	Z	6.2	4.5	4.6	4.1	3.8	2.9	1.4	3.3	6.1	4.8	4.0	7.0	3.2	2.6	3.5	3.5	11.4	15.6	17.3	17.1	12.4	10.6	9.9	6.9	17.3																							
17-Oct	8.9	Z	7.3	6.7	5.5	6.2	6.2	6.5	9.1	11.8	6.6	6.9	7.4	6.3	6.1	6.9	7.7	9.8	11.5	11.4	11.8	9.5	8.6	8.3	8.1	11.8																							
18-Oct	6.7	5.8	Z	7.4	7.4	5.1	2.6	1.8	6.6	8.6	7.8	5.7	4.9	5.0	6.0	5.0	5.1	8.0	6.6	6.3	7.5	15.3	20.5	10.7	7.2	20.5																							
19-Oct	12.7	11.5	10.9	Z	8.7	7.0	6.3	4.5	3.2	5.9	0.7	0.3	0.5	0.3	0.4	10.9	18.8	12.7	6.1	0.5	6.4	3.3	0.5	13.2	6.3	18.8																							
20-Oct	0.4	0.4	0.3	0.3	Z	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.4	1.2	2.2	3.2	4.8	3.8	4.4	3.2	2.5	2.2	1.4	4.8																						
21-Oct	2.2	2.2	3.5	2.7	3.4	Z	4.6	5.3	5.3	4.4	4.8	7.7	7.5	12.6	6.0	5.1	2.3	2.5	8.5	7.2	8.2	9.0	2.6	0.8	5.1	12.6																							
22-Oct	Z	2.5	3.2	2.5	3.1	4.6	2.9	1.9	0.9	2.4	4.7	5.5	8.5	9.6	9.0	11.7	9.2	7.1	5.5	4.4	11.5	0.8	0.0	0.0	4.8	11.7																							
23-Oct	0.0	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2																							
24-Oct	0.0	0.1	Z	0.2	0.1	0.2	0.1	0.1	C	C	C	C	C	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2																							
25-Oct	0.0	0.0	0.1	Z	0.2	0.2	0.1	0.2	0.1	0.2	1.5	3.2	1.3	0.2	0.2	0.2	0.4	0.6	0.1	0.1	0.2	0.1	0.1	0.1	0.4	3.2																							
26-Oct	0.1	0.1	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.2	1.1	11.1	4.7	0.4	0.1	0.2	0.4	0.2	0.9	11.1																							
27-Oct	0.1	0.1	1.8	6.7	6.7	Z	0.5	3.3	9.3	13.5	12.0	4.2	4.9	5.2	1.6	0.1	0.0	0.1	0.1	0.1	13.4	25.1	17.1	18.0	6.3	25.1																							
28-Oct	Z	20.5	17.2	2.4	0.2	0.2	0.1	0.1	0.2	0.4	1.2	4.5	9.2	2.1	1.7	2.1	1.4	0.2	0.1	0.0	0.1	0.1	0.1	0.1	2.8	20.5																							
29-Oct	0.1	Z	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.2	2.9	2.4	0.3	0.2	0.0	0.0	0.0	0.3	0.7	5.6	8.1	10.7	16.3	17.2	2.8	17.2																							
30-Oct	6.1	3.4	Z	7.7	4.4	1.8	1.3	1.3	1.4	9.5	14.4	4.7	1.6	1.2	1.2	1.2	1.8	1.8	1.1	2.3	3.7	8.0	8.7	5.1	4.1	14.4																							
31-Oct	4.7	4.2	6.3	Z	5.3	3.7	12.7	19.1	12.0	14.1	7.6	1.7	8.7	15.2	12.1	12.0	13.3	16.3	13.0	9.4	6.7	7.1	7.0	12.0	9.7	19.1																							
																								4.2	4.8	4.1	3.9	4.0	2.8	3.1	3.1	4.0	5.7	5.4	4.0	3.8	3.7	3.1	3.6	4.5	4.8	4.2	3.7	5.4	5.6	5.2	5.2	Diurnal Average	
																								16.4	20.5	17.2	11.0	12.1	12.5	14.7	19.1	12.0	14.1	14.5	15.5	11.5	15.2	12.1	12.0	24.5	20.5	15.6	17.3	17.1	25.1	20.5	18.0	Diurnal Maximum	

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



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Fort McKay South - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Fort McKay South - October 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
Fort McKay South - October 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	15	5	5	5	5	23	106	108	56	39	84	69	46	62	42	701
21 - 40	0	0	0	0	0	0	0	1	0	2	1	1	0	0	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	31	15	5	5	5	5	23	107	108	58	40	85	69	46	62	42	706

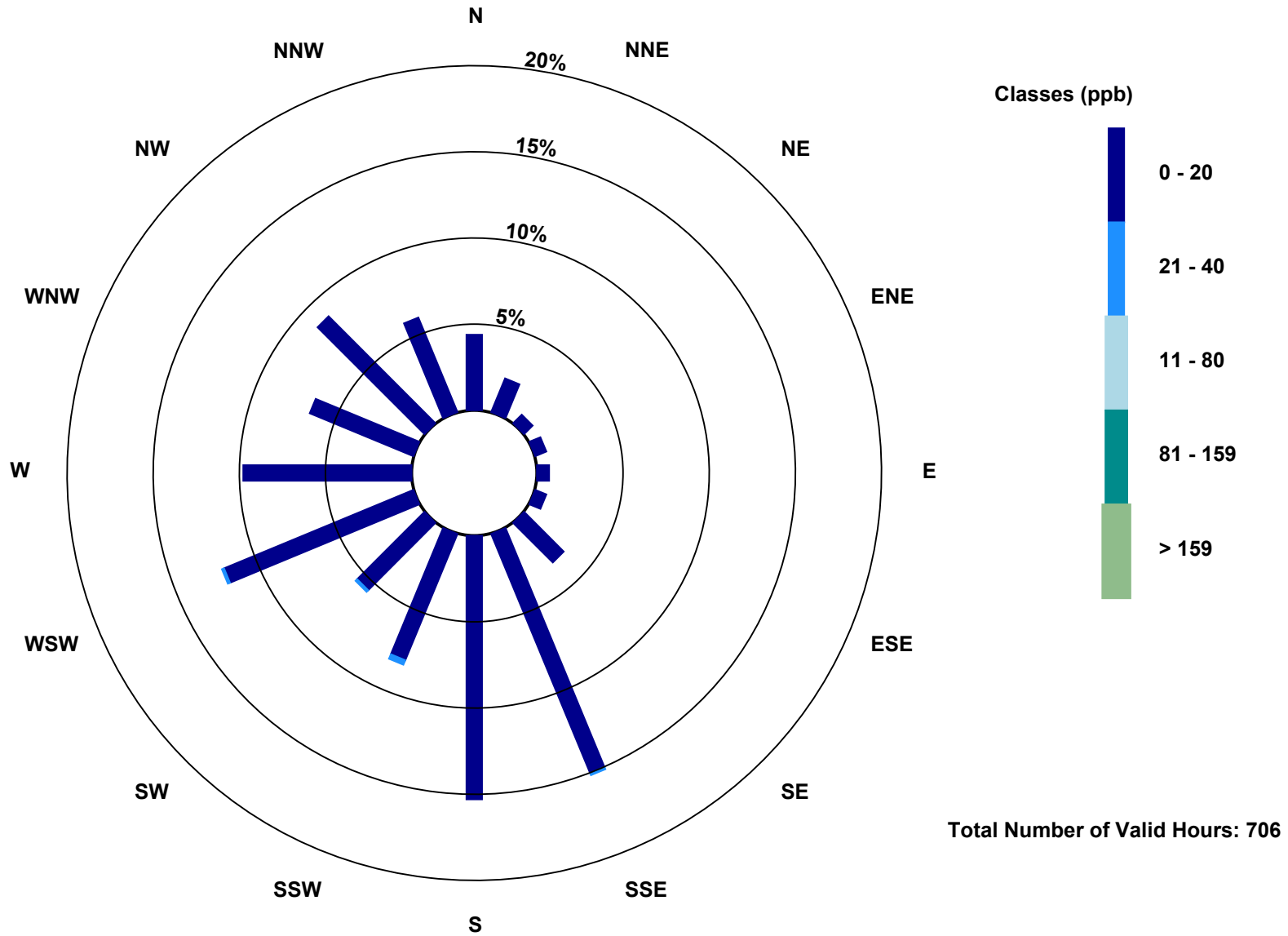
Total Number of Valid Hours: 706

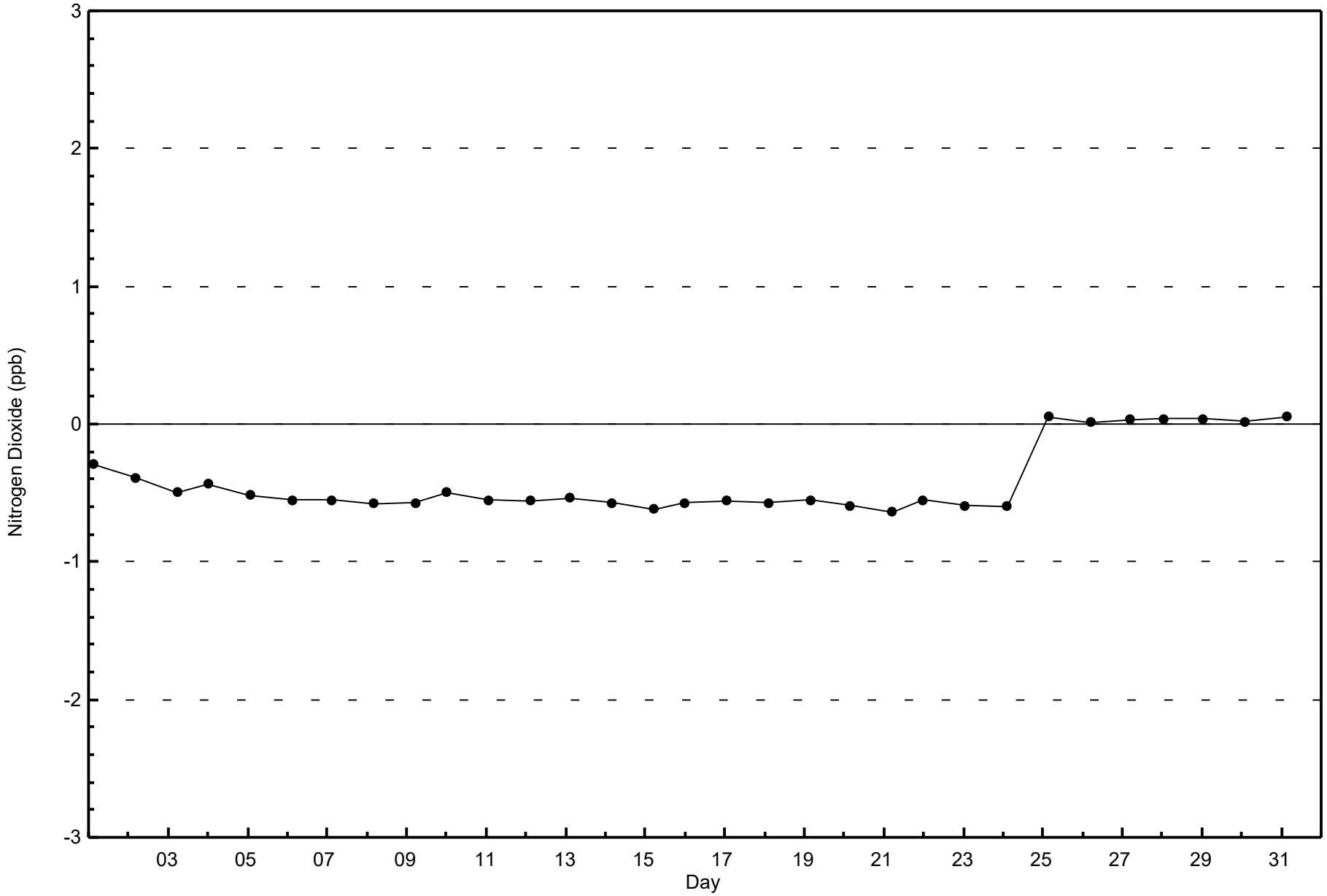
Total Number of Hours: 744

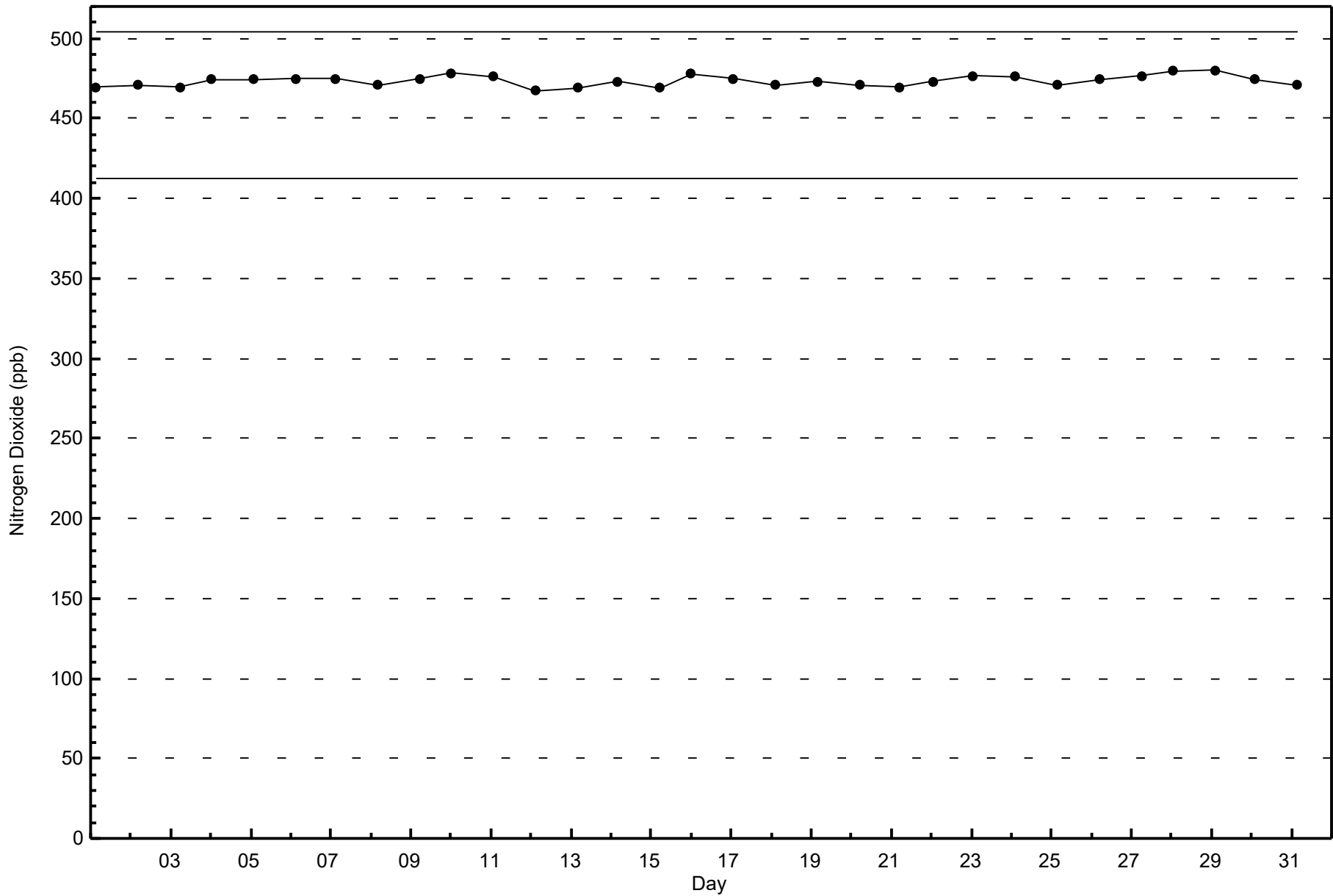


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitrogen Dioxide (NO₂) - ppb
Fort McKay South









Wood Buffalo Environmental Association
Summary of Hour Averages

Nitrogen Oxides (NO_x) - ppb
Fort McKay South - October 2023

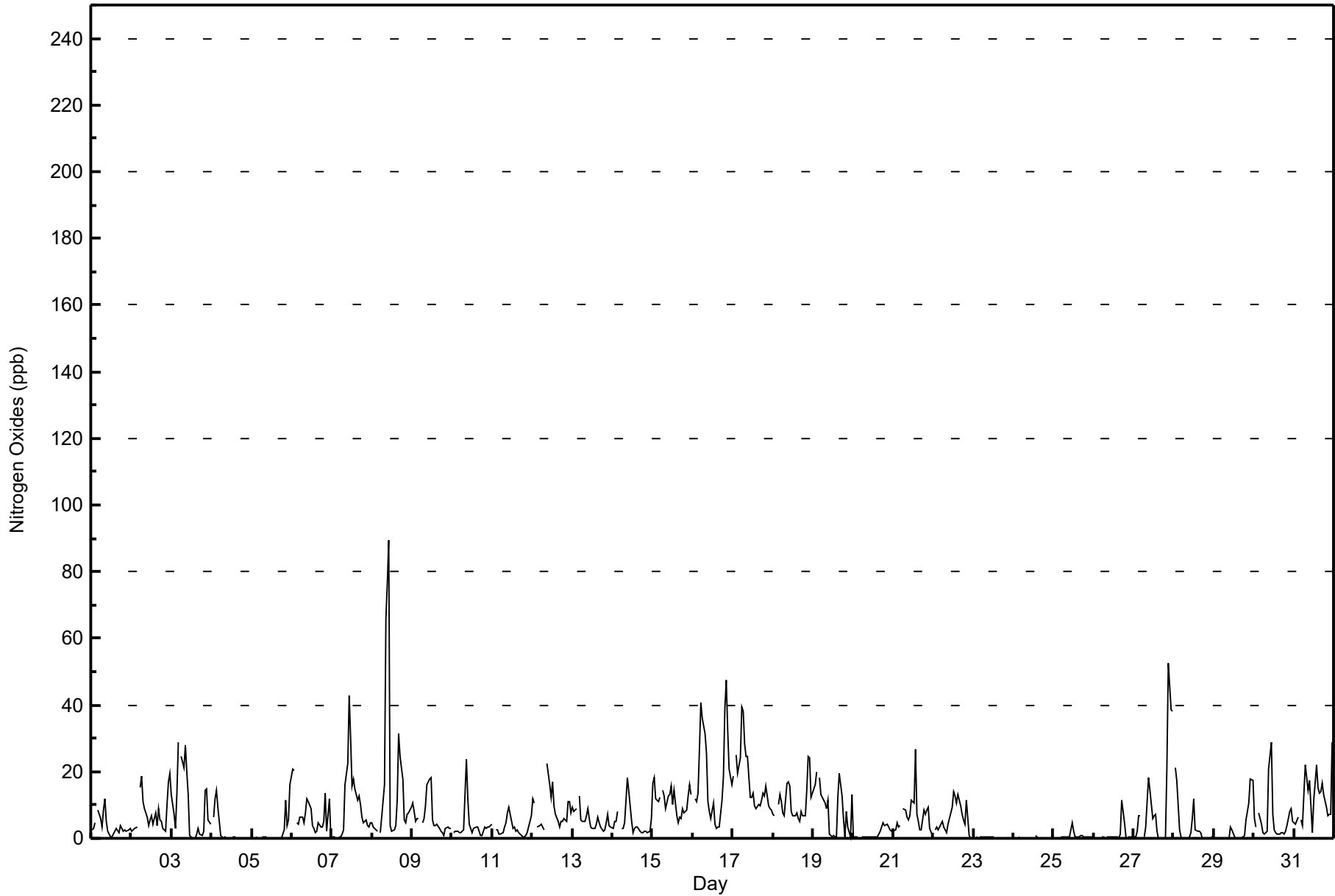
Maximum Value: 89.6 ppb on Oct 8 11:00		Maximum Daily Average: 18.8 ppb on Oct 16		Hours in Service: 744																						
Minimum Value: 0.0 ppb on Oct 4 17:00		Minimum Daily Average: 0.1 ppb on Oct 24		Hours of Data: 707																						
Maximum Diurnal Average: 12.4 ppb at hour 10		Minimum Diurnal Average: 3.9 ppb at hour 15		Hours of Missing Data: 37																						
Monthly Average: 6.75 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.5 Median = 3.6 Q ₃ = 9.6 P ₉₀ = 16.4 P ₉₉ = 39.3		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-Oct	2.3	3.2	4.8	Z	8.4	6.1	3.4	8.4	12.0	5.3	2.0	0.6	0.5	1.4	1.9	2.8	1.8	3.9	3.0	2.3	2.4	2.3	2.3	2.9	3.6	12.0
2-Oct	2.2	2.3	2.9	3.2	Z	15.2	18.8	11.2	9.0	6.3	3.8	5.7	6.6	4.4	7.6	3.7	8.7	5.6	5.1	2.9	2.2	10.2	17.0	19.4	7.6	19.4
3-Oct	13.3	7.1	3.1	13.5	28.6	Z	24.4	21.2	27.8	19.7	13.1	0.7	0.2	0.1	0.1	1.1	3.0	1.5	0.6	2.0	14.5	14.7	5.5	4.3	9.6	28.6
4-Oct	Z	6.3	11.7	14.4	9.4	0.9	0.2	0.2	0.3	0.2	0.2	0.2	0.1	0.4	0.4	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	2.0	14.4
5-Oct	0.0	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	11.3	3.7	5.4	16.1	1.8	16.1
6-Oct	20.6	20.2	Z	4.8	4.4	6.2	6.4	4.5	7.7	11.8	10.8	9.1	3.6	2.8	1.9	1.9	4.7	3.3	3.5	5.2	13.4	2.2	12.1	0.6	7.0	20.6
7-Oct	0.5	0.3	0.3	Z	0.4	0.3	1.4	2.6	16.2	22.6	42.8	30.0	15.8	17.7	14.8	11.3	12.8	10.1	6.3	4.8	5.6	3.9	3.2	4.6	9.9	42.8
8-Oct	4.5	3.2	2.3	2.3	Z	1.8	6.3	16.2	65.9	76.5	89.6	3.6	2.1	2.7	3.7	11.3	31.5	24.4	18.0	5.6	4.6	7.2	7.7	9.3	17.4	89.6
9-Oct	10.7	8.2	5.1	6.1	5.8	Z	4.9	6.0	9.9	15.9	17.6	18.4	5.6	3.8	4.0	4.4	3.2	2.2	1.5	1.0	3.0	3.5	3.1	3.1	6.4	18.4
10-Oct	Z	1.8	2.2	2.2	1.5	1.5	1.9	2.4	23.7	11.9	4.3	3.0	1.8	3.2	3.5	3.5	1.9	0.8	1.0	3.5	2.8	3.5	3.3	3.9	3.9	23.7
11-Oct	4.2	Z	2.3	2.5	1.3	1.2	1.9	3.5	4.6	7.5	9.4	7.0	3.1	3.4	2.3	2.7	1.5	0.7	0.5	0.4	0.9	1.8	3.4	6.7	3.2	9.4
12-Oct	11.8	10.8	Z	3.6	3.7	4.2	3.5	2.5	M	22.4	16.3	12.5	17.0	9.8	7.1	5.3	3.4	5.2	5.3	5.8	5.2	11.1	10.8	7.6	8.4	22.4
13-Oct	9.5	8.1	8.7	Z	12.6	5.6	4.9	5.3	6.6	8.8	5.7	3.2	3.1	3.0	4.4	6.4	4.8	3.5	2.3	2.4	4.7	7.1	3.9	3.4	5.6	12.6
14-Oct	2.8	4.9	4.9	7.9	Z	3.1	2.9	4.7	11.3	18.3	14.0	5.3	1.8	2.8	3.3	3.3	2.0	1.6	1.7	2.0	1.9	1.6	2.0	6.1	4.8	18.3
15-Oct	16.7	18.0	12.0	10.9	12.3	Z	14.3	12.9	8.9	12.9	12.9	15.7	10.0	14.2	7.0	4.5	6.2	6.0	9.1	7.8	8.4	12.9	16.1	13.0	11.4	18.0
16-Oct	Z	11.7	10.8	13.8	26.9	40.6	36.2	31.2	25.3	11.0	8.2	6.1	10.4	4.4	2.8	3.6	3.5	11.4	18.5	39.0	47.7	32.4	20.8	16.3	18.8	47.7
17-Oct	18.8	Z	25.0	19.5	24.2	39.3	38.2	28.2	24.8	24.4	12.1	12.2	13.6	9.9	8.9	10.0	9.6	11.3	13.4	12.8	15.9	9.9	8.7	8.5	17.3	39.3
18-Oct	7.0	6.9	Z	10.0	13.2	11.0	7.6	6.7	16.5	16.8	15.9	8.1	6.9	6.7	7.6	5.8	5.2	8.0	6.6	6.8	14.5	24.6	24.1	12.1	10.8	24.6
19-Oct	15.0	16.0	20.0	Z	18.2	12.9	11.5	10.7	8.9	11.2	1.1	0.5	0.7	0.4	0.4	12.1	19.7	12.7	6.1	0.5	8.0	3.3	0.5	13.3	8.9	20.0
20-Oct	0.4	0.4	0.3	0.3	Z	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.5	0.4	1.2	2.2	3.2	4.8	3.8	4.4	3.4	2.6	2.3	1.4	4.8
21-Oct	2.2	2.4	4.7	3.5	3.6	Z	8.8	8.3	6.5	5.7	6.8	11.3	10.6	26.7	7.4	5.3	2.3	2.5	8.6	7.3	8.4	9.3	2.9	1.0	6.8	26.7
22-Oct	Z	2.6	3.3	2.7	3.4	5.0	3.4	2.5	1.9	4.1	7.7	9.3	13.9	12.6	10.5	13.1	9.7	7.1	5.5	4.4	11.5	0.8	0.0	0.0	5.9	13.9
23-Oct	0.0	Z	0.3	0.2	0.3	0.4	0.4	0.5	0.5	0.6	0.5	0.4	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.6
24-Oct	0.0	0.1	Z	0.3	0.2	0.2	0.1	0.1	C	C	C	C	C	0.8	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.8
25-Oct	0.0	0.0	0.1	Z	0.3	0.3	0.3	0.3	0.3	0.4	2.4	4.7	2.1	0.5	0.5	0.4	0.6	0.8	0.4	0.4	0.5	0.5	0.4	0.2	0.7	4.7
26-Oct	0.1	0.1	0.1	0.1	Z	0.3	0.2	0.2	0.3	0.4	0.4	0.4	0.3	0.2	0.2	1.1	11.2	4.7	0.4	0.2	0.3	0.5	0.3	1.0	11.2	11.2
27-Oct	0.2	0.3	2.0	6.9	6.8	Z	0.5	3.3	11.0	18.1	14.6	5.9	6.7	7.3	2.0	0.1	0.0	0.1	0.2	0.3	21.2	52.4	38.5	38.3	10.3	52.4
28-Oct	Z	21.2	17.5	2.5	0.2	0.2	0.1	0.1	0.2	0.5	1.8	5.8	11.7	2.7	2.2	2.3	1.5	0.2	0.1	0.1	0.2	0.1	0.2	0.2	3.1	21.2
29-Oct	0.1	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	3.3	2.7	0.3	0.2	0.0	0.0	0.0	0.3	0.7	5.6	8.1	10.7	17.6	17.4	3.0	17.6
30-Oct	6.1	3.4	Z	7.7	4.4	1.8	1.3	1.5	2.2	21.0	28.8	7.0	2.4	1.7	1.4	1.3	1.8	1.8	1.1	2.3	3.7	8.1	8.8	5.2	5.4	28.8
31-Oct	4.8	4.3	6.4	Z	5.4	3.8	13.2	21.8	14.5	17.3	9.8	1.9	11.5	22.2	15.1	13.4	13.8	16.4	13.0	9.5	6.9	7.3	7.2	28.9	11.7	28.9
																								Diurnal Average		
																								Diurnal Maximum		
																								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
Fort McKay South - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Oxides (NO_x) - ppb
Fort McKay South - October 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	663	93.78	93.78
21 - 40	37	5.23	99.01
41 - 80	6	0.85	99.86
81 - 159	1	0.14	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 - October 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	14	4	4	4	3	22	104	104	47	35	80	69	46	61	38	662
21 - 40	3	1	1	1	0	1	1	3	4	10	4	4	0	0	1	3	37
11 - 80	1	0	0	0	0	1	0	0	0	1	1	1	0	0	0	1	6
81 - 159	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	31	15	5	5	5	5	23	107	108	58	40	85	69	46	62	42	706

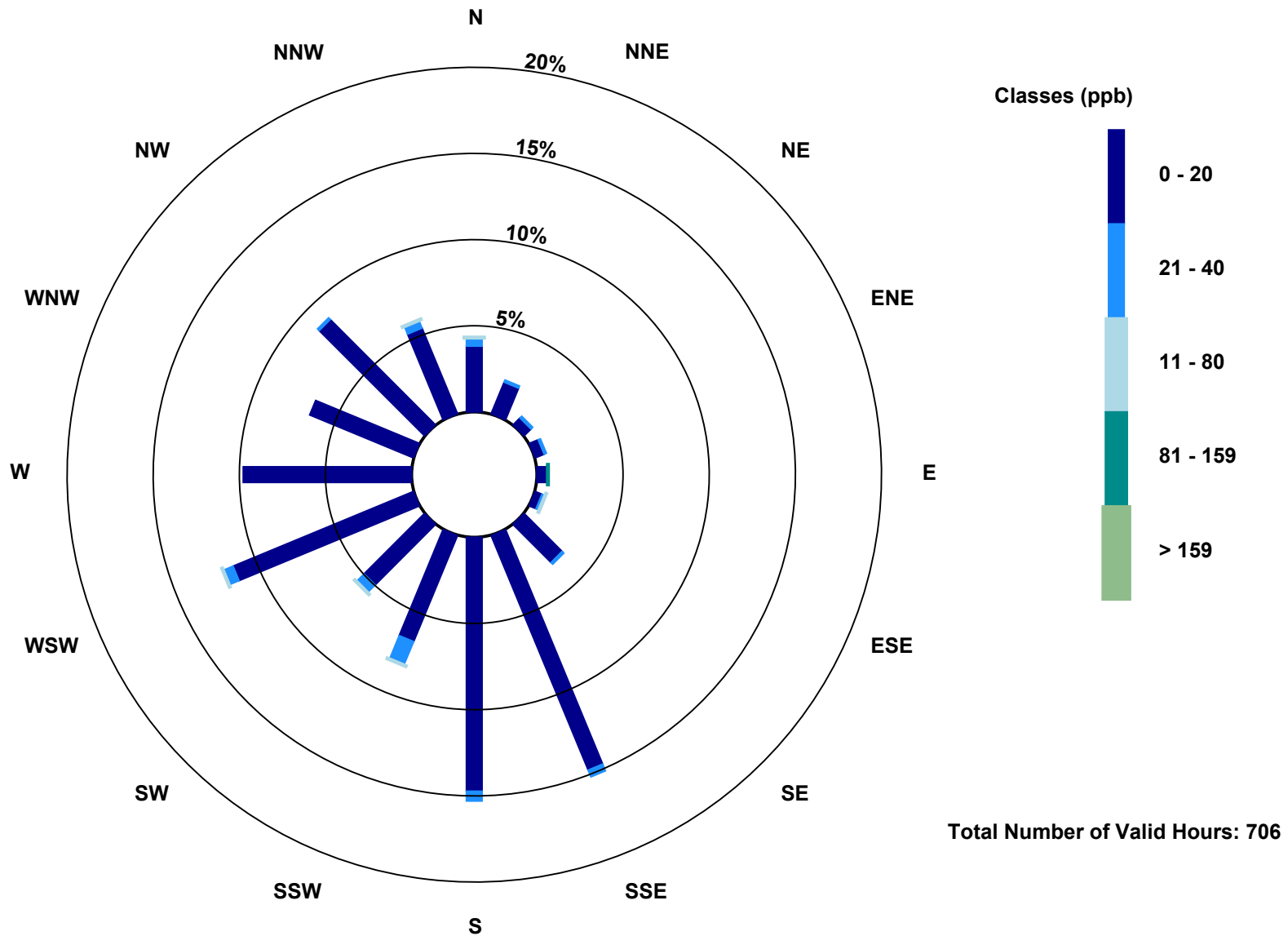
Total Number of Valid Hours: 706

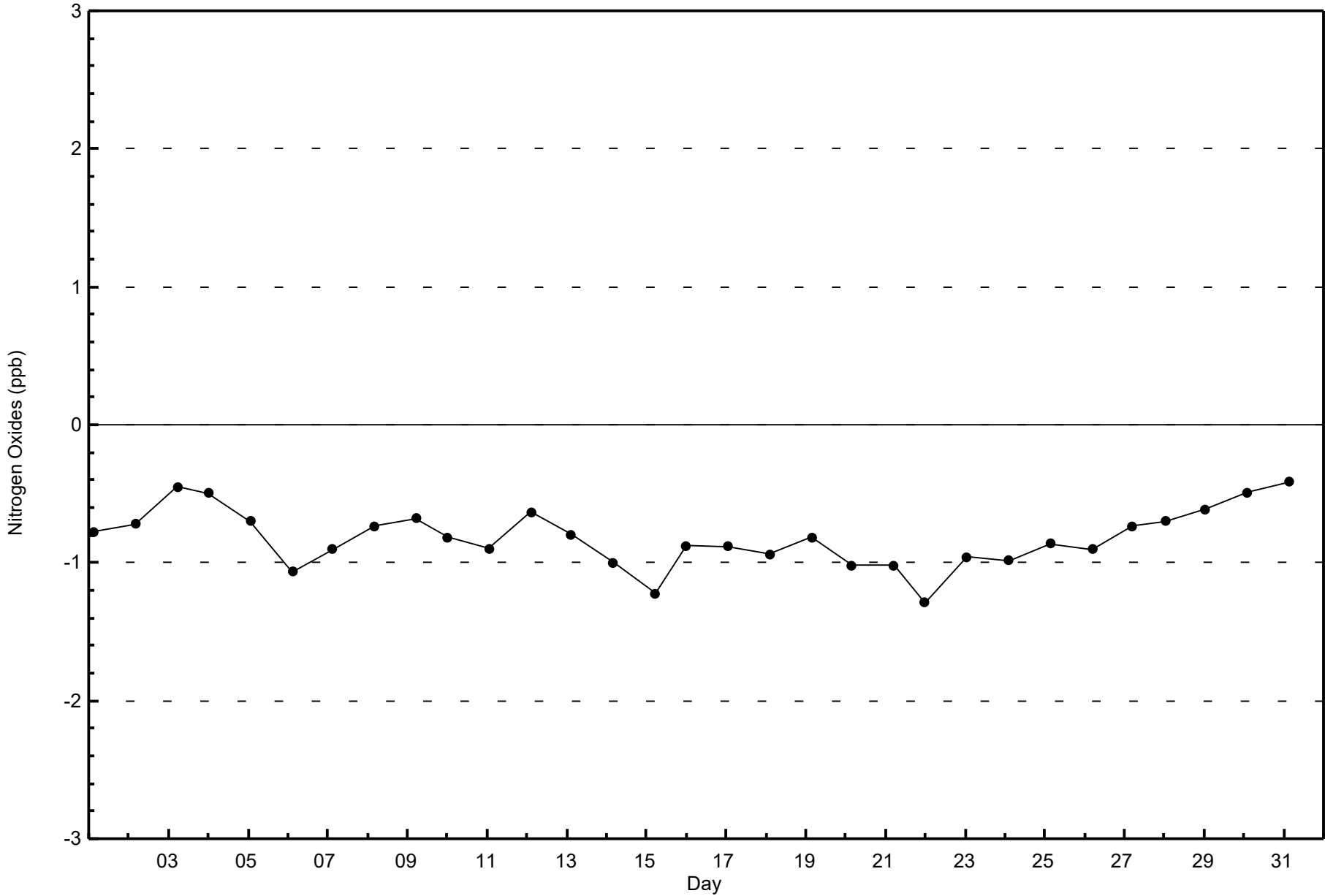
Total Number of Hours: 744

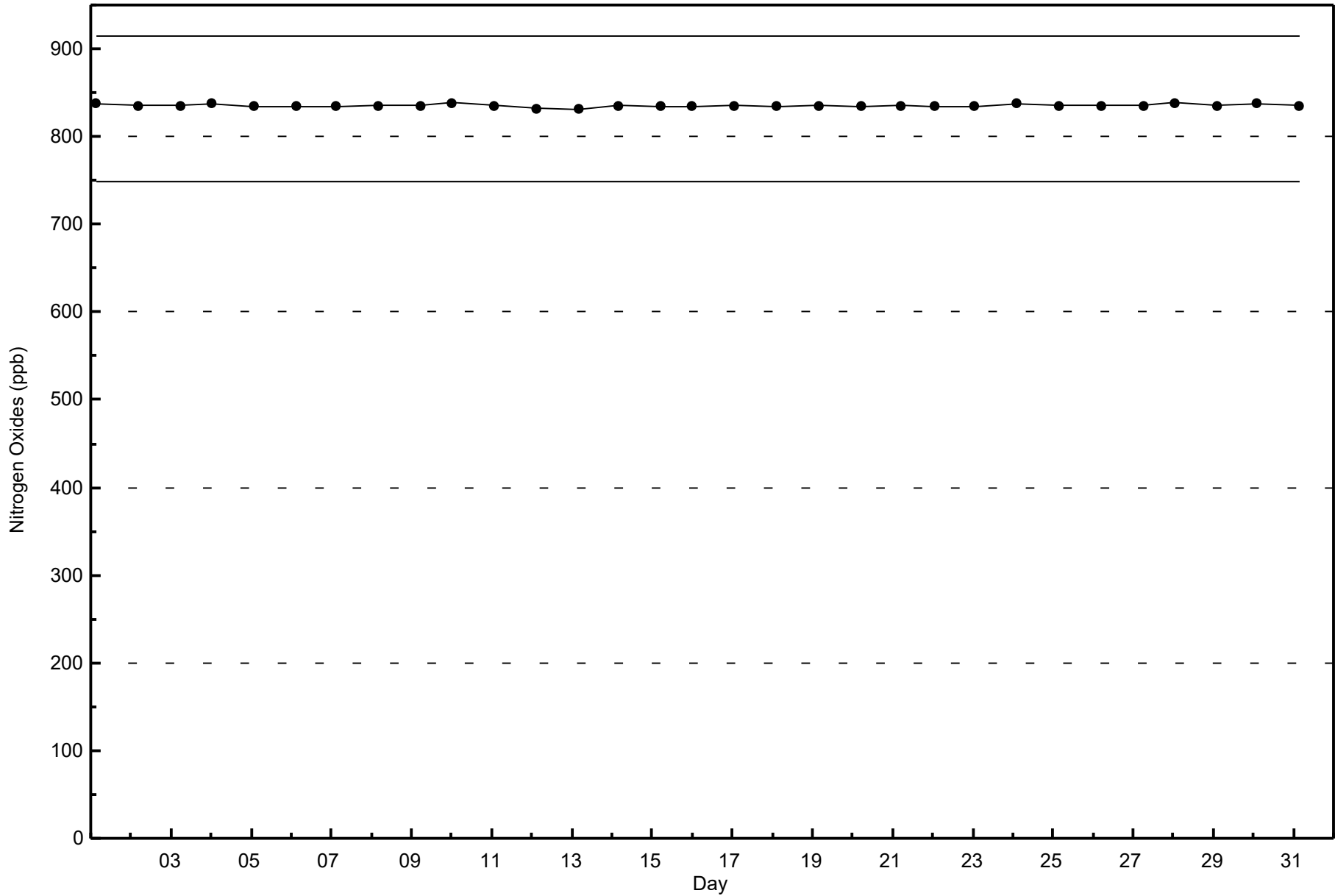


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitrogen Oxides (NO_x) - ppb
Fort McKay South









Wood Buffalo Environmental Association

Summary of Hour Averages

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

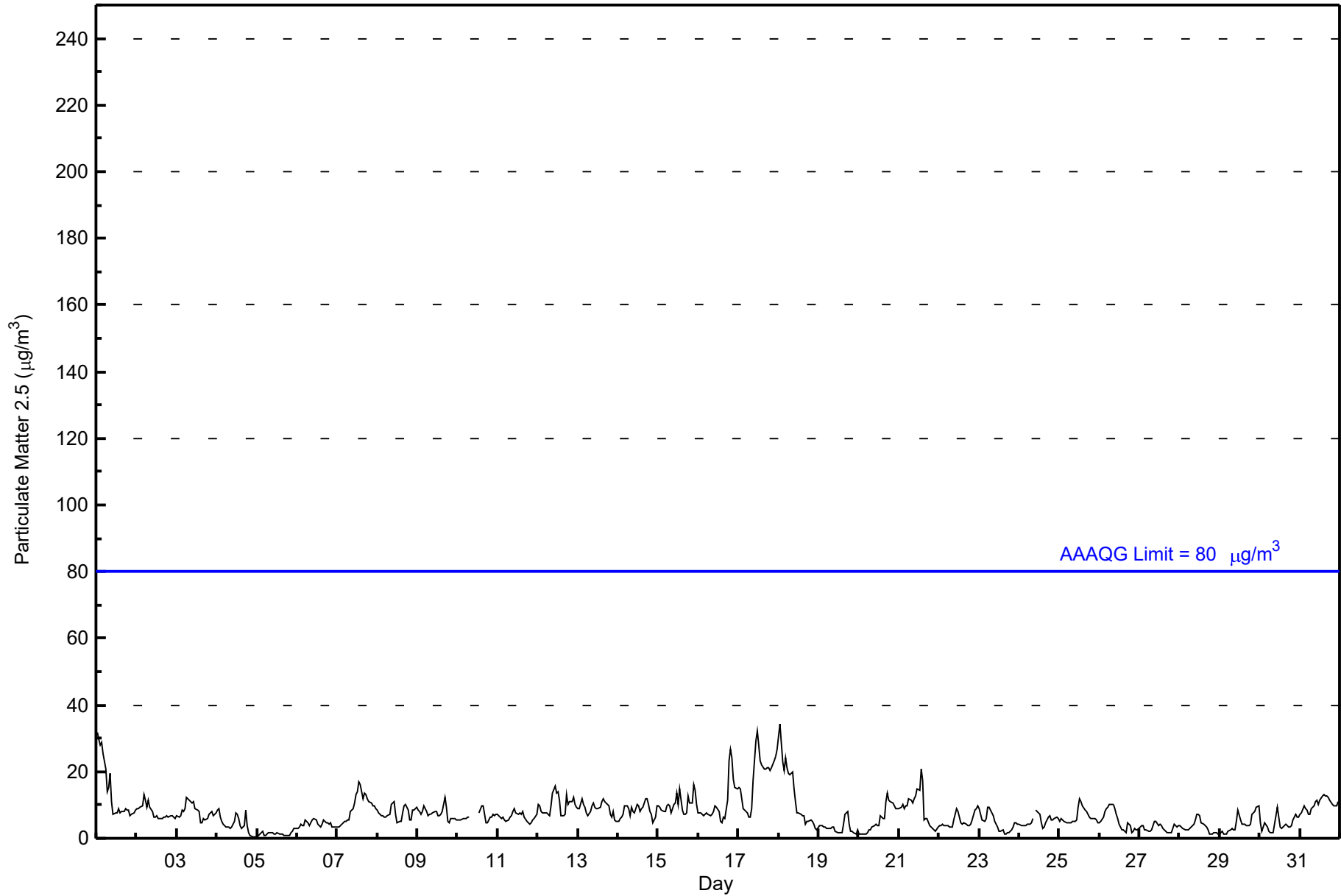
Fort McKay South - October 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 744																	744																												
Maximum Value: 34.2 µg/m ³ on Oct 18 02:00		Maximum Daily Average: 18.3 µg/m ³ on Oct 17																	Hours of Data: 738																														
Minimum Value: 0.3 µg/m ³ on Oct 4 23:00		Minimum Daily Average: 1.5 µg/m ³ on Oct 5																	Hours of Missing Data: 6																														
Maximum Diurnal Average: 8.7 µg/m ³ at hour 11		Minimum Diurnal Average: 6.6 µg/m ³ at hour 16																	Hours of Calibration: 1																														
Monthly Average: 7.32 µg/m ³		Percentiles: P ₁ = 1.0 P ₁₀ = 2.2 Q ₁ = 4.0 Median = 6.5 Q ₃ = 9.2 P ₉₀ = 12.0 P ₉₉ = 27.9																	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-Oct	31.8	29.6	27.8	28.7	25.6	20.9	14.1	15.3	19.7	11.0	7.3	7.6	7.7	8.8	7.8	7.9	8.2	9.0	8.5	8.4	6.8	7.3	7.7	8.6	14.0	31.8																							
2-Oct	8.8	8.7	9.5	9.6	13.2	11.5	9.3	11.3	9.2	8.2	6.3	6.2	6.9	5.8	6.0	6.0	6.4	6.2	6.6	6.5	6.6	6.7	6.4	6.0	7.8	13.2																							
3-Oct	6.6	6.5	6.6	8.4	7.9	9.1	12.3	11.6	11.0	10.8	10.9	9.1	8.5	8.0	4.8	4.5	5.8	5.7	5.8	7.1	7.5	8.2	6.9	7.6	8.0	12.3																							
4-Oct	8.4	8.7	6.5	4.9	4.3	3.6	3.4	3.2	3.1	3.4	5.1	7.5	7.4	5.8	3.7	3.0	4.0	8.5	3.9	1.8	0.9	0.4	0.3	0.4	4.3	8.7																							
5-Oct	0.4	0.8	1.8	2.2	1.0	0.7	1.4	1.9	1.8	1.6	1.3	1.2	1.5	1.5	1.4	1.1	1.0	1.0	1.0	1.9	2.0	3.1	2.9	1.5	3.1	0.4																							
6-Oct	3.0	3.3	4.1	3.9	4.0	5.6	4.8	4.0	4.7	5.6	5.8	5.7	4.1	3.6	3.5	4.1	5.4	4.8	4.5	4.4	4.6	3.2	3.5	3.4	4.3	5.8																							
7-Oct	3.5	3.4	3.7	4.4	5.1	4.9	5.6	5.7	7.9	9.0	10.6	13.1	14.0	17.1	16.2	11.9	13.5	13.1	11.7	11.0	10.6	9.9	9.6	9.0	9.4	17.1																							
8-Oct	8.3	7.5	6.8	6.7	6.4	6.4	6.7	7.0	10.4	10.8	11.0	7.3	4.8	5.0	5.1	7.5	9.8	10.4	8.6	5.4	5.5	8.4	8.4	9.2	7.6	11.0																							
9-Oct	8.4	7.9	7.3	7.9	9.7	7.9	6.7	7.3	7.0	7.7	7.9	8.2	6.7	6.9	7.4	8.2	12.2	9.5	5.2	4.7	5.8	5.9	5.8	5.6	7.4	12.2																							
10-Oct	5.5	5.4	5.7	6.1	5.7	5.8	6.2	6.3	UO	UO	UO	UO	M	7.8	9.8	9.8	7.0	4.7	4.8	6.3	6.5	7.2	6.6	7.1	6.5	9.8																							
11-Oct	7.3	6.5	5.9	6.4	5.3	5.1	5.4	6.2	6.9	8.2	8.8	7.7	7.4	7.7	7.4	8.2	6.5	4.9	4.6	4.4	4.8	5.4	5.9	7.4	6.4	8.8																							
12-Oct	10.3	9.7	8.1	7.7	7.4	7.5	7.1	6.6	9.5	13.6	15.8	13.6	14.1	11.4	6.7	6.8	7.4	13.3	10.3	11.1	11.1	12.2	10.0	9.4	10.0	15.8																							
13-Oct	9.1	9.1	11.7	10.1	9.3	7.5	6.7	8.0	9.6	10.5	9.4	8.9	9.1	9.4	11.0	12.0	11.0	10.5	9.9	7.2	6.4	8.2	5.4	5.0	9.0	12.0																							
14-Oct	5.1	6.0	6.5	7.3	9.7	9.9	8.8	6.6	9.5	7.9	7.7	10.1	9.6	8.2	9.1	9.3	11.9	12.0	10.1	8.2	7.3	4.8	6.2	9.8	8.4	12.0																							
15-Oct	9.9	9.1	8.6	8.1	8.2	9.9	10.2	9.7	7.8	10.0	10.5	13.7	10.2	14.9	8.5	7.3	7.4	7.6	12.8	10.6	10.4	16.2	14.5	10.1	10.3	16.2																							
16-Oct	7.7	7.5	7.2	6.9	7.2	7.4	7.2	6.7	7.1	8.0	9.9	9.3	8.0	5.0	4.6	6.2	6.0	11.6	23.3	26.6	24.1	17.7	15.4	14.7	10.6	26.6																							
17-Oct	15.2	14.7	12.0	9.1	7.9	7.4	6.3	6.4	9.0	17.4	29.3	32.2	27.9	23.4	21.9	20.7	20.8	21.3	21.2	20.5	21.2	23.4	24.4	26.5	18.3	32.2																							
18-Oct	30.4	34.2	22.8	20.4	24.0	21.1	19.7	19.1	19.8	15.0	11.1	7.8	7.6	7.1	7.0	6.9	4.4	5.0	5.2	5.4	5.0	4.1	3.1	2.4	12.9	34.2																							
19-Oct	3.7	3.9	3.7	3.5	3.3	2.9	3.0	3.1	3.5	3.5	2.0	1.6	1.6	1.6	1.7	4.1	7.3	7.9	4.4	2.1	2.2	1.6	1.2	2.3	3.1	7.9																							
20-Oct	1.2	1.3	1.4	1.3	1.4	1.8	2.4	2.7	3.2	3.8	4.2	3.8	3.9	6.7	6.1	5.9	11.0	13.4	11.4	10.9	10.5	9.7	9.1	8.7	5.7	13.4																							
21-Oct	8.8	9.2	10.1	9.0	9.8	9.7	12.0	11.3	10.5	11.7	12.8	15.0	14.6	20.8	17.2	5.5	5.9	6.1	3.8	3.2	2.8	2.6	2.0	3.3	9.1	20.8																							
22-Oct	4.0	4.0	4.1	3.9	3.9	3.9	3.6	3.3	3.2	5.6	8.9	8.3	6.2	4.8	4.0	4.7	4.2	3.8	3.7	4.2	5.6	8.3	9.1	9.7	5.2	9.7																							
23-Oct	9.0	7.2	5.6	4.9	6.1	9.3	9.5	8.4	6.6	5.1	4.2	3.4	2.3	2.0	2.6	1.4	1.3	1.5	1.7	2.4	3.5	4.5	4.6	4.4	4.6	9.5																							
24-Oct	4.1	3.9	3.9	3.9	3.9	4.1	4.3	4.8	6.0	C	8.6	7.5	7.1	4.7	3.0	3.6	4.9	6.3	6.8	5.7	5.4	6.1	6.5	5.9	5.3	8.6																							
25-Oct	5.0	5.8	5.5	5.0	4.6	4.5	4.5	4.8	5.0	5.2	5.6	9.4	11.7	10.9	9.6	8.5	8.0	7.2	6.2	5.8	6.0	6.1	5.6	4.5	6.5	11.7																							
26-Oct	4.8	5.1	6.3	8.2	9.1	9.4	10.1	10.2	10.1	8.8	7.3	5.8	4.4	2.6	2.5	2.0	1.7	4.7	3.9	1.7	2.0	2.9	2.5	2.6	5.4	10.2																							
27-Oct	3.4	3.7	3.7	2.4	2.5	2.2	2.0	2.7	3.9	4.9	5.0	3.6	4.1	4.0	3.1	2.4	1.8	1.7	1.6	1.6	2.9	4.0	3.4	3.7	3.1	5.0																							
28-Oct	3.7	3.3	3.1	2.5	2.5	2.6	3.0	3.4	4.3	5.4	7.0	7.2	6.8	4.5	4.1	3.8	3.5	2.4	1.4	1.2	1.5	1.7	1.8	1.2	3.4	7.2																							
29-Oct	1.5	2.2	1.4	1.2	1.3	2.1	2.6	3.0	2.4	2.8	5.3	8.5	5.4	4.4	4.2	4.1	3.8	3.9	4.3	7.2	7.5	7.8	9.3	9.8	4.4	9.8																							
30-Oct	4.6	2.2	3.5	4.8	3.5	2.1	1.7	1.6	1.9	4.4	9.5	6.2	3.5	3.0	3.3	4.1	3.7	3.4	3.4	4.0	5.3	7.2	6.5	6.2	4.1	9.5																							
31-Oct	7.1	7.4	9.9	8.8	8.5	7.4	7.2	9.1	9.8	11.0	11.5	10.3	11.4	12.6	13.0	12.6	12.7	12.4	11.4	10.2	9.7	9.8	9.8	10.9	10.2	13.0																							
																								7.8	7.7	7.3	7.0	7.2	6.9	6.7	6.8	7.5	8.0	8.7	8.7	7.9	7.7	7.0	6.6	7.0	7.5	7.2	6.8	6.8	7.2	6.9	7.0	Diurnal Average	
																								31.8	34.2	27.8	28.7	25.6	21.1	19.7	19.1	19.8	17.4	29.3	32.2	27.9	23.4	21.9	20.7	20.8	21.3	23.3	26.6	24.1	23.4	24.4	26.5	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
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	292	39.57	39.57
6 - 15	405	54.88	94.44
16 - 25	29	3.93	98.37
26 - 80	12	1.63	100.00
> 81.0	0	0.00	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}) - μg/m³
Fort McKay South - October 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	10	3	3	0	2	2	5	14	25	16	21	57	43	32	41	18	292
6 - 15	13	9	2	4	3	3	17	87	84	42	16	32	33	13	22	24	404
16 - 25	8	1	0	0	0	0	0	7	2	2	3	0	0	2	1	3	29
26 - 80	1	2	0	1	0	0	0	0	1	4	2	1	0	0	0	0	12
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	32	15	5	5	5	5	22	108	112	64	42	90	76	47	64	45	737

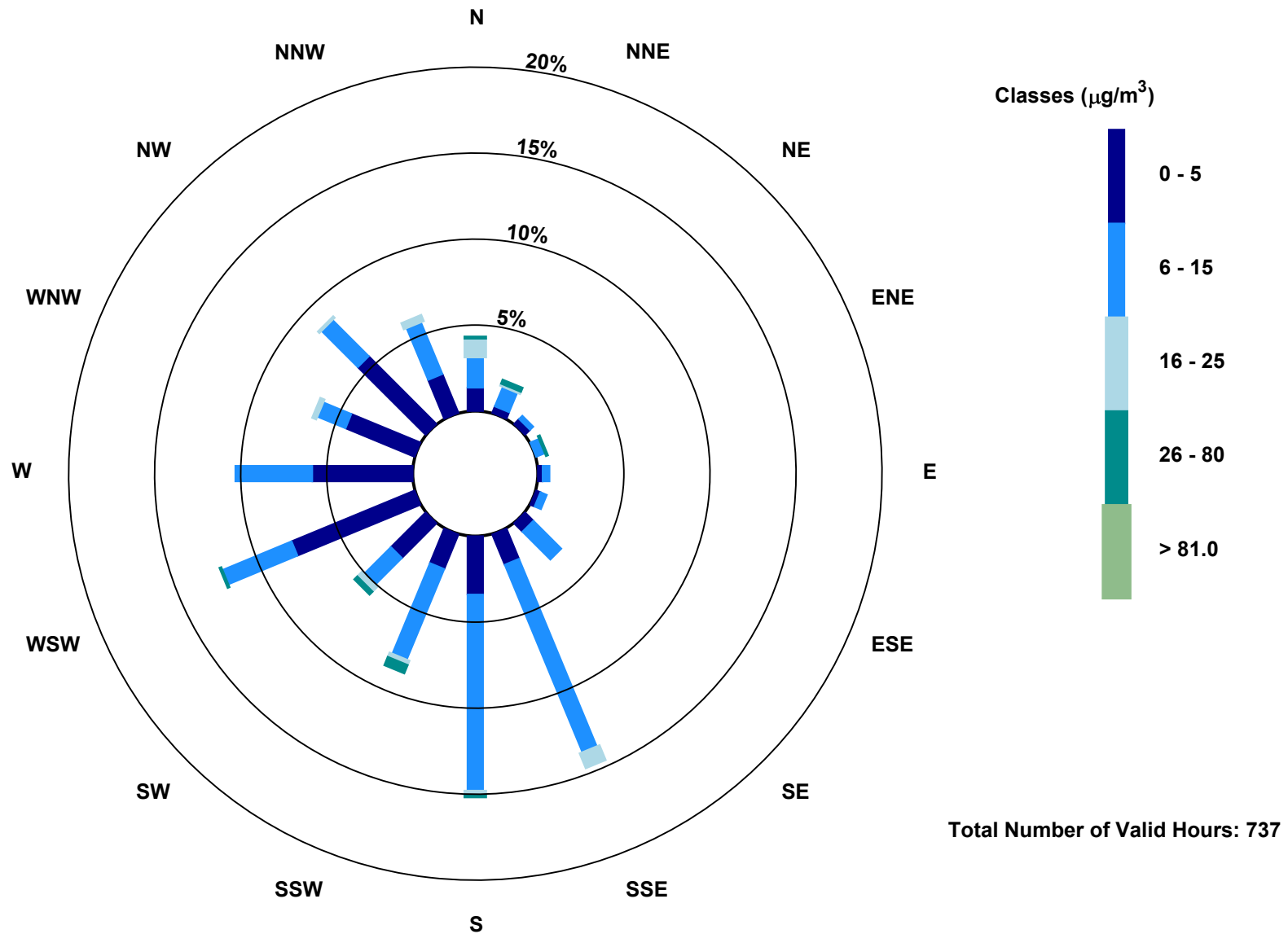
Total Number of Valid Hours: 737

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

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

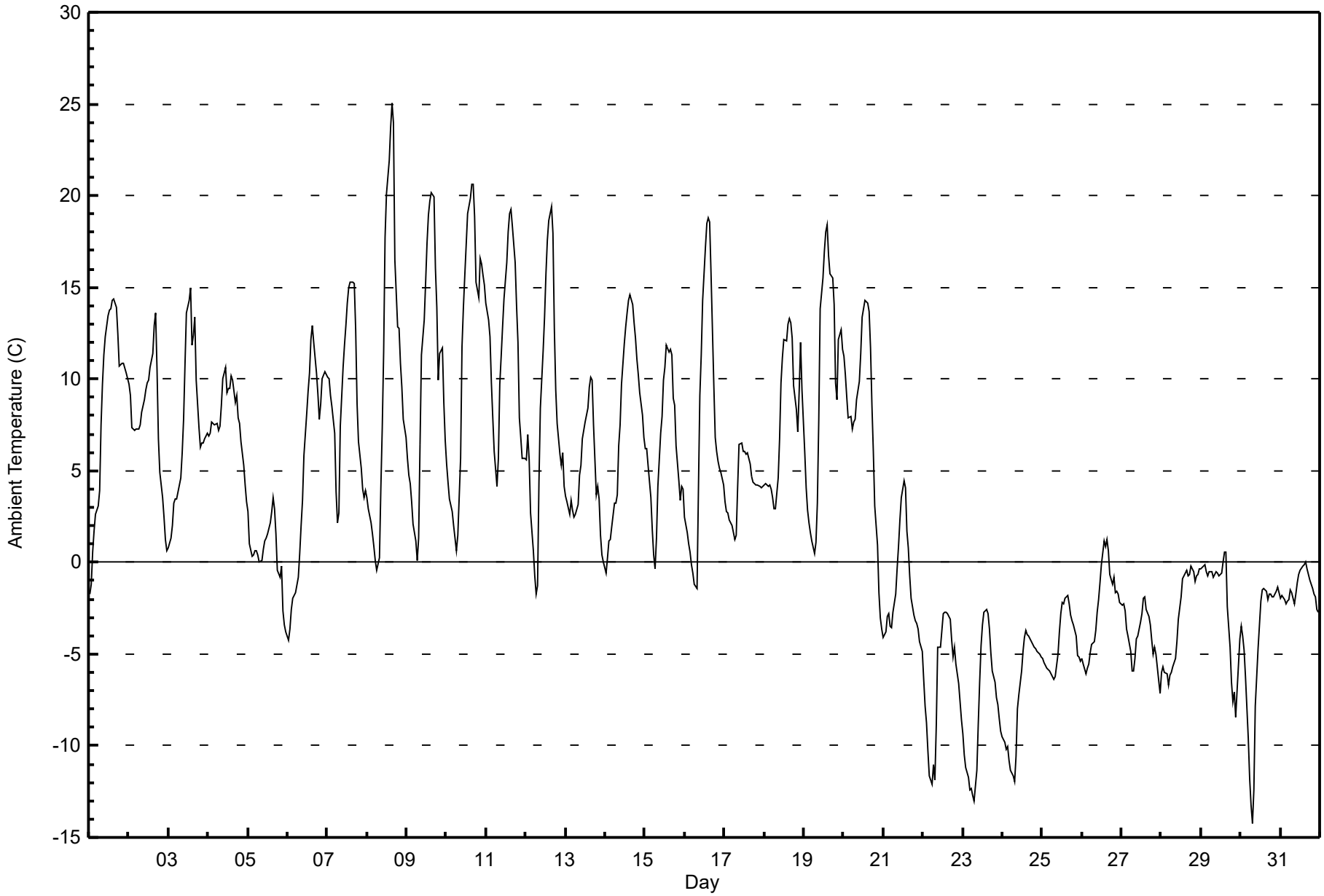




Wood Buffalo Environmental Association
Summary of Hour Averages

Ambient Temperature (AT) - C
Fort McKay South - October 2023

Maximum Value: 25.0 C on Oct 8 16:00		Maximum Daily Average: 11.7 C on Oct 11		Hours in Service: 744																																												
Minimum Value: -14.3 C on Oct 30 08:00		Minimum Daily Average: -7.9 C on Oct 23		Hours of Data: 744																																												
Maximum Diurnal Average: 8.9 C at hour 16		Minimum Diurnal Average: -1.1 C at hour 7		Hours of Missing Data: 0																																												
Monthly Average: 3.51 C		Percentiles: P ₁ = -12.0 P ₁₀ = -5.6 Q ₁ = -2.1 Median = 3.1 Q ₃ = 9.3 P ₉₀ = 13.8 P ₉₉ = 20.0		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-Oct	-1.8	-1.2	0.6	1.7	2.6	3.0	3.9	7.5	9.7	11.3	12.3	13.5	13.7	13.9	14.3	14.3	13.9	12.5	10.7	10.8	10.8	10.9	10.3	10.0	8.7	14.3																						
2-Oct	9.7	9.1	7.4	7.2	7.3	7.3	7.2	7.5	8.2	8.8	9.4	9.8	10.0	10.6	11.4	12.9	13.6	10.5	6.8	4.9	3.5	2.5	1.3	0.7	7.8	13.6																						
3-Oct	0.8	1.4	2.0	3.2	3.4	3.5	3.8	4.6	6.0	7.8	10.8	13.6	14.3	15.0	11.8	12.4	13.4	9.9	7.3	6.3	6.5	6.5	6.7	7.1	7.4	15.0																						
4-Oct	6.9	7.0	7.6	7.6	7.5	7.6	7.2	7.4	8.5	10.0	10.6	9.2	9.5	9.5	10.2	9.9	8.8	9.1	7.9	7.6	6.6	5.3	4.2	3.3	7.9	10.6																						
5-Oct	2.8	1.0	0.3	0.4	0.6	0.6	0.4	0.0	0.1	0.7	1.2	1.4	1.6	2.1	2.8	3.6	2.9	1.5	-0.5	-0.8	-0.2	-2.6	-3.4	-3.8	0.5	3.6																						
6-Oct	-4.2	-3.6	-2.6	-2.0	-1.8	-1.6	-0.8	0.5	2.0	3.4	5.8	8.1	9.4	10.3	12.1	12.9	12.0	10.3	9.2	7.8	8.7	10.1	10.4	10.2	5.3	12.9																						
7-Oct	10.1	10.0	9.1	8.5	7.0	3.9	2.1	2.7	7.4	10.6	11.8	12.9	14.1	15.0	15.3	15.3	15.2	12.7	8.6	6.6	5.2	4.0	3.5	3.9	9.0	15.3																						
8-Oct	3.5	2.9	2.1	1.6	0.9	0.1	-0.4	0.2	4.1	7.3	11.5	17.7	20.1	21.9	23.7	25.0	24.0	16.5	12.8	12.7	10.8	9.5	7.8	6.8	10.1	25.0																						
9-Oct	5.7	4.8	4.3	3.3	2.1	1.1	0.1	1.3	6.4	11.3	13.2	15.3	17.4	19.0	19.7	20.1	20.0	16.0	13.9	10.0	11.4	11.7	8.7	6.7	10.1	20.1																						
10-Oct	5.3	4.4	3.5	2.8	2.0	1.3	0.7	1.5	5.7	11.7	13.9	15.7	17.4	19.0	19.9	20.6	20.6	18.8	15.3	14.4	16.6	16.3	15.6	15.1	11.6	20.6																						
11-Oct	14.2	13.2	12.3	9.8	7.9	6.1	4.2	5.6	9.7	11.2	12.8	14.3	16.3	18.0	19.0	19.3	18.3	16.3	14.0	12.0	7.9	6.8	5.7	5.7	11.7	19.3																						
12-Oct	5.6	7.0	5.6	2.7	0.6	-0.7	-1.7	-1.3	4.3	8.5	11.6	13.4	15.7	17.6	18.6	19.4	18.0	12.8	9.4	7.6	5.9	5.3	6.0	4.1	8.2	19.4																						
13-Oct	3.6	3.3	2.6	3.4	2.8	2.5	2.6	3.1	4.8	5.3	6.7	7.2	7.6	8.4	9.5	10.1	9.9	7.5	3.7	4.2	3.4	1.5	0.4	0.0	4.8	10.1																						
14-Oct	-0.6	0.3	1.1	1.3	1.9	3.2	3.2	3.7	6.4	7.5	9.7	11.9	12.9	13.6	14.3	14.6	14.1	13.1	12.2	11.1	10.2	9.2	8.0	6.8	7.9	14.6																						
15-Oct	6.2	6.2	5.3	3.5	1.8	0.4	-0.3	1.3	4.2	7.0	8.0	9.9	10.6	11.9	11.5	11.6	11.3	9.0	8.5	6.4	4.4	3.4	4.1	4.0	6.3	11.9																						
16-Oct	2.5	1.6	1.0	0.5	-0.1	-0.6	-1.2	-1.4	4.0	9.1	11.3	14.3	17.2	18.5	18.8	18.6	15.7	9.6	6.8	6.0	5.5	5.2	4.9	4.2	7.2	18.8																						
17-Oct	3.3	2.8	2.7	2.3	2.0	1.6	1.2	1.5	4.1	6.4	6.5	6.1	6.0	5.9	6.0	5.3	4.6	4.4	4.3	4.3	4.2	4.1	4.1	4.2	4.1	6.5																						
18-Oct	4.2	4.3	4.1	4.2	4.0	3.6	3.0	2.9	4.6	6.7	9.8	11.1	12.2	12.1	13.0	13.3	13.0	12.3	9.6	8.3	7.1	9.3	12.0	9.4	8.1	13.3																						
19-Oct	6.0	4.0	2.8	2.2	1.6	1.1	0.5	1.1	3.2	7.7	13.8	15.5	17.0	18.0	18.4	16.8	15.8	15.5	14.1	9.8	8.9	12.2	12.7	11.6	9.6	18.4																						
20-Oct	11.2	10.3	9.0	7.9	7.9	7.3	7.7	7.8	8.8	9.8	11.4	13.4	13.8	14.3	14.2	13.7	11.7	8.5	6.0	3.1	1.0	-1.7	-3.0	-3.6	7.9	14.3																						
21-Oct	-4.1	-3.8	-3.0	-2.8	-3.5	-3.6	-2.7	-1.7	-0.3	0.9	2.3	3.5	4.5	4.0	1.7	0.8	-0.7	-2.0	-2.8	-3.2	-3.3	-3.7	-4.3	-4.8	-1.4	4.5																						
22-Oct	-6.4	-7.8	-8.8	-10.2	-11.6	-12.1	-11.1	-11.8	-8.9	-4.6	-4.6	-3.7	-2.8	-2.7	-2.7	-2.8	-3.1	-4.2	-5.2	-4.6	-5.5	-6.6	-7.6	-8.6	-6.6	-2.7																						
23-Oct	-9.3	-10.5	-11.2	-11.7	-12.4	-12.3	-12.7	-13.0	-11.3	-8.8	-6.5	-4.5	-3.4	-2.7	-2.6	-2.8	-3.6	-4.9	-5.9	-6.5	-7.4	-7.8	-8.5	-9.2	-7.9	-2.6																						
24-Oct	-9.5	-9.8	-10.2	-10.1	-10.8	-11.3	-11.7	-12.0	-10.5	-8.0	-7.2	-5.9	-4.8	-4.1	-3.7	-3.9	-4.0	-4.3	-4.5	-4.6	-4.7	-4.9	-5.0	-5.2	-7.1	-3.7																						
25-Oct	-5.2	-5.5	-5.6	-5.8	-5.9	-6.1	-6.3	-6.4	-6.2	-5.0	-3.8	-2.8	-2.2	-2.3	-1.9	-1.8	-2.2	-2.9	-3.2	-3.4	-4.1	-5.1	-5.2	-5.4	-4.3	-1.8																						
26-Oct	-5.2	-5.6	-6.0	-5.7	-5.6	-4.9	-4.5	-4.3	-3.7	-2.7	-2.1	-1.2	-0.1	1.1	0.8	1.3	0.7	-0.7	-1.2	-0.8	-1.6	-1.6	-1.8	-2.2	-2.4	1.3																						
27-Oct	-2.4	-2.2	-2.6	-3.6	-4.1	-4.8	-5.9	-6.0	-5.2	-4.2	-4.0	-3.2	-2.8	-2.0	-1.9	-2.5	-2.9	-3.4	-4.2	-5.0	-4.6	-5.0	-6.5	-7.2	-4.0	-1.9																						
28-Oct	-6.0	-5.7	-6.0	-6.0	-6.7	-6.1	-6.0	-5.7	-5.2	-4.3	-3.1	-2.5	-1.9	-0.9	-0.6	-0.4	-0.8	-0.7	-0.2	-0.5	-1.0	-0.7	-0.7	-0.3	-3.0	-0.2																						
29-Oct	-0.4	-0.2	-0.1	-0.5	-0.7	-0.5	-0.5	-0.8	-0.7	-0.5	-0.6	-0.7	-0.6	0.1	0.5	0.5	-2.4	-4.7	-6.6	-7.6	-7.1	-8.5	-7.0	-4.2	-2.2	0.5																						
30-Oct	-3.5	-4.1	-4.8	-6.2	-9.6	-11.8	-13.2	-14.3	-12.4	-7.9	-4.7	-3.4	-2.1	-1.5	-1.4	-1.6	-2.0	-1.7	-1.8	-1.9	-1.9	-1.6	-1.3	-1.7	-4.8	-1.3																						
31-Oct	-1.9	-1.8	-2.0	-2.2	-2.1	-2.1	-1.5	-1.6	-2.2	-1.7	-1.1	-0.6	-0.4	-0.2	-0.1	0.0	-0.3	-0.7	-1.0	-1.4	-1.7	-1.9	-2.5	-2.7	-1.4	0.0																						
																								1.3	1.0	0.7	0.2	-0.3	-0.8	-1.1	-0.6	1.5	3.7	5.4	6.7	7.7	8.5	8.8	8.9	8.2	6.3	4.7	3.7	3.1	2.7	2.3	1.8	Diurnal Average
																								14.2	13.2	12.3	9.8	7.9	7.6	7.7	7.8	9.7	11.7	13.9	17.7	20.1	21.9	23.7	25.0	24.0	18.8	15.3	14.4	16.6	16.3	15.6	15.1	Diurnal Maximum





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Fort McKay South - October 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	279	37.50	37.50
0 - 10	304	40.86	78.36
10 - 20	153	20.56	98.92
> 20	8	1.08	100.00

Total Number of Valid Hours: 744

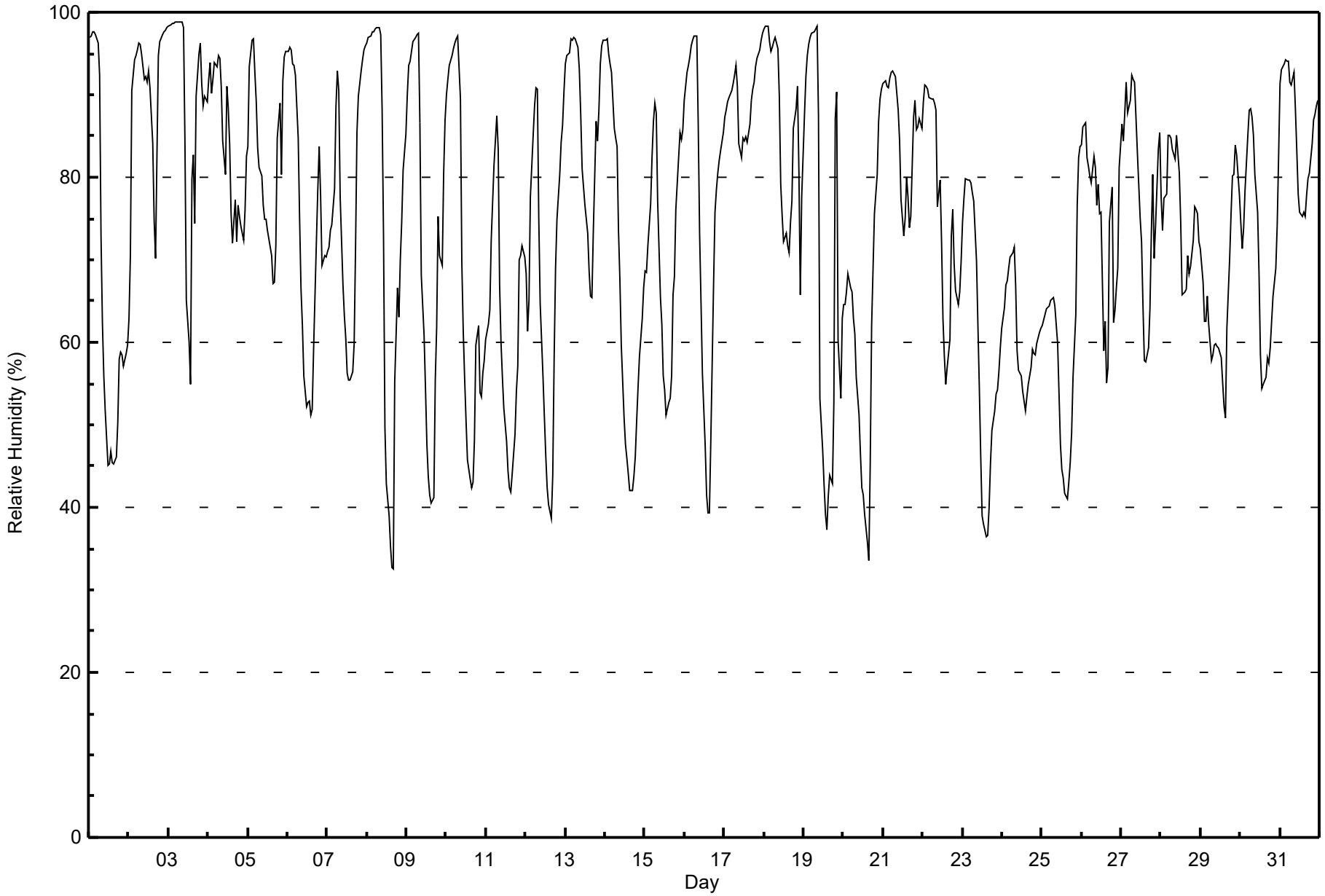
Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

Relative Humidity (RH) - %
Fort McKay South - October 2023

Maximum Value: 98.8 % on Oct 3 08:00 Maximum Daily Average: 89.7 % on Oct 17 Minimum Value: 32.6 % on Oct 8 17:00 Minimum Daily Average: 58.7 % on Oct 25 Maximum Diurnal Average: 88.0 % at hour 6 Minimum Diurnal Average: 55.0 % at hour 16 Monthly Average: 74.27 % Percentiles: P ₁ = 37.6 P ₁₀ = 49.8 Q ₁ = 60.9 Median = 75.8 Q ₃ = 89.4 P ₉₀ = 95.5 P ₉₉ = 98.4																						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-Oct	96.9	97.0	97.6	97.6	97.2	96.3	92.4	72.8	62.3	55.9	51.7	45.0	45.2	46.7	45.4	45.3	46.1	50.3	57.9	58.9	58.4	57.2	58.7	59.7	66.4	97.6																					
2-Oct	62.8	70.5	90.6	94.2	94.8	95.4	96.3	96.2	94.9	91.9	92.2	91.6	92.9	90.9	84.1	74.7	70.2	82.7	94.7	96.5	97.2	97.7	97.9	98.1	89.5	98.1																					
3-Oct	98.3	98.5	98.6	98.7	98.8	98.8	98.8	98.8	98.8	98.1	84.4	65.1	60.0	54.9	79.9	82.7	74.3	89.8	95.0	96.3	91.3	88.7	89.8	89.2	88.7	98.8																					
4-Oct	91.9	93.8	90.2	91.8	93.9	93.3	94.8	94.5	90.9	84.4	80.3	91.0	88.4	83.8	75.6	72.0	77.2	72.2	76.6	75.3	74.0	72.3	76.1	82.6	84.0	94.8																					
5-Oct	83.8	93.4	96.6	96.8	92.7	89.2	83.5	81.2	80.1	76.7	75.0	79.7	73.6	71.5	70.5	67.2	67.3	71.8	84.8	89.0	80.3	91.8	94.6	95.3	82.6	96.8																					
6-Oct	95.3	95.8	95.3	93.7	93.5	92.4	84.7	74.9	66.4	62.0	55.8	52.2	52.7	52.8	51.1	51.9	59.1	72.2	78.4	83.7	77.8	69.3	70.4	70.4	73.0	95.8																					
7-Oct	71.0	71.6	73.6	74.2	78.6	88.6	92.8	90.6	77.7	67.0	63.1	60.5	56.3	55.5	55.5	56.4	59.9	71.6	85.4	89.8	92.8	94.3	95.5	96.0	75.8	96.0																					
8-Oct	96.3	96.9	97.1	97.6	97.7	97.9	98.1	98.2	97.4	88.2	72.8	49.6	42.9	38.9	35.2	32.6	32.6	55.3	66.6	63.0	69.9	74.5	80.8	85.2	73.6	98.2																					
9-Oct	90.0	93.6	94.1	95.3	96.5	96.9	97.3	97.4	86.7	68.2	60.8	54.4	47.6	43.8	41.5	40.4	41.2	55.5	61.8	75.2	70.5	69.3	80.5	87.0	72.7	97.4																					
10-Oct	89.9	91.9	93.5	94.7	95.7	96.3	96.8	97.1	89.6	69.5	61.3	55.6	50.5	45.7	43.4	42.4	43.0	48.1	59.6	62.0	54.0	53.5	56.2	57.8	68.7	97.1																					
11-Oct	60.3	62.2	63.9	72.3	77.0	81.6	87.5	83.4	66.9	60.1	55.8	52.1	47.9	44.4	42.4	41.9	44.1	48.8	54.1	57.1	70.1	70.4	71.8	70.3	61.9	87.5																					
12-Oct	68.4	61.4	65.0	77.7	85.1	88.6	90.8	90.7	75.0	64.8	55.9	50.9	46.3	42.4	40.4	38.7	44.0	58.2	69.0	74.9	80.3	84.3	86.3	90.3	67.9	90.8																					
13-Oct	93.7	94.7	95.2	96.7	96.5	97.0	96.8	95.8	93.1	87.6	81.1	78.7	76.7	73.3	68.6	65.7	65.5	73.3	86.7	84.5	88.1	93.7	96.0	96.7	86.5	97.0																					
14-Oct	96.7	96.9	95.0	93.8	92.8	86.0	84.8	83.8	73.5	67.7	59.7	50.8	47.7	45.9	44.1	42.1	42.0	43.8	46.1	50.5	54.6	58.4	62.8	66.6	66.1	96.9																					
15-Oct	68.7	68.5	71.6	76.9	82.6	86.7	88.9	87.8	77.1	65.5	62.2	56.0	54.3	51.1	52.8	53.3	56.0	65.8	68.0	76.1	82.3	85.3	84.6	85.8	71.2	88.9																					
16-Oct	89.4	92.7	93.5	94.6	95.9	96.7	97.1	97.1	86.7	73.3	64.9	56.3	47.5	41.5	39.3	39.4	47.9	67.0	75.8	78.5	80.5	82.1	83.2	85.5	75.3	97.1																					
17-Oct	87.2	88.2	89.2	89.6	90.4	91.4	92.3	93.5	91.1	84.1	82.4	84.8	84.3	84.9	84.3	86.4	89.3	90.7	91.5	93.4	94.5	95.5	96.6	97.5	89.7	97.5																					
18-Oct	98.0	98.3	98.3	96.5	95.3	95.7	96.5	97.0	95.7	89.8	79.2	75.4	72.2	73.2	71.7	70.9	74.5	77.2	86.0	88.3	91.0	80.9	65.8	77.6	85.2	98.3																					
19-Oct	87.7	92.3	94.7	96.1	96.9	97.4	97.7	98.0	98.2	87.5	53.3	47.0	42.6	39.2	37.3	41.3	43.9	42.8	52.8	87.1	90.3	60.4	53.2	62.9	70.9	98.2																					
20-Oct	64.6	64.5	66.0	68.3	66.6	66.1	62.9	60.9	55.8	51.2	46.4	42.4	41.5	39.1	35.8	33.5	45.2	62.1	68.8	75.6	80.3	86.7	89.6	90.7	61.0	90.7																					
21-Oct	91.3	91.7	91.1	90.9	92.0	92.8	92.8	92.1	90.2	88.2	84.4	77.3	72.9	75.0	80.0	77.5	73.8	75.3	87.3	89.3	85.7	86.1	87.1	86.0	85.5	92.8																					
22-Oct	89.1	91.2	91.0	90.7	89.6	89.5	89.6	88.9	88.1	76.5	79.6	72.3	62.9	58.3	54.9	56.9	60.4	72.8	76.1	69.5	66.2	64.5	66.1	69.8	75.6	91.2																					
23-Oct	74.7	77.5	79.9	79.7	79.6	79.3	78.1	77.2	69.8	62.0	54.6	46.3	39.0	38.0	36.5	36.6	40.0	45.4	49.3	51.6	53.8	54.3	56.4	59.4	59.1	79.9																					
24-Oct	61.7	64.3	67.0	67.5	69.0	70.4	70.8	71.5	66.8	58.9	56.6	55.9	54.1	52.9	51.7	53.4	54.9	57.0	59.2	58.7	58.5	59.8	61.2	61.8	61.0	71.5																					
25-Oct	62.0	62.7	63.3	64.1	64.4	65.0	65.3	65.3	64.4	59.9	53.8	47.7	44.7	43.6	41.7	41.0	43.1	45.4	49.0	55.8	63.5	76.5	82.4	83.7	58.7	83.7																					
26-Oct	83.9	86.1	86.6	82.3	81.4	80.1	79.4	82.5	81.2	76.6	79.1	75.6	75.8	59.1	62.5	55.0	57.0	74.5	78.9	62.4	63.9	66.5	68.9	81.2	74.2	86.6																					
27-Oct	86.4	84.4	87.8	91.5	87.9	89.4	92.3	91.9	91.6	87.3	83.1	75.1	72.1	64.6	57.9	57.7	59.4	64.0	73.3	80.4	70.2	74.1	83.4	85.4	78.8	92.3																					
28-Oct	77.7	73.6	77.4	78.0	85.2	85.0	84.8	83.4	82.1	85.1	82.8	80.5	74.6	65.7	66.1	66.5	70.5	68.3	69.1	72.4	76.4	76.1	75.6	72.2	76.2	85.2																					
29-Oct	71.3	67.3	62.6	62.6	65.6	62.3	57.8	58.5	59.7	59.8	59.5	59.4	58.1	55.2	52.1	50.9	61.8	70.1	75.6	80.1	80.4	83.9	82.7	77.7	65.6	83.9																					
30-Oct	74.5	71.4	73.9	78.5	85.1	88.2	88.3	87.3	85.1	80.3	75.8	68.3	58.4	54.5	54.9	55.7	58.2	57.4	59.2	62.6	65.6	69.1	74.3	82.5	71.2	88.3																					
31-Oct	91.4	93.1	93.8	94.3	94.1	94.1	91.6	91.1	92.8	88.3	83.2	78.1	75.7	75.3	75.7	75.2	77.8	79.8	80.5	84.2	87.0	87.6	88.6	89.4	85.9	94.3																					
																						82.4	83.4	85.0	86.4	87.5	88.0	87.8	86.4	81.6	74.7	68.7	63.6	60.0	56.8	55.9	55.0	57.4	64.8	71.5	74.9	75.8	76.3	78.0	80.5	Diurnal Average	
																						98.3	98.5	98.6	98.7	98.8	98.8	98.8	98.8	98.8	98.1	92.2	91.6	92.9	90.9	84.3	86.4	89.3	90.7	95.0	96.5	97.2	97.7	97.9	98.1	Diurnal Maximum	





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Speed (WS) - km/h
Fort McKay South - October 2023

Maximum Speed: 28 km/h on Oct 21 18:00	Maximum Daily Speed Average: 14.1 km/h on Oct 14	Hours in Service: 744
Minimum Speed Value: 0 km/h on Oct 15 06:00	Minimum Daily Speed Average: 1.3 km/h on Oct 31	Hours of Data: 743
Maximum Diurnal Speed Average: 4.2 km/h at hour 13	Minimum Diurnal Speed Average: 1.1 km/h at hour 18	Hours of Missing Data: 1
Monthly Average Velocity: 2.7 km/h 216.8 deg	Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 3 Median = 7 Q ₃ = 10 P ₉₀ = 14 P ₉₉ = 23	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-Oct	SSW2	SSW3	SW1	SSW2	SW2	SSW2	S6	S9	S12	S17	SSE19	S19	S19	S21	S21	S20	S18	SSE12	S9	SSE11	SSE12	SSE13	SSE12	SSE13	\$11.4	S21	
2-Oct	SSE12	S8	SSW4	S6	SSE7	SSE7	S7	SSE4	S4	S10	S9	S11	S8	S6	SW4	S5	SSW5	S3	SSW3	WSW2	W2	WSW2	WSW3	SSW2	\$5.2	SSE12	
3-Oct	NW1	SSW2	S3	SSW2	S4	SW1	SW3	S1	WSW0	SSE3	SE5	W6	WNW5	NNW2	W2	SSW4	S4	SW3	SSW4	S4	SSW5	SSE5	S3	SSE4	SSW2.2	W6	
4-Oct	SSW2	S8	S7	SSE5	W1	WNW5	NW5	NW5	NW3	WNW8	WNW11	WNW7	NW7	NW11	NW9	WNW11	WNW12	NW16	NW14	NW12	WNW13	WNW12	NW12	NW9	WNW6.9	NW16	
5-Oct	NW8	NW7	NW8	WNW4	WNW7	WNW10	NW11	NW11	NW11	NW12	NW12	NW12	NW11	NW12	NW10	NW10	NW10	W5	SW4	WSW5	WSW6	SW2	SW3	SW2	WNW7.3	NW12	
6-Oct	SW1	SSW2	S4	S5	S4	S6	SSE10	SSE13	S8	SSE9	SSE13	SSE16	S14	S15	S14	S10	S4	WSW2	W1	WSW3	WSW6	WSW9	WSW9	W9	\$6.5	SSE16	
7-Oct	WSW12	W12	W12	W12	NNW3	SW4	S2	S3	E2	ENE4	ESE3	ESE4	SE4	S3	SSE3	ENE3	NNW3	NW2	W2	WSW2	W2	WSW2	WSW1	NNW1	WSW2.0	W12	
8-Oct	WNW2	NW1	NNW2	NW2	NNW2	WNW1	NW1	NNW3	NNW4	N5	E3	SSE15	SSE19	SSE20	SSE15	SSW6	SSW6	SSW2	S6	S5	S5	SW2	SSW3	SW3	\$3.5	SSE20	
9-Oct	SSW2	S3	WSW1	W1	WNW2	W1	W3	WNW1	NNW1	SE9	SE10	SSE12	SSE12	SSE12	SSE15	SSE15	SSE11	SE3	E5	SW1	S8	S6	NW2	NW1	SSE4.6	SSE15	
10-Oct	NW2	NW2	W1	W1	WNW1	NW1	WNW1	NNW2	N2	SE5	SSE10	SSE10	SSE12	SSE15	SSE16	SSE15	SE9	ESE7	E3	SSE8	SSE17	SSE18	SSE19	SSE19	SSE7.0	SSE19	
11-Oct	SE11	SSE13	SSE12	SE3	ESE3	SE3	SSW2	SE3	SSE14	SSE19	SE16	SSE16	SSE14	SSE15	SSE16	SSE15	SE11	SE8	SE8	SE7	SSE4	SSE4	SSE7	S5	SSE9.3	SSE19	
12-Oct	S5	S11	S9	ENE1	NNW2	WSW1	WSW2	WSW1	SSE3	SE10	SSE12	SSE11	SSE14	S13	S13	S5	SSW2	S5	S4	S4	SSW2	S5	S3	SSE6	\$5.6	SSE14	
13-Oct	SSE6	SE4	W1	SSW1	S5	S4	S8	S10	SSE11	SSE13	SSE15	SSE14	SSE14	SSE14	SE13	SE14	SE10	ESE4	SSE4	SSE8	S5	SE5	SSE2	SE3	SSE7.5	SSE15	
14-Oct	SW2	S4	S5	S5	S6	S8	S8	S11	SSE13	SSE17	SE19	SSE22	SSE24	SSE25	SSE25	SSE25	SSE21	SSE19	SSE20	S16	S16	S14	S12	S9	SSE14.1	SSE25	
15-Oct	S9	S10	S10	S5	S3	SSW0	SW0	S11	SSE9	S13	SE13	SSE13	SSE14	SSE11	SSE12	S8	SSW4	SSW6	S5	S3	SSW2	SSW2	SSW3		\$6.9	SSE14	
16-Oct	SSW3	SSW3	SSW2	SSW1	SSW2	SSW2	SSW3	SSW4	S6	SSE10	SSE11	S10	SSW7	WSW5	SSW7	S9	S6	SSW3	SW2	SSW3	SW1	NNW2	WSW2	SW2	SSW3.9	SSE11	
17-Oct	NNW2	W2	NNW2	NW3	SSW1	NW2	SSW2	WSW2	N6	NNE12	NNE14	N15	NNE13	N13	N12	N13	N12	NNW9	N8	NNW7	NW4	WNW3	WNW2	ENE1	N5.9	N15	
18-Oct	WSW1	S5	SSE8	SSE6	SSE6	SW1	N1	SSE1	SSE7	S6	SSE13	S14	S16	SSE15	SSE13	SSE12	SSE14	S9	SSW3	SSW1	SW4	SW6	SW6	SSW2	\$6.6	S16	
19-Oct	SSE3	S2	W1	N0	SW1	SW1	SSW3	SSW2	S5	S7	WSW11	SW11	SW11	WSW12	SW13	SW9	SSW7	SSW10	WSW9	W1	SSW6	W9	W7	SW10	SW5.7	SW13	
20-Oct	WSW10	WSW11	W9	W5	WSW11	WSW11	WSW12	WSW10	WSW13	W16	NW11	NW13	NW18	NNW16	NNW16	NNW14	N10	NNE9	NNE5	N4	N3	W2	WSW3	SW2	WNW7.3	NW18	
21-Oct	WSW2	WSW2	SW2	SW2	SW2	SW3	S3	SSW4	S1	NW1	WSW2	NNW6	N7	N19	N23	N25	N27	N28	N19	N18	N14	NNW8	NNW7	NNW8	N8.0	N28	
22-Oct	NW6	NW5	NW5	SW3	SW3	WSW3	WSW2	WSW3	WSW4	SSE3	N4	NNE5	NNE5	NNE4	NE2	WSW1	W3	WSW1	WSW4	WNW7	NW8	WNW8	WNW7	W8	WNW2.9	WNW8	
23-Oct	W8	W8	W7	W8	W10	W11	W10	W8	W10	W11	W10	NNW11	NNW13	NW13	NNW12	NNW13	NW11	WNW6	WNW6	W7	WSW10	W10	W10	WSW10	W9.3	WNW13	
24-Oct	W10	WSW10	WSW11	W10	WSW11	WSW9	WSW10	WSW9	W8	WSW10	WSW11	W11	WSW12	W10	W9	W9	WNW9	W8	NNW10	NNW10	WNW9	W8	W8	W9	W9.5	WSW12	
25-Oct	W9	W10	W7	WSW7	WSW7	WSW8	WSW8	WSW8	WSW7	WSW9	WSW9	SW9	WSW9	WSW10	W9	WSW9	WSW8	SW7	WSW5	NW8	NW7	WNW5	SSW3	WSW6	WSW8	WSW7.0	WSW10
26-Oct	WSW8	WSW7	WSW8	W10	W8	W5	WSW4	WSW9	WSW10	WSW8	WSW8	W7	W7	NW9	WNW7	WNW6	WNW3	NNE4	SSW2	WNW7	WSW4	SW6	WSW6	WSW6	W6.0	WSW10	
27-Oct	WSW5	W7	NNW8	N12	NNW7	NNW4	NW4	NNW5	WNW3	NNW2	WNW3	N2	NE3	NNW8	NNW9	NW8	NW7	W3	W3	WSW4	WSW5	WSW5	SSW3	S5	NW3.5	N12	
28-Oct	S7	SSE6	SSW3	WSW6	WSW7	WSW6	W7	W7	WNW5	WNW4	NNE3	NNE4	N7	NNW12	N6	NE0	SSW2	W5	W7	W7	W7	W6	NW8	WNW7	WNW3.6	NNW12	
29-Oct	W6	WNW7	NW8	W4	W6	WNW7	NW9	W5	WNW8	NW10	NNW12	NNW11	NNW10	N7	NW5	NW5	NNW4	WNW2	NNW2	NW3	NNW3	NW3	NNW5	N10	NW5.7	NNW12	
30-Oct	N13	NNE12	N11	NNW7	NW3	WSW2	WSW3	WSW4	SSW2	SSE4	SSE9	S13	S15	S16	S14	S12	S11	S13	S11	S9	S8	S8	S9	SSE9	\$5.0	S16	
31-Oct	SSE7	SSE6	SSE4	SSW1	N2	NW3	NW5	NNW7	NNW4	NNW7	NNW8	NNE6	NNE5	NE4	SE4	ENE1	NNE4	NE2	E2	UO	NNW1	S1	SSW3	SSW3	N1.3	NNW8	

SW2.8 SW3.4 NSW2.7 NSW2.6 NSW2.7 NSW3.0 NSW3.1 SW3.0 SW2.9 SSW3.4 S3.8 S4.2 S4.2 SSW3.0 S3.5 S3.1 SSW1.8 SW1.1 SW1.7 WSW2.2 SW3.1 SW3.3 SW3.3 SW3.1	Diurnal Average
N13 SSE13 W12 W12 WSW11 WSW11 WSW12 SSE13 SSE14 SSE19 SSE19 SSE22 SSE24 SSE25 SSE25 N25 N27 N28 SSE20 N18 SSE17 SSE18 SSE19 SSE19	Diurnal Maximum

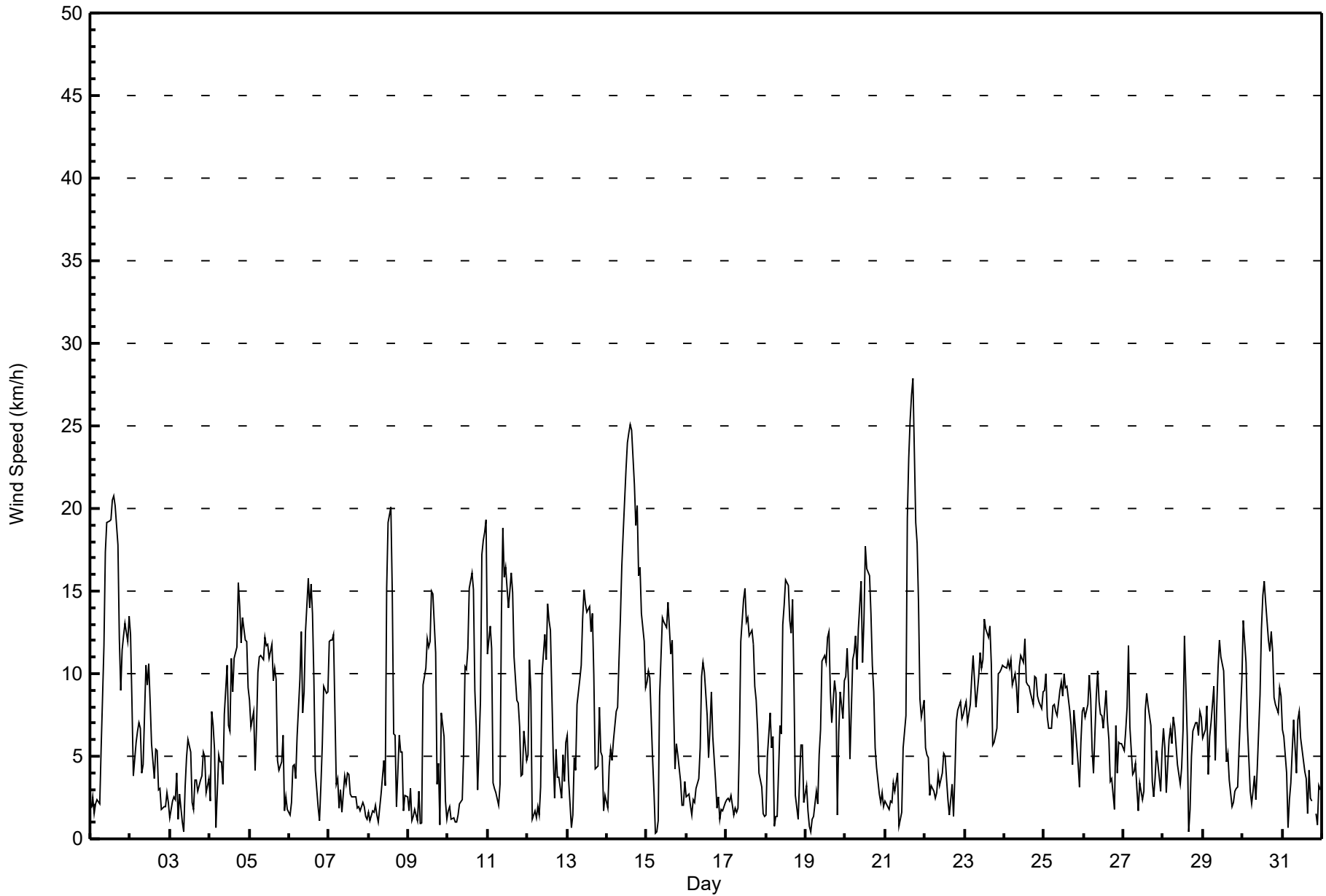
UO - Unstable Operation
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Fort McKay South - October 2023

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Wind Speed (WS) - km/h
Fort McKay South - October 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	326	43.88	43.88
6 - 11	273	36.74	80.62
12 - 19	129	17.36	97.98
20 - 28	15	2.02	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 - October 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	9	5	5	5	4	11	16	42	56	32	40	24	18	27	23	326
6 - 11	9	2	0	0	0	1	9	31	44	8	9	46	48	23	26	17	273
12 - 19	11	4	0	0	0	0	3	56	23	0	1	5	4	6	11	5	129
20 - 28	4	0	0	0	0	0	0	8	3	0	0	0	0	0	0	0	15
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	15	5	5	5	5	23	111	112	64	42	91	76	47	64	45	743

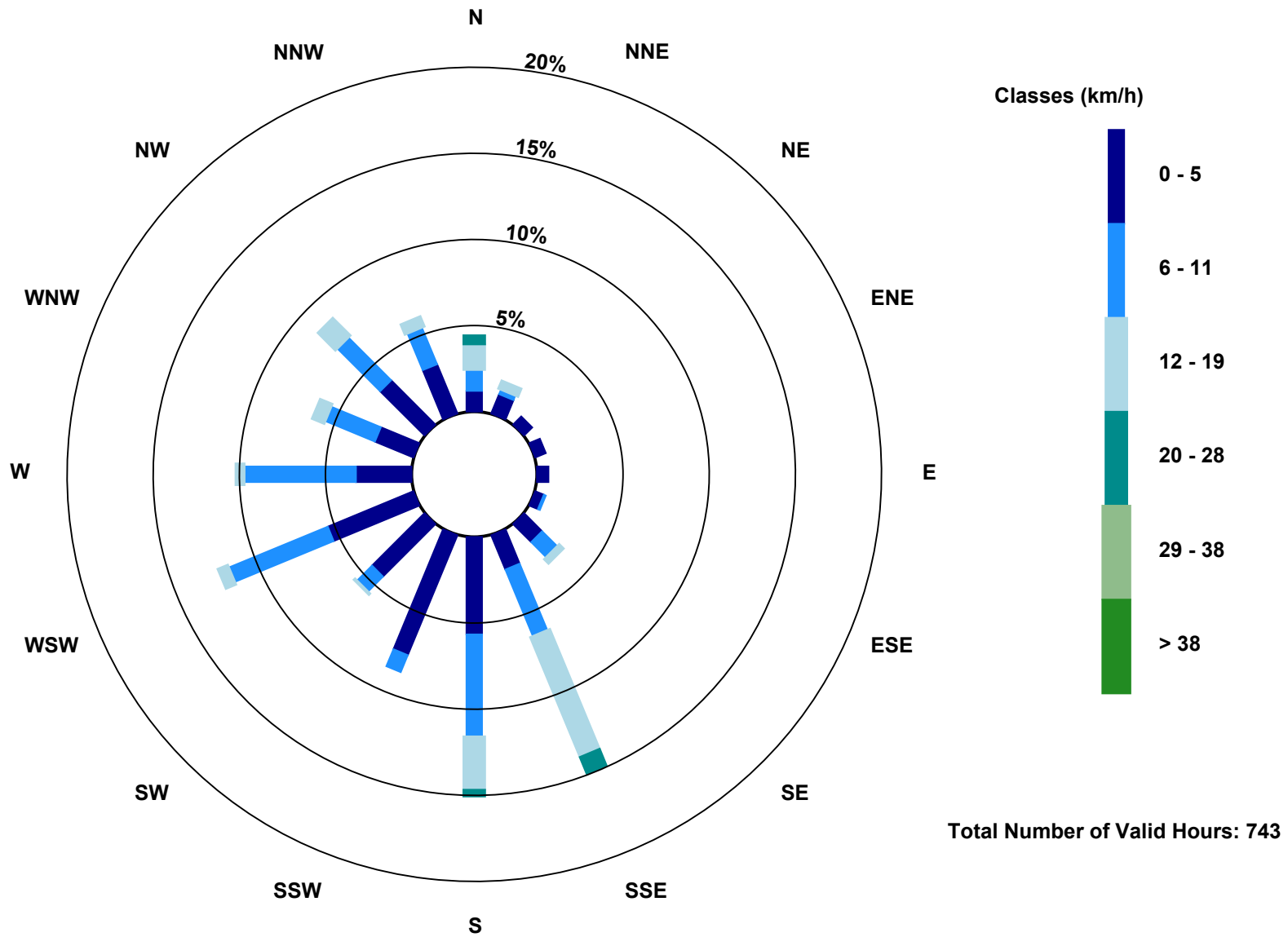
Total Number of Valid Hours: 743

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

Wind Speed (WS) - km/h
Fort McKay South





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Fort McKay South - October 2023

Direction of Maximum Speed: 4 deg on Oct 21 18:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 161.0 deg on Oct 14	Hours of Data: 743
Direction of Minimum Speed: 197 deg on Oct 15 06:00	Hours of Missing Data: 1
Direction of Minimum Daily Speed Average: 1.3 deg on Oct 31	Percent Operational Time: 99.9
Monthly Average Direction: 216.8 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-Oct	195	196	221	210	218	206	172	174	175	174	167	176	176	177	171	171	174	166	174	167	164	164	167	165	172.6
2-Oct	163	177	192	184	166	166	172	166	170	174	176	169	169	171	218	180	198	185	196	243	274	248	258	207	179.5
3-Oct	305	209	179	198	180	229	221	191	251	157	135	274	285	340	266	193	179	218	203	177	210	163	179	166	201.3
4-Oct	206	184	185	165	264	293	317	305	312	295	296	293	310	323	324	300	302	315	305	307	299	302	308	310	299.8
5-Oct	314	309	317	292	302	303	309	307	306	311	311	310	304	308	305	306	313	281	224	237	247	219	224	235	300.8
6-Oct	224	196	182	191	189	178	166	166	173	166	160	167	178	187	187	175	172	251	268	246	240	248	257	267	189.5
7-Oct	258	261	266	261	330	232	175	181	101	68	106	103	140	185	150	65	341	324	262	256	261	244	248	332	250.5
8-Oct	294	319	343	324	336	293	307	348	348	1	89	163	163	161	166	209	209	192	181	173	187	219	208	215	176.6
9-Oct	202	171	237	263	298	269	259	294	332	141	146	147	147	149	153	154	159	127	85	222	171	177	324	315	155.9
10-Oct	308	323	271	279	288	305	303	328	3	142	151	151	152	153	154	150	130	114	93	160	157	153	154	160	151.6
11-Oct	146	156	165	128	110	127	200	137	150	148	146	152	151	150	157	151	142	130	137	139	161	156	162	178	149.7
12-Oct	170	184	171	67	330	248	247	237	162	145	165	149	163	178	172	171	205	187	170	191	195	189	184	159	171.9
13-Oct	157	142	260	199	179	173	172	176	157	150	157	164	167	164	140	142	132	109	149	160	175	143	166	124	156.4
14-Oct	226	178	176	178	174	177	182	184	159	149	144	154	156	148	150	150	155	161	165	170	171	175	180	172	161.0
15-Oct	174	169	171	182	180	197	230	236	167	173	164	160	153	165	168	161	173	203	193	190	188	204	204	194	171.6
16-Oct	209	202	204	211	198	204	201	195	172	166	166	182	203	246	209	183	181	194	224	204	221	332	242	236	193.2
17-Oct	339	267	327	309	209	310	196	244	359	12	16	10	19	6	6	6	0	348	352	347	326	302	290	68	358.7
18-Oct	241	182	168	154	166	230	355	153	168	184	161	170	177	160	168	157	166	169	204	195	227	219	223	198	173.4
19-Oct	165	174	280	8	221	235	193	206	185	183	239	235	233	240	234	222	203	213	248	281	205	272	261	219	227.3
20-Oct	254	254	275	273	253	253	257	251	255	274	306	320	325	330	338	337	358	13	16	4	354	269	247	233	297.9
21-Oct	240	249	217	224	229	230	183	200	171	316	241	337	3	4	5	4	3	4	3	357	354	340	330	338	354.4
22-Oct	326	323	312	235	227	239	248	258	257	158	358	29	24	12	48	255	278	254	242	284	312	299	295	276	298.0
23-Oct	277	266	272	273	264	260	263	262	265	267	277	288	289	304	303	301	314	298	286	259	257	264	262	256	276.9
24-Oct	259	257	256	260	254	253	257	253	260	249	256	267	253	260	270	260	288	274	282	290	282	272	269	266	263.8
25-Oct	269	263	267	257	255	245	255	252	252	253	237	226	241	262	251	241	232	250	311	316	301	209	239	246	254.8
26-Oct	249	246	250	259	260	266	243	249	249	255	249	261	260	316	290	284	288	21	196	297	251	235	240	245	261.3
27-Oct	256	266	335	355	345	346	322	333	284	331	294	357	36	348	333	313	307	275	259	244	240	240	195	186	309.5
28-Oct	185	166	193	258	250	257	262	273	290	290	24	28	351	346	6	51	212	279	273	264	266	270	305	297	283.6
29-Oct	280	289	314	269	268	288	306	277	296	316	330	338	339	9	314	317	347	288	337	316	343	308	327	353	316.7
30-Oct	6	12	359	343	304	245	257	241	206	155	162	179	185	187	178	179	181	183	182	184	180	178	173	161	182.4
31-Oct	165	165	163	201	0	317	316	346	343	347	345	12	32	52	131	78	24	48	80	UO	328	188	211	203	10.3

235.1 224.8 240.7 250.3 244.5 248.2 244.1 235.8 217.3 193.4 183.6 184.8 189.2 193.2 188.5 188.3 198.3 224.0 231.3 238.2 227.3 224.4 231.0 221.3
 Diurnal Average

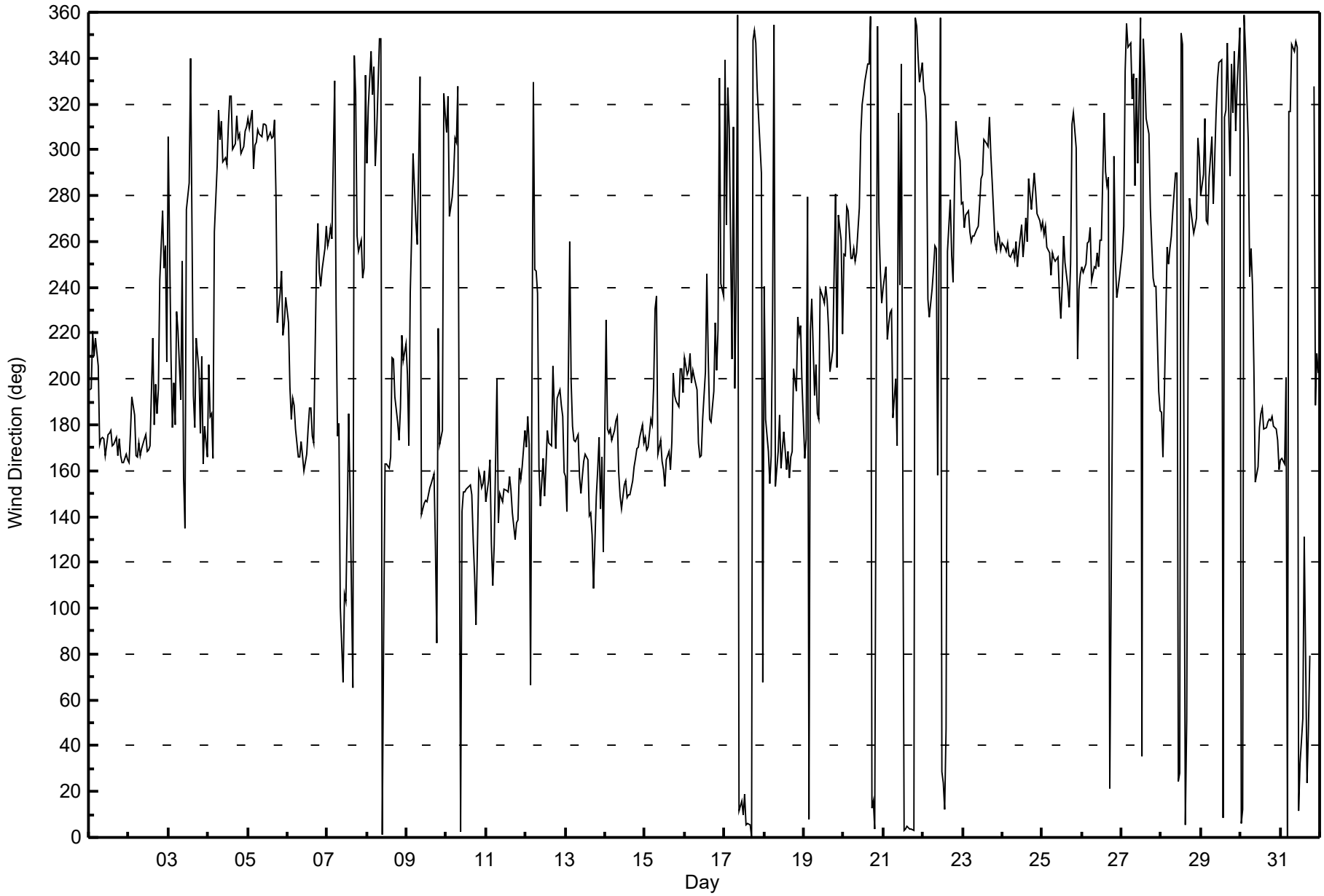
UO - Unstable Operation
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Fort McKay South - October 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 99 deg on Oct 28 16:00 Minimum Value: 8 deg on Oct 13 20:00 Percentiles: P ₁ = 9 P ₁₀ = 12 Q ₁ = 17 Median = 23 Q ₃ = 36 P ₉₀ = 55 P ₉₉ = 86											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-Oct	31	35	76	60	44	47	17	12	14	15	14	17	16	15	14	17	14	10	12	11	11	12	11	10	76
2-Oct	11	14	22	23	14	12	12	77	65	11	13	10	12	15	32	37	24	21	22	27	26	28	41	58	77
3-Oct	59	21	18	72	33	66	25	61	91	27	37	59	50	78	79	35	25	19	23	17	17	17	66	28	91
4-Oct	63	15	9	13	91	28	21	26	53	26	28	27	20	21	23	30	24	23	25	25	28	27	25	24	91
5-Oct	21	23	22	43	23	24	28	22	20	24	22	23	25	23	27	25	22	31	16	19	10	51	34	14	51
6-Oct	42	32	13	29	23	14	9	11	16	13	15	15	17	14	16	16	60	70	81	34	41	16	16	25	81
7-Oct	17	20	22	20	57	38	85	46	61	26	50	37	47	39	40	44	27	45	31	39	30	29	51	76	85
8-Oct	36	53	45	41	20	48	37	22	15	22	56	15	15	13	16	27	28	38	15	18	20	68	44	20	68
9-Oct	46	52	71	48	49	46	40	46	80	15	14	18	19	17	14	13	12	60	36	76	12	51	53	72	80
10-Oct	42	38	40	40	50	39	36	39	18	55	18	22	20	16	15	14	22	18	51	13	11	11	11	11	55
11-Oct	17	13	10	71	58	54	43	51	15	14	18	14	16	18	16	14	17	16	20	17	33	12	12	17	71
12-Oct	13	10	12	68	31	31	30	39	48	10	19	18	19	17	18	32	79	13	25	9	36	11	16	15	79
13-Oct	12	42	61	64	35	26	12	12	19	14	16	15	14	16	18	16	19	23	22	8	10	18	79	29	79
14-Oct	54	27	17	22	28	19	21	23	13	12	14	14	14	13	12	12	11	11	10	10	11	9	9	9	54
15-Oct	10	10	10	64	28	86	82	85	17	14	14	19	16	16	15	12	12	22	16	10	9	48	74	19	86
16-Oct	30	22	55	65	41	45	22	20	11	11	17	20	31	62	41	19	8	26	24	38	48	51	34	35	65
17-Oct	53	36	60	40	66	33	80	46	18	14	17	18	17	19	21	18	15	15	14	18	31	37	65	57	80
18-Oct	84	37	11	22	12	87	69	64	33	21	17	14	15	13	15	12	10	13	39	74	14	15	21	25	87
19-Oct	15	33	64	86	65	59	20	34	19	24	33	30	29	30	28	24	19	24	48	78	20	31	43	24	86
20-Oct	31	28	32	48	26	22	23	23	26	26	36	32	23	23	20	18	25	13	15	25	49	38	35	37	49
21-Oct	43	35	52	40	33	24	21	29	98	85	64	47	24	18	17	18	18	18	18	17	17	16	12	12	98
22-Oct	14	13	17	49	34	32	45	18	28	48	69	35	44	59	63	69	26	41	18	29	13	16	17	19	69
23-Oct	19	19	20	20	18	16	18	21	24	25	33	34	29	32	29	27	20	20	20	19	19	22	21	18	34
24-Oct	19	19	17	19	19	23	24	26	38	27	24	29	26	30	32	28	27	26	27	25	25	23	25	23	38
25-Oct	27	23	26	21	21	19	22	19	20	23	22	29	29	31	31	27	23	24	29	22	33	38	22	15	38
26-Oct	15	16	17	20	23	44	47	23	20	24	26	30	34	32	45	34	52	47	60	26	30	20	18	26	60
27-Oct	26	22	40	16	12	13	17	11	31	50	35	72	78	37	30	19	20	23	44	18	11	15	20	15	78
28-Oct	15	15	40	24	17	26	21	24	31	36	41	27	24	20	39	99	45	22	24	18	19	18	16	21	99
29-Oct	25	24	25	23	25	26	20	22	27	22	19	23	27	45	50	21	25	42	52	42	24	16	18	19	52
30-Oct	18	17	19	15	19	31	14	11	29	15	24	19	19	16	14	12	11	11	10	11	10	11	10	10	31
31-Oct	26	11	23	97	57	22	17	14	30	16	17	24	26	37	34	51	25	39	43	UO	46	94	18	23	97
84 53 76 97 91 87 85 85 98 85 69 72 78 78 79 99 79 70 81 78 49 94 79 76																								Diurnal Maximum	
UO - Unstable Operation																									





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

**AMS14
ANZAC
OCTOBER 2023**

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

November 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ANZAC (AMS14)
OCTOBER 2023

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

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2(ppb) Average	709	35	35	100	4.8	0	1.4	0
TRS(ppb) Average	708	36	36	100	0.9	0	0.3	0
THC(ppm) Average	707	37	37	100	2.7	-	2.2	-
NMHC(ppm) Average	707	37	37	100	0.485	-	0.054	-
CH4(ppm) Average	707	37	37	100	2.5	-	2.1	-
NO2(ppb) Average	708	36	36	100	15.6	0	5.8	-
NO(ppb) Average	708	36	36	100	13.5	-	2	-
NOX(ppb) Average	708	36	36	100	27.7	-	7.8	-
O3(ppb) Average	701	35	43	98.92	42.6	0	33.6	-
PM2.5(ug/m3) Average	743	1	1	100	28.9	0	15.6	0
AT 2m(C) Average	744	0	0	100	23.6	-	14	-
RH(%) Average	731	0	13	98.25	100	-	88.4	-
WS(km/h) Average	744	0	0	100	28	-	18	-
WD(deg) Average	744	0	0	100	-	-	-	-
Leaf Wetness (% of range) Average	744	0	0	100	67.5	-	17.5	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ANZAC (AMS14)
OCTOBER 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	0.45	0.7	-	0	0	0.1	0.2	0.4	1	4.8
TRS(ppb) Average	708	0.18	0.1	-	0	0.1	0.1	0.1	0.2	0.3	0.9
THC(ppm) Average	707	2.05	0.1	-	2	2	2	2	2.1	2.1	2.7
NMHC (ppm) Average	707	0.008	0.039	-	0	0	0	0	0	0	0.485
CH4(ppm) Average	707	2.04	0.1	-	2	2	2	2	2.1	2.1	2.5
NO2(ppb) Average	708	1.84	2.1	-	0	0.4	0.6	1.2	2.2	4.3	15.6
NO(ppb) Average	708	0.38	1.1	-	0	0	0	0.1	0.3	0.8	13.5
NOX(ppb) Average	708	2.22	2.8	-	0	0.4	0.7	1.3	2.6	5.1	27.7
O3(ppb) Average	701	24.42	7.6	-	2.6	14.2	19.1	25.2	30.4	33.5	42.6
PM2.5(ug/m3) Average	743	5.65	4.1	-	0.7	2.2	3.6	4.8	6.2	9	28.9
Temperature 2 m (C) Average	744	4	7.9	-	-14.4	-6.6	-3.2	5.6	10.2	13.4	23.6
Relative Humidity (%) Average	731	71.61	16.1	-	29.3	47.6	59.6	73	84.9	91.6	100
Wind Speed 20 m (km/h) Average	744	13.1	5	-	1	6	9	13	17	20	28
Wind Direction 20 m (deg) Average	744	194.4	-	-	-	-	-	-	-	-	-
Leaf Wetness (% of range) Average	744	2.42	8.4	-	0	0	0	0	0.2	5.5	67.5

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ANZAC (AMS14)
OCTOBER 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
03	13 Oct 2023 12:00	13 Oct 2023 19:00	8	Maintenance - replaced analyzer
Relative Humidity	03 Oct 2023 01:00	18 Oct 2023 06:00	13	Sensor operated out of range



Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 744														Daily Average		Daily Maximum					
Maximum Value: 4.8 ppb on Oct 22 23:00		Maximum Daily Average: 1.4 ppb on Oct 10		Hours of Data: 709														Hours of Missing Data: 35		Hours of Calibration: 35							
Minimum Value: 0.0 ppb on Oct 4 19:00		Minimum Daily Average: 0.0 ppb on Oct 24		Hours of Calibration: 35														Percent Operational Time: 100.0									
Maximum Diurnal Average: 0.8 ppb at hour 12		Minimum Diurnal Average: 0.2 ppb at hour 5		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 = 3.8																							
Monthly Average: 0.45 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-Oct	0.4	0.7	0.5	Z	0.5	0.5	0.4	0.5	1.0	1.1	1.6	1.3	1.0	1.0	0.7	0.4	0.4	0.5	0.5	0.5	0.6	0.7	0.7	0.5	0.7	1.6	
2-Oct	0.5	0.5	0.4	0.4	Z	0.4	0.4	0.3	0.3	0.4	0.3	0.3	0.2	0.2	0.3	0.3	0.4	0.3	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.5	
3-Oct	0.2	0.1	0.1	0.4	0.2	Z	0.2	0.3	0.2	C	C	C	C	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.4	
4-Oct	Z	0.2	0.2	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.2	
5-Oct	0.1	Z	0.1	0.0	0.0	0.2	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.2	0.1	0.1	0.1	0.2	
6-Oct	0.1	0.1	Z	0.2	0.1	0.1	0.3	0.3	0.3	0.4	0.5	0.4	0.4	0.5	0.4	0.2	0.2	0.2	0.1	0.2	0.3	0.1	0.1	0.1	0.2	0.5	
7-Oct	0.2	0.1	0.2	Z	0.2	0.2	0.3	0.3	0.5	1.7	1.8	1.1	0.6	0.3	0.9	1.5	1.5	1.7	1.7	0.5	0.4	0.3	0.3	0.3	0.7	1.8	
8-Oct	1.0	1.1	1.0	0.5	Z	1.1	0.5	0.3	0.4	0.7	0.7	0.8	0.7	0.8	0.4	0.6	0.6	0.5	0.4	0.3	0.2	0.1	0.3	0.4	0.6	1.1	
9-Oct	0.7	0.5	0.7	0.1	0.6	Z	4.4	2.3	0.2	0.6	1.3	2.0	1.0	0.2	0.3	0.2	0.2	0.1	0.2	0.3	0.2	0.3	0.3	0.4	0.7	4.4	
10-Oct	Z	0.3	2.4	3.8	1.1	2.4	0.6	0.4	0.3	0.6	0.8	0.9	1.6	1.0	0.8	0.6	0.4	0.2	0.5	3.5	4.1	1.3	2.9	1.7	1.4	4.1	
11-Oct	0.4	Z	0.2	0.2	0.1	0.7	4.1	2.6	2.0	0.2	0.7	1.0	1.3	0.8	0.4	0.1	0.2	0.4	1.4	0.1	0.0	0.0	0.0	0.0	0.7	4.1	
12-Oct	0.0	0.2	Z	0.3	0.3	0.3	0.4	0.4	0.7	0.8	1.0	1.2	0.7	0.8	0.8	0.8	0.5	0.4	0.4	0.4	0.5	0.0	0.2	0.1	0.5	1.2	
13-Oct	0.1	0.2	0.0	Z	0.1	0.1	0.0	0.1	0.2	0.3	0.4	0.3	0.2	0.4	0.5	0.3	0.4	0.2	1.7	0.7	0.2	0.1	0.0	0.1	0.3	1.7	
14-Oct	0.1	0.1	0.1	0.1	Z	0.1	0.0	0.1	0.0	0.1	0.1	0.3	0.3	0.3	0.2	0.4	0.3	0.3	0.2	0.2	0.3	0.5	0.8	1.9	0.3	1.9	
15-Oct	0.4	0.2	0.3	0.3	0.3	Z	0.6	0.2	1.3	1.5	2.4	3.2	0.9	0.7	0.8	0.9	1.0	0.9	0.7	0.4	0.1	0.3	0.4	0.4	0.8	3.2	
16-Oct	Z	0.3	0.3	0.3	0.2	0.3	0.2	0.2	0.3	0.4	0.4	0.6	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.0	0.0	0.2	0.5	0.2	0.6	
17-Oct	0.1	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.4	1.0	1.9	2.9	4.2	3.7	1.9	0.7	0.6	1.4	0.9	4.2	
18-Oct	1.5	1.0	Z	0.3	0.1	0.2	0.2	0.1	0.4	0.5	0.4	0.4	0.4	0.3	0.5	0.2	0.3	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.4	1.5	
19-Oct	0.3	0.2	0.3	Z	0.3	0.3	0.2	0.3	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.5	0.3	0.6	0.7	0.6	0.4	0.3	0.2	0.3	0.7	
20-Oct	0.3	0.4	0.3	0.3	Z	0.3	0.3	0.2	0.1	0.2	0.2	0.1	0.1	0.2	0.1	0.0	0.0	0.1	0.3	0.4	0.1	0.0	0.0	0.0	0.2	0.4	
21-Oct	0.0	0.0	0.0	0.0	0.0	Z	0.3	0.4	0.4	0.5	0.3	0.1	0.2	0.0	0.4	0.4	0.6	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.6	
22-Oct	Z	0.3	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.4	0.3	0.2	0.3	2.3	4.8	2.8	0.7	4.8	
23-Oct	1.4	Z	1.6	0.3	0.3	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.2	0.1	0.2	0.1	0.0	0.3	1.6	
24-Oct	0.0	0.0	Z	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
25-Oct	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	0.1	0.0	0.1	0.0	0.1	
26-Oct	0.1	0.2	0.2	0.1	Z	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.2	
27-Oct	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	0.8	3.0	4.2	3.7	3.7	2.0	0.9	0.4	0.3	0.2	0.2	0.9	4.2	
28-Oct	Z	0.3	0.1	0.2	0.2	0.2	0.1	0.3	0.2	0.2	0.9	3.9	3.7	2.0	2.1	0.7	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.7	3.9	
29-Oct	0.2	Z	0.2	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.6	0.3	0.1	0.3	0.1	0.1	0.2	0.3	0.2	0.6	0.7	0.2	0.7	
30-Oct	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.6	0.9	0.3	0.2	0.2	0.2	0.3	0.4	0.4	0.4	0.3	0.4	0.5	0.5	0.3	0.9	
31-Oct	0.5	0.5	0.3	Z	0.7	0.4	0.6	1.7	0.7	0.5	1.0	3.0	1.2	1.6	2.1	3.5	1.9	1.1	0.8	0.6	0.3	0.4	0.3	0.2	1.0	3.5	
																								Diurnal Average		Diurnal Maximum	
																								0.3		1.5	
																								0.3		1.1	
																								0.4		2.4	
																								0.3		3.8	
																								0.2		1.1	
																								0.3		2.4	
																								0.5		4.4	
																								0.4		2.6	
																								0.4		2.0	
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																								0.5		2.4	
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																								0.4		4.1	
																								0.3		2.3	
																								0.5		4.8	
																								0.4		2.8	

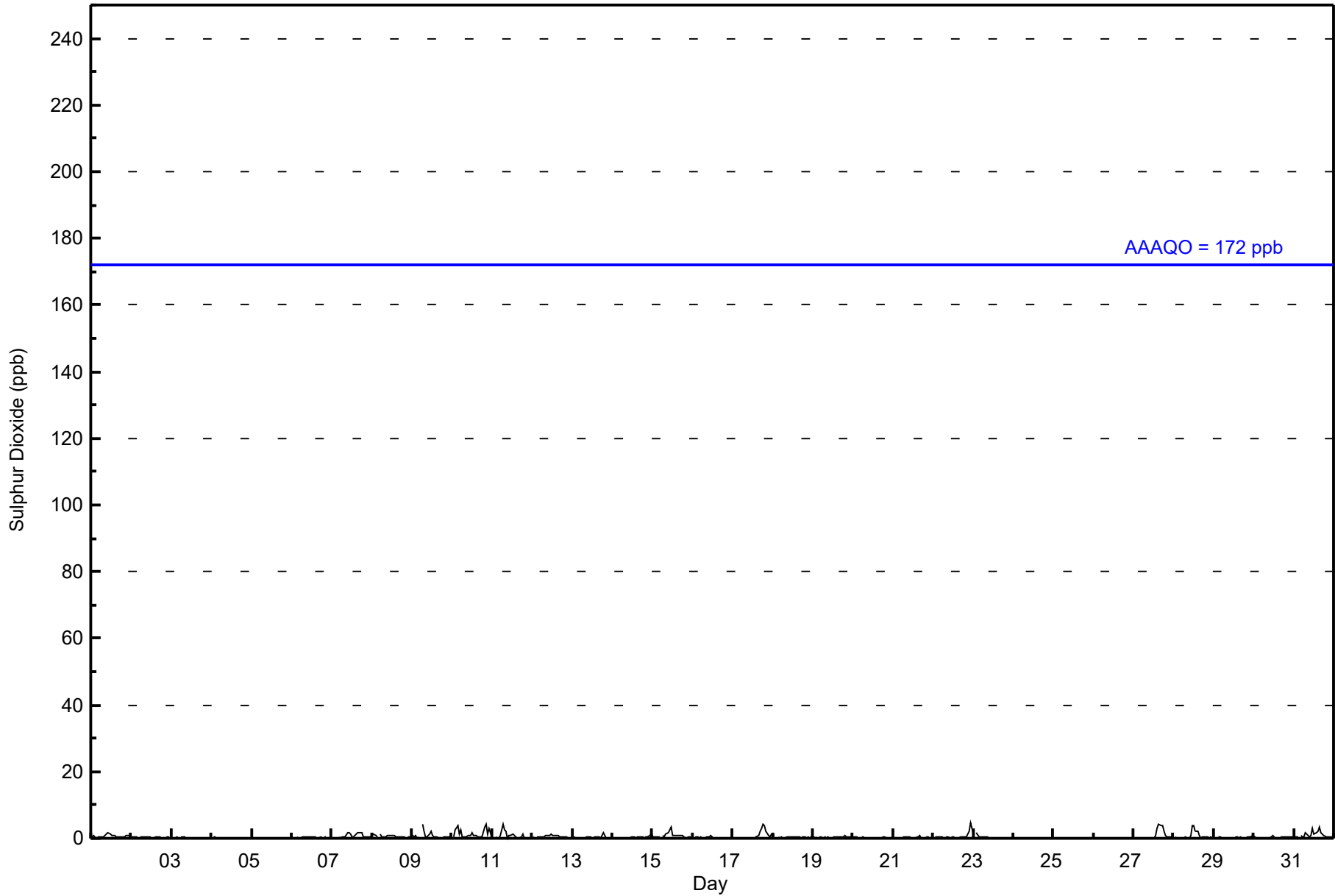
Z - zerospan C - Calibration

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



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Anzac - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Anzac - October 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
Anzac - October 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	1	4	6	53	159	59	36	24	20	43	111	112	40	28	7	709
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	1	4	6	53	159	59	36	24	20	43	111	112	40	28	7	709

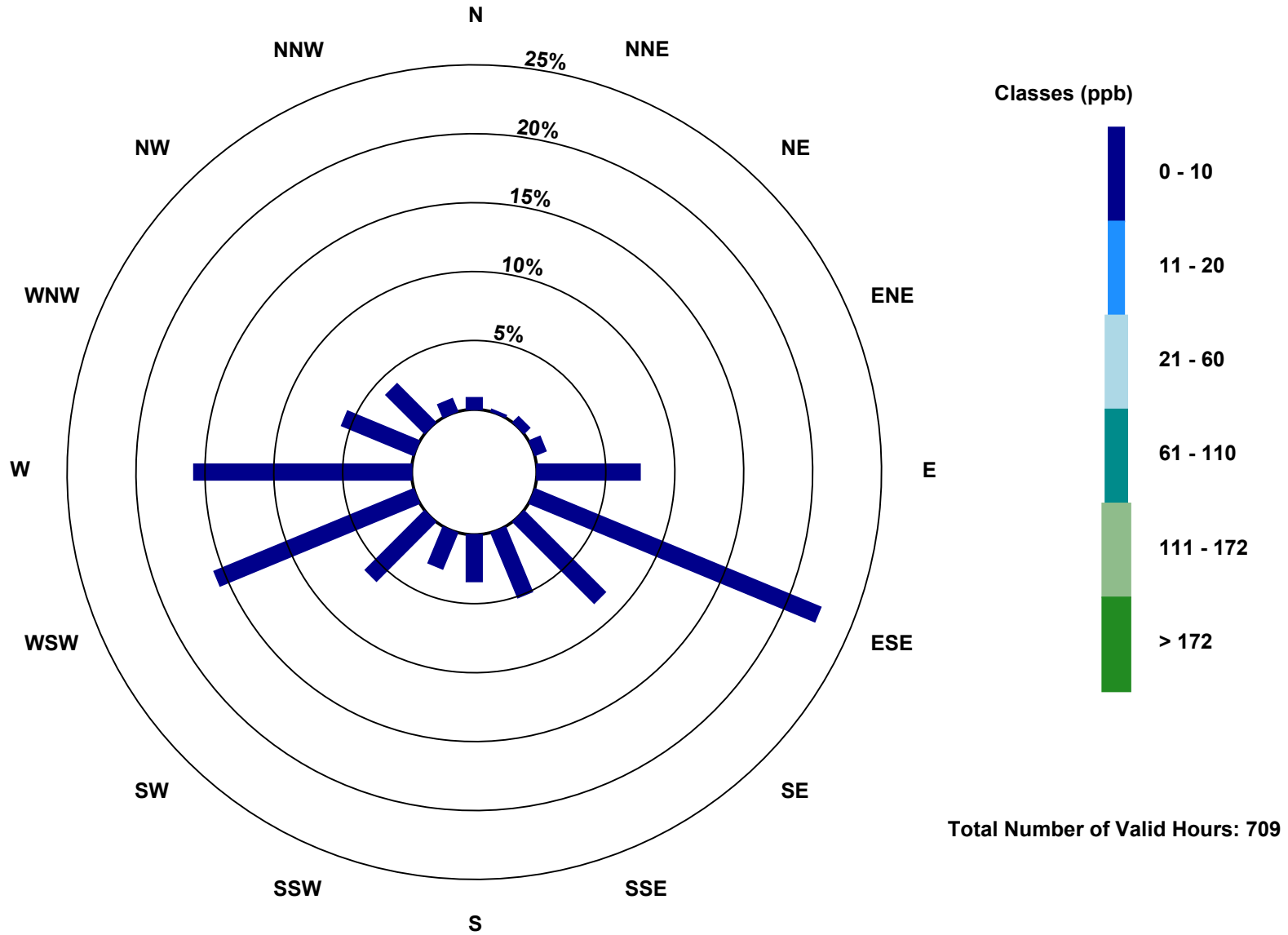
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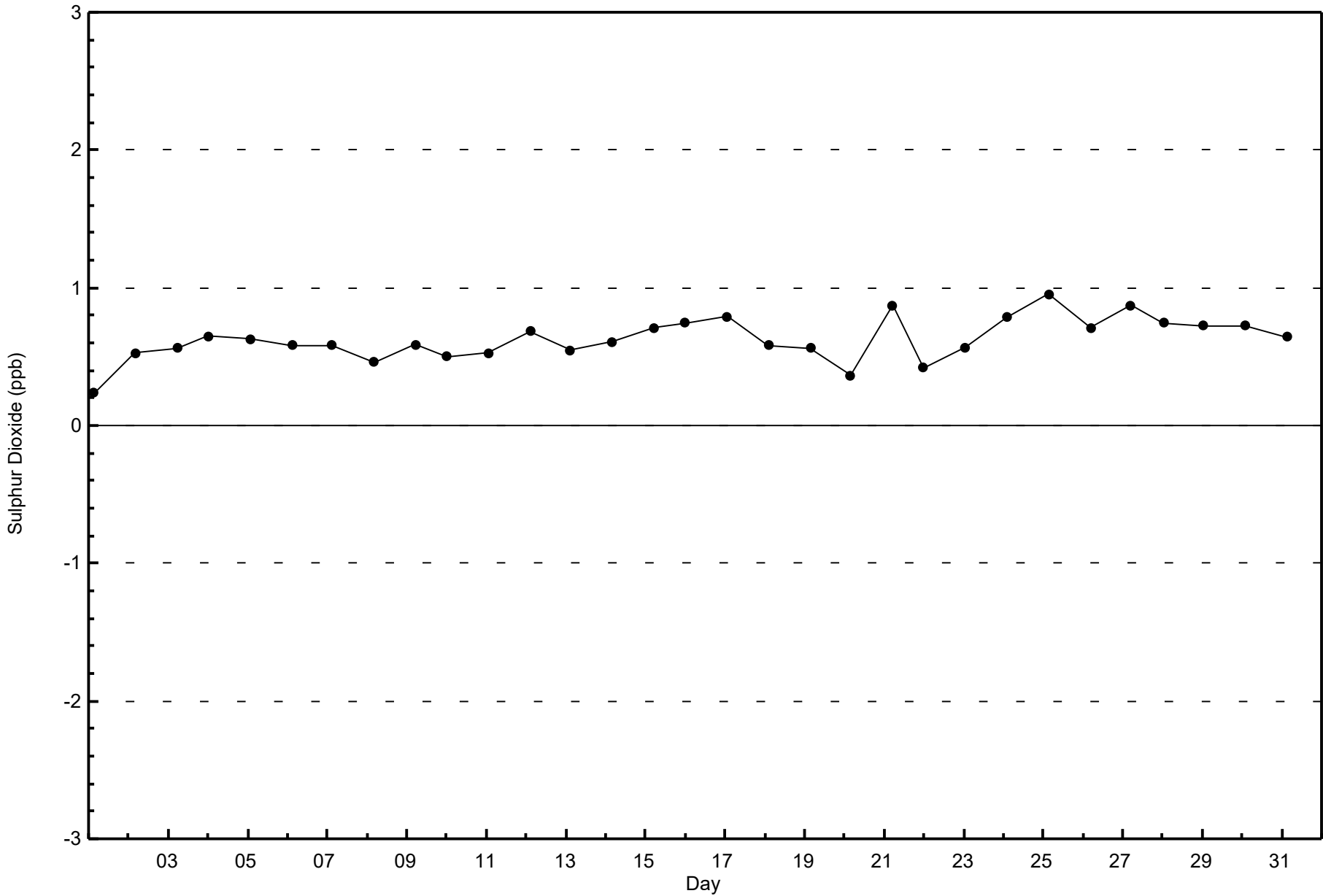
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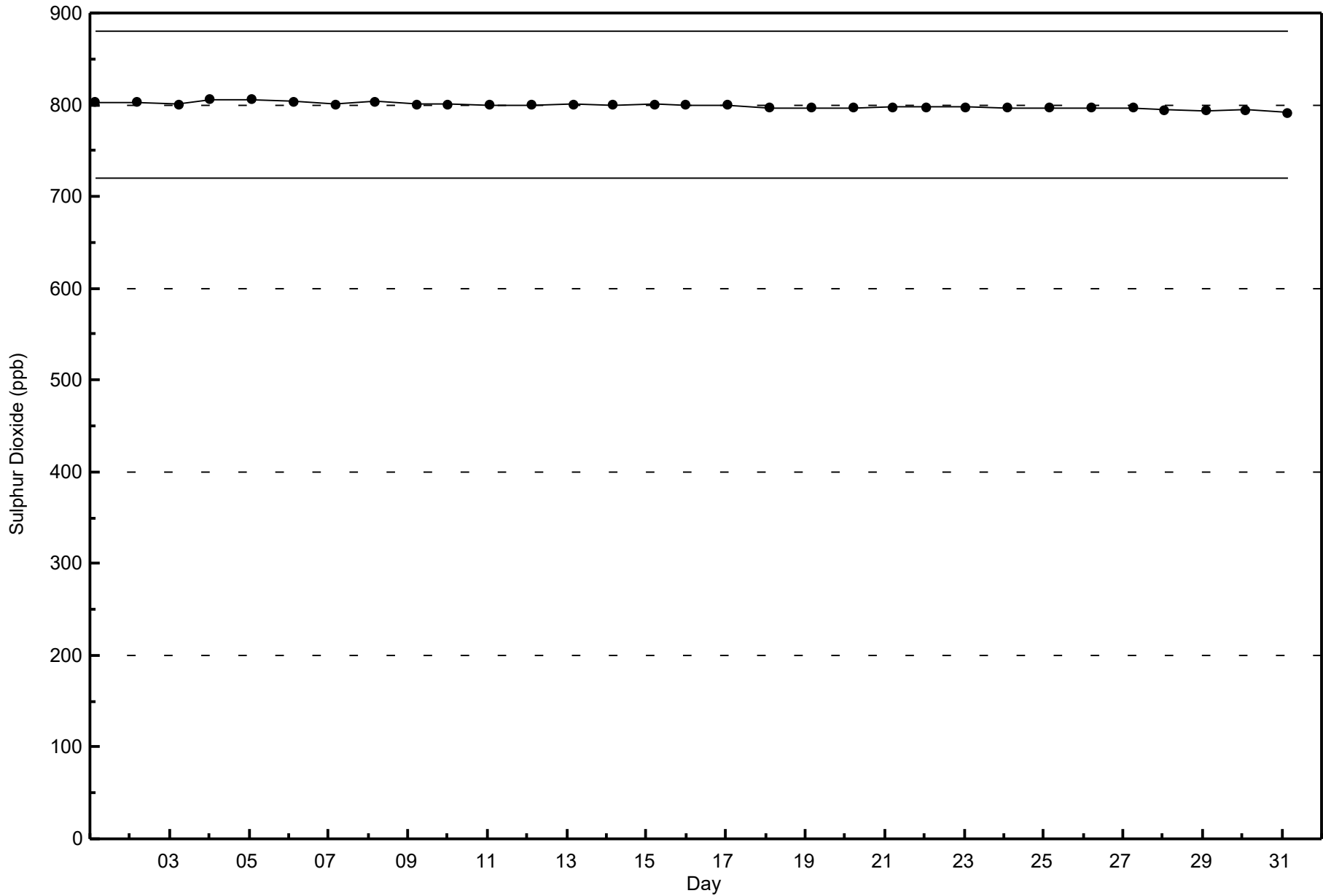


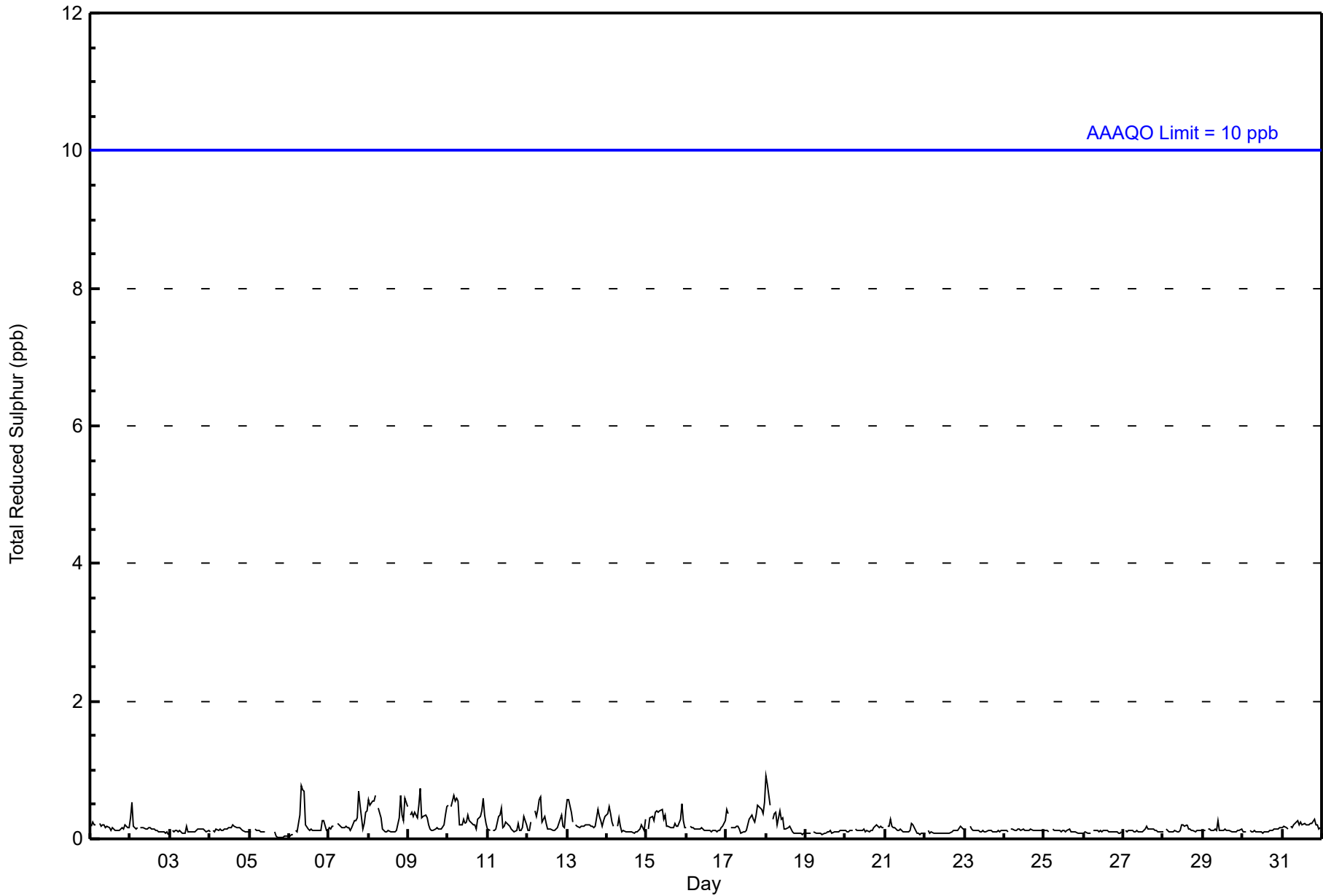
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Sulphur Dioxide (SO₂) - ppb
Anzac











Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Reduced Sulphur (TRS) - ppb
Anzac - October 2023

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

Total Number of Valid Hours: 708

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Total Reduced Sulphur (TRS) - ppb
Anzac - October 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	6	1	5	5	53	160	56	38	24	19	43	113	109	41	28	7	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	6	1	5	5	53	160	56	38	24	19	43	113	109	41	28	7	708

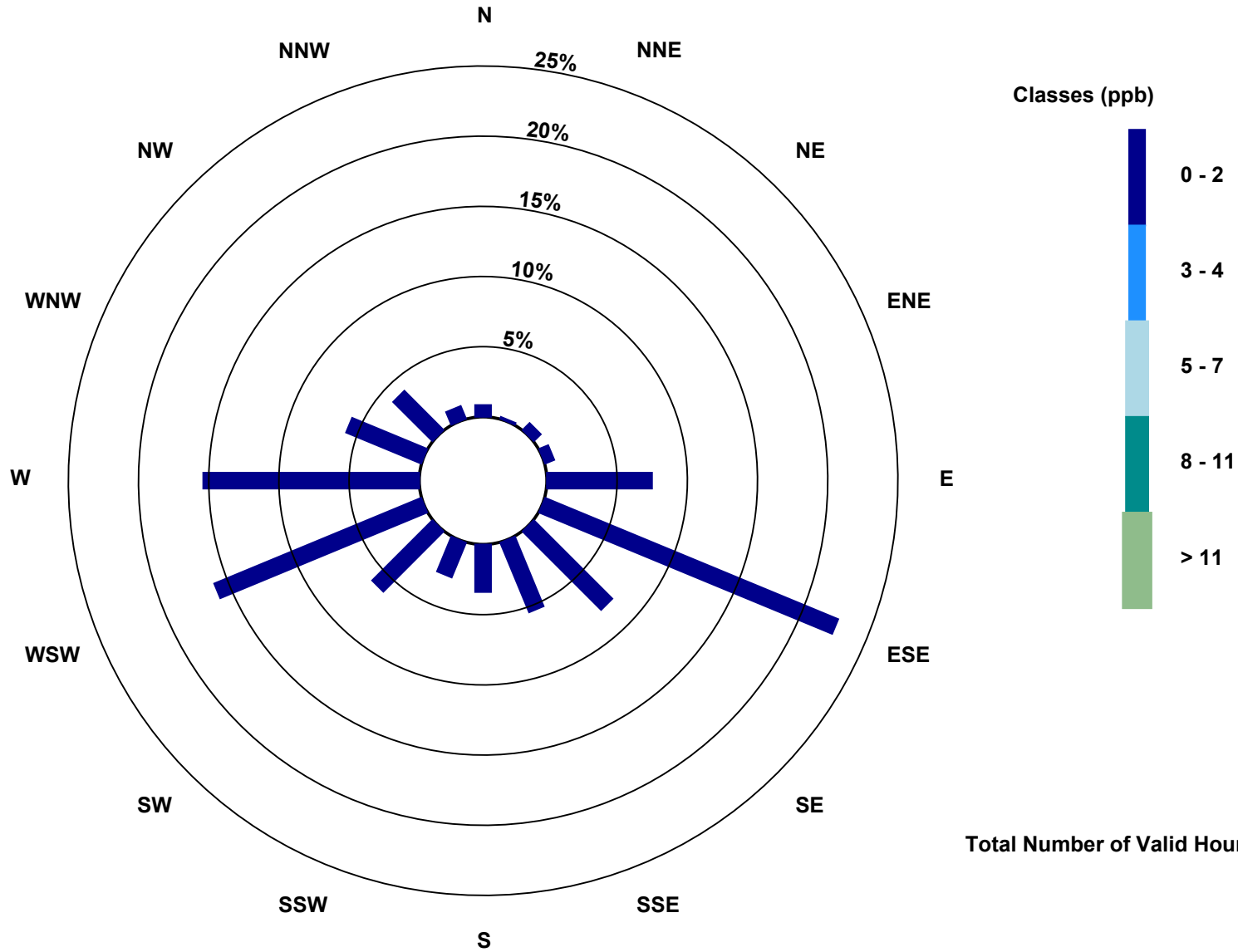
Total Number of Valid Hours: 708

Total Number of Hours: 744

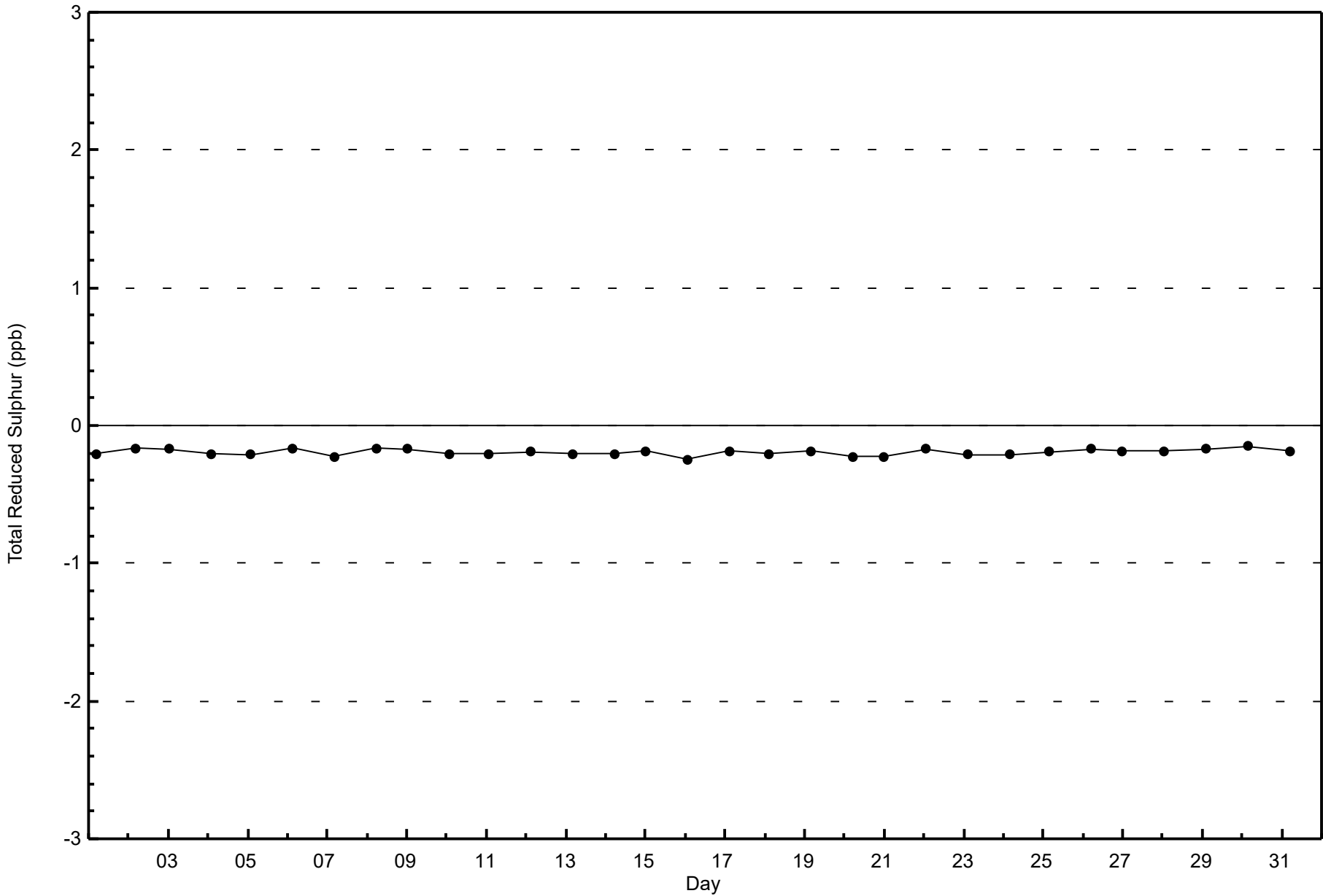


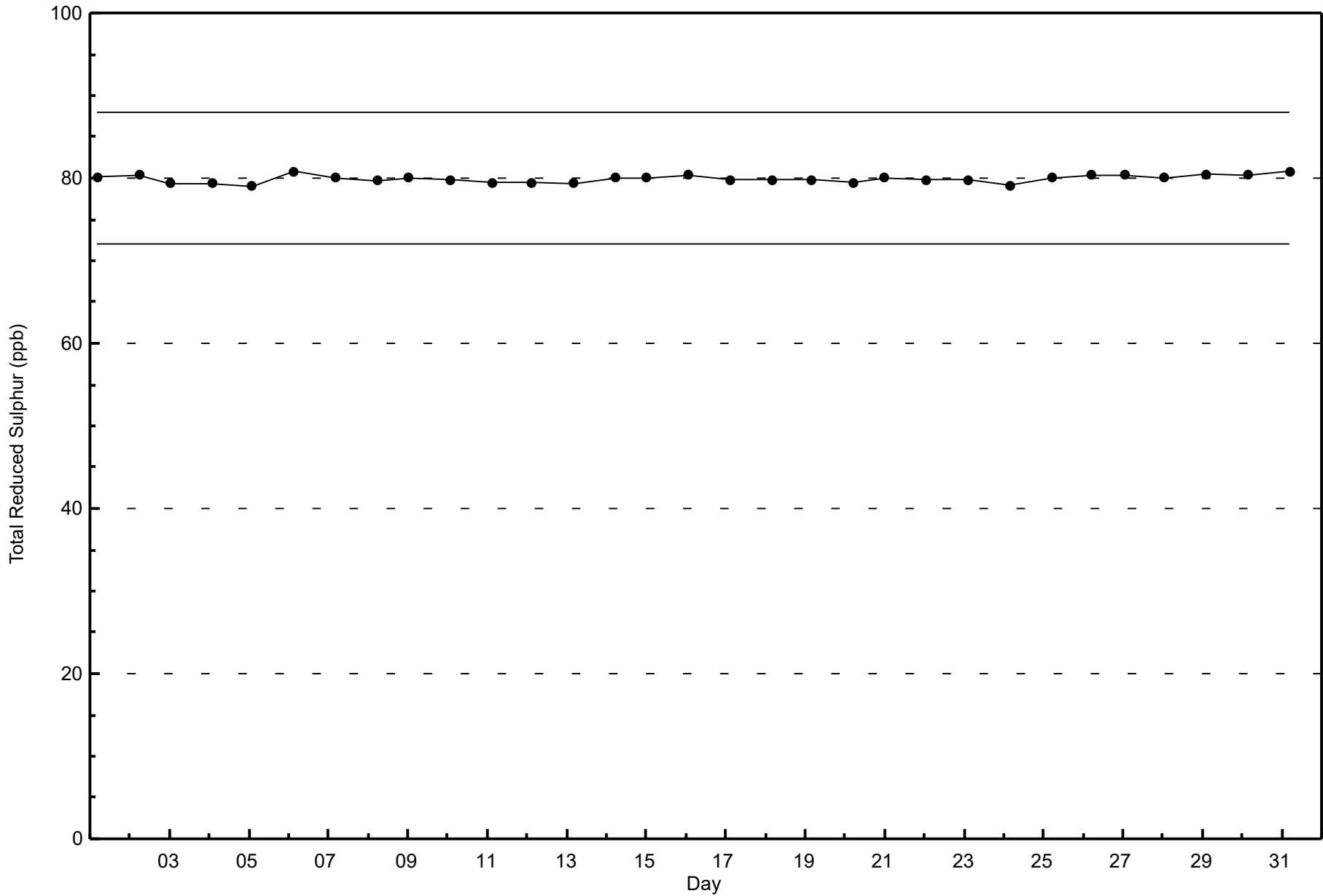
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Total Reduced Sulphur (TRS) - ppb
Anzac



Total Number of Valid Hours: 708



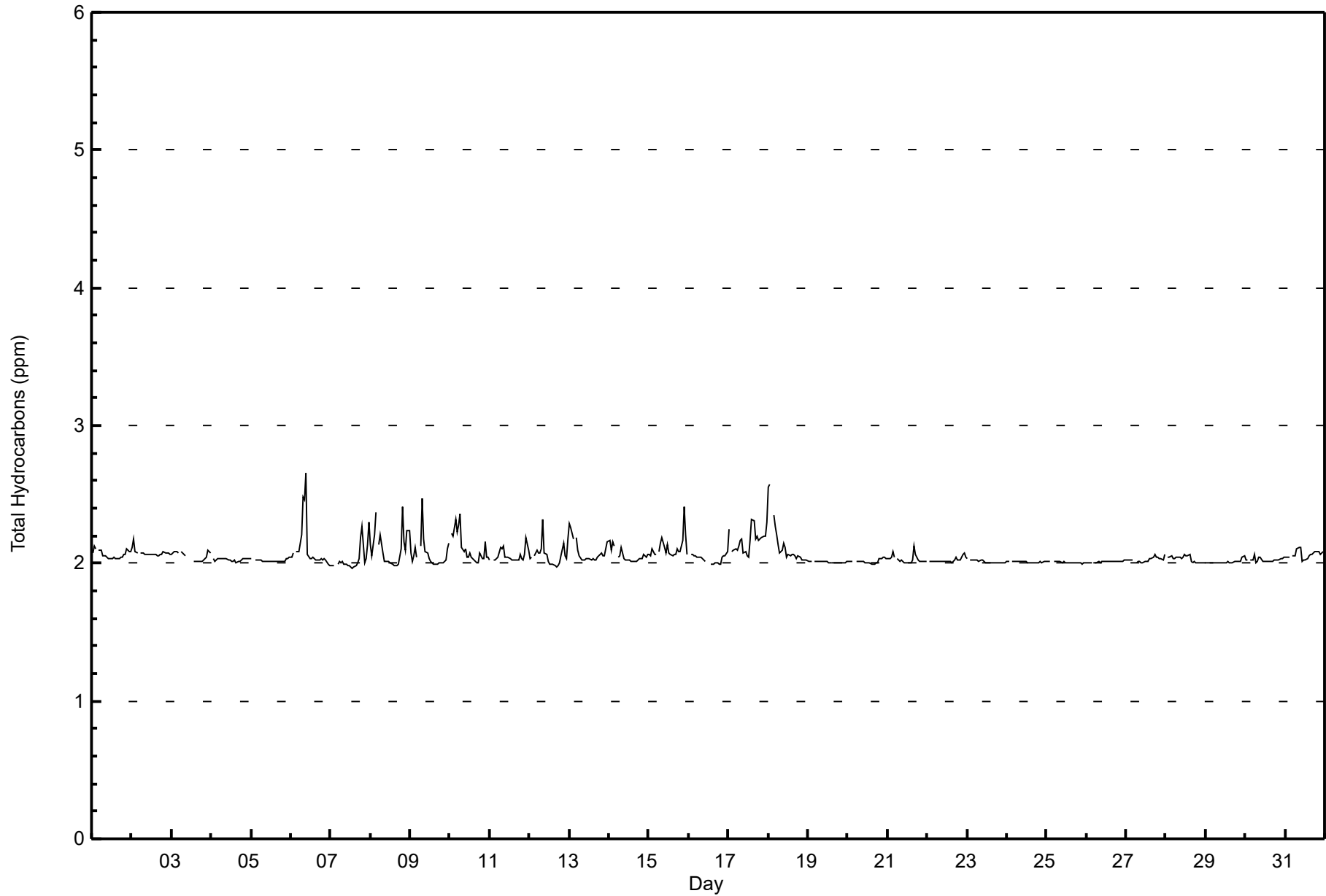




Wood Buffalo Environmental Association
Summary of Hour Averages

Total Hydrocarbons (THC) - ppm
Anzac - October 2023

Maximum Value: 2.7 ppm on Oct 6 10:00		Maximum Daily Average: 2.2 ppm on Oct 17		Hours in Service: 744																																													
Minimum Value: 2.0 ppm on Oct 7 14:00		Minimum Daily Average: 2.0 ppm on Oct 25		Hours of Data: 707																																													
Maximum Diurnal Average: 2.1 ppm at hour 4		Minimum Diurnal Average: 2.0 ppm at hour 13		Hours of Missing Data: 37																																													
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 = 2.4		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-Oct	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	2.1	2.1																					
2-Oct	2.1	2.2	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1																					
3-Oct	2.1	2.1	2.1	2.1	2.1	Z	2.1	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	2.1	2.1	2.1	2.1	2.1	2.1																					
4-Oct	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																					
5-Oct	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0																					
6-Oct	2.0	2.1	Z	2.1	2.1	2.1	2.2	2.5	2.5	2.7	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0																					
7-Oct	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	2.2	2.3	2.0	2.0	2.1	2.3	2.0	2.0	2.3	2.0																					
8-Oct	2.1	2.1	2.2	2.4	Z	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	2.4	2.2	2.1	2.2	2.2	2.1	2.1	2.4	2.1																					
9-Oct	2.1	2.0	2.1	2.1	2.0	Z	2.1	2.5	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	2.1	2.1	2.1	2.1	2.1																					
10-Oct	Z	2.2	2.2	2.3	2.2	2.3	2.4	2.1	2.1	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.2	2.0	2.0	2.1	2.1	2.1	2.4																					
11-Oct	2.0	Z	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.2	2.1	2.1	2.1	2.1	2.2																					
12-Oct	2.0	2.0	Z	2.1	2.1	2.1	2.1	2.1	2.3	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.2	2.1	2.1	2.1	2.3																					
13-Oct	2.3	2.3	2.2	Z	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	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.3																					
14-Oct	2.2	2.1	2.2	2.1	Z	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	2.1	2.0	2.1	2.0	2.1	2.1	2.2																					
15-Oct	2.1	2.0	2.1	2.1	2.1	Z	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	2.2	2.4	2.2	2.1	2.1	2.1	2.1	2.4																					
16-Oct	Z	2.1	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	C	C	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.1	2.1																					
17-Oct	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.0	2.2	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																					
18-Oct	2.6	2.6	Z	2.4	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.6																					
19-Oct	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	2.0	2.0	2.0	2.0																					
20-Oct	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	2.0	2.0	2.0																					
21-Oct	2.0	2.0	2.0	2.1	2.0	Z	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1																					
22-Oct	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	2.1	2.0	2.0	2.0	2.0	2.1																					
23-Oct	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0																					
24-Oct	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0																					
25-Oct	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	2.0	2.0	2.0	2.0																					
26-Oct	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	2.0	2.0	2.0																					
27-Oct	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	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.1																					
28-Oct	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	2.1	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																					
29-Oct	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1																					
30-Oct	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1																					
31-Oct	2.0	2.0	2.0	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1																					
																								2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.1	Diurnal Average		
																								2.6	2.6	2.2	2.4	2.3	2.3	2.4	2.5	2.5	2.7	2.1	2.1	2.1	2.2	2.3	2.3	2.2	2.2	2.2	2.4	2.2	2.4	2.2	2.3	Diurnal Maximum	
Z - zerospan C - Calibration																																																	





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Anzac - October 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	479	67.75	67.75
2.1 - 3.0	228	32.25	100.00
3.1 - 10.0	0	0.00	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
Anzac - October 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	6	1	2	3	21	71	34	20	16	10	37	97	104	30	20	7	479
2.1 - 3.0	0	0	2	3	32	88	25	16	8	10	6	12	8	10	8	0	228
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	6	1	4	6	53	159	59	36	24	20	43	109	112	40	28	7	707

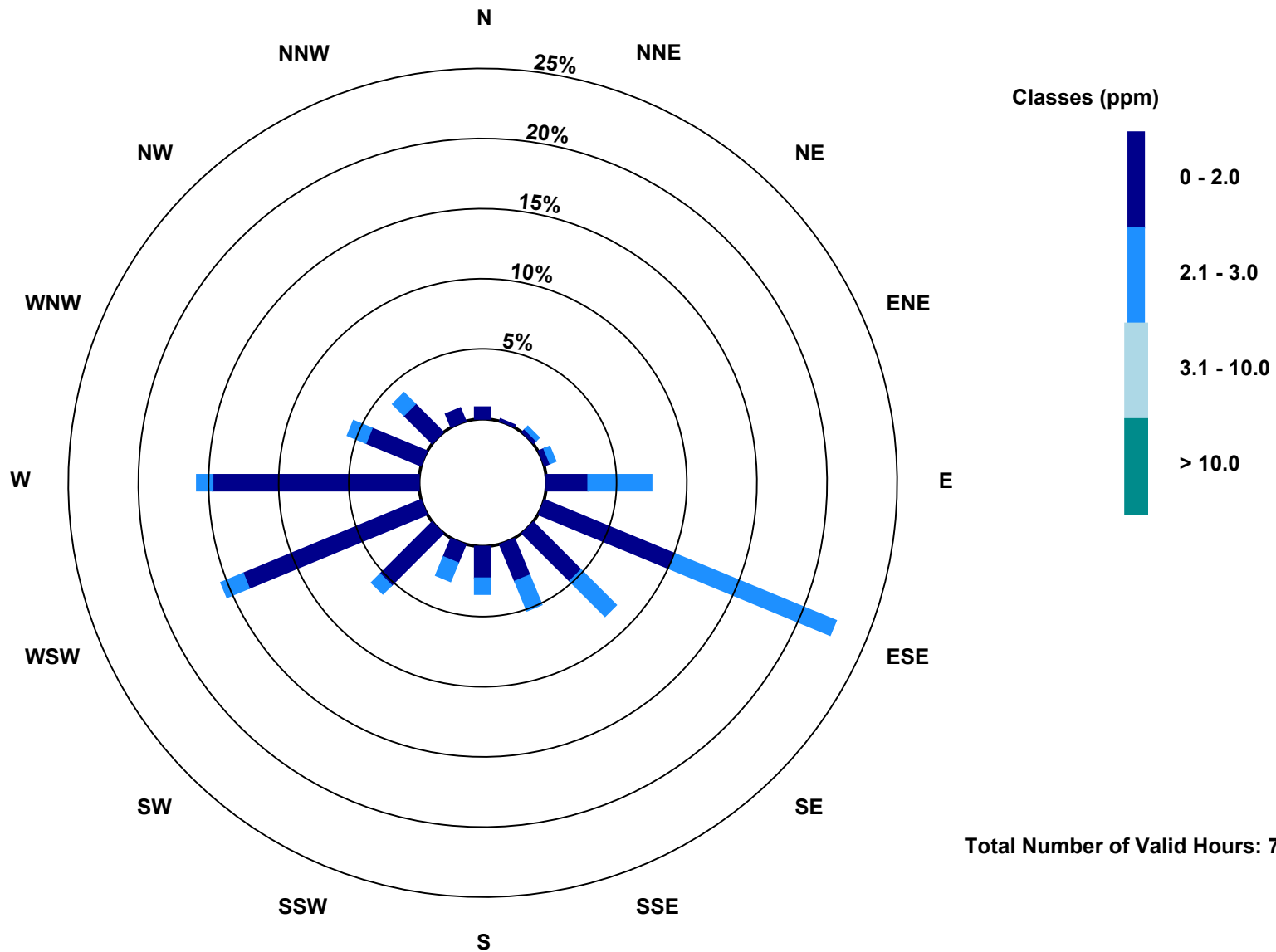
Total Number of Valid Hours: 707

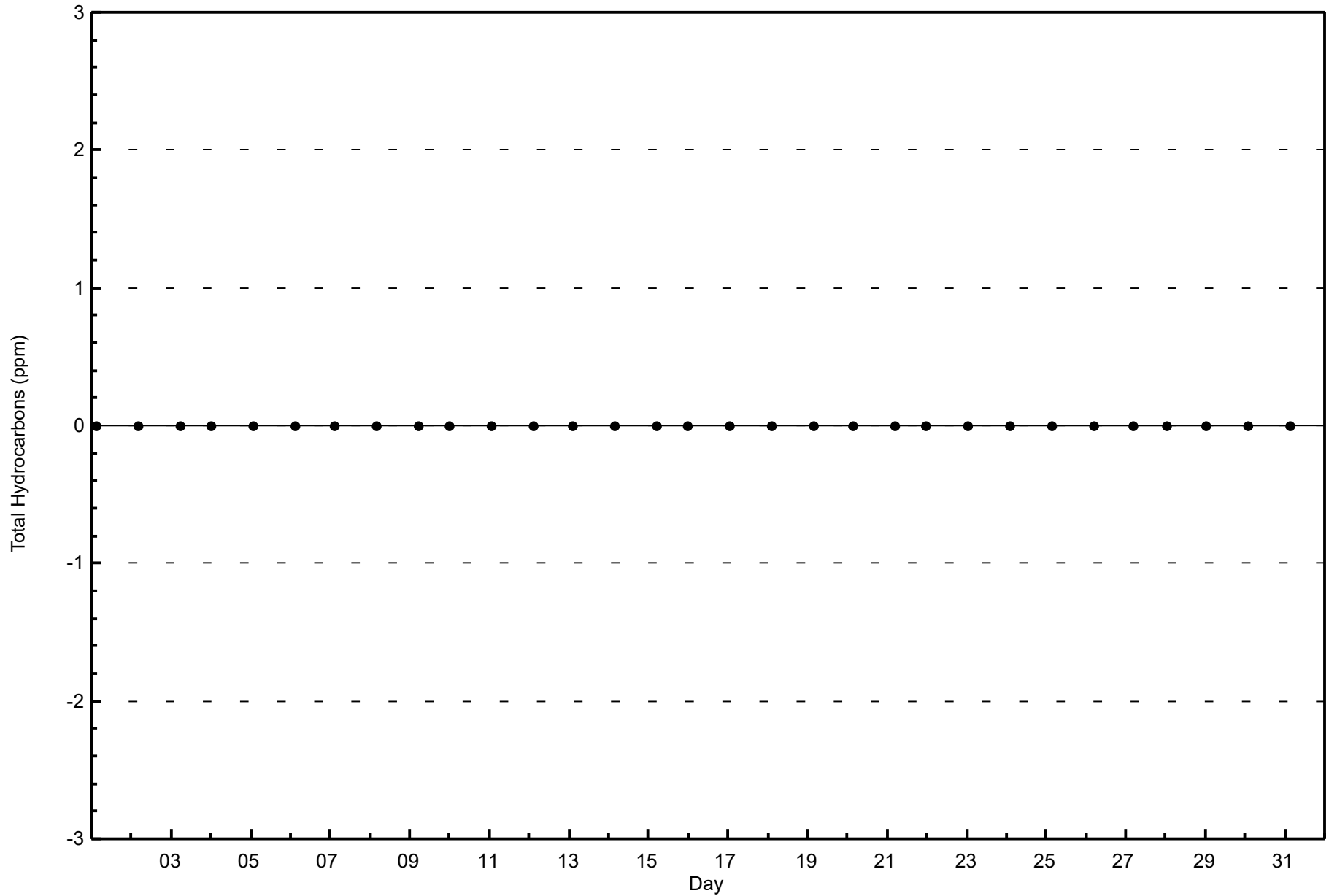
Total Number of Hours: 744

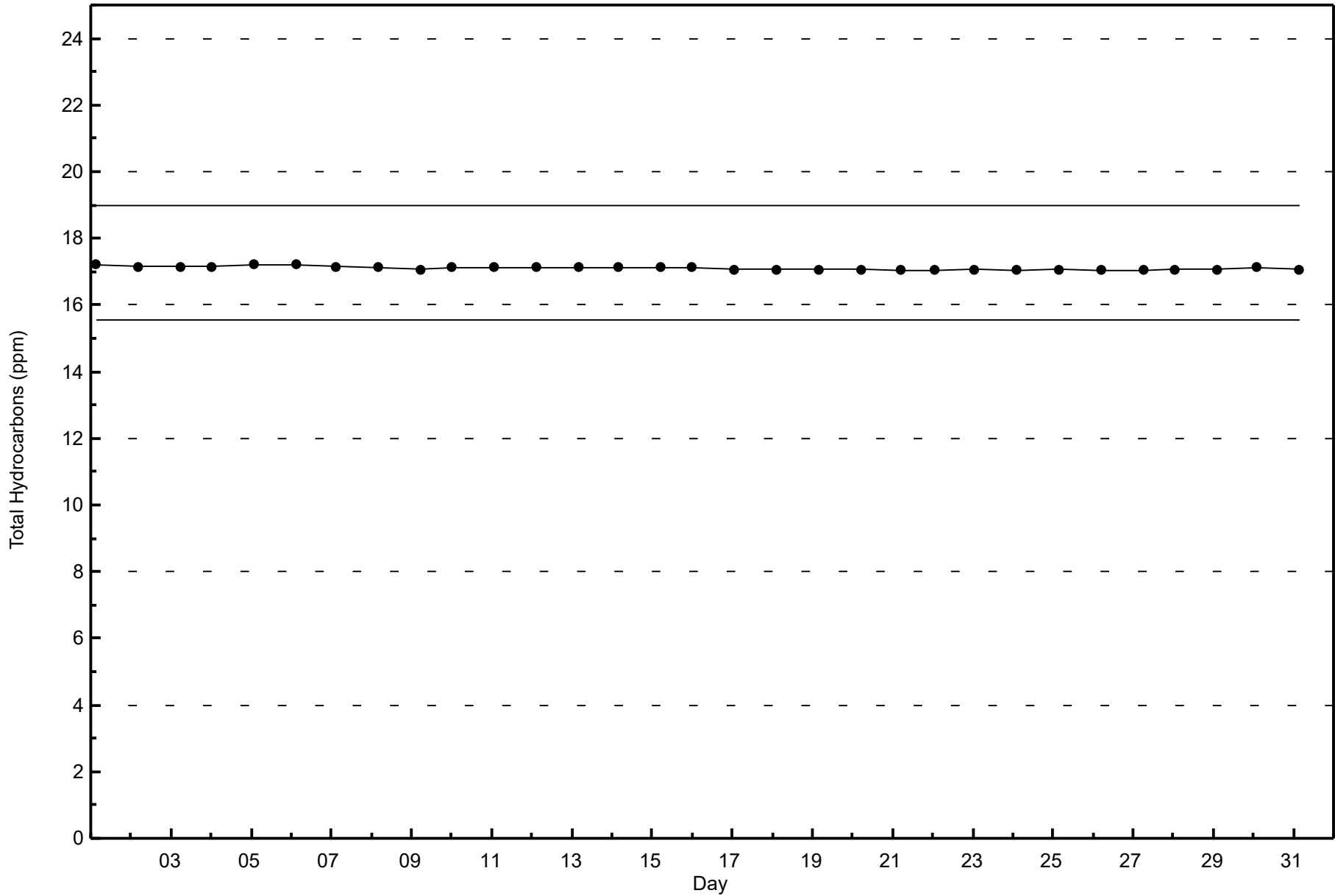


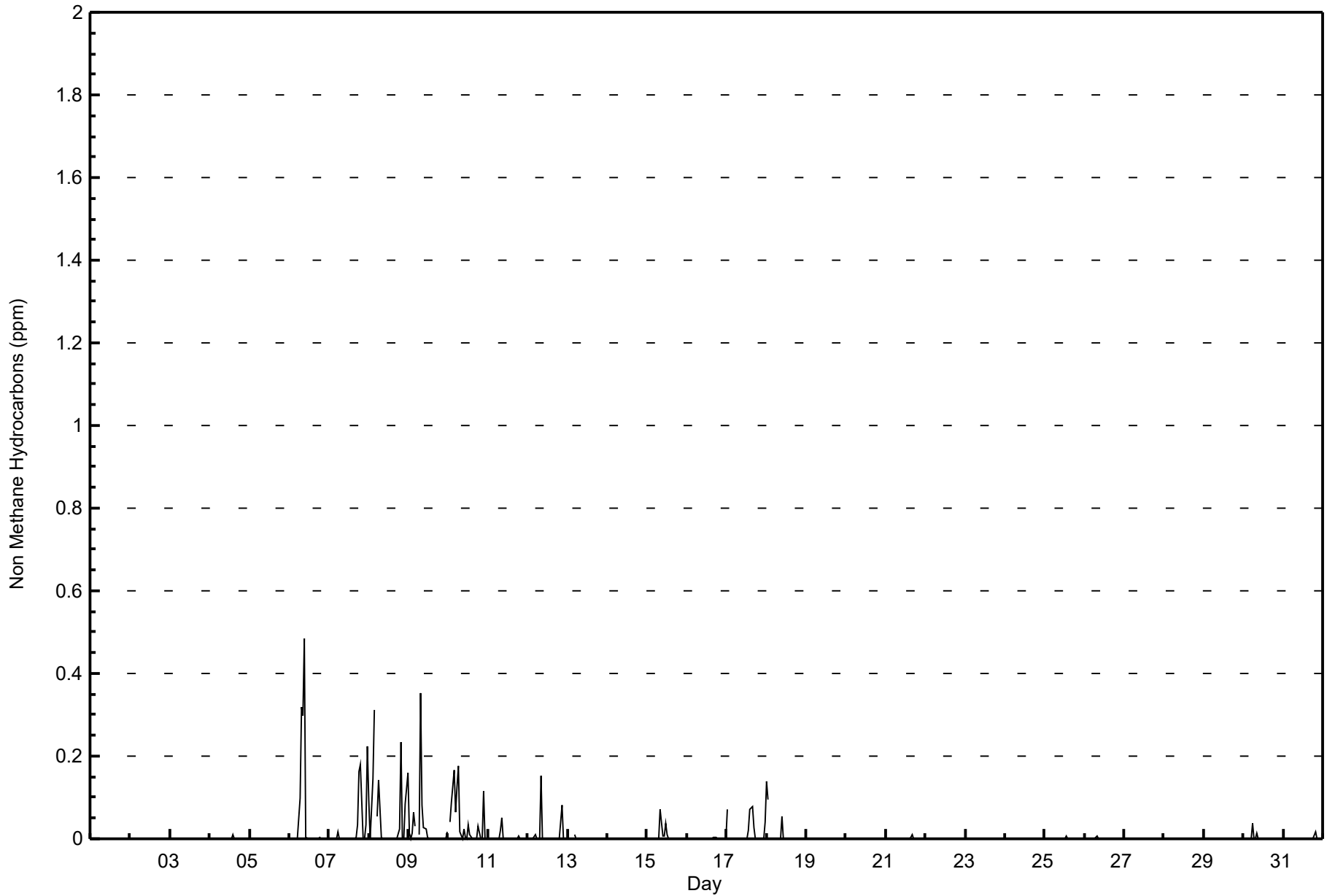
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Total Hydrocarbons (THC) - ppm
Anzac











**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Anzac - October 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	638	90.24	90.24
0.006 - 0.05	37	5.23	95.47
0.06 - 0.1	19	2.69	98.16
> 0.1	13	1.84	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm
Anzac - October 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	6	1	4	6	33	124	58	35	23	19	42	103	111	39	27	7	638
0.006 - 0.05	0	0	0	0	11	16	0	0	1	1	1	4	1	1	1	0	37
0.06 - 0.1	0	0	0	0	5	11	0	1	0	0	0	2	0	0	0	0	19
> 0.1	0	0	0	0	4	8	1	0	0	0	0	0	0	0	0	0	13
Totals	6	1	4	6	53	159	59	36	24	20	43	109	112	40	28	7	707

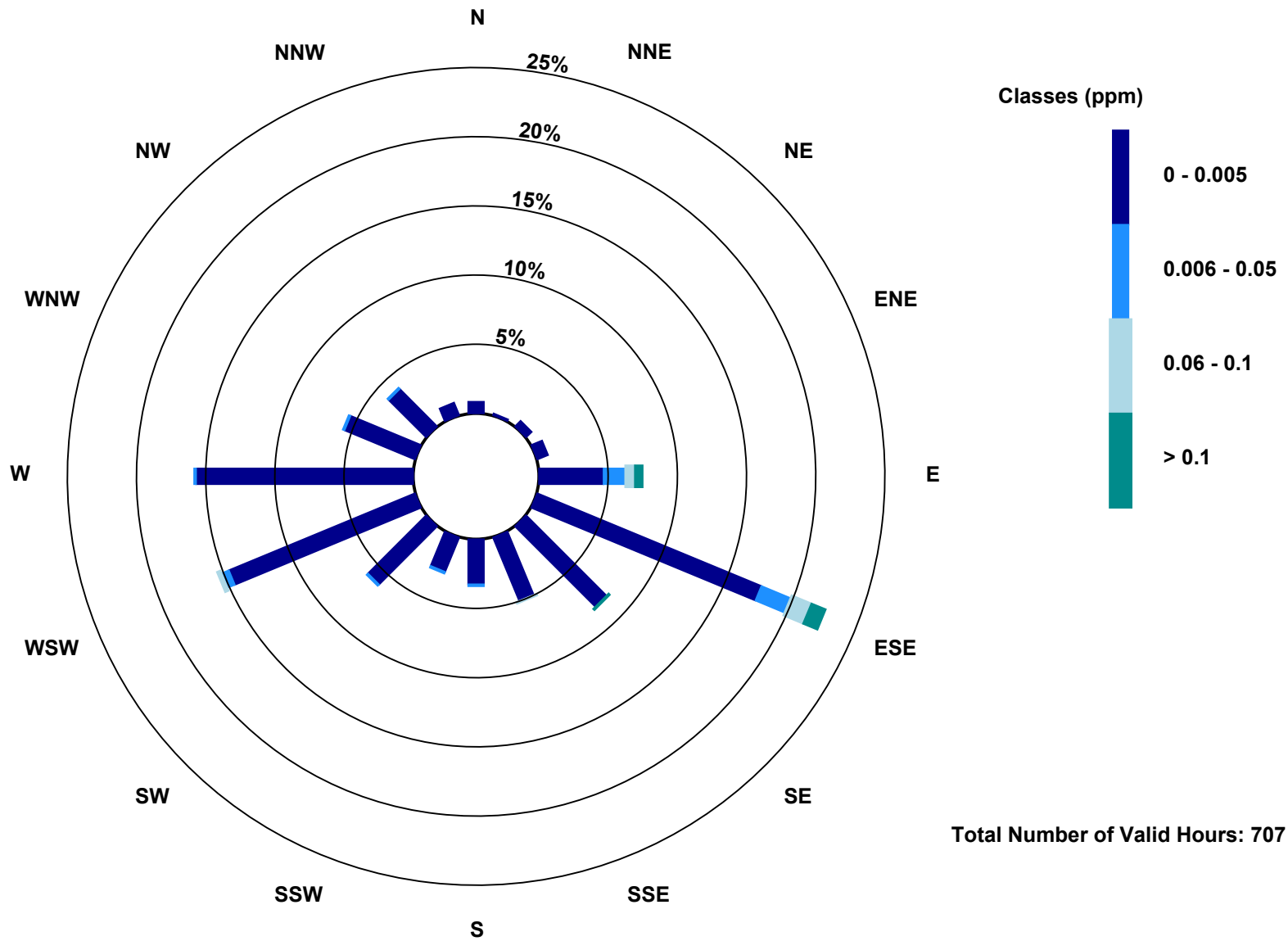
Total Number of Valid Hours: 707

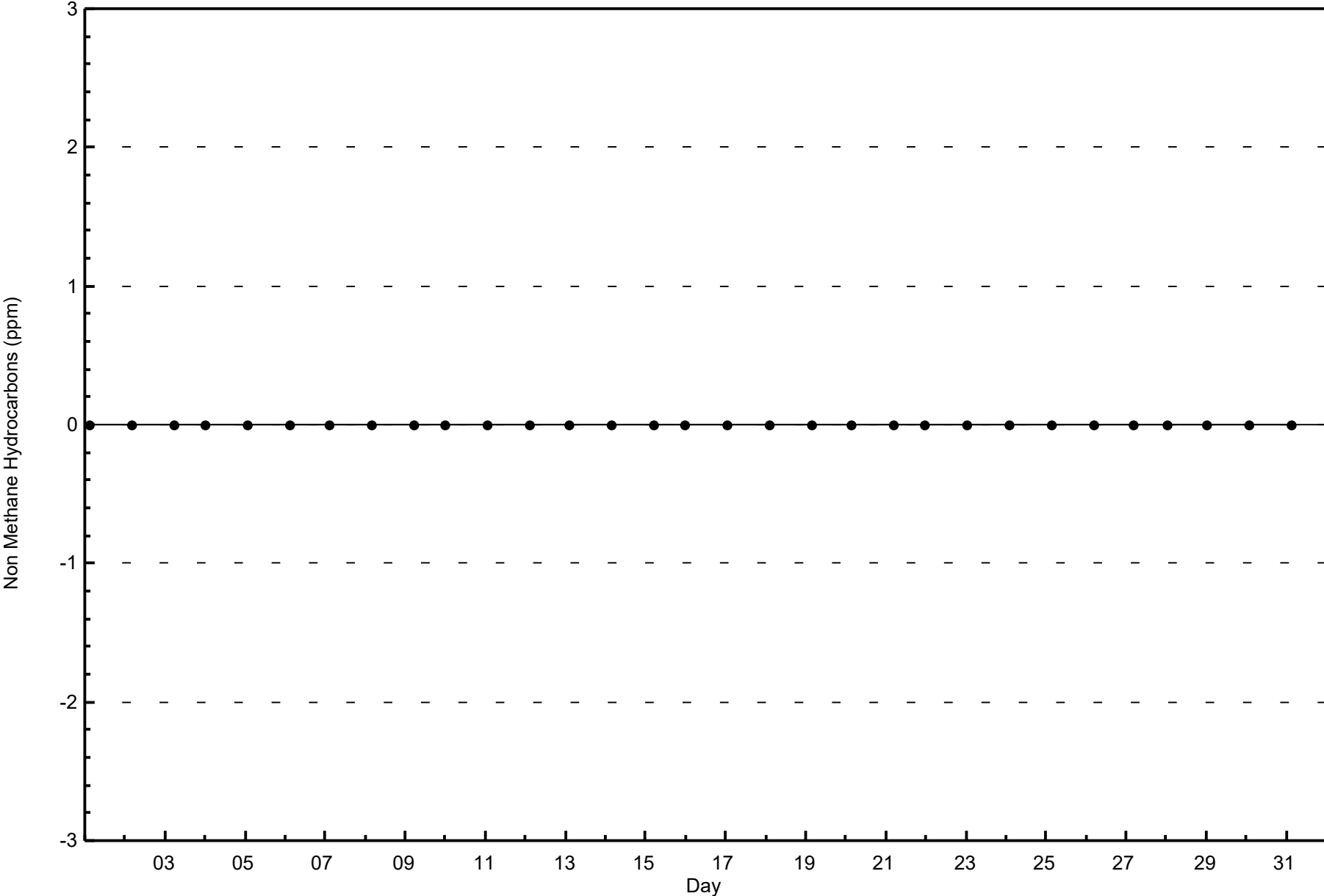
Total Number of Hours: 744

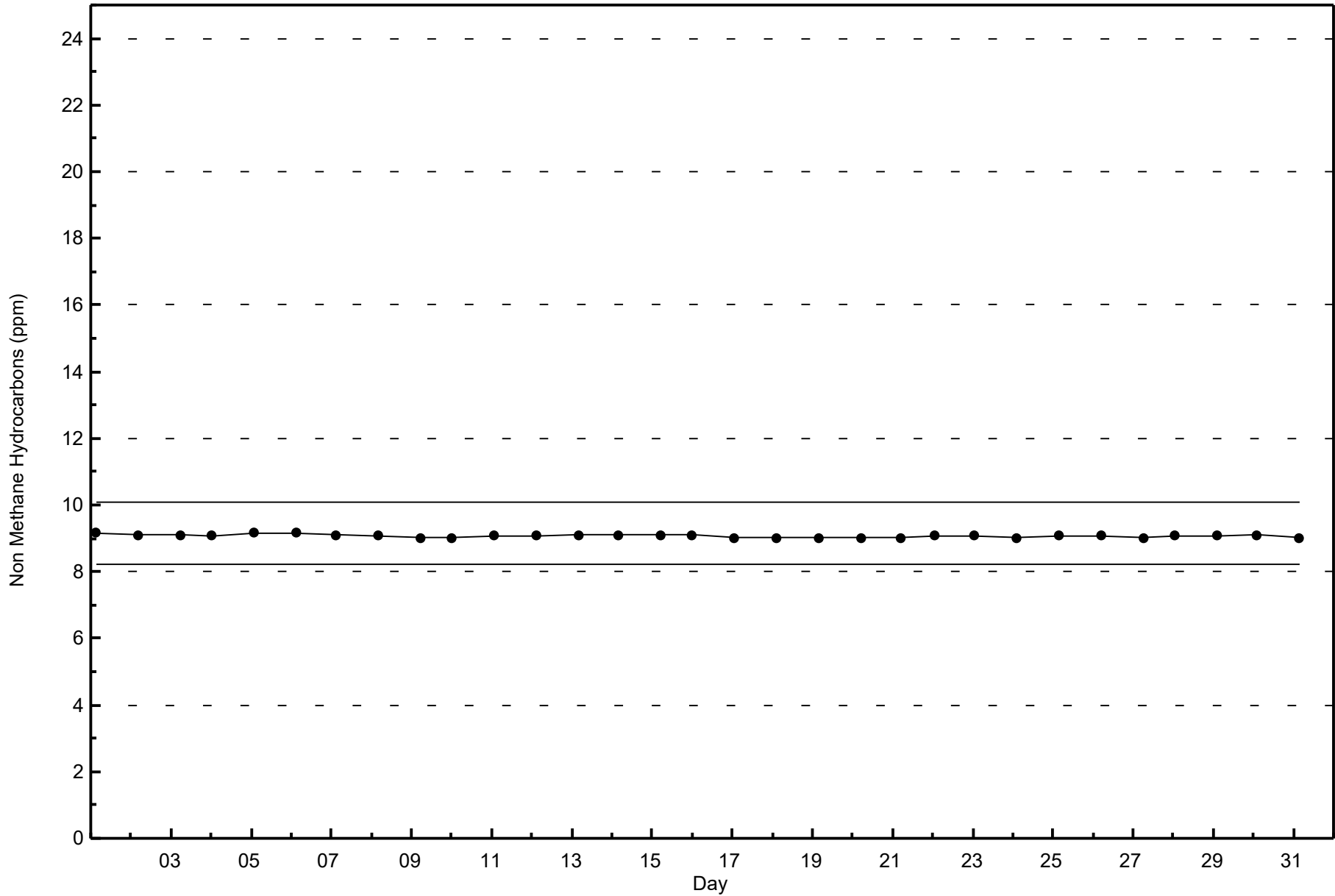


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Non Methane Hydrocarbons (NMHC) - ppm
Anzac



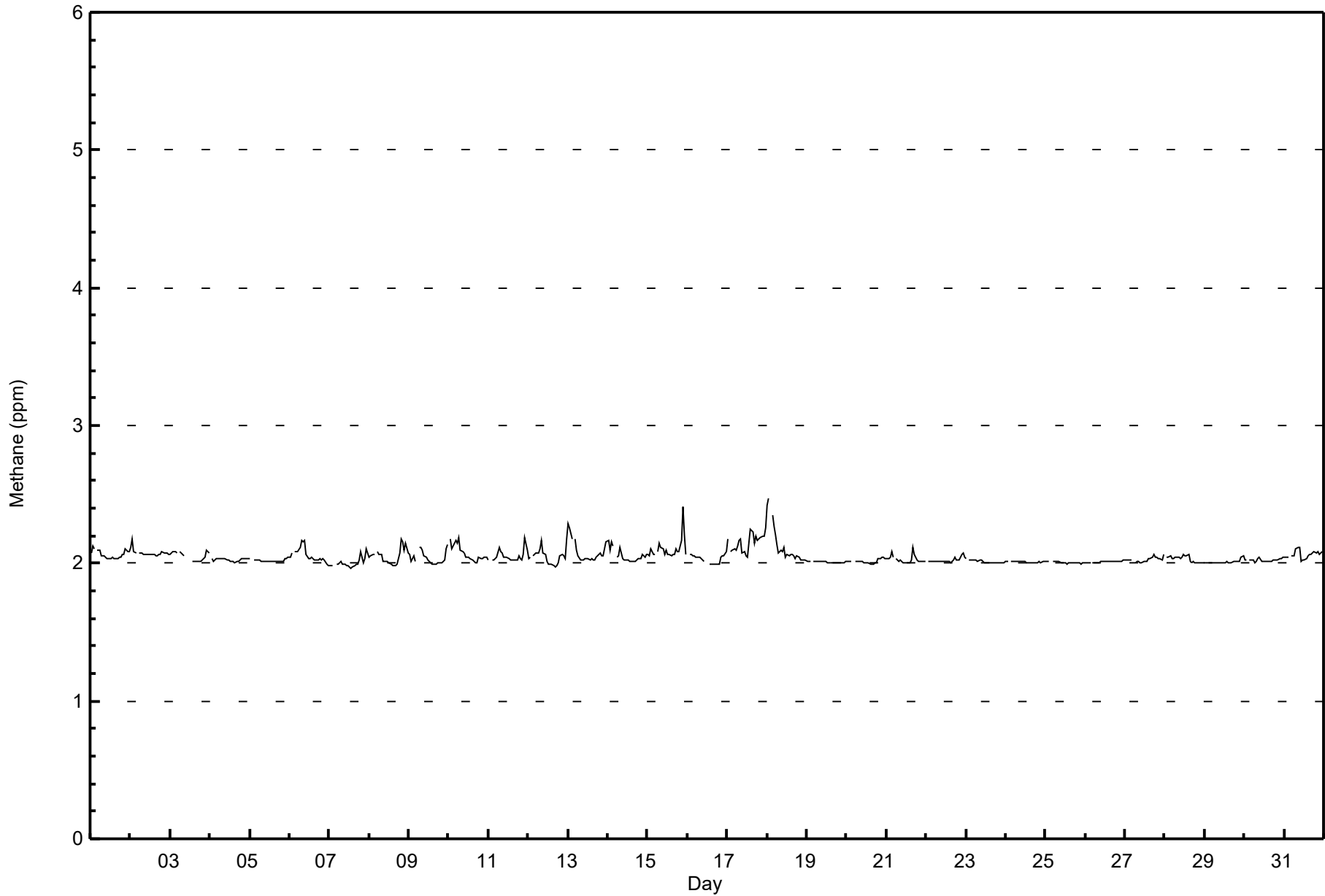






Wood Buffalo Environmental Association
Hourly Averages

Methane (CH₄) - ppm
Anzac - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Methane (CH₄) - ppm
Anzac - October 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	487	68.88	68.88
2.1 - 3.0	220	31.12	100.00
3.1 - 10.0	0	0.00	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
Anzac - October 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	6	1	2	3	23	76	34	20	16	10	37	97	104	30	21	7	487
2.1 - 3.0	0	0	2	3	30	83	25	16	8	10	6	12	8	10	7	0	220
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	6	1	4	6	53	159	59	36	24	20	43	109	112	40	28	7	707

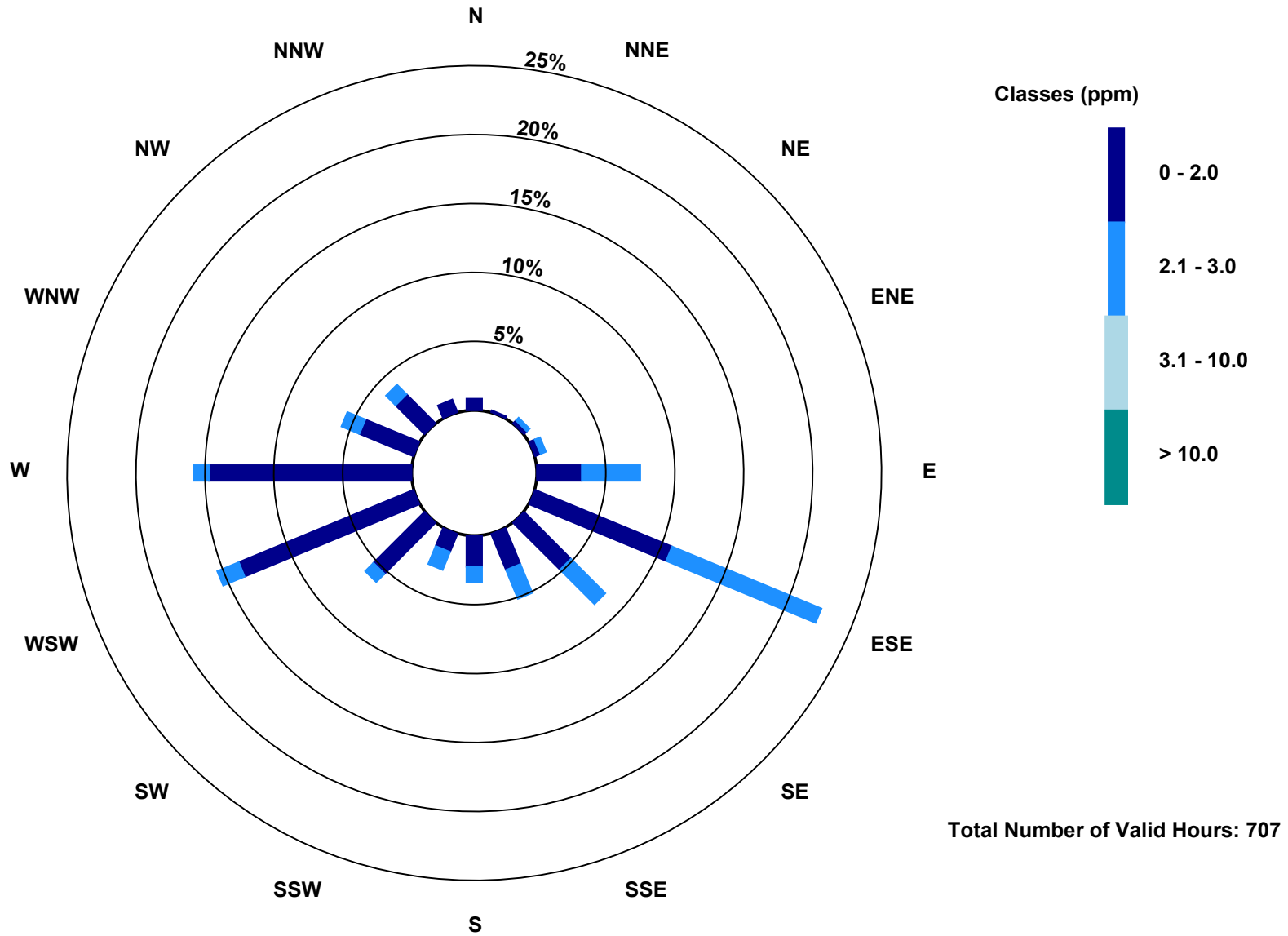
Total Number of Valid Hours: 707

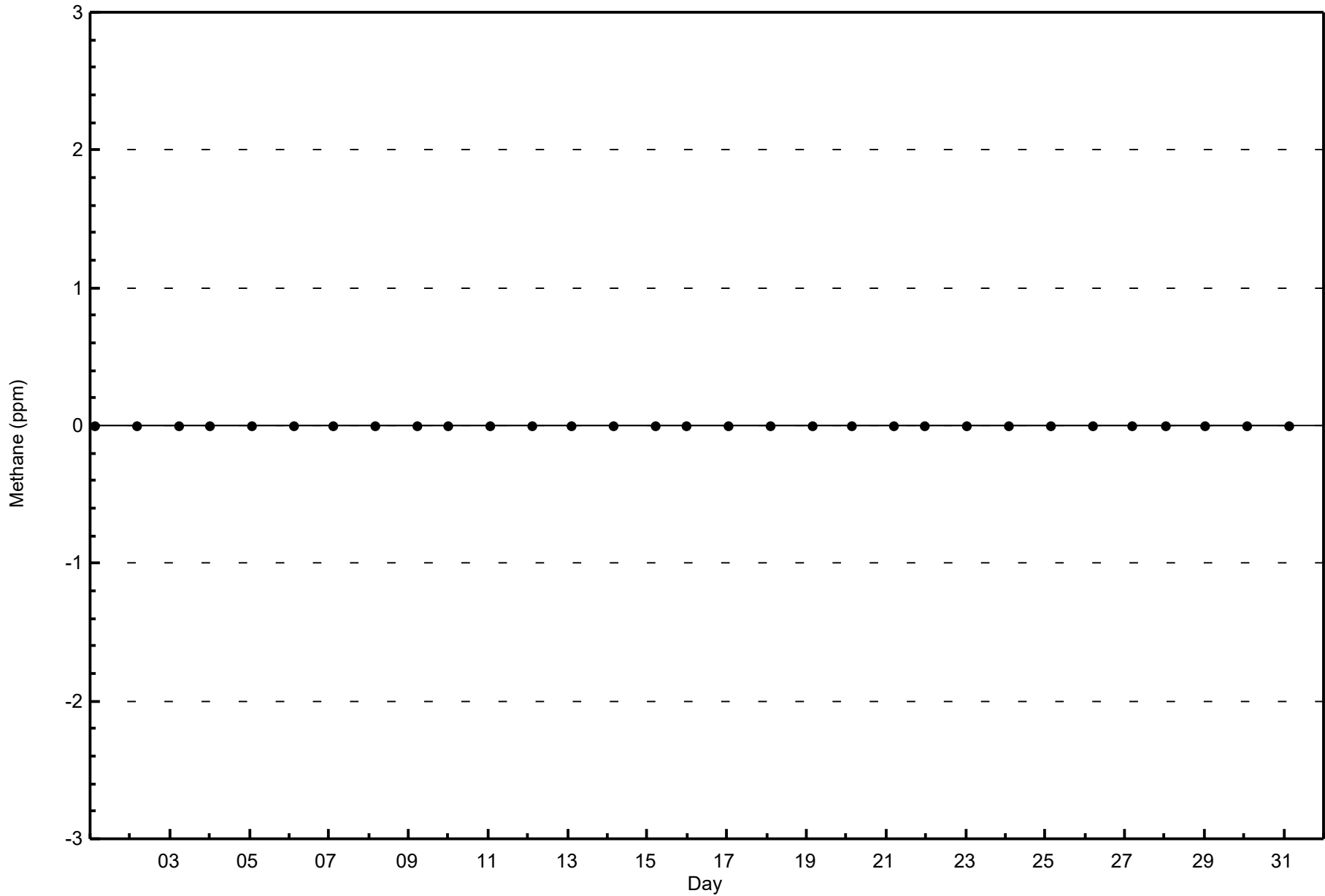
Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

Methane (CH₄) - ppm
Anzac

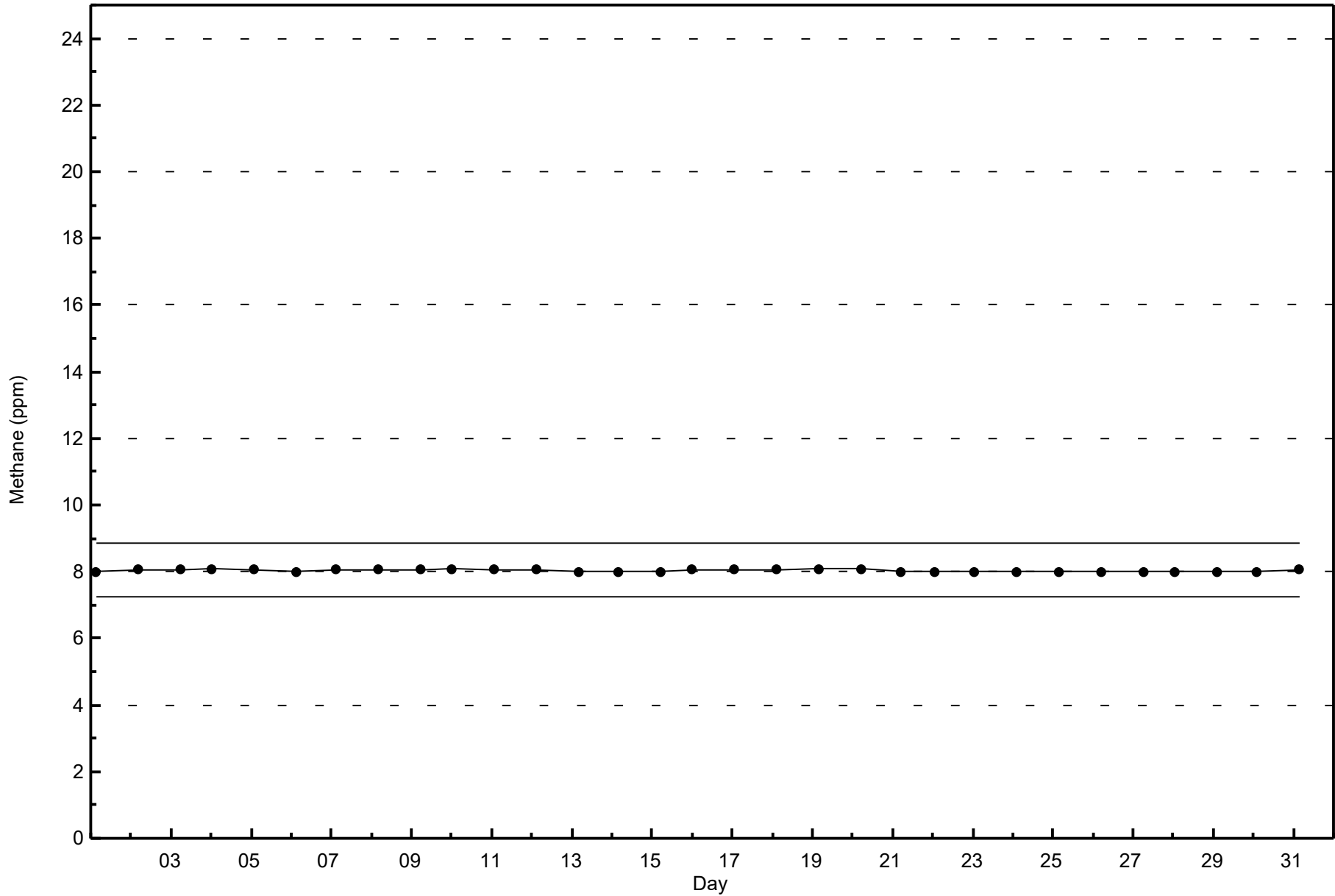






Wood Buffalo Environmental Association
Span Responses

Methane (CH₄) - ppm
Anzac - October 2023





Wood Buffalo Environmental Association
Summary of Hour Averages

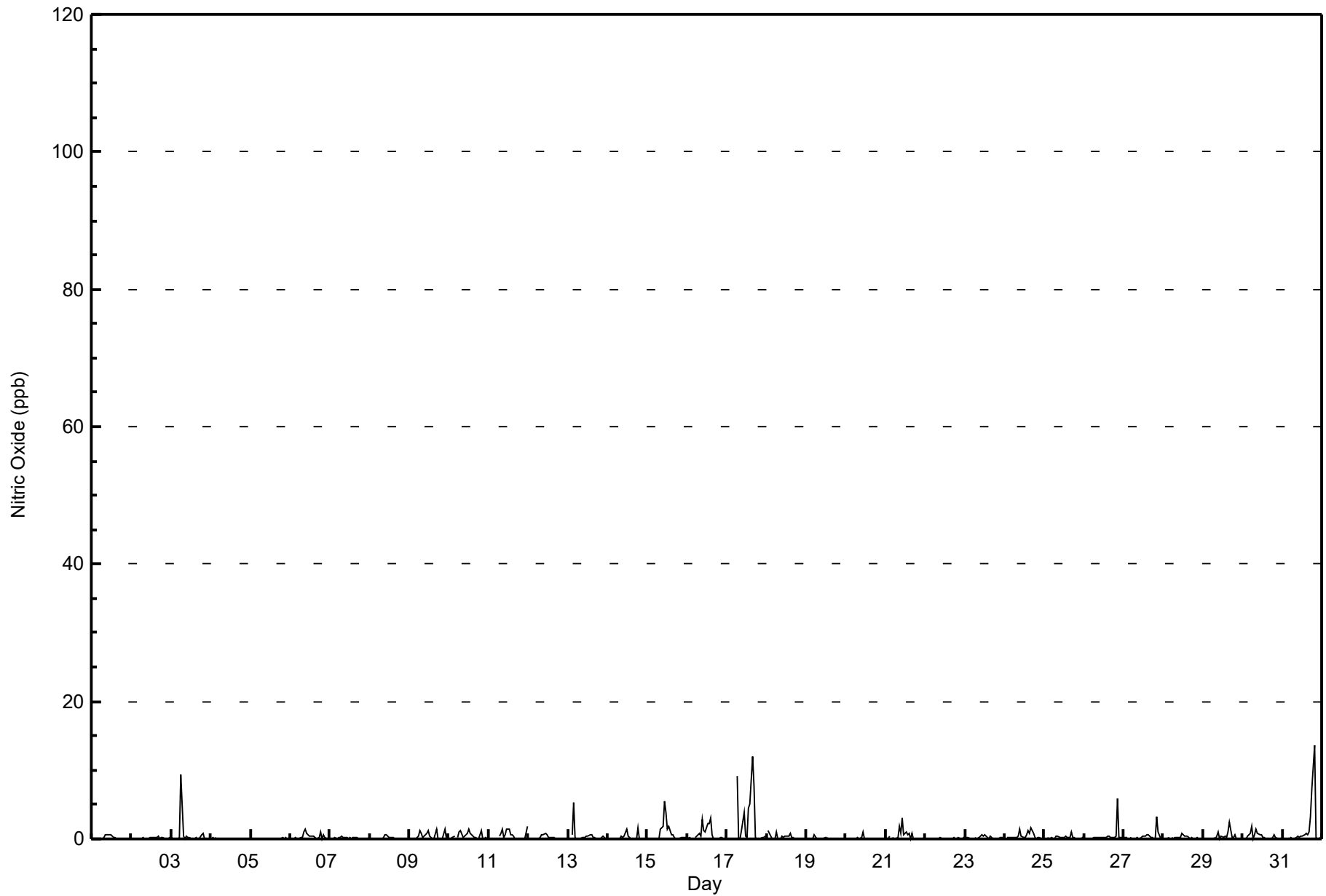
Nitric Oxide (NO) - ppb
Anzac - October 2023

Maximum Value: 13.5 ppb on Oct 31 20:00		Maximum Daily Average: 2.0 ppb on Oct 17		Hours in Service: 744																						
Minimum Value: 0.0 ppb on Oct 1 01:00		Minimum Daily Average: 0.0 ppb on Oct 22		Hours of Data: 708																						
Maximum Diurnal Average: 0.8 ppb at hour 7		Minimum Diurnal Average: 0.1 ppb at hour 1		Hours of Missing Data: 36																						
Monthly Average: 0.38 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.3 P ₉₀ = 0.8 P ₉₉ = 5.4		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-Oct	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.2	0.6	0.6	0.5	0.6	0.3	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6
2-Oct	0.0	0.0	Z	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.3	0.1	0.3	0.2	0.0	0.0	0.0	0.2	0.1	0.3
3-Oct	0.2	0.0	0.1	Z	0.0	0.1	9.3	0.4	0.1	0.5	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.8	0.1	0.1	0.1	0.0	0.6	9.3
4-Oct	0.1	0.2	0.1	0.1	Z	0.1	0.1	0.1	0.1	C	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
5-Oct	0.0	0.1	0.0	0.1	0.0	Z	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.2	0.0	0.1	0.0	0.1	0.1	0.2
6-Oct	Z	0.0	0.0	0.1	0.0	0.0	0.2	0.2	1.1	1.4	0.8	0.5	0.5	0.5	0.4	0.3	0.1	0.2	1.0	0.1	0.6	0.3	0.0	0.0	0.4	1.4
7-Oct	0.0	Z	0.0	0.1	0.0	0.2	0.1	0.4	0.2	0.3	0.3	0.1	0.1	0.0	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4
8-Oct	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.2	0.5	0.5	0.4	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5
9-Oct	0.1	0.0	0.0	Z	0.0	0.4	1.2	0.8	0.2	0.4	0.8	1.3	0.4	0.1	0.1	0.1	1.4	0.1	0.0	0.0	0.0	1.3	0.0	0.0	0.4	1.4
10-Oct	0.0	0.0	0.2	0.4	Z	0.3	1.1	1.2	0.2	0.5	0.6	0.8	1.4	0.8	0.5	0.2	0.1	0.0	0.0	1.2	0.1	0.0	0.1	0.1	0.4	1.4
11-Oct	0.0	0.0	0.0	0.0	0.0	Z	0.5	0.9	1.5	0.2	0.7	1.4	1.4	0.6	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	0.4	1.8
12-Oct	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.6	0.7	0.7	0.7	0.3	0.3	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7
13-Oct	0.2	Z	0.6	5.2	0.1	0.1	0.0	0.0	0.2	0.2	0.3	0.4	0.4	0.7	0.6	0.2	0.3	0.0	0.1	0.1	0.4	0.1	0.0	0.4	5.2	
14-Oct	0.0	0.0	Z	0.0	0.1	0.0	0.1	0.1	0.5	0.2	0.4	1.4	0.3	0.2	0.1	0.1	0.1	0.0	1.7	0.0	0.1	0.0	0.0	0.0	0.2	1.7
15-Oct	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	1.3	1.8	5.4	3.8	1.3	1.9	0.7	0.6	0.2	0.1	0.0	0.0	0.2	0.2	0.2	0.1	0.8	5.4
16-Oct	0.0	0.1	0.0	0.0	Z	0.1	0.5	0.8	0.4	2.8	1.3	1.0	2.2	2.2	3.0	0.5	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.7	3.0
17-Oct	0.0	0.0	0.0	0.1	0.0	Z	9.1	0.0	0.0	1.3	3.9	0.4	0.3	4.4	5.1	12.1	7.6	0.1	0.0	0.1	0.1	0.1	0.1	0.3	2.0	12.1
18-Oct	Z	1.2	0.4	0.0	0.0	0.0	1.0	0.0	0.1	0.4	0.3	0.4	0.5	0.5	0.7	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.2
19-Oct	0.0	Z	0.0	0.0	0.0	0.6	0.0	0.0	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	0.0	0.1	0.6
20-Oct	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.2	0.1	0.2	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	0.1	0.1	1.1
21-Oct	0.2	0.0	0.5	Z	0.3	0.1	0.0	0.1	1.8	0.9	3.1	0.6	1.0	0.7	0.8	0.1	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	3.1
22-Oct	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	0.1	0.0	0.0	0.2	0.1	0.1	0.1	0.0	0.2
23-Oct	0.1	0.2	0.1	0.1	0.1	Z	0.3	0.1	0.1	0.4	0.5	0.4	0.6	0.5	0.1	0.3	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.6
24-Oct	Z	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.4	1.4	0.3	0.1	0.2	0.6	1.2	0.9	1.7	0.9	0.2	0.1	0.1	0.1	0.1	0.1	0.4	1.7
25-Oct	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.3	0.4	0.2	0.2	0.3	0.2	0.4	0.3	0.2	1.0	0.2	0.2	0.1	0.0	0.1	0.1	0.1	0.2	1.0
26-Oct	0.1	0.2	Z	0.1	0.0	0.1	0.1	0.2	0.2	0.1	0.2	0.1	0.2	0.3	0.3	0.4	0.2	0.2	0.1	0.3	6.0	0.2	0.2	0.1	0.4	6.0
27-Oct	0.1	0.1	0.1	Z	0.2	0.0	0.0	0.1	0.1	0.0	0.1	0.4	0.3	0.3	0.6	0.6	0.2	0.1	0.0	0.1	3.3	0.9	0.0	0.0	0.3	3.3
28-Oct	0.0	0.0	0.1	0.1	Z	0.2	0.0	0.2	0.2	0.2	0.2	0.8	0.6	0.3	0.5	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.2	0.8
29-Oct	0.0	0.0	0.0	0.1	0.0	Z	0.1	0.0	0.3	0.9	0.0	0.4	0.1	0.3	0.2	0.9	2.4	0.2	0.1	0.6	0.0	0.0	0.0	0.0	0.3	2.4
30-Oct	Z	0.0	0.0	0.3	0.7	1.8	0.1	0.6	1.4	0.8	0.5	0.6	0.2	0.1	0.1	0.1	0.0	0.1	0.2	0.6	0.2	0.0	0.1	0.0	0.4	1.8
31-Oct	0.1	Z	0.0	0.0	0.1	0.1	0.1	0.0	0.3	0.4	0.2	0.5	0.4	0.6	0.8	0.6	1.1	3.4	7.3	13.5	0.1	0.1	0.1	0.1	1.3	13.5
																								Diurnal Average		
																								Diurnal Maximum		
																								0.1 0.1 0.1 0.3 0.1 0.2 0.8 0.2 0.4 0.6 0.8 0.6 0.5 0.6 0.6 0.6 0.6 0.2 0.4 0.6 0.4 0.1 0.1 0.1		
																								0.2 1.2 0.6 5.2 0.7 1.8 9.3 1.2 1.8 2.8 5.4 3.8 2.2 4.4 5.1 12.1 7.6 3.4 7.3 13.5 6.0 1.3 0.2 1.8		
Z - zerospan C - Calibration																										



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Anzac - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Anzac - October 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
Anzac - October 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	6	1	5	6	52	160	56	39	23	21	42	113	108	41	30	5	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	6	1	5	6	52	160	56	39	23	21	42	113	108	41	30	5	708

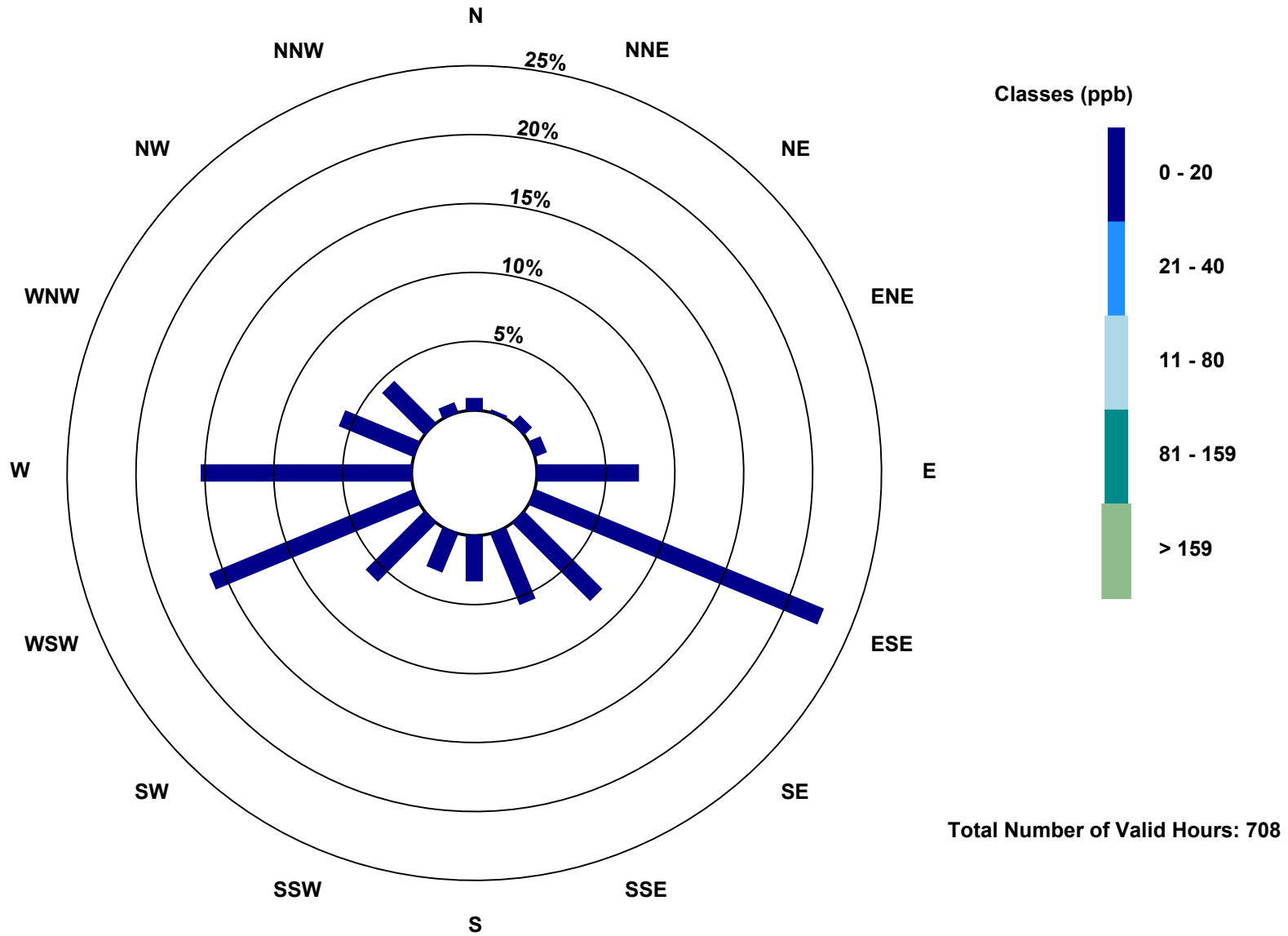
Total Number of Valid Hours: 708

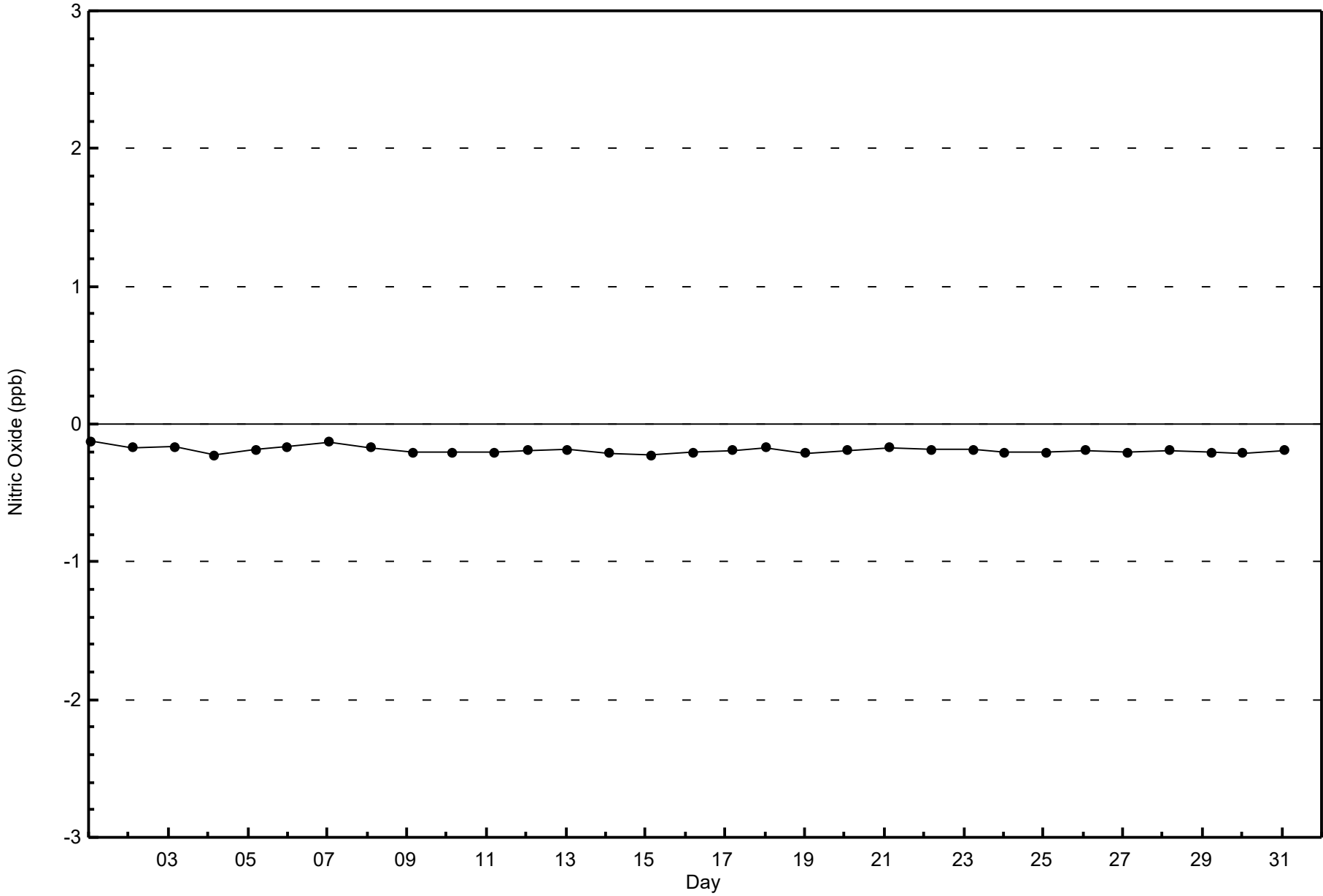
Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitric Oxide (NO) - ppb
Anzac

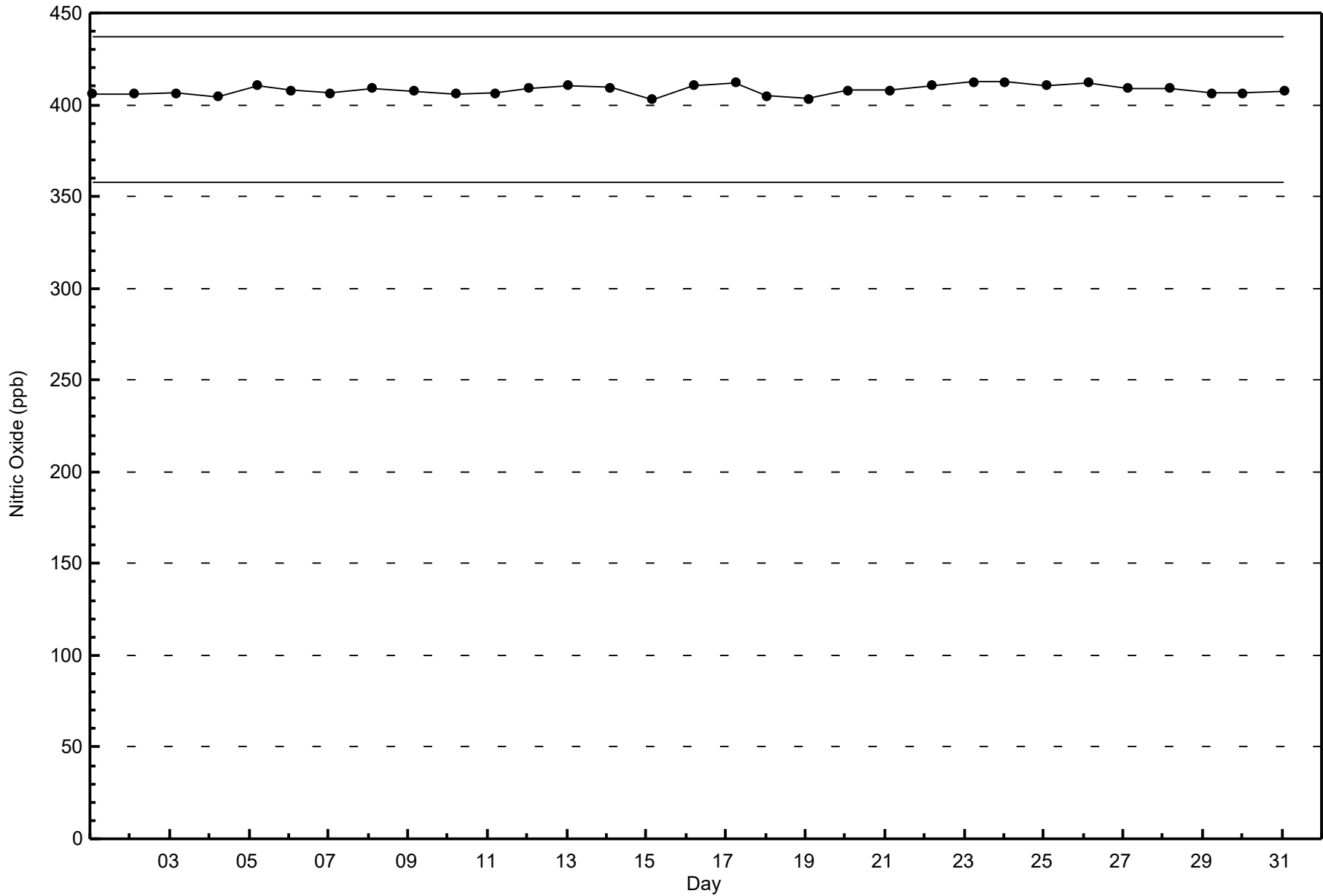






Wood Buffalo Environmental Association
Span Responses

Nitric Oxide (NO) - ppb
Anzac - October 2023





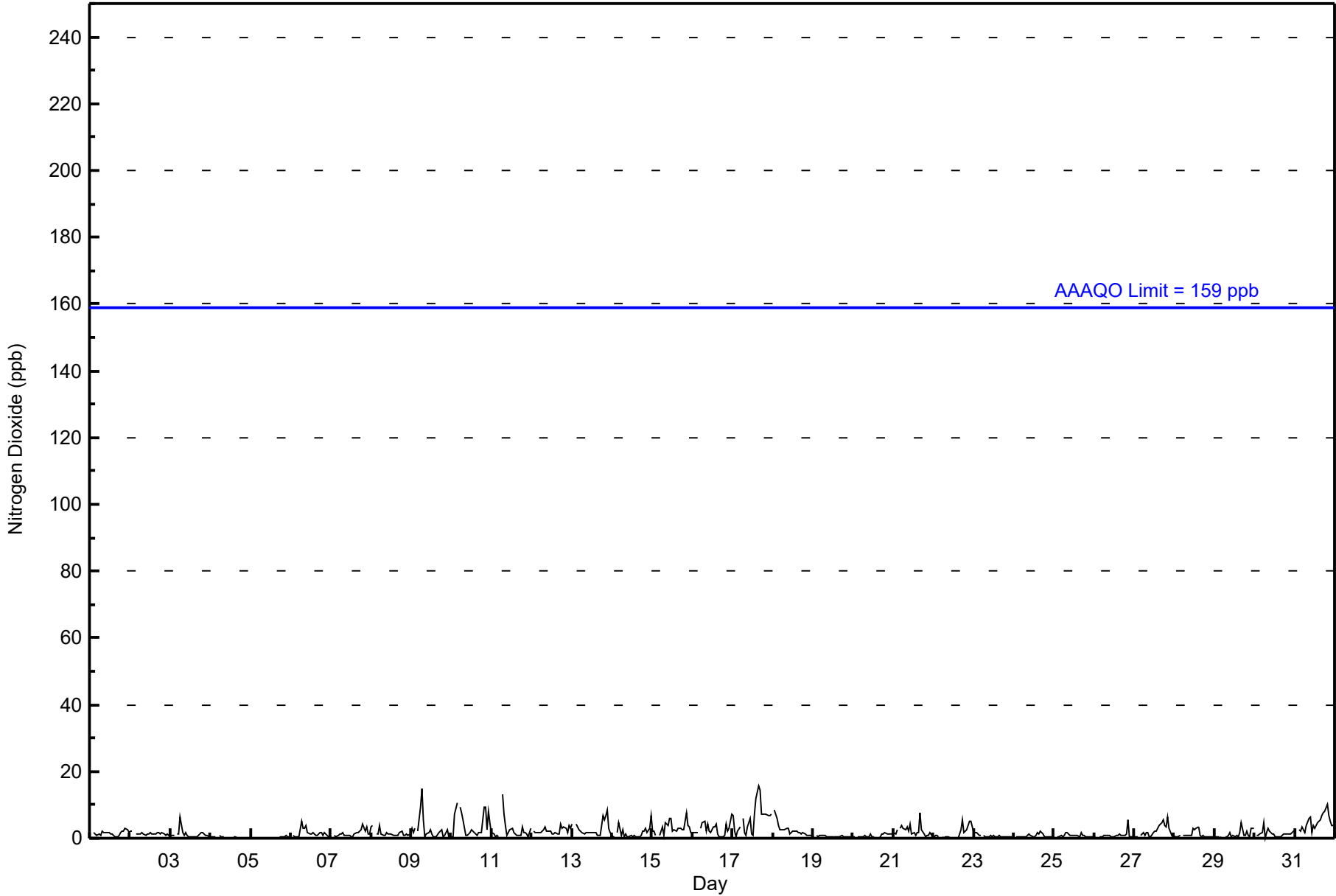
Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	744					
Maximum Value: 15.6 ppb on Oct 17 16:00		Maximum Daily Average: 5.8 ppb on Oct 17																			Hours of Data:	708					
Minimum Value: 0.0 ppb on Oct 5 00:00		Minimum Daily Average: 0.2 ppb on Oct 5																			Hours of Missing Data:	36					
Maximum Diurnal Average: 2.8 ppb at hour 7		Minimum Diurnal Average: 1.3 ppb at hour 13																			Hours of Calibration:	36					
Monthly Average: 1.84 ppb		Percentiles: P ₁ = 0.1 P ₁₀ = 0.4 Q ₁ = 0.6 Median = 1.2 Q ₃ = 2.2 P ₉₀ = 4.3 P ₉₉ = 9.3																			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-Oct	1.3	Z	1.5	1.1	1.0	1.2	1.0	2.0	1.8	1.5	1.9	1.5	1.4	1.4	0.8	0.6	0.6	0.9	1.6	2.3	2.2	3.0	2.5	1.5	1.5	3.0	
2-Oct	2.0	2.0	Z	1.3	1.2	1.2	1.4	1.9	1.3	1.0	1.1	1.4	1.7	1.2	1.4	1.2	1.8	1.6	1.3	1.5	1.3	1.0	1.2	1.0	1.4	2.0	
3-Oct	0.8	0.9	0.9	Z	1.2	1.3	6.4	1.6	0.8	1.5	0.8	0.6	0.3	0.4	0.4	0.5	0.5	0.8	1.5	1.8	1.1	0.9	0.7	0.4	1.1	6.4	
4-Oct	0.3	0.6	0.3	0.5	Z	0.7	0.5	0.3	0.6	C	C	C	C	C	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.3	0.7	
5-Oct	0.1	0.0	0.0	0.0	0.1	Z	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.4	0.3	1.0	0.6	0.5	0.2	1.0
6-Oct	Z	0.7	0.5	0.6	0.4	0.6	5.1	3.0	2.9	3.7	1.8	1.3	1.3	1.9	1.3	0.9	1.0	1.6	1.6	0.9	1.5	1.2	0.5	0.4	1.5	5.1	
7-Oct	0.4	Z	0.7	0.4	0.8	1.1	1.2	1.6	0.9	0.9	0.9	0.7	0.6	0.3	1.3	1.8	1.6	2.0	2.6	4.4	2.2	3.5	1.3	1.2	1.4	4.4	
8-Oct	3.2	3.9	Z	1.3	1.3	4.0	1.1	0.8	1.0	1.5	1.3	1.1	1.1	0.9	0.7	0.8	0.9	1.5	2.2	0.7	0.8	1.3	0.7	1.3	1.5	4.0	
9-Oct	3.0	1.5	2.9	Z	2.0	9.2	14.9	5.7	0.6	1.1	1.7	2.4	1.2	0.5	0.5	0.6	1.7	2.1	2.5	0.6	0.8	2.4	0.5	0.4	2.6	14.9	
10-Oct	0.4	0.4	7.2	10.8	Z	9.2	7.6	5.6	0.8	1.0	1.4	1.6	2.6	2.2	1.4	1.0	1.6	1.5	1.7	9.2	9.3	2.6	7.9	4.7	4.0	10.8	
11-Oct	1.5	1.3	0.6	0.7	0.6	Z	13.1	7.4	3.9	0.7	1.5	2.4	2.8	1.7	1.3	0.8	0.7	0.7	3.2	1.5	1.5	1.4	0.6	2.8	2.3	13.1	
12-Oct	Z	2.0	1.5	1.5	1.5	1.9	2.1	2.6	3.2	2.3	2.2	2.1	1.2	1.3	1.5	1.3	1.4	4.4	2.8	3.6	2.8	1.5	4.0	3.1	2.3	4.4	
13-Oct	4.2	Z	4.3	3.5	2.4	2.1	1.7	1.1	1.9	1.7	1.9	1.8	1.6	1.6	1.6	0.9	0.9	0.8	6.8	5.4	6.8	8.6	2.8	1.8	2.9	8.6	
14-Oct	0.6	0.6	Z	1.6	4.7	1.0	2.7	0.6	1.3	0.5	0.5	0.8	0.6	0.7	0.5	0.5	1.0	2.3	2.2	2.8	1.7	2.9	6.7	1.6	6.7		
15-Oct	2.0	2.1	0.8	Z	0.9	2.0	3.4	0.9	4.5	4.0	5.8	5.8	2.0	2.7	2.2	2.9	3.0	3.0	2.4	2.7	7.6	3.8	3.2	1.8	3.0	7.6	
16-Oct	1.8	1.8	1.7	1.6	Z	2.8	4.7	5.1	2.2	4.2	2.2	1.9	3.3	3.3	4.4	1.4	0.6	0.6	0.5	0.8	4.3	2.0	2.9	7.3	2.7	7.3	
17-Oct	6.9	2.3	0.4	2.0	3.2	Z	6.1	1.5	1.0	3.5	6.0	1.1	1.0	7.4	12.0	15.6	14.4	7.1	7.3	7.3	7.2	6.6	6.6	7.2	5.8	15.6	
18-Oct	Z	8.5	5.8	3.8	2.4	2.4	2.6	2.6	2.9	2.8	1.4	1.9	2.0	2.1	2.1	1.7	1.8	1.4	1.6	1.1	0.8	0.7	0.9	0.8	2.4	8.5	
19-Oct	0.6	Z	0.7	0.6	0.7	1.0	0.7	0.7	0.6	0.6	0.4	0.5	0.4	0.3	0.4	0.5	0.6	0.7	0.5	0.5	0.5	0.6	0.4	0.4	0.6	1.0	
20-Oct	0.5	0.5	Z	0.6	0.5	0.5	0.6	0.7	0.4	0.5	1.2	0.3	0.3	0.2	0.2	0.2	0.4	1.1	1.3	1.8	1.4	1.3	1.4	1.3	0.7	1.8	
21-Oct	1.8	1.1	2.7	Z	2.9	3.8	3.1	2.5	3.3	2.3	4.4	1.3	1.9	0.8	1.6	1.5	7.6	2.7	1.3	0.5	0.7	1.0	1.5	0.4	2.2	7.6	
22-Oct	0.6	0.7	0.8	0.6	Z	0.3	0.1	0.3	0.3	0.5	0.2	0.1	0.1	0.2	0.1	0.1	2.5	5.6	1.8	2.0	2.4	4.9	5.2	3.3	1.4	5.6	
23-Oct	1.9	1.7	1.6	0.7	0.7	Z	1.0	0.5	0.6	0.5	0.8	0.6	0.8	0.6	0.3	0.8	0.6	0.4	0.5	0.4	0.3	0.5	0.5	0.4	0.7	1.9	
24-Oct	Z	0.5	0.4	0.4	0.5	0.6	0.5	0.6	0.7	1.4	0.8	0.4	0.5	0.9	1.6	1.4	2.0	1.3	0.5	0.3	0.5	0.5	0.4	0.5	0.7	2.0	
25-Oct	0.4	Z	0.5	0.4	0.7	0.5	0.7	1.8	1.9	0.8	0.8	0.7	0.8	0.9	0.7	0.5	1.6	0.7	0.9	0.4	0.3	0.4	0.4	0.5	0.8	1.9	
26-Oct	0.4	0.5	Z	0.5	0.4	0.4	0.7	0.7	0.8	0.7	0.5	0.5	0.5	0.8	1.0	1.2	0.8	0.8	0.7	1.2	5.7	0.6	0.6	0.5	0.9	5.7	
27-Oct	0.5	0.5	0.5	Z	0.7	1.6	1.0	1.6	1.8	0.4	0.3	1.7	2.0	2.2	3.0	3.7	4.8	5.6	3.8	3.2	6.2	3.0	0.7	1.2	2.2	6.2	
28-Oct	0.6	0.4	0.4	0.8	Z	0.8	0.7	1.0	0.8	0.8	1.0	2.9	2.5	2.8	3.2	0.9	0.6	0.7	0.4	0.5	0.5	0.6	0.4	0.4	1.0	3.2	
29-Oct	0.4	0.4	0.3	0.2	0.3	Z	0.5	0.4	0.9	1.7	0.3	0.7	0.6	1.0	0.6	1.8	4.6	0.9	0.9	2.0	0.7	0.3	2.8	3.0	1.1	4.6	
30-Oct	Z	0.9	0.7	1.2	1.5	4.6	0.2	1.5	2.9	2.3	1.3	1.2	0.5	0.3	0.3	0.6	0.7	1.1	1.1	1.2	1.4	1.1	1.6	2.2	1.3	4.6	
31-Oct	2.3	Z	2.4	2.3	3.2	2.6	1.9	3.7	5.9	6.4	1.9	3.7	3.1	4.8	5.1	5.6	6.6	7.7	8.1	10.2	6.6	5.1	3.7	3.7	4.6	10.2	
																								Diurnal Average			
																								Diurnal Maximum			
																								1.5 3.0			
																								1.4 2.0			
																								1.1 6.4			
																								0.3 0.7			
																								0.2 1.0			
																								1.5 5.1			
																								1.4 4.4			
																								1.5 4.0			
																								2.6 14.9			
																								4.0 10.8			
																								2.3 13.1			
																								2.3 4.4			
																								2.9 8.6			
																								1.6 6.7			
																								3.0 7.6			
																								2.7 7.3			
																								5.8 15.6			
																								2.4 8.5			
																								0.6 1.0			
																								0.7 1.8			
																								2.2 7.6			
																								1.4 5.6			
																								0.7 1.9			
																								0.7 2.0			
																								0.8 1.9			
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																								2.2 6.2			
																								1.0 3.2			
																								1.1 4.6			
																								1.3 4.6			
																								4.6 10.2			
																								1.5 3.0			
																								6.9 8.5			
																								7.2 10.8			
																								4.7 9.2			
																								14.9 7.4			
																								5.9 6.4			
																								6.0 5.8			
																								3.3 7.4			
																								12.0 15.6			
																								14.4 7.7			
																								8.1 10.2			
																								9.3 8.6			
																								7.9 7.3			

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



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Anzac - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Anzac - October 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
Anzac - October 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	6	1	5	6	52	160	56	39	23	21	42	113	108	41	30	5	708
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	6	1	5	6	52	160	56	39	23	21	42	113	108	41	30	5	708

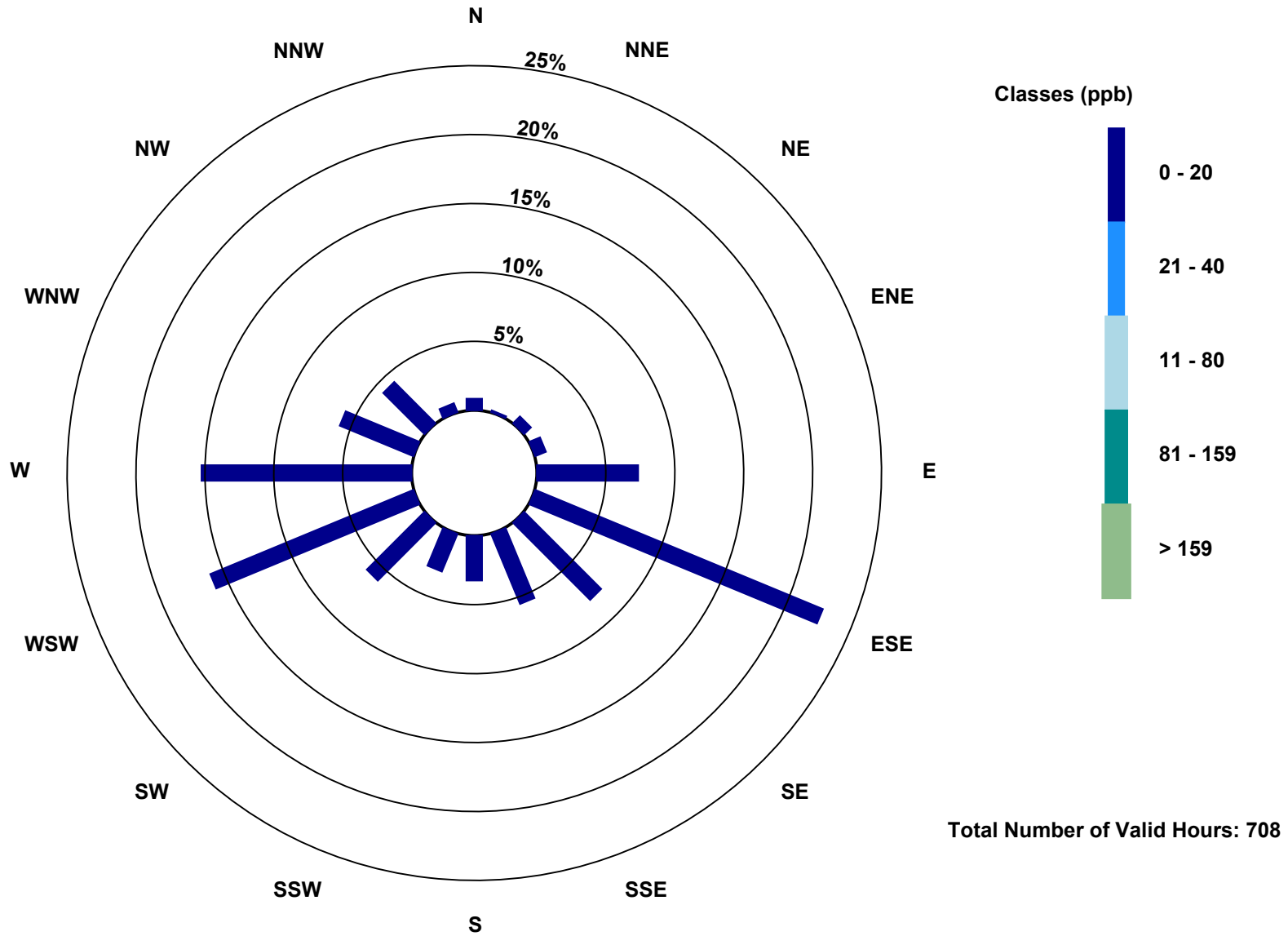
Total Number of Valid Hours: 708

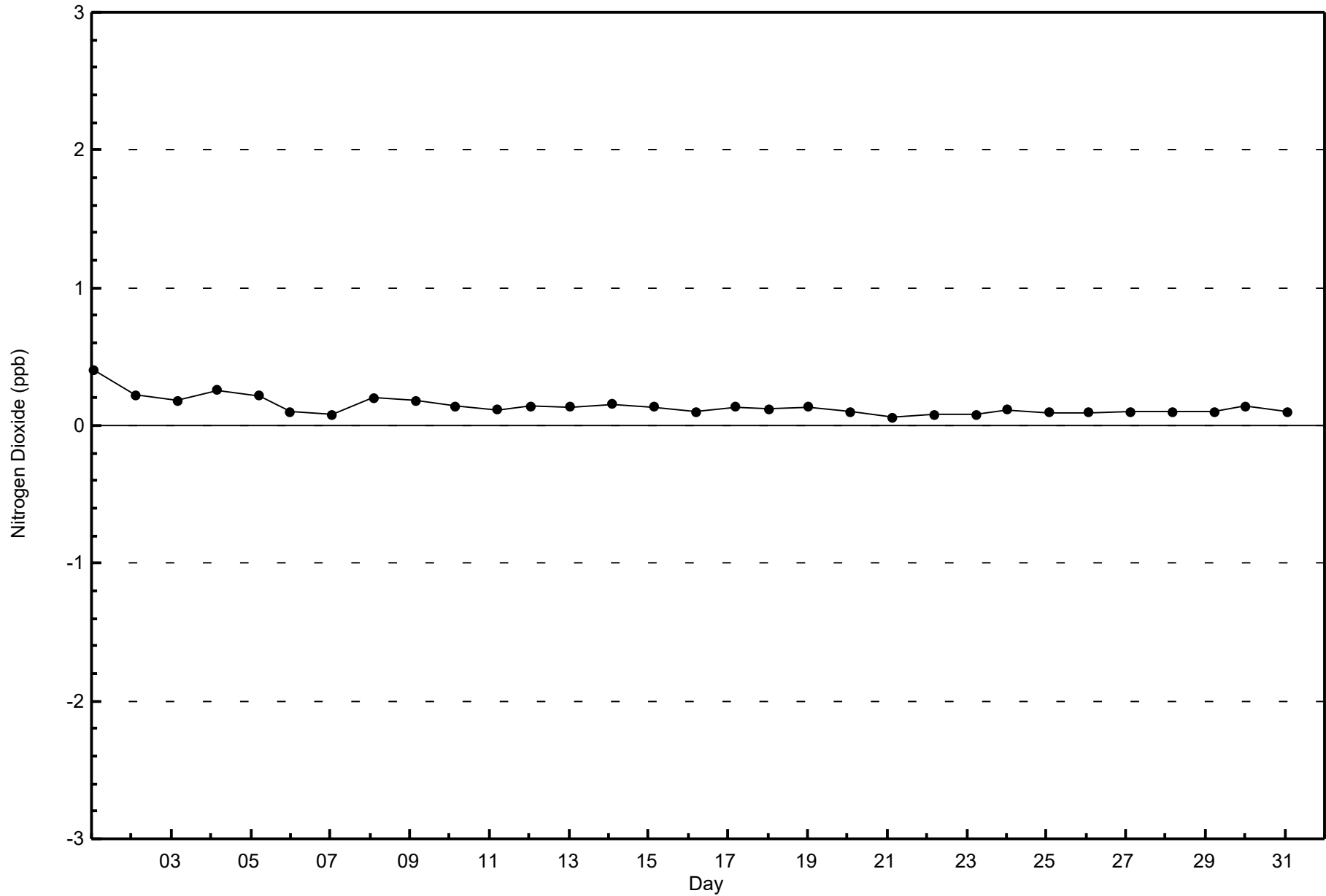
Total Number of Hours: 744

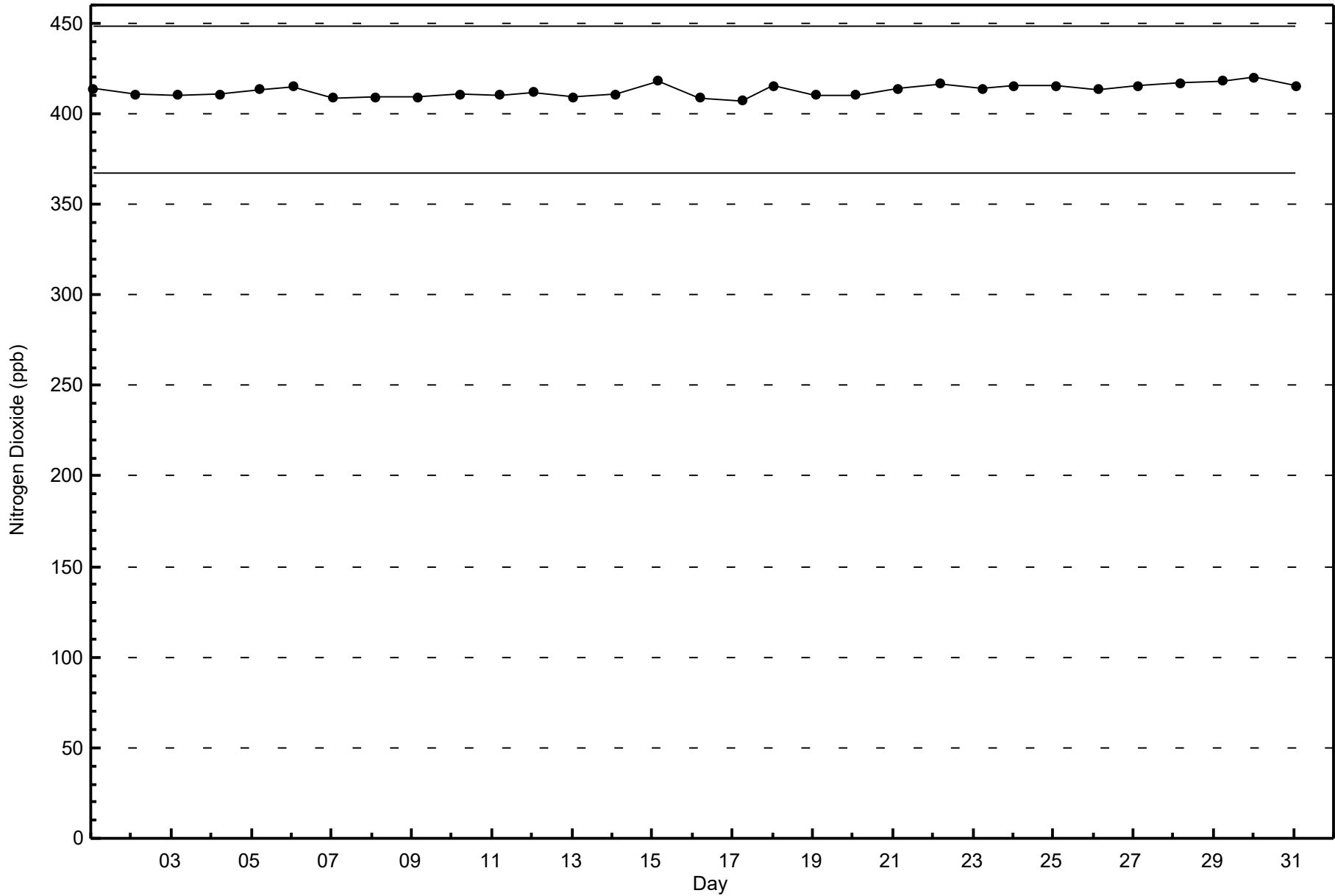


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitrogen Dioxide (NO₂) - ppb
Anzac









Wood Buffalo Environmental Association
Summary of Hour Averages

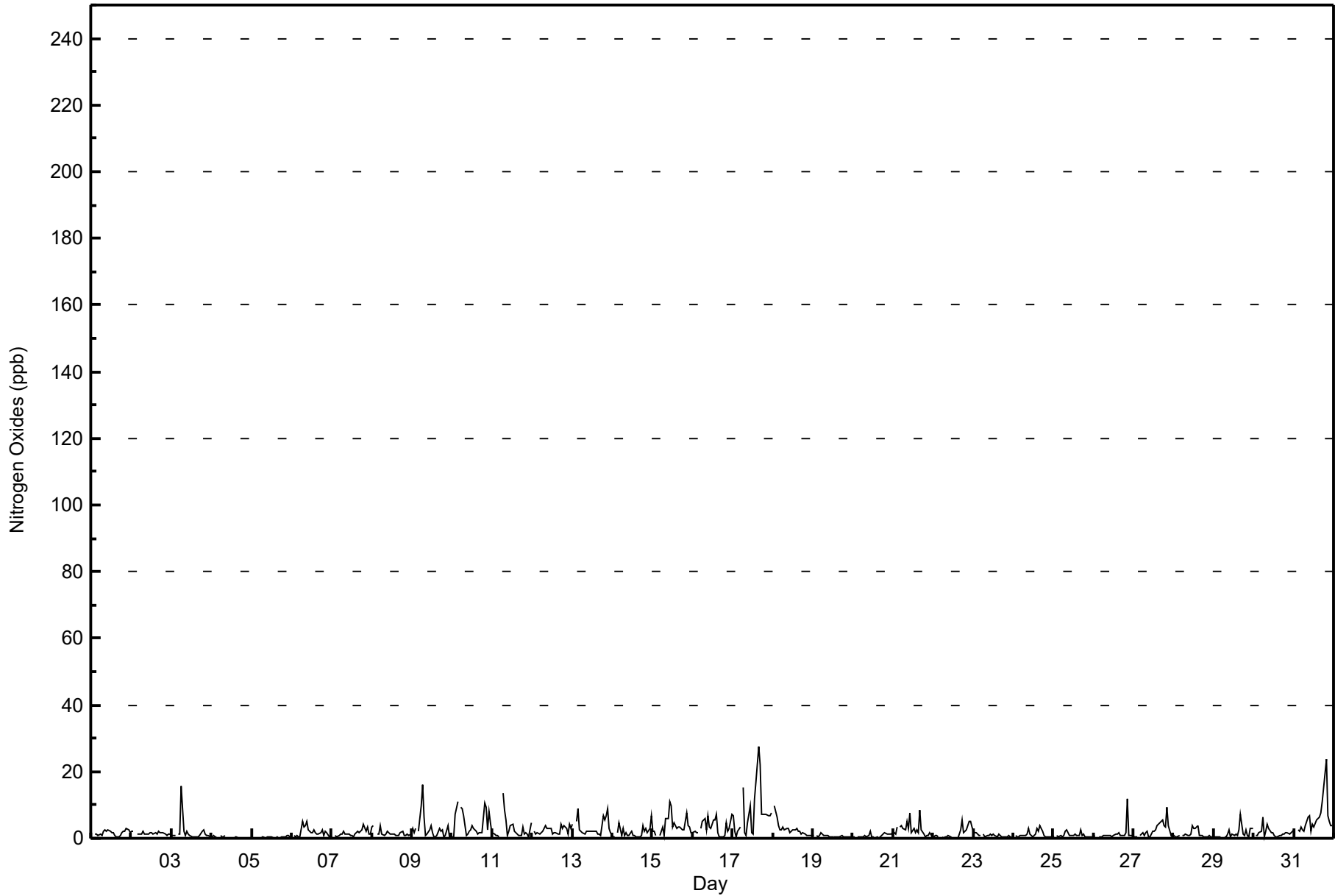
Nitrogen Oxides (NO_x) - ppb
Anzac - October 2023

Maximum Value: 27.7 ppb on Oct 17 16:00		Maximum Daily Average: 7.8 ppb on Oct 17		Hours in Service: 744																							
Minimum Value: 0.0 ppb on Oct 5 00:00		Minimum Daily Average: 0.3 ppb on Oct 5		Hours of Data: 708																							
Maximum Diurnal Average: 3.6 ppb at hour 7		Minimum Diurnal Average: 1.4 ppb at hour 5		Hours of Missing Data: 36																							
Monthly Average: 2.22 ppb		Percentiles: P ₁ = 0.1 P ₁₀ = 0.4 Q ₁ = 0.7 Median = 1.3 Q ₃ = 2.6 P ₉₀ = 5.1 P ₉₉ = 15.1		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-Oct	1.3	Z	1.5	1.1	1.0	1.2	1.0	2.2	2.4	2.1	2.4	2.1	1.7	1.7	1.0	0.6	0.6	0.9	1.6	2.3	2.2	3.0	2.5	1.5	1.7	3.0	
2-Oct	2.0	2.0	Z	1.4	1.2	1.2	1.4	2.0	1.3	1.1	1.2	1.6	1.9	1.4	1.6	1.3	2.1	1.7	1.6	1.7	1.3	1.0	1.2	1.2	1.5	2.1	
3-Oct	1.0	0.9	1.0	Z	1.2	1.4	15.7	2.0	0.9	2.0	1.1	0.7	0.4	0.5	0.5	0.6	0.6	0.9	2.0	2.6	1.2	1.0	0.8	0.4	1.7	15.7	
4-Oct	0.4	0.8	0.4	0.6	Z	0.8	0.6	0.4	0.7	C	C	C	C	C	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.3	0.8	
5-Oct	0.1	0.1	0.0	0.1	0.1	Z	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.4	0.6	0.3	1.1	0.6	0.6	0.3	1.1
6-Oct	Z	0.7	0.5	0.7	0.4	0.6	5.3	3.2	4.0	5.1	2.6	1.8	1.8	2.4	1.7	1.2	1.1	1.8	2.6	1.0	2.1	1.5	0.5	0.4	1.9	5.3	
7-Oct	0.4	Z	0.7	0.5	0.8	1.3	1.3	2.0	1.1	1.2	1.2	0.8	0.7	0.3	1.4	2.0	1.7	2.0	2.6	4.4	2.2	3.5	1.3	1.2	1.5	4.4	
8-Oct	3.2	3.9	Z	1.3	1.3	4.0	1.1	0.9	1.2	2.0	1.8	1.5	1.4	1.1	0.8	0.9	1.0	1.5	2.2	0.7	0.8	1.3	0.7	1.3	1.6	4.0	
9-Oct	3.1	1.5	2.9	Z	2.0	9.6	16.1	6.5	0.8	1.5	2.5	3.7	1.6	0.6	0.6	0.7	3.1	2.2	2.5	0.6	0.8	3.7	0.5	0.4	2.9	16.1	
10-Oct	0.4	0.4	7.4	11.2	Z	9.5	8.7	6.8	1.0	1.5	2.0	2.4	4.0	3.0	1.9	1.2	1.7	1.5	1.7	10.4	9.4	2.6	8.0	4.8	4.4	11.2	
11-Oct	1.5	1.3	0.6	0.7	0.6	Z	13.6	8.3	5.4	0.9	2.2	3.8	4.2	2.3	1.8	1.1	0.7	0.7	3.2	1.5	1.5	1.4	0.6	4.6	2.7	13.6	
12-Oct	Z	2.0	1.5	1.5	1.5	1.9	2.1	2.8	3.8	3.0	2.9	2.8	1.5	1.6	1.8	1.4	1.5	4.4	2.8	3.6	2.8	1.5	4.0	3.1	2.4	4.4	
13-Oct	4.4	Z	4.9	8.7	2.5	2.2	1.7	1.1	2.1	1.9	2.2	2.2	2.0	2.3	2.2	1.1	1.2	0.8	6.9	5.5	6.9	9.0	2.9	1.8	3.3	9.0	
14-Oct	0.6	0.6	Z	1.6	4.8	1.0	2.8	0.7	1.8	0.7	0.9	2.2	0.9	0.9	0.6	0.6	1.0	4.0	2.2	2.9	1.7	2.9	6.7	1.8	6.7		
15-Oct	2.0	2.1	0.8	Z	0.9	2.0	3.4	1.0	5.8	5.8	11.2	9.6	3.3	4.6	2.9	3.5	3.2	3.1	2.4	2.7	7.8	4.0	3.4	1.9	3.8	11.2	
16-Oct	1.8	1.9	1.7	1.6	Z	2.9	5.2	5.9	2.6	7.0	3.5	2.9	5.5	5.5	7.4	1.9	0.6	0.6	0.5	0.8	4.5	2.1	2.9	7.3	3.3	7.4	
17-Oct	6.9	2.3	0.4	2.1	3.2	Z	15.2	1.5	1.0	4.8	9.9	1.5	1.3	11.8	17.1	27.7	22.0	7.2	7.3	7.4	7.3	6.7	6.7	7.5	7.8	27.7	
18-Oct	Z	9.7	6.2	3.8	2.4	2.4	3.6	2.6	3.0	3.2	1.7	2.3	2.5	2.6	2.8	2.0	1.9	1.4	1.6	1.1	0.8	0.7	0.9	0.8	2.6	9.7	
19-Oct	0.6	Z	0.7	0.6	0.7	1.6	0.7	0.7	0.7	0.7	0.5	0.6	0.5	0.4	0.5	0.5	0.6	0.7	0.5	0.5	0.5	0.6	0.4	0.4	0.6	1.6	
20-Oct	0.5	0.5	Z	0.6	0.5	0.5	0.6	0.9	0.5	0.7	2.3	0.3	0.3	0.2	0.2	0.2	0.4	1.1	1.3	1.8	1.4	1.3	1.4	1.4	0.8	2.3	
21-Oct	2.0	1.1	3.2	Z	3.2	3.9	3.1	2.6	5.1	3.2	7.5	1.9	2.9	1.5	2.4	1.6	8.4	2.7	1.3	0.5	0.7	1.0	1.5	0.4	2.7	8.4	
22-Oct	0.6	0.7	0.8	0.6	Z	0.3	0.1	0.3	0.3	0.6	0.2	0.1	0.1	0.2	0.1	0.1	2.5	5.7	1.8	2.0	2.6	5.0	5.3	3.4	1.4	5.7	
23-Oct	2.0	1.9	1.7	0.8	0.8	Z	1.3	0.6	0.7	0.9	1.3	1.0	1.4	1.1	0.4	1.1	0.8	0.5	0.6	0.5	0.4	0.7	0.6	0.5	0.9	2.0	
24-Oct	Z	0.7	0.6	0.5	0.7	0.8	0.7	0.7	1.1	2.8	1.1	0.5	0.7	1.5	2.8	2.3	3.7	2.2	0.7	0.4	0.6	0.6	0.5	0.6	1.2	3.7	
25-Oct	0.5	Z	0.6	0.5	0.8	0.6	0.8	2.1	2.3	1.0	1.0	1.0	1.0	1.3	1.0	0.7	2.6	0.9	1.1	0.5	0.3	0.5	0.5	0.6	1.0	2.6	
26-Oct	0.5	0.7	Z	0.6	0.4	0.5	0.8	0.9	1.0	0.8	0.7	0.6	0.7	1.1	1.3	1.6	1.0	1.0	0.8	1.5	11.7	0.8	0.8	0.6	1.3	11.7	
27-Oct	0.6	0.6	0.6	Z	0.9	1.6	1.0	1.7	1.9	0.4	0.4	2.1	2.3	2.5	3.6	4.3	5.0	5.7	3.8	3.3	9.5	3.9	0.7	1.2	2.5	9.5	
28-Oct	0.6	0.4	0.5	0.9	Z	1.0	0.7	1.2	1.0	1.0	1.2	3.7	3.1	3.1	3.7	1.0	0.7	0.9	0.5	0.6	0.6	0.7	0.5	0.4	1.2	3.7	
29-Oct	0.4	0.4	0.3	0.3	0.3	Z	0.6	0.4	1.2	2.6	0.3	1.1	0.7	1.3	0.8	2.7	7.0	1.1	1.0	2.6	0.7	0.3	2.8	3.0	1.4	7.0	
30-Oct	Z	0.9	0.7	1.5	2.2	6.4	0.3	2.1	4.3	3.1	1.8	1.8	0.7	0.4	0.4	0.7	0.7	1.2	1.3	1.8	1.6	1.1	1.7	2.2	1.7	6.4	
31-Oct	2.4	Z	2.4	2.3	3.3	2.7	2.0	3.7	6.2	6.8	2.1	4.2	3.5	5.4	5.9	6.2	7.7	11.1	15.4	23.7	6.7	5.2	3.8	3.8	5.9	23.7	
		1.5	1.5	1.6	1.8	1.4	2.4	3.6	2.2	2.1	2.3	2.3	2.0	1.8	2.1	2.2	2.3	2.7	2.1	2.5	2.9	3.0	2.2	2.0	2.1	Diurnal Average	
		6.9	9.7	7.4	11.2	4.8	9.6	16.1	8.3	6.2	7.0	11.2	9.6	5.5	11.8	17.1	27.7	22.0	11.1	15.4	23.7	11.7	9.0	8.0	7.5	Diurnal Maximum	
Z - zerospan		C - Calibration																									



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Anzac - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Anzac - October 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	705	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: 708

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Anzac - October 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	6	1	5	6	52	160	56	39	23	20	42	111	108	41	30	5	705
21 - 40	0	0	0	0	0	0	0	0	0	1	0	2	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	6	1	5	6	52	160	56	39	23	21	42	113	108	41	30	5	708

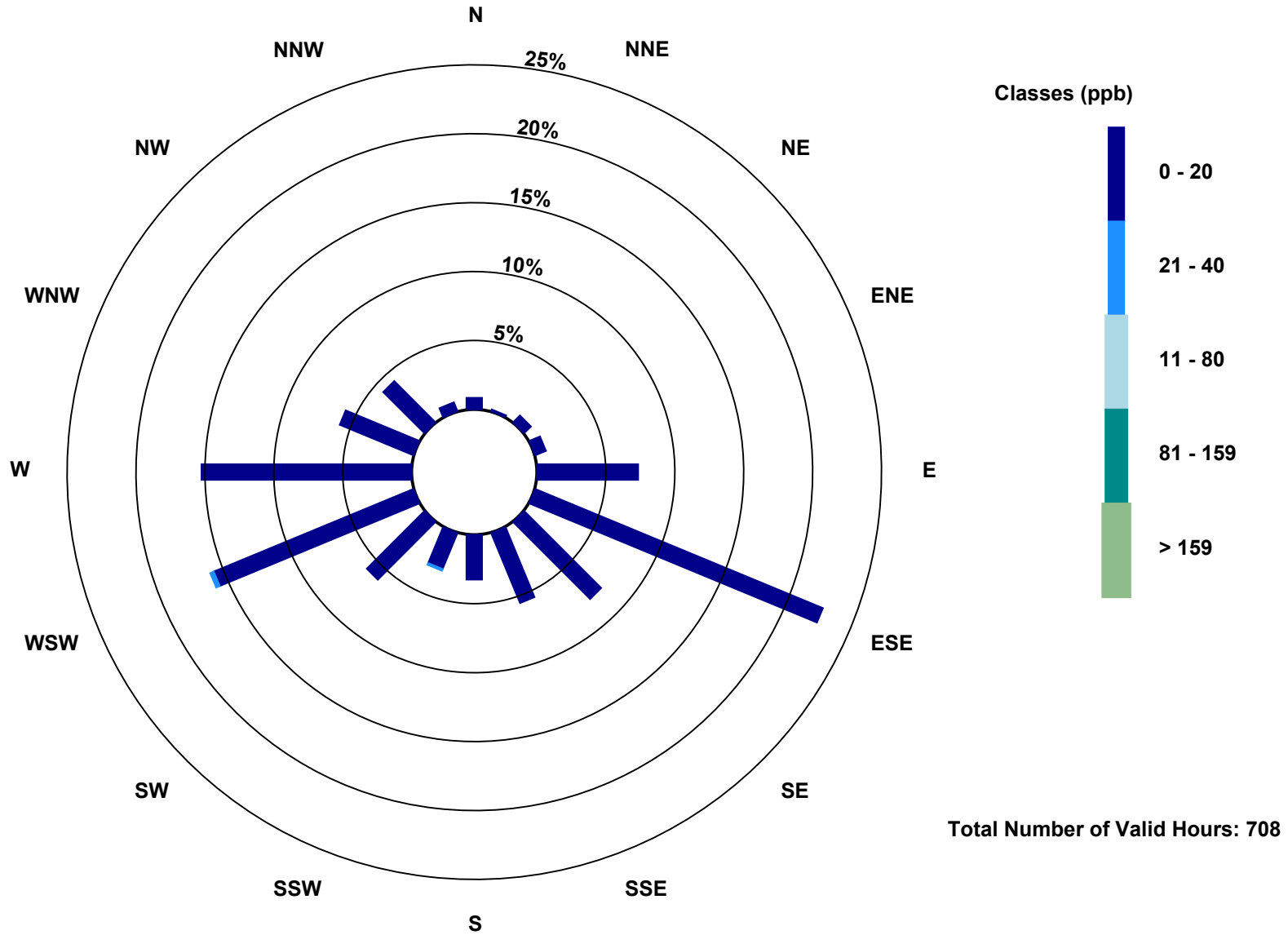
Total Number of Valid Hours: 708

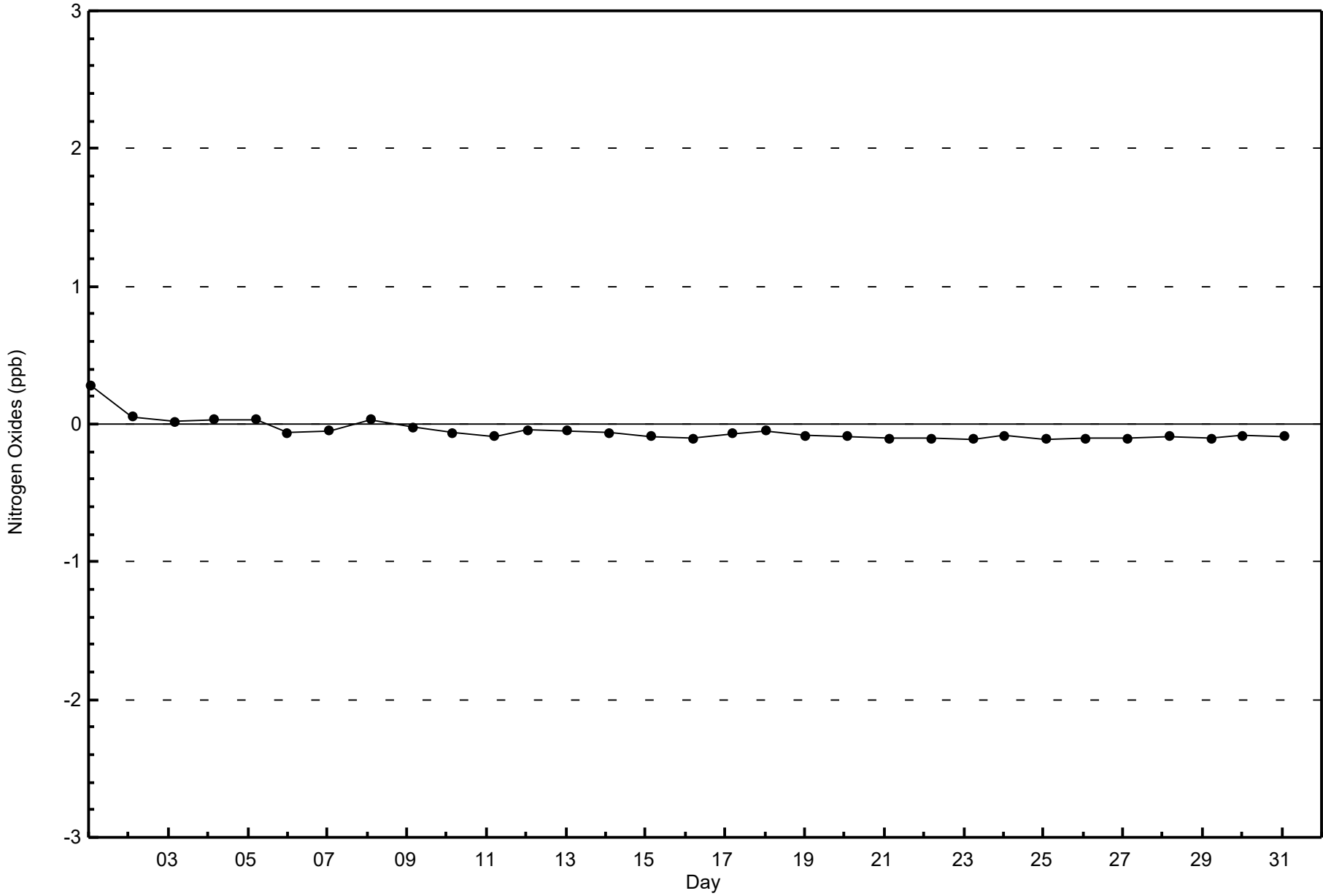
Total Number of Hours: 744

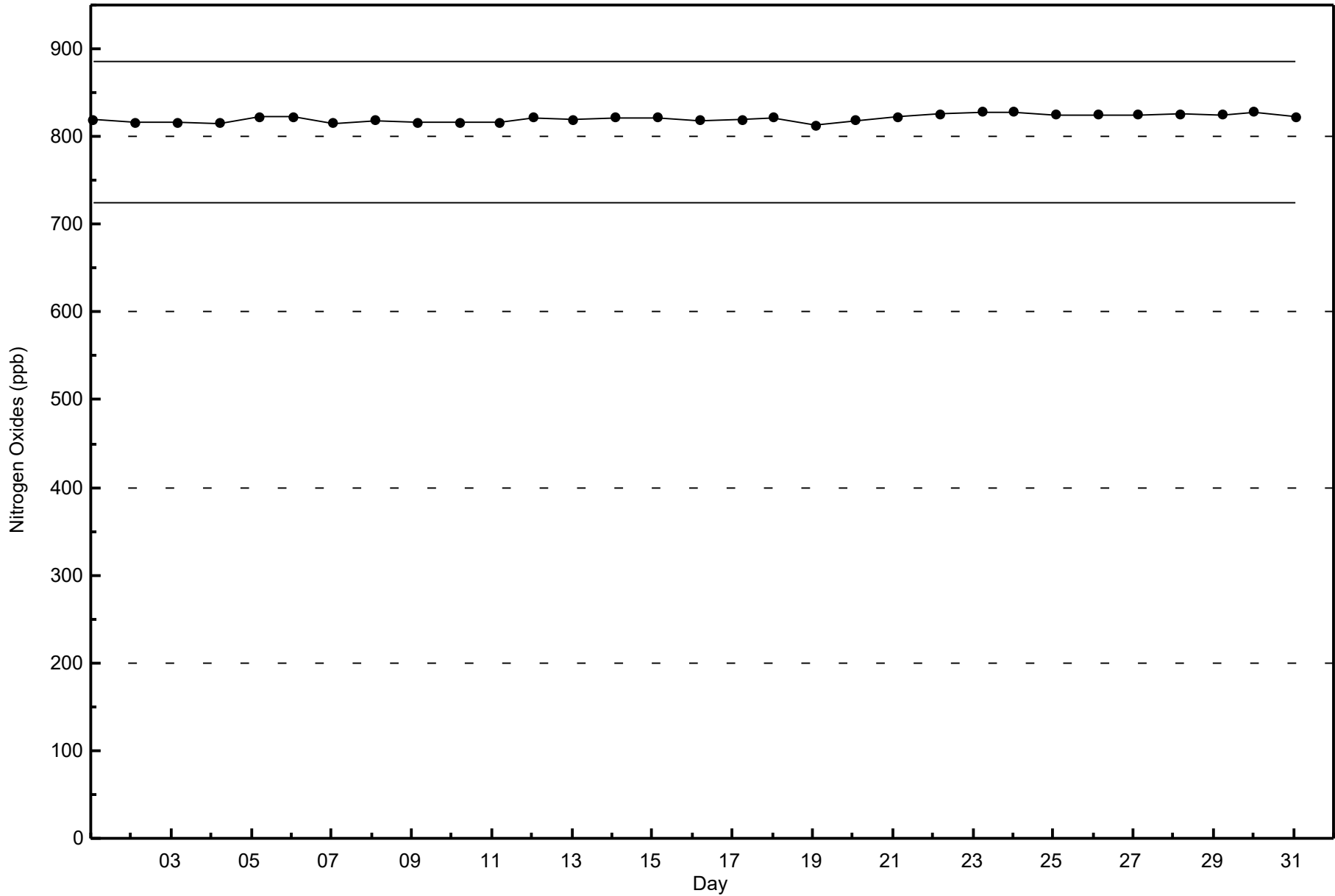


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitrogen Oxides (NO_x) - ppb
Anzac









Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O₃) - ppb

Anzac - October 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 42.6 ppb on Oct 12 17:00	Maximum Daily Average: 33.6 ppb on Oct 19		Hours of Data:	701
Minimum Value: 2.6 ppb on Oct 18 00:00	Minimum Daily Average: 16.9 ppb on Oct 2		Hours of Missing Data:	43
Maximum Diurnal Average: 28.8 ppb at hour 16	Minimum Diurnal Average: 21.4 ppb at hour 7		Hours of Calibration:	35
Monthly Average: 24.42 ppb	Percentiles: P ₁ = 4.8 P ₁₀ = 14.2 Q ₁ = 19.1 Median = 25.2 Q ₃ = 30.4 P ₉₀ = 33.5 P ₉₉ = 38.9		Percent Operational Time:	98.9

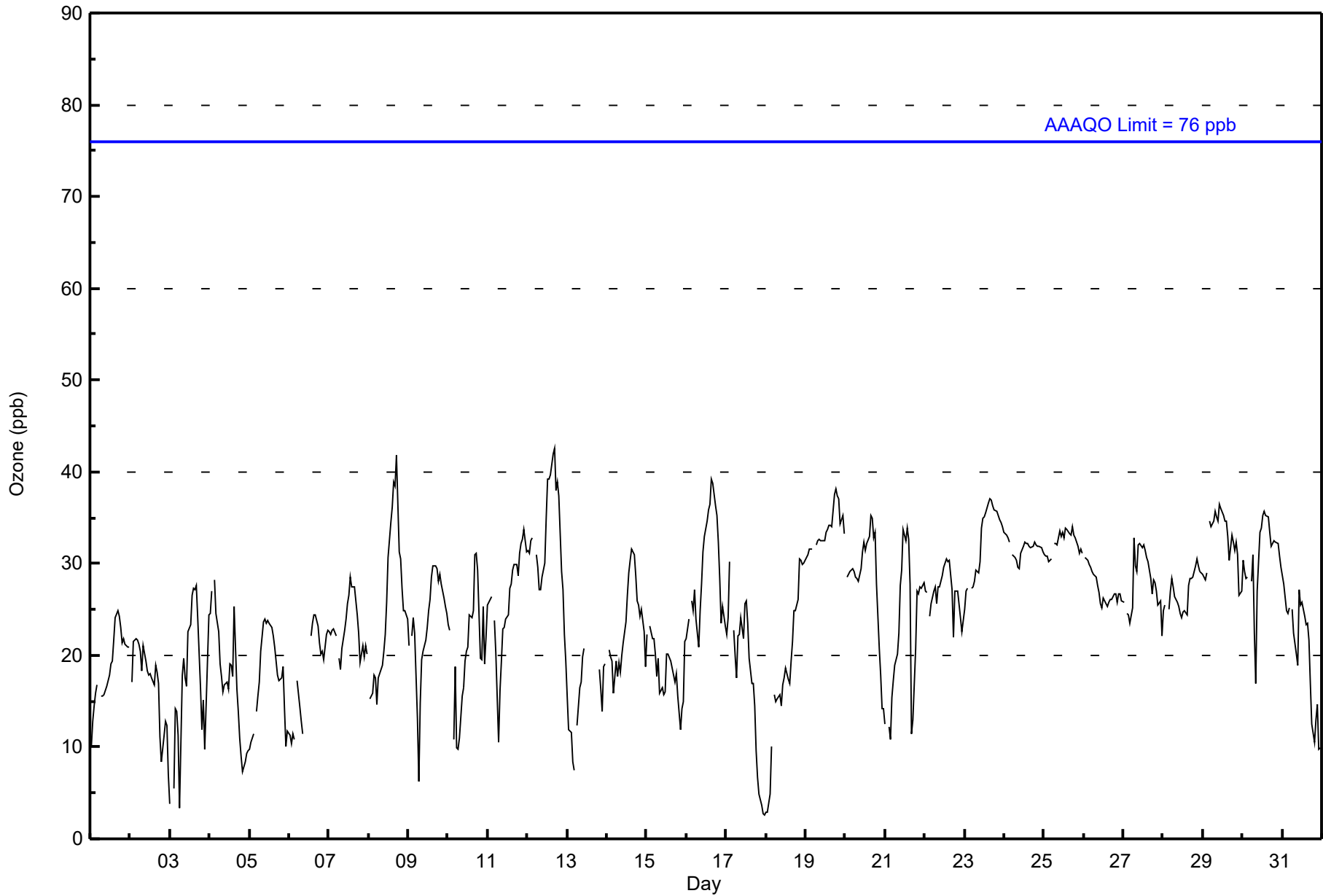
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Oct	10.1	12.8	14.5	15.9	16.9	Z	15.6	15.6	15.7	16.2	16.6	17.8	19.0	19.3	21.7	24.2	24.9	24.3	23.0	21.3	21.8	21.2	20.9	20.9	18.7	24.9																							
2-Oct	Z	17.1	21.5	21.8	21.6	21.2	20.4	18.4	21.1	19.4	18.3	17.8	17.9	17.5	16.8	18.9	18.1	17.0	11.1	8.3	11.3	12.9	12.3	7.1	16.9	21.8																							
3-Oct	3.8	Z	5.6	14.1	13.9	11.3	3.4	17.9	19.7	17.5	16.6	22.6	23.3	26.6	27.3	27.2	27.6	24.1	16.5	11.9	15.1	9.8	14.4	24.3	17.2	27.6																							
4-Oct	24.6	27.0	Z	28.3	24.6	22.5	19.0	17.7	16.0	16.7	17.0	16.4	19.1	18.9	17.7	25.3	16.4	13.9	11.0	9.0	7.3	8.3	9.3	9.6	17.2	28.3																							
5-Oct	9.8	10.6	11.4	Z	13.9	15.6	17.0	20.5	23.6	23.9	23.5	23.7	23.5	23.0	22.2	20.8	19.4	17.8	17.2	17.5	18.8	14.2	10.0	11.8	17.8	23.9																							
6-Oct	11.2	10.4	11.4	10.8	Z	17.3	14.3	12.8	11.4	C	C	C	C	22.1	23.5	24.4	24.4	23.2	21.4	20.2	20.4	19.6	22.3	22.7	18.1	24.4																							
7-Oct	22.6	22.2	22.7	22.9	22.1	Z	19.7	18.5	20.7	22.8	23.9	25.6	26.6	28.5	27.5	27.4	25.9	24.3	22.4	19.3	21.1	19.9	21.0	20.1	22.9	28.5																							
8-Oct	Z	15.3	15.8	17.8	17.6	14.7	17.5	18.4	19.0	20.4	22.3	25.7	30.7	34.5	36.1	38.9	38.5	41.8	31.3	30.6	27.3	24.9	24.9	23.9	25.6	41.8																							
9-Oct	21.0	Z	22.0	24.1	22.5	13.2	6.2	14.8	19.5	20.5	21.6	23.1	24.8	26.1	28.5	29.7	29.7	29.5	28.1	28.8	27.8	26.2	25.3	24.5	23.4	29.7																							
10-Oct	23.4	22.7	Z	10.9	18.8	10.0	9.8	11.0	15.5	16.4	19.4	20.4	20.9	24.3	24.2	24.8	30.9	31.1	29.3	19.6	19.5	25.3	19.0	21.9	20.4	31.1																							
11-Oct	25.4	26.1	26.4	Z	23.7	20.3	10.5	16.2	19.4	22.8	23.1	23.9	24.4	27.3	27.8	29.2	29.9	29.9	28.7	31.2	32.1	32.6	33.7	31.3	25.9	33.7																							
12-Oct	31.5	31.1	32.4	32.8	Z	30.9	29.6	27.1	27.2	28.5	30.0	34.9	39.2	39.2	39.7	42.0	42.6	38.0	38.9	37.3	29.2	27.2	22.2	19.3	32.6	42.6																							
13-Oct	15.6	11.9	11.7	8.4	7.4	Z	12.3	16.5	17.1	19.9	20.8	M	M	M	M	M	M	M	M	18.5	16.3	13.9	18.8	19.0	--	20.8																							
14-Oct	Z	20.7	19.8	19.4	15.8	19.4	17.7	19.3	18.1	20.0	21.3	23.6	26.5	28.9	30.4	31.6	31.0	28.7	26.0	25.5	24.2	25.0	22.6	18.7	23.2	31.6																							
15-Oct	22.2	Z	23.1	21.7	21.8	20.1	17.7	19.6	15.9	16.5	15.7	16.1	20.2	20.1	19.4	18.6	17.8	17.0	18.0	15.5	12.0	14.2	14.9	21.5	18.2	23.1																							
16-Oct	21.8	23.9	Z	26.0	24.9	27.1	23.9	20.9	24.8	27.8	31.2	32.9	34.6	35.9	36.5	39.1	38.7	36.2	35.3	32.3	28.3	23.6	25.4	23.2	29.3	39.1																							
17-Oct	22.3	24.1	30.2	Z	22.7	20.0	17.5	22.1	22.2	24.0	21.8	25.7	26.0	23.5	19.7	16.9	16.9	14.5	9.7	6.8	4.8	3.6	2.8	2.6	17.4	30.2																							
18-Oct	2.9	2.9	4.9	10.1	Z	15.7	15.0	15.3	15.6	14.5	16.8	17.6	18.7	17.4	16.9	19.3	21.6	24.9	24.8	26.1	30.4	30.4	29.9	30.1	18.3	30.4																							
19-Oct	30.6	31.0	31.5	31.5	31.6	Z	32.1	32.4	32.6	32.4	32.5	32.5	33.4	33.8	34.2	34.2	34.0	37.6	38.2	37.4	37.0	34.3	35.2	33.3	33.6	38.2																							
20-Oct	Z	28.5	28.8	29.2	29.4	29.2	28.6	28.4	28.1	29.4	31.2	32.4	31.4	32.1	32.9	35.3	35.0	32.8	33.4	27.7	20.7	17.9	14.2	14.2	28.3	35.3																							
21-Oct	12.5	Z	12.2	10.8	15.5	17.2	19.0	20.2	22.5	27.6	29.3	33.7	32.5	33.8	32.6	27.8	11.5	13.0	20.7	27.0	26.8	27.4	27.3	28.0	23.0	33.8																							
22-Oct	27.1	26.9	Z	24.2	25.6	27.0	27.5	25.7	27.4	27.5	28.7	29.6	30.1	30.4	30.2	30.4	27.1	22.0	27.0	27.0	24.0	22.5	23.8	26.9	26.9	30.4																							
23-Oct	25.1	27.0	27.4	Z	27.2	27.5	28.1	29.3	28.9	30.1	33.9	34.9	35.2	35.6	36.6	37.1	36.9	36.3	35.8	35.7	35.3	34.8	34.4	34.0	32.5	37.1																							
24-Oct	33.4	33.0	32.8	32.4	Z	31.0	30.7	30.3	29.6	29.4	31.1	31.8	32.3	32.2	32.2	31.8	31.7	31.9	32.3	32.1	31.9	31.8	31.7	31.3	31.7	33.4																							
25-Oct	30.9	30.8	30.8	30.3	30.5	Z	32.1	32.2	32.0	33.5	32.9	33.4	32.7	33.8	33.7	33.3	33.1	34.1	33.1	32.8	31.8	31.1	31.5	31.2	32.2	34.1																							
26-Oct	Z	30.7	30.4	29.8	29.6	29.1	28.8	28.6	27.6	26.9	25.6	25.2	26.2	25.6	25.3	25.8	26.1	26.0	26.7	26.8	25.7	26.8	26.7	26.0	27.2	30.7																							
27-Oct	25.8	Z	24.5	24.4	23.5	25.2	32.8	29.7	29.2	32.0	32.3	31.7	32.0	31.5	30.7	30.2	28.4	26.7	28.2	27.9	27.0	25.5	26.0	22.1	28.1	32.8																							
28-Oct	24.8	25.5	Z	25.0	27.1	28.4	27.4	26.5	25.8	25.3	24.6	24.1	24.8	24.9	24.3	27.6	28.4	28.4	28.6	29.8	30.4	29.7	29.1	29.0	26.9	30.4																							
29-Oct	28.8	28.2	29.0	Z	34.6	34.0	34.6	35.7	35.1	34.7	36.4	36.0	35.3	34.6	34.6	32.9	30.3	33.1	32.3	31.5	32.4	31.0	26.5	27.1	32.5	36.4																							
30-Oct	30.3	29.1	28.3	28.5	Z	28.0	30.9	22.4	16.9	27.0	33.5	33.9	35.2	35.7	35.2	35.1	33.4	31.9	32.2	32.5	32.3	32.2	30.8	29.5	30.7	35.7																							
31-Oct	28.7	27.7	24.9	24.6	25.2	Z	24.9	22.4	20.1	19.0	27.2	25.5	25.8	24.2	23.4	23.5	21.7	17.0	12.6	10.5	12.9	14.6	9.8	9.9	20.7	28.7																							
																								21.8	23.0	22.1	22.1	22.6	22.2	21.4	22.1	22.5	24.1	25.3	26.6	27.7	28.0	28.1	28.8	27.7	26.9	25.8	24.5	23.8	23.0	22.4	22.3	Diurnal Average	
																								33.4	33.0	32.8	32.8	34.6	34.0	34.6	35.7	35.1	34.7	36.4	36.0	39.2	39.2	39.7	42.0	42.6	41.8	38.9	37.4	37.0	34.8	35.2	34.0	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
Anzac - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ozone (O₃) - ppb
Anzac - October 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	214	30.53	30.53
21 - 50	487	69.47	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 701

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Ozone (O₃) - ppb
Anzac - October 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	0	0	0	3	23	63	31	19	9	9	4	14	28	8	3	0	214
21 - 50	6	1	5	3	26	90	25	18	14	10	37	102	85	33	25	7	487
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	6	1	5	6	49	153	56	37	23	19	41	116	113	41	28	7	701

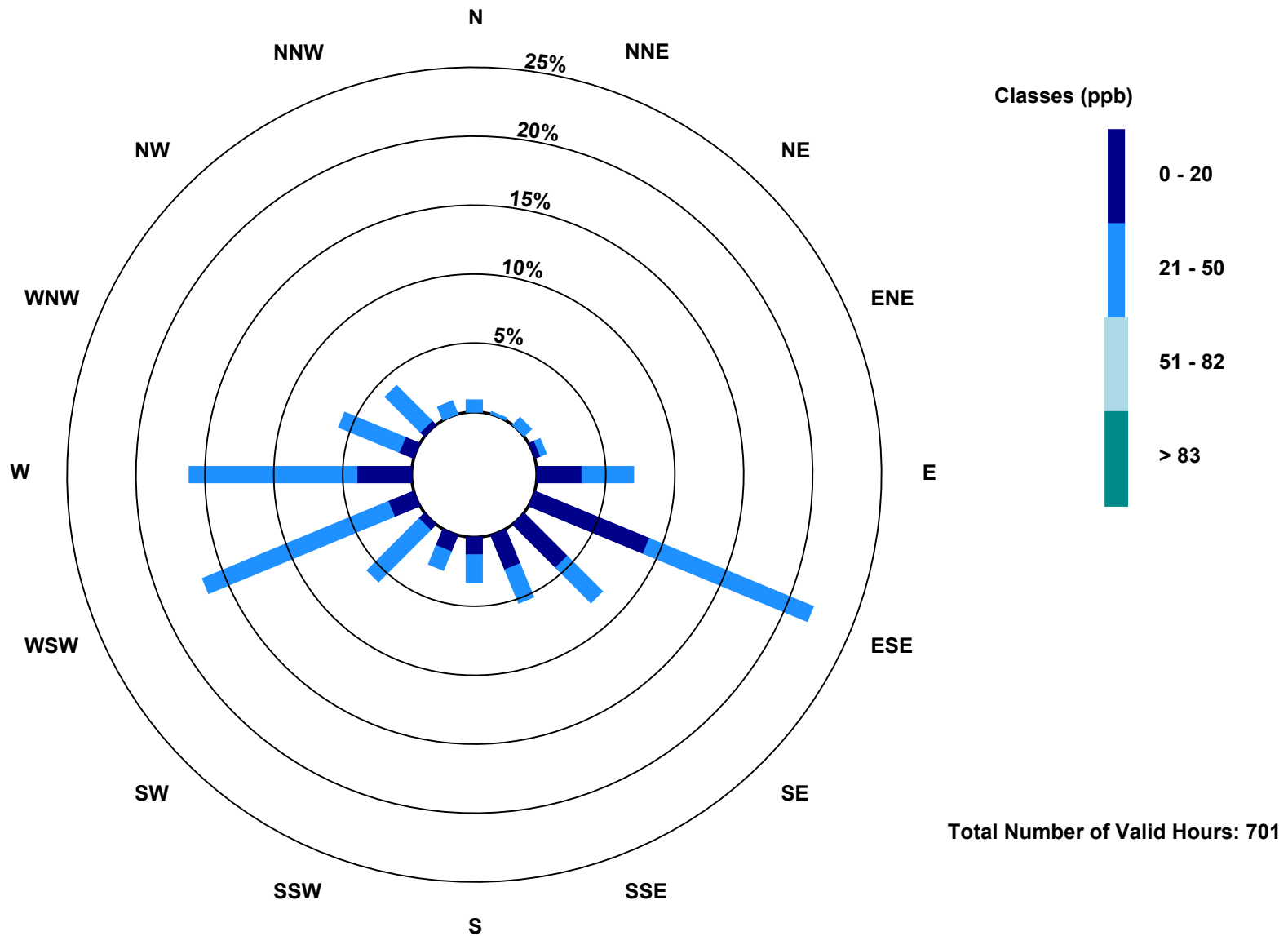
Total Number of Valid Hours: 701

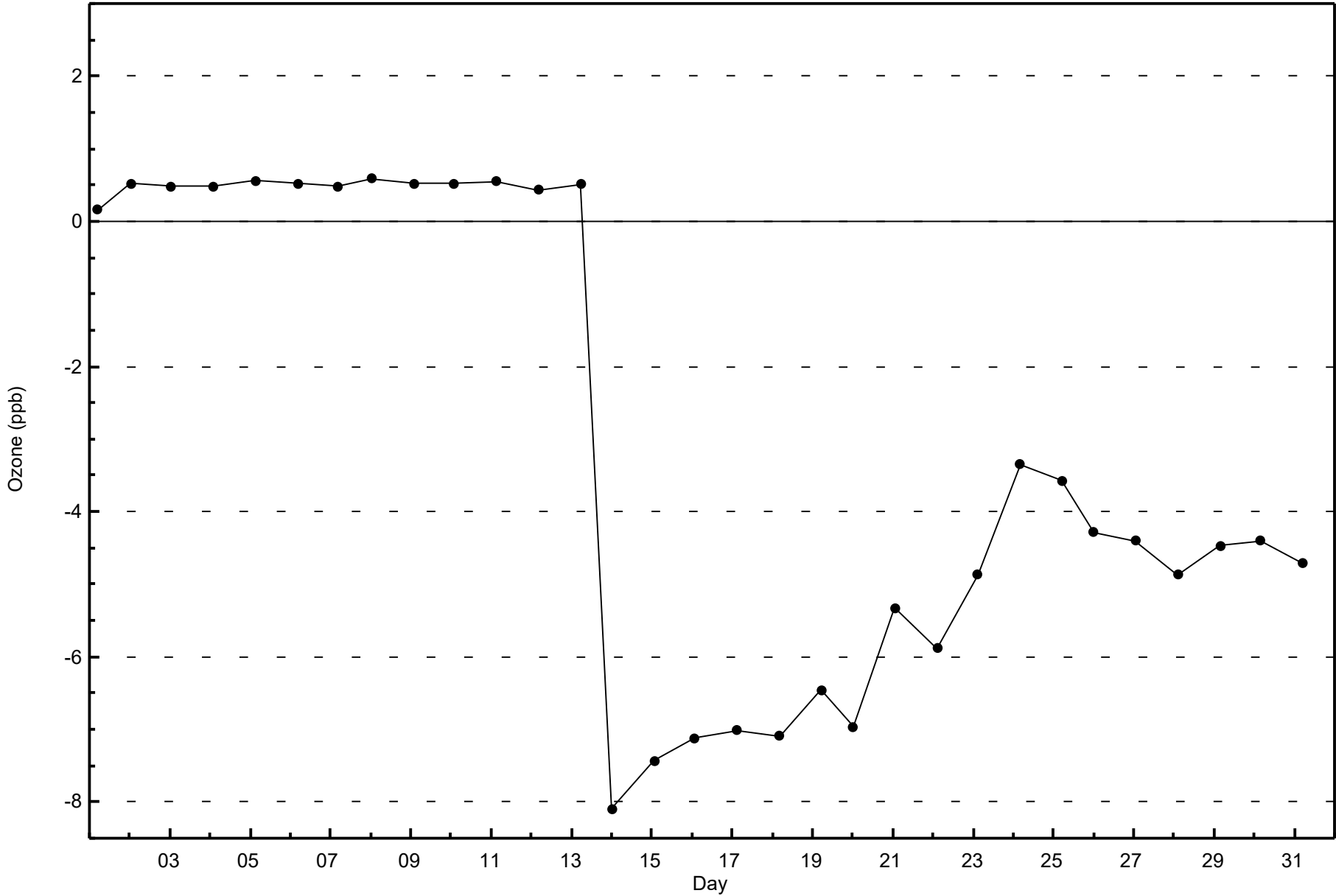
Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

Ozone (O₃) - ppb
Anzac

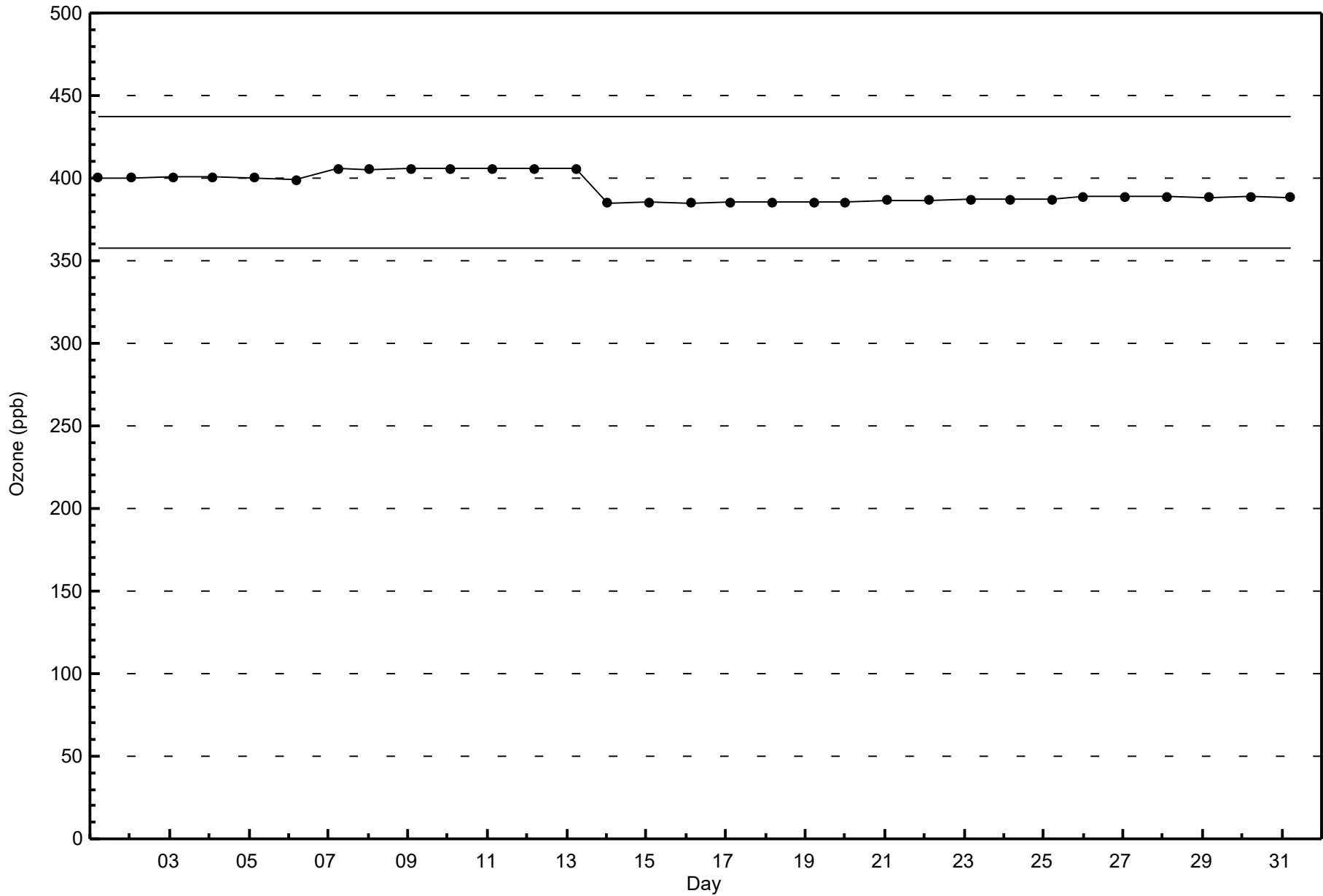






Wood Buffalo Environmental Association
Span Responses

Ozone (O₃) - ppb
Anzac - October 2023

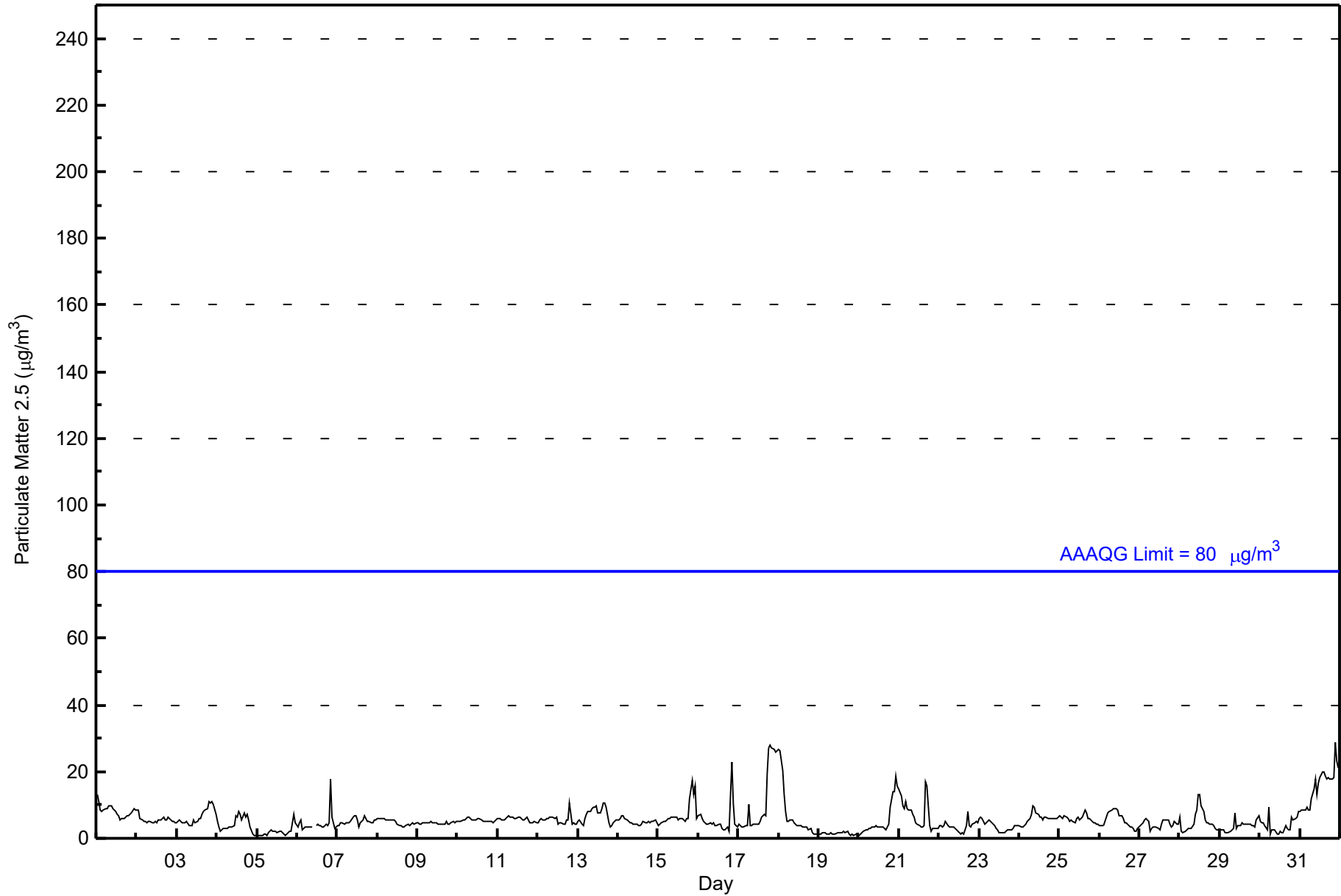




Summary of Hour Averages

Anzac - October 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 744														Daily Average		Daily Maximum																																																	
Maximum Value: 28.9 µg/m ³ on Oct 31 22:00		Maximum Daily Average: 15.6 µg/m ³ on Oct 31		Hours of Data: 743														Hours of Missing Data: 1		Hours of Calibration: 1																																																			
Minimum Value: 0.7 µg/m ³ on Oct 5 04:00		Minimum Daily Average: 1.4 µg/m ³ on Oct 19		Hours of Calibration: 1														Percent Operational Time: 100.0																																																					
Maximum Diurnal Average: 7.3 µg/m ³ at hour 21		Minimum Diurnal Average: 4.9 µg/m ³ at hour 4		Percentiles: P ₁ = 1.0 P ₁₀ = 2.2 Q ₁ = 3.6 Median = 4.8 Q ₃ = 6.2 P ₉₀ = 9.0 P ₉₉ = 26.1																																																																			
Monthly Average: 5.65 µg/m ³																																																																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																																													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																																															
1-Oct	13.1	10.9	8.7	8.2	8.3	8.8	9.0	9.6	9.7	9.7	9.0	7.9	7.2	6.6	5.6	5.8	6.0	6.3	6.9	6.8	7.1	7.7	8.9	8.6	8.2	13.1																																													
2-Oct	8.4	8.3	5.9	5.5	5.1	4.9	4.7	5.0	5.0	4.8	4.8	4.9	4.8	5.4	5.5	5.9	6.3	5.7	5.6	6.4	5.3	5.0	4.9	4.9	5.5	8.4																																													
3-Oct	4.8	5.4	5.2	4.6	4.8	4.6	5.1	4.0	3.6	3.8	5.7	4.8	5.2	5.8	6.1	7.4	8.2	8.4	8.9	11.0	10.4	11.0	10.3	7.0	6.5	11.0																																													
4-Oct	5.0	3.5	2.3	2.6	2.9	3.0	3.1	3.2	3.2	3.4	4.0	6.7	6.6	8.2	7.3	5.5	7.8	6.3	7.2	5.4	3.5	1.2	0.7	0.7	4.3	8.2																																													
5-Oct	1.0	1.0	0.7	0.7	1.4	1.1	0.8	1.7	2.3	2.1	2.3	2.2	1.8	2.0	2.0	1.7	1.1	1.0	1.3	2.2	2.1	4.5	7.3	4.9	2.0	7.3																																													
6-Oct	3.3	4.7	5.4	2.7	3.2	3.3	3.5	3.3	3.5	3.4	C	4.0	4.3	4.0	3.6	3.4	3.5	4.4	3.9	4.6	17.8	6.2	3.0	3.3	4.4	17.8																																													
7-Oct	3.9	4.0	4.6	4.7	4.4	4.7	4.6	4.8	5.0	6.2	7.0	6.9	5.5	3.3	4.5	5.7	6.7	6.0	5.2	5.0	4.7	4.8	5.3	5.6	5.1	7.0																																													
8-Oct	6.0	5.9	6.0	6.1	6.0	5.7	5.7	5.6	5.5	5.5	5.4	4.9	4.4	4.0	3.7	3.4	3.5	3.8	4.4	3.8	4.3	4.5	4.4	4.6	4.9	6.1																																													
9-Oct	4.8	4.4	4.4	4.6	4.6	4.6	4.6	4.8	4.9	4.7	4.7	4.5	4.4	4.3	4.2	4.2	4.4	5.1	4.4	4.3	4.5	5.0	4.8	4.9	4.6	5.1																																													
10-Oct	4.9	5.0	5.1	5.4	5.5	5.8	6.4	6.6	5.7	5.6	5.6	5.6	5.8	6.1	5.5	5.2	5.2	5.1	5.0	5.0	4.9	4.9	5.1	5.7	5.4	6.6																																													
11-Oct	5.8	5.9	5.5	5.5	5.6	5.9	6.6	6.5	6.3	6.3	6.0	6.0	6.2	6.4	6.1	5.6	5.5	6.2	5.3	4.5	4.5	4.8	5.3	4.8	5.7	6.6																																													
12-Oct	4.6	5.4	5.7	5.4	5.5	5.9	6.1	6.3	6.5	6.2	6.1	6.2	4.3	4.6	4.5	4.1	4.2	5.3	5.5	10.7	4.4	4.5	4.2	4.4	5.4	10.7																																													
13-Oct	5.0	5.4	4.3	3.8	5.8	7.1	8.1	7.9	8.7	9.3	9.2	9.6	7.7	7.5	9.1	10.5	10.5	9.2	4.6	3.6	3.9	4.6	5.0	5.3	6.9	10.5																																													
14-Oct	5.7	6.1	6.7	6.6	6.1	5.4	5.0	4.8	4.6	4.4	4.3	4.1	3.9	3.8	4.3	4.9	4.8	4.8	4.9	4.7	5.0	4.9	5.3	4.5	5.0	6.7																																													
15-Oct	3.9	4.2	4.8	5.2	5.2	5.6	5.9	6.0	6.2	6.4	6.3	6.3	5.5	5.8	5.8	5.7	5.2	6.0	6.0	11.9	17.2	13.1	15.7	5.9	7.1	17.2																																													
16-Oct	6.7	7.0	5.9	4.9	4.5	4.2	4.3	4.6	4.3	4.7	3.8	3.9	4.1	4.3	2.9	2.4	2.5	3.3	2.3	12.9	22.8	10.4	4.3	3.6	5.6	22.8																																													
17-Oct	4.2	3.7	3.2	3.4	3.7	3.8	10.2	3.7	3.8	4.4	4.4	4.3	4.2	5.2	6.6	7.1	7.0	19.4	27.2	28.0	27.3	26.8	26.0	26.2	11.0	28.0																																													
18-Oct	26.6	26.3	20.2	13.3	7.9	5.3	4.9	5.6	5.3	4.9	4.4	3.9	3.6	3.6	3.5	3.3	3.6	3.2	2.7	2.8	1.7	1.4	1.3	1.1	6.7	26.6																																													
19-Oct	1.2	1.4	1.6	1.6	1.5	1.3	1.4	1.5	1.3	1.4	1.4	1.5	1.7	1.6	1.6	2.0	1.6	2.2	1.4	1.0	1.1	0.9	1.1	1.0	1.4	2.2																																													
20-Oct	1.0	1.4	1.8	2.3	2.5	2.6	2.8	3.1	3.2	3.4	3.7	3.5	3.3	3.2	3.6	2.8	2.5	3.6	4.2	9.1	14.0	13.9	18.8	15.5	5.2	18.8																																													
21-Oct	14.7	12.5	9.6	9.0	11.1	8.9	8.4	8.4	7.4	6.3	4.8	4.3	3.9	3.4	3.6	4.0	16.8	15.5	4.0	2.2	2.9	3.0	2.9	3.0	7.1	16.8																																													
22-Oct	3.7	3.6	3.3	3.7	5.2	3.8	3.2	3.3	3.3	3.2	2.7	1.9	1.6	1.3	1.5	1.5	3.7	8.0	3.9	3.5	4.2	4.6	4.9	4.8	3.5	8.0																																													
23-Oct	6.0	6.5	6.1	4.4	4.8	4.9	5.5	5.1	4.3	3.7	3.0	2.4	1.8	1.7	1.9	1.9	2.7	2.7	2.5	3.1	3.7	3.7	4.0	3.7	6.5																																														
24-Oct	4.0	3.6	3.6	3.8	4.4	5.0	6.0	7.3	9.7	9.5	7.8	7.3	6.5	6.4	5.5	6.5	6.2	5.9	5.9	5.8	6.1	5.7	5.9	6.4	6.0	9.7																																													
25-Oct	6.6	6.3	6.1	6.7	6.4	6.0	5.3	5.5	5.3	4.7	6.1	6.4	5.7	6.0	6.4	8.5	7.8	5.9	5.8	5.3	4.9	4.7	4.4	4.1	5.9	8.5																																													
26-Oct	4.0	3.7	3.9	5.0	6.5	7.7	7.9	8.5	8.9	8.8	9.0	8.4	7.0	6.8	6.1	4.8	4.5	4.2	3.3	3.3	3.0	2.3	2.0	3.0	5.5	9.0																																													
27-Oct	3.7	4.1	4.6	5.3	5.9	5.0	2.2	3.1	3.5	3.4	3.2	2.9	2.7	4.1	5.7	5.6	5.4	5.6	4.4	3.5	3.8	5.0	4.2	4.4	4.2	5.9																																													
28-Oct	6.5	1.9	1.8	2.0	2.6	2.9	3.1	3.1	4.3	7.4	8.5	13.2	13.3	9.8	7.9	5.4	4.6	4.6	4.4	4.4	3.6	2.9	2.5	2.6	5.1	13.3																																													
29-Oct	2.7	2.6	2.4	1.6	1.5	1.8	2.1	2.6	2.9	7.6	3.0	3.7	3.6	4.6	4.3	4.2	4.3	4.4	4.1	3.8	3.7	3.5	5.6	6.6	3.6	7.6																																													
30-Oct	5.0	4.8	4.8	3.7	2.7	9.4	1.3	2.4	2.4	2.4	1.1	1.1	1.9	1.6	1.7	3.8	3.0	2.5	2.6	6.5	5.4	5.8	6.5	8.1	3.8	9.4																																													
31-Oct	8.2	8.5	8.4	8.5	9.5	8.7	8.4	11.7	14.7	17.8	13.3	16.6	18.1	20.0	19.7	18.6	17.8	18.4	18.0	17.9	18.1	28.9	23.3	21.0	15.6	28.9																																													
																								Diurnal Average		Diurnal Maximum																																													
																								6.0 26.6		5.7 26.3		5.2 20.2		4.9 13.3		5.0 11.1		5.1 9.4		5.0 10.2		5.1 11.7		5.3 14.7		5.7 17.8		5.4 13.3		5.5 16.6		5.2 18.1		5.2 20.0		5.2 19.7		5.2 18.6		5.7 17.8		6.2 19.4		5.7 27.2		6.5 28.0		7.3 27.3		6.8 28.9		6.7 26.0		6.1 26.2	
C - Calibration																																																																							
Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 µg/m ³ 24-hr 29 µg/m ³																																																																							





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	465	62.58	62.58
6 - 15	246	33.11	95.69
16 - 25	23	3.10	98.79
26 - 80	9	1.21	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - µg/m³
Anzac - October 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	1	5	4	26	95	28	24	13	13	37	72	90	25	21	6	465
6 - 15	1	0	0	2	28	70	29	10	9	5	6	47	25	9	4	1	246
16 - 25	0	0	0	0	0	0	2	4	1	3	2	0	1	6	4	0	23
26 - 80	0	0	0	0	1	1	1	1	1	0	0	1	1	1	1	0	9
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	6	1	5	6	55	166	60	39	24	21	45	120	117	41	30	7	743

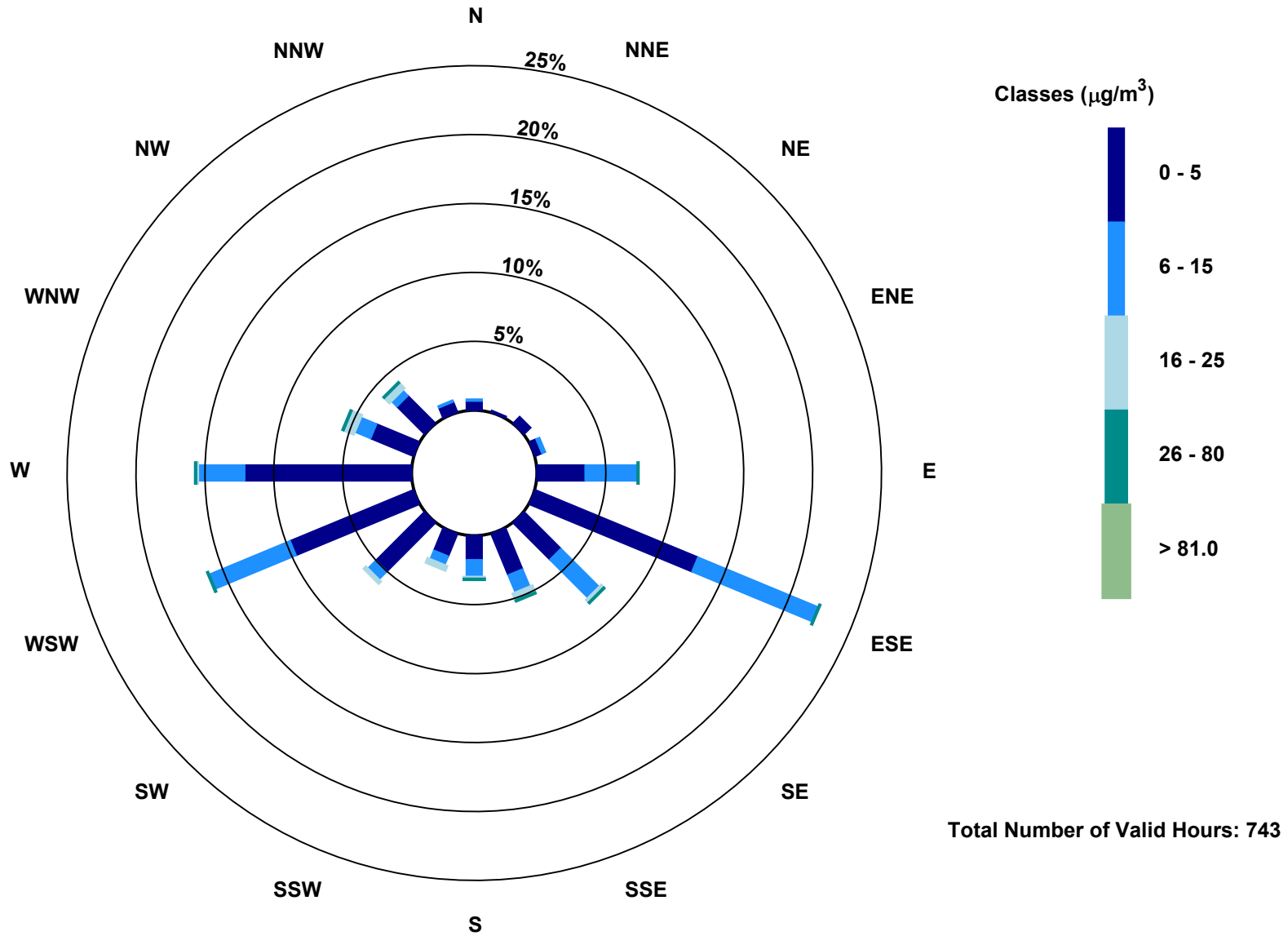
Total Number of Valid Hours: 743

Total Number of Hours: 744



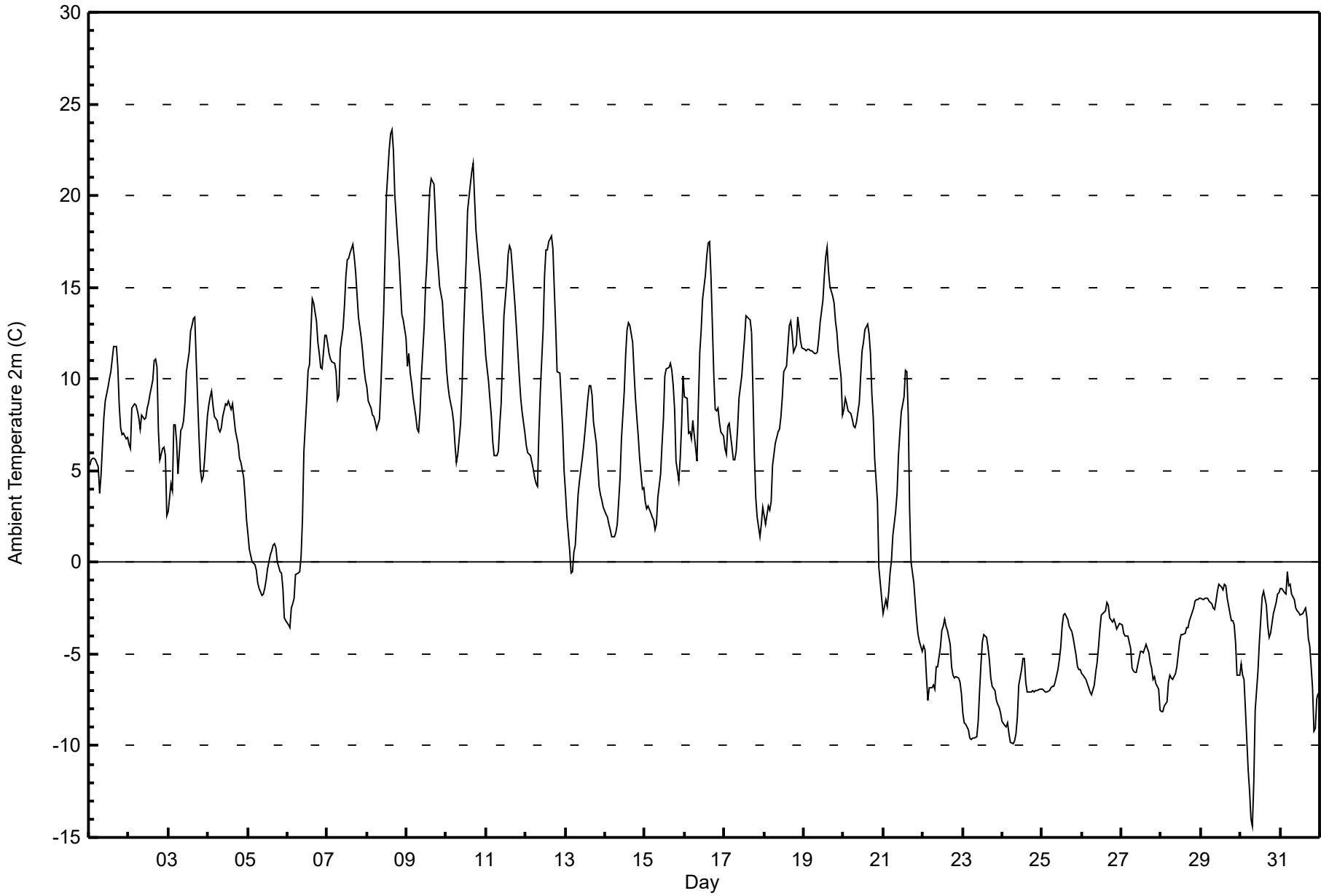
Wood Buffalo Environmental Association
Wind Rose Oct 2023

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





Maximum Value: 23.6 C on Oct 8 16:00		Maximum Daily Average: 14.0 C on Oct 8		Hours in Service: 744																							
Minimum Value: -14.4 C on Oct 30 08:00		Minimum Daily Average: -7.7 C on Oct 24		Hours of Data: 744																							
Maximum Diurnal Average: 8.3 C at hour 16		Minimum Diurnal Average: 1.1 C at hour 7		Hours of Missing Data: 0																							
Monthly Average: 4.00 C		Percentiles: P ₁ = -9.7 P ₁₀ = -6.6 Q ₁ = -3.2 Median = 5.6 Q ₃ = 10.2 P ₉₀ = 13.4 P ₉₉ = 20.6		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-Oct	5.3	5.6	5.7	5.7	5.6	5.2	3.8	4.8	6.4	7.9	8.8	9.6	10.0	10.4	11.1	11.7	11.7	10.7	8.5	7.3	7.0	7.0	6.7	6.8	7.6	11.7	
2-Oct	6.5	6.2	8.4	8.6	8.6	8.2	7.9	7.3	8.0	7.8	7.8	8.4	8.7	9.2	9.9	11.0	11.1	10.7	7.2	5.6	6.2	6.3	5.8	2.5	7.8	11.1	
3-Oct	2.8	4.3	4.0	7.5	7.5	6.5	4.8	7.2	7.3	7.8	8.7	10.4	11.5	12.6	13.0	13.3	13.4	11.1	6.9	5.1	4.5	4.7	5.6	8.0	7.9	13.4	
4-Oct	8.5	9.0	9.3	8.6	8.0	7.7	7.3	7.1	7.4	7.9	8.7	8.6	8.8	8.6	8.3	8.6	7.2	6.8	6.5	5.7	5.5	4.6	3.5	2.3	7.3	9.3	
5-Oct	1.6	0.7	0.1	0.0	-0.1	-0.5	-1.1	-1.5	-1.8	-1.8	-1.4	-1.0	-0.4	0.4	0.6	1.0	1.0	0.8	0.0	-0.5	-0.6	-1.4	-3.0	-3.2	-0.5	1.6	
6-Oct	-3.4	-3.6	-2.5	-2.2	-1.9	-0.7	-0.6	-0.5	0.3	2.4	6.0	8.9	10.5	10.8	12.6	14.4	14.2	13.2	12.0	11.4	10.6	10.5	12.4	12.4	6.1	14.4	
7-Oct	11.9	11.4	11.1	10.9	10.8	10.4	8.9	9.1	11.6	12.8	14.0	15.6	16.5	16.6	16.9	17.3	16.6	15.8	14.6	13.4	12.2	11.4	10.6	9.9	12.9	17.3	
8-Oct	9.6	8.8	8.4	8.0	8.0	7.6	7.3	7.8	9.5	11.6	13.6	16.7	20.0	22.5	23.4	23.6	22.4	20.0	17.6	16.6	15.1	13.5	13.2	12.2	14.0	23.6	
9-Oct	10.7	11.4	10.4	9.8	9.0	8.0	7.3	7.1	8.2	10.2	12.9	15.1	16.5	18.5	20.3	21.0	20.6	18.9	17.1	16.1	15.1	14.2	12.9	11.8	13.5	21.0	
10-Oct	10.5	9.6	9.0	8.3	7.6	6.4	5.4	5.9	7.6	9.4	12.2	14.4	16.5	19.1	20.6	21.3	21.8	19.9	18.1	16.3	15.6	14.6	13.5	12.4	13.2	21.8	
11-Oct	11.3	9.9	8.9	7.9	6.6	5.8	5.8	6.0	7.5	8.7	11.1	13.4	15.3	16.8	17.3	17.0	16.0	13.9	12.7	11.4	10.1	9.0	8.2	7.1	10.7	17.3	
12-Oct	6.3	6.0	5.9	5.8	5.0	4.6	4.3	4.1	7.1	9.4	12.7	15.6	17.0	17.0	17.5	17.8	17.1	14.9	12.9	10.4	10.4	8.8	7.2	5.0	10.1	17.8	
13-Oct	3.8	2.4	0.6	-0.6	-0.5	0.6	1.0	3.7	4.5	5.0	5.7	6.4	7.2	9.0	9.7	9.7	9.1	7.7	6.5	5.4	4.1	3.7	3.4	3.0	4.6	9.7	
14-Oct	2.6	2.5	2.1	1.8	1.4	1.4	1.6	2.1	3.3	4.6	6.8	9.4	11.3	12.7	13.1	12.9	12.0	10.4	9.0	7.9	6.9	5.7	4.0	4.1	6.2	13.1	
15-Oct	3.3	3.0	3.1	2.7	2.5	2.3	1.7	2.1	3.5	4.8	6.4	7.8	10.2	10.6	10.6	10.9	10.5	9.6	8.3	5.5	4.5	5.7	7.5	10.2	6.1	10.9	
16-Oct	9.0	8.9	7.0	7.1	6.7	7.7	7.0	5.5	8.7	11.4	12.7	14.4	15.7	16.7	17.4	17.5	15.6	10.2	8.3	8.2	8.4	7.6	7.1	6.9	10.2	17.5	
17-Oct	6.2	5.9	7.4	7.5	6.3	5.6	5.6	6.1	7.2	9.0	10.2	11.2	12.3	13.5	13.4	13.2	12.5	9.3	5.9	3.5	2.5	1.4	2.1	3.0	7.5	13.5	
18-Oct	2.6	2.1	3.1	2.9	3.3	5.3	5.9	6.5	7.1	7.3	7.9	9.1	10.4	10.7	11.9	12.9	13.1	12.4	11.5	11.9	13.3	12.8	12.1	11.7	8.7	13.3	
19-Oct	11.6	11.5	11.6	11.6	11.5	11.5	11.4	11.4	11.5	12.2	13.1	14.3	15.6	16.6	17.2	15.9	15.0	14.5	14.1	13.2	12.6	11.5	10.1	8.1	12.8	17.2	
20-Oct	8.3	9.0	8.6	8.2	8.1	7.8	7.4	7.4	7.6	8.7	10.2	11.5	12.0	12.7	13.0	12.5	11.4	9.1	7.9	5.7	3.3	-0.3	-1.1	-2.0	7.8	13.0	
21-Oct	-2.8	-2.1	-2.4	-1.6	-0.6	0.1	1.5	2.7	3.8	5.8	7.0	8.2	9.0	10.5	10.4	8.0	2.8	0.0	-1.1	-2.2	-3.2	-4.0	-4.3	-4.8	1.7	10.5	
22-Oct	-4.5	-4.8	-6.3	-7.5	-6.9	-6.9	-6.7	-6.9	-5.7	-5.7	-4.6	-3.7	-3.5	-3.1	-3.5	-3.7	-4.5	-5.7	-6.2	-6.3	-6.2	-6.3	-6.6	-7.1	-5.5	-3.1	
23-Oct	-8.2	-8.8	-8.8	-9.1	-9.6	-9.6	-9.6	-9.6	-9.5	-8.7	-7.0	-5.6	-4.4	-3.9	-4.1	-4.6	-5.3	-6.3	-6.8	-7.0	-7.5	-7.8	-7.9	-8.2	-7.4	-3.9	
24-Oct	-8.6	-8.9	-9.0	-8.8	-9.4	-9.8	-9.9	-9.7	-9.4	-8.4	-6.7	-5.9	-5.2	-5.2	-6.5	-7.1	-7.1	-7.1	-7.0	-7.0	-7.0	-7.0	-6.9	-6.9	-7.7	-5.2	
25-Oct	-6.9	-7.0	-7.0	-7.1	-7.0	-6.8	-6.8	-6.7	-6.5	-5.9	-5.3	-4.6	-3.5	-2.9	-2.8	-3.1	-3.5	-3.6	-3.8	-4.2	-5.1	-5.7	-5.9	-5.9	-5.3	-2.8	
26-Oct	-6.1	-6.2	-6.4	-6.6	-6.8	-7.1	-7.2	-6.7	-6.0	-5.5	-4.7	-3.7	-2.9	-2.7	-2.6	-2.2	-2.4	-3.0	-3.3	-3.1	-3.3	-3.6	-3.5	-3.3	-4.5	-2.2	
27-Oct	-3.4	-3.9	-4.0	-4.0	-4.0	-4.7	-5.8	-5.9	-6.0	-6.0	-5.6	-4.8	-4.8	-5.0	-4.7	-4.5	-4.9	-5.5	-5.8	-6.4	-6.2	-6.6	-6.9	-8.1	-5.3	-3.4	
28-Oct	-8.2	-8.1	-7.8	-7.6	-6.6	-6.1	-6.3	-6.4	-6.1	-5.7	-5.0	-4.3	-3.9	-4.0	-3.9	-3.6	-3.6	-3.2	-3.0	-2.5	-2.1	-2.0	-2.0	-2.0	-4.7	-2.0	
29-Oct	-2.0	-2.0	-2.0	-2.0	-2.0	-2.1	-2.3	-2.5	-2.6	-2.1	-1.6	-1.2	-1.3	-1.5	-1.2	-1.3	-1.9	-2.8	-3.2	-3.2	-3.4	-4.4	-6.2	-6.1	-2.5	-1.2	
30-Oct	-5.6	-6.1	-6.4	-8.0	-11.4	-12.5	-14.0	-14.4	-12.0	-8.1	-5.9	-4.3	-3.1	-1.9	-1.6	-2.3	-3.5	-4.1	-3.8	-3.4	-2.8	-2.2	-1.8	-1.6	-5.9	-1.6	
31-Oct	-1.4	-1.4	-1.6	-1.7	-0.5	-1.3	-1.2	-1.7	-2.0	-2.5	-2.7	-2.7	-2.9	-2.8	-2.7	-2.5	-3.1	-4.2	-4.6	-6.9	-9.2	-9.1	-7.4	-7.1	-3.5	-0.5	
		2.3	2.1	1.9	1.8	1.6	1.4	1.1	1.3	2.3	3.4	4.7	6.0	7.1	7.8	8.2	8.3	7.6	6.3	5.1	4.1	3.6	3.0	2.7	2.3	Diurnal Average	
		11.9	11.5	11.6	11.6	11.5	11.5	11.4	11.4	11.6	12.8	14.0	16.7	20.0	22.5	23.4	23.6	22.4	20.0	18.1	16.6	15.6	14.6	13.5	12.4	Diurnal Maximum	





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature 2m (AT 2m) - C
Anzac - October 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	279	37.50	37.50
0 - 10	273	36.69	74.19
10 - 20	181	24.33	98.52
> 20	11	1.48	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

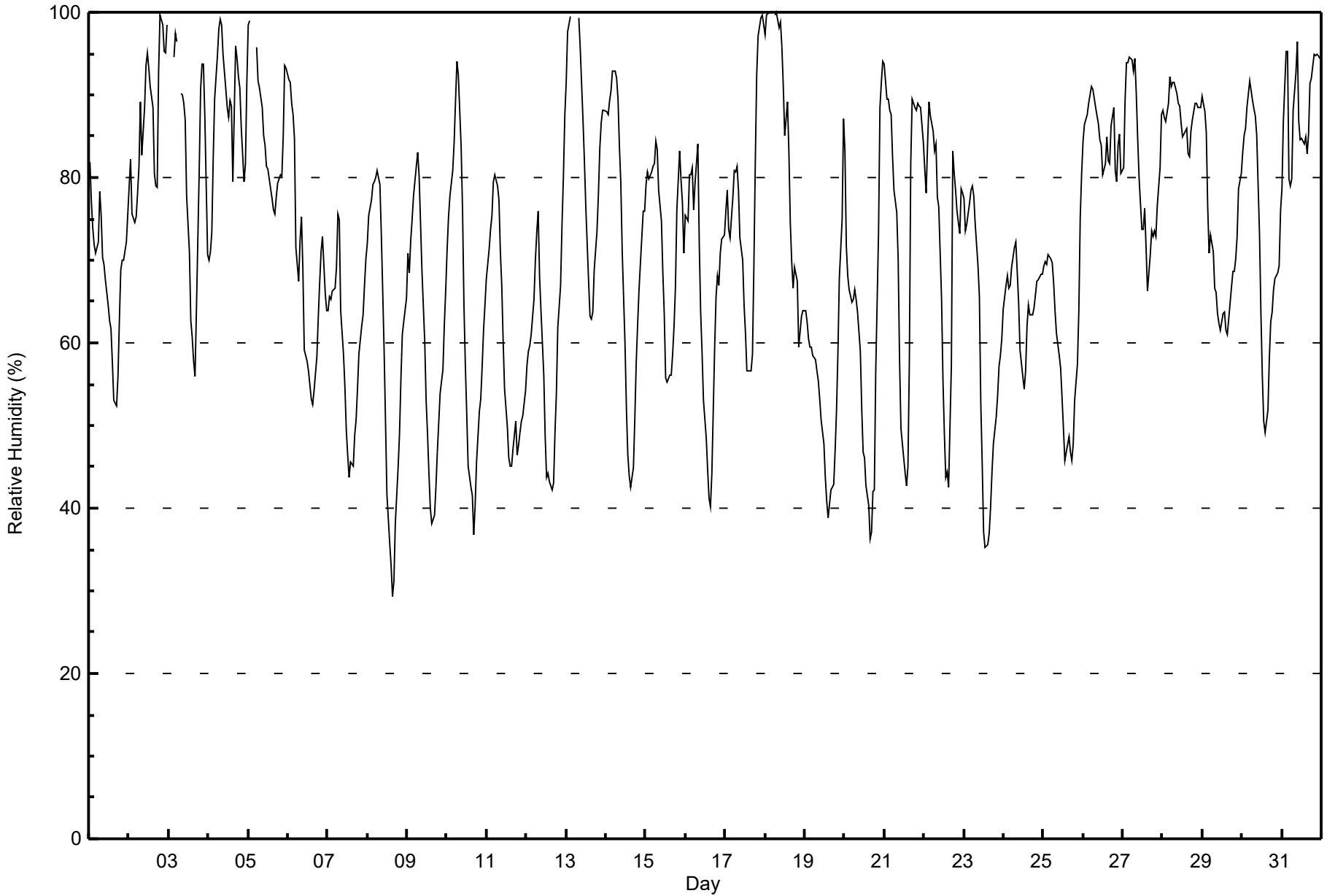
Relative Humidity (RH) - %
Anzac - October 2023

Maximum Value: 100.0 % on Oct 18 03:00		Maximum Daily Average: 88.4 % on Oct 31		Hours in Service: 744																							
Minimum Value: 29.3 % on Oct 8 16:00		Minimum Daily Average: 55.1 % on Oct 19		Hours of Data: 731																							
Maximum Diurnal Average: 82.1 % at hour 8		Minimum Diurnal Average: 55.7 % at hour 16		Hours of Missing Data: 13																							
Monthly Average: 71.61 %		Percentiles: P ₁ = 36.8 P ₁₀ = 47.6 Q ₁ = 59.6 Median = 73.0 Q ₃ = 84.9 P ₉₀ = 91.6 P ₉₉ = 99.4		Hours of Calibration: 0																							
				Percent Operational Time: 98.3																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Oct	81.8	77.2	73.8	71.9	70.8	72.2	78.3	75.3	70.4	69.5	67.7	64.6	62.6	61.8	57.6	53.1	52.4	56.0	62.8	68.8	69.9	70.0	72.1	75.5	68.2	81.8	
2-Oct	79.0	82.2	75.5	74.5	75.2	78.2	81.4	89.1	82.7	88.6	93.5	95.2	93.2	90.9	88.5	80.5	78.9	78.8	92.7	99.7	98.5	95.2	95.0	98.5	86.9	99.7	
3-Oct	OR	OR	OR	94.6	97.5	96.4	OR	90.2	90.0	89.0	87.0	77.7	71.0	62.8	60.7	57.8	55.9	63.9	80.9	90.7	93.7	93.7	87.5	70.7	80.6	97.5	
4-Oct	70.0	71.1	73.3	82.3	89.5	94.8	97.9	99.2	98.5	94.9	90.7	88.4	87.2	89.3	88.6	79.5	95.9	94.5	92.3	90.9	86.1	79.6	81.7	91.6	87.8	99.2	
5-Oct	98.5	99.0	OR	OR	OR	95.7	91.7	90.9	88.5	85.1	83.9	81.3	81.1	78.6	77.5	76.1	75.7	77.6	79.3	80.3	80.2	85.1	93.6	93.3	85.4	99.0	
6-Oct	91.9	91.6	89.0	87.6	84.8	71.5	67.5	72.4	75.2	68.9	59.2	57.8	56.6	54.9	53.2	52.5	54.2	58.3	63.0	67.2	71.0	72.9	65.9	64.0	68.8	91.9	
7-Oct	63.8	65.6	65.3	66.2	66.5	69.1	75.6	74.9	63.9	58.6	54.8	49.4	46.4	43.8	45.5	45.1	48.8	50.6	54.3	58.7	62.1	63.4	67.0	70.1	59.6	75.6	
8-Oct	72.1	75.4	77.3	79.2	79.4	80.1	80.8	79.2	73.2	66.2	59.2	50.5	41.8	35.7	33.1	29.3	31.2	38.1	44.9	49.0	55.6	61.1	62.5	65.4	59.2	80.8	
9-Oct	70.9	68.5	72.3	74.9	77.8	81.4	83.1	80.1	74.6	68.8	60.2	53.1	49.1	44.2	40.0	38.2	39.2	42.5	46.8	50.3	53.9	56.8	62.2	66.4	60.6	83.1	
10-Oct	71.4	75.3	77.8	80.9	84.3	89.4	94.1	92.4	83.8	76.1	64.6	57.2	51.4	45.0	42.5	41.5	36.7	40.4	45.5	51.6	53.3	57.2	61.5	64.6	64.1	94.1	
11-Oct	67.8	71.4	73.8	75.5	79.5	80.4	78.9	77.3	71.0	67.0	60.2	54.4	49.9	46.1	45.1	45.0	47.1	50.5	46.5	47.6	49.2	50.5	51.2	54.3	60.0	80.4	
12-Oct	57.3	59.0	59.7	61.0	65.3	69.9	73.4	76.0	67.9	63.8	56.1	48.6	43.8	44.3	43.2	42.2	43.1	49.1	53.9	61.8	67.0	74.2	79.9	87.5	60.3	87.5	
13-Oct	91.6	97.6	99.5	OR	OR	OR	OR	99.3	95.8	91.3	86.9	82.1	76.5	67.4	63.2	62.8	63.8	68.8	73.6	78.0	83.6	86.7	88.1	88.2	82.2	99.5	
14-Oct	88.0	87.6	89.3	90.6	92.8	92.9	92.0	89.5	83.8	79.4	70.9	59.8	52.0	46.4	43.9	42.6	44.8	50.9	57.6	62.2	66.5	69.6	75.9	75.9	71.0	92.9	
15-Oct	79.1	80.7	79.9	80.7	81.3	81.7	84.4	83.3	78.5	74.7	68.4	63.6	55.8	55.3	56.0	56.1	58.6	62.0	66.7	76.1	83.2	79.7	76.9	70.8	72.2	84.4	
16-Oct	75.4	74.8	80.4	80.3	81.2	76.1	79.3	84.0	72.0	63.6	58.8	53.1	48.5	44.6	41.2	40.2	44.2	59.5	65.6	68.1	66.9	70.9	72.6	73.1	65.6	84.0	
17-Oct	76.0	78.4	73.7	72.8	77.6	80.8	80.7	81.3	78.4	72.6	70.0	64.6	61.2	56.6	56.6	56.7	58.7	69.4	81.7	92.4	97.1	99.3	99.7	98.5	76.5	99.7	
18-Oct	97.2	99.7	100.0	100.0	OR	OR	99.7	100.0	98.2	98.9	95.8	91.0	85.2	89.1	83.0	74.6	69.8	66.5	69.2	67.5	59.5	61.4	63.2	63.9	83.3	100.0	
19-Oct	63.9	62.6	60.5	59.5	59.5	58.5	57.9	56.6	55.3	53.3	50.8	47.9	43.8	40.8	38.9	40.5	42.2	42.8	47.0	51.9	58.7	67.7	75.0	87.1	55.1	87.1	
20-Oct	83.3	71.8	68.1	66.5	64.8	65.2	66.5	65.3	63.8	59.0	52.0	46.8	46.1	42.7	40.4	36.2	37.1	42.0	42.2	56.6	73.3	88.4	91.4	94.1	61.0	94.1	
21-Oct	93.7	89.5	89.5	88.2	87.6	82.6	78.5	75.7	70.2	57.9	49.6	47.8	44.2	42.6	45.1	57.8	81.7	89.5	88.5	88.2	89.0	88.6	88.4	84.3	75.0	93.7	
22-Oct	81.0	78.2	84.1	89.2	87.4	85.6	83.2	84.1	77.6	76.4	65.2	55.4	49.0	43.7	44.3	42.5	57.3	83.3	80.5	78.5	75.9	73.3	78.6	78.1	72.2	89.2	
23-Oct	77.5	73.6	74.3	76.9	78.5	79.0	77.7	74.5	69.4	65.7	52.8	45.4	37.1	35.2	35.6	37.0	40.1	44.4	47.7	51.1	53.6	57.1	58.5	60.5	58.5	79.0	
24-Oct	64.0	67.0	68.1	66.6	67.0	69.2	71.5	72.2	68.7	65.0	59.2	56.0	54.4	56.6	62.0	64.6	63.4	63.5	64.2	65.7	67.5	67.7	68.4	68.3	65.0	72.2	
25-Oct	69.2	69.8	69.5	70.6	70.1	69.6	67.3	63.9	61.2	58.4	57.0	53.4	49.6	45.8	46.9	48.6	46.8	45.8	47.7	53.0	57.5	63.9	75.2	80.5	60.1	80.5	
26-Oct	84.5	86.4	87.7	89.0	90.0	91.1	90.7	88.5	87.5	86.5	84.5	83.9	80.3	81.7	84.9	82.0	81.7	86.4	88.5	80.9	79.5	83.9	85.3	80.4	85.2	91.1	
27-Oct	81.2	89.3	93.8	93.9	94.6	94.3	92.9	94.5	90.2	84.7	80.0	73.8	73.7	76.2	71.6	66.4	70.6	73.6	72.9	73.5	72.9	76.6	81.1	87.6	81.7	94.6	
28-Oct	88.1	87.3	86.8	89.0	92.2	91.0	91.6	91.5	90.2	89.0	88.7	86.6	85.0	85.3	86.0	83.0	82.6	85.6	87.0	89.0	88.9	88.6	88.5	88.4	87.9	92.2	
29-Oct	89.8	87.9	85.4	76.4	70.9	73.0	71.1	66.7	66.0	63.5	62.4	61.6	63.5	63.7	61.5	61.1	62.9	66.8	68.7	68.7	70.2	72.9	78.7	80.6	70.6	89.8	
30-Oct	83.1	85.1	86.0	88.4	91.7	90.5	89.3	88.3	87.5	85.0	73.1	63.5	55.9	50.5	49.1	51.8	58.1	62.5	63.7	66.5	67.7	68.5	69.3	75.9	73.0	91.7	
31-Oct	78.7	86.8	95.3	95.3	79.9	79.0	79.9	88.1	92.7	96.4	86.7	84.6	84.8	84.1	84.9	82.9	85.2	91.3	92.0	94.9	94.7	94.9	94.8	94.4	88.4	96.4	
		79.0	79.7	79.6	80.1	79.9	80.7	81.3	82.1	78.3	74.8	69.3	64.5	60.7	58.3	57.1	55.7	58.3	63.1	66.7	70.3	72.5	74.8	77.1	78.5	Diurnal Average	
		98.5	99.7	100.0	100.0	97.5	96.4	99.7	100.0	98.5	98.9	95.8	95.2	93.2	90.9	88.6	83.0	95.9	94.5	92.7	99.7	98.5	99.3	99.7	98.5	Diurnal Maximum	
OR - Out of Range																											



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Anzac - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Anzac - October 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	16	2.19	2.19
40 - 60	169	23.12	25.31
60 - 80	288	39.40	64.71
80 - 100	255	34.88	99.59

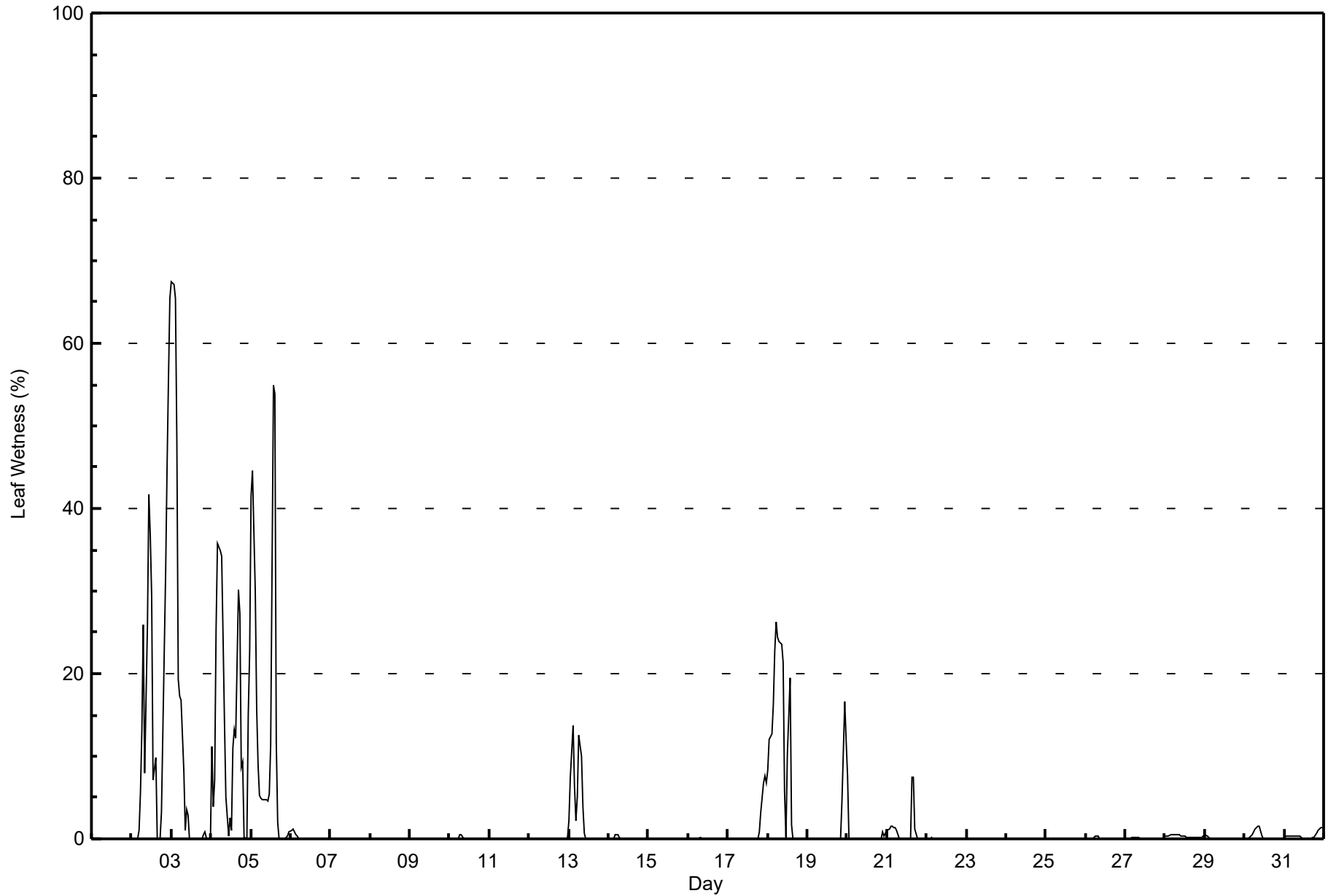
Total Number of Valid Hours: 731

Total Number of Hours: 744



Wood Buffalo Environmental Association
Hourly Averages

Leaf Wetness (LW) - %
Anzac - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Leaf Wetness (LW) - %
Anzac - October 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 0.3	588	79.03	79.03
0.4 - 0.5	27	3.63	82.66
0.6 - 0.7	6	0.81	83.47
0.8 - 1.4	23	3.09	86.56
1.5 - 10	42	5.65	92.20
> 10	55	7.39	99.60

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 - October 2023

Maximum Speed: 28 km/h on Oct 14 13:00	Maximum Daily Speed Average: 17.5 km/h on Oct 8	Hours in Service: 744
Minimum Speed Value: 1 km/h on Oct 16 18:00	Minimum Daily Speed Average: 1.1 km/h on Oct 17	Hours of Data: 744
Maximum Diurnal Speed Average: 4.4 km/h at hour 13	Minimum Diurnal Speed Average: 2.9 km/h at hour 7	Hours of Missing Data: 0
Monthly Average Velocity: 3.5 km/h 205.6 deg	Percentiles: P ₁ = 2 P ₁₀ = 6 Q ₁ = 9 Median = 13 Q ₃ = 17 P ₉₀ = 20 P ₉₉ = 25	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-Oct	SE6	SE8	SE8	SE8	SE8	ESE7	ESE8	ESE9	ESE10	SE14	ESE12	ESE14	SE16	SE16	SE18	SE16	SE16	SE13	ESE11	ESE12	ESE11	ESE12	ESE12	ESE8	SE11.3	SE18
2-Oct	E7	ENE7	SE11	SSE9	SSE9	SE11	SE14	SSE12	SSE12	SE12	SE9	SE6	SSE8	SSE7	SSE7	SSW10	SSW7	SSW5	SSW5	S7	SSW8	S8	S7	SW1	SSE7.1	SE14
3-Oct	SSW5	SSW6	WNW6	WSW12	WSW8	SW6	SW6	WSW12	WSW14	WSW10	WSW12	WSW11	WSW14	WSW14	WSW11	SW12	SW10	S6	SSE6	SE7	SSE5	SE7	S8	S9	SW7.3	WSW14
4-Oct	SSW7	SSW10	SW10	SW8	SW11	WSW13	W14	W13	W13	W17	W17	W21	W21	W20	W22	WNW24	W21	W25	W25	W23	W27	W25	W22	W19	W17.1	W27
5-Oct	W20	W23	W22	W21	W22	W24	W22	W20	W22	W24	W24	W24	W21	W22	W21	WNW19	WNW17	WNW13	W10	W9	W9	S5	SSE6	SSE7	W16.7	W24
6-Oct	SSE8	SSE7	SSE6	SE8	SSE9	SE11	ESE9	E8	E6	SE6	SSE8	S11	SSE11	SE11	SE14	S18	S11	S10	S9	S8	SSW7	WSW10	WSW17	W19	S7.2	W19
7-Oct	W17	WSW13	WSW12	WSW12	WSW10	SW9	WSW8	WSW9	WSW7	WSW7	SW4	WSW2	WSW4	WNW4	NNE3	E8	E9	E10	ESE11	ESE11	ESE12	ESE14	ESE15	ESE14	S2.5	W17
8-Oct	E16	E14	ESE16	ESE17	ESE17	ESE18	ESE17	ESE20	ESE20	ESE22	ESE24	ESE25	ESE26	ESE23	ESE23	SE23	SE21	SE10	ESE10	ESE14	E11	ESE12	ESE16	E12	ESE17.5	ESE26
9-Oct	E14	ESE16	E13	ESE15	ESE16	E14	E14	ESE15	ESE16	ESE16	ESE17	ESE19	E19	ESE19	ESE20	ESE19	ESE15	ESE15	ESE14	ESE16	ESE15	ESE15	ESE18	ESE17	ESE16.0	ESE20
10-Oct	ESE15	ESE14	E12	E12	ESE14	E9	ESE10	ESE14	ESE17	ESE20	ESE20	ESE22	ESE22	ESE21	E19	E17	ESE19	ESE17	E12	E18	ESE21	ESE21	E18	E18	ESE16.5	ESE22
11-Oct	E17	E16	E16	E14	E16	E15	E14	E15	ESE18	ESE19	ESE18	ESE17	E17	ESE18	E18	E19	E16	E16	E19	ESE18	ESE13	ESE14	ESE15	ESE13	E16.2	E19
12-Oct	ESE12	ESE14	ESE15	ESE15	E15	ESE14	ESE13	ESE11	ESE10	ESE11	ESE12	ESE13	ESE17	ESE20	ESE19	ESE13	ESE11	ESE9	ESE9	ESE9	ESE13	ESE11	ESE9	ESE8	ESE12.5	ESE20
13-Oct	ESE8	E5	ENE5	ESE5	ESE9	SE11	SE10	ESE9	SE12	SE14	ESE16	ESE15	ESE16	ESE17	ESE19	ESE19	ESE17	ESE13	E13	ESE13	ESE11	ESE12	ESE14	ESE14	ESE12.1	ESE19
14-Oct	E14	ESE14	ESE12	ESE12	ESE11	ESE13	ESE16	ESE17	ESE15	ESE20	ESE23	SE27	SE28	ESE27	ESE24	SE25	SE24	ESE15	ESE13	ESE13	ESE12	E10	E13	ESE14	ESE16.9	SE28
15-Oct	ESE16	ESE18	ESE16	E13	ESE15	ESE14	ESE14	E13	E10	E9	E13	E13	ESE12	ESE13	ESE14	ESE13	SE10	SE8	SE9	SE7	SE8	SSE7	SW10	WSW10	ESE10.3	ESE18
16-Oct	SW9	SW9	SSW9	SW9	SW10	SW11	SW9	SW6	SSW4	WSW9	WSW11	WSW11	WSW12	WSW10	WSW7	WSW5	W2	ENE1	NE2	ESE3	SE8	SE7	ESE8	ESE6	SW5.2	WSW12
17-Oct	E6	NE8	ENE9	ESE7	ESE5	SE4	E3	NE5	NE4	W2	W5	NW7	WSW8	WSW11	WSW13	WSW10	WSW8	WNW10	WNW8	W5	WSW4	S2	SE7	E9	WSW1.1	WSW13
18-Oct	ESE9	SSE6	SSE6	SSE6	ESE8	ESE12	ESE11	E10	E10	E11	ESE13	ESE10	ESE9	ESE8	ESE10	SE11	SSE10	SSE8	S10	SSW12	SW16	WSW13	SW11	SW10	SE6.7	SW16
19-Oct	SW12	SW14	SW15	SW17	SW17	SW19	SW16	SW20	SW20	SW18	SW19	SW18	SW15	SW16	SW18	SW17	SSW13	SW16	SSW21	SSW19	SW22	SW19	WSW20	WSW4	SW16.6	SW22
20-Oct	SW15	WSW23	WSW24	WSW22	WSW23	WSW22	WSW21	WSW19	WSW20	WSW24	WSW24	W25	W24	W27	WNW24	WNW23	WNW13	WNW11	WNW13	NW12	N5	ENE2	SSE1	SSE5	W15.5	W27
21-Oct	SSE5	SE10	SE11	SE14	SE13	ESE13	SE16	SE13	SE13	SSE16	SSE17	SSE18	S19	SSW20	SSW17	WNW10	WNW21	NW21	NW20	NW21	NW18	NW18	NW18	NW17	SW3.7	NW21
22-Oct	NW18	NW16	NW13	NW10	NNW10	NNW8	N6	N4	E2	N5	NE9	ENE8	N6	N7	NNW11	NNW8	NW11	WNW10	NW13	WNW4	W6	W8	W12	W13	NW7.2	NW18
23-Oct	W11	W11	W11	W12	W13	W14	W17	W16	W18	W18	W19	W20	W24	W23	W22	W21	W18	W15	W15	W17	W18	W17	W17	W18	W16.9	W24
24-Oct	W17	W16	WSW18	WSW17	WSW18	WSW18	WSW19	W18	WSW20	W19	W18	W19	W19	WSW19	WSW21	WSW18	WSW17	WSW18	W15	WSW15	WSW14	WSW13	WSW14	WSW14	WSW17.3	WSW21
25-Oct	WSW14	WSW13	WSW13	W13	WSW13	W12	WSW11	SW10	SW12	WSW12	SW12	WSW11	WSW14	WSW14	WSW16	WSW16	WSW15	WSW14	WSW13	W18	W18	W15	W14	WSW15	WSW13.4	W18
26-Oct	WSW14	WSW14	WSW16	WSW15	WSW15	WSW16	WSW16	WSW18	WSW16	WSW18	WSW17	WSW17	WSW16	WSW13	WSW11	WSW10	WSW10	WSW13	WSW11	WSW12	WSW13	WSW13	SW12	WSW14	WSW14.2	WSW18
27-Oct	WSW15	WSW14	WSW15	WSW14	W12	WNW17	NW13	WNW11	WNW13	NW15	WNW12	WNW14	WNW15	NW14	WNW15	WNW13	WNW11	W8	WNW10	W7	WSW5	SSW5	SSE4	SSE6	WNW9.8	WNW17
28-Oct	SSE7	SE7	SE7	SSE6	WSW8	W11	W11	W11	W12	W14	W14	WNW18	WNW19	WNW16	WNW14	W13	W12	WSW13	WSW16	WSW17	WSW17	WSW15	W14	W12	W10.5	WNW19
29-Oct	W12	W12	W13	W14	W12	W14	W15	W13	W15	W13	W15	W15	WNW16	WNW14	WNW13	W12	W9	WSW9	W11	W12	W11	NW7	NNW8	NW9	W11.7	WNW16
30-Oct	NNW9	NW9	NW8	NW8	NW9	NW7	NNW6	SSE1	S5	SSE7	SE11	SE10	SSE10	SSE10	SE11	SSE11	SE11	SE11	SE11	SSE8	S7	S12	S12	S10	SSE4.0	S12
31-Oct	S10	S7	ESE3	W3	WSW14	WSW14	W15	WNW14	WNW13	NW19	NW19	WNW18	WNW18	WNW16	WNW12	NW9	NW5	SSE3	SSW4	SSW5	W4	NW4	SW3	S4	W7.5	NW19

SSW3.3SSW3.4SSW3.0SSW3.6SSW3.9SSW3.7SSW2.9SSW3.0SSW3.4SSW3.5SSW3.5SSW3.8SSW4.4SSW4.0SSW3.4SSW4.1SSW3.5SSW3.1SSW3.2SSW3.3SSW4.0SSW3.4SSW3.4SSW2.9	Diurnal Average
W20 W23 WSW24 WSW22 WSW23 W24 W22 ESE20 W22 WSW24 WSW24 SE27 SE28 ESE27 ESE24 SE25 SE24 W25 W25 W23 W27 W25 W22 W19	Diurnal Maximum

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

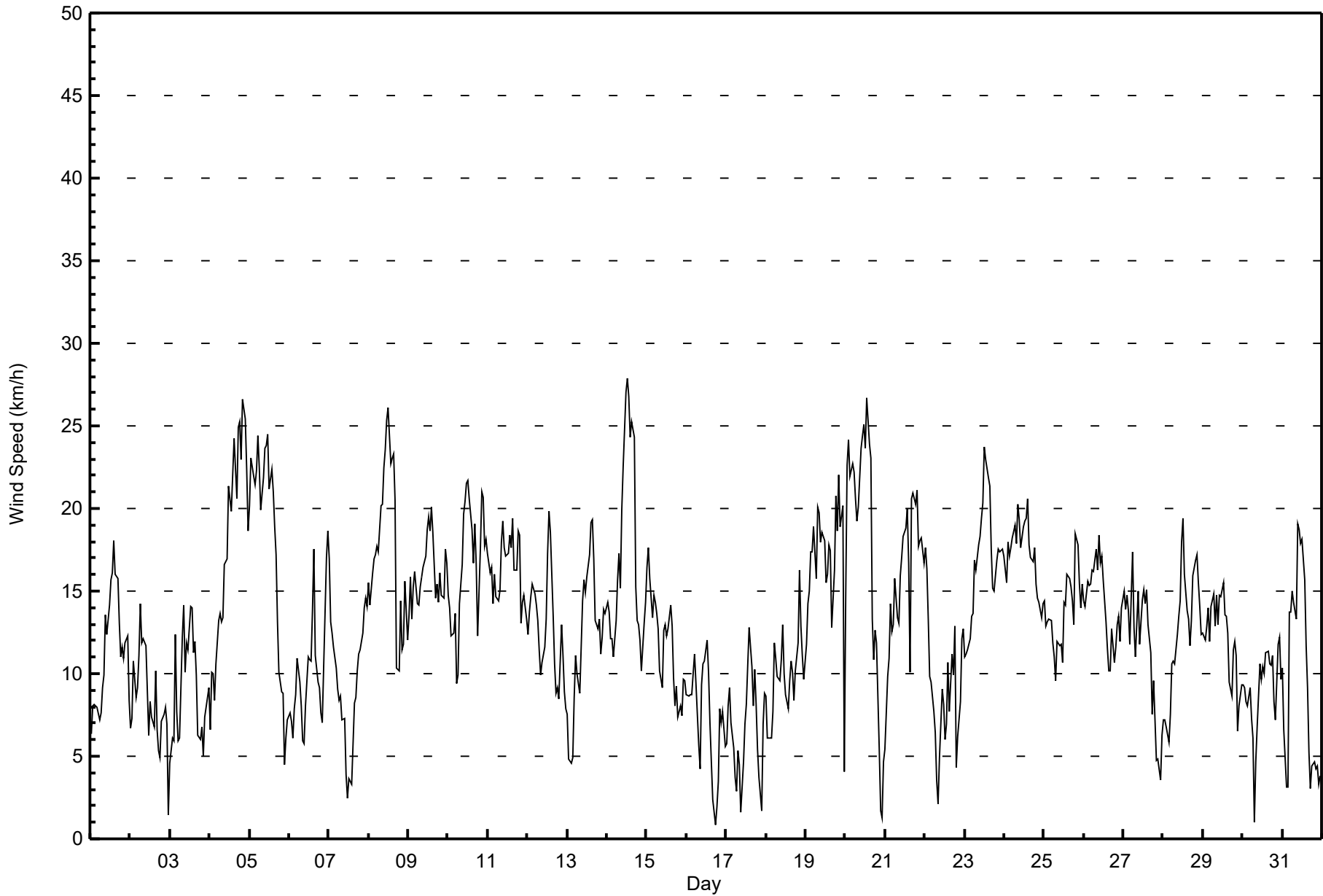
Wind Speed (WS) - km/h
Anzac - October 2023

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Anzac - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Anzac - October 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	55	7.39	7.39
6 - 11	239	32.12	39.52
12 - 19	365	49.06	88.58
20 - 28	85	11.42	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
Anzac - October 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	3	1	3	3	3	4	1	7	4	7	3	6	6	2	2	0	55
6 - 11	3	0	2	3	16	37	37	28	16	8	17	29	15	10	11	7	239
12 - 19	0	0	0	0	36	104	16	5	4	4	22	73	62	25	14	0	365
20 - 28	0	0	0	0	0	21	6	0	0	2	3	12	34	4	3	0	85
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	6	1	5	6	55	166	60	40	24	21	45	120	117	41	30	7	744

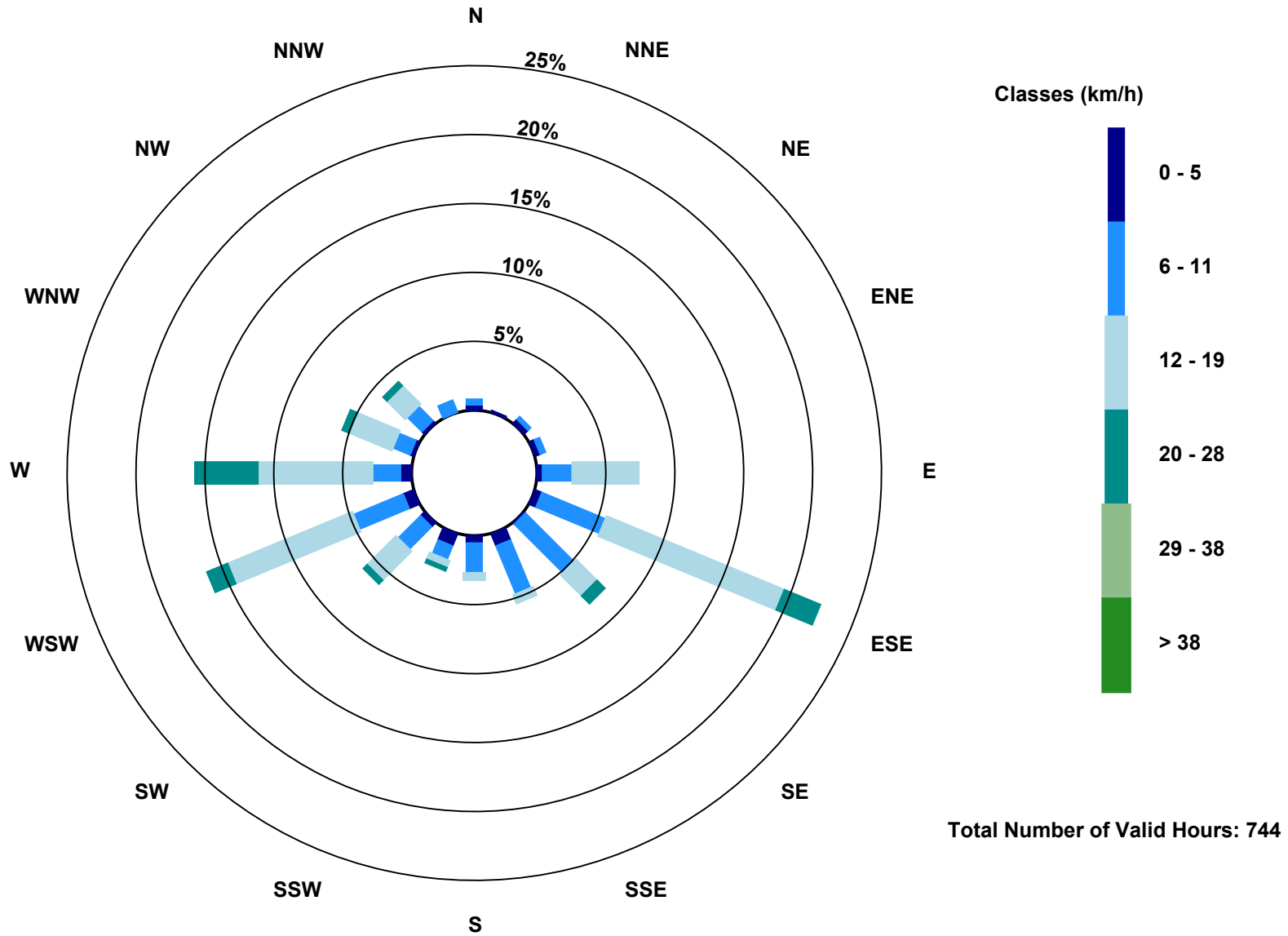
Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

Wind Speed (WS) - km/h
Anzac





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Anzac - October 2023

Direction of Maximum Speed: 124 deg on Oct 14 13:00		Hours in Service: 744
Direction of Maximum Daily Speed Average: 112.3 deg on Oct 8		Hours of Data: 744
Direction of Minimum Speed: 58 deg on Oct 16 18:00	Direction of Minimum Daily Speed Average: 1.1 deg on Oct 17	Hours of Missing Data: 0
Monthly Average Direction: 205.6 deg		Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Oct	124	128	127	129	124	118	119	118	122	127	117	122	126	131	131	143	139	126	119	121	113	107	116	109	124.3
2-Oct	88	70	132	148	149	135	128	147	151	129	128	145	153	155	165	197	211	205	193	176	193	180	190	232	152.7
3-Oct	200	211	285	257	258	236	228	247	253	243	253	250	252	251	244	226	223	187	152	139	162	145	175	177	229.5
4-Oct	203	209	232	232	230	249	268	267	264	266	264	267	268	272	274	287	277	275	273	271	266	271	270	270	265.7
5-Oct	264	267	270	273	270	270	276	279	278	270	270	274	275	276	279	288	301	292	281	275	272	186	151	152	273.3
6-Oct	162	157	148	144	150	134	115	99	94	130	147	181	168	131	144	190	184	176	189	176	192	239	255	260	171.4
7-Oct	264	255	254	249	248	234	246	249	258	242	219	241	241	293	20	87	96	93	102	111	114	111	106	106	187.3
8-Oct	101	99	103	107	105	103	106	109	105	111	111	117	120	123	117	137	138	125	110	107	99	104	104	97	112.3
9-Oct	94	105	101	108	104	94	98	105	103	103	102	102	101	109	107	111	111	110	111	116	117	107	104	108	105.5
10-Oct	110	102	90	101	105	101	111	110	108	106	108	109	104	102	89	83	106	106	92	96	104	103	95	94	101.6
11-Oct	90	87	88	89	89	92	101	96	104	106	104	103	100	102	88	87	85	90	101	110	111	105	107	111	97.7
12-Oct	114	111	103	105	101	106	107	113	113	108	104	110	119	119	121	120	112	112	119	109	104	114	113	107	111.3
13-Oct	117	99	74	105	119	136	132	117	124	127	120	113	118	111	116	114	116	108	98	110	112	107	103	108	114.0
14-Oct	100	102	102	104	104	107	102	104	108	113	117	124	124	120	118	125	126	115	110	111	112	92	83	102	112.2
15-Oct	114	114	110	100	110	103	105	101	90	83	82	91	107	104	110	118	125	130	140	140	129	147	227	238	113.4
16-Oct	230	215	209	230	230	229	234	221	201	242	252	251	253	255	250	252	266	58	47	107	140	128	122	117	223.7
17-Oct	96	54	67	106	120	126	83	40	46	281	263	311	244	241	243	251	258	295	299	271	246	173	141	93	251.9
18-Oct	121	148	151	150	117	110	105	99	93	99	104	121	119	115	107	135	160	157	169	201	223	237	230	230	144.2
19-Oct	232	226	227	223	228	234	236	231	231	232	235	230	235	235	226	216	208	216	206	205	218	226	246	258	226.5
20-Oct	232	237	243	242	241	245	246	248	246	254	255	276	273	278	291	286	293	293	296	324	6	62	153	164	261.9
21-Oct	152	140	131	130	129	121	126	129	140	148	167	167	182	197	213	288	300	309	307	313	304	306	309	314	213.9
22-Oct	312	316	318	314	335	334	5	355	88	10	39	67	4	2	333	342	312	291	316	301	269	270	278	275	321.8
23-Oct	275	274	269	270	269	264	263	268	268	260	273	272	269	272	278	275	275	279	274	272	271	267	263	262	270.1
24-Oct	260	262	256	255	256	253	255	259	258	261	261	260	261	255	258	251	254	253	249	261	252	249	246	249	255.8
25-Oct	252	254	255	260	258	259	253	228	217	255	235	242	243	239	256	249	249	244	237	261	271	274	267	258	251.8
26-Oct	255	257	255	257	254	254	255	246	249	253	257	253	257	247	243	246	247	247	242	246	250	248	236	237	250.2
27-Oct	239	240	254	258	262	303	316	288	301	313	302	295	300	307	301	289	292	277	293	277	249	202	165	162	282.3
28-Oct	157	139	134	161	257	272	270	270	266	276	276	293	295	301	290	278	264	252	254	253	256	256	259	266	266.0
29-Oct	266	265	262	268	269	260	269	281	278	273	281	275	300	294	287	279	269	253	261	266	275	319	333	324	277.5
30-Oct	329	311	316	325	316	315	346	163	170	154	129	134	152	151	143	162	144	132	139	156	178	181	180	181	162.4
31-Oct	181	181	119	274	252	258	277	292	298	310	304	300	295	296	300	304	310	168	196	203	275	307	216	189	280.7

195.7	196.8	201.7	205.3	207.7	212.6	209.5	203.4	205.0	206.8	201.7	207.9	211.3	209.5	209.2	209.0	208.1	210.7	212.1	203.0	209.0	199.1	198.1	195.0
Diurnal Average																							

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

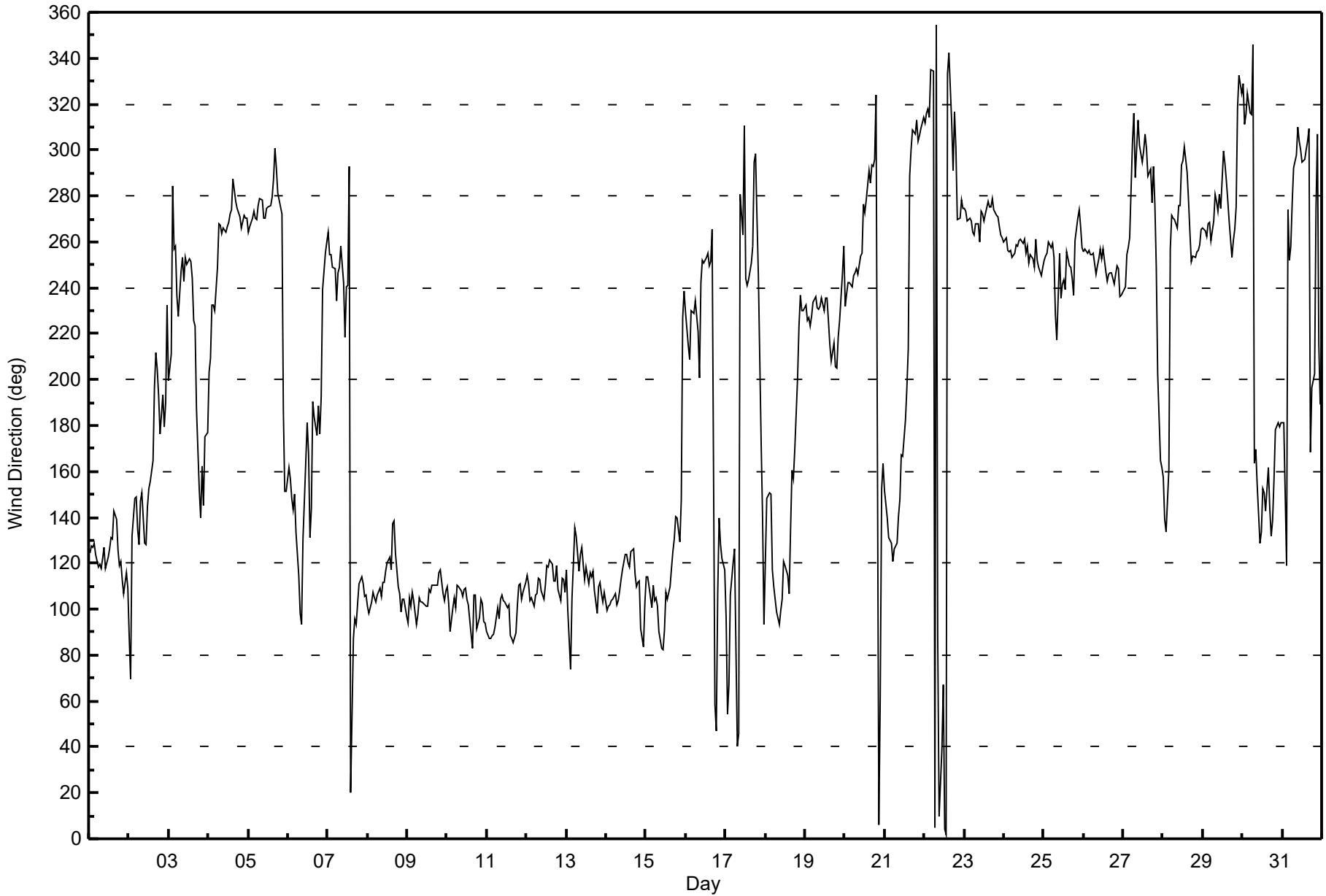
Wind Direction (WD) - deg
Anzac - October 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 91 deg on Oct 16 18:00											Hours in Service: 744 Hours of Data: 744 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0														
Minimum Value: 4 deg on Oct 21 02:00																									
Percentiles: P ₁ = 7 P ₁₀ = 11 Q ₁ = 13 Median = 16 Q ₃ = 18 P ₉₀ = 22 P ₉₉ = 67																									
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-Oct	10	8	9	10	8	13	10	11	13	14	15	15	15	16	14	21	17	12	10	9	12	14	10	18	21
2-Oct	31	35	16	26	25	16	13	26	20	14	21	20	18	18	20	18	19	16	16	10	12	11	12	67	67
3-Oct	16	15	40	16	17	25	16	15	15	17	15	20	17	18	22	18	18	22	13	5	11	9	16	16	40
4-Oct	43	20	21	23	21	18	15	16	16	16	16	16	16	17	16	18	16	15	16	16	17	16	16	16	43
5-Oct	16	17	15	16	15	16	15	16	16	16	15	14	16	15	15	15	12	13	15	13	13	42	8	6	42
6-Oct	8	11	15	11	13	14	15	17	19	23	26	30	28	20	17	22	19	16	16	14	12	23	16	16	30
7-Oct	16	18	17	17	17	14	10	12	18	22	63	68	37	31	36	23	16	14	12	11	10	11	12	13	68
8-Oct	12	13	13	12	12	12	13	12	13	12	13	13	13	14	14	14	13	18	12	13	13	11	12	14	18
9-Oct	10	13	14	11	12	13	13	12	14	15	15	15	17	17	15	15	13	12	11	10	10	11	12	13	17
10-Oct	12	15	14	14	13	11	11	13	14	13	14	15	15	18	18	17	15	14	19	17	13	14	15	14	19
11-Oct	14	14	14	15	14	15	15	15	14	15	17	17	18	18	17	17	18	15	16	13	14	11	12	12	18
12-Oct	11	11	12	12	12	11	11	9	11	14	17	27	17	14	14	16	17	12	8	20	13	11	11	11	27
13-Oct	10	25	13	15	11	7	11	14	13	15	14	15	17	18	18	16	14	14	15	12	11	12	12	12	25
14-Oct	12	13	12	12	12	13	13	14	13	13	13	14	14	15	16	14	12	14	13	13	14	16	12	13	16
15-Oct	10	10	12	15	11	13	13	15	17	23	16	19	19	17	15	13	12	16	6	6	10	15	16	14	23
16-Oct	16	15	10	12	11	11	12	23	27	18	18	18	17	20	22	20	23	91	27	24	7	9	7	11	91
17-Oct	11	24	12	24	22	21	50	39	44	67	25	28	17	17	15	15	15	12	14	18	28	71	13	16	71
18-Oct	15	28	19	17	14	14	22	18	22	19	15	16	16	14	14	17	16	12	15	27	16	19	16	17	28
19-Oct	17	17	17	16	17	18	18	17	18	20	18	16	19	19	18	17	18	18	17	18	16	17	23	67	67
20-Oct	19	19	18	17	17	16	17	16	18	17	16	18	17	16	15	14	14	10	11	11	29	56	67	12	67
21-Oct	8	4	8	6	7	9	9	8	13	16	19	18	20	17	16	43	14	13	13	13	14	13	14	11	43
22-Oct	12	12	10	8	17	22	30	46	51	52	24	26	36	34	20	17	21	13	12	40	15	20	14	14	52
23-Oct	13	13	12	14	13	15	17	16	16	18	17	18	18	19	19	17	16	14	14	15	14	15	15	16	19
24-Oct	15	17	15	17	16	16	16	16	17	16	19	20	20	18	19	20	18	18	17	17	19	18	18	17	20
25-Oct	18	18	16	17	16	19	21	20	18	24	20	26	22	21	19	18	19	17	19	18	16	15	16	17	26
26-Oct	16	16	15	16	16	16	15	17	17	15	17	16	15	17	20	19	20	16	17	17	17	17	18	17	20
27-Oct	16	17	17	17	16	23	16	13	14	13	17	16	15	14	14	13	15	11	11	11	27	13	18	10	27
28-Oct	12	7	13	21	32	15	15	14	16	17	15	15	14	14	16	16	16	17	17	17	16	15	15	16	32
29-Oct	16	15	16	17	17	17	18	14	15	17	18	22	16	18	18	15	18	14	15	14	18	29	14	12	29
30-Oct	15	12	11	11	6	8	12	85	18	20	16	20	21	21	19	18	13	11	11	15	18	17	16	17	85
31-Oct	17	19	49	70	16	16	17	13	15	12	13	14	13	14	15	12	17	33	10	12	34	36	20	24	70
											43 35 49 70 32 25 50 85 51 67 63 68 37 34 36 43 23 91 27 40 34 71 67 67														
Diurnal Maximum																									



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Anzac - October 2023





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

**AMS17
WAPASU
OCTOBER 2023**

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

November 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WAPASU (AMS17)
OCTOBER 2023

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	709	35	35	100	11.5	0	4	0
H2S (ppb) Average	708	36	36	100	0.7	0	0.2	0
THC (ppm) Average	709	35	35	100	2.7	-	2.4	-
O3 (ppb) Average	710	34	34	100	46	0	37.7	-
NO2 (ppb) Average	708	36	36	100	18.2	0	5.7	-
NO (ppb) Average	708	36	36	100	5.5	-	0.9	-
NOX (ppb) Average	708	36	36	100	20.3	-	6.3	-
PM2.5 (ug/m3) Average	741	3	3	100	27.4	0	13.4	0
Temperature 2 m (C) Average	744	0	0	100	22.3	-	14.9	-
Relative Humidity (%) Average	724	0	20	97.31	100	-	97.9	-
Wind Speed 10 m (km/h) Average	712	2	32	95.97	24	-	19	-
Wind Direction 10 m (deg) Average	712	2	32	95.97	-	-	-	-
Precipitation (mm) Total	742	2	2	100	1.8	-	9.4	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WAPASU (AMS17)
OCTOBER 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	0.34	1.3	-	0	0	0	0	0	0	0.3	11.5
H2S (ppb) Average	708	0.11	0.1	-	0	0	0	0.1	0.2	0.2	0.2	0.7
THC (ppm) Average	709	2.3	0.1	-	2.1	2.2	2.3	2.3	2.3	2.3	2.4	2.7
O3 (ppb) Average	710	24.08	7.7	-	2.6	13.8	19.4	24.9	29.1	33.3	46	
NO2 (ppb) Average	708	2.28	2.6	-	0	0.4	0.6	1.2	3.1	5.9	18.2	
NO (ppb) Average	708	0.26	0.6	-	0	0	0	0.1	0.2	0.6	5.5	
NOX (ppb) Average	708	2.54	2.9	-	0.1	0.4	0.6	1.3	3.5	6.6	20.3	
PM2.5 (ug/m3) Average	741	6.25	4	-	0.6	3	3.9	5	7.6	10.4	27.4	
Temperature 2 m (C) Average	744	3.15	8.2	-	-16.3	-7.3	-4.1	5.2	9.2	13.5	22.3	
Relative Humidity (%) Average	724	76.41	16.4	-	36.6	52.3	64	77.4	92	96.2	100	
Wind Speed 10 m (km/h) Average	712	9.9	5	-	0	4	6	9	13	17	24	
Wind Direction 10 m (deg) Average	712	-	-	-	-	-	-	-	-	-	-	-
Precipitation (mm) Total	742	-	-	34.72	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WAPASU (AMS17)
OCTOBER 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
Relative Humidity	02 Oct 2023 23:00	03 Oct 2023 10:00	12	Sensor operated out of range
Relative Humidity	05 Oct 2023 05:00	05 Oct 2023 08:00	4	Sensor operated out of range
Relative Humidity	17 Oct 2023 23:00	18 Oct 2023 02:00	4	Sensor operated out of range
Wind Speed, Wind Direction	05 Oct 2023 03:00	06 Oct 2023 08:00	30	Flat line in sensor output signal

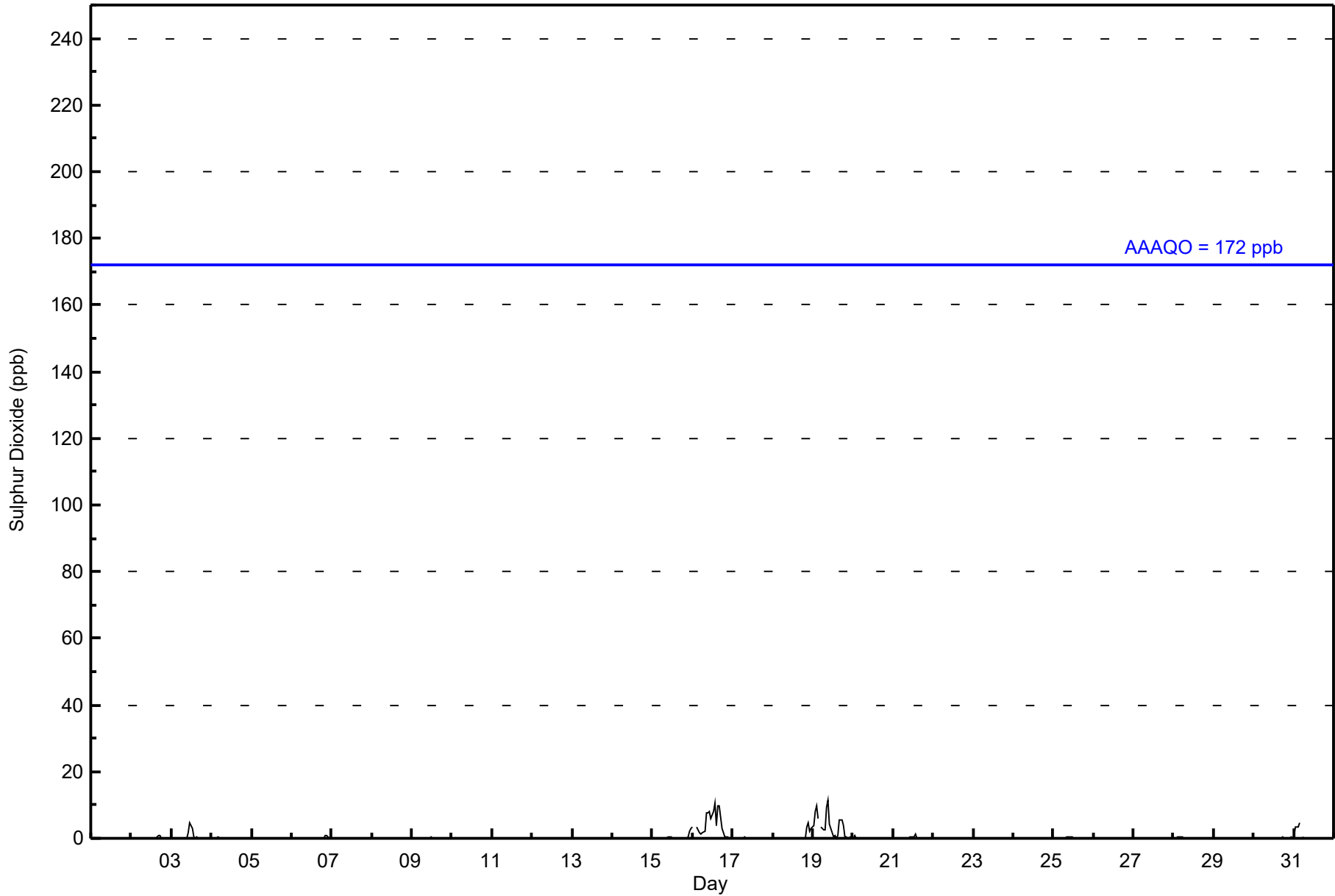


Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:														744											
Maximum Value: 11.5 ppb on Oct 19 10:00		Maximum Daily Average: 4.0 ppb on Oct 16		Hours of Data:														709													
Minimum Value: 0.0 ppb on Oct 1 01:00		Minimum Daily Average: 0.0 ppb on Oct 5		Hours of Missing Data:														35													
Maximum Diurnal Average: 0.7 ppb at hour 3		Minimum Diurnal Average: 0.1 ppb at hour 20		Hours of Calibration:														35													
Monthly Average: 0.34 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.3 P ₉₉ = 8.0		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-Oct	0.0	0.0	0.0	0.0	Z	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.0	0.2					
2-Oct	0.0	0.0	0.1	0.0	0.1	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.9	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.9					
3-Oct	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	1.8	4.7	2.8	0.2	0.0	0.5	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.7					
4-Oct	0.0	Z	0.0	0.1	0.6	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	0.0	0.0	0.0	0.0	0.0	0.0	0.6					
5-Oct	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					
6-Oct	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.0	0.9	0.1	0.0	0.1	1.0					
7-Oct	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1					
8-Oct	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					
9-Oct	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2					
10-Oct	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1					
11-Oct	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.0	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	0.1					
12-Oct	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2					
13-Oct	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					
14-Oct	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.2					
15-Oct	Z	0.2	0.0	0.1	0.1	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	2.1	2.9	0.3	2.9					
16-Oct	3.4	Z	3.3	2.4	1.8	1.5	1.5	2.0	7.7	7.4	8.2	5.9	8.0	10.5	4.0	9.7	9.7	3.0	1.5	0.6	0.4	0.3	0.2	0.2	4.0	10.5					
17-Oct	0.1	0.1	Z	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2				
18-Oct	0.0	0.0	0.0	Z	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.1	3.6	4.8	2.2	3.1	0.6	4.8					
19-Oct	3.9	7.8	9.7	6.1	Z	3.5	2.7	2.7	9.1	11.5	4.2	1.7	0.5	1.0	0.2	0.9	5.4	5.5	4.0	0.6	0.3	0.1	0.2	0.1	3.6	11.5					
20-Oct	0.1	0.6	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6					
21-Oct	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.5	0.3	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.2				
22-Oct	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				
23-Oct	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				
24-Oct	0.0	0.0	0.0	Z	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	0.0	0.0	0.0	0.0	0.0	0.0	0.1				
25-Oct	0.1	0.0	0.0	0.1	Z	0.0	0.0	0.0	0.3	0.2	0.2	0.3	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.3				
26-Oct	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				
27-Oct	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				
28-Oct	0.0	Z	0.5	0.4	0.6	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	0.1	0.6				
29-Oct	0.0	0.1	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	0.0	0.0	0.0	0.0	0.1				
30-Oct	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	0.2	0.1	0.0	0.0	0.4	0.1	0.0	0.1	0.0	0.2	0.2	0.1	0.4					
31-Oct	1.0	3.4	3.4	4.5	Z	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	0.6	4.5					
																								Diurnal Average				Diurnal Maximum			
																								0.3 0.5 0.7 0.5 0.1 0.2 0.1 0.2 0.6 0.6 0.5 0.5 0.4 0.5 0.1 0.4 0.5 0.3 0.2 0.1 0.2 0.2 0.2 0.2 0.2 0.2				3.9 7.8 9.7 6.1 1.8 3.5 2.7 2.7 9.1 11.5 8.2 5.9 8.0 10.5 4.0 9.7 9.7 5.5 4.0 0.6 3.6 4.8 2.2 3.1			
Z - zerospan C - Calibration																															
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb																															



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Wapasu - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Wapasu - October 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	707	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: 709

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Wapasu - October 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	43	16	4	7	6	10	96	163	83	36	48	57	15	25	32	37	678
11 - 20	0	0	0	0	0	0	0	0	0	0	1	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	43	16	4	7	6	10	96	163	83	36	49	57	15	25	32	37	679

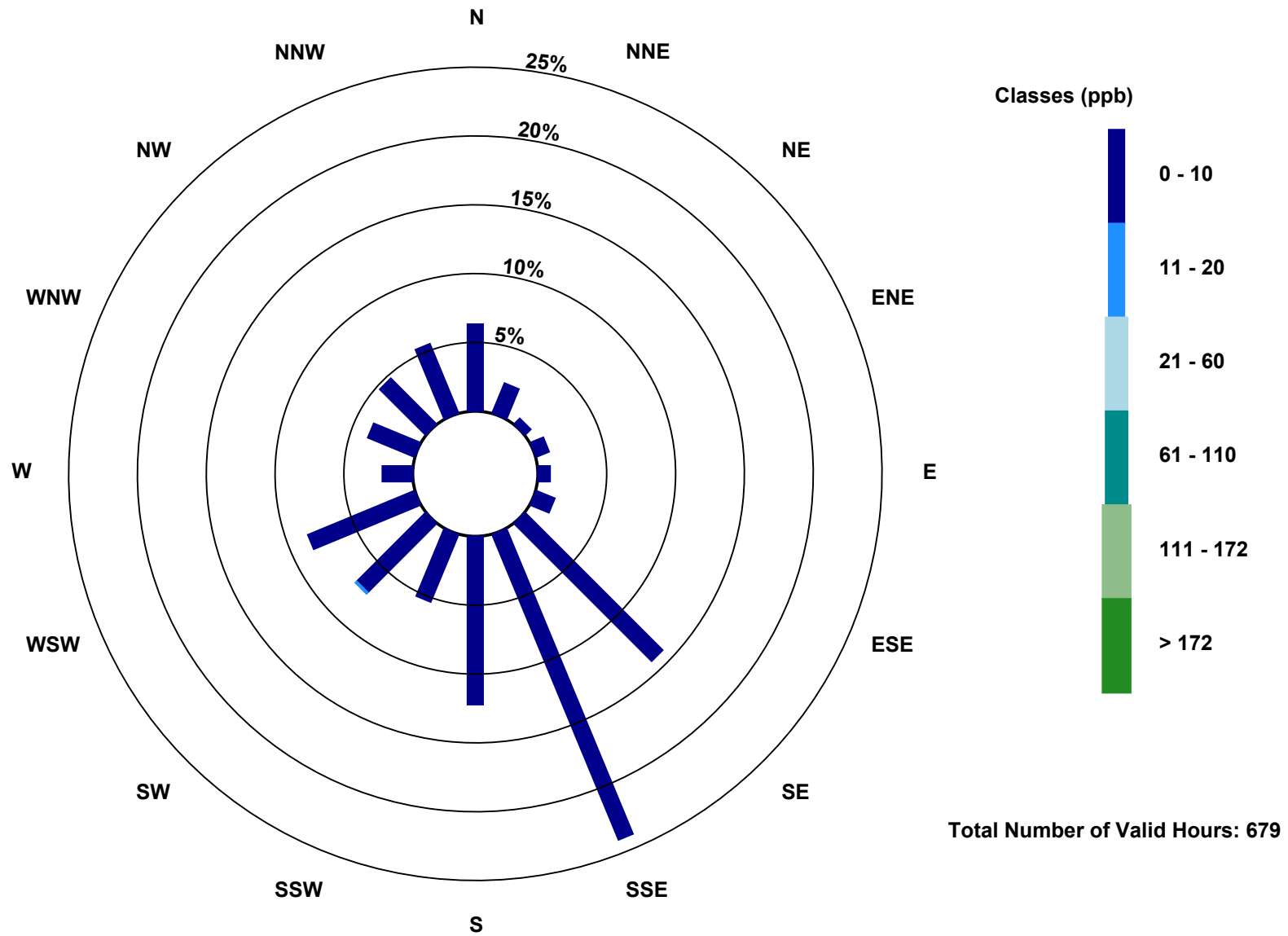
Total Number of Valid Hours: 679

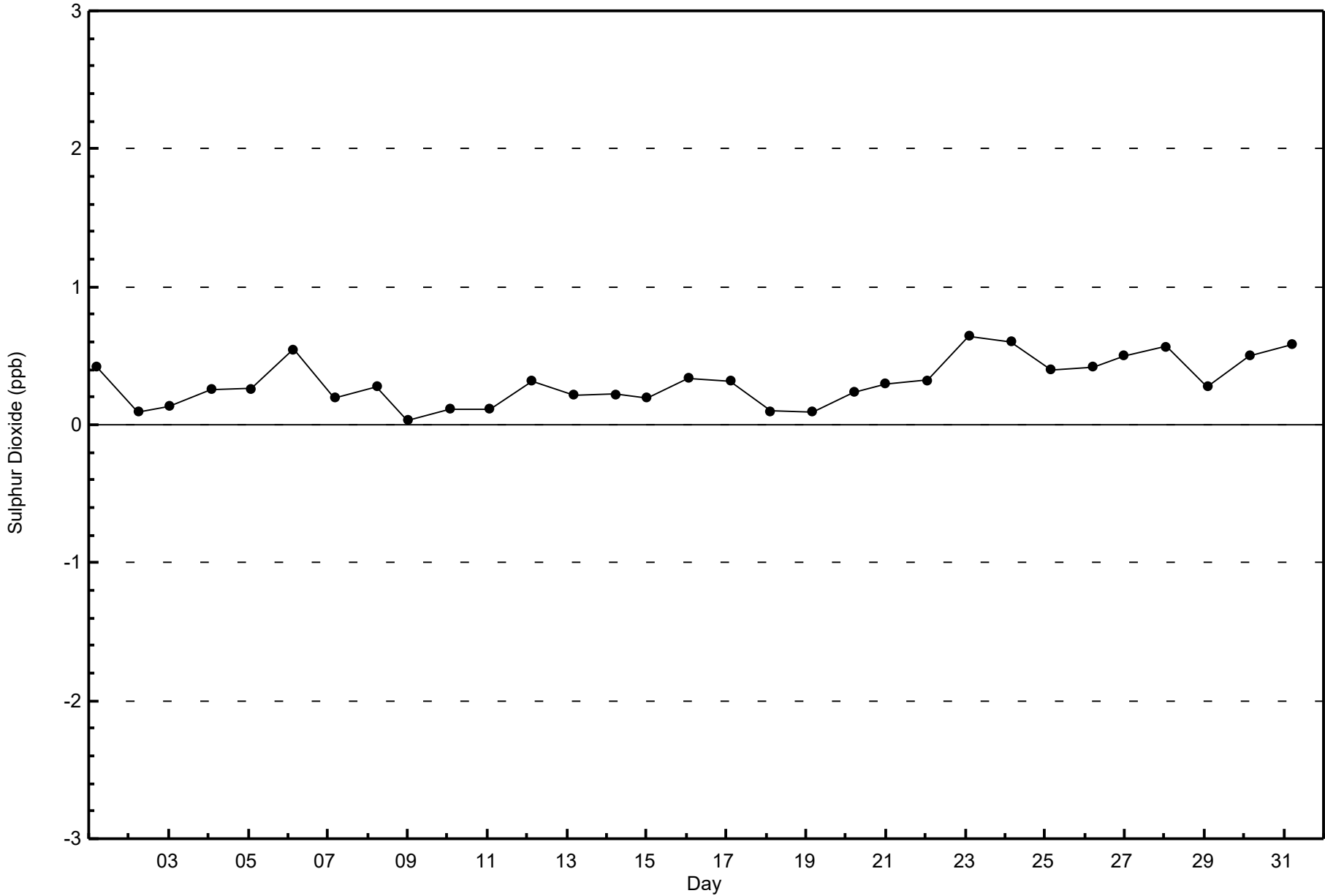
Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

Sulphur Dioxide (SO₂) - ppb
Wapasu

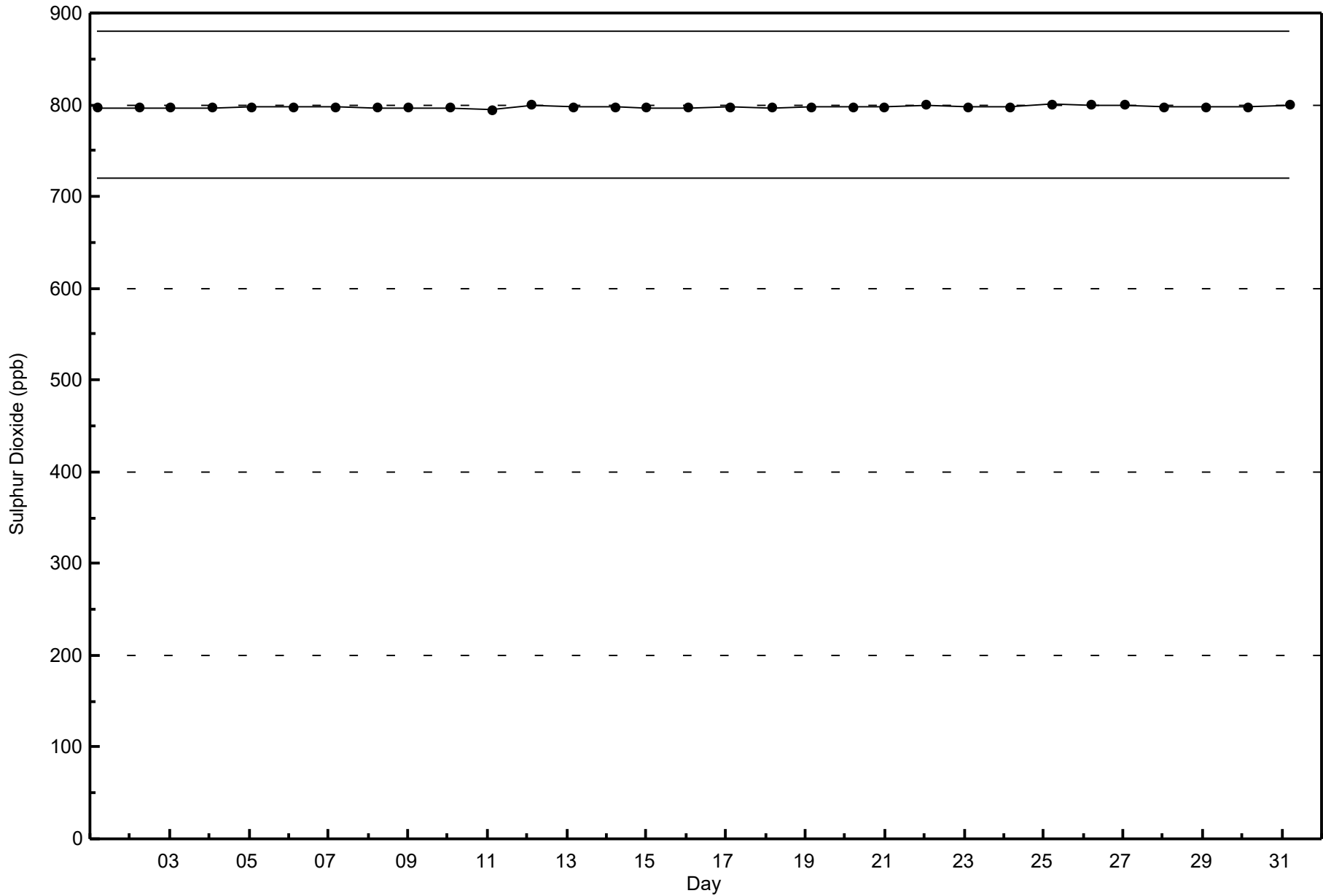


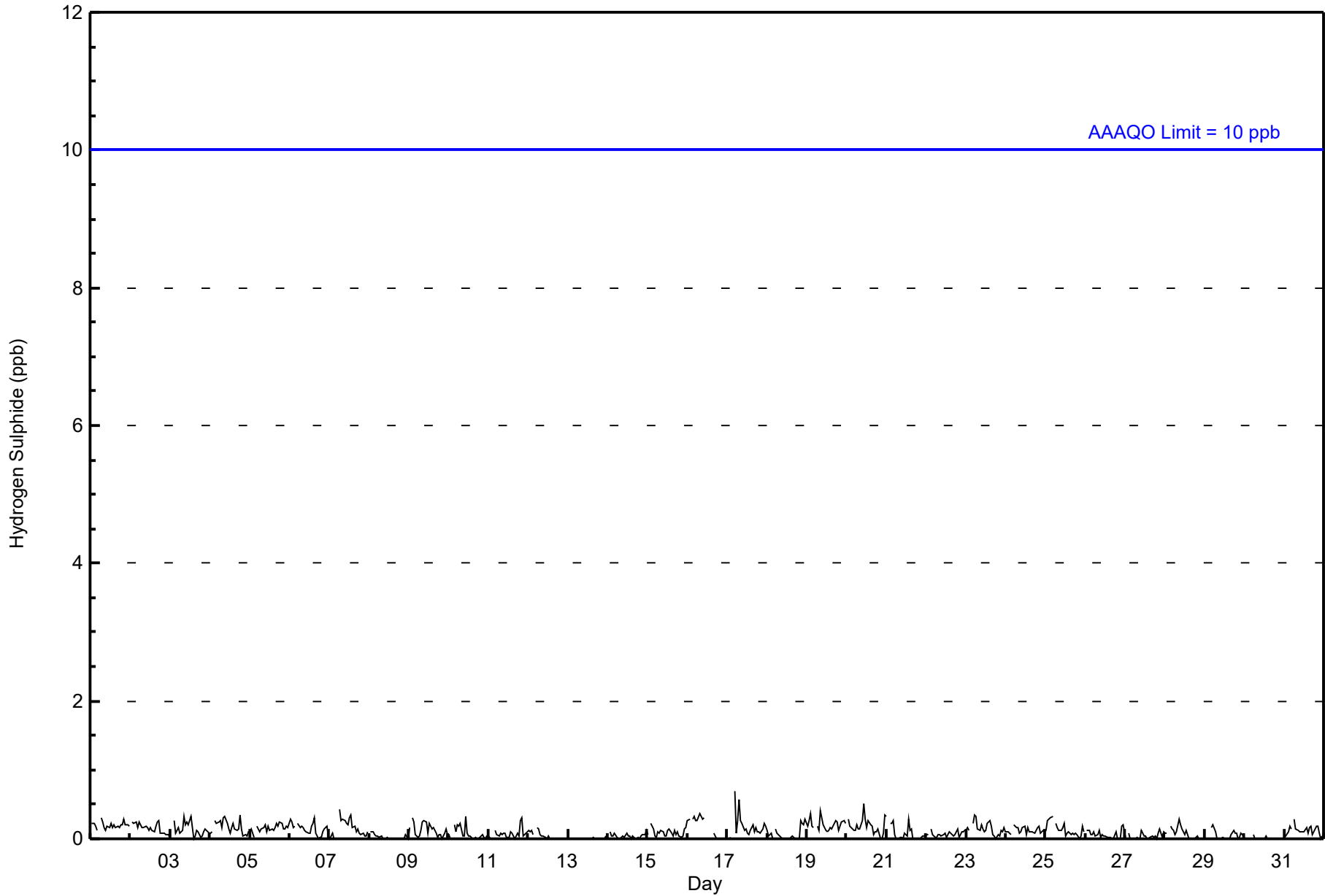




Wood Buffalo Environmental Association
Span Responses

Sulphur Dioxide (SO₂) - ppb
Wapasu - October 2023







Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Hydrogen Sulphide (H₂S) - ppb
Wapasu - October 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
Wapasu - October 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	44	15	5	6	7	8	99	166	82	35	46	57	16	26	32	36	680
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	44	15	5	6	7	8	99	166	82	35	46	57	16	26	32	36	680

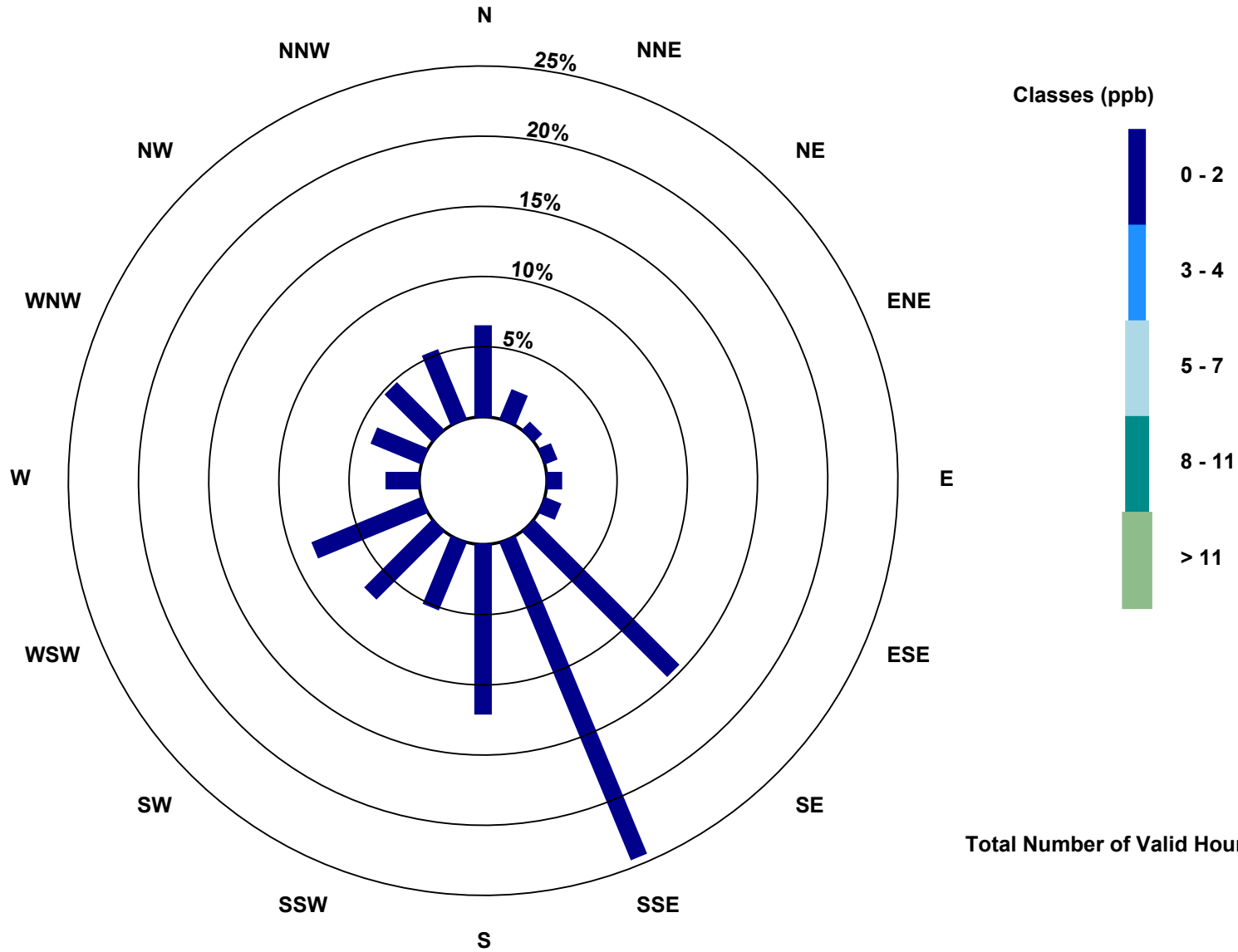
Total Number of Valid Hours: 680

Total Number of Hours: 744

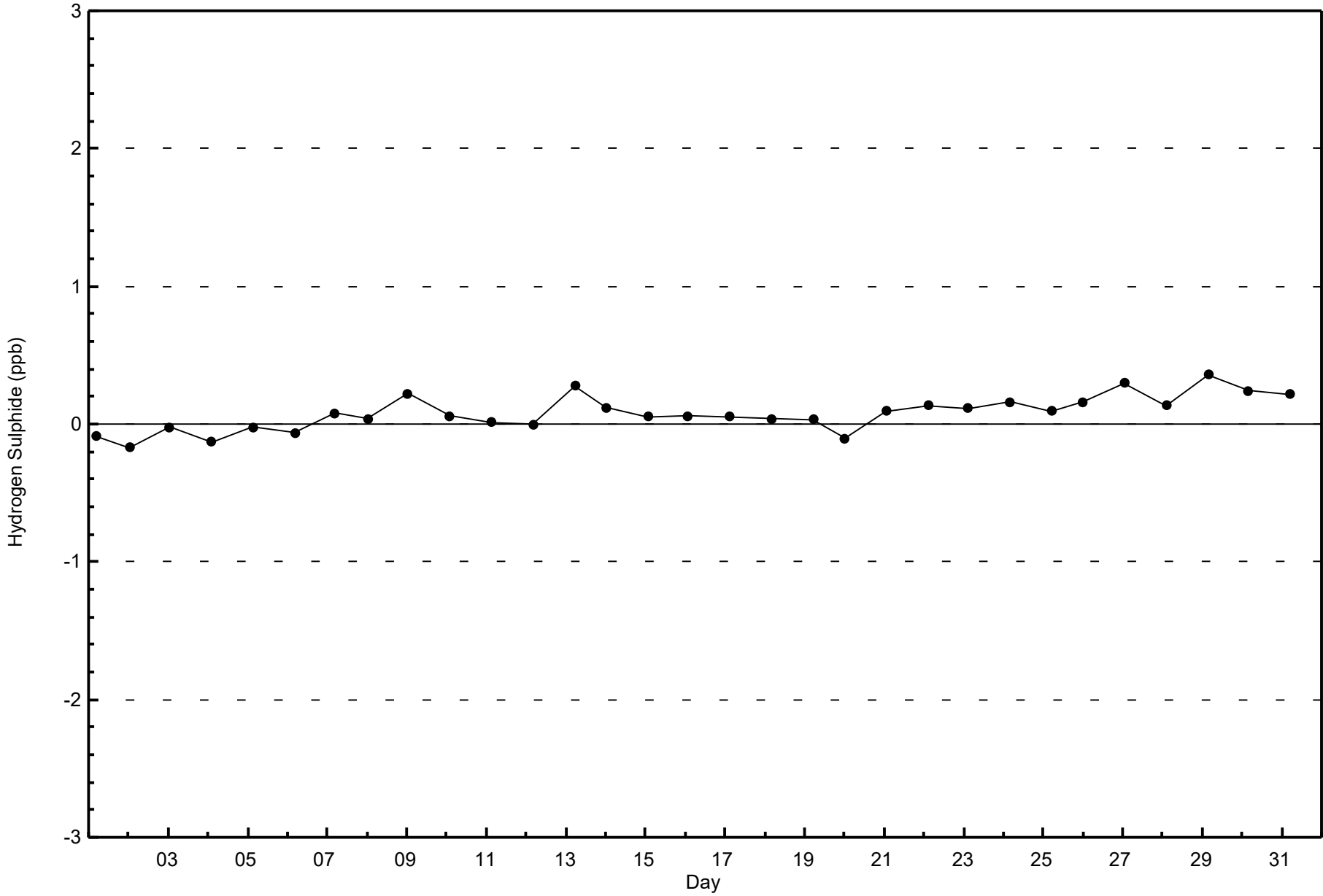


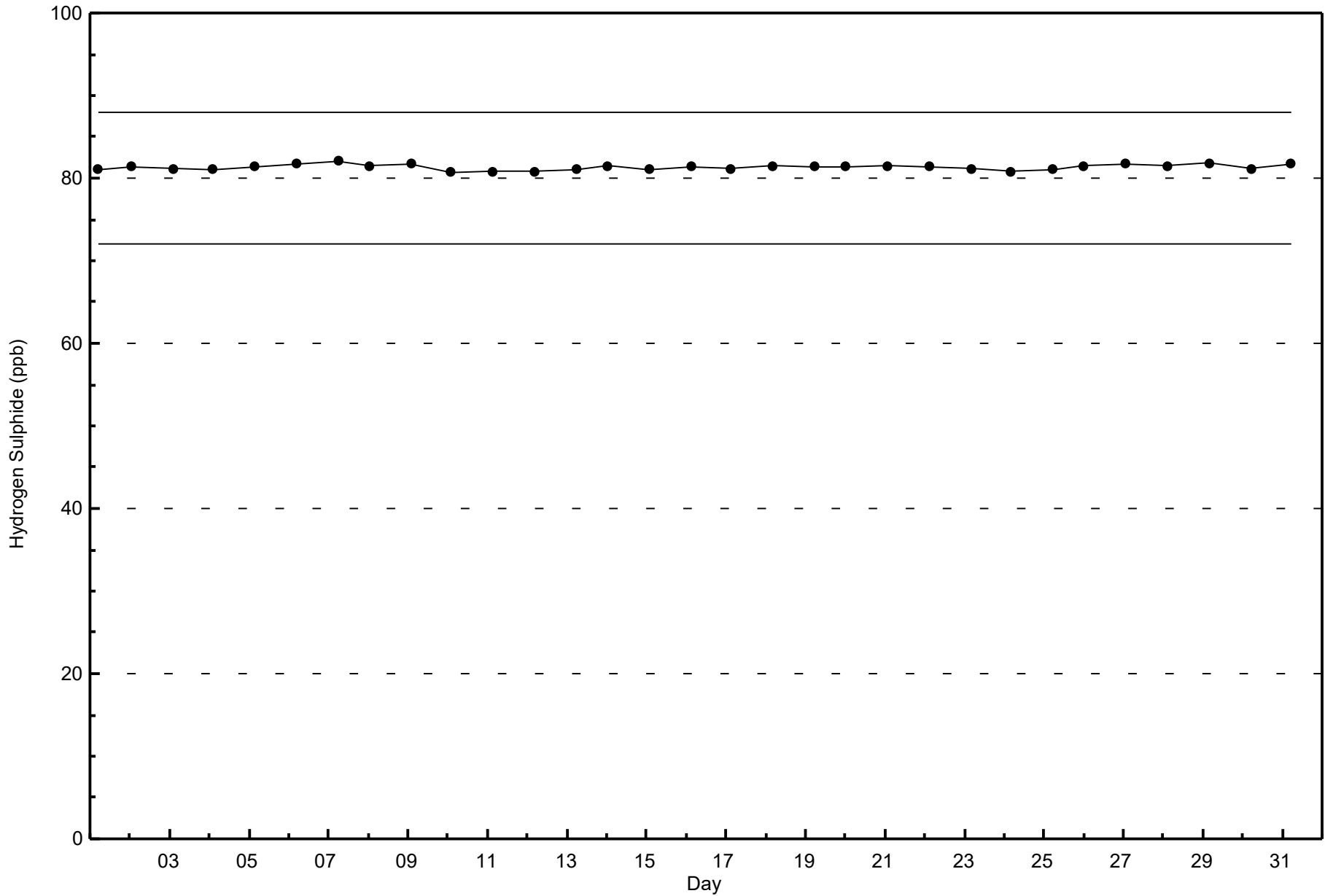
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Hydrogen Sulphide (H₂S) - ppb
Wapasu



Total Number of Valid Hours: 680

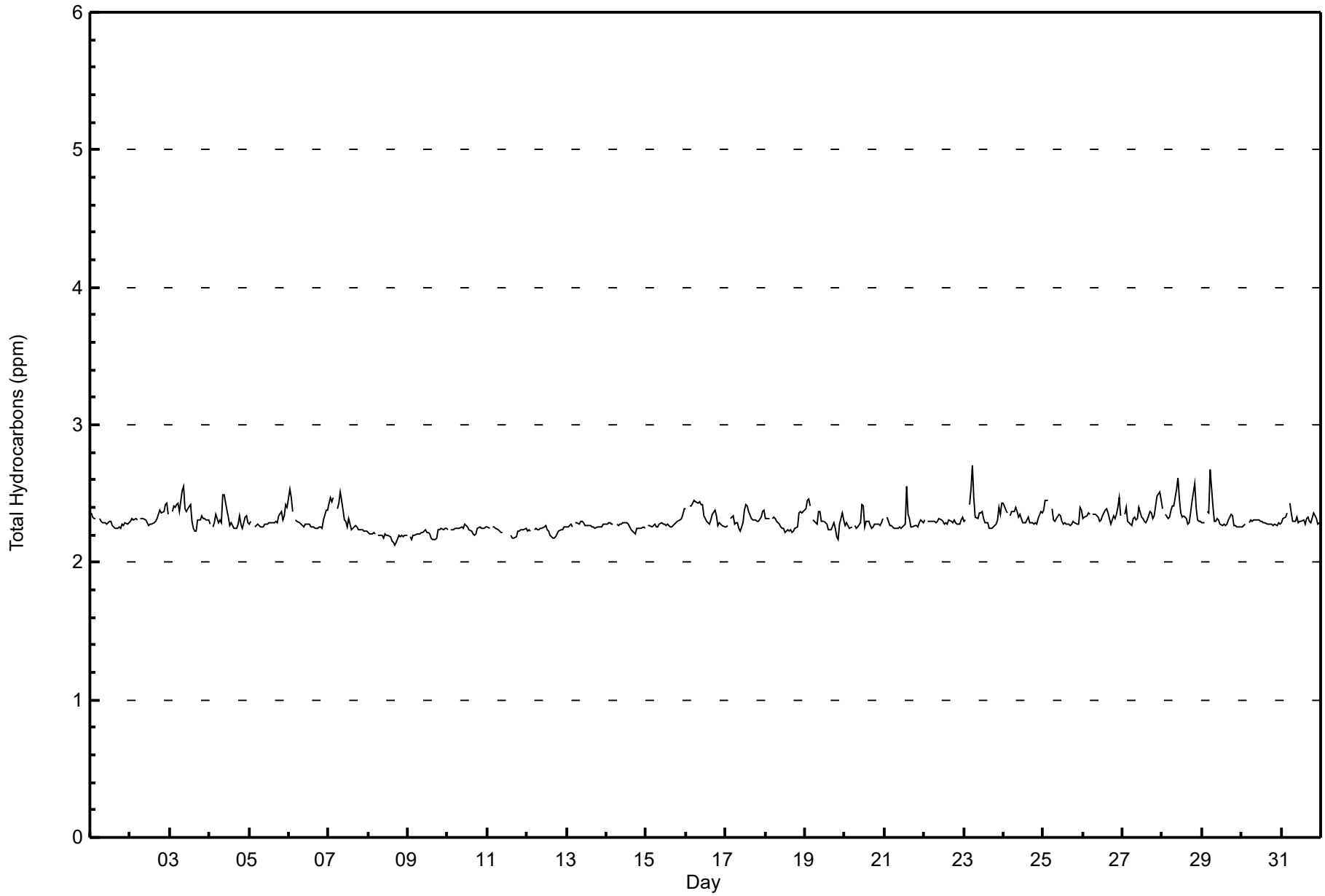






Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Wapasu - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Wapasu - October 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	0	0.00	0.00
2.1 - 3.0	709	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: 709

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Wapasu - October 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	43	16	4	7	6	10	96	163	83	36	49	57	15	25	32	37	679
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	43	16	4	7	6	10	96	163	83	36	49	57	15	25	32	37	679

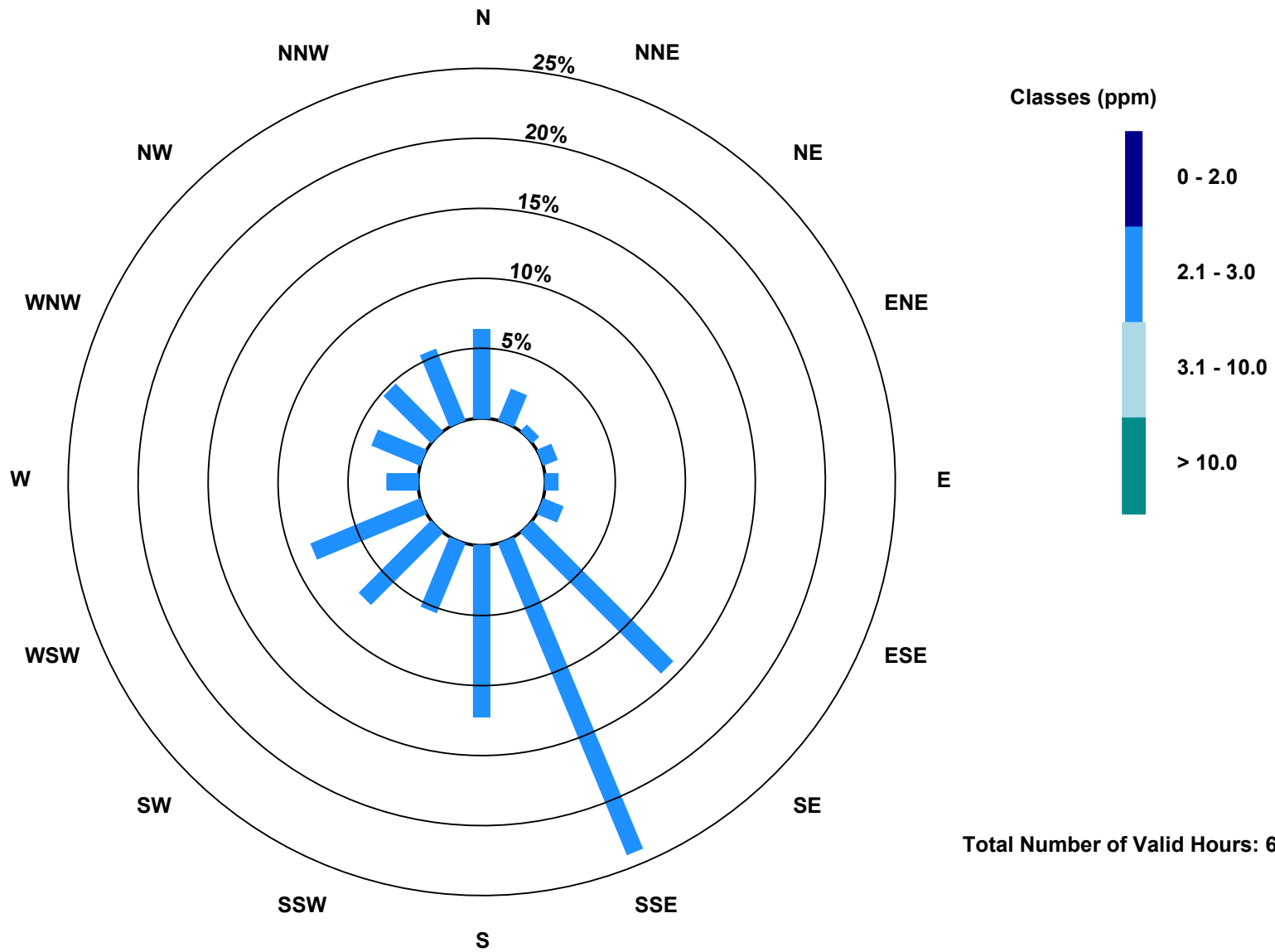
Total Number of Valid Hours: 679

Total Number of Hours: 744

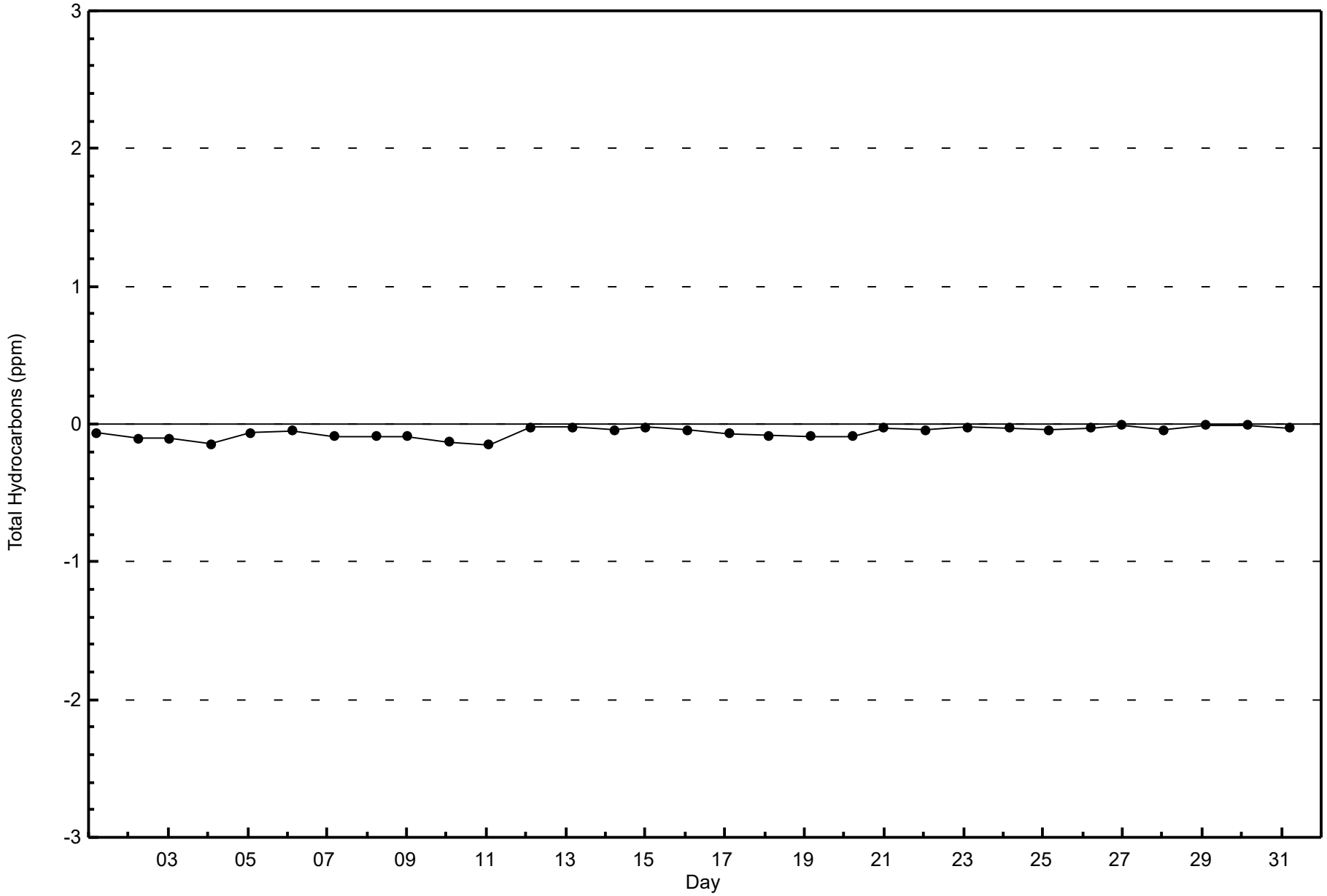


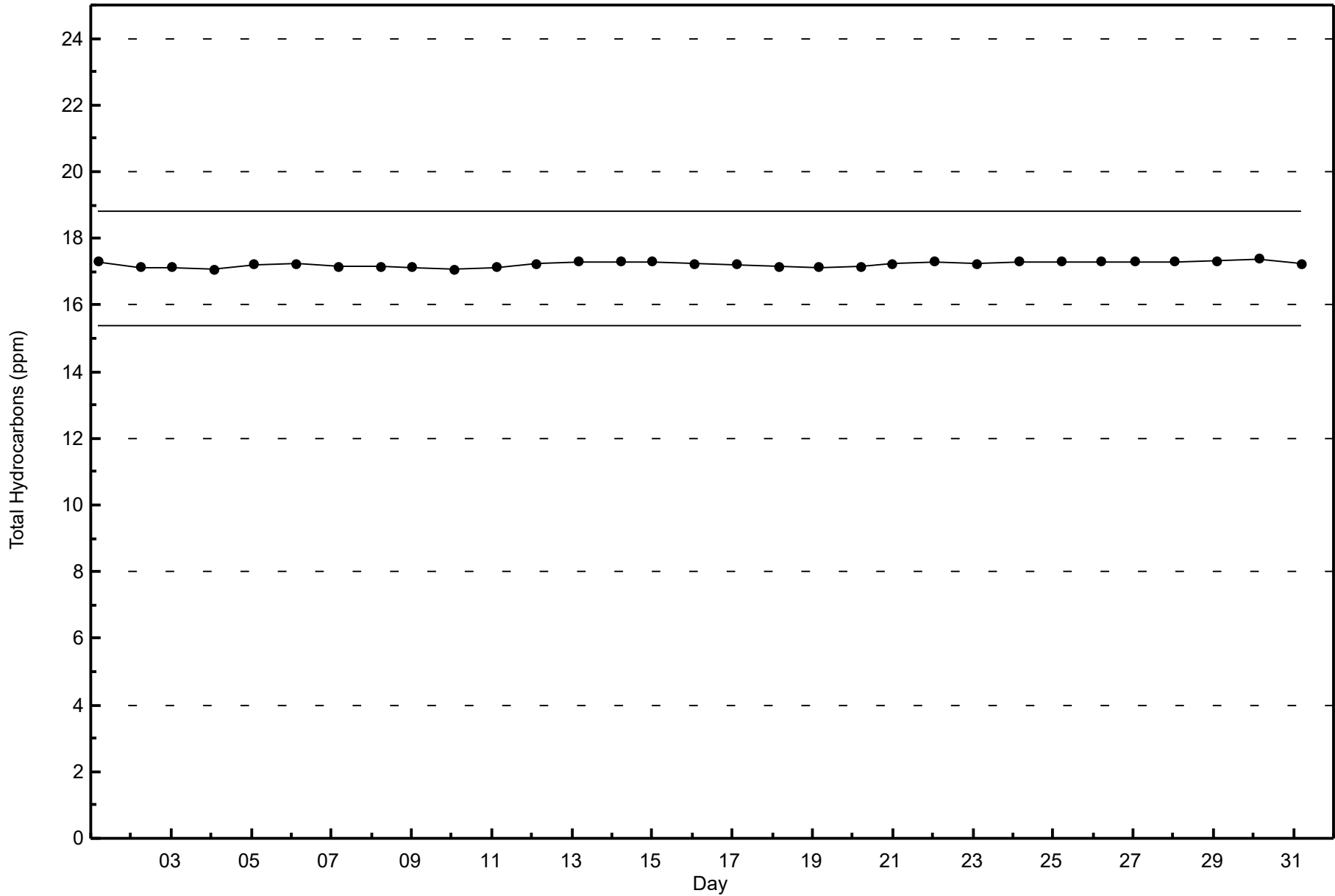
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Total Hydrocarbons (THC) - ppm
Wapasu



Total Number of Valid Hours: 679







Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O₃) - ppb

Wapasu - October 2023

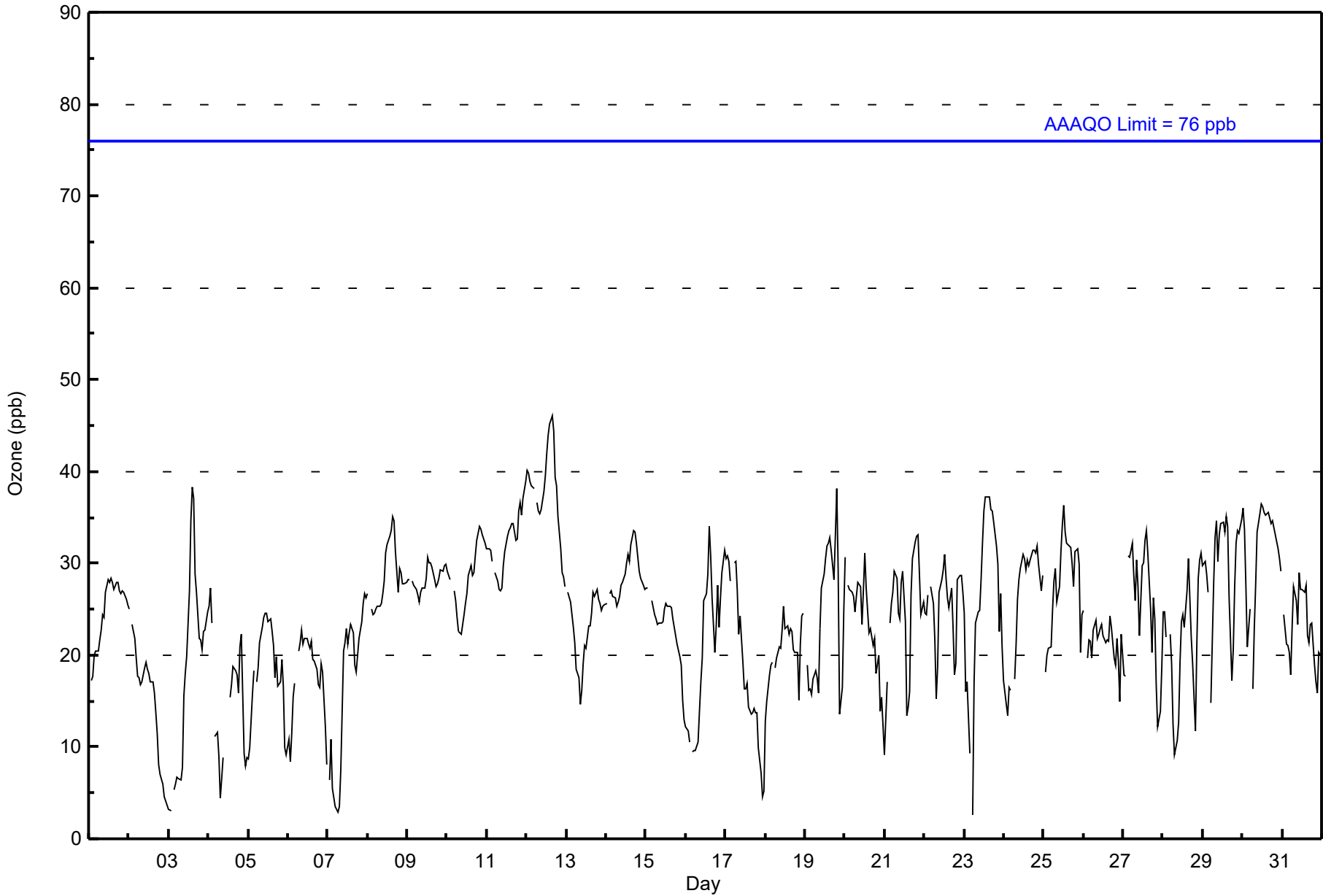
Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service:																	744						
Maximum Value: 46.0 ppb on Oct 12 16:00		Maximum Daily Average: 37.7 ppb on Oct 12																	Hours of Data:	710							
Minimum Value: 2.6 ppb on Oct 23 06:00		Minimum Daily Average: 14.9 ppb on Oct 2																	Hours of Missing Data:	34							
Maximum Diurnal Average: 28.0 ppb at hour 13		Minimum Diurnal Average: 20.1 ppb at hour 6																	Hours of Calibration:	34							
Monthly Average: 24.08 ppb		Percentiles: P ₁ = 3.7 P ₁₀ = 13.8 Q ₁ = 19.4 Median = 24.9 Q ₃ = 29.1 P ₉₀ = 33.3 P ₉₉ = 39.5																	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-Oct	Z	17.2	17.7	19.9	20.4	20.5	21.7	22.7	24.4	24.1	26.8	28.2	27.9	28.4	27.9	27.2	27.8	27.9	27.0	26.7	27.0	26.9	26.1	25.6	24.8	28.4	
2-Oct	25.0	Z	23.3	21.9	19.7	17.7	17.5	16.7	17.1	18.6	19.2	18.5	18.0	17.1	17.2	15.8	13.8	11.5	8.0	7.0	5.9	4.6	4.2	3.6	14.9	25.0	
3-Oct	3.2	3.1	Z	5.4	6.0	6.8	6.5	6.4	7.8	15.5	18.0	19.8	27.1	34.7	38.3	37.1	28.8	26.9	21.8	21.7	20.6	22.6	22.8	24.7	18.5	38.3	
4-Oct	25.4	27.4	23.5	Z	11.1	11.5	9.0	4.4	6.6	8.8	C	C	C	15.4	16.8	18.8	18.3	17.8	15.9	20.9	22.3	9.3	7.9	8.9	15.0	27.4	
5-Oct	8.8	9.9	15.9	18.3	Z	17.1	18.6	21.4	23.1	24.2	24.5	24.6	23.7	24.0	22.6	21.1	17.5	19.9	16.6	17.1	19.5	16.6	9.9	9.1	18.4	24.6	
6-Oct	10.8	8.4	11.5	15.4	17.0	Z	20.5	21.3	22.8	21.2	21.8	21.8	21.1	20.8	21.5	19.6	19.4	18.5	16.7	16.5	19.1	18.1	12.3	8.1	17.6	22.8	
7-Oct	Z	6.4	10.8	5.5	3.5	3.3	2.9	3.4	7.5	20.4	21.4	22.8	21.2	22.5	23.4	22.5	18.9	18.1	20.0	21.8	23.6	25.6	26.7	26.2	16.4	26.7	
8-Oct	26.7	Z	25.0	24.3	24.6	25.0	25.4	25.4	25.6	26.7	28.1	31.2	32.1	32.9	33.6	35.1	34.7	31.3	26.8	29.5	29.0	27.7	27.7	28.0	28.5	35.1	
9-Oct	28.2	28.2	Z	28.1	27.6	27.1	26.5	25.7	26.8	27.4	27.3	28.3	30.6	30.1	30.1	29.6	28.3	27.4	27.7	28.4	29.4	29.2	29.8	29.9	28.3	30.6	
10-Oct	29.2	28.6	28.2	Z	27.0	25.9	24.1	22.5	22.2	23.3	24.4	25.7	26.7	28.6	29.8	28.7	29.0	30.8	32.6	34.0	33.7	33.0	32.6	32.3	28.4	34.0	
11-Oct	31.6	31.6	31.4	30.2	Z	29.0	28.0	27.2	27.0	27.3	29.7	31.2	33.0	33.5	33.8	34.3	34.3	32.6	32.6	35.7	36.5	35.2	37.1	38.9	32.2	38.9	
12-Oct	40.1	39.8	39.0	38.5	38.1	Z	36.6	35.7	35.4	35.9	37.8	39.5	42.0	43.9	45.2	46.0	44.4	39.4	38.4	35.1	31.6	29.0	28.6	27.5	37.7	46.0	
13-Oct	Z	26.9	25.7	24.4	23.0	21.3	18.5	17.5	14.6	16.1	19.1	21.1	20.7	23.2	23.2	24.6	26.8	26.4	27.1	26.0	25.7	24.8	25.3	25.5	22.9	27.1	
14-Oct	25.6	Z	26.6	26.9	26.3	26.2	25.3	25.8	26.3	27.7	28.0	28.8	30.0	31.0	30.2	32.0	33.5	33.4	32.2	30.7	29.1	28.4	27.7	27.2	28.7	33.5	
15-Oct	27.3	27.3	Z	26.0	25.1	24.5	23.9	23.4	23.5	23.5	23.7	25.0	25.6	25.3	25.3	25.1	23.9	23.0	22.1	21.1	19.8	18.8	15.1	13.0	23.1	27.3	
16-Oct	12.1	11.8	10.5	Z	9.4	9.6	9.7	10.6	13.9	17.1	19.7	26.0	26.8	28.9	34.0	30.9	26.2	20.2	23.3	27.7	23.1	26.2	29.0	31.4	20.8	34.0	
17-Oct	30.5	30.8	30.2	28.0	Z	30.1	30.2	27.0	22.3	24.3	19.2	16.3	16.4	16.9	14.4	13.5	13.7	14.2	13.7	13.7	9.9	7.2	4.6	5.2	18.8	30.8	
18-Oct	12.8	15.0	17.8	18.9	19.2	Z	18.6	19.7	20.9	20.7	22.7	25.3	22.8	23.2	22.2	22.8	22.5	20.6	20.2	20.3	15.1	21.2	24.2	24.5	20.5	25.3	
19-Oct	Z	19.0	16.1	16.3	15.7	17.4	18.3	17.6	15.8	22.9	27.3	28.8	30.6	31.9	32.2	32.8	31.4	28.2	33.0	38.1	29.3	13.6	16.4	24.7	24.2	38.1	
20-Oct	30.7	Z	27.7	27.2	26.8	26.5	24.8	26.4	27.9	27.4	23.3	26.9	31.1	27.4	22.4	22.9	22.0	21.0	21.8	18.1	20.0	13.9	15.4	12.4	23.7	31.1	
21-Oct	9.2	17.1	Z	23.5	25.6	26.8	29.1	28.3	24.6	23.9	27.9	29.1	23.6	13.5	14.3	16.1	26.6	30.5	32.4	33.0	33.1	28.9	24.4	25.8	24.7	33.1	
22-Oct	24.6	24.4	26.5	Z	27.4	25.7	21.7	15.2	18.7	26.8	28.2	29.3	30.9	28.4	26.3	25.2	27.3	23.1	17.9	19.1	28.3	28.7	28.6	26.8	25.2	30.9	
23-Oct	24.6	15.9	17.1	9.3	Z	2.6	16.9	23.5	24.7	24.9	28.2	32.1	35.7	37.2	37.2	37.1	35.8	35.7	34.5	32.0	30.0	22.6	26.6	20.9	26.3	37.2	
24-Oct	17.3	14.7	13.4	16.5	16.2	Z	17.3	21.1	26.2	28.2	29.4	31.0	30.6	29.2	30.4	29.7	30.3	31.4	31.4	31.1	31.9	30.0	27.1	28.7	25.8	31.9	
25-Oct	Z	18.2	19.9	20.8	20.8	24.8	28.1	29.5	25.7	27.4	31.3	34.2	36.3	33.5	32.1	31.8	31.8	29.9	27.4	31.3	31.6	30.0	20.3	24.4	27.9	36.3	
26-Oct	24.9	Z	19.7	21.7	21.5	19.6	22.7	23.8	21.8	22.3	22.8	23.4	22.1	21.4	21.7	21.6	24.2	23.0	19.6	18.9	21.7	19.3	14.9	22.3	21.5	24.9	
27-Oct	17.9	17.7	Z	30.9	30.7	32.2	28.7	25.9	30.3	27.4	22.1	29.7	30.0	32.5	33.6	31.2	25.0	20.4	26.3	24.0	16.8	12.2	13.9	18.7	25.1	33.6	
28-Oct	24.7	24.7	21.9	Z	22.2	19.0	12.6	9.1	10.7	12.7	19.2	23.6	24.4	23.0	27.1	30.6	26.3	21.9	19.0	11.7	21.1	28.4	30.4	31.2	21.5	31.2	
29-Oct	29.8	30.1	28.8	26.9	Z	14.9	27.7	32.9	34.6	30.1	33.0	34.4	34.4	33.4	35.1	34.0	26.3	17.3	20.6	27.4	32.1	33.5	33.3	34.8	29.8	35.1	
30-Oct	35.9	33.6	27.7	20.9	25.1	Z	16.4	22.9	27.8	33.3	35.4	36.4	36.1	35.6	35.2	35.6	35.0	34.3	34.6	33.9	33.1	31.6	30.6	29.1	31.3	36.4	
31-Oct	Z	24.4	21.2	21.1	20.2	17.9	23.0	27.4	25.9	23.3	29.0	27.2	27.1	26.8	27.6	22.1	21.3	23.4	23.5	18.9	17.0	15.8	20.2	20.1	22.8	29.0	
		23.1	21.2	22.2	21.8	21.2	20.1	21.0	21.3	22.0	23.7	25.6	27.3	28.0	27.6	27.9	27.6	26.6	25.2	24.7	24.9	24.7	23.0	22.4	22.9	Diurnal Average	
		40.1	39.8	39.0	38.5	38.1	32.2	36.6	35.7	35.4	35.9	37.8	39.5	42.0	43.9	45.2	46.0	44.4	39.4	38.4	38.1	36.5	35.2	37.1	38.9	Diurnal Maximum	

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



Wood Buffalo Environmental Association
Hourly Averages

Ozone (O₃) - ppb
Wapasu - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ozone (O₃) - ppb
Wapasu - October 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	204	28.73	28.73
21 - 50	506	71.27	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 710

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Ozone (O₃) - ppb
Wapasu - October 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	2	3	3	4	5	15	39	37	16	11	17	3	9	6	8	186
21 - 50	36	13	2	3	3	4	84	126	49	16	37	40	13	16	23	29	494
51 - 82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	44	15	5	6	7	9	99	165	86	32	48	57	16	25	29	37	680

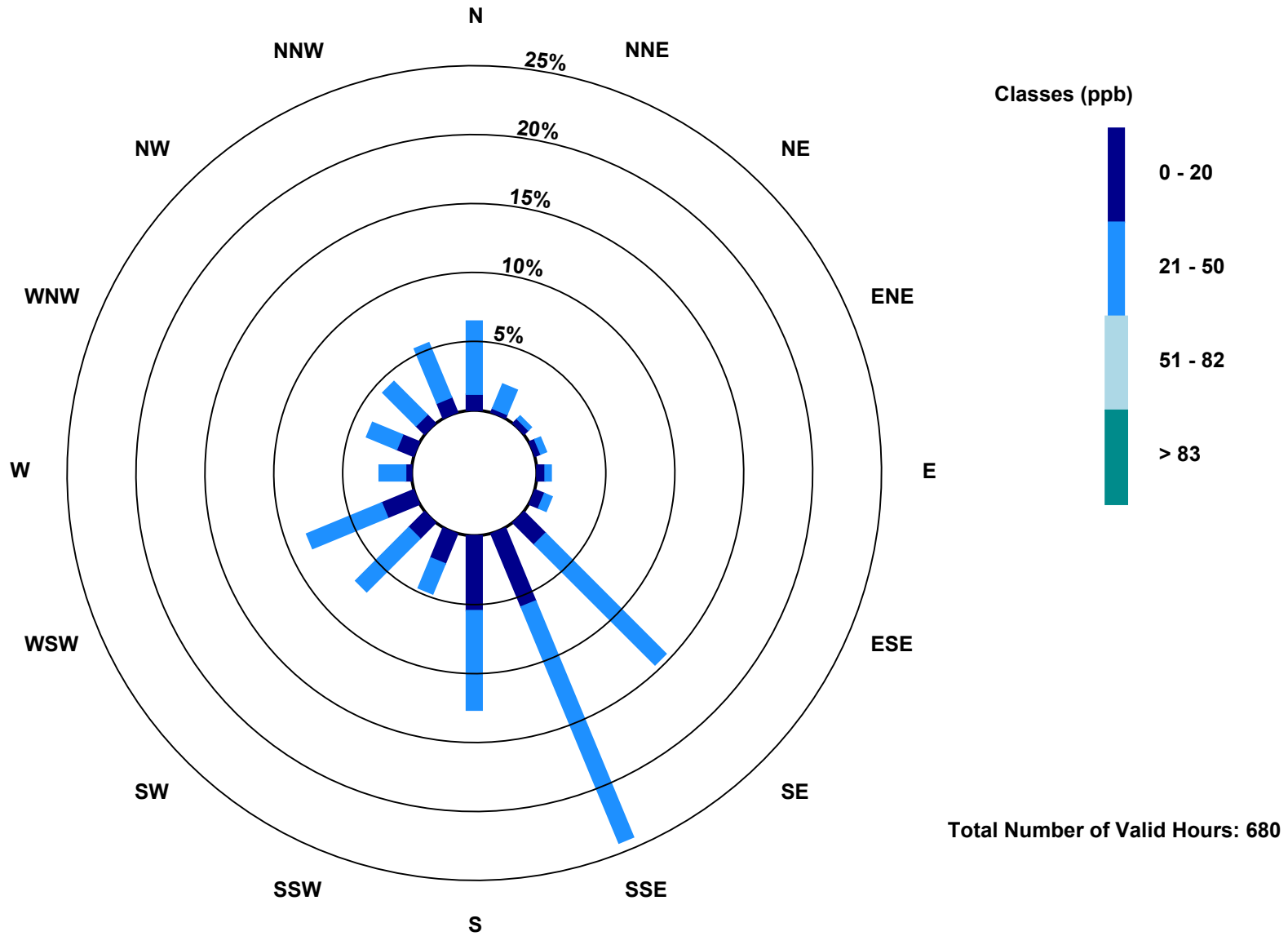
Total Number of Valid Hours: 680

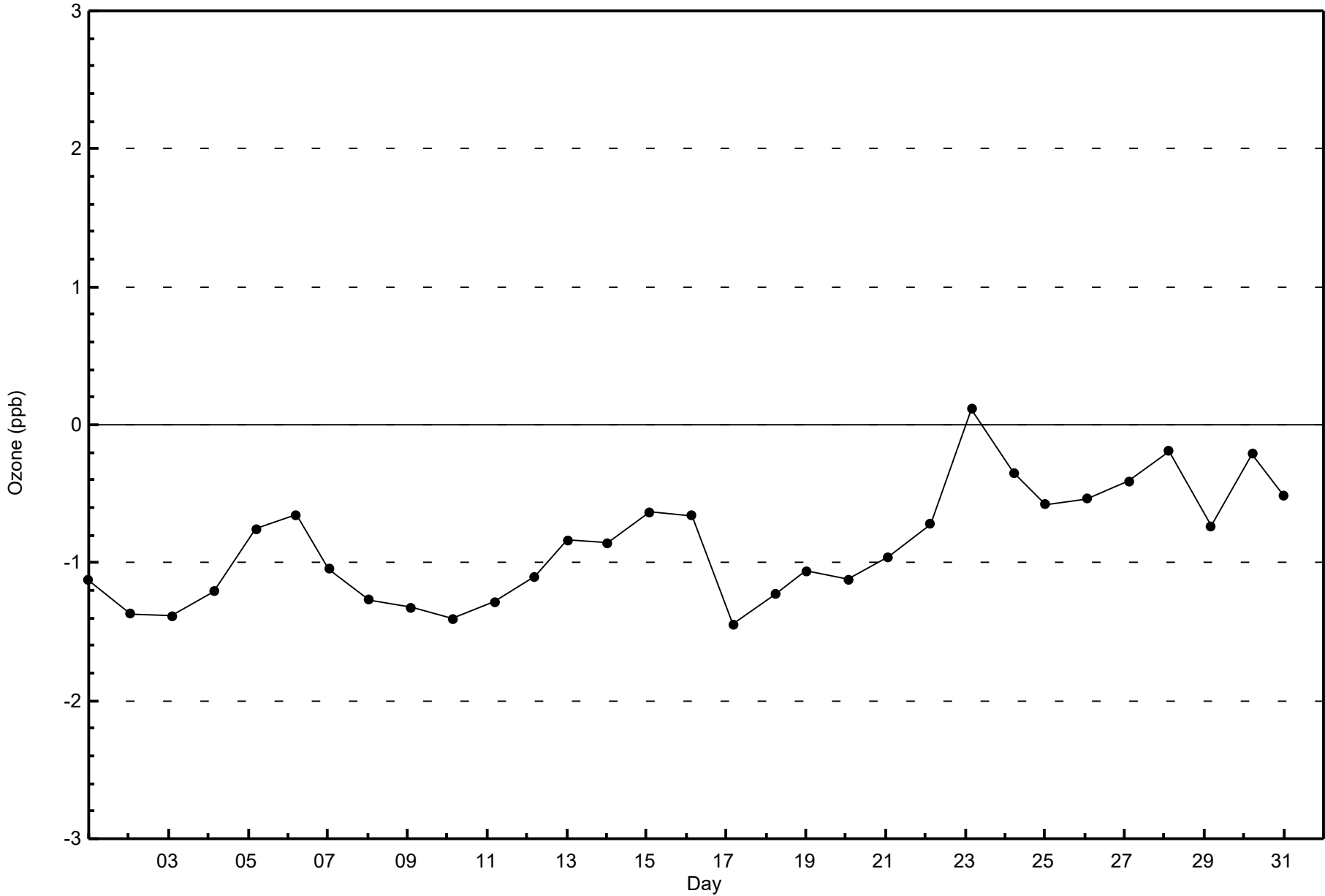
Total Number of Hours: 744

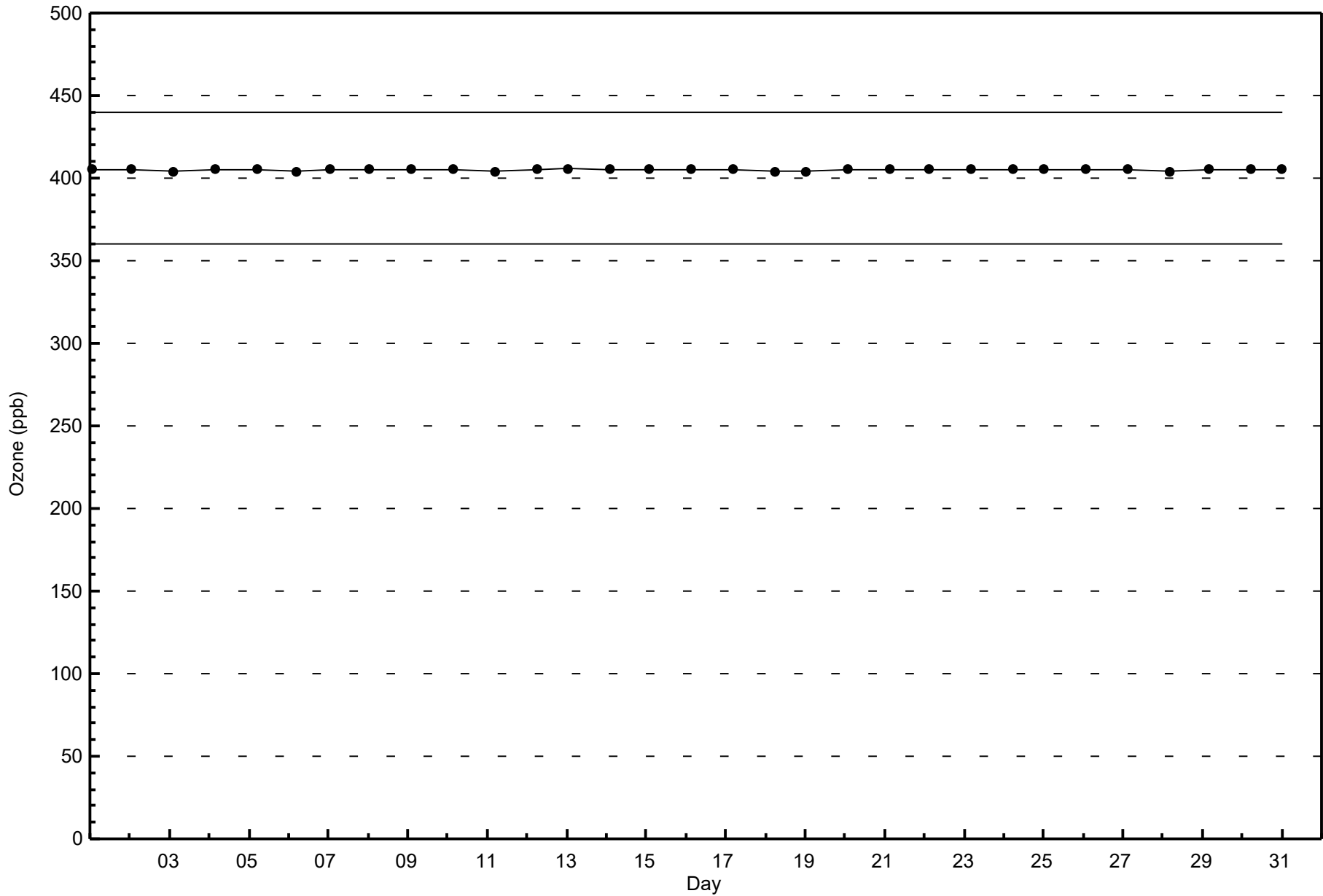


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Ozone (O₃) - ppb
Wapasu









Wood Buffalo Environmental Association
Summary of Hour Averages

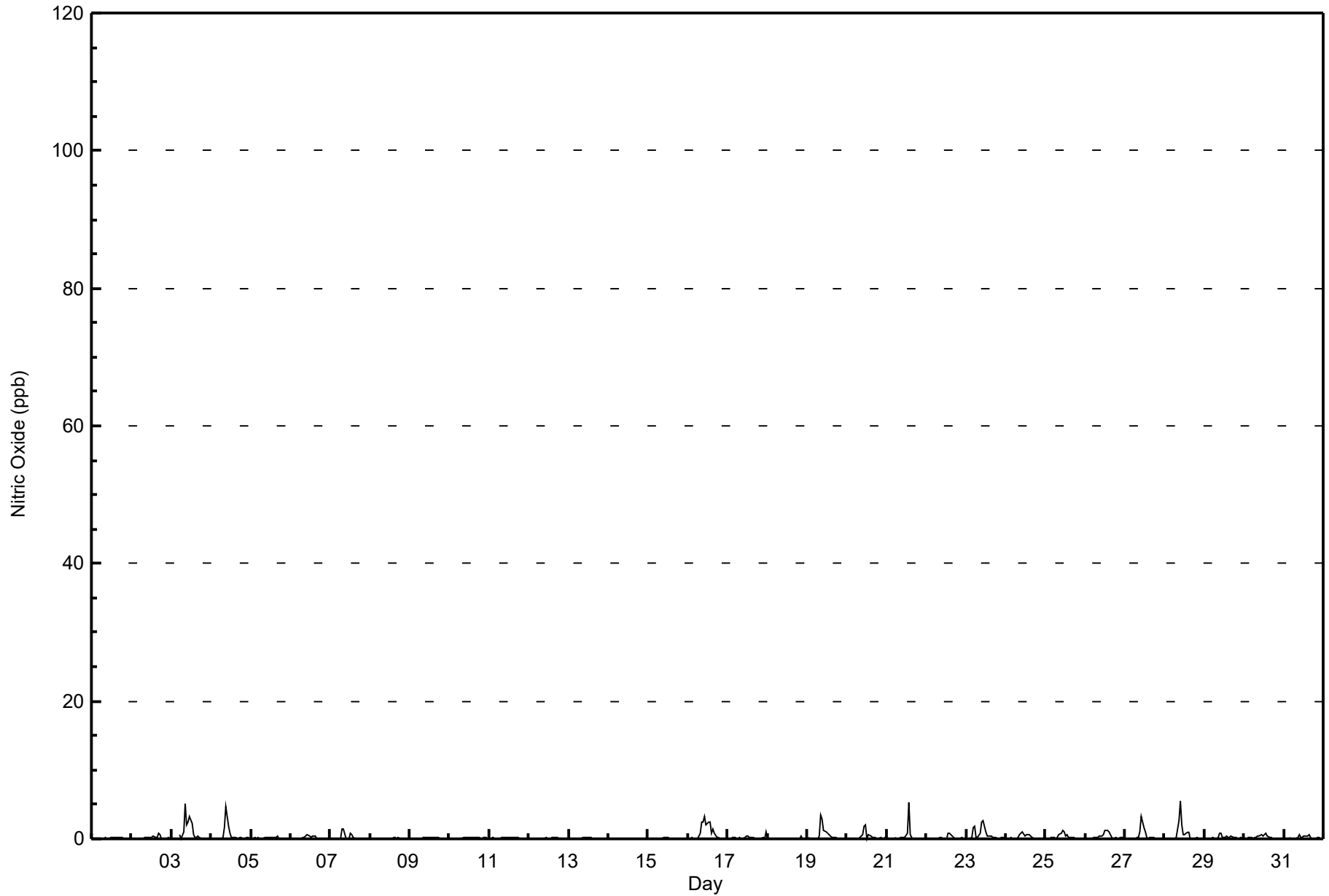
Nitric Oxide (NO) - ppb
Wapasu - October 2023

Maximum Value: 5.5 ppb on Oct 28 10:00		Maximum Daily Average: 0.9 ppb on Oct 16		Hours in Service: 744																							
Minimum Value: 0.0 ppb on Oct 2 00:00		Minimum Daily Average: 0.0 ppb on Oct 15		Hours of Data: 708																							
Maximum Diurnal Average: 0.9 ppb at hour 10		Minimum Diurnal Average: 0.1 ppb at hour 1		Hours of Missing Data: 36																							
Monthly Average: 0.26 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.2 P ₉₀ = 0.6 P ₉₉ = 3.1		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-Oct	0.1	0.0	Z	0.1	0.0	0.0	0.0	0.1	0.2	0.0	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.2	
2-Oct	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.8	0.6	0.1	0.0	0.0	0.0	0.1	0.0	0.2	0.8	
3-Oct	0.1	0.1	0.0	0.0	Z	0.7	0.0	1.0	5.1	2.0	2.4	3.3	2.1	0.5	0.2	0.3	0.4	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.8	5.1	
4-Oct	0.0	0.1	0.1	0.0	0.0	Z	0.1	0.2	1.7	4.7	1.9	0.8	0.1	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	4.7	
5-Oct	Z	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	0.5	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.5	
6-Oct	0.1	Z	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.3	0.5	0.4	0.3	0.3	0.3	0.3	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.2	0.5	
7-Oct	0.1	0.1	Z	0.1	0.1	0.0	0.1	1.5	1.5	0.1	0.0	0.0	0.9	0.6	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.5	
8-Oct	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	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
9-Oct	0.0	0.0	0.1	0.0	Z	0.0	0.0	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	0.0	0.0	0.0	0.0	0.1	0.2	
10-Oct	0.0	0.1	0.1	0.0	0.0	Z	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.3	
11-Oct	Z	0.1	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.2	
12-Oct	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	
13-Oct	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	
14-Oct	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1
15-Oct	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
16-Oct	0.0	0.0	0.2	0.0	0.0	Z	0.0	0.8	2.4	2.5	3.2	2.0	2.4	2.5	0.7	1.4	0.8	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.9	3.2	
17-Oct	Z	0.0	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.3	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	1.0	0.2	1.0	
18-Oct	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	C	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.4	0.1	0.0	0.0	0.0	0.4	
19-Oct	0.1	0.1	Z	0.0	0.0	0.0	0.0	0.4	3.4	2.8	1.2	1.0	0.7	0.7	0.4	0.3	0.2	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.5	3.4	
20-Oct	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.2	0.6	1.9	2.0	0.1	0.6	0.4	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.3	2.0	
21-Oct	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.8	5.2	0.7	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.4	5.2	
22-Oct	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.0	0.2	0.2	0.0	0.0	0.0	0.8	0.8	0.7	0.2	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.8	
23-Oct	Z	0.0	0.1	0.1	1.7	1.9	0.2	0.2	0.8	2.5	2.7	1.8	0.9	0.4	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.7	2.7	
24-Oct	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.2	0.7	0.8	1.0	0.3	0.5	0.7	0.5	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	1.0	
25-Oct	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.5	0.9	1.2	1.0	0.4	0.5	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	1.2	
26-Oct	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.2	0.5	0.5	0.4	0.6	1.2	1.2	1.1	0.6	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	1.2	
27-Oct	0.1	0.1	0.1	0.0	Z	0.1	0.0	0.1	0.1	1.0	3.2	1.5	1.0	0.2	0.1	0.3	0.3	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.4	3.2	
28-Oct	0.0	0.0	0.0	0.1	0.0	Z	0.0	0.1	2.6	5.5	2.0	0.5	0.6	0.9	1.0	0.0	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.0	0.6	5.5	
29-Oct	Z	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.9	0.8	0.2	0.1	0.3	0.2	0.3	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.9	
30-Oct	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.4	0.4	0.5	0.4	0.6	0.9	0.5	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.2	0.9	
31-Oct	0.0	0.1	Z	0.2	0.1	0.1	0.1	0.1	0.2	0.6	0.2	0.3	0.3	0.5	0.3	0.6	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.6	
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerospan C - Calibration																											



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Wapasu - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Wapasu - October 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
Wapasu - October 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	42	16	4	7	7	9	97	165	82	33	49	57	16	27	29	37	677
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	42	16	4	7	7	9	97	165	82	33	49	57	16	27	29	37	677

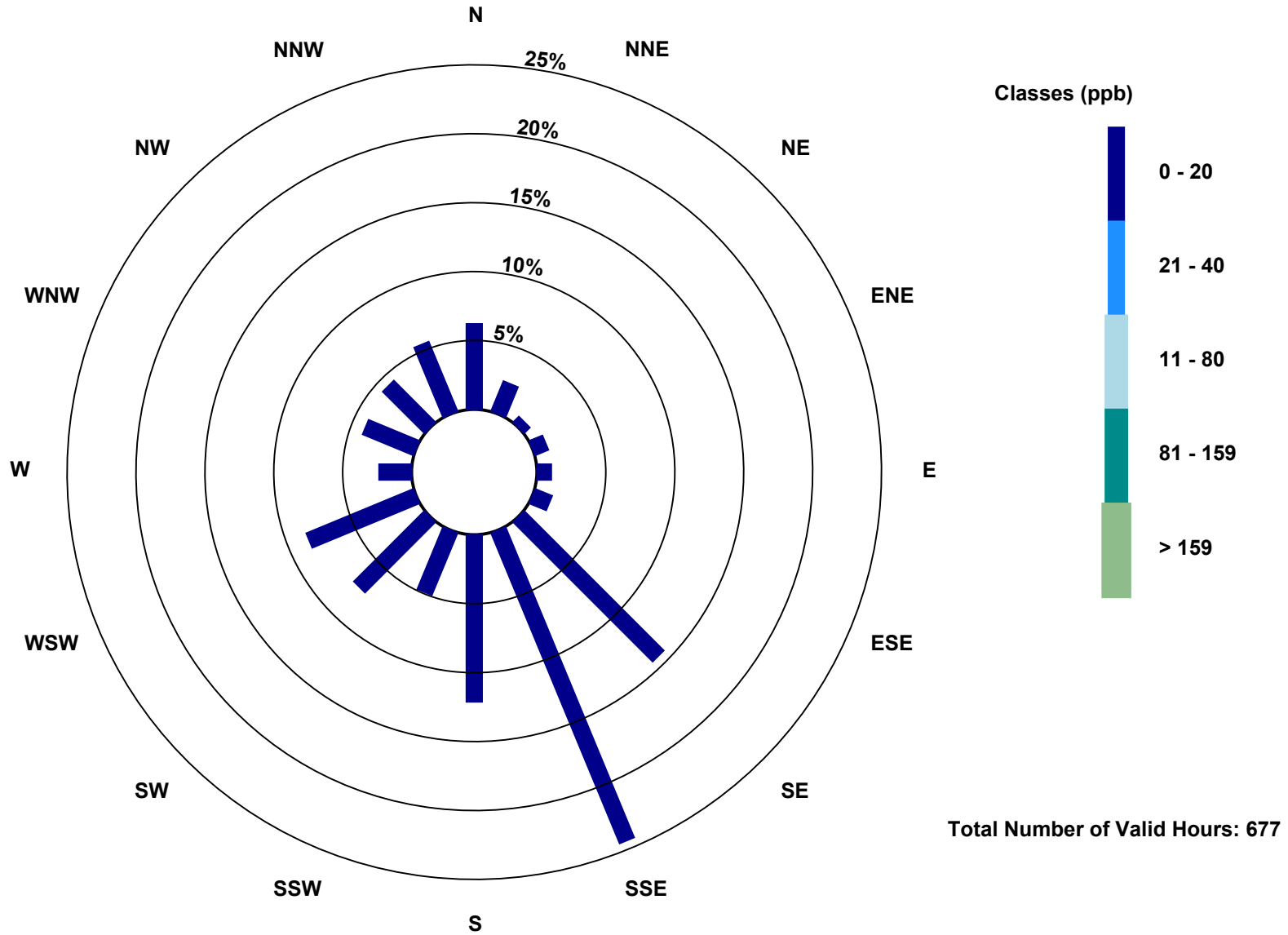
Total Number of Valid Hours: 677

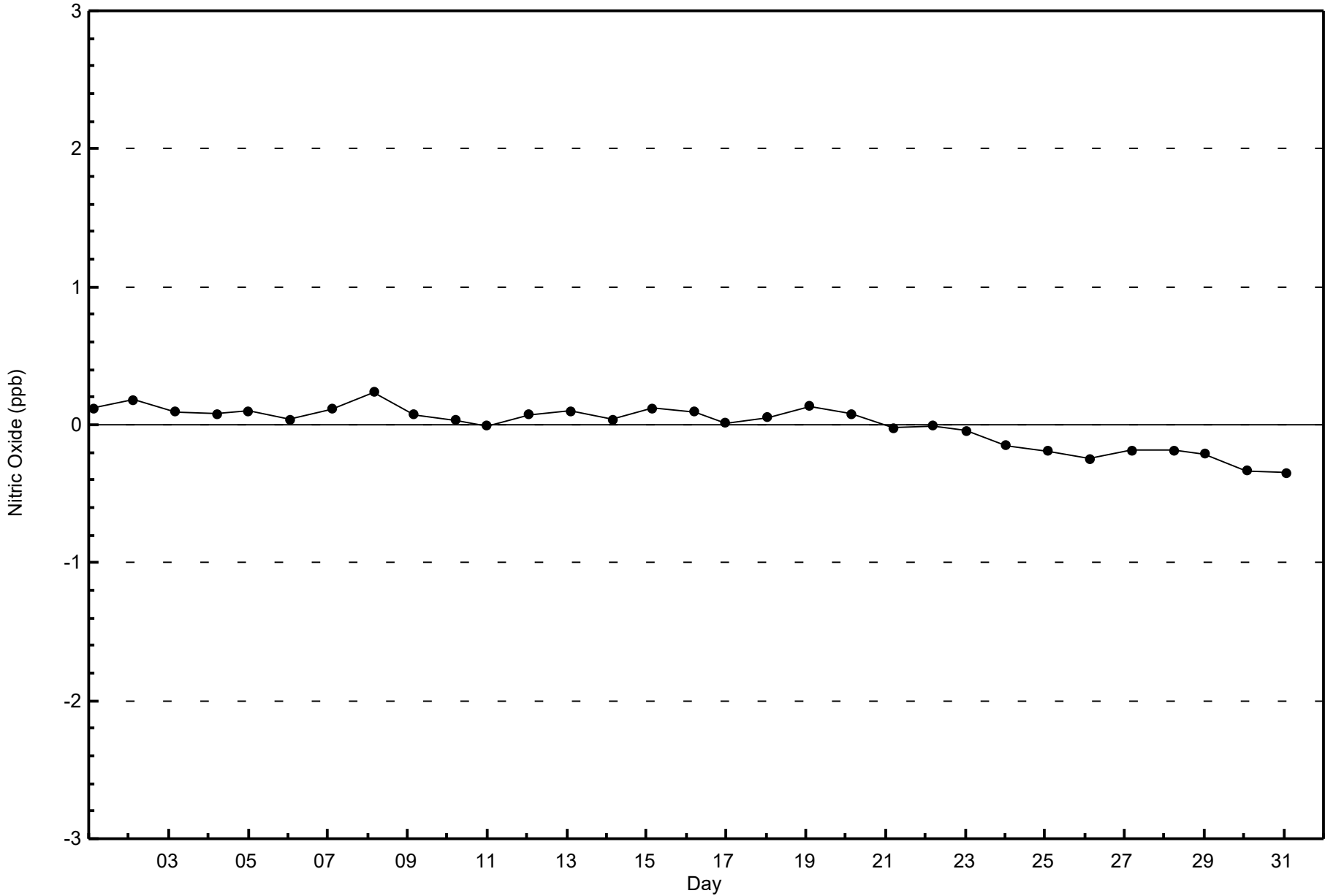
Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitric Oxide (NO) - ppb
Wapasu

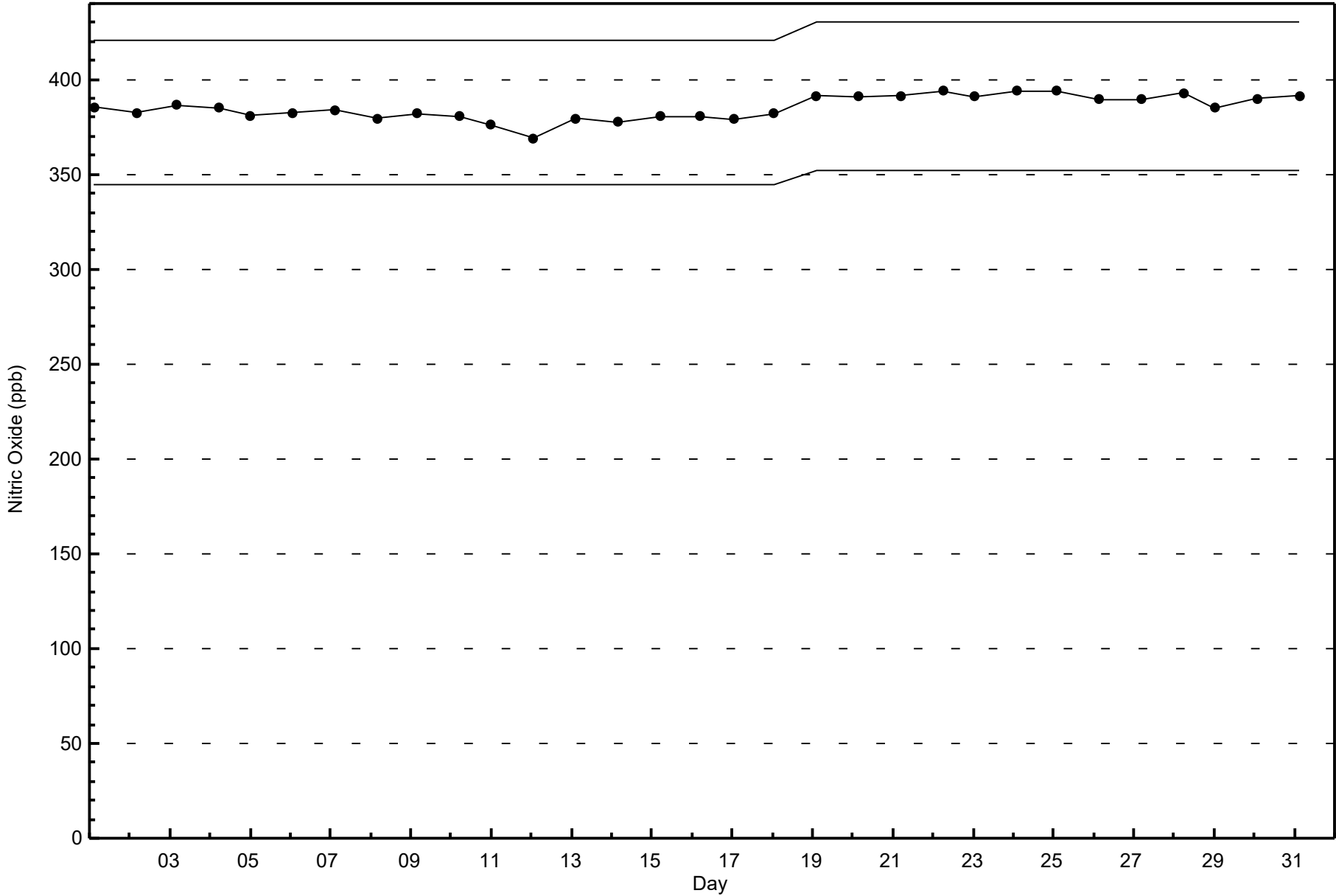






Wood Buffalo Environmental Association
Span Responses

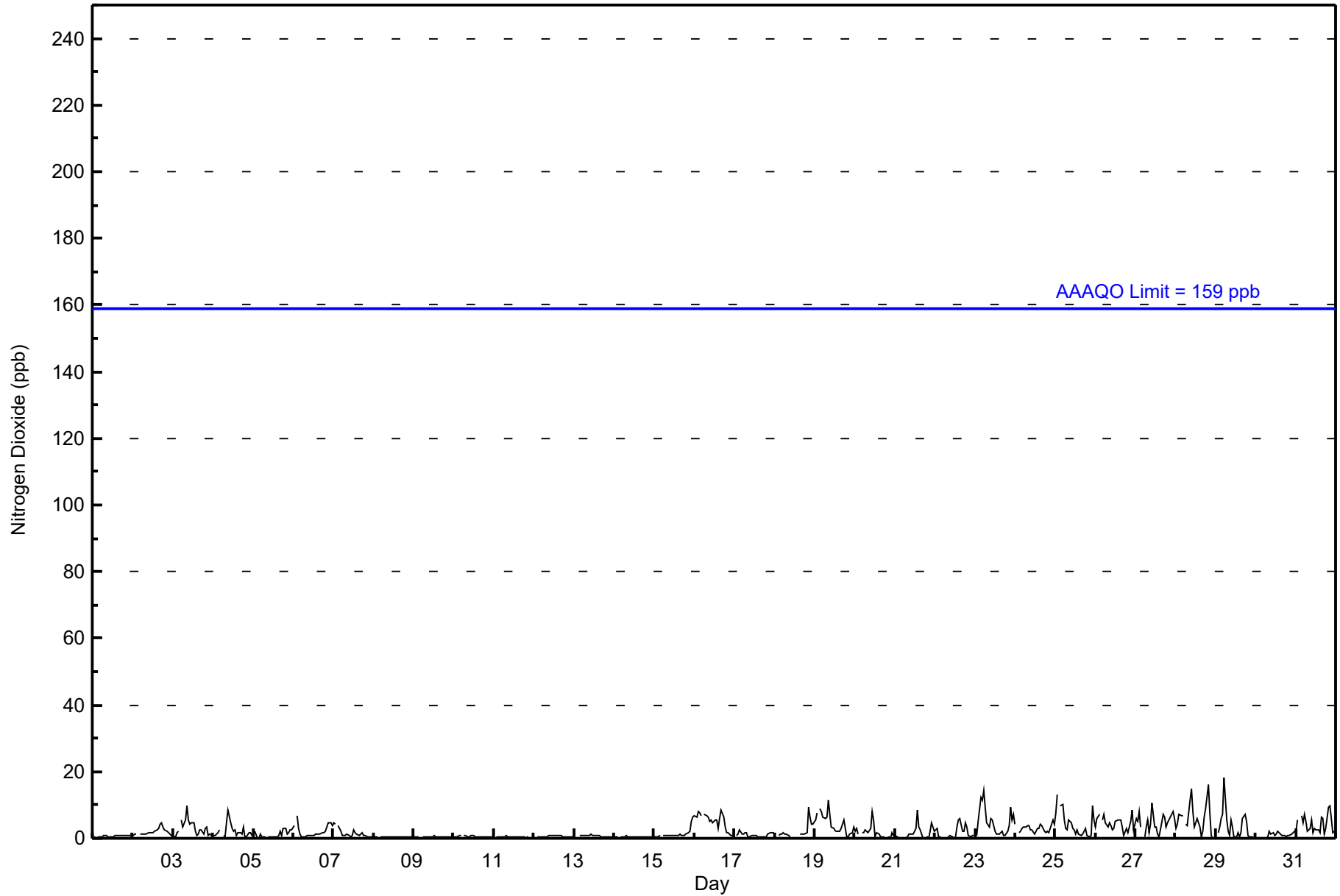
Nitric Oxide (NO) - ppb
Wapasu - October 2023





Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Wapasu - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Dioxide (NO₂) - ppb
Wapasu - October 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
Wapasu - October 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	16	4	7	7	9	97	165	82	33	49	57	16	27	29	37	677
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	42	16	4	7	7	9	97	165	82	33	49	57	16	27	29	37	677

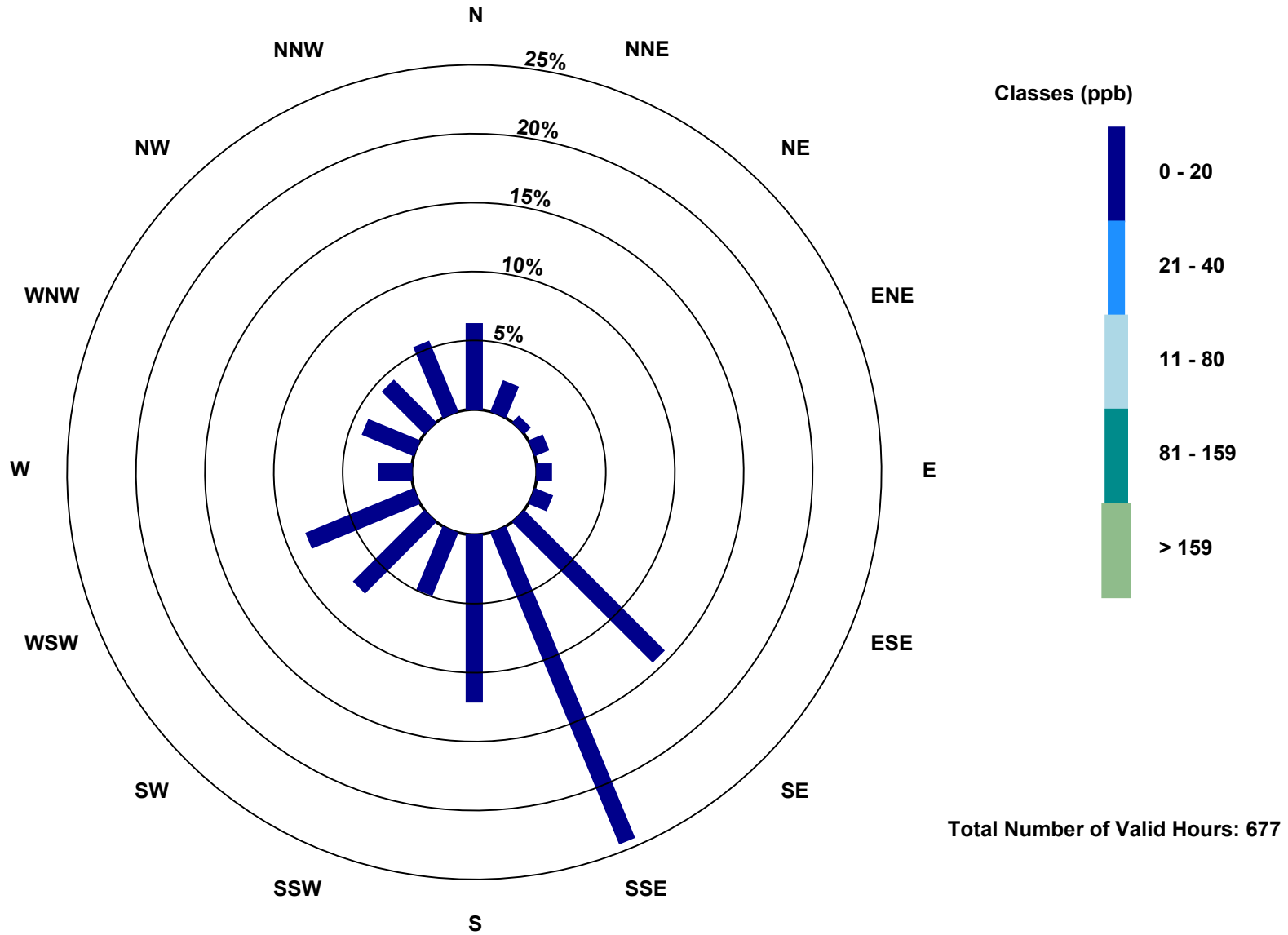
Total Number of Valid Hours: 677

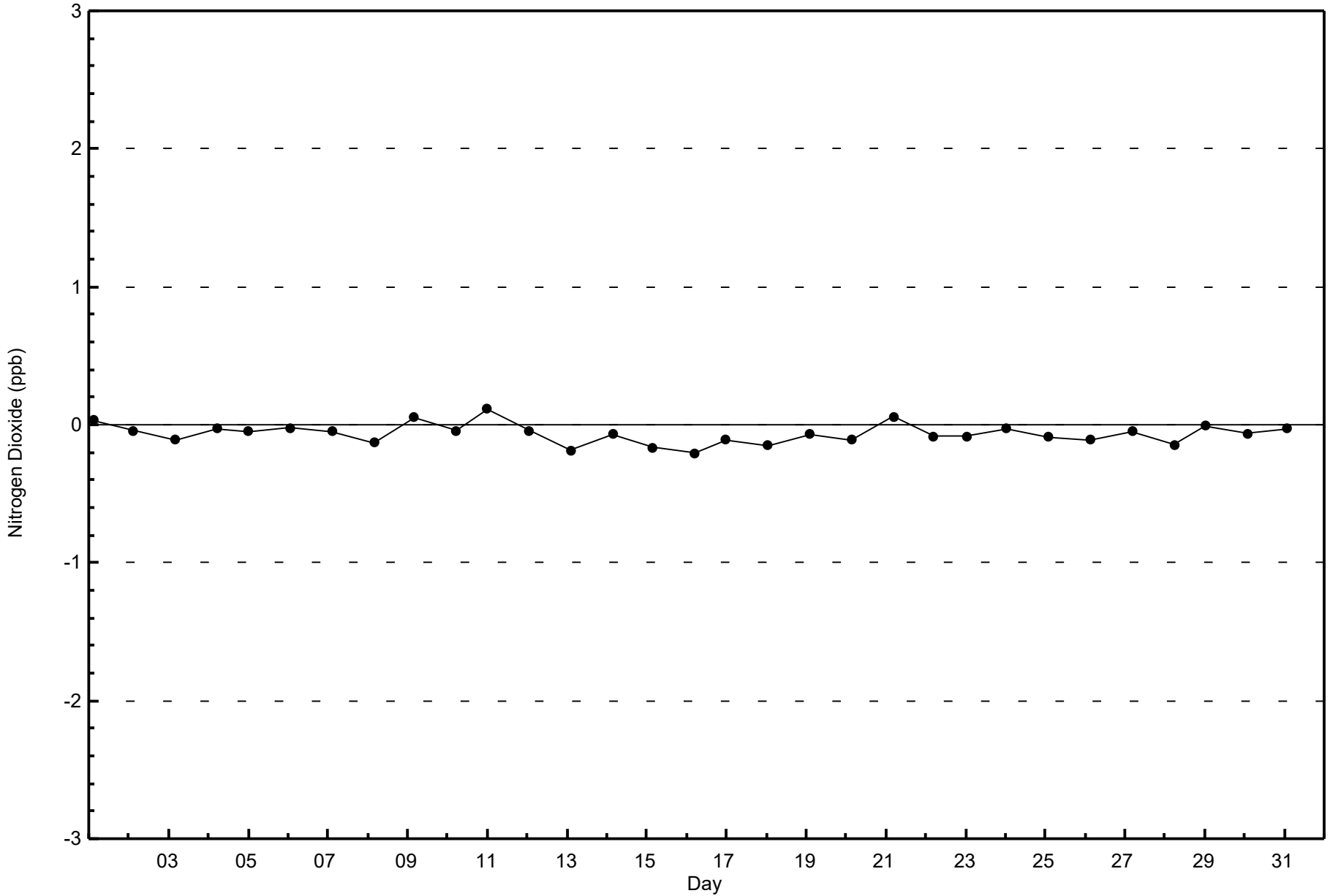
Total Number of Hours: 744

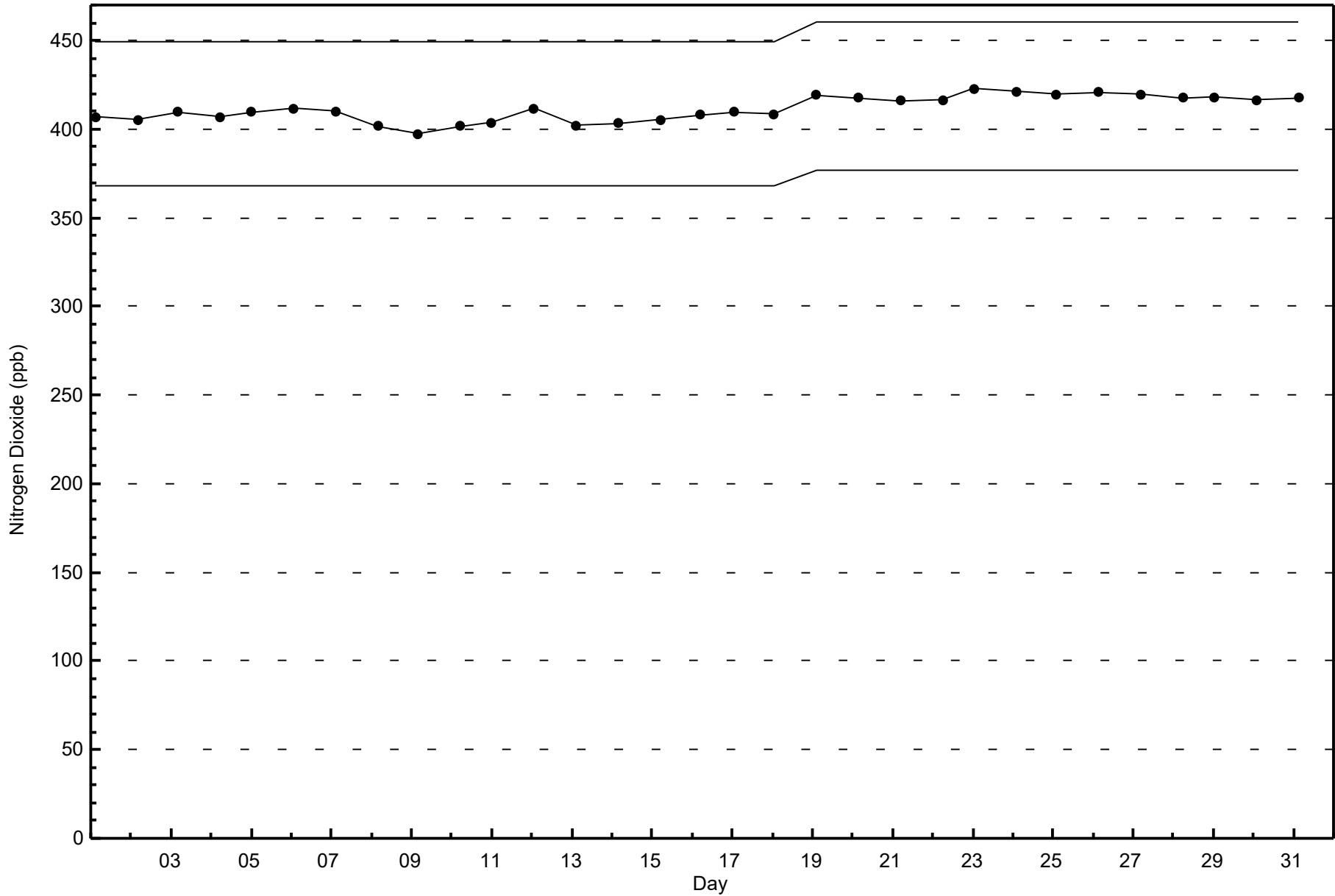


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitrogen Dioxide (NO₂) - ppb
Wapasu



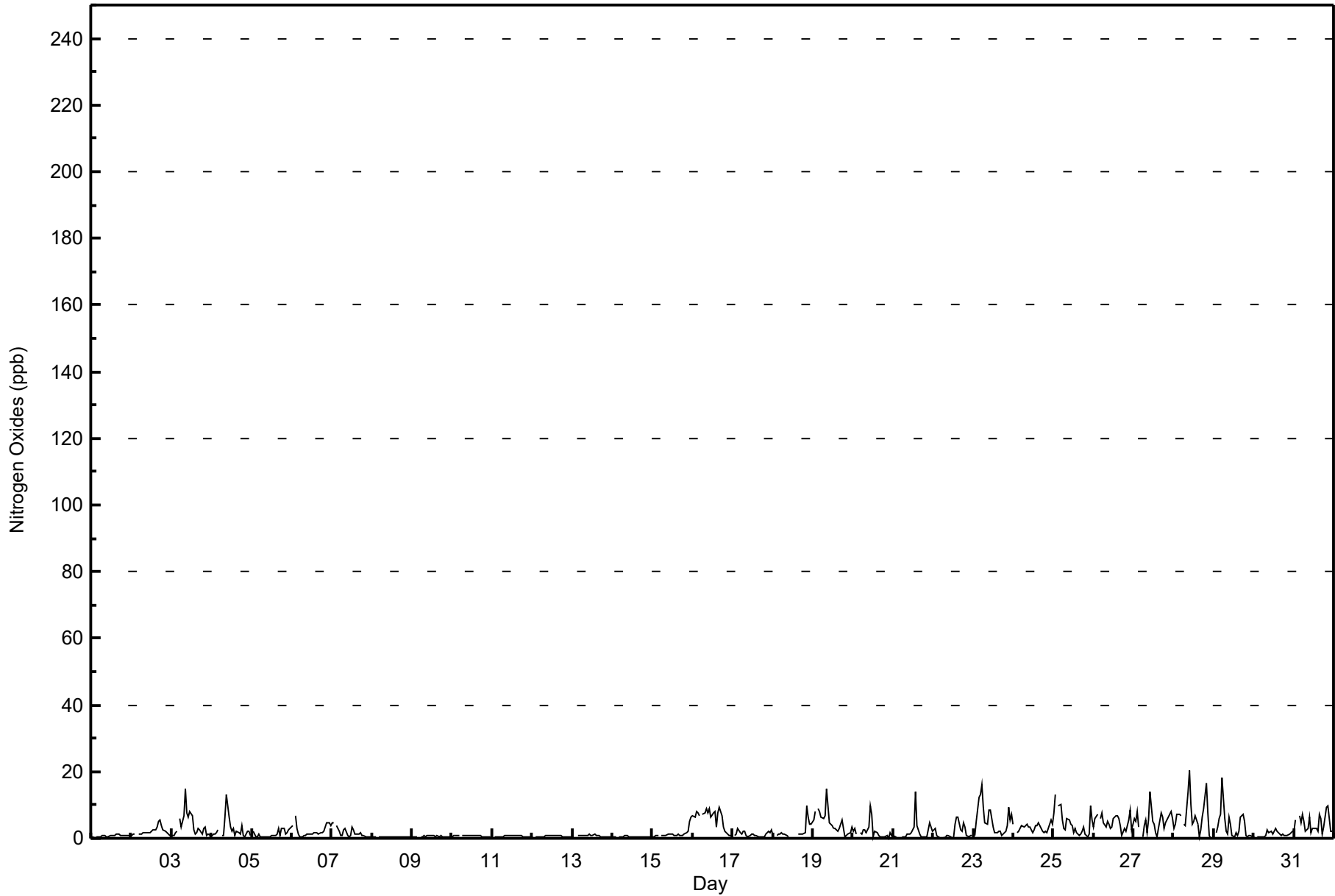






Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Wapasu - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Wapasu - October 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
Wapasu - October 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	16	4	7	7	9	97	165	82	33	49	57	16	27	29	37	677
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	42	16	4	7	7	9	97	165	82	33	49	57	16	27	29	37	677

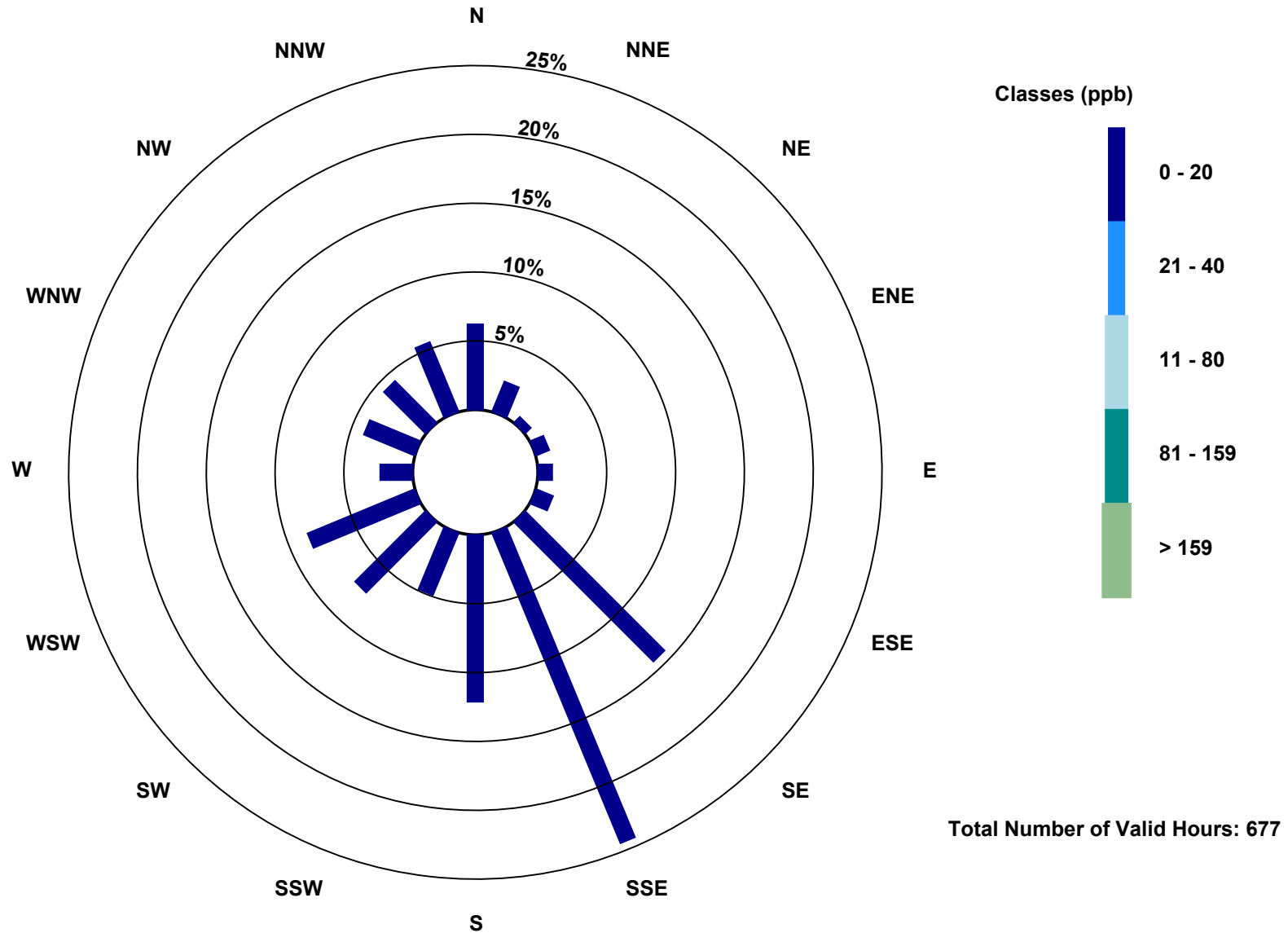
Total Number of Valid Hours: 677

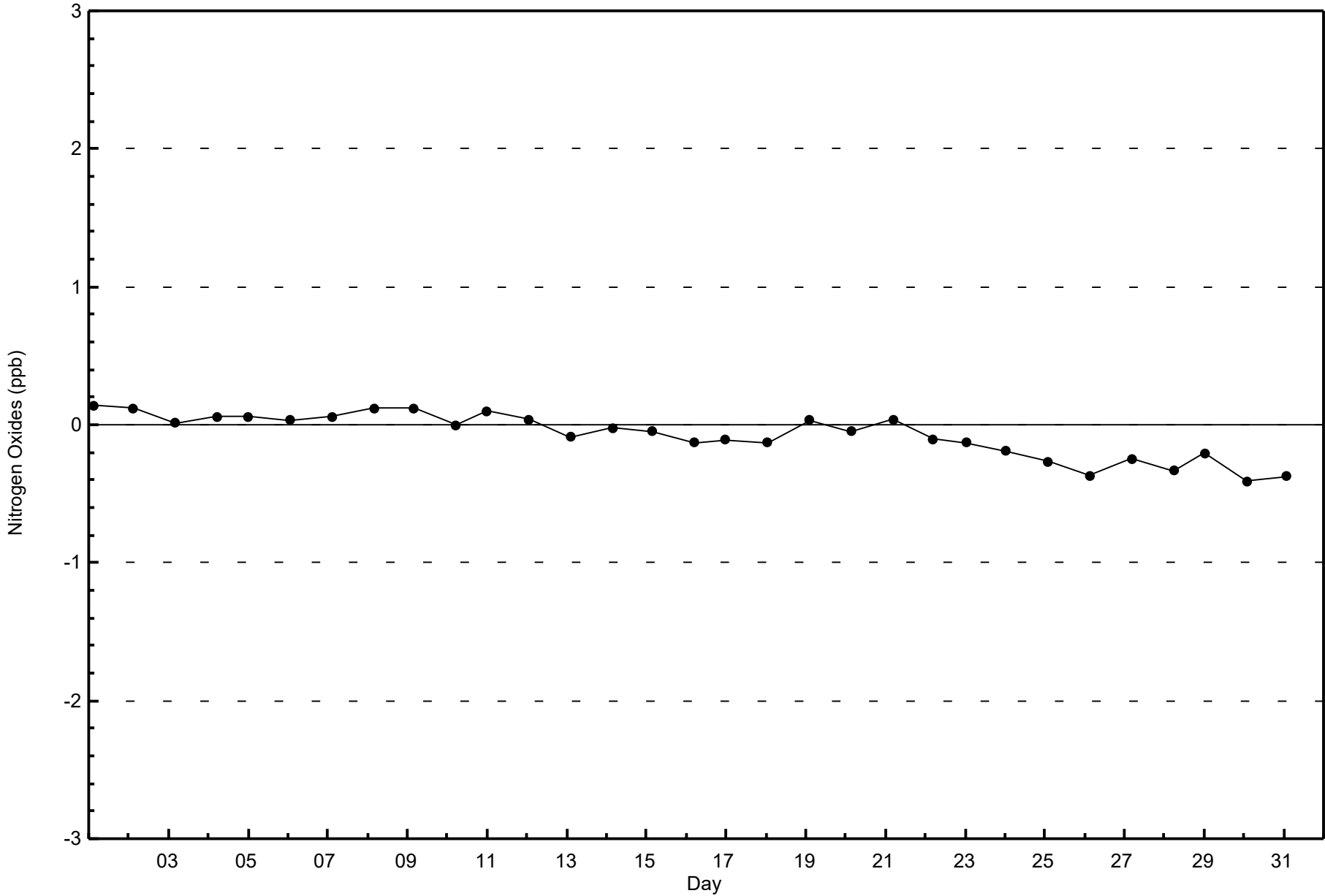
Total Number of Hours: 744

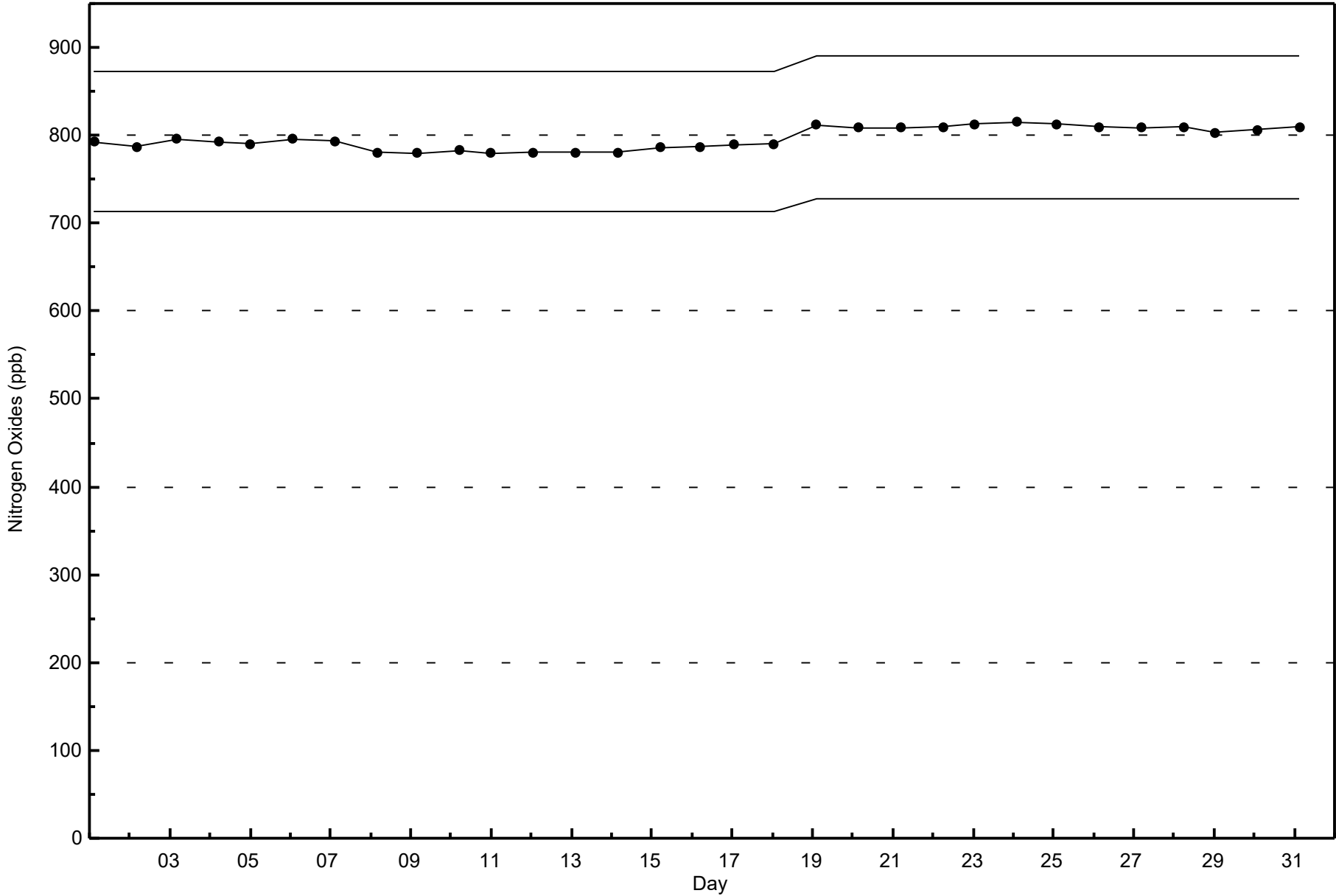


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitrogen Oxides (NO_x) - ppb
Wapasu









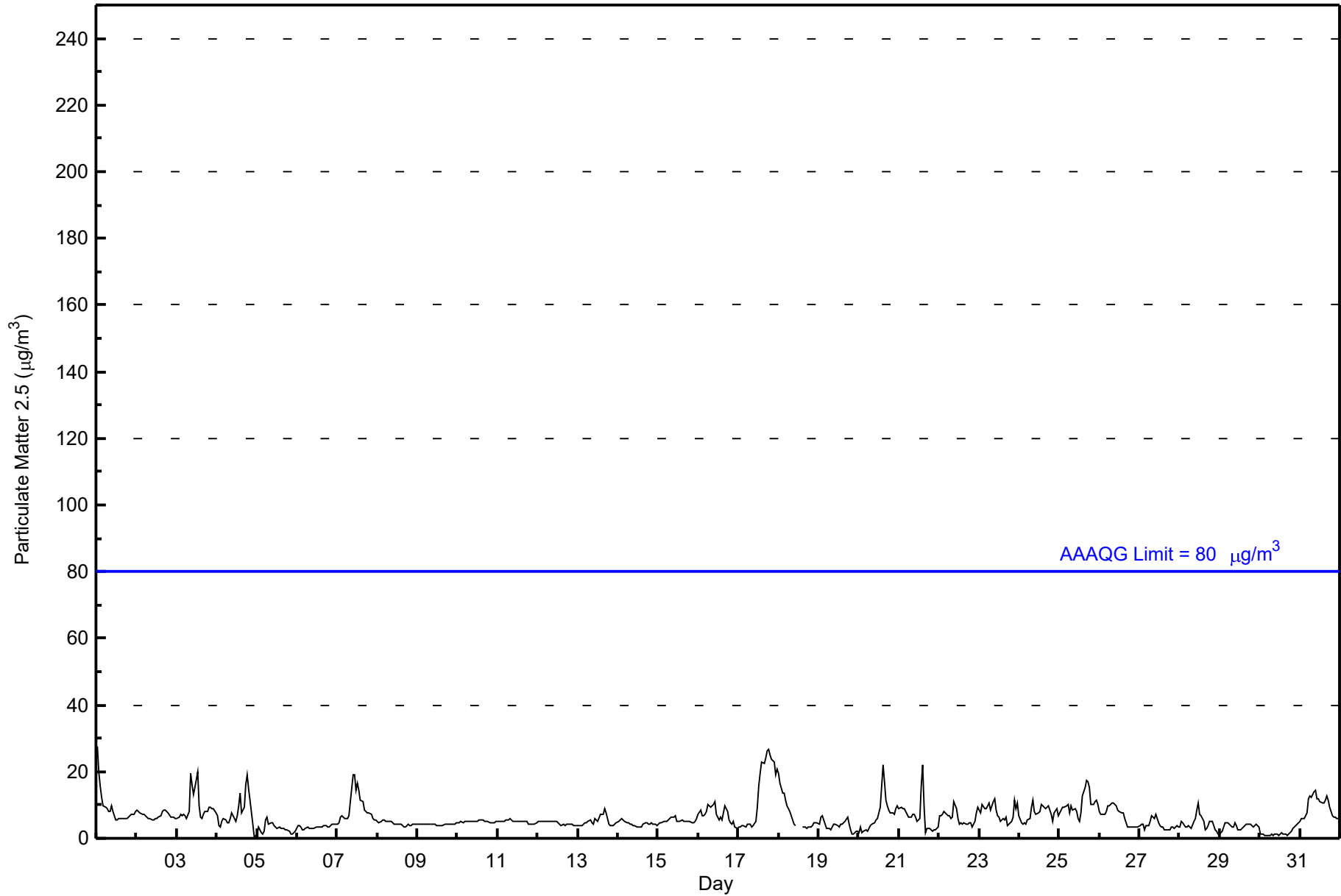
Wood Buffalo Environmental Association

Summary of Hour Averages

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

Wapasu - October 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 744																	744																												
Maximum Value: 27.4 µg/m ³ on Oct 1 01:00		Maximum Daily Average: 13.4 µg/m ³ on Oct 17																	Hours of Data: 741																														
Minimum Value: 0.6 µg/m ³ on Oct 4 23:00		Minimum Daily Average: 1.6 µg/m ³ on Oct 30																	Hours of Missing Data: 3																														
Maximum Diurnal Average: 7.5 µg/m ³ at hour 15		Minimum Diurnal Average: 5.5 µg/m ³ at hour 23																	Hours of Calibration: 3																														
Monthly Average: 6.25 µg/m ³		Percentiles: P ₁ = 1.1 P ₁₀ = 3.0 Q ₁ = 3.9 Median = 5.0 Q ₃ = 7.6 P ₉₀ = 10.4 P ₉₉ = 22.7																	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-Oct	27.4	19.8	15.5	12.4	9.7	9.3	8.9	8.1	8.3	9.9	8.0	5.6	5.4	5.7	5.9	5.9	5.7	6.0	6.3	6.8	7.1	7.2	7.8	9.1	27.4																								
2-Oct	8.6	8.2	7.7	7.3	7.0	6.8	6.4	6.1	5.8	5.6	5.7	5.9	5.8	6.5	6.7	7.9	8.5	8.3	8.2	7.7	6.2	6.6	6.2	6.0	6.9	8.6																							
3-Oct	5.9	6.1	7.4	6.9	7.3	6.9	6.1	7.9	19.6	16.2	13.2	15.3	19.8	9.9	6.5	6.0	7.3	7.9	8.1	9.1	9.2	9.0	8.7	7.6	9.5	19.8																							
4-Oct	6.6	3.9	3.5	5.2	6.1	5.3	4.9	4.7	6.0	7.5	6.0	4.9	6.9	9.7	13.5	7.6	9.4	16.1	19.3	14.6	11.4	4.2	0.6	0.6	7.4	19.3																							
5-Oct	1.2	3.3	1.8	1.4	2.1	5.6	6.2	4.2	4.5	4.6	3.8	3.5	3.2	3.4	2.9	2.8	3.0	2.6	2.4	2.0	1.3	1.4	1.7	2.1	3.0	6.2																							
6-Oct	3.7	3.7	3.2	2.7	2.7	3.1	3.2	3.2	2.9	2.8	3.1	3.5	3.5	3.5	3.5	3.6	3.6	3.6	3.6	3.4	3.8	4.3	4.4	4.1	3.4	4.4																							
7-Oct	4.1	4.7	6.5	6.6	5.9	5.7	6.0	6.9	11.2	19.0	19.2	14.4	16.5	14.2	11.3	10.9	8.6	7.9	7.8	7.6	7.0	5.9	5.6	5.7	9.1	19.2																							
8-Oct	4.9	4.7	5.0	5.4	5.4	5.2	5.1	5.0	4.9	4.7	4.3	4.3	4.2	4.3	4.0	3.7	3.5	3.6	4.1	3.8	4.0	4.2	4.2	4.2	4.4	5.4																							
9-Oct	4.2	4.3	4.3	4.4	4.3	4.3	4.3	4.2	4.2	4.1	4.0	4.0	3.9	3.8	3.8	3.8	4.0	4.1	4.1	4.4	4.2	4.2	4.4	4.6	4.2	4.6																							
10-Oct	4.7	4.8	4.9	4.9	5.0	5.0	5.0	4.9	4.9	4.9	4.9	5.0	5.1	5.3	5.5	5.2	5.0	4.9	4.8	4.6	4.7	4.7	4.9	5.0	5.5	5.5																							
11-Oct	5.0	5.0	5.0	5.0	5.1	5.5	5.6	5.7	5.4	5.3	5.1	5.2	4.9	5.0	4.9	5.0	5.0	5.1	4.3	4.4	4.3	4.2	4.3	4.6	5.0	5.7																							
12-Oct	5.0	5.1	5.1	5.0	5.1	5.1	5.2	5.0	4.9	5.0	5.1	4.9	4.5	4.2	4.0	4.1	3.9	4.3	4.3	4.2	4.3	4.0	3.7	3.6	4.6	5.2																							
13-Oct	3.7	3.8	3.9	4.2	4.6	4.8	5.2	5.7	4.7	4.2	5.9	5.4	5.2	7.2	7.1	7.1	8.7	7.8	4.3	3.7	3.6	3.8	4.1	4.5	5.1	8.7																							
14-Oct	4.9	5.5	5.8	5.5	5.0	4.8	4.5	4.3	4.2	3.8	3.8	3.6	3.4	3.3	3.5	4.1	4.7	4.7	4.3	4.3	4.7	4.4	4.1	3.9	4.4	5.8																							
15-Oct	4.3	4.5	4.6	5.0	5.2	5.2	5.5	5.8	6.2	6.4	6.8	5.2	5.0	5.1	5.3	5.1	5.3	5.1	5.2	4.9	4.7	4.7	5.3	6.0	5.3	6.8																							
16-Oct	7.2	8.4	6.9	6.9	7.2	8.0	10.0	9.3	9.8	10.2	10.8	7.0	5.4	6.2	5.3	7.6	9.5	8.1	5.6	4.6	4.3	5.0	3.6	3.1	7.1	10.8																							
17-Oct	3.5	3.3	3.7	3.9	3.6	4.1	4.4	4.0	3.4	3.6	5.0	9.4	15.8	19.5	23.0	22.5	24.2	26.2	26.6	25.0	23.7	22.9	19.1	20.8	13.4	26.6																							
18-Oct	19.5	16.4	13.4	13.5	11.4	9.7	9.0	7.9	5.4	4.2	3.9	C	C	C	3.4	3.4	3.3	3.2	3.2	3.3	3.8	4.5	4.5	4.7	7.2	19.5																							
19-Oct	4.2	6.3	6.8	5.5	4.3	3.0	2.8	2.7	3.3	4.3	4.1	3.7	3.4	4.2	4.4	4.7	5.2	6.2	4.1	2.5	1.5	1.5	2.1	1.9	3.9	6.8																							
20-Oct	1.5	3.2	1.8	2.0	2.7	2.0	2.8	3.7	4.2	4.5	5.6	6.0	7.6	9.4	21.9	17.0	11.4	9.6	8.5	7.8	7.6	7.4	9.1	9.7	7.0	21.9																							
21-Oct	9.0	9.3	9.0	9.1	7.9	7.2	6.5	6.4	7.3	7.3	6.4	5.2	6.1	15.6	22.1	9.8	1.6	2.8	3.1	2.4	1.9	2.6	2.4	3.4	6.9	22.1																							
22-Oct	6.8	6.9	7.2	7.9	7.6	6.9	6.7	5.8	6.2	11.0	9.0	6.1	4.4	4.8	4.3	4.6	4.3	4.4	4.7	4.7	3.3	5.0	7.7	9.1	6.2	11.0																							
23-Oct	8.5	7.8	10.3	8.9	9.0	9.7	10.4	8.5	10.9	11.8	8.5	6.7	6.4	4.9	5.8	5.7	6.4	3.7	4.4	4.9	6.6	11.5	8.9	10.7	7.9	11.8																							
24-Oct	6.7	4.7	4.2	4.5	4.4	5.4	5.8	9.4	11.5	7.9	7.3	7.7	7.9	10.1	9.8	9.3	8.9	9.7	8.5	7.1	5.3	7.7	8.8	6.8	7.5	11.5																							
25-Oct	7.6	8.3	9.4	9.3	9.6	10.0	7.6	9.6	8.4	9.0	8.1	5.8	5.1	7.5	12.8	15.3	17.6	16.9	15.2	10.3	10.1	10.8	11.3	10.1	10.2	17.6																							
26-Oct	8.0	7.2	7.2	7.1	7.9	9.9	9.8	10.4	10.5	10.1	9.5	8.5	8.2	7.8	7.5	5.9	4.5	3.5	3.4	3.2	3.3	3.3	3.5	3.3	6.8	10.5																							
27-Oct	3.8	4.1	4.2	2.6	3.8	3.7	5.1	6.6	6.5	5.9	7.2	4.8	3.9	3.4	3.2	2.7	2.7	2.6	2.3	3.2	3.3	3.1	3.8	3.5	4.0	7.2																							
28-Oct	3.4	4.9	4.9	3.2	3.4	3.6	3.3	3.1	5.0	5.9	8.6	10.4	7.3	6.8	5.0	2.7	2.9	3.8	4.9	5.0	3.8	2.7	2.0	1.1	4.5	10.4																							
29-Oct	1.4	2.3	3.5	4.7	4.6	4.7	3.8	3.6	3.5	4.7	3.6	2.5	2.6	3.1	3.4	3.9	4.2	4.1	4.3	3.7	3.6	3.9	4.2	3.2	3.6	4.7																							
30-Oct	1.4	1.1	1.1	0.9	1.0	0.8	0.8	1.3	1.0	1.2	1.2	1.1	1.1	1.5	1.3	1.1	1.1	1.1	1.5	2.0	3.0	3.8	4.3	4.8	1.6	4.8																							
31-Oct	5.0	5.9	6.0	6.7	7.7	11.9	12.6	12.1	14.1	14.2	11.8	11.9	10.9	10.6	10.8	11.5	12.6	11.6	9.4	6.7	6.4	6.4	5.8	6.0	9.5	14.2																							
																								6.2	6.1	5.9	5.8	5.7	5.9	5.9	6.0	6.7	7.1	6.8	6.2	6.4	6.9	7.5	6.8	6.7	6.7	6.5	5.9	5.5	5.6	5.5	5.6	Diurnal Average	
																								27.4	19.8	15.5	13.5	11.4	11.9	12.6	12.1	19.6	19.0	19.2	15.3	19.8	19.5	23.0	22.5	24.2	26.2	26.6	25.0	23.7	22.9	19.1	20.8	Diurnal Maximum	
C - Calibration																																																	
Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 µg/m ³ 24-hr 29 µg/m ³																																																	





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Wapasu - October 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	420	56.68	56.68
6 - 15	290	39.14	95.82
16 - 25	28	3.78	99.60
26 - 80	3	0.40	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 741

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Wapasu - October 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	23	6	1	3	4	6	82	103	51	16	22	23	3	13	18	17	391
6 - 15	13	8	1	4	2	4	21	66	31	18	28	33	13	14	14	17	287
16 - 25	8	2	1	0	1	0	0	5	2	2	1	3	0	0	0	3	28
26 - 80	0	0	2	0	0	0	0	1	0	0	0	0	0	0	0	0	3
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	44	16	5	7	7	10	103	175	84	36	51	59	16	27	32	37	709

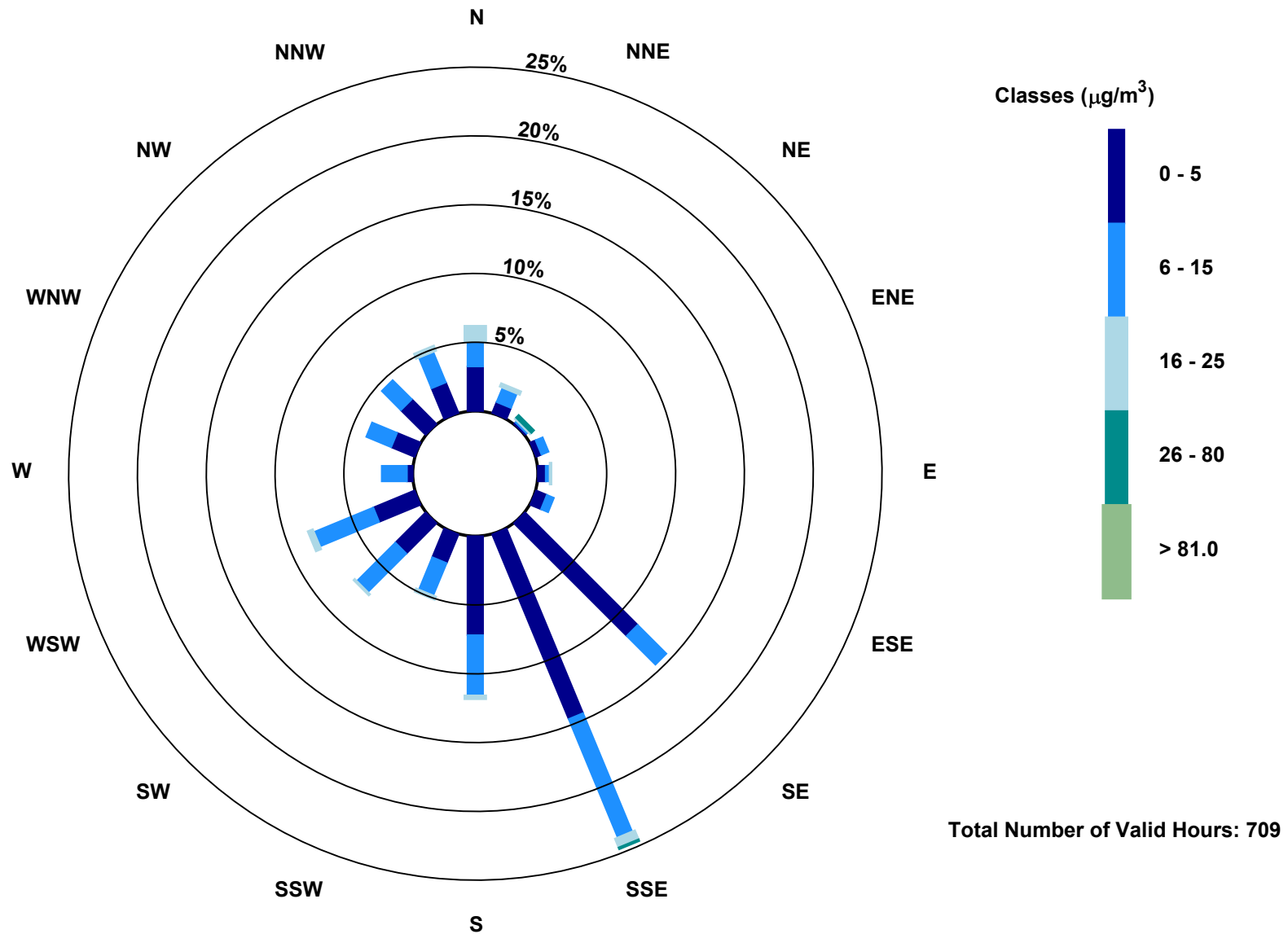
Total Number of Valid Hours: 709

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

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





Wood Buffalo Environmental Association
Summary of Hour Averages

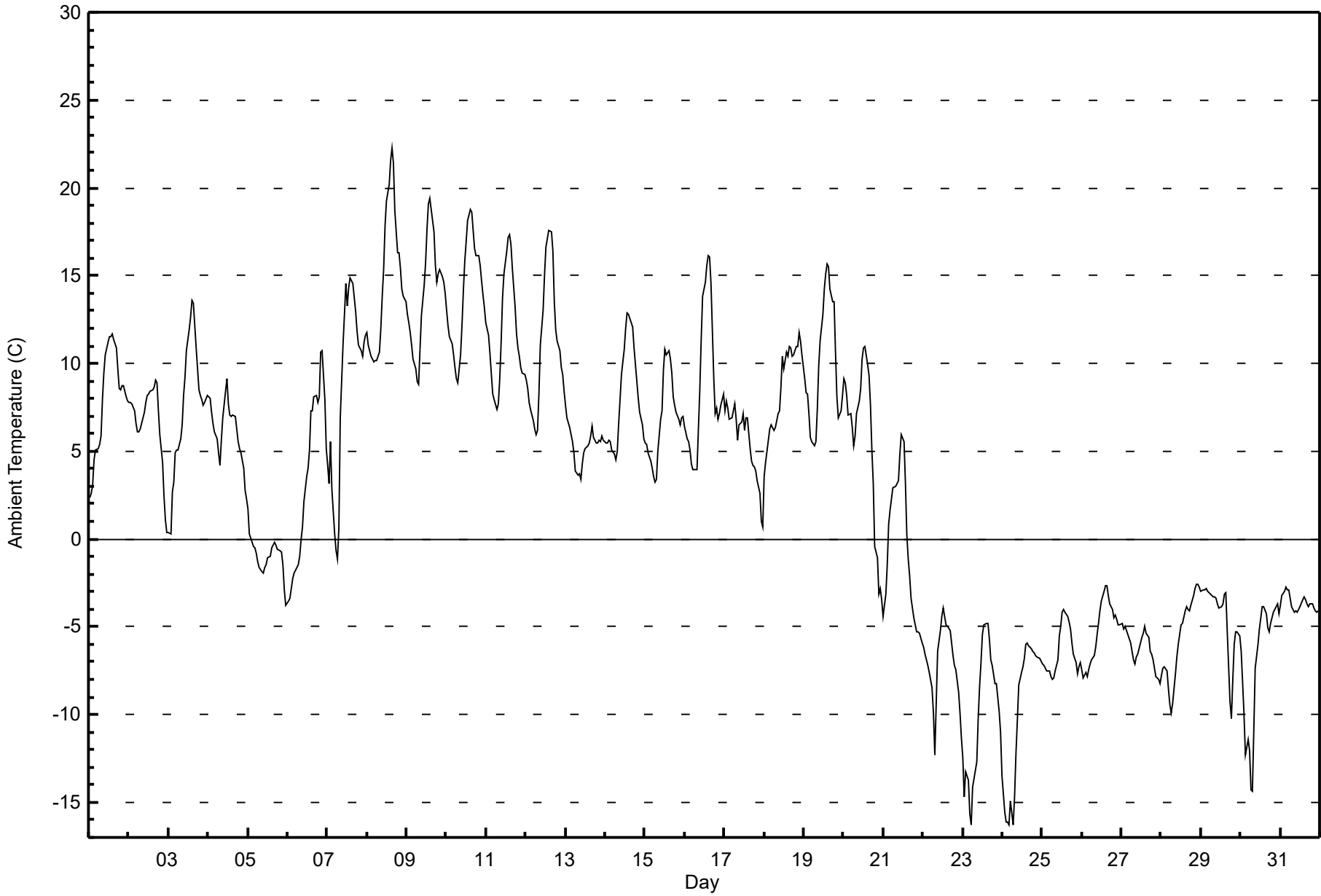
Ambient Temperature (AT) - C
Wapasu - October 2023

Maximum Value: 22.3 C on Oct 8 16:00 Maximum Daily Average: 14.9 C on Oct 8		Hours in Service: 744 Hours of Data: 744 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0																								
Minimum Value: -16.3 C on Oct 24 05:00 Minimum Daily Average: -10.0 C on Oct 24 Maximum Diurnal Average: 6.6 C at hour 15 Minimum Diurnal Average: 0.3 C at hour 7 Monthly Average: 3.15 C Percentiles: P ₁ = -14.8 P ₁₀ = -7.3 Q ₁ = -4.1 Median = 5.2 Q ₃ = 9.2 P ₉₀ = 13.5 P ₉₉ = 18.8																										
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-Oct	2.4	2.6	3.1	4.5	5.1	5.2	5.4	5.9	7.9	9.5	10.5	11.2	11.5	11.5	11.7	11.4	10.9	9.7	8.6	8.5	8.7	8.7	8.1	7.9	7.9	11.7
2-Oct	7.8	7.7	7.7	7.3	6.6	6.1	6.1	6.2	6.6	7.2	7.8	8.2	8.3	8.4	8.5	8.7	9.1	8.9	7.3	6.0	4.4	2.4	1.1	0.3	6.6	9.1
3-Oct	0.4	0.3	2.7	3.3	4.9	5.0	5.1	5.7	6.5	8.1	9.2	10.7	11.9	12.7	13.6	13.4	12.1	10.9	8.5	8.2	7.9	7.6	7.8	8.2	7.7	13.6
4-Oct	8.1	8.0	7.3	6.6	6.1	5.7	4.9	4.2	5.7	6.9	8.4	9.1	7.7	7.1	7.0	7.0	6.9	6.2	5.5	5.2	4.9	4.0	2.7	2.3	6.1	9.1
5-Oct	1.7	0.3	-0.2	-0.5	-0.5	-0.8	-1.3	-1.6	-1.8	-1.9	-1.7	-1.4	-1.1	-1.0	-0.5	-0.3	-0.2	-0.4	-0.6	-0.7	-0.8	-1.5	-2.9	-3.8	-1.0	1.7
6-Oct	-3.5	-3.4	-2.8	-2.3	-2.0	-1.8	-1.5	-1.0	0.0	0.7	2.1	3.6	4.0	5.1	7.3	7.3	8.1	8.2	7.8	8.1	10.6	10.7	8.0	5.1	3.3	10.7
7-Oct	4.2	3.1	5.5	2.8	0.3	-0.7	-1.1	0.6	6.9	11.1	12.8	14.5	13.3	14.3	14.8	14.5	13.8	13.0	11.9	11.0	10.7	10.4	11.2	11.6	8.8	14.8
8-Oct	11.8	11.0	10.4	10.2	10.1	10.2	10.2	10.6	12.0	13.8	15.4	17.8	19.2	20.2	21.5	22.3	21.4	18.7	16.3	16.3	15.5	14.2	13.8	13.5	14.9	22.3
9-Oct	12.8	12.3	11.7	11.0	10.3	9.6	9.0	8.8	10.8	12.7	14.5	15.8	17.6	19.1	19.4	18.8	17.5	15.5	14.6	15.1	15.3	15.0	14.6	14.0	14.0	19.4
10-Oct	13.0	12.2	11.5	11.1	10.5	9.8	9.1	8.9	10.4	12.2	14.1	15.8	17.0	18.1	18.7	18.6	17.5	16.5	16.1	16.2	15.6	14.7	13.9	13.2	14.0	18.7
11-Oct	12.3	11.6	10.6	9.3	8.3	7.9	7.4	7.7	9.1	11.2	13.7	15.1	16.4	17.2	17.3	16.8	15.4	13.2	11.7	10.9	10.4	9.7	9.5	9.3	11.8	17.3
12-Oct	9.1	8.6	7.8	7.4	6.7	6.3	5.9	6.2	8.3	11.0	13.0	15.0	16.6	17.1	17.6	17.5	16.4	13.5	12.0	11.3	10.7	9.8	9.4	8.4	11.1	17.6
13-Oct	7.6	6.9	6.4	5.9	5.5	4.9	3.9	3.6	3.7	3.4	4.3	4.9	5.1	5.3	5.5	5.8	6.4	5.8	5.5	5.5	5.6	5.5	5.8	5.6	5.4	7.6
14-Oct	5.4	5.5	5.6	5.5	5.0	4.8	4.5	5.0	6.6	7.9	9.4	10.8	12.0	12.9	12.8	12.6	12.0	10.8	10.0	8.9	8.0	7.2	6.5	5.7	8.2	12.9
15-Oct	5.5	5.4	4.9	4.4	4.0	3.6	3.2	3.4	5.0	6.8	7.3	9.6	10.8	10.5	10.8	10.2	9.4	8.1	7.6	7.2	6.8	6.5	6.9	6.9	6.9	10.8
16-Oct	6.4	5.7	5.6	5.1	4.2	3.9	3.9	4.0	6.3	8.5	11.4	13.8	14.6	15.6	16.1	16.0	14.5	9.2	7.1	7.5	6.8	7.1	7.6	8.3	8.7	16.1
17-Oct	7.3	7.8	7.5	6.8	6.9	7.3	7.7	6.8	5.6	6.5	6.6	7.1	6.2	6.9	6.9	5.1	4.4	4.2	4.1	3.8	3.3	2.6	1.0	0.7	5.6	7.8
18-Oct	3.6	4.4	5.7	6.3	6.5	6.3	6.1	6.3	7.1	7.3	8.7	10.4	9.7	10.6	10.4	11.0	10.9	10.4	10.5	11.0	11.0	11.8	11.3	10.5	8.7	11.8
19-Oct	9.1	8.3	8.3	7.1	5.8	5.5	5.3	5.5	7.3	9.9	11.3	12.8	14.3	15.1	15.7	15.5	14.2	13.5	13.5	10.7	8.1	6.9	7.3	8.2	10.0	15.7
20-Oct	9.1	8.9	8.2	7.1	7.1	6.3	5.3	5.8	7.1	7.8	8.5	10.2	10.9	11.0	10.0	9.3	7.6	5.1	3.1	-0.5	-1.1	-3.1	-2.8	-3.4	5.7	11.0
21-Oct	-4.4	-3.1	-1.4	0.8	1.6	2.3	2.9	3.0	3.2	3.3	4.8	6.0	5.5	3.1	0.2	-1.1	-2.1	-3.4	-4.5	-4.9	-5.3	-5.3	-5.4	-5.9	-0.4	6.0
22-Oct	-6.2	-6.6	-6.9	-7.2	-7.6	-8.5	-9.9	-12.3	-9.3	-6.4	-5.2	-4.4	-3.9	-4.4	-4.9	-5.0	-5.2	-5.9	-6.7	-7.2	-7.4	-8.7	-9.9	-11.3	-7.1	-3.9
23-Oct	-12.5	-14.7	-13.2	-13.8	-15.6	-16.3	-14.1	-13.7	-12.7	-10.2	-8.4	-7.0	-5.5	-4.9	-4.8	-4.8	-5.7	-6.9	-7.2	-8.3	-8.3	-9.1	-9.8	-11.1	-9.9	-4.8
24-Oct	-13.5	-15.6	-16.1	-16.1	-16.3	-15.0	-16.3	-14.7	-12.3	-10.3	-8.3	-7.6	-7.3	-6.8	-6.0	-5.9	-6.1	-6.2	-6.4	-6.4	-6.6	-6.8	-6.8	-7.0	-10.0	-5.9
25-Oct	-7.1	-7.2	-7.4	-7.5	-7.5	-7.8	-8.0	-7.9	-7.5	-6.9	-5.5	-4.9	-4.2	-4.0	-4.2	-4.4	-4.8	-5.1	-5.9	-6.6	-7.0	-7.7	-7.3	-7.1	-6.4	-4.0
26-Oct	-7.4	-7.9	-7.6	-7.8	-7.5	-7.2	-6.9	-6.7	-6.1	-5.5	-4.8	-4.1	-3.5	-3.0	-2.7	-2.7	-3.2	-3.7	-4.0	-4.5	-4.3	-4.6	-4.9	-4.9	-5.2	-2.7
27-Oct	-4.8	-5.1	-5.0	-5.2	-5.4	-5.9	-6.4	-6.9	-7.1	-6.8	-6.6	-5.9	-5.6	-5.4	-5.0	-5.3	-5.6	-6.4	-6.6	-6.9	-7.3	-7.9	-8.0	-8.2	-6.2	-4.8
28-Oct	-7.8	-7.4	-7.3	-7.5	-8.6	-9.4	-9.9	-9.3	-7.7	-6.7	-6.0	-5.4	-4.9	-4.8	-4.1	-3.9	-4.1	-4.1	-3.8	-3.2	-2.8	-2.6	-2.5	-2.8	-5.7	-2.5
29-Oct	-2.9	-2.9	-2.9	-2.9	-3.0	-3.1	-3.2	-3.3	-3.3	-3.4	-3.7	-3.9	-3.9	-3.7	-3.2	-3.0	-5.2	-9.3	-10.2	-8.0	-6.0	-5.3	-5.3	-5.5	-4.5	-2.9
30-Oct	-6.4	-8.1	-10.0	-12.3	-11.4	-12.0	-14.3	-14.4	-11.0	-7.3	-6.0	-5.1	-4.5	-3.9	-3.9	-4.2	-5.0	-5.3	-4.8	-4.5	-4.2	-3.8	-3.7	-4.2	-7.1	-3.7
31-Oct	-3.8	-3.2	-3.0	-2.7	-2.9	-2.9	-3.3	-3.9	-4.2	-4.1	-4.2	-4.0	-3.9	-3.5	-3.3	-3.5	-3.7	-3.9	-3.7	-3.7	-3.9	-4.1	-4.2	-4.1	-3.6	-2.7
	1.8	1.5	1.5	1.2	0.9	0.6	0.3	0.4	1.7	3.1	4.3	5.4	5.9	6.3	6.6	6.4	5.7	4.5	3.8	3.4	3.2	2.7	2.4	2.0		Diurnal Average
	13.0	12.3	11.7	11.1	10.5	10.2	10.2	10.6	12.0	13.8	15.4	17.8	19.2	20.2	21.5	22.3	21.4	18.7	16.3	16.3	15.6	15.0	14.6	14.0		Diurnal Maximum



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Wapasu - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Wapasu - October 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	290	38.98	38.98
0 - 10	287	38.58	77.55
10 - 20	163	21.91	99.46
> 20	4	0.54	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

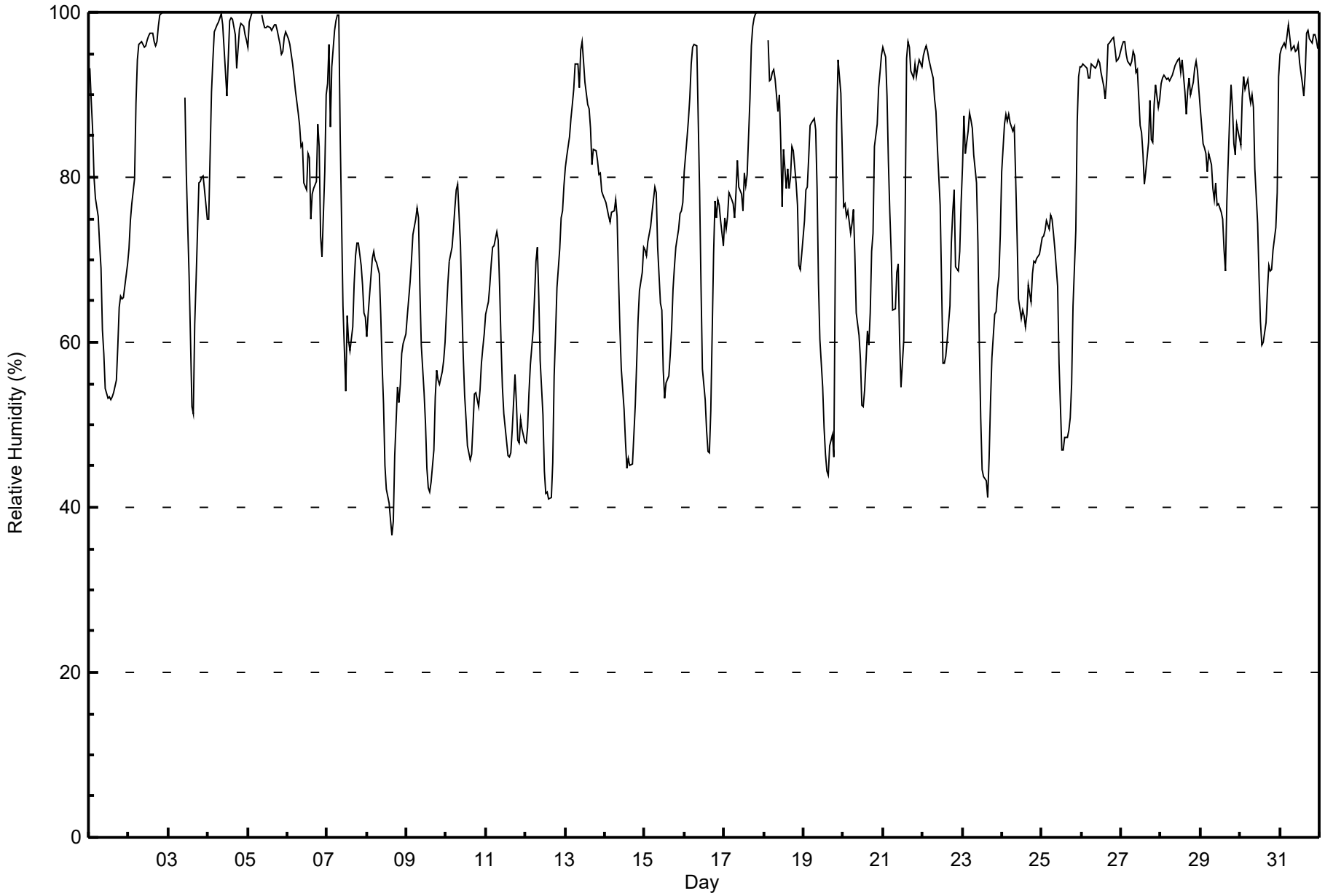
Relative Humidity (RH) - %
Wapasu - October 2023

Maximum Value: 100.0 % on Oct 2 21:00																						Maximum Daily Average: 97.9 % on Oct 5																						Hours in Service: 744		
Minimum Value: 36.6 % on Oct 8 16:00																						Minimum Daily Average: 56.0 % on Oct 8																						Hours of Data: 724		
Maximum Diurnal Average: 84.4 % at hour 7																						Minimum Diurnal Average: 65.7 % at hour 15																						Hours of Missing Data: 20		
Monthly Average: 76.41 %																						Percentiles: P ₁ = 41.8 P ₁₀ = 52.3 Q ₁ = 64.0 Median = 77.4 Q ₃ = 92.0 P ₉₀ = 96.2 P ₉₉ = 99.8																						Hours of Calibration: 0		
																																												Percent Operational Time: 97.3		
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-Oct	93.2	89.4	85.7	80.0	77.5	75.2	71.9	69.0	61.5	58.6	54.4	53.3	53.4	53.0	53.4	53.9	55.3	59.5	64.3	65.7	65.3	65.4	68.1	69.5	66.5	93.2																				
2-Oct	71.4	74.8	76.8	79.8	89.0	94.2	96.1	96.2	96.5	95.8	96.0	96.6	97.1	97.5	97.4	96.5	95.9	96.5	98.4	99.7	100.0	100.0	OR	OR	92.8	100.0																				
3-Oct	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	89.7	80.3	67.9	60.4	52.3	51.4	62.3	67.6	79.3	79.5	80.0	80.2	78.4	75.0	--	89.7																				
4-Oct	74.9	82.7	90.3	94.3	97.7	98.5	98.9	99.3	99.8	98.5	92.7	89.8	94.5	99.0	99.4	99.1	97.2	93.3	95.6	98.0	98.7	98.2	97.3	96.6	95.2	99.8																				
5-Oct	95.7	98.8	100.0	100.0	OR	OR	OR	OR	99.7	98.8	98.2	98.1	98.3	98.1	97.9	98.1	98.5	98.5	97.8	96.1	94.9	95.3	97.0	97.6	97.9	100.0																				
6-Oct	96.8	96.1	94.9	93.7	92.1	90.4	87.9	86.3	83.8	84.1	79.4	78.4	82.9	82.4	75.0	78.0	78.6	79.5	86.4	83.8	72.8	70.4	80.6	90.0	84.3	96.8																				
7-Oct	91.4	96.1	86.1	93.3	97.8	99.0	99.6	99.6	85.3	64.4	59.2	54.0	63.3	60.1	59.0	61.8	67.1	70.6	72.1	72.0	69.3	66.9	63.6	63.1	75.6	99.6																				
8-Oct	60.6	63.4	67.9	70.1	71.0	69.9	69.6	68.3	63.4	57.2	52.5	45.2	42.2	40.6	38.5	36.6	38.3	46.3	54.5	52.7	54.9	58.6	59.9	60.9	56.0	71.0																				
9-Oct	63.3	65.2	67.2	70.0	73.0	74.9	76.3	75.0	66.5	59.6	53.9	50.2	44.8	42.4	41.8	43.1	46.9	53.3	56.6	55.5	55.0	56.5	57.8	60.1	58.7	76.3																				
10-Oct	63.8	67.0	69.8	71.5	73.7	76.2	78.4	79.2	71.9	64.8	58.4	53.6	50.8	47.5	45.8	46.4	50.0	53.7	53.9	52.2	54.2	57.4	59.3	61.0	60.9	79.2																				
11-Oct	63.4	65.0	67.0	69.5	71.6	71.7	73.4	72.4	66.8	60.2	54.6	51.4	47.9	46.3	46.1	46.6	49.2	56.0	52.7	48.1	47.8	50.7	49.4	47.9	57.3	73.4																				
12-Oct	47.9	49.7	53.8	57.3	61.6	65.6	69.8	71.5	65.6	57.7	51.2	44.4	41.7	41.9	41.0	41.2	45.4	56.0	61.0	66.7	71.3	75.1	76.0	79.0	58.0	79.0																				
13-Oct	81.1	82.6	84.9	87.1	88.8	90.6	93.7	93.8	90.8	95.5	96.5	94.0	91.5	88.8	88.3	85.9	81.6	83.5	83.3	82.1	80.4	80.5	78.2	77.8	86.7	96.5																				
14-Oct	77.0	76.2	75.3	74.5	75.8	75.9	77.3	75.2	68.0	61.7	56.8	51.9	48.0	44.7	45.9	45.1	45.2	48.7	52.4	57.5	62.7	66.2	68.5	71.5	62.6	77.3																				
15-Oct	71.3	70.5	72.3	74.1	75.8	77.2	78.7	78.2	71.5	64.7	63.8	56.7	53.1	55.1	55.9	58.4	61.7	66.4	69.2	71.4	73.7	75.7	76.0	76.9	68.7	78.7																				
16-Oct	80.6	84.7	86.9	89.6	93.8	95.8	96.0	95.9	87.1	78.4	67.0	56.9	53.0	49.3	46.7	46.7	51.7	70.7	77.1	75.1	77.2	76.7	74.8	71.6	74.3	96.0																				
17-Oct	75.0	73.7	75.3	78.1	77.4	76.7	75.0	78.1	82.1	78.8	77.9	75.8	80.4	79.0	80.3	89.5	96.0	98.3	99.3	99.8	100.0	100.0	OR	OR	83.9	100.0																				
18-Oct	OR	OR	96.7	91.6	91.9	92.8	93.0	91.8	88.0	90.0	84.3	76.4	83.4	78.7	81.0	78.6	80.0	83.8	83.3	79.3	76.7	69.4	68.8	70.6	83.2	96.7																				
19-Oct	74.8	78.5	78.8	82.4	86.4	86.7	87.2	85.8	78.6	67.1	60.3	54.6	49.6	46.4	44.4	44.0	47.4	48.7	46.0	69.1	86.5	94.2	90.2	83.2	69.6	94.2																				
20-Oct	76.4	76.9	75.3	76.0	73.2	74.3	76.1	70.6	63.6	60.9	58.1	52.4	52.1	54.3	61.4	59.6	63.6	70.9	73.2	83.7	86.4	90.9	92.6	94.8	71.6	94.8																				
21-Oct	95.8	94.6	89.8	81.9	75.8	70.8	63.9	64.1	68.5	69.6	60.3	54.6	60.4	75.8	94.3	96.5	95.8	93.0	92.0	93.7	92.2	93.5	94.2	93.4	81.9	96.5																				
22-Oct	94.7	95.5	95.9	95.3	94.2	92.6	92.1	89.5	87.9	83.7	76.6	67.3	57.5	57.5	58.3	60.2	64.4	72.1	75.7	78.6	69.1	68.6	71.0	76.9	78.1	95.9																				
23-Oct	81.3	87.4	82.9	85.5	87.8	87.0	85.9	82.7	79.3	72.0	59.9	50.9	44.5	43.7	43.2	41.2	45.9	52.8	58.1	63.3	63.8	66.4	67.9	73.0	66.9	87.8																				
24-Oct	80.8	86.5	87.7	86.8	87.6	86.7	85.7	86.1	79.8	72.9	65.2	62.9	64.0	63.3	61.9	63.4	66.9	65.0	68.3	69.9	69.6	70.2	70.7	71.7	73.9	87.7																				
25-Oct	72.6	72.9	73.6	74.7	73.8	75.4	75.0	73.2	71.4	66.8	57.4	52.2	47.0	47.0	48.5	48.4	49.2	50.8	54.8	64.4	73.6	86.8	92.1	93.4	66.5	93.4																				
26-Oct	93.3	93.7	93.4	93.2	92.1	92.1	93.7	93.3	93.2	93.5	94.3	94.0	92.8	91.0	89.5	91.7	96.2	96.2	96.9	96.9	95.6	94.0	94.2	94.5	93.7	96.9																				
27-Oct	96.0	96.5	96.5	95.0	94.0	93.5	94.1	95.2	94.8	92.8	93.1	86.4	85.5	82.8	79.1	80.6	84.2	89.4	84.5	84.3	88.9	91.2	88.5	89.5	89.9	96.5																				
28-Oct	91.3	92.1	92.3	91.8	92.1	91.6	92.0	92.4	93.6	93.8	94.3	94.5	92.6	94.3	90.4	87.6	90.6	92.1	90.0	91.5	93.2	94.1	92.9	90.5	92.1	94.5																				
29-Oct	88.3	84.1	83.6	82.9	80.7	82.8	81.6	78.6	77.2	79.3	76.6	76.7	75.8	74.9	71.2	68.7	77.1	87.2	91.2	88.5	84.1	82.7	86.4	84.7	81.0	91.2																				
30-Oct	83.8	89.7	92.3	90.7	91.8	90.2	89.0	89.9	88.5	81.0	74.4	68.0	62.6	59.7	60.0	62.4	66.3	69.4	68.6	68.8	71.3	73.9	78.1	92.2	77.6	92.3																				
31-Oct	95.0	95.6	96.3	95.8	97.0	98.5	96.9	95.5	95.9	95.2	95.4	96.1	93.8	91.4	89.8	92.5	97.5	97.8	96.8	96.3	97.2	97.3	96.7	95.7	95.7	98.5																				
																						80.4	82.1	83.0	83.5	84.0	84.4	84.4	83.7	80.7	76.6	72.7	68.3	66.9	66.0	65.7	66.3	69.2	73.1	75.3	76.9	77.6	78.9	78.3	79.4	Diurnal Average
																						96.8	98.8	100.0	100.0	97.8	99.0	99.6	99.6	99.8	98.8	98.2	98.1	98.3	99.0	99.4	99.1	98.5	98.5	99.3	99.8	100.0	100.0	97.3	97.6	Diurnal Maximum
OR - Out of Range																																														



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Wapasu - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Wapasu - October 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	3	0.41	0.41
40 - 60	137	18.92	19.34
60 - 80	259	35.77	55.11
80 - 100	319	44.06	99.17

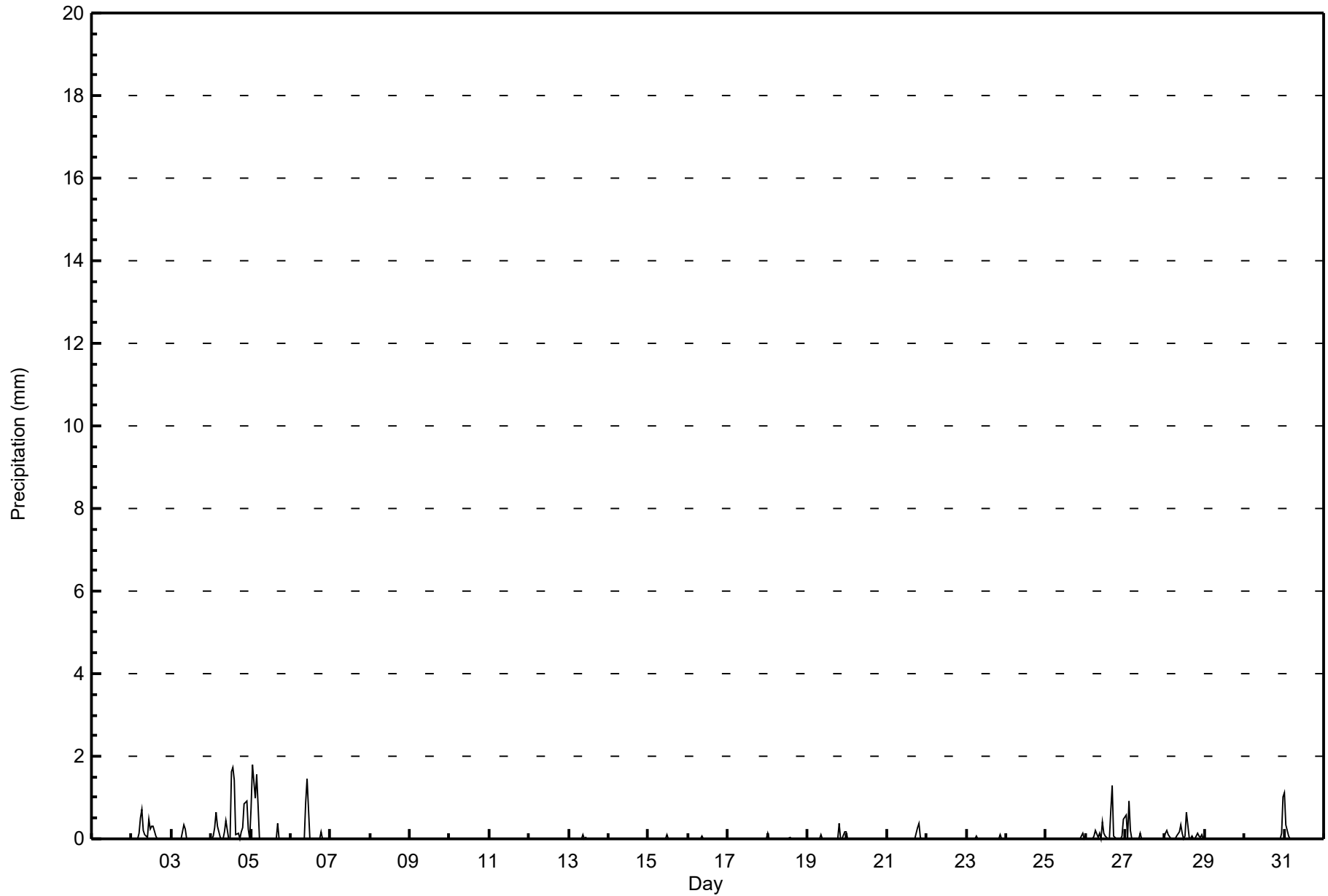
Total Number of Valid Hours: 724

Total Number of Hours: 744



Wood Buffalo Environmental Association
Hourly Averages

Precipitation (PC) - mm
Wapasu - October 2023





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Speed (WS) - km/h
Wapasu - October 2023

Maximum Speed: 24 km/h on Oct 14 16:00	Maximum Daily Speed Average: 18.6 km/h on Oct 14	Hours in Service: 744
Minimum Speed Value: 0 km/h on Oct 4 08:00	Minimum Daily Speed Average: 1.7 km/h on Oct 21	Hours of Data: 712
Maximum Diurnal Speed Average: 6.6 km/h at hour 6	Minimum Diurnal Speed Average: 3.4 km/h at hour 17	Hours of Missing Data: 32
Monthly Average Velocity: 4.9 km/h 169.4 deg	Percentiles: P ₁ = 2 P ₁₀ = 4 Q ₁ = 6 Median = 9 Q ₃ = 13 P ₉₀ = 17 P ₉₉ = 22	Percent Operational Time: 96.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Oct	SSE8	SSE8	SSE7	SSE9	SSE12	SSE11	SSE11	SSE10	SSE11	S14	S15	S16	S16	S16	S15	S16	S14	SSE12	SSE13	SSE14	SSE15	SSE13	SSE14	SSE14	SSE12.4	S16
2-Oct	SSE14	SSE12	SSE9	SSE11	SSE10	SSE11	SSE12	SSE11	SSE11	S10	S10	S9	SSW8	S8	SSW8	SW8	SW7	SSW5	SSE4	SSE5	SSE5	SE6	SE6	SE4	SSE8.0	SSE14
3-Oct	SE5	SE5	SSE5	SE5	SE6	SSE6	SE5	S5	S6	SSW4	SW7	WSW8	SW9	WSW8	SW6	SW7	SSW5	S5	SSE6	SSE7	SSE7	SSE8	SSE7	SSE8	S5.1	SW9
4-Oct	S9	S8	S6	SSE5	SSE4	SE4	SE3	SW0	W2	W3	NW6	NW7	NNW8	NW8	NW8	NNW7	NNW11	NNW16	NNW15	NW15	NW10	NNW13	NNW9	NNW8	WNW4.6	NNW16
5-Oct	NNW9	NNW14	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	NNW14
6-Oct	UO	UO	UO	UO	UO	UO	UO	UO	SSE10	S11	SSE13	S12	S12	SSE13	S13	SSE11	S8	S6	S7	S7	WSW10	WSW9	WSW5	WSW4	---	SSE13
7-Oct	WSW3	SW5	WSW5	SSW3	SE4	ESE4	SE4	ESE4	E4	N5	N2	SSW2	WSW5	S4	SSW4	SSE4	SE5	SE6	SE9	SE11	SE12	SE14	SE16	SSE18	SSE4.7	SSE18
8-Oct	SSE18	SE17	SE16	SE18	SE18	SE20	SE20	SE21	SE22	SSE22	SSE20	SSE22	SSE22	SSE22	SSE17	SSE15	SSE15	SE13	SE14	SSE15	SSE16	SSE16	SSE18	SSE17	SSE18.0	SE22
9-Oct	SSE16	SSE16	SSE16	SE14	SE13	SE13	SE14	SE15	SSE13	SSE15	SSE12	SSE11	SE14	SSE13	SSE14	SE15	SE14	SE13	SE17	SE18	SE18	SE19	SE19	SE17	SE15.1	SE19
10-Oct	SE16	SE16	SE16	SE17	SE16	SE15	SE13	SSE12	SSE11	SE14	SSE14	SE14	SE15	SE15	SSE16	SE15	SE16	SE20	SE21	SE23	SE22	SE23	SE21	SE19	SE16.6	SE23
11-Oct	SE19	SE19	SE19	SE17	SE18	SE18	SE15	SSE13	SE15	SSE13	SSE13	SSE17	SE17	SE15	SE16	SE14	SE13	SE13	SE16	SE16	SE17	SE16	SSE17	SSE17	SE16.0	SE19
12-Oct	SSE16	SSE15	SE14	SSE13	SE13	SE13	SE13	SSE13	SSE11	SSE9	S10	SSE11	S14	S15	S12	S10	SSE9	SE9	SE10	SE12	SE14	SE15	SSE14	SE13	SSE12.2	SSE16
13-Oct	SSE12	SSE9	SSE9	SSE10	SSE11	SSE11	SSE9	SSE8	SSE8	SSE12	SSE13	SSE13	SSE13	SSE13	SSE13	SSE14	SSE13	SE12	SE17	SSE16	SSE16	SE14	SSE15	SSE16	SSE12.3	SE17
14-Oct	SSE17	SSE18	SSE19	SSE19	SSE18	SSE18	SSE20	SSE20	SSE18	SE18	S19	SSE20	SSE20	SSE19	SSE20	SSE24	SSE20	SSE19	SSE18	SSE17	SSE16	SSE17	SSE18	SSE18	SSE18.6	SSE24
15-Oct	SSE18	SSE19	SSE18	SSE17	SSE16	SE16	SE15	SE16	SSE14	SSE15	S10	S10	S10	S11	S9	S10	SSE10	SSE11	SSE12	S9	S8	S8	S7	S7	SSE12.0	SSE19
16-Oct	S7	S7	S7	S6	S6	S6	S6	S7	S8	SSW8	SSW9	SW11	C	C	SW9	SW9	S4	SSE5	SSE6	SE6	SE5	SE6	SE6	SE6	S6.1	SW11
17-Oct	ESE6	ESE6	E5	ESE5	ESE6	E6	ESE7	N4	NNE5	NNE7	N9	N9	N10	N10	N10	NNE8	NE7	NE7	NE5	NE5	E3	SSE2	SSW1	S5	NE3.8	N10
18-Oct	SSE9	SSE8	SSE10	SSE10	SSE11	SSE11	SSE12	SSE12	SSE13	SSE15	SSE14	S12	S12	S13	SSE12	S11	S11	S11	S9	S8	SSW7	SW9	SW8	SW8	S10.0	SSE15
19-Oct	SSW6	SSW6	SSW8	S8	S8	S8	S8	S7	SSW9	SW13	SW17	SW15	WSW15	WSW15	WSW12	SW13	SW12	SW11	SW15	WSW18	WSW4	SE3	SW4	SW6	SW9.3	WSW18
20-Oct	WSW11	SW11	WSW10	SW9	SW8	SW7	SW9	WSW10	WSW10	W10	W10	NNW14	NNW16	N16	N14	N11	N8	NNE7	NNE6	ENE4	ENE5	ESE5	ESE4	SSE5	WNW3.9	NNW16
21-Oct	SSE5	SSE7	SSE8	SSE12	SSE11	SSE13	SSE14	S12	SSE12	SSE13	S12	SW10	NNW7	NNW14	N16	N16	N19	N18	N17	N14	N12	N11	N11	N11	NNE1.7	N19
22-Oct	N10	N10	NNE8	NNE6	NNE6	NE3	ENE3	E3	ENE4	NNE6	NNE5	N7	N7	N7	N6	NNE4	N4	NW2	WNW2	NW4	NW6	NW5	NW6	NW4	N4.6	N10
23-Oct	NW2	WSW2	W4	WSW4	SW5	SSW4	SW8	SW8	SW9	W9	W11	W14	NNW14	NNW14	NNW14	NNW12	NNW11	NNW9	NNW9	WNW5	W4	WSW5	WSW6	SW5	W6.8	WNW14
24-Oct	S4	S3	SSE4	SSE4	S5	SSW5	SSW5	SSW7	SW8	SW11	WSW11	WSW10	W10	WSW9	WSW9	WSW9	W6	NW8	WNW7	WNW7	NW6	WNW4	W5	W5	WSW5.1	WSW11
25-Oct	WSW5	WSW5	WSW4	WSW5	WSW5	SSW4	SSW4	SW7	SW7	SW9	SW11	WSW10	WSW11	WSW11	WSW11	WSW11	WSW9	WSW7	WNW4	NW7	NW6	WSW4	WSW5	WSW6	WSW6.3	WSW11
26-Oct	SW6	SW6	SW7	SW7	SW8	SW7	SW8	SW9	WSW8	WSW8	WSW8	W8	W7	WSW6	WSW7	WSW6	NW6	W2	S3	S3	SW5	SW5	SSW3	SW5	WSW5.6	SW9
27-Oct	WSW4	SW4	NW5	N10	N12	N9	N9	NNW8	N7	NNW6	NNW9	NNW9	NNW7	NNW8	NNW8	NNW7	NNW3	WSW2	WSW4	WSW2	SSE3	SSE3	S4	S4	NNW4.1	N12
28-Oct	S4	S6	S6	SSW5	SSW4	SSW3	S2	SSE2	WNW3	NW6	NNW10	NNW11	NNW13	NNW8	NNW8	NW7	W3	WSW6	WSW6	WNW6	NW7	NW7	NNW10	NW6	WNW3.5	NNW13
29-Oct	NW6	WNW7	WNW7	WNW7	WNW6	WNW7	NW8	NW8	NNW10	NNW12	NNW13	NNW12	NNW10	NNW8	NNW7	NNW7	N3	E3	ENE5	E5	NNE6	N8	N11	NNE9	NNW6.4	NNW13
30-Oct	NNE9	N4	N3	NE3	ENE3	ENE2	ESE4	SSE5	SSE5	S6	SSW10	SSW12	SSW13	SSW12	SSW11	SSW9	S10	S13	S13	S12	S12	SSW11	S10	S10	S6.2	SSW13
31-Oct	SSW8	SSW8	SSW6	SW6	WNW5	NNW7	N15	N15	N14	NNW13	N11	NNW12	NNW12	N9	NNW7	NNW7	NNW6	NW3	N6	NNW7	NW2	WSW2	WSW2	WSW2	NNW5.4	N15

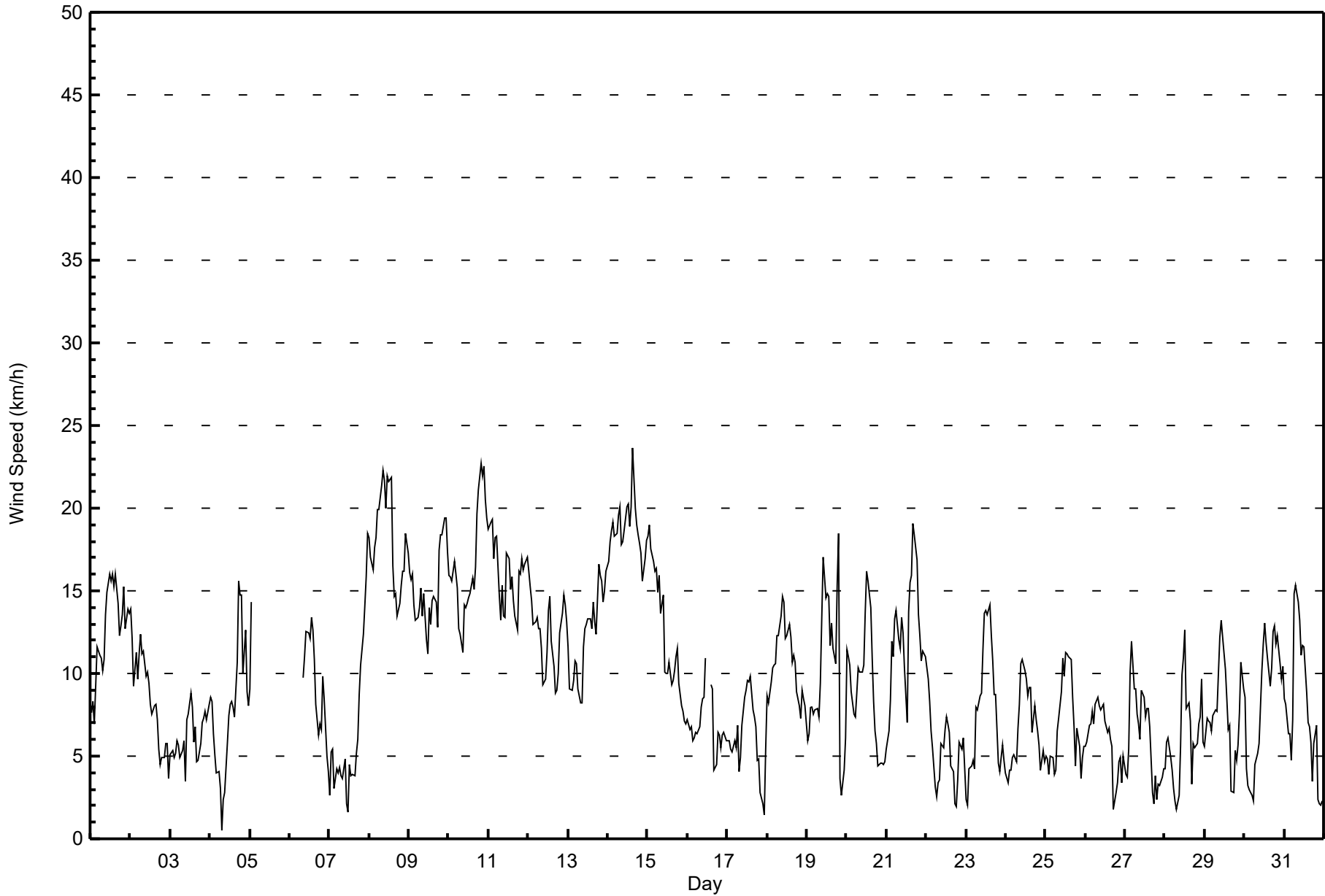
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C - Calibration UO - Unstable Operation
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Wapasu - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Wapasu - October 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	148	20.79	20.79
6 - 11	309	43.40	64.19
12 - 19	233	32.72	96.91
20 - 28	22	3.09	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 712

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Wapasu - October 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	3	4	7	6	6	11	19	14	16	9	23	8	6	8	1	148
6 - 11	24	13	1	0	1	4	12	51	49	17	36	32	7	15	23	24	309
12 - 19	13	0	0	0	0	0	70	93	24	3	6	4	1	6	1	12	233
20 - 28	0	0	0	0	0	0	10	12	0	0	0	0	0	0	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	44	16	5	7	7	10	103	175	87	36	51	59	16	27	32	37	712

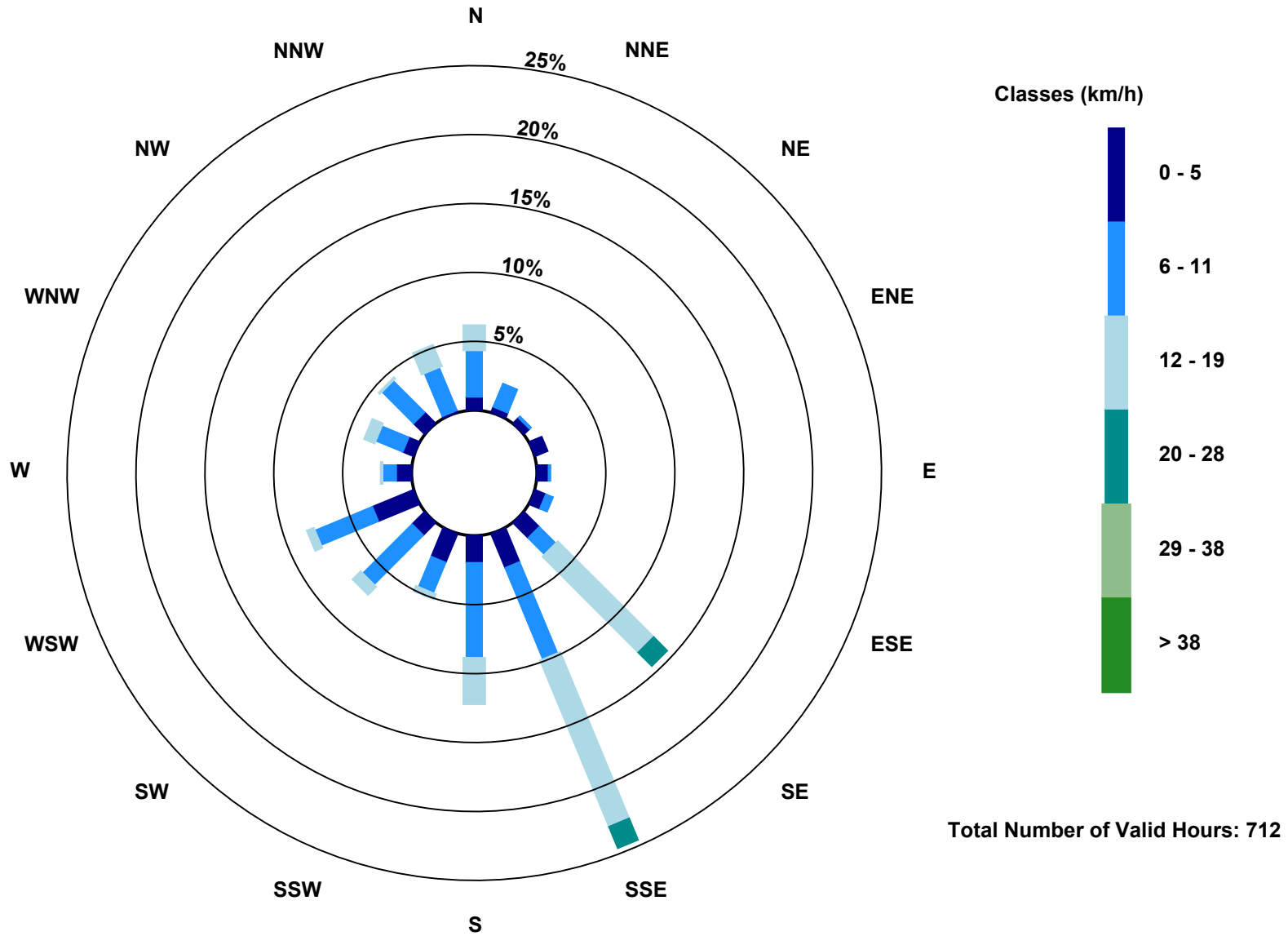
Total Number of Valid Hours: 712

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

Wind Speed (WS) - km/h
Wapasu





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Wapasu - October 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 744
Maximum Value: 8 km/h on Oct 14 12:00	Hours of Data: 712
Minimum Value: 0 km/h on Oct 2 22:00	Hours of Missing Data: 32
Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 3 Q ₃ = 4 P ₉₀ = 5 P ₉₉ = 7	Hours of Calibration: 2
	Percent Operational Time: 96.0

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

C - Calibration UO - Unstable Operation



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Wapasu - October 2023

Direction of Maximum Speed: 154 deg on Oct 14 16:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 155.3 deg on Oct 14	Hours of Data: 712
Direction of Minimum Speed: 223 deg on Oct 4 08:00	Hours of Missing Data: 32
Direction of Minimum Daily Speed Average: 1.7 deg on Oct 21	Percent Operational Time: 96.0
Monthly Average Direction: 169.4 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-Oct	150	150	155	157	156	154	154	154	166	172	177	181	177	180	176	177	169	168	154	155	158	160	151	152	164.3
2-Oct	151	158	166	160	158	151	151	157	158	173	185	182	192	191	199	217	215	209	159	152	152	144	143	133	168.1
3-Oct	139	144	152	146	143	165	145	171	190	195	230	237	231	242	235	222	199	190	161	159	165	165	160	160	182.6
4-Oct	171	173	178	164	150	131	146	223	279	281	307	314	294	308	310	296	327	331	334	326	309	291	286	296	299.9
5-Oct	314	334	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
6-Oct	UO	UO	UO	UO	UO	UO	UO	UO	164	169	167	175	173	164	170	166	182	174	169	185	237	243	237	237	--
7-Oct	258	225	247	202	142	121	134	104	81	6	352	211	239	173	195	164	137	135	137	134	136	142	145	147	149.0
8-Oct	147	145	143	142	142	144	145	143	144	147	151	152	162	164	168	159	154	143	145	152	153	150	150	152	150.0
9-Oct	147	148	149	145	140	143	141	138	150	154	154	151	144	150	149	146	142	142	137	139	144	143	144	146	144.9
10-Oct	141	140	140	139	138	135	144	147	149	142	149	142	133	145	150	143	135	132	135	139	141	144	142	140	140.8
11-Oct	138	139	143	135	133	136	144	149	144	151	151	156	144	137	136	134	139	134	135	139	140	146	148	148	141.5
12-Oct	151	153	145	148	146	144	144	147	154	163	173	168	174	175	178	174	161	141	142	141	146	144	148	146	153.8
13-Oct	154	152	153	150	150	155	156	157	156	150	160	158	159	161	155	150	154	140	144	147	149	144	150	150	151.8
14-Oct	148	149	149	150	149	152	152	153	158	164	169	165	162	164	153	154	159	152	155	156	159	155	150	149	155.3
15-Oct	149	152	149	148	148	146	145	144	156	156	173	178	179	179	173	181	163	156	157	170	170	175	174	173	159.0
16-Oct	181	179	182	169	177	172	171	174	188	201	206	215	C	C	229	227	186	153	147	144	137	145	140	130	179.6
17-Oct	117	122	93	108	123	99	114	5	12	12	6	3	3	3	359	21	34	47	37	41	81	157	206	171	44.7
18-Oct	148	159	159	153	158	161	155	154	158	152	157	170	171	178	167	176	169	174	184	191	208	224	226	224	170.6
19-Oct	194	196	202	189	177	179	181	185	206	220	233	235	238	237	240	230	222	222	227	239	239	135	222	224	219.2
20-Oct	237	230	240	232	236	224	236	250	248	270	281	303	330	354	357	6	7	15	31	63	70	114	118	147	290.4
21-Oct	148	164	152	156	164	164	164	171	168	167	182	214	296	345	355	353	358	4	7	5	10	355	355	2	23.7
22-Oct	2	4	12	28	25	44	62	100	59	24	18	11	354	9	353	14	356	322	292	309	322	312	322	310	2.2
23-Oct	319	255	261	257	217	208	223	220	233	262	271	280	300	294	289	290	294	307	309	295	274	252	249	230	272.9
24-Oct	188	172	161	166	169	199	196	211	222	230	237	254	259	250	257	256	276	308	299	299	315	293	277	270	247.5
25-Oct	248	250	238	239	241	203	200	217	215	226	232	239	253	256	252	246	246	248	283	314	310	255	253	246	245.8
26-Oct	223	226	225	229	232	230	234	230	238	244	248	261	267	253	243	241	321	271	191	181	225	226	213	234	238.0
27-Oct	253	231	325	357	2	0	354	347	355	340	340	336	335	335	328	333	329	249	258	244	159	153	185	179	334.7
28-Oct	179	186	190	196	195	194	170	163	287	312	334	334	342	347	329	325	260	241	257	285	313	319	326	318	301.2
29-Oct	307	297	291	294	294	299	314	308	329	345	346	331	333	341	340	336	3	92	66	80	18	4	1	14	336.5
30-Oct	17	9	7	37	69	67	119	149	159	180	206	205	210	206	193	195	181	178	183	187	191	195	190	187	186.8
31-Oct	198	201	209	230	297	346	352	351	350	347	358	343	346	351	348	336	336	323	353	337	310	246	245	250	333.5

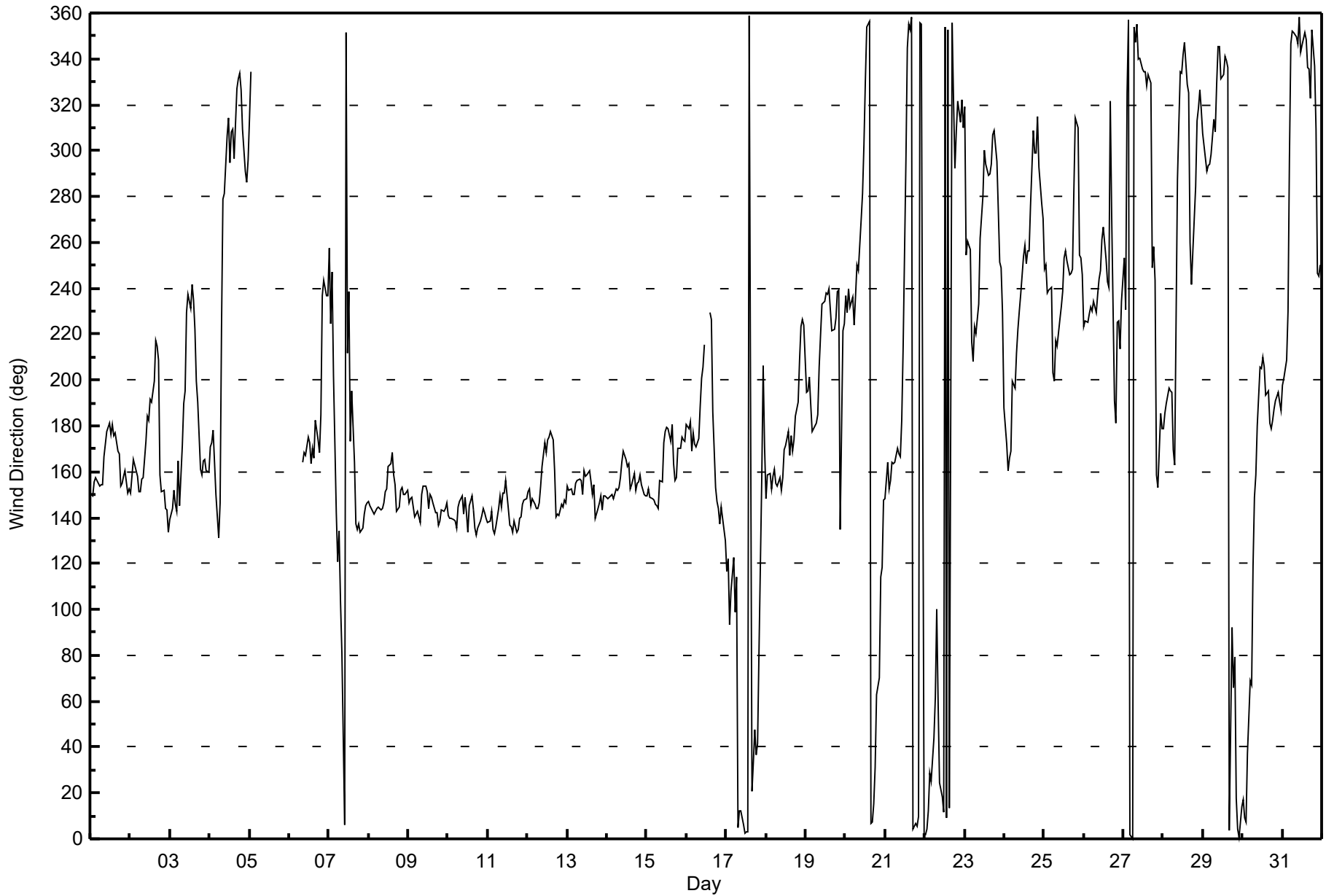
159.9	163.6	163.5	158.2	154.8	153.6	155.7	161.9	169.9	178.2	195.2	204.1	207.1	198.4	198.7	191.6	173.2	159.2	153.7	158.9	159.8	164.3	163.8	163.2
Diurnal Average																							

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
Wapasu - October 2023





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Wapasu - October 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0										Hours in Service: 744															
Maximum Value: 88 deg on Oct 7 11:00										Hours of Data: 712															
Minimum Value: 3 deg on Oct 2 22:00										Hours of Missing Data: 32															
Percentiles: P ₁ = 8 P ₁₀ = 17 Q ₁ = 19 Median = 22 Q ₃ = 27 P ₉₀ = 30 P ₉₉ = 60										Hours of Calibration: 2															
										Percent Operational Time: 96.0															
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-Oct	14	15	16	19	21	20	19	21	27	30	31	30	30	30	31	29	27	25	20	20	22	23	19	21	31
2-Oct	19	25	27	22	22	18	20	21	22	29	28	28	29	28	26	19	19	24	15	8	12	3	5	19	29
3-Oct	13	8	11	11	12	28	12	21	26	46	23	27	29	36	52	37	25	27	22	14	19	19	19	20	52
4-Oct	24	24	27	22	12	11	16	74	31	30	27	24	29	26	27	27	29	18	17	19	25	26	31	28	74
5-Oct	23	20	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	23
6-Oct	UO	UO	UO	UO	UO	UO	UO	UO	24	25	24	28	26	23	27	25	28	21	18	25	26	26	27	24	28
7-Oct	60	22	20	36	19	21	10	15	17	30	88	82	27	50	35	22	16	13	13	13	17	16	18	19	88
8-Oct	19	19	18	17	18	18	19	18	19	19	22	22	25	26	27	25	21	18	18	19	20	19	19	19	27
9-Oct	18	19	18	18	17	17	16	18	22	23	26	24	25	27	21	20	21	21	18	19	19	19	19	17	27
10-Oct	18	18	18	17	17	17	22	20	25	22	24	26	25	25	22	23	21	19	19	19	19	20	20	20	26
11-Oct	18	18	18	18	17	18	20	23	22	24	26	25	22	24	22	22	22	19	18	19	19	19	19	19	26
12-Oct	21	20	17	19	18	17	17	18	21	28	32	29	30	30	30	28	26	12	15	16	17	18	18	17	32
13-Oct	21	17	19	17	18	20	21	20	29	24	24	25	25	27	25	23	22	18	19	18	19	18	19	17	29
14-Oct	18	19	19	19	19	21	19	19	23	26	28	29	26	28	26	22	24	22	23	22	23	23	18	19	29
15-Oct	18	20	20	19	18	18	18	17	26	22	27	29	32	29	28	28	25	20	21	26	24	23	22	21	32
16-Oct	23	23	23	14	19	15	18	21	25	26	21	21	C	C	23	18	37	13	10	9	10	7	8	15	37
17-Oct	14	14	18	21	15	22	15	42	32	26	24	25	26	25	23	31	30	27	34	34	79	61	69	44	79
18-Oct	17	19	20	18	20	21	19	19	23	19	20	27	26	29	25	28	25	27	30	29	23	18	15	16	30
19-Oct	27	28	25	24	18	19	23	24	24	22	18	20	20	19	22	20	18	22	18	20	49	51	33	27	51
20-Oct	17	17	17	20	18	19	23	21	24	29	29	30	22	25	28	29	30	29	22	21	23	12	17	7	30
21-Oct	11	17	19	20	26	23	23	25	26	26	29	37	38	20	24	23	26	29	28	28	30	23	22	26	38
22-Oct	28	27	30	33	34	28	31	27	34	31	43	37	36	33	25	29	23	18	34	27	18	23	18	25	43
23-Oct	84	55	31	30	17	20	13	13	22	26	28	27	31	29	29	27	28	28	27	32	29	21	21	23	84
24-Oct	23	13	12	18	16	19	20	16	15	18	26	27	29	26	27	25	33	24	28	26	28	32	28	31	33
25-Oct	23	24	27	16	19	26	23	18	21	19	22	26	29	28	25	22	20	22	35	23	29	23	24	22	35
26-Oct	18	13	13	14	15	17	17	15	16	20	21	35	28	26	20	20	40	51	29	18	17	13	20	16	51
27-Oct	30	16	52	24	26	27	24	22	24	20	18	23	24	22	21	18	49	25	21	32	15	21	19	16	52
28-Oct	22	28	27	24	23	21	20	30	38	27	19	19	17	20	23	22	32	22	24	32	26	22	19	21	38
29-Oct	29	30	29	30	28	30	24	27	20	19	20	18	20	18	25	22	28	27	21	15	27	28	25	30	30
30-Oct	29	28	22	35	29	39	18	7	13	27	24	26	23	25	28	26	27	26	29	29	28	27	27	29	39
31-Oct	31	25	26	43	25	21	21	22	20	20	25	20	20	24	21	17	17	24	24	16	47	21	30	36	47
										Diurnal Maximum															
										84 55 52 43 34 39 31 74 38 46 88 82 38 50 52 37 49 51 35 34 79 61 69 44															
C - Calibration										UO - Unstable Operation															



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS18 STONY MOUNTAIN OCTOBER 2023

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

November 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - STONY MOUNTAIN (AMS18)
OCTOBER 2023

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

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2(ppb) Average	709	35	35	100	2.8	0	0.5	0
TRS(ppb) Average	707	37	37	100	0.3	0	0.2	0
THC(ppm) Average	709	35	35	100	2.1	-	2.1	-
NMHC(ppm) Average	709	35	35	100	0.022	-	0.003	-
CH4(ppm) Average	709	35	35	100	2.1	-	2.1	-
O3 (ppb) Average	708	36	36	100	42.8	0	33.4	-
NO2 (ppb) Average	707	37	37	100	3.6	0	1.5	-
NO (ppb) Average	707	37	37	100	0.8	-	0.2	-
NOX (ppb) Average	707	37	37	100	4	-	1.7	-
PM2.5 (ug/m3) Average	741	3	3	100	20.4	0	14.1	0
CO(ppm) Average	710	34	34	100	0.3	0	0.3	0
CO2(ppm) Average	703	36	41	99.33	445.3	0	427.8	0
Temperature 2 m (C) Average	744	0	0	100	22.7	-	14.2	-
Relative Humidity (%) Average	744	0	0	100	99.9	-	91	-
Wind Speed 20 m (km/h) Average	599	0	145	80.51	24	-	18	-
Wind Direction 20 m (deg) Average	599	0	145	80.51	-	-	-	-
Precipitation (mm) Total	743	0	1	99.87	1.4	-	5.1	-
Leaf Wetness (% of range) Average	744	0	0	100	32.1	-	15.6	-
Global Solar Radiation (W/m2) Average	744	0	0	100	541.4	-	133.9	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - STONY MOUNTAIN (AMS18)
OCTOBER 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	0.23	0.3	-	0	0	0	0.1	0.3	0.6	2.8
TRS (ppb) Average	707	0.18	0	-	0	0.1	0.2	0.2	0.2	0.2	0.3
THC (ppm) Average	709	2.02	0	-	2	2	2	2	2	2.1	2.1
NMHC(ppm) Average	709	0	0.001	-	0	0	0	0	0	0	0.022
CH4(ppm) Average	709	2.02	0	-	2	2	2	2	2	2.1	2.1
O3 (ppb) Average	708	26.65	5.6	-	9.3	19.5	22.8	26.7	30.8	33.7	42.8
NO2 (ppb) Average	707	0.72	0.6	-	0	0.1	0.2	0.5	1.1	1.6	3.6
NO (ppb) Average	707	0.09	0.1	-	0	0	0	0.1	0.1	0.2	0.8
NOX (ppb) Average	707	0.82	0.7	-	0	0.1	0.3	0.6	1.3	1.8	4
PM2.5 (ug/m3) Average	741	4.91	2.8	-	0.8	1.9	3.3	4.5	5.8	7.9	20.4
CO(ppm) Average	710	0.17	0	-	0.1	0.1	0.1	0.2	0.2	0.2	0.3
CO2(ppm) Average	703	418.08	6.1	-	400.2	411.6	414	418.1	421.5	426	445.3
Temperature 2 m (C) Average	744	3.69	8.2	-	-13	-7.5	-4.1	5.5	9.7	13.4	22.7
Relative Humidity (%) Average	744	70.59	15.7	-	28.2	47.4	59.3	72.6	83.3	90.1	99.9
Wind Speed 10 m (km/h) Average	599	13.1	4	-	2	8	10	13	15	19	24
Wind Direction 10 m (deg) Average	599	-	-	-	-	-	-	-	-	-	-
Precipitation (mm) Total	743	-	-	12.29	-	-	-	-	-	-	-
Surface Wetness (% of range) Average	744	2.91	4.3	-	0.3	1.3	1.6	1.8	2	3.9	32.1
Global Solar Radiation (W/m2) Average	744	75.3	127.4	-	0	0	0	0.2	106.7	290.4	541.4

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - STONY MOUNTAIN (AMS18)
OCTOBER 2023

MONTHLY SUMMARY

Parameter	Period Start	Period End	Duration (Hours)	Notes
CO2	25 Oct 2023 11:00	25 Oct 2023 15:00	5	Maintenance - nitrogen generator replaced
Wind Speed, Wind Direction	07 Oct 2023 12:00	11 Oct 2023 10:00	95	Unstable Operations - inconsistent response
Wind Speed, Wind Direction	11 Oct 2023 11:00	11 Oct 2023 11:00	1	Maintenance - wiring issue repaired
Wind Speed, Wind Direction	21 Oct 2023 21:00	23 Oct 2023 21:00	49	Flat line in sensor output signal - Sensor frozen
Precipitation Collector	11 Oct 2023 13:00	11 Oct 2023 13:00	1	Maintenance - field operations check



Wood Buffalo Environmental Association

Summary of Hour Averages

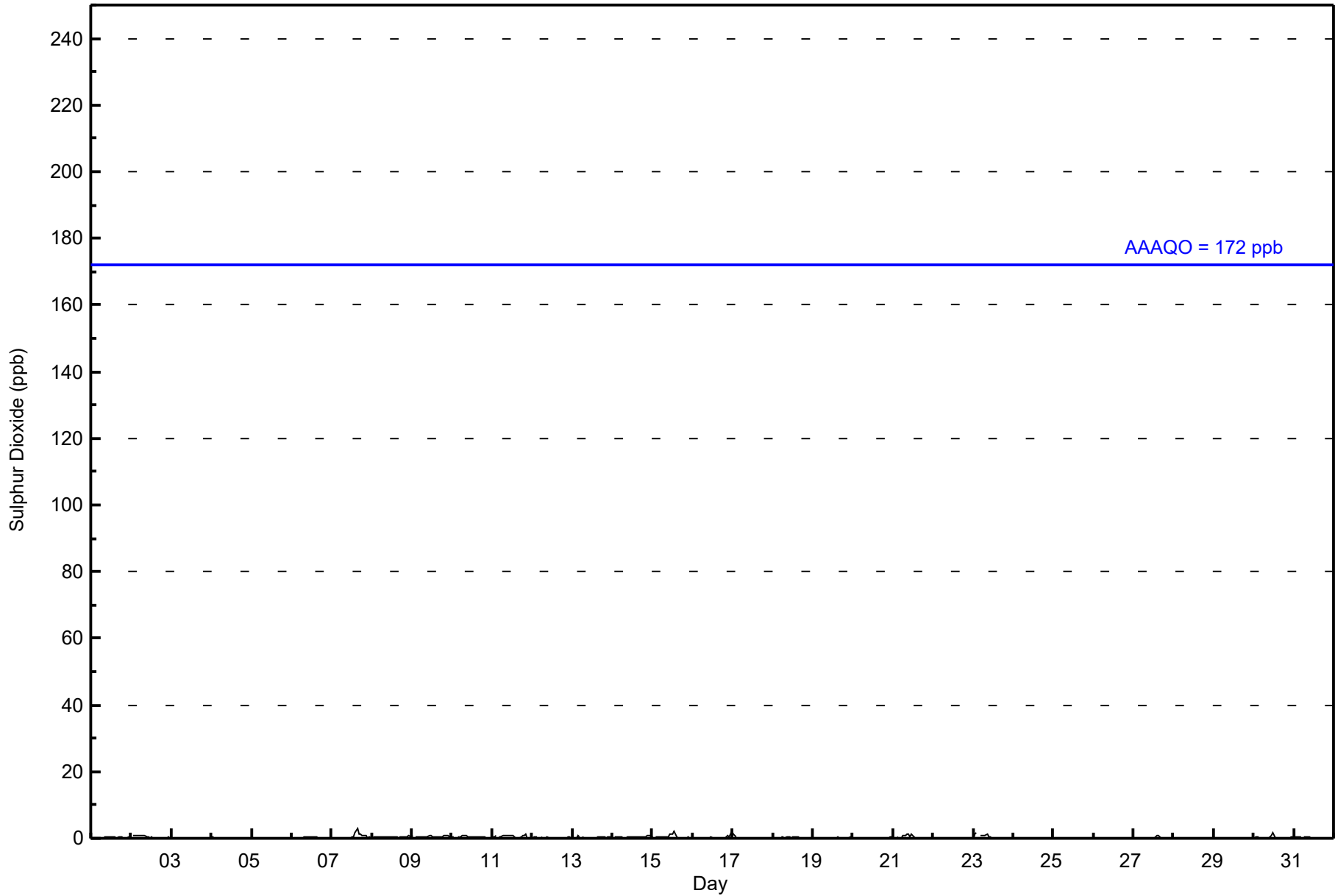
Sulphur Dioxide (SO₂) - ppb
Stony Mountain - October 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		744																																									
Maximum Value: 2.8 ppb on Oct 7 16:00		Maximum Daily Average: 0.5 ppb on Oct 11				Hours of Data:		709																																									
Minimum Value: 0.0 ppb on Oct 3 06:00		Minimum Daily Average: 0.0 ppb on Oct 25				Hours of Missing Data:		35																																									
Maximum Diurnal Average: 0.3 ppb at hour 12		Minimum Diurnal Average: 0.2 ppb at hour 20				Hours of Calibration:		35																																									
Monthly Average: 0.23 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.3 P ₉₀ = 0.6 P ₉₉ = 1.4				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-Oct	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.2	0.3	0.4	0.5	0.4	0.6	0.4	0.3	0.2	0.3	0.3	0.3	0.1	0.1	0.2	0.5	0.2	0.3	0.6																							
2-Oct	Z	0.9	0.8	0.9	0.9	0.9	0.7	1.0	0.9	0.5	0.2	0.2	0.3	0.1	0.2	0.1	0.1	0.2	0.1	0.0	0.0	0.2	0.2	0.1	0.4	1.0																							
3-Oct	0.1	Z	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.2	0.0	0.2																							
4-Oct	0.3	0.2	Z	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.3																							
5-Oct	0.1	0.1	0.2	Z	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.0	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	0.2																							
6-Oct	0.0	0.1	0.1	0.0	Z	0.0	0.2	0.5	0.6	0.6	0.6	0.6	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.3	0.6																							
7-Oct	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	1.5	2.8	1.4	1.5	0.8	0.7	0.8	0.2	0.5	0.5	0.5	2.8																							
8-Oct	Z	0.5	0.4	0.4	0.4	0.4	0.4	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.2	0.3	0.2	0.3	0.3	0.5	0.7	0.4	0.4	0.7																							
9-Oct	0.7	Z	0.3	0.3	0.4	0.4	0.2	0.3	0.5	0.5	0.8	0.7	0.5	0.5	0.6	0.5	0.5	0.3	0.3	0.6	0.9	0.7	0.3	0.4	0.5	0.9																							
10-Oct	0.6	0.5	Z	0.4	0.4	0.4	0.8	0.7	0.8	0.5	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	0.4	0.8																							
11-Oct	0.3	0.4	0.7	Z	0.5	0.5	0.9	0.9	0.8	0.7	0.8	1.0	0.8	0.4	0.1	0.1	0.1	0.4	0.9	0.8	1.2	0.0	0.0	0.1	0.5	1.2																							
12-Oct	0.2	0.3	0.5	0.3	Z	0.3	0.2	0.1	0.2	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.4	0.3	0.0	0.2	0.5																							
13-Oct	0.0	0.0	0.0	0.9	0.6	Z	0.2	0.1	0.1	0.0	0.2	0.0	0.1	0.1	0.1	0.2	0.4	0.5	0.5	0.2	0.1	0.3	0.6	0.5	0.2	0.9																							
14-Oct	Z	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.4	0.5	0.3	0.3	0.5	0.4	0.5	0.4	0.4	0.3	0.3	0.4	0.8	0.7	0.5	0.4	0.8																							
15-Oct	0.4	Z	0.4	0.5	0.5	0.4	0.3	0.2	0.3	0.4	1.3	1.2	1.2	2.0	0.6	0.1	0.1	0.1	0.0	0.1	0.1	0.3	0.1	0.1	0.5	2.0																							
16-Oct	0.1	0.0	Z	0.0	0.1	0.1	0.2	0.0	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.3	0.8	0.4	2.0	0.2	2.0																							
17-Oct	1.3	0.8	0.3	Z	0.1	0.1	0.1	0.1	0.1	0.2	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.3																							
18-Oct	0.2	0.0	0.0	0.1	Z	0.3	0.3	0.1	0.4	0.4	0.6	0.2	0.4	0.4	0.4	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.2	0.6																							
19-Oct	0.1	0.1	0.1	0.1	0.1	Z	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.2	0.1	0.2																							
20-Oct	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	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.5	0.5	0.1	0.5																							
21-Oct	0.3	Z	0.3	0.2	0.1	0.1	0.8	0.7	1.4	1.4	0.3	1.2	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.3	1.4																							
22-Oct	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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1																							
23-Oct	0.1	1.3	1.6	Z	0.7	0.8	0.8	0.9	1.1	0.5	0.2	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.4	1.6																							
24-Oct	0.0	0.0	0.0	0.0	Z	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1																							
25-Oct	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	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1																							
26-Oct	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1																							
27-Oct	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	0.6	0.7	0.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7																							
28-Oct	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.0	0.1	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2																							
29-Oct	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1																							
30-Oct	0.1	0.4	0.3	0.3	Z	0.1	0.1	0.2	0.2	0.2	0.7	1.8	0.7	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3	1.8																							
31-Oct	0.5	0.5	0.4	0.4	0.5	Z	0.3	0.2	0.2	0.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.2	0.5																							
																								0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	Diurnal Average
																								1.3	1.3	1.6	0.9	0.9	0.9	0.9	1.0	1.4	1.4	1.3	1.8	1.2	2.0	1.5	2.8	1.4	1.5	0.9	0.8	1.2	0.8	0.7	2.0	0.2	Diurnal Maximum
Z - zerospan C - Calibration																																																	
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb																																																	



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Stony Mountain - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Stony Mountain - October 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
Stony Mountain - October 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	4	3	3	1	9	16	45	73	64	41	51	60	94	79	16	570
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	4	3	3	1	9	16	45	73	64	41	51	60	94	79	16	570

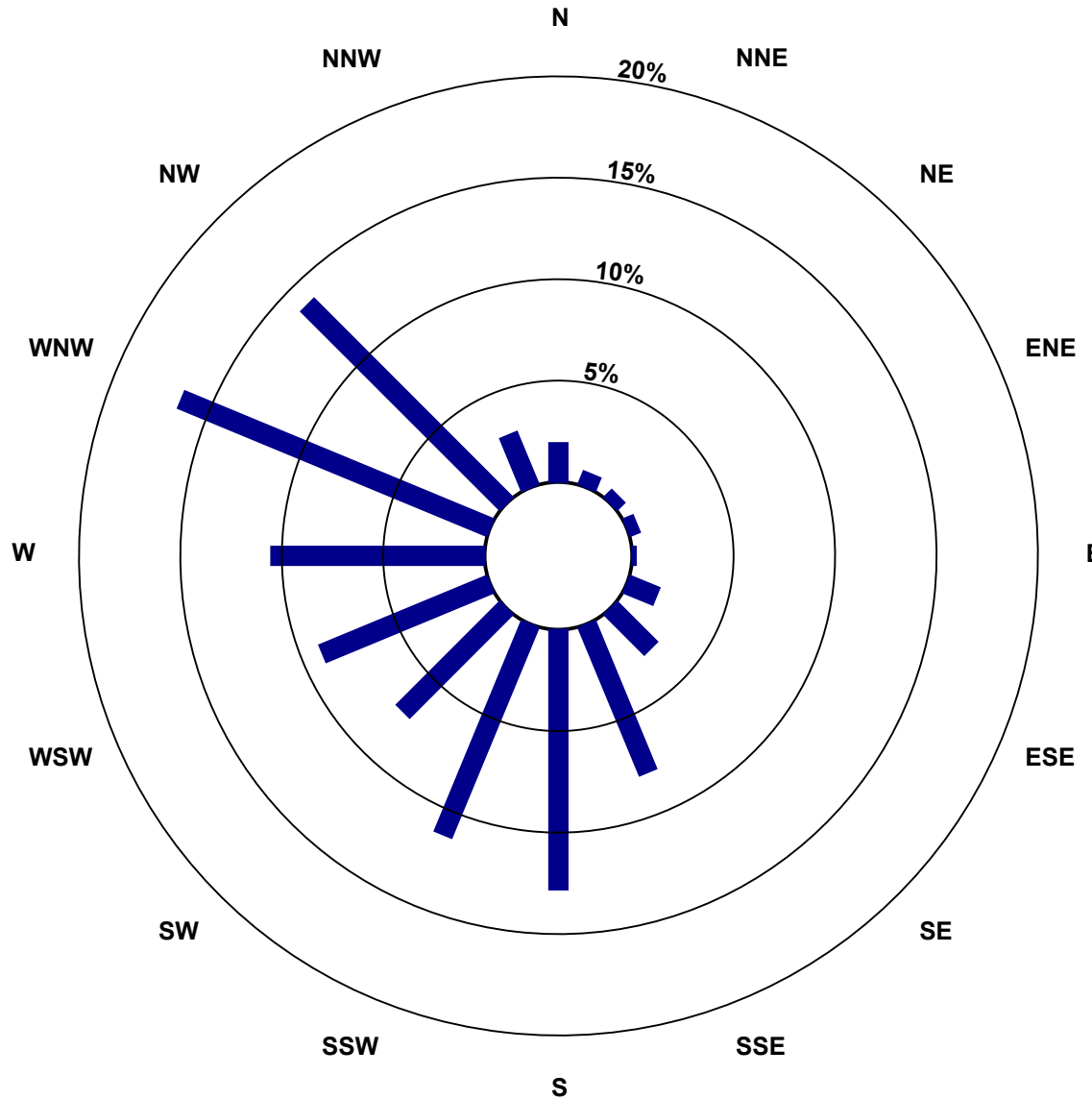
Total Number of Valid Hours: 570

Total Number of Hours: 744

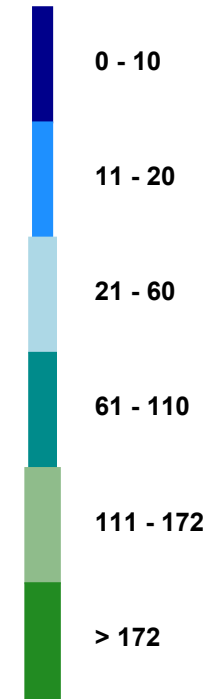


Wood Buffalo Environmental Association
Wind Rose Oct 2023

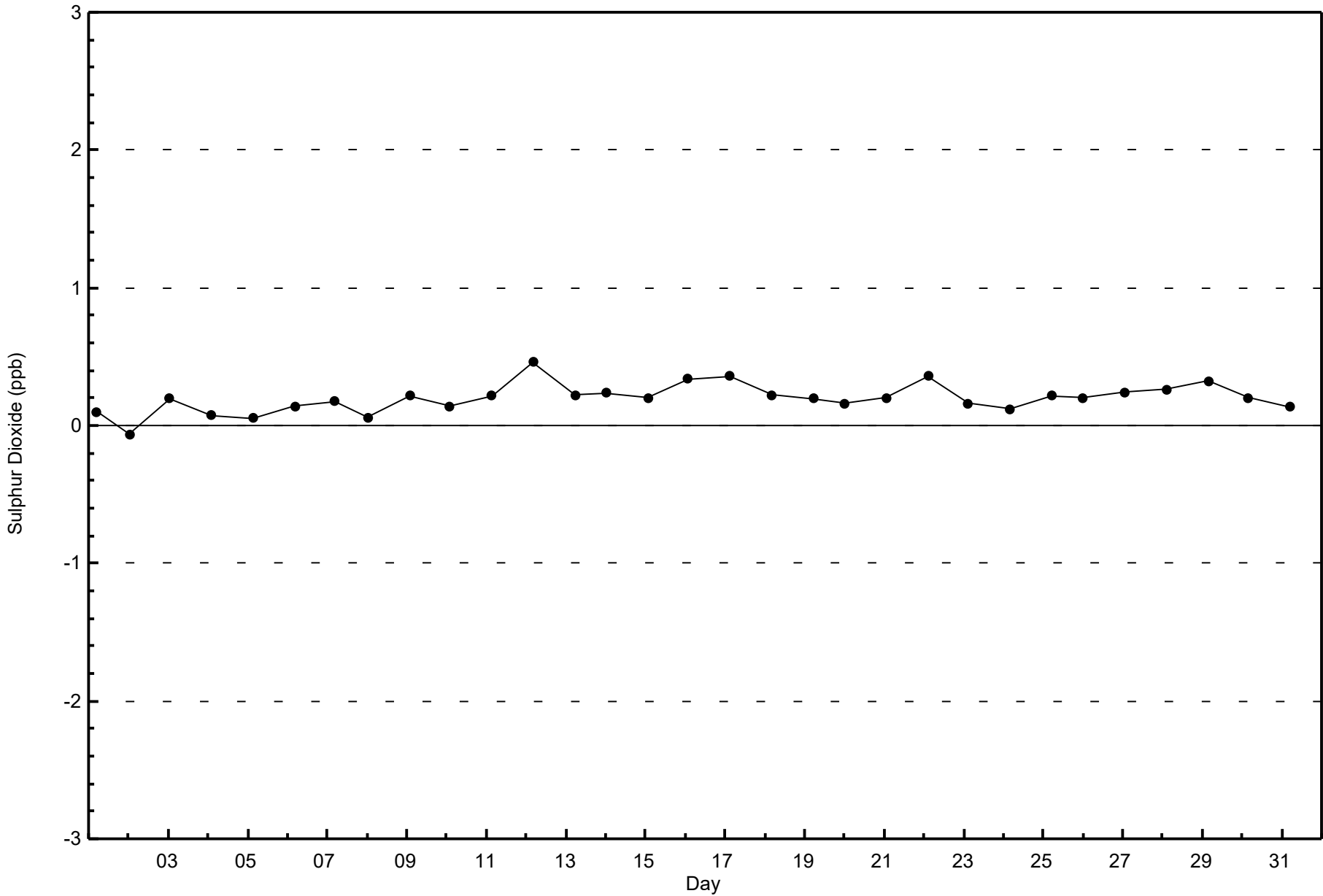
Sulphur Dioxide (SO₂) - ppb
Stony Mountain

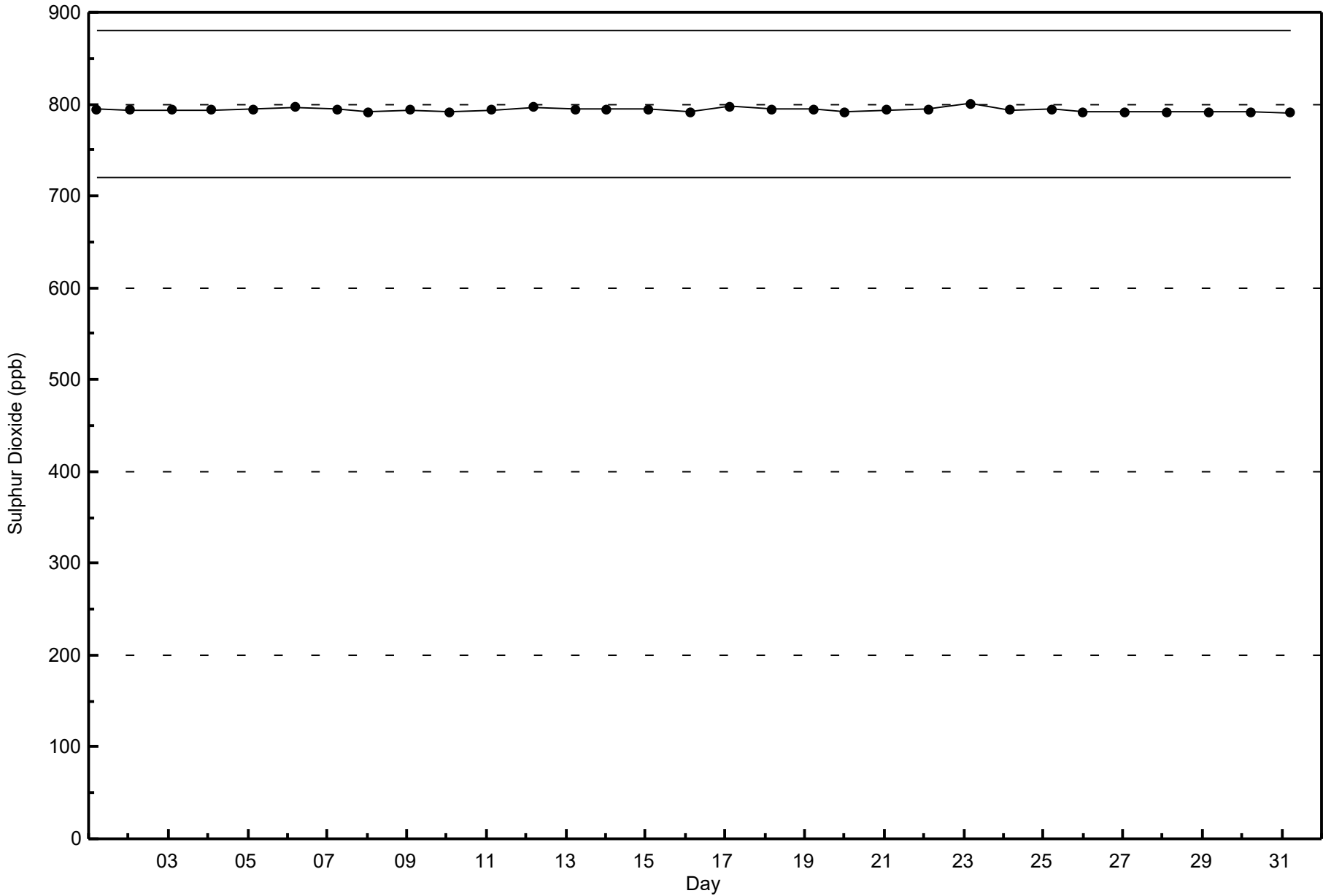


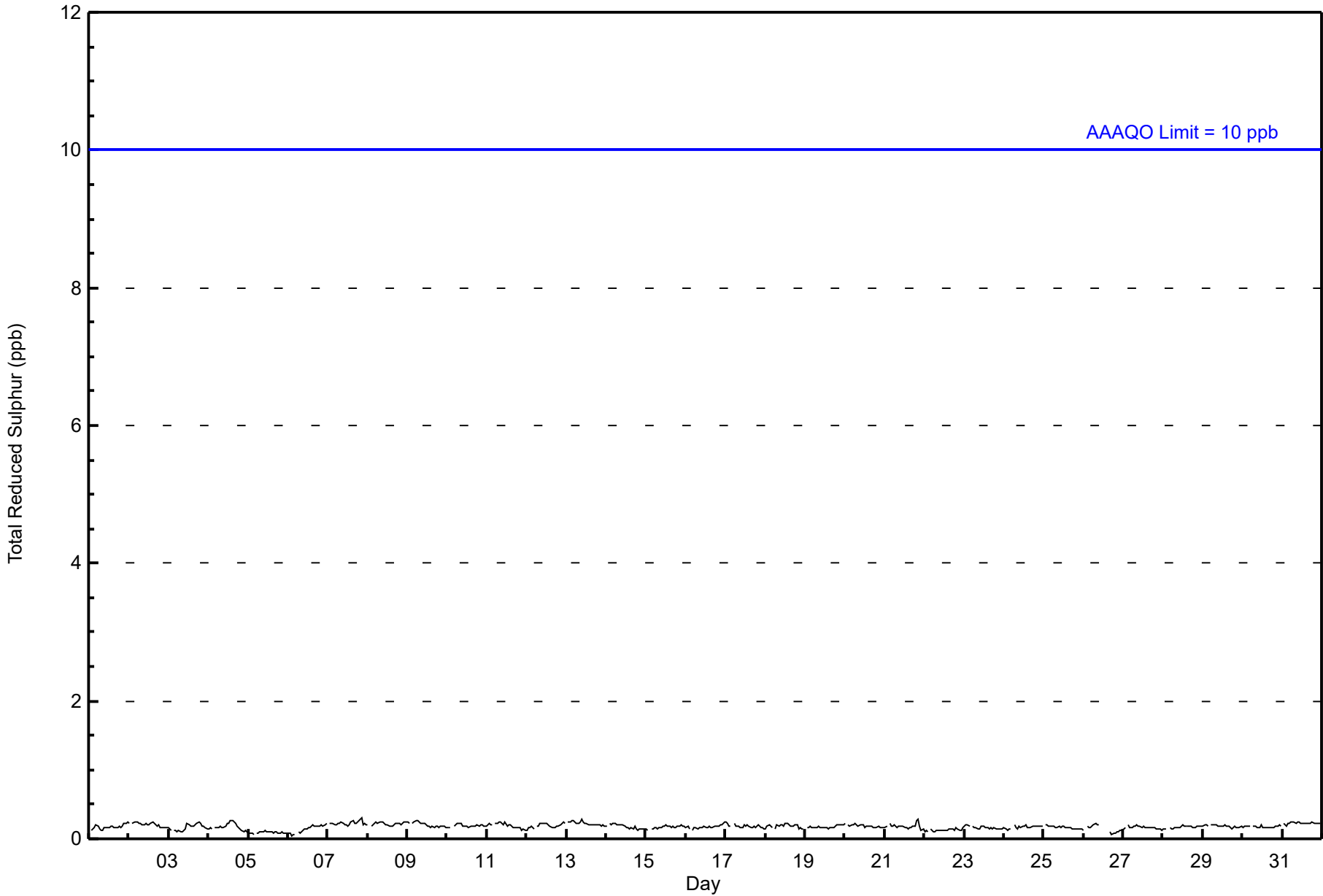
Classes (ppb)



Total Number of Valid Hours: 570









**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Stony Mountain - October 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
Stony Mountain - October 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	4	3	3	1	9	17	46	72	62	42	51	60	93	77	17	568
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	11	4	3	3	1	9	17	46	72	62	42	51	60	93	77	17	568

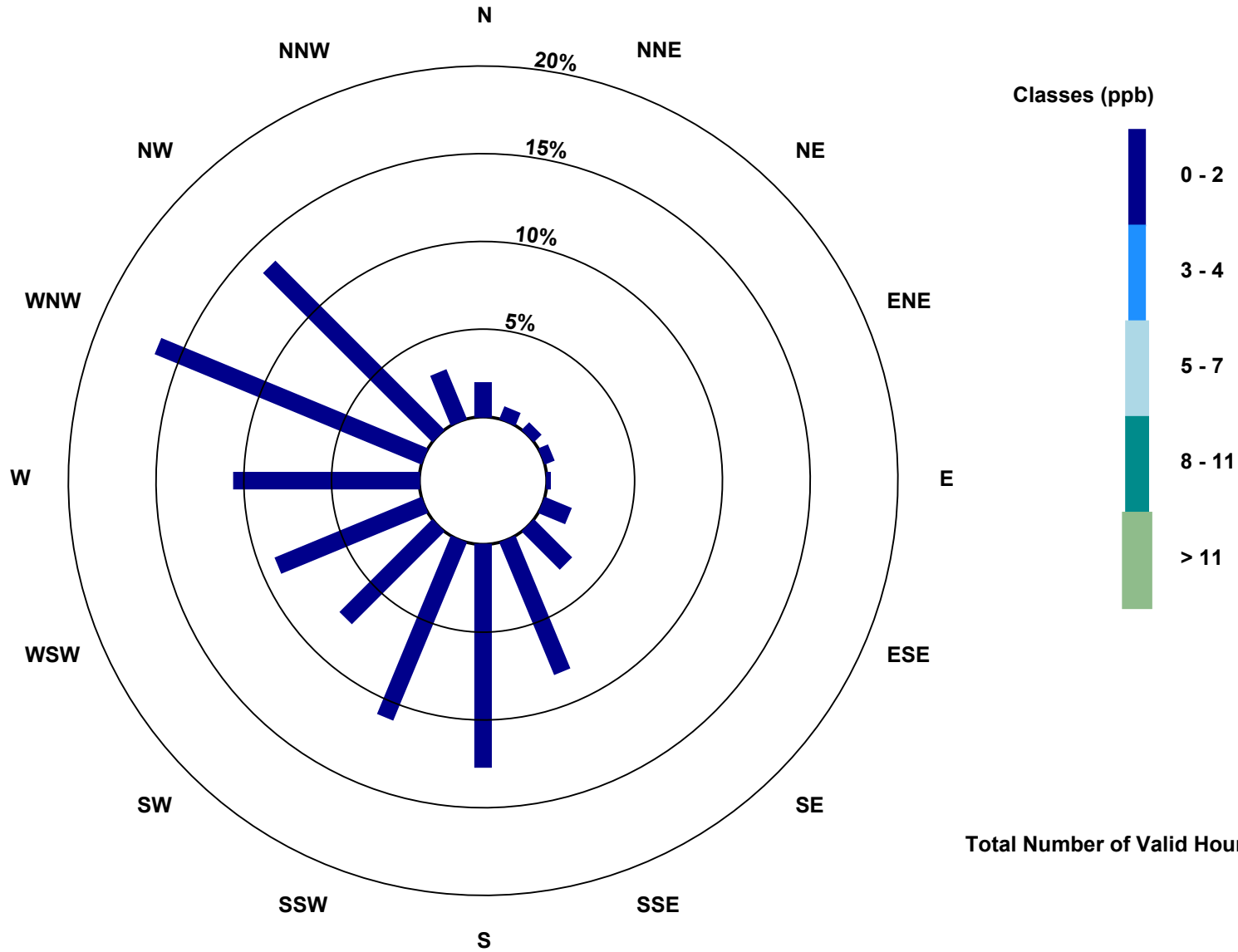
Total Number of Valid Hours: 568

Total Number of Hours: 744

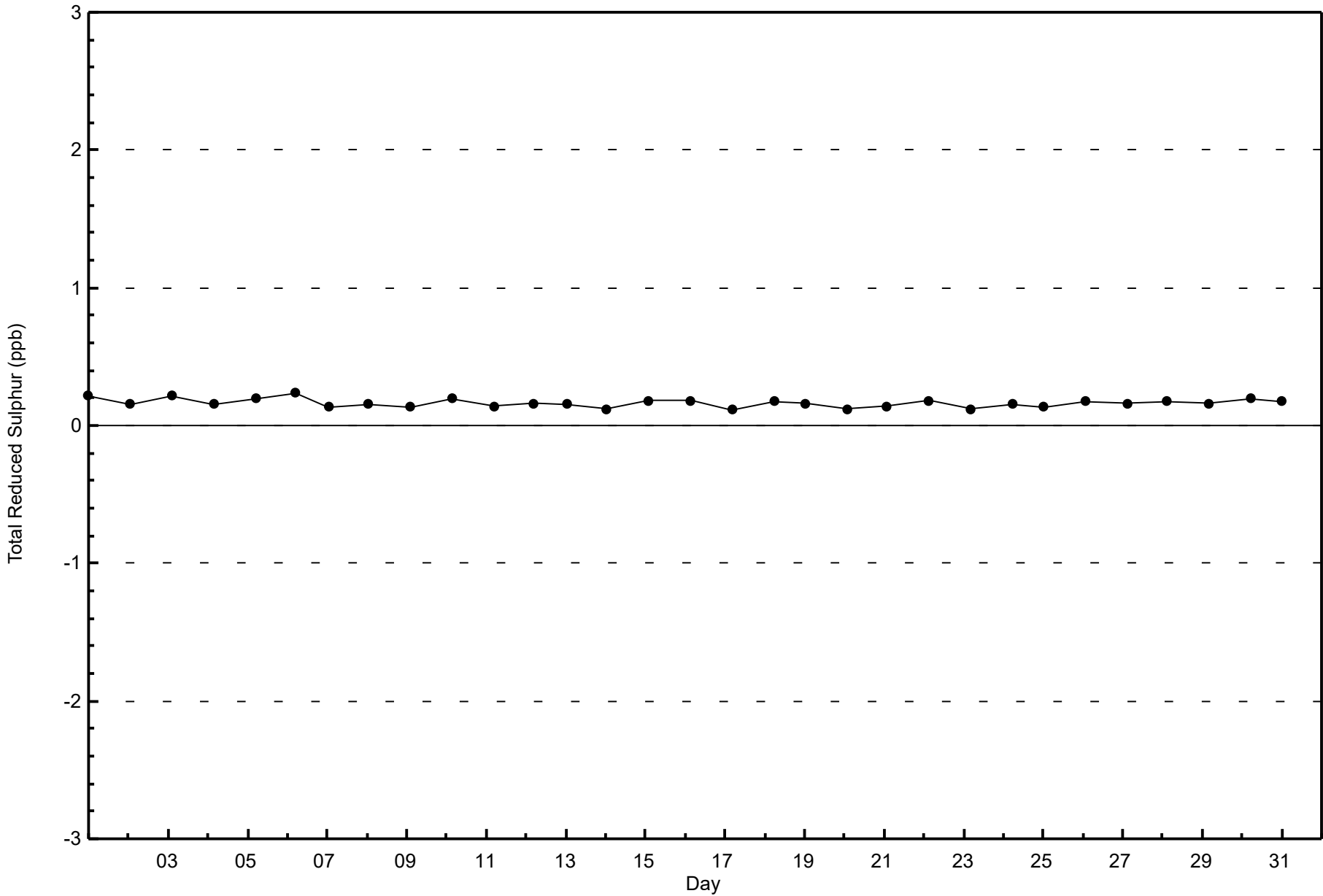


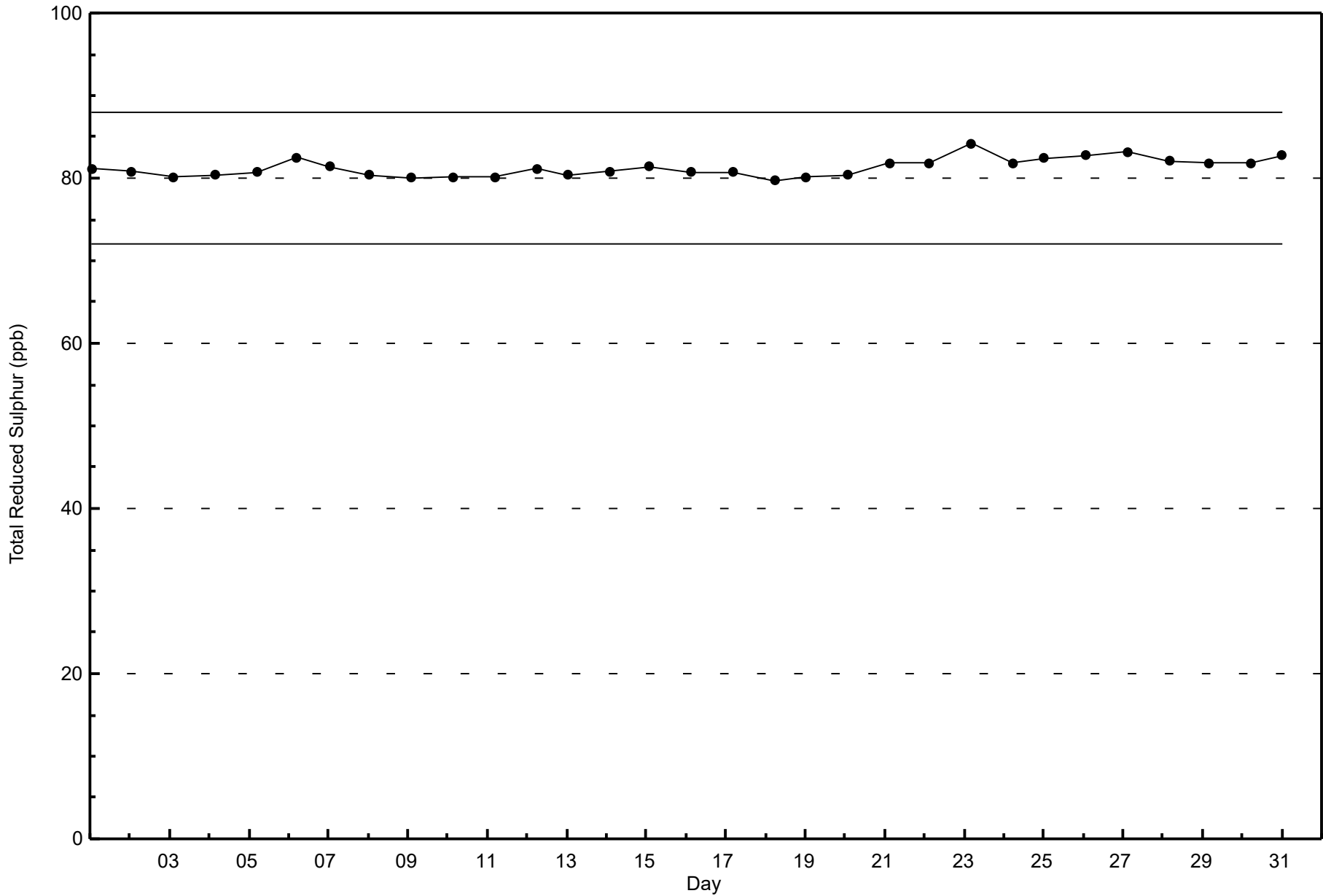
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Total Reduced Sulphur (TRS) - ppb
Stony Mountain



Total Number of Valid Hours: 568



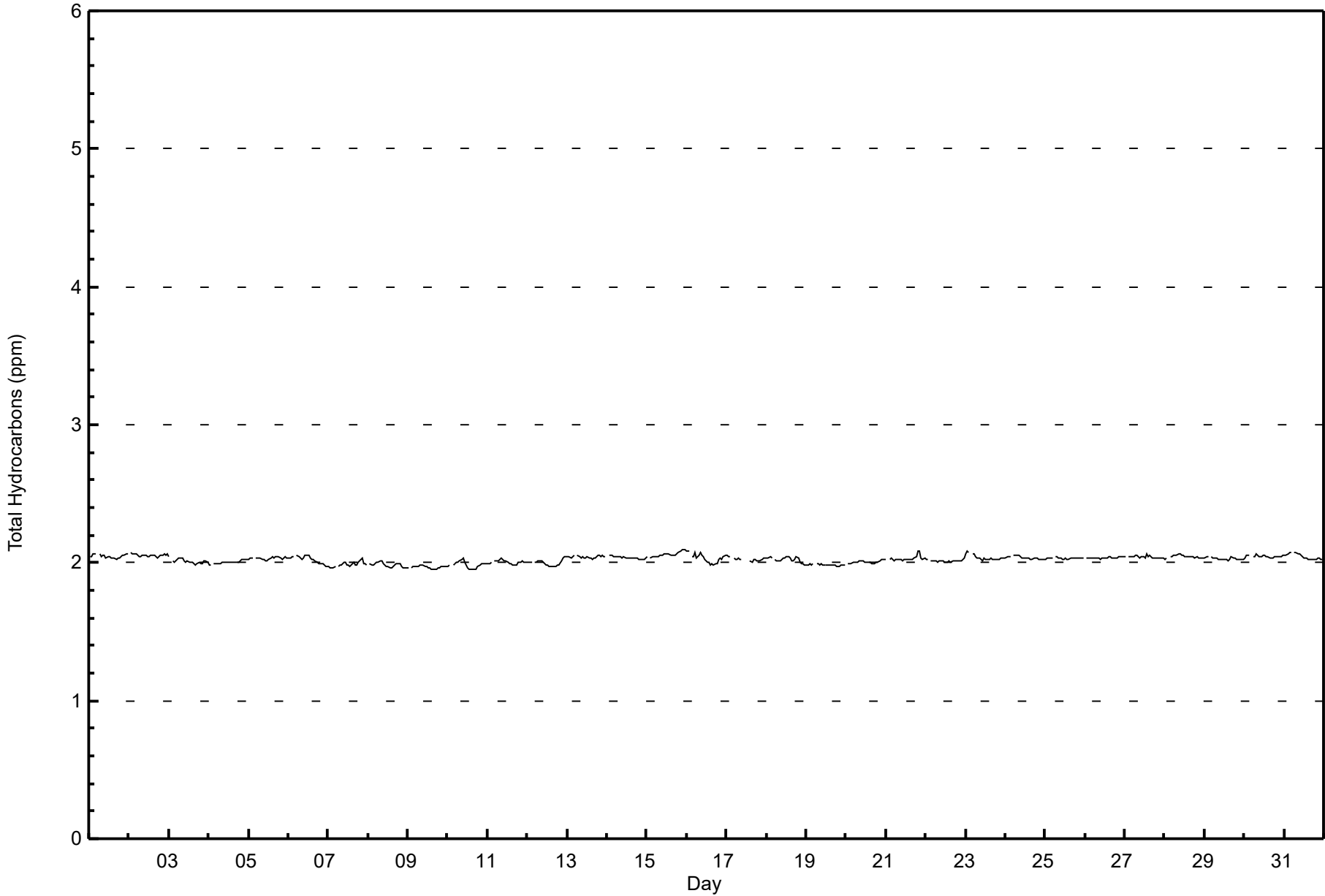




Wood Buffalo Environmental Association
Summary of Hour Averages

Total Hydrocarbons (THC) - ppm
Stony Mountain - October 2023

Maximum Value: 2.1 ppm on Oct 15 23:00		Maximum Daily Average: 2.1 ppm on Oct 15		Hours in Service: 744																						
Minimum Value: 2.0 ppm on Oct 10 16:00		Minimum Daily Average: 2.0 ppm on Oct 9		Hours of Data: 709																						
Maximum Diurnal Average: 2.0 ppm at hour 3		Minimum Diurnal Average: 2.0 ppm at hour 17		Hours of Missing Data: 35																						
Monthly Average: 2.02 ppm		Percentiles: P ₁ = 2.0 P ₁₀ = 2.0 Q ₁ = 2.0 Median = 2.0 Q ₃ = 2.0 P ₉₀ = 2.1 P ₉₉ = 2.1		Hours of Calibration: 35																						
				Percent Operational Time: 100.0																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Oct	2.0	2.0	2.1	2.1	2.1	Z	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	2.1	2.1	2.1	2.1	2.0	2.1
2-Oct	Z	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
3-Oct	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
4-Oct	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
5-Oct	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	2.0	2.0
6-Oct	2.0	2.0	2.0	2.0	Z	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
7-Oct	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
8-Oct	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
9-Oct	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
10-Oct	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
11-Oct	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	2.0	2.0
12-Oct	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	2.0
13-Oct	2.0	2.0	2.0	2.0	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	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.1
14-Oct	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	2.0	2.0	2.0
15-Oct	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
16-Oct	2.1	2.1	Z	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	2.1	2.0	2.1
17-Oct	2.1	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	C	C	C	C	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
18-Oct	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	2.0
19-Oct	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
20-Oct	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
21-Oct	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	2.1	2.1	2.0	2.0	2.0	2.0	2.1
22-Oct	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
23-Oct	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	2.1
24-Oct	2.0	2.0	2.0	2.0	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	2.1
25-Oct	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
26-Oct	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
27-Oct	2.0	Z	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	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
28-Oct	2.0	2.0	Z	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
29-Oct	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	2.0	2.0
30-Oct	2.0	2.1	2.1	2.1	Z	2.0	2.0	2.1	2.1	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
31-Oct	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	2.0	2.0	2.0	2.0	2.0	2.1
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan C - Calibration																										





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Stony Mountain - October 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	617	87.02	87.02
2.1 - 3.0	92	12.98	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
Stony Mountain - October 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	3	2	3	1	7	13	39	54	50	27	46	60	86	71	13	484
2.1 - 3.0	2	1	1	0	0	2	3	6	19	14	14	5	0	8	8	3	86
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	4	3	3	1	9	16	45	73	64	41	51	60	94	79	16	570

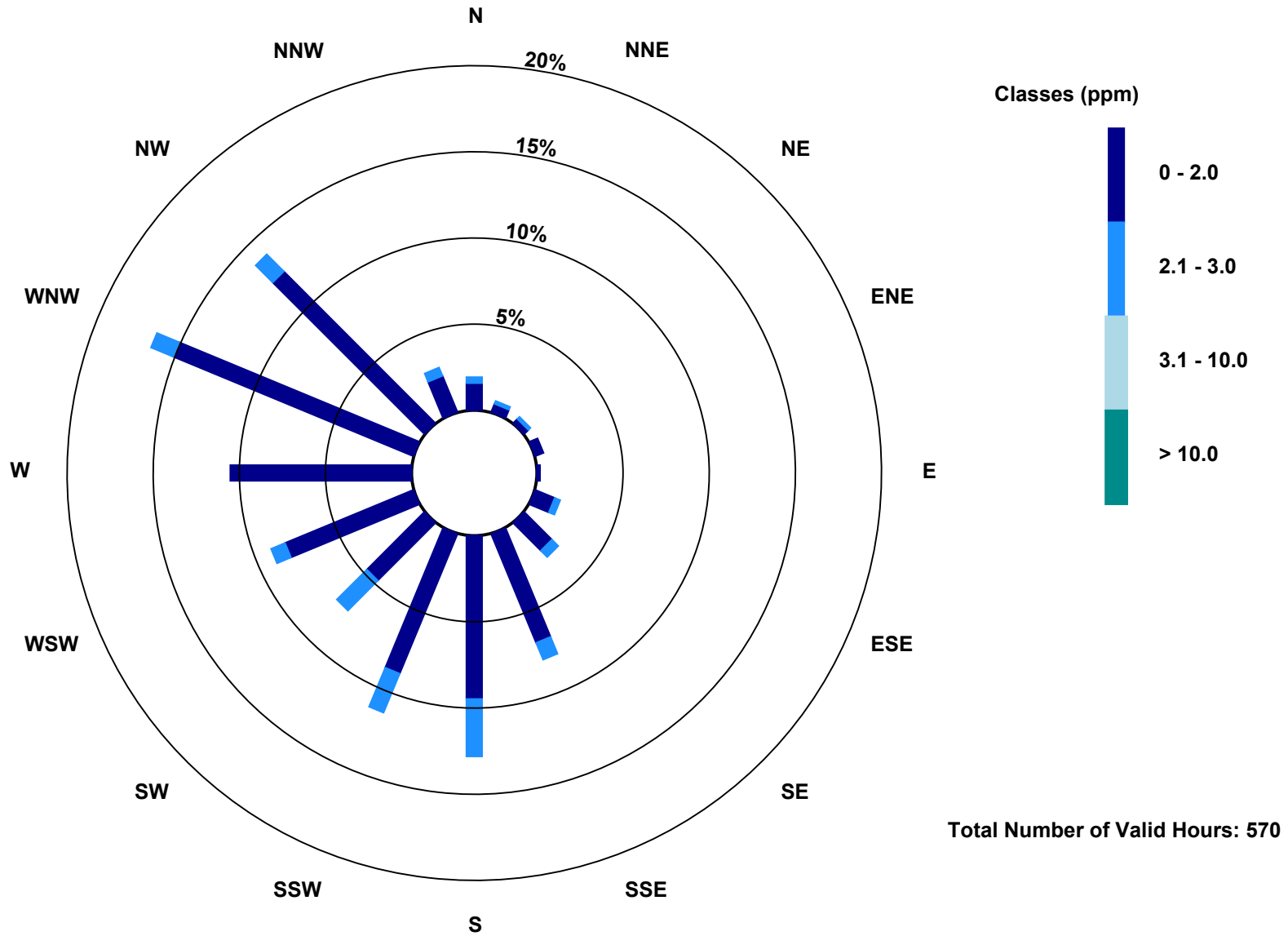
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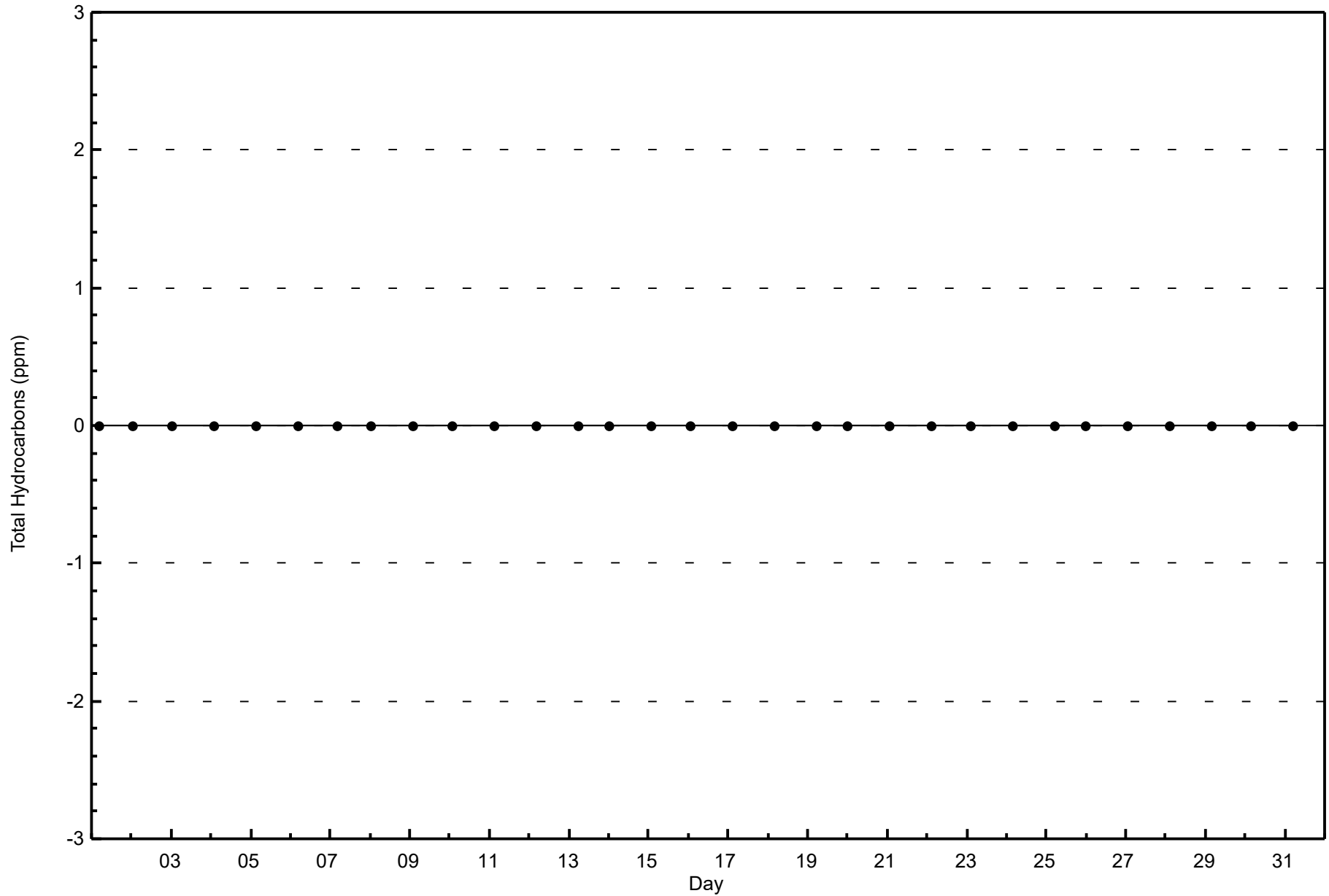
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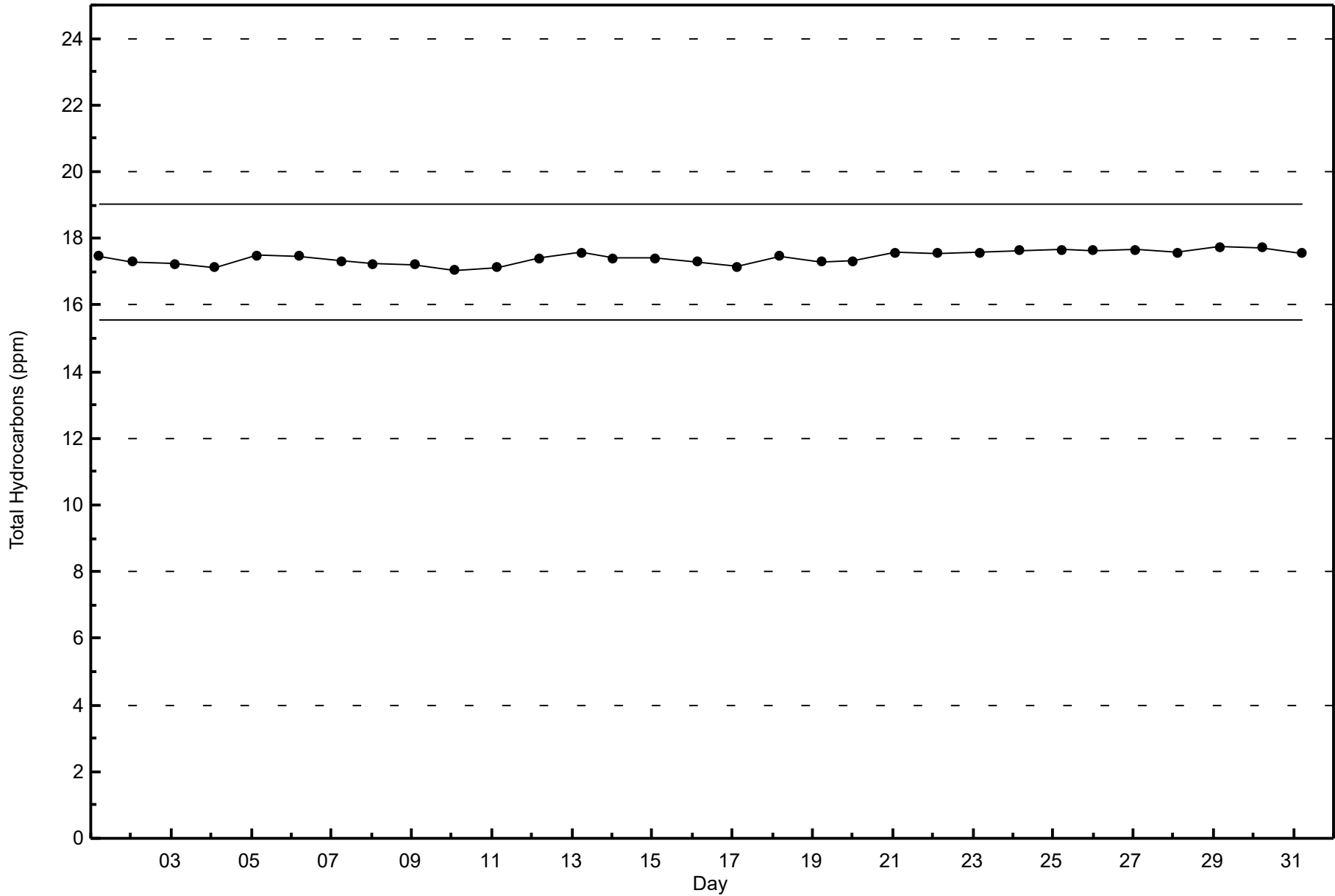


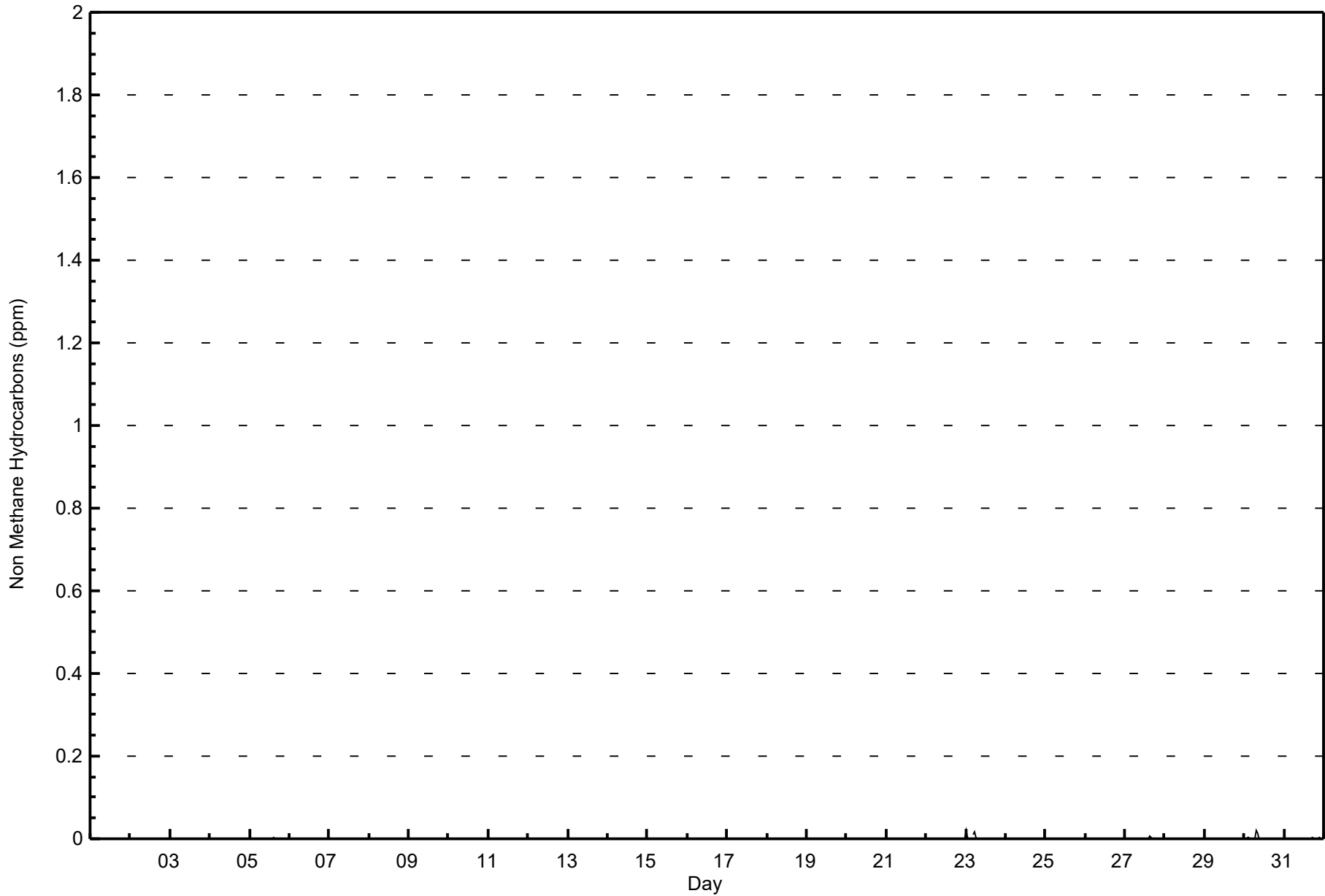
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Total Hydrocarbons (THC) - ppm
Stony Mountain











**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Stony Mountain - October 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	703	99.15	99.15
0.006 - 0.05	6	0.85	100.00
0.06 - 0.1	0	0.00	100.00
> 0.1	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Stony Mountain - October 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	10	4	2	3	1	9	16	45	73	64	41	51	60	94	78	16	567
0.006 - 0.05	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	3
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	11	4	3	3	1	9	16	45	73	64	41	51	60	94	79	16	570

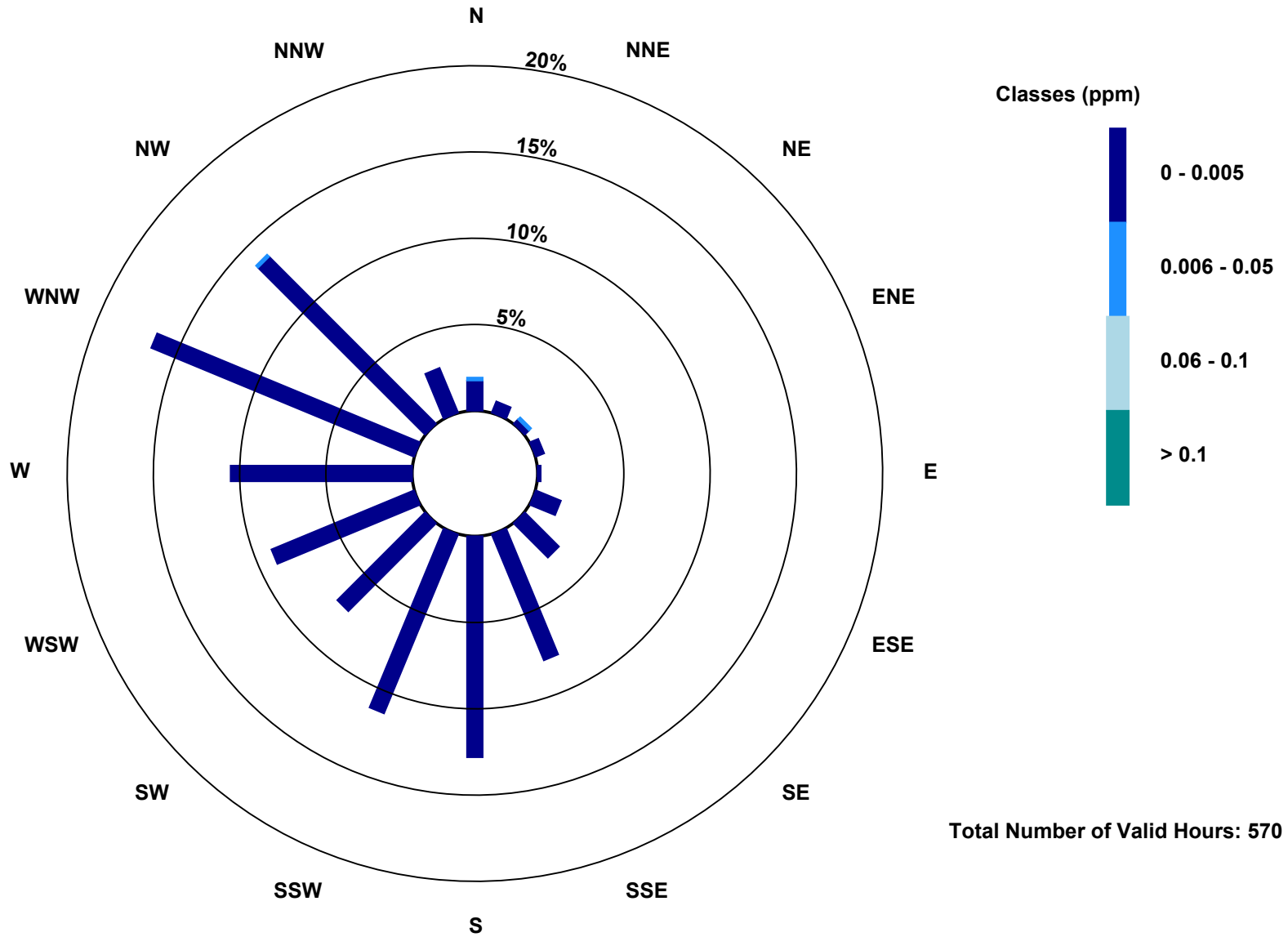
Total Number of Valid Hours: 570

Total Number of Hours: 744

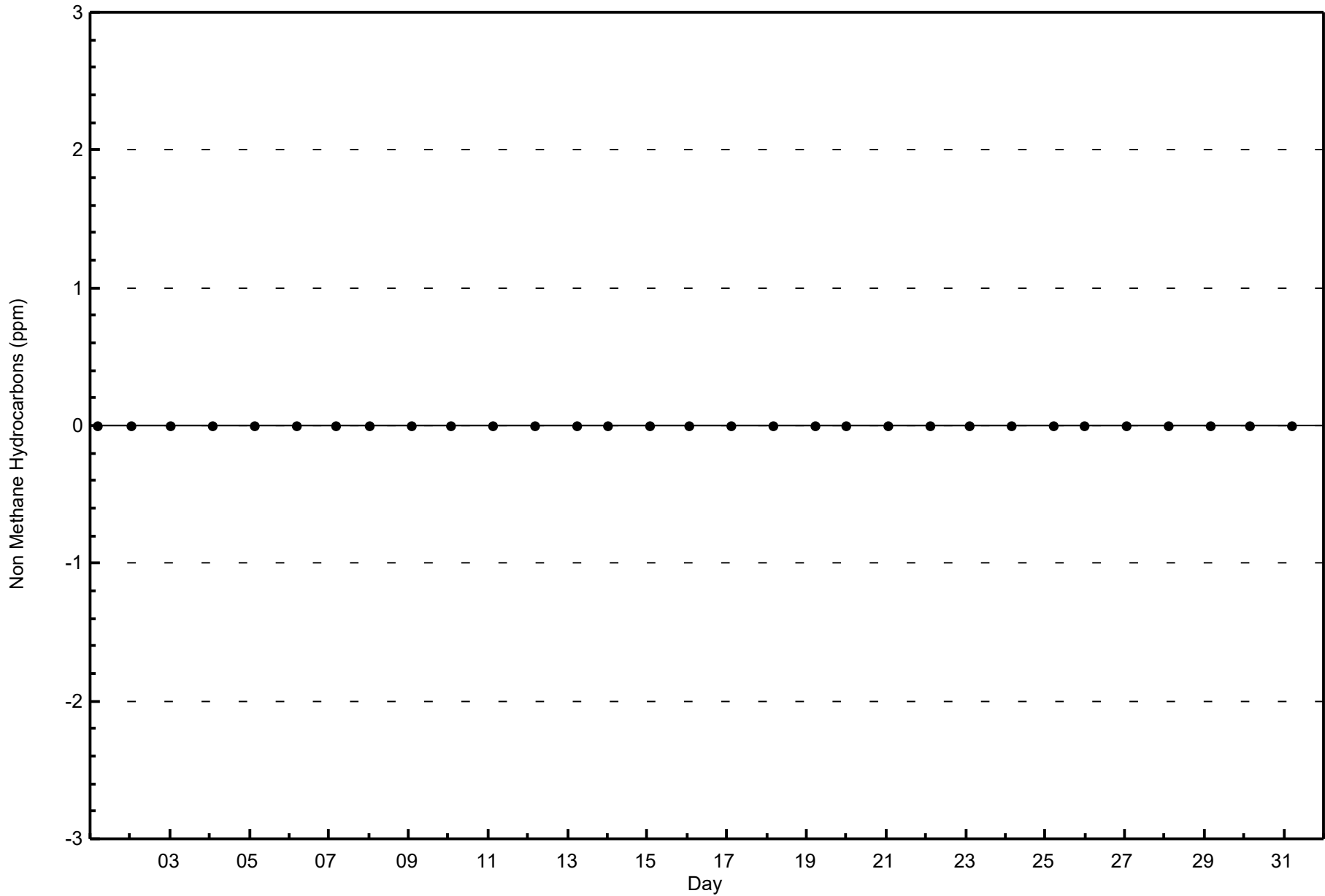


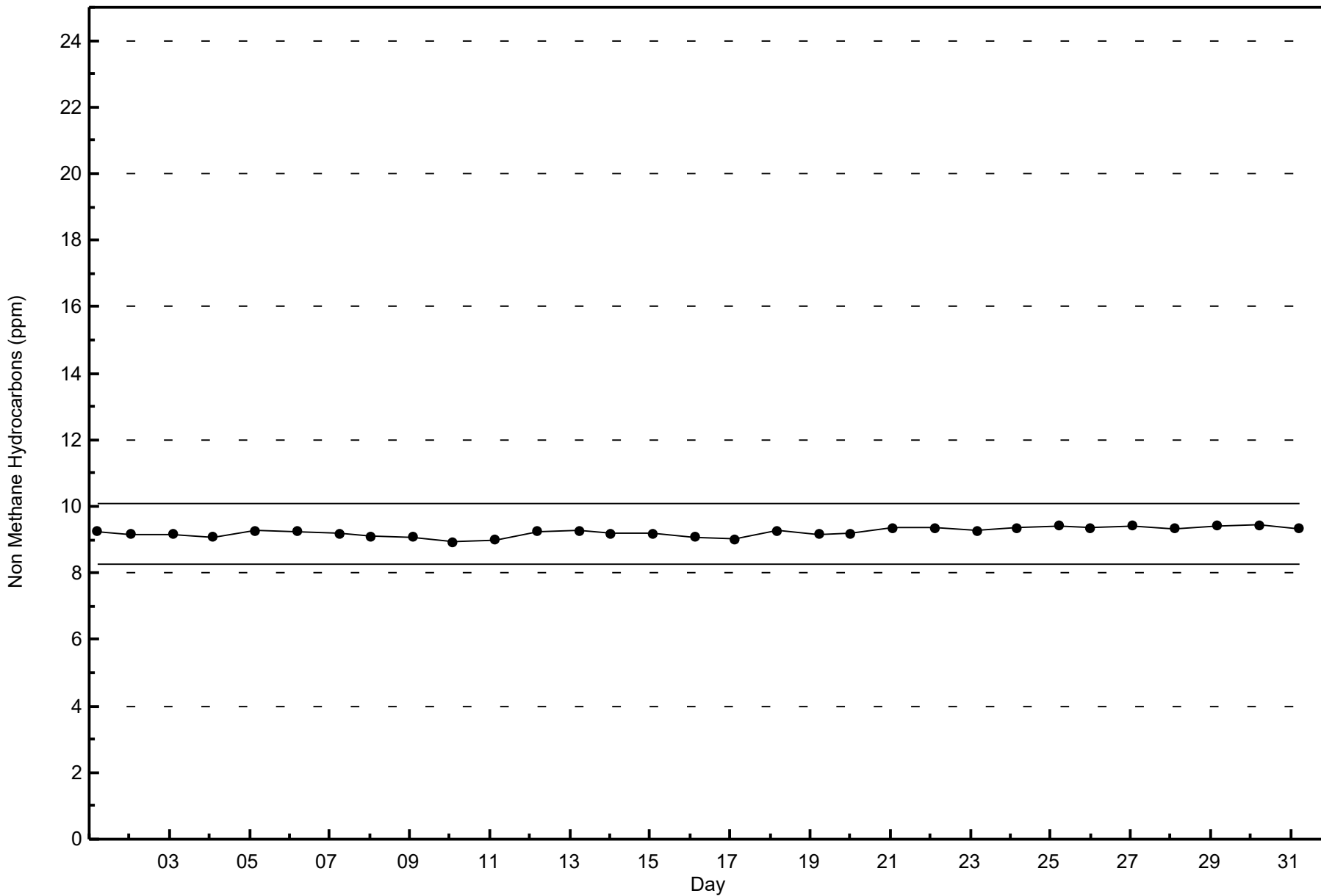
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Non Methane Hydrocarbons (NMHC) - ppm
Stony Mountain



Total Number of Valid Hours: 570







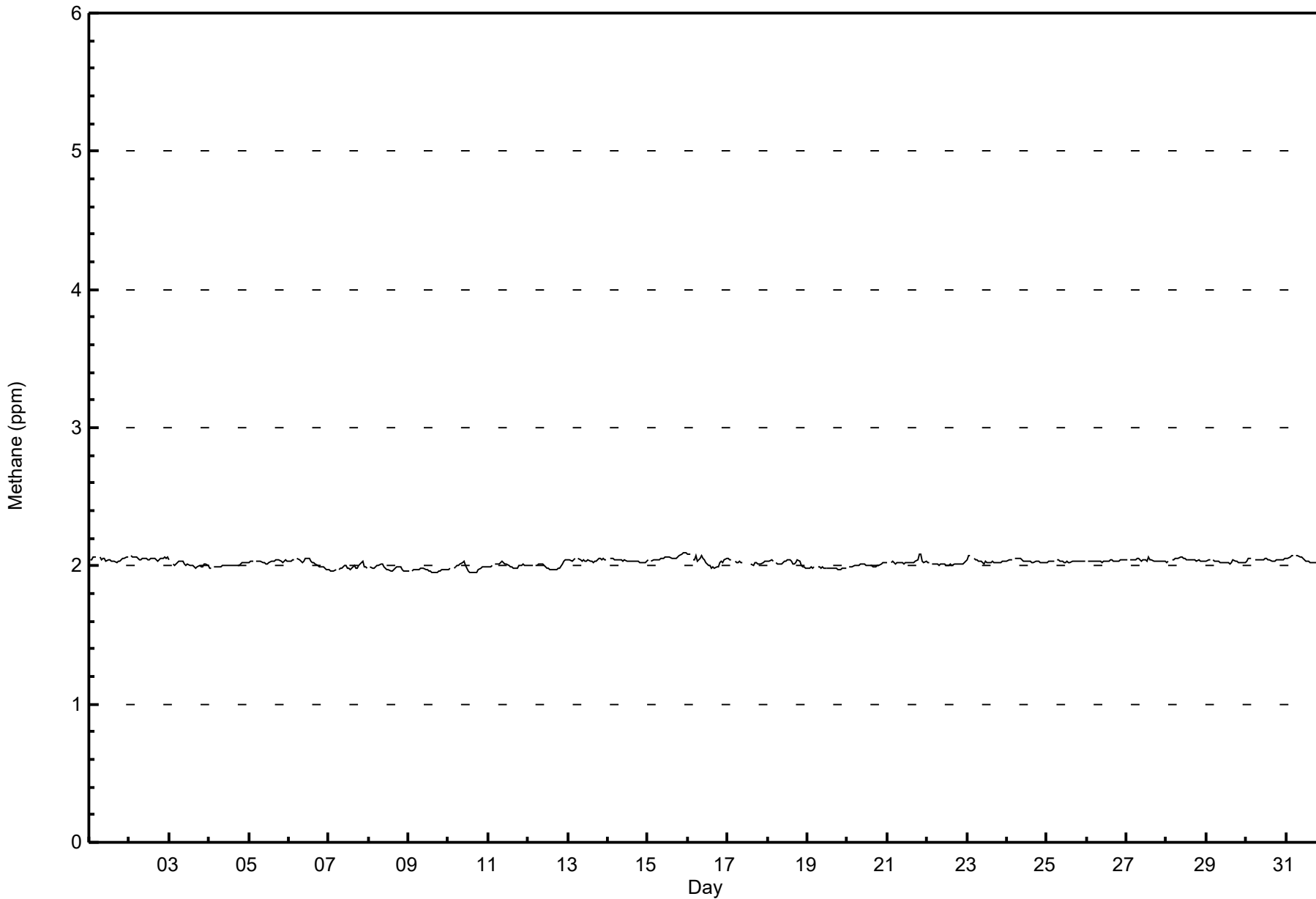
Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH₄) - ppm

Stony Mountain - October 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 744														744						
Maximum Value: 2.1 ppm on Oct 15 23:00		Maximum Daily Average: 2.1 ppm on Oct 15		Hours of Data: 709														709								
Minimum Value: 2.0 ppm on Oct 10 16:00		Minimum Daily Average: 2.0 ppm on Oct 9		Hours of Missing Data: 35														35								
Maximum Diurnal Average: 2.0 ppm at hour 3		Minimum Diurnal Average: 2.0 ppm at hour 17		Hours of Calibration: 35														35								
Monthly Average: 2.02 ppm		Percentiles: P ₁ = 2.0 P ₁₀ = 2.0 Q ₁ = 2.0 Median = 2.0 Q ₃ = 2.0 P ₉₀ = 2.1 P ₉₉ = 2.1		Percent Operational Time: 100.0														100.0								
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Oct	2.0	2.0	2.1	2.1	2.1	Z	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	2.1	2.1	2.1	2.1	2.0	2.1
2-Oct	Z	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
3-Oct	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
4-Oct	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
5-Oct	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	2.0	2.0
6-Oct	2.0	2.0	2.0	2.0	Z	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
7-Oct	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
8-Oct	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
9-Oct	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
10-Oct	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
11-Oct	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	2.0	2.0
12-Oct	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	2.0
13-Oct	2.0	2.0	2.0	2.0	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	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.1
14-Oct	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	2.0	2.0	2.0
15-Oct	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
16-Oct	2.1	2.1	Z	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	2.1	2.0	2.1
17-Oct	2.1	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	C	C	C	C	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
18-Oct	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	2.0
19-Oct	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
20-Oct	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
21-Oct	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	2.0	2.0	2.0	2.0	2.0	2.1
22-Oct	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
23-Oct	2.0	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	2.0	2.0	2.0	2.0	2.1
24-Oct	2.0	2.0	2.0	2.0	Z	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
25-Oct	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
26-Oct	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
27-Oct	2.0	Z	2.0	2.0	2.0	2.0	2.1	2.1	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	2.1
28-Oct	2.0	2.0	Z	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
29-Oct	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	2.0	2.0
30-Oct	2.0	2.1	2.1	2.1	Z	2.0	2.0	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	2.0	2.0	2.1
31-Oct	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	2.0	2.0	2.0	2.0	2.0	2.1
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerspan C - Calibration																										





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Methane (CH₄) - ppm
Stony Mountain - October 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	622	87.73	87.73
2.1 - 3.0	87	12.27	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
Stony Mountain - October 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	3	3	3	1	7	13	39	54	50	27	46	60	86	72	13	487
2.1 - 3.0	1	1	0	0	0	2	3	6	19	14	14	5	0	8	7	3	83
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	4	3	3	1	9	16	45	73	64	41	51	60	94	79	16	570

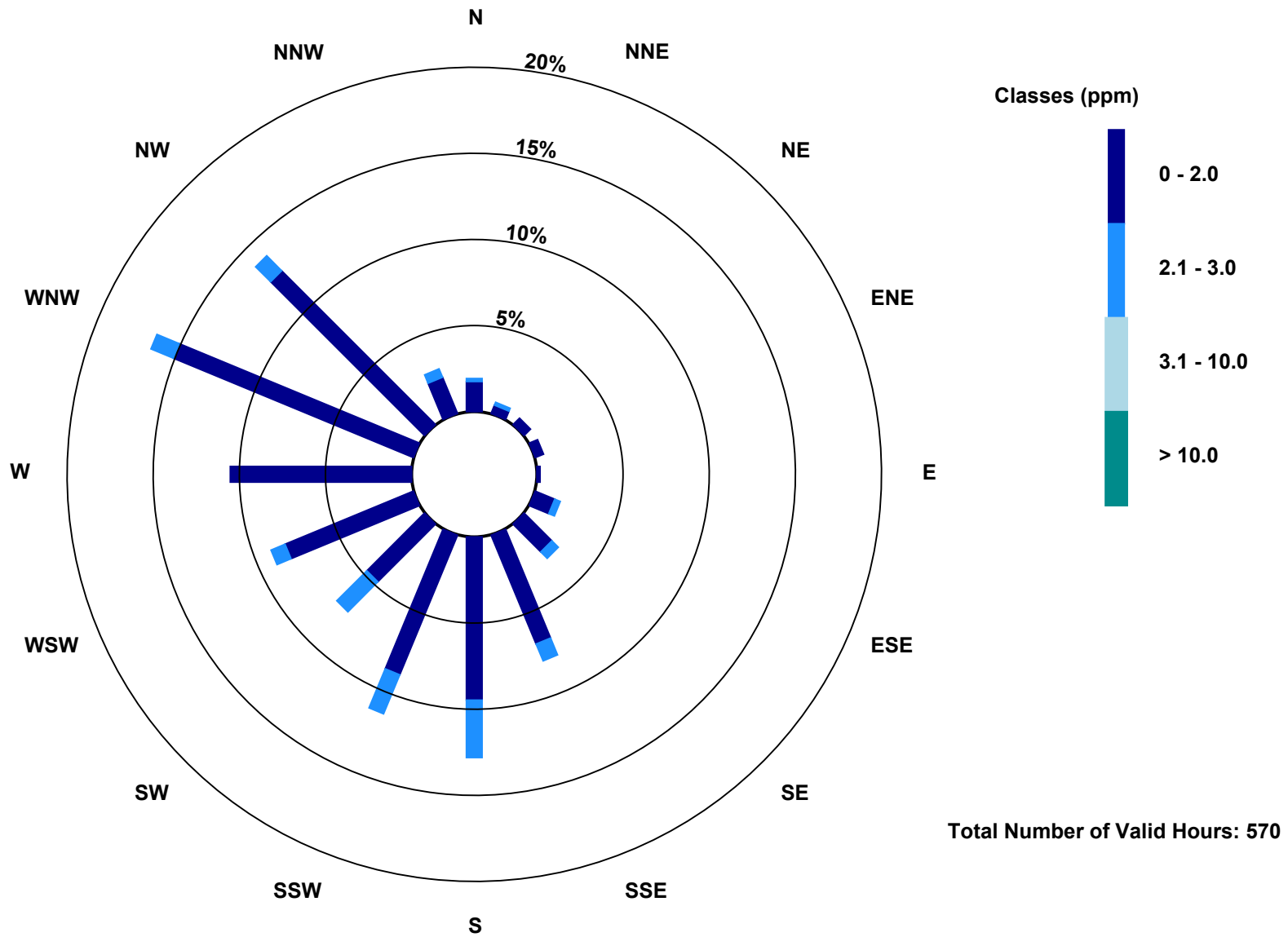
Total Number of Valid Hours: 570

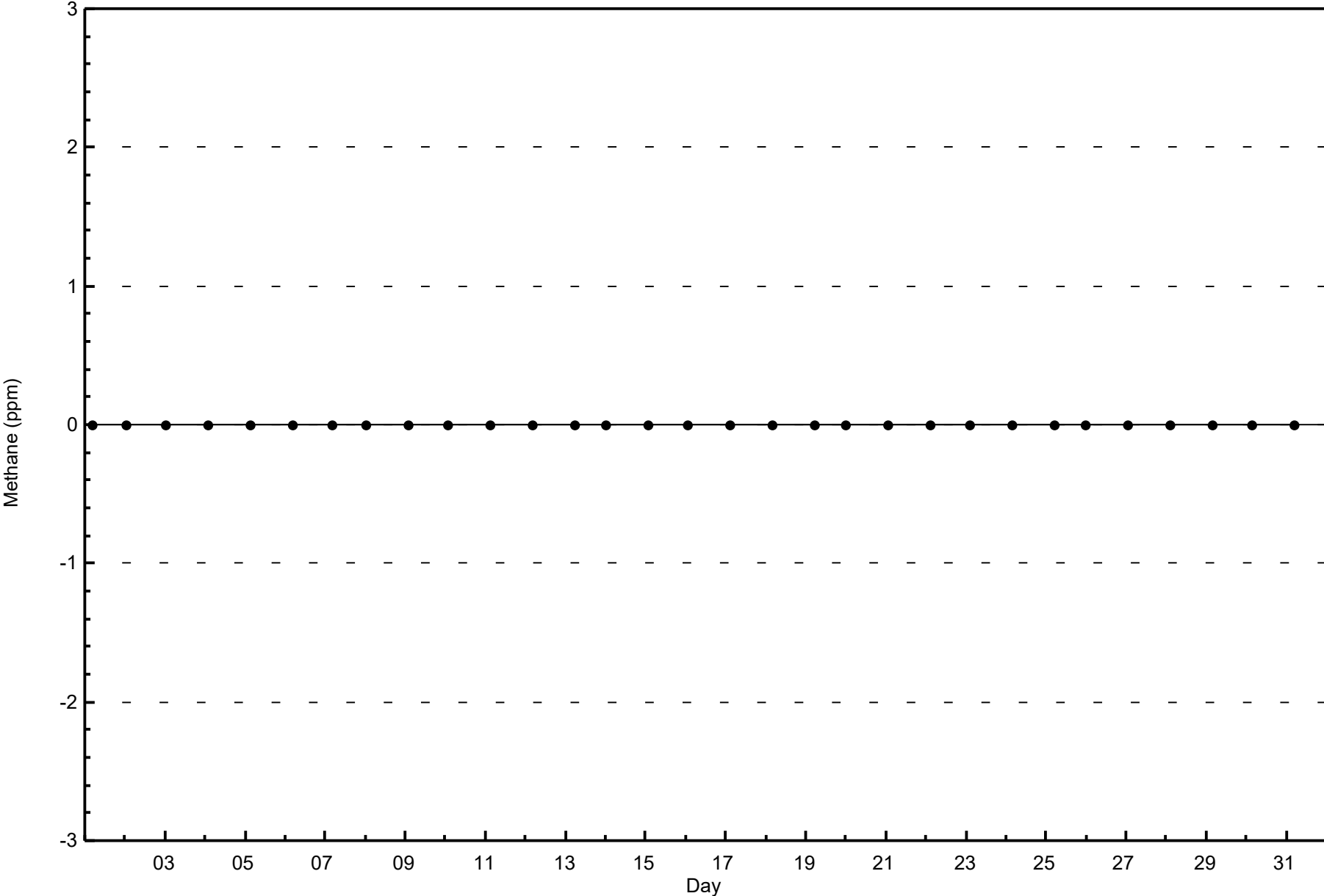
Total Number of Hours: 744

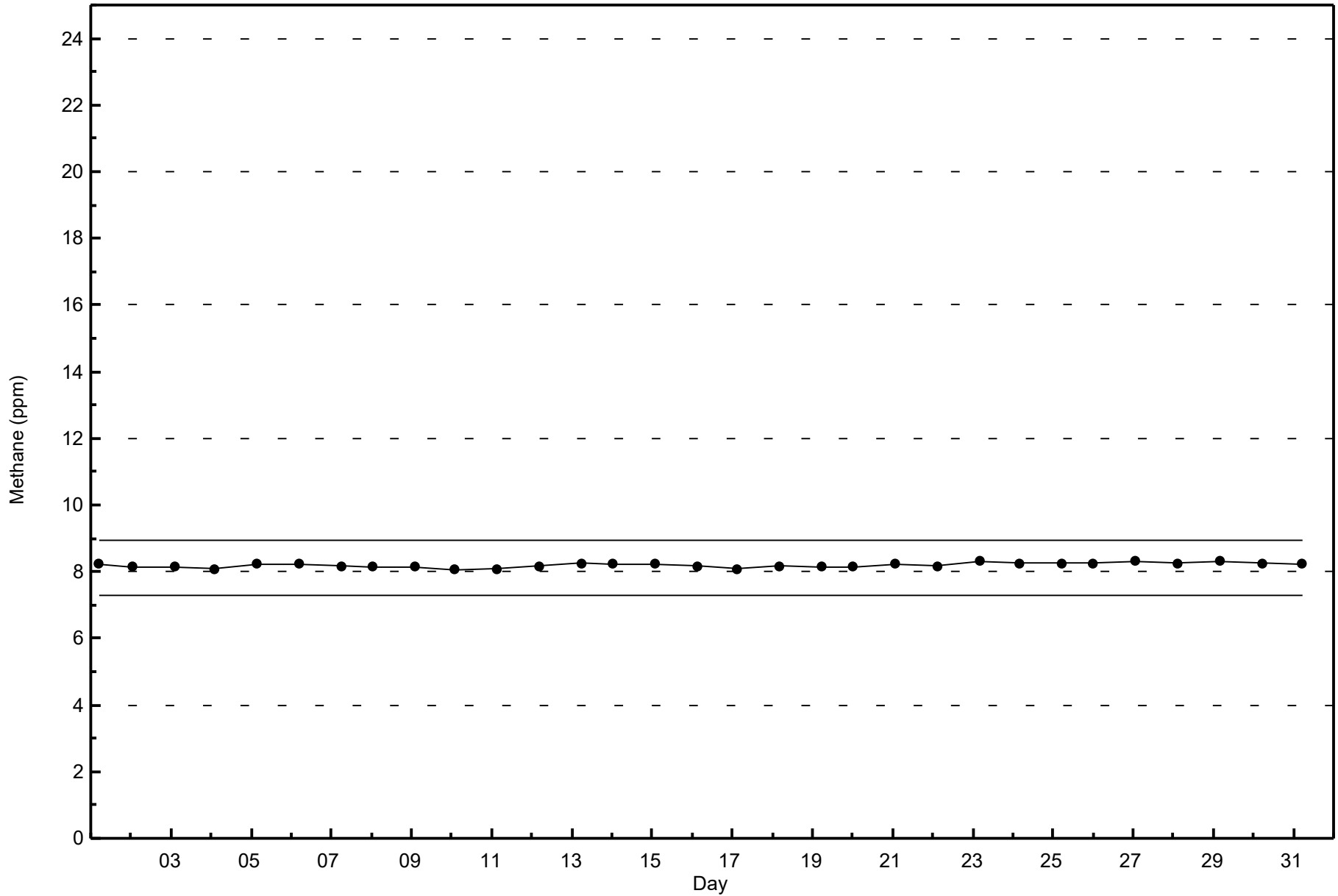


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Methane (CH₄) - ppm
Stony Mountain



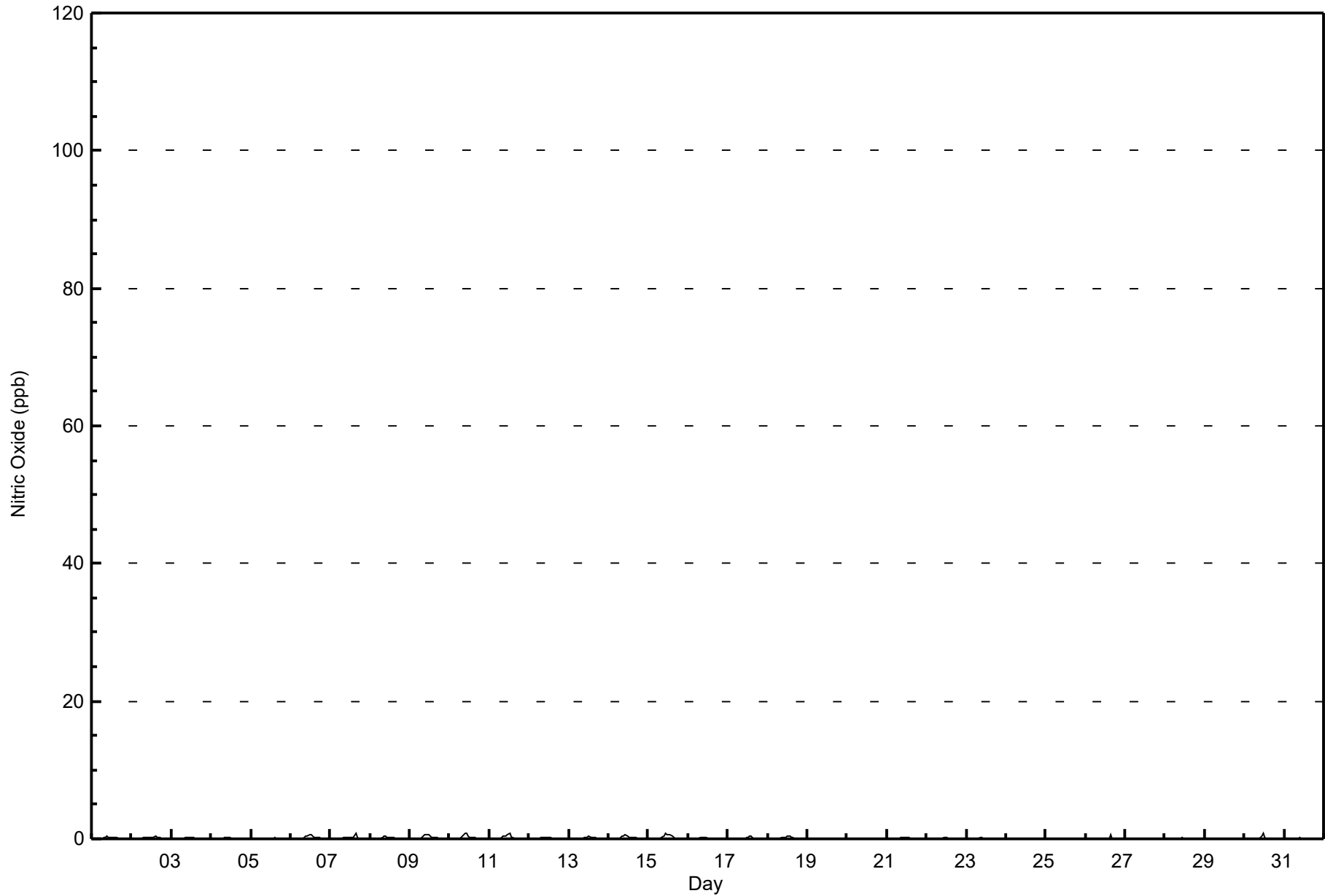






Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Stony Mountain - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Stony Mountain - October 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
Stony Mountain - October 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	4	4	3	1	8	16	47	72	63	42	52	57	97	79	15	568
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	8	4	4	3	1	8	16	47	72	63	42	52	57	97	79	15	568

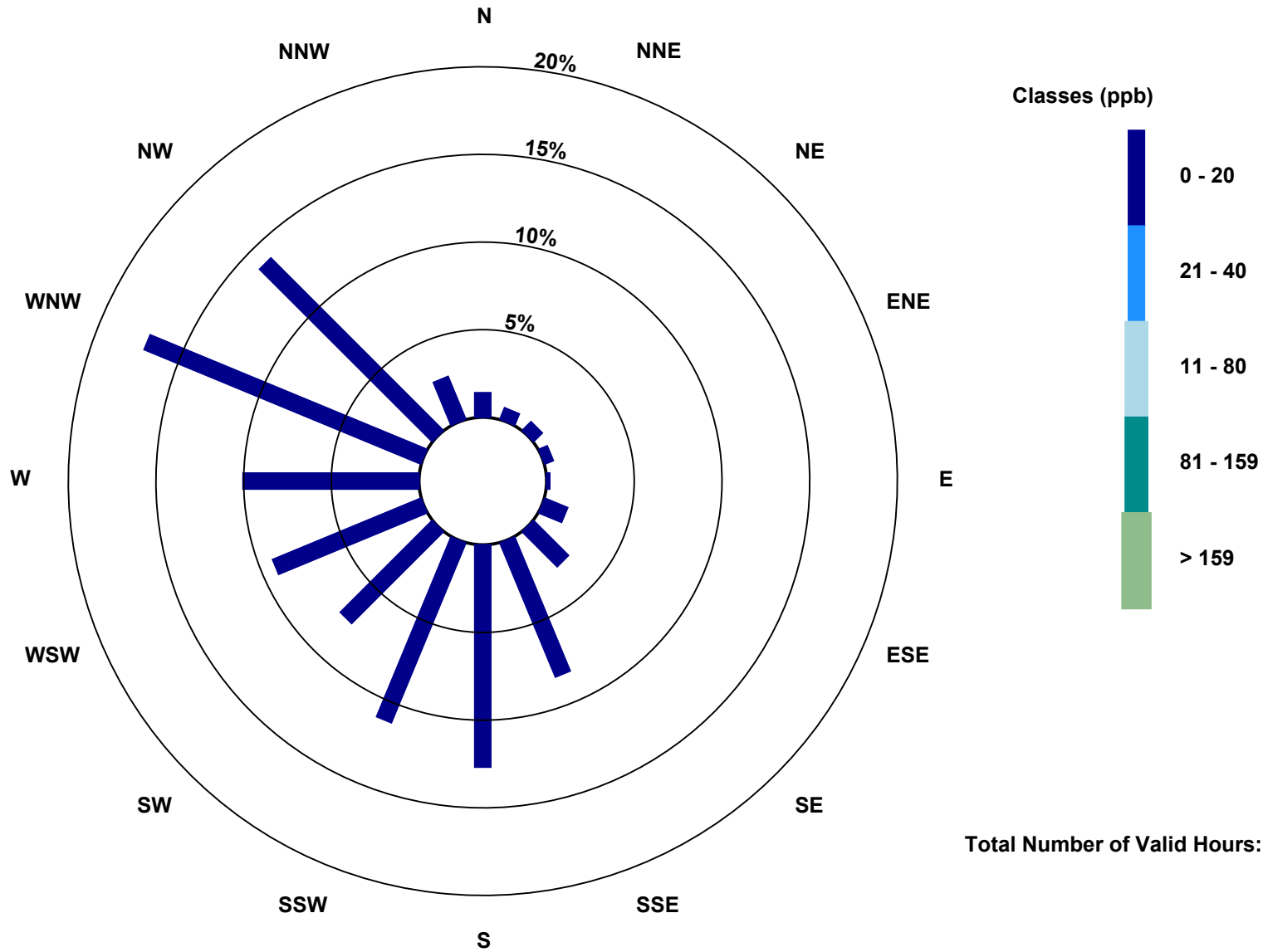
Total Number of Valid Hours: 568

Total Number of Hours: 744

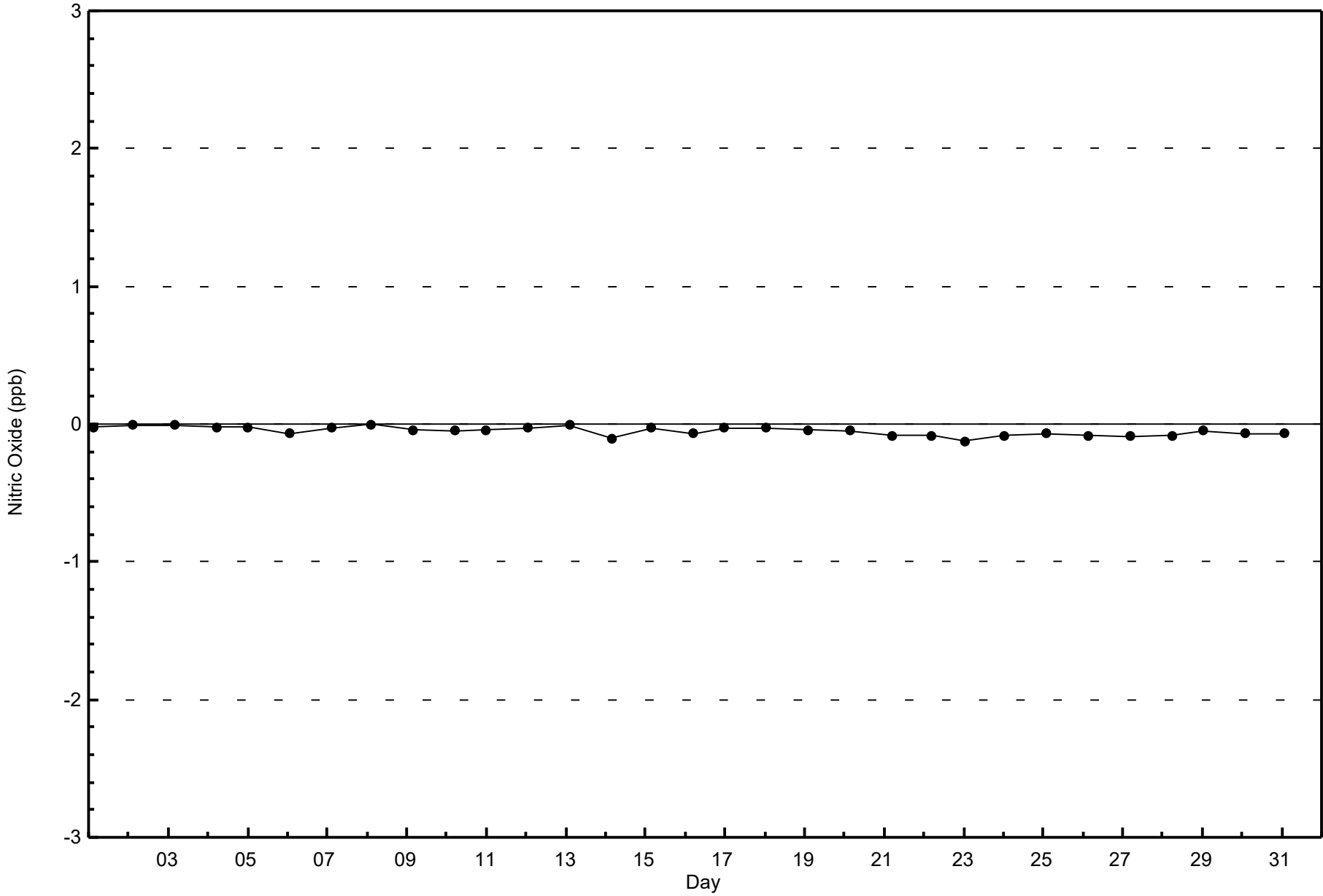


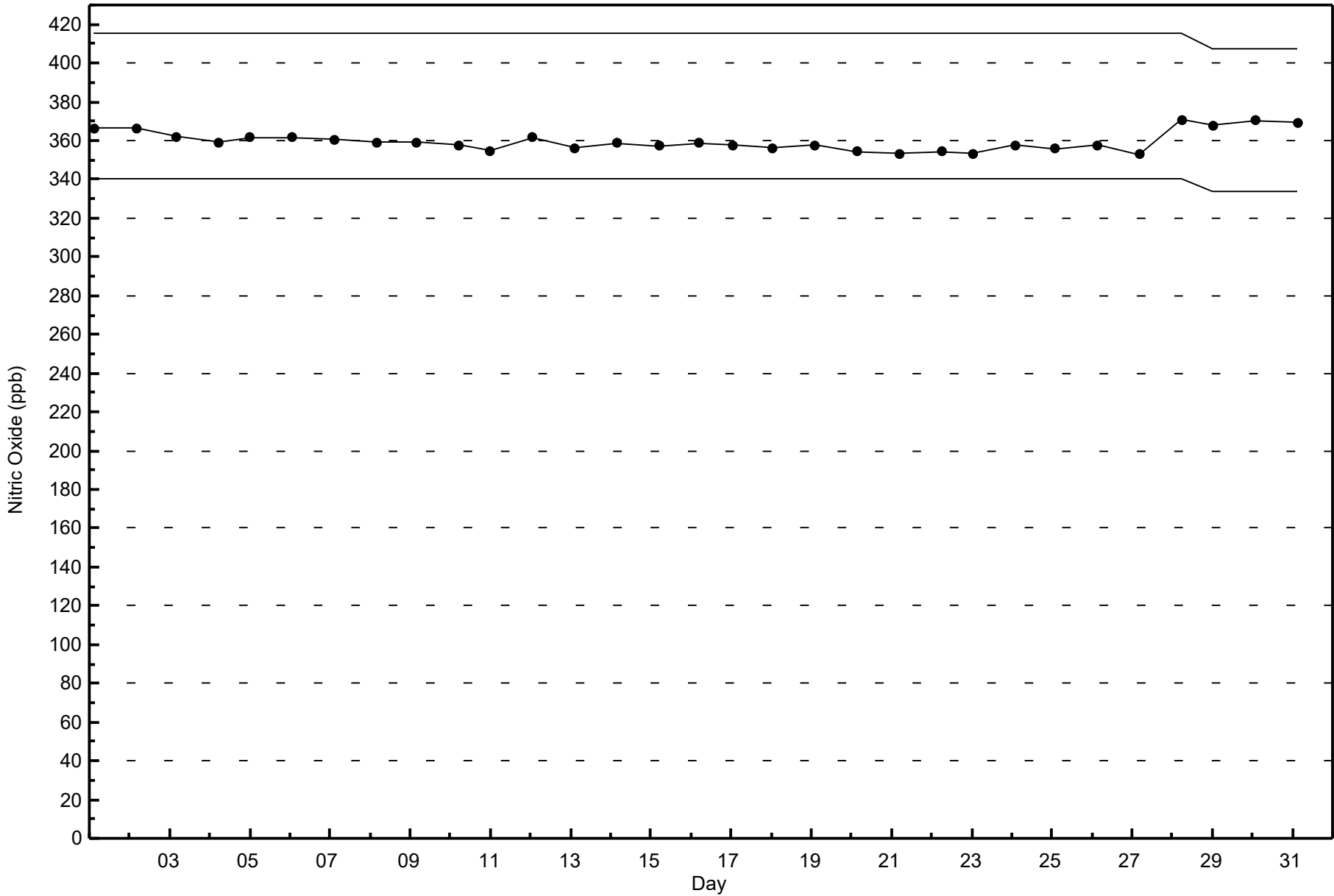
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitric Oxide (NO) - ppb
Stony Mountain



Total Number of Valid Hours: 568







Wood Buffalo Environmental Association
Summary of Hour Averages

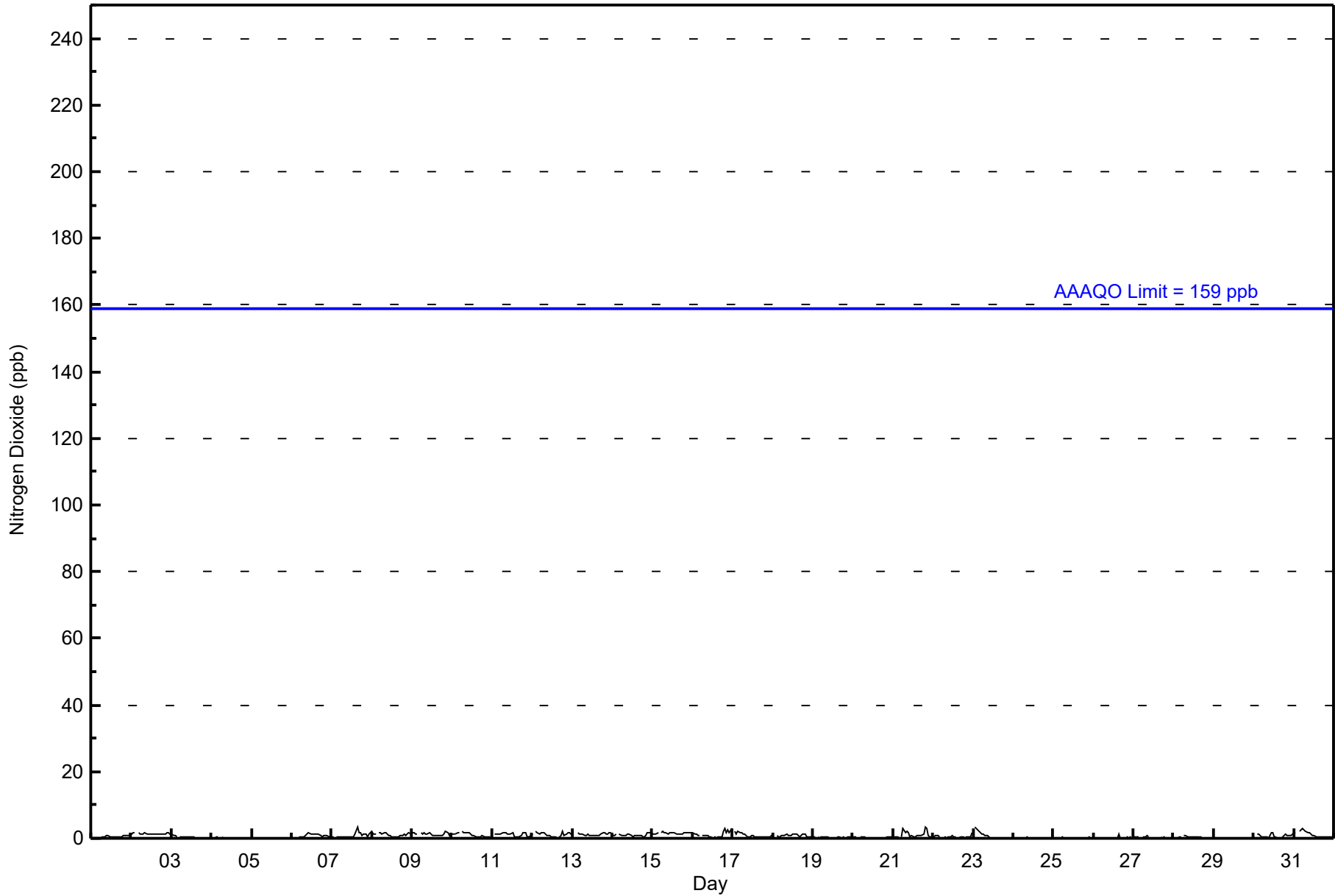
Nitrogen Dioxide (NO₂) - ppb
Stony Mountain - October 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	744																										
Maximum Value: 3.6 ppb on Oct 23 02:00		Maximum Daily Average: 1.5 ppb on Oct 15																	Hours of Data:	707																												
Minimum Value: 0.0 ppb on Oct 4 13:00		Minimum Daily Average: 0.0 ppb on Oct 5																	Hours of Missing Data:	37																												
Maximum Diurnal Average: 0.9 ppb at hour 2		Minimum Diurnal Average: 0.5 ppb at hour 15																	Hours of Calibration:	37																												
Monthly Average: 0.72 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.2 Median = 0.5 Q ₃ = 1.1 P ₉₀ = 1.6 P ₉₉ = 2.9																	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-Oct	0.2	0.2	Z	0.2	0.2	0.2	0.4	0.5	0.6	1.0	0.7	0.6	0.6	0.4	0.6	0.5	0.4	0.4	0.4	0.9	0.8	0.7	0.9	1.0	0.5	1.0																						
2-Oct	1.3	1.7	1.6	Z	1.7	1.4	1.2	1.4	1.5	1.4	1.1	1.1	1.3	1.2	1.4	1.3	1.1	1.1	1.1	1.2	1.3	1.5	1.5	1.4	1.3	1.7																						
3-Oct	1.2	0.9	0.7	0.6	Z	0.5	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	0.1	0.1	0.2	0.2	0.2	0.4	1.2																						
4-Oct	0.2	0.2	0.2	0.3	0.3	Z	0.3	0.2	0.2	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	0.0	0.0	0.1	0.3																						
5-Oct	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	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1																						
6-Oct	0.0	Z	0.0	0.0	0.2	0.3	0.4	0.6	0.7	1.4	1.6	1.3	1.2	1.2	1.1	1.1	1.1	0.7	0.6	0.7	0.9	0.7	0.5	0.3	0.7	1.6																						
7-Oct	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	1.3	3.3	1.8	1.7	0.9	1.1	1.3	0.3	1.3	1.7	0.8	3.3																						
8-Oct	2.2	1.4	1.2	Z	1.6	1.7	1.4	1.5	1.5	1.1	0.9	0.7	0.5	0.6	0.5	0.5	0.6	0.8	0.9	1.2	0.9	1.2	1.8	1.2	1.1	2.2																						
9-Oct	1.9	1.7	1.3	1.3	Z	1.6	1.4	1.5	1.3	1.3	1.5	1.3	1.0	0.7	0.8	0.9	0.8	0.8	0.8	1.3	2.0	1.9	1.0	1.1	1.3	2.0																						
10-Oct	1.3	1.3	1.4	1.5	1.5	Z	2.0	1.9	1.9	1.6	1.6	1.1	0.9	0.7	0.5	0.6	0.6	0.6	0.7	0.6	0.6	0.5	0.6	0.6	1.1	2.0																						
11-Oct	Z	1.1	1.4	1.1	1.2	1.1	1.6	1.7	1.7	1.4	1.1	1.3	1.7	0.6	0.6	0.5	0.4	0.9	1.9	1.6	1.8	0.4	0.5	0.9	1.2	1.9																						
12-Oct	1.1	Z	2.1	1.7	1.3	1.8	1.8	1.5	1.2	0.9	0.7	0.6	0.6	0.4	0.3	0.2	0.3	1.0	2.2	1.0	1.1	1.6	1.8	1.4	1.2	2.2																						
13-Oct	1.4	1.2	Z	1.6	1.3	1.4	1.1	0.8	1.0	1.2	0.9	0.7	0.8	0.7	0.7	0.9	1.0	1.2	1.8	1.6	1.1	1.2	1.9	1.5	1.2	1.9																						
14-Oct	0.9	1.0	1.4	Z	1.1	0.9	0.8	0.9	0.9	1.3	1.1	0.7	0.4	0.7	0.7	0.9	0.8	0.7	0.6	0.6	0.9	1.8	1.8	1.7	1.0	1.8																						
15-Oct	1.4	1.4	1.3	1.6	Z	1.5	2.1	1.7	1.5	1.3	1.5	1.6	1.6	1.9	1.2	1.1	1.1	1.1	1.2	1.6	1.5	1.7	1.7	1.6	1.5	2.1																						
16-Oct	1.5	1.4	1.1	0.9	0.9	Z	0.8	0.8	0.8	0.7	0.6	0.4	0.2	0.3	0.2	0.3	0.3	0.3	2.3	2.8	1.9	2.5	1.8	3.0	1.1	3.0																						
17-Oct	Z	2.1	1.2	2.2	1.5	1.6	1.4	1.2	0.8	0.6	0.6	1.0	0.9	0.6	0.4	0.5	0.5	0.6	0.5	0.4	0.4	0.4	0.6	0.8	0.9	2.2																						
18-Oct	1.0	Z	0.7	0.6	0.6	0.8	0.8	0.7	1.2	1.0	1.0	1.0	1.4	1.4	1.1	0.8	0.6	0.9	1.2	1.1	0.6	0.5	0.4	0.4	0.9	1.4																						
19-Oct	0.4	0.4	Z	0.4	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.3	0.2	0.2	0.3	0.4	0.5	0.3	0.5																						
20-Oct	0.4	0.4	0.4	Z	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.3	0.4	0.6	0.6	0.3	0.6																						
21-Oct	0.5	0.5	0.6	0.6	Z	0.5	2.9	1.6	2.3	1.6	0.6	0.9	0.6	0.6	0.8	0.9	1.0	1.0	1.3	3.4	2.9	1.0	0.6	0.6	1.2	3.4																						
22-Oct	0.6	0.9	0.9	0.9	0.4	Z	0.2	0.3	0.2	0.5	0.4	0.7	0.4	0.4	0.1	0.2	0.4	0.4	0.3	0.1	0.3	0.5	0.5	1.5	0.5	1.5																						
23-Oct	Z	3.6	2.9	2.2	1.6	1.2	1.2	1.0	1.0	0.3	0.2	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.7	3.6																						
24-Oct	0.1	Z	0.2	0.2	0.2	0.2	0.2	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	0.1	0.1	0.1	0.1	0.2	0.3																						
25-Oct	0.1	0.1	Z	0.2	0.2	0.3	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	0.2	0.2	0.3	0.2	0.2	0.2	0.3																						
26-Oct	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.2	1.1	0.1	0.1	0.1	0.1	0.3	0.2	0.3	0.2	0.2	1.1																						
27-Oct	0.3	0.3	0.3	0.3	Z	0.3	0.4	0.4	0.8	0.6	C	C	C	C	C	C	0.4	0.2	0.3	0.1	0.1	0.1	0.2	0.1	--	0.8																						
28-Oct	0.1	0.1	0.2	0.4	0.5	Z	0.7	0.8	0.6	0.5	0.6	0.6	0.3	0.3	0.3	0.4	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.8																						
29-Oct	Z	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2																						
30-Oct	0.4	Z	1.2	1.1	0.5	0.4	0.3	0.3	0.3	0.2	1.5	1.8	0.6	0.3	0.1	0.2	0.2	0.3	1.0	1.1	1.0	1.0	1.0	1.2	0.7	1.8																						
31-Oct	1.8	1.9	Z	2.3	2.7	3.1	2.6	2.0	1.6	1.5	1.3	1.0	0.7	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	1.2	3.1																						
																								0.8	0.9	0.9	0.9	0.8	0.8	0.9	0.8	0.8	0.7	0.7	0.7	0.6	0.5	0.5	0.6	0.5	0.5	0.7	0.8	0.8	0.7	0.7	0.8	Diurnal Average
																								2.2	3.6	2.9	2.3	2.7	3.1	2.9	2.0	2.3	1.6	1.6	1.8	1.7	1.9	1.4	3.3	1.8	1.7	2.3	3.4	2.9	2.5	1.9	3.0	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
Stony Mountain - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Stony Mountain - October 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
Stony Mountain - October 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	4	4	3	1	8	16	47	72	63	42	52	57	97	79	15	568
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	8	4	4	3	1	8	16	47	72	63	42	52	57	97	79	15	568

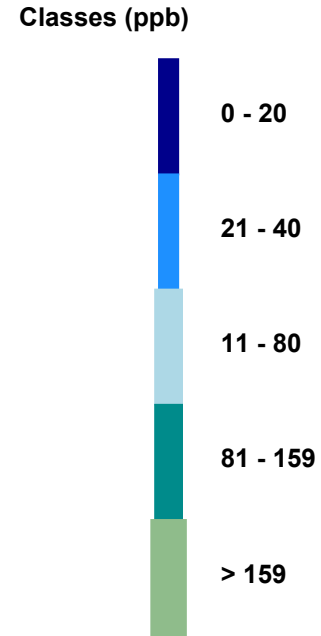
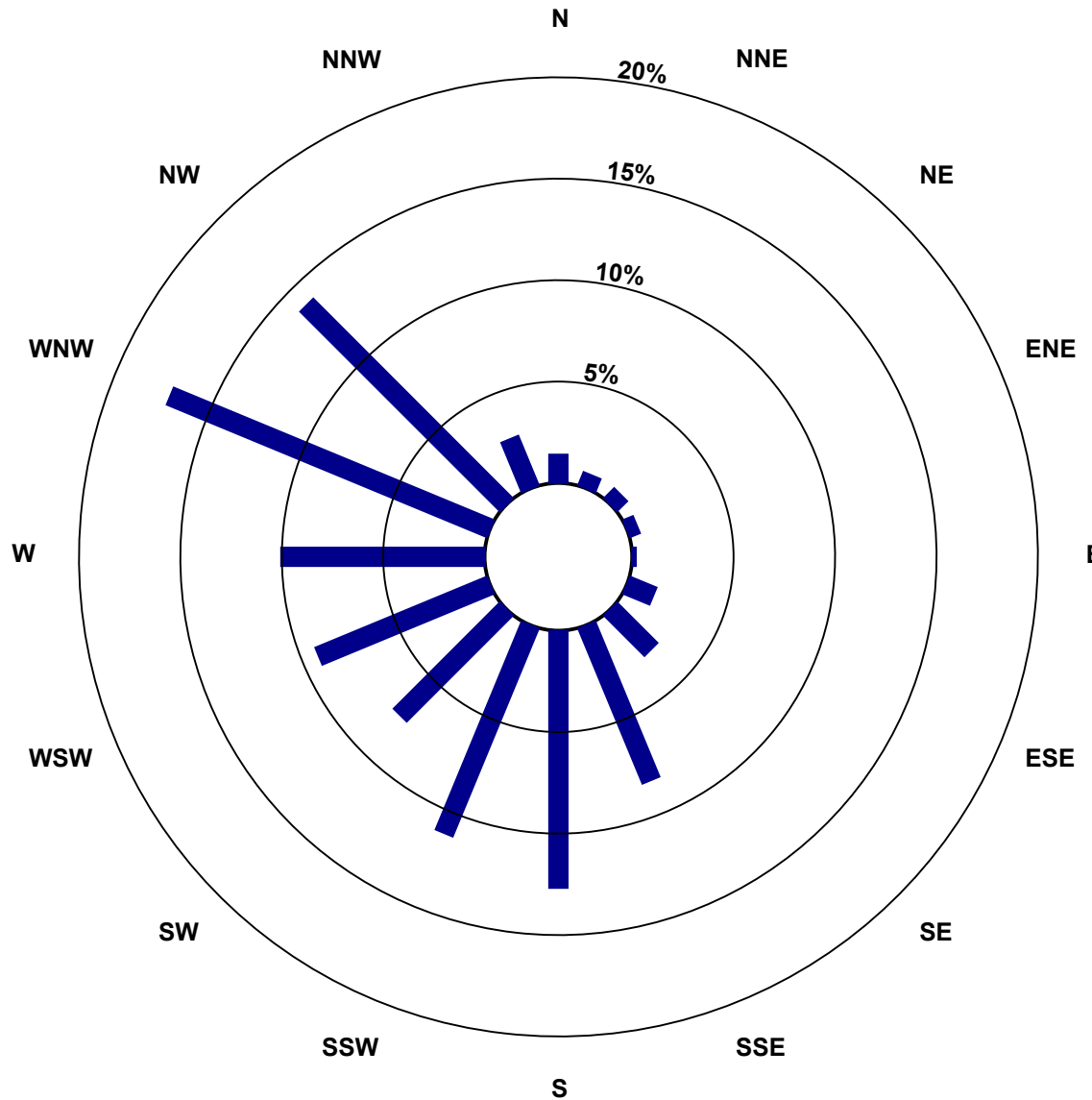
Total Number of Valid Hours: 568

Total Number of Hours: 744

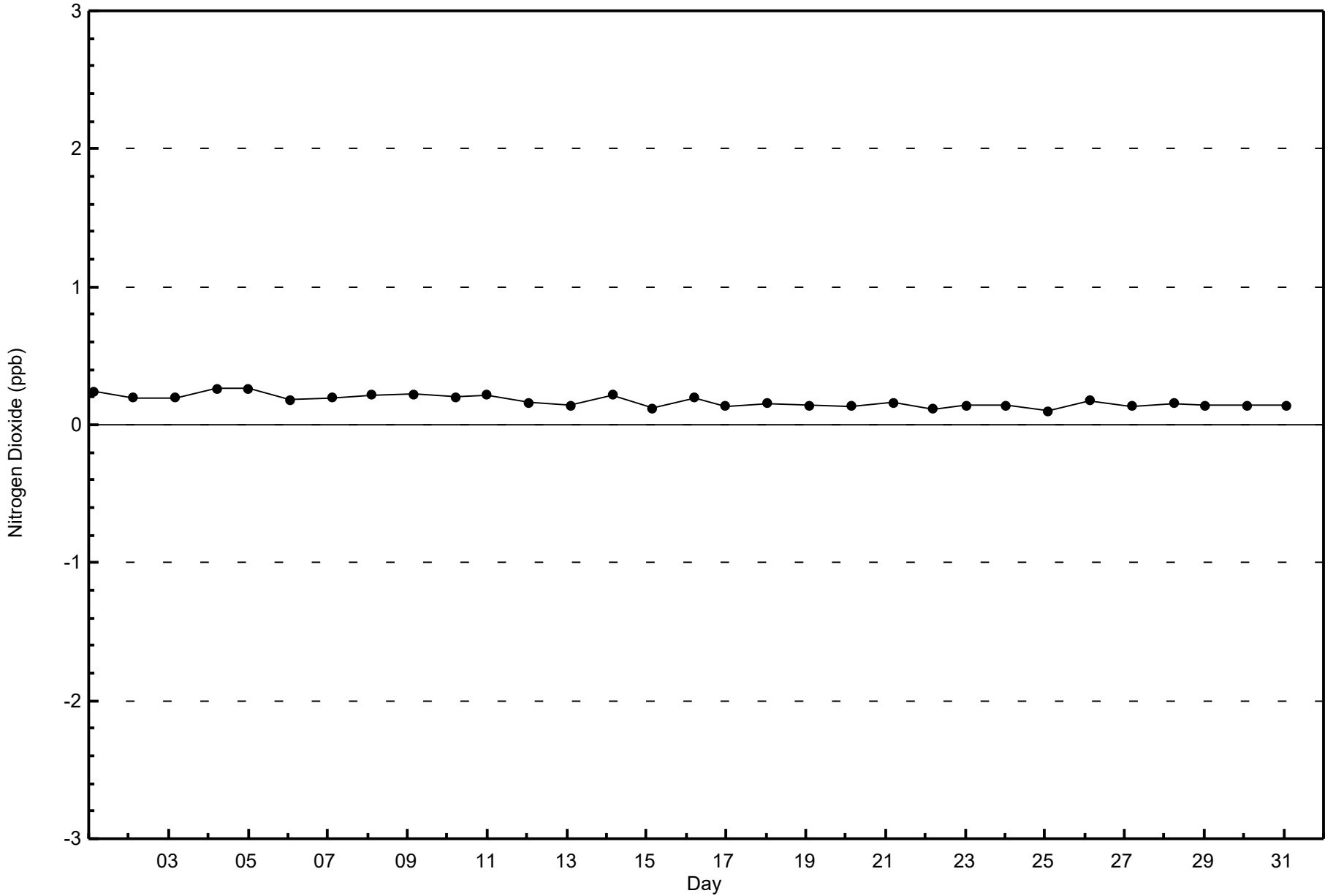


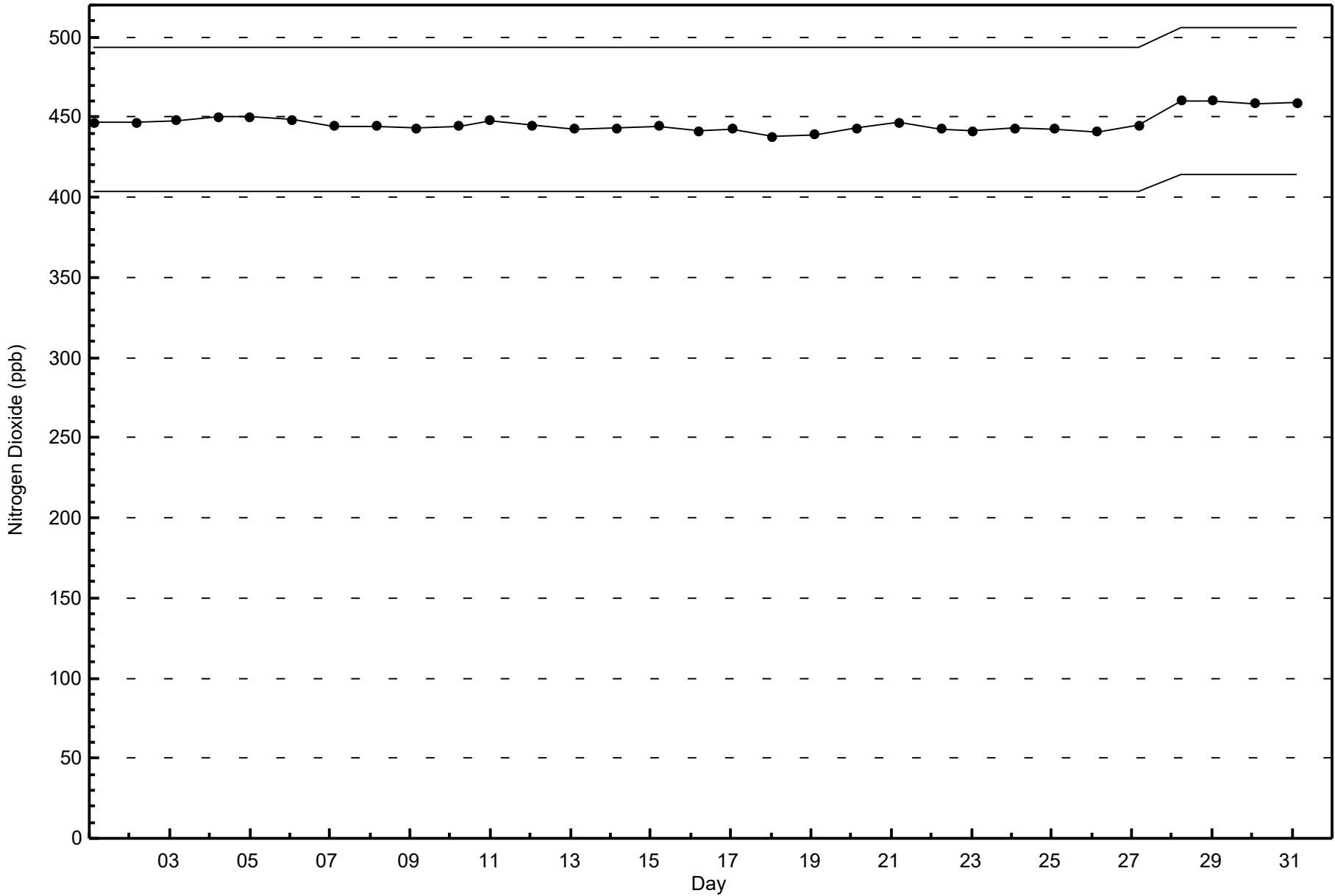
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitrogen Dioxide (NO₂) - ppb
Stony Mountain



Total Number of Valid Hours: 568







Wood Buffalo Environmental Association
Summary of Hour Averages

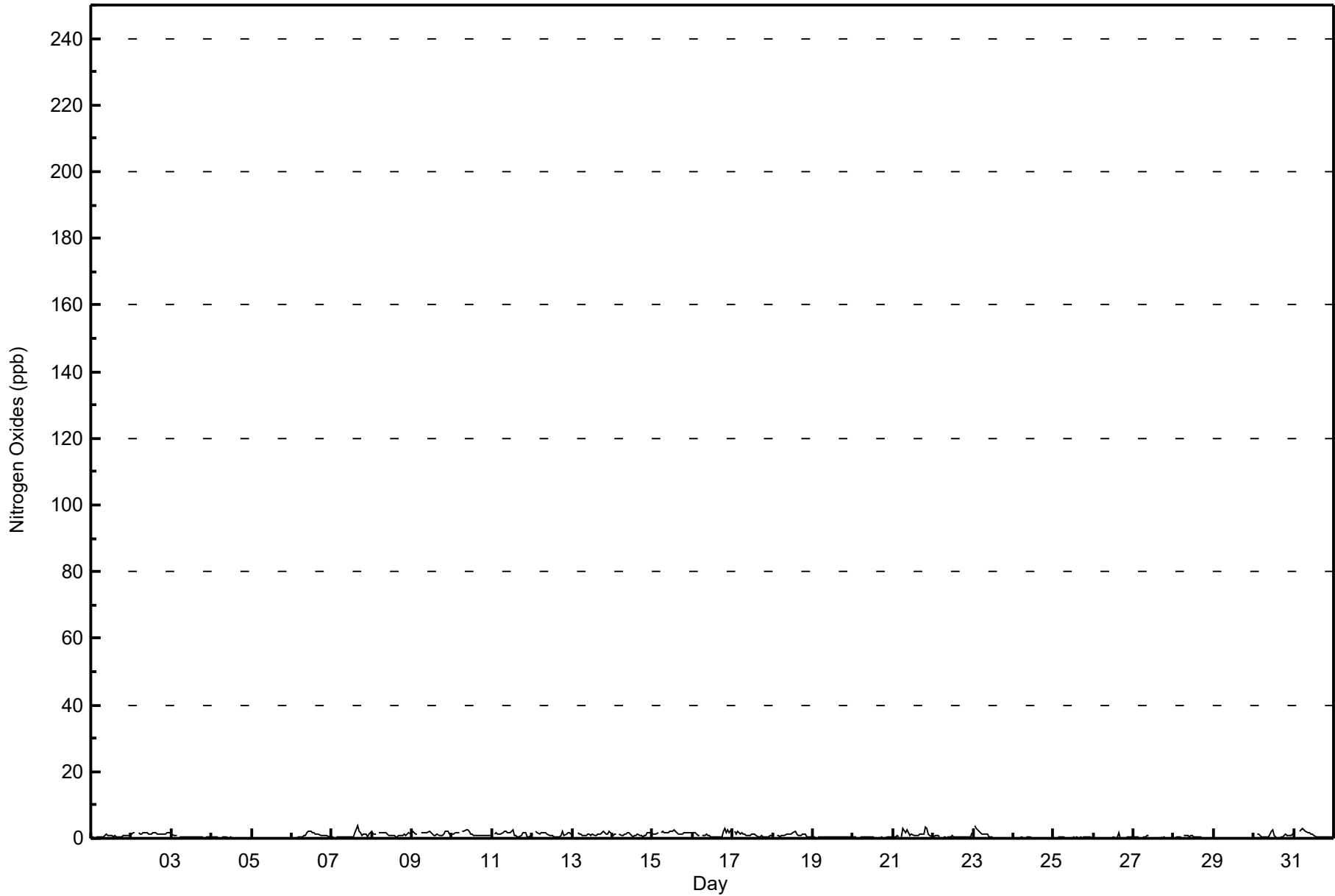
Nitrogen Oxides (NO_x) - ppb
Stony Mountain - October 2023

Maximum Value: 4.0 ppb on Oct 7 16:00		Maximum Daily Average: 1.7 ppb on Oct 15		Hours in Service: 744																							
Minimum Value: 0.0 ppb on Oct 29 04:00		Minimum Daily Average: 0.1 ppb on Oct 5		Hours of Data: 707																							
Maximum Diurnal Average: 1.0 ppb at hour 2		Minimum Diurnal Average: 0.6 ppb at hour 17		Hours of Missing Data: 37																							
Monthly Average: 0.82 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.3 Median = 0.6 Q ₃ = 1.3 P ₉₀ = 1.8 P ₉₉ = 3.0		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-Oct	0.3	0.3	Z	0.3	0.3	0.3	0.5	0.6	0.8	1.3	0.9	0.8	0.8	0.6	0.7	0.6	0.5	0.5	0.5	1.0	0.9	0.8	1.0	1.1	0.7	1.3	
2-Oct	1.4	1.8	1.7	Z	1.8	1.5	1.3	1.5	1.7	1.6	1.3	1.3	1.5	1.5	1.7	1.5	1.3	1.2	1.2	1.3	1.4	1.6	1.6	1.5	1.5	1.8	
3-Oct	1.3	1.0	0.8	0.7	Z	0.6	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.5	1.3	
4-Oct	0.3	0.3	0.3	0.4	0.4	Z	0.4	0.3	0.3	0.3	0.2	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	0.2	0.4	
5-Oct	Z	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	
6-Oct	0.1	Z	0.1	0.1	0.3	0.4	0.5	0.7	0.9	1.7	2.0	1.9	1.7	1.6	1.4	1.4	1.2	0.8	0.7	0.8	1.0	0.8	0.6	0.4	0.9	2.0	
7-Oct	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.5	0.5	0.4	0.4	1.6	4.0	2.0	1.8	1.0	1.2	1.4	0.4	1.4	1.8	1.0	4.0	
8-Oct	2.3	1.5	1.3	Z	1.7	1.7	1.5	1.7	1.8	1.4	1.1	0.9	0.7	0.8	0.6	0.6	0.7	0.9	1.0	1.3	1.0	1.3	1.9	1.3	1.3	2.3	
9-Oct	2.0	1.8	1.4	1.4	Z	1.7	1.5	1.7	1.7	1.8	2.2	1.8	1.3	0.9	1.0	1.1	0.9	0.9	0.9	1.4	2.1	2.0	1.1	1.2	1.5	2.2	
10-Oct	1.4	1.4	1.5	1.6	1.6	Z	2.1	2.1	2.5	2.4	2.3	1.4	1.1	0.9	0.7	0.7	0.7	0.7	0.8	0.7	0.7	0.6	0.7	0.7	1.3	2.5	
11-Oct	Z	1.2	1.5	1.2	1.3	1.2	1.7	1.9	2.2	1.9	1.6	1.8	2.5	0.8	0.7	0.6	0.5	1.0	1.9	1.6	1.8	0.4	0.5	0.9	1.3	2.5	
12-Oct	1.1	Z	2.1	1.7	1.3	1.8	1.8	1.6	1.5	1.2	0.9	0.7	0.7	0.5	0.4	0.3	0.3	1.0	2.2	1.0	1.1	1.6	1.8	1.4	1.2	2.2	
13-Oct	1.4	1.2	Z	1.6	1.3	1.4	1.1	0.9	1.1	1.4	1.1	0.9	1.2	1.0	0.9	1.1	1.1	1.3	1.9	1.7	1.2	1.3	2.0	1.6	1.3	2.0	
14-Oct	1.0	1.1	1.5	Z	1.2	1.0	0.9	1.1	1.3	1.7	1.6	1.0	0.6	0.9	0.9	1.1	0.9	0.8	0.6	0.7	0.9	1.8	1.8	1.7	1.1	1.8	
15-Oct	1.4	1.4	1.3	1.6	Z	1.5	2.1	1.8	1.7	1.7	2.2	2.2	2.2	2.6	1.6	1.3	1.2	1.2	1.3	1.7	1.6	1.8	1.8	1.7	1.7	2.6	
16-Oct	1.6	1.5	1.2	1.0	1.0	Z	0.9	0.9	1.1	1.0	0.8	0.5	0.3	0.4	0.3	0.4	0.4	0.3	2.3	2.8	1.9	2.5	1.8	3.0	1.2	3.0	
17-Oct	Z	2.1	1.2	2.2	1.5	1.6	1.4	1.3	0.8	0.7	0.7	1.1	1.1	1.1	0.8	0.6	0.6	0.7	0.6	0.5	0.5	0.5	0.7	0.9	1.0	2.2	
18-Oct	1.0	Z	0.8	0.7	0.6	0.8	0.8	0.8	1.3	1.1	1.3	1.2	1.7	1.9	1.4	0.9	0.7	1.0	1.2	1.1	0.6	0.5	0.4	0.4	1.0	1.9	
19-Oct	0.4	0.4	Z	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.2	0.3	0.4	0.5	0.3	0.5	
20-Oct	0.4	0.4	0.4	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.3	0.4	0.6	0.6	0.3	0.6	
21-Oct	0.5	0.5	0.6	0.6	Z	0.5	3.0	1.7	2.5	1.8	0.7	1.1	0.7	0.7	0.9	1.0	1.1	1.1	1.4	3.5	3.0	1.1	0.7	0.6	1.3	3.5	
22-Oct	0.6	0.9	0.9	0.9	0.4	Z	0.2	0.3	0.2	0.6	0.5	0.8	0.5	0.5	0.2	0.2	0.5	0.5	0.4	0.2	0.4	0.5	0.6	1.6	0.5	1.6	
23-Oct	Z	3.7	3.0	2.3	1.6	1.2	1.2	1.1	1.2	0.4	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	0.1	0.8	3.7	
24-Oct	0.1	Z	0.2	0.2	0.2	0.2	0.2	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	0.1	0.1	0.1	0.1	0.2	0.3	
25-Oct	0.1	0.1	Z	0.2	0.2	0.3	0.2	0.2	0.1	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	0.2	0.2	0.2	0.3	
26-Oct	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	1.7	0.1	0.1	0.1	0.1	0.3	0.2	0.3	0.2	0.2	1.7	
27-Oct	0.3	0.3	0.3	0.3	Z	0.3	0.4	0.4	0.9	0.7	C	C	C	C	C	C	0.4	0.2	0.3	0.1	0.1	0.1	0.2	0.1	--	0.9	
28-Oct	0.1	0.1	0.2	0.4	0.5	Z	0.7	0.8	0.7	0.6	0.7	0.7	0.4	0.3	0.3	0.4	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.8	
29-Oct	Z	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	
30-Oct	0.4	Z	1.2	1.1	0.5	0.4	0.3	0.3	0.3	0.3	2.0	2.6	0.9	0.4	0.1	0.2	0.2	0.3	1.0	1.1	1.0	1.0	1.0	1.2	0.8	2.6	
31-Oct	1.8	1.9	Z	2.3	2.7	3.1	2.6	2.0	1.7	1.6	1.4	1.1	0.7	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	1.2	3.1	
		0.8	1.0	1.0	0.9	0.8	0.9	0.9	0.9	1.0	1.0	0.9	0.9	0.8	0.7	0.6	0.7	0.6	0.6	0.7	0.8	0.8	0.7	0.8	0.8	Diurnal Average	
		2.3	3.7	3.0	2.3	2.7	3.1	3.0	2.1	2.5	2.4	2.3	2.6	2.5	2.6	1.7	4.0	2.0	1.8	2.3	3.5	3.0	2.5	2.0	3.0	Diurnal Maximum	
Z - zerspan		C - Calibration																									



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Stony Mountain - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Stony Mountain - October 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
Stony Mountain - October 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	4	4	3	1	8	16	47	72	63	42	52	57	97	79	15	568
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	8	4	4	3	1	8	16	47	72	63	42	52	57	97	79	15	568

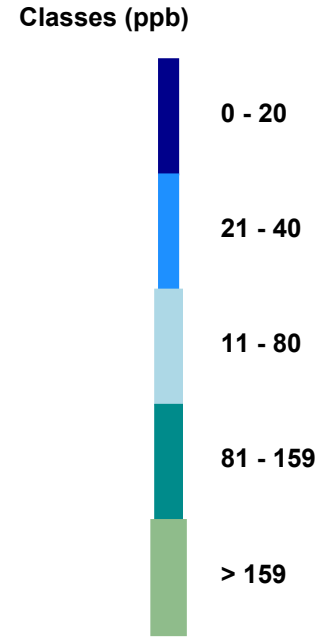
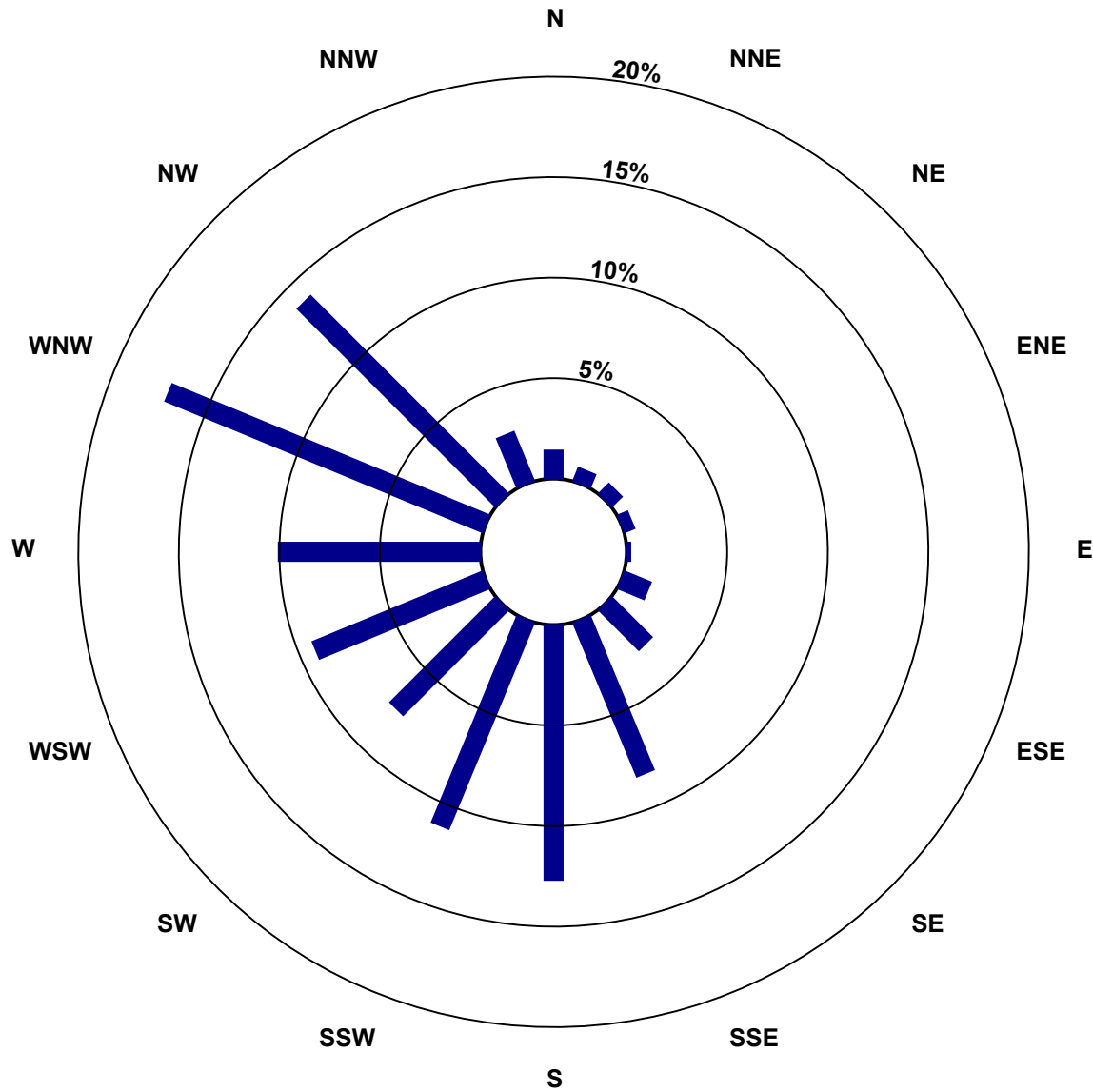
Total Number of Valid Hours: 568

Total Number of Hours: 744

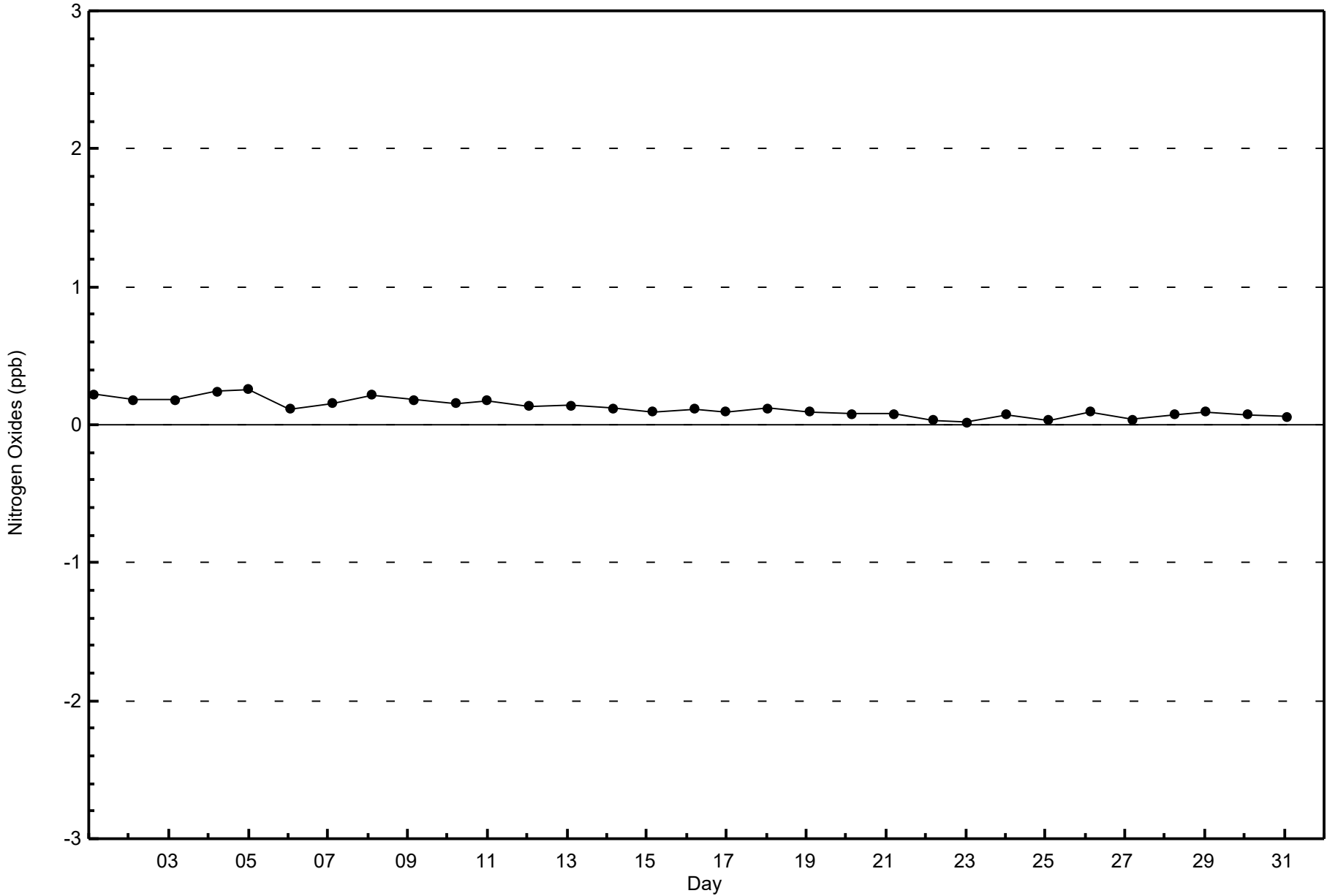


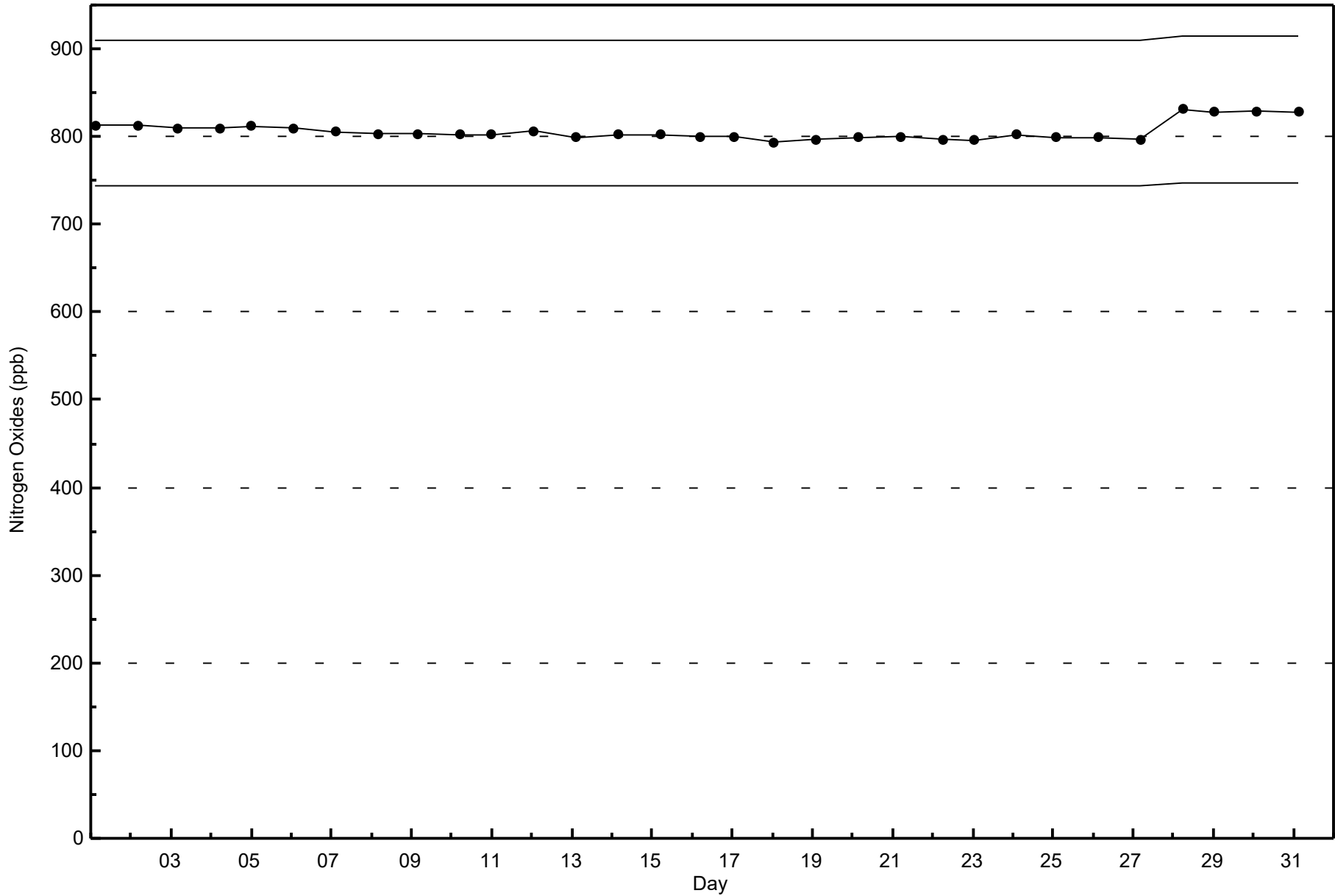
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitrogen Oxides (NO_x) - ppb
Stony Mountain



Total Number of Valid Hours: 568







Wood Buffalo Environmental Association

Summary of Hour Averages

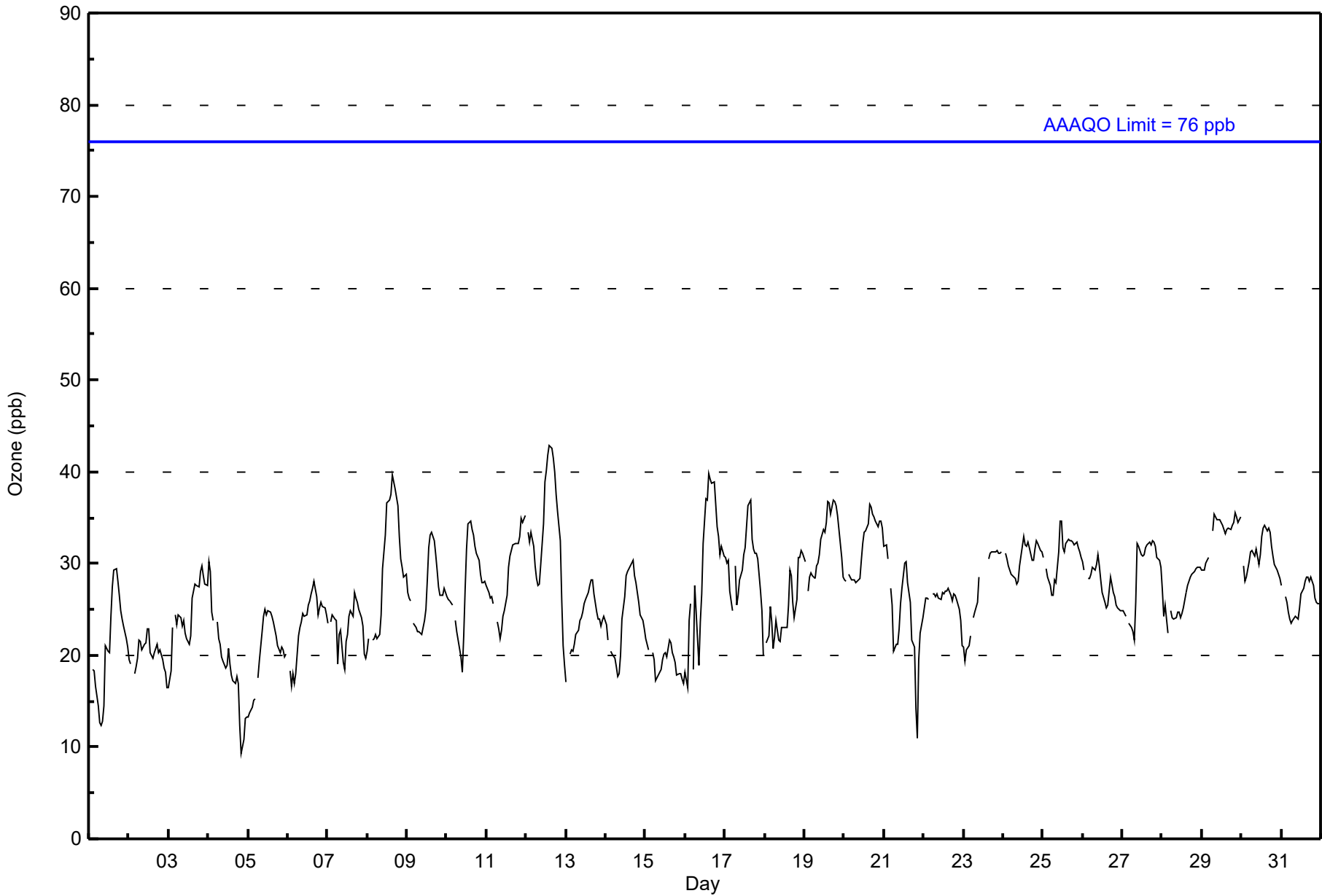
Ozone (O₃) - ppb

Stony Mountain - October 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 42.8 ppb on Oct 12 15:00	Maximum Daily Average: 33.4 ppb on Oct 29		Hours of Data:	708
Minimum Value: 9.3 ppb on Oct 4 21:00	Minimum Daily Average: 19.0 ppb on Oct 4		Hours of Missing Data:	36
Maximum Diurnal Average: 30.3 ppb at hour 16	Minimum Diurnal Average: 23.8 ppb at hour 6		Hours of Calibration:	36
Monthly Average: 26.65 ppb	Percentiles: P ₁ = 13.1 P ₁₀ = 19.5 Q ₁ = 22.8 Median = 26.7 Q ₃ = 30.8 P ₉₀ = 33.7 P ₉₉ = 39.6		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Oct	18.6	Z	18.5	18.3	16.6	14.5	12.7	12.4	12.9	14.5	21.1	20.5	20.3	24.2	27.4	29.3	29.4	28.1	26.6	24.8	24.0	23.3	21.8	20.9	20.9	29.4																						
2-Oct	19.5	19.1	Z	18.0	18.7	19.7	21.6	21.5	20.7	21.2	21.4	22.8	22.8	20.2	19.6	20.3	20.8	21.3	20.4	20.5	19.5	18.6	18.2	16.5	20.1	22.8																						
3-Oct	16.5	18.2	23.0	Z	24.4	23.3	24.4	24.0	23.1	23.8	22.3	21.8	21.2	22.1	26.2	27.0	27.8	27.6	27.5	29.1	29.8	28.7	27.8	27.6	24.7	29.8																						
4-Oct	30.1	29.1	24.7	23.7	Z	23.6	21.9	21.1	19.8	19.4	18.6	19.0	20.7	19.1	17.8	17.2	16.9	17.7	17.0	12.4	9.3	10.9	13.0	13.3	19.0	30.1																						
5-Oct	13.3	13.7	14.3	15.0	15.2	Z	17.5	19.3	22.6	24.3	25.0	24.5	24.9	24.7	24.3	23.6	22.9	22.1	21.1	20.3	20.9	20.6	19.8	20.1	20.4	25.0																						
6-Oct	Z	18.3	16.6	17.9	16.9	18.0	22.2	23.0	23.7	24.6	24.2	24.4	25.5	25.9	26.7	27.3	28.1	26.3	24.4	25.1	25.8	25.3	25.2	24.4	23.5	28.1																						
7-Oct	23.4	Z	23.7	24.4	24.0	23.9	19.1	22.3	22.7	19.2	18.4	21.5	22.3	24.3	24.8	24.3	26.8	26.2	25.8	25.0	24.1	23.1	20.1	19.7	23.0	26.8																						
8-Oct	20.4	21.8	Z	21.6	21.8	22.2	21.8	22.3	24.4	29.4	31.2	33.1	36.6	37.0	37.6	39.6	38.9	38.1	36.3	33.0	30.5	29.5	28.5	28.8	29.8	39.6																						
9-Oct	26.9	26.2	26.0	Z	23.5	23.0	22.6	22.6	22.4	22.3	23.8	25.0	28.2	31.7	33.2	33.5	32.6	30.9	29.2	27.5	26.5	26.5	27.3	26.9	26.9	33.5																						
10-Oct	26.5	26.1	25.9	25.4	Z	23.8	22.6	21.6	19.9	18.1	22.1	27.1	31.5	34.3	34.6	33.7	33.1	31.9	31.1	30.4	28.8	28.0	27.9	28.1	27.5	34.6																						
11-Oct	27.6	26.8	26.2	26.3	25.6	Z	23.7	22.9	21.7	22.7	24.2	24.9	26.6	29.6	30.8	31.5	32.0	32.2	32.2	32.2	32.9	34.9	34.4	35.2	28.6	35.2																						
12-Oct	Z	33.3	32.3	33.4	31.9	29.7	28.3	27.6	27.8	30.0	34.3	38.9	40.2	41.9	42.8	42.6	41.4	39.9	37.5	35.7	32.5	26.1	21.1	18.9	33.4	42.8																						
13-Oct	17.1	Z	20.2	20.6	20.4	21.2	22.2	22.8	23.8	24.1	24.7	25.7	26.2	26.8	27.6	28.2	28.3	26.7	24.7	24.0	24.0	23.2	23.7	24.2	23.9	28.3																						
14-Oct	23.4	21.7	Z	20.4	20.2	19.6	18.8	17.7	17.9	20.0	24.0	26.4	28.7	29.1	29.4	29.8	30.3	28.7	27.9	26.9	25.8	24.3	23.8	22.9	24.3	30.3																						
15-Oct	21.9	21.3	20.6	Z	20.3	19.5	17.2	17.5	17.8	18.5	19.5	20.1	20.3	19.9	21.7	21.4	20.3	19.9	19.2	17.8	18.0	18.0	17.3	16.9	19.3	21.9																						
16-Oct	18.2	16.5	23.8	25.7	Z	18.4	27.6	21.8	18.8	23.6	26.7	32.3	37.0	37.0	39.9	39.1	38.8	39.0	36.4	34.0	33.0	30.9	31.9	30.8	29.6	39.9																						
17-Oct	30.7	30.1	30.4	26.9	24.8	Z	29.7	25.5	26.5	28.2	29.4	30.9	31.7	34.0	36.3	36.9	32.6	31.6	31.1	31.1	30.4	26.9	24.8	20.0	29.6	36.9																						
18-Oct	Z	21.4	22.0	25.3	23.7	20.8	22.0	23.8	21.6	21.5	23.0	23.0	23.1	23.1	25.5	29.3	28.7	25.8	24.1	26.0	30.6	30.6	31.4	31.1	25.1	31.4																						
19-Oct	30.2	Z	27.1	28.5	29.0	28.7	28.4	29.8	30.1	31.0	32.7	33.6	33.5	34.4	36.7	36.6	35.4	36.9	36.7	36.3	35.2	33.7	30.6	28.5	32.3	36.9																						
20-Oct	28.3	28.1	Z	28.8	28.2	28.2	28.2	27.9	28.0	28.4	30.4	32.1	33.5	33.6	34.3	36.4	36.2	35.4	35.1	34.7	34.0	34.6	34.7	33.8	31.9	36.4																						
21-Oct	31.9	32.1	30.5	Z	27.3	25.5	20.4	21.3	21.2	22.8	25.7	27.3	30.0	30.2	27.9	26.9	25.8	21.7	20.9	14.2	11.0	19.5	22.4	24.1	24.4	32.1																						
22-Oct	25.2	26.3	26.2	26.1	Z	26.8	26.6	26.4	26.6	26.2	26.1	26.8	26.7	26.9	27.0	27.3	26.6	25.9	26.8	26.5	26.1	25.0	23.8	21.0	26.0	27.3																						
23-Oct	20.9	19.4	20.7	21.0	22.1	Z	24.1	24.7	25.7	28.5	C	C	C	C	C	30.4	31.2	31.2	31.3	31.3	31.4	31.2	31.1	31.3	27.1	31.4																						
24-Oct	Z	31.2	30.5	29.7	29.3	28.9	28.5	28.4	27.7	28.1	29.8	31.9	33.0	32.0	31.9	32.3	31.7	30.4	30.3	31.5	32.5	32.2	31.5	31.2	30.6	33.0																						
25-Oct	30.7	Z	29.5	28.5	27.7	26.5	26.5	28.2	28.0	31.3	34.7	34.6	31.7	31.3	32.2	32.6	32.5	32.6	32.3	32.0	32.3	31.7	31.3	30.7	30.8	34.7																						
26-Oct	30.3	29.4	Z	28.4	28.4	28.9	29.5	29.2	29.9	31.0	29.8	28.2	26.9	25.8	25.2	25.5	26.9	28.6	26.9	26.5	25.5	25.1	25.1	24.8	27.6	31.0																						
27-Oct	24.8	24.6	24.3	Z	23.4	23.1	22.5	21.7	25.7	32.2	31.8	31.0	30.9	31.0	31.7	32.0	32.3	32.1	32.5	32.4	31.9	30.6	30.3	29.6	28.8	32.5																						
28-Oct	27.1	24.3	25.5	22.5	Z	24.9	24.1	24.0	24.1	24.7	24.8	24.1	24.6	25.1	26.9	27.6	28.0	28.6	28.9	29.2	29.5	29.7	29.6	29.5	26.4	29.7																						
29-Oct	29.2	29.3	30.0	30.3	30.6	Z	33.5	35.4	35.1	34.7	34.7	34.8	34.2	33.7	33.3	33.7	33.8	33.7	34.2	34.4	35.5	35.2	34.5	35.1	33.4	35.5																						
30-Oct	Z	29.8	28.0	28.5	30.3	31.3	31.4	31.2	30.9	31.6	29.9	31.0	32.9	33.9	34.1	33.6	33.9	33.5	31.9	30.8	29.9	29.2	28.8	28.3	31.1	34.1																						
31-Oct	27.6	Z	26.4	25.7	24.7	24.0	23.6	23.8	24.2	24.0	23.9	25.2	26.6	27.4	28.1	28.6	28.5	28.0	28.5	27.7	26.3	25.8	25.7	25.6	26.1	28.6																						
																								24.6	24.7	24.9	24.7	24.2	23.8	24.0	23.9	24.0	25.2	26.3	27.4	28.4	29.0	29.9	30.3	30.1	29.4	28.7	27.9	27.3	26.9	26.4	25.8	Diurnal Average
																								31.9	33.3	32.3	33.4	31.9	31.3	33.5	35.4	35.1	34.7	34.7	38.9	40.2	41.9	42.8	42.6	41.4	39.9	37.5	36.3	35.5	35.2	34.7	35.2	Diurnal Maximum

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ozone (O₃) - ppb
Stony Mountain - October 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	103	14.55	14.55
21 - 50	605	85.45	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 - October 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	0	0	0	0	0	1	5	8	23	11	14	8	1	2	21	1	95
21 - 50	10	5	4	2	1	8	11	38	51	51	28	43	57	95	59	16	479
51 - 82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	10	5	4	2	1	9	16	46	74	62	42	51	58	97	80	17	574

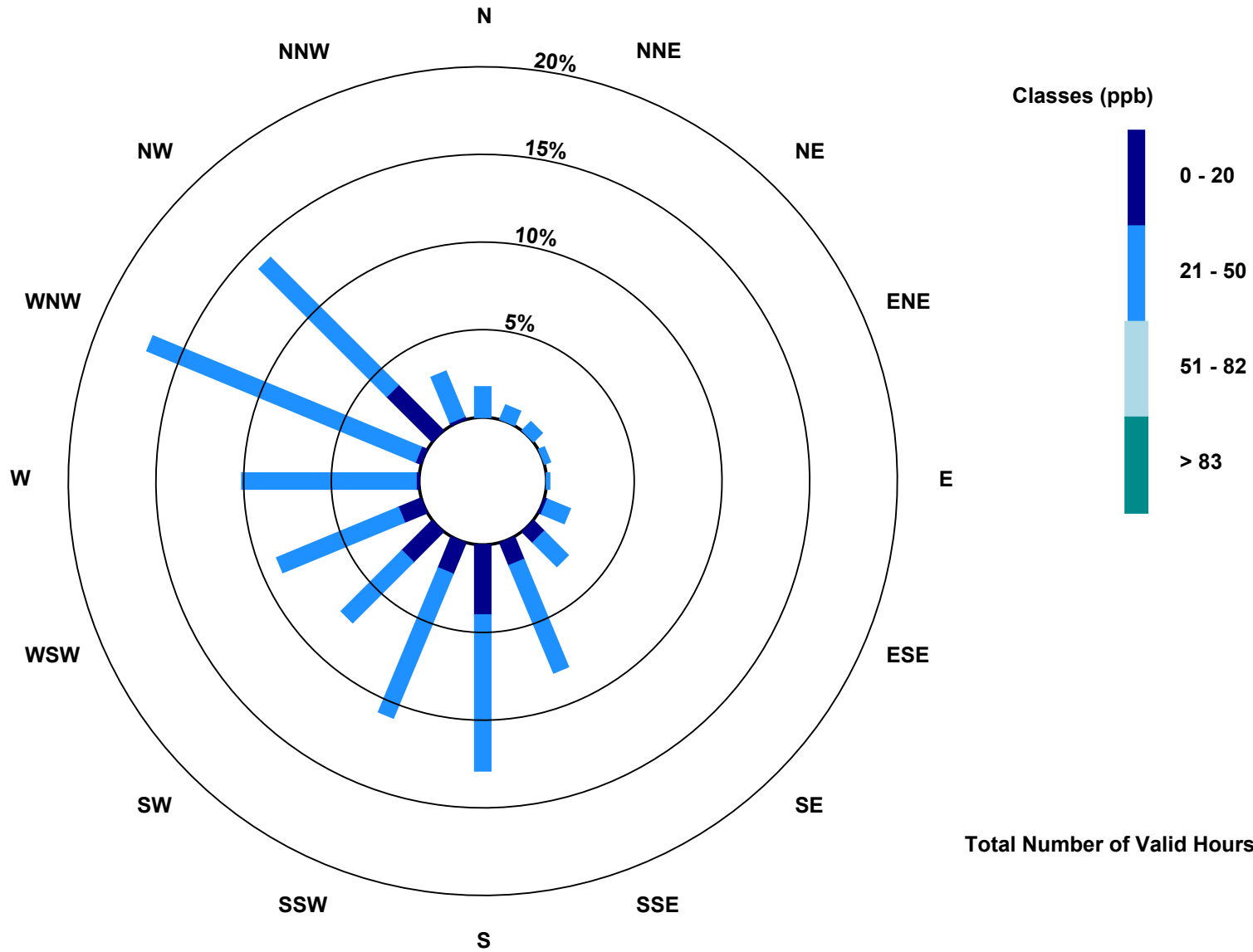
Total Number of Valid Hours: 574

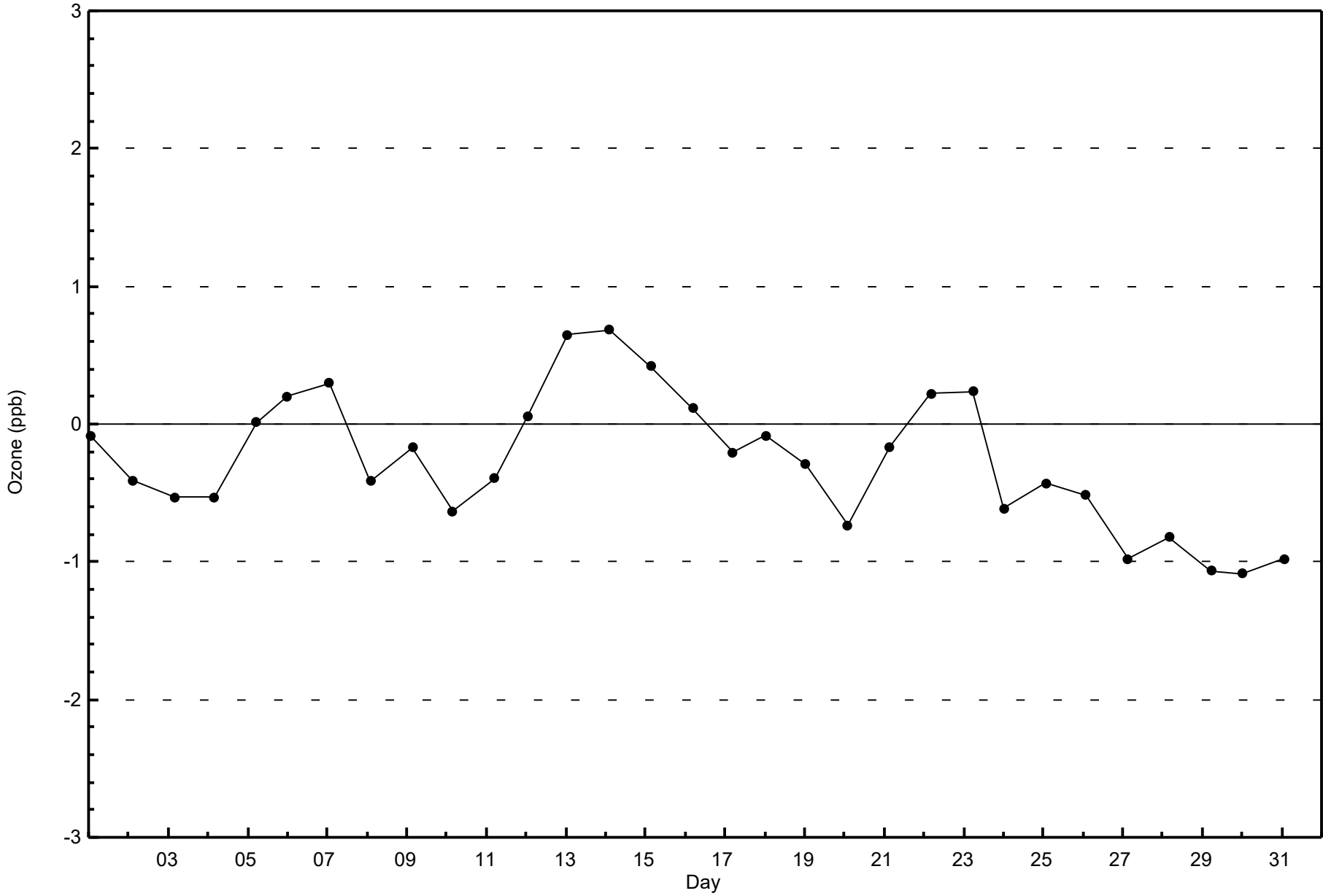
Total Number of Hours: 744

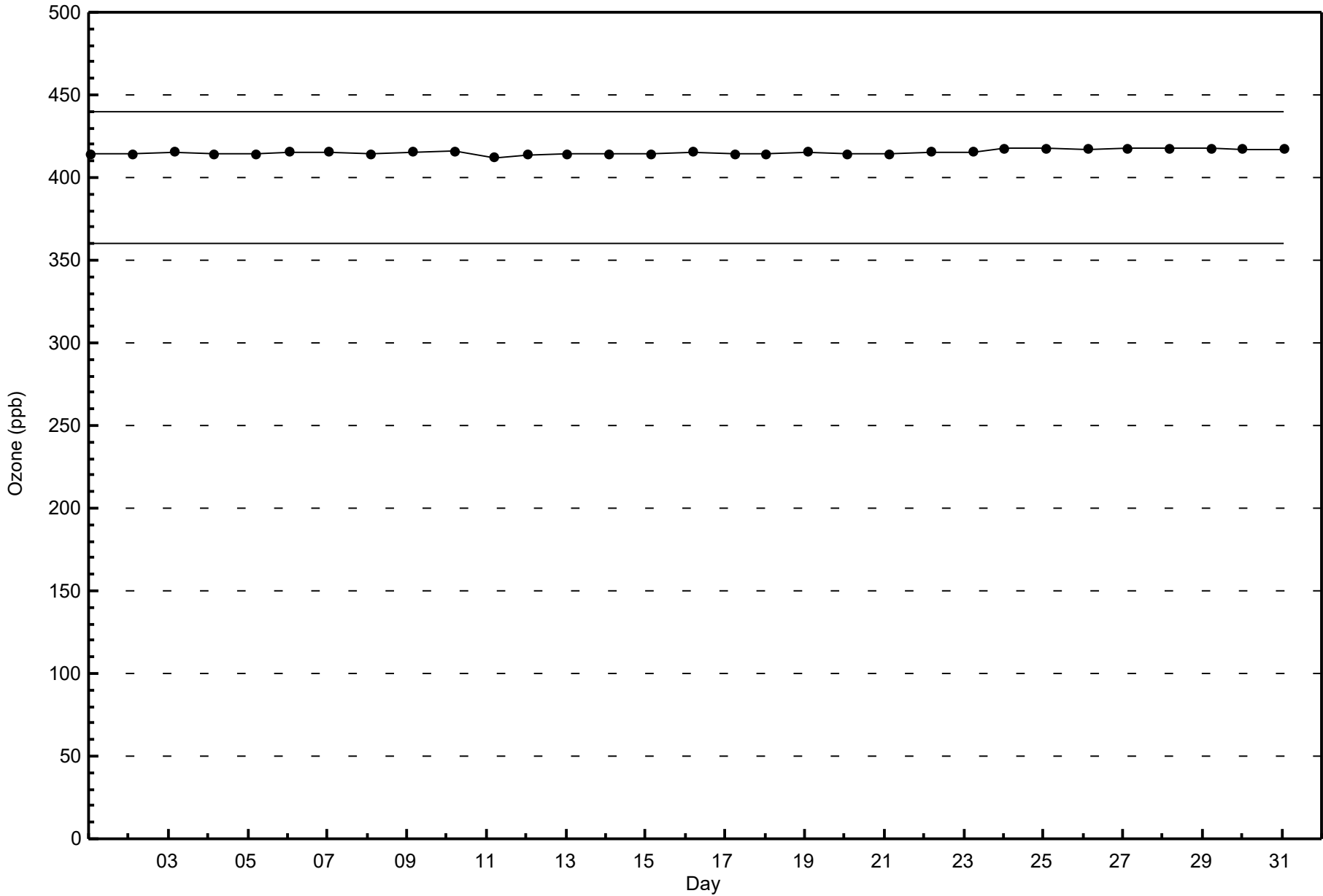


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Ozone (O₃) - ppb
Stony Mountain









Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 20.4 µg/m ³ on Oct 31 11:00	Maximum Daily Average: 14.1 µg/m ³ on Oct 31		Hours of Data:	741
Minimum Value: 0.8 µg/m ³ on Oct 19 19:00	Minimum Daily Average: 1.1 µg/m ³ on Oct 19		Hours of Missing Data:	3
Maximum Diurnal Average: 5.5 µg/m ³ at hour 12	Minimum Diurnal Average: 4.5 µg/m ³ at hour 1		Hours of Calibration:	3
Monthly Average: 4.91 µg/m ³	Percentiles: P ₁ = 0.9 P ₁₀ = 1.9 Q ₁ = 3.3 Median = 4.5 Q ₃ = 5.8 P ₉₀ = 7.9 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-Oct	6.3	7.0	8.0	8.8	8.8	9.0	9.3	8.9	8.8	7.8	5.9	5.6	6.0	6.8	7.0	7.1	7.2	7.6	8.3	8.9	10.2	9.6	7.9	6.8	7.8	10.2																							
2-Oct	6.5	6.2	6.0	6.1	6.4	6.3	6.0	5.6	5.6	5.2	5.2	5.1	6.4	8.1	8.8	8.2	7.7	7.0	6.5	6.2	6.7	9.0	10.4	10.4	6.9	10.4																							
3-Oct	8.7	6.5	4.5	4.2	4.0	3.9	3.8	3.5	3.7	4.4	8.8	15.9	15.1	13.9	11.0	10.7	10.7	12.6	13.8	11.3	9.6	8.4	6.9	5.1	8.4	15.9																							
4-Oct	3.3	2.8	3.2	3.4	3.3	3.0	3.0	3.0	3.2	3.3	4.5	7.4	8.3	7.4	10.5	9.8	6.7	6.0	6.9	4.6	2.0	2.8	2.9	3.0	4.8	10.5																							
5-Oct	2.2	1.2	0.9	1.0	1.1	1.0	1.1	1.4	1.5	1.8	2.4	3.2	3.3	2.3	3.2	1.7	1.4	1.4	1.5	1.5	1.6	2.1	2.3	2.7	1.8	3.3																							
6-Oct	3.7	4.0	3.8	3.7	3.8	3.6	3.4	3.3	3.2	3.4	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.5	3.4	3.6	4.0	3.7	3.5	3.6	3.6	4.0																							
7-Oct	3.7	4.1	4.2	4.3	4.8	4.9	4.9	5.2	5.3	4.9	4.8	5.0	4.9	4.7	5.5	5.7	5.9	5.8	6.0	5.8	5.4	5.4	5.3	5.3	5.1	6.0																							
8-Oct	5.4	5.8	5.8	5.7	5.8	5.5	5.2	5.0	4.6	4.0	3.9	4.0	3.8	3.6	3.5	3.4	3.6	4.0	4.5	4.2	4.2	4.4	4.3	4.2	4.5	5.8																							
9-Oct	4.0	4.0	4.2	4.3	4.3	4.3	4.3	4.3	4.1	4.2	4.1	4.1	4.0	4.1	4.3	4.5	4.4	4.6	4.9	5.1	5.4	5.8	5.8	5.7	4.5	5.8																							
10-Oct	5.7	5.4	5.4	5.4	5.6	5.4	5.5	5.5	5.4	5.4	5.5	5.8	5.9	6.0	6.1	5.6	5.4	5.7	6.5	5.2	5.2	5.3	5.4	5.8	5.6	6.5																							
11-Oct	6.0	6.1	6.3	6.3	6.4	6.3	6.5	6.3	6.4	6.5	6.7	7.0	6.4	5.8	5.5	5.4	5.0	5.0	4.8	4.7	4.5	4.6	5.0	5.6	5.8	7.0																							
12-Oct	5.6	5.6	5.5	5.5	5.3	5.2	5.3	5.6	5.6	5.2	5.1	4.9	4.1	3.8	3.8	3.5	3.5	3.4	4.1	4.5	4.8	5.6	6.5	6.5	4.9	6.5																							
13-Oct	7.8	10.0	10.3	9.6	9.3	8.5	8.2	7.1	5.7	6.1	6.5	5.9	6.3	5.6	5.7	7.1	8.7	8.7	7.0	5.8	5.6	5.9	5.9	5.8	7.2	10.3																							
14-Oct	6.0	6.3	6.5	6.0	5.4	4.9	4.8	4.4	4.3	3.9	3.7	3.6	3.5	4.1	4.0	4.6	4.9	4.9	4.9	4.7	4.6	4.8	5.1	5.0	4.8	6.5																							
15-Oct	4.9	4.8	4.9	5.3	4.9	4.9	5.0	5.2	5.3	5.1	4.7	4.8	4.7	4.6	4.4	4.5	4.2	4.2	4.2	4.5	4.5	5.0	5.3	5.3	4.8	5.3																							
16-Oct	5.3	5.3	4.6	4.5	4.6	5.0	4.1	4.3	4.9	4.1	3.6	2.6	1.6	2.4	1.6	2.0	2.0	1.9	2.4	2.9	3.9	4.0	3.8	4.6	3.6	5.3																							
17-Oct	4.5	4.4	4.0	4.0	4.3	3.9	3.9	3.8	4.1	4.1	4.2	4.2	3.7	3.5	3.1	2.9	3.1	3.3	3.3	3.1	2.6	2.9	3.1	2.9	3.6	4.5																							
18-Oct	3.5	4.5	4.7	4.6	5.0	5.2	4.7	4.0	3.6	3.5	3.2	3.3	3.4	3.5	3.5	3.1	3.0	3.7	4.0	3.5	1.8	1.5	1.1	0.9	3.5	5.2																							
19-Oct	0.9	1.0	0.9	1.0	1.2	1.2	1.1	1.3	1.3	1.3	1.1	1.2	1.3	1.2	1.0	0.9	1.0	0.8	0.8	0.8	0.8	1.0	1.0	1.1	1.1	1.3																							
20-Oct	1.3	1.6	1.8	2.0	2.2	2.4	2.9	3.0	3.3	3.4	3.5	4.0	3.5	2.9	2.2	1.9	2.3	2.8	2.6	2.9	2.9	2.9	3.1	3.6	2.7	4.0																							
21-Oct	5.2	4.7	5.1	5.2	5.3	5.4	7.1	7.9	6.7	6.0	5.9	5.1	4.1	3.8	3.8	3.8	3.5	3.7	3.9	8.3	16.0	4.8	4.0	3.4	5.5	16.0																							
22-Oct	2.4	3.2	4.0	4.6	4.1	3.1	2.5	2.5	2.5	3.2	3.0	3.4	2.9	2.5	2.1	1.8	1.6	1.5	1.2	1.1	1.2	1.3	1.8	3.7	2.6	4.6																							
23-Oct	4.3	5.2	4.7	4.6	4.6	4.4	4.0	3.6	3.6	3.4	2.5	2.4	1.9	1.7	2.0	2.6	2.1	2.1	1.9	1.8	1.7	1.7	1.8	2.2	3.0	5.2																							
24-Oct	2.8	3.1	3.4	3.5	3.9	4.8	6.3	7.1	8.0	9.9	9.0	7.3	4.8	5.3	4.6	3.9	3.8	5.4	6.8	6.0	5.0	4.9	5.3	5.8	5.4	9.9																							
25-Oct	5.7	6.2	7.6	7.6	7.4	7.4	7.1	5.8	5.1	4.1	2.7	4.5	7.3	7.5	6.7	6.6	6.5	5.2	4.3	4.2	4.2	4.4	4.3	4.5	5.7	7.6																							
26-Oct	4.6	4.7	4.8	4.3	4.6	6.1	7.2	7.9	7.8	6.5	6.2	6.1	6.0	6.5	7.5	6.7	5.1	3.5	3.6	3.6	5.0	4.9	4.3	3.9	5.5	7.9																							
27-Oct	3.8	4.1	4.4	4.5	5.1	5.5	5.1	5.3	4.2	2.2	2.8	2.9	3.3	C	C	C	1.8	1.8	1.5	1.4	1.6	1.9	2.6	2.8	3.3	5.5																							
28-Oct	2.5	2.2	2.6	2.7	3.7	5.7	5.8	6.4	6.2	6.8	9.3	12.2	12.1	9.5	6.3	5.1	4.9	5.4	4.9	3.8	2.6	2.1	2.2	2.1	5.3	12.2																							
29-Oct	2.1	1.8	1.6	1.6	2.1	2.7	2.6	2.6	2.5	2.7	3.1	3.5	4.2	5.1	4.8	3.6	3.4	3.9	3.7	3.2	2.7	2.4	2.3	2.1	2.9	5.1																							
30-Oct	2.8	4.5	6.0	6.3	5.2	4.3	3.9	3.7	3.7	2.8	3.1	2.9	2.5	2.3	2.1	2.2	2.0	2.2	2.9	3.7	4.6	5.1	5.5	7.0	3.8	7.0																							
31-Oct	8.7	9.0	9.8	11.1	12.3	12.3	10.4	10.3	12.4	15.9	20.4	17.7	15.1	14.8	15.0	15.0	15.2	14.8	15.0	14.7	15.7	16.8	17.3	17.7	14.1	20.4																							
																								4.5	4.7	4.8	4.9	5.0	5.0	5.0	4.9	4.9	5.1	5.5	5.3	5.2	5.1	4.9	4.7	4.7	4.8	4.7	4.9	4.7	4.7	4.8	Diurnal Average		
																								8.7	10.0	10.3	11.1	12.3	12.3	10.4	10.3	12.4	15.9	20.4	17.7	15.1	14.8	15.0	15.0	15.2	14.8	15.0	14.7	16.0	16.8	17.3	17.7	Diurnal Maximum	

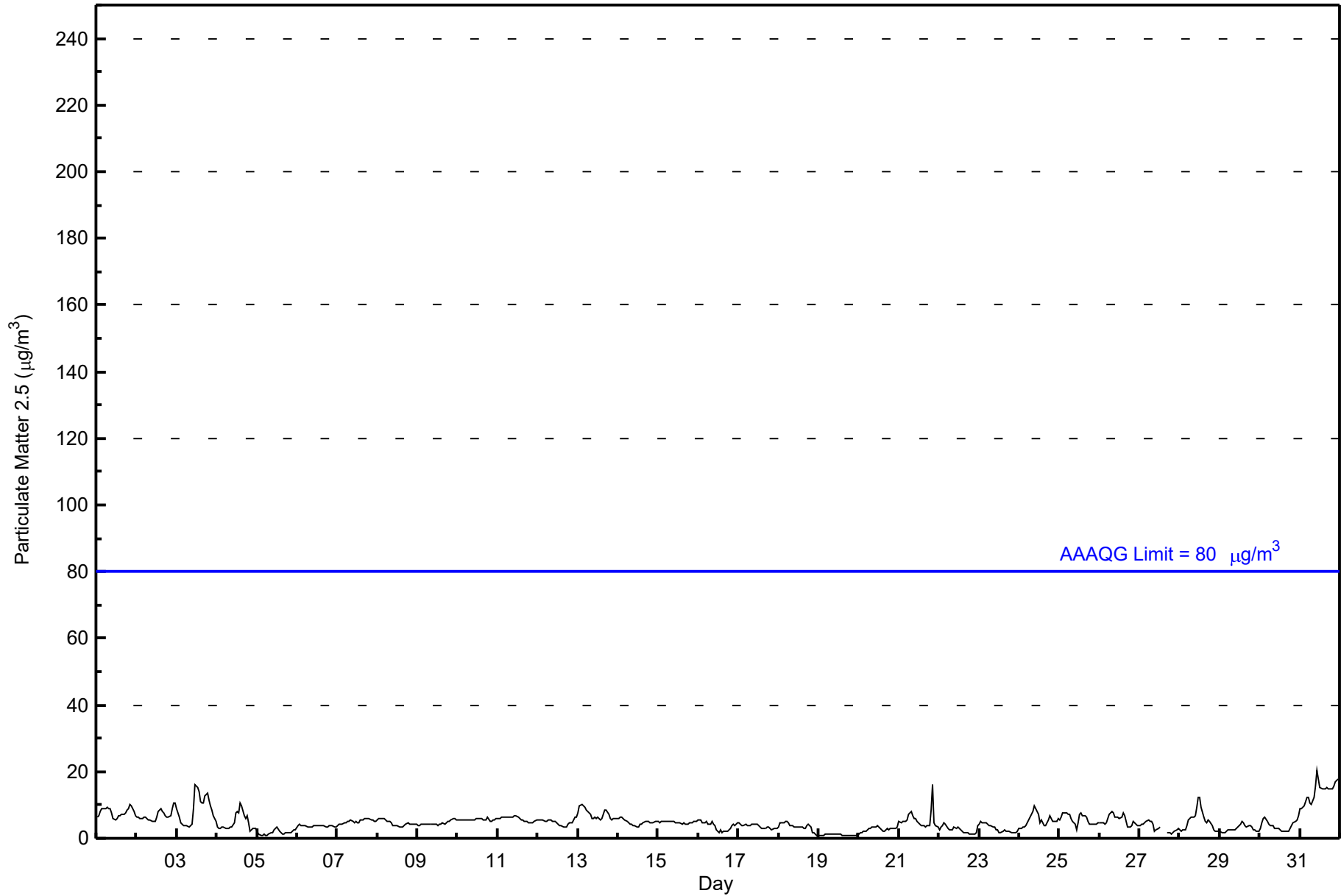
C - Calibration

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



Wood Buffalo Environmental Association
Hourly Averages

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Stony Mountain - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Stony Mountain - October 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	521	70.31	70.31
6 - 15	211	28.48	98.79
16 - 25	9	1.21	100.00
26 - 80	0	0.00	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 741

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - μg/m³
Stony Mountain - October 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	7	4	4	3	1	6	12	26	42	44	28	51	51	78	49	6	412
6 - 15	4	1	0	0	0	3	5	22	35	21	15	3	10	20	28	9	176
16 - 25	0	0	0	0	0	0	0	0	0	0	0	0	3	2	3	0	8
26 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	11	5	4	3	1	9	17	48	77	65	43	54	64	100	80	15	596

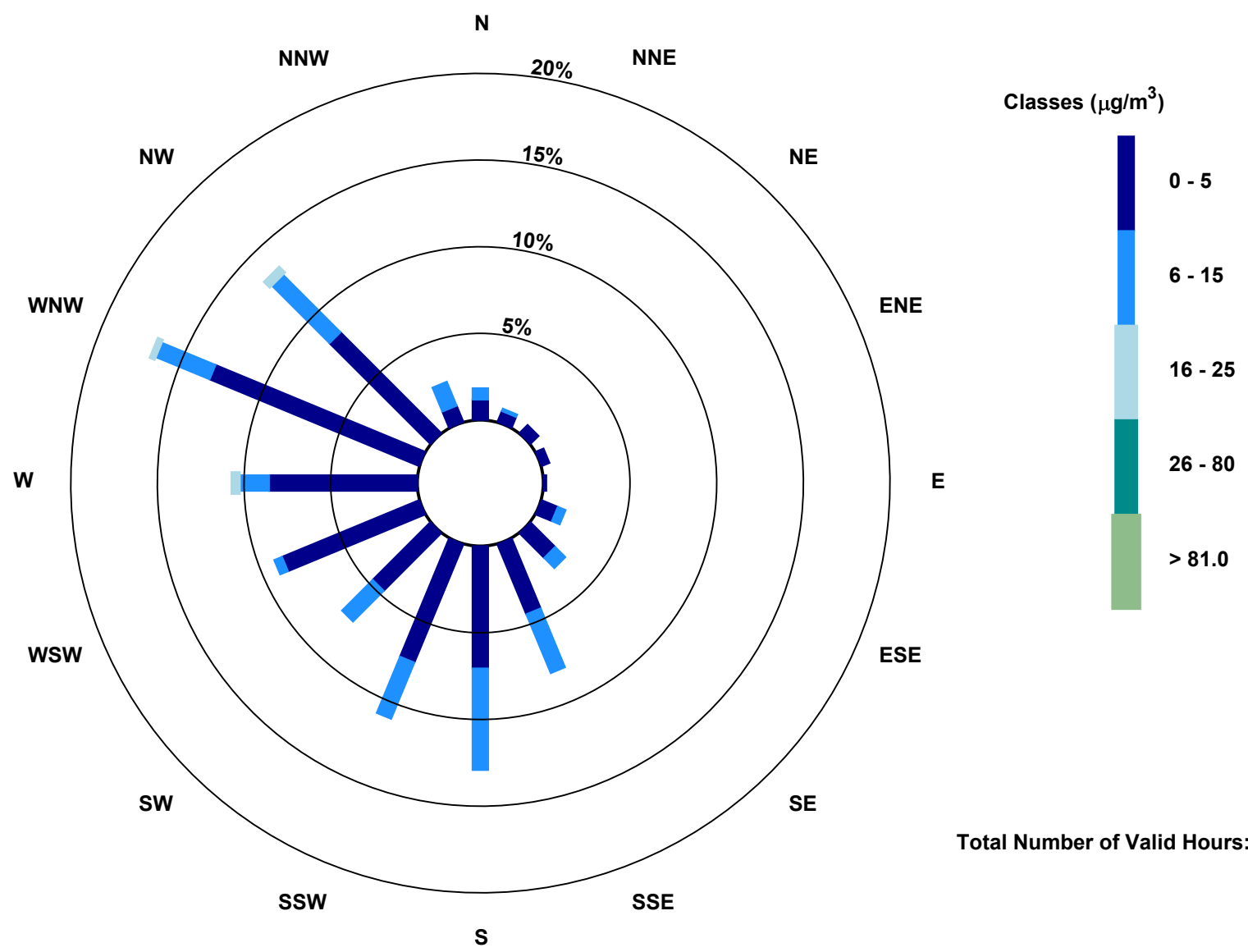
Total Number of Valid Hours: 596

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

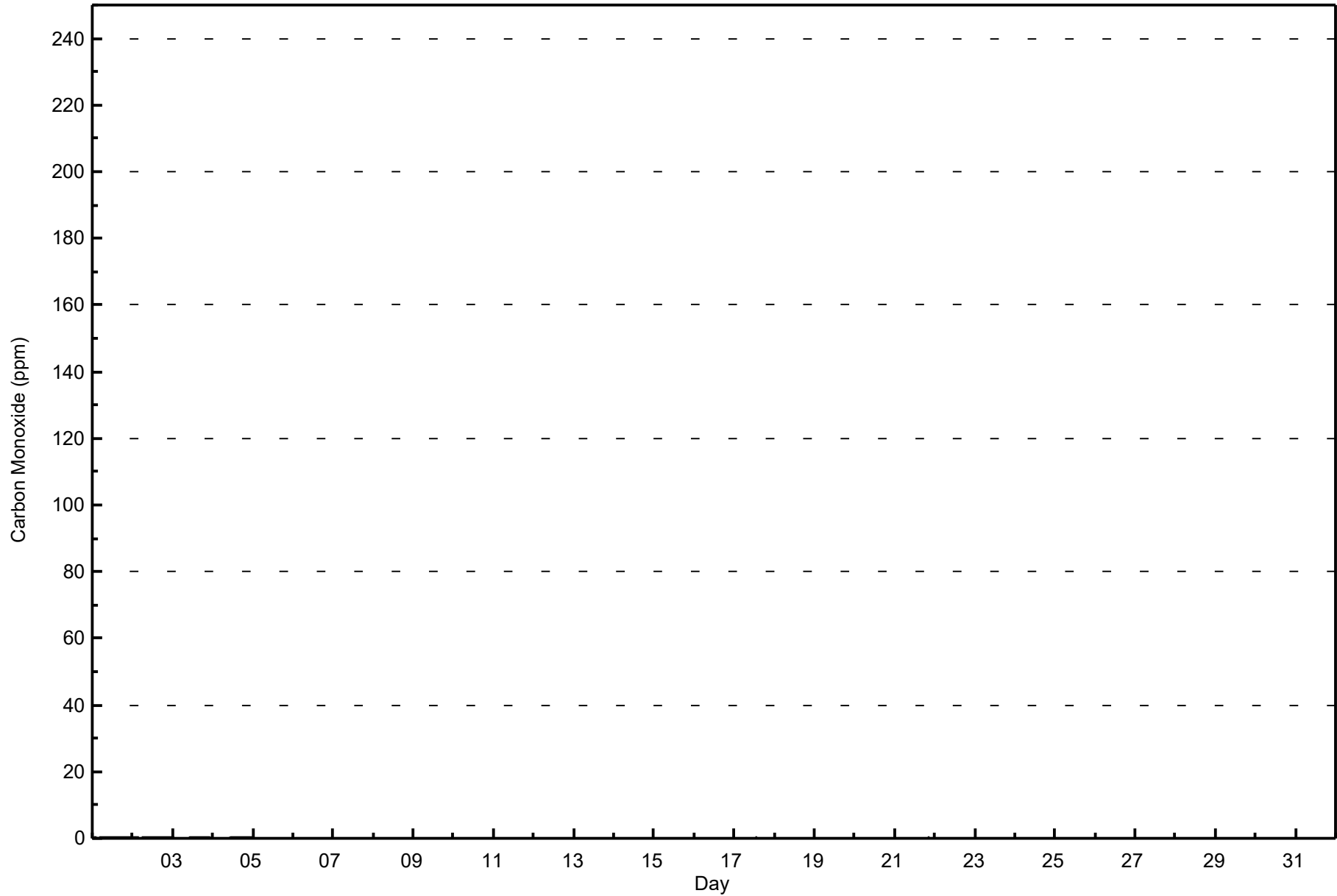
Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Stony Mountain





Wood Buffalo Environmental Association
Hourly Averages

Carbon Monoxide (CO) - ppm
Stony Mountain - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Carbon Monoxide (CO) - ppm
Stony Mountain - October 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.3	710	100.00	100.00
0.4 - 0.5	0	0.00	100.00
0.6 - 0.7	0	0.00	100.00
0.8 - 1.4	0	0.00	100.00
1.5 - 10	0	0.00	100.00
> 10	0	0.00	100.00

Total Number of Valid Hours: 710

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Carbon Monoxide (CO) - ppm
Stony Mountain - October 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.3	10	5	4	3	0	9	17	45	70	64	41	50	59	97	80	17	571
0.4 - 0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.6 - 0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.8 - 1.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.5 - 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	10	5	4	3	0	9	17	45	70	64	41	50	59	97	80	17	571

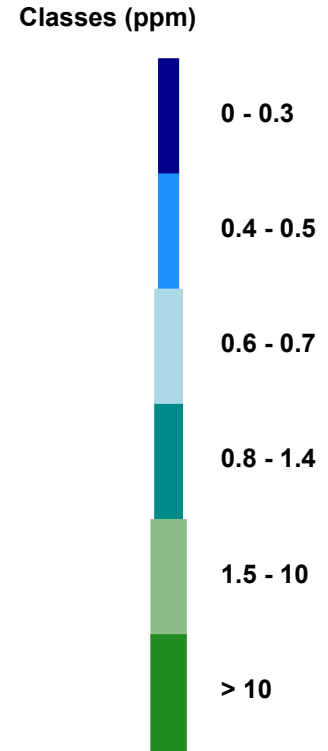
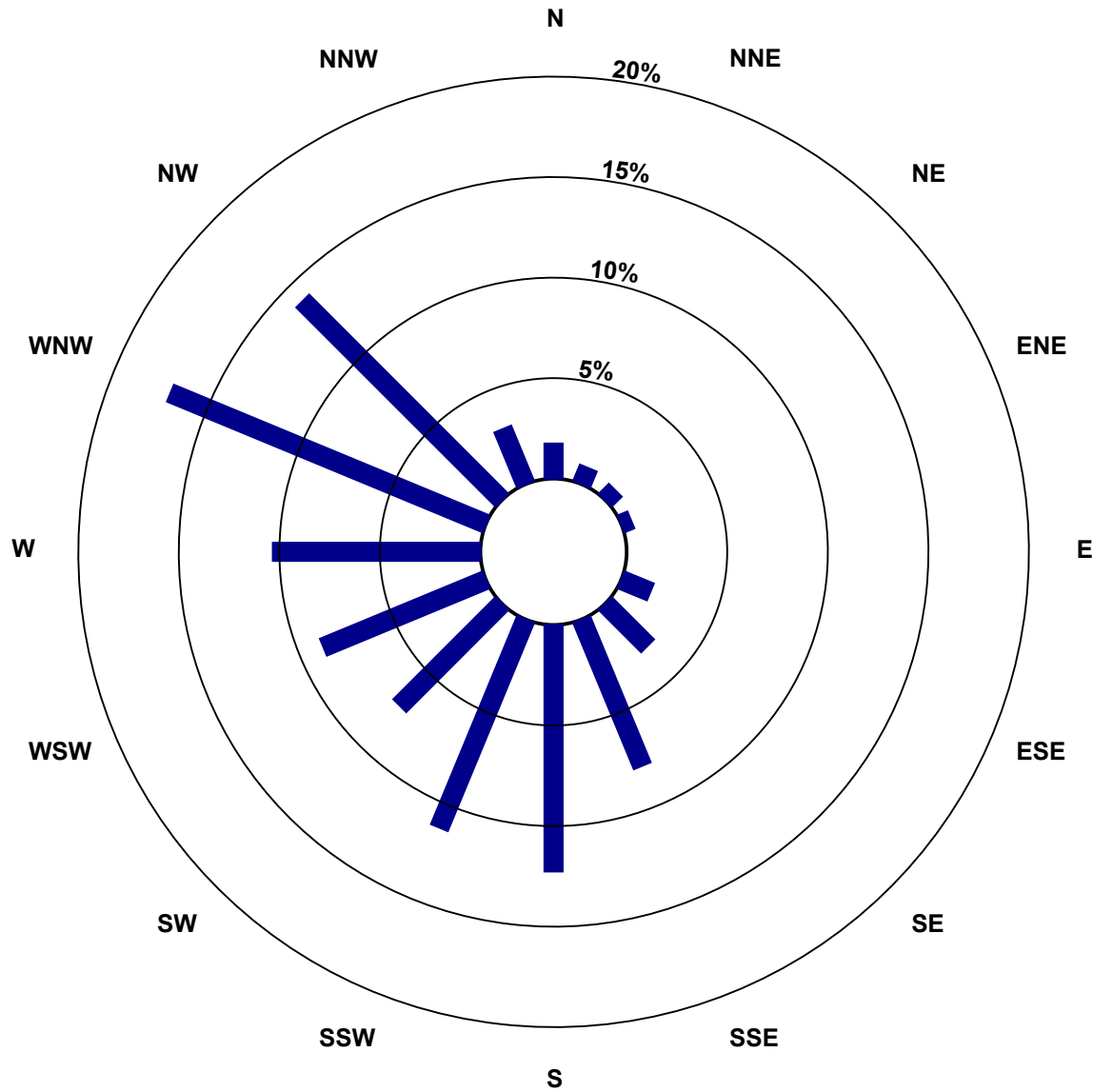
Total Number of Valid Hours: 571

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

Carbon Monoxide (CO) - ppm
Stony Mountain



Total Number of Valid Hours: 571

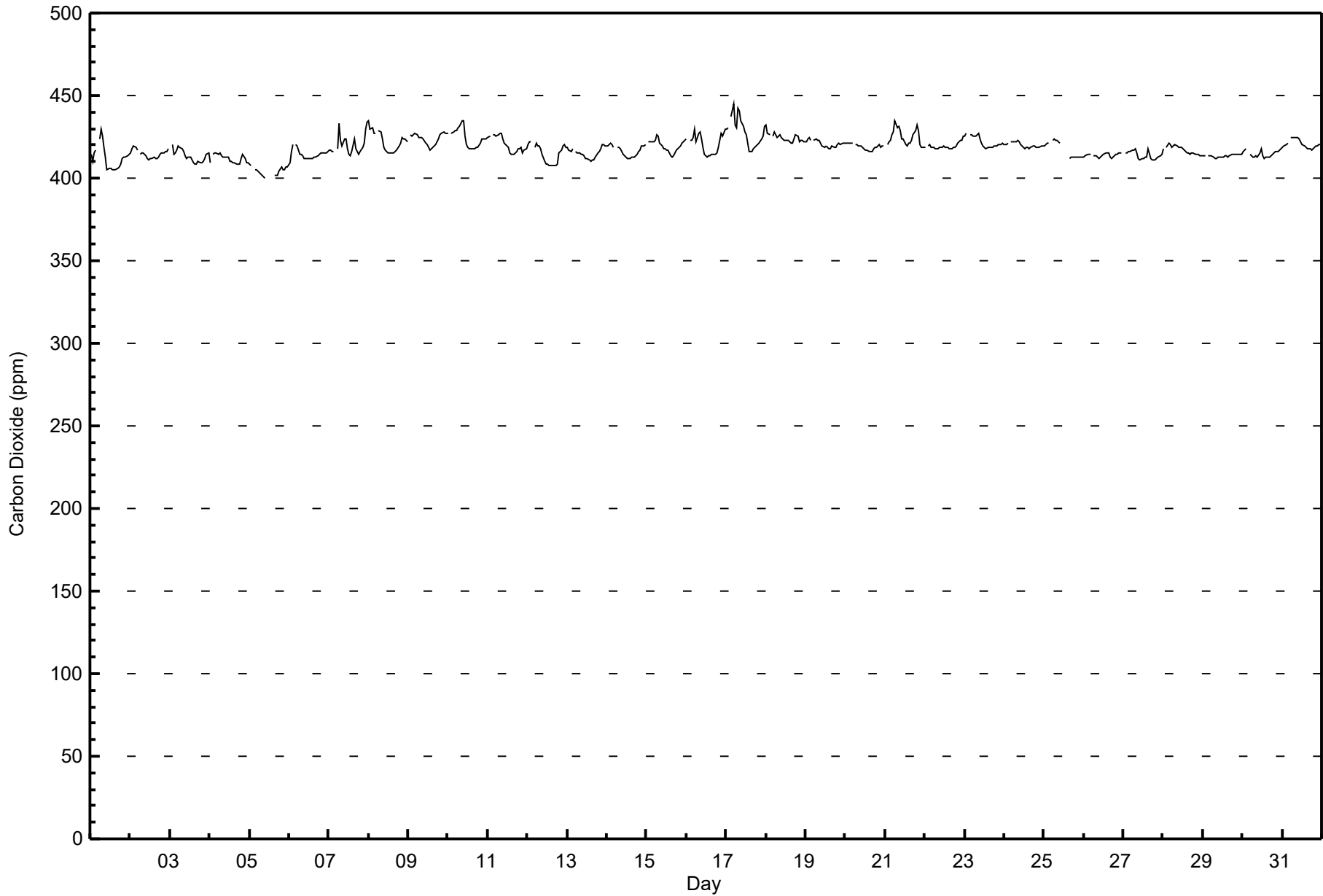


Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service:																	744					
Maximum Value: 445.3 ppm on Oct 17 05:00		Maximum Daily Average: 427.8 ppm on Oct 17																	Hours of Data:		703					
Minimum Value: 400.2 ppm on Oct 5 10:00		Minimum Daily Average: 404.3 ppm on Oct 5																	Hours of Missing Data:		41					
Maximum Diurnal Average: 421.5 ppm at hour 7		Minimum Diurnal Average: 414.3 ppm at hour 17																	Hours of Calibration:		36					
Monthly Average: 418.08 ppm		Percentiles: P ₁ = 403.9 P ₁₀ = 411.6 Q ₁ = 414.0 Median = 418.1 Q ₃ = 421.5 P ₉₀ = 426.0 P ₉₉ = 434.4																	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-Oct	414.6	410.4	414.8	416.9	Z	424.1	429.3	425.7	419.0	412.8	405.0	405.9	405.7	404.9	404.7	405.1	405.6	406.9	408.8	411.5	412.9	412.8	413.8	414.2	412.4	429.3
2-Oct	415.6	417.8	419.2	418.7	416.9	Z	414.8	414.9	414.9	413.7	412.0	410.9	411.4	412.3	412.9	412.1	411.9	412.6	414.3	414.8	415.6	416.0	416.0	417.7	414.7	419.2
3-Oct	Z	420.0	414.7	414.9	416.7	419.8	419.0	418.0	416.5	413.5	412.3	412.4	412.3	411.3	409.0	408.7	408.7	410.1	409.3	408.9	410.1	412.0	414.7	415.3	413.4	420.0
4-Oct	409.2	Z	414.7	415.4	415.2	414.2	415.0	413.8	413.1	412.4	412.4	412.6	410.5	409.8	409.4	409.2	408.7	408.1	408.8	411.6	414.1	411.7	409.2	409.1	411.7	415.4
5-Oct	408.8	407.6	Z	405.4	404.7	403.9	403.3	402.5	401.3	400.2	C	C	C	C	C	401.6	401.5	402.0	404.3	406.7	405.0	404.7	406.6	406.7	404.3	408.8
6-Oct	409.3	416.3	420.4	Z	420.4	419.8	414.7	414.1	413.3	411.6	412.1	412.1	411.6	411.5	411.7	412.3	412.5	413.6	414.4	415.2	415.2	415.5	415.2	415.9	414.3	420.4
7-Oct	416.7	416.8	416.4	416.2	Z	418.1	433.0	422.6	419.7	423.6	424.1	417.4	414.5	413.6	416.2	423.7	417.5	416.3	414.4	415.8	418.3	420.9	429.4	433.8	420.0	433.8
8-Oct	434.7	429.9	430.9	426.9	427.3	Z	428.7	427.8	423.8	418.7	416.8	416.1	415.2	415.2	415.2	415.1	416.4	417.3	419.1	421.4	424.6	424.0	424.0	422.3	422.2	434.7
9-Oct	Z	425.9	425.3	426.2	427.5	426.2	424.7	424.9	424.4	423.7	421.6	420.4	418.8	417.4	417.8	418.5	420.1	421.8	424.0	426.0	427.2	428.0	426.8	426.9	423.7	428.0
10-Oct	427.1	Z	427.2	427.7	428.5	429.2	430.8	431.7	434.4	434.4	425.5	420.4	419.0	418.2	417.9	417.8	417.8	418.5	419.0	420.8	423.6	423.7	423.6	423.8	424.4	434.4
11-Oct	424.5	425.4	Z	426.0	426.0	425.8	426.3	426.9	427.1	424.0	421.0	420.7	418.5	415.6	414.7	414.4	414.0	415.9	418.1	417.8	418.9	415.4	416.7	417.9	420.5	427.1
12-Oct	420.4	422.1	422.4	Z	418.9	421.0	419.8	419.6	418.1	414.8	409.9	408.2	408.1	407.5	407.3	407.2	407.5	407.4	408.7	415.5	416.9	419.4	420.2	418.6	414.8	422.4
13-Oct	418.6	417.1	416.4	417.7	Z	416.5	415.4	415.3	414.5	414.6	413.3	412.1	411.5	410.7	410.4	410.6	411.3	412.7	415.2	416.3	417.5	420.1	420.4	419.7	415.1	420.4
14-Oct	419.5	420.2	421.0	420.1	418.9	Z	418.5	418.6	418.2	416.3	414.1	412.4	411.5	411.7	412.0	412.5	412.6	413.3	414.8	416.2	417.1	419.4	419.6	420.0	416.5	421.0
15-Oct	Z	422.0	422.4	421.7	421.7	422.8	426.4	425.3	421.4	419.2	418.2	417.5	416.8	417.0	413.6	412.8	413.9	415.2	417.2	418.1	419.8	420.8	421.7	423.2	419.5	426.4
16-Oct	423.9	Z	422.9	422.9	424.6	429.5	422.2	426.9	428.0	423.4	418.7	414.8	412.8	413.6	413.2	414.2	414.6	414.3	415.3	418.7	422.8	426.9	425.2	429.6	420.8	429.6
17-Oct	429.5	430.4	Z	437.5	445.3	432.0	430.5	442.5	440.8	435.0	431.1	428.2	426.7	421.4	416.4	415.8	417.8	418.3	419.3	420.4	421.0	423.7	425.7	431.1	427.8	445.3
18-Oct	431.8	427.0	426.6	Z	425.2	427.6	426.3	424.8	426.5	424.9	423.5	422.5	422.8	423.2	422.2	421.0	421.4	424.0	425.9	425.0	422.4	422.9	422.5	422.1	424.4	431.8
19-Oct	422.3	423.9	424.7	422.8	Z	423.2	423.9	422.9	422.5	421.5	419.6	419.0	419.1	418.5	418.0	417.9	419.3	418.7	418.8	419.9	420.9	420.4	420.9	421.1	420.9	424.7
20-Oct	421.0	421.2	421.2	420.9	420.8	Z	420.6	420.3	419.8	419.1	418.5	417.8	417.3	416.6	416.2	415.8	416.4	417.7	418.2	418.9	420.2	419.0	419.3	419.7	419.0	421.2
21-Oct	Z	420.7	422.1	422.9	426.6	427.9	434.3	430.9	431.7	428.8	423.3	423.8	420.7	419.7	420.9	421.3	422.9	426.5	428.5	432.4	428.4	420.5	419.0	418.5	424.9	434.3
22-Oct	418.6	Z	419.8	420.0	418.7	418.3	418.0	418.2	418.2	419.1	418.9	419.4	418.9	418.7	418.2	418.0	418.0	418.5	418.5	419.2	420.8	422.7	423.3	425.2	419.4	425.2
23-Oct	425.0	427.3	Z	426.5	426.2	425.7	425.6	425.7	426.7	423.5	421.5	419.6	418.4	418.2	418.3	418.5	418.4	418.9	419.3	419.8	419.9	420.2	420.5	420.8	421.9	427.3
24-Oct	420.6	420.4	421.0	Z	421.7	422.0	422.2	422.2	422.7	422.0	420.3	418.9	418.1	418.6	418.5	418.0	418.3	419.4	419.6	419.0	418.7	418.8	419.2	419.5	420.0	422.7
25-Oct	419.8	420.2	420.8	421.6	Z	423.2	423.5	422.9	423.2	420.9	M	M	M	M	M	412.0	412.4	412.5	412.8	413.1	412.5	412.7	412.9	413.0	417.2	423.5
26-Oct	413.1	413.5	414.2	414.3	414.5	Z	413.4	413.3	412.9	412.1	412.9	413.7	414.0	415.2	415.1	415.7	413.0	412.2	414.0	414.5	414.7	415.2	415.2	415.3	414.0	415.7
27-Oct	Z	415.6	415.6	416.0	416.5	416.7	417.1	417.8	415.4	411.7	411.4	412.0	411.8	412.4	412.5	417.8	411.9	411.4	410.8	411.1	411.7	412.8	413.5	414.2	413.8	417.8
28-Oct	417.4	Z	418.5	421.4	420.0	418.4	419.5	420.1	419.8	418.8	418.6	418.9	417.9	417.0	415.3	415.0	414.8	415.0	414.9	414.7	414.4	414.0	413.6	413.5	417.0	421.4
29-Oct	413.6	413.6	Z	413.4	413.6	413.6	412.8	411.9	412.2	412.3	412.4	412.3	412.8	413.6	413.3	412.8	413.9	414.3	414.2	414.5	414.1	414.3	414.8	414.3	413.4	414.8
30-Oct	416.5	416.9	417.7	Z	414.7	413.2	412.7	412.6	413.3	412.5	415.3	417.8	413.5	412.2	412.4	412.8	412.8	413.3	414.3	415.0	415.8	416.5	416.9	417.6	414.6	417.8
31-Oct	418.7	419.5	420.3	421.6	Z	424.3	424.7	424.8	424.5	424.4	423.8	422.2	420.6	419.4	418.4	417.4	417.6	418.2	417.4	418.3	419.8	419.9	420.2	420.2	420.7	424.8
419.6 420.1 420.4 420.6 421.2 421.4 421.5 421.3 420.6 418.8 417.5 416.6 415.5 415.0 414.5 414.4 414.3 415.0 415.9 417.1 417.9 418.2 418.7 419.4																								Diurnal Average		
434.7 430.4 430.9 437.5 445.3 432.0 434.3 442.5 440.8 435.0 431.1 428.2 426.7 423.2 422.2 423.7 422.9 426.5 428.5 432.4 428.4 428.0 429.4 433.8																								Diurnal Maximum		
Z - zerospan C - Calibration M - Maintenance																										



Wood Buffalo Environmental Association
Hourly Averages

Carbon Dioxide (CO₂) - ppm
Stony Mountain - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Carbon Dioxide (CO₂) - ppm
Stony Mountain - October 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
400 - 420	490	69.70	69.70
420 - 440	210	29.87	99.57
440 - 460	3	0.43	100.00
460 - 480	0	0.00	100.00
480 - 500	0	0.00	100.00
> 500	0	0.00	100.00

Total Number of Valid Hours: 703

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Carbon Dioxide (CO₂) - ppm
Stony Mountain - October 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	10	3	3	0	0	4	14	39	53	46	28	23	42	81	67	12	425
420 - 440	0	0	1	2	1	4	3	5	22	17	13	25	18	14	7	4	136
440 - 460	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3
460 - 480	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
480 - 500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	11	4	4	2	1	8	17	44	75	63	41	48	60	95	74	17	564

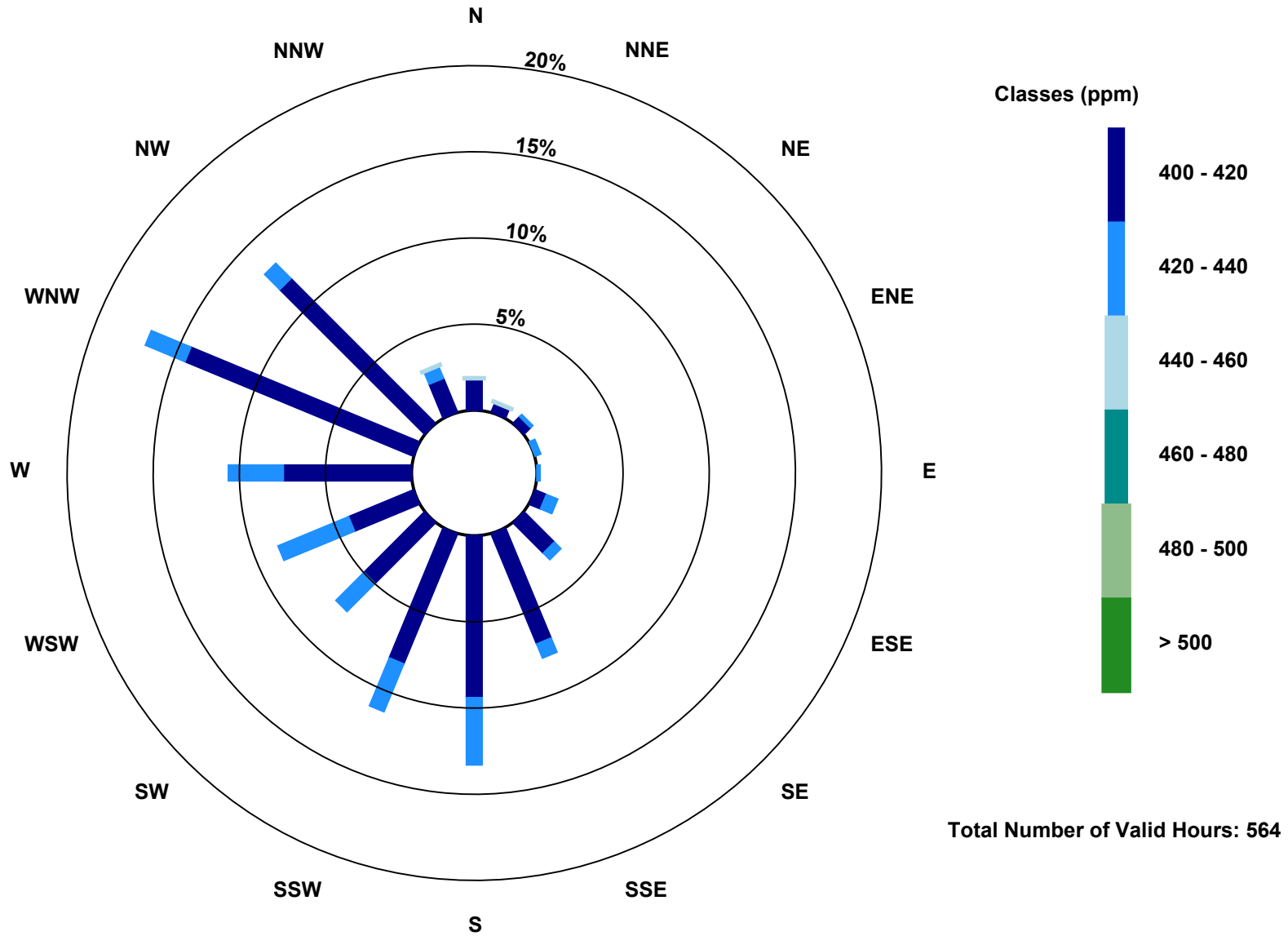
Total Number of Valid Hours: 564

Total Number of Hours: 744



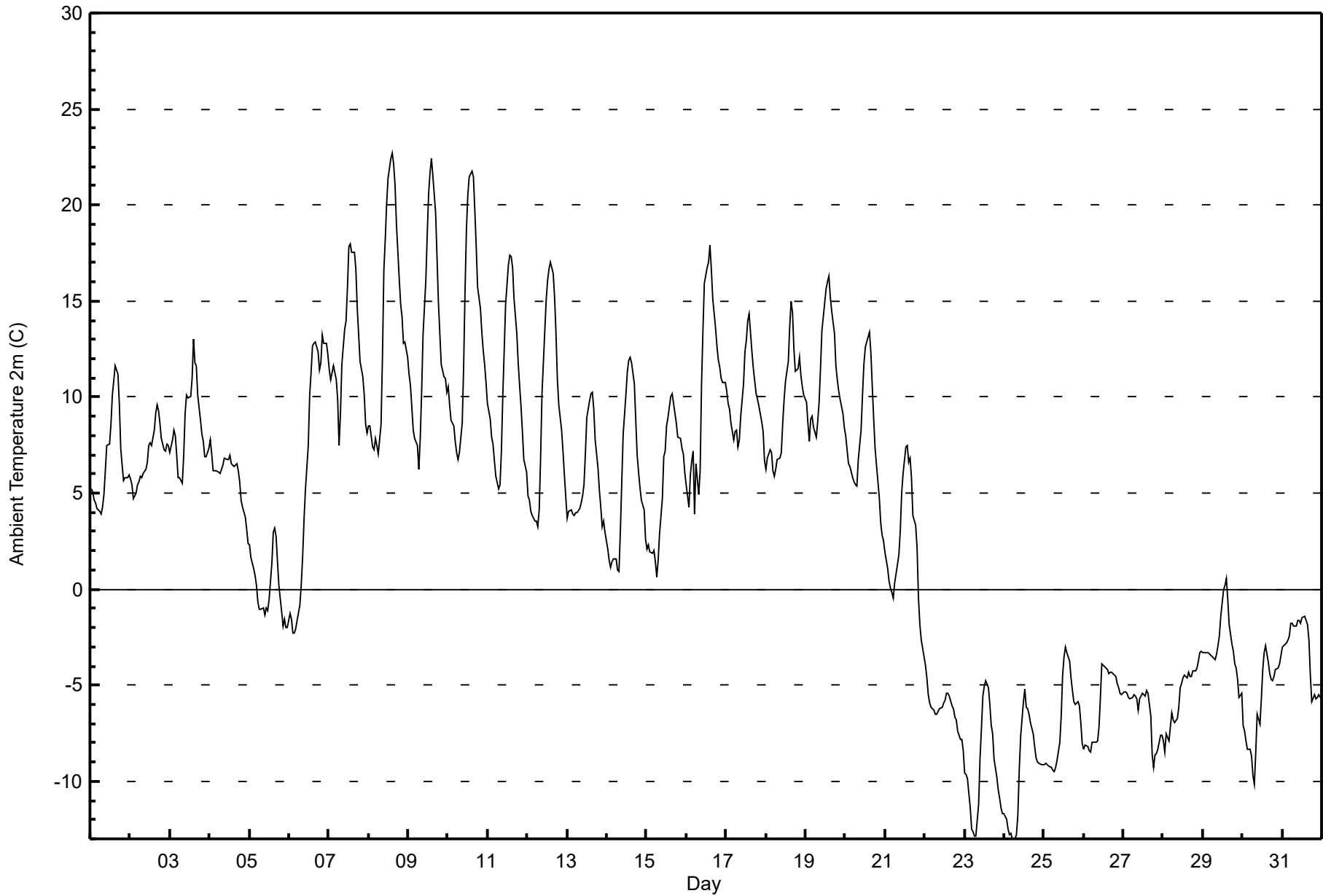
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Carbon Dioxide (CO₂) - ppm
Stony Mountain





Maximum Value: 22.7 C on Oct 8 15:00 Maximum Daily Average: 14.2 C on Oct 8																				Hours in Service: 744 Hours of Data: 744						
Minimum Value: -13.0 C on Oct 24 07:00 Minimum Daily Average: -9.5 C on Oct 24 Maximum Diurnal Average: 8.0 C at hour 15 Minimum Diurnal Average: 0.6 C at hour 7 Monthly Average: 3.69 C Percentiles: P ₁ = -12.6 P ₁₀ = -7.5 Q ₁ = -4.1 Median = 5.5 Q ₃ = 9.7 P ₉₀ = 13.4 P ₉₉ = 21.5																				Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Oct	5.2	5.1	4.7	4.5	4.2	4.0	3.9	4.3	4.9	6.1	7.5	7.6	8.6	10.1	10.8	11.6	11.2	9.7	7.4	6.5	5.7	5.8	5.8	6.0	6.7	11.6
2-Oct	5.7	5.4	4.7	5.0	5.4	5.6	5.9	5.8	6.0	6.2	6.6	7.5	7.6	7.5	8.3	9.2	9.6	9.3	8.6	7.8	7.3	7.2	7.6	7.5	7.0	9.6
3-Oct	7.1	7.8	8.3	8.0	7.0	5.8	5.8	5.5	7.0	9.1	10.1	10.0	10.0	10.9	13.0	11.8	11.7	10.1	8.8	8.1	7.7	6.9	6.9	7.3	8.5	13.0
4-Oct	7.7	7.0	6.2	6.2	6.2	6.1	6.1	6.2	6.4	6.8	6.7	7.0	6.6	6.5	6.4	6.5	6.2	5.6	4.6	4.3	3.7	3.1	2.4	5.9	7.7	
5-Oct	2.3	1.6	1.0	0.7	0.2	-0.7	-1.0	-1.1	-1.0	-1.3	-1.0	-1.1	-0.5	1.4	2.9	3.2	2.7	1.4	0.2	-1.2	-1.9	-1.6	-2.0	-2.0	0.1	3.2
6-Oct	-1.3	-1.6	-2.3	-2.3	-2.1	-1.6	-0.8	0.2	1.8	3.7	5.2	7.5	10.1	11.3	12.6	12.8	12.9	12.3	11.4	11.8	13.2	12.8	12.8	12.3	6.4	13.2
7-Oct	11.4	10.9	11.3	11.7	10.9	9.9	7.5	9.2	11.7	13.5	14.0	15.7	17.8	17.9	17.5	16.6	14.6	13.2	11.8	11.0	10.1	8.6	8.2	12.6	17.9	
8-Oct	8.5	8.5	7.4	7.3	7.8	7.5	7.0	8.6	12.1	16.6	18.2	20.1	21.4	22.4	22.7	22.1	21.0	19.0	16.1	14.8	14.2	12.8	12.9	12.1	14.2	22.7
9-Oct	11.2	10.6	9.5	8.3	7.8	7.4	6.3	7.9	10.2	13.2	16.1	18.5	20.6	21.7	22.4	21.6	19.6	17.2	14.9	13.3	11.7	11.0	11.0	10.3	13.4	22.4
10-Oct	10.5	9.6	8.8	8.5	7.7	7.1	6.8	7.1	8.7	11.6	15.5	18.7	20.5	21.5	21.8	21.4	19.7	17.8	15.7	14.7	13.4	12.4	11.7	10.8	13.4	21.8
11-Oct	9.6	8.8	8.0	7.5	6.7	5.9	5.2	5.4	7.2	10.1	12.4	14.9	16.9	17.4	17.3	16.7	15.2	13.3	11.8	10.7	9.6	8.2	6.7	6.1	10.5	17.4
12-Oct	4.9	4.6	4.1	3.8	3.6	3.6	3.2	4.1	6.8	10.2	13.5	15.0	16.0	16.7	17.0	16.4	15.2	13.3	10.9	9.6	8.3	7.2	5.9	4.8	9.1	17.0
13-Oct	3.7	4.0	4.2	3.9	3.9	4.0	4.0	4.2	4.5	4.8	5.4	7.0	8.9	9.8	10.2	10.3	9.4	7.8	6.3	5.1	4.3	3.2	3.5	3.0	5.6	10.3
14-Oct	2.1	1.5	1.1	1.5	1.6	1.6	1.0	3.0	5.6	8.1	10.2	11.4	12.0	12.1	11.8	10.7	8.8	7.0	6.1	5.3	4.6	4.1	2.6	5.6	12.1	
15-Oct	2.1	2.3	1.9	1.9	2.0	1.5	0.6	1.5	2.9	4.7	6.9	7.2	8.5	8.9	10.1	10.2	9.7	9.2	8.6	7.9	7.9	7.4	7.0	6.1	5.7	10.2
16-Oct	5.4	4.2	6.0	6.7	7.2	3.9	6.6	4.9	6.2	10.7	13.4	16.0	16.8	17.1	17.9	16.7	15.1	13.6	12.6	11.9	11.5	10.9	10.8	10.7	10.7	17.9
17-Oct	10.3	9.7	9.4	8.6	7.8	8.2	8.3	7.4	7.8	9.0	10.7	12.4	12.9	14.0	14.3	12.4	11.5	10.8	10.2	9.9	9.5	8.7	8.2	6.7	9.9	14.3
18-Oct	6.3	6.8	7.2	7.1	6.2	5.9	6.3	6.7	6.8	7.1	8.6	9.9	10.8	11.9	13.7	15.0	14.4	12.5	11.3	11.5	12.1	11.1	10.5	10.1	9.6	15.0
19-Oct	9.7	8.6	7.7	8.9	9.0	8.5	7.9	8.7	9.7	11.5	13.4	14.9	15.6	16.0	16.3	15.2	14.4	13.3	11.6	10.9	10.3	9.9	9.2	8.4	11.2	16.3
20-Oct	8.0	7.2	6.6	6.4	5.8	5.6	5.4	5.4	6.7	8.3	10.1	11.7	12.6	12.9	13.4	12.3	10.6	8.8	7.4	6.5	4.8	3.5	2.8	2.5	7.7	13.4
21-Oct	1.9	1.0	0.4	0.1	-0.2	-0.4	0.3	1.3	1.8	3.1	5.0	6.0	7.4	7.5	6.6	6.8	5.8	3.9	3.3	2.2	-0.4	-1.9	-2.7	-3.5	2.3	7.5
22-Oct	-4.0	-4.6	-5.5	-5.9	-6.2	-6.3	-6.5	-6.5	-6.3	-6.2	-6.2	-5.9	-5.8	-5.5	-5.5	-5.6	-6.1	-6.3	-6.6	-6.8	-7.4	-7.8	-7.9	-8.4	-6.2	-4.0
23-Oct	-9.6	-9.6	-9.8	-11.4	-12.5	-12.6	-12.9	-12.9	-11.2	-8.7	-7.2	-5.6	-5.1	-4.8	-5.1	-6.0	-7.1	-7.5	-8.8	-9.8	-10.5	-10.9	-11.4	-11.7	-9.3	-4.8
24-Oct	-11.7	-12.0	-12.5	-12.8	-12.7	-13.0	-13.0	-12.8	-11.7	-9.4	-7.7	-5.9	-5.2	-6.2	-6.2	-6.5	-6.9	-7.5	-8.2	-8.7	-9.0	-9.1	-9.1	-9.2	-9.5	-5.2
25-Oct	-9.1	-9.1	-9.1	-9.2	-9.3	-9.4	-9.5	-9.3	-8.9	-8.0	-6.6	-4.5	-3.6	-3.0	-3.3	-3.7	-4.6	-5.3	-5.8	-6.0	-5.8	-6.1	-6.9	-8.0	-6.8	-3.0
26-Oct	-8.4	-8.1	-8.2	-8.4	-8.5	-8.0	-7.9	-8.0	-7.9	-7.2	-5.6	-3.9	-4.0	-4.1	-4.2	-4.4	-4.4	-4.3	-4.5	-4.6	-4.9	-5.1	-5.4	-5.5	-6.1	-3.9
27-Oct	-5.4	-5.4	-5.4	-5.7	-5.7	-5.6	-5.5	-5.6	-5.7	-6.3	-5.7	-5.4	-5.5	-5.5	-5.3	-5.4	-6.6	-8.7	-9.3	-8.7	-8.6	-8.3	-7.6	-7.6	-6.4	-5.3
28-Oct	-7.9	-8.5	-7.5	-7.9	-7.2	-6.4	-6.8	-6.9	-6.8	-6.1	-5.1	-4.9	-4.6	-4.5	-4.6	-4.4	-4.6	-4.5	-4.3	-4.2	-4.1	-3.7	-3.3	-3.2	-5.5	-3.2
29-Oct	-3.3	-3.3	-3.3	-3.3	-3.4	-3.4	-3.6	-3.6	-3.4	-2.9	-2.4	-1.4	0.0	0.2	0.5	-0.6	-1.9	-2.9	-3.3	-3.9	-4.1	-4.7	-5.6	-5.4	-2.9	0.5
30-Oct	-7.1	-7.4	-7.9	-8.4	-8.3	-8.7	-9.7	-10.2	-8.5	-6.5	-7.0	-5.7	-4.2	-3.3	-2.9	-3.8	-4.4	-4.7	-4.8	-4.6	-4.2	-4.1	-3.9	-3.5	-6.0	-2.9
31-Oct	-3.0	-2.9	-2.8	-2.7	-2.4	-1.8	-1.8	-1.9	-1.9	-1.6	-1.6	-1.8	-1.5	-1.4	-1.6	-1.8	-2.7	-4.5	-5.8	-5.5	-5.7	-5.6	-5.5	-5.6	-3.1	-1.4
2.0 1.7 1.4 1.2 1.0 0.8 0.6 0.9 1.9 3.5 4.9 6.2 7.2 7.7 8.0 7.7 6.9 5.7 4.6 3.9 3.4 2.9 2.5 2.1																								Diurnal Average		
11.4 10.9 11.3 11.7 10.9 9.9 8.3 9.2 12.1 16.6 18.2 20.1 21.4 22.4 22.7 22.1 21.0 19.0 16.1 14.8 14.2 12.8 12.9 12.3																								Diurnal Maximum		





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature 2m (AT 2m) - C
Stony Mountain - October 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	264	35.48	35.48
0 - 10	301	40.46	75.94
10 - 20	165	22.18	98.12
> 20	14	1.88	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

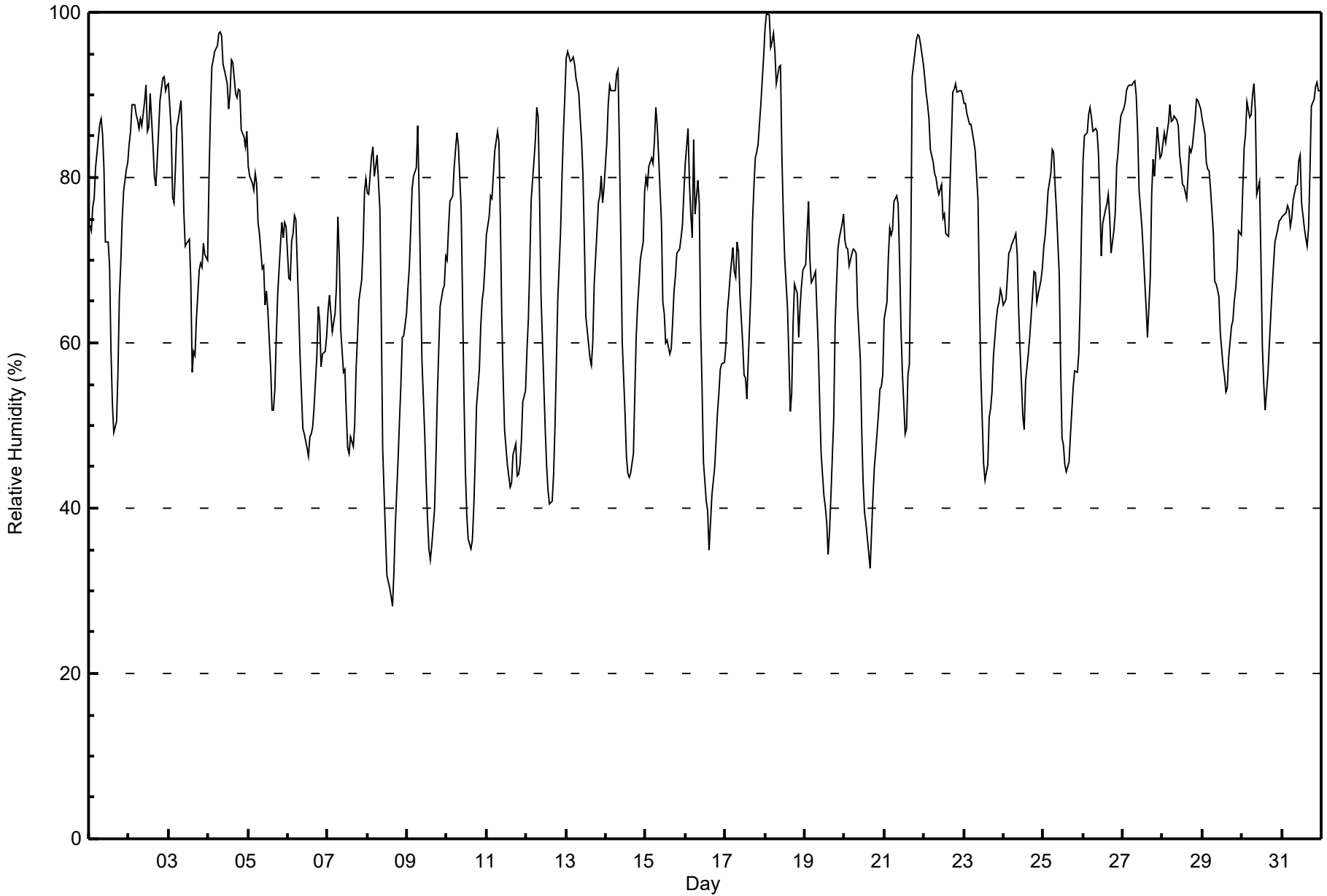


Wood Buffalo Environmental Association

Summary of Hour Averages

**Relative Humidity (RH) - %
Stony Mountain - October 2023**

Maximum Value: 99.9 % on Oct 18 02:00																						Hours in Service: 744				
Maximum Daily Average: 91.0 % on Oct 4																						Hours of Data: 744				
Minimum Value: 28.2 % on Oct 8 16:00																						Hours of Missing Data: 0				
Minimum Daily Average: 54.8 % on Oct 20																						Hours of Calibration: 0				
Maximum Diurnal Average: 82.3 % at hour 7																						Percent Operational Time: 100.0				
Monthly Average: 70.59 %																										
Percentiles: P ₁ = 34.5 P ₁₀ = 47.4 Q ₁ = 59.3 Median = 72.6 Q ₃ = 83.3 P ₉₀ = 90.1 P ₉₉ = 97.1																										
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-Oct	74.3	73.6	76.5	77.4	81.2	84.7	86.4	87.1	85.3	81.0	72.2	72.2	69.3	59.2	52.8	49.2	50.4	56.5	65.5	69.7	75.0	78.4	81.1	81.9	72.5	87.1
2-Oct	84.1	85.6	88.9	88.9	87.6	86.9	85.9	87.1	86.2	89.1	91.1	85.6	86.2	90.3	83.9	80.1	79.1	82.0	85.6	89.3	92.0	92.2	90.4	91.1	87.0	92.2
3-Oct	91.4	85.8	77.7	77.0	81.0	86.2	87.0	89.3	84.0	75.9	71.6	72.1	72.6	67.5	56.5	59.0	58.4	62.9	68.7	69.6	69.1	72.1	70.7	70.1	74.0	91.4
4-Oct	80.0	87.6	93.3	94.3	95.3	96.0	97.5	97.6	97.1	93.8	92.3	91.3	88.2	90.2	94.3	94.0	90.2	89.6	90.7	90.5	85.7	85.0	83.7	85.6	91.0	97.6
5-Oct	81.4	80.2	79.3	78.5	80.6	79.3	74.6	73.2	68.9	69.3	64.6	66.3	63.9	56.9	51.8	51.8	54.4	60.5	65.8	71.9	74.6	72.7	74.6	74.0	69.5	81.4
6-Oct	67.8	67.6	72.4	73.3	75.4	74.9	64.2	58.3	53.9	49.7	48.9	47.3	46.2	48.7	49.1	49.8	52.2	58.4	64.4	62.7	57.1	58.7	59.0	60.9	59.2	75.4
7-Oct	63.9	65.7	63.5	61.4	63.5	67.0	75.2	70.6	61.7	56.4	56.9	51.6	47.2	46.5	48.7	47.5	50.1	56.7	60.7	65.1	67.6	71.7	78.3	79.8	61.6	79.8
8-Oct	78.1	78.0	82.6	83.8	80.2	81.4	82.8	76.1	62.7	47.2	41.8	36.8	31.8	30.3	29.3	28.2	32.1	38.0	46.0	50.6	54.9	60.6	60.8	63.6	56.6	83.8
9-Oct	66.6	69.2	73.7	78.6	80.1	81.2	86.3	77.9	68.0	58.0	49.0	43.5	38.6	35.1	33.7	35.4	39.9	45.9	53.6	59.1	64.4	66.4	66.9	70.4	60.1	86.3
10-Oct	70.0	74.0	77.2	77.8	81.2	83.4	85.4	83.9	76.2	65.4	53.7	44.6	39.3	36.3	35.1	36.1	40.0	45.5	52.3	56.7	62.0	65.1	66.4	69.3	61.5	85.4
11-Oct	73.1	75.3	77.9	77.4	80.3	83.2	85.5	84.2	74.9	63.2	55.6	49.5	45.3	43.8	42.6	43.1	46.4	47.7	43.8	44.1	45.3	48.2	52.9	54.2	59.9	85.5
12-Oct	59.1	63.0	69.6	77.2	82.0	84.6	88.5	87.2	77.4	65.9	55.1	49.7	45.3	42.2	40.6	40.9	44.1	49.8	57.6	65.3	73.6	79.9	85.5	89.7	65.6	89.7
13-Oct	94.5	95.3	94.0	94.3	94.5	93.7	92.1	90.2	87.1	84.4	80.2	72.3	63.2	59.8	58.2	57.3	60.2	67.1	73.5	76.9	77.8	80.2	77.0	78.8	79.3	95.3
14-Oct	84.2	88.8	91.2	90.4	90.6	90.5	92.5	93.0	83.8	72.6	60.2	51.6	46.3	44.2	43.7	44.2	46.6	53.8	60.9	64.5	67.3	70.2	72.2	78.3	70.1	93.0
15-Oct	80.0	78.9	81.4	82.3	81.7	84.4	88.5	86.3	82.5	74.5	65.0	63.6	60.1	60.3	58.6	59.4	62.6	66.3	68.2	70.9	71.4	72.7	74.2	78.2	73.0	88.5
16-Oct	81.7	85.9	79.3	75.5	72.8	84.6	75.6	79.6	76.9	62.0	54.6	45.6	40.8	39.6	34.9	38.2	41.4	44.9	48.1	51.5	53.9	56.8	57.5	57.6	60.0	85.9
17-Oct	59.7	63.6	65.6	67.9	71.5	68.7	68.1	72.1	71.0	66.0	60.0	56.2	55.7	53.3	58.0	66.9	74.5	78.8	82.3	83.0	84.1	88.9	91.9	94.8	71.0	94.8
18-Oct	98.1	99.9	99.6	95.8	96.5	97.5	95.2	91.3	93.4	93.5	82.5	75.6	70.1	64.2	58.2	51.7	54.0	62.3	67.2	66.0	60.7	64.4	67.0	68.9	78.1	99.9
19-Oct	69.4	73.3	77.1	69.9	67.4	67.7	68.7	63.8	59.4	52.5	46.6	41.6	40.1	38.3	34.3	37.1	41.5	50.8	62.2	67.1	71.4	72.6	74.4	75.6	59.3	77.1
20-Oct	72.5	71.5	71.4	69.4	70.9	71.3	71.2	70.8	64.4	57.9	49.3	43.0	39.5	38.1	34.6	32.7	36.9	41.4	44.9	46.9	51.5	54.5	54.7	56.1	54.8	72.5
21-Oct	62.9	64.9	70.3	73.9	73.1	73.7	77.1	77.8	76.8	70.2	61.8	56.5	49.0	49.6	56.1	57.4	69.8	92.2	95.0	96.6	97.3	97.1	96.2	93.7	74.5	97.3
22-Oct	92.0	90.3	88.7	87.2	83.4	81.9	80.6	80.1	78.8	77.9	79.2	75.1	75.6	73.3	73.0	72.9	84.5	90.3	90.6	91.3	90.4	90.6	90.5	89.9	83.7	92.0
23-Oct	88.9	89.0	87.8	86.4	86.5	85.4	84.4	83.3	77.3	65.9	56.3	50.9	45.4	43.4	45.2	51.0	52.0	54.0	58.4	62.8	64.2	65.0	66.4	65.7	67.3	89.0
24-Oct	64.5	65.3	68.0	70.9	71.1	71.9	72.6	73.3	70.6	64.0	59.3	51.2	49.4	55.5	57.2	58.9	60.9	66.0	68.6	68.5	65.0	66.0	67.7	69.2	64.8	73.3
25-Oct	71.7	73.1	75.4	78.4	80.4	83.4	83.1	79.2	76.0	68.3	57.1	48.5	47.7	45.3	44.5	45.6	48.8	51.8	54.7	56.7	56.5	58.8	65.3	74.7	63.5	83.4
26-Oct	82.0	85.0	85.4	87.6	88.6	87.3	85.7	85.9	85.5	82.8	77.2	70.5	74.4	76.2	76.8	77.9	75.3	70.9	73.6	75.8	81.4	83.1	85.8	87.5	80.9	88.6
27-Oct	88.4	89.0	90.6	91.0	91.1	91.1	91.5	91.7	89.9	85.5	78.4	74.1	71.1	67.6	64.4	60.6	68.0	78.0	82.2	80.1	83.1	86.1	82.4	82.7	81.6	91.7
28-Oct	84.1	85.4	84.3	86.7	88.9	86.8	86.9	87.5	86.9	86.2	82.7	81.2	79.1	79.0	77.4	80.4	83.6	83.0	83.7	87.1	89.5	89.4	88.9	88.3	84.9	89.5
29-Oct	87.2	85.2	81.8	81.1	80.9	78.7	73.4	67.5	67.2	66.4	65.5	61.1	57.1	55.8	54.0	54.6	58.4	62.1	62.7	65.0	66.5	68.9	73.6	73.1	68.7	87.2
30-Oct	78.4	83.6	85.2	89.2	87.3	87.6	90.0	91.3	88.2	78.0	79.5	70.4	59.6	55.1	51.9	56.3	59.9	63.3	66.6	69.4	72.2	73.8	74.7	75.0	74.4	91.3
31-Oct	75.3	75.4	75.7	76.7	76.1	74.0	75.1	77.3	79.0	79.1	82.1	82.7	77.0	73.9	72.7	71.7	73.9	80.7	88.7	89.5	91.1	91.5	90.5	90.5	80.0	91.5
	77.6	79.0	80.2	80.6	81.3	82.2	82.3	81.1	77.1	71.0	65.5	60.7	57.3	55.5	53.9	54.5	57.7	62.9	67.3	69.8	71.5	73.6	74.9	76.4		Diurnal Average
	98.1	99.9	99.6	95.8	96.5	97.5	97.5	97.6	97.1	93.8	92.3	91.3	88.2	90.3	94.3	94.0	90.2	92.2	95.0	96.6	97.3	97.1	96.2	94.8		Diurnal Maximum



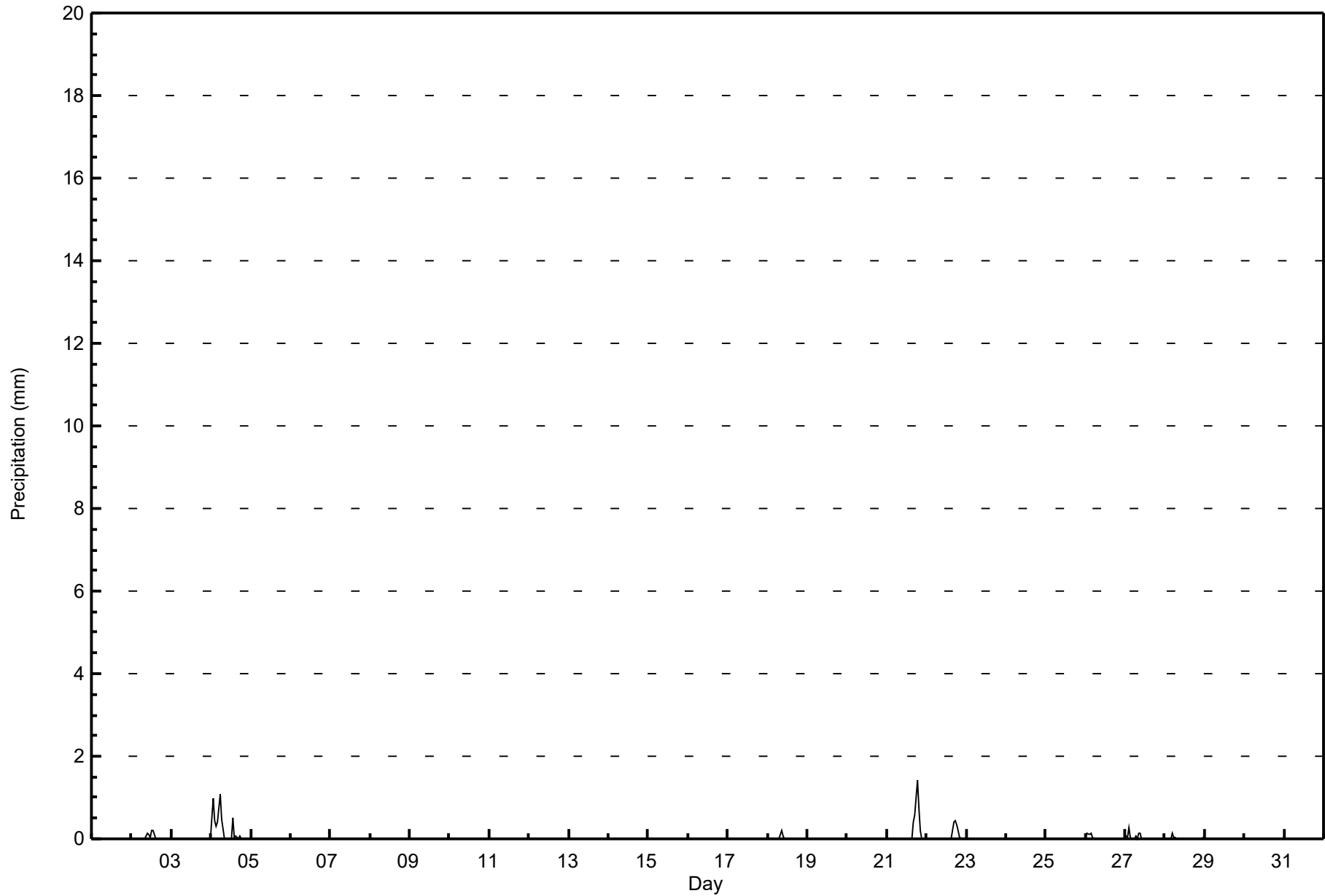


Maximum Value: 1.4 mm on Oct 21 19:00																				Maximum Daily Total: 5.1 mm on Oct 4					Hours in Service: 744																								
Minimum Value: 0.0 mm on Oct 1 01:00																				Minimum Daily Total: 0.0 mm on Oct 1					Hours of Data: 743																								
Maximum Diurnal Total: 1.8 mm at hour 19																				Minimum Diurnal Total: 0.0 mm at hour 22					Hours of Missing Data: 1																								
Monthly Total: 12.29 mm																				Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.0 P ₉₉ = 0.5					Hours of Calibration: 0																								
																									Percent Operational Time: 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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.2													
3-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.5	1.0	0.4	0.3	0.4	1.1	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.5	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	5.1	1.1														
5-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2														
19-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.6	1.4	0.8	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	3.3	1.4														
22-Oct	0.0	0.0	0.0	0.0	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	0.4	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	1.5	0.4														
23-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.1														
27-Oct	0.1	0.1	0.3	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.3														
28-Oct	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.3	0.2															
29-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0														
																								0.6	1.2	0.8	0.5	0.6	1.1	0.6	0.2	0.3	0.4	0.1	0.1	0.2	0.7	0.0	0.1	0.8	1.1	1.8	1.0	0.2	0.0	0.0	0.1	Diurnal Average	
																								0.5	1.0	0.4	0.3	0.4	1.1	0.5	0.2	0.2	0.2	0.1	0.1	0.2	0.5	0.0	0.1	0.4	0.6	1.4	0.8	0.2	0.0	0.0	0.1	Diurnal Maximum	
M - Maintenance																																																	



Wood Buffalo Environmental Association
Hourly Averages

Precipitation (PC) - mm
Stony Mountain - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Precipitation (PC) - mm
Stony Mountain - October 2023

Concentration Ranges (mm)	Number of Hours	%	Cumulative %
0 - 0.3	730	98.25	98.25
0.4 - 0.5	8	1.08	99.33
0.6 - 0.7	1	0.13	99.46
0.8 - 1.4	4	0.54	100.00
1.5 - 10	0	0.00	100.00
> 10	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744



Wood Buffalo Environmental Association

Summary of Hour Averages

Leaf Wetness (LW) - %

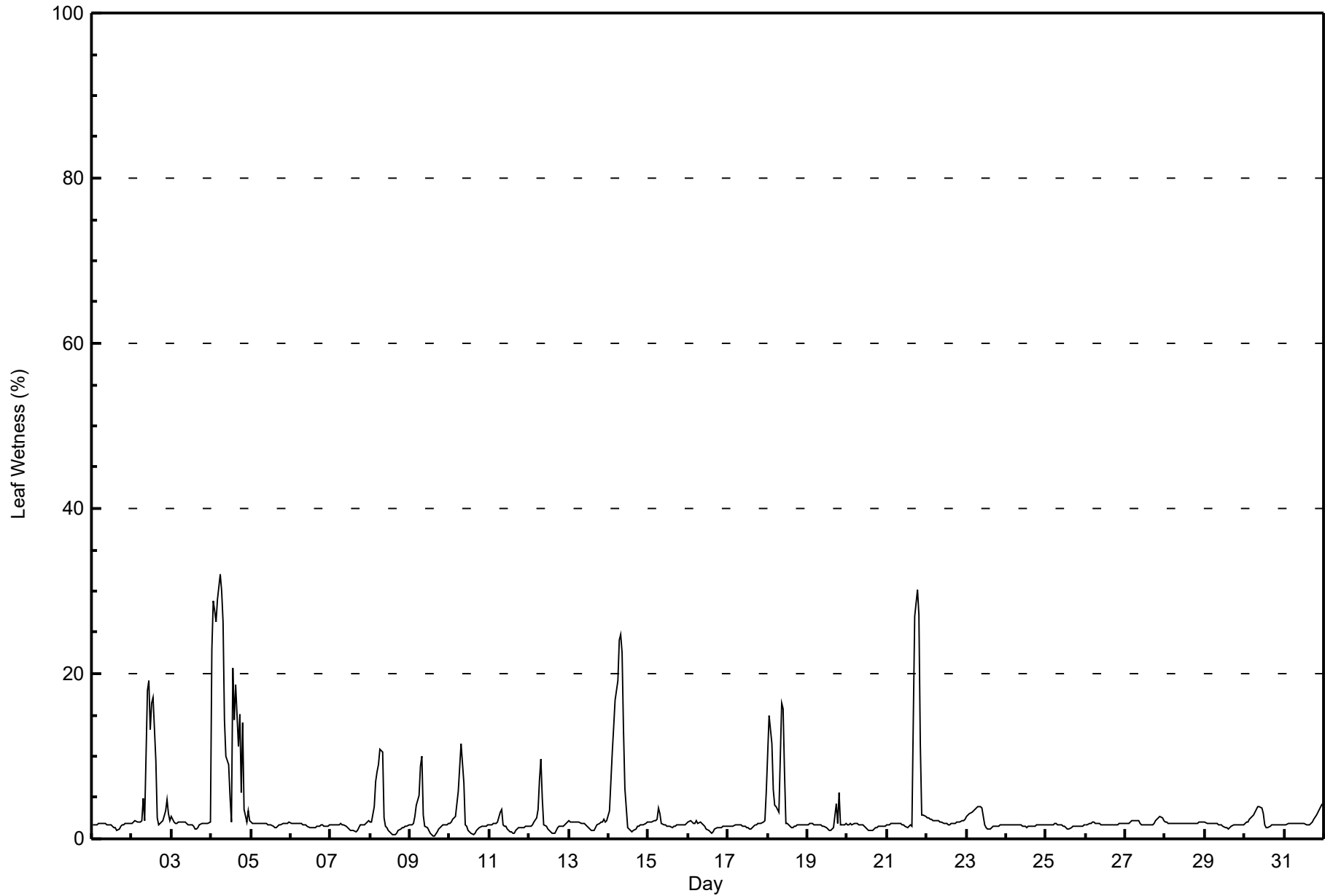
Stony Mountain - October 2023

Maximum Value: 32.1 % on Oct 4 06:00																				Maximum Daily Average: 15.6 % on Oct 4					Hours in Service:	744																						
Minimum Value: 0.3 % on Oct 9 15:00																				Minimum Daily Average: 1.5 % on Oct 20					Hours of Data:	744																						
Maximum Diurnal Average: 4.8 % at hour 8																				Minimum Diurnal Average: 1.8 % at hour 16					Hours of Missing Data:	0																						
Monthly Average: 2.91 %																				Percentiles: P ₁ = 0.6 P ₁₀ = 1.3 Q ₁ = 1.6 Median = 1.8 Q ₃ = 2.0 P ₉₀ = 3.9 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-Oct	1.8	1.7	1.8	1.8	1.8	1.9	1.9	1.9	1.8	1.7	1.6	1.7	1.6	1.3	1.3	1.0	1.2	1.5	1.7	1.7	1.8	1.8	1.8	1.9	1.7	1.9																						
2-Oct	1.9	2.0	2.1	2.0	2.0	2.0	2.2	4.9	2.3	17.9	19.2	13.3	16.4	17.2	9.5	2.6	1.8	1.9	2.0	2.3	3.4	4.8	3.0	2.2	5.8	19.2																						
3-Oct	2.7	2.1	1.9	1.9	2.0	2.1	2.1	2.1	2.0	1.9	1.8	1.7	1.7	1.6	1.1	1.3	1.3	1.6	1.8	1.9	1.8	1.9	1.8	2.1	1.8	2.7																						
4-Oct	22.8	28.8	27.6	26.2	28.9	32.1	30.0	26.2	14.4	10.1	9.0	5.1	2.1	20.6	14.4	18.7	11.3	15.0	5.6	14.1	3.6	2.1	3.4	2.1	15.6	32.1																						
5-Oct	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.7	1.5	1.3	1.4	1.4	1.4	1.7	1.7	1.8	1.9	1.9	1.9	2.0	1.8	2.0																						
6-Oct	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.7	1.7	1.6	1.5	1.4	1.3	1.3	1.3	1.3	1.5	1.5	1.7	1.7	1.6	1.6	1.6	1.6	1.6	1.8																						
7-Oct	1.7	1.7	1.7	1.7	1.7	1.8	1.8	1.8	1.7	1.5	1.4	1.2	0.9	1.0	1.1	0.9	1.0	1.4	1.6	1.7	1.8	1.8	2.0	2.2	1.5	2.2																						
8-Oct	2.0	2.1	4.0	7.0	8.1	9.0	10.9	10.6	2.5	1.5	1.3	1.0	0.8	0.6	0.5	0.6	0.7	1.0	1.3	1.3	1.4	1.5	1.6	1.6	3.0	10.9																						
9-Oct	1.7	1.8	1.9	2.8	4.1	5.2	8.8	10.0	2.9	1.5	1.4	1.0	0.7	0.5	0.3	0.4	0.8	1.2	1.4	1.5	1.6	1.7	1.8	1.8	2.4	10.0																						
10-Oct	1.8	2.0	2.3	2.8	4.2	5.8	8.7	11.5	6.9	1.7	1.5	1.1	0.9	0.7	0.5	0.6	1.0	1.2	1.3	1.4	1.5	1.6	1.6	1.6	2.7	11.5																						
11-Oct	1.7	1.8	1.9	1.8	1.9	2.1	3.1	3.5	1.8	1.6	1.4	1.1	0.9	0.8	0.7	0.7	1.0	1.3	1.3	1.4	1.4	1.4	1.4	1.5	1.6	3.5																						
12-Oct	1.6	1.6	1.7	2.0	2.5	3.6	7.1	9.6	5.0	1.6	1.5	1.2	1.0	0.8	0.7	0.8	1.0	1.3	1.5	1.5	1.6	1.7	1.8	2.1	2.3	9.6																						
13-Oct	2.3	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.8	1.7	1.6	1.3	1.1	0.9	1.0	1.3	1.6	1.8	2.1	2.0	2.3	2.1	2.2	1.8	2.3																						
14-Oct	3.5	6.9	10.5	13.6	16.7	19.2	24.1	24.7	22.6	13.3	6.0	1.4	1.2	1.0	0.9	0.9	1.2	1.5	1.6	1.7	1.7	1.7	1.8	2.0	7.5	24.7																						
15-Oct	2.0	2.0	2.1	2.2	2.2	2.4	3.7	3.1	1.9	1.7	1.6	1.6	1.5	1.5	1.4	1.5	1.6	1.6	1.7	1.7	1.7	1.8	1.8	1.9	1.9	3.7																						
16-Oct	2.0	2.2	2.0	1.9	1.9	2.2	1.9	2.0	1.9	1.7	1.5	1.2	1.0	0.9	0.7	0.8	1.2	1.3	1.4	1.4	1.4	1.5	1.5	1.5	1.5	2.2																						
17-Oct	1.5	1.5	1.6	1.6	1.6	1.7	1.7	1.7	1.6	1.6	1.5	1.4	1.4	1.3	1.1	1.4	1.6	1.7	1.8	1.9	1.9	2.1	2.2	5.8	1.8	5.8																						
18-Oct	10.4	14.9	11.5	6.0	4.0	3.9	3.5	3.2	16.4	15.8	8.1	1.8	1.8	1.6	1.4	1.4	1.4	1.6	1.7	1.7	1.6	1.7	1.7	1.7	4.9	16.4																						
19-Oct	1.8	1.8	1.9	1.8	1.8	1.8	1.8	1.7	1.7	1.6	1.5	1.3	1.2	1.0	1.0	1.2	1.3	4.3	1.9	5.6	1.7	1.8	1.8	1.8	1.9	5.6																						
20-Oct	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.7	1.6	1.5	1.4	1.2	1.1	0.9	1.0	1.2	1.4	1.4	1.5	1.5	1.6	1.6	1.6	1.5	1.8																						
21-Oct	1.7	1.7	1.8	1.9	1.9	1.9	1.9	1.8	1.8	1.7	1.6	1.6	1.4	1.4	1.6	1.6	14.5	27.0	30.1	27.1	11.5	3.0	2.8	2.7	6.1	30.1																						
22-Oct	2.6	2.5	2.4	2.3	2.2	2.2	2.2	2.1	2.1	2.0	1.9	1.9	1.8	1.8	1.8	1.8	1.9	1.9	2.0	2.0	2.1	2.2	2.3	2.4	2.1	2.6																						
23-Oct	2.6	2.9	3.0	3.2	3.4	3.6	3.8	3.9	3.9	3.7	2.7	1.6	1.4	1.2	1.2	1.3	1.5	1.5	1.5	1.6	1.6	1.6	1.6	1.7	2.3	3.9																						
24-Oct	1.6	1.6	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.6	1.6	1.5	1.4	1.5	1.5	1.5	1.6	1.6	1.6	1.6	1.6	1.6	1.7	1.7	1.6	1.7																						
25-Oct	1.7	1.7	1.7	1.7	1.8	1.8	1.8	1.8	1.7	1.7	1.6	1.5	1.4	1.2	1.3	1.3	1.4	1.5	1.5	1.5	1.5	1.5	1.6	1.7	1.6	1.8																						
26-Oct	1.7	1.8	1.8	1.9	2.1	2.0	1.8	1.8	1.8	1.8	1.7	1.6	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.8	1.8	1.8	1.9	1.8	2.1																						
27-Oct	1.9	1.9	1.9	2.0	2.2	2.2	2.2	2.2	2.1	1.9	1.8	1.7	1.7	1.7	1.7	1.6	1.7	1.9	2.1	2.4	2.5	2.7	2.6	2.2	2.0	2.7																						
28-Oct	2.1	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	1.9	2.1																						
29-Oct	2.0	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.7	1.7	1.6	1.4	1.3	1.2	1.3	1.6	1.6	1.6	1.6	1.7	1.7	1.7	1.7	1.7	2.0																						
30-Oct	1.9	2.0	2.0	2.4	2.6	3.0	3.3	3.6	3.9	3.9	3.8	3.1	1.6	1.3	1.3	1.6	1.7	1.7	1.7	1.7	1.7	1.8	1.8	1.8	2.3	3.9																						
31-Oct	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	2.1	2.4	2.8	3.2	3.6	4.0	4.3	2.2	4.3																						
																								2.9	3.4	3.4	3.5	3.8	4.1	4.7	4.8	3.8	3.5	2.9	2.0	1.9	2.4	1.9	1.8	2.1	2.9	2.7	3.1	2.2	2.0	2.0	2.1	Diurnal Average
																								22.8	28.8	27.6	26.2	28.9	32.1	30.0	26.2	22.6	17.9	19.2	13.3	16.4	20.6	14.4	18.7	14.5	27.0	30.1	27.1	11.5	4.8	4.0	5.8	Diurnal Maximum



Wood Buffalo Environmental Association
Hourly Averages

Leaf Wetness (LW) - %
Stony Mountain - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Leaf Wetness (LW) - %
Stony Mountain - October 2023

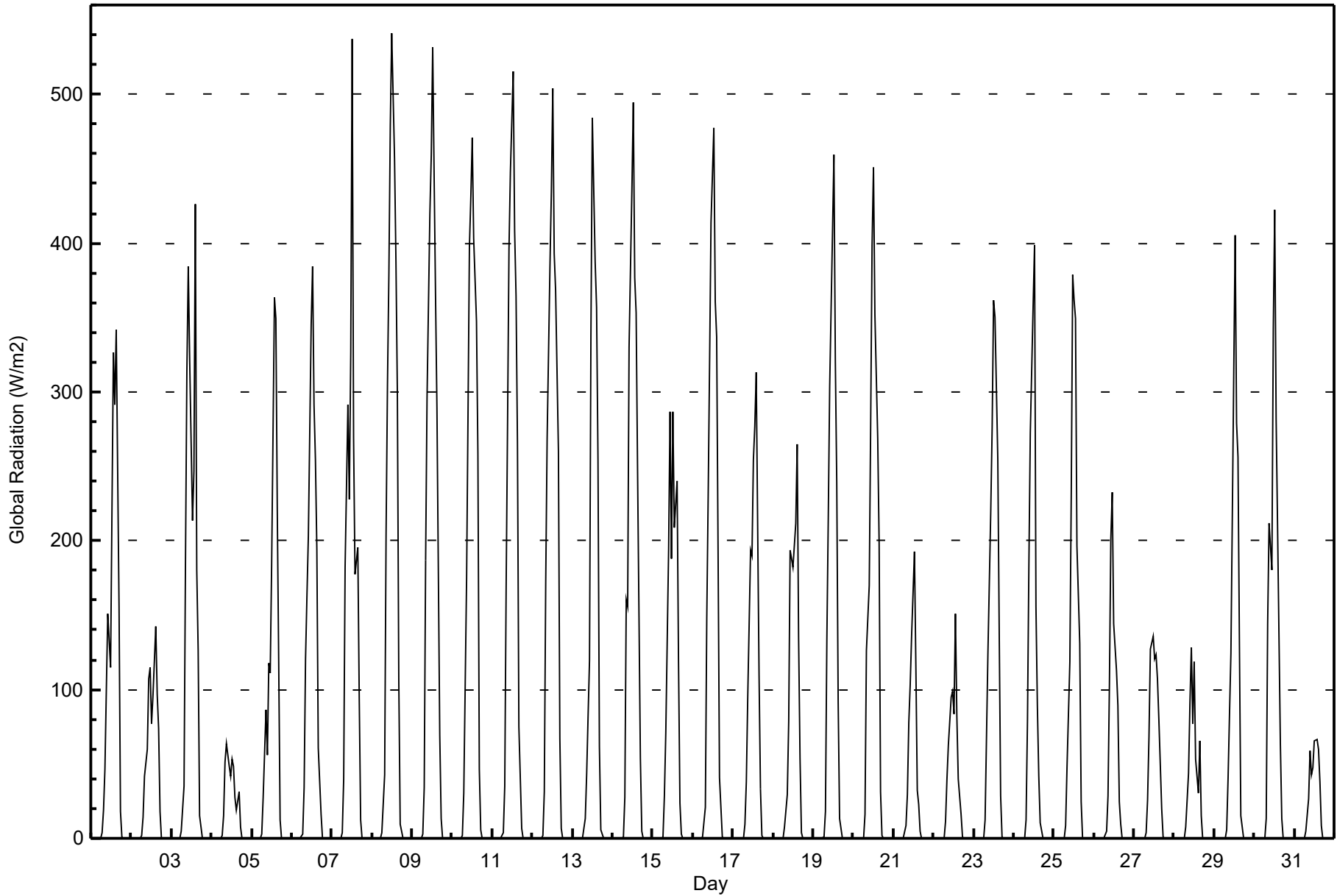
Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 0.3	1	0.13	0.13
0.4 - 0.5	4	0.54	0.67
0.6 - 0.7	10	1.34	2.02
0.8 - 1.4	119	15.99	18.01
1.5 - 10	545	73.25	91.26
> 10	42	5.65	96.91

Total Number of Valid Hours: 744

Total Number of Hours: 744



Maximum Value: 541.4 W/m2 on Oct 8 13:00																				Maximum Daily Average: 133.9 W/m2 on Oct 8					Hours in Service: 744	
Minimum Value: 0.0 W/m2 on Oct 3 03:00																				Minimum Daily Average: 17.1 W/m2 on Oct 4					Hours of Data: 744	
Maximum Diurnal Average: 322.6 W/m2 at hour 13																				Minimum Diurnal Average: 0.0 W/m2 at hour 20					Hours of Missing Data: 0	
Monthly Average: 75.30 W/m2																				Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.2 Q ₃ = 106.7 P ₉₀ = 290.4 P ₉₉ = 478.7					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-Oct	0.0	0.0	0.0	0.0	0.0	0.0	3.3	18.7	46.2	99.6	151.0	115.1	221.9	326.6	290.9	341.7	154.8	18.3	0.6	0.0	0.0	0.0	0.0	0.0	74.5	341.7
2-Oct	0.0	0.0	0.0	0.0	0.0	0.0	2.3	14.7	42.1	59.9	107.1	114.9	77.3	95.8	142.5	96.9	74.2	18.3	0.4	0.0	0.0	0.0	0.0	0.0	35.3	142.5
3-Oct	0.0	0.0	0.0	0.0	0.0	0.0	4.4	35.3	183.2	313.4	384.7	320.5	214.0	247.0	426.5	180.1	126.7	15.2	0.3	0.0	0.0	0.0	0.0	0.0	102.1	426.5
4-Oct	0.0	0.0	0.0	0.0	0.0	0.0	1.7	15.1	51.2	63.7	48.2	41.8	53.1	48.3	28.0	19.0	31.1	8.1	0.0	0.0	0.0	0.0	0.0	0.0	17.1	63.7
5-Oct	0.0	0.0	0.0	0.0	0.0	0.0	3.0	27.9	86.0	56.4	117.3	111.1	183.2	363.4	349.3	219.8	118.2	12.6	0.1	0.0	0.0	0.0	0.1	0.1	68.7	363.4
6-Oct	0.2	0.0	0.0	0.0	0.0	0.0	2.9	34.5	120.2	163.1	203.1	345.1	384.7	291.1	254.1	194.9	61.1	15.9	0.1	0.0	0.0	0.0	0.0	0.0	86.3	384.7
7-Oct	0.0	0.0	0.0	0.0	0.0	0.0	3.5	39.5	182.6	291.8	227.5	326.2	537.1	270.0	177.4	195.7	94.9	12.3	0.0	0.0	0.0	0.0	0.0	0.0	98.3	537.1
8-Oct	0.0	0.0	0.0	0.0	0.0	0.0	3.8	42.7	204.1	305.3	379.8	479.5	541.4	456.2	386.9	299.0	106.6	9.2	0.0	0.0	0.0	0.0	0.0	0.0	133.9	541.4
9-Oct	0.0	0.1	0.1	0.0	0.0	0.0	2.8	33.7	186.7	295.7	419.4	459.8	531.5	446.4	365.3	289.2	69.6	13.2	0.0	0.0	0.0	0.0	0.0	0.0	129.7	531.5
10-Oct	0.0	0.0	0.0	0.0	0.0	0.0	2.4	30.4	175.0	284.6	397.2	431.0	471.1	403.5	347.5	258.5	46.3	5.9	0.0	0.0	0.0	0.0	0.0	0.0	118.9	471.1
11-Oct	0.0	0.0	0.0	0.0	0.0	0.0	3.7	35.0	170.1	280.4	395.8	448.2	515.5	408.4	364.4	265.8	74.7	6.7	0.0	0.0	0.0	0.0	0.0	0.0	123.7	515.5
12-Oct	0.0	0.0	0.0	0.0	0.1	0.0	1.9	31.2	172.3	268.4	384.3	434.9	504.5	393.1	368.6	260.2	67.8	6.7	0.0	0.0	0.0	0.0	0.0	0.0	120.6	504.5
13-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.4	13.1	43.7	83.0	119.8	338.0	484.3	386.8	356.5	254.6	61.5	6.0	0.0	0.0	0.0	0.0	0.0	0.0	89.5	484.3
14-Oct	0.0	0.0	0.0	0.0	0.0	0.0	1.3	27.1	160.2	156.1	330.6	435.6	494.4	376.7	353.5	248.8	54.3	5.1	0.0	0.0	0.0	0.0	0.0	0.0	110.2	494.4
15-Oct	0.0	0.0	0.0	0.0	0.1	0.0	1.3	28.9	71.1	194.2	286.5	187.0	287.0	208.4	240.0	119.1	23.5	2.5	0.0	0.0	0.0	0.0	0.0	0.0	68.7	287.0
16-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.8	21.0	147.7	230.7	319.5	414.1	477.6	360.8	337.3	192.4	40.6	1.2	0.0	0.0	0.0	0.0	0.0	0.0	106.0	477.6
17-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.6	38.2	94.9	193.3	189.5	254.5	277.0	313.1	110.3	33.5	1.5	0.0	0.0	0.0	0.0	0.0	0.0	63.1	313.1
18-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.4	7.6	29.5	78.5	193.6	187.5	181.9	211.6	264.4	134.8	53.7	3.7	0.0	0.0	0.0	0.0	0.0	0.0	56.1	264.4
19-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.5	17.9	134.2	215.7	303.9	407.5	459.3	320.8	239.5	92.1	13.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	91.9	459.3
20-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.3	16.4	126.1	170.0	277.3	398.2	451.1	352.6	268.5	198.7	31.7	2.4	0.0	0.0	0.0	0.0	0.0	0.0	95.6	451.1
21-Oct	0.3	0.3	0.2	0.3	0.4	0.3	0.3	8.4	29.4	78.0	103.6	136.8	192.3	115.6	32.0	22.6	4.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	30.2	192.3
22-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.1	11.0	40.3	63.0	94.9	98.6	83.5	150.9	83.0	39.9	15.7	0.6	0.0	0.0	0.0	0.0	0.0	0.0	28.4	150.9
23-Oct	0.0	0.0	0.0	0.1	0.1	0.1	0.3	12.3	124.7	171.9	218.8	276.6	361.9	350.7	254.4	138.1	28.5	0.8	0.0	0.0	0.0	0.0	0.0	0.0	80.8	361.9
24-Oct	0.1	0.0	0.0	0.0	0.0	0.0	0.1	12.2	79.2	184.6	272.1	358.1	398.3	155.4	89.5	41.8	10.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	66.8	398.3
25-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.7	48.6	118.6	232.2	378.8	361.3	348.9	196.7	130.7	24.8	0.4	0.0	0.0	0.0	0.0	0.0	0.0	77.1	378.8
26-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.2	28.3	103.8	201.4	232.5	144.7	112.8	89.4	24.9	9.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	39.7	232.5
27-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.8	25.6	68.6	126.7	135.4	120.3	123.0	107.2	80.1	19.5	0.9	0.4	0.2	0.2	0.0	0.0	0.0	33.8	135.4
28-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.6	43.7	91.5	128.3	76.9	118.9	52.7	30.6	65.0	15.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	26.3	128.3
29-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.9	41.1	83.4	124.6	217.4	405.5	278.7	256.7	133.2	15.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	65.1	405.5
30-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.1	13.3	144.1	212.0	180.5	343.0	422.4	281.8	210.8	63.8	12.8	0.1	0.0	0.0	0.0	0.1	0.0	0.0	78.5	422.4
31-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.8	26.9	58.4	42.9	47.0	65.1	66.5	60.0	37.7	8.8	0.4	0.3	0.0	0.3	0.2	0.3	0.3	17.5	66.5
																								Diurnal Average		
																								Diurnal Maximum		





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Global Radiation (GR) - W/m2
Stony Mountain - October 2023

Concentration Ranges (W/m2)	Number of Hours	%	Cumulative %
0 - 20	464	62.37	62.37
21 - 100	91	12.23	74.60
101 - 300	119	15.99	90.59
301 - 600	70	9.41	100.00
601 - 900	0	0.00	100.00
> 900	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

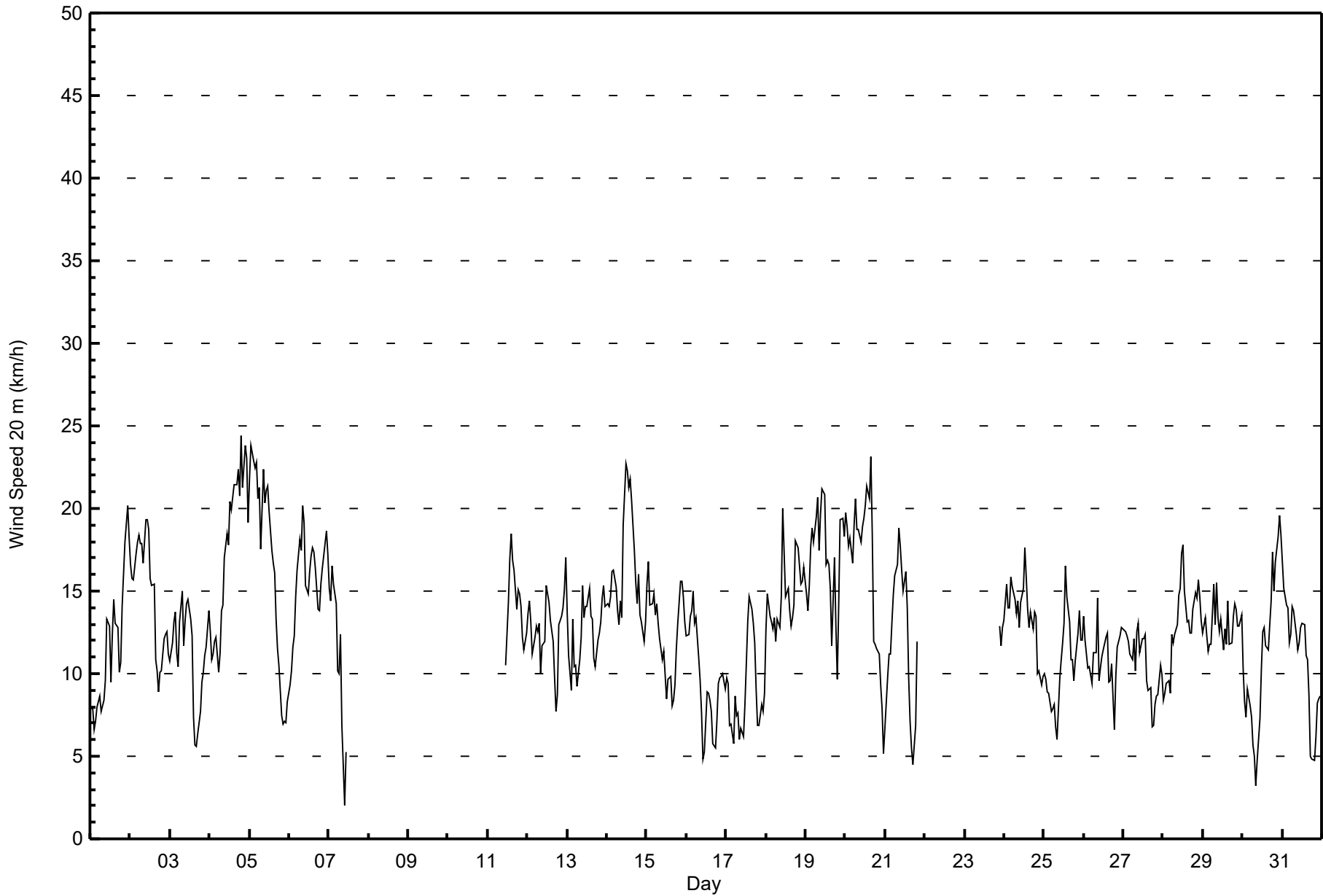
Wind Speed 20 m (WS20m) - km/h
Stony Mountain - October 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 8 km/h on Oct 4 20:00 Minimum Value: 1 km/h on Oct 31 19:00 Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 3 Median = 4 Q ₃ = 4 P ₉₀ = 6 P ₉₉ = 7																	Hours in Service: 744 Hours of Data: 599 Hours of Missing Data: 145 Hours of Calibration: 0 Percent Operational Time: 80.5								
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-Oct	2	2	1	2	2	2	2	2	2	3	5	4	4	4	5	4	4	3	2	3	4	4	5	4	5
2-Oct	4	3	3	4	4	4	5	5	4	5	5	5	4	4	4	4	3	2	2	2	3	3	3	2	5
3-Oct	3	3	4	4	3	3	4	4	4	5	4	5	4	4	4	4	2	2	1	1	2	2	3	4	5
4-Oct	5	3	3	3	4	4	5	4	4	5	5	6	6	7	6	7	7	7	7	8	7	7	7	6	8
5-Oct	7	8	7	7	7	6	7	6	7	6	7	7	6	6	6	6	4	4	2	2	1	1	1	1	8
6-Oct	2	2	3	3	3	4	4	4	5	6	5	5	5	6	6	6	5	3	3	4	4	5	5	4	6
7-Oct	4	4	4	4	4	2	2	3	3	2	2	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	4
8-Oct	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-Oct	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-Oct	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-Oct	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	3	4	5	5	5	5	3	4	3	4	3	3	2	5
12-Oct	2	3	2	2	2	2	2	2	3	3	4	5	5	5	4	4	3	1	2	3	3	3	4	4	5
13-Oct	5	4	3	4	4	4	3	4	4	4	4	4	4	5	4	4	3	2	2	2	3	3	3	3	5
14-Oct	2	2	3	3	4	4	3	3	3	4	6	7	7	7	7	6	6	4	3	4	3	3	3	2	7
15-Oct	2	3	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	5	4	3	3	5
16-Oct	3	3	3	3	4	3	3	3	3	3	2	3	3	3	3	2	1	1	1	2	2	1	2	2	4
17-Oct	2	2	1	1	1	2	1	2	2	1	2	3	3	4	5	4	4	3	3	2	2	2	2	2	5
18-Oct	3	4	4	4	4	3	3	3	3	4	5	5	4	4	5	4	4	4	5	5	5	4	4	5	5
19-Oct	4	4	4	5	5	5	5	6	5	6	7	7	6	6	6	5	3	6	4	3	6	7	6	6	7
20-Oct	6	6	5	6	5	6	5	6	5	6	6	6	7	7	7	7	6	3	3	3	2	2	2	1	7
21-Oct	1	1	1	2	2	2	3	3	4	4	4	4	5	4	3	2	2	2	2	6	UO	UO	UO	UO	6
22-Oct	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
23-Oct	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
24-Oct	3	4	3	3	4	4	4	4	4	4	5	5	5	5	4	5	4	4	4	4	3	3	3	3	5
25-Oct	3	2	3	3	2	2	2	2	1	3	3	5	5	5	5	4	3	3	3	3	4	4	3	3	5
26-Oct	4	3	3	3	3	3	3	3	4	3	4	3	4	4	4	3	3	4	2	3	3	3	3	3	4
27-Oct	3	3	4	3	3	3	3	3	4	5	4	4	4	4	4	3	4	1	1	2	2	2	3	2	5
28-Oct	3	2	2	2	3	4	3	3	4	4	4	6	5	5	4	4	3	3	4	4	4	4	4	4	6
29-Oct	4	4	3	3	4	3	5	4	5	5	4	4	3	5	4	4	3	3	4	4	3	3	3	3	5
30-Oct	3	2	2	2	2	1	1	1	1	2	2	3	4	4	4	4	4	4	4	4	5	5	5	5	5
31-Oct	4	4	4	4	3	4	4	4	3	4	4	4	4	4	4	4	3	1	1	1	1	1	2	2	4
Diurnal Maximum																								7	
M - Maintenance UO - Unstable Operation																									



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed 20 m (WS20m) - km/h
Stony Mountain - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Wind Speed 20 m (WS20m) - km/h
Stony Mountain - October 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	13	2.17	2.17
6 - 11	189	31.55	33.72
12 - 19	354	59.10	92.82
20 - 28	43	7.18	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 599

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed 20 m (WS20m) - km/h
Stony Mountain - October 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	1	1	0	0	2	0	0	1	0	1	1	1	1	2	1	13
6 - 11	7	4	3	3	1	4	3	12	27	11	19	22	26	24	17	6	189
12 - 19	3	0	0	0	0	3	14	31	49	50	23	28	33	74	36	10	354
20 - 28	0	0	0	0	0	0	0	5	0	4	0	3	4	1	26	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	11	5	4	3	1	9	17	48	77	65	43	54	64	100	81	17	599

Total Number of Valid Hours: 599

Total Number of Hours: 744



Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction 20 m (WD20m) - deg

Stony Mountain - October 2023

Direction of Maximum Speed: 312 deg on Oct 4 20:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 250.7 deg on Oct 19	Hours of Data: 599
Direction of Minimum Speed: 281 deg on Oct 7 10:00	Direction of Minimum Daily Speed Average: 3.7 deg on Oct 17
Direction of Minimum Speed: 281 deg on Oct 7 10:00	Hours of Missing Data: 145
Monthly Average Direction: 247.0 deg	Percent Operational Time: 80.5

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-Oct	170	155	158	157	158	158	169	170	164	175	185	188	174	185	194	195	186	181	181	181	187	191	192	190	180.4
2-Oct	188	187	186	186	187	186	187	188	187	192	196	194	204	197	199	213	225	223	223	231	229	234	235	226	200.6
3-Oct	241	257	267	278	274	276	277	284	290	295	300	302	309	311	5	312	314	255	224	225	215	213	215	228	271.6
4-Oct	246	253	234	246	259	275	292	301	301	309	310	315	312	308	311	311	308	306	305	312	311	306	314	306	300.1
5-Oct	311	307	310	316	316	307	319	319	312	320	317	318	320	317	324	327	317	311	309	303	273	252	240	244	311.4
6-Oct	244	234	218	210	206	202	205	196	205	210	215	210	218	215	212	210	206	206	217	240	274	284	290	290	224.0
7-Oct	279	273	272	278	289	284	252	265	280	281	111	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
8-Oct	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-Oct	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-Oct	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-Oct	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	102	108	120	123	125	133	138	137	138	145	150	166	166	--
12-Oct	165	178	175	165	180	186	186	193	186	185	160	170	179	176	177	180	182	191	181	188	196	195	197	196	182.2
13-Oct	192	198	191	186	189	179	181	172	162	160	178	164	147	143	149	154	149	136	146	151	151	154	158	152	163.0
14-Oct	154	147	143	144	149	147	146	142	144	146	161	161	165	159	157	160	157	150	156	161	160	162	162	150	154.2
15-Oct	155	166	169	181	184	174	165	172	179	171	179	196	180	190	204	199	190	205	218	215	226	232	238	235	192.1
16-Oct	245	231	251	253	255	240	262	245	233	250	223	251	237	233	229	199	195	178	164	177	179	152	136	122	222.5
17-Oct	114	88	76	34	27	67	77	349	337	328	331	320	288	299	293	287	295	297	290	261	242	230	215	179	306.6
18-Oct	195	209	200	197	190	177	187	197	188	181	193	202	203	202	213	241	230	212	217	230	248	237	237	241	210.2
19-Oct	241	233	238	242	242	238	239	245	245	249	266	268	263	251	249	245	237	275	273	238	239	252	262	268	250.7
20-Oct	268	269	267	269	271	273	281	285	284	297	295	288	300	309	316	319	319	307	305	306	315	310	322	19	293.8
21-Oct	114	141	157	173	190	185	196	199	199	194	186	194	195	203	209	231	270	284	313	347	UO	UO	UO	UO	195.2
22-Oct	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
23-Oct	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
24-Oct	284	294	285	283	289	290	285	287	283	290	287	295	301	298	288	284	297	312	322	314	291	284	289	282	292.4
25-Oct	285	276	271	269	276	273	262	261	226	248	239	250	273	291	298	310	284	276	276	269	274	286	300	288	276.1
26-Oct	287	287	284	288	292	307	308	302	309	298	301	303	305	306	306	288	285	280	253	257	266	274	274	272	289.7
27-Oct	273	267	271	274	281	280	284	296	343	359	357	350	349	346	340	322	329	319	293	268	264	258	261	247	302.0
28-Oct	249	245	236	226	248	272	286	303	309	309	314	329	330	332	331	320	313	304	296	299	297	297	299	301	299.8
29-Oct	296	296	297	295	294	297	305	314	315	323	323	318	305	289	296	297	290	285	295	302	303	303	302	311	302.5
30-Oct	351	14	356	12	32	42	52	360	37	112	176	192	204	187	190	191	195	189	190	195	203	203	209	216	195.8
31-Oct	213	205	213	216	228	267	290	311	320	315	322	326	328	330	341	351	353	335	307	309	285	280	272	267	288.8

238.1 236.7 237.4 239.0 241.8 239.3 247.4 253.2 254.6 253.0 249.7 253.9 258.1 254.9 253.6 257.9 255.1 252.6 245.0 244.1 241.9 245.2 246.1 242.9

Diurnal Average

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



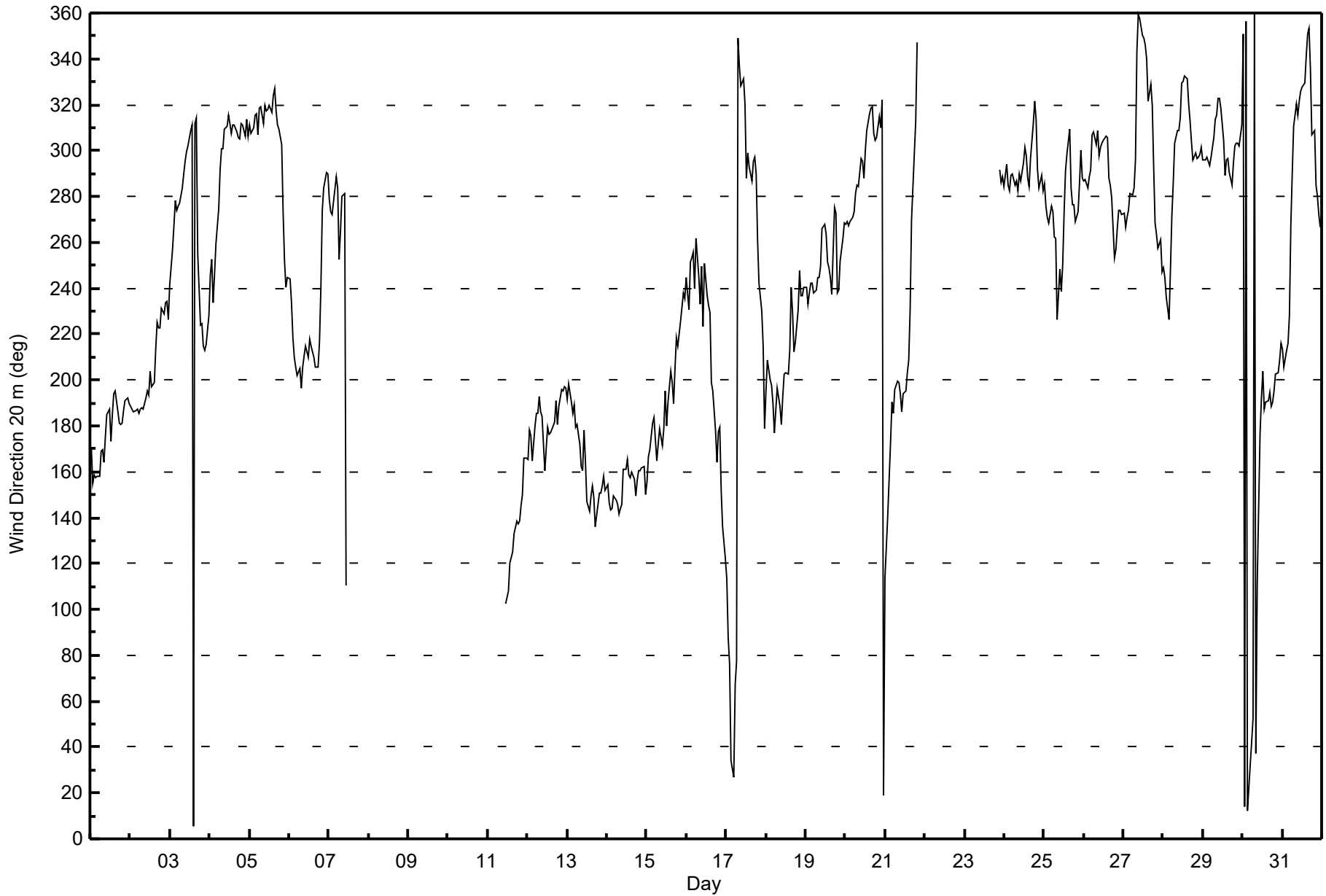
Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction 20 m (WD20m) - deg
Stony Mountain - October 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 744
Maximum Value: 90 deg on Oct 7 10:00	Hours of Data: 599
Minimum Value: 8 deg on Oct 21 03:00	Hours of Missing Data: 145
Percentiles: P ₁ = 10 P ₁₀ = 14 Q ₁ = 17 Median = 19 Q ₃ = 22 P ₉₀ = 25 P ₉₉ = 45	Hours of Calibration: 0
	Percent Operational Time: 80.5

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-Oct	22	19	16	15	15	14	15	16	18	21	28	24	44	28	26	28	25	21	15	17	16	18	18	18	44
2-Oct	17	16	16	17	17	17	19	19	20	19	18	20	20	20	21	25	23	19	18	16	16	17	17	16	25
3-Oct	20	22	25	23	21	20	20	20	21	23	24	23	24	26	63	77	27	21	11	11	13	15	17	23	77
4-Oct	20	20	22	20	23	25	26	21	20	22	21	20	19	21	21	20	20	22	21	20	21	19	20	26	26
5-Oct	20	21	21	21	20	21	19	20	21	20	21	21	21	25	26	23	19	18	16	17	15	18	12	10	26
6-Oct	14	13	14	16	16	15	16	17	18	21	21	21	23	22	23	21	18	16	15	19	21	20	19	19	23
7-Oct	19	19	20	20	19	18	16	17	37	90	28	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	90
8-Oct	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-Oct	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-Oct	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-Oct	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	26	21	24	20	21	19	17	15	15	17	17	15	13	26
12-Oct	11	14	15	14	14	12	12	14	20	21	25	25	28	27	26	24	21	13	15	16	14	15	17	16	28
13-Oct	23	23	26	22	22	23	21	22	22	22	22	25	25	23	26	22	22	15	13	13	13	14	14	13	26
14-Oct	12	12	13	15	17	16	14	13	16	19	22	21	24	23	23	21	22	17	14	14	16	16	14	10	24
15-Oct	10	12	12	12	12	14	11	13	15	21	26	24	35	22	25	26	19	19	16	17	18	17	15	16	35
16-Oct	18	14	18	18	19	18	18	21	20	28	44	70	40	39	34	30	16	9	14	12	15	13	11	14	70
17-Oct	13	15	23	15	30	14	14	31	27	16	19	24	25	22	23	20	19	18	20	20	22	18	24	13	31
18-Oct	15	19	21	20	21	17	17	18	15	19	19	20	22	22	22	21	21	18	18	19	20	19	21	20	22
19-Oct	21	20	19	19	20	19	19	21	22	22	23	24	25	25	26	23	19	25	26	26	21	22	22	22	26
20-Oct	21	20	21	22	20	19	19	19	19	21	21	22	23	22	21	19	18	17	16	17	14	14	17	32	32
21-Oct	17	12	8	13	10	11	15	14	16	19	18	19	21	22	21	23	29	58	14	22	UO	UO	UO	UO	58
22-Oct	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
23-Oct	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	18	17	18	18
24-Oct	18	18	19	18	18	19	19	19	19	22	24	25	23	23	23	22	21	24	18	19	20	20	21	19	25
25-Oct	21	18	20	21	18	19	19	25	19	24	25	31	29	24	24	22	21	19	17	19	20	20	17	19	31
26-Oct	19	18	19	18	17	18	20	19	18	22	23	22	22	21	22	22	19	20	19	21	20	19	19	20	23
27-Oct	19	20	19	19	19	18	19	21	21	22	25	24	25	23	25	20	18	15	14	16	16	18	20	18	25
28-Oct	20	17	15	14	22	21	19	19	18	17	18	19	19	21	20	19	18	18	18	18	19	19	18	20	22
29-Oct	20	20	19	19	19	21	20	19	20	20	22	21	24	25	26	22	20	18	18	17	16	16	16	18	26
30-Oct	22	18	17	21	16	15	12	31	46	34	25	24	26	24	26	20	21	19	18	20	19	18	18	18	46
31-Oct	17	17	20	21	22	23	20	18	16	20	20	19	19	20	23	21	20	16	9	17	13	13	14	14	23
	23	23	26	23	30	25	26	31	46	90	44	70	44	39	63	77	29	58	26	26	22	22	24	32	
	Diurnal Maximum																								

M - Maintenance UO - Unstable Operation





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS19 FIREBAG OCTOBER 2023

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

November 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FIREBAG (AMS19)
OCTOBER 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	14.5	0	3.5	0
H2S (ppb) Average	706	37	38	99.87	8.8	0	1	0
THC (ppm) Average	708	35	36	99.87	2.8	-	2.4	-
NO2 (ppb) Average	708	36	36	100	22.9	0	5.8	-
NO (ppb) Average	708	36	36	100	9.2	-	1.3	-
NOX (ppb) Average	708	36	36	100	26.3	-	6.4	-
Temperature 2 m (C) Average	744	0	0	100	20.5	-	13.4	-
Relative Humidity (%) Average	731	0	13	98.25	100	-	93.5	-
Wind Speed 10 m (km/h) Average	744	0	0	100	37	-	28	-
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)
OCTOBER 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	0.38	1.1	-	0	0	0	0.1	0.2	0.6	14.5
H2S (ppb) Average	706	0.13	0.4	-	0	0	0.1	0.1	0.1	0.2	8.8
THC (ppm) Average	708	2.26	0.1	-	2.1	2.2	2.2	2.2	2.3	2.4	2.8
NO2 (ppb) Average	708	2.36	2.6	-	0.1	0.4	0.7	1.4	3.1	5.5	22.9
NO (ppb) Average	708	0.35	0.8	-	0	0	0	0.1	0.3	0.7	9.2
NOX (ppb) Average	708	2.71	3	-	0.1	0.5	0.9	1.6	3.5	6.3	26.3
Temperature 2 m (C) Average	744	2.74	7.9	-	-14.3	-7.7	-4.8	4.7	8.7	12.5	20.5
Relative Humidity (%) Average	731	75.77	14.6	-	40.1	53.7	65.1	76.7	89.5	93.2	100
Wind Speed 10 m (km/h) Average	744	14.7	7	-	2	7	10	14	19	23	37
Wind Direction 10 m (deg) Average	744	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FIREBAG (AMS19)
OCTOBER 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
H2S,SO2, THC	26 Oct 2023 13:00	26 Oct 2023 13:00	1	Maintenance - sample manifold cleaned
Relative Humidity	02 Oct 2023 21:00	03 Oct 2023 09:00	13	Sensor operated out of range



Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 14.5 ppb on Oct 19 14:00	Maximum Daily Average: 3.5 ppb on Oct 19		Hours of Data:	708
Minimum Value: 0.0 ppb on Oct 1 01:00	Minimum Daily Average: 0.0 ppb on Oct 5		Hours of Missing Data:	36
Maximum Diurnal Average: 0.9 ppb at hour 14	Minimum Diurnal Average: 0.1 ppb at hour 20		Hours of Calibration:	35
Monthly Average: 0.38 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.2 P ₉₀ = 0.6 P ₉₉ = 5.4		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-Oct	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	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.2		
2-Oct	Z	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	
3-Oct	0.0	Z	0.1	0.0	0.1	0.2	0.1	0.2	1.4	0.1	0.2	1.3	2.4	2.0	0.4	0.1	0.1	0.1	0.3	0.4	0.1	0.0	0.1	0.0	0.4	2.4	
4-Oct	0.5	0.5	Z	0.5	2.5	1.0	0.6	0.5	0.5	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	2.5	
5-Oct	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	
6-Oct	0.4	0.2	0.0	0.0	Z	0.0	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.2	1.1	1.1	0.8	0.3	0.3	1.1	
7-Oct	0.4	0.2	0.3	0.2	0.0	Z	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.4	
8-Oct	Z	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2	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	0.1	0.2	
9-Oct	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.4	0.2	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4	
10-Oct	0.1	0.1	Z	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	
11-Oct	0.0	0.1	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.3	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.3	
12-Oct	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.2	3.2	0.3	0.3	0.2	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	3.2	
13-Oct	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
14-Oct	Z	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	
15-Oct	0.1	Z	0.1	0.2	0.1	0.2	0.1	0.1	0.2	0.4	0.4	0.3	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.3	0.4	1.7	3.5	0.4	3.5	
16-Oct	3.4	4.1	Z	4.1	4.8	4.1	3.4	4.0	6.2	4.2	2.0	2.3	3.1	7.4	3.9	6.7	10.1	2.9	0.7	0.3	0.3	0.2	0.2	0.1	3.4	10.1	
17-Oct	0.1	0.2	0.2	Z	0.2	0.2	0.6	0.4	0.7	1.6	0.3	0.6	0.5	0.3	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.6	
18-Oct	0.0	0.0	0.0	0.1	Z	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.7	2.2	2.8	3.4	0.4	3.4	
19-Oct	3.2	5.3	5.5	4.6	5.6	Z	2.4	2.0	2.1	5.7	4.9	3.0	3.5	14.5	5.2	5.1	2.0	0.9	1.2	0.9	0.4	0.4	1.6	0.6	3.5	14.5	
20-Oct	Z	1.6	0.6	0.2	0.2	0.1	0.1	0.2	0.1	0.9	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.2	1.6	
21-Oct	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.4	1.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.3	
22-Oct	0.0	0.0	Z	0.1	0.1	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
23-Oct	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.2	1.1	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	1.1	
24-Oct	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.1	0.5	0.5	0.5	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	
25-Oct	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.0	0.4	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	0.1	0.1	0.4	
26-Oct	Z	0.2	0.1	0.0	0.1	0.1	0.3	0.1	0.1	0.3	0.4	0.3	M	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.1	0.4	
27-Oct	0.0	Z	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	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	0.1	0.1
28-Oct	0.1	1.9	Z	0.4	0.4	0.8	0.5	0.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.1	0.0	0.2	1.9	
29-Oct	0.1	0.0	0.1	Z	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
30-Oct	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.1	0.6	0.8	1.3	1.1	0.4	0.4	0.4	0.4	0.3	0.3	0.3	1.3	
31-Oct	1.1	2.7	2.9	2.5	2.6	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.6	2.9	

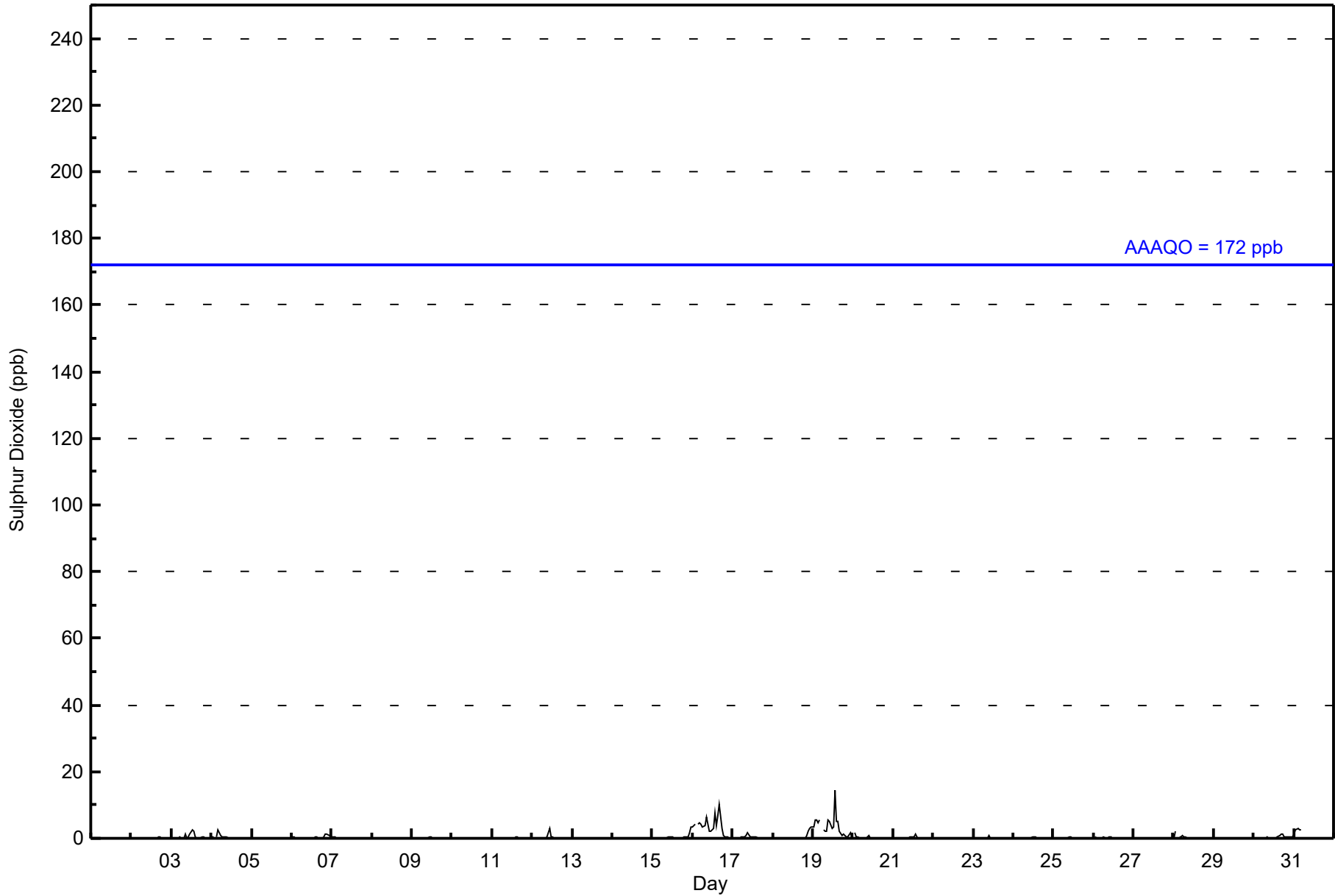
0.4	0.7	0.4	0.5	0.7	0.3	0.3	0.3	0.4	0.5	0.5	0.4	0.4	0.9	0.4	0.5	0.5	0.2	0.1	0.1	0.1	0.2	0.3	0.3	Diurnal Average	
3.4	5.3	5.5	4.6	5.6	4.1	3.4	4.0	6.2	5.7	4.9	3.0	3.5	14.5	5.2	6.7	10.1	2.9	1.2	0.9	1.1	2.2	2.8	3.5	Diurnal Maximum	

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



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Firebag - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Firebag - October 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	707	99.86	99.86
11 - 20	1	0.14	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Firebag - October 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	37	19	6	0	5	6	50	121	106	37	65	67	51	50	48	39	707
11 - 20	0	0	0	0	0	0	0	0	0	0	0	1	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	37	19	6	0	5	6	50	121	106	37	65	68	51	50	48	39	708

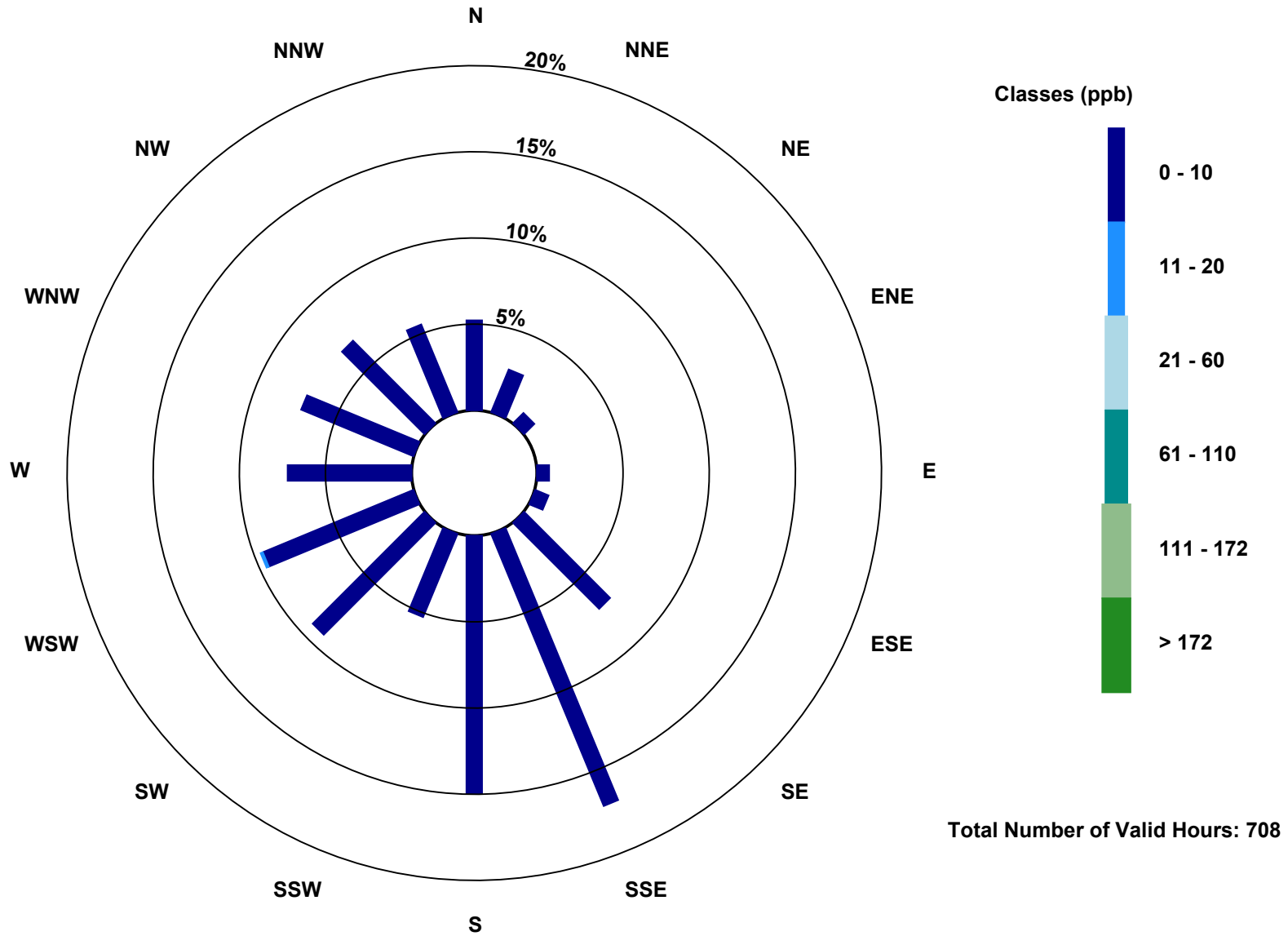
Total Number of Valid Hours: 708

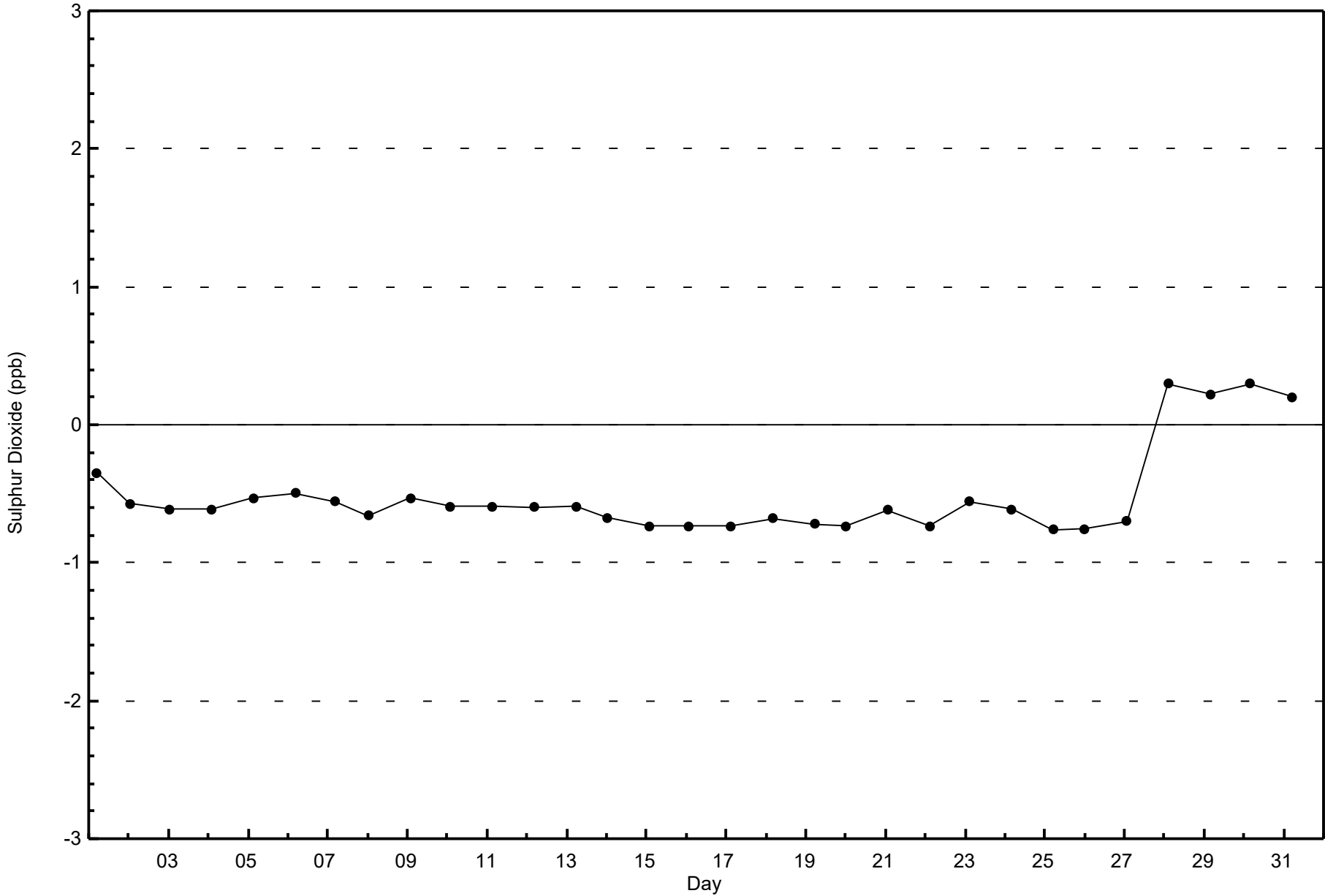
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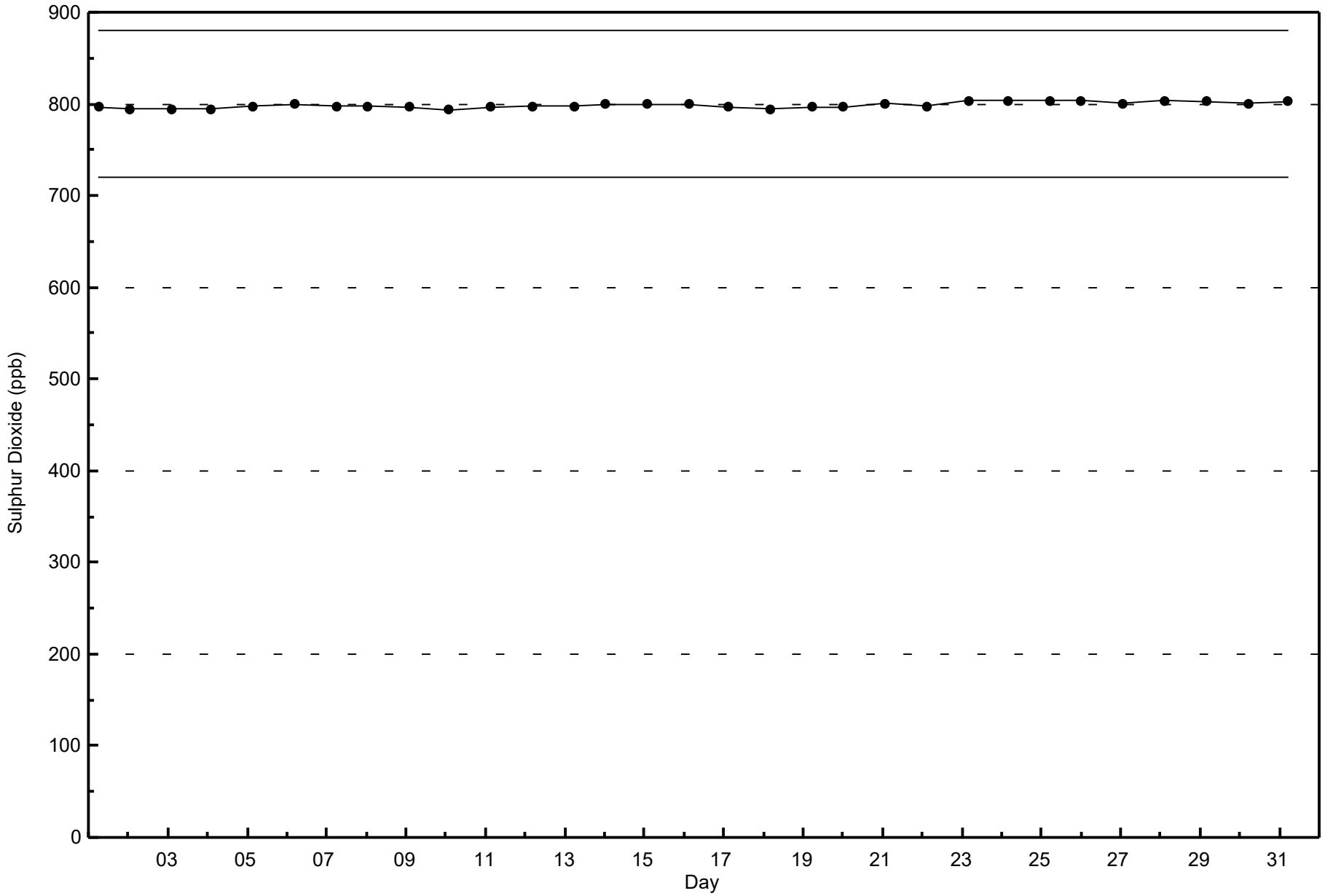


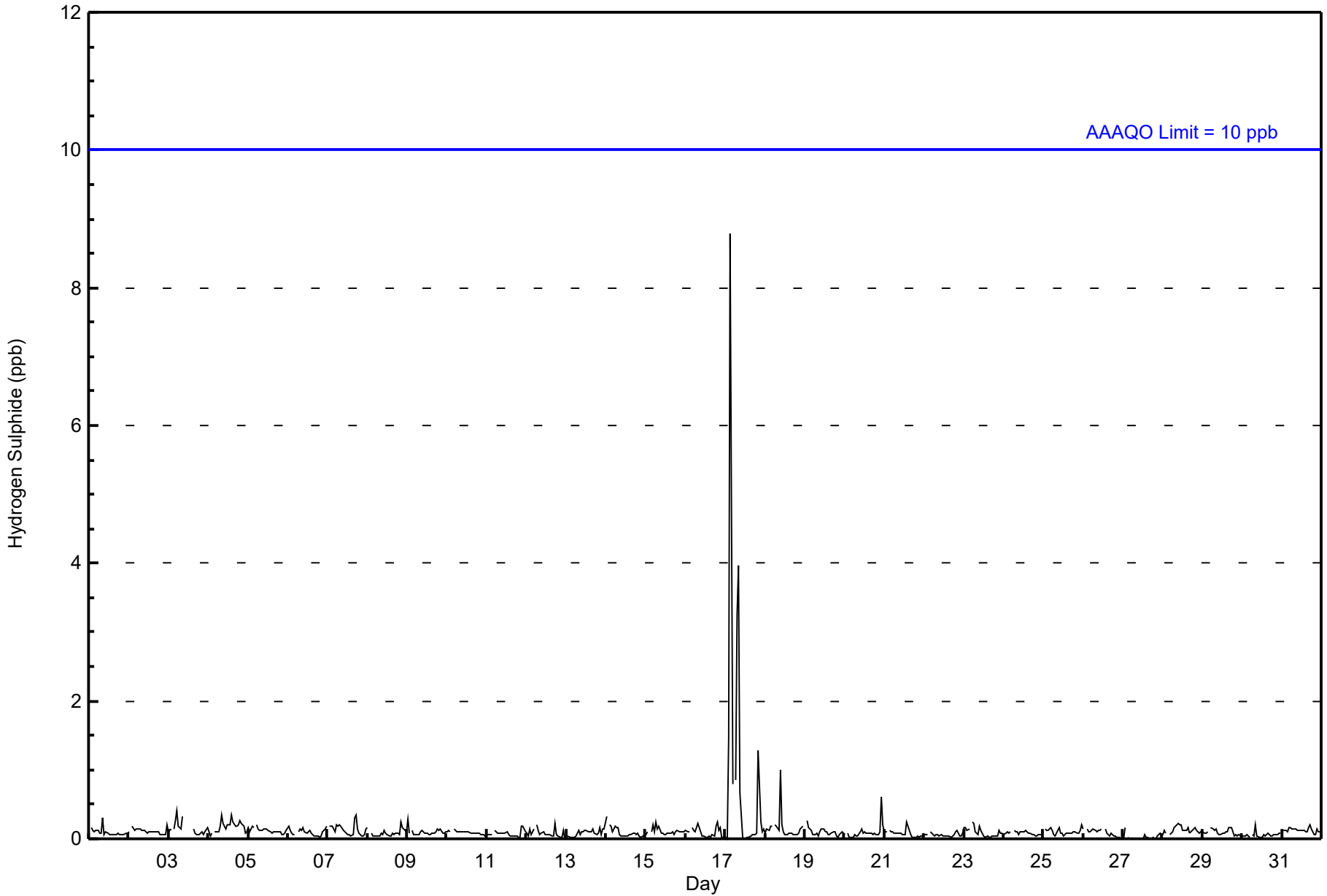
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Sulphur Dioxide (SO₂) - ppb
Firebag











**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Firebag - October 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	703	99.58	99.58
3 - 4	2	0.28	99.86
5 - 7	0	0.00	99.86
8 - 11	1	0.14	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
Firebag - October 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	39	18	6	0	3	5	49	122	105	40	64	64	48	50	47	43	703
3 - 4	0	0	0	0	2	0	0	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	1	0	0	0	0	0	0	0	0	0	0	0	1
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	39	18	6	0	6	5	49	122	105	40	64	64	48	50	47	43	706

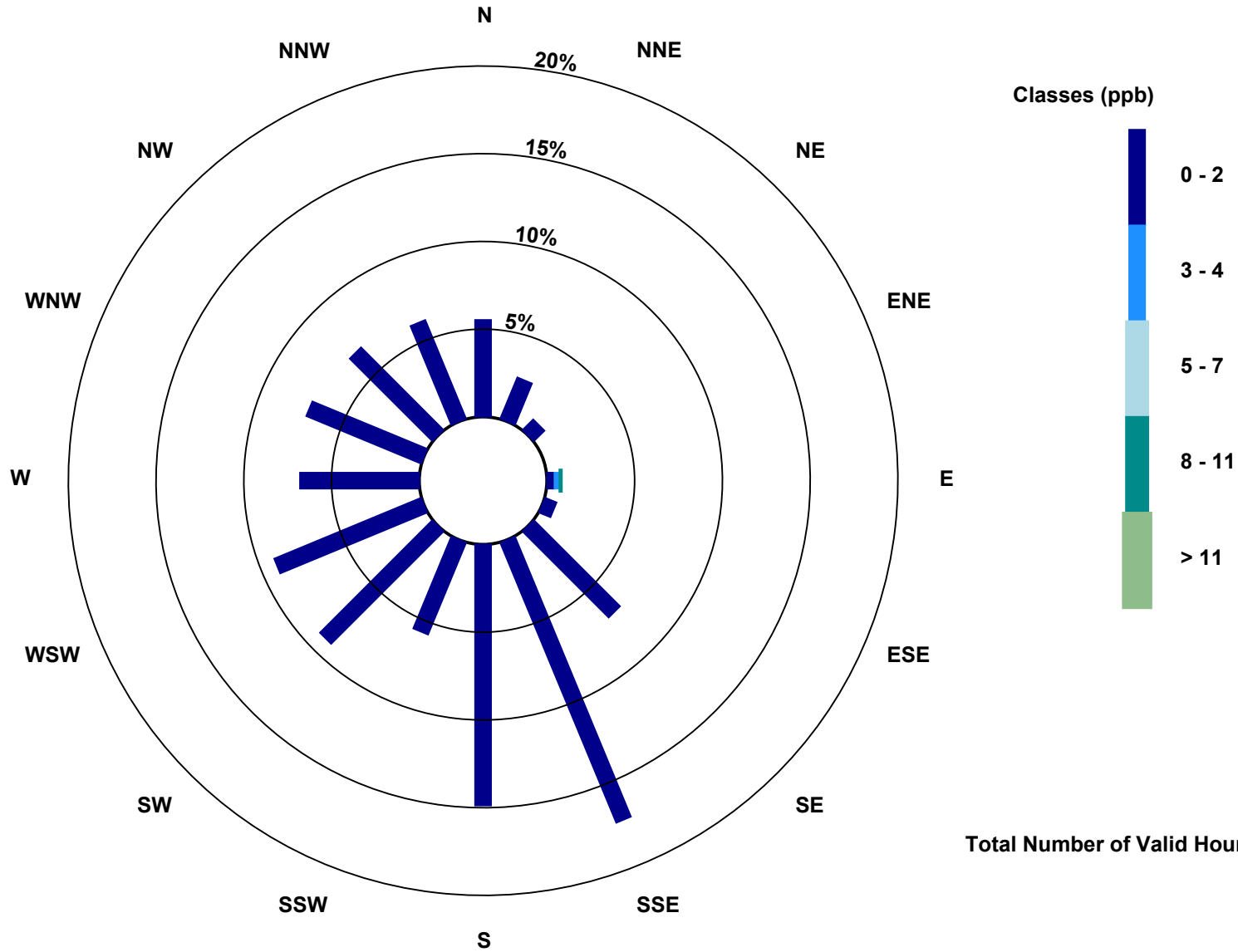
Total Number of Valid Hours: 706

Total Number of Hours: 744

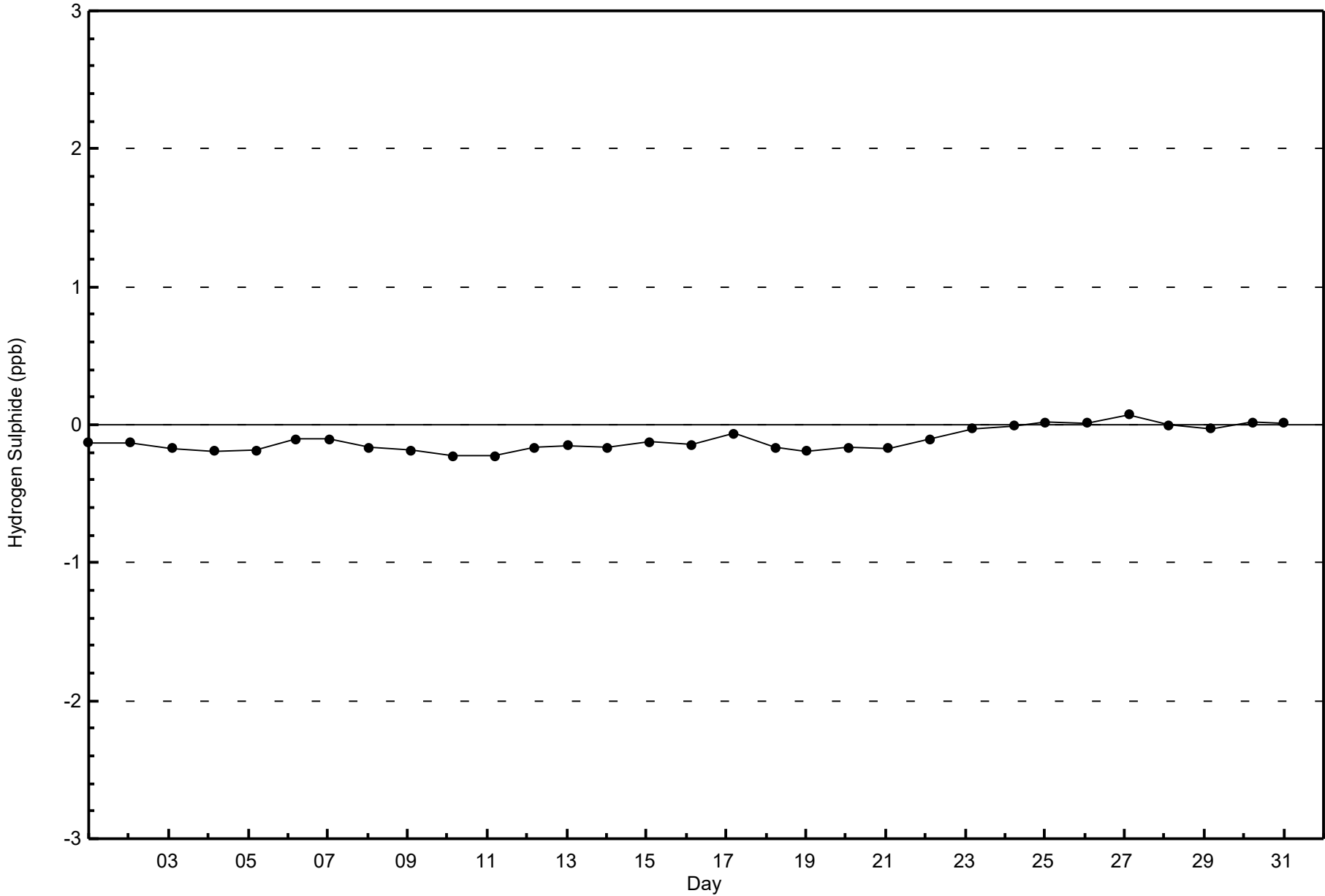


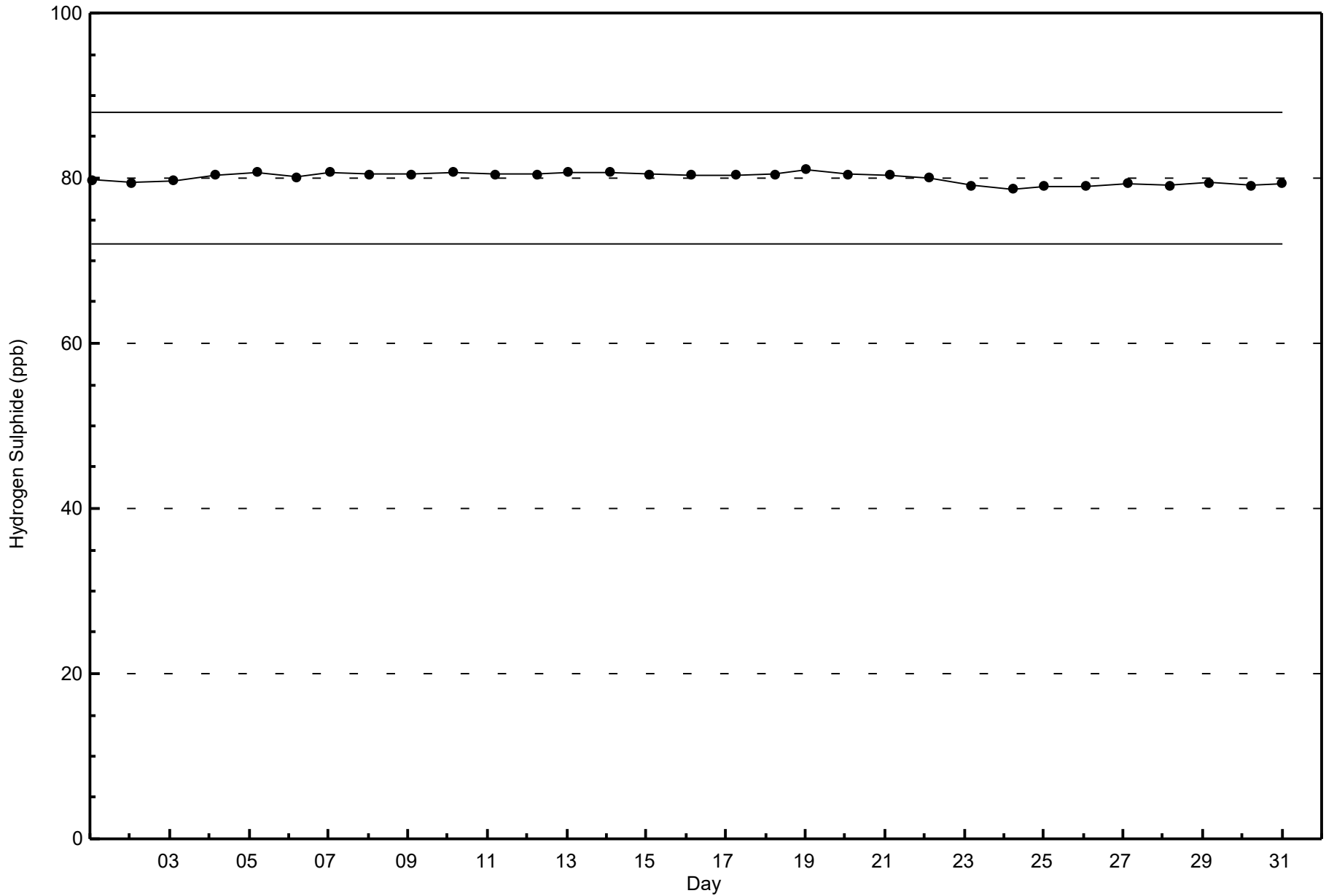
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Hydrogen Sulphide (H₂S) - ppb
Firebag



Total Number of Valid Hours: 706







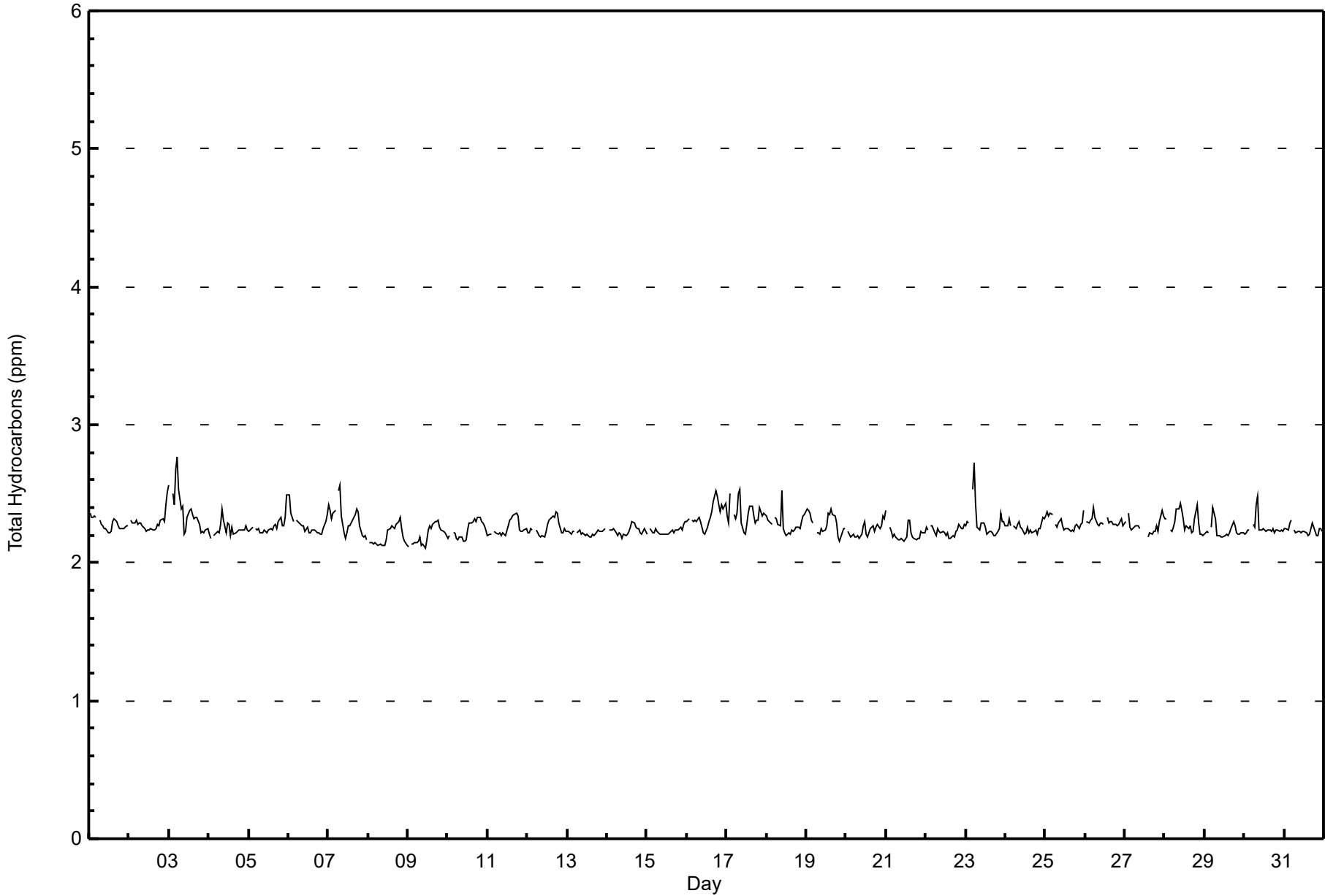
Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Firebag - October 2023

Maximum Value: 2.8 ppm on Oct 3 06:00																				Maximum Daily Average: 2.4 ppm on Oct 3					Hours in Service:	744											
Minimum Value: 2.1 ppm on Oct 9 11:00																				Minimum Daily Average: 2.2 ppm on Oct 8					Hours of Data:	708											
Maximum Diurnal Average: 2.3 ppm at hour 6																				Minimum Diurnal Average: 2.2 ppm at hour 11					Hours of Missing Data:	36											
Monthly Average: 2.26 ppm																				Percentiles: P ₁ = 2.1 P ₁₀ = 2.2 Q ₁ = 2.2 Median = 2.2 Q ₃ = 2.3 P ₉₀ = 2.4 P ₉₉ = 2.5					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-Oct	2.4	2.3	2.3	2.3	2.3	Z	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.4											
2-Oct	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.5	2.3	2.5											
3-Oct	2.6	Z	2.5	2.4	2.7	2.8	2.5	2.4	2.4	2.2	2.2	2.3	2.4	2.4	2.4	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.4	2.8											
4-Oct	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.3	2.4	2.3	2.2	2.3	2.3	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.4											
5-Oct	2.2	2.2	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	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.5	2.3	2.5											
6-Oct	2.5	2.4	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.3	2.5											
7-Oct	2.4	2.4	2.3	2.4	2.4	Z	2.5	2.6	2.3	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.3	2.2	2.2	2.2	2.2	2.3	2.6											
8-Oct	Z	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	2.3	2.3	2.2	2.3	2.3	2.3	2.2	2.2	2.2	2.1	2.2	2.3											
9-Oct	2.1	Z	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.3											
10-Oct	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.3											
11-Oct	2.2	2.2	2.2	Z	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	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.4											
12-Oct	2.2	2.2	2.3	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.3	2.2	2.2	2.3	2.2	2.3	2.4											
13-Oct	2.2	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2											
14-Oct	Z	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.3											
15-Oct	2.2	Z	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.3	2.3	2.2	2.3											
16-Oct	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.3	2.3	2.4	2.4	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.3	2.5											
17-Oct	2.3	2.3	2.5	Z	2.3	2.3	2.4	2.5	2.5	2.3	2.2	2.2	2.3	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.4	2.3	2.4	2.3	2.3	2.5											
18-Oct	2.3	2.3	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.5	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.5											
19-Oct	2.4	2.4	2.4	2.3	2.3	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.3	2.4	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.4											
20-Oct	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	2.3	2.2	2.3	2.3	2.2	2.3	2.3	2.3	2.2	2.3											
21-Oct	2.4	Z	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	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4											
22-Oct	2.3	2.2	Z	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.3	2.2	2.3											
23-Oct	2.3	2.3	2.3	Z	2.5	2.7	2.4	2.3	2.2	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.3	2.3	2.3	2.7											
24-Oct	2.3	2.3	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3											
25-Oct	2.3	2.4	2.3	2.4	2.4	Z	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.4	2.4	2.3	2.4											
26-Oct	Z	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.3	M	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											
27-Oct	2.3	Z	2.4	2.3	2.2	2.3	2.3	2.3	2.3	2.2	C	C	C	C	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.3	2.4	2.3	2.3	2.4											
28-Oct	2.3	2.3	Z	2.2	2.2	2.3	2.3	2.4	2.4	2.4	2.4	2.3	2.2	2.3	2.2	2.3	2.2	2.2	2.3	2.4	2.3	2.2	2.2	2.2	2.3	2.4											
29-Oct	2.2	2.2	2.2	Z	2.3	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.4											
30-Oct	2.2	2.2	2.2	2.2	Z	2.3	2.3	2.4	2.5	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.5											
31-Oct	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	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.3											
																								Diurnal Average				2.3					Diurnal Maximum				2.6
Z - zerospan C - Calibration M - Maintenance																																					





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Firebag - October 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	0	0.00	0.00
2.1 - 3.0	708	100.00	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Total Hydrocarbons (THC) - ppm
Firebag - October 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	37	19	6	0	5	6	50	121	106	37	65	68	51	50	48	39	708
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	37	19	6	0	5	6	50	121	106	37	65	68	51	50	48	39	708

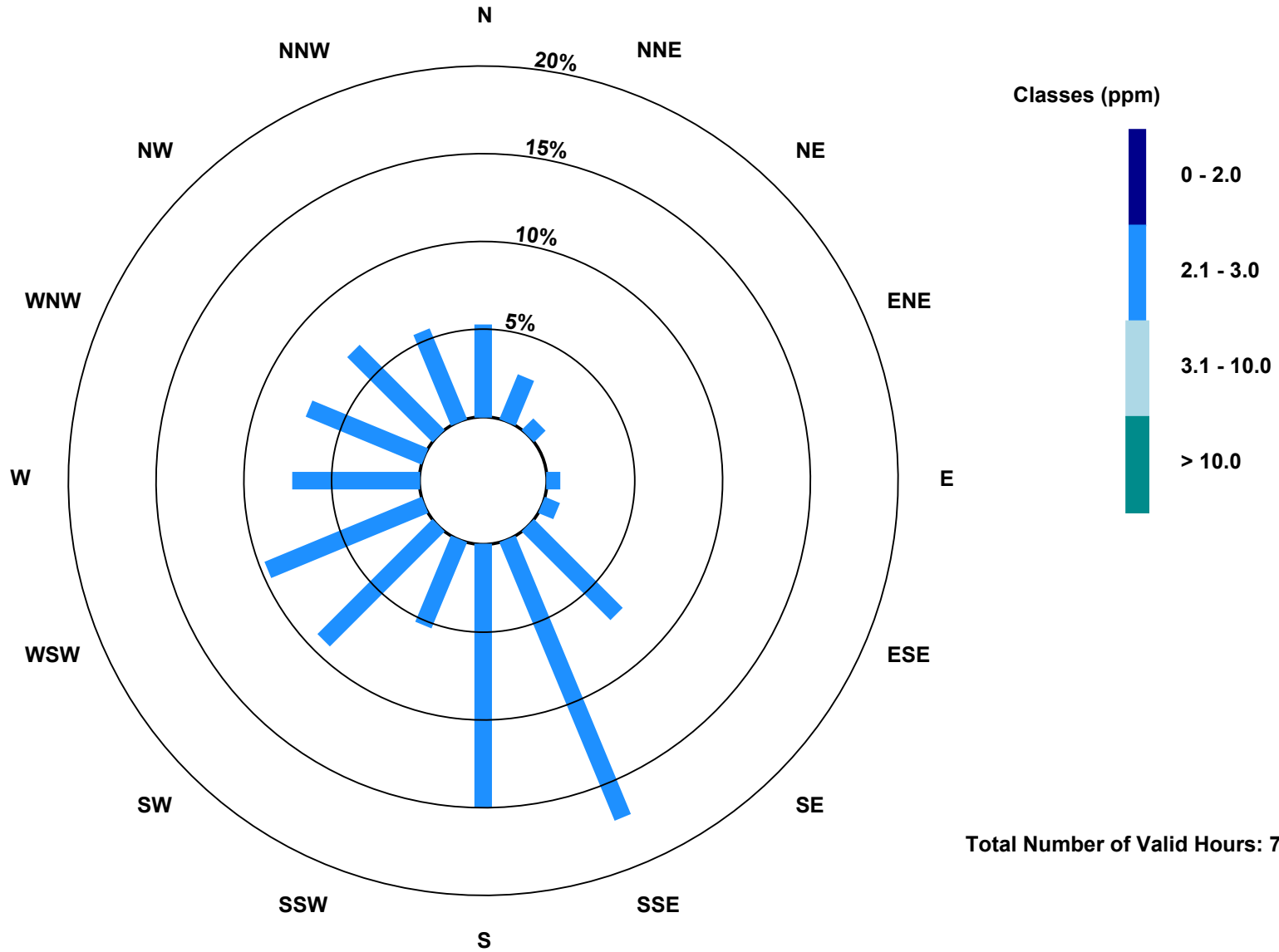
Total Number of Valid Hours: 708

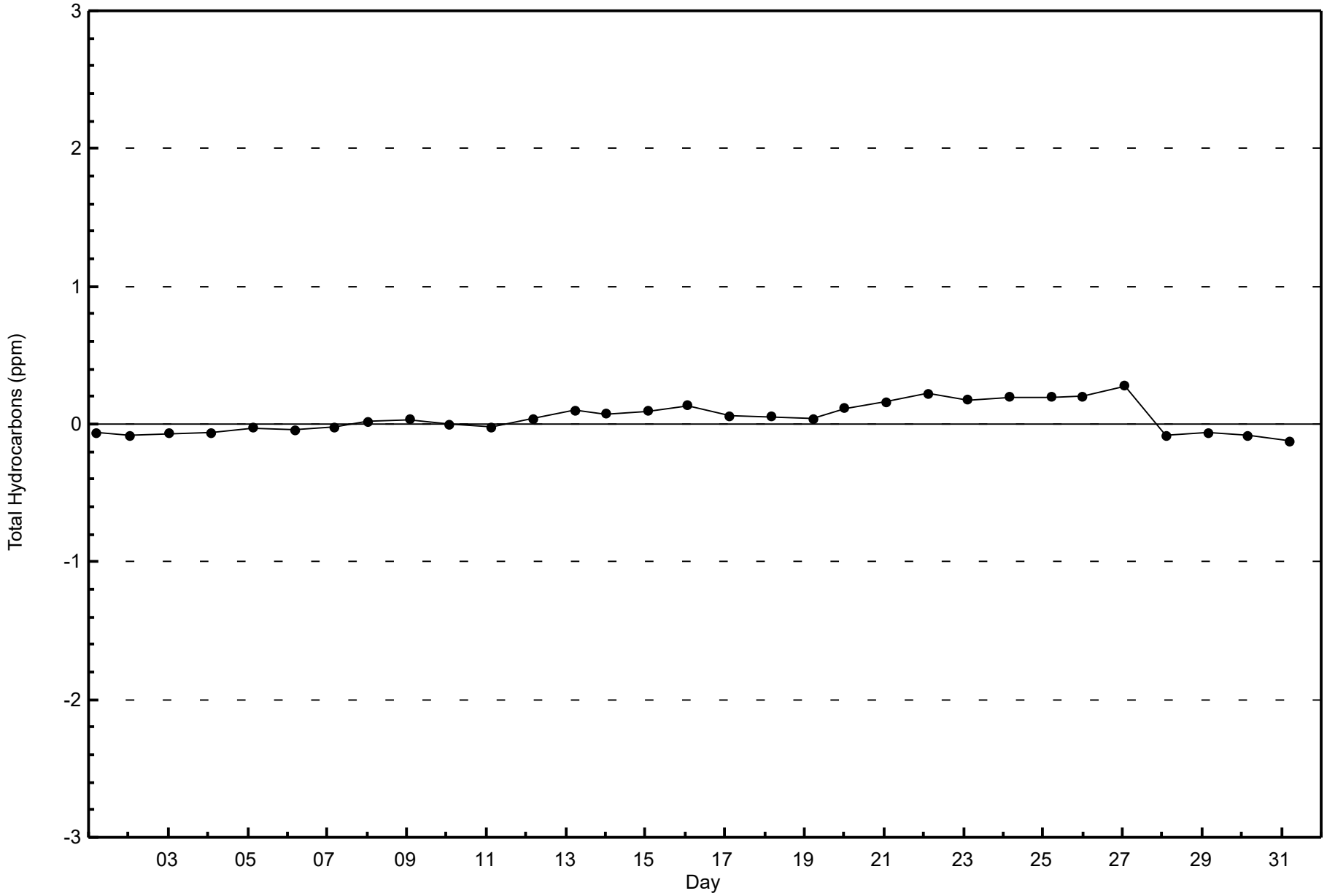
Total Number of Hours: 744

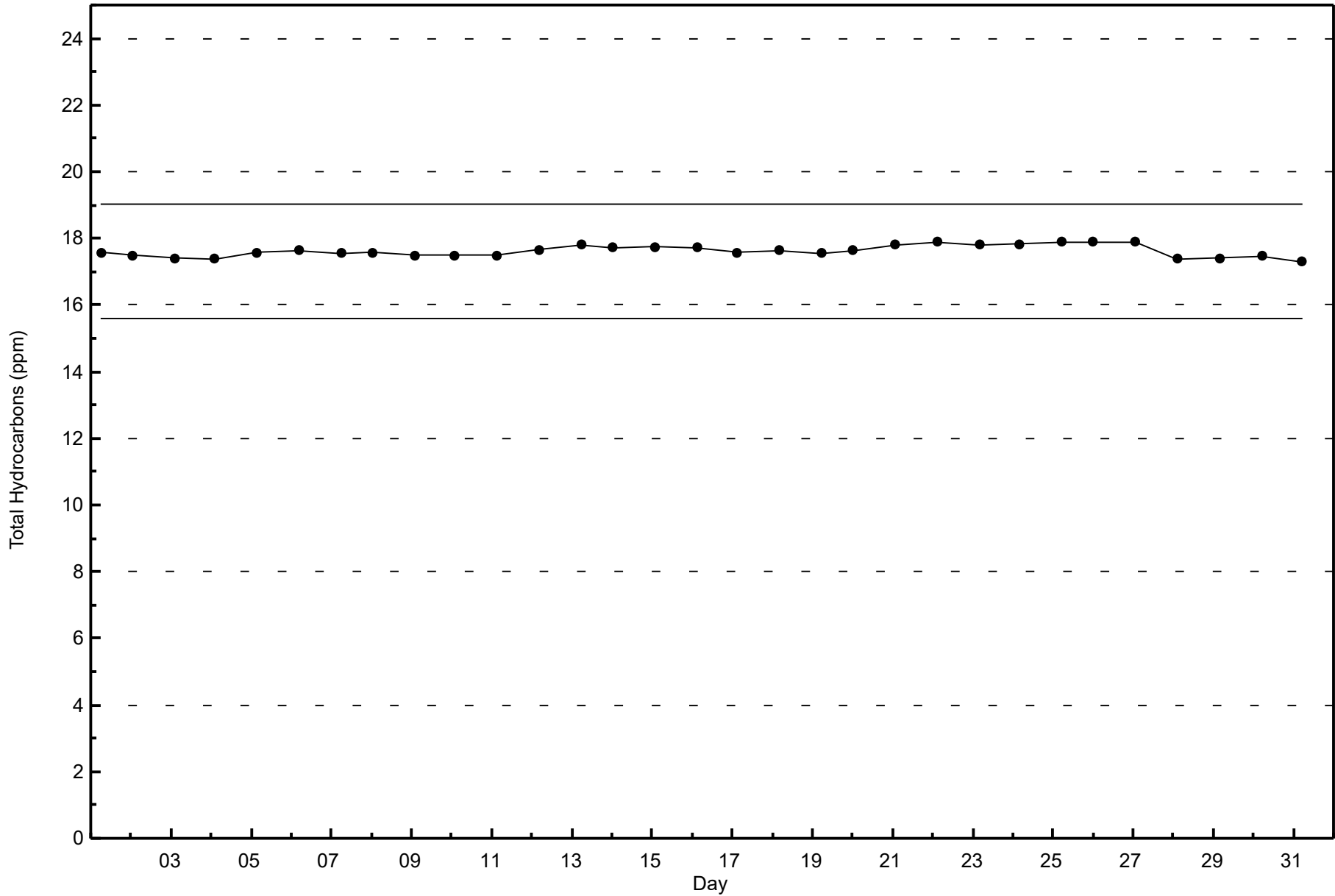


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Total Hydrocarbons (THC) - ppm
Firebag







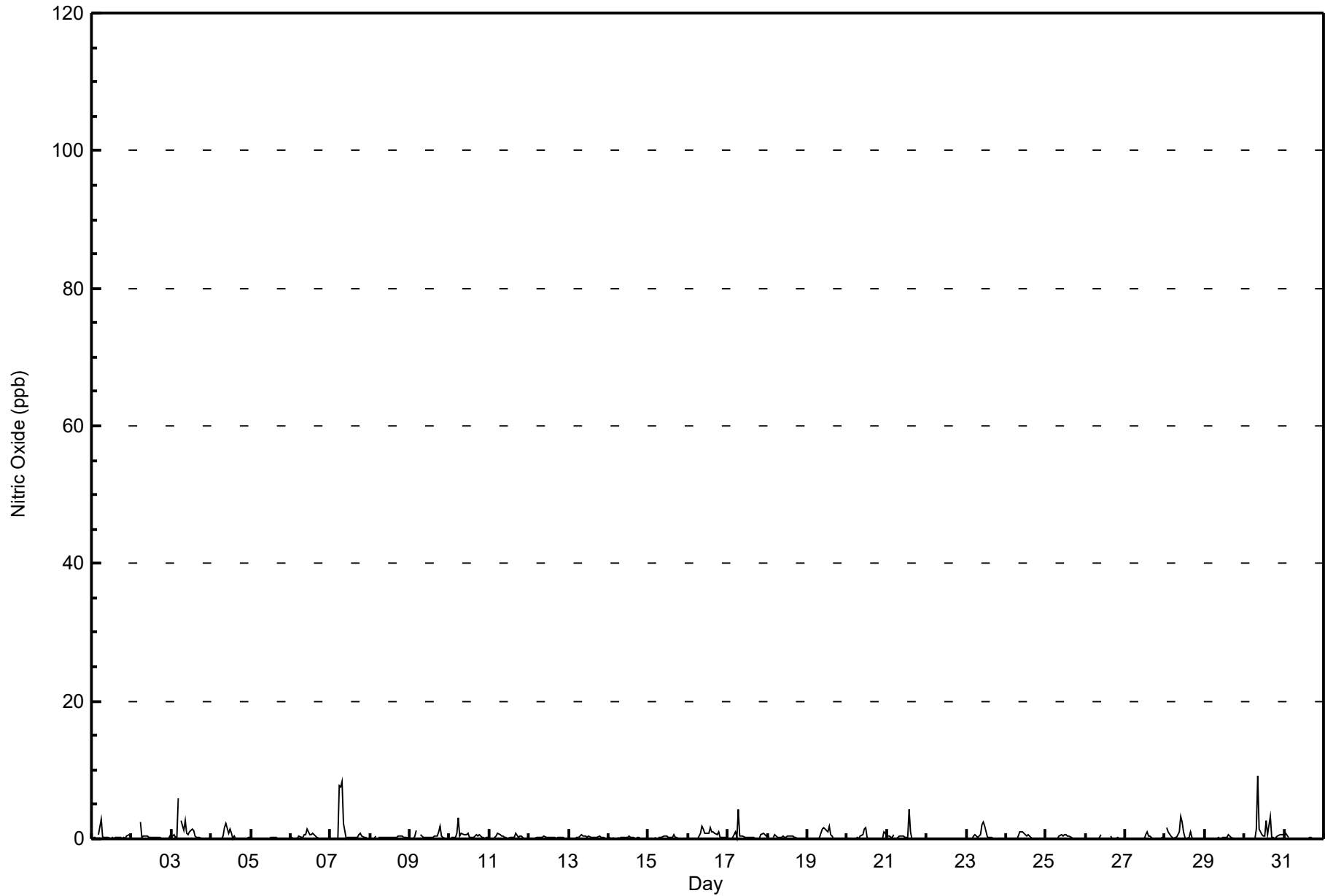


Maximum Value: 9.2 ppb on Oct 30 09:00		Maximum Daily Average: 1.3 ppb on Oct 7		Hours in Service: 744																																												
Minimum Value: 0.0 ppb on Oct 4 04:00		Minimum Daily Average: 0.0 ppb on Oct 22		Hours of Data: 708																																												
Maximum Diurnal Average: 0.9 ppb at hour 9		Minimum Diurnal Average: 0.1 ppb at hour 21		Hours of Missing Data: 36																																												
Monthly Average: 0.35 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.3 P ₉₀ = 0.7 P ₉₉ = 3.3		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-Oct	0.0	0.2	0.1	Z	0.6	2.8	0.1	0.3	0.2	0.2	0.2	0.1	0.2	0.1	0.2	0.3	0.2	0.3	0.1	0.1	0.1	0.5	0.6	0.3	0.3	2.8																						
2-Oct	0.1	0.1	0.0	0.1	Z	2.5	0.2	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.0	0.1	0.1	0.1	0.4	0.3	2.5																						
3-Oct	0.3	0.5	0.2	0.1	5.8	Z	2.6	1.3	2.7	0.9	0.7	1.1	1.5	1.3	0.5	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.9	5.8																						
4-Oct	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.6	2.2	0.9	1.5	0.8	0.1	0.4	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.4	2.2																						
5-Oct	0.1	Z	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2																						
6-Oct	0.1	0.1	Z	0.0	0.0	0.4	0.1	0.2	0.7	0.7	1.4	0.7	0.6	0.7	0.6	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.4																						
7-Oct	0.1	0.0	0.0	Z	0.0	7.8	7.4	8.3	2.2	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.3	0.7	0.8	0.4	0.2	0.2	0.0	0.1	1.3	8.3																						
8-Oct	0.1	0.1	0.1	0.4	Z	0.3	0.3	0.2	0.3	0.1	0.1	0.2	0.1	0.2	0.1	0.2	0.1	0.3	0.5	0.4	0.1	0.1	0.1	0.1	0.2	0.5																						
9-Oct	0.0	0.1	0.1	0.4	1.3	Z	0.6	0.4	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.4	0.4	1.0	1.8	0.3	0.2	0.1	0.1	0.1	0.4	1.8																						
10-Oct	Z	0.1	0.2	0.3	0.8	3.1	0.4	0.8	0.7	0.7	0.6	0.8	0.3	0.2	0.2	0.4	0.6	0.4	0.6	0.2	0.1	0.1	0.1	0.1	0.5	3.1																						
11-Oct	0.1	Z	0.1	0.1	0.4	0.7	0.6	0.4	0.4	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.8	0.2	0.5	0.3	0.1	0.1	0.0	0.0	0.3	0.8																						
12-Oct	0.0	0.0	Z	0.1	0.1	0.2	0.2	0.1	0.2	0.3	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.3	0.2	0.2	0.1	0.1	0.1	0.2	0.3																						
13-Oct	0.0	0.1	0.1	Z	0.2	0.2	0.1	0.6	0.5	0.4	0.4	0.2	0.3	0.2	0.1	0.2	0.1	0.3	0.4	0.3	0.2	0.2	0.1	0.1	0.2	0.6																						
14-Oct	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.3	0.2	0.2	0.2	0.4	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.4																						
15-Oct	0.1	0.1	0.1	0.1	0.2	Z	0.1	0.2	0.2	0.4	0.4	0.5	0.3	0.2	0.3	0.5	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.5																						
16-Oct	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.7	1.8	1.5	0.9	0.8	0.9	1.7	1.1	1.0	0.7	0.6	1.1	0.3	0.1	0.1	0.1	0.1	0.6	1.8																						
17-Oct	0.1	Z	0.1	0.1	1.0	0.2	4.2	0.3	0.3	0.3	0.3	0.1	0.2	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.6	0.8	0.6	0.5	4.2																						
18-Oct	0.2	0.3	Z	0.2	0.5	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.3	0.3	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.2	0.5																						
19-Oct	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.2	0.7	1.4	1.6	1.2	1.0	1.9	0.6	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.9																						
20-Oct	0.0	0.0	0.0	0.0	Z	0.0	0.2	0.1	0.3	0.6	1.4	1.6	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	1.0	0.7	0.3	1.6																						
21-Oct	0.3	0.3	0.2	0.3	0.6	Z	0.1	0.4	0.4	0.4	0.4	0.2	0.2	4.2	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	4.2																						
22-Oct	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																						
23-Oct	0.0	Z	0.0	0.0	0.4	0.7	0.5	0.2	0.7	2.1	2.4	1.8	1.1	0.2	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	2.4																						
24-Oct	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.5	1.1	1.1	1.0	0.6	0.4	0.6	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.1																						
25-Oct	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.3	0.7	0.5	0.6	0.7	0.3	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7																						
26-Oct	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.3	0.6	C	C	C	C	C	0.3	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.1	0.6																						
27-Oct	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.1	0.0	0.1	0.6	1.0	0.5	0.4	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.6	0.2	1.0																						
28-Oct	Z	1.6	1.0	0.5	0.2	0.1	0.1	0.1	1.0	3.2	2.5	1.0	0.1	0.0	0.2	1.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.6	3.2																						
29-Oct	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.2	0.2	0.3	0.5	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5																						
30-Oct	0.0	0.0	Z	0.0	0.0	0.0	0.0	1.4	9.2	1.4	0.5	0.5	0.5	2.6	0.6	3.3	0.3	0.1	0.1	0.2	0.5	0.7	0.7	0.7	1.0	9.2																						
31-Oct	0.6	0.7	0.2	Z	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7																						
																								0.1	0.2	0.1	0.1	0.5	0.8	0.6	0.6	0.9	0.7	0.6	0.5	0.4	0.6	0.3	0.4	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	Diurnal Average
																								0.6	1.6	1.0	0.5	5.8	7.8	7.4	8.3	9.2	3.2	2.5	1.8	1.5	4.2	1.1	3.3	0.8	1.0	1.8	0.4	0.6	0.8	1.0	0.7	Diurnal Maximum
Z - zerospan C - Calibration																																																



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Firebag - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Firebag - October 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 - October 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	36	19	6	0	6	5	50	121	105	38	66	65	49	50	49	43	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	36	19	6	0	6	5	50	121	105	38	66	65	49	50	49	43	708

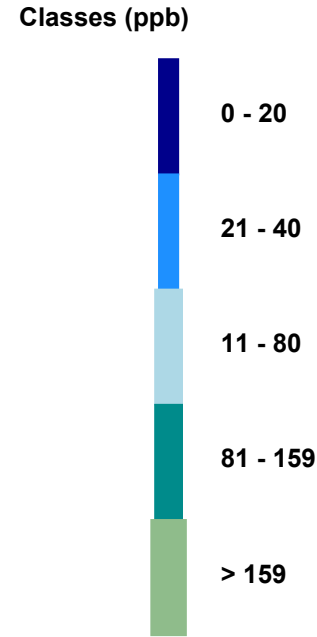
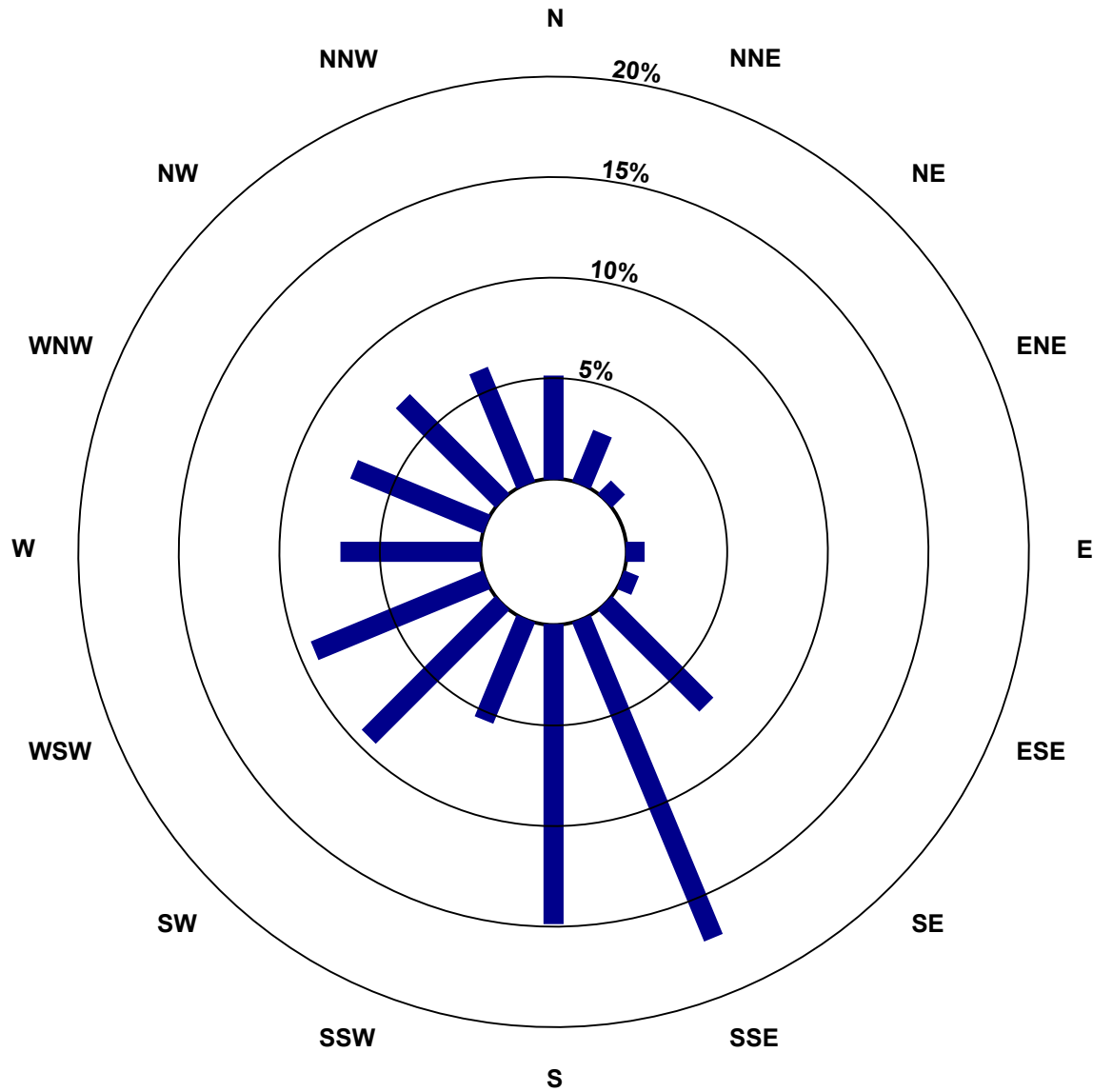
Total Number of Valid Hours: 708

Total Number of Hours: 744

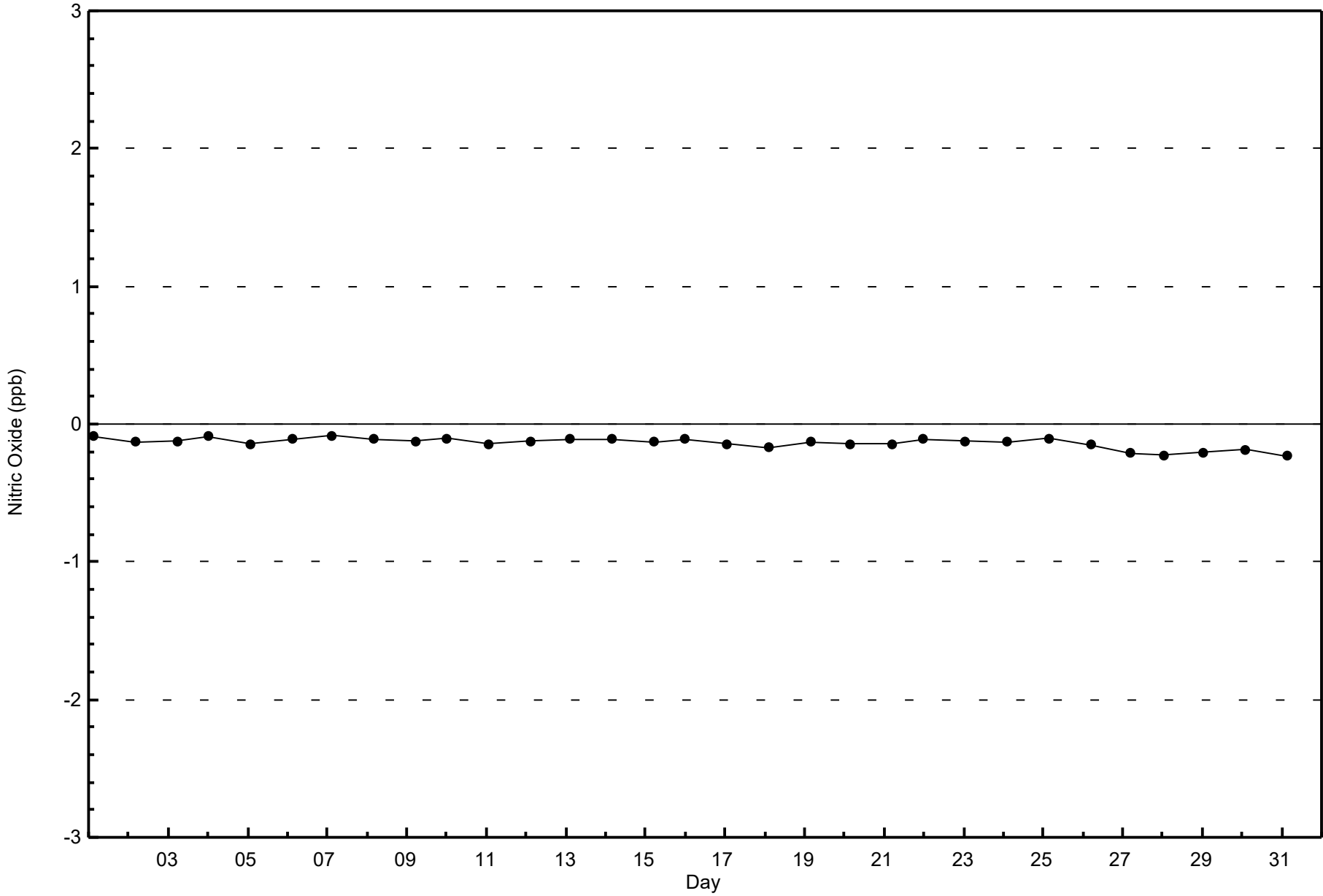


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitric Oxide (NO) - ppb
Firebag



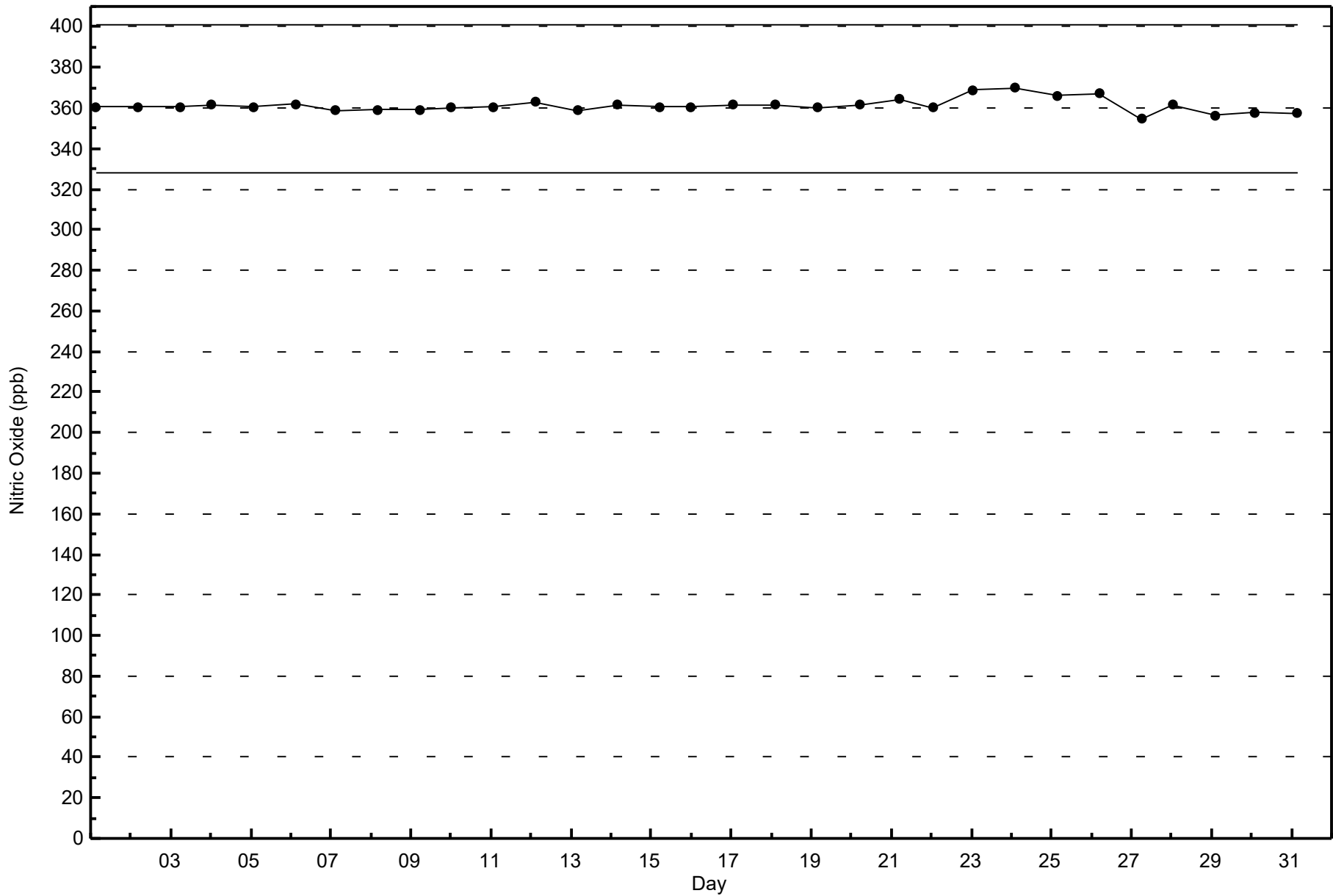
Total Number of Valid Hours: 708





Wood Buffalo Environmental Association
Span Responses

Nitric Oxide (NO) - ppb
Firebag - October 2023





Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

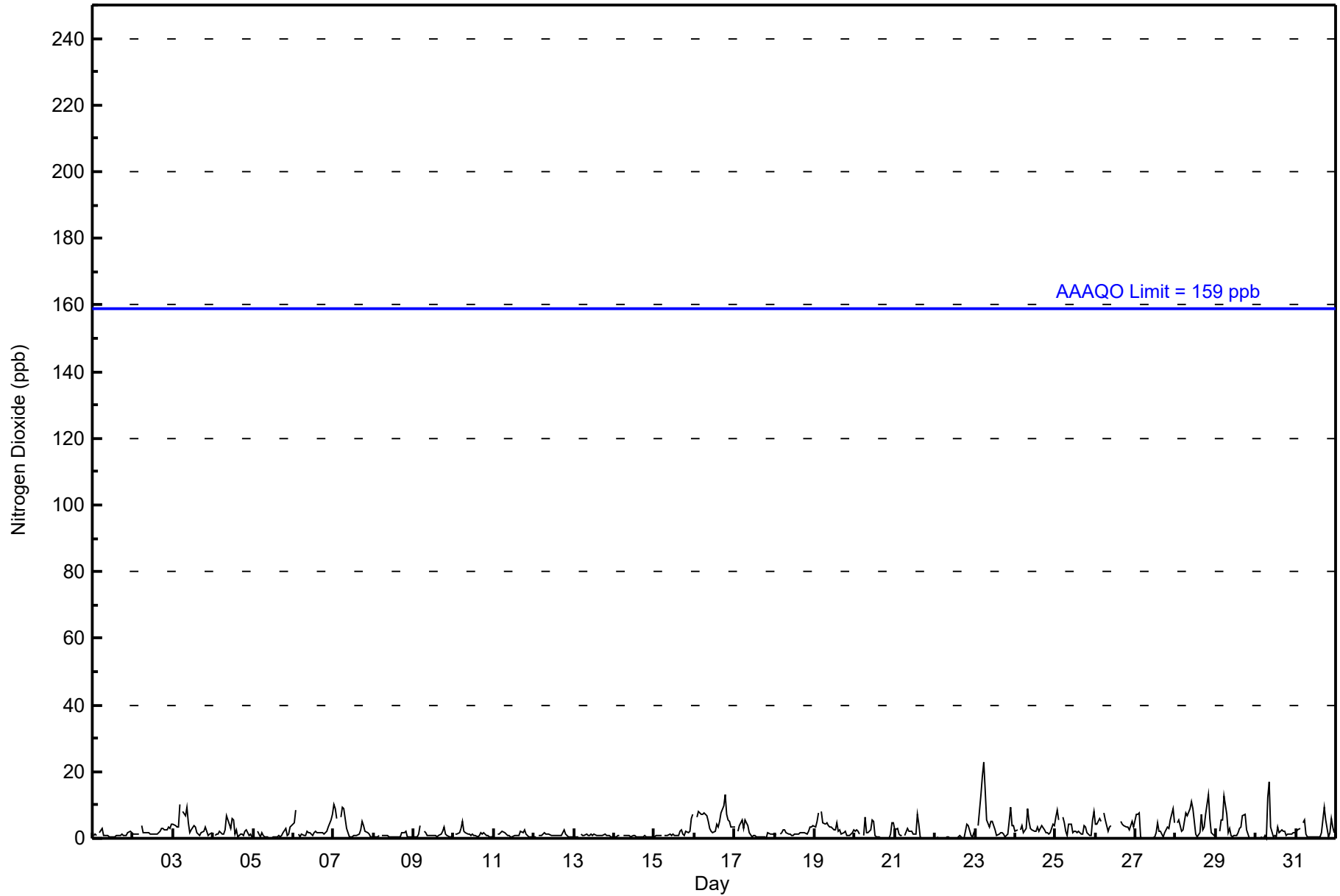
Firebag - October 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 744																	Daily Average		Daily Maximum																										
Maximum Value: 22.9 ppb on Oct 23 06:00		Maximum Daily Average: 5.8 ppb on Oct 16																	Hours of Data: 708		Hours of Missing Data: 36																												
Minimum Value: 0.1 ppb on Oct 5 11:00		Minimum Daily Average: 0.6 ppb on Oct 14																	Hours of Calibration: 36		Percent Operational Time: 100.0																												
Maximum Diurnal Average: 4.3 ppb at hour 6		Minimum Diurnal Average: 1.4 ppb at hour 13																																															
Monthly Average: 2.36 ppb		Percentiles: P ₁ = 0.2 P ₁₀ = 0.4 Q ₁ = 0.7 Median = 1.4 Q ₃ = 3.1 P ₉₀ = 5.5 P ₉₉ = 12.9																																															
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-Oct	0.9	1.1	1.0	Z	1.5	2.8	1.0	1.0	0.9	0.7	0.6	0.5	0.6	0.6	0.7	0.9	1.0	1.2	0.8	1.0	0.8	1.9	2.0	1.5	1.1	2.8																							
2-Oct	1.1	1.2	1.2	1.3	Z	4.0	1.6	1.8	1.9	1.6	1.4	1.3	1.4	1.3	1.5	2.0	2.8	3.0	2.4	2.7	3.3	3.1	4.3	2.1	4.3																								
3-Oct	4.1	3.8	3.3	3.2	10.1	Z	8.0	6.8	9.4	4.6	1.9	2.5	3.8	3.4	1.9	1.3	0.9	1.6	2.1	3.4	2.2	0.8	1.3	1.6	3.6	10.1																							
4-Oct	Z	0.9	1.2	1.1	2.0	1.1	1.1	2.7	6.8	5.4	2.9	5.8	5.4	1.1	2.5	0.6	1.1	1.4	1.0	2.2	2.6	0.7	1.2	0.6	2.2	6.8																							
5-Oct	0.4	Z	2.0	1.3	0.4	1.8	0.7	0.3	0.4	0.2	0.1	0.2	0.5	0.6	0.5	0.8	0.5	0.7	1.9	3.1	0.9	1.2	3.2	3.8	1.1	3.8																							
6-Oct	4.8	8.5	Z	1.2	0.6	1.2	0.8	0.9	2.0	1.7	1.9	1.0	1.6	2.1	1.5	1.6	1.7	1.8	1.4	1.5	2.0	3.6	5.7	7.4	2.5	8.5																							
7-Oct	10.0	9.1	5.9	Z	6.2	9.5	8.7	5.9	2.9	0.6	0.6	0.6	0.7	0.8	0.8	1.4	2.5	5.0	4.0	2.1	1.6	1.1	0.6	0.4	3.5	10.0																							
8-Oct	0.4	0.3	0.5	0.8	Z	0.9	0.8	0.8	0.8	0.6	0.6	0.5	0.6	0.5	0.6	0.4	0.6	1.5	1.7	2.3	0.6	0.6	0.6	0.6	0.8	2.3																							
9-Oct	0.5	0.5	0.6	1.1	4.0	Z	2.0	1.6	0.7	0.8	0.8	0.9	0.8	0.7	0.5	0.9	1.3	2.0	3.4	1.3	0.9	0.6	0.6	0.7	1.2	4.0																							
10-Oct	Z	1.3	1.1	1.5	2.8	5.1	2.0	1.5	1.1	1.1	1.0	1.2	0.8	0.8	0.6	1.0	1.5	1.4	1.8	1.0	0.8	0.5	0.6	0.6	1.4	5.1																							
11-Oct	0.9	Z	1.1	1.2	1.7	2.1	1.7	1.1	0.8	0.7	0.6	0.6	0.7	0.9	0.8	0.9	2.0	1.5	2.6	1.3	0.9	0.5	0.5	0.5	1.1	2.6																							
12-Oct	0.5	0.5	Z	0.7	1.0	1.1	1.5	1.1	1.2	1.2	1.0	0.9	0.8	0.7	0.8	0.7	0.7	1.8	2.5	1.3	0.6	0.4	0.4	0.3	0.9	2.5																							
13-Oct	0.4	0.4	0.5	Z	1.1	0.9	0.9	1.4	0.8	1.0	1.1	0.8	1.1	0.8	0.8	1.0	0.7	0.9	1.1	0.9	0.7	0.9	0.5	0.4	0.8	1.4																							
14-Oct	0.6	0.5	0.7	0.9	Z	0.9	0.8	0.8	0.8	0.7	0.5	0.7	0.9	0.6	0.5	0.6	0.4	0.6	0.7	0.5	0.4	0.4	0.5	0.5	0.6	0.9																							
15-Oct	0.6	0.7	0.7	0.8	1.0	Z	0.9	1.0	1.0	1.2	1.0	1.1	0.8	0.8	1.0	2.0	2.4	1.4	1.0	2.0	1.9	2.3	5.9	7.2	1.7	7.2																							
16-Oct	Z	6.3	8.2	7.5	7.1	7.4	7.6	6.9	5.1	3.1	2.1	1.9	2.3	4.1	3.5	4.9	7.7	9.7	13.1	7.1	5.5	5.1	3.5	3.5	5.8	13.1																							
17-Oct	3.5	Z	2.2	3.8	5.7	2.9	5.7	4.6	4.0	1.8	0.4	0.7	0.8	0.6	0.6	0.4	0.3	0.3	0.3	0.2	1.6	1.2	1.3	1.1	1.9	5.7																							
18-Oct	0.7	1.2	Z	1.1	1.9	2.7	2.5	1.8	1.3	1.3	0.9	0.9	1.3	1.4	1.3	1.8	1.9	1.8	1.5	1.3	2.3	3.5	3.6	3.7	1.8	3.7																							
19-Oct	3.4	4.9	7.8	Z	7.9	4.8	4.3	4.5	4.0	3.5	3.5	2.7	2.5	4.6	2.3	2.6	1.4	1.8	2.0	1.0	0.7	0.9	1.8	2.7	3.3	7.9																							
20-Oct	2.2	2.6	2.0	1.4	Z	1.0	6.5	1.9	1.9	2.6	5.5	4.9	0.7	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	1.2	4.8	4.6	2.0	6.5																							
21-Oct	2.7	3.1	1.1	1.0	1.0	Z	0.7	2.9	2.2	2.1	2.3	1.3	1.3	7.1	4.2	0.6	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	1.5	7.1																							
22-Oct	Z	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.2	0.2	0.2	0.2	0.2	0.4	0.7	0.2	0.2	2.0	4.3	4.0	0.7	0.4	1.8	0.8	4.3																							
23-Oct	0.9	Z	3.8	13.0	18.6	22.9	14.3	5.4	3.4	5.1	4.9	3.9	2.7	0.9	1.2	1.5	1.7	1.4	0.4	1.1	5.1	9.2	4.0	3.9	5.6	22.9																							
24-Oct	2.1	2.5	Z	2.4	3.7	1.8	3.1	9.1	4.9	3.0	2.4	2.2	2.1	3.5	2.2	2.8	3.9	2.7	1.5	1.6	1.4	1.9	4.3	3.7	3.0	9.1																							
25-Oct	6.5	8.3	5.6	Z	6.4	4.5	2.1	0.7	4.1	4.3	1.9	2.1	2.0	1.6	2.2	1.4	1.2	3.9	3.5	1.9	0.8	0.7	5.4	8.1	3.4	8.3																							
26-Oct	4.2	4.3	6.0	5.2	Z	7.5	5.3	2.2	3.2	4.0	C	C	C	C	C	5.0	4.3	3.7	3.5	3.3	2.5	3.8	5.1	3.2	4.2	7.5																							
27-Oct	7.3	7.3	7.6	0.6	0.2	Z	0.2	0.2	0.1	0.1	0.2	0.3	1.8	4.8	2.3	2.3	0.3	1.5	2.5	3.2	2.9	5.4	8.9	4.8	2.8	8.9																							
28-Oct	Z	4.7	5.4	2.3	2.6	4.9	7.6	6.8	8.7	11.1	9.1	5.2	1.1	0.4	1.6	7.1	2.6	3.6	7.4	13.0	6.0	1.5	1.1	0.8	5.0	13.0																							
29-Oct	0.7	Z	2.2	5.6	5.5	12.9	7.1	1.9	2.8	0.7	0.5	1.0	1.0	1.7	3.0	3.5	6.8	7.0	2.4	1.1	0.2	0.2	0.2	0.2	3.0	12.9																							
30-Oct	0.2	0.2	Z	0.3	0.2	1.0	0.2	12.3	17.1	3.2	0.6	0.7	0.5	3.6	1.7	2.7	2.2	2.3	0.8	1.2	1.2	1.3	1.6	1.7	2.5	17.1																							
31-Oct	1.8	2.7	2.9	Z	4.7	5.3	1.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	1.8	5.5	9.3	5.3	0.4	1.8	5.8	3.2	1.6	2.5	9.3																							
																								2.4	3.0	2.9	2.4	3.8	4.3	3.3	2.9	3.1	2.2	1.7	1.6	1.4	1.7	1.4	1.8	1.9	2.4	2.4	2.2	1.8	2.0	2.5	2.5	Diurnal Average	
																								10.0	9.1	8.2	13.0	18.6	22.9	14.3	12.3	17.1	11.1	9.1	5.8	5.4	7.1	4.2	7.1	7.7	9.7	13.1	13.0	6.0	9.2	8.9	8.1	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 - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Firebag - October 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	707	99.86	99.86
21 - 40	1	0.14	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Firebag - October 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	36	19	6	0	6	5	50	121	105	38	66	64	49	50	49	43	707
21 - 40	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	36	19	6	0	6	5	50	121	105	38	66	65	49	50	49	43	708

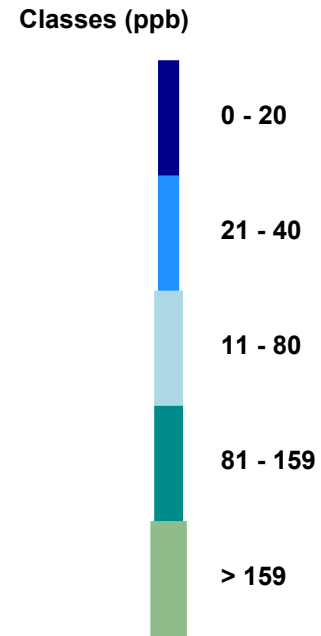
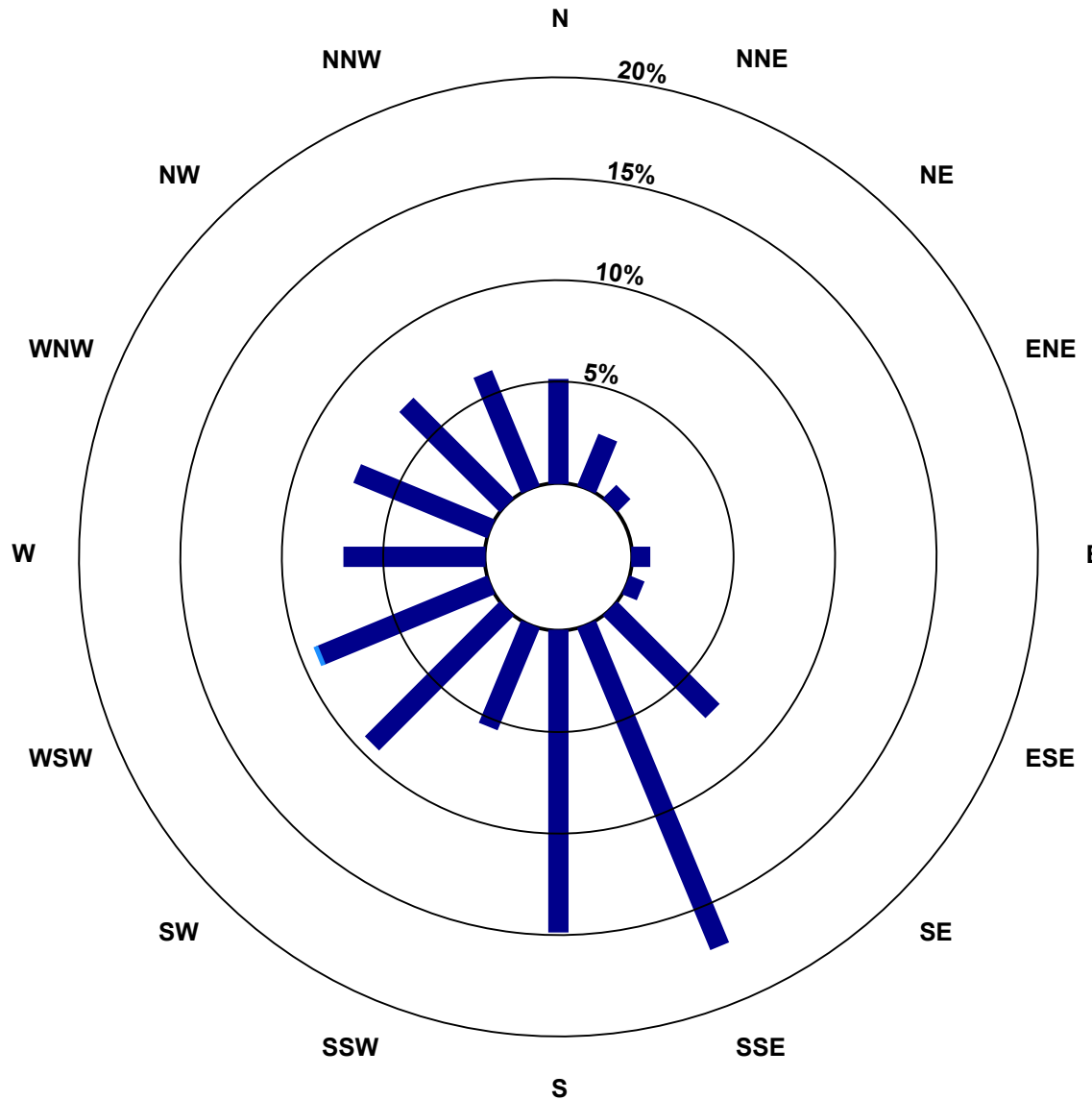
Total Number of Valid Hours: 708

Total Number of Hours: 744

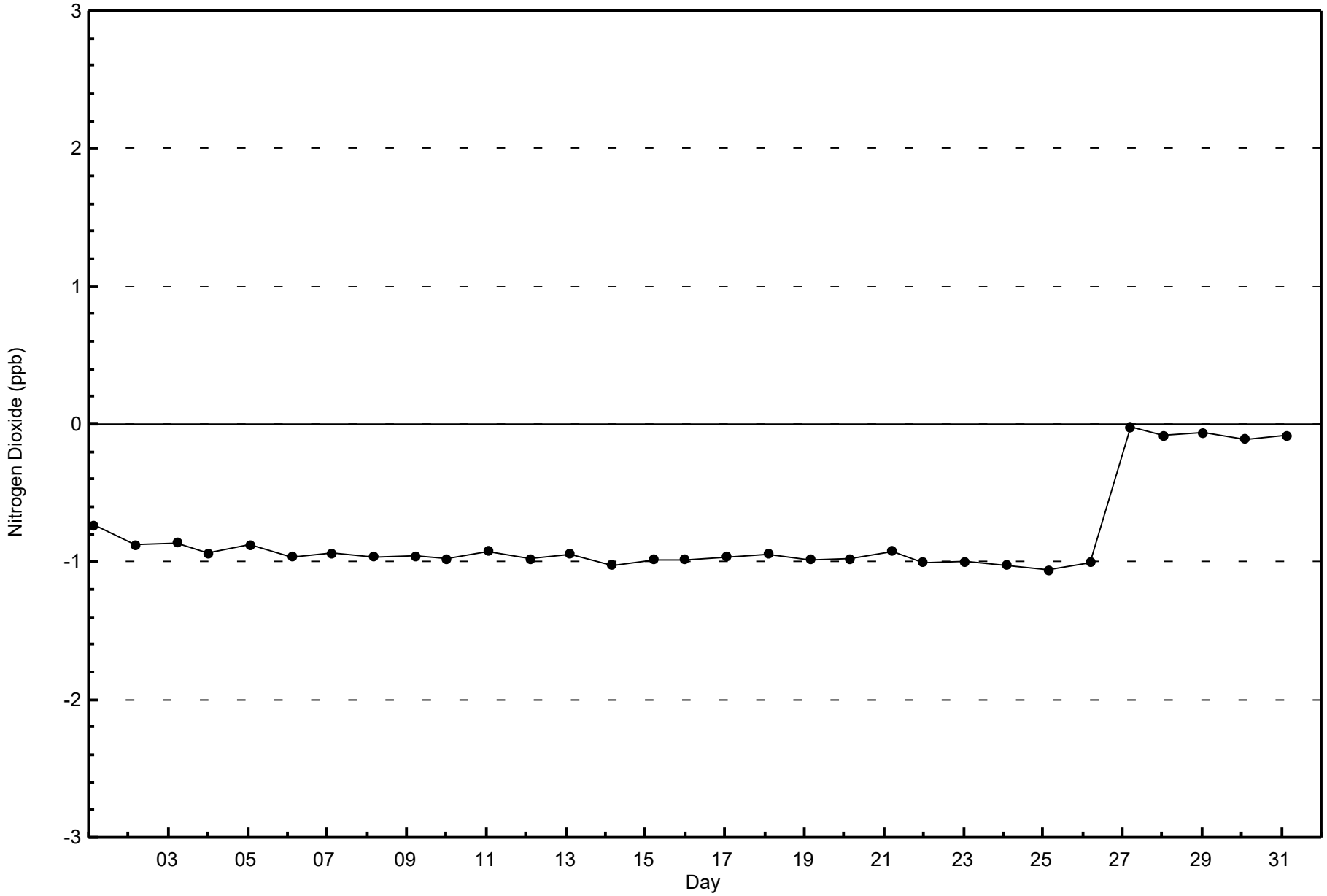


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitrogen Dioxide (NO₂) - ppb
Firebag



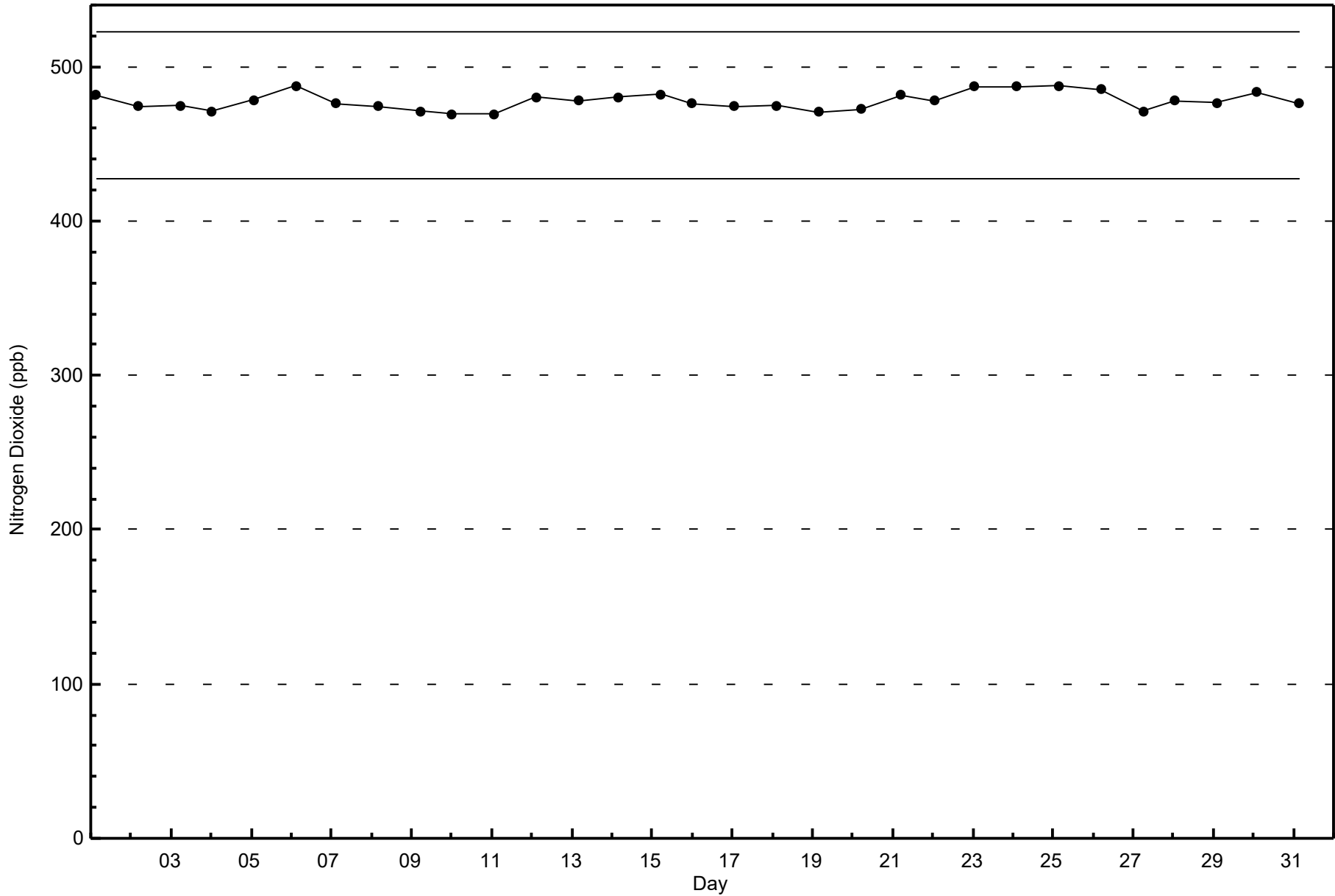
Total Number of Valid Hours: 708





Wood Buffalo Environmental Association
Span Responses

Nitrogen Dioxide (NO₂) - ppb
Firebag - October 2023





Wood Buffalo Environmental Association
Summary of Hour Averages

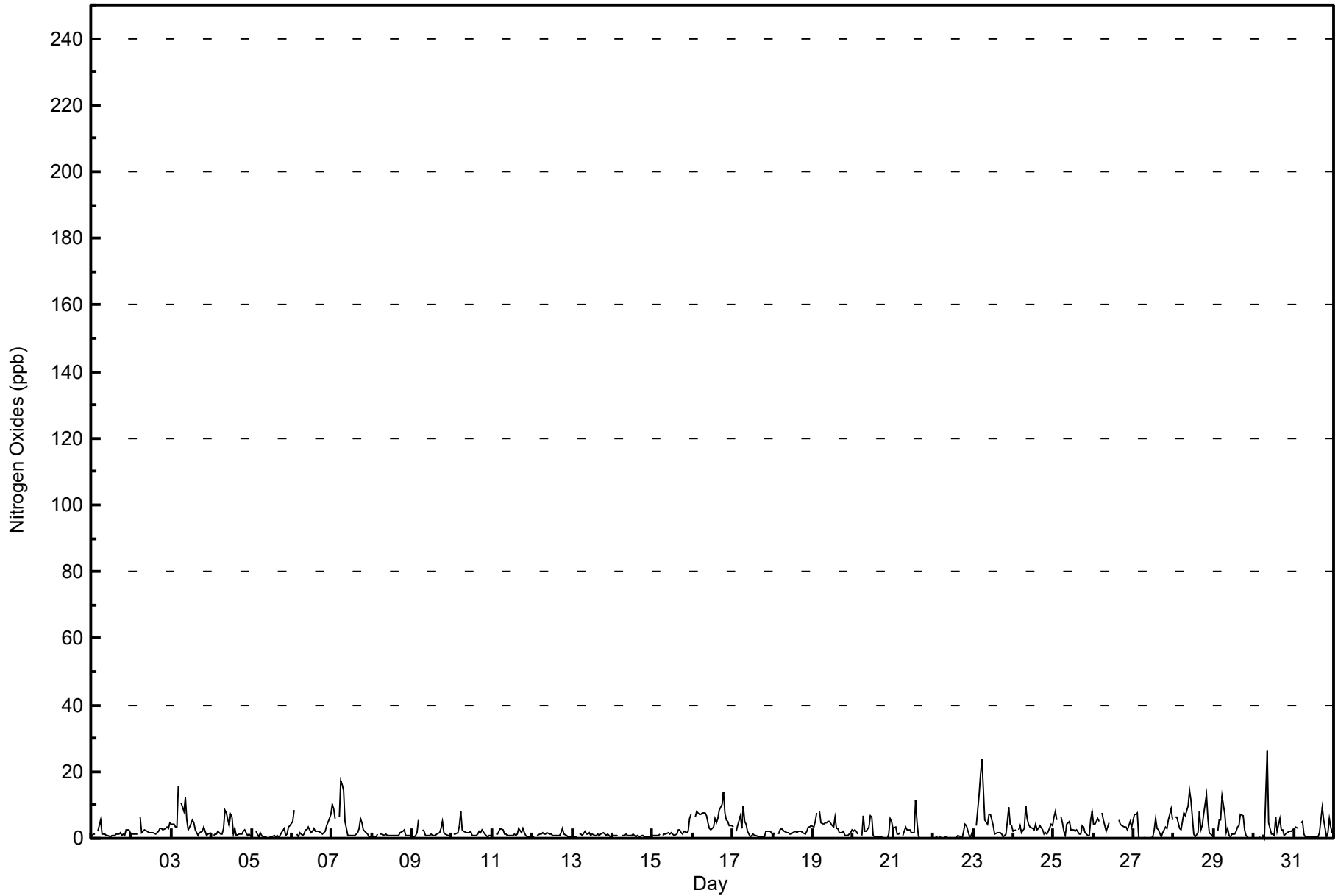
Nitrogen Oxides (NO_x) - ppb
Firebag - October 2023

Maximum Value: 26.3 ppb on Oct 30 09:00 Maximum Daily Average: 6.4 ppb on Oct 16																				Hours in Service: 744 Hours of Data: 708						
Minimum Value: 0.1 ppb on Oct 21 23:00 Minimum Daily Average: 0.8 ppb on Oct 22 Maximum Diurnal Average: 5.0 ppb at hour 6 Minimum Diurnal Average: 1.7 ppb at hour 15 Monthly Average: 2.71 ppb Percentiles: P ₁ = 0.2 P ₁₀ = 0.5 Q ₁ = 0.9 Median = 1.6 Q ₃ = 3.5 P ₉₀ = 6.3 P ₉₉ = 14.3																				Hours of Missing Data: 36 Hours of Calibration: 36 Percent Operational Time: 100.0						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Oct	0.9	1.3	1.1	Z	2.1	5.6	1.1	1.3	1.1	0.9	0.8	0.6	0.8	0.7	0.9	1.2	1.2	1.5	0.9	1.1	0.9	2.4	2.6	1.8	1.4	5.6
2-Oct	1.2	1.3	1.2	1.4	Z	6.5	1.8	2.2	2.3	1.9	1.7	1.5	1.6	1.5	1.6	2.2	3.0	3.1	2.4	2.8	3.4	3.2	4.7	2.4	6.5	
3-Oct	4.4	4.3	3.5	3.3	15.9	Z	10.6	8.1	12.1	5.5	2.6	3.6	5.3	4.7	2.4	1.5	1.0	1.7	2.1	3.4	2.2	0.8	1.3	1.8	4.4	15.9
4-Oct	Z	0.9	1.2	1.1	2.0	1.1	1.1	3.0	8.4	7.6	3.8	7.3	6.2	1.2	2.9	0.7	1.2	1.4	1.1	2.3	2.7	0.8	1.4	0.7	2.6	8.4
5-Oct	0.5	Z	2.1	1.4	0.4	1.9	0.8	0.3	0.5	0.2	0.2	0.3	0.6	0.7	0.6	1.0	0.6	0.8	1.9	3.1	0.9	1.2	3.2	3.8	1.2	3.8
6-Oct	4.9	8.6	Z	1.2	0.6	1.6	0.9	1.1	2.7	2.4	3.3	1.7	2.2	2.8	2.1	2.1	1.9	1.8	1.4	1.5	2.0	3.6	5.7	7.4	2.8	8.6
7-Oct	10.1	9.1	5.9	Z	6.2	17.3	16.1	14.2	5.1	0.7	0.8	0.7	0.9	1.0	1.0	1.6	2.8	5.7	4.8	2.5	1.8	1.3	0.6	0.5	4.8	17.3
8-Oct	0.5	0.4	0.6	1.2	Z	1.2	1.1	1.0	1.1	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.7	1.8	2.2	2.7	0.7	0.7	0.7	0.7	1.0	2.7
9-Oct	0.5	0.6	0.7	1.5	5.3	Z	2.6	2.0	0.9	1.0	1.0	1.2	1.0	0.9	0.7	1.3	1.7	3.0	5.2	1.6	1.1	0.7	0.7	0.8	1.6	5.3
10-Oct	Z	1.4	1.3	1.8	3.6	8.2	2.4	2.3	1.8	1.8	1.6	2.0	1.1	1.0	0.8	1.4	2.1	1.8	2.4	1.2	0.9	0.6	0.7	0.7	1.9	8.2
11-Oct	1.0	Z	1.2	1.3	2.1	2.8	2.3	1.5	1.2	0.9	0.8	0.7	0.8	1.1	1.0	1.1	2.8	1.7	3.1	1.6	1.0	0.6	0.5	0.5	1.4	3.1
12-Oct	0.5	0.5	Z	0.8	1.1	1.3	1.7	1.2	1.4	1.5	1.2	1.1	1.0	0.8	1.0	0.9	0.8	1.9	2.8	1.5	0.8	0.5	0.5	0.4	1.1	2.8
13-Oct	0.4	0.5	0.6	Z	1.3	1.1	1.0	2.0	1.3	1.4	1.5	1.0	1.4	1.0	0.9	1.2	0.8	1.2	1.5	1.2	0.9	1.1	0.6	0.5	1.1	2.0
14-Oct	0.7	0.6	0.8	1.0	Z	1.0	0.9	0.9	1.1	0.9	0.7	0.9	1.3	0.8	0.6	0.8	0.5	0.7	0.8	0.6	0.5	0.4	0.6	0.6	0.8	1.3
15-Oct	0.7	0.8	0.8	0.9	1.2	Z	1.0	1.2	1.2	1.6	1.4	1.6	1.1	1.0	1.3	2.5	2.7	1.6	1.1	2.0	1.9	2.3	5.9	7.2	1.9	7.2
16-Oct	Z	6.3	8.2	7.5	7.1	7.4	7.7	7.6	6.9	4.6	3.0	2.7	3.2	5.8	4.6	5.9	8.4	10.3	14.2	7.4	5.6	5.2	3.6	3.6	6.4	14.2
17-Oct	3.6	Z	2.3	3.9	6.7	3.1	9.9	4.9	4.3	2.1	0.5	0.9	1.1	0.9	0.8	0.5	0.4	0.4	0.3	2.2	2.0	1.9	1.6	2.4	9.9	
18-Oct	0.9	1.5	Z	1.3	2.4	3.0	2.7	2.0	1.6	1.6	1.2	1.2	1.7	1.9	1.6	2.1	2.1	2.0	1.6	1.3	2.3	3.5	3.6	3.7	2.0	3.7
19-Oct	3.4	4.9	7.8	Z	7.9	4.8	4.3	4.7	4.7	4.9	5.1	3.9	3.5	6.5	2.9	2.9	1.5	1.8	2.0	1.0	0.7	0.9	1.8	2.7	3.7	7.9
20-Oct	2.2	2.6	2.0	1.4	Z	1.0	6.7	2.0	2.2	3.2	6.9	6.5	0.8	0.5	0.4	0.3	0.2	0.2	0.2	0.2	0.2	1.3	5.8	5.3	2.3	6.9
21-Oct	3.0	3.4	1.3	1.3	1.6	Z	0.8	3.3	2.6	2.5	2.7	1.5	1.5	11.3	5.3	0.6	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	1.9	11.3
22-Oct	Z	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.2	0.2	0.2	0.2	0.2	0.4	0.7	0.2	0.2	2.0	4.3	4.0	0.7	0.4	1.8	0.8	4.3
23-Oct	0.9	Z	3.8	13.0	19.0	23.6	14.8	5.6	4.1	7.2	7.3	5.7	3.8	1.1	1.5	1.7	1.8	1.4	0.4	1.1	5.1	9.2	4.0	3.9	6.1	23.6
24-Oct	2.1	2.5	Z	2.4	3.7	1.8	3.1	9.6	6.0	4.1	3.4	2.8	2.5	4.1	2.5	2.9	3.9	2.7	1.5	1.6	1.4	1.9	4.3	3.7	3.2	9.6
25-Oct	6.5	8.3	5.6	Z	6.4	4.5	2.1	0.7	4.4	5.0	2.4	2.7	2.7	1.9	2.6	1.5	1.2	3.9	3.5	1.9	0.8	0.7	5.4	8.1	3.6	8.3
26-Oct	4.2	4.3	6.0	5.2	Z	7.5	5.3	2.2	3.5	4.6	C	C	C	C	C	5.3	4.3	3.7	3.5	3.5	2.5	3.8	5.1	3.2	4.3	7.5
27-Oct	7.3	7.3	7.6	0.6	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.4	2.4	5.8	2.8	2.7	0.3	1.5	2.5	3.2	2.9	5.5	9.1	5.4	3.0	9.1
28-Oct	Z	6.3	6.4	2.8	2.8	5.0	7.7	6.9	9.7	14.3	11.6	6.2	1.2	0.4	1.8	8.1	2.7	3.6	7.4	13.1	6.0	1.5	1.1	0.8	5.5	14.3
29-Oct	0.7	Z	2.2	5.6	5.5	12.9	7.1	1.9	3.0	0.7	0.6	1.2	1.2	2.0	3.5	4.0	7.1	7.0	2.4	1.1	0.2	0.2	0.2	0.2	3.1	12.9
30-Oct	0.2	0.2	Z	0.3	0.2	1.0	0.2	13.7	26.3	4.6	1.1	1.2	1.0	6.2	2.3	6.0	2.5	2.4	0.9	1.4	1.7	2.0	2.3	2.4	3.5	26.3
31-Oct	2.4	3.4	3.1	Z	4.7	5.3	1.4	0.4	0.4	0.5	0.4	0.4	0.5	0.5	0.5	1.9	5.6	9.3	5.3	0.4	1.8	5.8	3.2	1.6	2.6	9.3
2.4 3.1 3.0 2.5 4.2 5.0 3.9 3.5 4.0 2.9 2.3 2.1 1.8 2.3 1.7 2.2 2.1 2.6 2.7 2.3 1.9 2.1 2.6 2.6																								Diurnal Average		
10.1 9.1 8.2 13.0 19.0 23.6 16.1 14.2 26.3 14.3 11.6 7.3 6.2 11.3 5.3 8.1 8.4 10.3 14.2 13.1 6.0 9.2 9.1 8.1																								Diurnal Maximum		
Z - zerospan C - Calibration																										



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Firebag - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Firebag - October 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	706	99.72	99.72
21 - 40	2	0.28	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Firebag - October 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	36	19	6	0	6	5	50	121	104	38	66	64	49	50	49	43	706
21 - 40	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	2
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	36	19	6	0	6	5	50	121	105	38	66	65	49	50	49	43	708

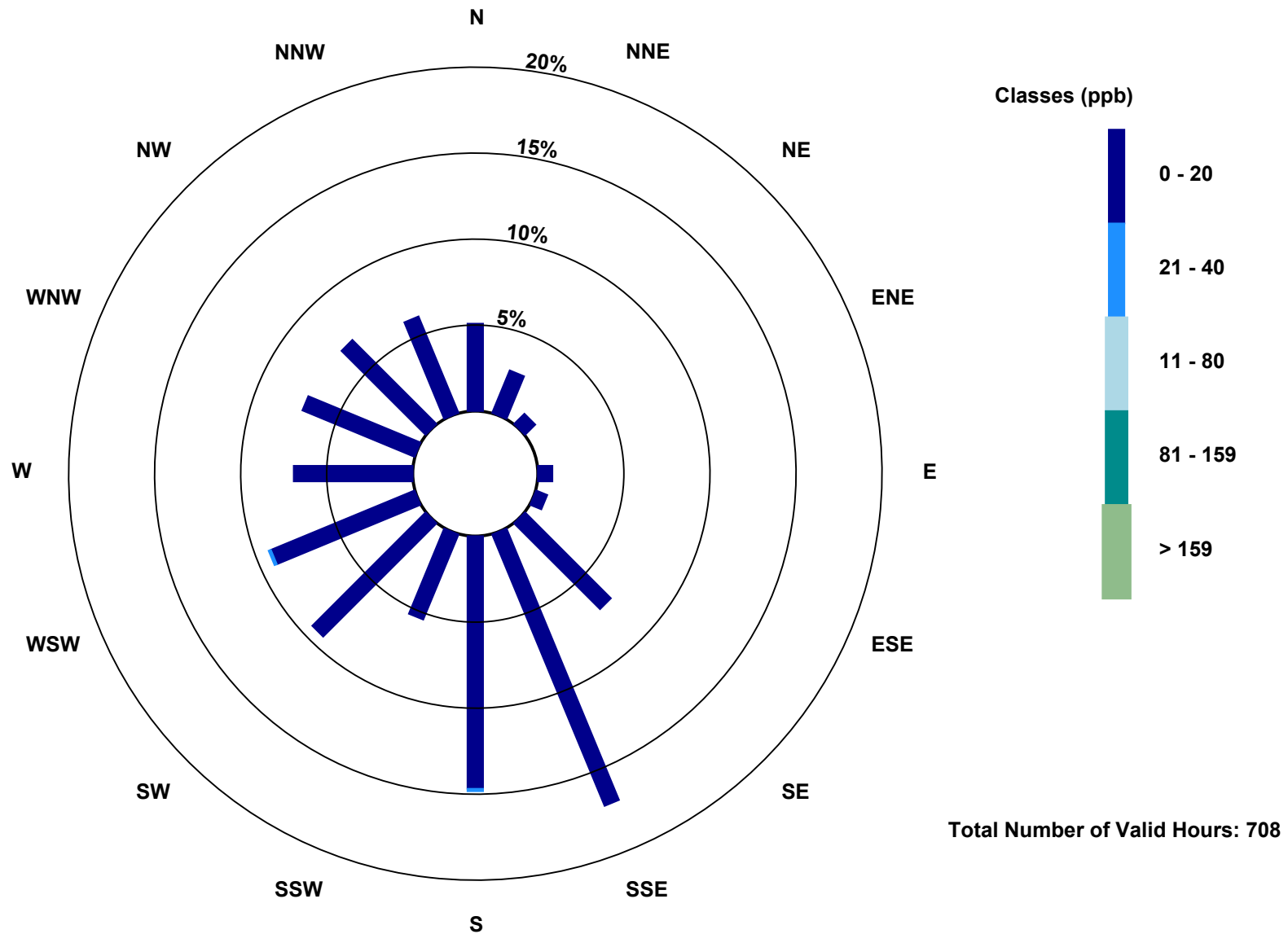
Total Number of Valid Hours: 708

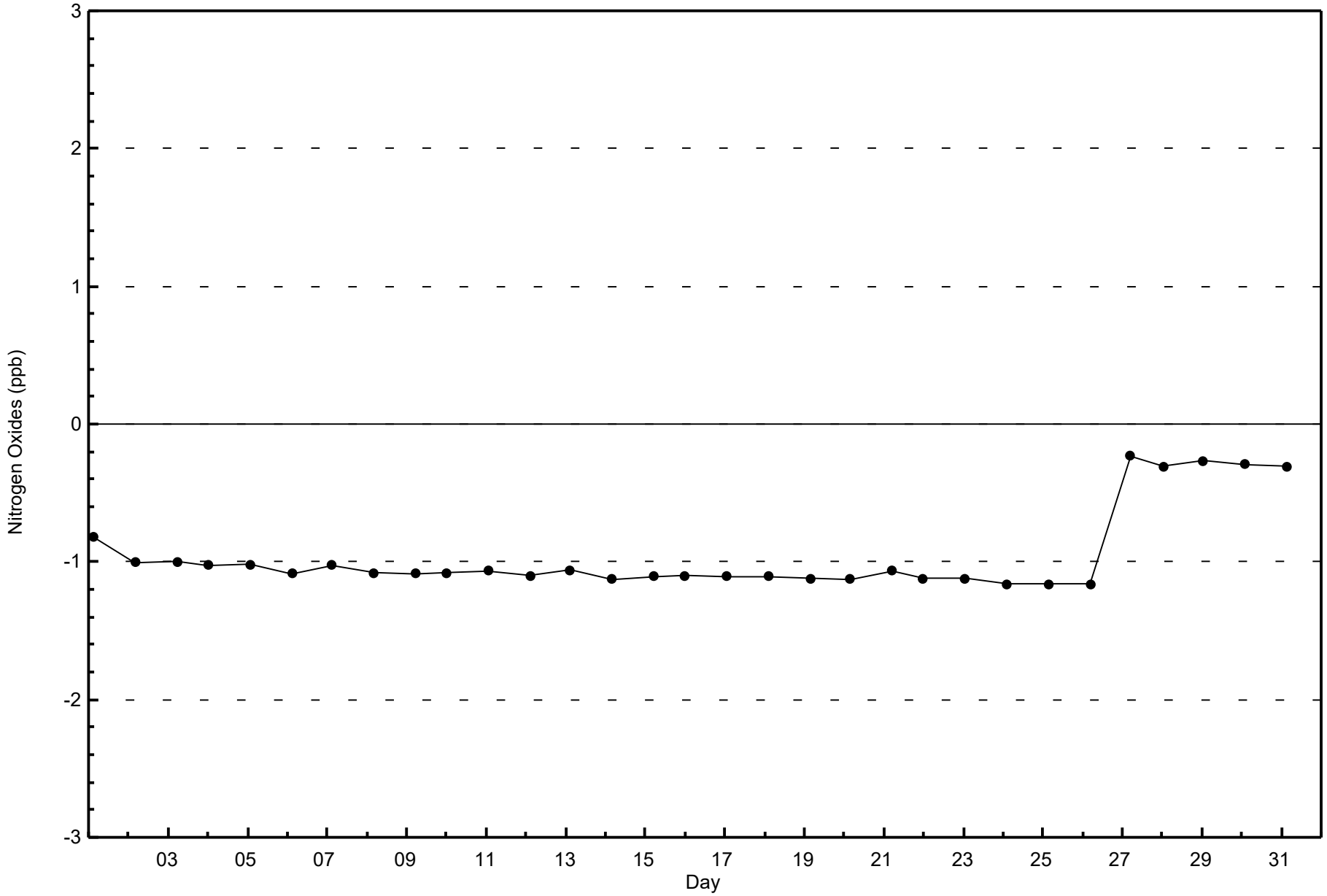
Total Number of Hours: 744

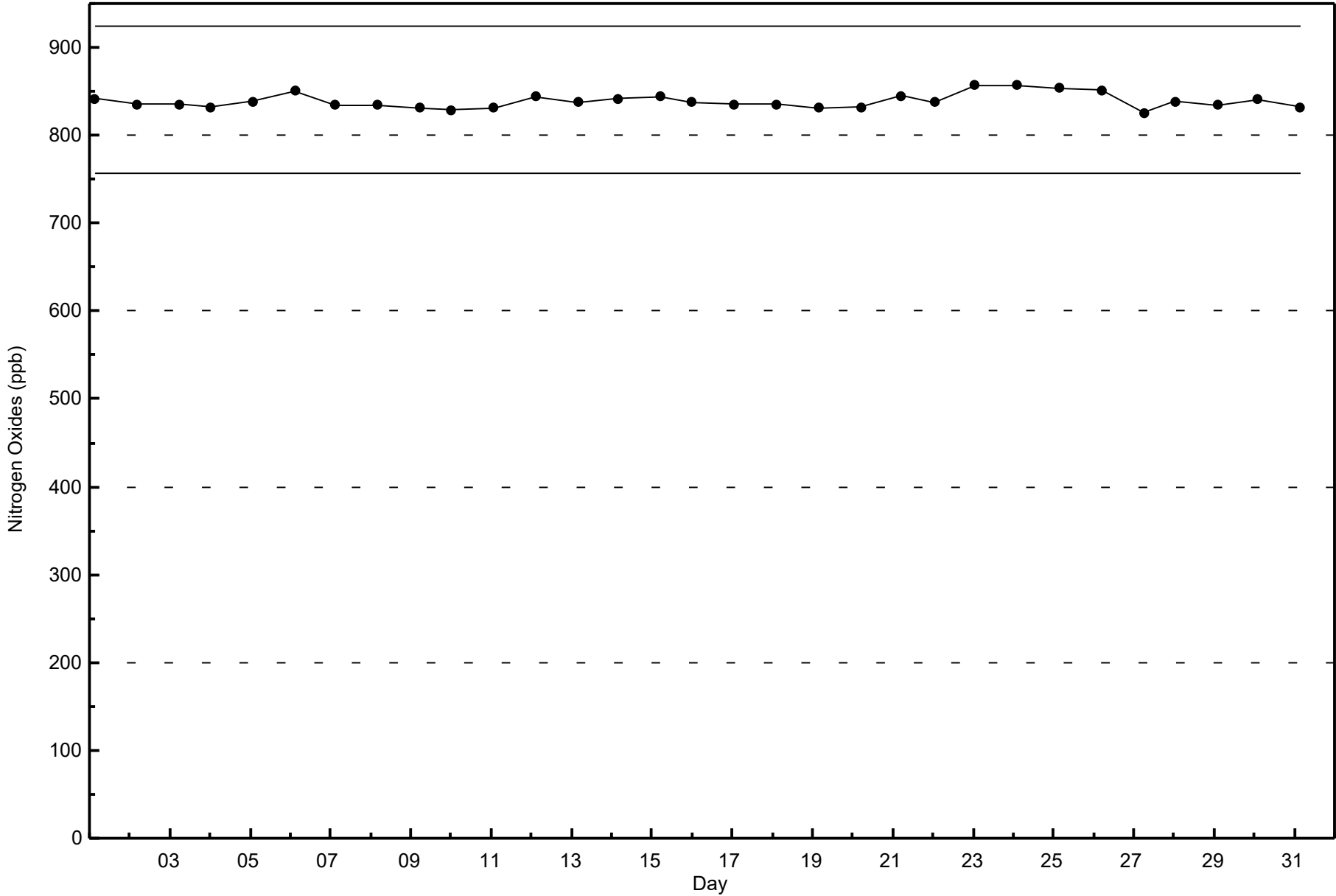


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitrogen Oxides (NO_x) - ppb
Firebag

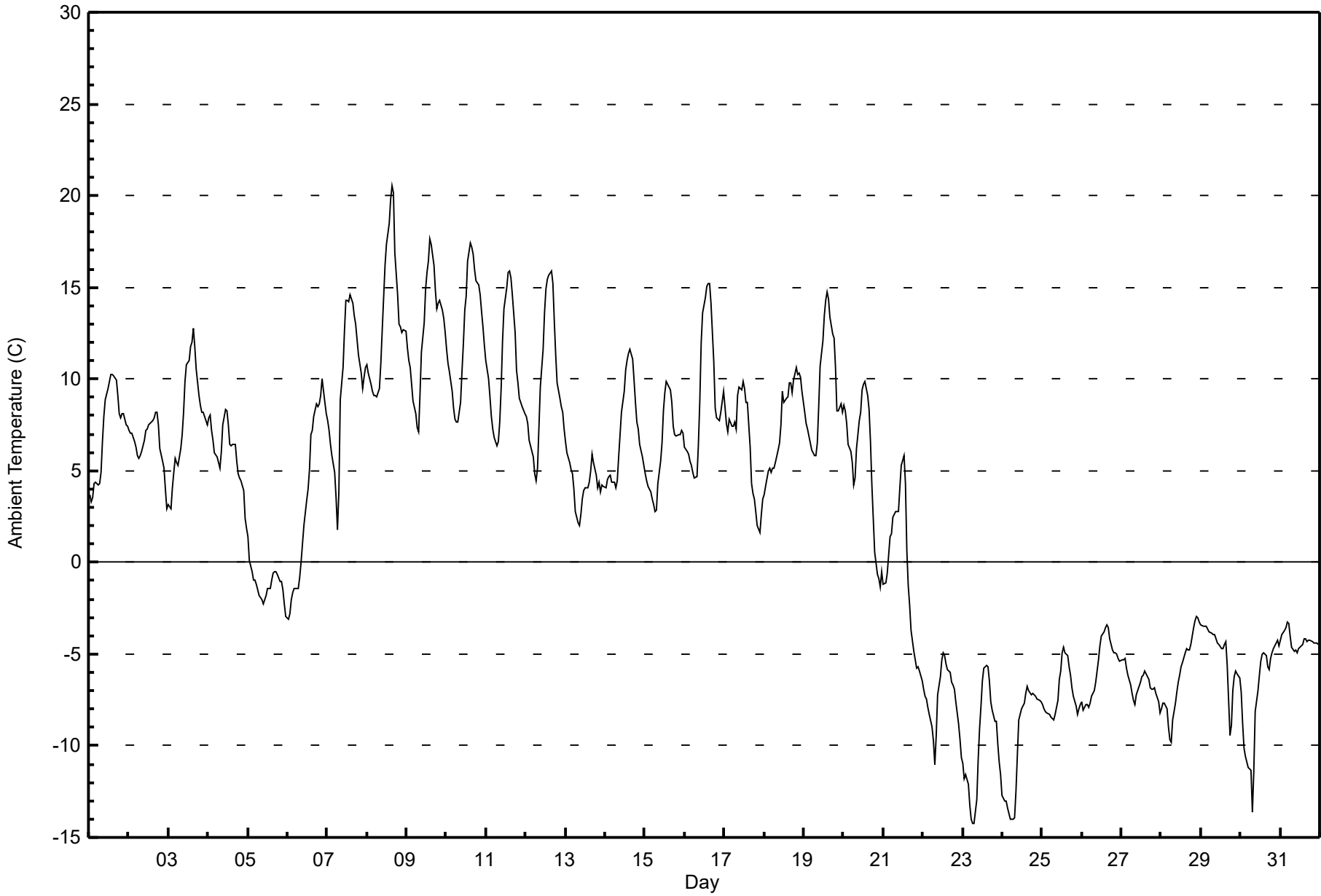








Maximum Value: 20.5 C on Oct 8 16:00		Maximum Daily Average: 13.4 C on Oct 8		Hours in Service: 744																																												
Minimum Value: -14.3 C on Oct 23 08:00		Minimum Daily Average: -9.9 C on Oct 23		Hours of Data: 744																																												
Maximum Diurnal Average: 5.6 C at hour 15		Minimum Diurnal Average: 0.1 C at hour 7		Hours of Missing Data: 0																																												
Monthly Average: 2.74 C		Percentiles: P ₁ = -13.5 P ₁₀ = -7.7 Q ₁ = -4.8 Median = 4.7 Q ₃ = 8.7 P ₉₀ = 12.5 P ₉₉ = 17.3		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-Oct	3.7	3.3	3.6	4.3	4.4	4.2	4.3	4.9	6.6	7.9	8.8	9.5	9.9	10.3	10.2	10.2	9.9	9.1	8.1	7.9	8.1	8.1	7.5	7.4	7.2	10.3																						
2-Oct	7.2	7.0	7.0	6.6	6.2	5.8	5.7	5.8	6.1	6.6	7.2	7.3	7.5	7.6	7.8	7.9	8.2	8.2	7.5	6.2	5.5	5.1	4.0	2.9	6.5	8.2																						
3-Oct	3.1	2.9	4.1	4.9	5.7	5.4	5.3	6.2	6.9	8.2	9.8	10.8	11.0	11.8	12.0	12.8	11.8	10.5	9.1	8.6	8.2	8.2	8.0	7.5	8.0	12.8																						
4-Oct	7.9	8.0	7.2	6.7	6.0	5.7	5.5	5.1	6.1	7.5	8.4	8.3	7.5	6.5	6.3	6.4	6.4	5.5	4.8	4.6	4.5	3.9	2.4	1.8	6.0	8.4																						
5-Oct	1.4	0.1	-0.5	-1.0	-1.0	-1.2	-1.5	-1.8	-2.1	-2.2	-2.1	-1.8	-1.4	-1.4	-1.0	-0.6	-0.5	-0.5	-0.7	-1.0	-1.1	-1.5	-2.2	-3.0	-1.2	1.4																						
6-Oct	-3.1	-2.8	-2.1	-1.6	-1.4	-1.4	-1.4	-0.8	0.1	1.0	2.0	3.3	4.0	5.0	6.9	7.2	7.9	8.6	8.5	8.6	9.1	10.0	8.7	8.1	3.5	10.0																						
7-Oct	7.7	7.2	6.4	5.8	4.9	3.5	1.8	3.9	8.9	10.6	12.6	14.3	14.3	14.2	14.6	14.1	13.4	13.0	12.2	11.3	10.3	9.5	10.1	10.6	9.8	14.6																						
8-Oct	10.8	10.3	9.7	9.3	9.1	9.1	9.0	9.5	10.8	12.7	14.4	16.2	17.4	18.5	19.8	20.5	20.2	16.9	14.6	13.0	12.9	12.5	12.7	12.6	13.4	20.5																						
9-Oct	11.7	11.0	10.6	9.7	8.8	8.1	7.4	7.1	9.2	11.5	13.1	14.9	15.9	16.4	17.6	17.3	16.2	14.8	13.8	14.2	14.3	13.7	13.3	12.5	12.6	17.6																						
10-Oct	11.6	10.8	10.4	9.3	8.4	7.8	7.6	7.7	8.7	10.4	11.9	13.7	14.5	16.5	17.4	17.2	16.8	16.0	15.4	15.1	14.6	13.7	12.9	11.9	12.5	17.4																						
11-Oct	11.0	10.0	9.0	8.0	7.3	6.8	6.4	6.6	7.6	9.5	12.1	13.8	15.0	15.8	15.9	15.5	14.6	12.5	10.5	9.8	8.9	8.7	8.5	8.1	10.5	15.9																						
12-Oct	8.0	7.6	6.6	6.4	5.8	4.8	4.5	5.2	7.3	9.5	11.6	13.6	14.9	15.4	15.6	15.9	15.2	13.1	11.3	9.8	8.9	8.5	8.2	7.3	9.8	15.9																						
13-Oct	6.6	5.9	5.5	5.1	4.8	4.0	2.8	2.1	2.0	2.6	3.4	3.9	4.1	4.1	4.4	5.0	5.9	5.5	4.7	4.1	4.4	3.9	4.2	4.1	4.3	6.6																						
14-Oct	4.0	4.5	4.7	4.7	4.4	4.4	4.1	4.4	5.7	7.0	8.2	9.3	10.5	11.0	11.4	11.6	11.1	10.0	8.7	7.7	7.3	6.4	5.7	5.3	7.2	11.6																						
15-Oct	4.8	4.4	4.1	3.9	3.5	3.2	2.8	2.8	4.3	5.5	6.5	8.3	9.3	9.9	9.6	9.4	8.7	7.5	7.0	6.9	7.0	7.0	7.2	7.0	6.3	9.9																						
16-Oct	6.2	6.1	5.9	5.5	5.3	4.9	4.6	4.6	6.4	8.8	12.0	13.6	14.4	15.0	15.2	15.2	14.2	10.9	8.4	7.8	7.8	7.7	8.2	9.3	9.1	15.2																						
17-Oct	8.5	7.6	7.1	7.8	7.5	7.4	7.7	7.3	9.1	9.6	9.4	9.8	9.5	8.7	8.7	6.2	4.3	3.8	3.4	2.8	2.0	1.6	2.6	3.5	6.5	9.8																						
18-Oct	3.7	4.1	5.0	5.2	4.9	5.1	5.1	5.4	6.1	6.5	7.5	9.4	8.7	8.9	9.0	9.8	9.8	9.2	10.0	10.6	10.3	10.3	10.1	9.3	7.7	10.6																						
19-Oct	8.2	7.6	7.3	6.9	6.5	6.2	5.8	5.8	6.5	8.5	10.7	12.1	13.5	14.3	14.7	14.4	13.3	12.5	12.2	10.7	8.3	8.3	8.7	8.2	9.6	14.7																						
20-Oct	8.6	8.3	7.6	6.5	6.1	5.5	4.2	4.6	6.2	7.7	8.2	9.4	9.7	9.9	9.1	8.4	6.6	4.2	2.4	0.6	-0.7	-0.9	-1.3	-0.5	5.4	9.9																						
21-Oct	-1.2	-1.1	-0.6	0.4	1.4	1.6	2.4	2.8	2.8	2.7	4.1	5.3	5.8	4.3	0.6	-1.3	-2.3	-3.7	-4.8	-5.3	-5.7	-5.7	-5.9	-6.4	-0.4	5.8																						
22-Oct	-6.9	-7.3	-7.5	-7.9	-8.3	-9.0	-9.7	-11.0	-9.5	-7.2	-6.2	-5.3	-4.9	-5.1	-5.5	-5.8	-6.0	-6.5	-6.7	-7.0	-7.6	-8.8	-9.7	-10.6	-7.5	-4.9																						
23-Oct	-10.9	-11.8	-11.6	-12.1	-13.2	-14.0	-14.2	-14.3	-12.9	-10.7	-9.0	-7.8	-6.5	-5.7	-5.6	-5.7	-6.5	-7.6	-8.0	-8.6	-8.7	-9.9	-10.9	-11.6	-9.9	-5.6																						
24-Oct	-12.7	-13.0	-13.0	-13.4	-13.7	-14.0	-14.0	-13.9	-12.5	-10.5	-8.6	-8.0	-7.9	-7.7	-7.1	-6.8	-7.0	-7.2	-7.1	-7.2	-7.3	-7.4	-7.5	-7.6	-9.8	-6.8																						
25-Oct	-7.7	-8.0	-8.2	-8.2	-8.3	-8.4	-8.5	-8.6	-8.3	-7.5	-6.4	-5.9	-4.9	-4.6	-4.9	-5.1	-5.7	-6.1	-6.8	-7.3	-7.8	-8.3	-8.0	-7.8	-7.1	-4.6																						
26-Oct	-7.6	-8.0	-7.8	-7.8	-7.9	-7.7	-7.3	-7.0	-6.5	-5.9	-5.3	-4.6	-4.0	-3.8	-3.5	-3.4	-3.6	-4.2	-4.7	-4.9	-4.9	-5.0	-5.2	-5.4	-5.7	-3.4																						
27-Oct	-5.3	-5.3	-5.3	-5.8	-6.1	-6.7	-7.1	-7.5	-7.7	-7.2	-7.0	-6.6	-6.2	-6.2	-5.9	-6.1	-6.4	-6.9	-6.9	-6.9	-6.9	-7.1	-7.6	-8.2	-6.6	-5.3																						
28-Oct	-8.0	-7.7	-7.7	-8.0	-9.0	-9.6	-9.9	-8.6	-7.7	-7.0	-6.5	-6.2	-5.7	-5.5	-4.9	-4.7	-4.7	-4.8	-4.4	-3.6	-3.2	-2.9	-3.0	-3.3	-6.1	-2.9																						
29-Oct	-3.4	-3.5	-3.5	-3.5	-3.6	-3.8	-3.9	-3.9	-3.9	-4.2	-4.4	-4.5	-4.7	-4.7	-4.4	-4.3	-5.6	-9.5	-8.9	-7.0	-6.3	-5.9	-6.0	-6.3	-5.0	-3.4																						
30-Oct	-7.1	-8.7	-10.1	-10.6	-11.2	-11.2	-11.3	-13.6	-11.4	-8.2	-7.0	-6.2	-5.4	-5.0	-4.9	-5.1	-5.7	-5.9	-5.3	-4.9	-4.7	-4.4	-4.2	-4.5	-7.4	-4.2																						
31-Oct	-4.3	-4.0	-3.7	-3.5	-3.3	-3.3	-4.0	-4.7	-4.9	-4.8	-4.9	-4.7	-4.6	-4.5	-4.2	-4.2	-4.3	-4.3	-4.2	-4.3	-4.4	-4.4	-4.4	-4.5	-4.3	-3.3																						
																								1.8	1.5	1.3	1.1	0.8	0.4	0.1	0.2	1.3	2.5	3.7	4.7	5.2	5.5	5.6	5.5	5.0	4.0	3.4	3.0	2.7	2.4	2.2	1.9	Diurnal Average
																								11.7	11.0	10.6	9.7	9.1	9.1	9.0	9.5	10.8	12.7	14.4	16.2	17.4	18.5	19.8	20.5	20.2	16.9	15.4	15.1	14.6	13.7	13.3	12.6	Diurnal Maximum





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Firebag - October 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	286	38.44	38.44
0 - 10	332	44.62	83.06
10 - 20	124	16.67	99.73
> 20	2	0.27	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

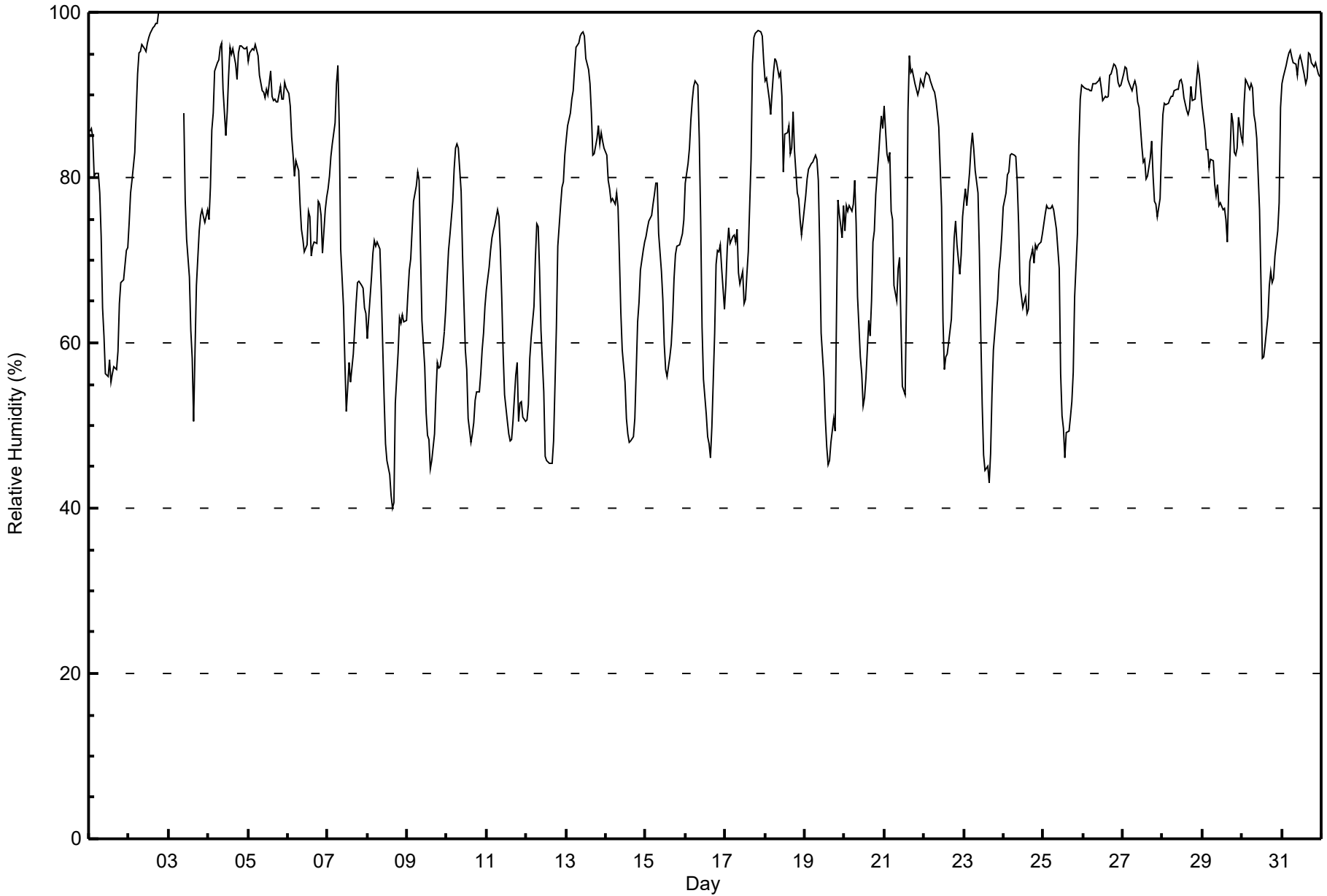
Firebag - October 2023

Maximum Value: 100.0 % on Oct 2 20:00 Maximum Daily Average: 93.5 % on Oct 31																						Hours in Service: 744 Hours of Data: 731																										
Minimum Value: 40.1 % on Oct 8 16:00 Minimum Daily Average: 58.9 % on Oct 8 Maximum Diurnal Average: 84.6 % at hour 7 Minimum Diurnal Average: 66.0 % at hour 14 Monthly Average: 75.77 % Percentiles: P ₁ = 45.2 P ₁₀ = 53.7 Q ₁ = 65.1 Median = 76.7 Q ₃ = 89.5 P ₉₀ = 93.2 P ₉₉ = 97.7																						Hours of Missing Data: 13 Hours of Calibration: 0 Percent Operational Time: 98.3																										
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Oct	85.6	85.9	85.0	80.2	80.5	80.5	78.1	72.9	64.2	60.9	56.3	56.0	58.0	55.2	56.3	57.1	56.7	59.0	64.7	67.3	67.4	67.7	71.3	71.5	68.3	85.9																						
2-Oct	74.6	78.1	79.7	83.0	87.9	92.6	95.1	95.3	96.1	95.6	95.2	96.3	97.0	97.5	98.1	98.4	98.6	98.6	99.9	100.0	OR	OR	OR	OR	92.9	100.0																						
3-Oct	OR	OR	OR	OR	OR	OR	OR	OR	OR	87.8	77.2	72.6	68.0	61.5	58.2	50.6	58.9	67.0	73.6	75.5	76.1	75.3	74.6	76.1	--	87.8																						
4-Oct	74.9	78.9	85.8	87.7	92.8	93.9	94.3	95.7	96.3	90.7	85.0	88.0	92.4	95.7	94.9	95.5	93.8	91.9	95.0	95.9	95.9	95.5	95.5	95.7	91.7	96.3																						
5-Oct	94.0	95.1	95.6	95.4	96.1	95.5	94.7	92.4	90.4	90.3	89.6	90.8	90.0	92.8	89.9	89.4	89.6	89.2	89.2	91.0	89.4	89.5	91.5	90.8	91.8	96.1																						
6-Oct	90.1	88.7	84.8	82.7	80.1	82.1	80.9	76.8	73.8	72.5	71.1	71.8	75.9	75.3	70.5	71.6	72.2	72.0	77.2	76.7	75.4	70.9	76.1	77.6	76.9	90.1																						
7-Oct	78.6	80.1	82.5	84.1	86.6	91.4	93.6	86.0	71.4	64.3	57.6	51.7	54.6	57.6	55.2	58.7	61.6	64.8	67.3	67.5	67.0	66.7	64.2	63.6	69.9	93.6																						
8-Oct	60.4	63.0	68.0	70.9	72.4	71.7	72.1	71.3	66.4	59.6	53.4	47.7	45.8	44.1	41.5	40.1	40.7	52.6	58.7	63.0	62.4	63.3	62.6	62.7	58.9	72.4																						
9-Oct	66.0	68.8	70.2	73.7	77.1	79.0	80.7	79.7	71.0	62.6	57.1	51.5	48.7	48.3	44.8	45.8	49.0	53.7	57.6	56.9	57.1	59.4	61.4	64.1	61.8	80.7																						
10-Oct	67.8	71.2	73.0	77.2	81.1	83.6	84.1	83.6	78.3	70.7	64.8	59.2	56.7	50.8	48.0	48.9	50.3	53.1	54.1	54.0	56.2	59.2	61.2	64.4	64.6	84.1																						
11-Oct	66.4	69.2	71.2	72.7	73.5	74.3	76.2	75.3	71.1	65.4	58.7	53.7	50.5	49.0	48.2	48.3	50.6	56.1	57.6	50.5	52.7	52.9	51.0	50.6	60.2	76.2																						
12-Oct	50.7	52.6	58.1	60.7	64.4	70.2	74.4	74.1	68.6	61.6	54.1	46.3	45.8	45.5	45.4	45.3	48.1	54.9	61.9	71.7	76.7	78.8	79.6	82.7	61.3	82.7																						
13-Oct	84.6	86.3	87.9	89.4	90.5	93.2	95.8	96.2	97.1	97.5	97.6	97.2	94.4	93.0	91.3	87.8	82.7	82.9	84.7	86.2	84.1	85.4	84.4	83.6	89.7	97.6																						
14-Oct	82.7	79.6	78.6	77.1	77.4	76.7	78.1	76.4	70.3	63.7	59.2	55.3	50.9	49.0	48.0	48.1	48.7	50.8	56.7	62.6	65.0	68.8	71.1	72.2	65.3	82.7																						
15-Oct	73.0	73.9	74.7	75.4	76.7	77.9	79.3	79.3	73.3	68.6	65.2	59.9	56.7	56.0	58.3	59.8	63.1	67.8	70.6	71.7	71.9	72.5	73.3	75.0	69.7	79.3																						
16-Oct	79.4	81.8	83.6	86.9	89.4	91.0	91.7	91.2	84.8	74.9	61.8	55.6	51.4	48.7	47.9	46.0	49.8	61.2	69.5	71.2	71.0	71.8	69.0	64.1	70.6	91.7																						
17-Oct	67.2	71.5	74.0	72.1	72.9	73.0	72.2	73.8	68.4	67.1	68.7	64.8	65.2	68.4	71.0	82.3	93.7	96.9	97.4	97.6	97.7	97.7	97.1	94.0	79.4	97.7																						
18-Oct	91.8	92.0	89.6	87.7	90.3	92.7	94.4	94.0	92.1	92.8	89.9	80.6	85.3	85.5	86.2	83.0	83.6	88.0	83.2	78.2	77.5	74.8	73.0	74.6	85.9	94.4																						
19-Oct	77.7	79.9	81.1	81.4	81.7	81.9	82.7	82.3	79.6	71.7	61.1	55.7	50.8	47.4	45.2	45.8	48.0	50.8	49.3	63.5	77.3	75.6	72.7	76.6	67.5	82.7																						
20-Oct	73.5	76.7	76.0	76.6	75.9	76.7	79.6	74.3	65.6	58.3	56.3	52.4	53.3	55.7	62.8	60.9	65.1	72.3	73.6	78.0	82.5	85.3	87.5	85.9	71.0	87.5																						
21-Oct	88.6	82.8	82.1	83.0	75.9	74.9	66.9	65.1	69.0	70.4	62.2	54.8	53.8	65.9	87.9	94.8	92.8	93.0	91.4	90.7	90.0	90.7	91.9	91.0	79.6	94.8																						
22-Oct	92.1	92.7	92.6	92.4	91.7	90.7	90.4	89.3	87.8	86.2	76.4	62.7	56.7	58.3	58.7	60.1	62.9	67.9	72.7	74.7	71.8	68.2	70.6	75.2	76.8	92.7																						
23-Oct	77.2	78.7	76.6	80.7	83.6	85.5	83.4	80.8	78.2	70.8	60.9	52.6	46.5	44.7	45.1	43.0	46.6	53.9	59.2	63.5	65.3	68.9	70.6	73.1	66.2	85.5																						
24-Oct	76.5	78.1	80.3	80.7	82.7	82.9	82.7	82.5	79.6	74.5	67.1	64.3	64.8	65.6	63.5	64.0	69.8	71.4	69.7	71.8	71.4	71.8	72.2	73.3	73.4	82.9																						
25-Oct	74.4	75.6	76.6	76.2	76.2	76.7	76.1	74.9	73.7	69.0	56.3	51.1	49.7	46.1	49.1	49.3	51.0	52.9	56.5	65.5	73.2	83.8	89.5	91.2	67.3	91.2																						
26-Oct	91.1	90.8	90.8	90.7	90.5	90.5	91.4	91.4	91.5	91.7	92.0	90.8	89.3	89.9	89.6	89.8	92.4	92.6	93.8	93.6	93.0	91.5	90.9	91.3	91.3	93.8																						
27-Oct	92.5	93.4	93.2	91.8	91.3	90.5	91.1	91.7	91.0	89.1	88.4	83.8	81.9	82.3	79.9	80.3	82.3	84.4	80.1	77.2	76.8	75.3	77.5	83.5	85.4	93.4																						
28-Oct	87.7	89.1	88.8	88.9	89.5	89.8	89.9	90.5	90.6	90.6	91.7	91.9	91.2	89.7	88.2	87.6	88.4	91.0	89.3	89.5	91.7	93.5	92.3	90.5	90.1	93.5																						
29-Oct	88.6	85.8	83.4	83.4	81.3	82.2	82.0	79.2	77.8	79.1	76.5	76.9	76.0	76.3	74.8	72.2	78.5	87.7	86.7	83.1	82.8	83.6	87.2	84.9	81.2	88.6																						
30-Oct	84.2	89.0	91.8	91.4	90.7	91.4	90.8	87.7	86.6	84.8	76.0	67.6	58.2	58.4	59.9	63.3	66.9	68.6	67.2	67.8	70.5	73.6	77.0	88.5	77.2	91.8																						
31-Oct	91.3	92.2	93.5	94.3	95.0	95.5	94.6	93.9	93.7	92.4	94.2	94.7	94.1	92.3	91.4	92.1	95.0	94.9	93.9	93.4	94.0	93.1	92.6	92.3	93.5	95.5																						
																								79.4	80.7	81.6	82.3	83.2	84.3	84.6	83.2	79.9	76.6	71.7	67.7	66.3	66.0	66.1	66.4	68.8	72.3	74.3	75.8	76.1	76.8	77.6	78.7	Diurnal Average
																								94.0	95.1	95.6	95.4	96.1	95.5	95.8	96.2	97.1	97.5	97.6	97.2	97.0	97.5	98.1	98.4	98.6	98.6	99.9	100.0	97.7	97.7	97.1	95.7	Diurnal Maximum
OR - Out of Range																																																



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Firebag - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Firebag - October 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	133	18.19	18.19
60 - 80	283	38.71	56.91
80 - 100	314	42.95	99.86

Total Number of Valid Hours: 731

Total Number of Hours: 744



Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Firebag - October 2023

Maximum Speed: 37 km/h on Oct 8 14:00	Maximum Daily Speed Average: 27.5 km/h on Oct 14	Hours in Service: 744
Minimum Speed Value: 2 km/h on Oct 22 08:00	Minimum Daily Speed Average: 1.9 km/h on Oct 21	Hours of Data: 744
Maximum Diurnal Speed Average: 8.1 km/h at hour 11	Minimum Diurnal Speed Average: 4.2 km/h at hour 19	Hours of Missing Data: 0
Monthly Average Velocity: 6.4 km/h 198.4 deg	Percentiles: P ₁ = 3 P ₁₀ = 7 Q ₁ = 10 Median = 14 Q ₃ = 19 P ₉₀ = 23 P ₉₉ = 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-Oct	S13	S12	S11	S13	S15	S15	S14	S15	S18	S24	S30	S28	S28	S27	S29	S29	S27	S22	S19	S21	S23	S21	S20	S21	S20.5	S30
2-Oct	S21	S19	S15	S16	S14	S15	SSE18	S17	S17	S18	SSW20	SSW18	SSW17	SSW15	SW13	SW10	WSW9	SW10	SW8	SW6	SW7	SW6	SW4	SSW3	SSW12.2	S21
3-Oct	SW3	SW2	SW5	SSW4	S4	S3	SW5	SSW8	SW11	WSW8	WSW9	WSW9	W12	W10	W8WSW10	SW9	SSW8	SSW9	SSW11	SSW12	SSW11	S11	S10	SW7.0	SSW12	
4-Oct	SSW15	SSW14	SSW12	SW9	SW6	SW3	SW3	WNW6	NW8	NW12	NW13	NNW12	NNW12	NW15	NW17	NW14	NW20	NNW22	NNW24	NNW22	NW20	NW18	WNW17	NW15	NW10.3	NNW24
5-Oct	NNW20	NNW25	NNW23	NNW25	NW19	NW20	NW16	NW17	NW17	NW18	NW17	NW17	WNW16	WNW17	WNW15	WNW14	NW11	WNW10	WNW8	WSW9	W9	WSW8	WSW6	WSW7	NW13.9	NNW25
6-Oct	WSW9	WSW8	SSW11	SSW14	SSW15	S13	S16	S18	S20	S20	S22	S22	S21	S20	S22	SSW20	SSW17	SSW14	SW12	SW13	WSW12	W11	WNW10	WNW10	SSW13.5	S22
7-Oct	WNW10	W10	W9	W7	WSW7	SW2	NNE4	NNE4	NNE4	NE6	SE3	S3	WSW6	SSW6	SW7	SSW9	SSE9	SSE8	SE10	SE12	SE15	SSE15	SSE18	SSE23	S4.3	SSE23
8-Oct	SSE24	SSE23	SSE21	SSE21	SSE23	SSE22	SSE23	SSE25	SSE29	SSE31	SSE31	SSE36	S37	S37	S32	SSE25	SSE22	SE16	SE16	SE13	SSE17	SSE19	SSE24	SSE21	SSE24.3	S37
9-Oct	SSE19	S19	SSE20	SSE17	SE14	SSE14	SE14	SSE15	SSE19	SSE21	SSE20	SSE18	SE20	SE22	SSE22	SE20	SE22	SE22	SE19	SE20	SSE18	SSE20	SSE23	SSE21	SSE19.0	SSE23
10-Oct	SSE18	SE16	SSE17	SE15	SE15	SE16	SE19	SE21	SSE23	SE23	SE26	SE25	SE24	SE26	SSE26	SE26	SE25	SE25	SE26	SE27	SE28	SSE28	SSE25	SSE24	SE22.6	SSE28
11-Oct	SE21	SE19	SE21	SE19	SE21	SE21	SSE20	SSE19	SE24	SE25	SSE28	SSE29	SSE23	SE21	SE23	SSE23	SSE21	SSE17	SE14	SSE19	SSE19	SSE20	SSE20	SSE17	SSE20.8	SSE29
12-Oct	SSE22	S20	SSE15	S17	SSE15	SSE13	SSE12	S15	S16	S14	S14	S18	S26	S27	S22	S19	SSE17	SSE12	SE12	SSE13	SSE16	SSE18	SSE17	S16	SSE16.7	S27
13-Oct	S14	S13	S12	S13	S15	S15	S12	SSE10	SSE13	SSE17	S23	SSE22	SSE22	SSE24	SSE24	SSE23	SSE17	SSE18	SSE16	SSE17	SSE16	SSE19	SSE21	SSE17.3	SSE24	
14-Oct	SSE21	S23	SSE22	SSE21	SSE21	SSE23	SSE25	SSE28	S30	S32	S36	S35	S36	S35	SSE36	SSE31	SSE29	SSE24	SSE22	SSE25	S30	S27	SSE26	SSE27	SSE27.5	S36
15-Oct	SSE23	SSE23	SSE23	SSE22	SSE19	SSE19	SSE18	SSE18	SSE21	S25	SSE20	S15	S18	S19	S16	S16	S15	S14	S14	S14	SSW14	SW15	SW14	SW12	S17.0	S25
16-Oct	SW12	SW13	SW13	SW11	SW12	SW13	SW11	SW12	SW12	SW9	WSW13	WSW14	WSW15	WSW12	WSW12	WSW11	SW7	SSW7	SSE7	SSE6	SE5	SE6	SE9	SE9	SW8.9	WSW15
17-Oct	SE7	ESE8	ESE8	E8	ESE9	ESE8	ESE9	E9	E8	E6	NNE8	NNE10	NNE10	NNE11	NNE11	NNE11	NNE10	NE9	NE6	NE5	E6	SSE8	SE12	SSE13	ENE5.9	SSE13
18-Oct	SSE14	SSE12	S13	SSE13	SSE14	SSE14	SSE17	SSE18	SSE18	SSE17	SSE19	SSE21	S23	S21	S20	S18	S17	S15	SSW16	SW15	SW12	WSW11	WSW11	SW10	S14.6	S23
19-Oct	WSW11	SW12	SW15	SW16	SW17	SW15	SSW12	SW14	SW17	SW20	WSW22	WSW21	WSW19	WSW18	WSW18	SW15	SW15	SW14	SW14	WSW24	WSW8	W6	W5	WSW10	WSW14.5	WSW24
20-Oct	WSW15	WSW15	WSW15	WSW13	WSW11	WSW12	WSW14	W14	W17	WNW20	WNW19	WNW20	NW22	NNW21	N18	N15	N12	N10	NNE10	NNE8	NE9	E2	ESE5	SE6	WNW8.1	NW22
21-Oct	S5	S8	S12	S16	S15	S17	S22	S22	S23	S20	SSW22	SSW20	WSW16	NNW15	N21	N22	N28	N26	N25	N22	N22	N19	N20	N18	NW1.9	N28
22-Oct	N18	N15	N11	NNE11	NNE9	N4	NW3	NNE2	NNW2	N5	NNE7	NNE7	N10	N11	N9	N8	N7	NNW6	NW6	NW7	NW10	NW10	NW11	WNW9	N7.4	N18
23-Oct	WNW9	WNW7	WNW9	WNW9	WSW8	WSW7	SW10	WSW11	W11	WNW15	WNW16	WNW19	WNW21	WNW20	WNW19	WNW20	WNW16	NW14	NW14	NW11	WNW10	W8	W9	WSW8	WNW11.8	WNW21
24-Oct	WSW8	W8	W8	WSW8	WSW8	WSW9	WSW9	WSW10	WSW11	WSW14	WSW14	W13	W12	W13	W14	W12	W12	WNW9	WNW11	WNW11	WNW11	WNW8	WNW10	W9	W10.0	W14
25-Oct	W9	W8	W7	WSW8	W8	WSW8	SW8	SW9	SW10	WSW11	WSW13	WSW13	WSW16	W15	W16	W14	WSW11	WSW9	W7	NW10	NW10	WNW8	W8	W9	W9.6	W16
26-Oct	W9	W9	WSW9	W10	WSW10	W10	W11	W11	W11	W12	W11	W12	WNW11	W9	WSW11	W9	W8	NNW6	WSW5	SW7	WSW8	WSW8	W7	WSW8	W8.9	W12
27-Oct	W7	W7	NW10	N15	N17	N17	N14	NNW13	NNW11	NNW11	NNW14	NNW16	NNW15	NW13	NW13	NNW12	NNW7	WNW6	WNW7	WNW8	W6	WSW5	SW6	SW7	NNW8.8	N17
28-Oct	SW8	SW10	SW12	SW10	SW7	SW7	W5	W5	WNW7	NW10	NNW15	NNW16	NNW16	NNW15	NW13	NW12	WNW7	W9	W10	WNW12	NW13	NW14	NW15	NW11	WNW8.1	NNW16
29-Oct	WNW9	WNW11	WNW13	WNW12	WNW11	WNW11	NW13	WNW11	NW13	NNW16	NNW18	NNW15	NW16	NNW12	NNW11	NW9	NW5	NNW3	NNE7	NE3	N10	N13	N17	N15	NNW10.3	NNW18
30-Oct	NNE14	N9	N6	N7	N7	NNW4	N2	SSE3	S4	SSW7	SW15	SSW18	SSW20	SSW20	SSW19	S18	SSW18	S21	SSW22	SSW21	SSW21	SW21	SW19	SSW19	SSW10.0	SSW22
31-Oct	SW17	SW15	SW10	WSW8	WNW9	NNW13	NNW22	N23	N21	NNW20	N19	NNW17	NNW16	NNW15	NNW12	NW12	NNW11	NW10	NNW13	NNW11	NW7	NW7	WNW6	WNW5	NNW10.3	N23

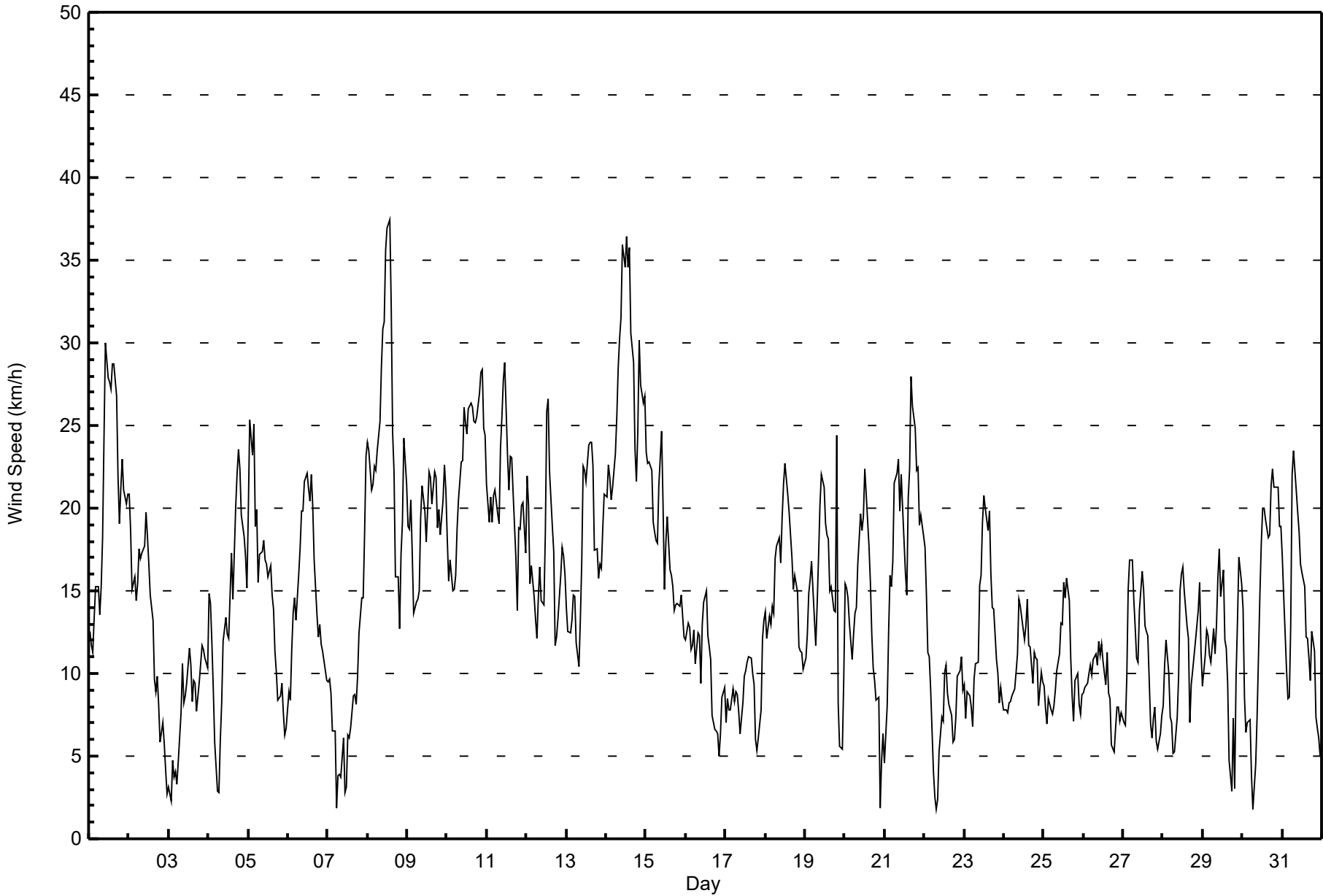
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SSE24	NNW25	NNW23	NNW25	SSE23	SSE23	SSE25	SSE28	S30	S32	S36	SSE36	S37	S37	SSE36	SSE31	SSE29	N26	SE26	SE27	S30	SSE28	SSE26	SSE27	Diurnal Maximum

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Firebag - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Firebag - October 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	40	5.38	5.38
6 - 11	233	31.32	36.69
12 - 19	287	38.58	75.27
20 - 28	163	21.91	97.18
29 - 38	21	2.82	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 - October 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	3	4	2	0	1	1	2	1	5	3	7	2	3	1	2	3	40
6 - 11	12	14	4	0	5	5	6	6	4	10	29	45	36	33	16	8	233
12 - 19	15	1	0	0	0	0	17	53	54	18	31	21	14	14	27	22	287
20 - 28	9	0	0	0	0	0	26	59	35	9	2	3	0	5	4	11	163
29 - 38	0	0	0	0	0	0	0	8	13	0	0	0	0	0	0	0	21
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	39	19	6	0	6	6	51	127	111	40	69	71	53	53	49	44	744

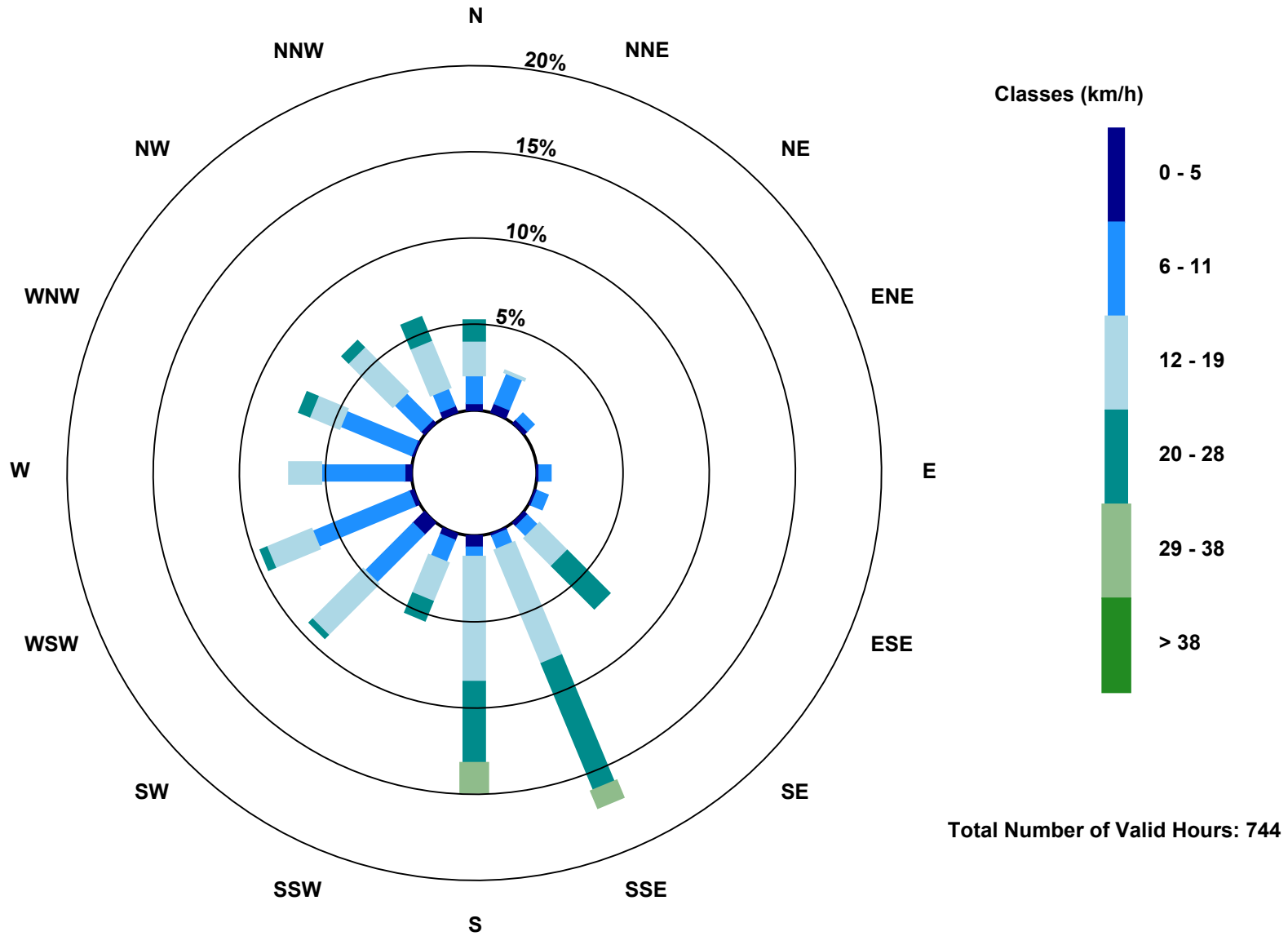
Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

Wind Speed (WS) - km/h
Firebag





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Firebag - October 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 8 km/h on Oct 19 20:00 Minimum Value: 0 km/h on Oct 30 08:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 3 Q ₃ = 4 P ₉₀ = 5 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-Oct	1	1	1	2	2	2	2	2	3	4	5	5	5	5	5	5	4	4	3	3	3	3	3	3	5
2-Oct	3	3	3	3	2	2	3	2	3	3	3	3	2	2	2	2	2	2	1	1	1	1	1	1	3
3-Oct	1	1	1	1	1	1	1	2	2	1	2	3	3	3	3	3	3	1	1	1	1	1	1	3	
4-Oct	6	5	2	2	1	1	1	1	2	3	3	3	4	7	5	4	7	6	6	6	5	5	4	3	7
5-Oct	6	6	6	7	5	5	4	4	4	4	4	3	4	4	4	3	3	3	2	2	2	2	2	7	
6-Oct	1	2	2	2	2	2	2	2	2	3	3	3	3	3	4	3	3	2	2	3	2	3	2	4	
7-Oct	2	1	1	1	1	1	1	1	2	2	1	2	2	2	2	2	2	1	2	2	2	2	3	4	4
8-Oct	4	4	3	3	4	3	4	4	5	5	6	7	7	6	6	5	4	3	3	2	3	3	4	4	7
9-Oct	3	2	3	3	3	2	2	3	4	3	3	3	4	4	4	4	5	4	3	4	3	3	4	3	5
10-Oct	3	3	3	3	3	3	3	4	4	5	5	5	5	5	5	6	5	5	5	5	5	5	5	5	6
11-Oct	4	3	3	4	4	4	3	3	5	5	5	4	4	4	4	5	4	4	3	3	4	3	3	3	5
12-Oct	3	3	3	2	2	2	2	2	2	2	3	3	5	5	4	3	3	1	2	2	2	3	2	2	5
13-Oct	2	1	1	2	2	2	1	2	3	3	4	3	4	4	4	5	5	3	3	2	3	3	3	4	5
14-Oct	3	3	4	4	3	4	4	4	4	5	6	5	6	6	6	5	6	4	4	5	5	4	4	4	6
15-Oct	4	4	3	3	3	3	3	3	4	3	5	2	3	3	3	3	2	2	2	1	2	2	2	2	5
16-Oct	2	2	2	1	1	2	2	2	2	3	2	3	3	3	3	2	2	1	1	1	1	2	1	2	3
17-Oct	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	3	2	3
18-Oct	2	1	2	2	2	2	2	2	2	3	3	3	4	3	3	3	3	3	3	3	2	2	2	2	4
19-Oct	3	1	2	2	2	2	2	3	3	4	5	5	4	4	5	4	3	3	5	8	2	1	2	2	8
20-Oct	3	3	3	4	2	2	2	3	4	5	5	5	6	4	4	3	3	2	1	1	1	2	1	1	6
21-Oct	1	3	2	2	2	2	3	3	3	3	4	4	4	4	5	5	6	7	6	5	5	4	4	4	7
22-Oct	4	4	3	3	3	2	1	1	1	1	2	2	3	3	2	2	2	1	1	2	2	2	2	2	4
23-Oct	2	2	3	2	1	1	1	1	3	4	4	5	6	6	6	5	5	3	3	3	2	1	1	1	6
24-Oct	1	1	1	1	1	1	1	1	2	3	3	3	3	3	3	2	3	3	3	3	2	2	2	2	3
25-Oct	2	2	1	1	2	1	1	1	2	2	3	3	4	4	4	4	2	2	2	2	2	1	2	2	4
26-Oct	2	2	1	2	2	2	2	2	2	3	2	3	3	2	2	2	3	2	1	2	1	1	1	1	3
27-Oct	2	2	5	4	3	4	3	3	2	2	3	3	3	3	3	3	2	1	1	2	2	1	1	1	5
28-Oct	1	2	2	2	1	1	1	1	2	2	3	5	5	4	3	3	2	2	2	3	3	3	4	3	5
29-Oct	2	3	3	3	3	3	3	3	3	4	4	3	3	3	3	2	2	2	2	1	3	3	4	4	4
30-Oct	4	1	1	2	1	2	1	0	1	2	3	3	3	3	4	3	3	3	3	4	3	3	3	3	4
31-Oct	3	2	3	3	2	3	5	6	5	5	4	3	4	4	3	3	2	2	3	3	2	1	1	1	6
Diurnal Maximum																									



Wood Buffalo Environmental Association
Summary of Hour Averages

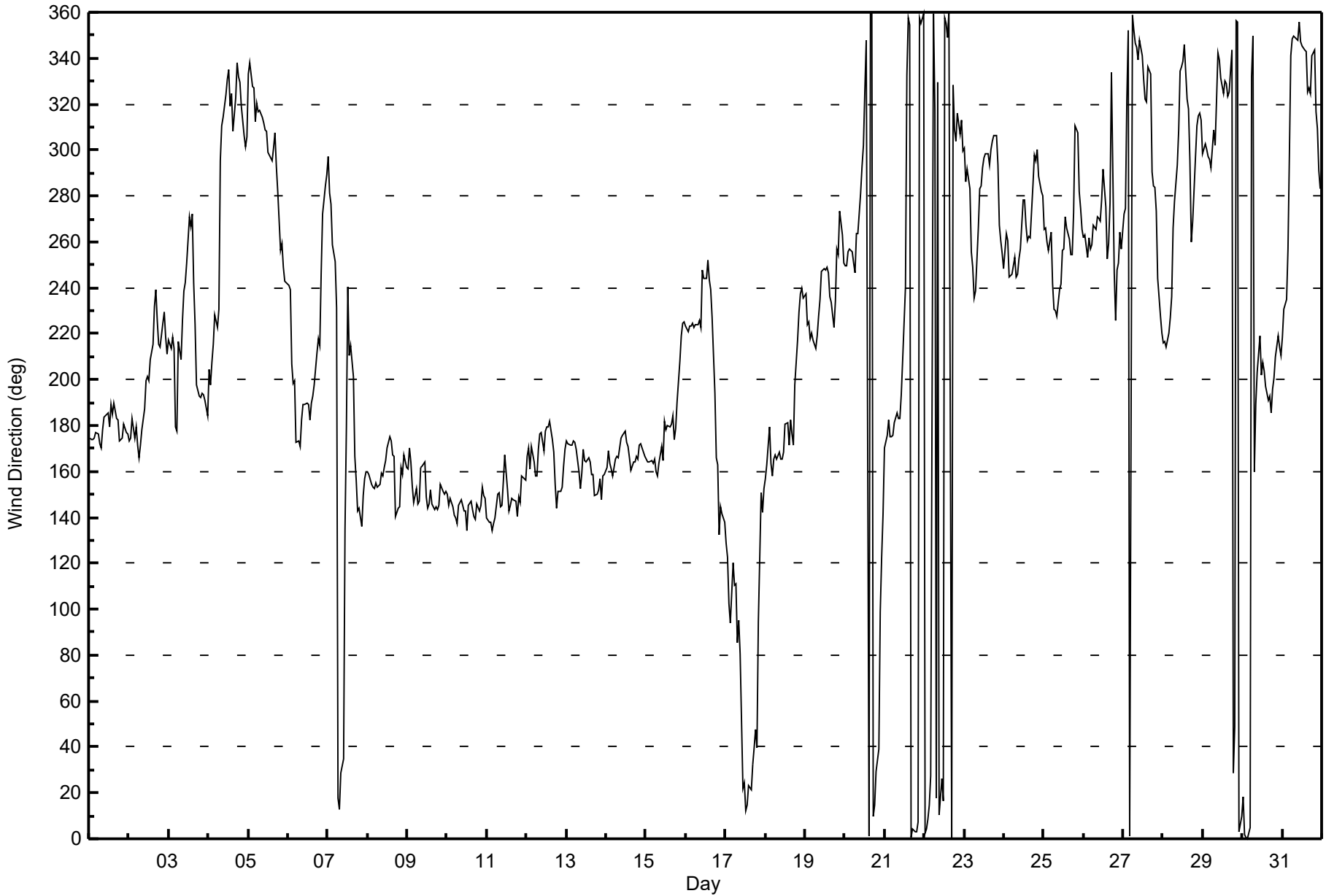
Wind Direction (WD) - deg
Firebag - October 2023

Direction of Maximum Speed: 175 deg on Oct 8 14:00 Direction of Maximum Daily Speed Average: 168.1 deg on Oct 14																						Hours in Service:	744		
Direction of Minimum Speed: 17 deg on Oct 22 08:00 Direction of Minimum Daily Speed Average: 1.9 deg on Oct 21																						Hours of Data:	744		
Monthly Average Direction: 198.4 deg																						Hours of Missing Data:	0		
																						Percent Operational Time:	100.0		
Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Oct	174	174	174	174	177	176	172	170	178	184	184	186	180	189	185	190	183	182	173	174	175	180	177	176	180.0
2-Oct	173	174	183	175	179	172	166	171	178	187	199	201	200	209	215	232	239	226	215	214	224	229	218	211	192.6
3-Oct	217	214	219	213	179	178	216	209	226	238	242	251	271	267	272	242	224	197	193	192	194	193	191	184	219.2
4-Oct	204	198	207	215	228	223	231	295	311	314	324	331	335	319	325	308	323	338	332	329	319	306	301	306	307.2
5-Oct	333	338	328	327	312	321	317	317	315	312	309	308	299	297	295	301	307	293	282	256	260	249	243	242	308.4
6-Oct	241	239	207	198	200	172	173	171	182	189	189	190	189	183	190	193	198	211	218	215	246	272	285	289	200.7
7-Oct	297	281	277	259	251	231	18	13	29	35	135	179	241	211	215	201	167	156	142	144	136	149	157	160	177.7
8-Oct	160	159	154	153	153	155	153	154	159	158	162	165	170	175	173	167	166	141	144	145	162	159	167	162	160.7
9-Oct	161	170	164	154	146	153	146	147	162	162	164	149	144	146	152	146	144	145	143	145	154	151	150	151	152.1
10-Oct	150	145	149	145	141	140	137	145	148	145	143	143	134	146	147	144	140	139	146	143	145	153	149	148	144.4
11-Oct	139	138	138	134	137	140	150	150	144	145	156	167	152	143	145	149	148	147	140	149	147	158	157	156	147.5
12-Oct	166	170	161	171	164	158	158	170	176	177	169	177	179	180	182	174	168	154	144	151	151	153	162	170	167.7
13-Oct	173	172	172	171	173	173	170	160	153	159	169	165	164	166	164	159	159	150	150	152	157	147	158	159	161.9
14-Oct	162	169	164	161	158	166	167	166	170	175	176	178	172	171	166	160	164	164	167	165	171	172	168	167	168.1
15-Oct	165	164	164	165	163	166	160	158	164	171	165	182	178	180	180	180	184	174	179	191	208	219	224	225	176.2
16-Oct	223	221	223	224	225	223	224	224	226	223	248	244	244	252	243	239	227	194	166	163	133	145	142	138	219.6
17-Oct	129	123	102	94	120	110	111	86	95	80	22	24	12	14	23	22	32	40	48	40	95	151	142	152	77.1
18-Oct	157	163	180	163	158	166	167	165	168	165	165	168	181	181	172	183	176	172	197	217	230	237	240	236	179.8
19-Oct	237	224	225	218	220	217	213	219	228	235	247	248	248	249	246	236	234	223	234	257	254	274	263	251	236.7
20-Oct	249	250	256	257	256	251	246	264	263	282	293	302	326	348	1	359	359	10	15	29	39	99	122	142	300.6
21-Oct	170	176	183	175	175	175	181	186	183	183	193	209	241	332	358	355	0	4	3	3	7	358	355	359	311.8
22-Oct	2	4	8	15	28	359	317	17	330	10	26	16	358	355	349	360	0	328	309	304	316	307	313	300	349.1
23-Oct	301	286	291	283	256	249	236	238	266	283	285	292	296	298	293	300	304	306	306	293	267	260	255	285.7	
24-Oct	249	263	261	245	246	246	253	245	246	252	257	278	279	267	260	263	262	285	298	296	300	288	282	280	266.9
25-Oct	266	266	260	257	264	241	231	230	228	239	242	256	257	271	266	261	255	254	273	311	307	282	274	265	260.2
26-Oct	262	263	253	262	257	259	267	265	271	270	269	278	292	275	253	259	277	334	247	226	247	251	264	257	264.8
27-Oct	272	275	322	352	1	359	352	347	345	339	348	341	331	322	321	336	333	290	284	284	273	244	228	220	327.4
28-Oct	216	217	214	220	227	236	266	277	294	309	334	336	339	346	322	318	295	260	269	297	311	315	316	313	297.1
29-Oct	299	303	300	297	296	293	309	302	322	342	339	331	325	330	329	323	325	343	29	49	356	356	3	10	328.8
30-Oct	19	2	0	0	5	332	350	160	189	203	219	202	207	204	197	191	193	186	196	201	210	219	214	211	206.2
31-Oct	218	231	235	257	298	341	348	349	349	348	356	347	345	344	343	325	327	325	341	344	317	309	291	283	328.0
193.9 197.3 197.8 194.1 189.9 186.7 185.3 187.7 192.8 199.5 204.3 210.1 214.8 213.4 209.2 207.5 198.2 187.8 192.5 198.4 198.3 200.7 196.4 192.2																									
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 - October 2023





Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Direction (WD) - deg

Firebag - October 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0										Hours in Service: 744															
Maximum Value: 77 deg on Oct 20 22:00										Hours of Data: 744															
Minimum Value: 0 deg on Oct 6 00:00										Hours of Missing Data: 0															
Percentiles: P ₁ = 6 P ₁₀ = 8 Q ₁ = 10 Median = 12 Q ₃ = 15 P ₉₀ = 18 P ₉₉ = 48										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-Oct	7	7	8	8	11	11	9	9	10	12	11	12	12	13	12	12	10	9	8	8	9	8	8	8	13
2-Oct	9	9	9	9	8	8	9	9	9	13	9	10	9	10	10	16	13	11	8	11	8	11	13	16	16
3-Oct	17	46	28	16	18	16	21	9	13	10	16	23	23	25	33	22	13	8	5	7	7	8	8	46	
4-Oct	14	12	12	10	11	11	24	13	20	13	13	16	24	13	15	23	13	13	13	16	18	16	14	24	
5-Oct	15	14	12	11	13	13	13	12	13	13	13	13	16	17	16	15	14	16	18	12	13	9	1	0	18
6-Oct	0	1	12	8	10	10	8	9	8	7	9	8	8	9	10	8	9	10	10	12	17	18	17	15	18
7-Oct	15	15	12	12	12	60	7	6	18	22	51	46	36	29	20	14	8	9	10	12	11	11	10	9	60
8-Oct	10	9	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	11	11	11	9	10	8	11	11
9-Oct	9	8	9	10	12	9	12	11	12	10	11	15	14	14	13	14	12	12	12	11	11	10	10	10	15
10-Oct	11	11	11	11	12	12	11	11	12	13	13	13	14	14	13	12	13	12	12	12	12	11	11	12	14
11-Oct	11	13	11	12	12	12	12	12	12	13	11	10	14	15	14	13	12	11	13	10	12	10	10	10	15
12-Oct	10	9	10	8	10	9	10	8	7	9	12	13	12	12	12	13	9	9	11	10	9	10	10	7	13
13-Oct	7	7	7	7	7	7	7	11	11	13	10	12	12	11	12	12	11	11	10	10	10	10	10	10	13
14-Oct	9	8	10	11	12	10	9	9	9	9	10	10	10	12	11	13	10	9	8	9	8	8	9	8	13
15-Oct	10	10	9	8	9	9	9	9	10	9	13	11	10	12	9	9	9	10	11	7	10	8	9	9	13
16-Oct	8	8	8	8	8	8	9	8	9	16	12	13	15	23	18	15	11	13	11	15	12	14	6	9	23
17-Oct	22	9	17	8	16	18	14	13	14	34	13	14	19	16	15	13	12	13	13	21	22	30	14	11	34
18-Oct	11	13	12	10	10	8	9	9	8	11	9	12	9	11	10	11	13	9	11	13	9	9	8	9	13
19-Oct	9	8	8	8	8	8	10	9	9	11	12	14	16	17	12	12	10	10	16	17	16	28	62	11	62
20-Oct	11	11	12	12	12	11	11	13	14	17	17	18	16	17	17	15	14	13	14	9	5	77	23	13	77
21-Oct	10	20	10	8	8	8	8	8	7	8	12	16	15	21	17	15	18	17	18	16	15	15	17	16	21
22-Oct	16	16	15	14	15	51	46	58	37	28	25	34	22	22	18	15	15	12	16	14	11	12	11	13	58
23-Oct	14	16	15	17	13	16	14	9	18	17	18	18	20	20	18	17	15	14	13	12	15	12	10	10	20
24-Oct	9	12	12	11	7	9	10	9	10	15	21	20	20	20	15	18	15	21	15	16	16	18	16	16	21
25-Oct	15	15	14	13	13	12	8	9	11	13	17	22	19	21	16	16	12	12	20	12	13	16	14	14	22
26-Oct	13	14	11	15	12	13	15	13	15	15	16	20	17	17	12	14	30	12	18	11	14	10	14	15	30
27-Oct	17	17	31	15	15	16	13	14	13	13	15	16	15	13	13	12	21	21	15	15	29	17	15	7	31
28-Oct	9	9	9	11	8	8	15	15	19	16	13	15	14	13	14	14	19	13	16	18	13	12	12	13	19
29-Oct	15	15	14	15	16	16	13	16	15	13	14	14	13	14	15	14	27	22	32	47	14	14	14	15	47
30-Oct	14	12	11	13	16	49	60	11	12	9	13	12	10	10	9	7	7	8	8	8	10	9	10	9	60
31-Oct	11	11	19	25	17	18	14	14	14	14	16	13	14	14	15	12	12	14	14	14	17	12	17	21	25
										Diurnal Maximum															



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS20 MACKAY RIVER OCTOBER 2023

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

November 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MACKAY RIVER (AMS20)
OCTOBER 2023

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	708	34	36	99.73	13.6	0	3.6	0
H2S (ppb) Average	683	35	61	96.51	1.1	0	0.3	0
THC (ppm) Average	708	34	36	99.73	3.9	-	2.8	-
NO2 (ppb) Average	706	35	38	99.6	27.2	0	11.8	-
NO (ppb) Average	706	35	38	99.6	43.3	-	9.1	-
NOX (ppb) Average	706	35	38	99.6	69.9	-	20.9	-
Temperature 2 m (C) Average	744	0	0	100	23	-	13	-
Relative Humidity (%) Average	744	0	0	100	99.8	-	88.3	-
Wind Speed 10 m (km/h) Average	744	0	0	100	19	-	12	-
Wind Direction 10 m (deg) Average	744	0	0	100	-	-	-	-
Precipitation (mm) Total	744	0	0	100	2.5	-	4.8	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MACKAY RIVER (AMS20)
OCTOBER 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	1.4	-	0	0	0	0.1	0.3	0.8	13.6
H2S (ppb) Average	683	0.1	0.1	-	0	0	0.1	0.1	0.1	0.2	1.1
THC (ppm) Average	708	2.28	0.1	-	2	2.2	2.2	2.3	2.3	2.4	3.9
NO2 (ppb) Average	706	1.18	2.6	-	0	0.2	0.2	0.6	1	1.9	27.2
NO (ppb) Average	706	0.38	2.6	-	0	0	0	0	0.1	0.3	43.3
NOX (ppb) Average	706	1.54	4.9	-	0.1	0.2	0.2	0.6	1.1	2	69.9
Temperature 2 m (C) Average	744	3.45	8	-	-15.2	-7.3	-3.3	5.2	9.2	13.5	23
Relative Humidity (%) Average	744	72.44	15.6	-	29.1	49.7	61.8	74.1	84.5	91.6	99.8
Wind Speed 10 m (km/h) Average	744	7.2	3	-	0	3	5	7	9	12	19
Wind Direction 10 m (deg) Average	744	-	-	-	-	-	-	-	-	-	-
Precipitation (mm) Total	744	-	-	13.49	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION -MACKAY RIVER (AMS20)
OCTOBER 2023

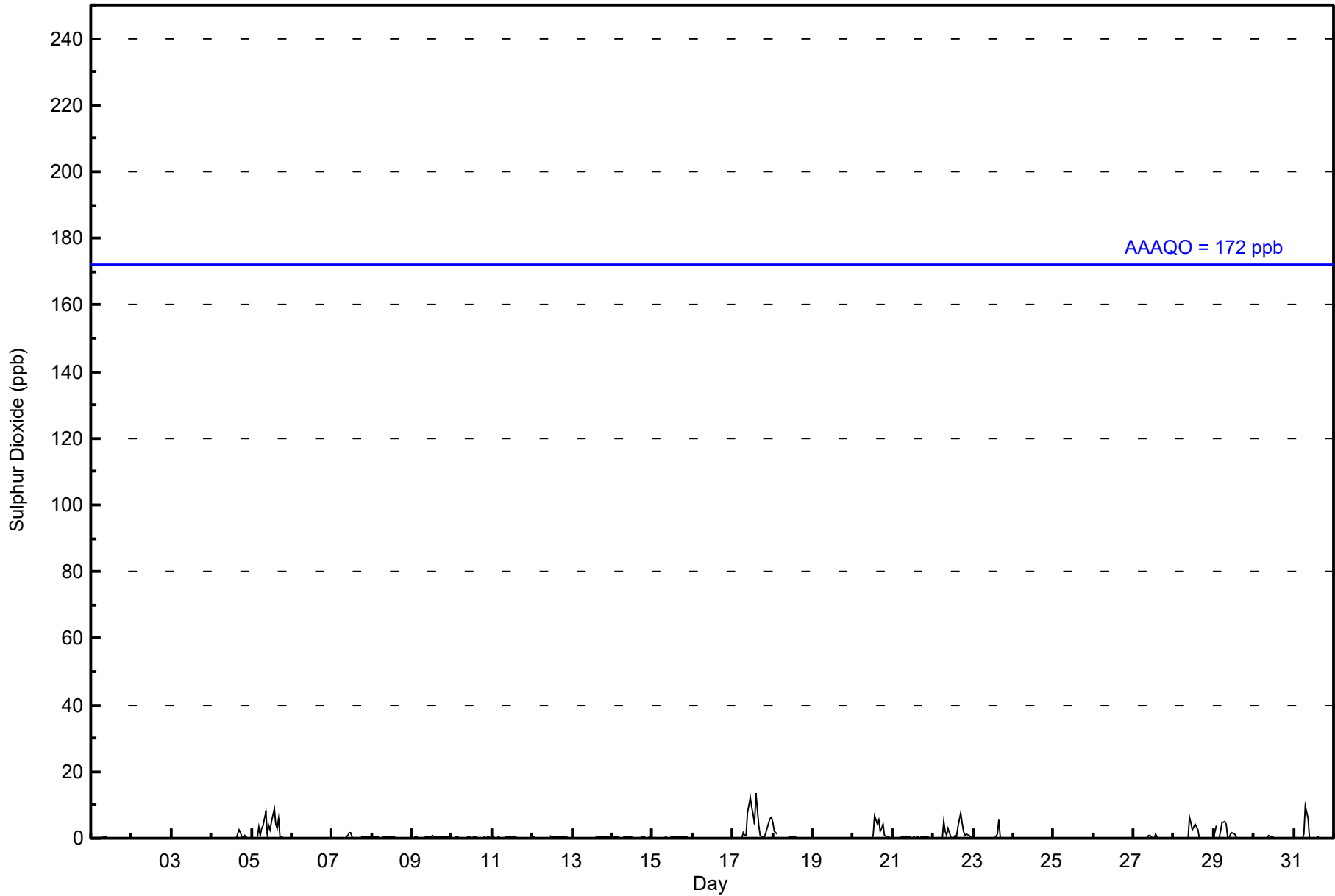
OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2	19 Oct 2023 12:00	19 Oct 2023 13:00	2	Maintenance - WBEA internal audit
H2S	19 Oct 2023 11:00	19 Oct 2023 12:00	2	Maintenance - WBEA internal audit
H2S	23 Oct 2023 11:00	24 Oct 2023 10:00	24	Maintenance - replaced analyzer
THC	19 Oct 2023 14:00	19 Oct 2023 15:00	2	Maintenance - WBEA internal audit
NO2	19 Oct 2023 11:00	19 Oct 2023 13:00	3	Maintenance - WBEA internal audit



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Mackay River - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Mackay River - October 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	706	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: 708

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Mackay River - October 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	23	6	8	9	75	101	59	83	41	35	82	52	77	27	15	706
11 - 20	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	14	24	6	8	9	75	101	59	83	41	35	82	52	77	27	15	708

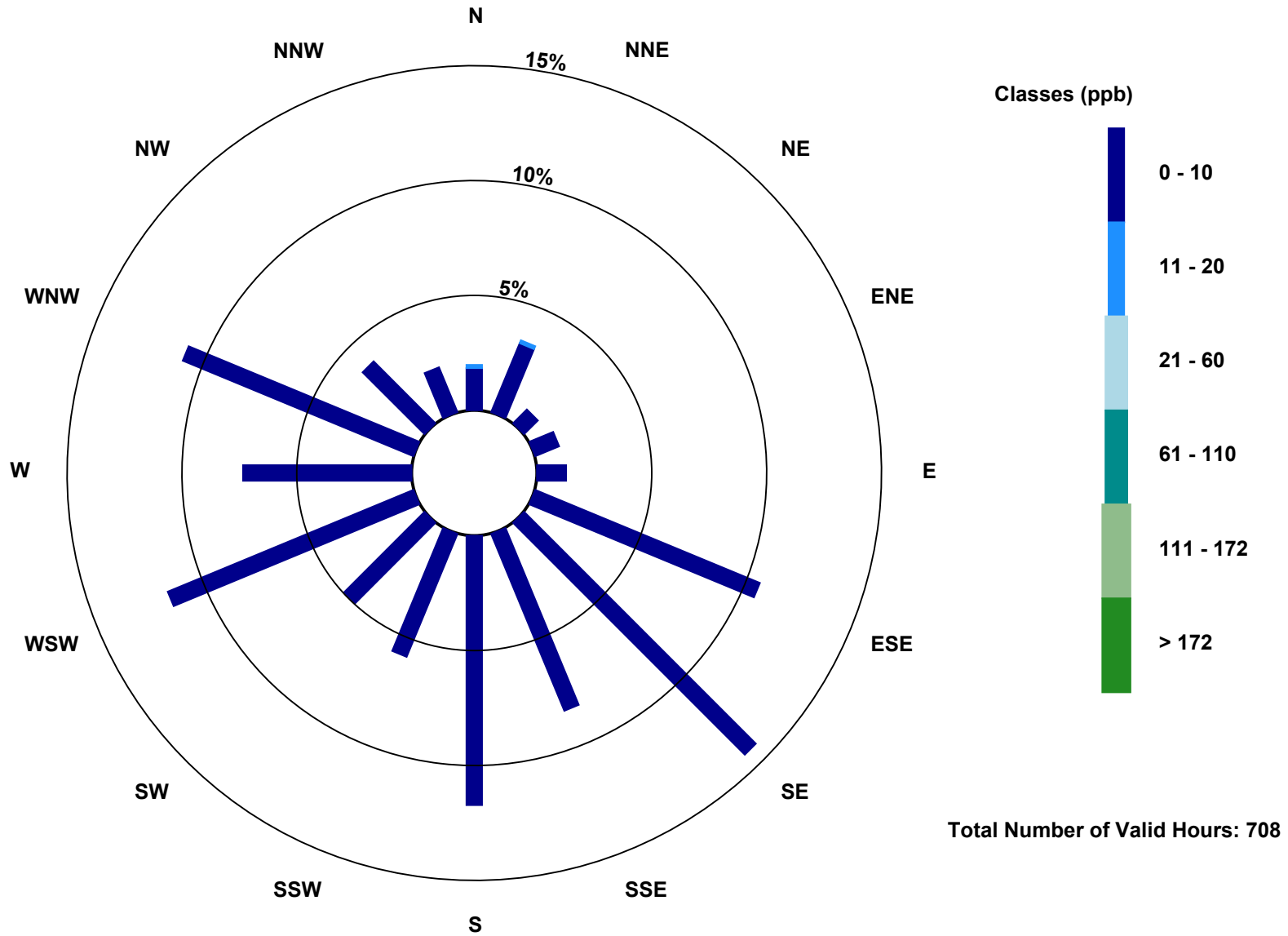
Total Number of Valid Hours: 708

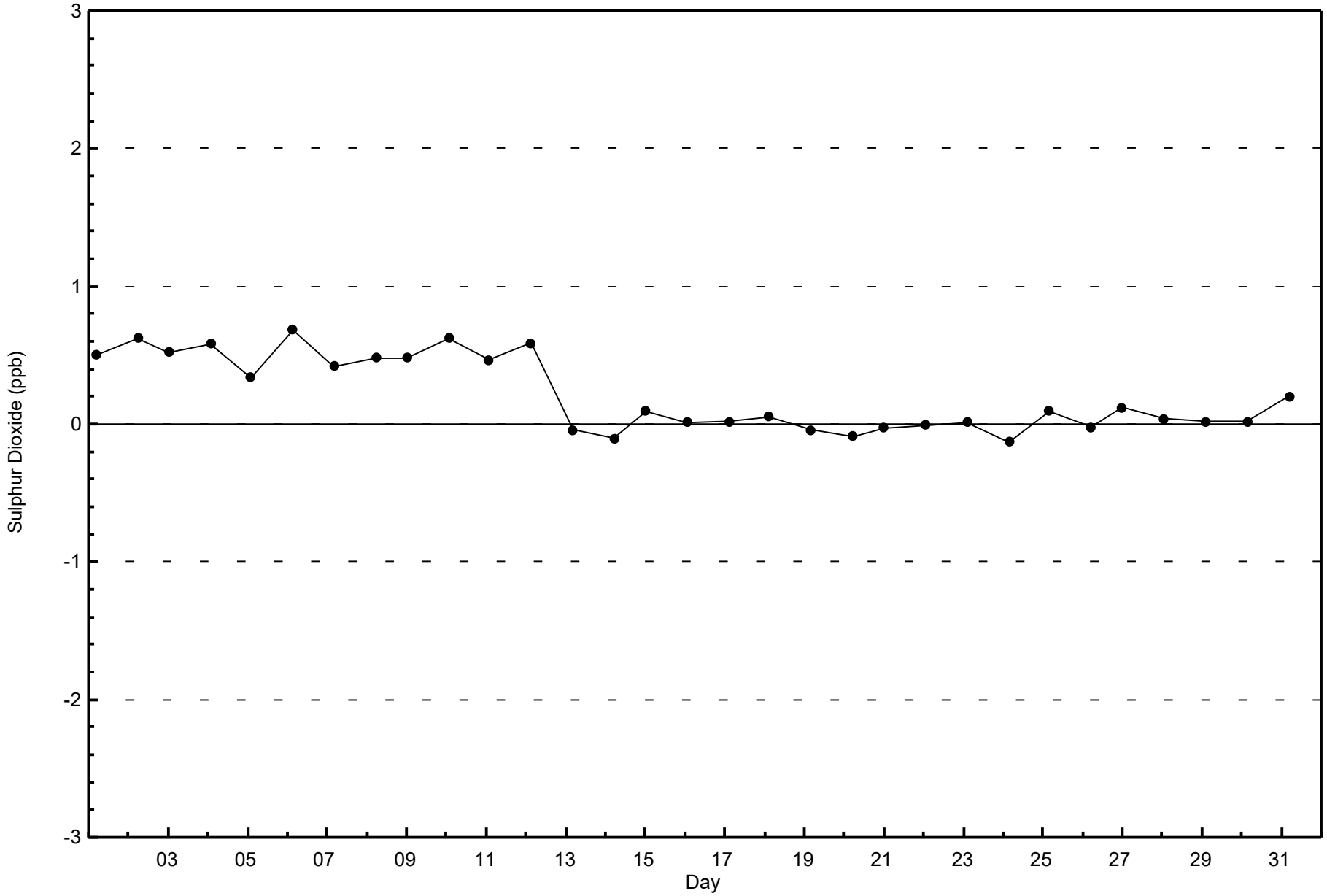
Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

Sulphur Dioxide (SO₂) - ppb
Mackay River

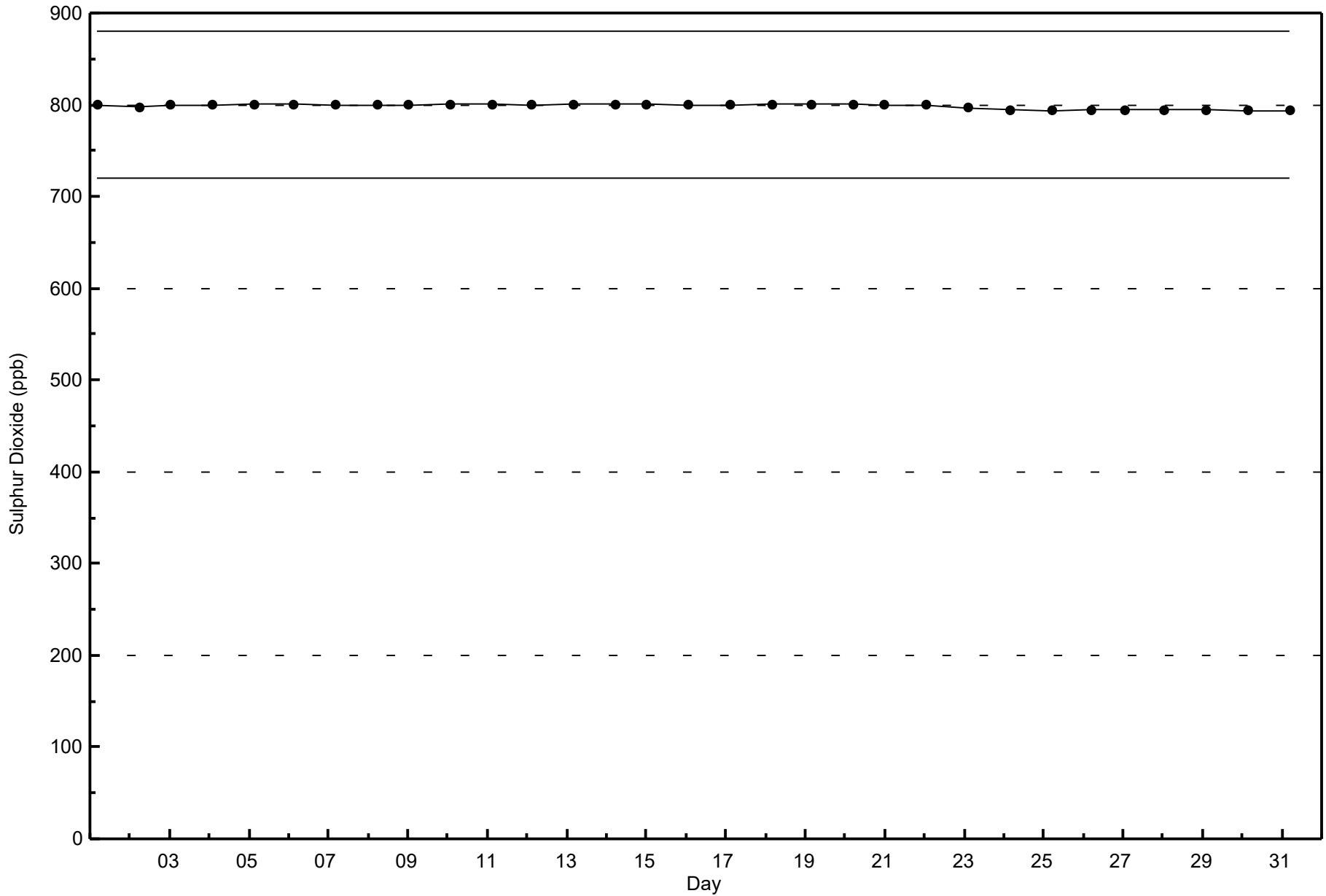


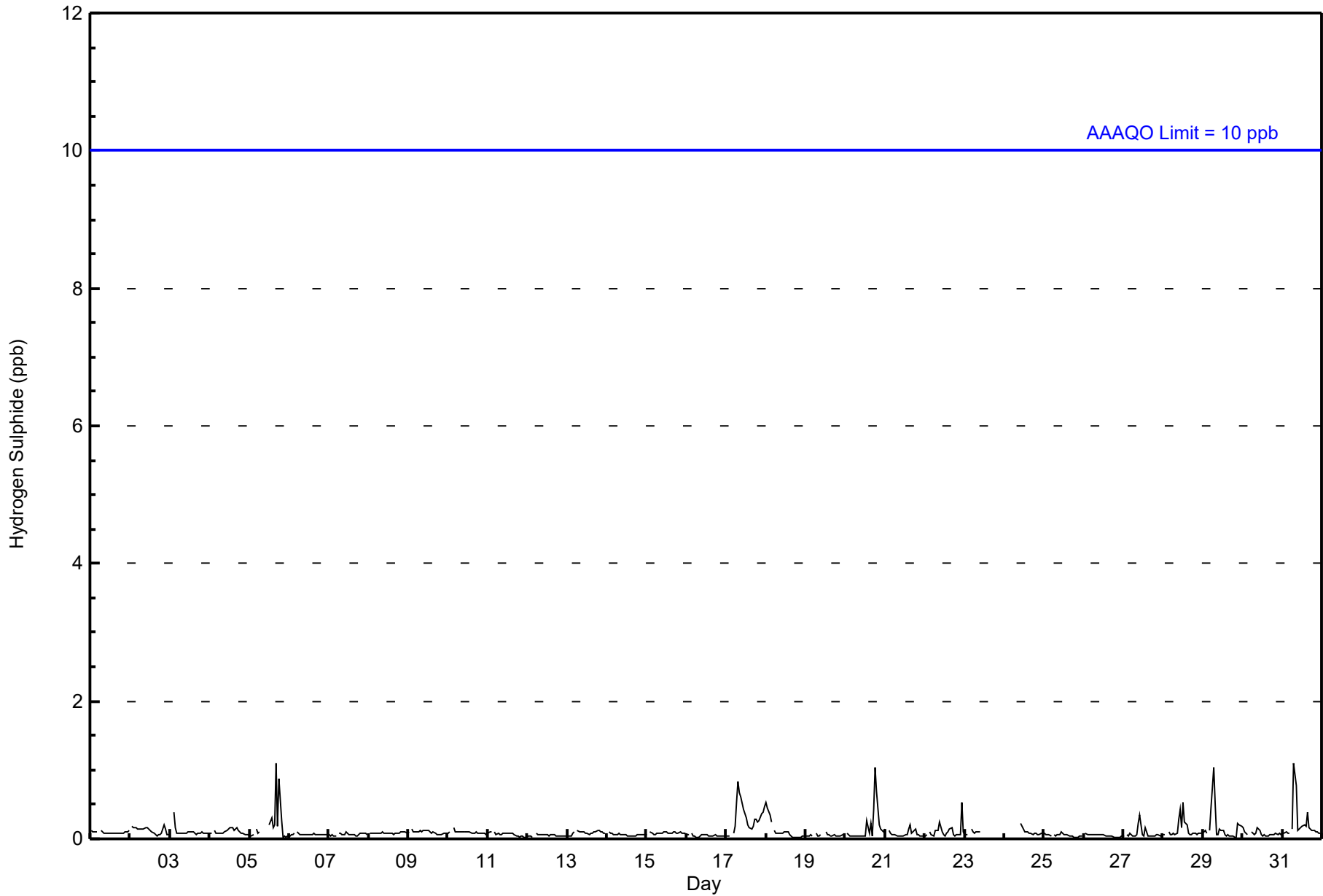




Wood Buffalo Environmental Association
Span Responses

Sulphur Dioxide (SO₂) - ppb
Mackay River - October 2023







Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Hydrogen Sulphide (H₂S) - ppb
Mackay River - October 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**

**Hydrogen Sulphide (H₂S) - ppb
Mackay River - October 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	26	5	8	9	73	105	59	84	42	34	73	49	62	27	16	683
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	11	26	5	8	9	73	105	59	84	42	34	73	49	62	27	16	683

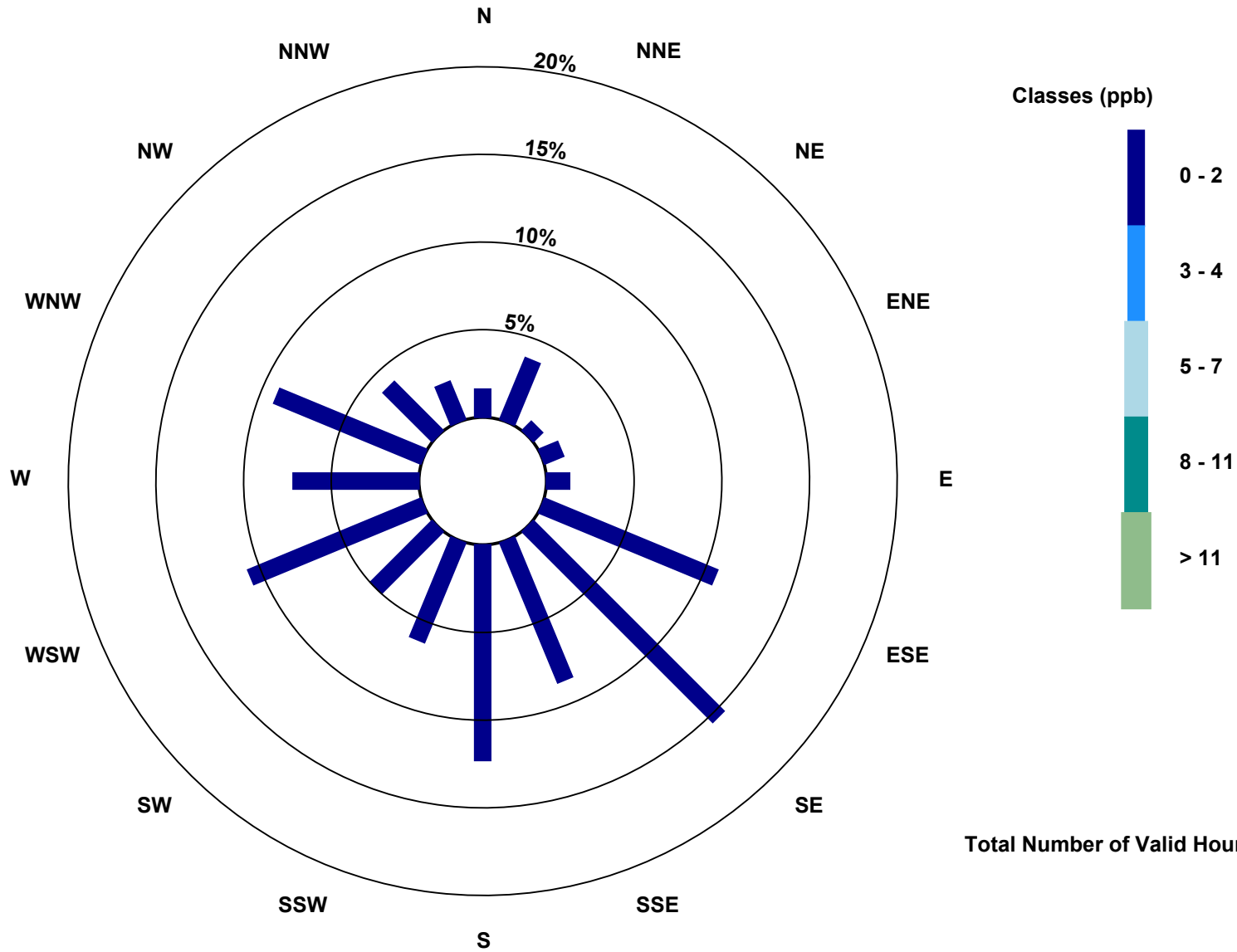
Total Number of Valid Hours: 683

Total Number of Hours: 744

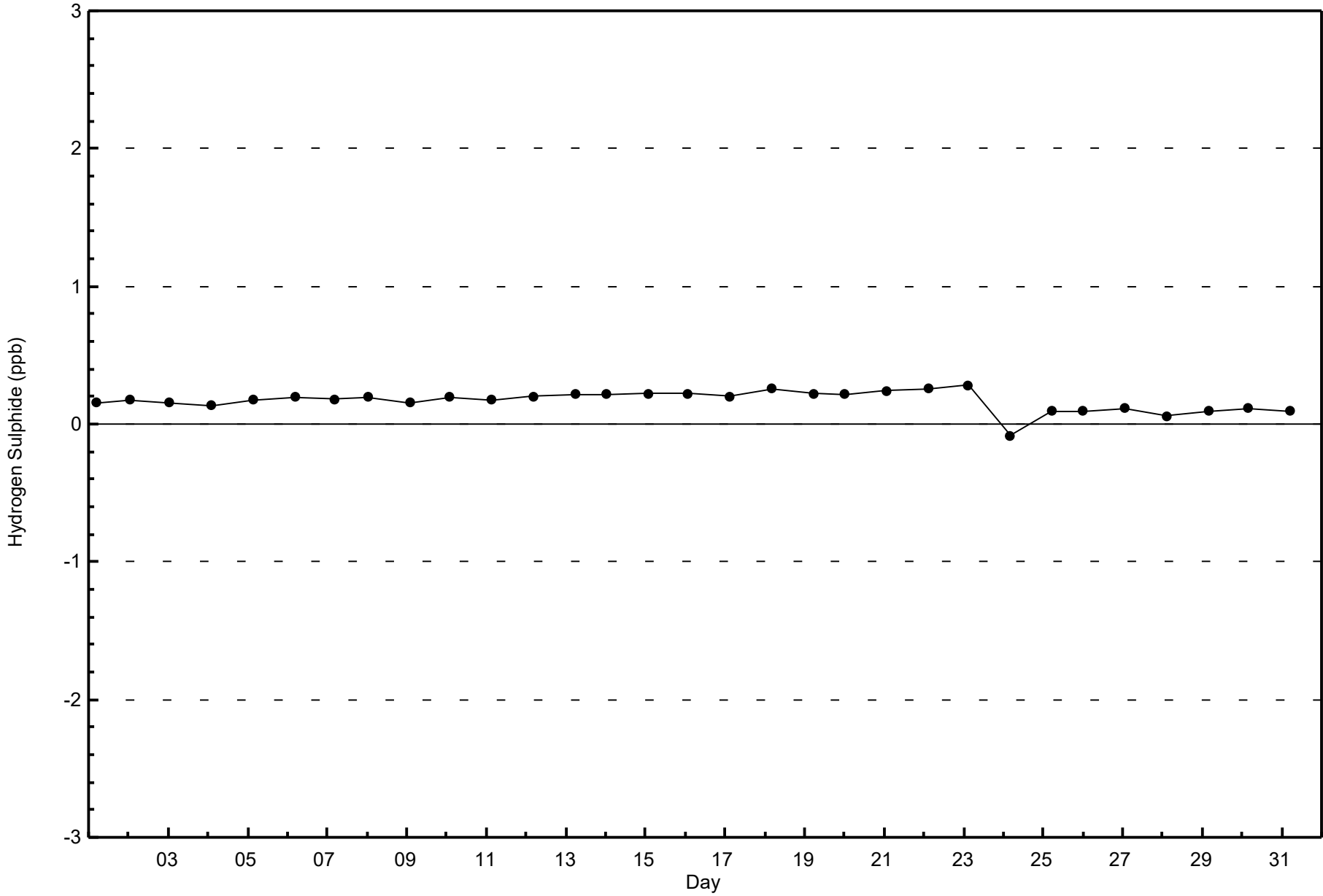


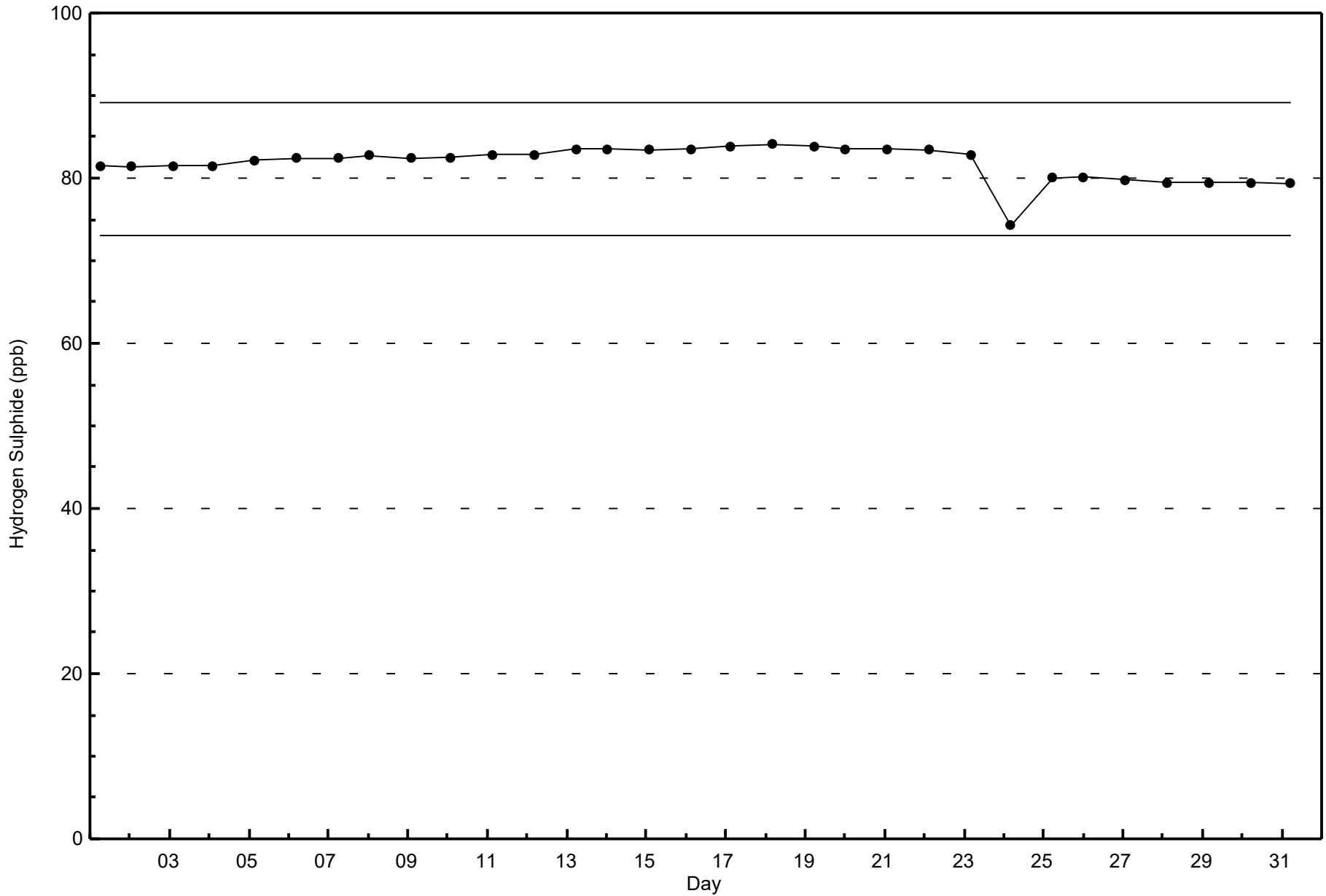
Wood Buffalo Environmental Association
Wind Rose Oct 2023

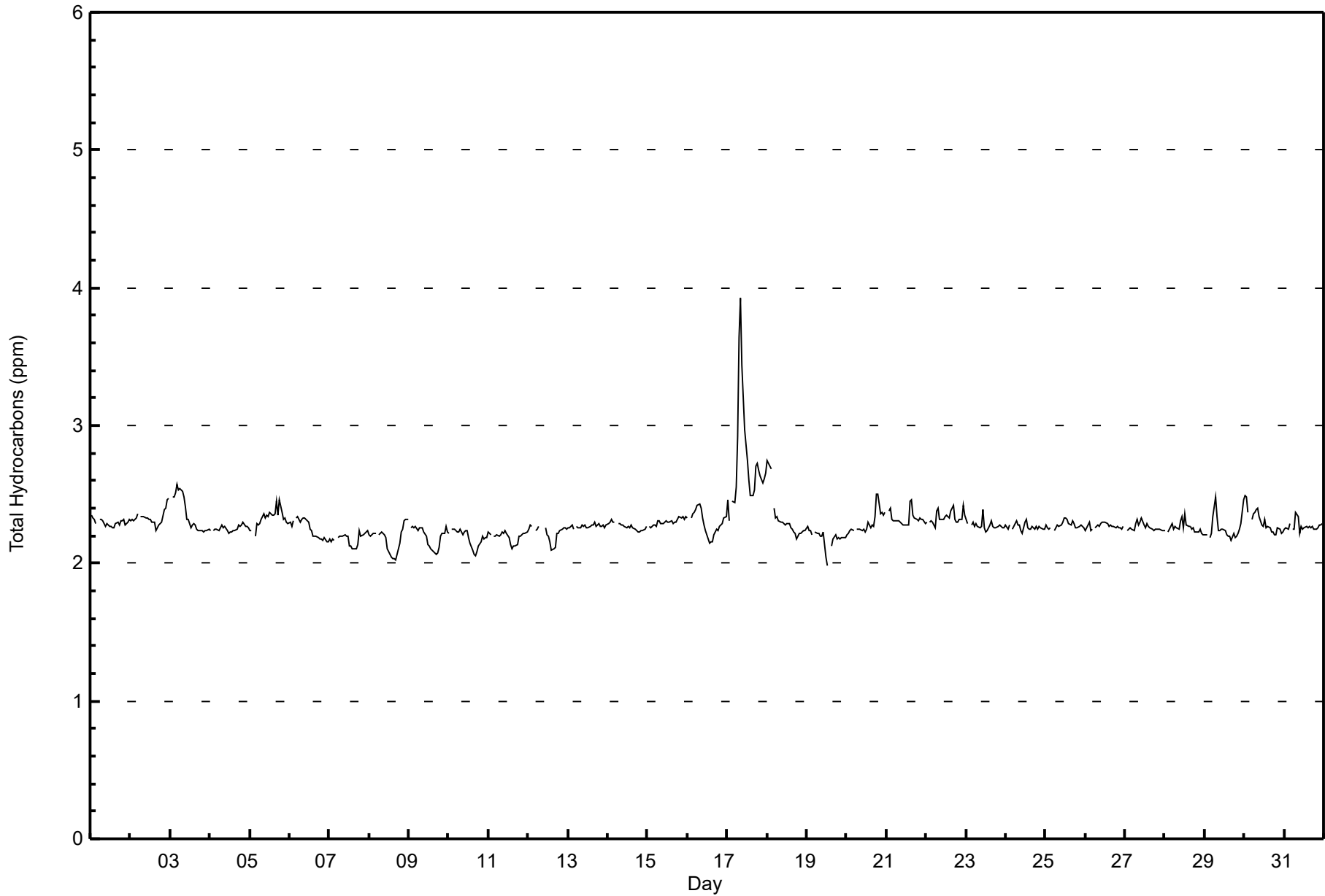
Hydrogen Sulphide (H₂S) - ppb
Mackay River



Total Number of Valid Hours: 683









Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Mackay River - October 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	6	0.85	0.85
2.1 - 3.0	699	98.73	99.58
3.1 - 10.0	3	0.42	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
Mackay River - October 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	4	0	0	2	0	0	0	0	6
2.1 - 3.0	14	21	6	8	9	75	101	59	79	41	34	81	52	77	27	15	699
3.1 - 10.0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	14	24	6	8	9	75	101	59	83	41	34	83	52	77	27	15	708

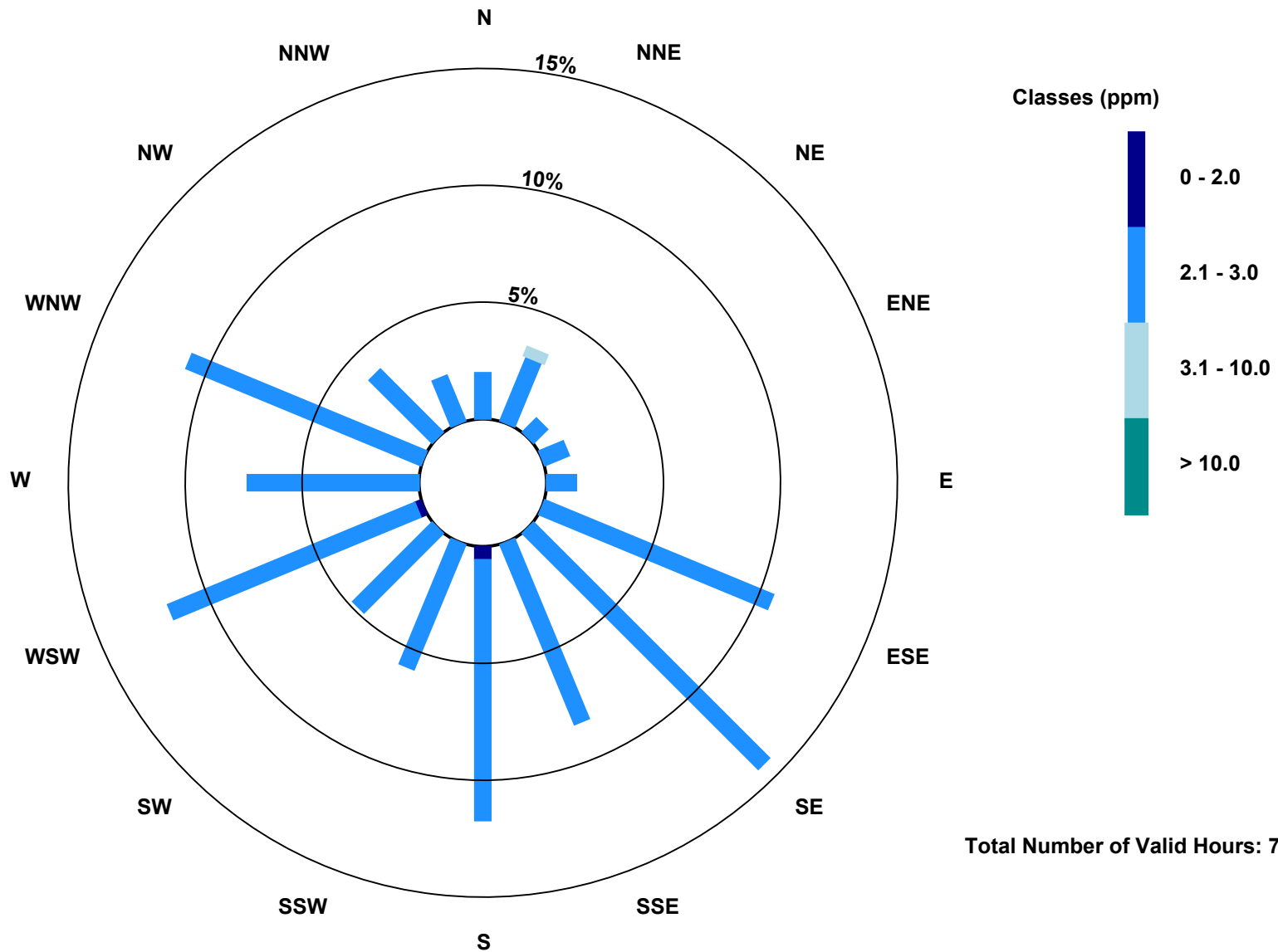
Total Number of Valid Hours: 708

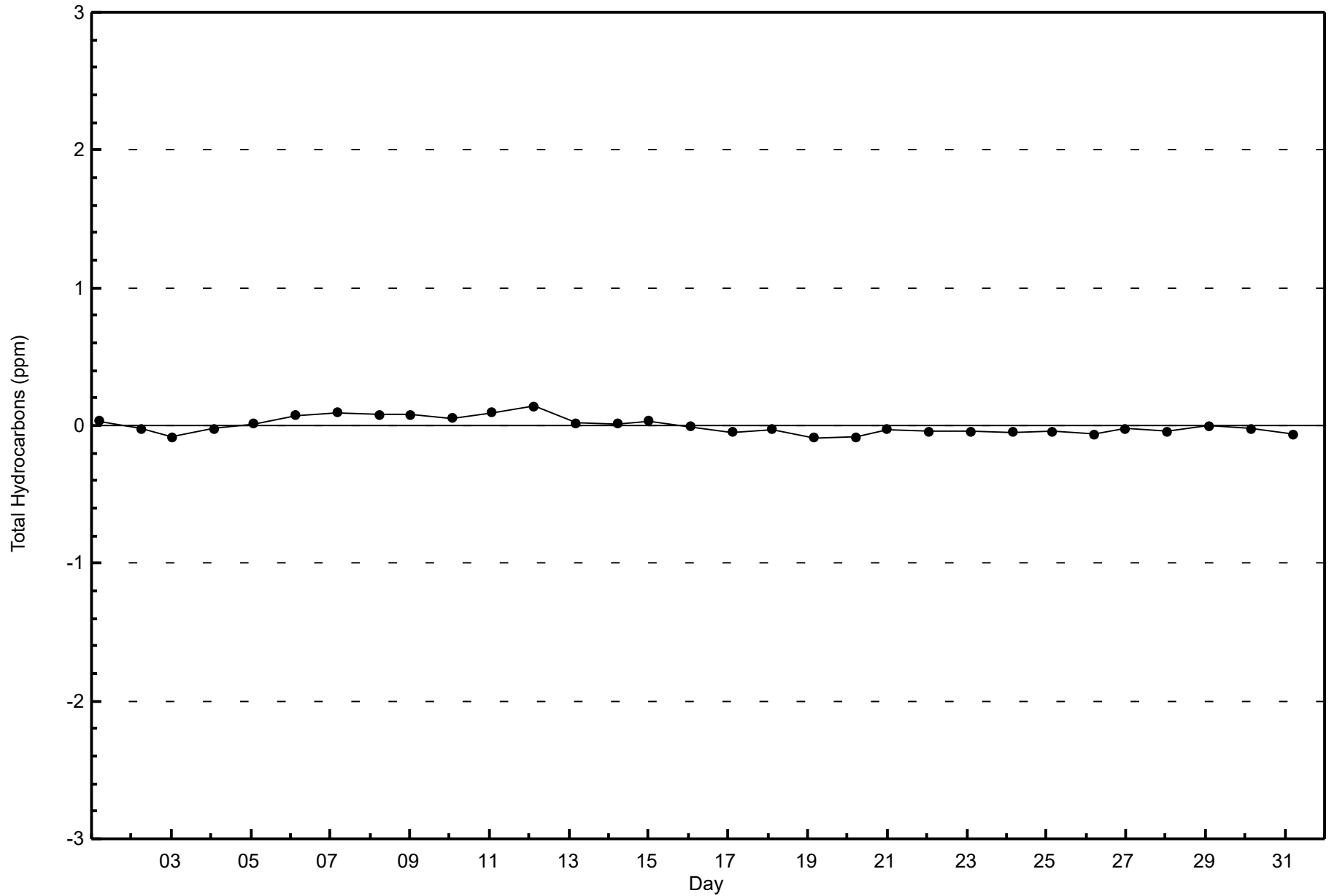
Total Number of Hours: 744

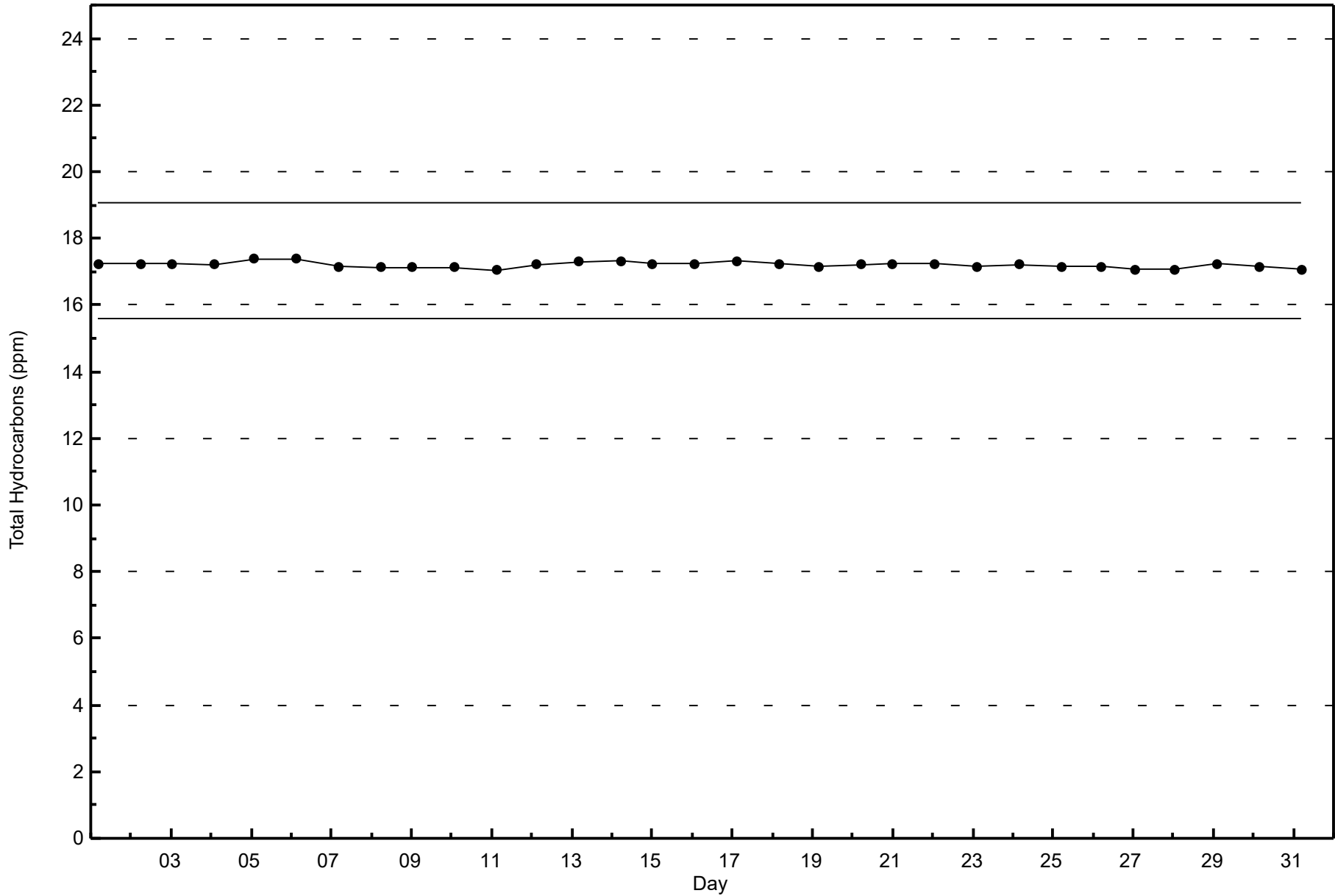


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Total Hydrocarbons (THC) - ppm
Mackay River



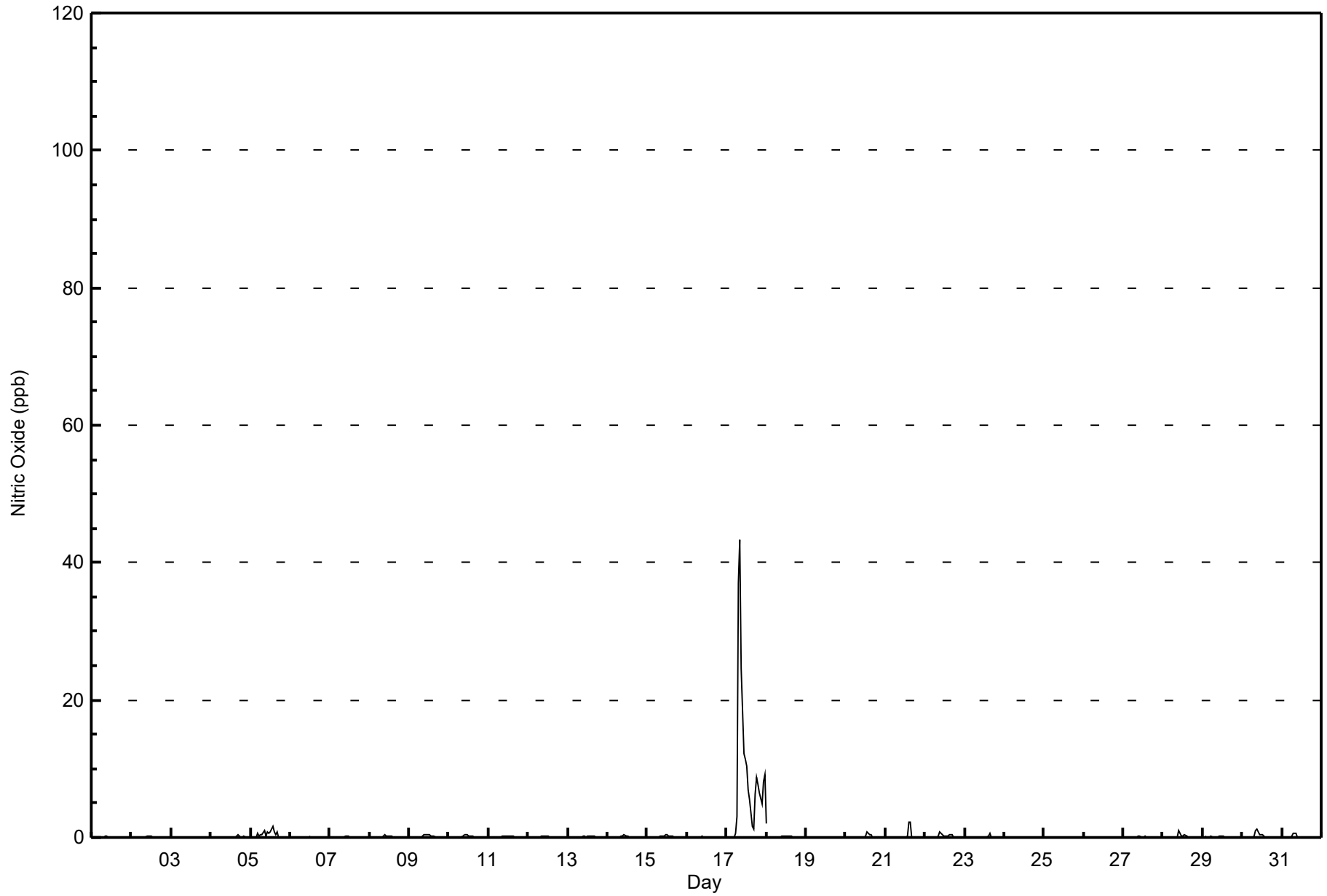






Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Mackay River - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb
Mackay River - October 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	703	99.58	99.58
21 - 40	2	0.28	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: 706

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Nitric Oxide (NO) - ppb
Mackay River - October 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	13	22	6	7	9	73	103	59	83	40	36	79	54	76	27	16	703
21 - 40	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
41 - 80	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	13	25	6	7	9	73	103	59	83	40	36	79	54	76	27	16	706

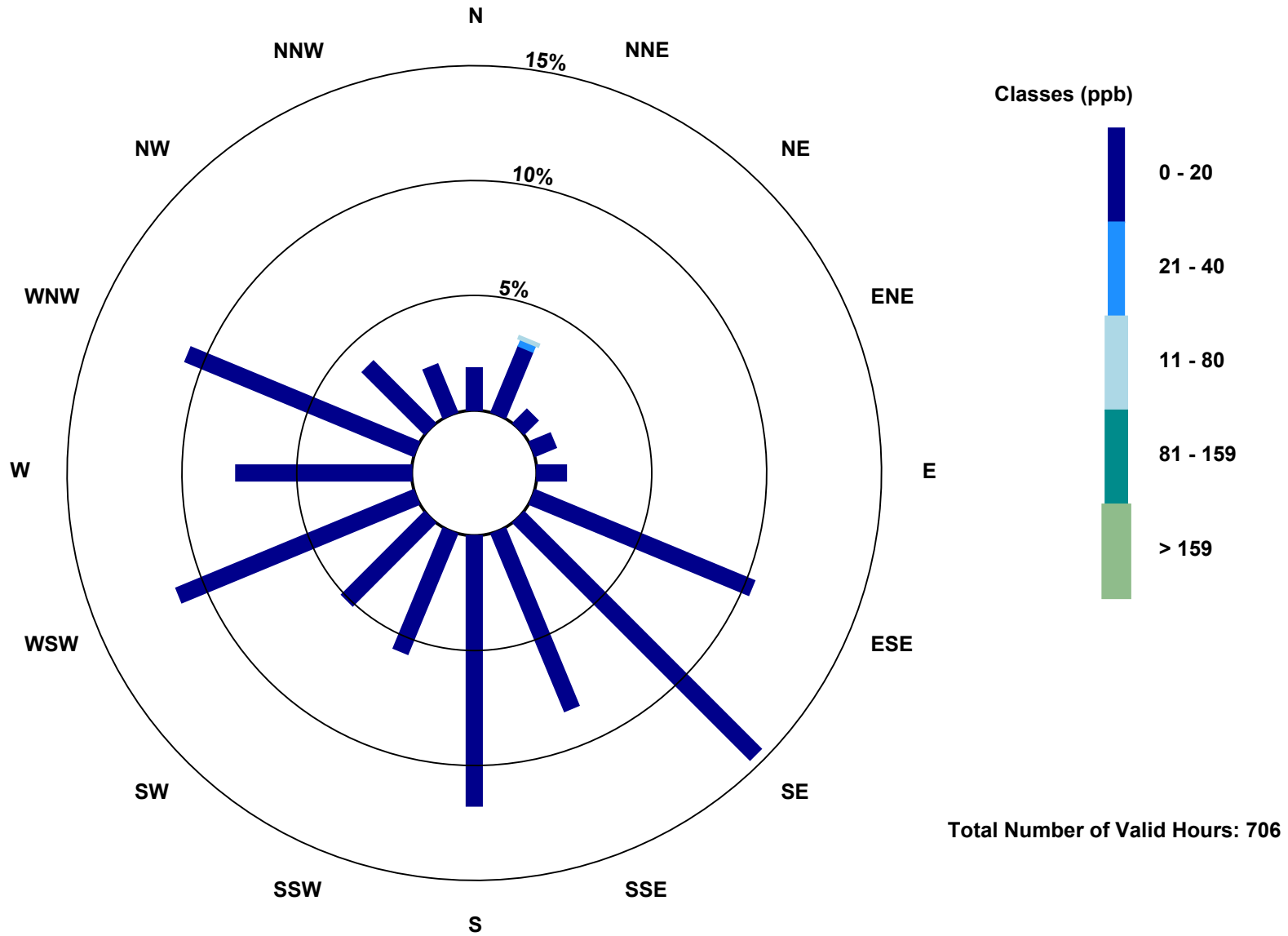
Total Number of Valid Hours: 706

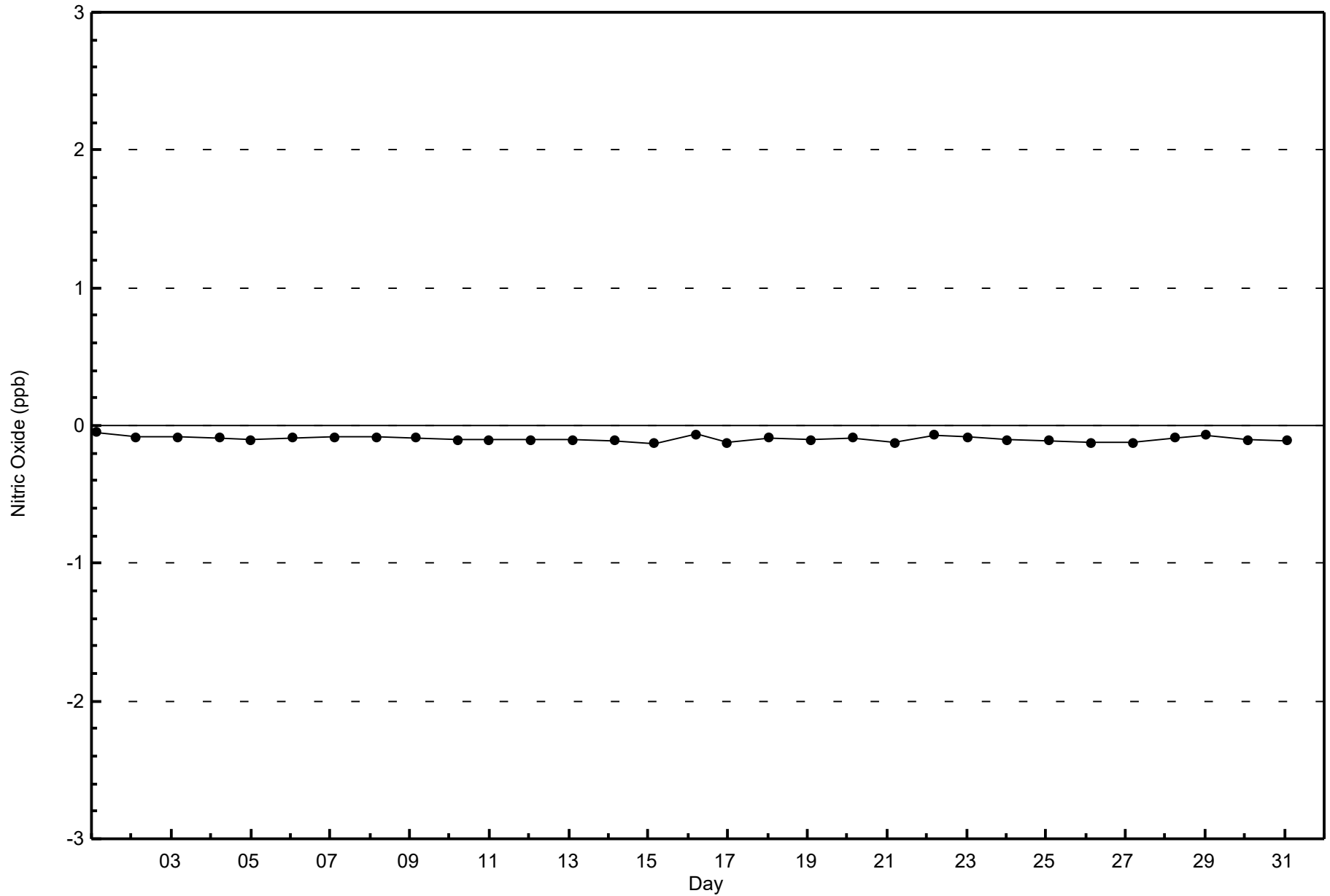
Total Number of Hours: 744

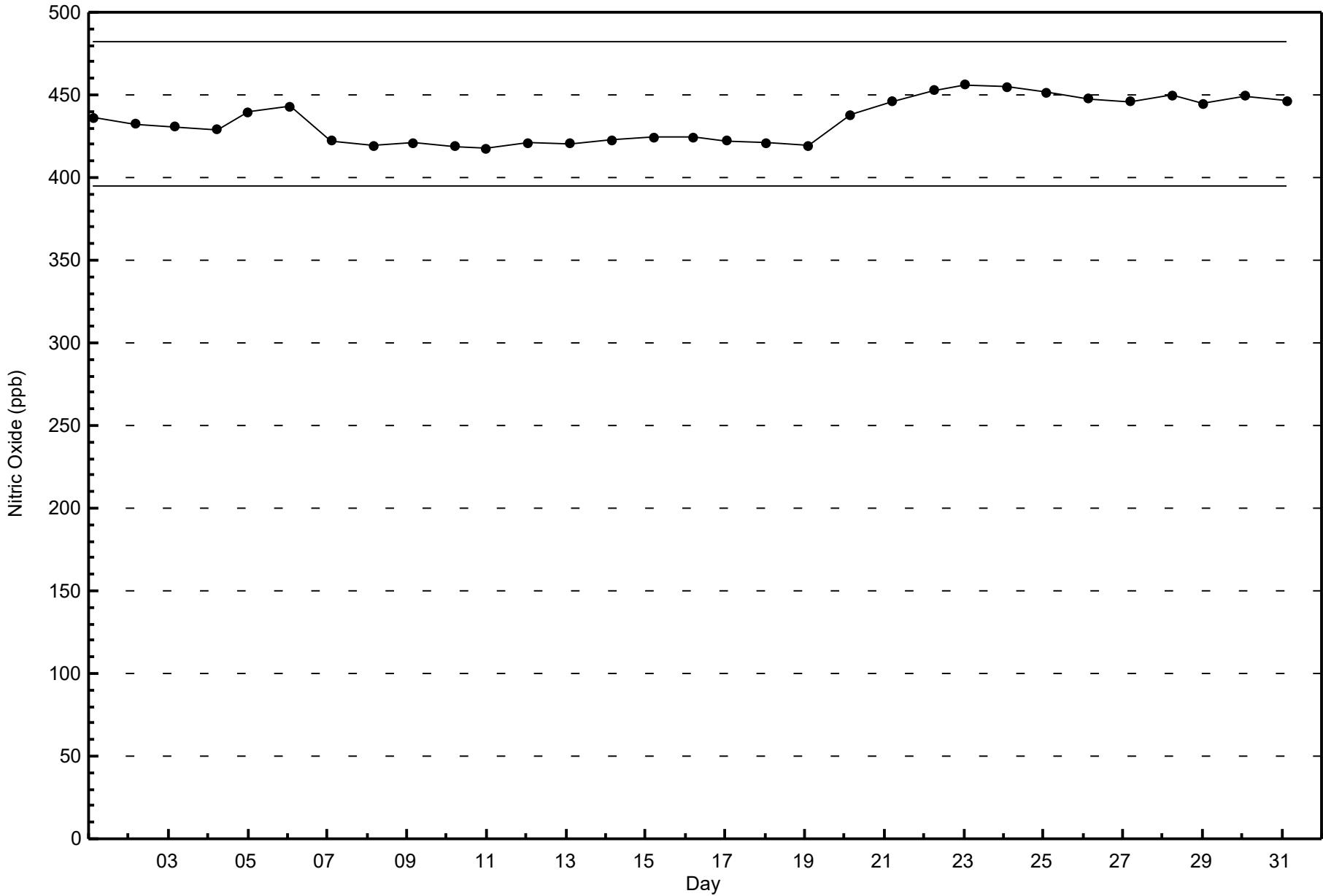


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitric Oxide (NO) - ppb
Mackay River









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

Mackay River - October 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 27.2 ppb on Oct 17 08:00	Maximum Daily Average: 11.8 ppb on Oct 17		Hours of Data:	706
Minimum Value: 0.0 ppb on Oct 3 01:00	Minimum Daily Average: 0.2 ppb on Oct 3		Hours of Missing Data:	38
Maximum Diurnal Average: 2.1 ppb at hour 8	Minimum Diurnal Average: 0.7 ppb at hour 2		Hours of Calibration:	35
Monthly Average: 1.18 ppb	Percentiles: P ₁ = 0.1 P ₁₀ = 0.2 Q ₁ = 0.2 Median = 0.6 Q ₃ = 1.0 P ₉₀ = 1.9 P ₉₉ = 13.3		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-Oct	0.4	0.4	Z	0.6	0.5	0.5	0.7	0.9	0.6	0.6	0.4	0.4	0.4	0.3	0.4	0.6	0.5	0.5	0.4	0.5	0.6	0.6	0.6	0.7	0.5	0.9
2-Oct	0.7	0.7	0.7	Z	0.7	0.8	0.9	0.9	1.0	1.3	1.2	1.0	1.0	0.8	0.7	0.5	0.5	0.3	0.2	0.3	0.3	0.2	0.1	0.1	0.6	1.3
3-Oct	0.0	0.3	0.3	0.2	Z	0.5	0.2	0.2	0.2	0.2	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	0.2	0.5
4-Oct	0.2	0.2	0.3	0.3	0.2	Z	0.5	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.9	0.5	0.2	0.1	0.3	0.1	0.1	0.1	0.3	0.9
5-Oct	Z	0.1	0.1	0.2	1.3	0.5	1.4	1.6	3.0	0.4	1.1	0.8	1.5	2.3	1.1	0.8	2.2	0.2	0.3	0.1	0.1	0.1	0.1	0.1	0.8	3.0
6-Oct	0.1	Z	0.1	0.1	0.2	0.3	0.3	C	C	C	C	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.1	0.3	0.6
7-Oct	0.1	0.2	Z	0.3	0.3	0.2	0.2	0.1	0.2	0.4	0.7	0.8	0.3	0.2	0.2	0.2	0.2	0.2	0.6	1.2	1.0	0.8	0.7	0.6	0.4	1.2
8-Oct	0.6	0.7	0.9	Z	1.2	1.5	1.5	1.3	1.2	1.2	0.9	0.8	0.8	0.8	0.6	0.6	0.6	0.5	0.6	0.6	0.5	0.5	0.5	0.6	0.8	1.5
9-Oct	0.7	1.0	1.0	0.9	Z	1.1	1.0	1.1	1.0	1.0	1.1	1.1	1.1	1.0	0.9	1.2	0.7	0.8	0.8	0.8	0.9	1.0	1.1	1.0	1.0	1.2
10-Oct	1.0	1.2	1.4	1.5	1.3	Z	1.1	1.0	1.0	1.1	1.0	0.9	0.9	1.1	0.9	0.7	0.7	0.7	0.6	0.7	0.7	0.8	0.9	0.8	1.0	1.5
11-Oct	Z	1.0	1.2	1.2	1.0	0.9	0.9	0.9	0.9	1.0	0.9	1.0	1.0	0.9	0.9	0.8	0.6	0.7	0.7	0.6	0.5	0.5	0.5	0.5	0.8	1.2
12-Oct	0.6	Z	0.6	0.5	0.5	0.7	0.9	0.9	1.1	1.0	0.8	0.7	0.7	0.6	0.6	0.6	0.6	0.5	0.4	0.3	0.3	0.3	0.3	0.6	0.6	1.1
13-Oct	0.6	0.6	Z	0.9	0.8	0.8	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.7	1.0	2.0	2.2	1.6	1.1	1.0	1.0	1.0	1.0	0.9	2.2
14-Oct	1.1	1.2	1.2	Z	1.2	1.1	1.0	1.0	1.0	1.0	0.9	0.7	0.5	0.5	0.5	0.4	0.6	0.6	0.8	1.0	0.9	0.8	0.8	0.8	0.9	1.2
15-Oct	0.9	0.9	1.0	0.9	Z	0.9	1.0	1.1	1.1	1.0	0.9	1.0	1.0	1.2	1.3	1.4	1.3	1.4	1.3	1.6	1.6	1.6	1.3	1.1	1.2	1.6
16-Oct	1.2	1.2	1.0	0.6	0.5	Z	0.4	0.3	0.4	0.6	0.6	0.5	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4	1.2
17-Oct	Z	0.3	0.2	0.3	1.2	11.2	23.3	27.2	26.6	20.3	14.8	12.8	13.1	10.6	10.7	7.9	9.5	14.8	13.3	11.6	11.1	9.9	9.8	10.1	11.8	27.2
18-Oct	9.4	Z	5.6	3.7	1.9	1.3	1.0	0.8	0.9	0.9	1.1	1.5	1.3	1.1	0.9	0.8	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.4	1.6	9.4
19-Oct	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.3	M	M	M	0.3	0.3	0.3	0.2	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.4
20-Oct	0.3	0.4	0.3	Z	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.4	2.2	1.5	2.0	1.1	1.4	2.2	0.8	0.5	0.9	0.9	0.9	0.8	2.2
21-Oct	2.5	2.8	1.7	1.3	Z	1.0	0.7	0.6	0.7	0.7	0.6	0.6	0.8	0.8	5.8	5.0	1.9	1.9	2.3	1.9	2.3	2.9	2.4	0.7	1.8	5.8
22-Oct	0.3	0.1	0.1	0.1	0.1	Z	5.7	4.8	2.2	3.2	1.4	1.0	0.9	2.0	1.9	4.8	8.1	3.7	2.3	1.8	2.1	2.3	1.8	1.3	2.3	8.1
23-Oct	Z	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	0.6	2.1	0.4	0.2	0.2	0.4	0.2	0.2	0.2	0.2	0.3	2.1
24-Oct	0.2	Z	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	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.3
25-Oct	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.2	0.3	0.4	0.2	0.2	0.3	0.4
26-Oct	0.2	0.2	0.2	Z	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	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.3
27-Oct	0.2	0.2	0.2	0.4	Z	0.8	1.3	1.3	0.4	0.6	0.4	0.2	0.1	0.7	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	1.3
28-Oct	0.1	0.2	0.3	0.4	0.4	Z	0.4	0.3	0.3	3.2	2.0	1.0	1.9	1.9	1.1	0.2	0.2	0.3	0.3	0.2	0.4	0.3	0.4	0.3	0.7	3.2
29-Oct	Z	1.6	0.3	0.2	1.0	2.1	2.4	2.0	0.2	0.2	0.7	0.7	0.6	0.3	0.2	0.2	0.3	0.2	0.1	0.1	0.1	0.2	1.1	8.0	1.0	8.0
30-Oct	15.5	Z	6.9	4.3	5.4	5.1	4.5	5.7	5.2	4.1	1.2	1.3	1.1	0.7	0.4	0.4	0.6	0.6	0.6	0.8	1.0	1.0	1.0	1.0	3.0	15.5
31-Oct	1.0	1.0	Z	1.0	1.4	1.1	1.4	5.2	2.9	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.4	0.9	5.2

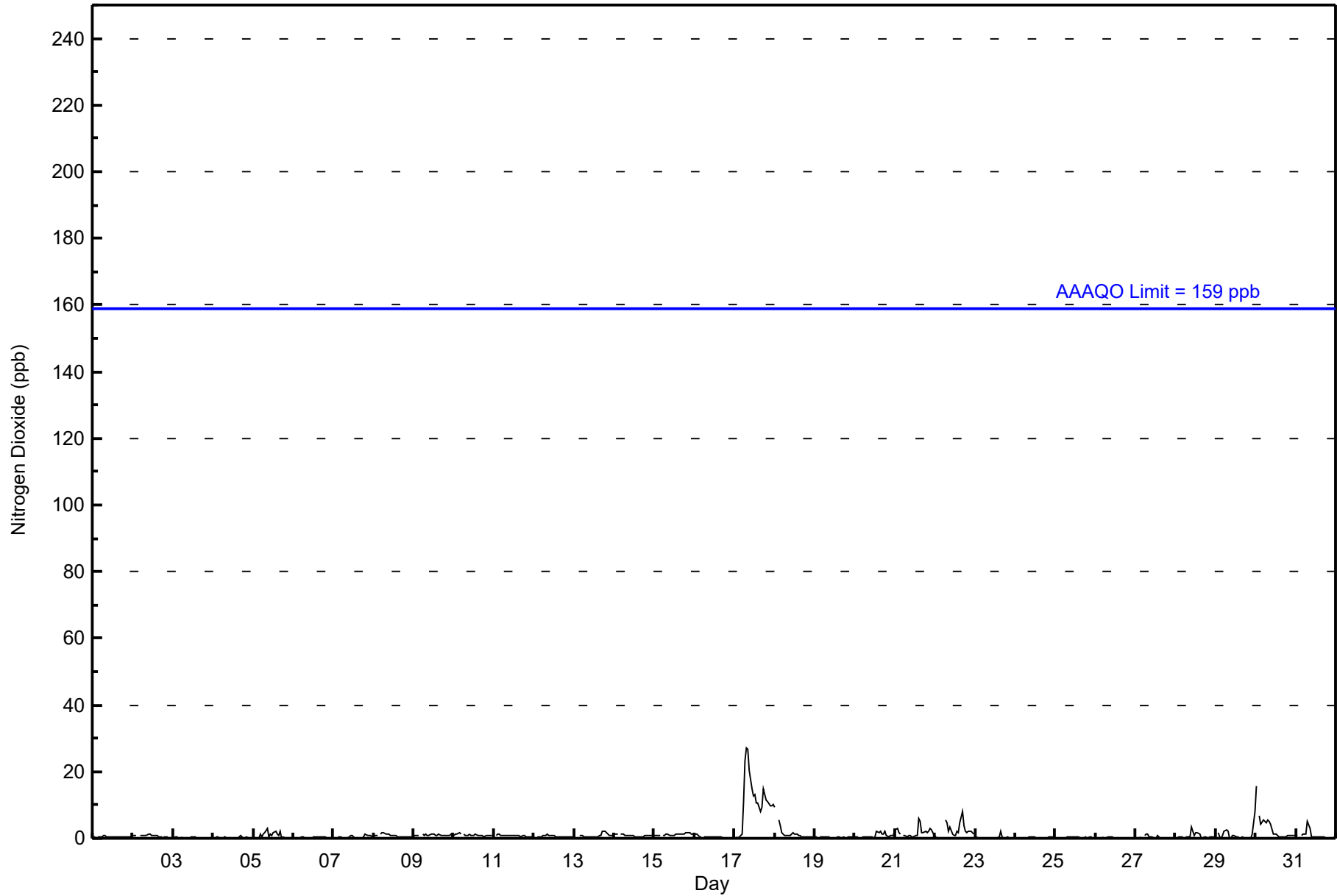
1.5	0.7	1.0	0.8	0.9	1.3	1.8	2.1	1.8	1.6	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	0.9	0.9	0.9	0.9	1.1	Diurnal Average	
15.5	2.8	6.9	4.3	5.4	11.2	23.3	27.2	26.6	20.3	14.8	12.8	13.1	10.6	10.7	7.9	9.5	14.8	13.3	11.6	11.1	9.9	9.8	10.1	Diurnal Maximum		

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 - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Mackay River - October 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	703	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: 706

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Mackay River - October 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	13	22	6	7	9	73	103	59	83	40	36	79	54	76	27	16	703
21 - 40	0	3	0	0	0	0	0	0	0	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	13	25	6	7	9	73	103	59	83	40	36	79	54	76	27	16	706

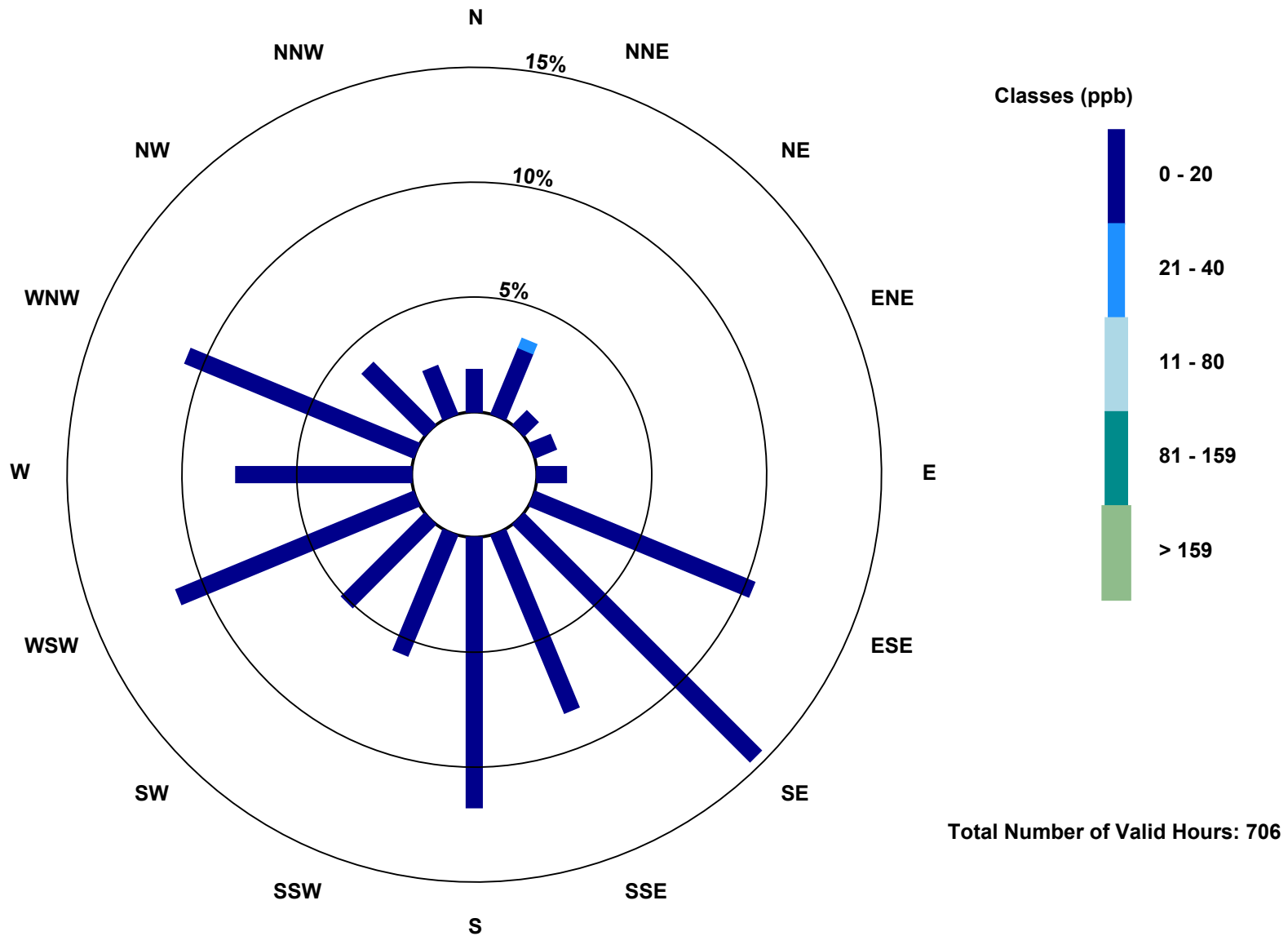
Total Number of Valid Hours: 706

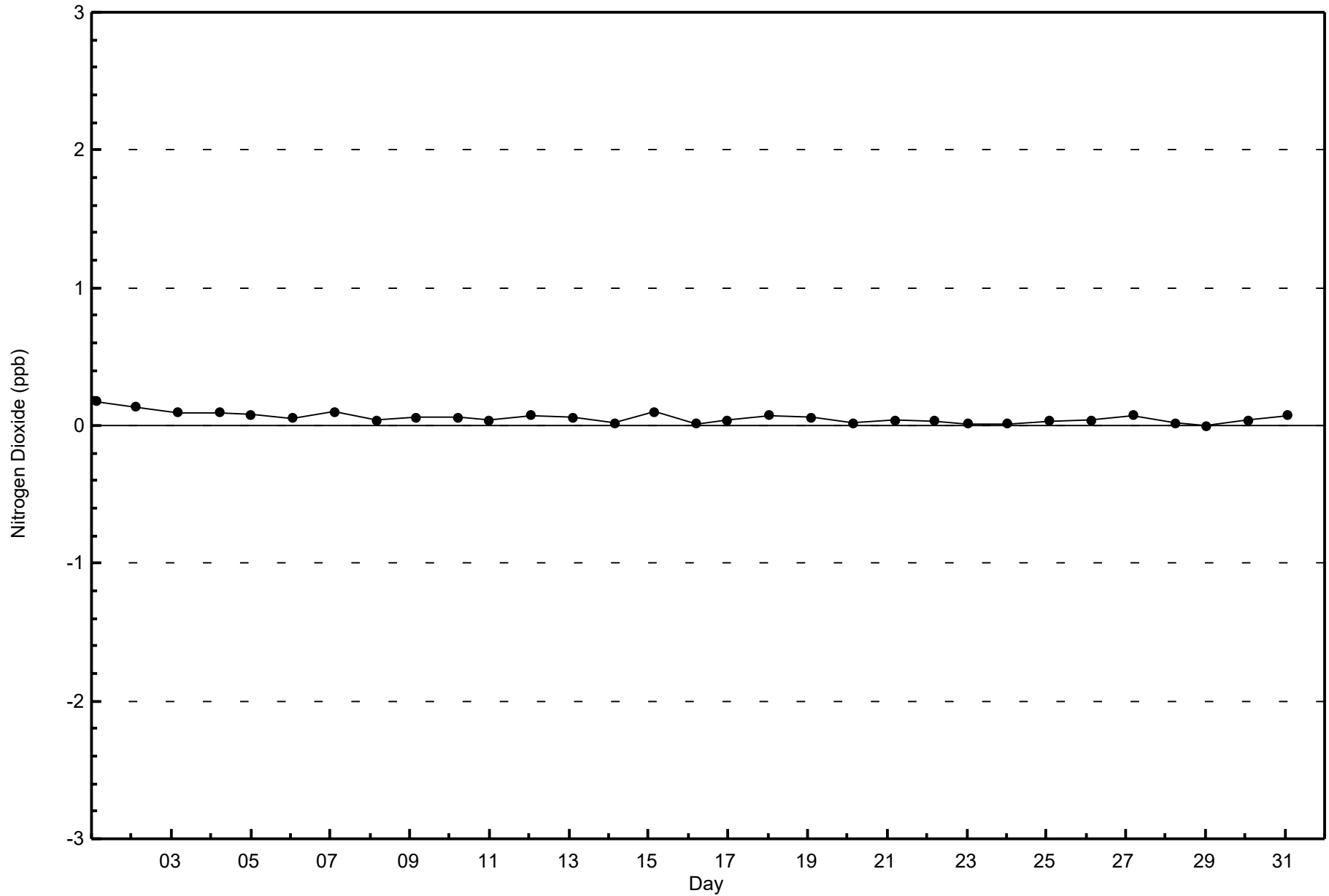
Total Number of Hours: 744

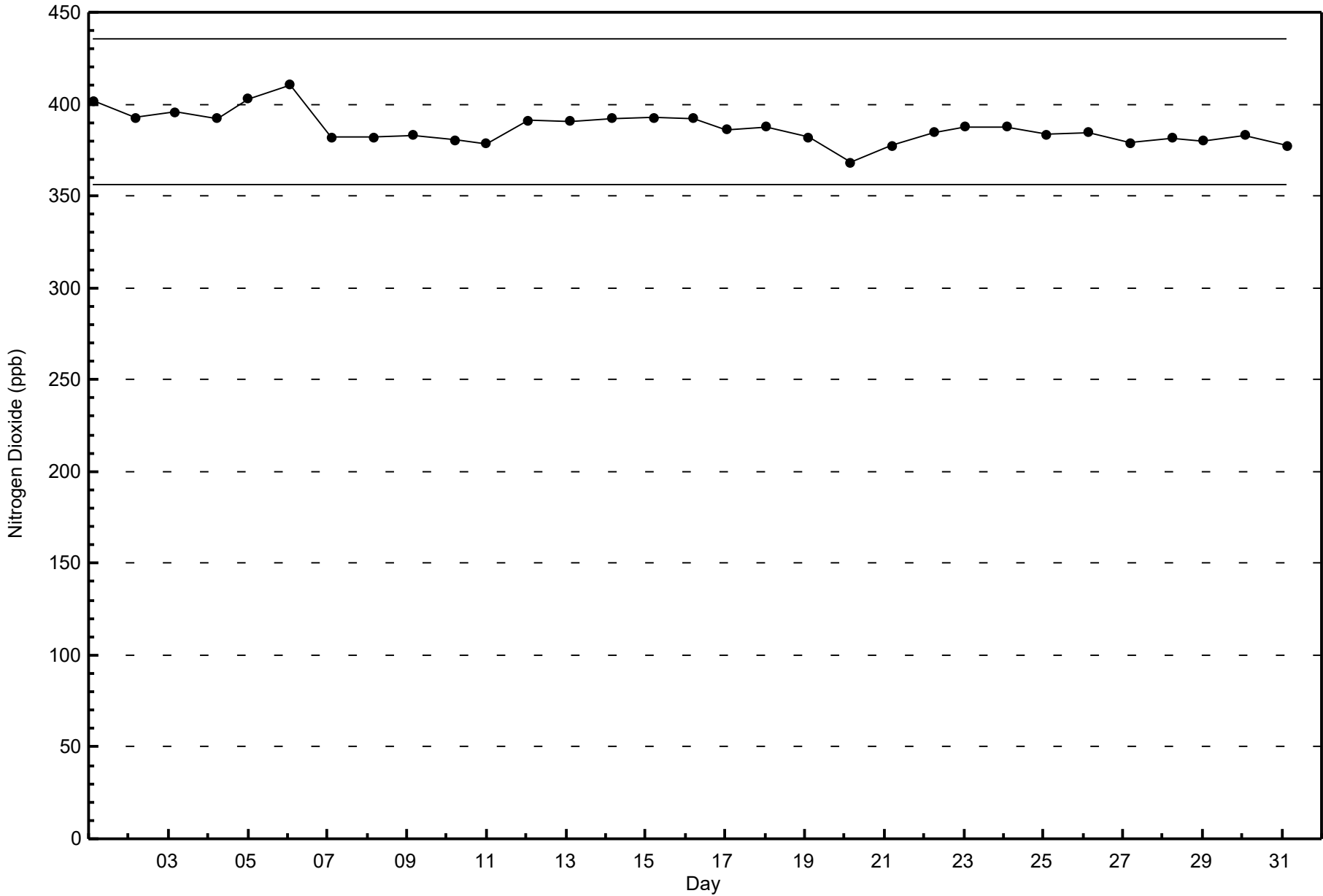


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitrogen Dioxide (NO₂) - ppb
Mackay River









Wood Buffalo Environmental Association
Summary of Hour Averages

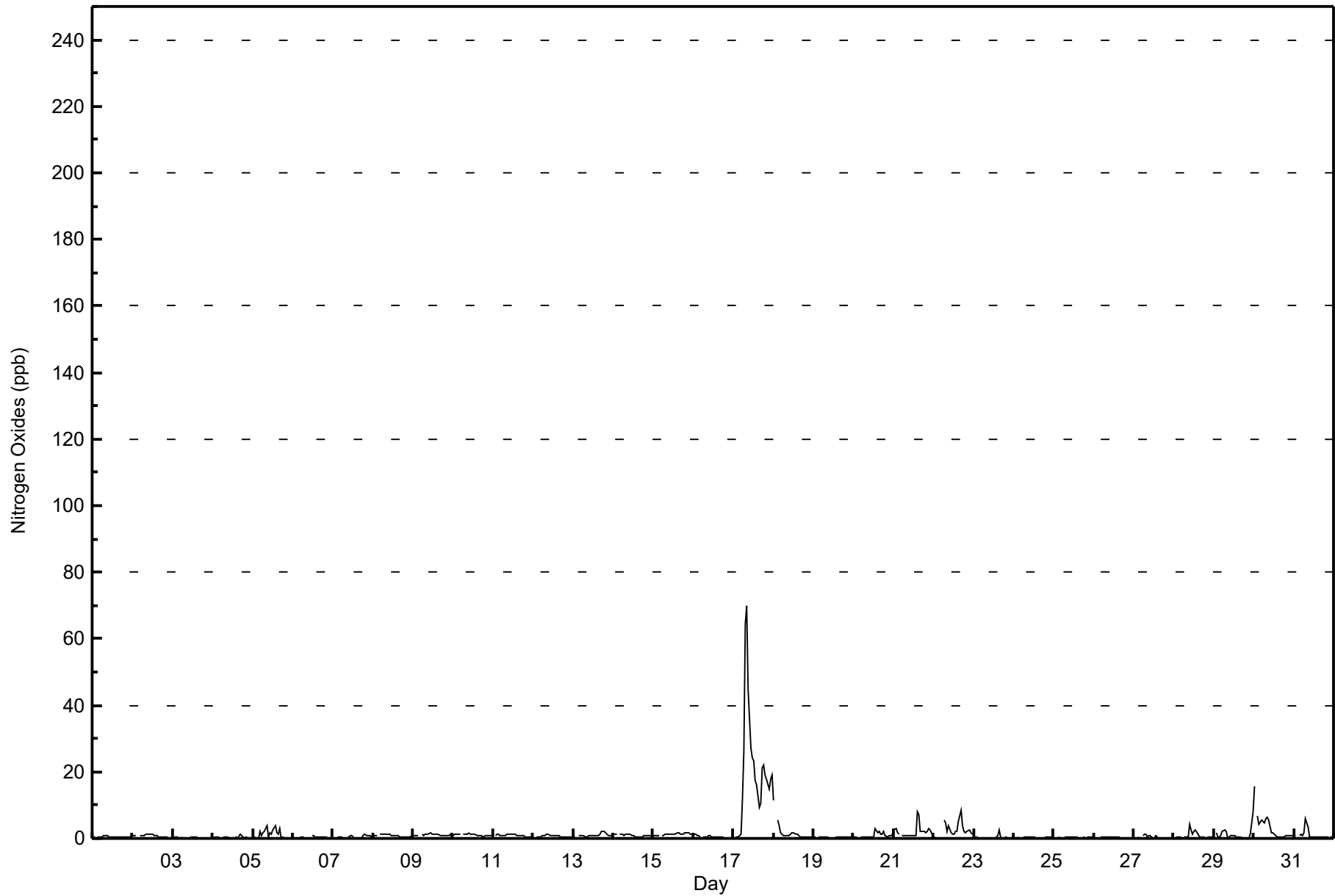
Nitrogen Oxides (NO_x) - ppb
Mackay River - October 2023

Maximum Value: 69.9 ppb on Oct 17 09:00																				Maximum Daily Average: 20.9 ppb on Oct 17					Hours in Service:	744
Minimum Value: 0.1 ppb on Oct 6 01:00																				Minimum Daily Average: 0.2 ppb on Oct 3					Hours of Data:	706
Maximum Diurnal Average: 3.4 ppb at hour 9																				Minimum Diurnal Average: 0.7 ppb at hour 2					Hours of Missing Data:	38
Monthly Average: 1.54 ppb																				Percentiles: P ₁ = 0.1 P ₁₀ = 0.2 Q ₁ = 0.2 Median = 0.6 Q ₃ = 1.1 P ₉₀ = 2.0 P ₉₉ = 22.0					Hours of Calibration:	35
																									Percent Operational Time:	99.6
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Oct	0.4	0.4	Z	0.6	0.5	0.5	0.7	0.9	0.8	0.7	0.5	0.4	0.4	0.3	0.4	0.6	0.5	0.5	0.4	0.5	0.6	0.6	0.6	0.7	0.5	0.9
2-Oct	0.7	0.7	0.7	Z	0.7	0.8	0.9	0.9	1.1	1.4	1.4	1.2	1.2	0.9	0.7	0.5	0.5	0.3	0.2	0.3	0.3	0.2	0.1	0.1	0.7	1.4
3-Oct	0.1	0.3	0.3	0.2	Z	0.5	0.2	0.2	0.2	0.2	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	0.2	0.5	
4-Oct	0.2	0.2	0.3	0.3	0.2	Z	0.5	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	1.4	0.7	0.3	0.1	0.5	0.1	0.1	0.1	0.3	1.4	
5-Oct	Z	0.2	0.1	0.2	1.9	0.6	1.7	2.0	3.9	0.6	1.8	1.4	2.4	3.9	1.9	1.3	3.0	0.2	0.3	0.1	0.1	0.1	0.1	1.2	3.9	
6-Oct	0.1	Z	0.1	0.1	0.2	0.3	0.3	C	C	C	C	0.7	0.6	0.5	0.5	0.5	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.3	0.7	
7-Oct	0.1	0.2	Z	0.3	0.3	0.2	0.2	0.1	0.2	0.5	0.9	0.9	0.3	0.2	0.2	0.2	0.2	0.2	0.6	1.2	1.0	0.8	0.7	0.4	1.2	
8-Oct	0.6	0.7	0.9	Z	1.2	1.5	1.5	1.4	1.4	1.5	1.2	1.0	1.0	0.9	0.7	0.7	0.6	0.5	0.6	0.6	0.5	0.5	0.5	0.9	1.5	
9-Oct	0.7	1.0	1.0	0.9	Z	1.1	1.0	1.2	1.2	1.4	1.5	1.4	1.4	1.2	1.1	1.4	0.8	0.8	0.8	0.8	0.9	1.0	1.1	1.1	1.5	
10-Oct	1.0	1.2	1.4	1.5	1.3	Z	1.1	1.1	1.2	1.5	1.4	1.2	1.1	1.4	1.0	0.8	0.8	0.7	0.6	0.7	0.7	0.8	0.9	1.1	1.5	
11-Oct	Z	1.0	1.2	1.2	1.0	0.9	0.9	1.0	1.1	1.3	1.2	1.2	1.2	1.1	1.0	0.9	0.7	0.7	0.7	0.6	0.5	0.5	0.5	0.9	1.3	
12-Oct	0.6	Z	0.6	0.5	0.5	0.7	0.9	1.0	1.3	1.2	1.0	0.9	0.8	0.7	0.7	0.7	0.6	0.5	0.4	0.3	0.3	0.3	0.3	0.7	1.3	
13-Oct	0.6	0.6	Z	0.9	0.8	0.8	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.8	0.8	0.8	1.1	2.0	2.2	1.6	1.1	1.0	1.0	0.9	2.2	
14-Oct	1.1	1.2	1.2	Z	1.2	1.1	1.0	1.1	1.2	1.2	1.2	0.9	0.6	0.6	0.6	0.5	0.6	0.6	0.8	1.0	0.9	0.8	0.8	0.9	1.2	
15-Oct	0.9	0.9	1.0	0.9	Z	0.9	1.0	1.2	1.3	1.3	1.2	1.4	1.3	1.5	1.6	1.5	1.4	1.4	1.3	1.6	1.6	1.6	1.3	1.3	1.6	
16-Oct	1.2	1.2	1.0	0.6	0.5	Z	0.4	0.3	0.5	0.7	0.7	0.5	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.5	1.2	
17-Oct	Z	0.3	0.2	0.3	1.2	11.8	26.3	64.2	69.9	44.8	27.0	24.1	23.4	17.5	16.1	9.5	10.8	21.0	22.1	19.3	17.7	14.9	17.9	20.9	69.9	
18-Oct	11.5	Z	5.6	3.7	1.9	1.3	1.0	0.8	1.0	1.0	1.3	1.7	1.6	1.4	1.1	0.9	0.6	0.5	0.4	0.4	0.4	0.4	0.4	1.7	11.5	
19-Oct	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	M	M	M	0.3	0.3	0.3	0.2	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.4	
20-Oct	0.3	0.4	0.3	Z	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.5	2.9	1.9	2.3	1.2	1.4	2.2	0.8	0.5	0.9	0.9	0.9	2.9	
21-Oct	2.5	2.8	1.7	1.3	Z	1.0	0.7	0.6	0.7	0.7	0.7	0.7	0.9	0.9	8.1	7.2	2.0	1.9	2.3	1.9	2.3	2.9	2.4	2.0	8.1	
22-Oct	0.3	0.1	0.1	0.1	0.1	Z	5.7	4.8	2.3	4.0	1.8	1.2	1.1	2.2	2.1	5.2	8.5	3.7	2.3	1.8	2.1	2.3	1.8	2.4	8.5	
23-Oct	Z	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	0.8	2.7	0.4	0.2	0.2	0.4	0.2	0.2	0.2	0.3	2.7	
24-Oct	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.3	
25-Oct	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.4	0.3	0.4	
26-Oct	0.2	0.2	0.2	Z	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	0.2	0.2	0.1	0.1	0.2	0.2	0.3	
27-Oct	0.2	0.2	0.2	0.4	Z	0.8	1.3	1.3	0.4	0.8	0.6	0.2	0.1	0.9	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4	1.3	
28-Oct	0.1	0.2	0.3	0.4	0.4	Z	0.4	0.3	0.3	4.2	2.6	1.2	2.2	2.3	1.3	0.2	0.2	0.3	0.3	0.2	0.4	0.3	0.4	0.8	4.2	
29-Oct	Z	1.8	0.3	0.2	1.1	2.2	2.5	2.1	0.2	0.2	0.8	0.9	0.8	0.4	0.2	0.2	0.3	0.2	0.1	0.1	0.1	0.2	1.1	1.0	8.0	
30-Oct	15.5	Z	6.9	4.3	5.4	5.1	4.5	5.9	6.2	5.3	1.5	1.7	1.4	0.9	0.5	0.4	0.6	0.6	0.6	0.6	0.8	1.0	1.0	3.1	15.5	
31-Oct	1.0	1.0	Z	1.0	1.4	1.1	1.6	5.9	3.5	0.4	0.4	0.4	0.5	0.5	0.6	0.6	0.4	0.3	0.2	0.2	0.2	0.2	0.4	1.0	5.9	
																								Diurnal Average		
																								Diurnal Maximum		
1.6 0.7 1.0 0.8 0.9 1.3 1.9 3.4 3.4 2.6 1.8 1.6 1.6 1.5 1.5 1.3 1.3 1.3 1.3 1.2 1.1 1.1 1.2 1.4 15.5 2.8 6.9 4.3 5.4 11.8 26.3 64.2 69.9 44.8 27.0 24.1 23.4 17.5 16.1 9.5 10.8 21.0 22.1 19.3 17.7 14.9 17.9 19.2																										
Z - zerospan C - Calibration M - Maintenance																										



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Mackay River - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Mackay River - October 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	697	98.73	98.73
21 - 40	6	0.85	99.58
41 - 80	3	0.42	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Mackay River - October 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	19	6	7	9	73	103	59	83	40	36	79	54	76	27	14	697
21 - 40	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	2	6
11 - 80	0	3	0	0	0	0	0	0	0	0	0	0	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	13	25	6	7	9	73	103	59	83	40	36	79	54	76	27	16	706

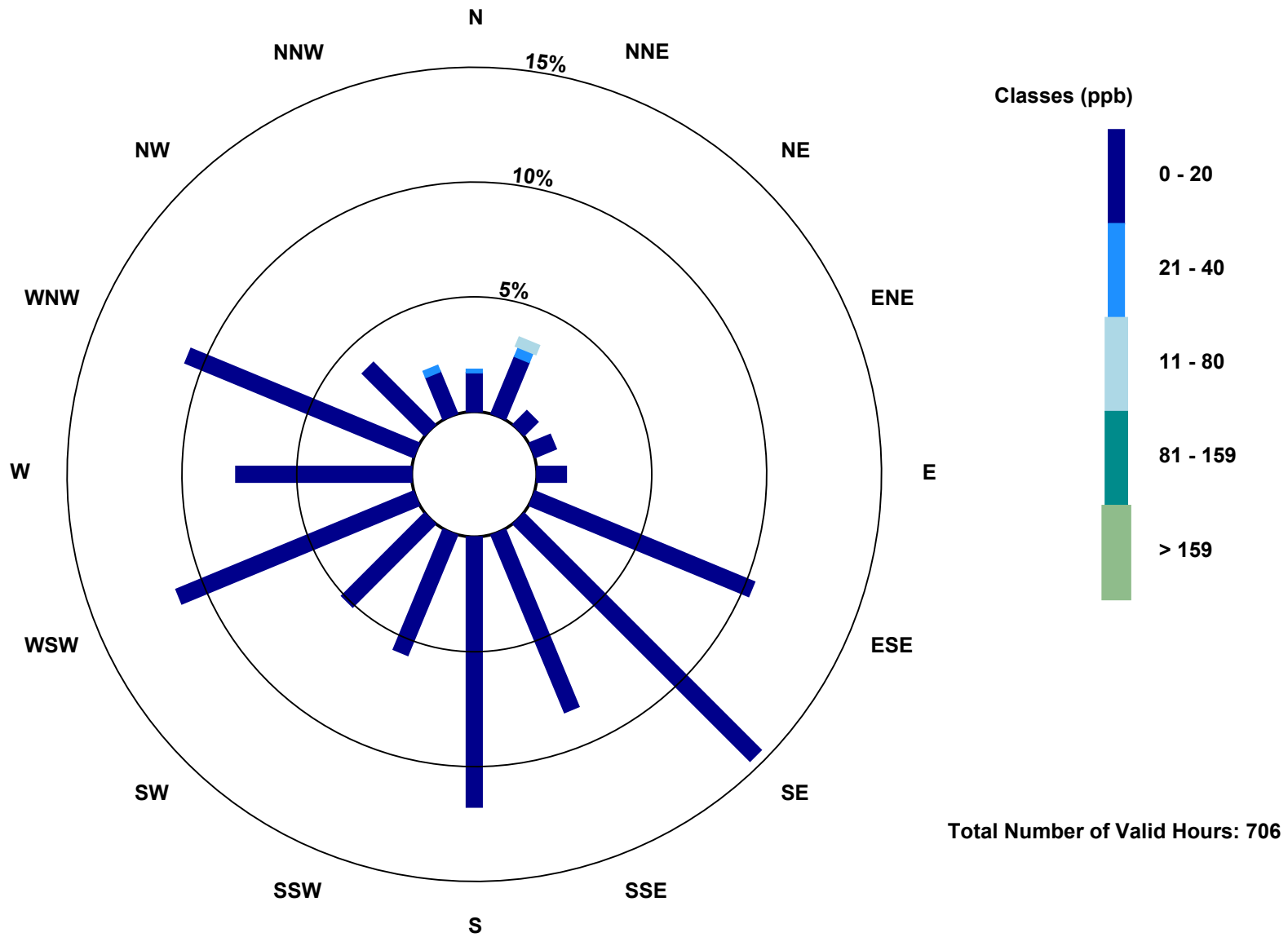
Total Number of Valid Hours: 706

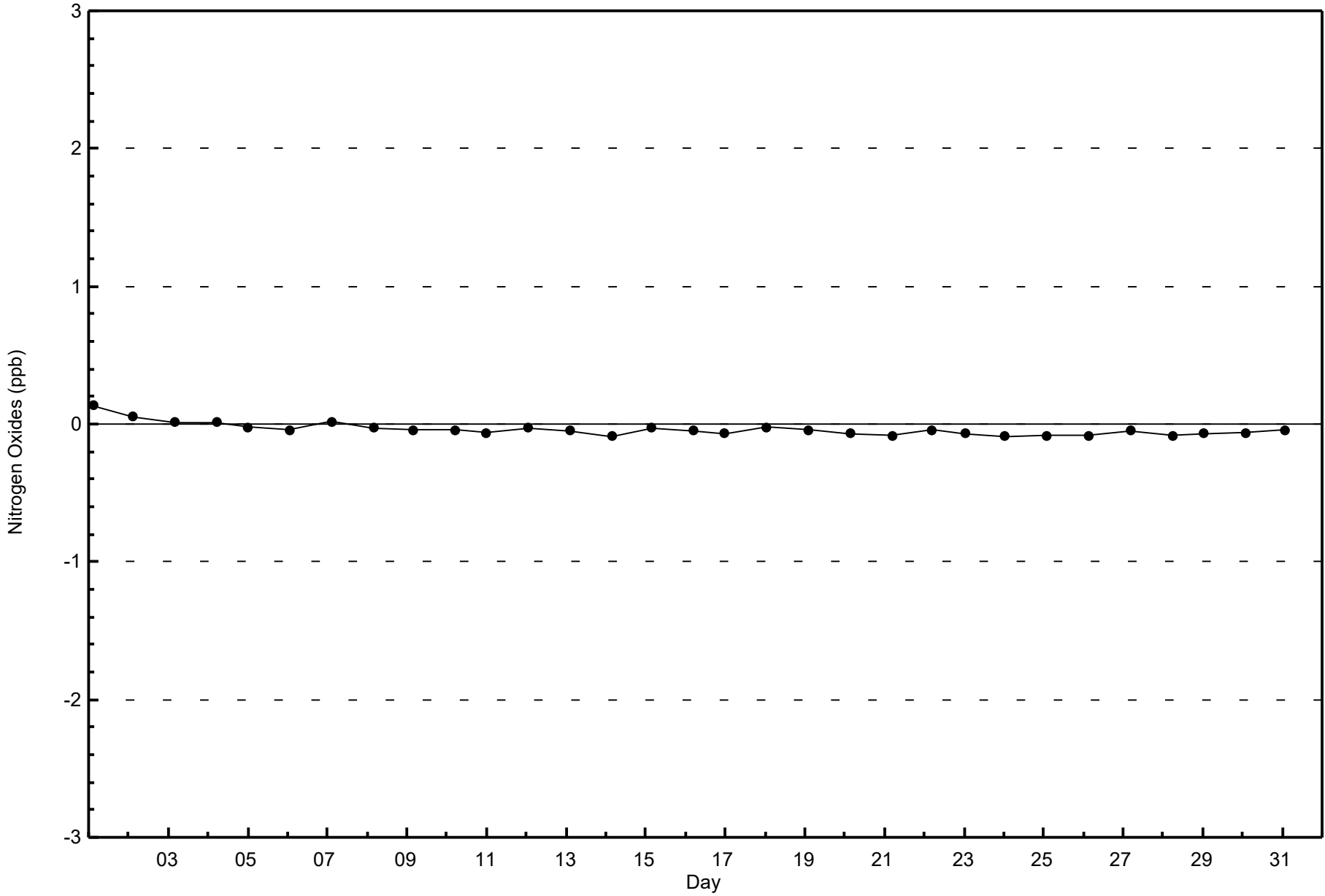
Total Number of Hours: 744

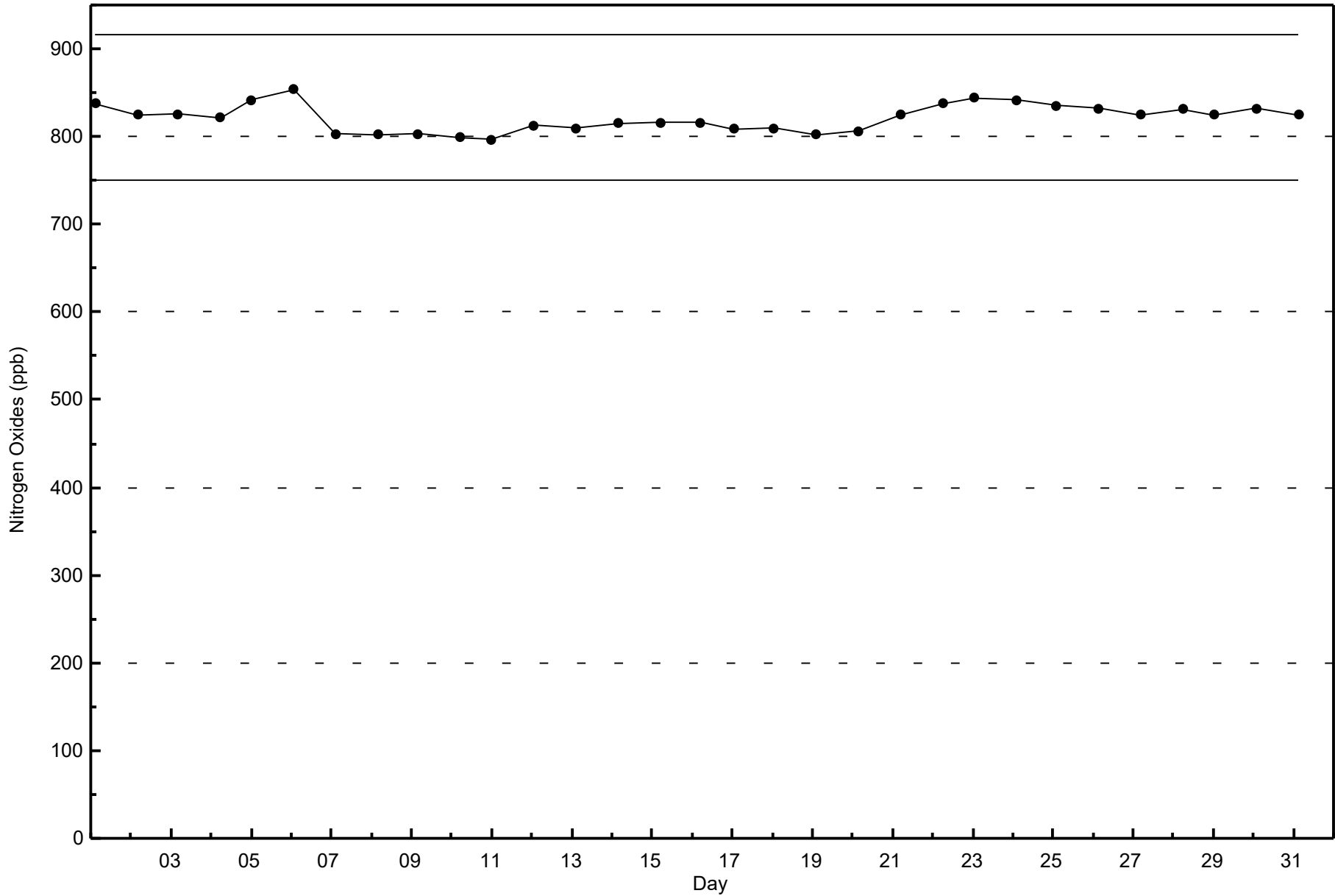


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitrogen Oxides (NO_x) - ppb
Mackay River









Wood Buffalo Environmental Association
Summary of Hour Averages

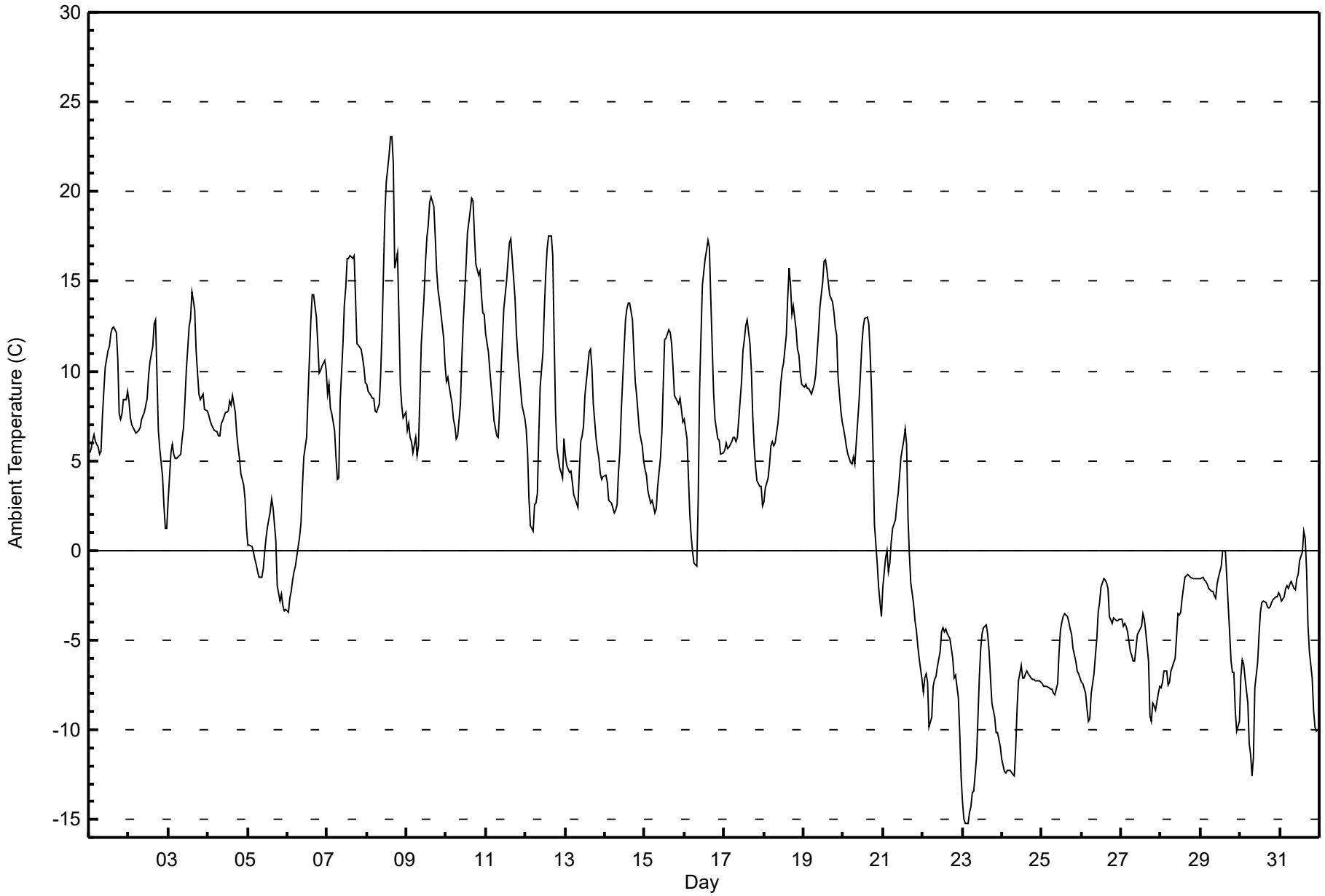
Ambient Temperature (AT) - C
Mackay River - October 2023

Maximum Value: 23.0 C on Oct 8 15:00		Maximum Daily Average: 13.0 C on Oct 8		Hours in Service: 744																																												
Minimum Value: -15.2 C on Oct 23 04:00		Minimum Daily Average: -10.0 C on Oct 23		Hours of Data: 744																																												
Maximum Diurnal Average: 8.5 C at hour 15		Minimum Diurnal Average: 0.4 C at hour 6		Hours of Missing Data: 0																																												
Monthly Average: 3.45 C		Percentiles: P ₁ = -13.1 P ₁₀ = -7.3 Q ₁ = -3.3 Median = 5.2 Q ₃ = 9.2 P ₉₀ = 13.5 P ₉₉ = 19.4		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-Oct	5.4	5.7	6.2	6.5	6.0	5.8	5.4	5.6	7.5	8.9	10.2	11.2	11.4	12.1	12.4	12.5	12.2	10.7	7.6	7.3	7.6	8.4	8.4	8.8	8.5	12.5																						
2-Oct	8.3	7.4	7.0	6.7	6.5	6.6	6.7	6.8	7.3	7.7	8.1	8.5	9.7	10.5	11.3	12.6	12.9	9.8	6.7	5.6	4.1	2.4	1.3	1.2	7.3	12.9																						
3-Oct	2.8	5.4	5.9	5.3	5.2	5.1	5.2	5.4	6.2	6.9	8.3	10.1	12.5	12.9	14.4	13.9	13.4	11.1	8.7	8.4	8.6	8.7	7.9	7.8	8.3	14.4																						
4-Oct	7.6	7.2	7.0	6.8	6.7	6.6	6.4	6.4	7.1	7.2	7.7	7.7	7.8	8.3	8.1	8.7	7.7	6.5	5.7	5.2	4.2	3.7	2.8	1.2	6.4	8.7																						
5-Oct	0.3	0.3	0.2	-0.1	-0.5	-0.8	-1.2	-1.5	-1.5	-1.0	-0.1	0.7	1.3	2.2	2.8	2.4	1.4	0.5	-1.9	-2.8	-2.4	-3.0	-3.3	-3.3	-0.5	2.8																						
6-Oct	-3.4	-2.7	-2.3	-1.6	-1.2	-0.9	0.2	0.8	1.6	3.6	5.2	6.3	8.5	10.7	12.8	14.2	14.2	13.0	11.6	9.9	10.0	10.3	10.6	10.0	5.9	14.2																						
7-Oct	8.7	9.3	7.9	7.6	6.7	5.2	3.9	4.1	8.3	11.5	13.7	14.6	16.3	16.3	16.5	16.3	16.4	14.0	11.5	11.5	11.2	10.8	10.2	9.3	10.9	16.5																						
8-Oct	9.2	8.9	8.7	8.5	8.5	7.8	7.7	8.2	9.9	12.4	15.7	18.8	20.6	22.1	23.0	23.0	21.6	15.8	16.6	13.1	9.3	8.1	7.4	7.7	13.0	23.0																						
9-Oct	6.7	7.1	6.3	6.1	5.5	6.3	5.3	5.8	8.5	11.5	14.2	16.0	17.5	18.1	19.4	19.7	19.1	17.5	15.6	14.5	13.9	12.5	11.8	10.4	12.0	19.7																						
10-Oct	9.5	9.7	9.1	8.2	7.3	6.9	6.2	6.4	8.2	10.7	12.7	14.2	15.9	17.7	18.9	19.6	19.4	17.6	15.9	15.4	15.6	14.3	13.3	13.2	12.7	19.6																						
11-Oct	12.1	11.0	10.0	9.1	8.2	7.2	6.4	6.3	7.8	9.9	11.7	13.5	15.0	16.2	17.2	17.4	16.3	14.1	12.2	10.9	9.9	9.0	8.1	7.4	11.1	17.4																						
12-Oct	6.7	5.4	2.9	1.4	1.0	2.6	2.6	3.2	6.4	9.1	11.0	13.4	15.4	16.8	17.5	17.5	16.4	11.9	7.7	5.7	4.6	4.4	4.1	6.2	8.1	17.5																						
13-Oct	5.3	4.7	4.3	4.4	3.8	3.1	2.9	2.4	4.4	6.0	6.4	7.0	8.6	10.2	11.0	11.2	10.2	8.1	6.2	5.6	5.1	4.2	4.0	4.1	6.0	11.2																						
14-Oct	4.2	3.8	2.8	2.7	2.6	2.1	2.3	2.5	4.3	5.5	7.8	11.2	12.9	13.5	13.8	13.8	12.8	11.0	9.5	8.6	7.6	6.6	5.9	5.0	7.2	13.8																						
15-Oct	4.5	4.2	3.3	2.6	2.8	2.4	2.1	2.3	3.6	5.2	6.5	9.2	11.8	11.8	12.3	12.2	11.6	10.2	8.7	8.5	8.1	8.5	7.8	7.2	7.0	12.3																						
16-Oct	7.3	6.2	4.1	2.0	0.8	-0.1	-0.7	-0.9	2.8	9.0	12.0	14.8	16.3	16.7	17.3	16.9	14.0	8.8	7.3	6.8	6.2	6.1	5.4	5.4	7.7	17.3																						
17-Oct	5.6	6.0	5.7	5.8	6.1	6.3	6.3	6.0	6.3	7.3	9.4	11.1	11.8	12.5	12.8	11.6	10.1	7.5	5.8	4.6	3.9	3.6	3.6	2.5	7.2	12.8																						
18-Oct	2.7	3.5	4.0	4.8	5.8	6.1	5.8	6.0	7.1	8.0	9.3	10.0	10.4	12.0	14.1	15.7	14.8	13.2	13.7	12.3	11.2	10.9	9.9	9.3	9.2	15.7																						
19-Oct	9.1	9.2	9.0	9.0	8.9	8.8	9.3	9.8	11.0	12.2	13.6	15.0	16.1	16.2	15.6	15.0	14.2	13.9	13.3	12.5	12.0	9.6	7.8	7.2	11.6	16.2																						
20-Oct	6.8	6.3	5.8	5.3	4.9	4.8	5.2	4.8	6.0	8.4	9.8	11.4	12.5	12.9	13.0	12.6	10.9	8.8	5.6	1.4	-0.7	-2.0	-2.9	-3.7	6.2	13.0																						
21-Oct	-2.1	-0.4	0.0	-1.1	-0.7	0.4	1.2	1.7	2.5	3.1	4.2	5.2	6.1	6.8	5.9	1.9	-0.2	-1.8	-3.0	-3.9	-4.4	-5.3	-6.0	-7.2	0.1	6.8																						
22-Oct	-7.9	-7.1	-6.9	-7.4	-9.9	-9.3	-7.6	-7.2	-7.0	-6.5	-5.7	-4.5	-4.3	-4.6	-4.4	-4.6	-4.9	-5.5	-6.0	-7.1	-6.9	-8.2	-10.2	-12.6	-6.9	-4.3																						
23-Oct	-14.0	-15.0	-15.2	-15.2	-14.6	-14.3	-13.5	-13.4	-11.6	-9.4	-7.1	-5.5	-4.6	-4.3	-4.2	-4.7	-5.6	-7.1	-8.5	-9.3	-10.1	-10.2	-10.5	-11.0	-10.0	-4.2																						
24-Oct	-11.6	-12.3	-12.4	-12.2	-12.2	-12.3	-12.5	-12.6	-11.0	-8.8	-7.2	-6.4	-7.1	-7.1	-6.8	-6.7	-6.9	-7.1	-7.2	-7.2	-7.2	-7.3	-7.3	-7.3	-9.0	-6.4																						
25-Oct	-7.4	-7.5	-7.6	-7.6	-7.7	-7.7	-7.7	-8.0	-8.1	-7.4	-5.7	-4.4	-4.0	-3.7	-3.6	-3.7	-4.0	-4.4	-4.7	-5.5	-6.2	-6.7	-6.9	-7.1	-6.1	-3.6																						
26-Oct	-7.3	-7.4	-8.0	-8.9	-9.5	-9.4	-8.0	-6.9	-5.9	-4.9	-3.5	-2.9	-2.1	-1.6	-1.6	-1.8	-2.2	-3.7	-4.0	-3.7	-3.8	-3.9	-3.9	-3.9	-4.9	-1.6																						
27-Oct	-3.9	-4.2	-4.1	-4.2	-4.6	-5.7	-5.9	-6.2	-6.2	-5.5	-4.7	-4.3	-4.2	-3.5	-3.9	-4.6	-6.2	-9.2	-9.6	-8.5	-8.7	-8.9	-8.0	-7.6	-5.9	-3.5																						
28-Oct	-7.7	-7.3	-6.7	-6.7	-7.5	-7.3	-6.7	-6.5	-6.0	-4.9	-3.5	-3.6	-3.5	-2.7	-1.5	-1.4	-1.4	-1.4	-1.5	-1.6	-1.6	-1.6	-1.5	-1.6	-4.0	-1.4																						
29-Oct	-1.6	-1.5	-1.6	-1.7	-1.9	-2.1	-2.3	-2.3	-2.5	-2.7	-1.9	-1.5	-0.9	-0.1	0.0	-0.1	-1.6	-4.6	-6.2	-6.8	-6.8	-8.9	-10.1	-9.6	-3.3	0.0																						
30-Oct	-7.0	-6.1	-6.4	-7.1	-8.5	-10.8	-11.4	-12.6	-11.5	-7.7	-6.3	-4.7	-3.4	-2.9	-2.8	-2.9	-3.1	-3.2	-3.2	-2.9	-2.7	-2.6	-2.6	-2.4	-5.6	-2.4																						
31-Oct	-2.5	-2.9	-2.6	-2.1	-1.9	-2.1	-1.9	-1.7	-2.1	-2.2	-1.6	-1.3	-0.6	-0.1	1.1	0.7	-1.1	-4.1	-5.7	-7.1	-8.9	-9.8	-10.1	-10.0	-3.4	1.1																						
																								1.5	1.5	1.2	0.9	0.5	0.4	0.4	0.5	1.7	3.3	4.8	6.2	7.2	7.9	8.5	8.3	7.5	5.5	4.1	3.3	2.7	2.1	1.5	1.2	Diurnal Average
																								12.1	11.0	10.0	9.1	8.9	8.8	9.3	9.8	11.0	12.4	15.7	18.8	20.6	22.1	23.0	23.0	21.6	17.6	16.6	15.4	15.6	14.3	13.3	13.2	Diurnal Maximum



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Mackay River - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Mackay River - October 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	277	37.23	37.23
0 - 10	302	40.59	77.82
10 - 20	160	21.51	99.33
> 20	5	0.67	100.00

Total Number of Valid Hours: 744

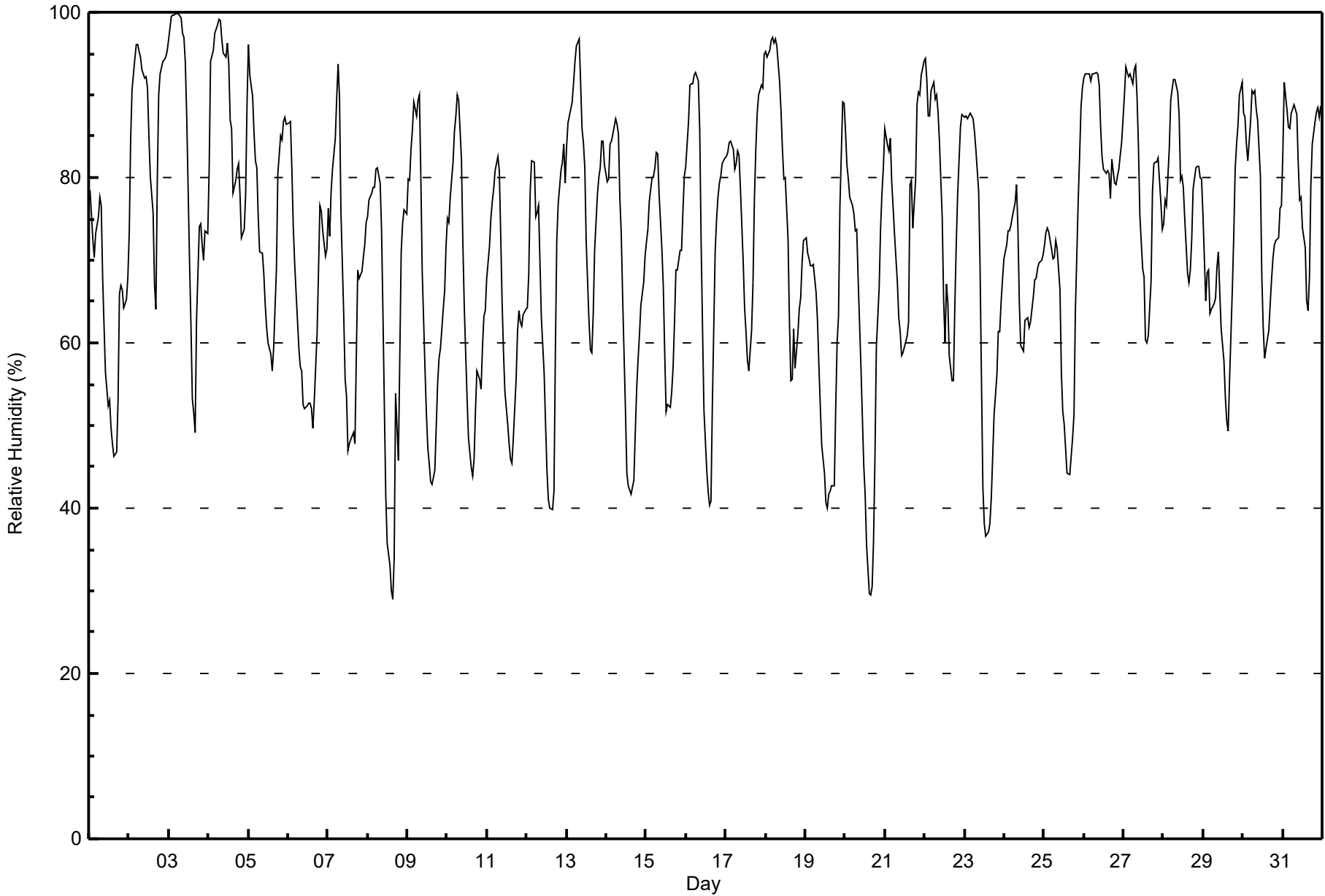
Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

Relative Humidity (RH) - %
Mackay River - October 2023

Maximum Value: 99.8 % on Oct 3 07:00 Maximum Daily Average: 88.3 % on Oct 4																						Hours in Service: 744				
Minimum Value: 29.1 % on Oct 8 16:00 Minimum Daily Average: 59.6 % on Oct 19																						Hours of Data: 744				
Maximum Diurnal Average: 84.3 % at hour 6 Minimum Diurnal Average: 53.3 % at hour 16																						Hours of Missing Data: 0				
Monthly Average: 72.44 % Percentiles: P₁ = 35.6 P₁₀ = 49.7 Q₁ = 61.8 Median = 74.1 Q₃ = 84.5 P₉₀ = 91.6 P₉₉ = 99.1																						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-Oct	78.4	75.6	72.5	70.4	73.3	75.3	77.6	76.7	68.0	62.1	56.5	52.3	53.1	49.7	47.7	46.3	46.8	53.1	65.9	66.9	66.5	64.2	65.2	68.0	63.8	78.4
2-Oct	73.4	84.7	90.7	94.5	96.1	96.1	95.2	94.6	93.1	92.1	92.1	90.9	85.1	80.1	75.8	67.2	64.0	79.7	90.1	92.5	94.1	94.2	94.6	95.2	87.7	96.1
3-Oct	96.7	99.5	99.6	99.7	99.8	99.8	99.8	99.3	97.5	96.9	93.9	87.4	69.8	62.2	53.2	51.5	49.2	62.8	74.1	74.5	71.8	70.0	73.5	73.2	81.5	99.8
4-Oct	81.0	94.0	94.7	95.4	97.5	98.5	99.2	98.9	96.8	95.2	94.5	96.2	93.8	87.0	86.0	78.2	79.6	81.0	81.8	78.0	72.7	73.7	77.8	88.8	88.3	99.2
5-Oct	96.1	92.4	89.8	85.4	82.0	81.1	75.3	71.1	70.8	68.3	64.5	61.8	60.0	58.6	56.7	59.3	64.3	68.9	80.5	85.1	84.6	86.7	87.3	86.5	75.7	96.1
6-Oct	86.6	86.8	81.0	74.1	69.7	66.1	59.2	57.2	56.6	52.6	52.0	52.4	52.8	52.7	52.1	49.6	53.0	61.2	68.6	76.7	76.0	73.5	70.6	71.3	64.7	86.8
7-Oct	76.3	72.8	78.3	81.1	84.8	89.7	93.8	89.6	76.0	63.4	55.6	53.6	47.0	47.7	48.3	49.2	47.9	58.5	68.7	67.8	68.7	70.3	71.9	74.7	68.2	93.8
8-Oct	75.3	77.3	78.1	78.9	78.9	81.1	81.1	79.3	73.5	63.4	52.1	41.5	35.8	33.0	30.0	29.1	33.9	53.9	45.8	58.2	71.0	74.5	76.2	75.6	61.6	81.1
9-Oct	79.9	79.7	83.3	85.7	89.1	87.5	89.3	89.9	80.3	68.7	56.8	51.4	47.2	45.4	43.3	42.8	44.6	49.8	55.1	58.2	59.3	64.1	66.3	71.7	66.2	89.9
10-Oct	75.0	74.6	77.6	81.8	85.6	87.5	90.1	89.4	82.2	72.1	64.5	58.8	53.3	48.4	44.9	44.0	45.9	51.9	56.6	55.6	54.5	59.5	63.2	63.9	65.9	90.1
11-Oct	67.9	71.7	75.1	77.1	78.6	80.9	82.5	80.9	73.0	65.0	58.8	54.1	50.1	47.7	45.9	45.5	48.4	55.6	61.3	63.9	62.5	62.1	63.4	64.0	64.0	82.5
12-Oct	64.3	68.3	78.1	82.0	81.9	75.3	75.8	76.5	69.8	63.1	56.3	50.1	44.5	40.9	40.0	39.8	42.0	58.7	72.3	76.7	80.8	81.8	84.0	79.3	65.9	84.0
13-Oct	83.7	86.6	88.4	89.1	91.5	94.0	96.0	96.8	91.5	86.0	84.3	81.2	72.2	62.6	59.1	58.8	63.5	71.2	77.9	80.0	81.2	84.4	84.4	81.5	81.1	96.8
14-Oct	79.4	79.9	84.1	84.4	85.3	87.1	86.5	85.2	77.5	73.2	65.5	51.9	44.2	42.8	42.3	41.7	43.4	49.2	54.5	58.0	61.1	64.5	67.3	70.4	65.8	87.1
15-Oct	72.3	73.8	77.1	80.1	80.1	81.1	83.0	82.8	78.0	71.3	66.8	58.7	51.7	52.5	52.2	54.1	57.1	62.5	68.8	68.7	71.1	71.2	75.9	80.2	69.6	83.0
16-Oct	81.4	86.8	91.2	91.4	91.4	92.3	92.7	91.6	85.6	72.0	61.6	51.9	44.7	42.0	40.3	40.9	52.5	71.0	74.9	77.6	79.3	80.1	81.8	82.4	73.2	92.7
17-Oct	82.6	83.0	84.2	84.5	83.3	81.0	81.6	83.3	82.6	78.9	69.9	64.2	61.4	58.0	56.6	61.5	67.4	77.4	83.4	87.7	89.9	91.2	90.9	94.8	78.3	94.8
18-Oct	95.3	94.6	95.4	96.7	96.9	96.3	96.8	95.9	91.5	87.9	83.4	79.8	79.9	72.6	62.6	55.4	55.7	61.7	57.0	61.0	64.0	65.4	69.7	72.3	78.7	96.9
19-Oct	72.7	70.8	70.2	69.3	69.4	69.5	66.2	62.6	57.3	52.4	47.7	44.2	40.6	40.0	41.7	42.0	42.6	42.7	52.0	60.0	63.2	76.4	89.1	88.9	59.6	89.1
20-Oct	85.5	81.6	79.8	77.6	76.7	75.6	73.5	73.7	67.9	57.1	51.2	45.3	41.7	35.5	29.7	29.5	30.5	36.1	46.1	59.4	66.6	73.7	78.1	81.1	60.6	85.5
21-Oct	85.9	83.9	83.2	84.7	79.3	76.2	73.0	67.3	63.0	61.4	58.5	58.8	60.2	60.8	62.5	79.2	79.6	74.0	79.7	88.8	90.3	90.0	92.3	94.0	76.1	94.0
22-Oct	94.4	91.9	87.4	87.4	90.5	91.5	89.5	90.1	88.0	84.4	75.0	65.3	60.0	67.1	64.9	58.5	55.4	55.4	64.5	71.8	78.0	86.1	87.7	87.5	78.0	94.4
23-Oct	87.3	87.5	87.2	87.8	87.5	87.2	85.5	83.4	78.3	69.1	55.4	42.5	38.1	36.6	37.1	38.1	41.1	46.2	51.4	56.1	61.4	61.3	64.9	67.6	64.1	87.8
24-Oct	70.1	71.8	73.6	73.6	74.2	75.3	76.9	79.2	73.9	65.0	59.7	59.0	62.7	62.8	63.0	61.8	62.6	65.6	67.6	67.8	69.0	69.6	69.9	70.8	68.6	79.2
25-Oct	71.9	73.4	73.9	73.4	71.4	70.1	70.3	72.3	71.4	66.4	56.4	51.8	50.2	47.3	44.3	44.2	46.2	48.4	51.4	63.9	77.1	82.5	88.5	90.8	64.9	90.8
26-Oct	92.0	92.6	92.6	92.5	91.8	92.5	92.5	92.8	92.5	91.2	86.1	82.5	80.9	80.5	80.9	80.6	77.5	82.2	79.3	79.2	80.2	81.0	82.7	84.3	85.9	92.8
27-Oct	90.0	93.4	92.7	92.2	92.5	91.4	93.0	93.6	89.7	83.8	75.5	68.9	68.0	60.3	60.0	60.9	67.4	78.3	81.7	81.9	81.8	82.3	76.9	73.8	80.4	93.6
28-Oct	74.4	77.3	76.6	83.6	89.3	90.6	91.8	91.9	90.4	87.7	79.6	80.1	78.8	75.0	68.4	67.3	68.9	72.5	78.6	81.1	81.4	81.4	80.0	79.8	80.3	91.9
29-Oct	75.5	65.0	68.4	68.8	63.6	64.1	64.7	65.5	69.1	71.0	66.1	61.6	57.7	53.3	50.5	49.3	55.6	66.6	73.0	81.0	84.1	86.3	90.1	91.5	68.4	91.5
30-Oct	87.8	87.3	84.1	82.0	86.8	90.6	90.1	90.5	88.3	86.9	80.2	68.2	61.9	58.2	59.3	61.5	64.8	67.8	70.3	71.8	72.3	72.8	76.2	76.7	76.5	90.6
31-Oct	82.9	91.5	88.1	86.2	85.9	87.8	88.2	88.7	87.6	81.6	77.2	77.7	73.8	71.4	65.0	63.8	67.9	79.1	84.0	86.9	88.0	88.5	87.3	88.7	82.0	91.5
																								Diurnal Average		
																								Diurnal Maximum		





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Relative Humidity (RH) - %
Mackay River - October 2023**

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	16	2.15	2.15
40 - 60	150	20.16	22.31
60 - 80	302	40.59	62.90
80 - 100	276	37.10	100.00

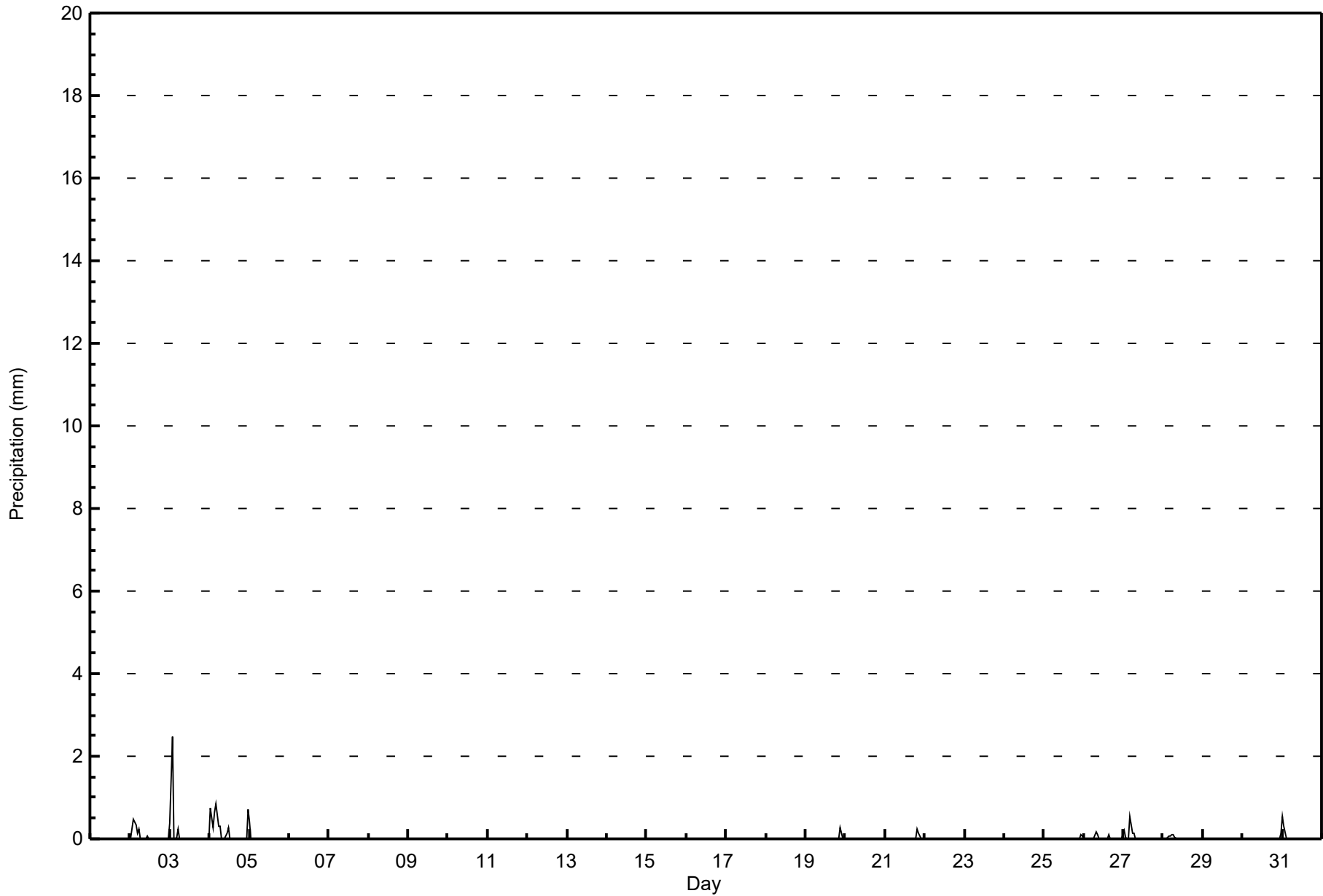
Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Hourly Averages

Precipitation (PC) - mm
Mackay River - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Precipitation (PC) - mm
Mackay River - October 2023

Concentration Ranges (mm)	Number of Hours	%	Cumulative %
0 - 0.3	733	98.52	98.52
0.4 - 0.5	5	0.67	99.19
0.6 - 0.7	3	0.40	99.60
0.8 - 1.4	2	0.27	99.87
1.5 - 10	1	0.13	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

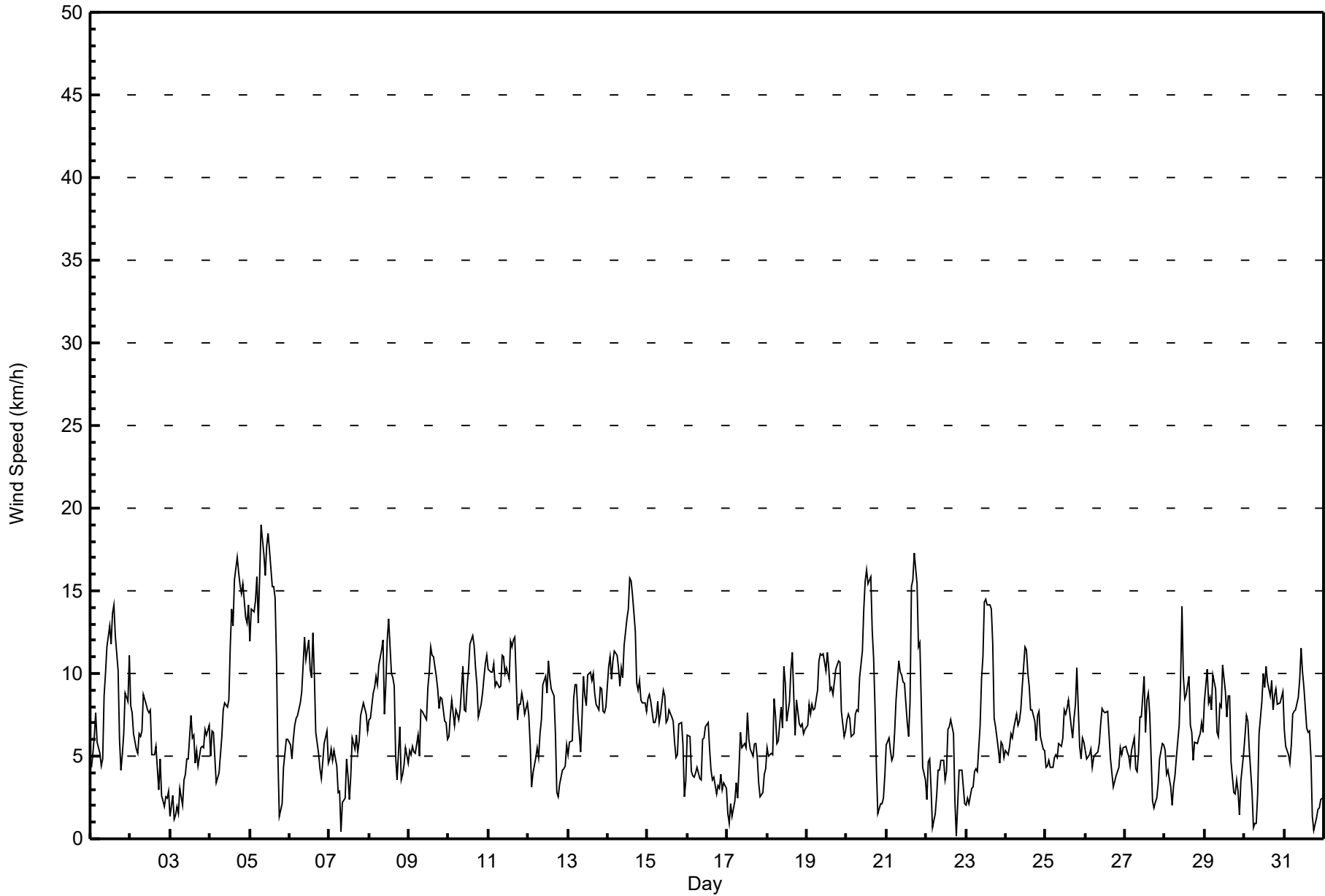
Wind Speed (WS) - km/h
Mackay River - October 2023

Maximum Speed: 19 km/h on Oct 5 08:00		Maximum Daily Speed Average: 10.8 km/h on Oct 14		Hours in Service: 744																							
Minimum Speed Value: 0 km/h on Oct 22 19:00		Minimum Daily Speed Average: 1.5 km/h on Oct 21		Hours of Data: 744																							
Maximum Diurnal Speed Average: 3.4 km/h at hour 12		Minimum Diurnal Speed Average: 1.2 km/h at hour 18		Hours of Missing Data: 0																							
Monthly Average Velocity: 2.2 km/h 201.7 deg		Percentiles: P ₁ = 1 P ₁₀ = 3 Q ₁ = 5 Median = 7 Q ₃ = 9 P ₉₀ = 12 P ₉₉ = 16		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-Oct	SE4	SE5	SE6	SSE8	SSE6	SSE5	SSE4	SSE5	SSE9	SSE10	SSE12	S13	S12	S14	S14	SSE12	SSE10	SSE6	SE4	SE5	SE6	SSE9	SSE8	S11	SSE8.0	S14	
2-Oct	S8	S8	S6	SE5	SE5	SSE6	SSE6	SSE7	S9	S8	SSW8	S8	S8	SW5	WNW5	WSW6	SW4	S3	S5	S3	SSE2	SE3	SE2	SE3	S4.7	S9	
3-Oct	SSW1	N3	S1	WSW1	WNW2	S2	WSW3	SW2	W4	W4	WSW5	WSW5	WSW7	WSW6	WSW6	WSW5	SW5	SSW4	S5	S6	S6	S7	S6	S7	SW3.3	WSW7	
4-Oct	SW5	SSW7	SSW6	SSW5	WSW3	W4	WNW5	W6	WNW8	WNW8	WNW8	WNW8	WNW8	WNW12	WNW14	WNW13	WNW16	WNW17	WNW16	WNW15	WNW15	WNW13	WNW13	WNW14	WNW9.5	WNW17	
5-Oct	WNW12	WNW14	WNW14	WNW14	WNW16	WNW13	WNW16	WNW19	WNW17	WNW16	WNW18	WNW19	WNW17	NW15	NW15	NW15	NW11	NW5	NW1	S2	S4	S5	S6	S6	WNW10.6	WNW19	
6-Oct	S6	SSE5	SSE6	S7	SSE7	SSE7	SSE8	S9	S10	S12	SSW11	S12	S10	S10	SSW12	SSW10	SSW6	SSW5	SSW4	SSW4	SW5	WSW6	WSW6	WSW5	S7.0	SSW12	
7-Oct	WSW5	WSW5	WSW5	WSW5	WSW4	WSW3	W3	SSW0	SW2	WSW2	S5	S4	SSE2	S4	SE6	ESE5	ESE6	ESE5	ESE6	ESE7	ESE8	SE8	SE8	ESE6	SSE2.7	ESE8	
8-Oct	ESE7	ESE7	SE9	SE9	SE10	SE9	SE11	SE11	SE12	SE8	SSE9	S12	S13	S10	S10	S9	S5	SSE4	SSE7	SSE4	SE4	SE4	ESE5	SE5	SSE7.5	S13	
9-Oct	SE5	SE5	SE6	SE5	SE5	SE6	SE5	ESE8	SE8	ESE8	SE7	ESE9	ESE10	ESE12	ESE11	ESE11	ESE10	ESE9	ESE8	SE9	SE8	SE7	SE7	SE6	ESE7.6	ESE12	
10-Oct	SE6	ESE7	ESE8	ESE7	ESE8	ESE8	ESE7	ESE8	ESE10	E8	E8	E9	E10	ESE12	ESE12	ESE12	ESE10	ESE9	SE7	ESE8	SE9	ESE10	ESE11	ESE11	ESE8.8	ESE12	
11-Oct	ESE10	ESE10	ESE10	ESE11	ESE9	ESE10	ESE9	ESE9	ESE11	ESE11	ESE10	ESE10	E10	ESE12	E12	ESE12	ESE12	ESE7	ESE8	ESE8	ESE9	ESE8	ESE8	SE8	ESE9.7	ESE12	
12-Oct	SE7	SE6	SE3	SE4	ESE5	SE5	SE5	SE6	SE7	S9	S10	SSE9	S11	S10	S9	S9	S6	SSE3	SE3	SE3	SSE4	SSE4	SSE4	SSE6	SSE5.8	S11	
13-Oct	SSE5	SE6	SSE6	SSE9	SSE9	SSE9	SSE8	SE5	SE7	SE10	SE9	SSE8	SE10	SE10	SE10	ESE10	ESE9	ESE8	ESE8	ESE9	ESE9	ESE8	ESE8	ESE8	SE7.8	SE10	
14-Oct	SE10	SE11	SE10	ESE11	ESE11	SE11	SE10	SE9	SE10	ESE12	SE13	SSE14	SSE16	SSE16	SE15	SE13	SE9	SE9	SE10	SE8	SE8	SE8	SE8	SE8	SE10.8	SSE16	
15-Oct	SE8	SE9	SE8	SE7	SE7	SE7	SE8	SE7	SE8	SSE9	S9	S7	SSE7	S8	S7	SSW7	SSW6	SSW5	S5	S7	SSW6	S3	SSW4	SSE6.2	SSE9		
16-Oct	S6	S6	S4	SSW4	SSW4	SSW4	SSW4	S4	S4	SW6	SW6	WSW7	W7	WSW5	SW4	SW4	SSE4	SE3	SE3	SE3	SE4	SE3	E3	ESE3	SSW3.1	W7	
17-Oct	ENE2	ENE1	NNE2	N1	N2	NNE3	NNE2	NNE4	NNE6	NNE6	N6	NNW5	NNW8	N6	NNE5	NNE5	NNE6	NNE6	NNE5	NE3	ENE3	E3	ESE4	SE4	NNE3.4	NNW8	
18-Oct	SE5	SE5	SE5	SE5	SSE8	SSE7	SE6	SE6	SSE8	SSE7	S10	S9	S7	S8	SSW10	SSW11	SSW9	S6	SW8	SW7	SW7	SW7	SW6	SW7	S6.5	SSW11	
19-Oct	SW7	SW8	SW8	SW8	SW8	SW8	SW9	SW11	WSW11	WSW11	WSW11	WSW11	WSW10	WSW11	WSW10	SW9	SW9	SSW9	SSW10	SW11	WSW11	WSW11	WSW8	SSW6	SW7	SW8.9	WSW11
20-Oct	SW7	WSW8	WSW7	WSW6	WSW6	WSW8	WSW8	WSW8	WSW8	WSW10	W11	W14	WNW16	WNW16	NW15	WNW16	WNW13	WNW11	WNW8	NW4	NE2	SE2	ESE2	SE2	SE4	W6.9	WNW16
21-Oct	SE6	SE6	SSE5	SE5	SSE5	SSE6	S8	S11	S10	S10	S9	SSW9	SSW7	SSW6	N8	NNE15	NNE16	NNE17	NNE15	NNE12	NNE12	N8	NNW4	NW4	ENE1.5	NNE17	
22-Oct	NW2	NNW5	N5	N3	SSE1	ESE2	NE3	ENE4	ENE4	ENE5	ESE5	NNE4	NE4	N7	NNE7	N7	N6	NE2	SE0	SW2	W4	WNW4	WNW3	SSW2	NNE2.2	N7	
23-Oct	SSW2	SW2	W2	WSW3	WSW3	WSW4	W4	W4	W7	W10	WNW11	WNW14	WNW15	WNW14	WNW14	WNW14	WNW12	WNW7	WNW7	W5	WSW5	W6	W6	W5	W7.0	WNW15	
24-Oct	WSW5	WSW5	WSW6	WSW6	WSW6	WSW7	WSW8	WSW7	W7	W8	W9	WNW12	WNW11	WNW10	W9	W8	W8	W7	W6	W7	W8	W6	W5	WSW5	W7.1	WNW12	
25-Oct	WSW4	W4	WSW5	WSW4	SW4	WSW5	WSW5	WSW6	WSW6	WSW6	WSW8	WSW8	WSW8	WSW8	WSW6	WSW7	WSW6	W7	W8	WNW10	W6	W5	WSW6	WSW6	WSW5.9	WNW10	
26-Oct	W5	WSW5	W5	WSW5	WSW4	WSW5	WSW5	WSW5	W6	W7	WNW8	W8	W8	WNW8	WNW6	W5	WSW4	WSW3	WSW4	W4	WSW4	WSW6	WSW5	WSW6	W5.3	WNW8	
27-Oct	W6	WSW5	WSW5	W4	N5	NNE6	NNW4	NNW4	NW5	NW7	NW7	NNW10	NW6	NW8	NNW9	NNW8	NNW2	SSE2	SE2	SE2	SSE3	S5	S6	S6	NW2.8	NNW10	
28-Oct	S5	SW4	SW4	W3	SW2	WSW3	W4	W5	WNW7	NW9	NW14	WNW10	NW9	WNW9	WNW10	WNW7	WNW6	W5	W6	W6	W6	W6	WNW7	W6	WNW5.7	NW14	
29-Oct	WNW8	WNW10	WNW8	WNW9	WNW8	NW10	NW9	WNW6	W6	WNW8	WNW8	NW11	NW9	WNW7	WNW9	WNW9	WNW5	WSW3	WSW3	W4	W3	NW1	NNE4	NNE5	WNW6.1	NW11	
30-Oct	NNE6	NNE7	NNE7	NNE5	NE3	ENE1	E1	SSW1	SSE3	SSE6	S8	S10	S9	S10	S9	S9	S10	S8	S9	SSW9	SSW8	SSW8	SSW9	S9	S4.4	S10	
31-Oct	SSW7	S6	SW5	WSW5	W6	WNW8	WNW8	NW8	NW9	NNW10	NNW11	NNW10	NNW9	NNW7	NNW6	NW7	NW5	N1	ENE0	SSE1	SE2	SSE2	SE2	SE2	NW3.5	NNW11	
S2.8 S2.4 S2.3 S2.3 S2.2 S2.4 SSW2.1 S2.0 SSW2.5 SW2.6 SW3.3 SW3.4 SW3.3 SW2.9 SW2.6 SW2.0 SW1.5 S1.2 S1.6 S1.9 S2.2 S2.4 S2.5 S2.9																								Diurnal Average			
WNW12WNW14WNW14WNW14WNW16WNW13WNW16WNW19WNW17WNW16WNW18WNW19WNW17 SSE16WNW16WNW16WNW17 NNE17 NNE15WNW15WNW15WNW13WNW13WNW14																								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
Mackay River - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Wind Speed (WS) - km/h
Mackay River - October 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	251	33.74	33.74
6 - 11	418	56.18	89.92
12 - 19	75	10.08	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: 744

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Mackay River - October 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	11	6	8	3	9	43	23	20	16	17	44	24	6	8	6	251
6 - 11	7	9	0	0	5	60	62	34	59	26	21	44	30	37	14	10	418
12 - 19	0	6	0	0	1	8	4	6	7	1	0	0	1	36	5	0	75
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	14	26	6	8	9	77	109	63	86	43	38	88	55	79	27	16	744

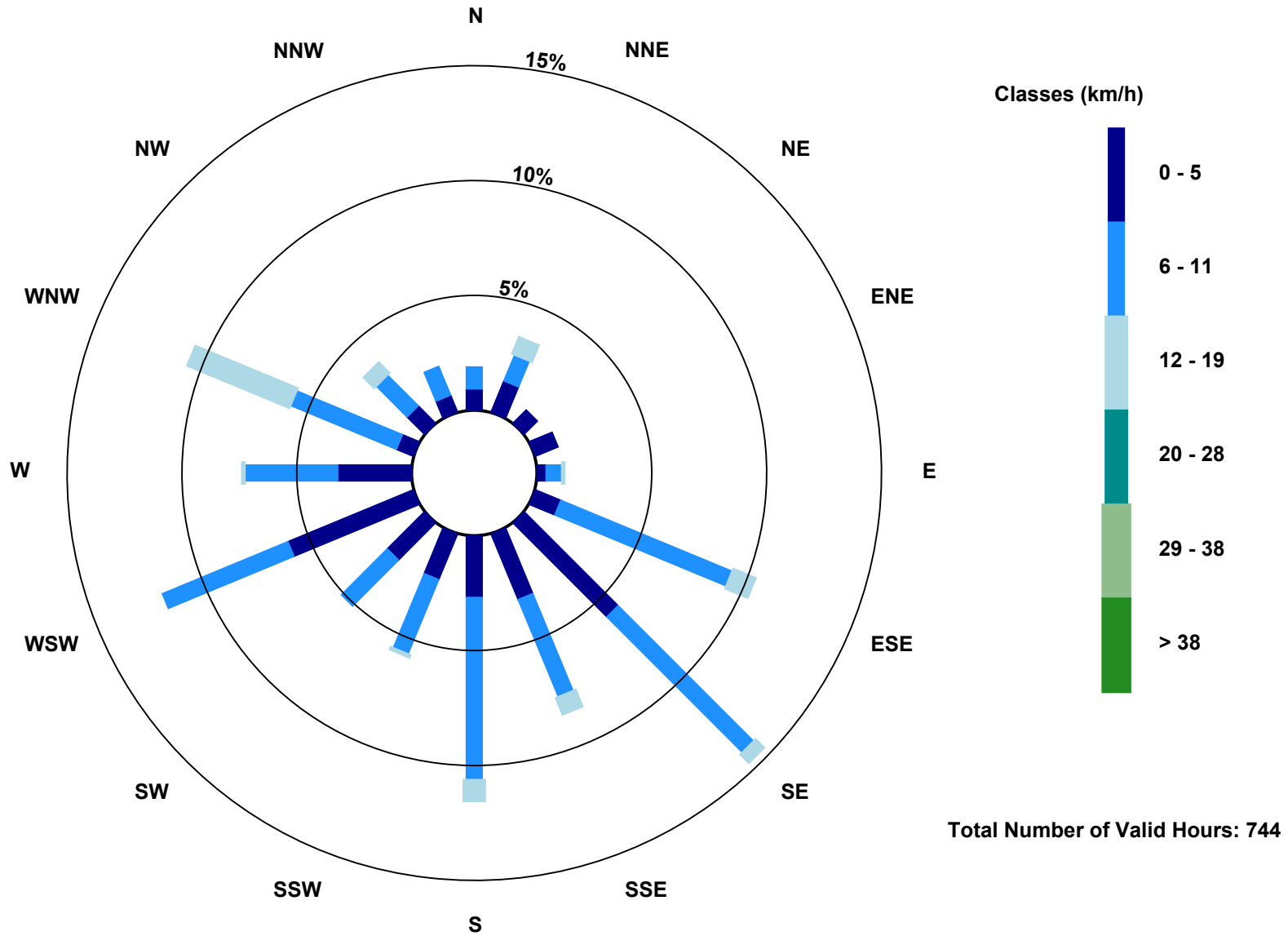
Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

Wind Speed (WS) - km/h
Mackay River





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Mackay River - October 2023

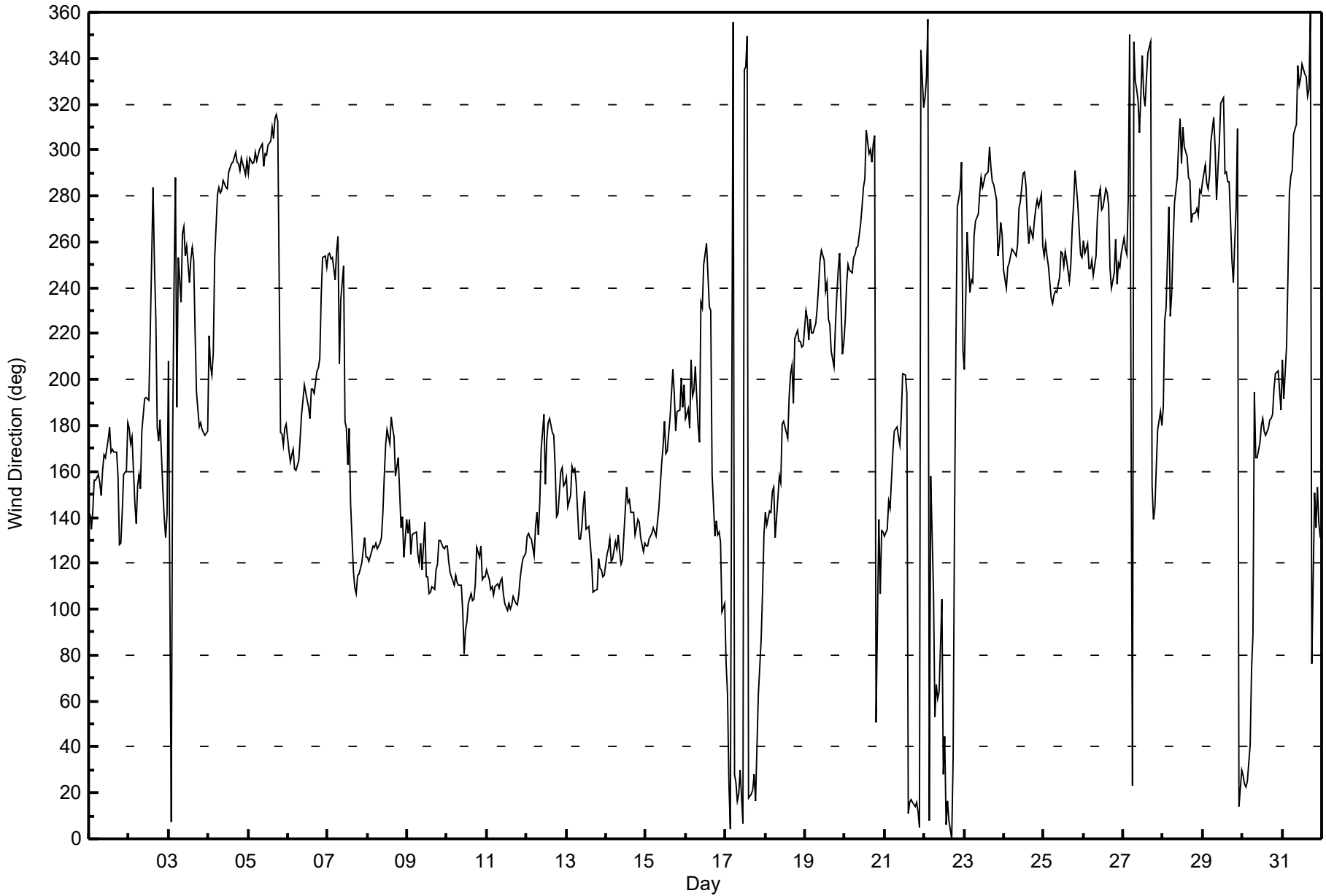
Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Oct 5 08:00 Minimum Value: 0 km/h on Oct 2 23:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 2 Q ₃ = 3 P ₉₀ = 4 P ₉₉ = 6																	Hours in Service: 744 Hours of Data: 744 Hours of Missing Data: 0 Hours of Calibration: 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-Oct	1	1	2	3	2	2	1	2	3	3	4	4	4	5	4	4	4	3	1	1	2	3	3	4	5
2-Oct	2	2	2	1	1	2	2	2	2	3	3	2	2	2	2	2	2	1	1	2	1	1	0	1	3
3-Oct	1	2	1	1	2	1	1	1	1	2	2	2	3	3	3	2	2	1	1	1	1	1	1	3	
4-Oct	3	2	2	1	2	1	2	2	3	3	3	4	5	5	6	6	6	6	5	6	6	5	5	6	6
5-Oct	4	4	5	5	5	5	6	7	6	5	6	6	6	5	5	5	3	2	1	1	1	1	1	7	
6-Oct	1	1	1	2	2	2	3	3	3	4	4	4	3	3	4	3	2	1	1	1	1	2	3	2	4
7-Oct	2	2	2	2	2	1	1	1	1	1	2	1	2	1	2	1	2	2	2	2	2	2	2	1	2
8-Oct	1	1	2	2	2	2	3	3	3	3	4	4	4	3	3	4	2	1	2	1	1	1	1	4	
9-Oct	1	1	1	1	1	1	2	2	2	2	2	3	3	3	3	3	3	2	2	2	2	2	2	3	3
10-Oct	1	2	2	2	2	2	2	2	3	2	3	3	3	4	3	4	3	2	2	2	3	2	2	4	4
11-Oct	3	3	2	3	2	2	2	2	3	3	3	3	3	4	4	4	4	2	3	2	2	2	2	2	4
12-Oct	2	2	1	1	1	1	1	2	2	3	3	3	4	4	3	3	2	1	0	1	1	1	1	1	4
13-Oct	1	2	2	3	2	3	3	1	2	3	3	3	3	3	3	3	2	2	2	2	2	2	2	3	3
14-Oct	3	3	3	3	3	3	3	3	3	3	4	5	5	6	5	5	5	3	3	3	2	2	2	2	6
15-Oct	2	2	2	2	2	2	2	2	2	3	3	2	2	2	3	2	2	1	1	2	2	2	1	1	3
16-Oct	1	1	1	1	1	1	1	1	1	2	2	3	3	2	2	2	1	0	1	1	1	1	1	1	3
17-Oct	1	1	1	1	2	1	1	1	2	2	2	2	2	2	2	1	2	2	2	2	1	1	1	1	2
18-Oct	2	1	1	1	3	2	2	2	3	2	3	3	2	3	4	4	3	2	3	2	2	2	2	2	4
19-Oct	3	3	2	3	2	3	3	4	5	5	5	4	5	4	4	4	3	4	4	4	5	4	2	2	5
20-Oct	2	3	3	2	3	3	3	3	4	5	5	6	6	5	5	4	4	2	2	1	1	1	0	1	6
21-Oct	1	2	1	1	1	2	2	3	3	3	3	3	3	2	6	5	6	6	5	5	5	3	1	1	6
22-Oct	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	1	1	1	2	1	2	1	2
23-Oct	1	1	1	1	1	1	2	2	3	3	4	5	5	5	5	4	4	2	2	2	2	2	2	2	5
24-Oct	2	2	2	2	2	3	3	3	3	3	4	4	4	4	3	3	3	3	3	3	3	3	2	2	4
25-Oct	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	2	3	3	4	2	2	2	2	4
26-Oct	2	2	2	2	1	2	2	2	2	3	3	3	3	3	3	2	2	1	1	2	2	2	2	2	3
27-Oct	2	2	2	2	3	3	1	1	2	2	2	4	2	3	3	2	2	1	0	0	1	1	2	1	4
28-Oct	1	1	1	1	1	1	1	2	2	4	4	3	3	3	3	3	2	2	2	3	3	2	2	2	4
29-Oct	3	4	3	3	4	3	3	2	2	3	3	3	3	3	3	3	2	1	1	1	1	1	2	2	4
30-Oct	2	3	2	2	1	1	1	1	1	2	3	3	3	3	3	3	3	2	3	3	2	2	2	2	3
31-Oct	2	1	2	2	2	2	2	3	3	3	3	3	3	2	2	2	2	1	1	1	1	1	0	1	3
Diurnal Maximum																									



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Mackay River - October 2023

Direction of Maximum Speed: 300 deg on Oct 5 08:00 Direction of Maximum Daily Speed Average: 133.8 deg on Oct 14																						Hours in Service: 744			
Direction of Minimum Speed: 138 deg on Oct 22 19:00											Direction of Minimum Daily Speed Average: 1.5 deg on Oct 21											Hours of Data: 744			
Monthly Average Direction: 201.7 deg																						Hours of Missing Data: 0			
																						Percent Operational Time: 100.0			
Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Oct	141	135	143	156	156	159	155	150	161	167	166	174	180	169	170	168	168	158	128	128	142	159	160	181	161.9
2-Oct	179	172	175	146	138	154	159	153	178	191	192	191	191	220	284	250	226	179	173	182	152	139	131	142	179.7
3-Oct	208	7	176	242	288	188	253	234	263	266	254	258	242	253	257	252	221	195	179	181	178	177	175	178	221.0
4-Oct	219	206	202	212	253	281	284	281	283	287	284	283	290	292	294	294	299	295	294	291	296	292	289	295	285.3
5-Oct	290	296	294	295	299	295	298	300	303	293	298	298	302	304	310	305	313	316	313	177	176	171	179	180	295.5
6-Oct	169	164	167	169	161	160	165	174	185	191	198	191	188	183	196	196	194	204	205	209	236	253	254	249	190.7
7-Oct	254	255	253	253	243	256	262	207	235	249	182	179	163	179	146	117	109	107	115	115	120	126	131	123	158.7
8-Oct	123	121	125	127	127	129	126	129	131	141	158	172	178	172	184	179	175	158	166	152	136	140	123	139	146.9
9-Oct	133	139	124	133	133	134	124	120	129	117	138	114	114	107	107	110	109	117	119	130	130	127	126	127	121.4
10-Oct	128	121	116	112	110	115	112	111	110	99	81	91	95	103	107	104	104	111	127	123	127	113	114	114	109.7
11-Oct	117	113	109	110	106	110	111	109	112	114	107	103	100	103	100	102	106	103	102	106	114	118	122	125	108.8
12-Oct	132	133	131	131	123	136	142	132	146	169	185	155	174	181	183	177	175	162	140	142	160	162	154	155	158.0
13-Oct	157	144	149	163	160	161	155	131	131	136	145	152	135	136	129	121	107	108	108	122	118	117	114	115	133.4
14-Oct	124	126	130	121	122	129	127	132	125	120	122	143	153	147	148	142	142	132	135	139	138	131	125	129	133.8
15-Oct	128	128	130	133	136	134	132	138	144	163	171	182	168	169	184	194	204	194	177	186	187	201	188	198	161.6
16-Oct	183	187	179	209	193	195	206	180	173	234	231	250	260	246	232	230	158	132	139	132	134	129	99	103	196.2
17-Oct	76	63	24	4	355	28	25	16	19	30	7	335	336	349	17	19	21	28	17	40	63	86	108	132	21.5
18-Oct	142	137	143	142	152	153	131	140	158	155	181	182	180	174	193	202	206	190	218	221	217	217	214	215	180.8
19-Oct	230	226	217	227	220	220	225	231	241	252	256	252	238	242	226	224	213	206	223	237	248	255	211	216	232.0
20-Oct	226	241	250	247	246	254	254	257	258	268	275	284	288	309	298	300	295	302	306	51	139	107	134	134	275.1
21-Oct	132	135	147	144	156	168	178	179	175	172	184	203	202	194	11	16	17	16	14	16	12	5	343	319	72.8
22-Oct	323	332	357	8	158	108	53	67	61	64	104	28	44	6	16	8	0	35	138	215	275	282	294	213	13.8
23-Oct	204	235	264	238	243	242	263	269	272	281	288	284	286	289	290	301	292	286	285	278	254	259	269	263	279.1
24-Oct	248	240	249	251	254	257	255	254	259	275	277	290	291	284	269	259	266	262	269	275	278	275	281	258	268.1
25-Oct	254	259	254	250	236	233	237	239	238	245	255	255	249	256	252	243	250	266	276	291	276	265	255	253	255.4
26-Oct	260	255	259	248	248	252	245	254	271	279	283	274	275	283	282	276	249	240	247	261	242	251	249	255	262.6
27-Oct	262	257	255	279	350	23	347	330	326	322	307	341	324	319	331	343	347	154	139	144	162	178	186	180	311.4
28-Oct	188	226	231	275	228	237	260	277	288	304	313	294	310	301	297	288	287	269	272	273	275	272	282	281	282.6
29-Oct	286	294	285	283	289	304	314	301	278	292	303	320	323	290	291	286	286	252	242	260	275	309	14	30	297.2
30-Oct	28	24	23	25	41	74	89	195	166	166	173	180	183	178	176	179	182	183	185	196	202	204	195	187	177.5
31-Oct	209	191	215	246	281	289	291	307	311	337	328	331	338	333	332	323	326	360	76	151	136	153	138	131	306.5
181.1 182.6 182.7 187.8 180.4 182.0 194.0 190.7 196.6 216.8 227.9 234.0 233.3 229.2 234.2 232.7 221.1 190.8 190.4 188.4 185.9 186.2 177.8 178.1																									
Diurnal Average																									
All monthly, daily, and diurnal averages have been calculated using vector methods																									





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Mackay River - October 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 104 deg on Oct 7 08:00											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 Oct 2 19:00																									
Percentiles: P ₁ = 12 P ₁₀ = 17 Q ₁ = 21 Median = 26 Q ₃ = 37 P ₉₀ = 47 P ₉₉ = 77																									
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-Oct	24	21	23	25	25	26	26	26	27	28	29	30	30	30	29	27	25	25	18	20	27	25	27	24	30
2-Oct	23	22	22	24	24	25	26	26	23	23	21	25	28	40	32	43	43	29	9	72	34	12	15	15	72
3-Oct	70	74	96	75	71	73	41	45	51	49	40	50	47	49	51	49	39	16	13	14	16	16	14	15	96
4-Oct	44	22	21	28	54	33	22	26	28	29	28	32	27	27	26	24	25	26	26	29	26	26	26	26	54
5-Oct	24	22	24	25	24	26	24	22	23	25	26	25	25	25	24	27	20	20	89	38	20	16	11	12	89
6-Oct	15	14	18	21	24	25	26	27	22	21	26	23	23	24	27	25	19	19	18	26	34	41	46	49	49
7-Oct	41	42	41	46	47	51	26	104	62	65	36	45	73	38	35	22	23	16	14	16	16	17	18	16	104
8-Oct	15	14	15	17	16	18	18	18	20	29	31	28	25	31	28	25	24	20	26	21	17	22	13	18	31
9-Oct	15	22	16	17	18	16	16	17	18	21	29	26	25	23	24	21	18	17	15	17	19	18	17	16	29
10-Oct	16	15	18	18	16	17	16	17	16	27	37	31	32	26	22	23	19	19	17	16	18	17	17	18	37
11-Oct	19	19	16	17	20	18	19	19	18	19	26	26	29	22	25	25	20	19	22	19	18	17	16	16	29
12-Oct	19	21	20	15	15	21	25	20	25	27	25	30	27	30	30	28	20	20	16	19	16	19	19	20	30
13-Oct	23	20	21	24	23	23	25	20	22	24	29	33	27	29	28	23	18	16	16	18	17	17	17	19	33
14-Oct	20	19	20	19	21	21	21	22	20	23	24	27	29	27	27	26	25	21	22	23	24	21	17	19	29
15-Oct	16	18	19	20	20	20	19	23	26	25	27	31	34	30	32	24	25	18	14	16	16	23	27	22	34
16-Oct	15	16	15	22	21	27	18	23	34	28	37	43	49	49	60	57	21	17	14	23	19	15	13	39	60
17-Oct	38	53	54	29	64	50	59	26	23	31	33	46	27	36	39	23	23	24	26	26	32	47	22	23	64
18-Oct	21	20	21	24	27	26	24	27	27	29	23	25	26	27	26	29	26	20	28	27	26	25	24	25	29
19-Oct	40	34	27	32	29	30	31	39	42	43	47	51	48	43	34	35	30	30	40	40	45	45	23	29	51
20-Oct	31	42	43	55	50	44	43	44	47	43	36	33	28	25	25	24	24	20	23	70	29	39	17	20	70
21-Oct	15	22	23	17	22	22	22	21	22	23	28	28	31	27	51	26	28	25	24	26	27	25	21	11	51
22-Oct	19	20	24	23	85	44	39	39	39	43	52	67	54	31	31	27	32	55	94	58	35	26	36	27	94
23-Oct	36	34	56	33	43	41	46	48	39	31	29	30	30	31	30	25	25	22	21	34	52	46	41	42	56
24-Oct	49	49	51	44	52	44	41	48	52	43	37	29	29	33	38	50	38	44	47	34	31	38	39	47	52
25-Oct	49	44	42	47	42	39	37	43	45	48	49	42	44	45	45	47	45	43	33	24	37	40	40	48	49
26-Oct	38	40	42	43	42	46	45	45	41	33	32	41	37	33	41	34	42	42	41	46	42	43	53	41	53
27-Oct	44	41	39	41	54	27	23	18	20	24	28	29	30	30	25	24	83	21	13	10	12	10	23	16	83
28-Oct	19	32	34	46	43	40	52	41	27	22	20	25	22	25	25	27	31	43	36	38	34	36	27	29	52
29-Oct	26	25	28	28	30	25	21	25	33	26	32	24	27	36	29	29	28	21	22	27	42	58	41	19	58
30-Oct	21	24	25	21	31	74	79	51	21	25	26	31	35	24	25	24	22	21	22	24	25	24	21	21	79
31-Oct	31	26	29	42	26	22	23	22	21	22	21	22	25	29	42	23	16	85	74	32	10	47	15	25	85
Diurnal Maximum																									
70 74 96 75 85 74 79 104 62 65 52 67 73 49 60 57 83 85 94 72 52 58 53 49																									



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

**AMS21
CONKLIN
OCTOBER 2023**

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

November 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CONKLIN (AMS21)
OCTOBER 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	702	36	42	99.19	4.7	0	0.8	0
TRS(ppb) Average	700	38	44	99.19	1.3	0	0.4	0
THC(ppm) Average	552	33	192	78.63	2.8	-	2.2	-
NMHC(ppm) Average	552	33	192	78.63	0.214	-	0.035	-
CH4(ppm) Average	552	33	192	78.63	2.8	-	2.2	-
O3 (ppb) Average	702	35	42	99.06	40.3	0	31.7	-
NO2 (ppb) Average	702	36	42	99.19	16.6	0	3.7	-
NO (ppb) Average	702	36	42	99.19	45.4	-	5.6	-
NOX (ppb) Average	702	36	42	99.19	55.8	-	7.9	-
PM2.5 (ug/m3) Average	737	1	7	99.19	194.8	7	31.3	1
Temperature 2 m (C) Average	744	0	0	100	22.9	-	11.3	-
Relative Humidity (%) Average	744	0	0	100	97.3	-	89.8	-
Wind Speed 10 m (km/h) Average	704	0	40	94.62	21	-	11	-
Wind Direction 10 m (deg) Average	704	0	40	94.62	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CONKLIN (AMS21)
OCTOBER 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	702	0.22	0.4	-	0	0	0	0.1	0.3	0.5	4.7
TRS (ppb) Average	700	0.34	0.1	-	0.2	0.3	0.3	0.3	0.4	0.4	1.3
THC (ppm) Average	552	2.08	0.1	-	1.9	2	2	2	2.1	2.2	2.8
NMHC(ppm) Average	552	0.002	0.016	-	0	0	0	0	0	0	0.214
CH4(ppm) Average	552	2.08	0.1	-	1.9	2	2	2	2.1	2.2	2.8
O3 (ppb) Average	702	22.18	8.8	-	2.1	8.6	15.7	24.4	28.6	31.9	40.3
NO2 (ppb) Average	702	2.04	1.8	-	0	0.5	0.9	1.5	2.5	4	16.6
NO (ppb) Average	702	1.05	3	-	0	0	0.1	0.2	0.8	2.7	45.4
NOX (ppb) Average	702	3.08	4.2	-	0.1	0.6	1.1	1.8	3.4	6.7	55.8
PM2.5 (ug/m3) Average	737	10.13	16	-	0.9	2.4	3.8	6.4	10.4	16.7	194.8
Temperature 2 m (C) Average	744	2.97	8.1	-	-16.5	-7.3	-3.5	3.4	8.6	13.3	22.9
Relative Humidity (%) Average	744	73.48	16.5	-	27.9	47.7	62	76.8	87.3	92.1	97.3
Wind Speed 10 m (km/h) Average	704	6.9	4	-	0	2	4	6	10	12	21
Wind Direction 10 m (deg) Average	704	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CONKLIN (AMS 21)
OCTOBER 2023

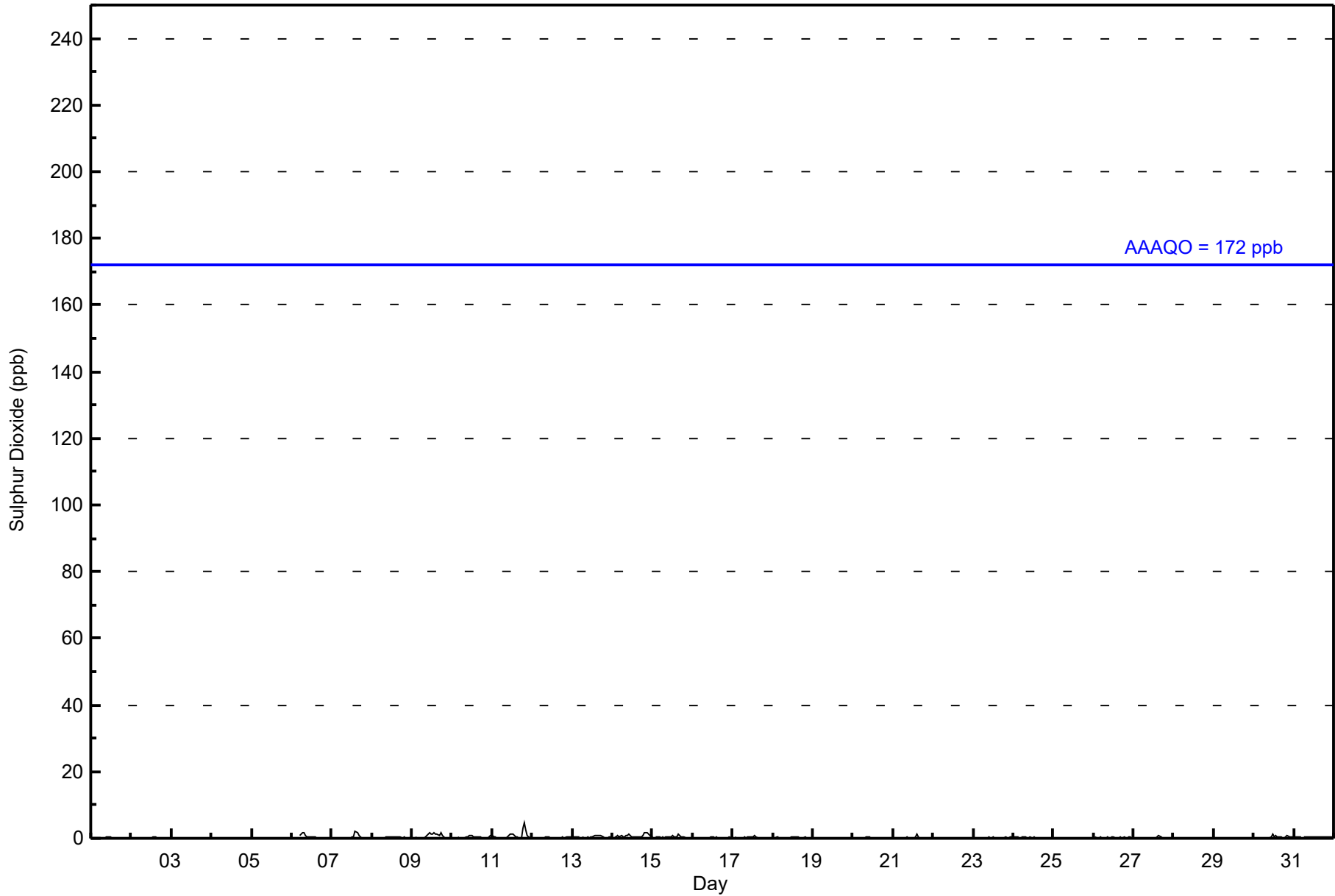
OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
AIR QUALITY ANALYZERS	12 Oct 2023 12:00	12 Oct 2023 17:00	6	Station power failure
THC/NMHC/CH4	20 Oct 2023 17:00	21 Oct 2023 12:00	20	Unstable Operation - excessive baseline drift
THC/NMHC/CH4	21 Oct 2023 13:00	24 Oct 2023 14:00	74	Maintenance - column conditioning
THC/NMHC/CH4	25 Oct 2023 07:00	25 Oct 2023 12:00	6	Unstable Operation - excessive baseline noise
THC/NMHC/CH4	25 Oct 2023 13:00	25 Oct 2023 16:00	4	Maintenance - sample pressure adjusted
THC/NMHC/CH4	27 Oct 2023 03:00	29 Oct 2023 03:00	49	Unstable Operation - excessive baseline drift
O3	17 Oct 2023 12:00	17 Oct 2023 12:00	1	Maintenance - station operator activities
Wind Speed, Wind Direction	10 Oct 2023 07:00	10 Oct 2023 08:00	2	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	21 Oct 2023 22:00	23 Oct 2023 11:00	38	Flat line in sensor output signal - Sensor frozen



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Conklin - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Conklin - October 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	702	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: 702

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Conklin - October 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	1	1	2	3	15	46	98	108	61	47	17	37	89	89	39	664
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	1	1	2	3	15	46	98	108	61	47	17	37	89	89	39	664

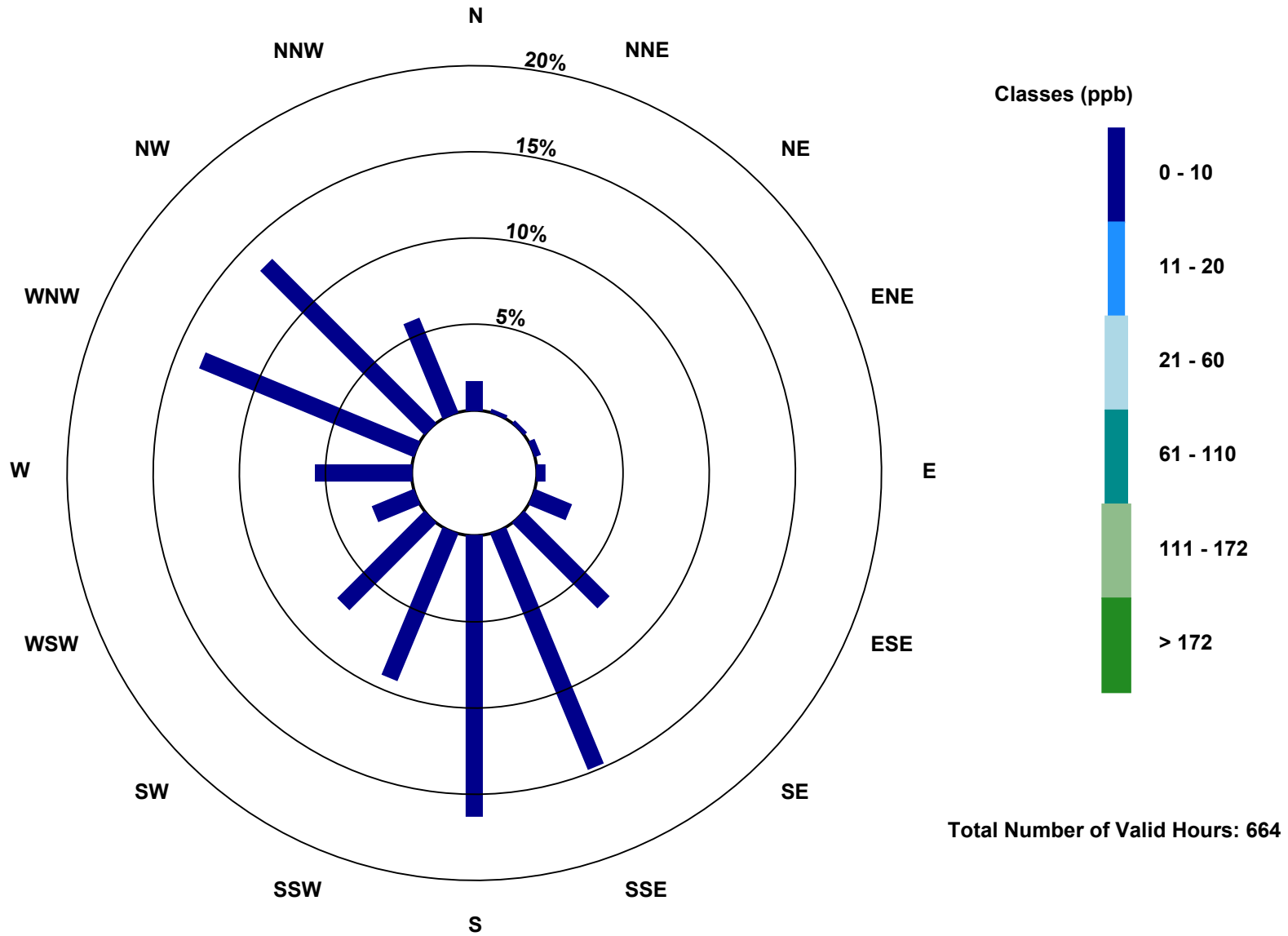
Total Number of Valid Hours: 664

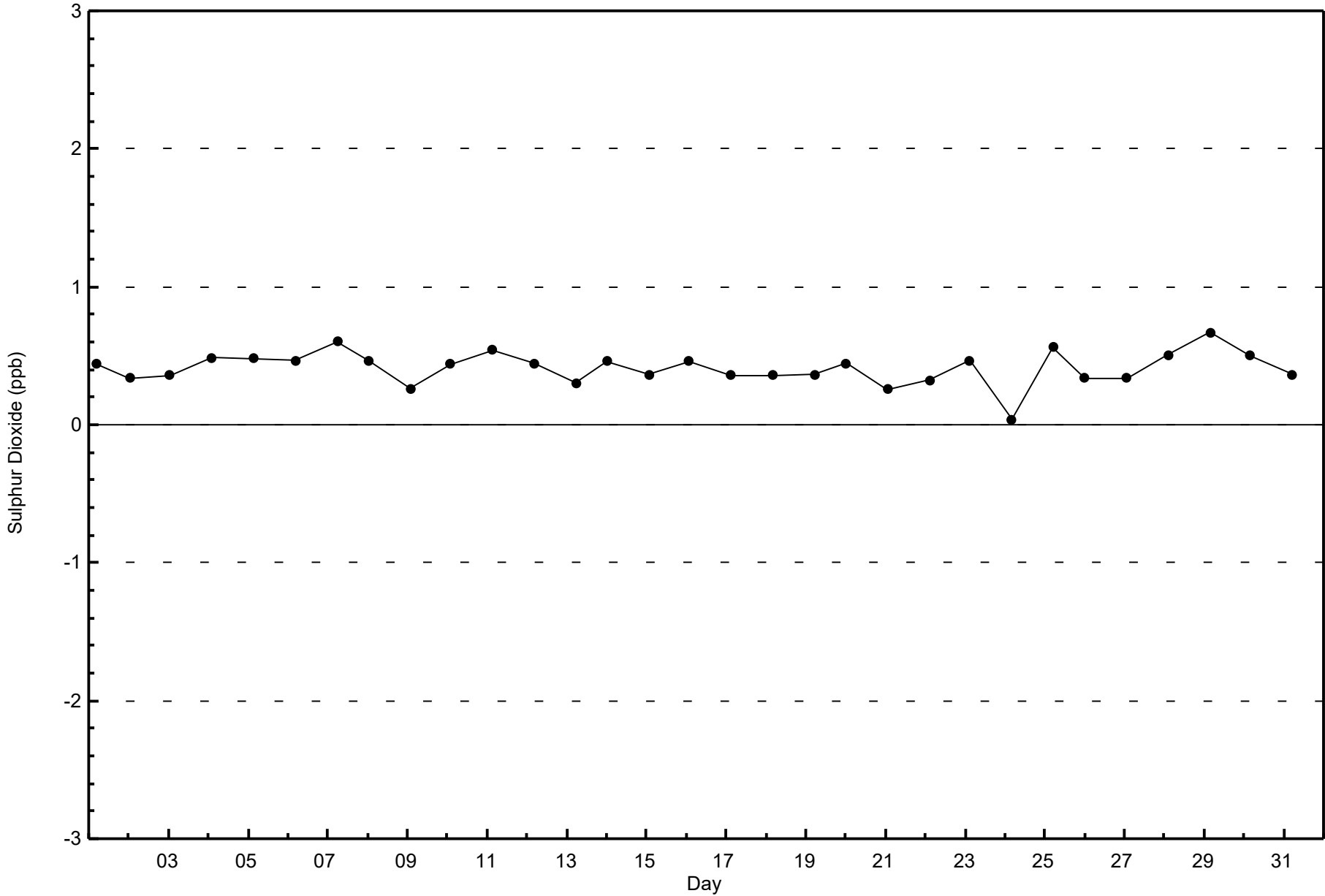
Total Number of Hours: 744

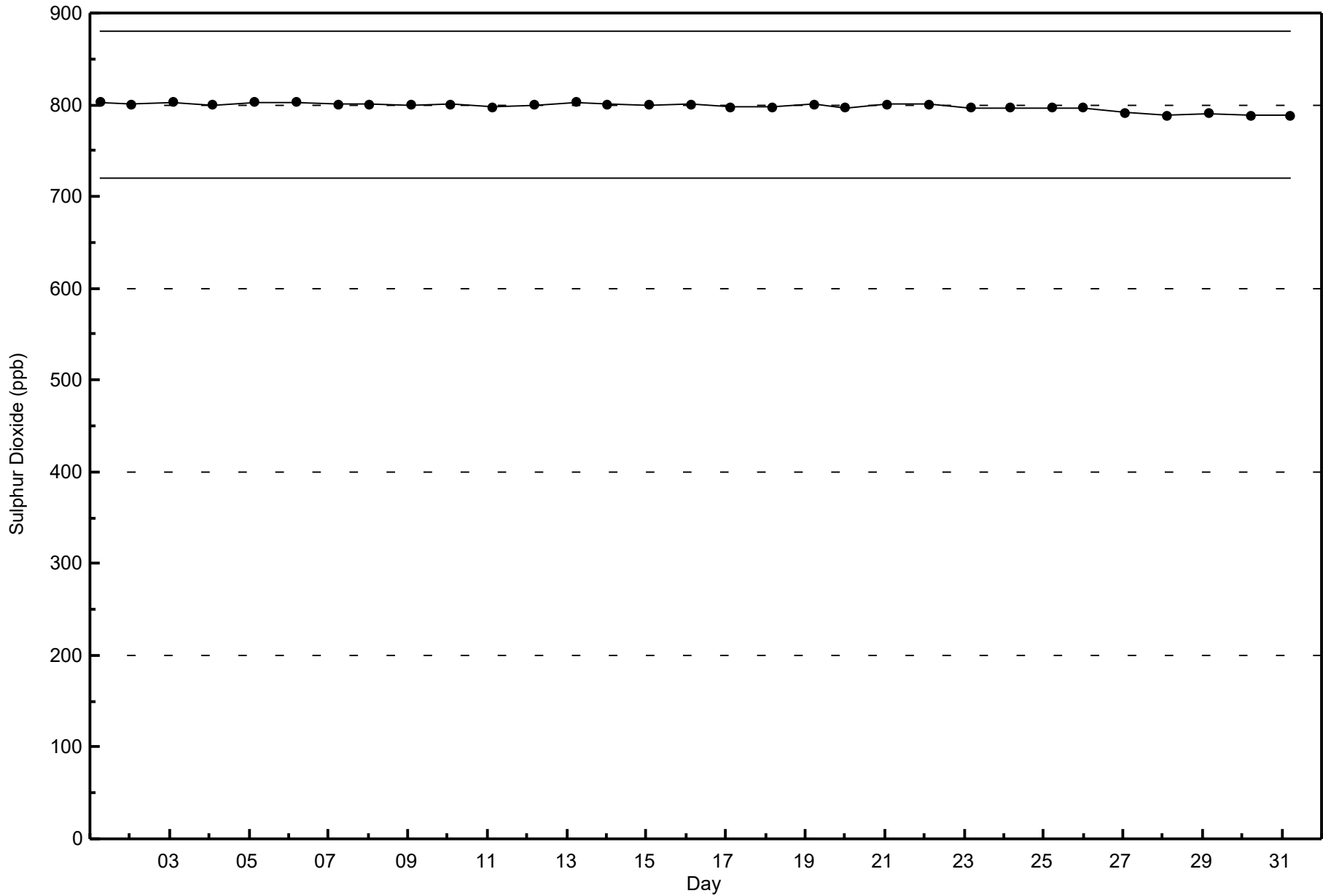


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Sulphur Dioxide (SO₂) - ppb
Conklin

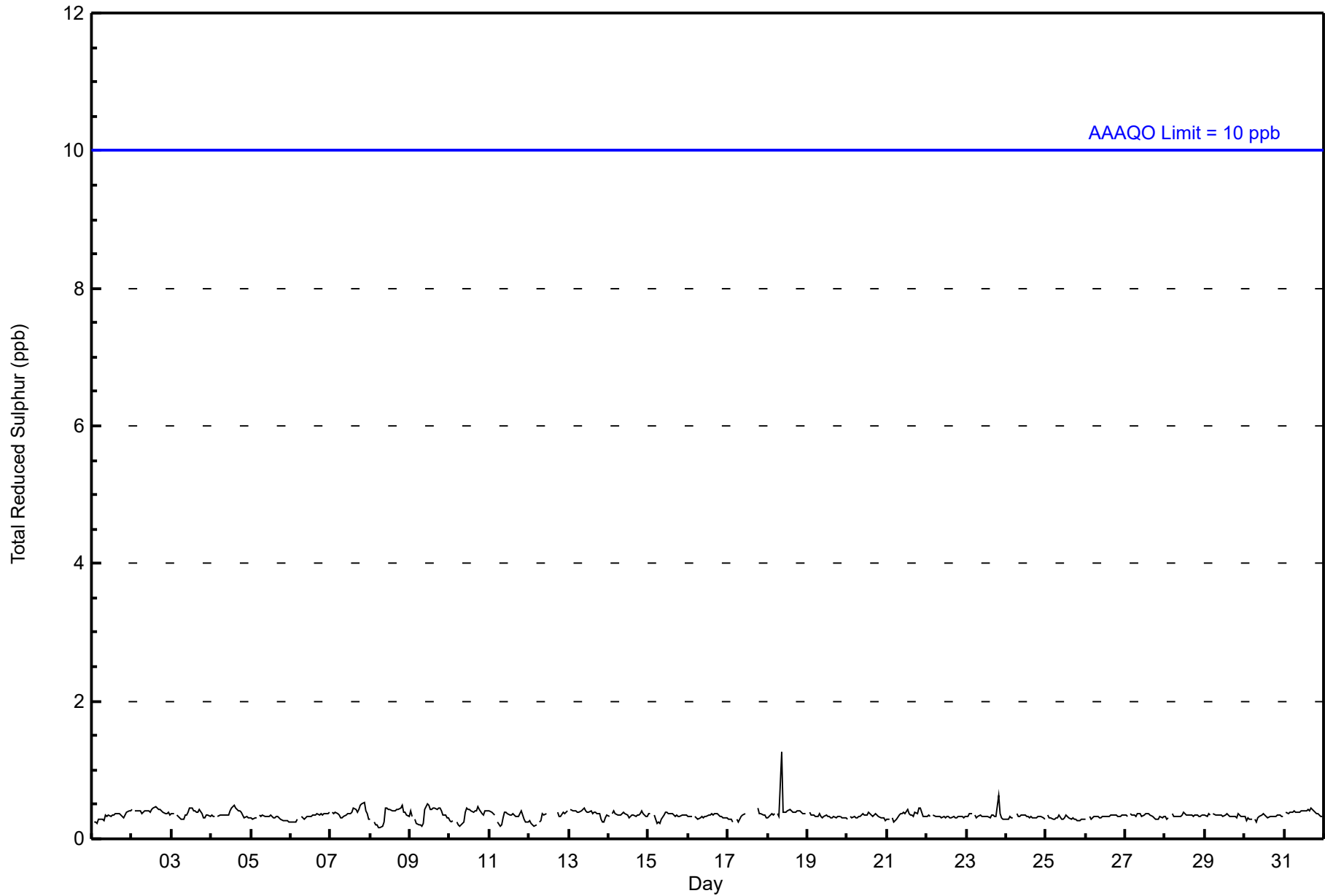








Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 744																	744														
Maximum Value: 1.3 ppb on Oct 18 09:00		Maximum Daily Average: 0.4 ppb on Oct 18																	Hours of Data: 700																
Minimum Value: 0.2 ppb on Oct 8 07:00		Minimum Daily Average: 0.3 ppb on Oct 25																	Hours of Missing Data: 44																
Maximum Diurnal Average: 0.4 ppb at hour 14		Minimum Diurnal Average: 0.3 ppb at hour 7																	Hours of Calibration: 38																
Monthly Average: 0.34 ppb		Percentiles: P ₁ = 0.2 P ₁₀ = 0.3 Q ₁ = 0.3 Median = 0.3 Q ₃ = 0.4 P ₉₀ = 0.4 P ₉₉ = 0.5																	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-Oct	Z	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.4			
2-Oct	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	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4		
3-Oct	0.4	0.4	Z	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	0.4	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		
4-Oct	0.3	0.3	0.3	Z	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4		
5-Oct	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	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3		
6-Oct	0.2	0.2	0.2	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	0.4	0.3	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4		
7-Oct	Z	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	0.5	0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.5		
8-Oct	0.3	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.5		
9-Oct	0.4	0.3	Z	0.3	0.2	0.2	0.2	0.2	0.2	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	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	
10-Oct	0.3	0.2	0.3	Z	0.2	0.2	0.2	0.2	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.5	
11-Oct	0.4	0.4	0.4	0.3	Z	0.2	0.2	0.2	0.3	0.4	0.4	0.4	0.3	0.3	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	
12-Oct	0.3	0.2	0.2	0.2	0.2	Z	0.2	0.3	0.4	0.3	0.4	PF	PF	PF	PF	PF	PF	PF	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	--	
13-Oct	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	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	
14-Oct	0.3	Z	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	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
15-Oct	0.4	0.4	Z	0.3	0.3	0.2	0.2	0.2	0.3	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	0.3	0.3	0.3	0.3	0.3	0.4
16-Oct	0.3	0.3	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.3	0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4
17-Oct	0.3	0.3	0.3	0.2	Z	0.3	0.2	0.3	0.3	0.3	0.4	C	C	C	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	0.3	0.3	--	
18-Oct	0.3	0.3	0.4	0.4	0.4	Z	0.4	0.3	1.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	1.3	
19-Oct	Z	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	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
20-Oct	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4
21-Oct	0.3	0.3	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	0.3	0.4	0.4	0.4	0.5	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	
22-Oct	0.3	0.3	0.3	Z	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	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
23-Oct	0.3	0.3	0.4	0.4	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	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	0.6	
24-Oct	0.3	0.3	0.3	0.3	0.3	Z	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	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
25-Oct	Z	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	0.3	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
26-Oct	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	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4
27-Oct	0.3	0.3	Z	0.4	0.3	0.4	0.3	0.4	0.4	0.4	0.4	0.3	0.3	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	0.3	0.3	0.3	0.4
28-Oct	0.3	0.3	0.3	Z	0.4	0.3	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	0.3	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
29-Oct	0.4	0.3	0.4	0.3	Z	0.4	0.4	0.4	0.3	0.4	0.3	0.3	0.3	0.4	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	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4
30-Oct	0.3	0.3	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	0.3	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
31-Oct	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
																								Diurnal Average											
																								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

Total Reduced Sulphur (TRS) - ppb
Conklin - October 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	700	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: 700

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Total Reduced Sulphur (TRS) - ppb
Conklin - October 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	1	1	1	3	15	48	97	110	60	48	17	38	82	90	40	662
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	11	1	1	1	3	15	48	97	110	60	48	17	38	82	90	40	662

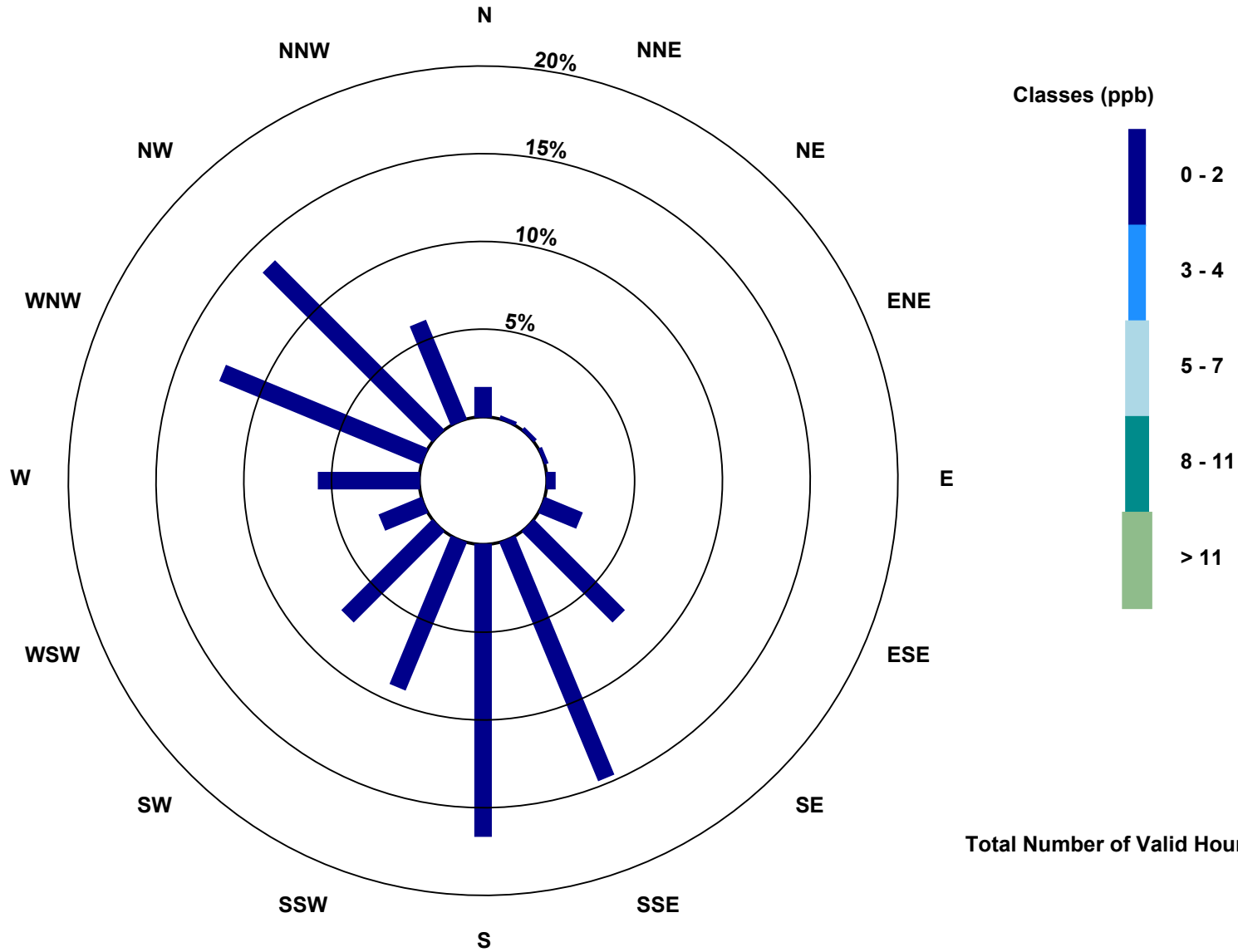
Total Number of Valid Hours: 662

Total Number of Hours: 744

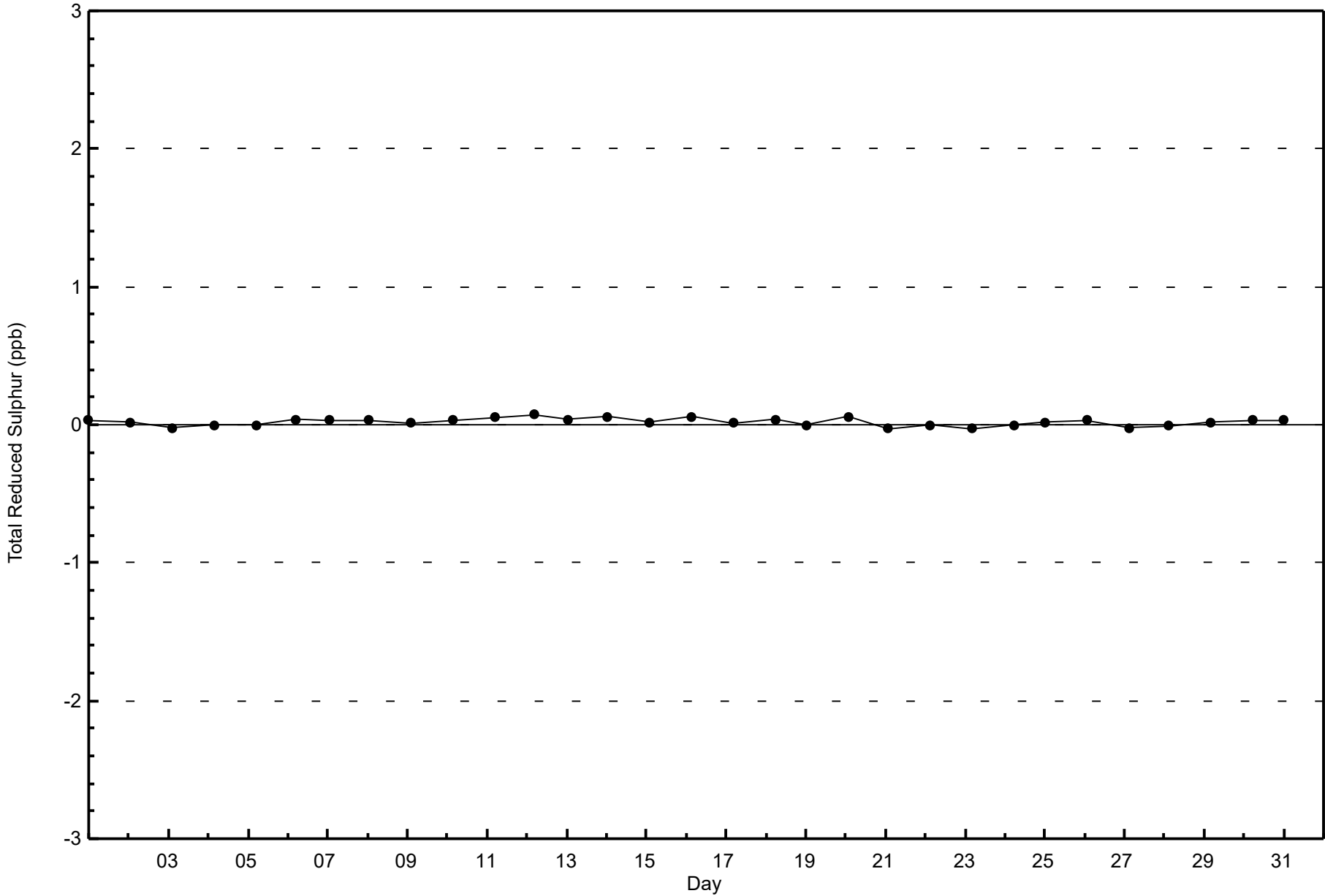


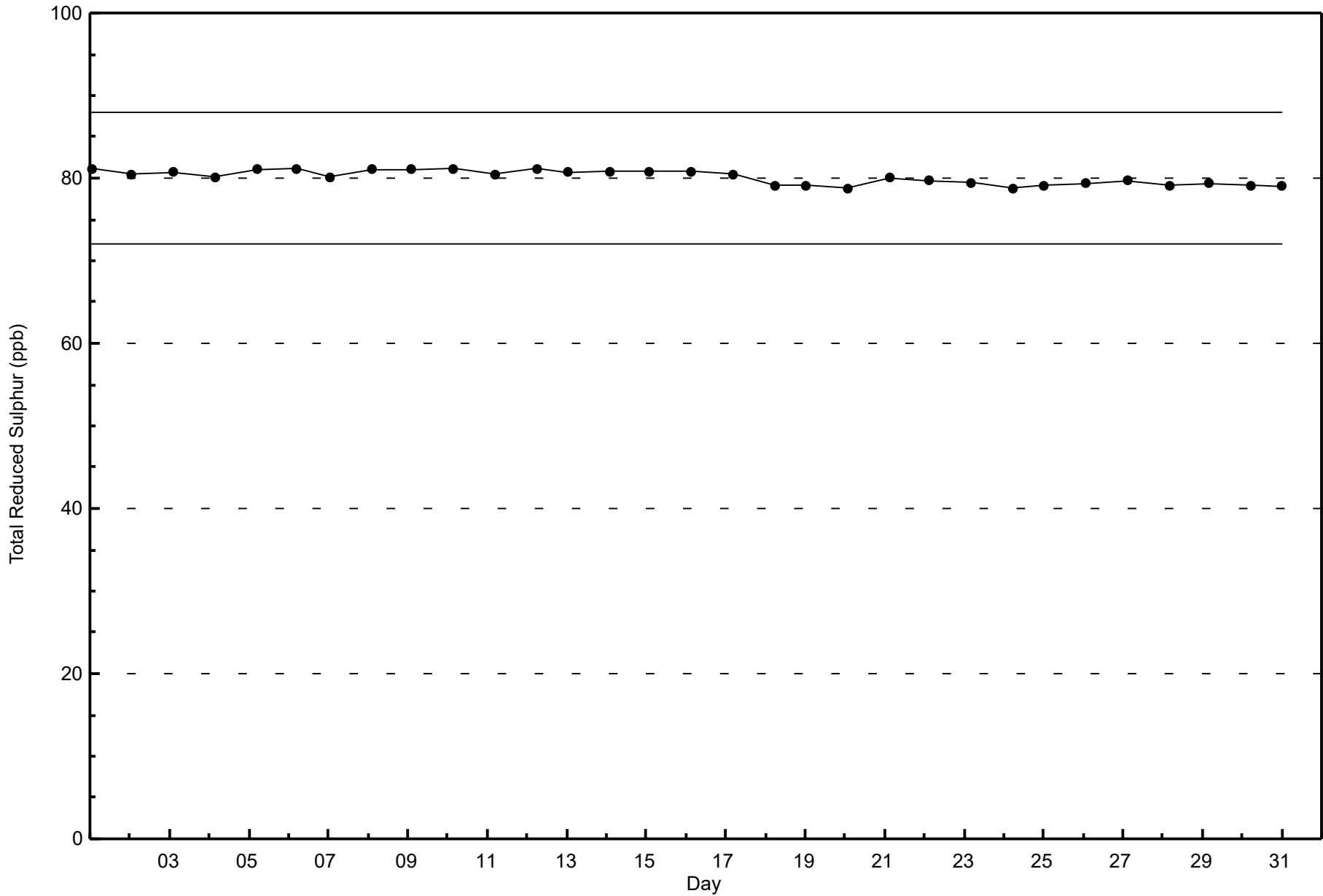
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Total Reduced Sulphur (TRS) - ppb
Conklin



Total Number of Valid Hours: 662





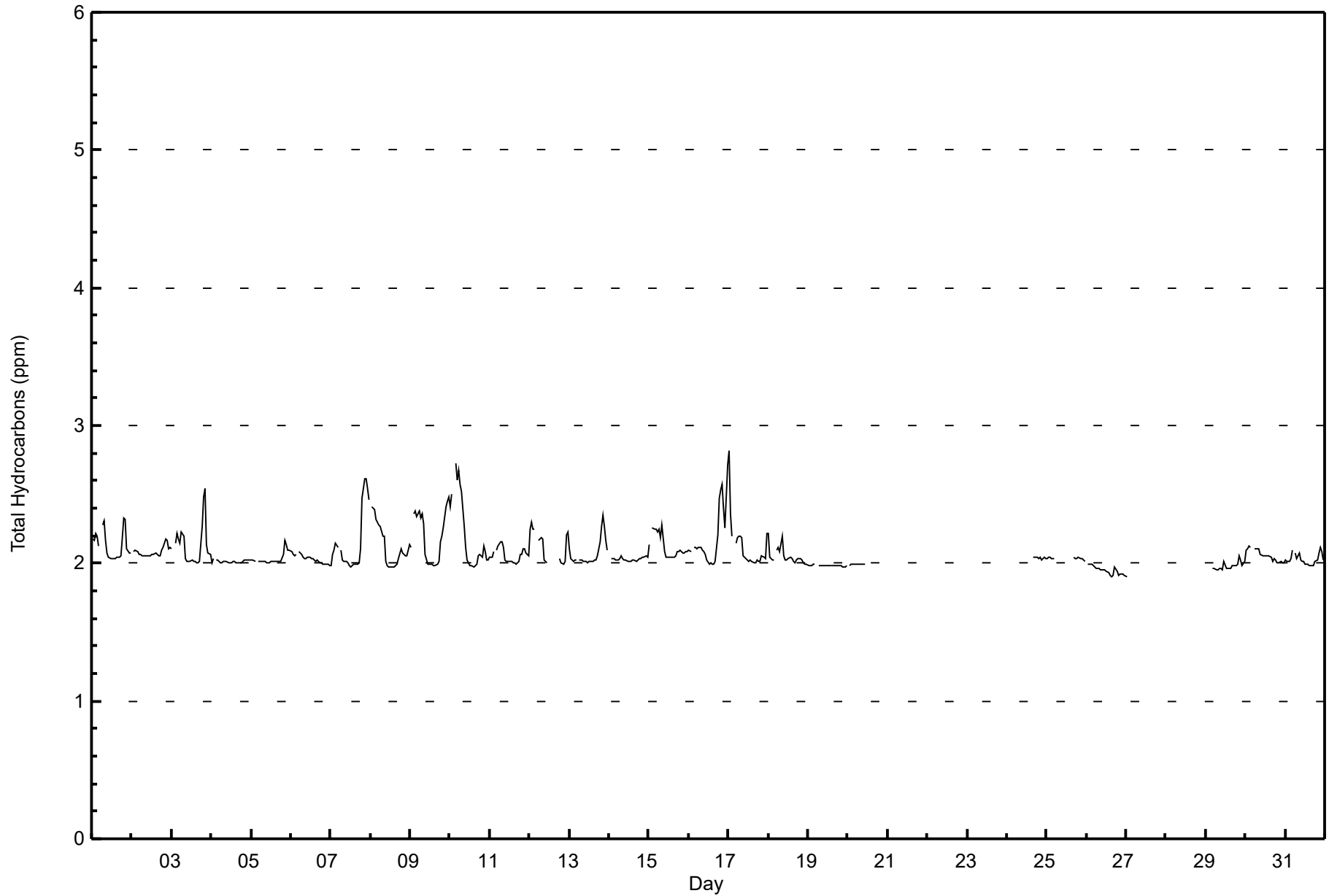


Maximum Value: 2.8 ppm on Oct 17 01:00		Maximum Daily Average: 2.2 ppm on Oct 10		Hours in Service: 744																																																				
Minimum Value: 1.9 ppm on Oct 26 16:00		Minimum Daily Average: 1.9 ppm on Oct 26		Hours of Data: 551																																																				
Maximum Diurnal Average: 2.1 ppm at hour 21		Minimum Diurnal Average: 2.0 ppm at hour 16		Hours of Missing Data: 193																																																				
Monthly Average: 2.08 ppm		Percentiles: P ₁ = 1.9 P ₁₀ = 2.0 Q ₁ = 2.0 Median = 2.0 Q ₃ = 2.1 P ₉₀ = 2.2 P ₉₉ = 2.6		Hours of Calibration: 33																																																				
				Percent Operational Time: 78.5																																																				
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-Oct	2.2	2.2	2.2	2.2	2.1	Z	2.3	2.3	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.3	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3																								
2-Oct	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2																									
3-Oct	2.1	Z	2.1	2.2	2.2	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	2.3	2.5	2.5	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.5																									
4-Oct	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0																									
5-Oct	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	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2																									
6-Oct	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	2.0	2.0	2.0	2.1																									
7-Oct	2.0	2.1	2.1	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	2.1	2.5	2.6	2.6	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.6																									
8-Oct	Z	2.4	2.4	2.3	2.3	2.3	2.3	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	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4																									
9-Oct	2.1	Z	2.4	2.4	2.3	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	2.2	2.2	2.3	2.4	2.4	2.4	2.5	2.5	2.5	2.5	2.5	2.5	2.5																									
10-Oct	2.4	2.5	Z	2.7	2.6	2.7	2.6	2.5	2.3	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.7																									
11-Oct	2.0	2.0	2.1	Z	2.1	2.1	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	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2																									
12-Oct	2.2	2.3	2.2	2.3	Z	2.2	2.2	2.2	2.2	2.0	2.0	PF	PF	PF	PF	PF	PF	PF	2.0	2.0	2.0	2.0	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3																									
13-Oct	2.1	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	2.1	2.2	2.3	2.4	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4																									
14-Oct	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1																									
15-Oct	2.1	Z	2.3	2.2	2.3	2.2	2.2	2.2	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	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3																									
16-Oct	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.5	2.5	2.6	2.4	2.3	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7																									
17-Oct	2.8	2.4	2.2	Z	2.1	2.2	2.2	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.8																									
18-Oct	2.2	2.0	2.0	2.0	Z	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2																									
19-Oct	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	2.0	2.0	2.0	2.0	2.0																									
20-Oct	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	C	C	C	C	C	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	2.0																										
21-Oct	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--																									
22-Oct	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--																									
23-Oct	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--																									
24-Oct	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	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	2.0	2.0																									
25-Oct	2.0	2.0	2.0	2.0	2.0	Z	UO	UO	UO	UO	UO	UO	M	M	M	M	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0																									
26-Oct	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	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																									
27-Oct	1.9	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	UO	1.9																									
28-Oct	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--																									
29-Oct	UO	UO	UO	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																									
30-Oct	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1																									
31-Oct	2.0	2.0	2.0	2.0	2.1	Z	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	2.1	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	2.1	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	2.1	2.1	2.1	2.1	Diurnal Average
																											2.8	2.5	2.4	2.7	2.6	2.7	2.6	2.5	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.5	2.5	2.6	2.6	2.5	2.7	2.7	2.7	2.7	2.7	2.7	Diurnal Maximum
Z - zerospan																											C - Calibration						M - Maintenance					UO - Unstable Operation					PF - Power Failure													



Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Conklin - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Conklin - October 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	333	60.44	60.44
2.1 - 3.0	218	39.56	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 551

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Total Hydrocarbons (THC) - ppm
Conklin - October 2023

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	1	0	0	1	1	11	30	32	34	30	33	13	29	47	60	11	333
2.1 - 3.0	6	1	1	1	2	4	15	59	59	25	10	1	1	9	8	14	216
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	7	1	1	2	3	15	45	91	93	55	43	14	30	56	68	25	549

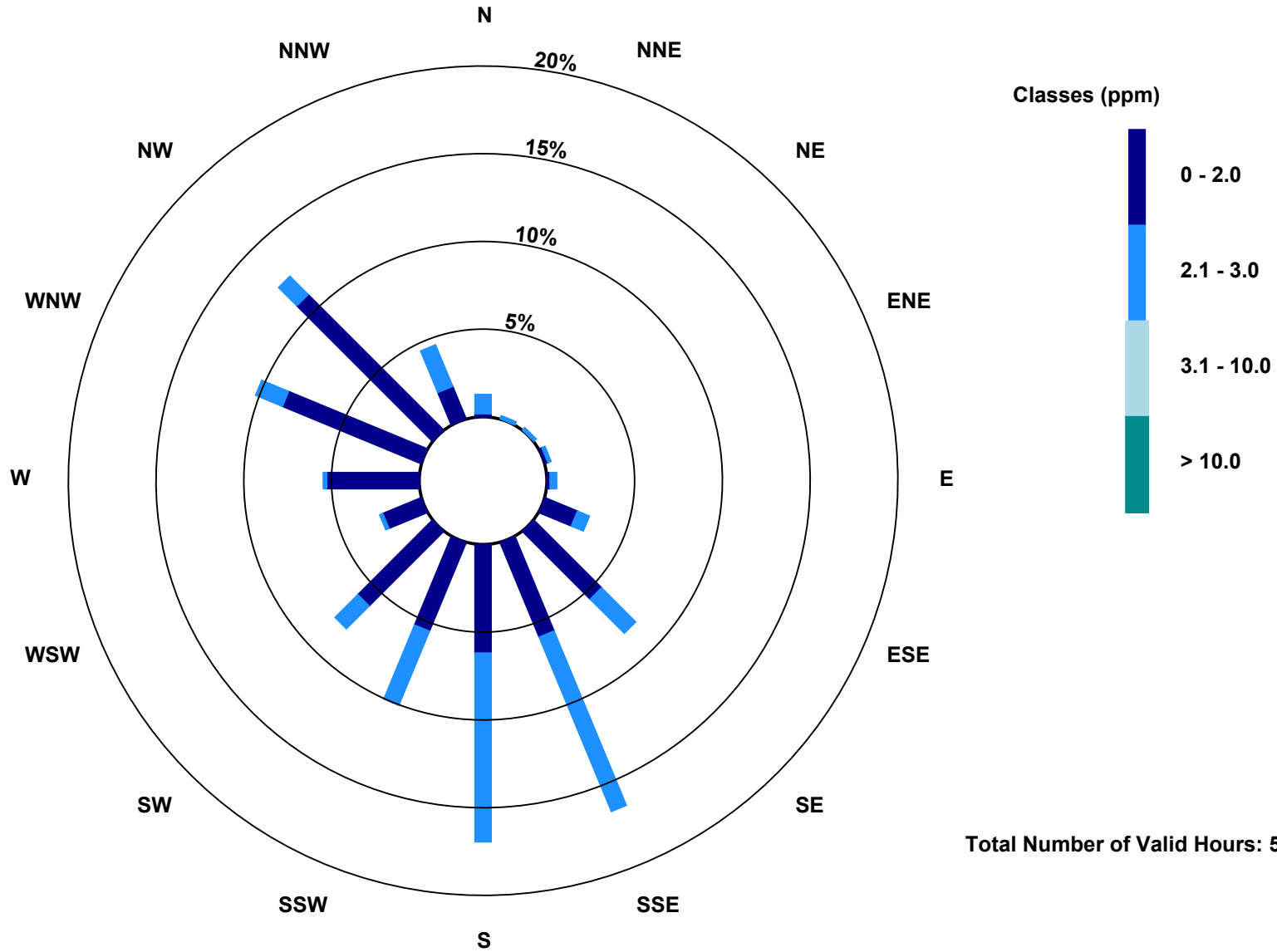
Total Number of Valid Hours: 549

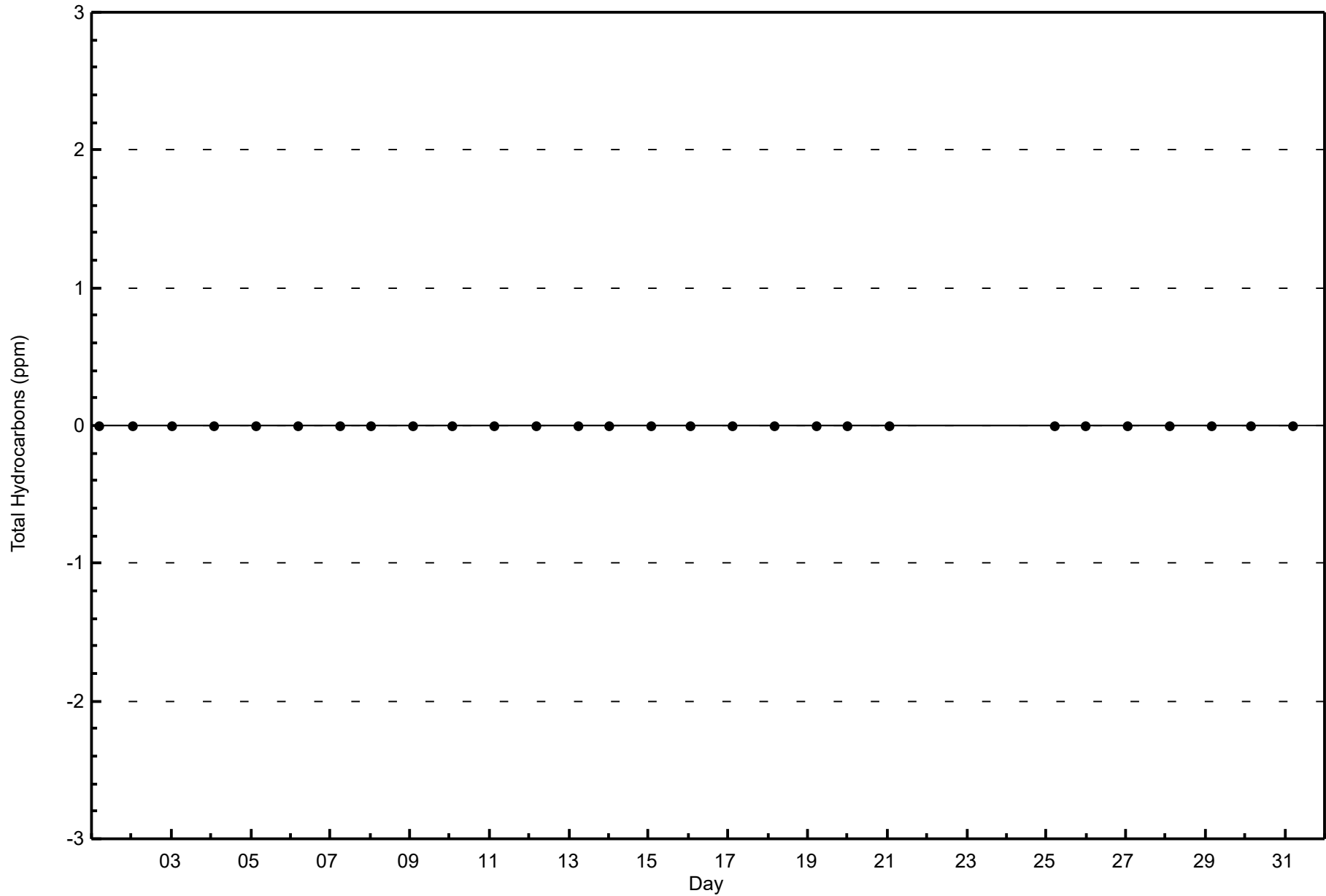
Total Number of Hours: 744

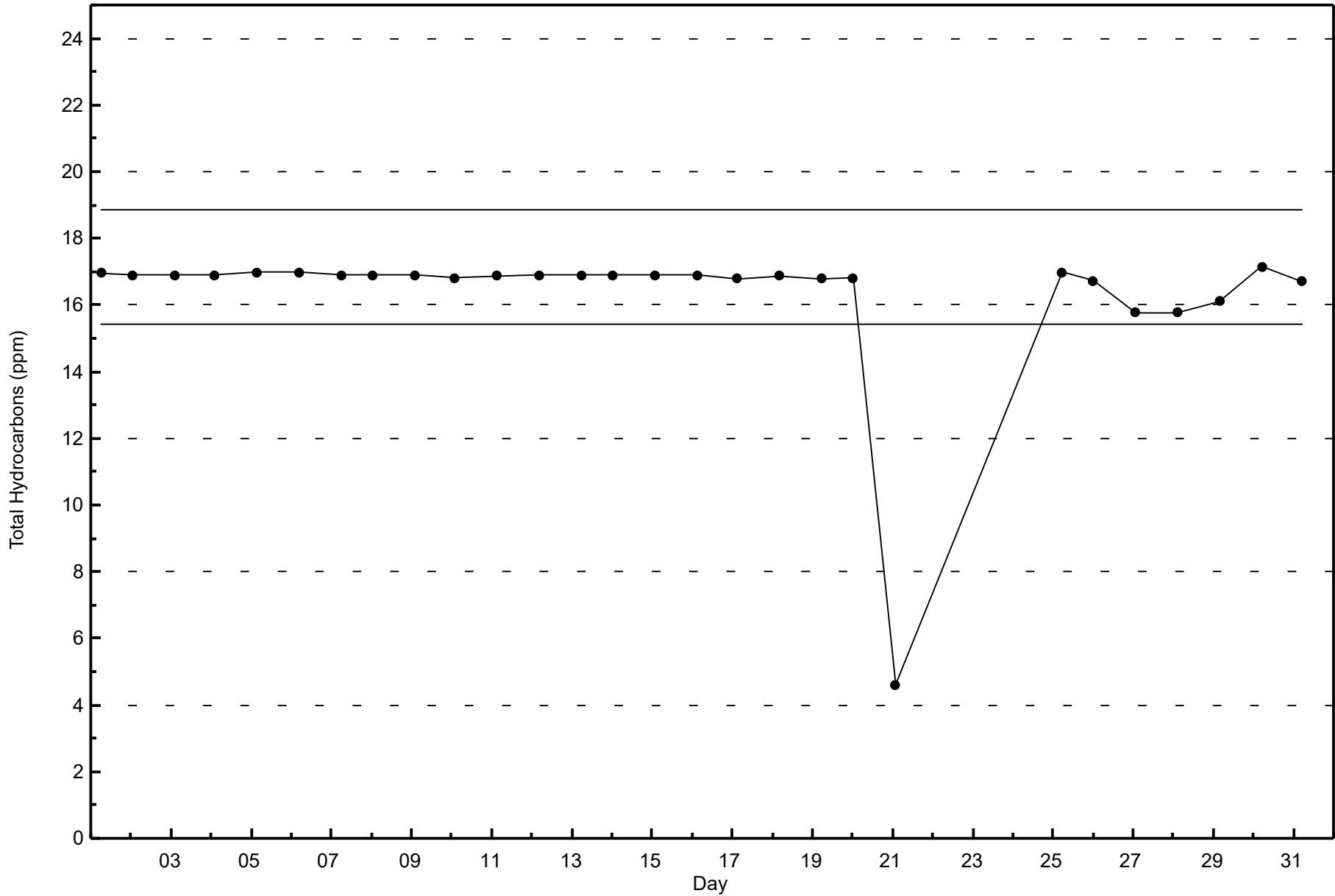


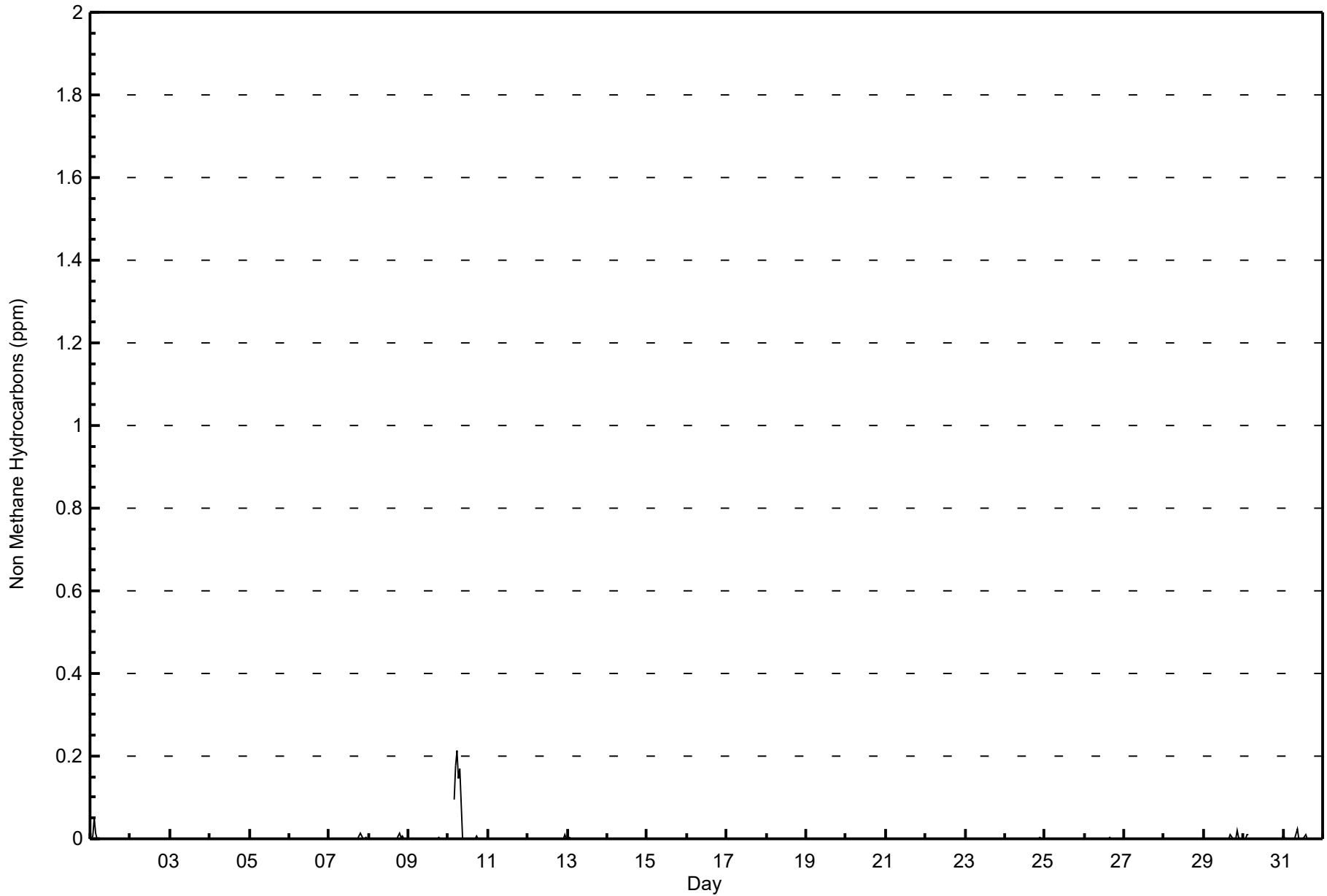
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Total Hydrocarbons (THC) - ppm
Conklin











**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Conklin - October 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	530	96.19	96.19
0.006 - 0.05	16	2.90	99.09
0.06 - 0.1	2	0.36	99.46
> 0.1	3	0.54	100.00

Total Number of Valid Hours: 551

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Conklin - October 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	1	1	2	3	15	43	88	92	54	43	14	30	54	65	20	530
0.006 - 0.05	2	0	0	0	0	0	1	3	1	1	0	0	0	1	2	5	16
0.06 - 0.1	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	1	0	0	0	0	0	0	1	0	0	2
Totals	7	1	1	2	3	15	45	91	93	55	43	14	30	56	68	25	549

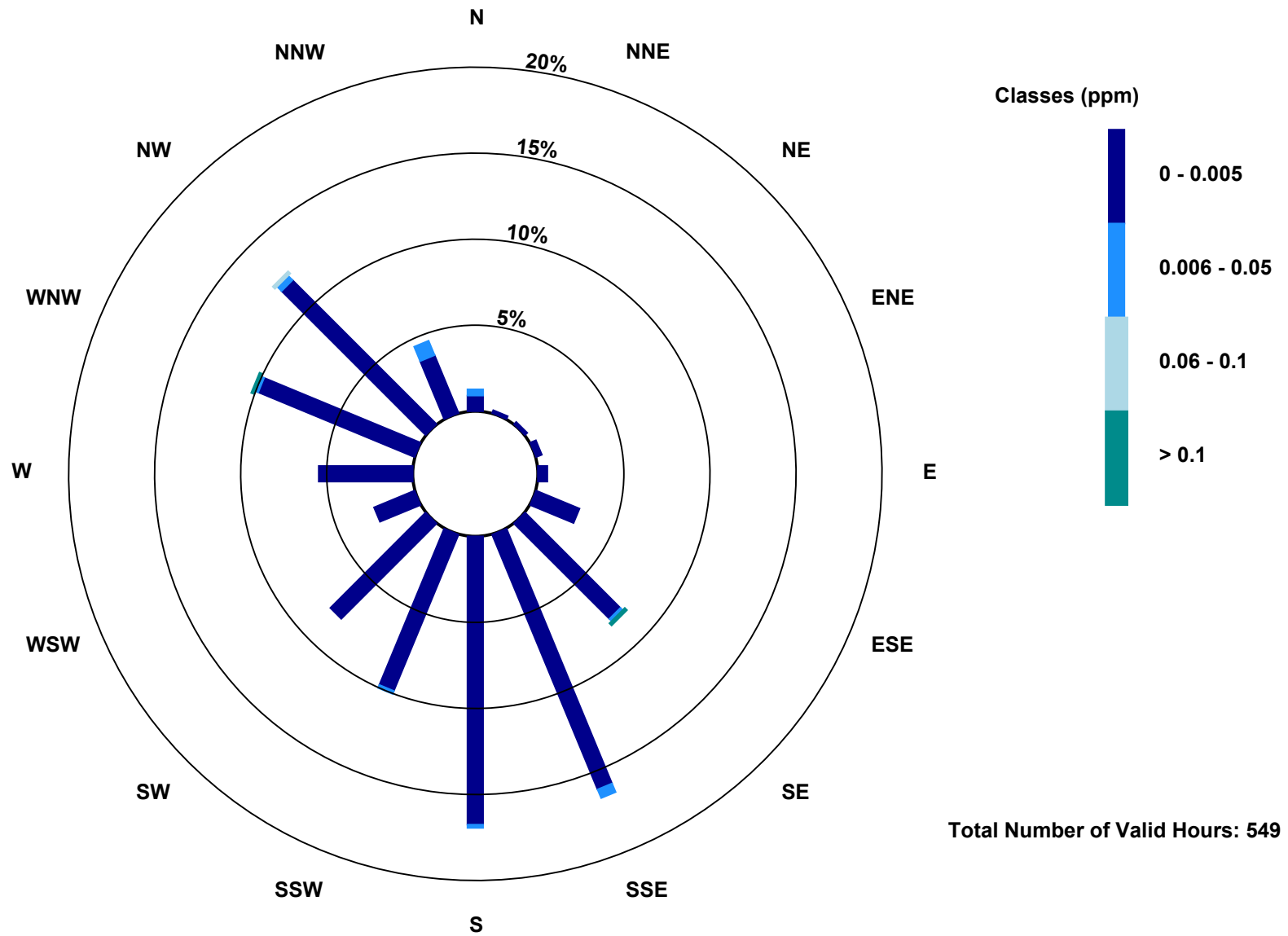
Total Number of Valid Hours: 549

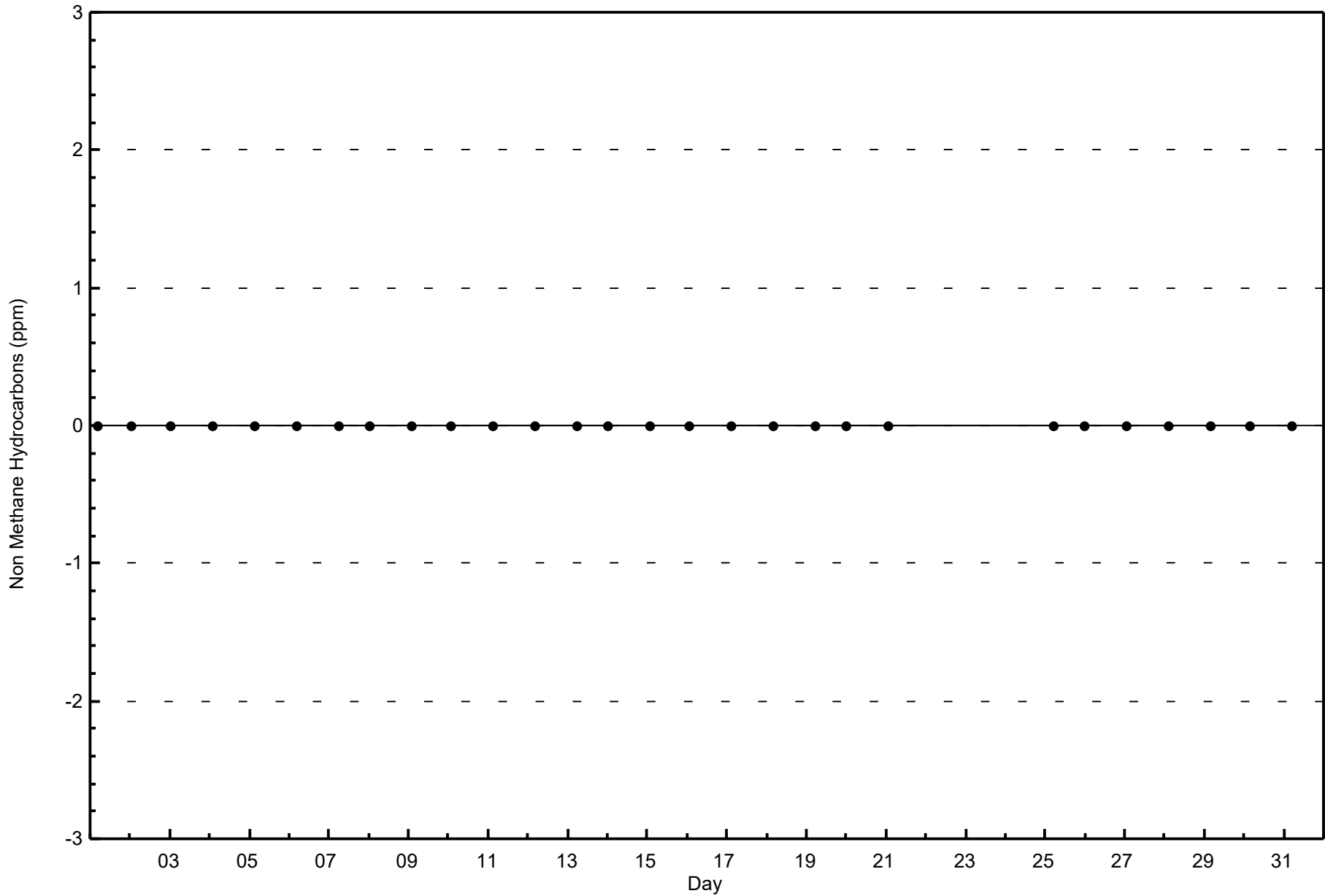
Total Number of Hours: 744

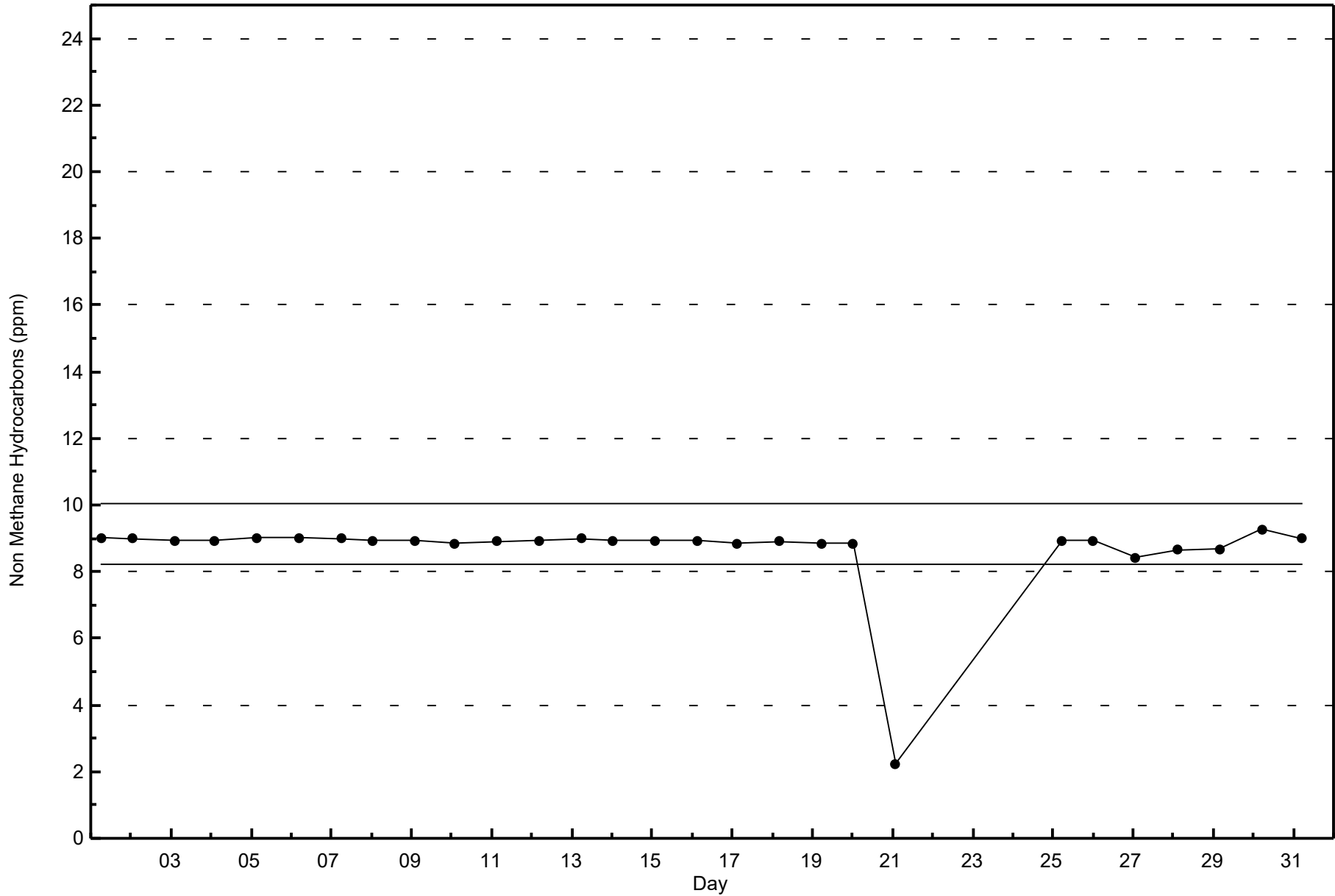


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Non Methane Hydrocarbons (NMHC) - ppm
Conklin



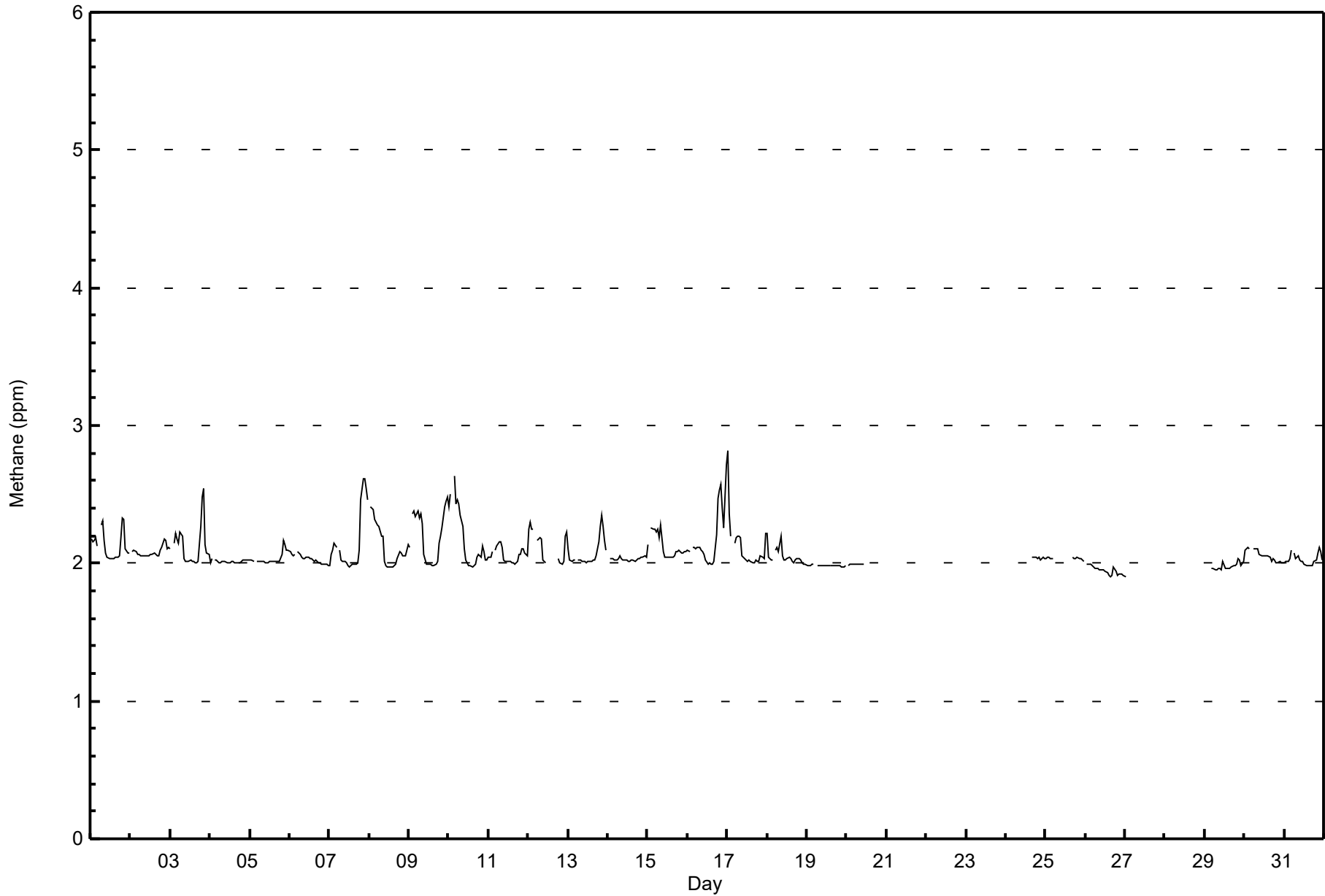






Wood Buffalo Environmental Association
Hourly Averages

Methane (CH₄) - ppm
Conklin - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Methane (CH₄) - ppm
Conklin - October 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	333	60.44	60.44
2.1 - 3.0	218	39.56	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 551

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Methane (CH₄) - ppm
Conklin - October 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	1	0	0	1	1	11	30	32	34	30	33	13	29	47	60	11	333
2.1 - 3.0	6	1	1	1	2	4	15	59	59	25	10	1	1	9	8	14	216
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	7	1	1	2	3	15	45	91	93	55	43	14	30	56	68	25	549

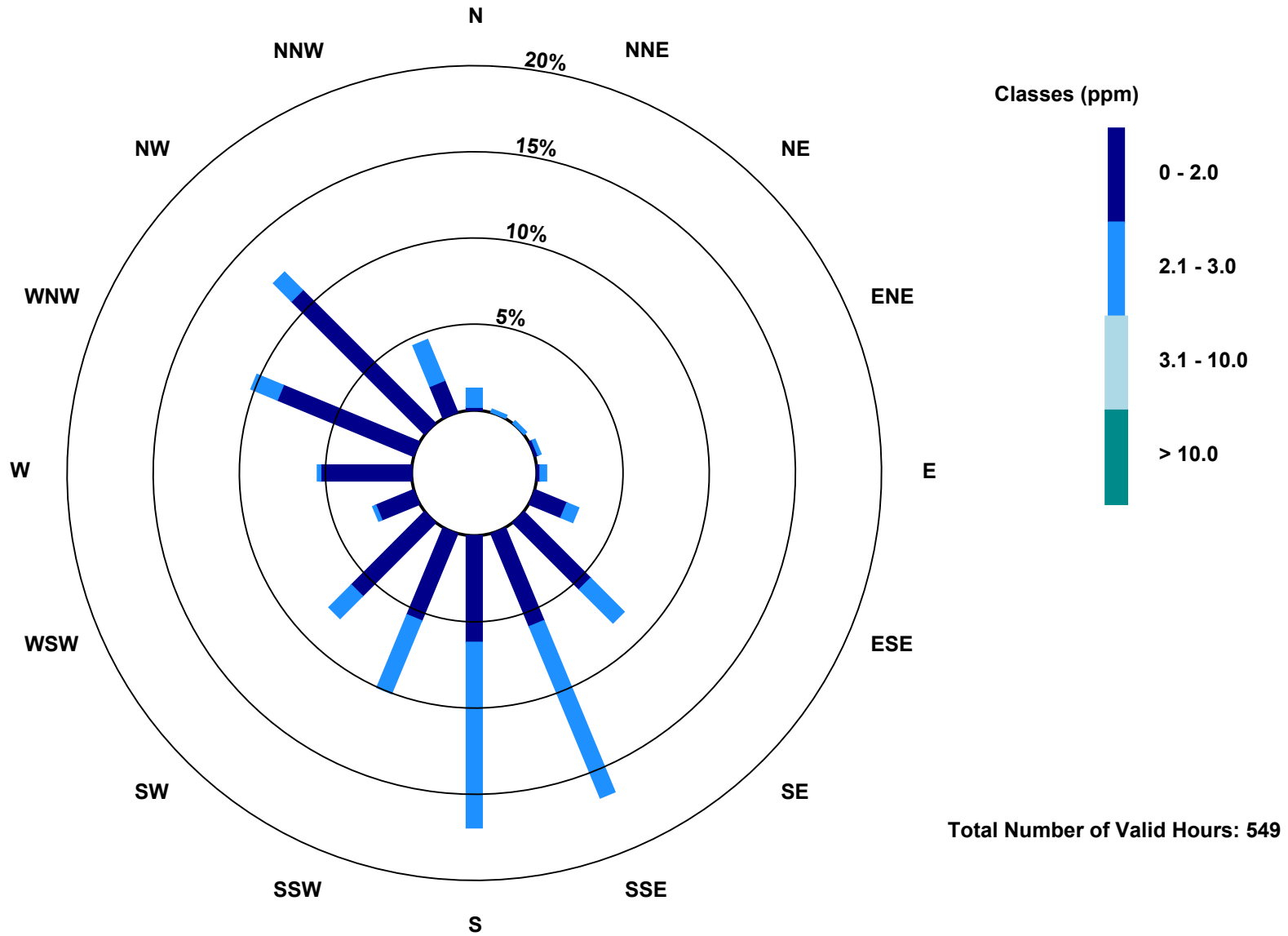
Total Number of Valid Hours: 549

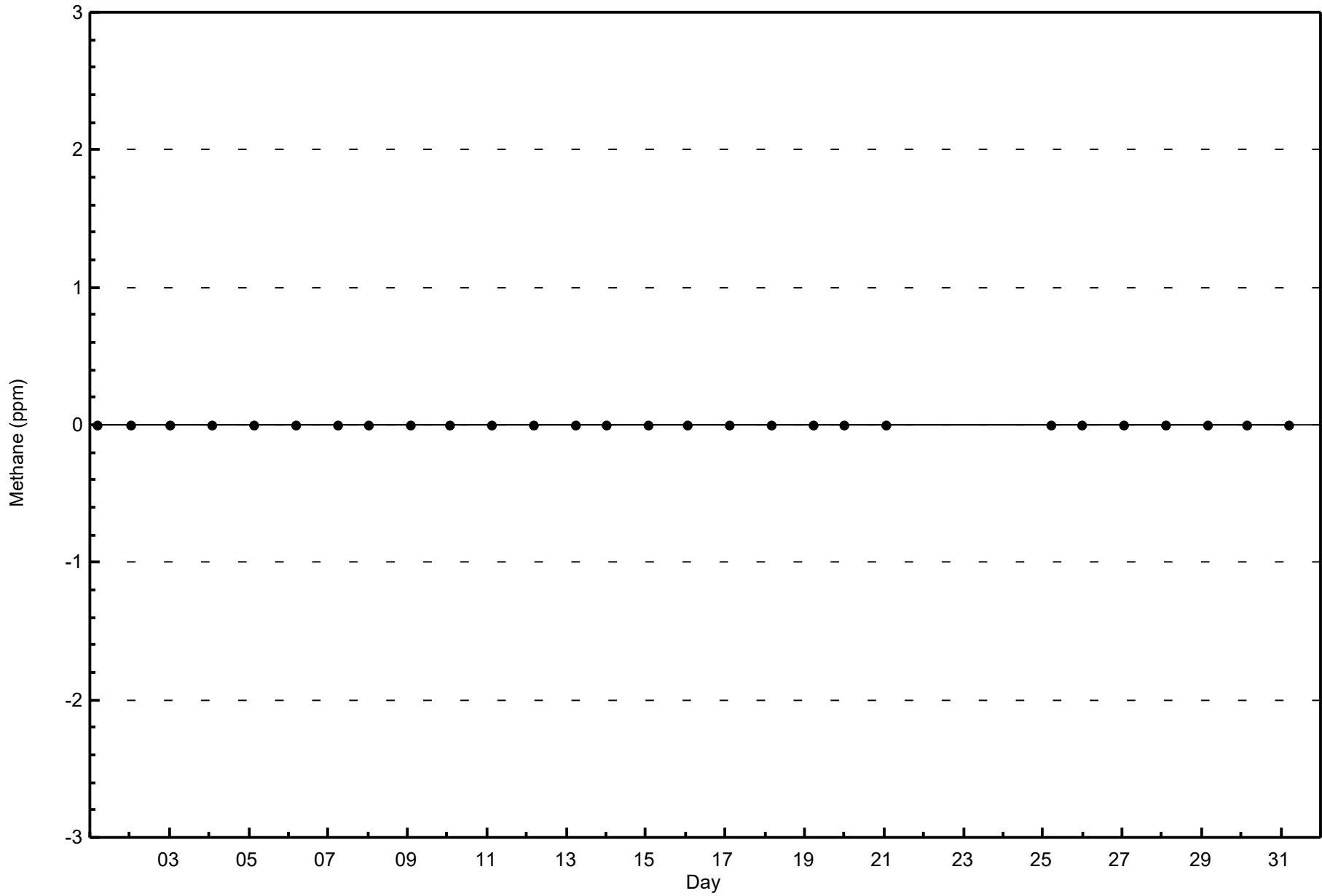
Total Number of Hours: 744

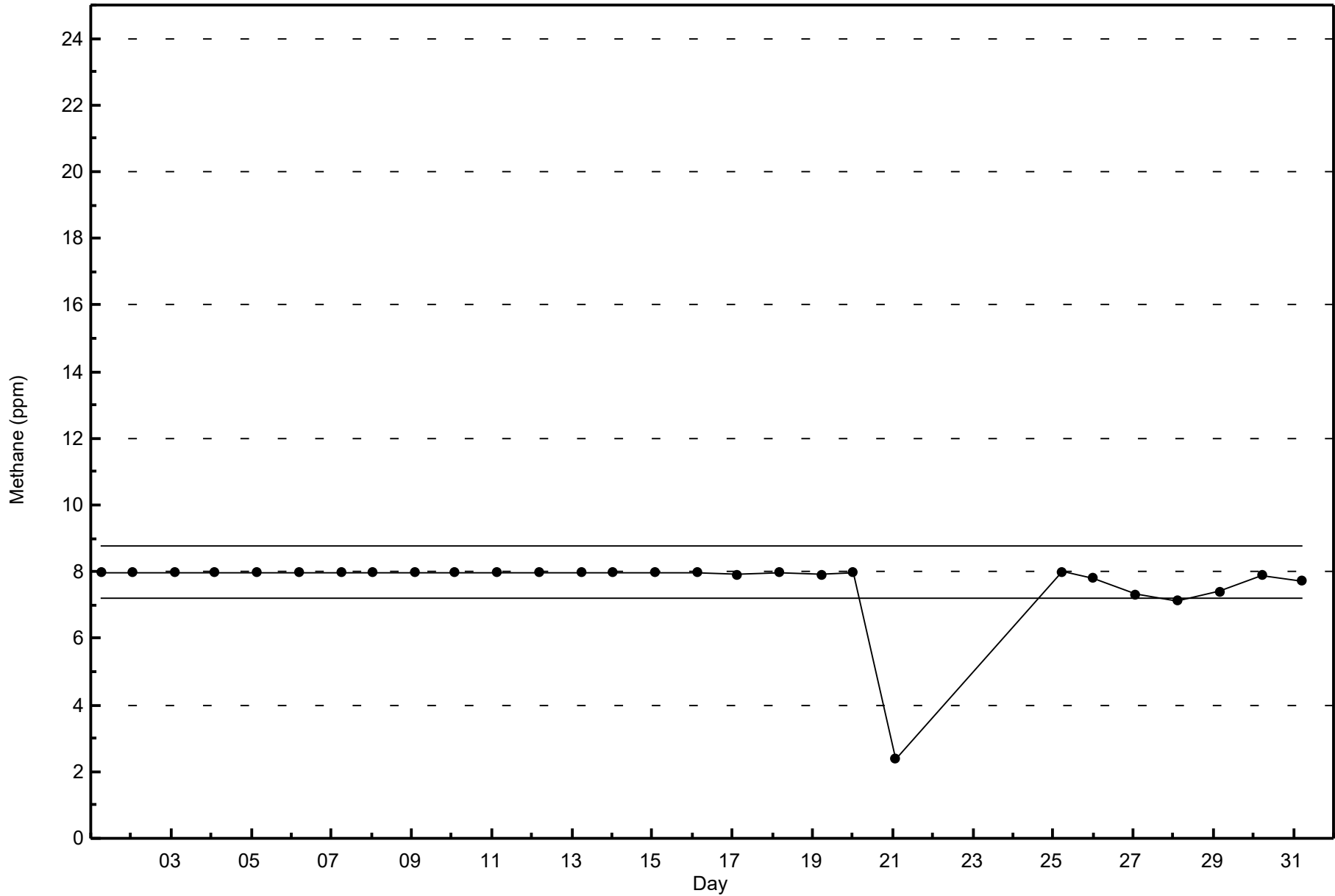


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Methane (CH₄) - ppm
Conklin









Wood Buffalo Environmental Association
Summary of Hour Averages

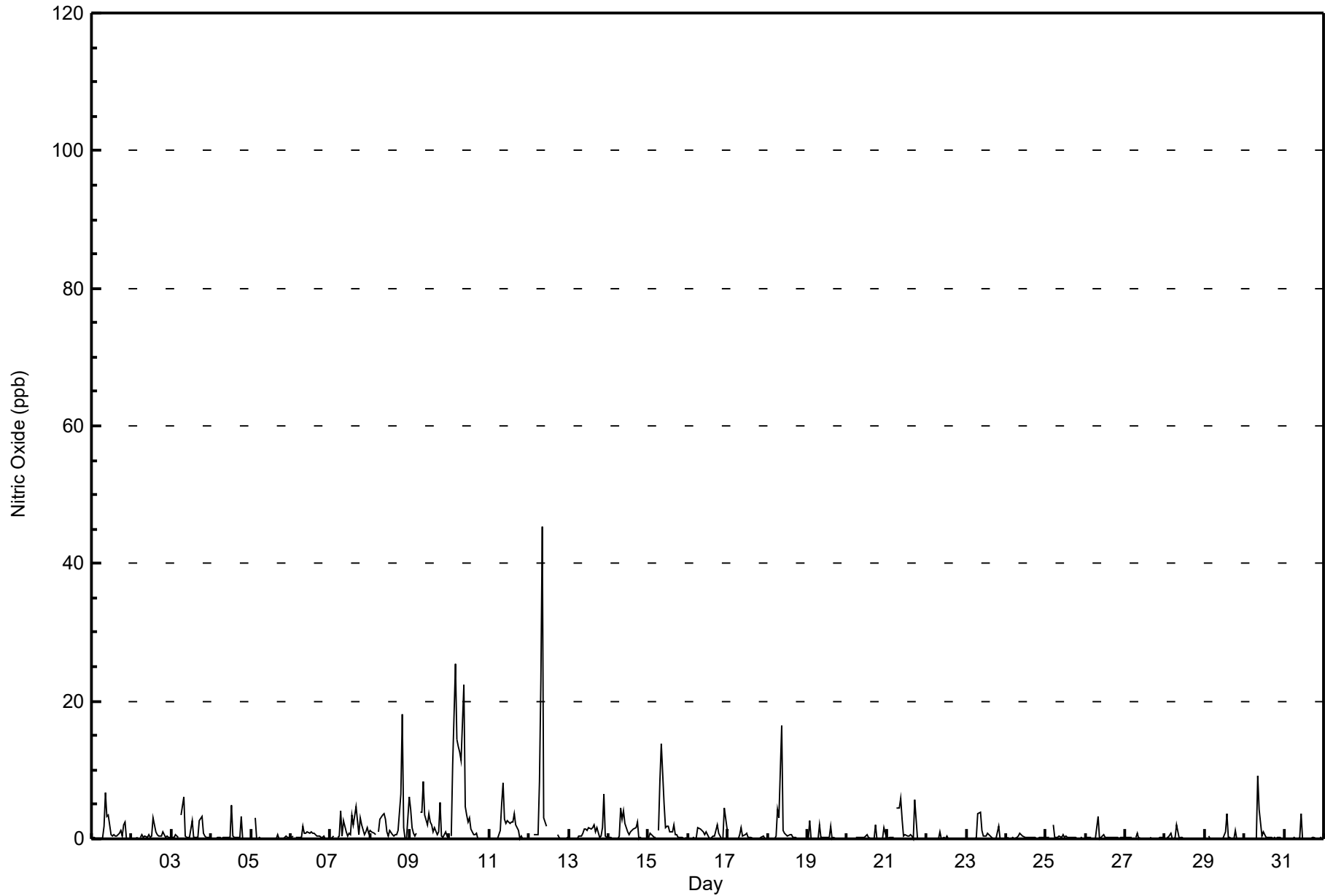
Nitric Oxide (NO) - ppb
Conklin - October 2023

Maximum Value: 45.4 ppb on Oct 12 09:00																					Maximum Daily Average: 5.6 ppb on Oct 10					Hours in Service: 744	
Minimum Value: 0.0 ppb on Oct 11 01:00										Minimum Daily Average: 0.1 ppb on Oct 22						Hours of Data: 702											
Maximum Diurnal Average: 5.1 ppb at hour 9										Minimum Diurnal Average: 0.3 ppb at hour 21						Hours of Missing Data: 42											
Monthly Average: 1.05 ppb										Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.2 Q ₃ = 0.8 P ₉₀ = 2.7 P ₉₉ = 13.8						Hours of Calibration: 36											
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-Oct	0.1	0.1	0.1	Z	0.1	0.0	0.1	1.8	6.6	3.3	3.4	0.6	0.4	0.5	0.3	0.4	0.9	1.3	0.5	2.0	2.4	0.1	0.1	0.1	1.1	6.6	
2-Oct	0.1	0.1	0.1	0.1	Z	0.3	0.6	0.1	0.3	0.3	0.7	0.3	0.3	3.1	1.1	0.6	0.5	0.5	0.3	0.9	0.2	0.3	0.2	0.1	0.5	3.1	
3-Oct	0.3	0.1	0.7	0.5	0.2	Z	3.4	6.2	0.3	0.2	0.2	0.3	2.6	0.2	0.1	0.1	0.2	2.6	3.3	0.9	0.3	0.1	0.2	0.2	1.0	6.2	
4-Oct	Z	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.3	0.2	0.2	0.1	4.8	0.4	0.1	0.1	0.1	0.2	3.3	0.1	0.1	0.1	0.1	0.1	0.5	4.8	
5-Oct	0.1	Z	3.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.6	0.0	0.0	0.0	0.2	0.4	0.2	0.2	0.2	3.1	
6-Oct	0.2	0.4	Z	0.3	0.3	0.3	0.3	1.8	0.9	0.7	1.1	0.9	0.9	0.7	0.7	0.7	0.5	0.4	0.2	0.2	0.4	0.0	0.0	0.0	0.5	1.8	
7-Oct	0.0	0.1	0.4	Z	0.2	0.5	4.1	0.5	2.7	1.0	0.5	0.8	0.5	3.4	2.0	4.6	2.6	0.6	3.0	2.1	0.5	0.9	1.6	0.8	1.5	4.6	
8-Oct	1.2	1.0	0.9	0.6	Z	1.1	2.9	3.4	3.6	2.8	0.9	0.3	1.2	0.5	0.3	0.6	0.5	1.2	6.5	18.2	1.7	0.0	0.0	6.1	2.4	18.2	
9-Oct	4.3	1.5	0.9	0.5	0.9	Z	3.8	3.8	8.3	3.4	2.0	3.6	2.4	2.1	0.9	1.6	0.6	0.9	5.3	0.4	0.2	1.0	0.5	0.6	2.2	8.3	
10-Oct	Z	0.3	10.8	25.4	14.4	13.4	12.5	11.4	22.4	4.8	3.4	2.4	3.1	1.4	0.6	0.6	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.6	25.4	
11-Oct	0.0	Z	0.0	0.0	0.0	0.0	1.2	5.1	8.2	2.8	2.3	2.7	2.3	2.4	2.5	3.7	2.1	1.3	0.0	0.4	0.0	0.0	0.0	0.0	1.6	8.2	
12-Oct	0.0	0.0	Z	0.5	0.6	0.5	8.4	23.0	45.4	3.0	1.7	PF	PF	PF	PF	PF	PF	0.5	0.2	0.0	0.0	0.0	0.1	0.1	--	45.4	
13-Oct	0.1	0.0	0.0	Z	0.0	0.1	0.3	0.5	0.8	1.3	1.3	1.2	1.7	1.5	1.7	1.9	1.0	1.6	0.3	0.4	1.6	6.4	0.5	0.1	1.1	6.4	
14-Oct	0.1	0.2	0.1	0.1	Z	0.1	0.4	4.5	2.8	4.0	2.2	1.1	0.6	1.1	1.2	1.4	1.7	2.5	0.0	0.2	0.1	0.0	0.1	0.0	1.1	4.5	
15-Oct	0.2	0.9	0.6	0.3	0.2	Z	1.2	8.4	13.8	5.2	1.6	1.8	1.8	1.1	1.1	2.0	0.6	0.5	0.2	0.3	0.1	0.1	0.1	0.1	1.8	13.8	
16-Oct	Z	0.1	0.1	0.1	0.1	0.2	1.6	1.3	1.3	0.9	0.6	1.0	0.1	0.1	0.2	0.4	0.5	2.0	0.7	0.4	0.1	0.1	4.5	1.4	0.8	4.5	
17-Oct	1.2	Z	0.0	0.0	0.0	0.0	0.0	0.7	1.7	0.4	0.6	0.8	0.2	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.3	0.0	0.0	0.3	1.7	
18-Oct	0.1	0.0	Z	0.0	0.0	0.3	4.3	3.0	16.5	1.2	0.8	0.6	0.5	0.7	0.5	0.1	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	1.3	16.5	
19-Oct	0.0	2.7	0.0	Z	0.0	0.0	0.1	2.1	0.1	0.2	0.1	0.1	0.1	0.1	1.8	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	2.7	
20-Oct	0.0	0.1	0.0	0.0	Z	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.6	0.1	0.0	0.0	0.0	2.0	0.0	0.1	0.0	0.0	1.6	0.9	0.3	2.0	
21-Oct	0.1	0.2	0.3	0.1	0.1	Z	4.4	4.5	5.8	2.8	0.3	0.5	0.3	0.3	0.6	0.4	0.1	5.6	0.0	0.1	0.0	0.0	0.0	0.0	1.2	5.8	
22-Oct	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.1	0.1	0.4	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	1.1	
23-Oct	0.0	Z	0.1	0.1	0.1	0.1	0.2	3.7	3.8	1.2	0.4	0.3	0.5	0.8	0.4	0.3	0.1	0.1	0.0	1.8	0.1	0.1	0.1	0.0	0.6	3.8	
24-Oct	0.0	0.1	Z	0.1	0.3	0.0	0.3	0.3	0.8	0.5	0.5	0.3	0.3	0.2	0.3	0.3	0.2	0.1	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.8	
25-Oct	0.2	0.2	0.2	Z	2.1	0.2	0.1	0.2	0.4	0.3	0.6	0.1	0.4	0.3	0.3	0.1	0.2	0.1	0.1	0.0	0.1	0.2	0.0	0.1	0.3	2.1	
26-Oct	0.1	0.1	0.2	0.2	Z	0.1	0.0	3.2	0.0	0.2	0.4	0.5	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.0	0.2	0.2	0.2	0.3	3.2	
27-Oct	0.2	0.2	0.2	0.2	0.2	Z	0.2	0.9	0.1	0.1	C	C	C	C	C	0.2	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.1	0.2	0.9	
28-Oct	Z	0.1	0.2	0.7	0.1	0.1	0.2	2.0	0.1	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.2	2.0	
29-Oct	0.1	Z	0.5	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	3.7	0.1	0.1	0.1	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.3	3.7	
30-Oct	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	9.1	4.3	0.5	1.0	0.5	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.7	9.1	
31-Oct	0.0	0.0	0.0	Z	0.0	0.1	0.1	0.0	0.1	0.1	3.7	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.1	0.1	0.1	0.2	0.0	0.2	3.7	
																								Diurnal Average			
																								Diurnal Maximum			
0.3 0.3 0.7 1.2 0.8 0.7 1.6 3.0 5.1 1.5 1.0 0.8 1.0 0.9 0.6 0.7 0.5 0.8 0.8 0.9 0.3 0.4 0.3 0.4																											
4.3 2.7 10.8 25.4 14.4 13.4 12.5 23.0 45.4 5.2 3.7 3.6 4.8 3.7 2.5 4.6 2.6 5.6 6.5 18.2 2.4 6.4 4.5 6.1																											
Z - zerospan C - Calibration PF - Power Failure																											



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Conklin - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Conklin - October 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	698	99.43	99.43
21 - 40	3	0.43	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: 702

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Conklin - October 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	9	1	1	2	3	14	46	97	111	59	48	16	36	91	91	35	660
21 - 40	1	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	3
11 - 80	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	10	1	1	2	3	14	47	98	111	59	48	16	36	91	92	35	664

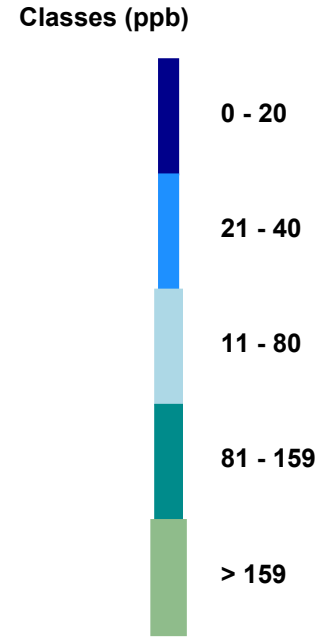
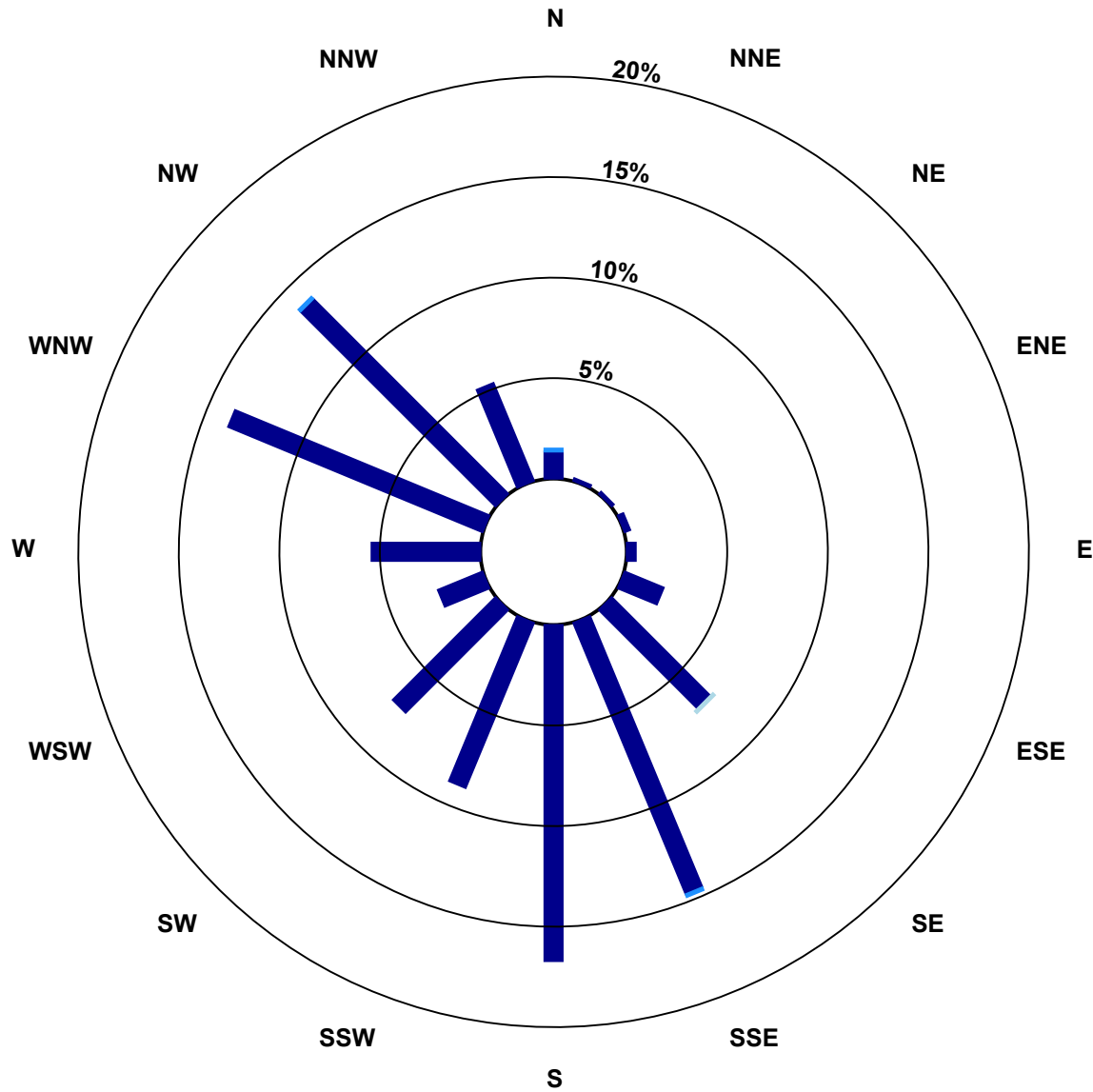
Total Number of Valid Hours: 664

Total Number of Hours: 744

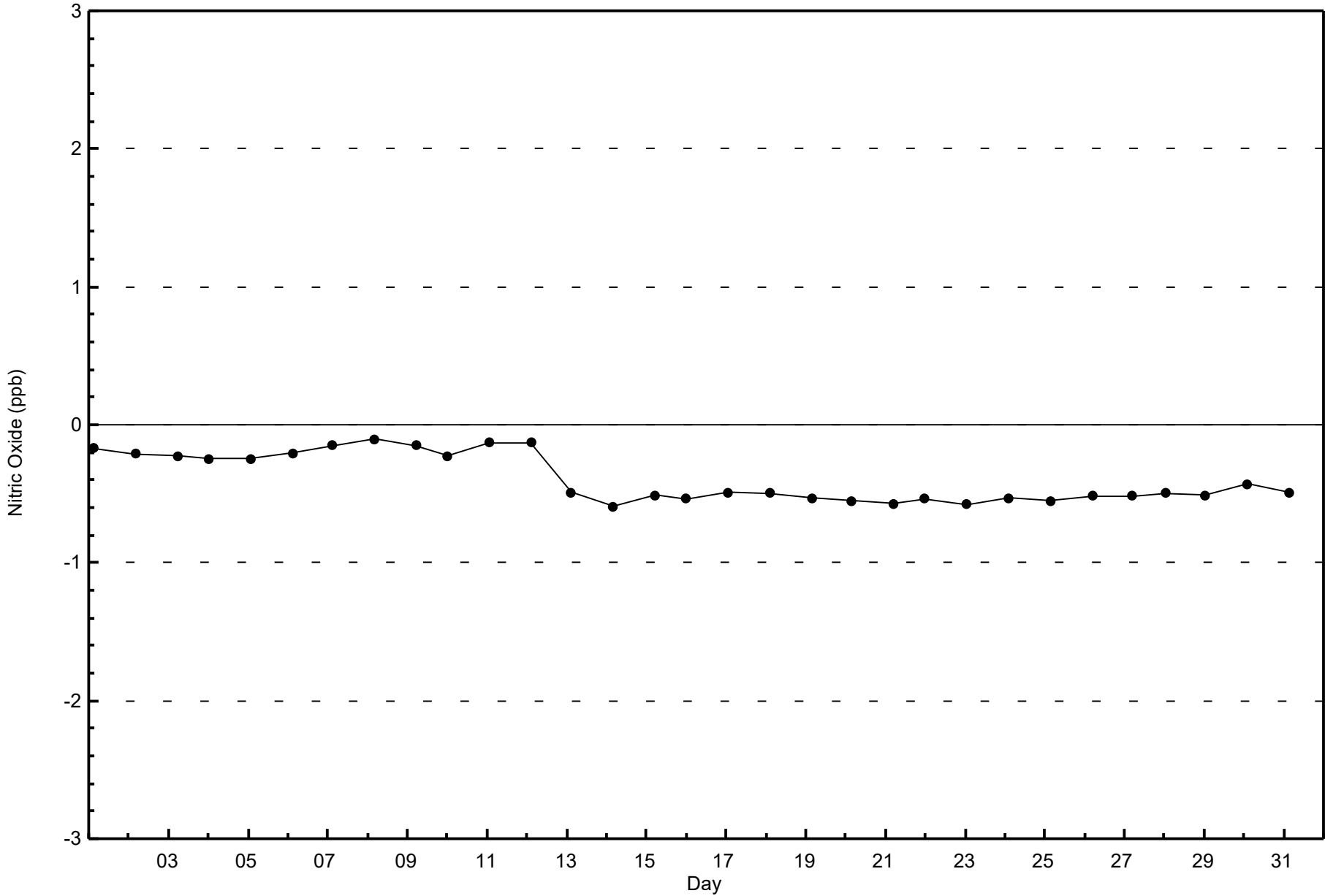


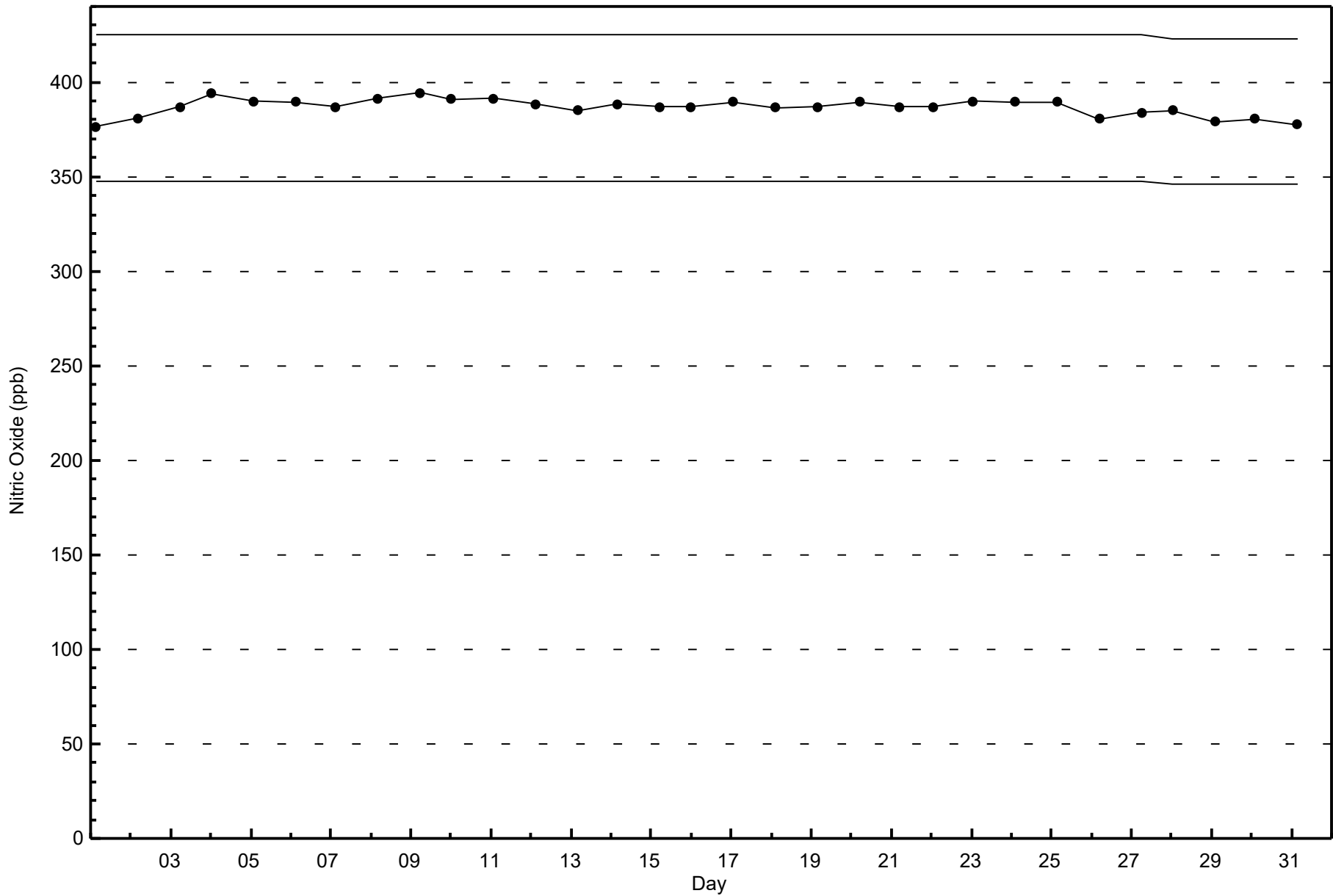
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitric Oxide (NO) - ppb
Conklin



Total Number of Valid Hours: 664







Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

Conklin - October 2023

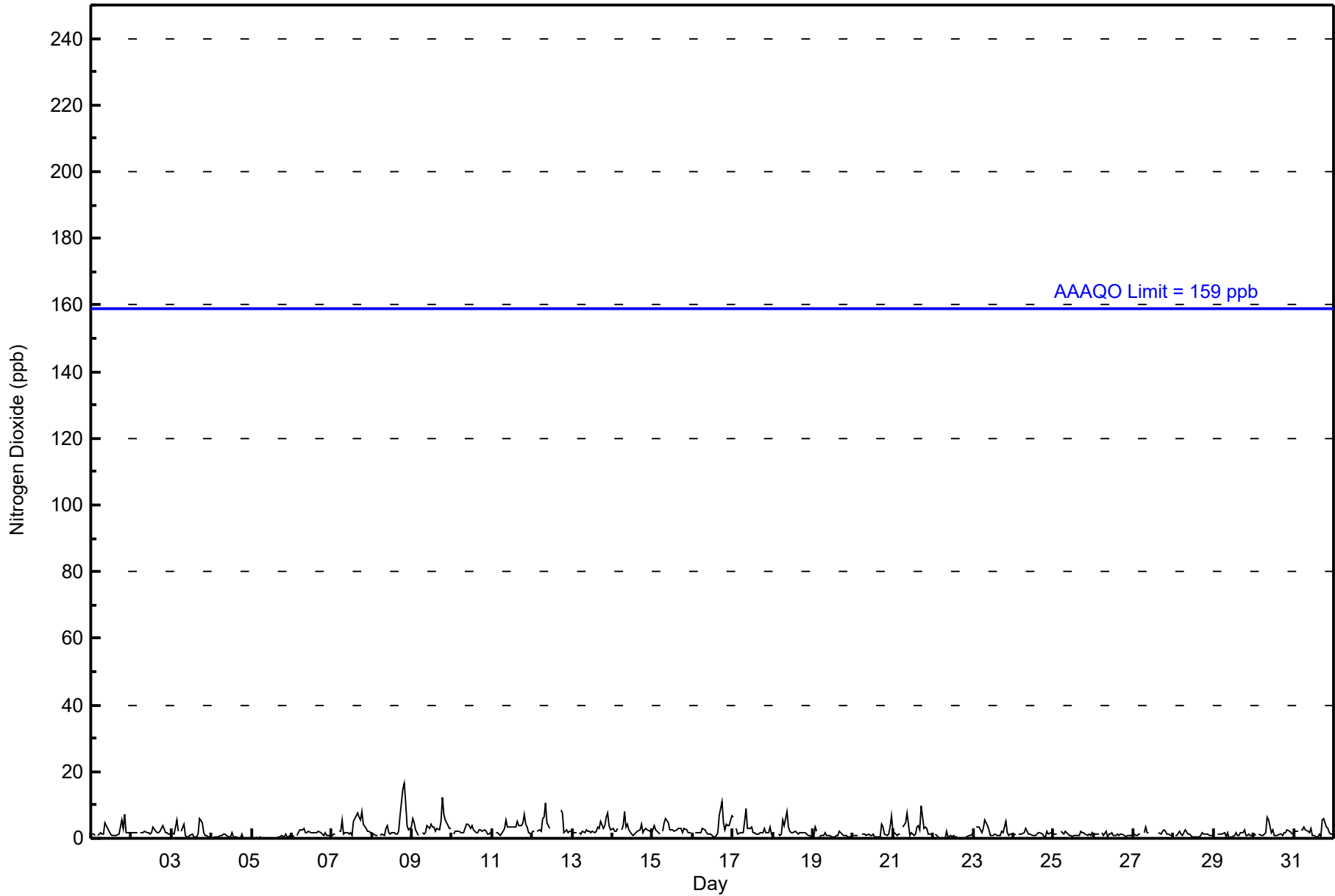
Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 744																	744					
Maximum Value: 16.6 ppb on Oct 8 20:00		Maximum Daily Average: 3.7 ppb on Oct 9																	Hours of Data: 702							
Minimum Value: 0.0 ppb on Oct 5 04:00		Minimum Daily Average: 0.3 ppb on Oct 5																	Hours of Missing Data: 42							
Maximum Diurnal Average: 3.4 ppb at hour 18		Minimum Diurnal Average: 1.4 ppb at hour 5																	Hours of Calibration: 36							
Monthly Average: 2.04 ppb		Percentiles: P ₁ = 0.1 P ₁₀ = 0.5 Q ₁ = 0.9 Median = 1.5 Q ₃ = 2.5 P ₉₀ = 4.0 P ₉₉ = 8.9																	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-Oct	1.3	1.2	0.8	Z	1.0	1.5	1.2	1.4	4.5	3.8	2.8	1.4	0.9	1.0	0.8	0.8	1.2	3.3	5.3	3.1	7.1	1.5	1.8	1.7	2.1	7.1
2-Oct	1.9	1.9	1.5	1.5	Z	1.7	1.9	1.6	2.0	1.5	1.7	1.4	1.7	3.3	2.1	1.8	1.7	2.1	2.8	3.7	1.8	1.5	1.3	1.2	1.9	3.7
3-Oct	1.6	1.4	3.5	5.6	2.2	Z	2.0	4.1	1.0	0.6	0.5	0.7	1.1	0.4	0.4	0.3	1.3	5.9	4.8	1.6	0.9	0.8	0.6	0.5	1.8	5.9
4-Oct	Z	0.4	0.4	0.4	0.5	0.7	0.8	1.4	1.2	0.7	0.4	0.5	1.5	0.6	0.5	0.3	0.2	0.2	1.1	0.1	0.1	0.1	0.1	0.1	0.5	1.5
5-Oct	0.1	Z	0.5	0.0	0.1	0.3	0.1	0.1	0.1	0.1	0.1	0.2	0.0	0.0	0.1	0.1	0.5	0.3	0.7	0.6	1.2	0.5	0.4	0.7	0.3	1.2
6-Oct	0.7	0.6	Z	0.8	1.7	2.5	2.7	3.1	1.7	1.7	2.2	1.8	1.8	1.7	1.7	1.8	2.3	1.7	1.3	1.0	1.5	1.0	0.8	0.6	1.6	3.1
7-Oct	0.7	1.1	1.1	Z	2.1	2.0	5.6	1.3	1.9	1.5	1.3	1.7	1.0	4.9	5.8	7.5	6.4	5.3	7.9	4.3	2.8	2.3	2.0	1.5	3.1	7.9
8-Oct	1.5	1.1	0.7	0.7	Z	0.8	1.1	1.0	2.8	3.7	1.5	1.1	1.7	1.5	1.2	1.4	2.0	6.8	14.8	16.6	10.6	3.9	2.7	3.3	3.6	16.6
9-Oct	6.0	4.5	2.5	1.8	1.0	Z	1.5	1.2	1.7	3.9	2.9	4.3	3.5	3.3	2.2	3.0	2.4	5.0	12.1	7.0	5.6	3.8	3.1	2.8	3.7	12.1
10-Oct	Z	1.2	2.3	2.2	2.0	1.8	1.6	1.8	4.4	4.1	3.9	3.0	4.0	2.6	1.5	1.8	2.5	2.5	2.3	2.5	2.1	1.2	1.4	1.7	2.4	4.4
11-Oct	1.9	Z	1.7	1.8	1.4	0.9	2.0	3.1	5.5	3.6	3.2	3.2	3.5	3.3	3.2	5.0	3.7	3.9	4.6	7.4	4.2	3.3	1.7	1.1	3.2	7.4
12-Oct	2.3	2.0	Z	2.1	2.4	2.0	5.8	6.4	10.4	4.7	3.0	PF	PF	PF	PF	PF	PF	8.5	7.8	1.9	2.6	1.5	2.2	2.0	--	10.4
13-Oct	1.8	1.6	1.5	Z	1.5	1.3	2.3	1.7	2.5	2.1	2.3	1.9	2.1	1.9	2.3	3.2	2.8	5.1	2.8	3.7	6.5	7.5	4.0	2.7	2.8	7.5
14-Oct	3.1	2.0	2.0	2.8	Z	2.7	3.8	8.0	3.3	4.1	2.4	1.4	0.9	1.3	1.7	2.2	2.7	4.3	1.7	2.7	3.0	2.7	2.3	1.9	2.7	8.0
15-Oct	2.6	4.0	2.7	1.6	1.3	Z	2.3	4.6	6.0	4.5	2.4	2.7	2.4	2.3	2.4	2.9	2.9	3.0	1.9	2.9	2.7	1.7	1.6	1.7	2.7	6.0
16-Oct	Z	1.9	1.8	1.7	1.7	1.9	3.1	2.4	1.8	1.4	1.3	1.2	0.6	0.5	0.7	1.7	6.7	11.2	4.6	2.4	4.4	3.8	4.0	6.6	2.9	11.2
17-Oct	6.4	Z	2.8	1.3	1.6	1.5	1.5	5.1	8.9	3.1	2.8	3.6	1.8	1.9	1.4	1.4	1.5	1.7	1.6	3.1	1.6	1.5	3.6	1.1	2.6	8.9
18-Oct	1.6	1.6	Z	1.1	0.8	1.1	5.5	3.7	8.2	3.3	2.1	1.9	1.8	2.2	1.8	1.4	1.8	1.7	1.6	1.6	1.3	0.9	0.7	0.6	2.1	8.2
19-Oct	0.6	3.3	2.0	Z	0.6	0.7	0.8	1.9	0.9	0.7	0.7	0.6	0.5	0.5	1.0	0.7	2.0	1.3	0.8	0.9	0.7	0.4	0.5	0.7	1.0	3.3
20-Oct	0.7	0.7	0.7	0.7	Z	1.1	1.1	1.3	1.0	1.1	0.9	0.9	1.1	0.6	0.4	0.3	0.3	4.1	3.3	1.2	0.8	1.4	3.5	6.6	1.5	6.6
21-Oct	2.3	1.2	1.0	1.1	1.2	Z	3.6	4.5	7.8	4.3	1.0	1.6	1.0	1.4	3.3	4.0	2.7	9.7	2.9	3.5	2.9	1.3	1.1	1.1	2.8	9.7
22-Oct	Z	1.2	0.7	0.4	0.2	0.1	0.1	0.1	2.1	0.4	0.8	0.5	1.0	0.6	0.3	0.2	0.2	0.2	0.1	0.2	0.5	0.7	0.8	1.1	0.5	2.1
23-Oct	1.6	Z	3.6	3.6	2.4	1.9	3.0	5.3	4.0	2.6	0.8	0.8	1.0	1.4	1.0	0.8	0.9	2.3	1.9	4.9	1.6	0.8	1.1	1.3	2.1	5.3
24-Oct	0.7	1.2	Z	1.1	1.3	1.4	1.7	3.0	2.2	1.4	1.1	0.9	0.9	0.9	1.3	1.5	1.6	1.1	0.5	0.5	2.0	1.3	1.5	1.6	1.3	3.0
25-Oct	1.4	1.3	1.2	Z	2.3	1.5	1.4	2.0	1.6	0.8	1.0	0.5	0.9	0.9	0.9	0.8	2.2	1.6	1.8	1.1	0.9	1.3	1.0	1.8	1.3	2.3
26-Oct	0.9	1.2	1.4	1.4	Z	1.6	0.8	2.1	0.5	1.3	1.2	1.5	0.9	0.8	1.3	1.0	1.2	1.4	0.9	0.6	0.7	1.0	1.0	0.8	1.1	2.1
27-Oct	1.1	0.9	1.0	1.2	1.2	Z	1.5	3.3	1.5	1.7	C	C	C	C	C	1.9	1.4	2.0	2.5	2.2	1.3	1.3	0.9	0.6	1.5	3.3
28-Oct	Z	0.8	0.9	2.3	1.2	1.0	1.8	2.5	1.4	1.1	0.9	0.6	0.5	0.4	0.4	0.4	1.0	1.8	1.2	1.1	1.1	1.0	0.8	0.8	1.1	2.5
29-Oct	1.0	Z	1.3	1.2	1.1	1.4	1.5	0.4	1.5	0.2	0.3	0.6	0.9	1.6	0.8	1.0	1.6	1.7	2.6	0.8	0.9	1.4	1.0	0.7	1.1	2.6
30-Oct	1.4	0.9	Z	1.3	0.9	0.9	1.4	1.7	6.2	5.4	1.6	2.4	1.0	0.8	0.7	1.1	1.1	0.9	1.6	1.6	2.7	2.0	1.6	1.4	1.8	6.2
31-Oct	1.8	2.0	2.1	Z	2.5	2.7	3.2	2.7	2.2	1.7	3.0	1.0	0.8	0.6	0.6	1.3	0.6	5.5	5.8	3.6	2.9	1.5	1.1	1.1	2.2	5.8
																								Diurnal Average		
																								Diurnal Maximum		
																								Diurnal Average		
																								Diurnal Maximum		
																								Diurnal Average		
																								Diurnal Maximum		

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



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Conklin - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Conklin - October 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	702	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 702

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Nitrogen Dioxide (NO₂) - ppb
Conklin - October 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	1	1	2	3	14	47	98	111	59	48	16	36	91	92	35	664
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	10	1	1	2	3	14	47	98	111	59	48	16	36	91	92	35	664

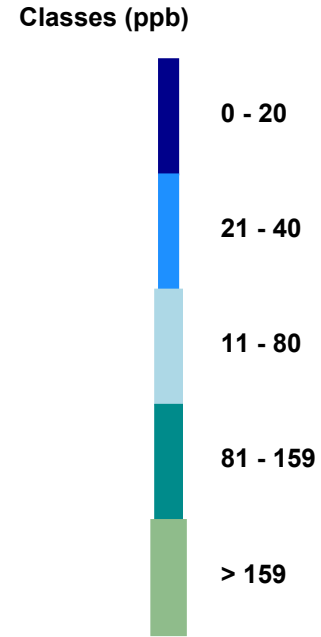
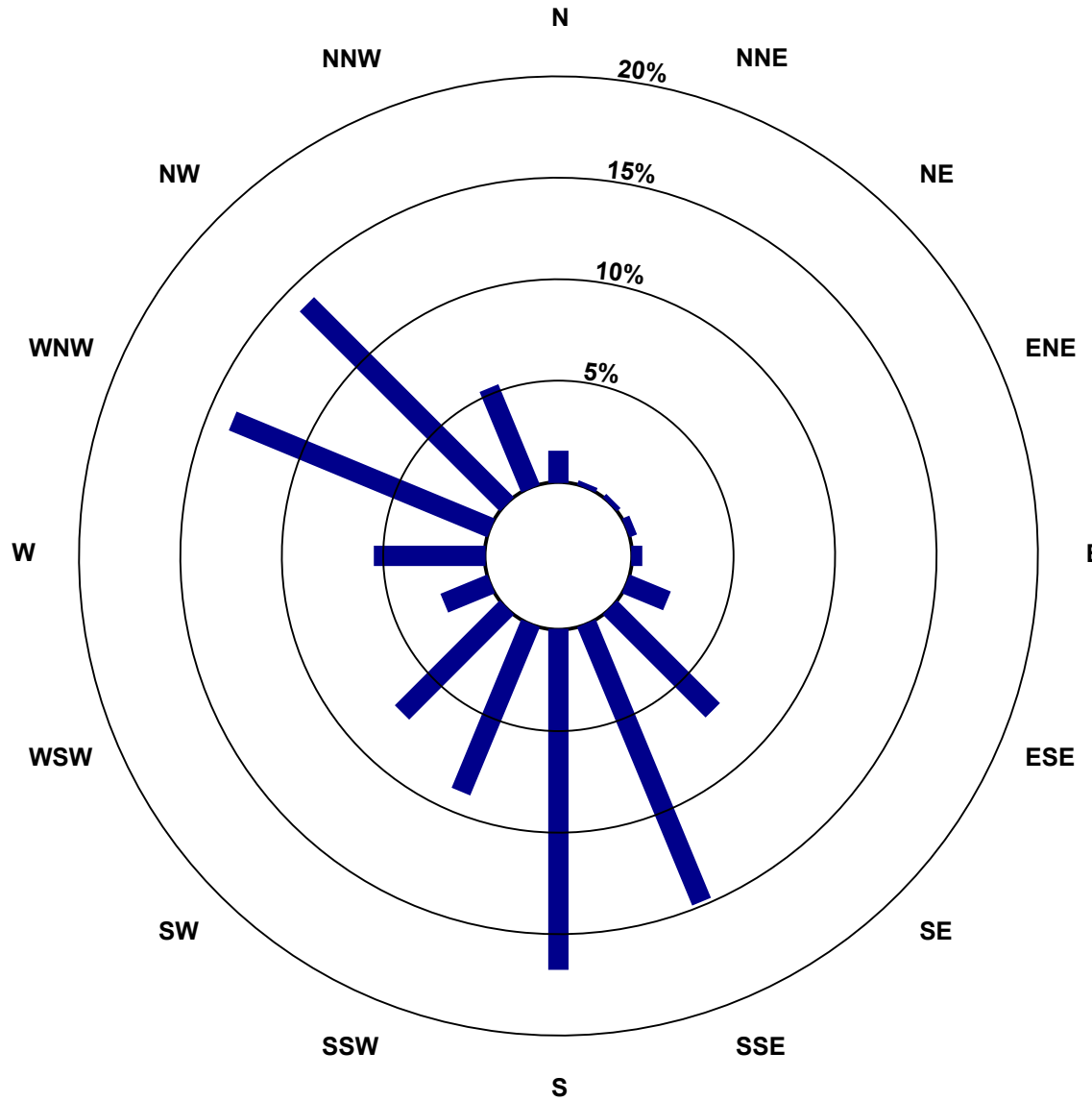
Total Number of Valid Hours: 664

Total Number of Hours: 744

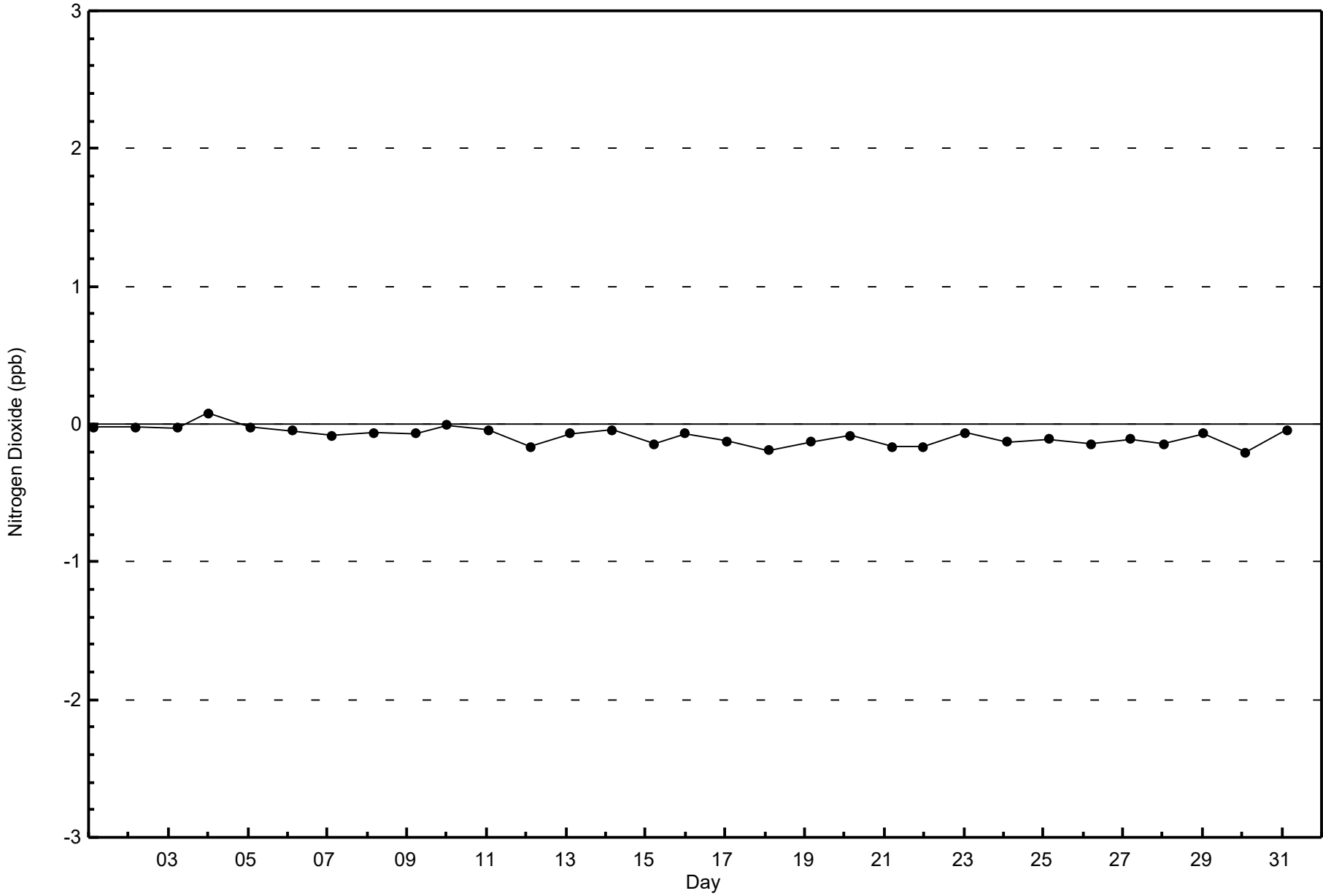


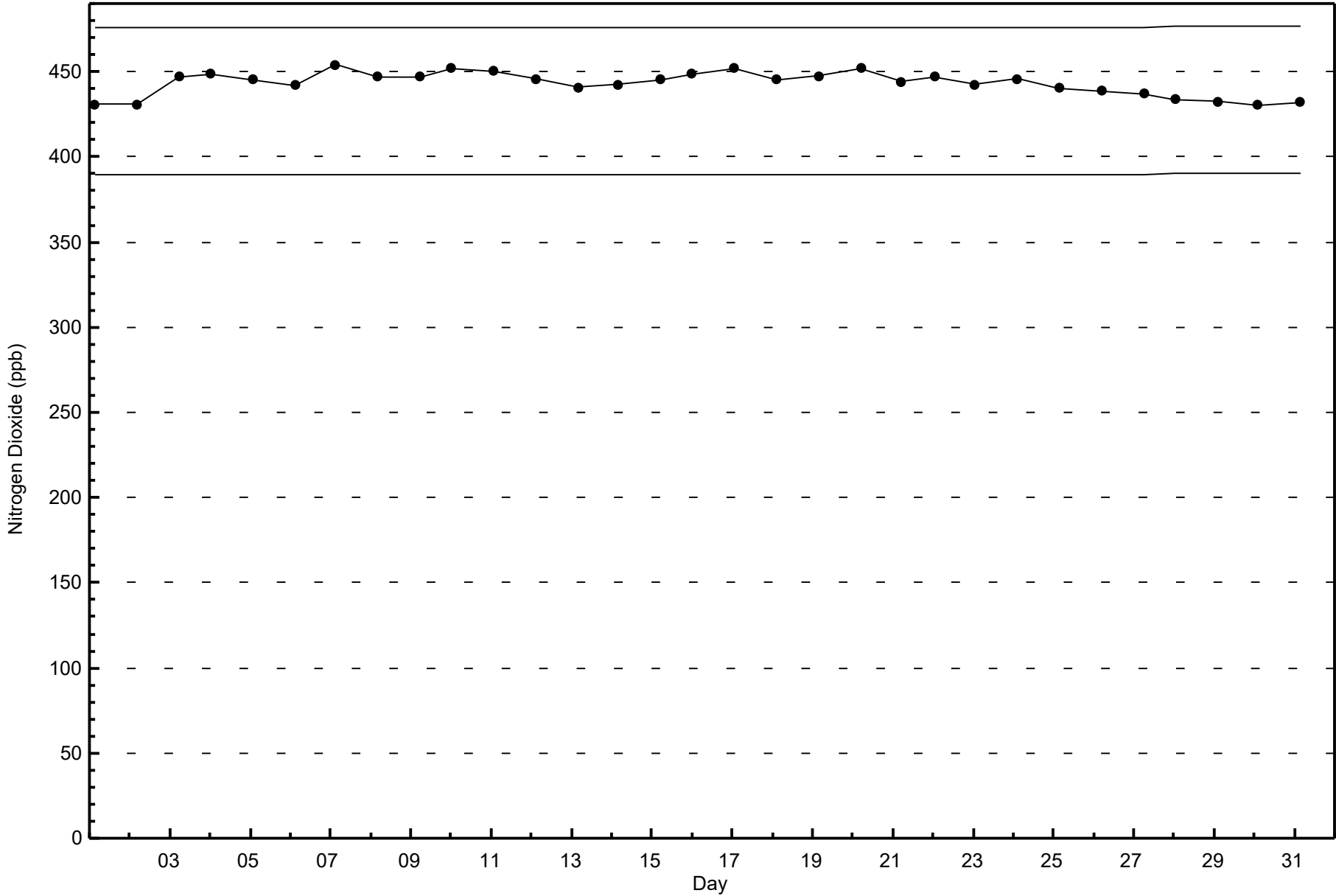
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitrogen Dioxide (NO₂) - ppb
Conklin



Total Number of Valid Hours: 664







Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_x) - ppb

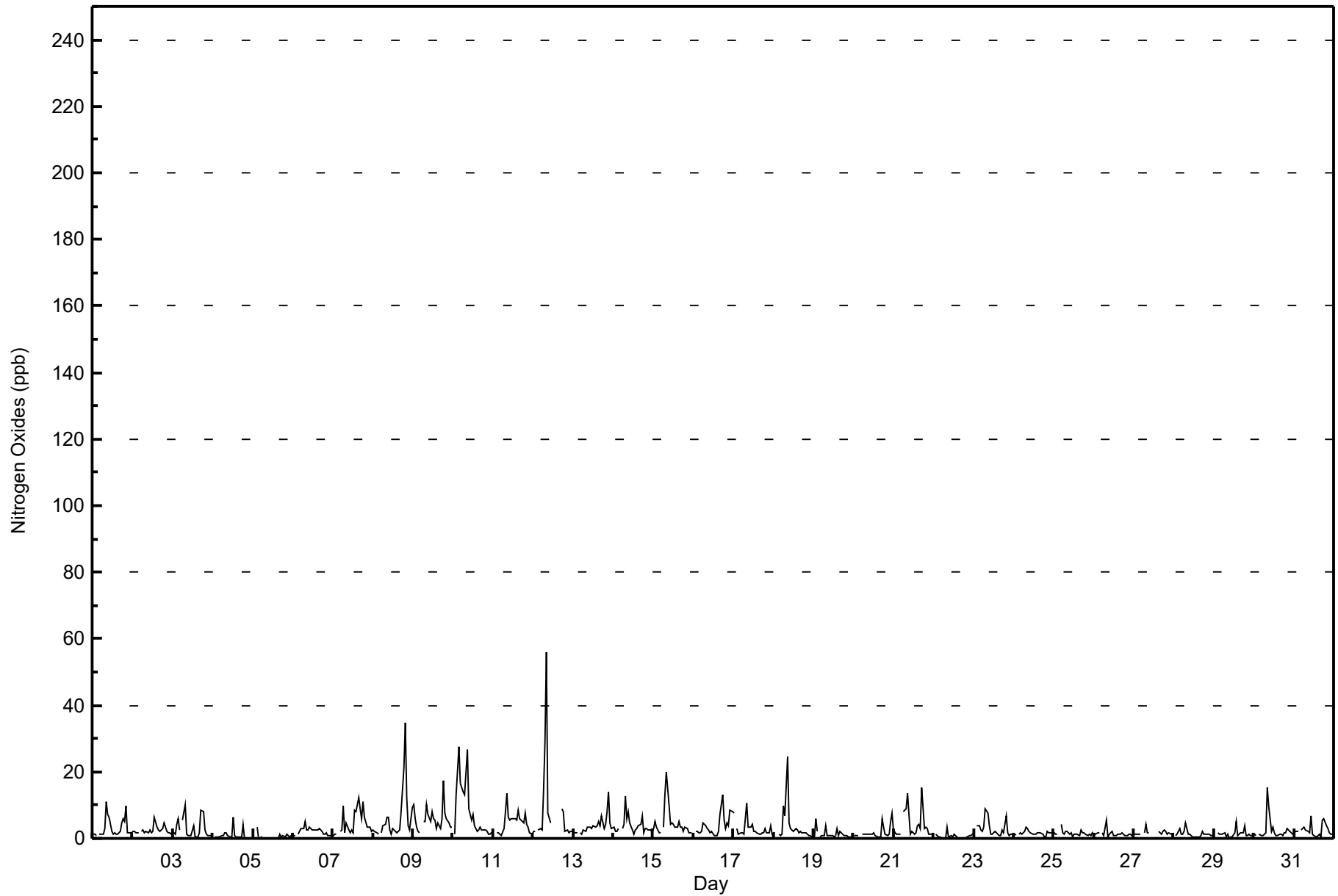
Conklin - October 2023

Maximum Value: 55.8 ppb on Oct 12 09:00																				Maximum Daily Average: 7.9 ppb on Oct 10					Hours in Service:	744
Minimum Value: 0.1 ppb on Oct 5 16:00																				Minimum Daily Average: 0.5 ppb on Oct 5					Hours of Data:	702
Maximum Diurnal Average: 8.3 ppb at hour 9																				Minimum Diurnal Average: 1.9 ppb at hour 2					Hours of Missing Data:	42
Monthly Average: 3.08 ppb																				Percentiles: P ₁ = 0.1 P ₁₀ = 0.6 Q ₁ = 1.1 Median = 1.8 Q ₃ = 3.4 P ₉₀ = 6.7 P ₉₉ = 19.8					Hours of Calibration:	36
																									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-Oct	1.4	1.3	0.9	Z	1.1	1.5	1.3	3.2	11.1	7.1	6.2	2.0	1.3	1.5	1.1	1.2	2.1	4.6	5.8	5.1	9.5	1.6	1.9	1.8	3.3	11.1
2-Oct	2.0	2.0	1.6	1.6	Z	2.0	2.5	1.7	2.3	1.8	2.4	1.7	2.0	6.4	3.2	2.4	2.2	2.6	3.1	4.6	2.0	1.8	1.5	1.3	2.4	6.4
3-Oct	1.9	1.5	4.2	6.1	2.4	Z	5.4	10.3	1.3	0.8	0.7	1.0	3.7	0.6	0.5	0.4	1.5	8.5	8.1	2.5	1.2	0.9	0.8	0.7	2.8	10.3
4-Oct	Z	0.5	0.5	0.5	0.6	0.9	0.9	1.6	1.5	0.9	0.6	0.6	6.3	1.0	0.6	0.4	0.3	0.4	4.4	0.2	0.2	0.2	0.2	0.2	1.0	6.3
5-Oct	0.2	Z	3.6	0.1	0.2	0.4	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	1.1	0.3	0.7	0.6	1.4	0.9	0.6	0.9	0.5	3.6
6-Oct	0.9	1.0	Z	1.1	2.0	2.8	3.0	4.9	2.6	2.4	3.3	2.7	2.7	2.4	2.4	2.5	2.8	2.1	1.5	1.2	1.9	1.0	0.8	0.6	2.1	4.9
7-Oct	0.7	1.2	1.5	Z	2.3	2.5	9.7	1.8	4.6	2.5	1.8	2.5	1.5	8.3	7.8	12.1	9.0	5.9	10.9	6.4	3.3	3.2	3.6	2.3	4.6	12.1
8-Oct	2.7	2.1	1.6	1.3	Z	1.9	4.0	4.4	6.4	6.5	2.4	1.4	2.9	2.0	1.5	2.0	2.5	8.0	21.3	34.8	12.3	3.9	2.7	9.4	6.0	34.8
9-Oct	10.3	6.0	3.4	2.3	1.9	Z	5.3	5.0	10.0	7.3	4.9	7.9	5.9	5.4	3.1	4.6	3.0	5.9	17.4	7.4	5.8	4.8	3.6	3.4	5.9	17.4
10-Oct	Z	1.5	13.1	27.6	16.4	15.2	14.1	13.2	26.8	8.9	7.3	5.4	7.1	4.0	2.1	2.4	3.4	2.5	2.3	2.5	2.1	1.2	1.4	1.7	7.9	27.6
11-Oct	1.9	Z	1.7	1.8	1.4	0.9	3.2	8.2	13.7	6.4	5.5	5.9	5.8	5.7	5.7	8.7	5.8	5.2	4.6	7.8	4.2	3.3	1.7	1.1	4.8	13.7
12-Oct	2.3	2.0	Z	2.6	3.0	2.5	14.2	29.4	55.8	7.7	4.7	PF	PF	PF	PF	PF	PF	9.0	8.0	1.9	2.6	1.5	2.3	2.1	--	55.8
13-Oct	1.9	1.6	1.5	Z	1.5	1.4	2.6	2.2	3.3	3.4	3.6	3.1	3.8	3.4	4.0	5.1	3.8	6.7	3.1	4.1	8.1	13.9	4.5	2.8	3.9	13.9
14-Oct	3.2	2.2	2.1	2.9	Z	2.8	4.2	12.5	6.1	8.1	4.6	2.5	1.5	2.4	2.9	3.6	4.4	6.8	1.7	2.9	3.1	2.7	2.4	1.9	3.8	12.5
15-Oct	2.8	4.9	3.3	1.9	1.5	Z	3.5	13.0	19.8	9.7	4.0	4.5	4.2	3.4	3.5	4.9	3.5	3.5	2.1	3.2	2.8	1.8	1.7	1.8	4.6	19.8
16-Oct	Z	2.0	1.9	1.8	1.8	2.1	4.7	3.7	3.1	2.3	1.9	2.2	0.7	0.6	0.9	2.1	7.2	13.2	5.3	2.8	4.5	3.9	8.5	8.0	3.7	13.2
17-Oct	7.6	Z	2.8	1.3	1.6	1.5	1.5	5.8	10.6	3.5	3.4	4.4	2.0	2.2	1.6	1.5	1.5	1.7	1.6	3.1	1.7	1.8	3.6	1.1	2.9	10.6
18-Oct	1.7	1.6	Z	1.1	0.8	1.4	9.8	6.7	24.7	4.5	2.9	2.5	2.3	2.9	2.3	1.5	2.0	1.9	1.7	1.6	1.3	0.9	0.7	0.6	3.4	24.7
19-Oct	0.6	6.0	2.0	Z	0.6	0.7	0.9	4.0	1.0	0.9	0.8	0.7	0.6	0.6	2.8	0.7	2.2	1.3	0.8	0.9	0.7	0.4	0.5	0.8	1.3	6.0
20-Oct	0.7	0.8	0.7	0.7	Z	1.2	1.2	1.4	1.2	1.3	1.2	1.2	1.7	0.7	0.4	0.3	0.3	6.1	3.3	1.3	0.8	1.4	5.1	7.5	1.8	7.5
21-Oct	2.4	1.4	1.3	1.2	1.3	Z	8.0	9.0	13.6	7.1	1.3	2.1	1.3	1.7	3.9	4.4	2.8	15.3	2.9	3.6	2.9	1.3	1.1	1.1	4.0	15.3
22-Oct	Z	1.2	0.7	0.4	0.2	0.1	0.1	0.1	3.2	0.4	0.9	0.6	1.4	0.7	0.4	0.2	0.2	0.2	0.1	0.2	0.5	0.7	0.8	1.2	0.6	3.2
23-Oct	1.6	Z	3.7	3.7	2.5	2.0	3.2	9.0	7.8	3.8	1.2	1.1	1.5	2.2	1.4	1.1	1.0	2.4	1.9	6.7	1.7	0.9	1.2	1.3	2.7	9.0
24-Oct	0.7	1.3	Z	1.2	1.6	1.4	2.0	3.3	3.0	1.9	1.6	1.2	1.2	1.1	1.6	1.8	1.8	1.2	0.5	0.5	2.2	1.5	1.7	1.8	1.6	3.3
25-Oct	1.6	1.5	1.4	Z	4.4	1.7	1.5	2.2	2.0	1.1	1.6	0.6	1.3	1.2	1.2	0.9	2.4	1.7	1.9	1.1	1.0	1.5	1.0	1.9	1.6	4.4
26-Oct	1.0	1.3	1.6	1.6	Z	1.7	0.8	5.3	0.5	1.5	1.6	2.0	1.1	0.9	1.5	1.2	1.4	1.6	1.0	0.7	0.7	1.2	1.2	1.0	1.4	5.3
27-Oct	1.3	1.1	1.2	1.4	1.4	Z	1.7	4.2	1.6	1.8	C	C	C	C	C	2.1	1.4	2.0	2.5	2.2	1.4	1.5	1.1	0.7	1.7	4.2
28-Oct	Z	0.9	1.1	3.0	1.3	1.1	2.0	4.5	1.5	1.3	1.0	0.6	0.6	0.4	0.4	0.4	1.0	1.9	1.3	1.2	1.2	1.1	0.8	0.8	1.3	4.5
29-Oct	1.1	Z	1.8	1.3	1.2	1.4	1.5	0.4	1.5	0.2	0.3	0.6	1.9	5.3	0.9	1.1	1.7	1.7	3.7	0.8	0.9	1.4	1.0	0.7	1.4	5.3
30-Oct	1.4	0.9	Z	1.3	0.9	0.9	1.4	1.8	15.3	9.7	2.1	3.4	1.5	1.0	0.9	1.3	1.2	1.0	1.7	1.7	2.8	2.2	1.7	1.4	2.5	15.3
31-Oct	1.8	2.0	2.1	Z	2.5	2.8	3.3	2.7	2.3	1.8	6.7	1.1	0.8	0.6	0.6	1.3	0.6	5.6	6.1	3.7	3.0	1.6	1.3	1.1	2.4	6.7
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan C - Calibration PF - Power Failure																										



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Conklin - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Conklin - October 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	695	99.00	99.00
21 - 40	6	0.85	99.86
41 - 80	1	0.14	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 702

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Conklin - October 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	9	1	1	2	3	14	46	96	110	59	48	16	36	91	91	34	657
21 - 40	1	0	0	0	0	0	0	2	1	0	0	0	0	0	1	1	6
11 - 80	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	10	1	1	2	3	14	47	98	111	59	48	16	36	91	92	35	664

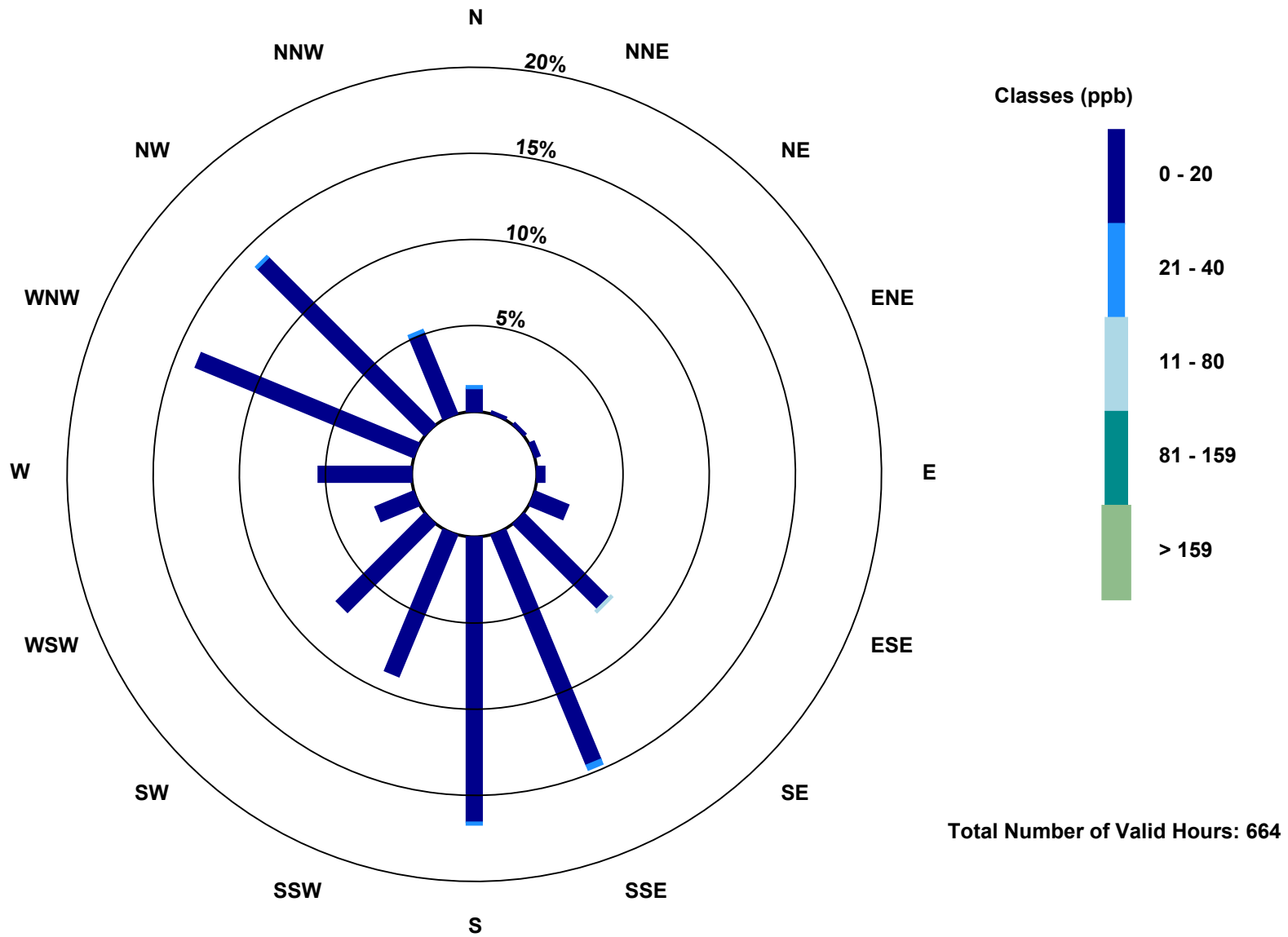
Total Number of Valid Hours: 664

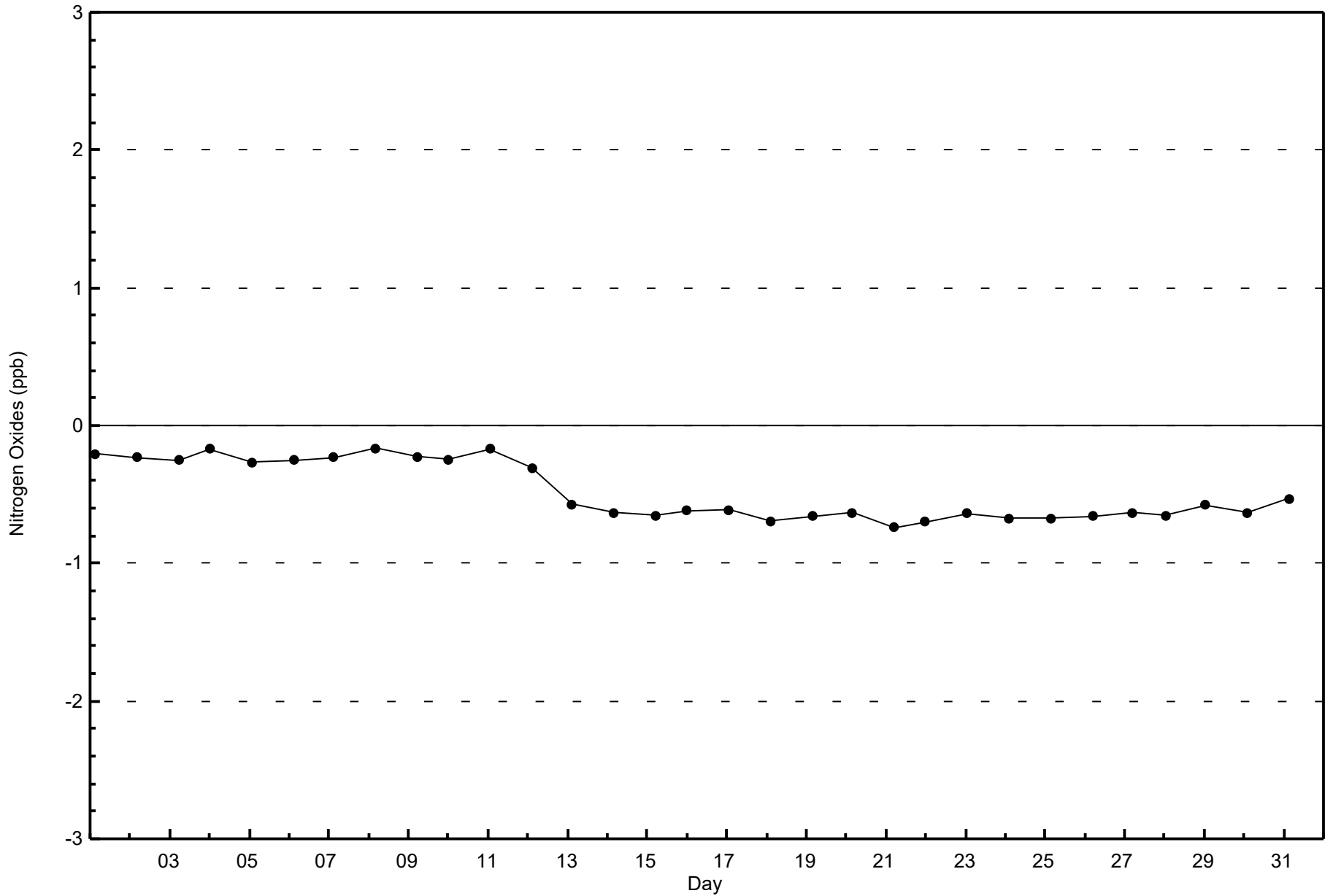
Total Number of Hours: 744

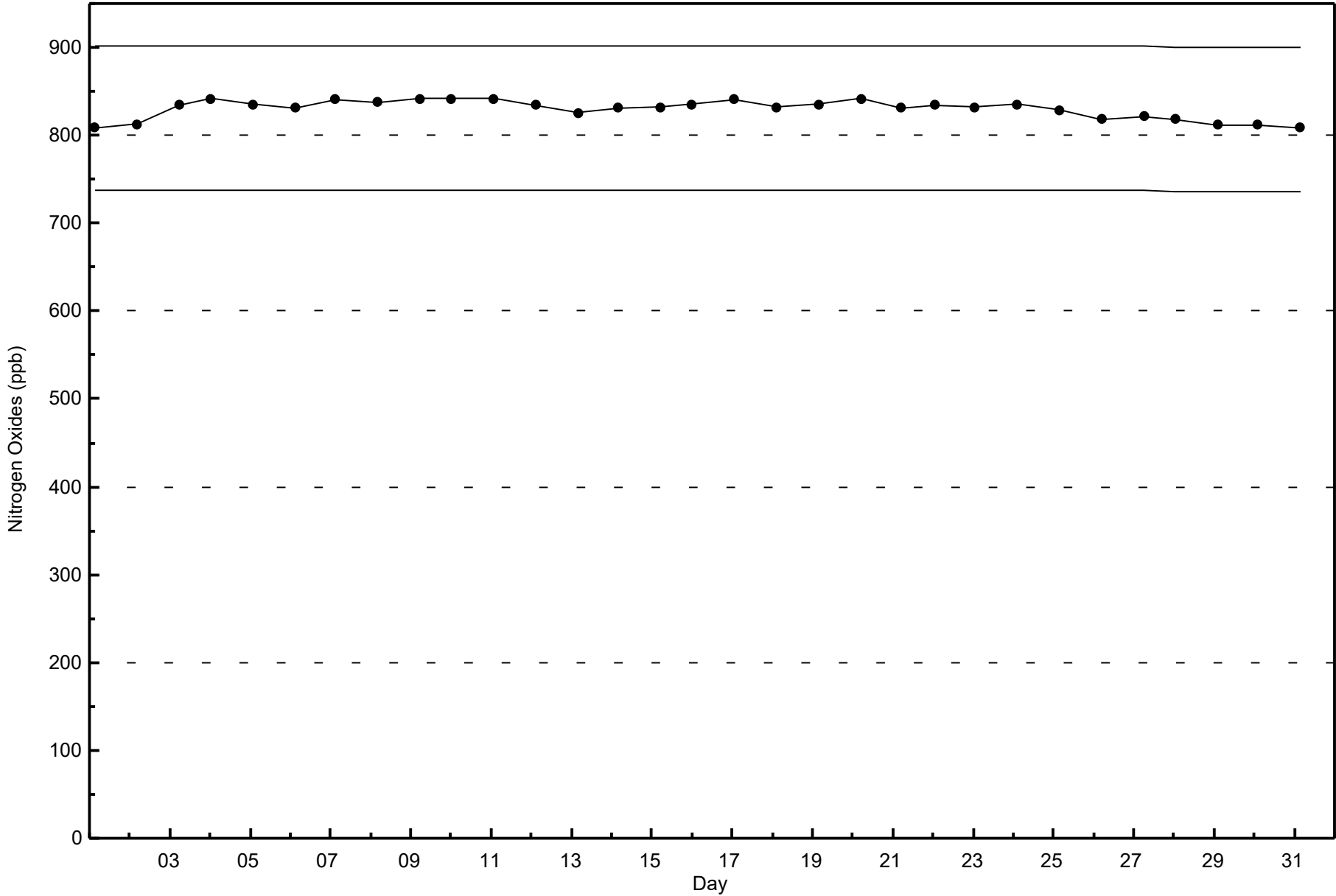


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitrogen Oxides (NO_x) - ppb
Conklin









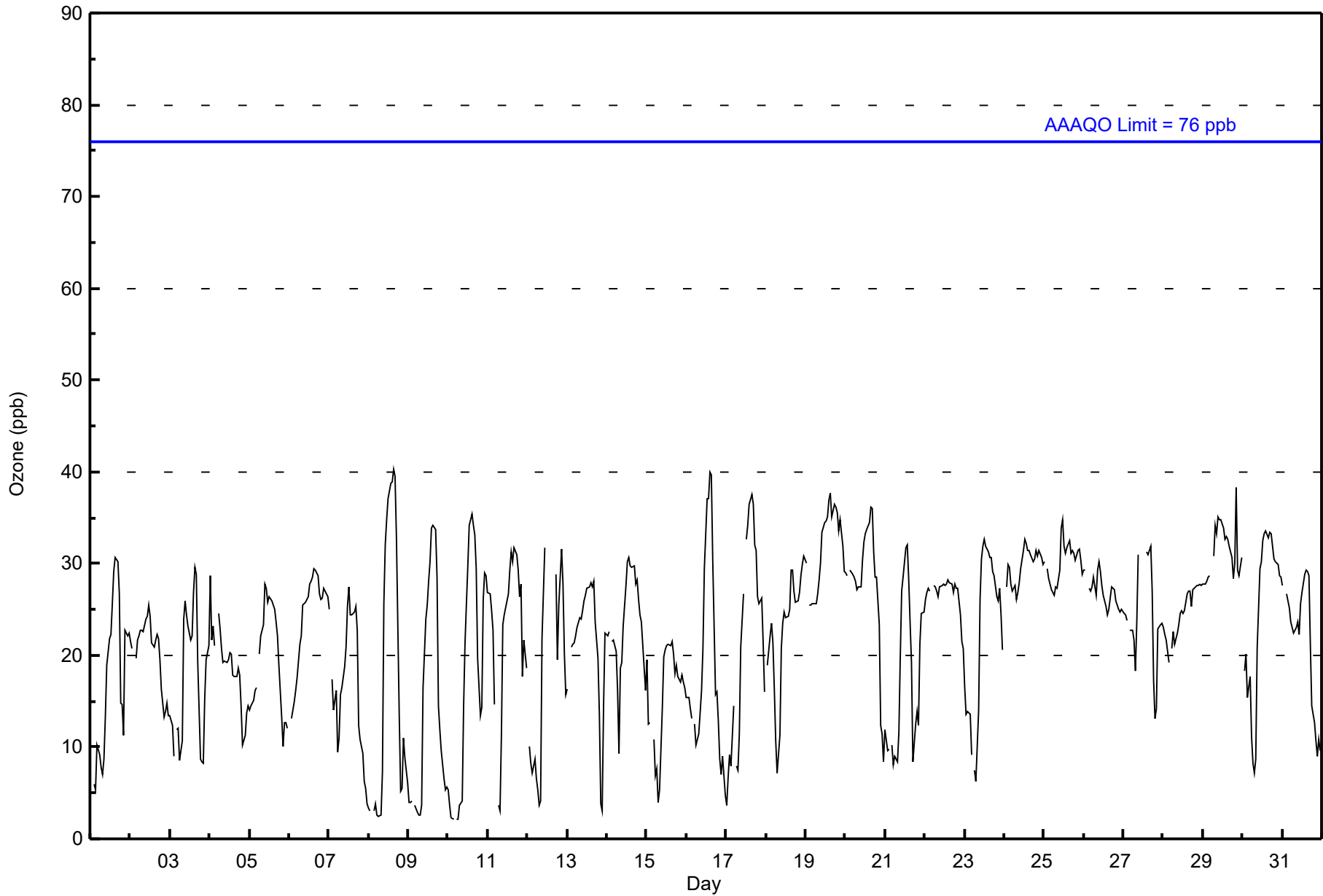
Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O₃) - ppb

Conklin - October 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service:																	744						
Maximum Value: 40.3 ppb on Oct 8 16:00		Maximum Daily Average: 31.7 ppb on Oct 19																	Hours of Data:	702							
Minimum Value: 2.1 ppb on Oct 10 06:00		Minimum Daily Average: 14.6 ppb on Oct 9																	Hours of Missing Data:	42							
Maximum Diurnal Average: 30.0 ppb at hour 16		Minimum Diurnal Average: 15.5 ppb at hour 8																	Hours of Calibration:	35							
Monthly Average: 22.18 ppb		Percentiles: P ₁ = 2.6 P ₁₀ = 8.6 Q ₁ = 15.7 Median = 24.4 Q ₃ = 28.6 P ₉₀ = 31.9 P ₉₉ = 37.7																	Percent Operational Time:	99.1							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Oct	6.0	Z	5.9	5.4	10.2	9.2	7.8	6.9	8.7	13.3	18.8	21.8	22.2	25.7	29.2	30.7	30.2	26.7	14.8	14.6	11.3	22.8	22.2	22.4	16.8	30.7	
2-Oct	21.5	20.8	Z	19.7	21.6	22.1	22.7	22.8	22.6	24.0	24.3	25.5	24.2	21.3	20.9	21.7	22.2	21.8	19.6	16.4	13.3	13.9	14.8	13.5	20.5	25.5	
3-Oct	13.4	12.4	9.1	Z	11.9	12.1	8.5	10.7	24.0	25.9	24.4	23.3	21.7	22.1	26.9	29.6	28.9	19.3	8.7	8.5	8.3	15.3	19.5	21.1	17.6	29.6	
4-Oct	28.7	21.7	23.2	21.1	Z	24.6	22.9	20.8	19.3	19.4	19.3	19.5	20.2	20.2	17.8	17.7	18.7	18.7	14.5	10.2	11.3	13.7	14.4	18.9	28.7		
5-Oct	14.1	14.5	15.2	16.1	16.5	Z	20.1	22.1	23.3	27.8	27.3	25.8	26.3	25.9	25.4	25.1	23.6	22.1	18.9	13.2	10.1	12.6	12.7	12.1	19.6	27.8	
6-Oct	Z	13.2	14.1	14.9	16.2	17.5	21.2	22.1	25.5	25.7	25.8	26.5	27.8	28.0	28.5	29.4	29.3	28.6	26.7	26.1	26.2	27.3	26.7	26.4	24.1	29.4	
7-Oct	25.0	Z	17.4	14.0	16.2	9.5	11.0	15.7	16.5	18.7	20.9	25.4	27.5	24.4	24.5	24.7	25.4	22.8	12.4	10.9	9.3	6.3	5.4	3.8	16.9	27.5	
8-Oct	3.4	3.1	Z	3.0	3.9	2.6	2.4	2.6	7.3	25.7	32.0	34.7	37.0	38.8	38.8	40.3	39.5	32.9	13.4	5.1	5.5	11.0	8.8	6.1	17.3	40.3	
9-Oct	4.0	4.0	4.1	Z	3.7	2.8	2.6	2.6	3.6	16.5	23.9	25.5	28.1	30.2	33.9	34.2	33.7	28.5	14.6	12.0	9.7	6.6	5.3	5.6	14.6	34.2	
10-Oct	5.4	3.7	2.3	2.1	Z	2.1	2.1	3.6	4.2	14.4	21.3	25.7	29.8	34.1	35.3	34.2	33.0	29.5	19.7	13.4	14.3	26.1	29.0	28.7	18.0	35.3	
11-Oct	26.9	26.7	24.8	22.7	14.7	Z	3.7	3.1	11.3	23.3	24.4	25.2	26.6	29.3	31.2	30.2	31.8	31.0	29.2	26.4	27.8	17.7	21.7	18.6	23.0	31.8	
12-Oct	Z	10.1	8.3	7.2	8.7	6.6	5.3	3.6	4.1	21.9	31.7	PF	PF	PF	PF	PF	PF	28.8	19.5	25.5	31.5	27.8	20.1	15.7	--	31.7	
13-Oct	16.3	Z	20.9	21.2	21.4	22.1	23.0	24.1	24.0	24.9	25.9	26.6	27.2	27.5	27.9	27.4	28.0	23.7	19.7	13.5	3.8	3.0	14.5	22.4	21.3	28.0	
14-Oct	22.2	22.6	Z	21.6	21.7	20.4	16.2	9.3	18.6	19.2	23.1	27.6	30.2	30.7	29.8	29.6	29.7	27.8	28.3	26.0	24.5	23.6	18.7	16.2	23.4	30.7	
15-Oct	19.6	12.5	12.7	Z	10.8	6.9	7.6	4.0	5.4	14.4	19.8	20.6	21.0	21.3	21.0	21.5	20.2	18.1	18.9	17.7	17.1	17.9	17.1	16.5	15.8	21.5	
16-Oct	15.3	15.4	14.2	13.1	Z	12.5	10.2	11.4	13.7	16.2	20.7	29.5	37.1	37.0	40.0	39.6	30.4	15.6	16.0	12.8	8.7	7.0	9.0	4.8	18.7	40.0	
17-Oct	3.7	6.6	9.2	7.9	14.5	Z	7.9	7.5	11.5	20.8	26.7	M	32.6	34.1	36.4	37.6	36.5	32.1	31.5	26.3	25.6	26.3	21.5	16.0	21.5	37.6	
18-Oct	Z	19.0	22.1	23.5	21.3	16.3	10.7	7.1	11.2	20.7	23.5	24.7	24.1	24.2	25.1	29.3	29.3	26.9	25.8	25.9	26.8	28.6	29.8	30.8	22.9	30.8	
19-Oct	30.1	Z	25.4	25.5	25.7	25.7	25.7	26.8	28.3	30.0	33.4	34.5	34.6	35.1	36.8	37.7	35.2	36.4	36.2	35.5	33.6	34.8	31.8	29.2	31.7	37.7	
20-Oct	28.9	28.6	Z	29.3	28.8	28.5	28.0	27.2	27.4	27.4	30.3	32.3	33.2	33.7	34.5	36.2	36.0	31.2	28.5	28.6	23.3	12.4	11.4	8.4	27.6	36.2	
21-Oct	12.0	9.6	9.7	Z	10.1	8.0	9.0	8.4	11.7	19.9	27.0	28.5	31.7	32.0	28.4	23.6	19.2	8.4	12.5	13.9	12.4	21.2	24.5	24.7	17.7	32.0	
22-Oct	26.1	26.8	27.3	27.1	Z	27.7	27.4	27.0	26.4	27.4	27.5	27.8	27.5	27.8	28.2	28.0	27.8	26.9	27.7	27.3	27.2	24.4	21.5	20.7	26.7	28.2	
23-Oct	16.6	13.6	13.9	13.6	9.2	Z	7.5	6.2	14.0	26.0	30.5	31.9	32.7	31.9	31.3	30.7	30.7	29.1	28.7	26.4	25.9	27.3	24.4	20.6	22.7	32.7	
24-Oct	Z	27.4	29.9	29.5	27.8	27.0	27.6	26.2	26.9	27.9	29.5	31.5	32.6	32.2	31.5	31.5	31.0	30.2	30.5	31.4	30.9	31.5	30.7	30.0	29.8	32.6	
25-Oct	30.2	Z	29.5	28.3	27.1	26.8	26.5	27.4	27.3	29.3	33.9	34.8	31.9	31.1	31.7	32.5	31.2	31.4	31.2	30.4	31.5	31.5	30.3	28.9	30.2	34.8	
26-Oct	29.2	29.3	Z	27.3	27.0	27.4	28.5	26.6	29.2	30.2	29.1	27.6	26.5	25.3	24.5	25.0	26.2	27.4	27.1	25.9	25.4	25.0	24.7	25.0	26.9	30.2	
27-Oct	24.5	24.4	23.7	Z	22.8	22.7	21.7	18.3	23.7	30.9	C	C	C	C	31.3	30.9	31.9	27.0	17.2	13.1	14.1	22.8	23.4	23.5	23.6	31.9	
28-Oct	23.1	22.3	21.6	19.2	Z	20.7	22.6	21.3	22.4	23.4	24.5	24.8	24.5	24.9	26.7	27.0	27.0	25.3	27.2	27.4	27.6	27.6	27.8	27.5	24.6	27.8	
29-Oct	27.7	27.7	28.0	28.5	28.7	Z	30.9	34.1	33.3	35.1	34.8	34.8	33.8	32.7	32.9	32.6	31.8	30.7	28.3	30.1	38.3	29.2	28.7	30.6	31.5	38.3	
30-Oct	Z	18.3	20.1	15.5	17.7	11.1	8.2	7.2	8.7	20.7	29.4	30.3	32.5	33.3	33.6	32.8	33.5	33.3	31.9	30.5	30.1	29.9	28.7	28.5	24.6	33.6	
31-Oct	27.6	Z	26.6	25.9	25.2	23.6	23.0	22.4	23.0	23.6	22.3	25.6	26.8	28.8	29.3	29.2	28.7	21.2	14.5	12.7	10.6	9.1	10.8	9.6	21.7	29.3	
		19.3	17.4	17.7	18.6	17.8	16.8	15.9	15.5	18.0	23.4	26.2	27.6	28.7	29.1	29.8	30.0	29.3	26.2	22.5	20.7	19.8	20.4	20.3	19.4	Diurnal Average	
		30.2	29.3	29.9	29.5	28.8	28.5	30.9	34.1	33.3	35.1	34.8	34.8	37.1	38.8	40.0	40.3	39.5	36.4	36.2	35.5	38.3	34.8	31.8	30.8	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
Conklin - October 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	243	34.62	34.62
21 - 50	459	65.38	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 702

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Ozone (O₃) - ppb
Conklin - October 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	7	1	1	1	2	5	16	60	59	19	7	1	1	7	31	15	233
21 - 50	2	0	0	1	1	10	31	39	50	41	40	16	37	81	61	21	431
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	9	1	1	2	3	15	47	99	109	60	47	17	38	88	92	36	664

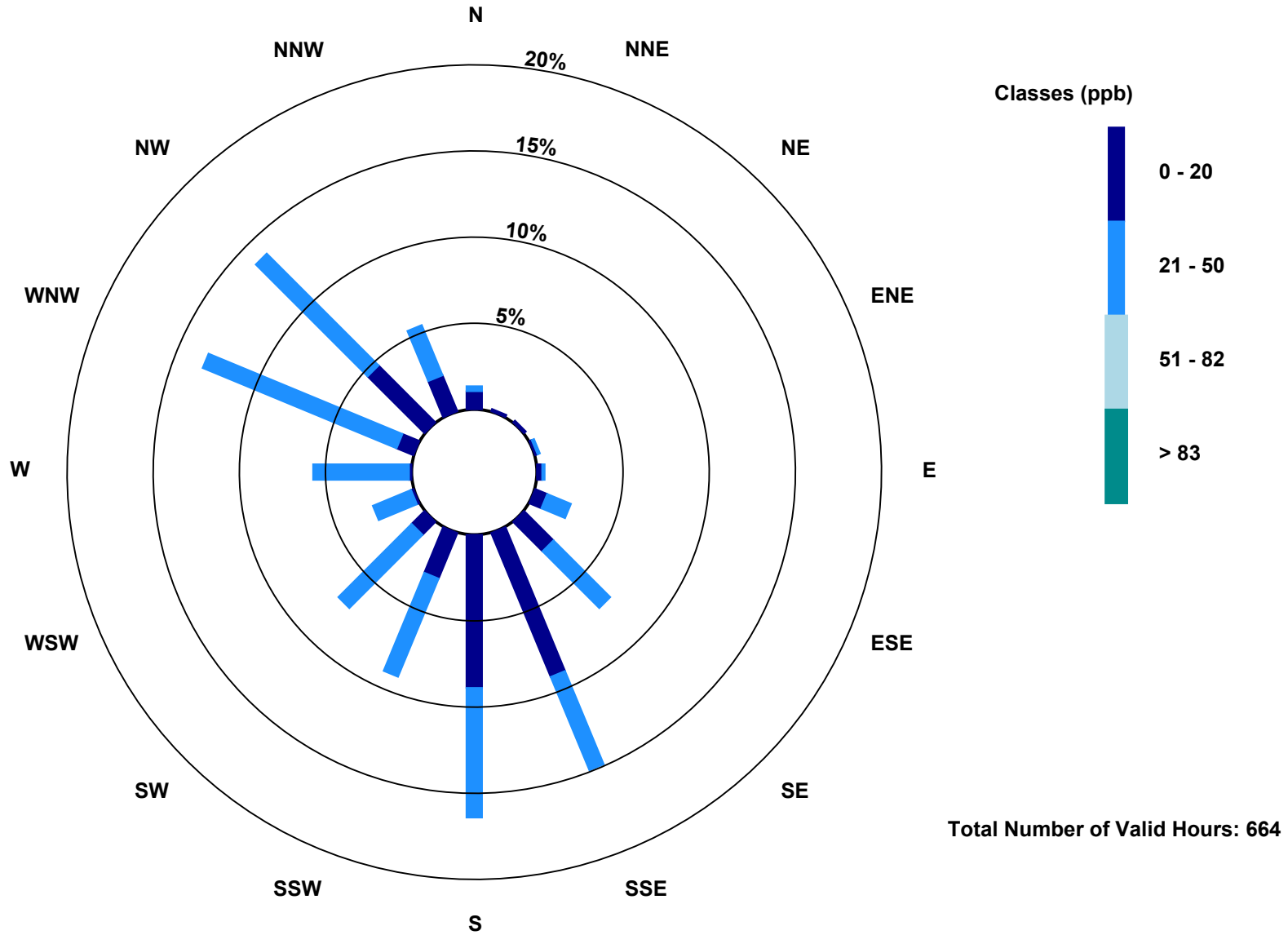
Total Number of Valid Hours: 664

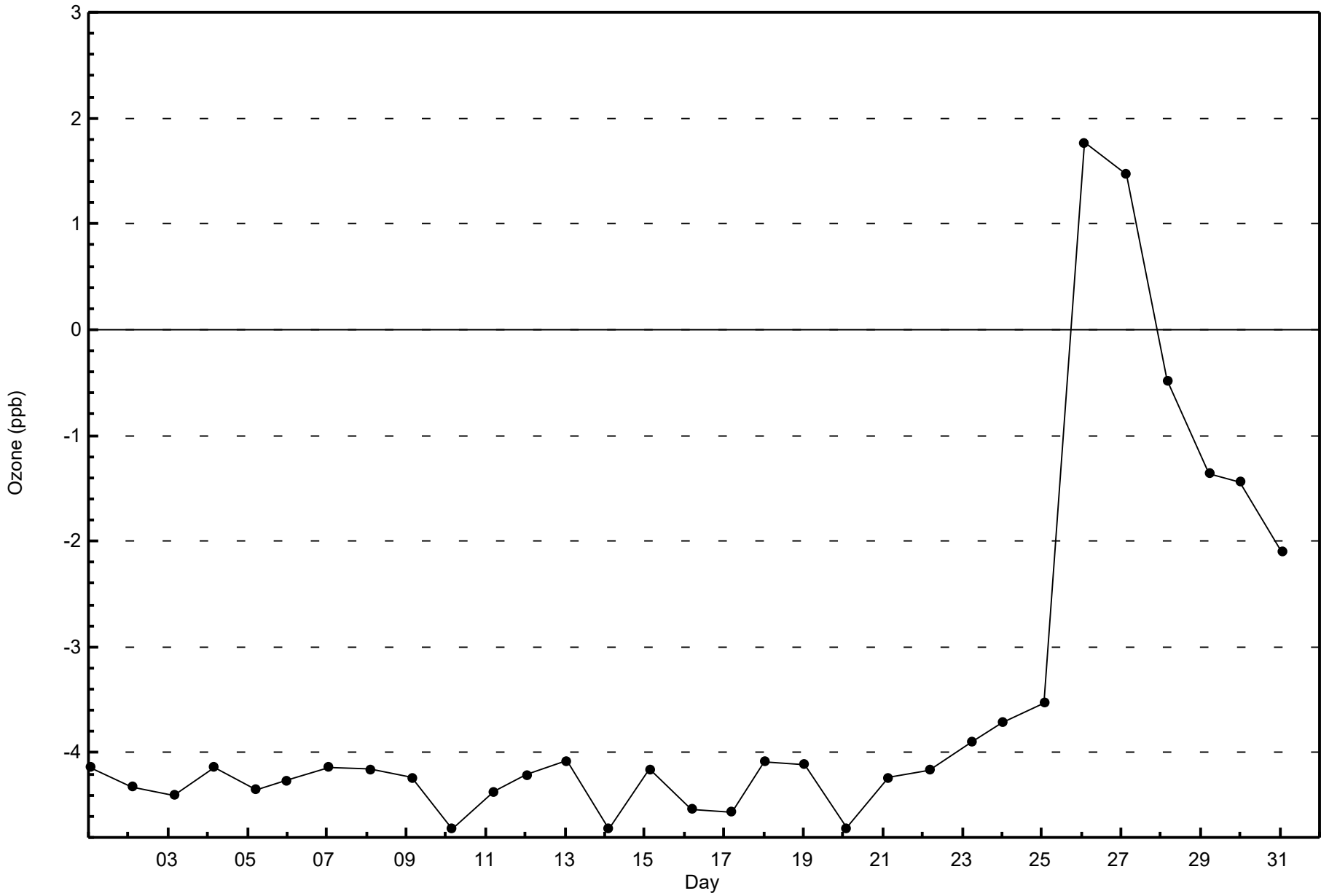
Total Number of Hours: 744

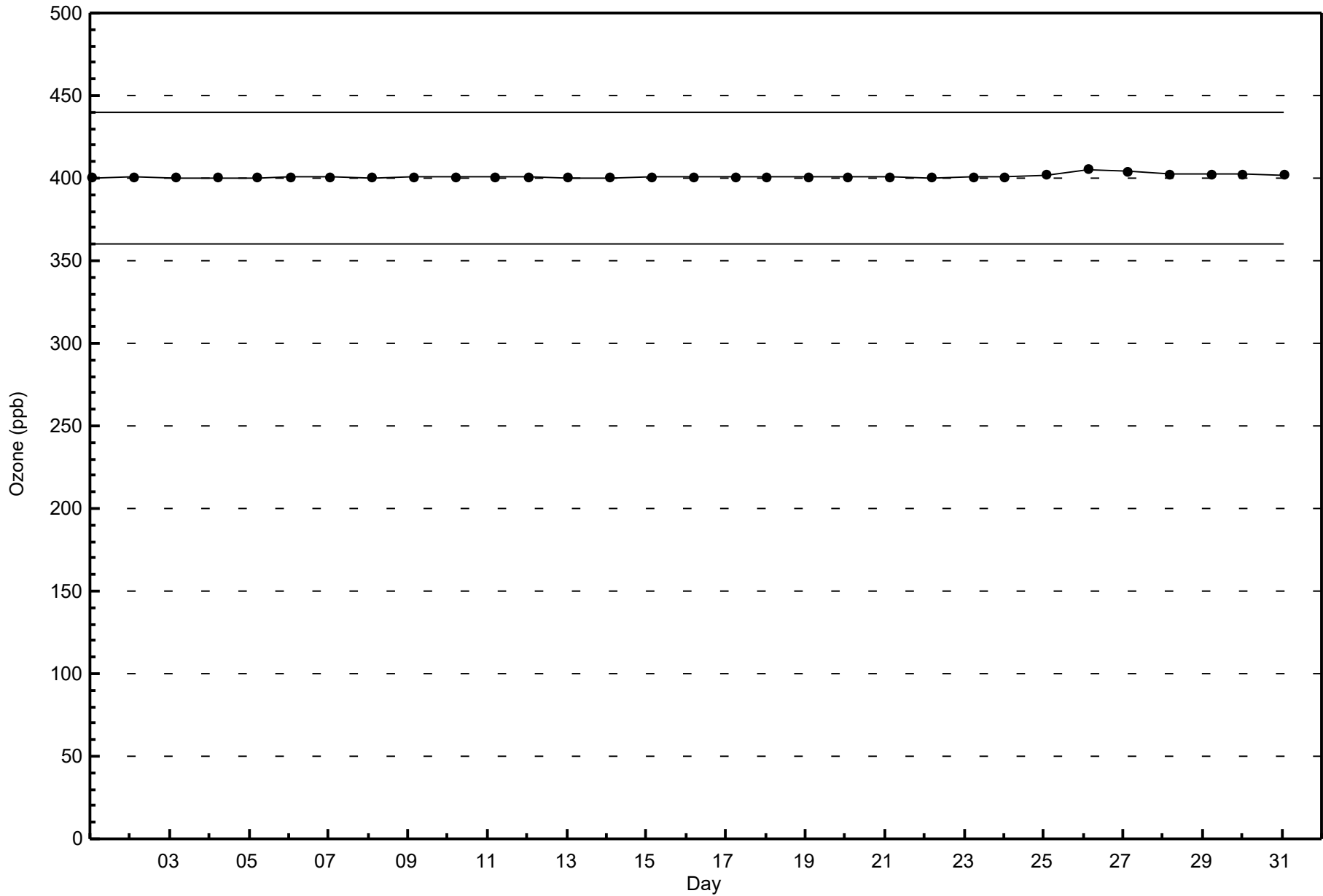


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Ozone (O₃) - ppb
Conklin









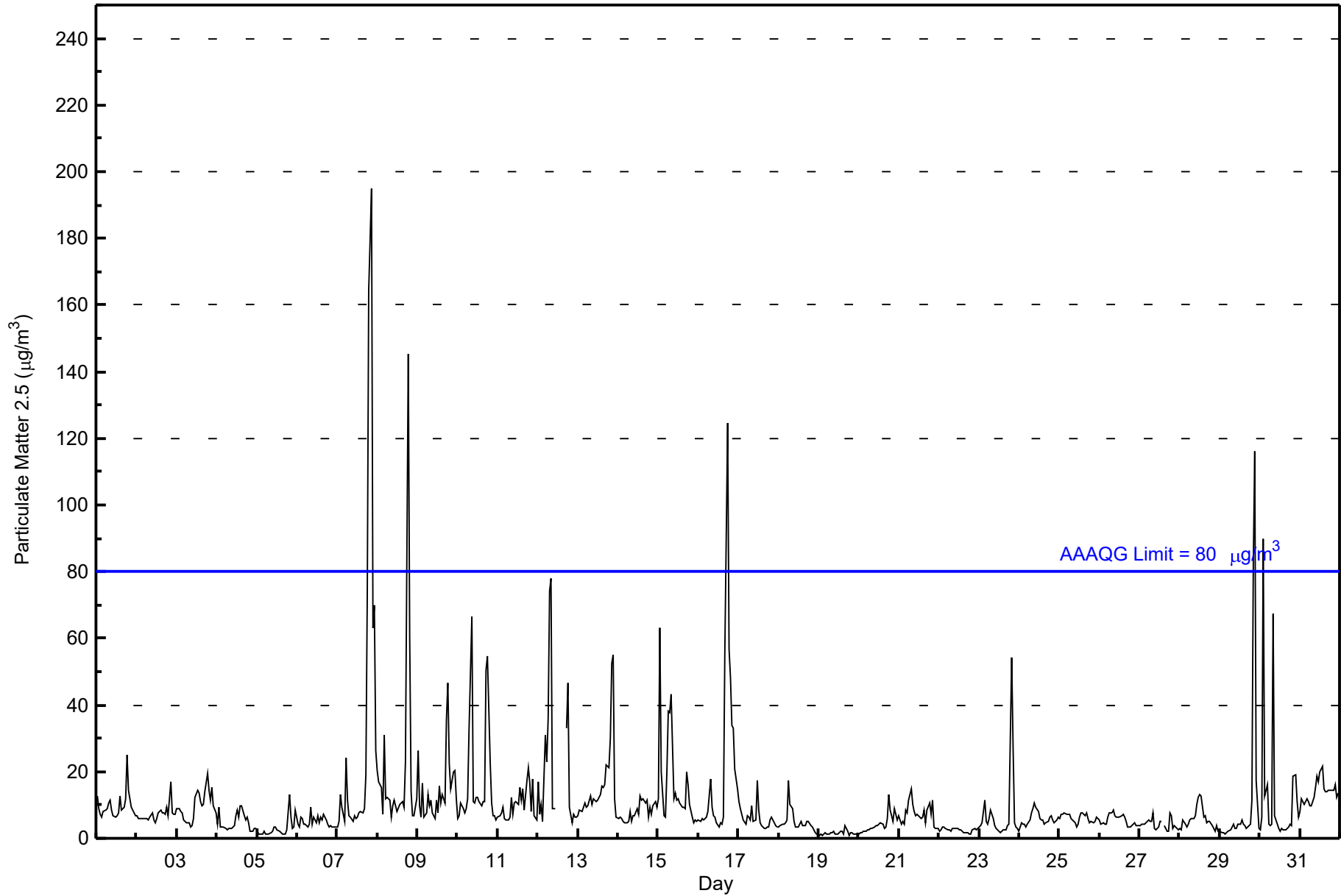
Wood Buffalo Environmental Association

Summary of Hour Averages

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

Conklin - October 2023

Number of Exceedences (AAAQO):		1-hr: 7	24-hr: 1	Hours in Service: 744																	Daily Average		Daily Maximum																									
Maximum Value: 194.8 µg/m ³ on Oct 7 21:00		Maximum Daily Average: 31.3 µg/m ³ on Oct 7																	Hours of Data: 737		Hours of Missing Data: 7																											
Minimum Value: 0.9 µg/m ³ on Oct 19 19:00		Minimum Daily Average: 1.6 µg/m ³ on Oct 19																	Hours of Calibration: 1		Percent Operational Time: 99.2																											
Maximum Diurnal Average: 20.8 µg/m ³ at hour 19		Minimum Diurnal Average: 6.3 µg/m ³ at hour 4																																														
Monthly Average: 10.13 µg/m ³		Percentiles: P ₁ = 1.2 P ₁₀ = 2.4 Q ₁ = 3.8 Median = 6.4 Q ₃ = 10.4 P ₉₀ = 16.7 P ₉₉ = 76.6																																														
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-Oct	12.7	8.8	7.3	6.5	7.9	8.4	8.8	10.5	11.6	8.6	6.7	6.5	6.9	7.6	12.8	8.5	9.3	12.0	25.0	14.4	11.9	9.4	7.6	6.6	9.9	25.0																						
2-Oct	6.6	5.8	5.7	6.0	6.1	6.1	5.8	5.5	6.5	7.5	5.6	4.8	6.1	7.4	8.4	7.8	7.8	7.2	9.2	6.8	16.8	7.7	7.2	7.3	7.2	16.8																						
3-Oct	8.7	8.9	8.1	7.6	5.5	4.9	4.8	4.6	3.4	3.7	6.1	12.3	14.4	13.6	11.0	9.7	10.1	14.0	19.4	14.3	11.6	15.1	9.8	7.7	9.6	19.4																						
4-Oct	4.2	9.5	3.4	3.4	3.3	3.0	2.7	2.8	2.8	3.1	3.8	6.8	8.3	6.4	9.8	9.7	6.9	5.4	6.3	4.5	2.2	2.3	3.2	2.9	4.9	9.8																						
5-Oct	2.6	1.3	1.2	1.2	2.1	1.1	1.3	1.4	1.5	2.2	3.2	3.3	2.5	2.0	1.5	1.2	1.4	1.4	2.7	13.0	6.2	3.1	3.3	8.4	2.9	13.0																						
6-Oct	4.1	3.3	6.4	6.0	4.3	4.4	3.6	4.4	9.4	4.4	6.3	4.6	6.7	4.5	6.4	5.5	7.2	5.3	4.2	3.5	3.6	3.4	3.4	3.4	4.9	9.4																						
7-Oct	3.5	5.0	12.9	9.5	5.2	24.2	11.5	6.6	6.5	4.9	6.9	6.0	6.3	7.5	8.0	7.6	8.7	19.3	73.8	164.2	194.8	62.9	69.7	26.1	31.3	194.8																						
8-Oct	20.2	16.8	15.1	7.0	31.0	11.9	12.1	11.5	6.6	9.6	11.5	9.9	8.2	10.0	10.6	11.2	9.3	22.8	145.5	60.5	14.1	6.6	6.7	11.8	20.0	145.5																						
9-Oct	26.4	9.7	6.5	16.6	6.3	7.5	13.2	9.8	11.6	7.5	6.1	11.3	7.8	15.5	10.5	13.3	10.7	35.5	46.6	22.3	14.8	20.0	20.5	11.8	15.1	46.6																						
10-Oct	5.9	6.6	10.7	9.1	7.8	8.8	11.8	32.5	66.3	10.9	10.4	12.2	12.3	11.1	9.8	10.9	10.9	50.2	54.7	22.5	10.6	6.8	6.7	5.6	16.9	66.3																						
11-Oct	6.2	6.8	7.8	9.3	6.1	5.4	5.4	6.2	12.2	7.0	10.6	11.0	10.0	15.3	11.6	14.6	8.5	17.5	21.0	16.7	8.2	17.8	6.9	5.6	10.3	21.0																						
12-Oct	16.9	7.2	10.3	5.0	30.8	22.7	36.2	74.1	78.0	9.0	8.9	PF	PF	PF	PF	PF	PF	32.9	46.7	9.2	4.7	7.0	6.3	6.5	22.9	78.0																						
13-Oct	6.8	8.3	7.9	9.5	10.4	9.4	9.9	12.6	10.0	11.8	11.2	10.8	11.4	13.3	15.5	15.2	16.0	22.2	21.2	29.9	52.6	55.0	11.9	6.4	16.2	55.0																						
14-Oct	6.1	6.6	5.9	5.1	4.8	4.5	5.0	7.9	5.0	6.7	6.7	9.0	7.4	12.7	11.5	11.8	10.5	11.6	6.5	9.1	7.3	9.9	11.2	9.1	8.0	12.7																						
15-Oct	11.9	63.3	20.0	6.7	6.2	19.8	37.9	37.9	43.0	11.7	13.4	11.3	12.1	10.4	9.4	9.3	9.0	19.7	16.3	10.2	6.5	4.6	5.7	5.1	16.7	63.3																						
16-Oct	5.4	5.1	5.9	5.6	6.0	6.5	7.9	17.6	9.3	6.9	6.4	4.7	3.4	4.9	4.3	6.5	55.4	124.6	57.0	48.4	34.1	32.9	20.9	14.6	20.6	124.6																						
17-Oct	11.1	8.8	7.3	5.4	4.3	6.7	6.4	5.6	9.9	5.0	5.4	17.2	8.4	4.6	3.8	2.9	2.8	3.3	3.3	5.5	6.2	4.8	4.0	3.2	6.1	17.2																						
18-Oct	3.3	3.7	4.2	4.3	4.8	5.4	17.5	10.0	9.0	4.9	3.5	3.3	3.4	5.0	3.9	3.7	3.7	5.1	5.1	3.7	3.3	2.5	1.8	1.2	4.8	17.5																						
19-Oct	0.9	1.3	1.0	1.1	1.5	1.2	1.4	1.6	1.8	2.0	1.4	1.4	1.6	2.0	2.2	1.4	3.9	2.2	0.9	1.8	1.8	1.1	1.1	1.1	1.6	3.9																						
20-Oct	1.3	1.6	1.8	2.0	2.1	2.4	2.5	2.8	3.1	3.4	3.7	3.9	4.2	4.5	4.2	2.9	3.3	6.1	13.0	8.5	4.9	8.8	7.3	5.3	4.3	13.0																						
21-Oct	6.7	4.1	5.0	4.1	8.4	7.5	11.4	14.7	10.2	8.3	6.8	7.3	6.2	5.9	6.2	8.5	4.7	8.3	10.6	7.2	11.5	3.5	2.8	3.1	7.2	14.7																						
22-Oct	2.2	2.7	3.4	3.5	3.0	2.4	2.4	2.3	2.8	2.9	3.0	2.9	2.4	2.5	2.0	1.6	1.6	1.7	1.3	1.4	2.6	2.8	2.4	3.0	2.5	3.5																						
23-Oct	3.4	3.6	4.5	11.5	5.0	4.1	5.7	8.4	5.9	3.6	2.8	2.5	2.3	1.7	2.7	2.7	2.7	4.0	4.1	54.2	27.2	4.9	3.4	2.9	7.2	54.2																						
24-Oct	2.3	4.7	4.1	4.1	3.5	4.1	5.5	7.6	9.1	10.8	9.4	7.9	5.9	5.5	5.5	4.3	4.7	5.1	6.5	6.9	5.7	4.7	5.5	6.4	5.8	10.8																						
25-Oct	6.1	7.2	7.4	7.6	7.4	7.4	7.2	6.0	5.6	4.6	3.3	4.2	6.4	7.8	7.6	6.8	7.6	5.9	4.7	5.0	4.5	5.0	6.4	6.1	6.2	7.8																						
26-Oct	5.6	4.4	4.5	4.2	4.3	6.3	7.6	7.6	8.4	6.7	6.3	6.1	6.4	6.9	7.0	6.4	5.1	3.6	3.5	3.8	4.4	4.5	4.0	3.6	5.5	8.4																						
27-Oct	3.7	4.0	4.2	4.3	4.8	5.4	4.9	5.2	7.8	2.9	2.4	3.2	5.2	5.0	C	4.0	2.2	1.9	7.6	6.7	3.1	3.8	2.9	2.7	4.2	7.8																						
28-Oct	3.2	2.4	5.3	4.0	3.4	4.1	5.5	6.1	6.0	6.9	10.4	12.3	13.1	12.6	6.5	6.7	4.8	5.2	5.2	4.0	2.9	2.1	3.6	2.2	5.8	13.1																						
29-Oct	2.0	1.8	1.8	1.4	1.8	2.3	2.5	3.3	4.1	3.1	3.0	4.1	4.1	5.4	4.4	3.7	3.2	3.7	4.1	11.4	82.6	116.0	17.3	3.1	12.1	116.0																						
30-Oct	2.6	6.3	89.9	12.6	16.3	4.3	3.9	4.1	67.4	6.6	4.1	2.8	2.3	2.8	2.4	2.7	3.1	3.3	4.4	3.7	18.7	18.9	11.0	6.5	12.5	89.9																						
31-Oct	8.2	11.7	10.3	11.0	11.7	11.0	9.8	9.6	12.4	15.2	18.5	16.8	19.9	21.5	14.7	13.9	14.2	14.4	14.6	14.5	14.3	16.3	12.3	13.5	13.8	21.5																						
																								6.8	7.8	9.3	6.3	7.3	7.2	8.8	11.0	14.4	6.5	6.7	7.4	7.2	7.9	7.4	7.2	8.3	15.3	20.8	19.0	19.1	15.0	9.2	6.5	Diurnal Average
																								26.4	63.3	89.9	16.6	31.0	24.2	37.9	74.1	78.0	15.2	18.5	17.2	19.9	21.5	15.5	15.2	55.4	124.6	145.5	164.2	194.8	116.0	69.7	26.1	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}) - $\mu\text{g}/\text{m}^3$
Conklin - October 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	308	41.79	41.79
6 - 15	347	47.08	88.87
16 - 25	41	5.56	94.44
26 - 80	34	4.61	99.05
> 81.0	7	0.95	100.00

Total Number of Valid Hours: 737

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - μg/m³
Conklin - October 2023

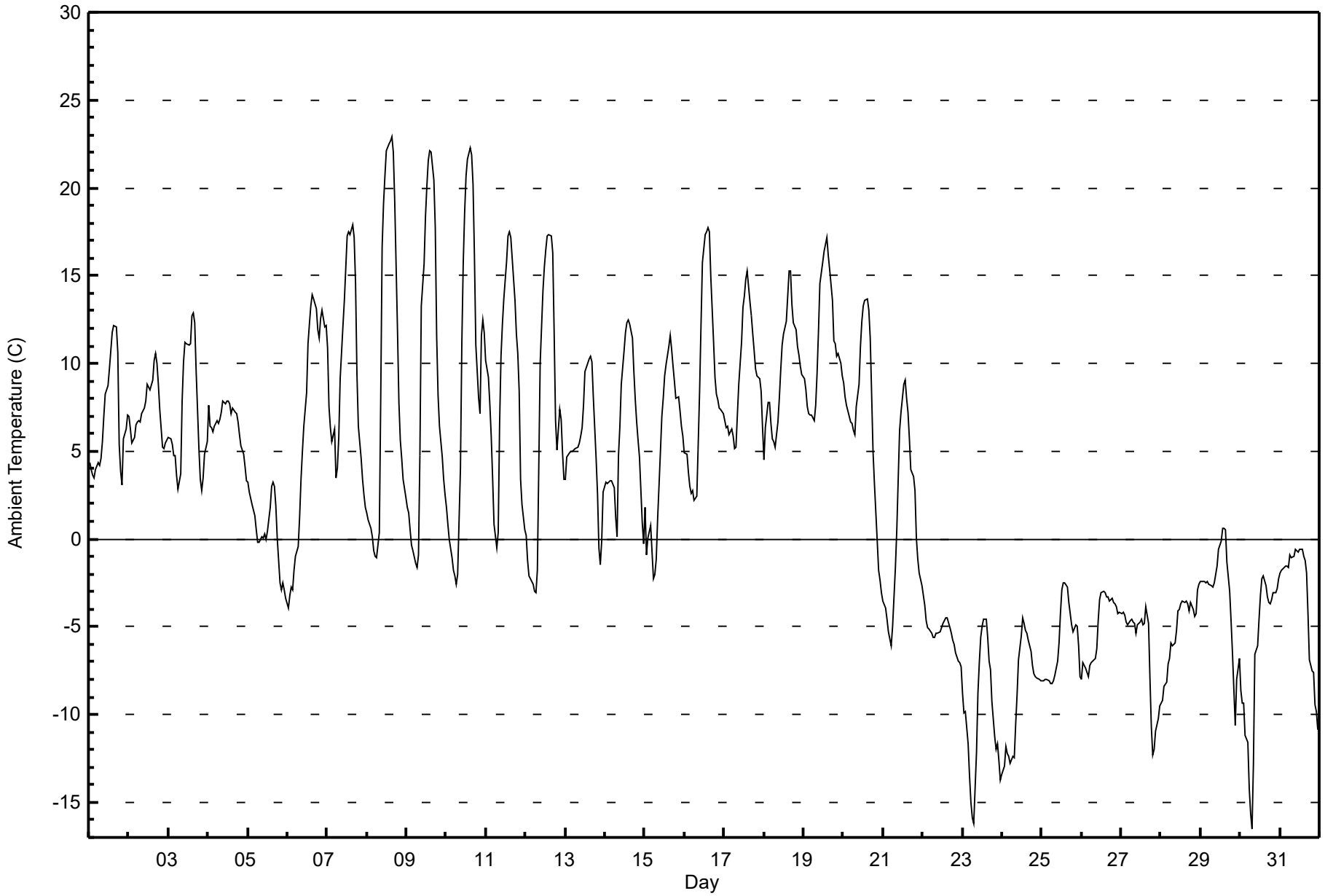
Concentration Ranges (μg/m ³)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	3	0	0	0	0	0	7	8	27	25	34	15	29	57	57	12	274
6 - 15	7	1	1	2	2	13	32	65	72	33	16	2	10	32	36	18	342
16 - 25	0	0	0	0	1	1	7	11	10	3	0	0	0	2	1	5	41
26 - 80	1	0	0	0	0	1	3	16	6	1	0	0	1	2	0	2	33
> 81.0	0	0	0	0	0	0	0	3	1	0	0	0	0	0	0	3	7
Totals	11	1	1	2	3	15	49	103	116	62	50	17	40	93	94	40	697

Total Number of Valid Hours: 697

Total Number of Hours: 744



Maximum Value: 22.9 C on Oct 8 16:00		Maximum Daily Average: 11.3 C on Oct 19		Hours in Service: 744																																												
Minimum Value: -16.5 C on Oct 30 08:00		Minimum Daily Average: -10.0 C on Oct 23		Hours of Data: 744																																												
Maximum Diurnal Average: 8.5 C at hour 15		Minimum Diurnal Average: -1.3 C at hour 7		Hours of Missing Data: 0																																												
Monthly Average: 2.97 C		Percentiles: P ₁ = -13.5 P ₁₀ = -7.3 Q ₁ = -3.5 Median = 3.4 Q ₃ = 8.6 P ₉₀ = 13.3 P ₉₉ = 22.0		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-Oct	4.3	4.0	3.7	3.5	4.0	4.3	4.2	4.6	5.5	6.9	8.2	8.7	9.7	10.7	11.7	12.1	12.0	10.6	5.4	3.9	3.1	5.7	6.3	7.1	6.7	12.1																						
2-Oct	7.0	6.3	5.5	5.8	6.5	6.7	6.7	6.7	7.1	7.5	7.9	8.8	8.7	8.5	9.0	10.2	10.5	10.0	8.8	7.4	5.3	5.1	5.4	5.6	7.4	10.5																						
3-Oct	5.8	5.7	5.4	4.8	4.8	3.6	2.8	3.7	7.8	10.1	11.2	11.1	11.0	11.1	12.7	12.8	12.3	9.6	5.1	3.4	2.8	3.5	4.9	5.5	7.1	12.8																						
4-Oct	7.6	6.4	6.4	6.1	6.4	6.8	6.6	6.8	7.2	7.9	7.7	7.9	7.7	7.2	7.4	7.2	7.1	6.7	5.9	5.3	4.8	4.1	3.4	6.6	7.9																							
5-Oct	3.3	2.7	2.0	1.7	1.3	0.6	-0.2	-0.2	0.1	0.1	0.3	-0.1	0.5	1.8	3.0	3.2	3.0	1.9	0.0	-2.5	-2.9	-2.5	-2.9	-3.4	0.4	3.3																						
6-Oct	-3.9	-3.2	-2.7	-2.9	-1.8	-1.0	-0.4	1.2	3.4	5.0	6.5	8.3	11.1	12.2	13.3	13.9	13.6	13.1	11.9	11.5	12.5	13.1	12.1	12.1	6.6	13.9																						
7-Oct	10.9	7.5	6.3	5.6	6.3	3.5	4.0	5.8	9.1	12.2	13.6	15.4	17.3	17.5	17.4	17.9	17.1	14.6	9.4	6.4	4.6	3.4	2.6	1.8	9.6	17.9																						
8-Oct	1.5	1.0	0.6	0.1	-0.6	-1.0	-1.1	0.4	8.0	16.6	19.1	20.7	22.1	22.5	22.6	22.9	22.0	19.3	11.8	7.8	5.6	4.5	3.4	2.4	9.7	22.9																						
9-Oct	1.8	1.5	0.5	-0.3	-0.7	-1.4	-1.6	-0.9	4.7	13.3	15.7	18.3	20.1	21.6	22.1	22.1	20.4	17.7	11.5	8.1	6.4	4.7	3.4	2.5	8.8	22.1																						
10-Oct	1.8	0.8	-0.1	-1.1	-1.8	-2.1	-2.6	-2.0	4.0	11.2	15.8	18.6	20.7	21.6	22.3	21.9	20.2	16.1	11.0	8.0	7.1	11.6	12.5	11.7	9.5	22.3																						
11-Oct	10.2	9.2	7.7	5.8	3.5	0.8	-0.5	0.4	6.6	10.4	12.2	13.7	15.8	17.3	17.5	17.1	15.9	13.6	11.7	10.6	8.4	3.4	2.0	0.5	8.9	17.5																						
12-Oct	0.2	-1.3	-2.1	-2.3	-2.5	-3.0	-3.1	-1.8	4.1	10.0	14.2	15.5	16.5	17.2	17.3	17.3	16.3	11.8	6.7	5.1	7.4	6.9	4.9	3.4	6.6	17.3																						
13-Oct	3.4	4.7	4.9	5.0	5.0	5.1	5.1	5.3	5.5	5.8	6.4	7.7	9.5	10.0	10.2	10.4	10.1	8.1	4.6	2.6	-0.5	-1.4	-0.1	2.7	5.4	10.4																						
14-Oct	3.2	3.2	3.2	3.3	3.3	3.0	1.3	0.2	4.8	6.4	8.8	10.7	11.8	12.3	12.5	12.2	11.4	9.5	7.9	6.7	5.6	4.6	0.9	-0.3	6.1	12.5																						
15-Oct	1.8	-0.9	0.1	0.8	-0.7	-2.2	-2.1	-1.1	1.1	5.0	7.0	8.0	9.3	9.9	11.0	11.6	10.8	9.8	8.9	8.0	8.1	7.3	6.4	5.8	5.2	11.6																						
16-Oct	4.9	4.8	3.8	3.0	2.6	2.7	2.2	2.5	5.4	8.4	12.2	15.8	17.3	17.5	17.7	17.5	14.9	11.2	9.2	8.3	7.9	7.5	7.4	7.1	8.8	17.7																						
17-Oct	6.7	6.3	6.4	6.0	6.3	5.9	5.1	5.2	7.1	8.8	11.2	13.2	13.8	14.8	15.2	13.5	12.7	11.7	10.8	9.7	9.3	9.1	8.4	6.3	9.3	15.2																						
18-Oct	4.5	6.3	7.8	7.8	6.6	5.7	5.5	5.2	6.7	8.0	9.6	11.1	11.7	12.4	13.8	15.3	15.3	13.4	12.3	12.0	10.9	10.5	9.9	9.4	9.7	15.3																						
19-Oct	9.1	8.5	7.6	7.1	7.1	7.1	6.7	7.6	9.5	11.9	14.5	15.7	16.4	16.8	17.2	16.2	15.3	13.6	11.2	11.2	10.4	10.5	10.0	9.3	11.3	17.2																						
20-Oct	8.9	8.1	7.6	7.3	6.6	6.6	6.2	6.0	7.5	8.8	10.9	12.4	13.3	13.6	13.7	13.0	11.4	8.2	5.0	3.2	-0.1	-1.7	-2.4	-3.0	7.1	13.7																						
21-Oct	-3.5	-4.0	-4.5	-5.3	-5.7	-6.1	-5.0	-1.7	0.6	3.4	6.1	7.2	8.8	9.0	8.0	7.2	5.7	4.0	3.6	2.8	0.1	-1.1	-2.0	-2.6	1.0	9.0																						
22-Oct	-3.2	-3.8	-4.7	-5.0	-5.1	-5.4	-5.6	-5.6	-5.4	-5.4	-5.3	-5.0	-4.8	-4.6	-4.5	-4.5	-5.1	-5.4	-5.8	-6.0	-6.5	-7.0	-7.1	-7.3	-5.3	-3.2																						
23-Oct	-8.8	-9.9	-9.8	-11.7	-13.5	-15.0	-15.9	-16.2	-12.2	-8.8	-7.0	-5.6	-4.9	-4.6	-4.6	-5.6	-7.0	-7.4	-9.3	-11.3	-12.0	-11.6	-12.6	-13.7	-10.0	-4.6																						
24-Oct	-13.4	-12.9	-11.9	-12.2	-12.4	-12.8	-12.4	-12.5	-10.6	-8.8	-6.9	-5.5	-4.5	-4.8	-5.2	-5.4	-5.8	-6.4	-7.2	-7.7	-7.8	-7.9	-8.0	-8.1	-8.8	-4.5																						
25-Oct	-8.0	-8.1	-8.0	-8.0	-8.1	-8.2	-8.3	-8.1	-7.7	-7.0	-5.9	-4.2	-2.9	-2.5	-2.5	-2.7	-3.6	-4.3	-4.9	-5.3	-4.9	-5.0	-6.1	-7.8	-5.9	-2.5																						
26-Oct	-8.0	-7.1	-7.4	-7.6	-7.9	-7.2	-7.0	-6.9	-6.8	-6.2	-4.7	-3.4	-3.0	-3.0	-3.1	-3.3	-3.3	-3.5	-3.4	-3.6	-3.7	-3.9	-4.2	-4.2	-5.1	-3.0																						
27-Oct	-4.2	-4.2	-4.3	-4.7	-4.9	-4.6	-4.6	-4.7	-4.8	-5.4	-4.9	-4.7	-4.5	-4.9	-4.8	-3.9	-4.8	-7.9	-10.7	-12.3	-12.0	-11.0	-10.2	-9.5	-6.4	-3.9																						
28-Oct	-9.4	-9.2	-8.4	-8.1	-7.1	-6.8	-6.0	-6.1	-6.0	-5.2	-4.1	-4.0	-3.7	-3.5	-3.6	-3.5	-3.7	-4.1	-3.6	-4.0	-4.4	-4.2	-2.9	-2.6	-5.2	-2.6																						
29-Oct	-2.4	-2.4	-2.4	-2.5	-2.5	-2.5	-2.6	-2.7	-2.5	-2.0	-1.5	-0.6	-0.1	0.6	0.6	0.5	-1.3	-3.0	-4.7	-6.5	-8.6	-10.6	-8.0	-6.8	-3.1	0.6																						
30-Oct	-8.6	-9.4	-9.4	-11.2	-11.6	-14.2	-15.6	-16.5	-12.8	-6.6	-6.1	-4.6	-3.2	-2.3	-2.1	-2.7	-3.3	-3.6	-3.7	-3.5	-3.1	-3.0	-2.8	-2.3	-6.8	-2.1																						
31-Oct	-2.0	-1.8	-1.6	-1.6	-1.5	-1.7	-0.9	-1.0	-1.0	-0.6	-0.6	-0.8	-0.6	-0.6	-1.0	-1.2	-2.0	-4.3	-6.9	-7.5	-7.6	-9.4	-9.9	-10.8	-3.2	-0.6																						
																								0.7	0.3	0.1	-0.4	-0.6	-1.1	-1.3	-0.9	1.5	3.9	5.6	6.8	7.8	8.3	8.5	8.5	7.7	6.0	3.7	2.3	1.5	1.2	0.8	0.5	Diurnal Average
																								10.9	9.2	7.8	7.8	7.1	7.1	6.7	7.6	9.5	16.6	19.1	20.7	22.1	22.5	22.6	22.9	22.0	19.3	12.3	12.0	12.5	13.1	12.5	12.1	Diurnal Maximum





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Conklin - October 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	298	40.05	40.05
0 - 10	294	39.52	79.57
10 - 20	136	18.28	97.85
> 20	16	2.15	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



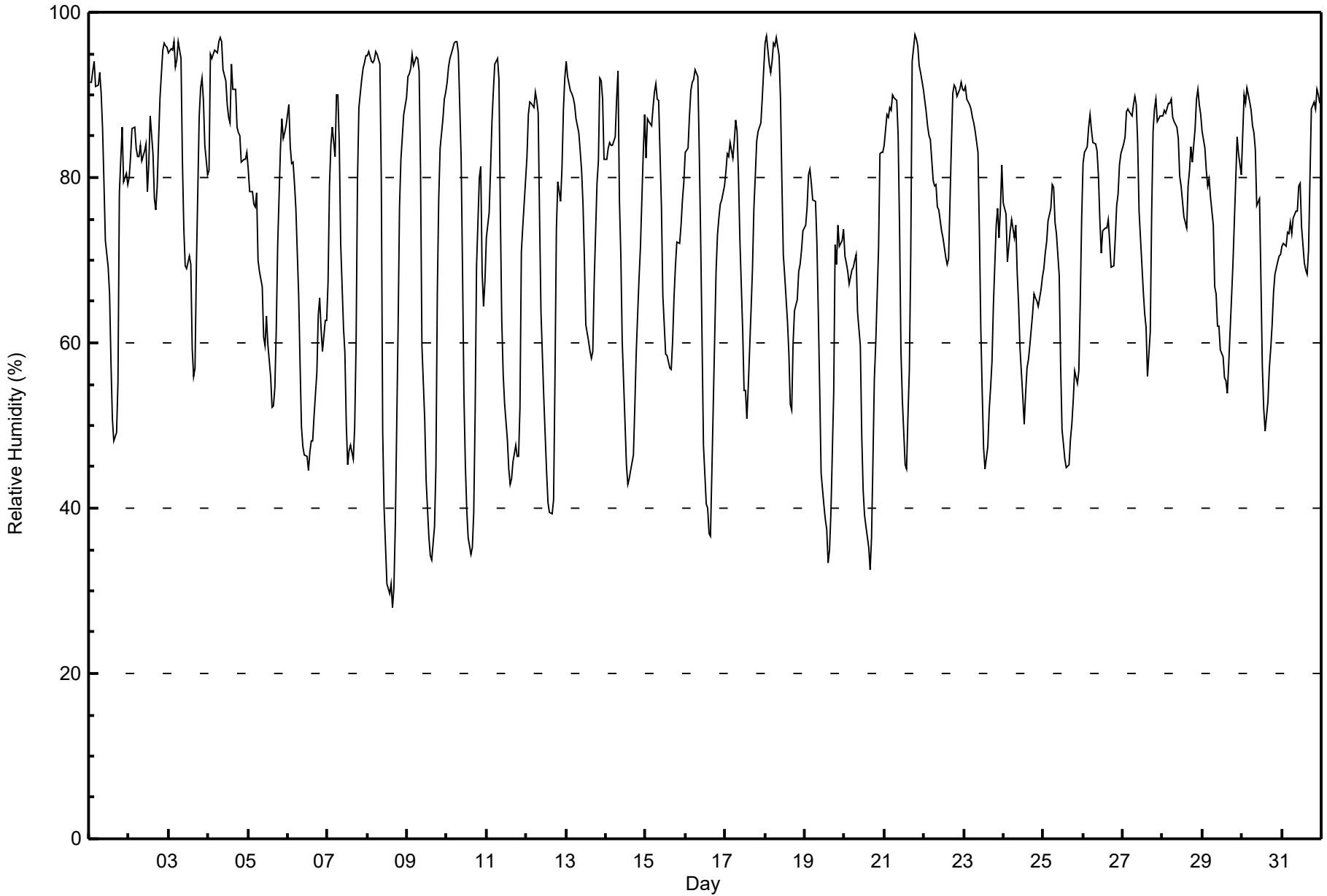
Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Conklin - October 2023

Maximum Value: 97.3 % on Oct 21 19:00 Maximum Daily Average: 89.8 % on Oct 4																						Hours in Service: 744 Hours of Data: 744																									
Minimum Value: 27.9 % on Oct 8 16:00 Minimum Daily Average: 59.7 % on Oct 20																						Hours of Missing Data: 0 Hours of Calibration: 0																									
Maximum Diurnal Average: 86.3 % at hour 6 Minimum Diurnal Average: 53.1 % at hour 16																						Percent Operational Time: 100.0																									
Monthly Average: 73.48 % Percentiles: P₁ = 34.0 P₁₀ = 47.7 Q₁ = 62.0 Median = 76.8 Q₃ = 87.3 P₉₀ = 92.1 P₉₉ = 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-Oct	91.5	91.5	92.8	94.1	90.9	91.2	92.7	90.1	86.0	79.3	72.5	69.1	66.0	57.6	50.9	48.2	49.2	55.2	78.1	82.3	86.1	79.6	80.5	79.2	77.3	94.1																					
2-Oct	80.0	82.5	85.9	86.1	83.5	82.6	82.5	83.8	82.1	83.3	84.1	78.4	81.7	87.4	82.9	77.4	76.1	79.0	84.7	89.6	95.4	96.3	95.9	95.7	84.9	96.3																					
3-Oct	95.1	95.6	95.4	96.4	93.4	94.3	96.4	94.4	82.1	74.0	69.2	69.0	70.5	69.4	59.2	56.0	56.9	69.6	87.5	90.9	92.0	89.3	83.8	80.3	81.7	96.4																					
4-Oct	80.8	95.0	94.5	94.9	95.4	95.1	96.5	96.9	96.5	93.0	91.6	88.8	87.3	86.6	93.7	90.7	90.7	86.2	85.5	85.2	81.9	82.2	82.3	83.1	89.8	96.9																					
5-Oct	81.0	78.3	78.4	76.7	76.4	78.1	70.0	68.7	66.9	60.6	59.6	63.2	59.8	56.0	52.2	52.3	54.6	61.5	71.6	83.6	87.2	84.7	85.4	86.2	70.5	87.2																					
6-Oct	88.8	83.8	81.8	81.9	79.4	76.4	65.8	57.5	49.8	47.4	46.4	46.2	44.6	46.8	48.1	48.2	51.2	56.4	63.3	65.5	61.7	59.0	62.8	62.8	61.5	88.8																					
7-Oct	67.5	79.0	83.9	86.1	82.6	90.0	89.9	84.1	72.0	61.8	58.8	50.2	45.3	46.9	47.6	45.9	49.9	59.9	79.6	88.6	91.8	93.2	93.9	94.7	72.6	94.7																					
8-Oct	94.8	95.2	94.1	93.8	94.2	95.2	94.8	93.8	79.7	49.2	40.0	35.5	30.9	29.7	30.8	27.9	30.4	38.0	62.1	76.4	82.1	84.9	87.6	89.7	68.0	95.2																					
9-Oct	92.2	92.6	93.2	95.0	93.5	94.6	94.4	93.0	81.0	59.6	50.6	43.4	39.8	36.5	34.3	33.8	37.7	45.2	66.2	77.4	83.6	87.1	89.6	90.4	71.0	95.0																					
10-Oct	91.6	93.5	94.5	95.6	96.3	96.4	96.5	95.0	82.3	68.6	53.5	45.3	39.9	36.4	34.5	35.2	39.5	51.8	69.2	79.9	81.3	68.5	64.5	67.5	69.9	96.5																					
11-Oct	72.6	75.7	81.0	86.9	90.4	93.8	94.3	91.8	75.6	62.7	56.3	52.7	48.3	44.7	42.9	43.6	45.6	47.7	46.3	46.2	52.1	71.0	74.1	79.7	65.7	94.3																					
12-Oct	82.6	87.6	89.2	89.0	88.6	90.3	89.3	87.8	75.1	63.7	53.3	48.8	44.4	40.7	39.5	39.4	41.0	55.9	73.7	79.5	77.2	81.2	88.1	92.1	70.7	92.1																					
13-Oct	94.0	92.2	90.5	90.2	89.6	88.8	87.1	85.5	83.3	80.8	76.9	70.2	62.2	60.2	59.0	58.2	58.9	67.4	79.4	82.0	92.1	91.6	89.5	82.2	79.7	94.0																					
14-Oct	82.2	83.6	84.2	83.8	84.0	85.0	89.4	92.9	77.3	70.6	60.1	50.4	45.2	42.9	43.5	44.6	46.5	52.3	58.8	63.4	67.8	71.5	82.9	87.6	68.8	92.9																					
15-Oct	82.4	87.2	86.8	86.3	88.5	90.4	91.4	89.4	89.3	76.4	65.7	62.2	58.6	58.5	56.9	56.8	60.3	65.7	69.4	72.2	72.0	74.2	77.3	79.5	74.9	91.4																					
16-Oct	83.0	83.6	87.4	90.5	91.5	91.8	93.0	92.3	83.3	72.8	60.4	47.7	40.5	40.0	37.0	36.5	44.4	60.5	68.6	73.1	75.1	76.8	77.2	79.0	70.3	93.0																					
17-Oct	80.6	82.8	82.5	84.3	82.4	84.4	86.9	85.7	80.3	72.5	61.5	54.2	54.2	50.8	54.8	64.0	68.9	76.2	80.2	84.5	85.6	86.6	89.7	93.1	76.1	93.1																					
18-Oct	96.3	97.1	93.7	92.7	94.0	96.2	95.9	96.9	94.7	89.5	79.5	70.7	68.2	62.5	58.6	52.5	51.9	59.9	63.9	65.2	68.6	69.5	71.2	73.6	77.6	97.1																					
19-Oct	74.3	76.4	80.4	81.0	79.2	77.2	77.1	72.0	63.6	54.2	44.3	40.3	38.6	37.5	33.4	34.9	39.6	54.1	71.9	69.5	74.2	71.8	72.4	73.7	62.1	81.0																					
20-Oct	70.5	69.7	68.6	67.1	68.9	69.1	69.9	70.7	63.8	59.6	48.9	42.2	39.1	37.8	35.2	32.6	36.5	45.7	55.5	60.0	71.4	82.9	83.0	83.1	59.7	83.1																					
21-Oct	83.8	87.6	87.3	88.4	88.2	90.1	89.7	89.4	85.1	73.9	59.0	53.1	45.3	44.7	51.1	56.8	70.7	94.0	97.3	96.8	95.9	93.5	92.7	90.7	79.4	97.3																					
22-Oct	89.4	87.9	86.2	85.1	84.6	79.7	79.0	79.2	76.4	76.0	73.6	72.7	71.5	70.4	69.4	70.1	83.8	90.2	91.1	90.9	89.9	90.7	91.5	90.7	82.1	91.5																					
23-Oct	90.5	91.0	89.5	88.8	88.3	87.3	86.6	85.6	83.1	73.5	61.8	54.1	47.3	44.7	47.4	51.9	54.6	57.8	64.6	74.2	76.3	72.6	76.2	81.6	72.1	91.0																					
24-Oct	76.9	75.5	69.8	71.7	73.5	75.0	72.8	74.2	68.5	64.6	59.3	53.4	50.2	53.9	56.9	57.9	59.7	63.5	65.9	65.5	65.1	64.4	66.4	68.0	65.5	76.9																					
25-Oct	69.0	70.9	72.2	74.7	76.2	79.1	78.8	74.6	73.2	68.1	57.2	49.4	47.8	45.9	44.9	45.2	48.3	50.1	53.1	56.5	55.1	56.6	64.9	74.9	62.0	79.1																					
26-Oct	81.6	83.1	83.8	86.1	87.6	85.7	84.3	84.1	83.2	80.1	74.9	70.9	73.5	73.9	73.9	74.9	72.2	69.1	69.4	72.8	76.6	78.0	81.4	83.0	78.5	87.6																					
27-Oct	84.1	84.9	87.9	88.3	88.0	87.5	88.9	89.8	88.8	84.2	76.0	69.5	66.3	63.5	61.9	56.0	61.4	75.8	85.6	88.3	89.4	86.8	87.5	87.5	80.3	89.8																					
28-Oct	87.4	88.2	87.9	89.0	89.0	89.4	87.3	86.8	86.2	84.7	80.1	79.0	77.1	75.3	73.8	79.0	80.8	83.8	81.9	85.9	89.4	90.6	88.8	87.6	84.5	90.6																					
29-Oct	85.6	83.5	80.9	79.1	79.9	77.6	74.2	66.8	65.9	62.0	62.0	59.1	58.4	55.8	55.4	53.9	57.4	65.5	69.4	74.5	79.6	84.8	82.9	80.4	70.6	85.6																					
30-Oct	85.3	89.9	88.9	90.9	89.2	88.1	86.2	85.4	83.4	76.6	77.5	67.6	57.2	52.1	49.3	52.9	56.9	59.3	62.2	66.1	68.3	69.8	70.5	70.7	72.7	90.9																					
31-Oct	71.7	72.1	71.8	73.3	73.2	74.5	73.3	75.1	75.9	75.9	79.0	79.3	74.0	69.7	68.9	68.4	71.2	79.9	88.4	89.2	88.4	90.6	89.9	89.0	77.6	90.6																					
																						83.5	85.1	85.3	86.0	85.8	86.3	85.6	84.3	78.5	70.9	64.3	59.2	55.9	54.2	53.2	53.1	56.4	63.8	72.4	76.6	79.1	80.0	81.4	82.5	Diurnal Average	
																						96.3	97.1	95.4	96.4	96.3	96.4	96.5	96.9	96.5	93.0	91.6	88.8	87.3	87.4	93.7	90.7	90.7	94.0	97.3	96.8	95.9	96.3	95.9	95.7	Diurnal Maximum	





Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Conklin - October 2023

Maximum Speed: 21 km/h on Oct 14 13:00	Maximum Daily Speed Average: 11.2 km/h on Oct 14	Hours in Service: 744
Minimum Speed Value: 0 km/h on Oct 9 21:00	Minimum Daily Speed Average: 2.6 km/h on Oct 7	Hours of Data: 704
Maximum Diurnal Speed Average: 3.7 km/h at hour 13	Minimum Diurnal Speed Average: 2.1 km/h at hour 19	Hours of Missing Data: 40
Monthly Average Velocity: 2.8 km/h 225.4 deg	Percentiles: P ₁ = 0 P ₁₀ = 2 Q ₁ = 4 Median = 6 Q ₃ = 10 P ₉₀ = 12 P ₉₉ = 18	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-Oct	SSW1	N1	NNW3	NW2	E2	S1	SSE1	S2	SSE2	S5	S10	S12	S10	S10	SSW11	S11	S10	SSE7	SSE3	SSE6	SSE5	S7	S8	S11	S5.2	S12	
2-Oct	S10	S6	S5	S8	S11	S12	S12	S10	S11	S13	SSW15	SSW15	S12	S10	SSW12	SW10	SW7	SW5	SSW4	SSW3	S5	S6	S7	S6	SSW8.8	SSW15	
3-Oct	S4	S4	S4	SSE4	SSW4	SSW4	S5	S3	WNW6	WNW7	NW9	NW9	WNW7	NW8	NW8	NW7	WNW4	SW2	SSE3	S5	S5	SSW7	SSW7	SSW8	WSW2.7	NW9	
4-Oct	WSW7	SW2	SW7	SW7	SW7	WSW6	WNW5	WNW5	NW5	NW7	NW9	NW11	NW9	NW10	NW10	NW10	NW11	NW12	NW12	NW14	NW12	NW11	NW11	NW10	WNW7.7	NW14	
5-Oct	NW11	NW13	NW12	NW13	NW14	NW10	NW16	NW13	NW16	NW18	NW17	NW15	NW15	NW12	NW12	NNW12	NW9	NW5	NW3	WSW1	S3	S4	S3	SSW5	NW9.2	NW18	
6-Oct	SSE3	S5	S6	S7	S7	S7	S7	S8	SSW10	SW13	SW11	SW11	SW12	SW12	SSW12	SSW14	SSW10	SSW9	SSW8	SW8	W6	WNW5	NW6	NW7	SSW7.4	SSW14	
7-Oct	WNW5	SE3	SSE4	SE3	N2	S4	S5	SSW5	S4	SSE3	S2	SE3	SE4	ESE6	E5	ESE7	ESE6	ESE3	SSE2	SSE2	SSE2	SSE3	SSE3	SSE2	SE2.6	ESE7	
8-Oct	SE2	SSE2	SSE4	SSE3	S3	SSE3	SSE2	NNE0	ESE2	SE11	S15	S18	S18	SSE19	SSE18	S18	S11	SSE6	S1	NNW2	NNW1	N1	SW0	NW2	SSE6.2	SSE19	
9-Oct	S1	SSE4	SSE2	S2	SSE3	SSE1	S2	WNW1	WNW1	ESE3	SE10	SE10	ESE10	SE11	SE13	SSE12	SSE12	SSE6	SSE2	E1	NW0	S2	S1	SSE3	SE4.4	SE13	
10-Oct	SSE3	SSE1	SSW1	NW1	WNW1	SE0	UO	UO	NO	ESE5	SE10	SE12	SE16	SE17	SE16	SSE16	SSE10	SE4	WNW1	SSW0	SE3	SE8	SE9	SE9	SE6.2	SE17	
11-Oct	SE6	ESE5	SE5	SE3	ENE1	WNW1	NW2	WNW1	SE3	ESE9	ESE10	E11	ESE11	SE14	SE16	SE14	SE14	SE8	SSE7	SSE6	SSE5	SSW0	SSE4	NNW1	SE5.9	SE16	
12-Oct	S3	SSE1	SSE1	S2	SSE3	SSE2	SSE3	SE3	SE2	ENE2	SSE6	SSE13	SSE13	S13	SSE12	SSE10	S8	S2	S3	SW4	SW5	S4	SSE6	SSE6	SSW5.0	SSE13	
13-Oct	S7	S9	SSW7	SSW7	S6	S6	S7	S9	SSE10	SSE11	SSE12	SSE13	SSE12	SE14	SE13	SE12	SE9	SE6	SSE5	SSE5	SSE2	SSE4	SSE6	SSE7	SSW7.8	SE14	
14-Oct	SSE9	SSE8	SE11	SE13	SE14	SE9	SSE4	SE3	SE11	SE11	SSE14	SSE19	SSE21	SSE21	SSE18	SSE18	SE16	SE13	SSE10	SSE7	SSE8	SSE6	SE4	ESE4	SSE11.2	SSE21	
15-Oct	SE6	SSE5	SSE6	SSE6	SSE4	SSE4	SSE6	S3	SE5	SE7	S10	S8	S8	S8	S6	SSW6	S4	S4	SSE5	S5	SSW6	SW6	SW7	SW8	SE5.5	S10	
16-Oct	SSW7	SW9	S5	S5	S5	S7	S5	S6	SSW8	SSW8	SSW6	SW4	WSW6	SSW7	SSW8	SSW6	S3	SSE1	SSE3	SE3	ESE0	NNW1	WNW1	SSE2	SSW4.5	SW9	
17-Oct	SSW1	NNW3	NW3	NNW4	NNW3	NNW1	NNW2	NNW4	NO	NNW4	NW4	WNW4	WNW6	WNW7	WNW8	WNW6	WNW7	WNW6	WNW3	WSW3	S3	SSW4	SSW2	SSE3	WNW2.8	WNW8	
18-Oct	SSW5	S7	S8	S6	SSE4	SE5	SE1	NE1	SSE6	S7	SSW10	SSW11	SSW12	SSW12	SSW9	SW9	SW7	SSW9	SSW10	SW11	SW8	SW10	SW12	SW10	SSW7.4	SSW12	
19-Oct	SW10	SW10	SW11	SW10	SW10	SW11	SW12	SW12	SW13	WSW14	W14	W13	W13	WSW13	W12	WSW13	WSW8	W9	W7	SW5	SW8	WSW14	WSW14	W11	WSW10.4	WSW14	
20-Oct	W12	W9	W10	W10	W9	W10	WNW10	WNW9	WNW9	WNW8	WNW11	WNW11	WNW12	NW13	NW13	NW15	NW11	WNW4	WNW3	NW4	NNW1	SSE2	S3	S3	WNW7.6	NW15	
21-Oct	S3	SE3	SSE3	S3	SSE3	SSE3	S4	SE4	S4	S8	SSW13	S10	SSW12	SSW9	SW6	NNW2	NW3	NNW2	NNW3	N9	N12	UO	UO	UO	SSW2.6	SSW13	
22-Oct	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	---	
23-Oct	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	NW8	NW9	WNW9	WNW9	NW7	NW6	NW4	NW4	WNW3	W4	NW4	WSW3	SSE2	---	WNW9
24-Oct	SSW5	WNW4	WNW6	WNW5	NW5	NW5	WNW5	WNW5	WNW7	WNW7	WNW8	WNW9	WNW9	WNW9	WNW9	WNW7	WNW8	NW9	NW10	NW8	WNW5	W5	WNW5	WNW4	WNW6.3	NW10	
25-Oct	WNW6	WNW5	W5	W5	W6	W6	W5	W6	SSW6	WSW7	SW8	WSW9	W10	WNW9	WNW9	NW8	WNW6	W7	W6	WSW5	W7	W7	NW5	WNW4	W6.0	W10	
26-Oct	WNW4	WNW6	WNW5	WNW5	W5	NW5	NW6	NW5	NW7	WNW6	WNW7	WNW6	WNW7	NW7	WNW7	W7	W7	W6	WSW7	WSW7	W8	W7	WNW7	W8	WNW6.0	W8	
27-Oct	WNW7	W8	W7	W6	WNW5	W6	WNW6	NW5	NNW10	N12	N12	NNW13	NNW12	NNW13	NNW9	WNW6	NNW10	NW1	SSW2	S2	SSE3	S4	S4	S4	NW4.8	NNW13	
28-Oct	S2	S3	S4	S3	SW6	SW4	WNW5	NW6	NW7	NW7	NW11	NNW13	NNW12	NNW12	NNW10	NW8	NW7	NW5	WNW5	WNW5	WNW5	WNW5	NW5	NW5	NW5.1	NNW13	
29-Oct	WNW5	WNW5	WNW6	WNW5	WNW5	NW5	WNW6	NW7	NW8	NW11	NW9	NW7	NW8	NW8	WNW8	WNW6	WNW4	W4	WNW4	NW3	NNW3	NNW4	NW5	NNW7	NW5.8	NNW11	
30-Oct	NNW5	NW3	NNW3	N5	NNW3	NW2	WNW1	W0	S1	SSE2	S6	SW8	SSW9	SSW10	SSW10	SSW8	SSW9	S8	S8	S7	SSW7	S11	SSW10	SW8	SSW4.3	S11	
31-Oct	SSW6	S5	SSW4	SW6	SW7	SW5	WNW5	NW6	NW6	NW7	NNW9	NNW11	NNW10	NNW13	NNW12	NNW12	N6	W1	SW1	S1	S2	S3	S3	S3	WNW3.2	NNW13	

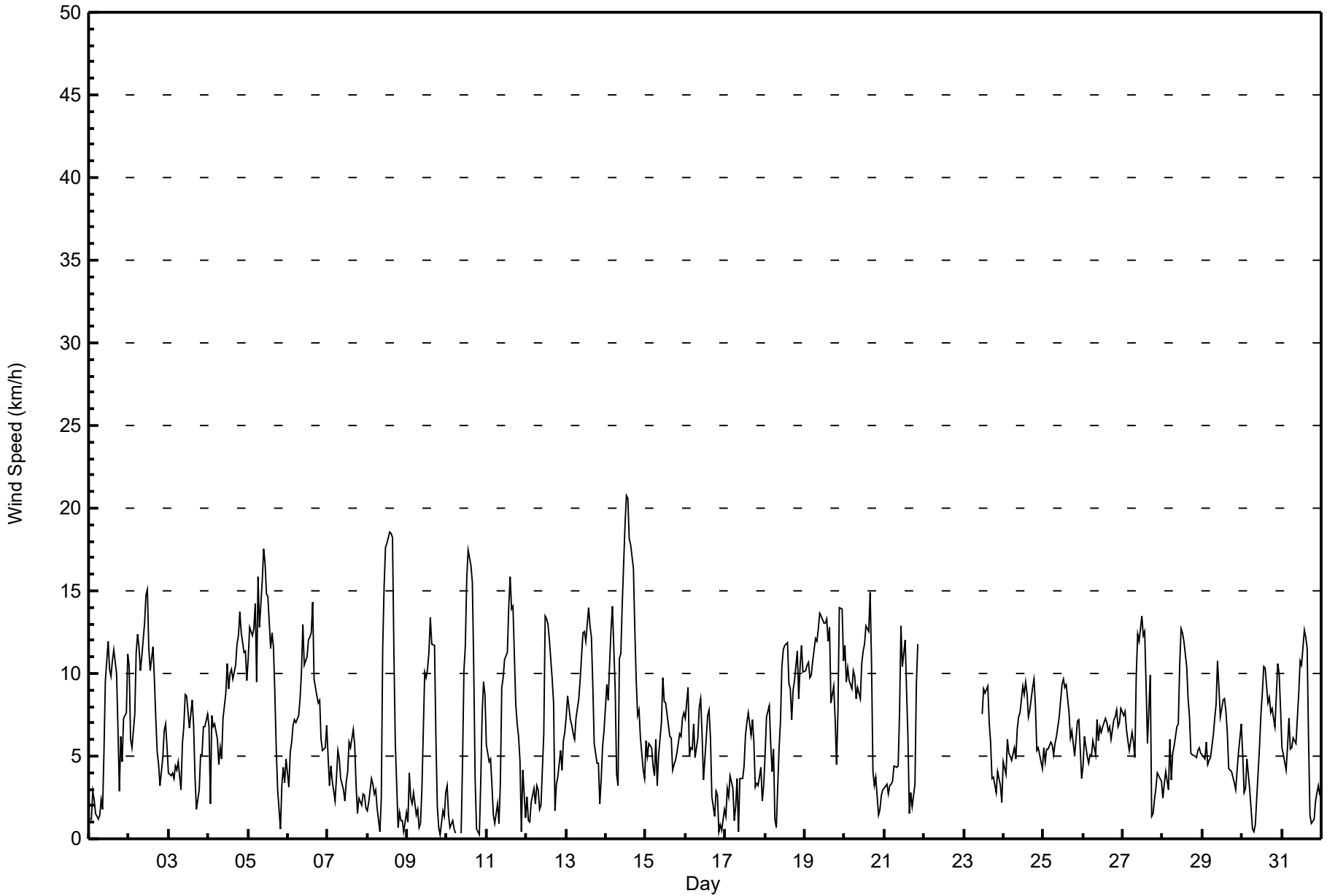
SW3.0 SW2.6 SW2.8 SW2.5 SW2.7 SW2.8 WSW2.7 WSW2.4 SW2.5 SW3.4 SW3.5 SW3.7 SW3.6 SW3.5 SW3.3 SW2.7 SW2.2 SW2.1 SW2.3 SW2.3 SW3.0 SW3.0 SW2.7	Diurnal Average
W12 NW13 NW12 NW13 NW14 S12 NW16 NW13 NW16 NW18 NW17 SSE19 SSE21 SSE21 SSE18 S18 SSE16 SSE13 NW12 NW14 NW12 WSW14 WSW14 S11	Diurnal Maximum

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Conklin - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Conklin - October 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	295	41.90	41.90
6 - 11	306	43.47	85.37
12 - 19	101	14.35	99.72
20 - 28	2	0.28	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 704

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Conklin - October 2023**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	6	1	1	2	3	7	19	59	61	18	11	4	9	45	27	22	295
6 - 11	2	0	0	0	0	8	16	27	49	35	32	8	26	47	47	9	306
12 - 19	3	0	0	0	0	0	14	19	8	9	7	5	5	1	20	10	101
20 - 28	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	11	1	1	2	3	15	49	107	118	62	50	17	40	93	94	41	704

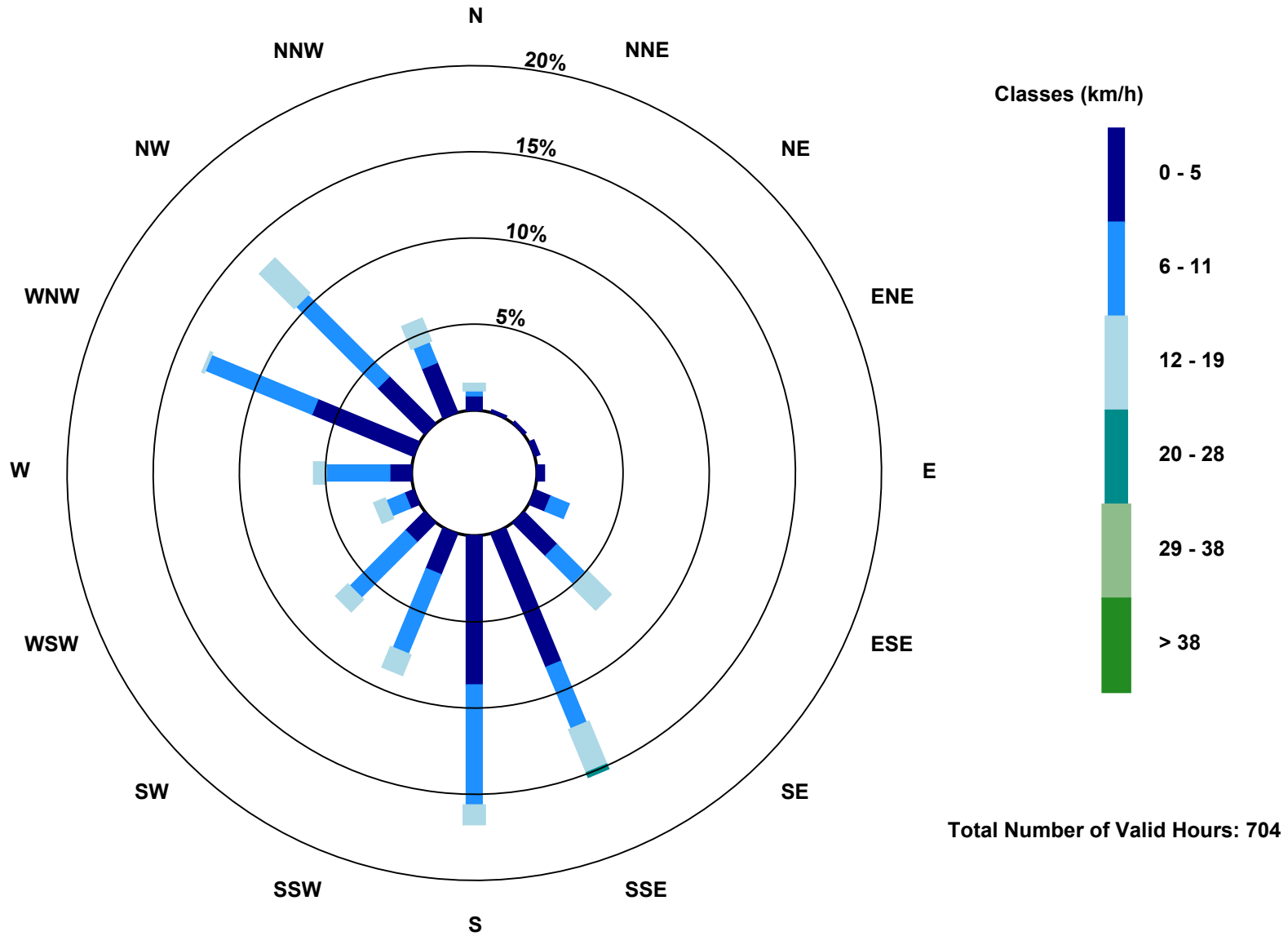
Total Number of Valid Hours: 704

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

Wind Speed (WS) - km/h
Conklin





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Conklin - October 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Oct 5 07:00 Minimum Value: 0 km/h on Oct 8 03:00 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: 704 Hours of Missing Data: 40 Hours of Calibration: 0 Percent Operational Time: 94.6								
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-Oct	1	1	1	1	1	1	1	1	1	2	4	3	3	3	4	4	3	2	1	1	1	2	2	3	4
2-Oct	3	2	1	2	3	3	3	3	3	4	4	4	4	3	3	3	2	2	1	1	2	1	1	1	4
3-Oct	1	2	1	1	1	1	1	2	2	3	4	4	3	3	3	3	2	1	1	1	1	1	1	4	
4-Oct	3	1	2	2	2	2	2	3	2	3	4	4	4	4	4	4	4	5	5	6	5	5	5	6	
5-Oct	5	6	5	5	6	4	7	4	7	6	6	6	6	4	5	5	3	3	1	1	1	1	1	7	
6-Oct	1	2	1	2	2	2	2	2	4	4	3	3	4	4	4	5	3	2	2	3	3	2	2	5	
7-Oct	2	1	2	1	1	2	1	2	1	1	1	2	2	2	2	2	2	1	1	1	1	1	1	2	
8-Oct	1	1	0	0	0	1	1	1	3	3	5	5	5	5	5	5	4	2	1	2	1	1	1	5	
9-Oct	1	1	1	1	1	1	1	1	1	2	2	3	3	3	3	3	3	2	1	1	1	1	1	3	
10-Oct	1	1	1	1	1	1	UO	UO	1	2	3	3	5	6	5	5	4	1	1	1	2	2	2	6	
11-Oct	2	2	1	1	1	1	1	1	4	3	3	3	3	5	4	4	4	3	2	2	2	1	2	5	
12-Oct	1	1	1	1	1	1	0	1	1	1	4	4	4	3	3	3	2	2	2	1	1	2	1	4	
13-Oct	3	3	3	2	2	2	3	3	3	3	4	3	3	4	3	3	3	2	1	1	2	2	1	4	
14-Oct	2	2	2	3	3	3	3	3	3	3	5	6	6	5	5	5	4	3	2	1	2	1	1	6	
15-Oct	1	1	1	1	1	1	1	1	1	2	3	2	2	2	2	2	1	1	1	1	3	3	3	3	
16-Oct	2	3	2	2	2	2	1	2	2	2	2	2	3	3	3	2	1	1	1	1	1	1	1	3	
17-Oct	1	1	1	1	1	1	1	2	1	2	1	2	3	3	3	3	3	2	1	2	1	2	1	3	
18-Oct	1	2	2	2	1	2	2	1	1	3	3	3	4	4	3	3	3	2	3	3	3	3	3	4	
19-Oct	3	3	3	3	2	3	3	3	4	4	6	5	5	5	5	4	3	4	3	2	3	4	5	6	
20-Oct	4	4	4	4	4	4	4	4	3	4	4	5	5	5	5	5	5	2	1	1	1	1	1	5	
21-Oct	1	1	1	1	1	1	1	1	1	3	3	3	3	3	3	1	1	2	1	6	4	UO	UO	UO	
22-Oct	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	
23-Oct	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	3	3	4	4	3	2	1	1	1	1	1	4	
24-Oct	2	2	2	2	2	2	2	2	3	3	3	3	4	4	4	3	3	4	3	3	2	2	2	4	
25-Oct	2	2	2	2	2	2	2	2	1	2	3	4	4	4	4	3	3	2	2	1	3	3	2	4	
26-Oct	2	2	2	2	2	2	2	2	3	2	3	3	3	3	3	2	2	2	2	2	3	3	3	3	
27-Oct	3	3	3	2	3	2	3	2	3	4	3	4	3	4	4	2	4	1	1	1	1	1	1	4	
28-Oct	1	1	1	1	2	2	2	2	3	3	4	4	4	4	3	3	3	2	2	2	2	2	2	4	
29-Oct	2	2	2	2	2	2	3	3	4	4	3	3	3	4	3	3	2	1	1	1	0	1	1	4	
30-Oct	1	1	1	1	1	1	1	1	1	2	3	2	3	3	3	2	3	2	3	2	2	3	3	3	
31-Oct	3	2	2	2	2	2	2	2	2	3	3	3	4	4	4	3	2	1	1	1	1	1	1	4	
Diurnal Maximum																									
UO - Unstable Operation																									



Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Conklin - October 2023

Direction of Maximum Speed: 168 deg on Oct 14 13:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 151.1 deg on Oct 14	Hours of Data: 704
Direction of Minimum Speed: 310 deg on Oct 9 21:00	Direction of Minimum Daily Speed Average: 2.6 deg on Oct 7
Direction of Minimum Speed: 310 deg on Oct 9 21:00	Hours of Missing Data: 40
Monthly Average Direction: 225.4 deg	Percent Operational Time: 94.6

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Oct	208	356	328	325	96	190	154	172	167	169	176	187	187	178	194	183	188	165	149	158	167	170	172	185	179.3
2-Oct	189	178	175	183	189	190	190	191	188	188	196	196	191	189	201	225	221	217	201	199	191	186	186	175	193.1
3-Oct	185	178	175	152	195	199	174	178	295	300	310	310	301	315	314	324	285	233	164	188	190	200	199	204	246.2
4-Oct	242	220	220	230	235	258	291	302	304	311	312	314	314	310	316	311	309	311	311	313	314	312	312	309	300.3
5-Oct	314	316	312	315	320	307	321	322	319	325	325	324	325	321	319	329	319	315	307	248	186	175	169	194	317.0
6-Oct	168	187	189	190	184	182	191	188	205	214	216	214	223	221	211	212	204	205	205	231	264	299	307	304	213.3
7-Oct	303	140	160	137	350	185	191	201	186	154	171	128	127	114	97	107	121	110	166	159	155	152	155	153	145.3
8-Oct	141	147	158	156	169	161	155	29	120	145	169	169	169	166	165	170	174	159	171	331	332	360	225	323	164.6
9-Oct	190	153	162	169	164	159	176	294	298	113	124	129	118	131	143	149	149	153	160	93	310	175	179	164	142.3
10-Oct	157	164	200	325	282	144	UO	UO	351	110	125	126	137	139	143	148	151	141	297	198	136	134	134	128	138.0
11-Oct	125	113	129	130	78	298	321	287	125	114	109	101	102	124	129	125	126	135	151	155	149	210	160	342	124.1
12-Oct	172	161	157	171	167	158	163	146	146	63	151	163	161	180	163	167	179	182	173	230	223	182	153	149	167.9
13-Oct	183	191	193	194	188	184	173	174	167	166	164	162	159	141	144	139	141	134	153	163	167	162	149	155	162.4
14-Oct	152	153	143	141	142	146	148	143	141	146	153	162	168	165	155	150	146	146	148	155	152	149	133	121	151.1
15-Oct	142	153	158	154	156	162	158	184	166	165	182	182	187	189	187	213	191	176	168	177	205	218	229	223	182.1
16-Oct	205	223	185	181	179	190	183	187	203	212	213	225	244	209	202	212	188	156	159	138	122	347	294	165	200.5
17-Oct	202	332	326	335	340	332	329	334	11	338	311	284	289	294	294	283	296	300	295	239	188	208	199	159	292.7
18-Oct	196	189	190	179	154	141	127	50	167	176	196	205	200	201	206	221	232	209	210	231	220	219	217	219	203.4
19-Oct	225	225	226	218	214	218	218	221	222	237	264	275	262	250	259	253	237	273	281	220	229	243	255	269	242.4
20-Oct	267	270	265	267	269	281	289	291	296	300	294	288	300	305	314	320	318	298	302	309	336	167	189	189	290.4
21-Oct	177	145	151	170	160	155	172	143	169	190	199	190	197	206	226	344	321	341	339	352	1	UO	UO	UO	194.5
22-Oct	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
23-Oct	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
24-Oct	208	297	296	300	308	312	282	294	284	289	287	296	296	298	294	287	295	308	321	318	287	277	286	293	294.8
25-Oct	285	287	281	280	280	274	266	265	210	243	230	248	271	299	296	307	285	268	271	245	261	281	308	285	272.0
26-Oct	303	291	282	286	280	307	311	305	309	282	296	292	303	304	303	280	268	274	247	240	260	278	283	277	285.0
27-Oct	284	275	279	280	285	278	288	304	338	350	352	346	344	342	342	299	340	314	200	180	164	175	175	171	317.8
28-Oct	187	178	172	175	232	215	293	308	312	306	315	336	328	334	332	318	314	306	298	295	300	301	307	306	307.7
29-Oct	298	298	291	291	290	304	302	312	316	326	325	313	308	309	287	293	285	265	297	314	344	327	317	338	307.8
30-Oct	340	324	340	349	339	309	303	280	191	159	187	225	208	200	208	212	199	178	180	187	194	190	200	215	206.4
31-Oct	209	182	206	214	219	233	291	311	308	309	327	328	330	341	342	347	358	271	215	189	184	177	186	182	301.9

221.0 218.9 218.4 217.9 221.5 222.3 239.7 249.6 240.8 232.0 222.6 227.2 226.7 220.9 221.9 223.2 221.2 225.3 231.6 232.0 231.1 221.9 218.7 217.9

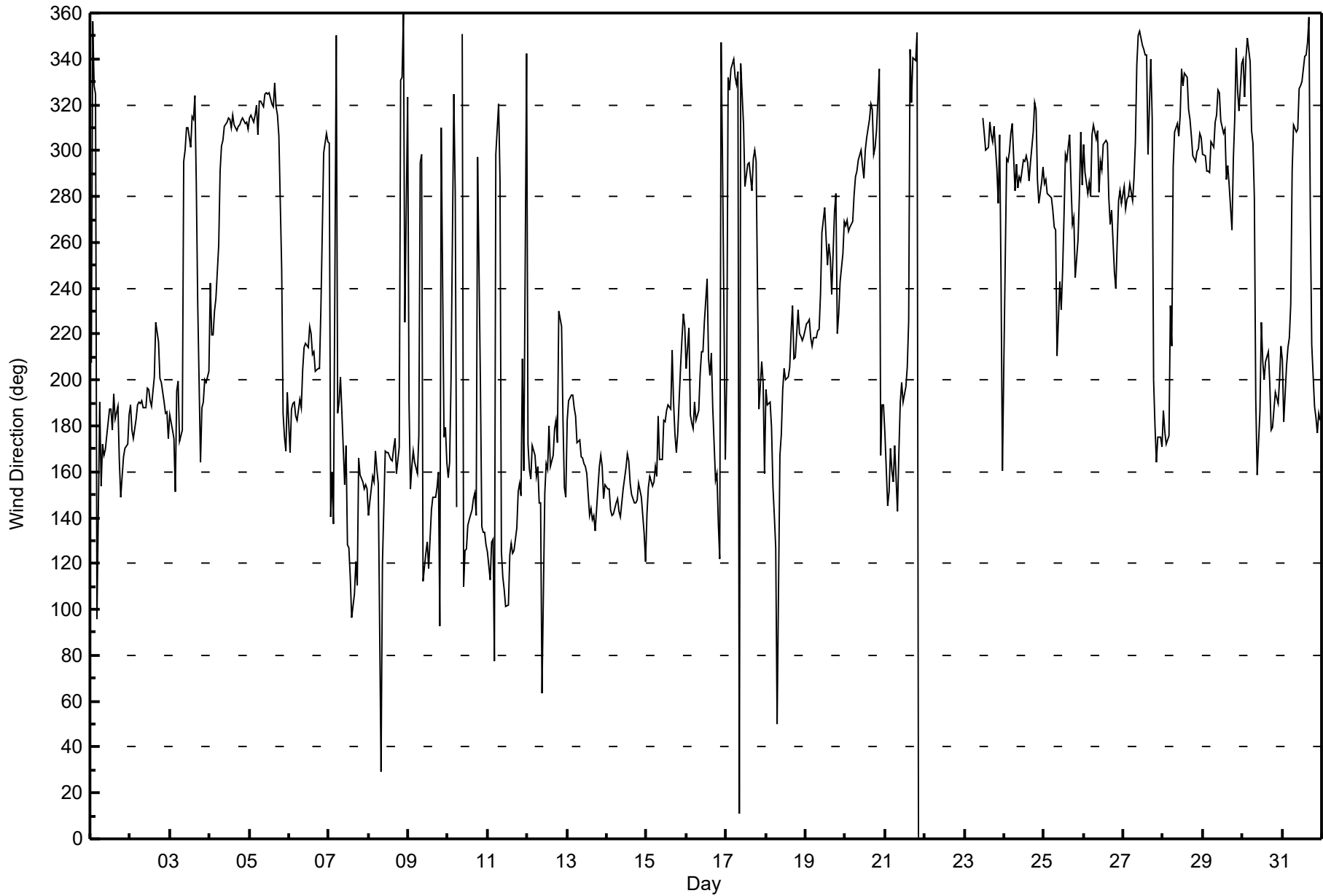
Diurnal Average

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
Conklin - October 2023





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Conklin - October 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 744
Maximum Value: 100 deg on Oct 9 21:00	Hours of Data: 704
Minimum Value: 8 deg on Oct 15 01:00	Hours of Missing Data: 40
Percentiles: P ₁ = 11 P ₁₀ = 16 Q ₁ = 20 Median = 25 Q ₃ = 33 P ₉₀ = 53 P ₉₉ = 92	Hours of Calibration: 0
	Percent Operational Time: 94.6

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-Oct	84	86	11	20	58	25	50	21	38	26	25	20	28	25	29	25	25	17	18	10	13	17	22	19	86	
2-Oct	19	23	19	19	18	18	18	20	19	19	18	19	20	19	20	24	23	21	20	23	18	14	19	16	24	
3-Oct	41	38	22	23	30	22	15	61	41	42	39	38	43	38	40	40	46	48	18	21	12	11	14	19	61	
4-Oct	31	64	21	18	21	40	40	39	43	35	33	30	33	34	29	31	35	32	30	31	28	34	32	36	64	
5-Oct	30	29	31	28	24	35	25	24	25	22	24	27	25	28	27	24	26	24	19	78	20	19	24	28	78	
6-Oct	23	18	16	16	17	17	19	20	28	27	26	22	23	26	23	21	20	19	16	29	42	42	39	32	42	
7-Oct	38	58	49	59	67	55	20	24	37	53	56	62	72	39	37	31	18	30	33	22	35	25	14	50	72	
8-Oct	45	45	12	11	14	18	21	92	65	18	19	20	21	20	20	18	19	12	55	62	92	87	73	80	92	
9-Oct	76	15	63	44	19	25	21	71	69	75	23	26	21	25	19	18	17	15	75	85	100	32	34	20	100	
10-Oct	21	67	77	86	51	88	UO	UO	91	43	17	21	20	18	20	21	17	23	71	89	29	16	14	16	91	
11-Oct	19	30	22	27	66	33	29	49	74	24	26	29	34	24	18	18	16	21	16	15	18	94	39	83	94	
12-Oct	24	45	85	28	15	25	13	12	19	61	42	21	23	26	23	24	17	78	29	26	23	28	15	12	85	
13-Oct	23	22	23	19	21	21	19	18	20	23	24	23	30	20	22	18	16	16	12	12	55	18	13	16	55	
14-Oct	14	16	13	13	13	16	49	85	16	16	20	21	20	20	19	19	15	14	13	11	12	13	20	23	85	
15-Oct	8	14	14	12	17	20	13	26	14	17	26	25	28	27	30	28	28	24	19	19	30	31	28	25	31	
16-Oct	22	22	50	32	28	26	23	19	21	18	27	78	53	39	35	39	20	66	14	15	84	77	81	16	84	
17-Oct	55	22	17	10	37	92	24	59	96	52	37	43	34	36	37	36	35	33	33	21	27	25	58	35	96	
18-Oct	13	24	22	27	28	17	99	78	15	23	30	22	22	21	24	21	29	18	19	20	19	18	19	19	99	
19-Oct	20	19	21	20	19	21	19	20	20	22	31	35	31	28	31	22	19	34	33	33	20	18	24	28	35	
20-Oct	26	31	25	29	28	31	34	34	32	33	32	36	35	31	28	22	22	22	16	27	67	58	40	28	67	
21-Oct	18	11	20	17	20	24	30	12	28	23	19	18	20	26	28	82	35	75	21	24	22	UO	UO	UO	82	
22-Oct	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	
23-Oct	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	32	31	34	34	28	27	26	18	30	31	26	43	31	43
24-Oct	26	72	32	34	32	33	32	32	34	37	35	35	34	33	33	34	33	31	21	26	32	28	36	35	72	
25-Oct	33	33	32	30	26	28	26	22	16	21	24	31	35	35	35	29	30	21	22	22	26	30	26	28	35	
26-Oct	31	32	31	29	26	30	25	32	25	35	34	36	33	31	35	30	24	25	18	13	25	31	32	32	36	
27-Oct	31	30	31	31	32	28	31	29	20	18	20	20	21	22	21	35	23	15	21	41	15	19	20	24	41	
28-Oct	81	31	24	38	25	35	35	27	26	26	26	21	21	22	21	22	25	26	33	34	30	29	31	31	81	
29-Oct	33	36	31	33	32	30	31	25	27	22	24	35	30	31	33	34	34	20	30	15	19	13	19	25	36	
30-Oct	15	20	16	16	25	43	79	80	75	63	31	24	28	23	22	22	19	19	19	22	25	18	23	32	80	
31-Oct	44	38	46	42	27	22	39	24	26	27	23	21	22	20	20	18	18	62	46	93	25	23	17	19	93	
	84	86	85	86	67	92	99	92	96	75	56	78	72	39	40	82	46	78	75	93	100	94	81	83		

Diurnal Maximum

UO - Unstable Operation



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

**AMS22
JANVIER
OCTOBER 2023**

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

November 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JANVIER (AMS22)
OCTOBER 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	2.3	0	0.8	0
TRS(ppb) Average	706	37	38	99.87	0.3	0	0.2	0
THC(ppm) Average	708	35	36	99.87	2.2	-	2.1	-
NMHC(ppm) Average	708	35	36	99.87	0.094	-	0.005	-
CH4(ppm) Average	708	35	36	99.87	2.2	-	2.1	-
O3 (ppb) Average	708	35	36	99.87	47.1	0	35.2	-
NO2 (ppb) Average	708	36	36	100	17.5	0	3	-
NO (ppb) Average	708	36	36	100	22.3	-	2.1	-
NOX (ppb) Average	708	36	36	100	39.8	-	4.2	-
PM2.5 (ug/m3) Average	742	2	2	100	31	0	12.7	0
Temperature 2 m (C) Average	744	0	0	100	23.3	-	12.4	-
Relative Humidity (%) Average	744	0	0	100	99	-	87.5	-
Wind Speed 20 m (km/h) Average	704	0	40	94.62	22	-	14	-
Wind Direction 20 m (deg) Average	704	0	40	94.62	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JANVIER (AMS22)
OCTOBER 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	0.18	0.3	-	0	0	0	0.1	0.2	0.5	2.3
TRS (ppb) Average	706	0.1	0	-	0	0	0.1	0.1	0.1	0.2	0.3
THC (ppm) Average	708	2.01	0	-	1.9	2	2	2	2	2.1	2.2
NMHC(ppm) Average	708	0	0.004	-	0	0	0	0	0	0	0.094
CH4(ppm) Average	708	2.01	0	-	1.9	2	2	2	2	2.1	2.2
O3 (ppb) Average	708	26.77	7.7	-	4.3	16.3	21.6	27.7	32.5	35.5	47.1
NO2 (ppb) Average	708	1.11	1.3	-	0	0.2	0.4	0.7	1.6	2.3	17.5
NO (ppb) Average	708	0.32	1.2	-	0	0	0	0.1	0.3	0.7	22.3
NOX (ppb) Average	708	1.43	2.4	-	0	0.2	0.4	0.9	1.8	2.9	39.8
PM2.5 (ug/m3) Average	742	4.94	3.2	-	0.7	1.8	3.2	4.4	5.8	8.1	31
Temperature 2 m (C) Average	744	3.81	8	-	-13	-6.7	-3.2	5	9.4	14.1	23.3
Relative Humidity (%) Average	744	72.45	16.8	-	31.2	46.8	60.8	75.2	86.4	92.3	99
Wind Speed 20 m (km/h) Average	704	8.8	4	-	0	3	6	9	11	14	22
Wind Direction 20 m (deg) Average	704	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JANVIER (AMS22)
OCTOBER 2023

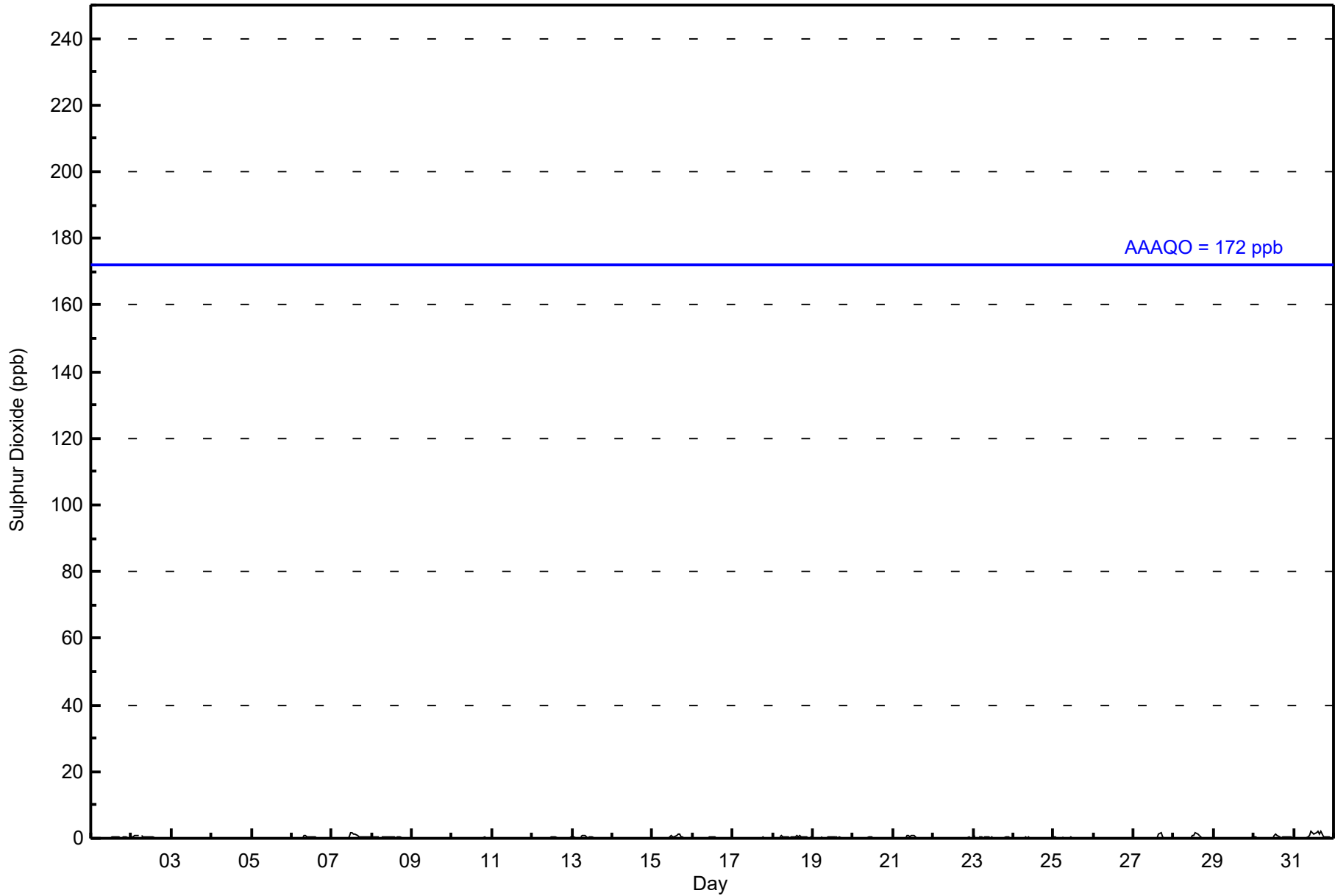
OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
O3, SO2, THC/NMHC/CH4, TRS	17 Oct 2023 15:00	17 Oct 2023 15:00	1	Maintenance - sample manifold cleaned
Wind Speed, Wind Direction	21 Oct 2023 21:00	23 Oct 2023 12:00	40	Flat line in sensor output signal - Sensor frozen



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Janvier - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Janvier - October 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
Janvier - October 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	22	33	12	8	12	20	52	52	41	128	83	42	53	62	33	17	670
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	22	33	12	8	12	20	52	52	41	128	83	42	53	62	33	17	670

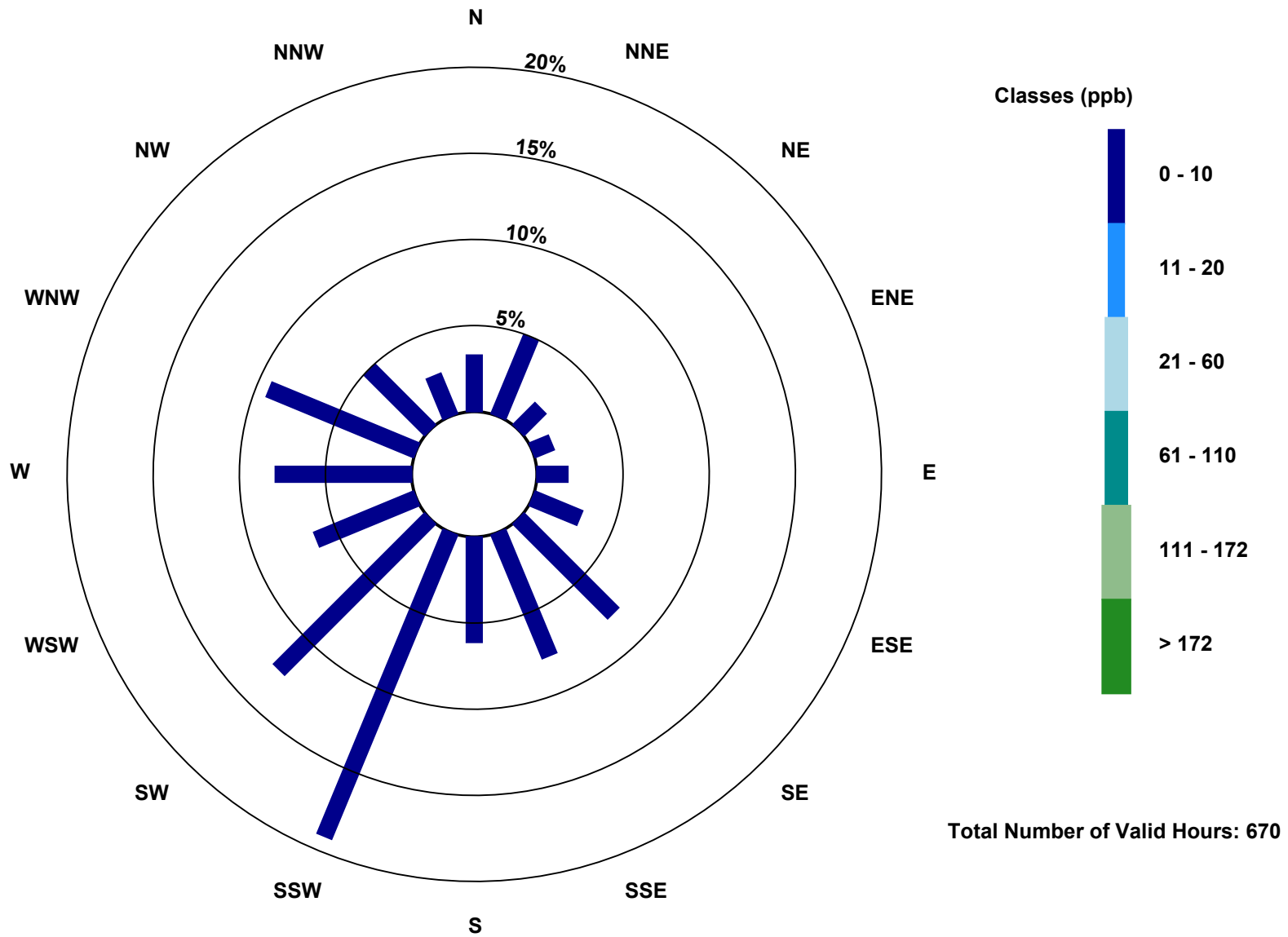
Total Number of Valid Hours: 670

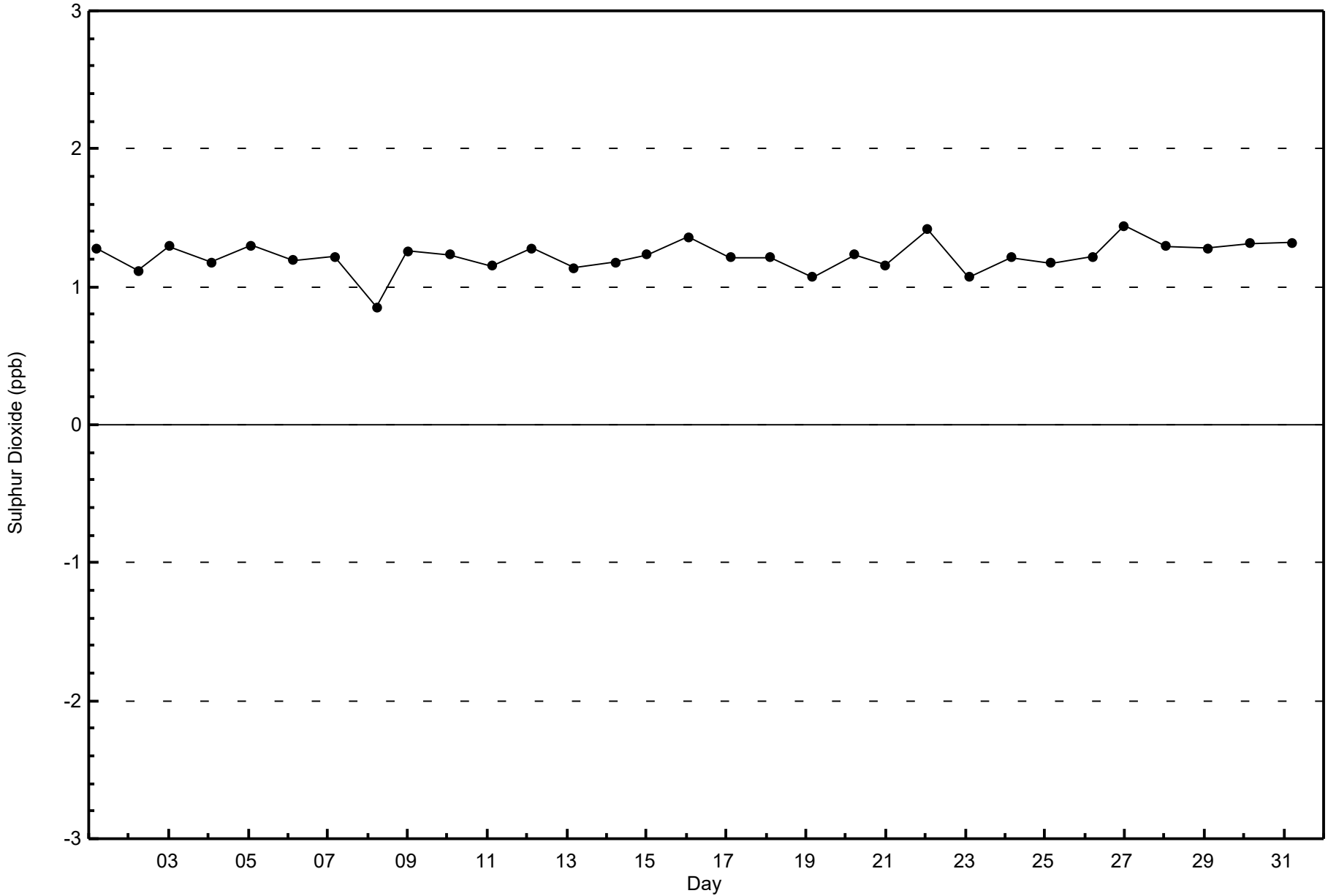
Total Number of Hours: 744

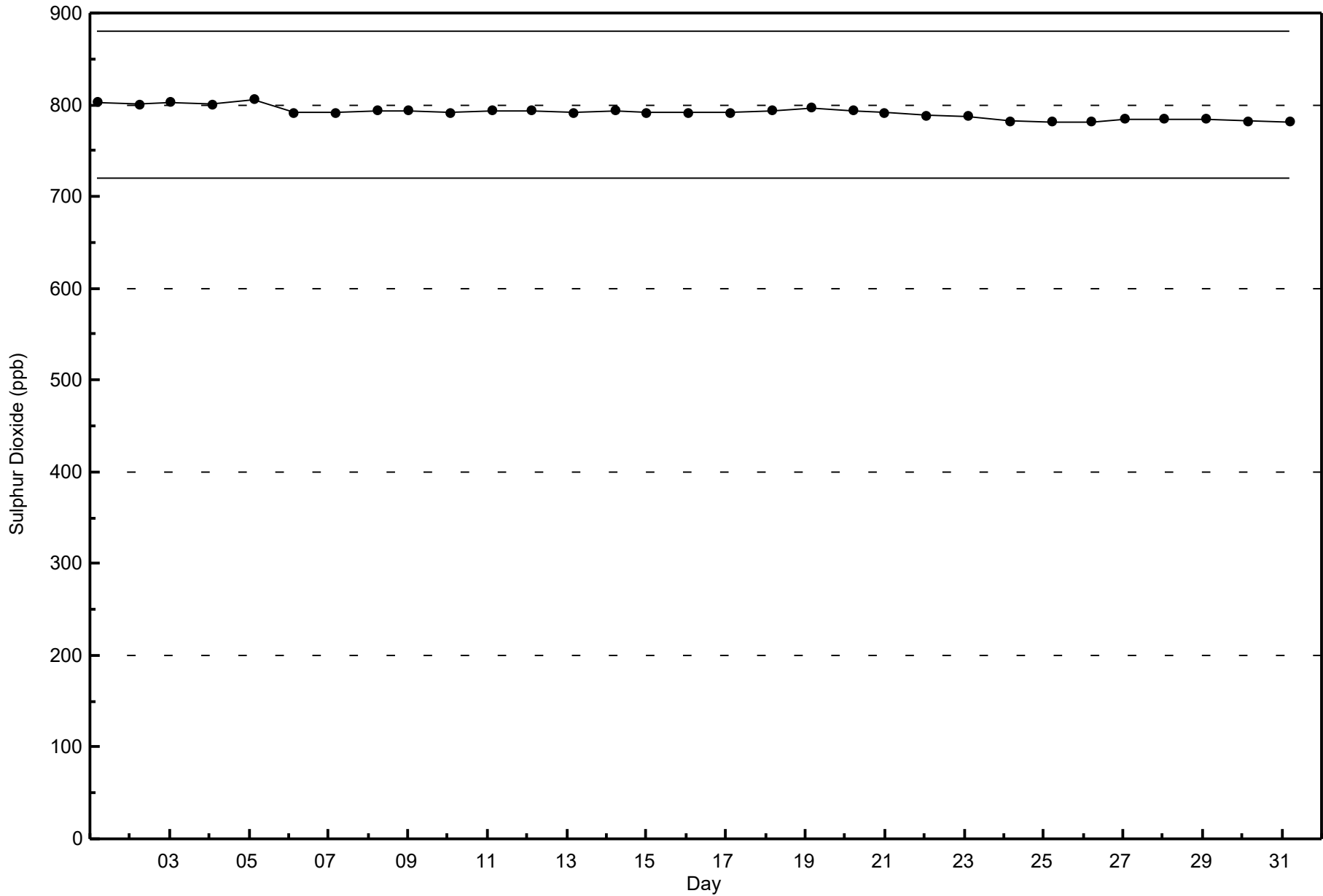


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Sulphur Dioxide (SO₂) - ppb
Janvier







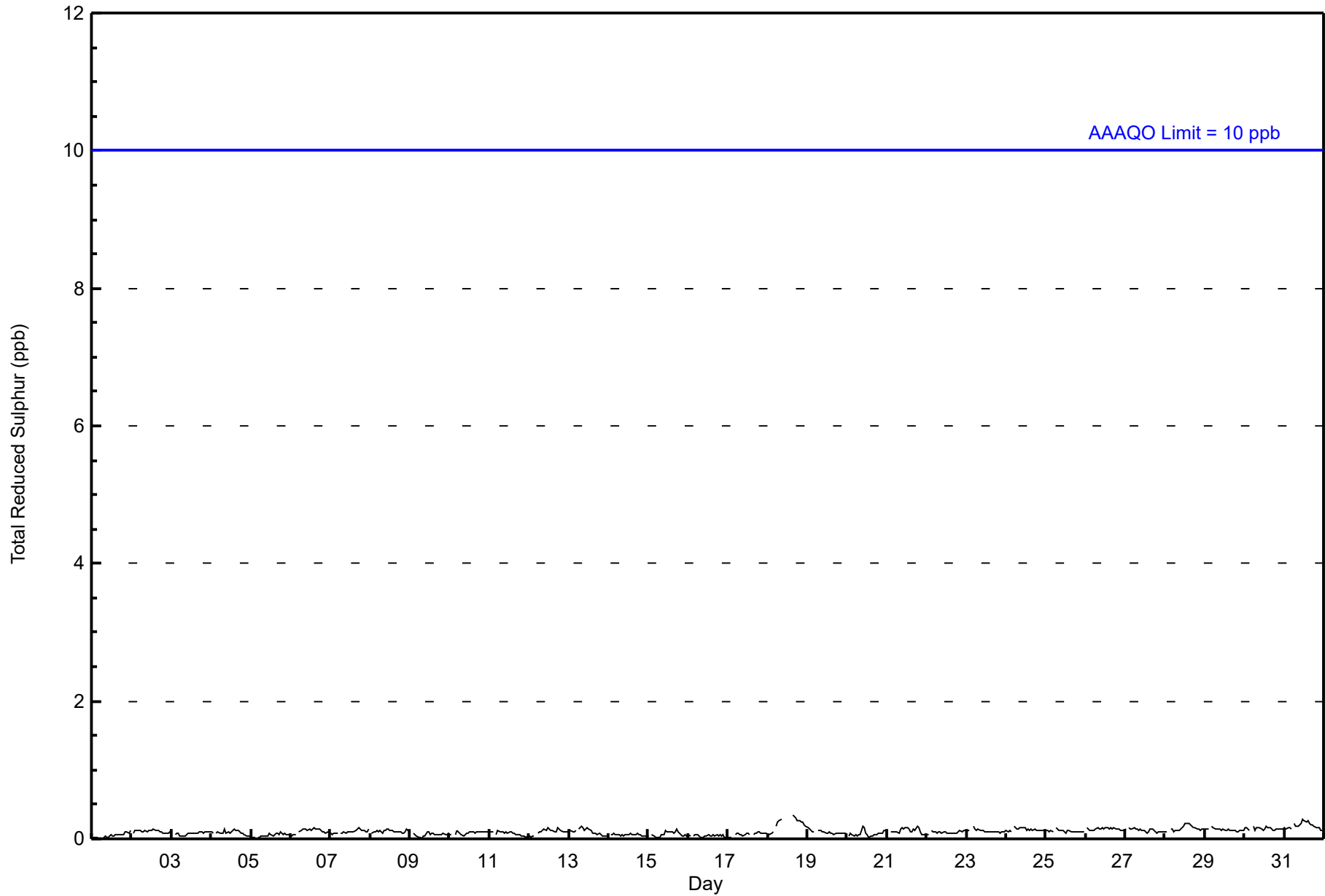


Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 0.3 ppb on Oct 18 16:00 Maximum Daily Average: 0.2 ppb on Oct 31		Hours in Service: 744 Hours of Data: 706 Hours of Missing Data: 38 Hours of Calibration: 37 Percent Operational Time: 99.9																										
Minimum Value: 0.0 ppb on Oct 1 07:00 Maximum Diurnal Average: 0.1 ppb at hour 16 Monthly Average: 0.10 ppb		Minimum Daily Average: 0.0 ppb on Oct 16 Minimum Diurnal Average: 0.1 ppb at hour 1 Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.1 Q ₃ = 0.1 P ₉₀ = 0.2 P ₉₉ = 0.3																										
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24				
1-Oct	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	
2-Oct	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
3-Oct	0.1	Z	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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1
4-Oct	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1
5-Oct	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
6-Oct	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	0.2	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
7-Oct	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	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
8-Oct	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
9-Oct	0.1	Z	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
10-Oct	0.1	0.1	Z	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	0.1	0.1	0.1	0.1	0.1
11-Oct	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
12-Oct	0.0	0.0	0.0	0.0	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	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
13-Oct	0.1	0.1	0.1	0.1	0.1	Z	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.2	
14-Oct	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1
15-Oct	0.0	Z	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	0.0	0.0	0.1	0.0	0.0	0.1	0.1	
16-Oct	0.1	0.0	Z	0.0	0.1	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	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1
17-Oct	0.0	0.0	0.0	Z	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	M	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
18-Oct	0.1	0.1	0.1	0.1	Z	0.2	0.2	0.3	0.3	C	C	C	C	C	C	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
19-Oct	0.2	0.2	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
20-Oct	Z	0.0	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
21-Oct	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2
22-Oct	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
23-Oct	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	0.1	0.1	0.1	0.2
24-Oct	0.1	0.1	0.1	0.1	Z	0.2	0.2	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	0.1	0.1	0.1	0.1	0.1	0.2
25-Oct	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	0.1	0.1	0.1	0.1	0.1	0.2
26-Oct	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
27-Oct	0.1	Z	0.2	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
28-Oct	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	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	0.2
29-Oct	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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
30-Oct	0.2	0.2	0.1	0.1	Z	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.2	0.1	0.2
31-Oct	0.2	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.3	0.3
																								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

Total Reduced Sulphur (TRS) - ppb
Janvier - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Reduced Sulphur (TRS) - ppb
Janvier - October 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	706	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Janvier - October 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	21	35	12	7	13	19	52	51	38	125	85	40	55	61	37	17	668
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	21	35	12	7	13	19	52	51	38	125	85	40	55	61	37	17	668

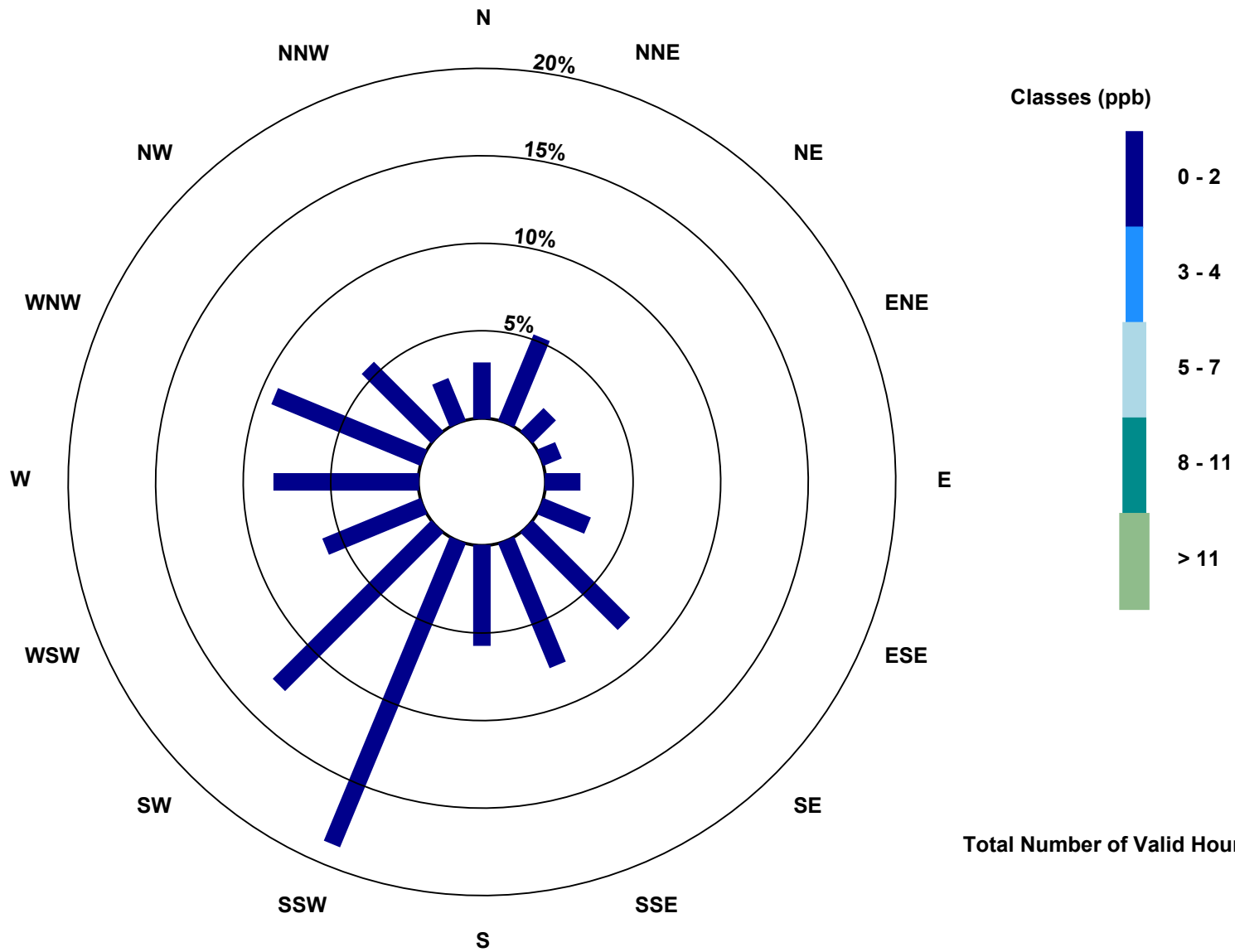
Total Number of Valid Hours: 668

Total Number of Hours: 744

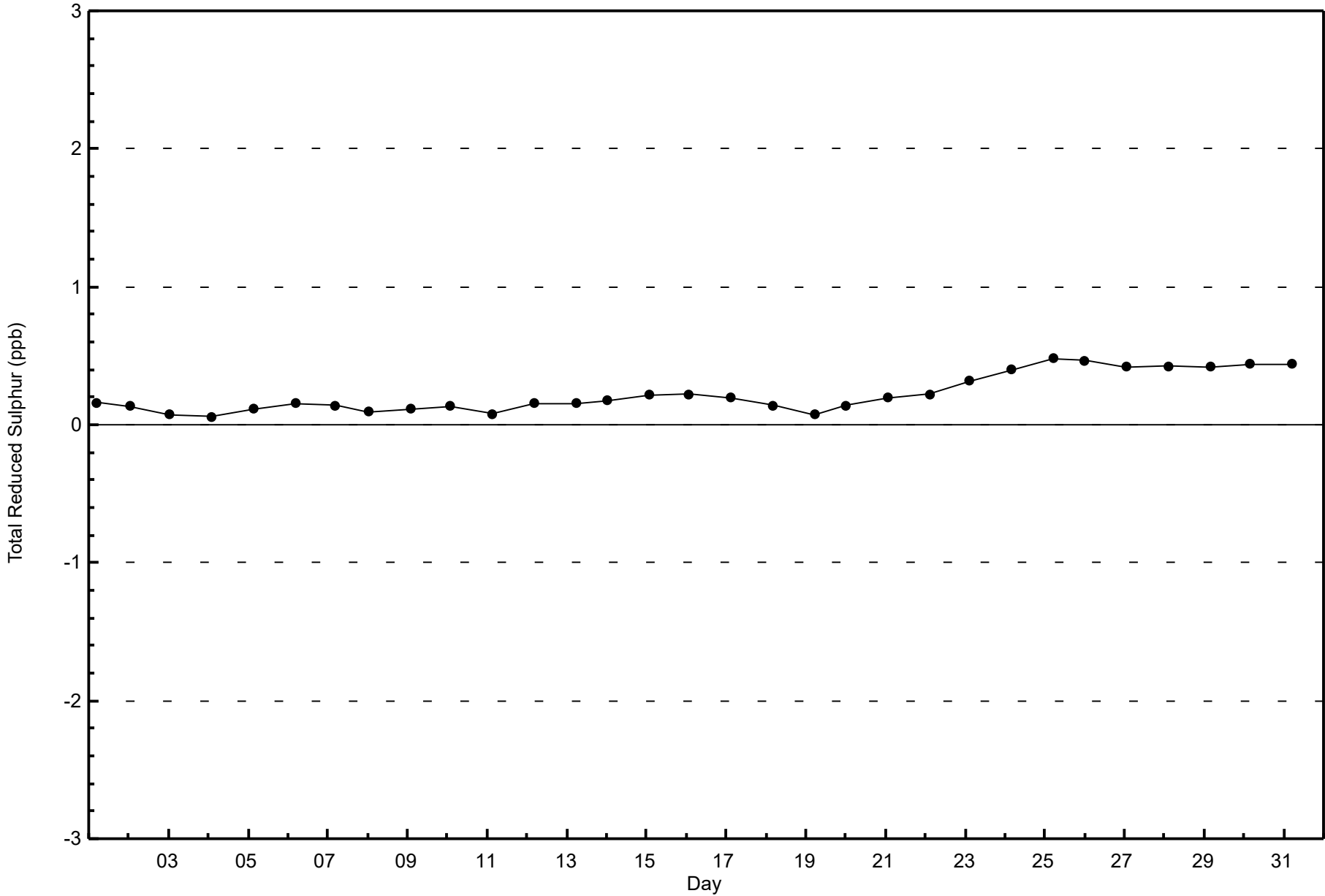


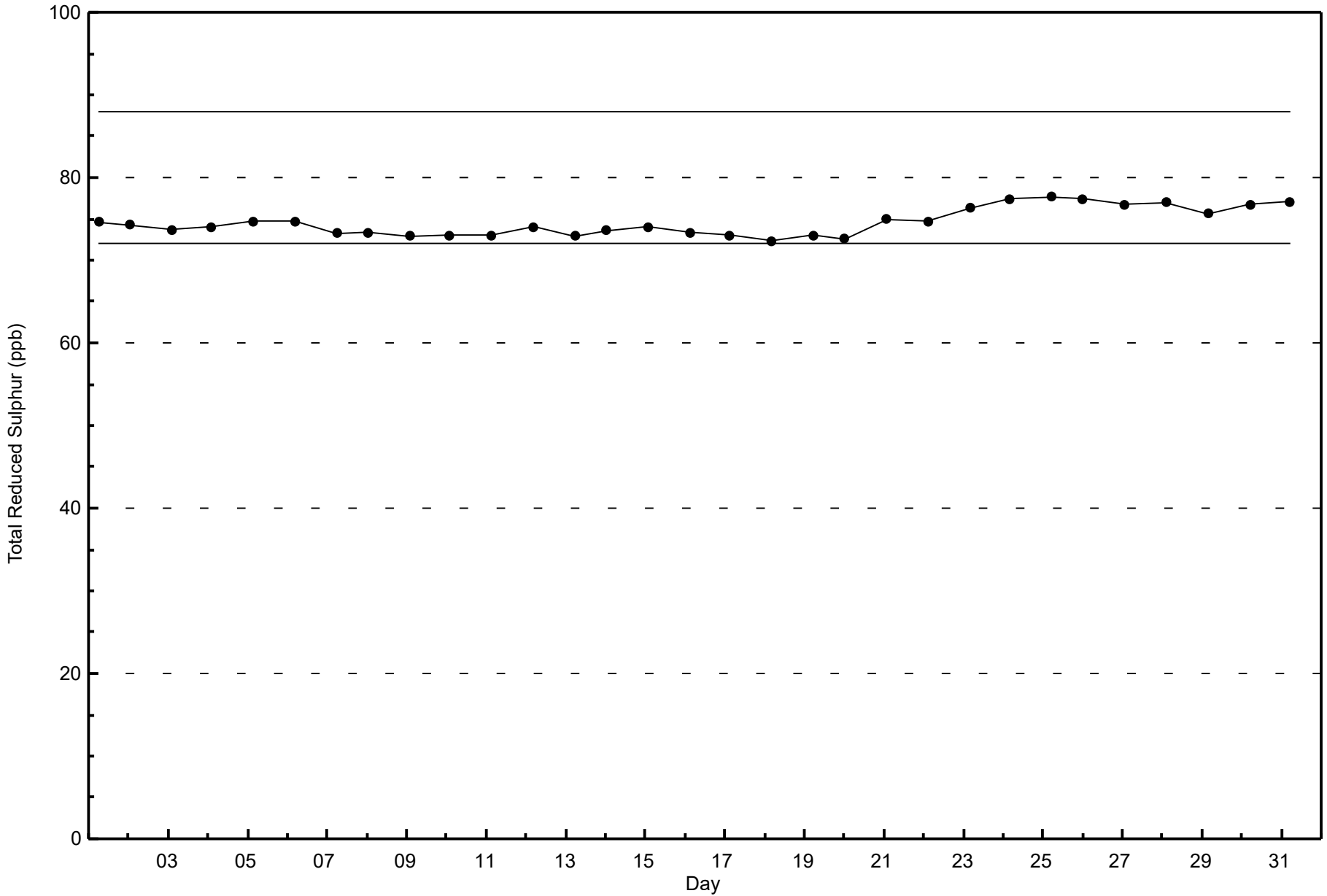
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Total Reduced Sulphur (TRS) - ppb
Janvier



Total Number of Valid Hours: 668





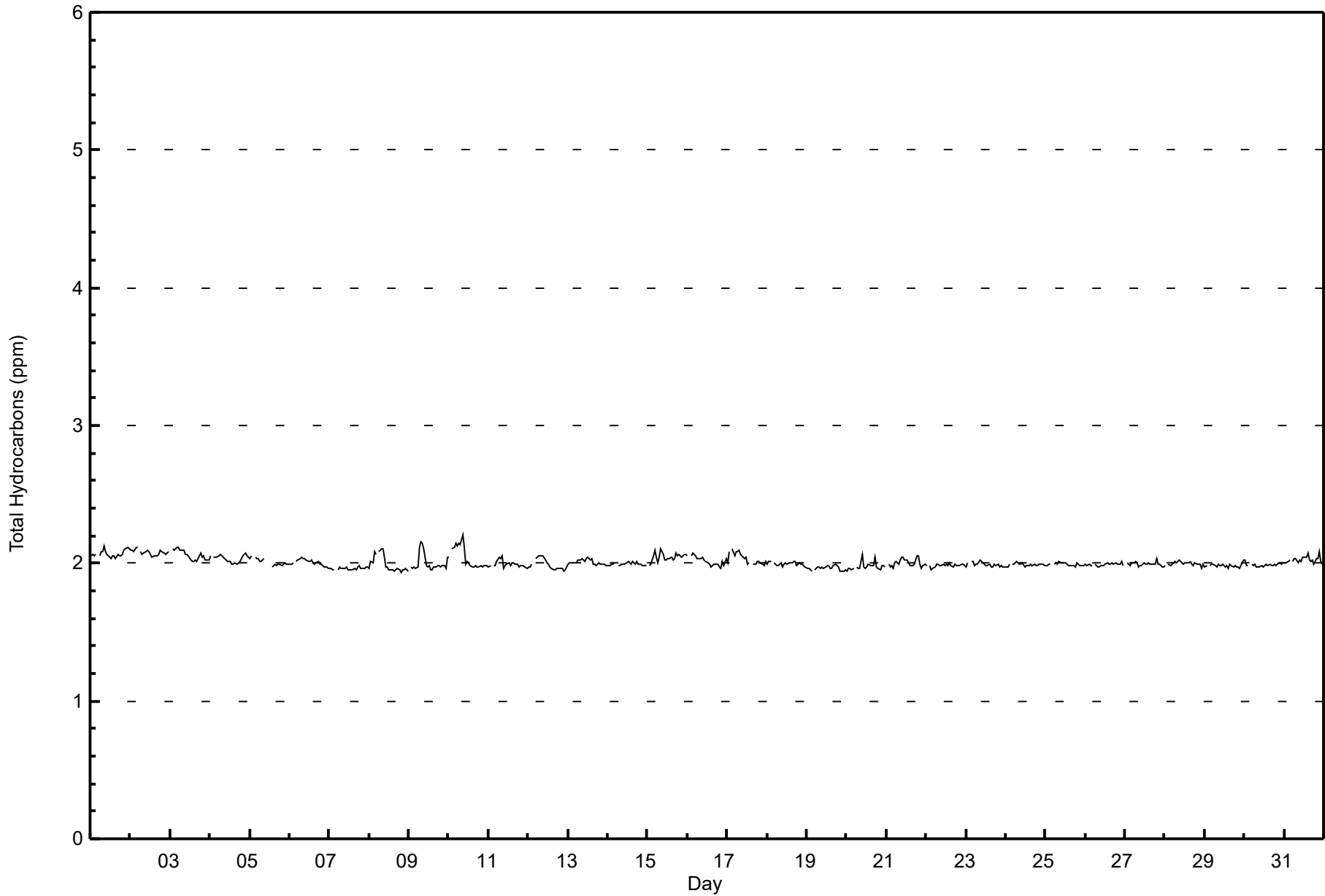


Maximum Value: 2.2 ppm on Oct 10 09:00		Maximum Daily Average: 2.1 ppm on Oct 2		Hours in Service: 744																								
Minimum Value: 1.9 ppm on Oct 8 20:00		Minimum Daily Average: 2.0 ppm on Oct 7		Hours of Data: 708																								
Maximum Diurnal Average: 2.0 ppm at hour 9		Minimum Diurnal Average: 2.0 ppm at hour 17		Hours of Missing Data: 36																								
Monthly Average: 2.01 ppm		Percentiles: P ₁ = 1.9 P ₁₀ = 2.0 Q ₁ = 2.0 Median = 2.0 Q ₃ = 2.0 P ₉₀ = 2.1 P ₉₉ = 2.1		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-Oct	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	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
2-Oct	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	2.1	2.1	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-Oct	Z	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	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1
4-Oct	2.1	Z	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1
5-Oct	2.0	2.1	Z	2.0	2.0	2.0	2.0	2.0	2.0	C	C	C	C	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
6-Oct	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	2.0	2.0	2.0	2.0
7-Oct	2.0	2.0	1.9	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
8-Oct	2.0	2.0	2.0	2.1	2.1	Z	2.1	2.1	2.1	2.0	2.0	2.0	2.0	1.9	2.0	1.9	2.0	2.0	2.0	1.9	2.0	2.0	2.0	1.9	2.0	2.0	1.9	2.0
9-Oct	Z	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2
10-Oct	2.0	Z	2.1	2.1	2.1	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2
11-Oct	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	2.0	2.0	2.0	2.1
12-Oct	2.0	2.0	2.0	Z	2.0	2.0	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	1.9	2.0	2.0	2.0	2.0	2.0	2.1
13-Oct	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	2.0	2.0	2.0
14-Oct	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	2.0	2.0
15-Oct	Z	2.0	2.0	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	2.0	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.0	2.1	2.1	2.1
16-Oct	2.1	Z	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
17-Oct	2.0	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	M	2.0	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-Oct	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	2.0	2.0	2.0	2.0
19-Oct	2.0	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	1.9	1.9	1.9	1.9	1.9	1.9	2.0
20-Oct	1.9	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
21-Oct	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	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
22-Oct	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
23-Oct	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
24-Oct	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	2.0	2.0	2.0	2.0
25-Oct	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	2.0	2.0	2.0
26-Oct	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	2.0	2.0
27-Oct	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
28-Oct	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
29-Oct	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
30-Oct	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	2.0	2.0	2.0	2.0
31-Oct	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	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.1
																								Diurnal Average				
																								Diurnal Maximum				
Z - zerospan		C - Calibration					M - Maintenance																					



Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Janvier - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Janvier - October 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	599	84.60	84.60
2.1 - 3.0	109	15.40	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Janvier - October 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	19	7	7	12	20	46	45	31	92	73	39	51	58	32	16	561
2.1 - 3.0	9	14	5	1	0	0	6	7	10	36	10	3	2	4	1	1	109
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	22	33	12	8	12	20	52	52	41	128	83	42	53	62	33	17	670

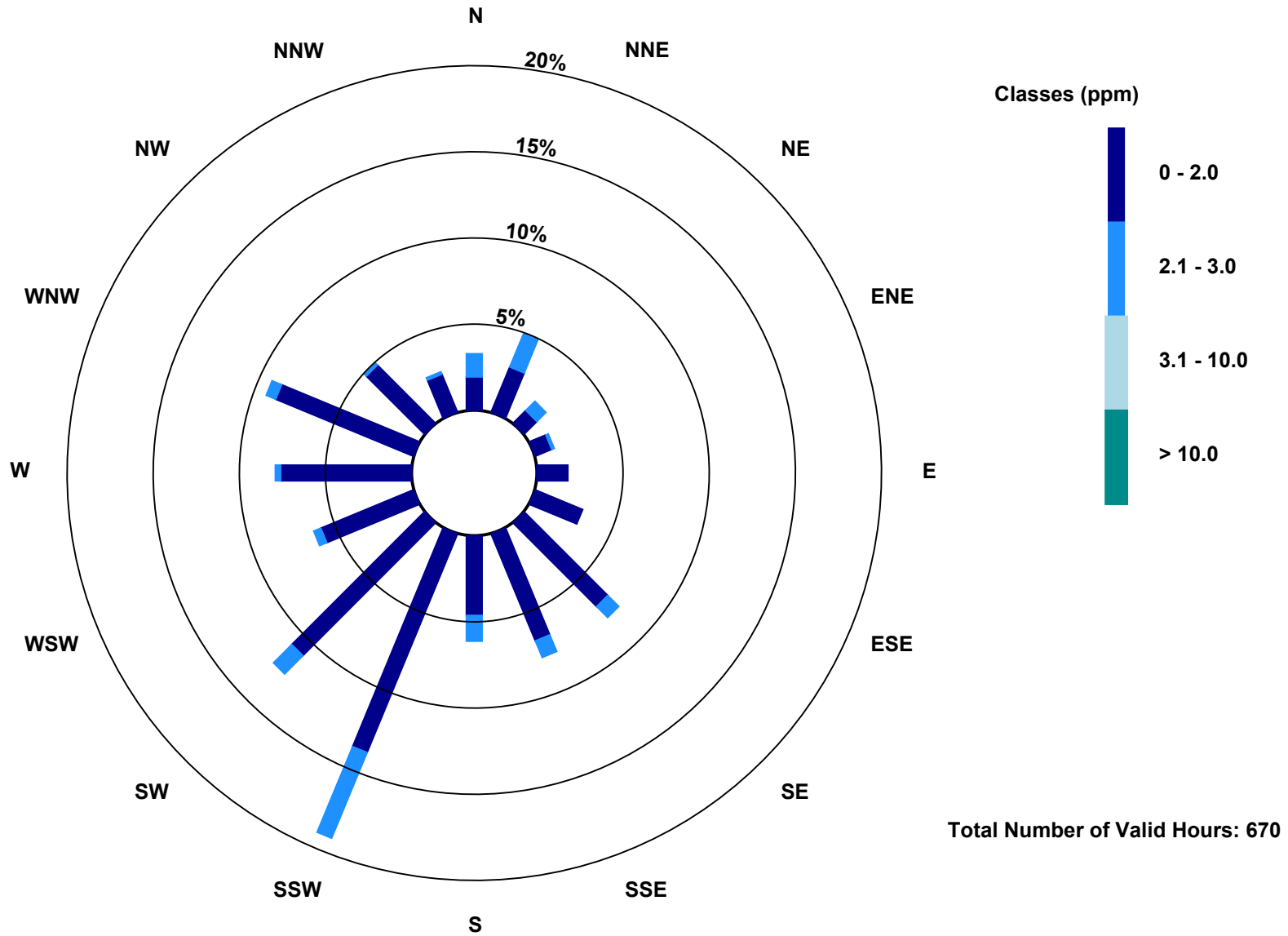
Total Number of Valid Hours: 670

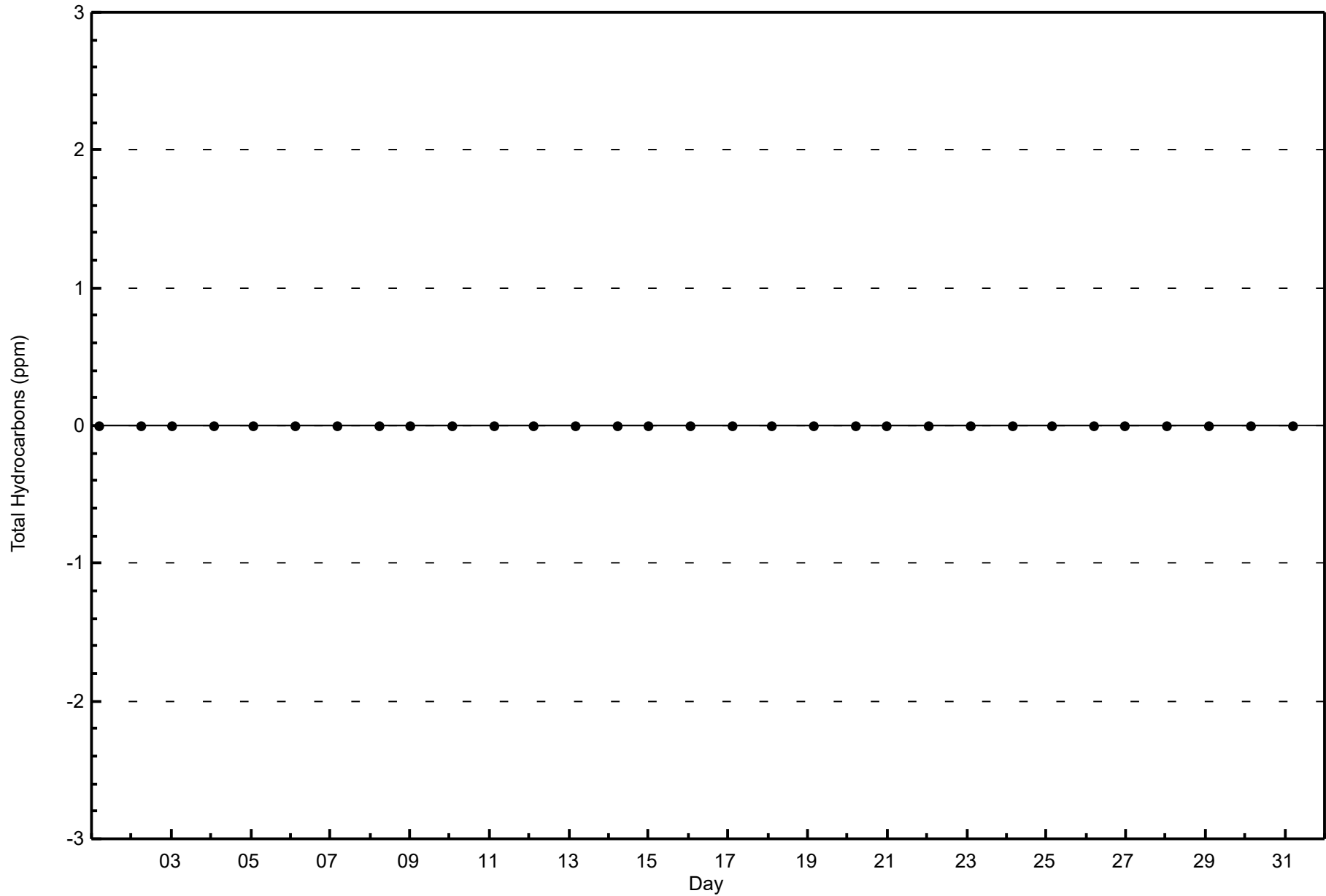
Total Number of Hours: 744

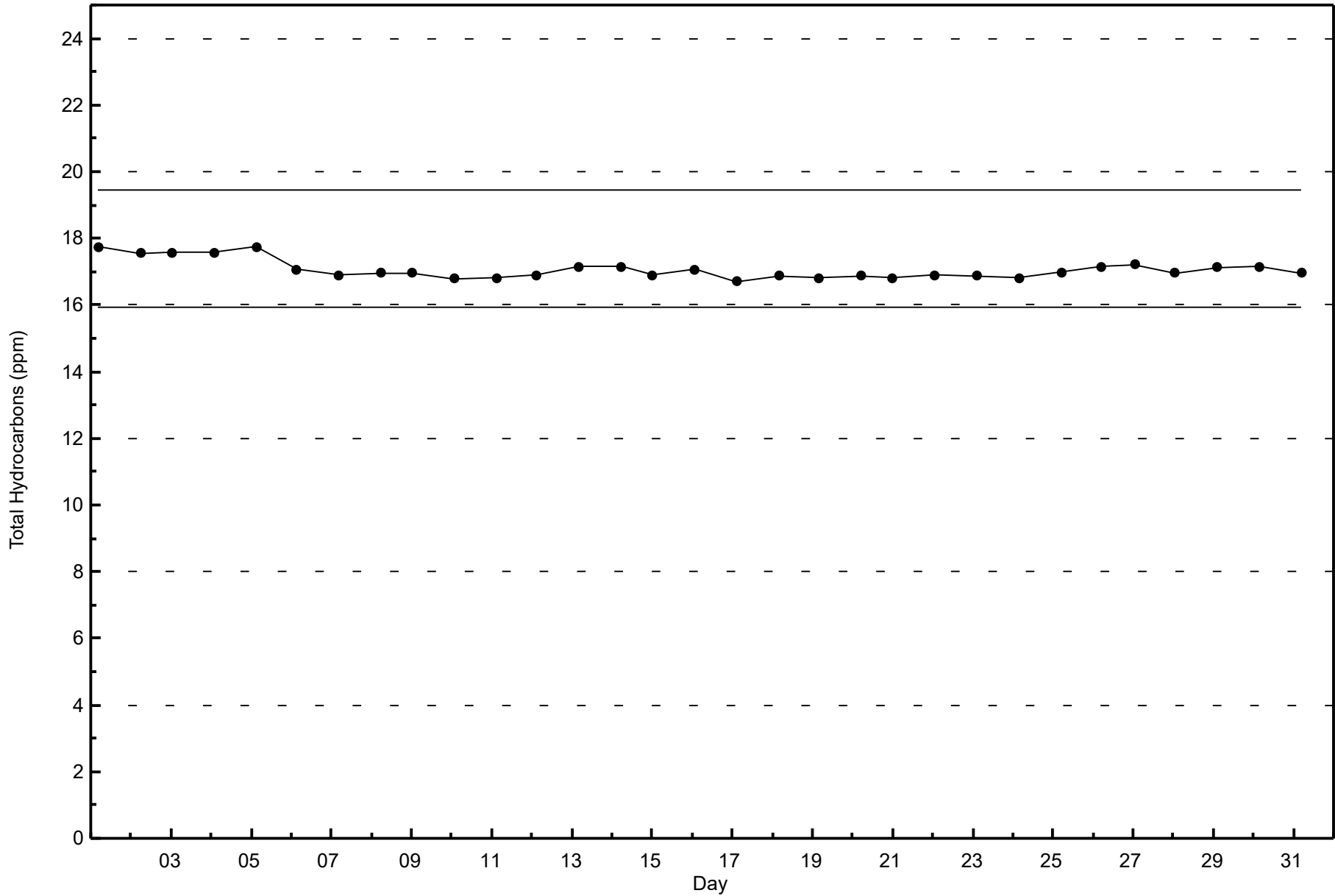


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Total Hydrocarbons (THC) - ppm
Janvier





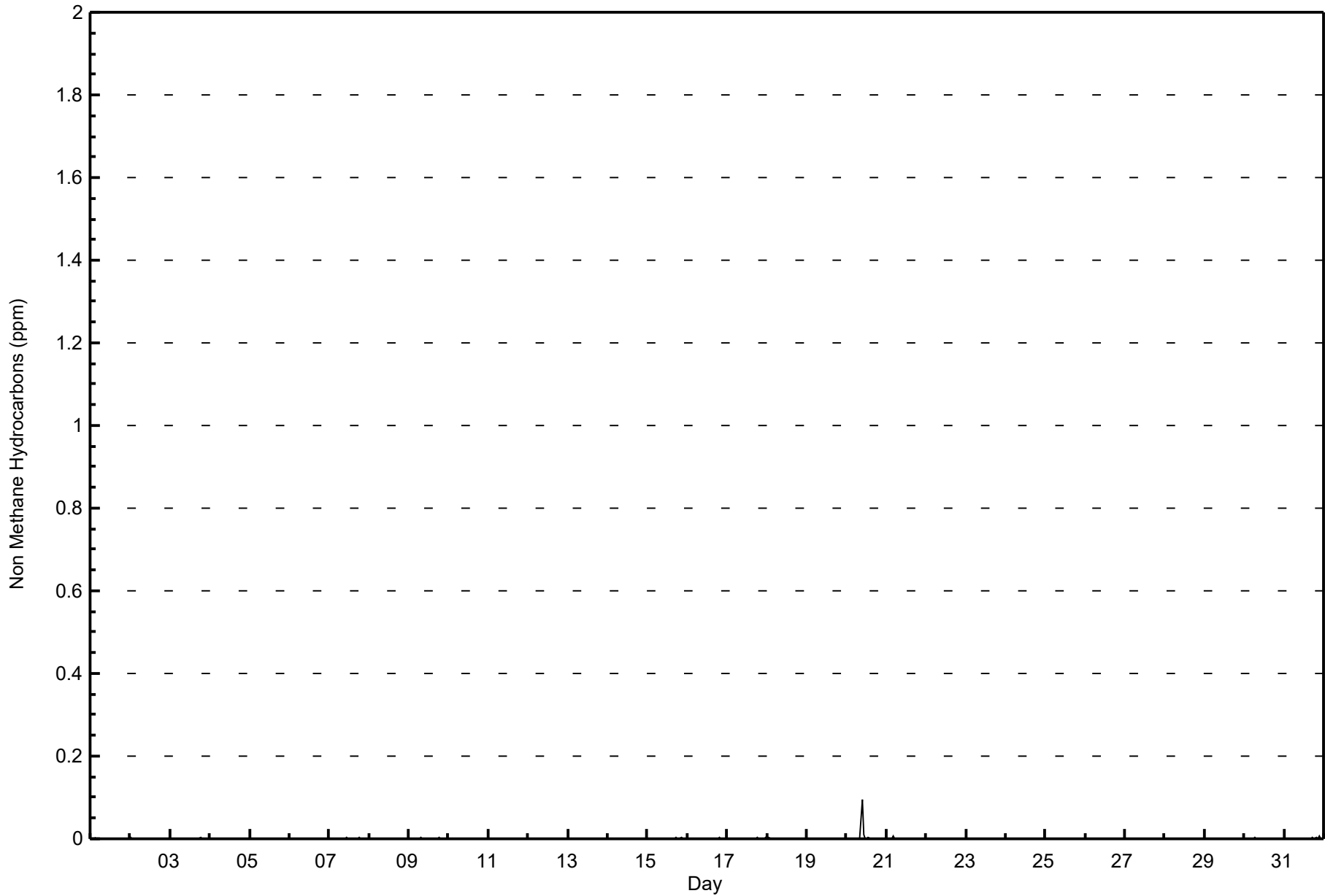




Summary of Hour Averages

Janvier - October 2023

Maximum Value: 0.094 ppm on Oct 20 10:00																								Hours in Service: 744									
Maximum Daily Average: 0.005 ppm on Oct 20																								Hours of Data: 708									
Minimum Value: 0.000 ppm on Oct 1 01:00																								Hours of Missing Data: 36									
Minimum Daily Average: 0.000 ppm on Oct 4																								Hours of Calibration: 35									
Maximum Diurnal Average: 0.003 ppm at hour 10																								Percent Operational Time: 99.9									
Minimum Diurnal Average: 0.000 ppm at hour 3																																	
Monthly Average: 0.000 ppm																																	
Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.0 P ₉₉ = 0.0																																	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24									
1-Oct	0.000	0.000	0.000	0.004	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	0.004
2-Oct	0.002	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	0.002	
3-Oct	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	
4-Oct	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-Oct	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	C	C	C	C	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
6-Oct	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		
7-Oct	0.000	0.000	0.000	0.000	Z	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	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	
8-Oct	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-Oct	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	
10-Oct	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-Oct	0.000	0.000	Z	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	
12-Oct	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	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	
13-Oct	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	
14-Oct	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	
15-Oct	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	0.003	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	
16-Oct	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	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	
17-Oct	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	M	0.000	0.000	0.000	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	
18-Oct	0.000	0.003	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	0.003	
19-Oct	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-Oct	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.094	0.009	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	0.005	
21-Oct	Z	0.000	0.000	0.000	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	
22-Oct	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	
23-Oct	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	
24-Oct	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	
25-Oct	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	
26-Oct	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	
27-Oct	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	
28-Oct	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	
29-Oct	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	
30-Oct	0.000	0.000	0.000	Z	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	
31-Oct	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	0.003	0.000	0.002	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	
																								Diurnal Average									
																								Diurnal Maximum									
Z - zerospan C - Calibration M - Maintenance																																	





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Janvier - October 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	705	99.58	99.58
0.006 - 0.05	2	0.28	99.86
0.06 - 0.1	1	0.14	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
Janvier - October 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	33	12	8	12	20	52	52	41	127	83	42	52	61	33	17	667
0.006 - 0.05	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	2
0.06 - 0.1	0	0	0	0	0	0	0	0	0	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
Totals	22	33	12	8	12	20	52	52	41	128	83	42	53	62	33	17	670

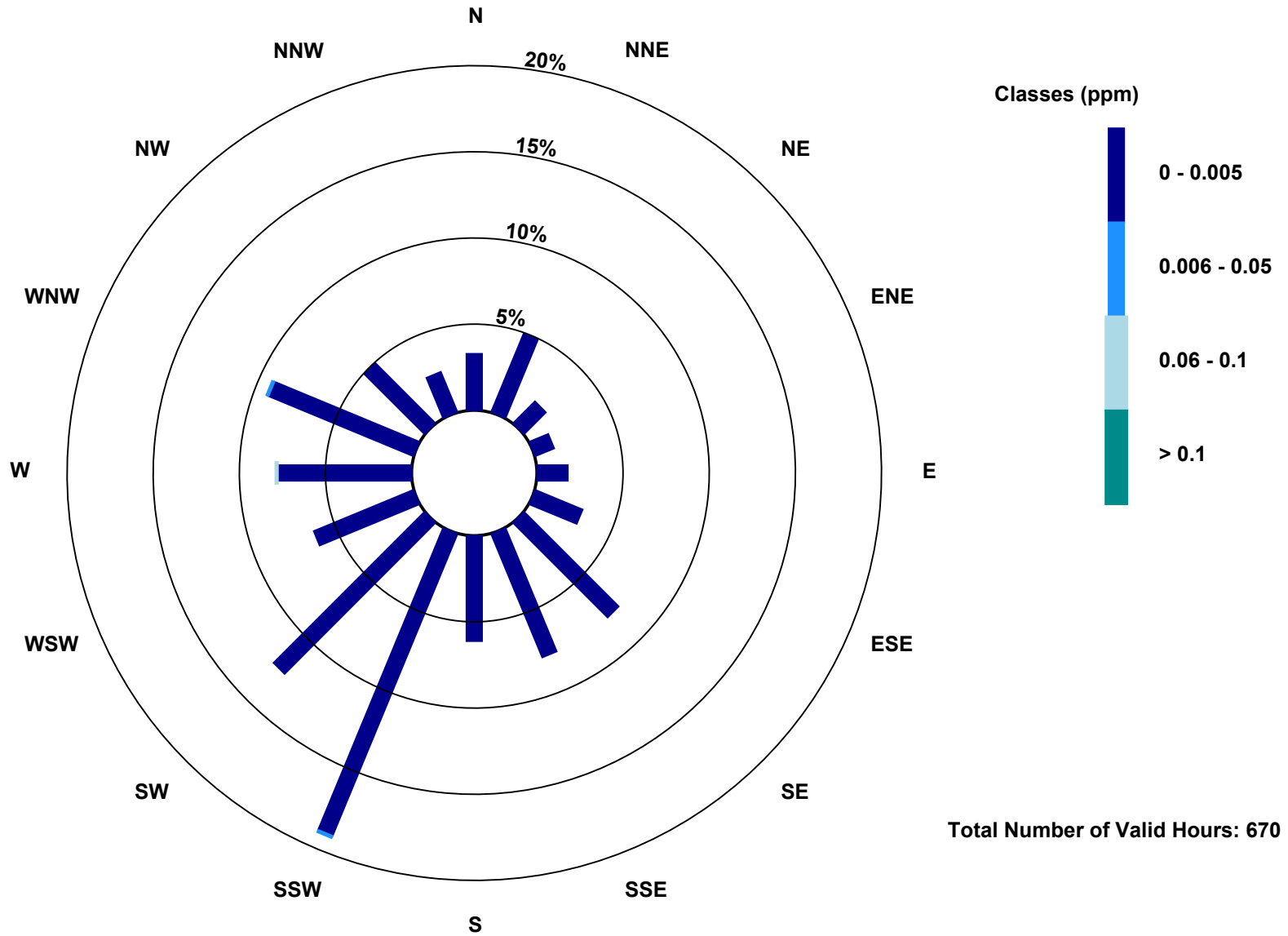
Total Number of Valid Hours: 670

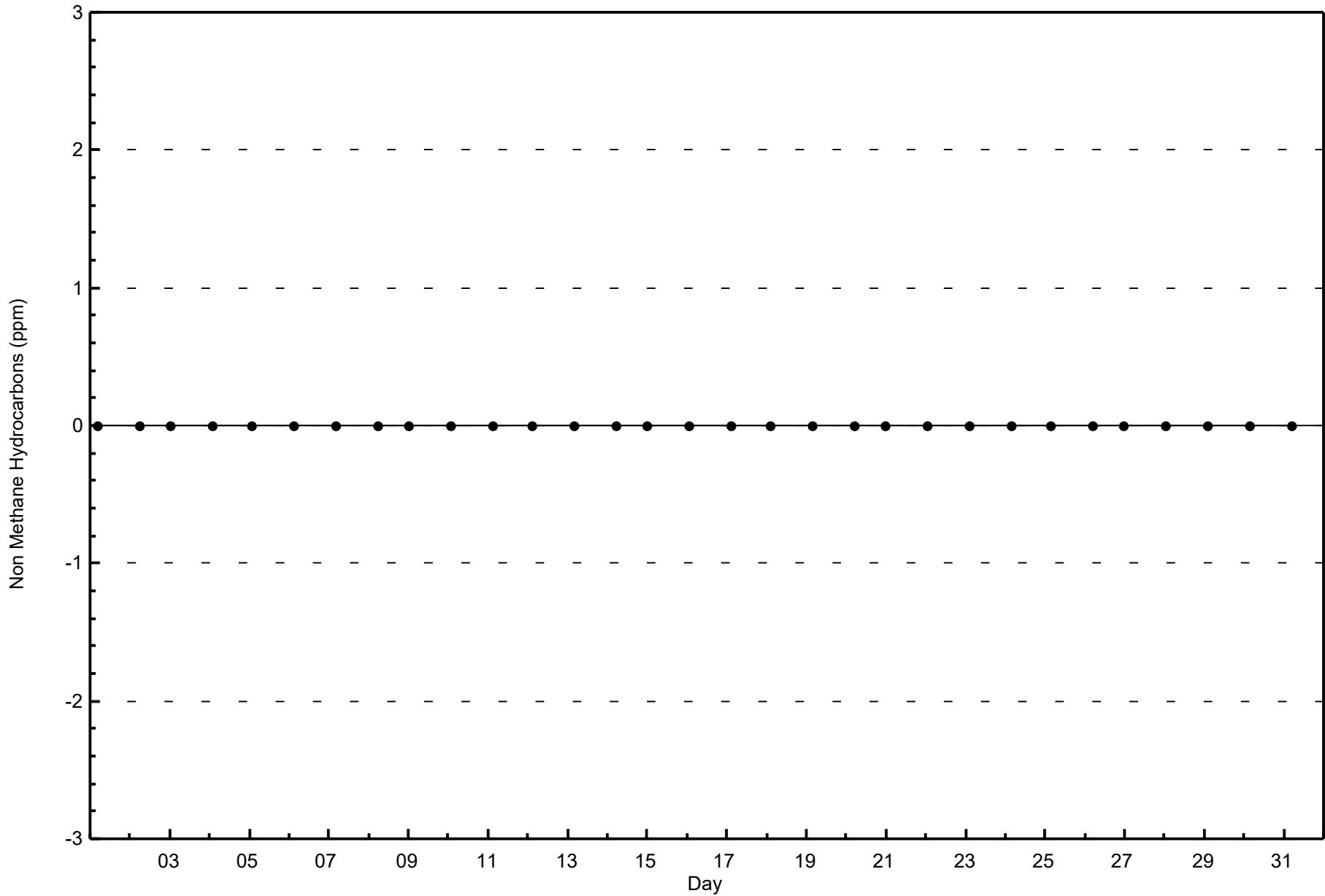
Total Number of Hours: 744

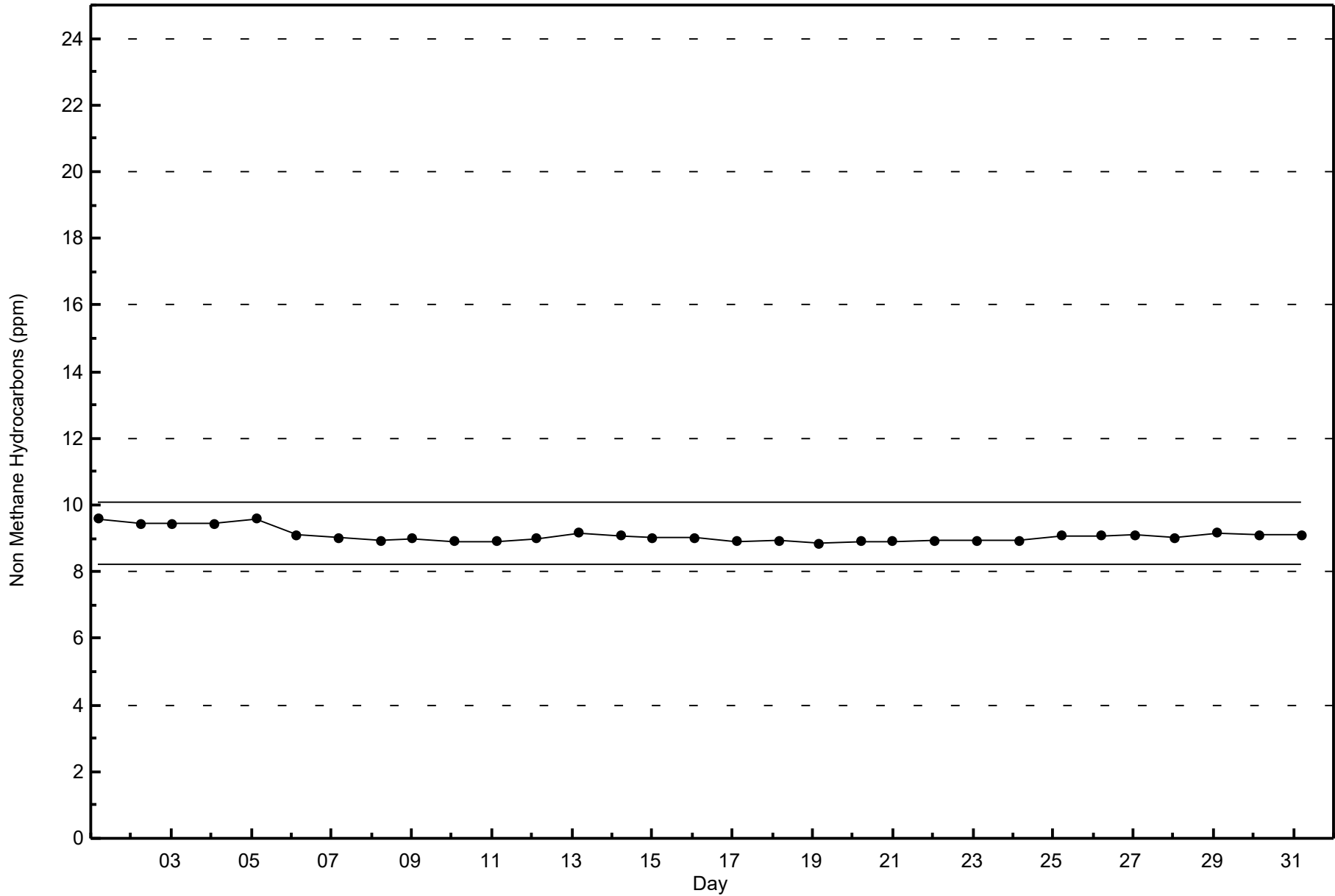


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Non Methane Hydrocarbons (NMHC) - ppm
Janvier



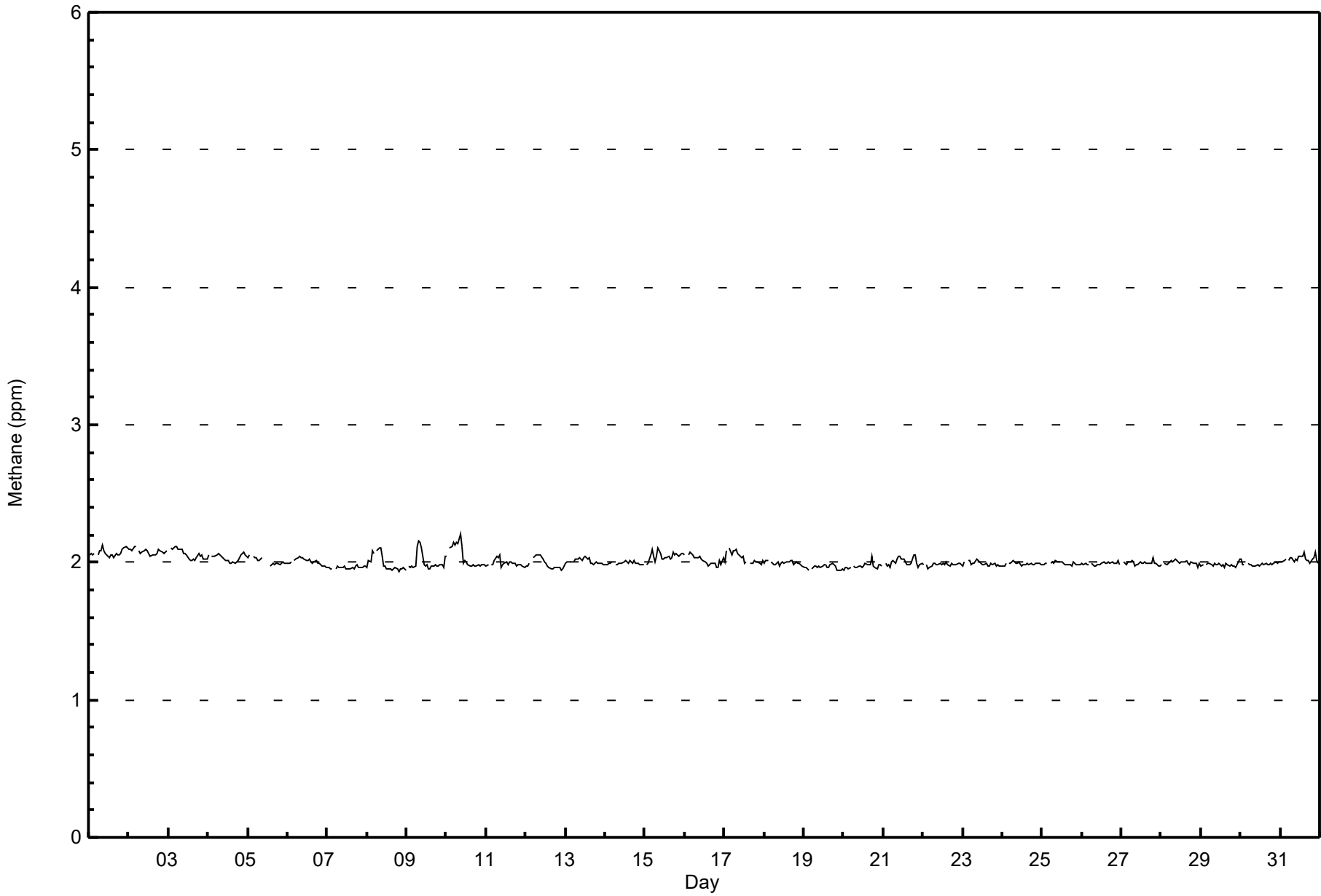






Wood Buffalo Environmental Association
Hourly Averages

Methane (CH₄) - ppm
Janvier - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Janvier - October 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	600	84.75	84.75
2.1 - 3.0	108	15.25	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Methane (CH₄) - ppm
Janvier - October 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	19	7	7	12	20	46	45	31	92	73	39	52	58	32	16	562
2.1 - 3.0	9	14	5	1	0	0	6	7	10	36	10	3	1	4	1	1	108
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	22	33	12	8	12	20	52	52	41	128	83	42	53	62	33	17	670

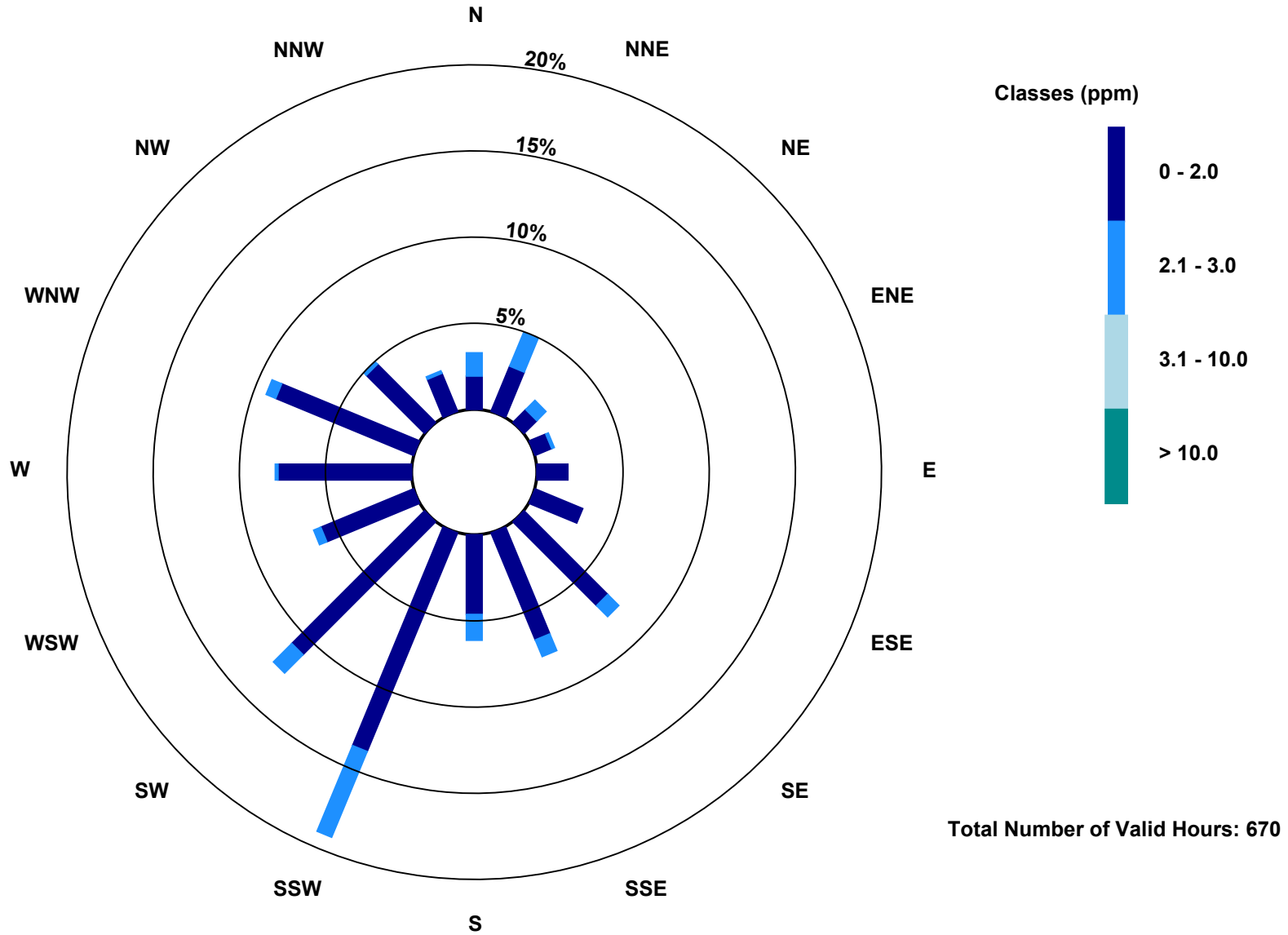
Total Number of Valid Hours: 670

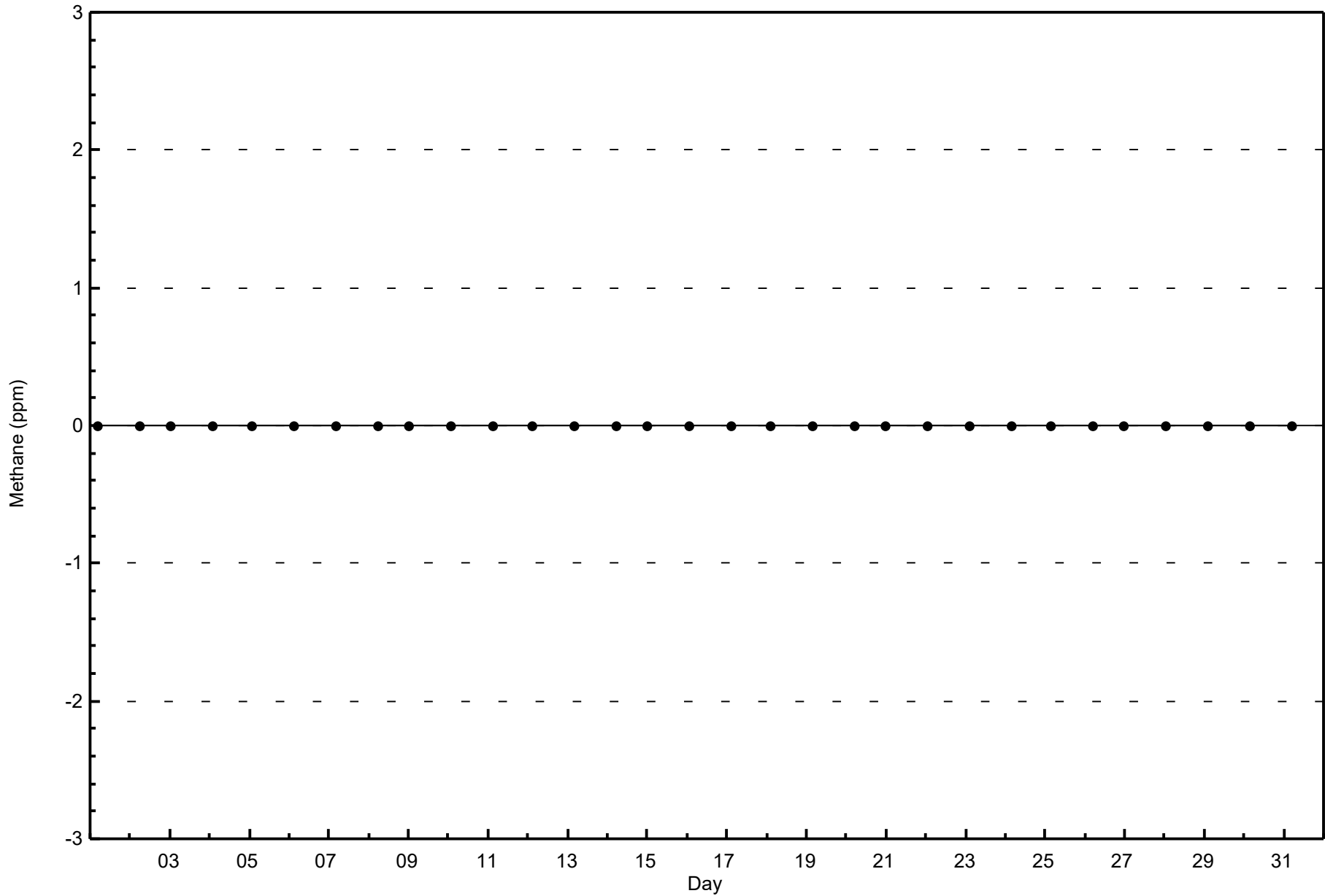
Total Number of Hours: 744

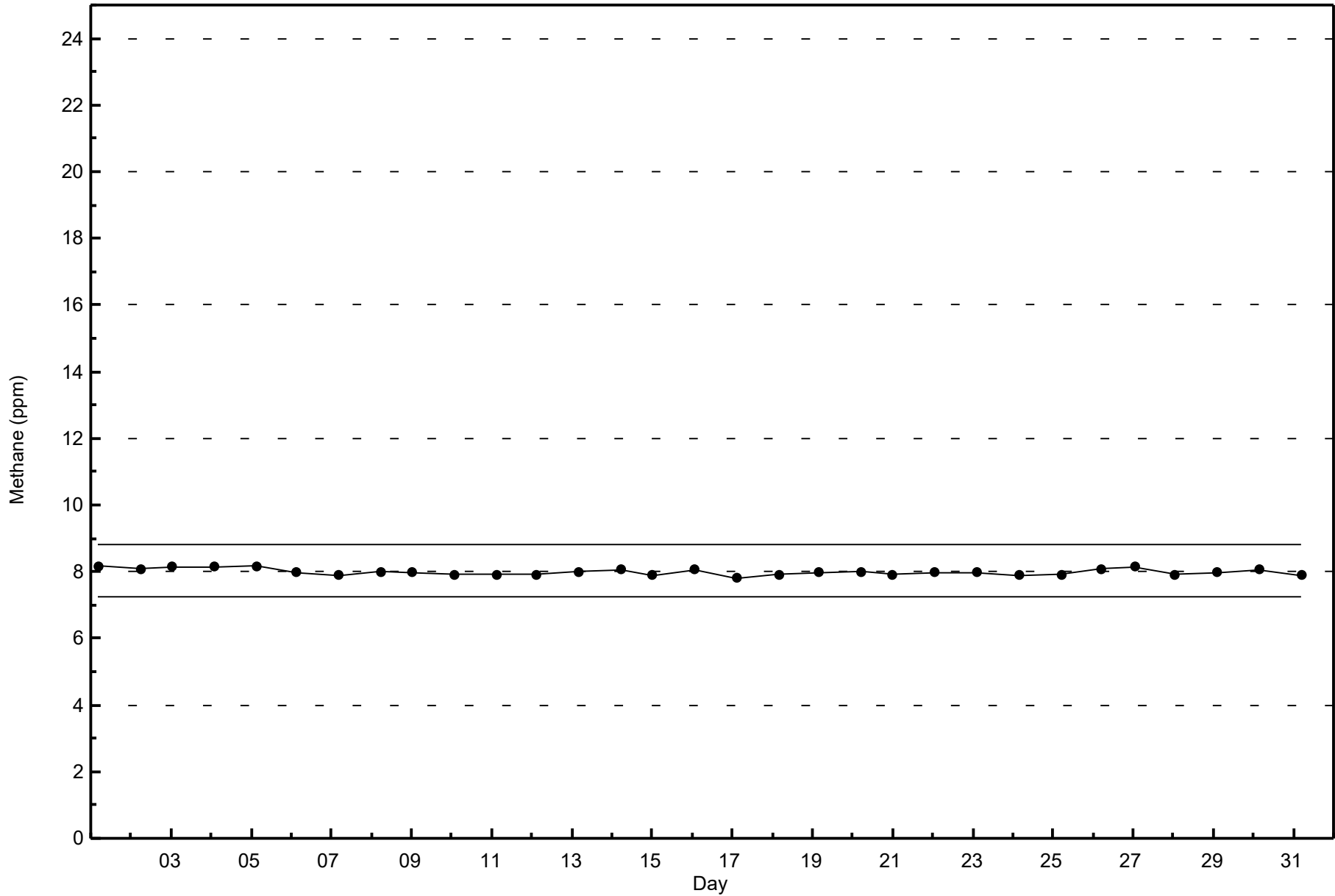


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Methane (CH₄) - ppm
Janvier









Wood Buffalo Environmental Association
Summary of Hour Averages

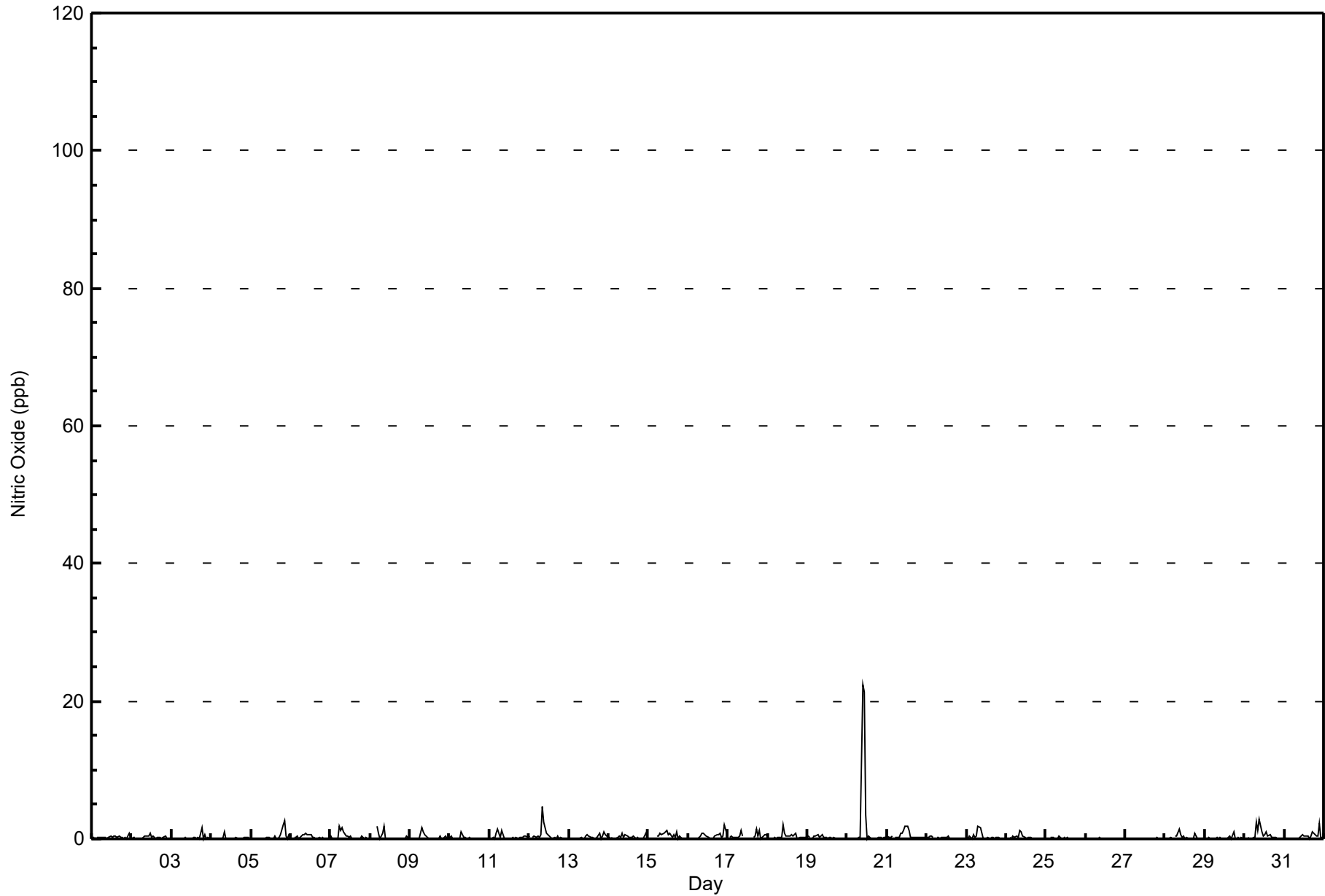
Nitric Oxide (NO) - ppb
Janvier - October 2023

Maximum Value: 22.3 ppb on Oct 20 10:00		Maximum Daily Average: 2.1 ppb on Oct 20		Hours in Service: 744																						
Minimum Value: 0.0 ppb on Oct 2 06:00		Minimum Daily Average: 0.0 ppb on Oct 26		Hours of Data: 708																						
Maximum Diurnal Average: 1.3 ppb at hour 10		Minimum Diurnal Average: 0.1 ppb at hour 2		Hours of Missing Data: 36																						
Monthly Average: 0.32 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.3 P ₉₀ = 0.7 P ₉₉ = 2.4		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-Oct	0.2	0.1	Z	0.2	0.1	0.1	0.3	0.1	0.2	0.0	0.2	0.3	0.2	0.4	0.5	0.2	0.4	0.2	0.2	0.1	0.3	0.1	0.7	0.2	0.2	0.7
2-Oct	0.1	0.1	0.2	Z	0.1	0.0	0.1	0.3	0.3	0.4	0.5	0.7	0.2	0.3	0.1	0.1	0.1	0.3	0.0	0.2	0.3	0.0	0.0	0.0	0.2	0.7
3-Oct	0.0	0.1	0.0	0.0	Z	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.0	1.6	0.0	0.5	0.0	0.2	0.0	0.1	1.6
4-Oct	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.2	1.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.2	0.1	0.2	0.0	0.1	1.0
5-Oct	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.1	0.1	0.1	0.1	0.3	0.1	0.0	0.2	0.6	2.0	2.7	0.5	0.1	0.7	0.3	2.7
6-Oct	0.3	Z	0.2	0.1	0.4	0.1	0.5	0.6	0.6	0.8	0.5	0.7	0.6	0.3	0.2	0.1	0.0	0.3	0.1	0.2	0.1	0.0	0.0	0.0	0.3	0.8
7-Oct	0.4	0.1	Z	0.0	0.0	1.8	1.3	1.6	1.0	0.4	0.5	0.1	0.4	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.1	0.0	0.0	0.0	0.4	1.8
8-Oct	0.0	0.0	0.0	Z	1.9	0.8	0.0	0.7	1.8	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	0.4	0.0	0.2	1.9
9-Oct	0.0	0.0	0.0	0.0	Z	0.0	0.8	1.7	1.1	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.4	0.0	0.0	0.2	1.7
10-Oct	0.2	0.4	0.0	0.0	0.0	Z	0.0	1.0	0.2	0.2	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.0
11-Oct	Z	0.0	0.1	0.0	0.8	1.5	0.1	1.3	0.6	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.3	0.3	0.4	0.2	0.3	1.5
12-Oct	0.3	Z	0.1	0.5	0.2	0.4	0.2	0.5	4.6	2.4	0.9	0.6	0.4	0.3	0.1	0.3	0.0	0.4	0.0	0.2	0.0	0.0	0.0	0.0	0.5	4.6
13-Oct	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.4	0.6	0.3	0.2	0.2	0.0	0.0	0.2	0.9	0.1	0.5	1.1	0.6	0.3	0.2	1.1
14-Oct	0.2	0.1	0.2	Z	0.0	0.2	0.4	0.1	0.8	0.2	0.6	0.3	0.2	0.2	0.2	0.3	0.1	0.1	0.0	0.0	0.1	0.0	0.9	0.3	0.2	0.9
15-Oct	0.0	0.1	0.0	0.0	Z	0.5	0.5	0.7	0.6	0.9	1.1	1.2	0.6	0.7	0.3	0.6	0.2	0.9	0.0	0.5	0.1	0.0	0.0	0.1	0.4	1.2
16-Oct	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.4	0.8	0.8	0.6	0.4	0.2	0.1	0.0	0.1	0.5	0.5	0.6	0.7	0.3	0.3	2.0	0.6	0.4	2.0
17-Oct	Z	0.3	0.4	0.1	0.2	0.2	0.5	1.3	0.4	0.4	C	C	C	C	C	0.1	0.4	1.5	0.4	1.3	0.1	0.4	0.7	0.6	0.5	1.5
18-Oct	0.3	Z	0.0	0.0	0.1	0.0	0.3	0.3	0.2	2.0	0.8	0.5	0.4	0.4	0.6	0.4	0.6	0.8	0.0	0.3	0.2	0.2	0.2	0.2	0.4	2.0
19-Oct	0.4	0.3	Z	0.0	0.4	0.4	0.6	0.2	0.4	0.6	0.1	0.2	0.0	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.6
20-Oct	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.2	0.2	22.3	21.3	3.4	0.1	0.4	0.0	0.0	0.1	0.0	0.1	0.3	0.1	0.0	0.3	0.2	2.1	22.3
21-Oct	0.4	0.2	0.3	0.4	Z	0.1	0.1	0.2	0.8	0.9	1.1	1.9	1.9	1.2	0.3	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.5	1.9
22-Oct	0.1	0.1	0.3	0.3	0.2	Z	0.3	0.1	0.1	0.2	0.2	0.3	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3
23-Oct	Z	0.0	0.5	0.0	0.6	0.2	0.5	1.9	1.6	0.8	0.0	0.0	0.0	0.1	0.0	0.1	0.2	0.1	0.3	0.2	0.1	0.0	0.1	0.1	0.3	1.9
24-Oct	0.2	Z	0.2	0.0	0.4	0.1	0.3	0.3	1.3	1.1	0.5	0.1	0.1	0.2	0.2	0.2	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.2	1.3
25-Oct	0.0	0.0	Z	0.1	0.2	0.0	0.0	0.0	0.5	0.0	0.0	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.5
26-Oct	0.0	0.0	0.0	Z	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	0.0	0.0	0.2
27-Oct	0.0	0.0	0.0	0.0	Z	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.2
28-Oct	0.0	0.0	0.0	0.2	0.0	Z	0.5	0.3	1.5	0.5	0.1	0.4	0.1	0.1	0.0	0.0	0.0	0.1	0.8	0.0	0.1	0.0	0.0	0.0	0.2	1.5
29-Oct	Z	0.0	0.2	0.0	0.0	0.1	0.0	0.1	0.0	0.2	0.0	0.0	0.1	0.1	0.1	0.4	0.0	1.0	0.0	0.0	0.1	0.0	0.2	0.1	0.1	1.0
30-Oct	0.0	Z	0.1	0.1	0.0	0.1	0.1	2.5	1.2	2.9	1.0	0.4	0.5	1.0	0.3	0.6	0.2	0.2	0.2	0.3	0.0	0.0	0.1	0.0	0.5	2.9
31-Oct	0.0	0.1	Z	0.0	0.0	0.1	0.0	0.0	0.1	0.2	0.4	0.6	0.5	0.3	0.5	0.0	0.3	0.9	0.7	0.4	0.4	2.3	0.2	0.2	0.4	2.3
																								Diurnal Average		
																								Diurnal Maximum		
																								0.1 0.1 0.1 0.1 0.2 0.3 0.2 0.5 0.7 1.3 1.0 0.4 0.2 0.2 0.1 0.1 0.1 0.3 0.2 0.3 0.2 0.2 0.2 0.1 0.1 0.1 0.1		
																								0.4 0.4 0.5 0.5 1.9 1.8 1.3 2.5 4.6 22.3 21.3 3.4 1.9 1.2 0.6 0.6 0.6 1.5 1.6 2.0 2.7 2.3 2.0 0.7		
Z - zerospan C - Calibration																										



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Janvier - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Janvier - October 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	706	99.72	99.72
21 - 40	2	0.28	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Janvier - October 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	33	9	8	12	20	51	52	41	126	86	41	54	60	36	17	668
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	22	33	9	8	12	20	51	52	41	126	86	41	55	61	36	17	670

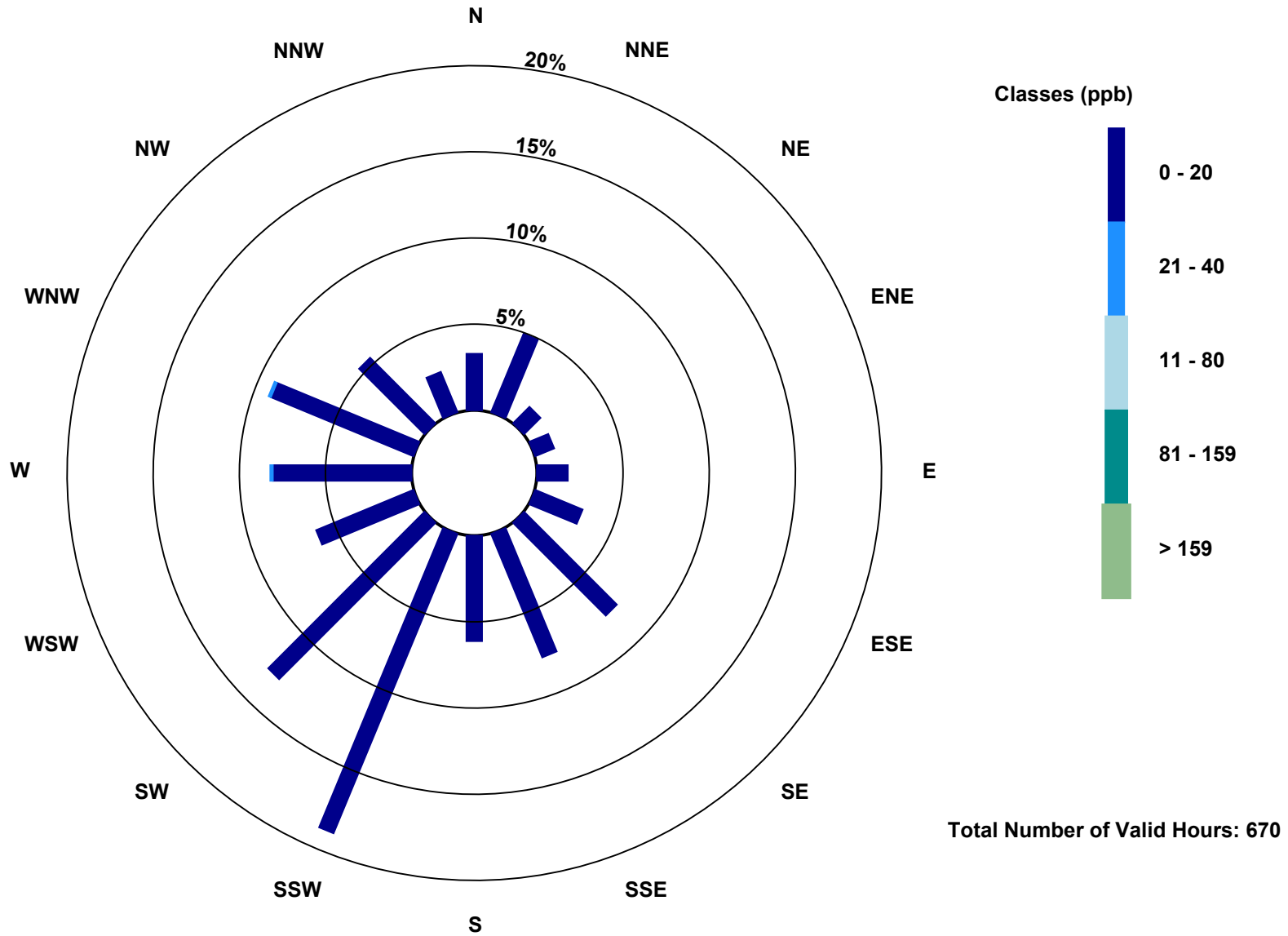
Total Number of Valid Hours: 670

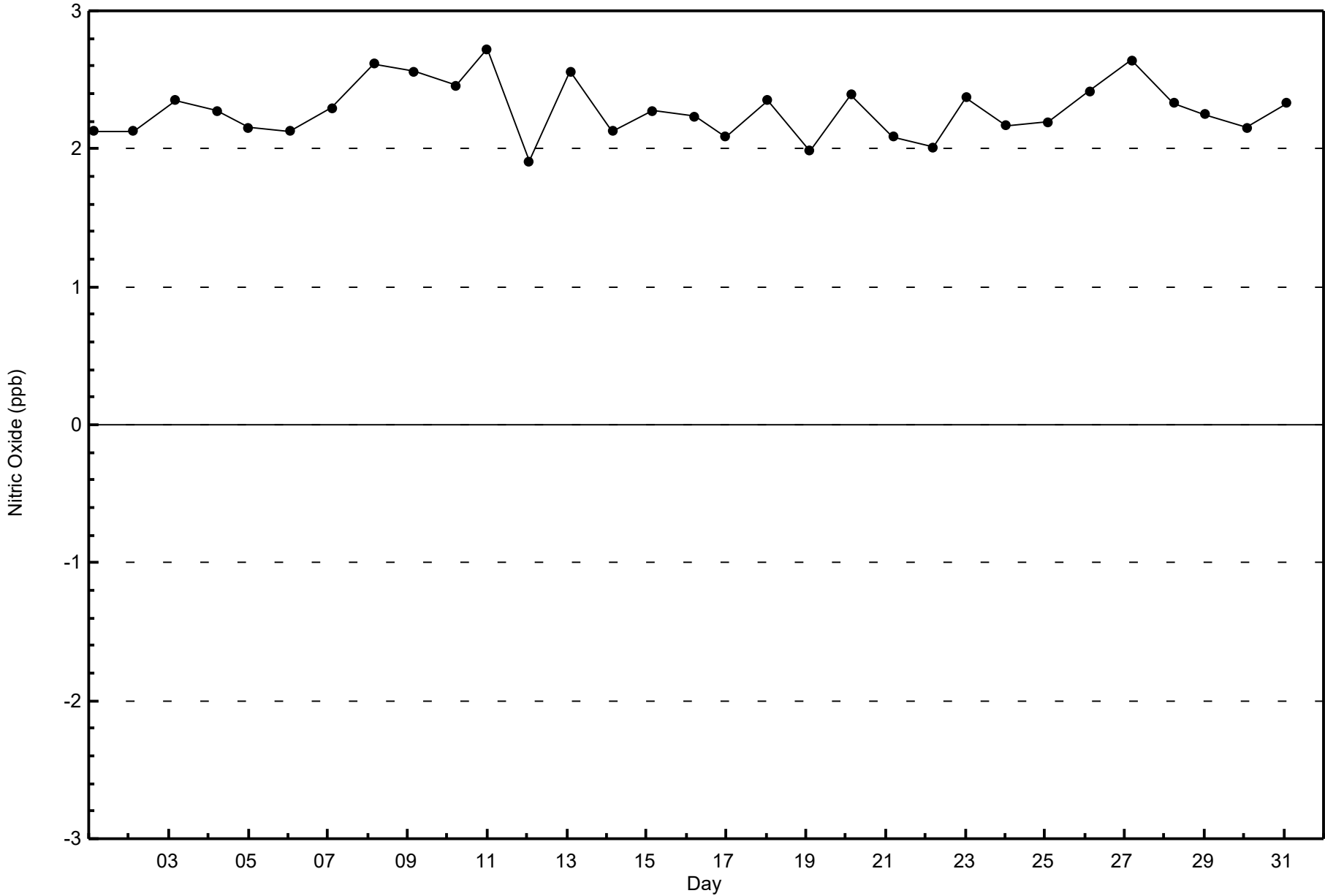
Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitric Oxide (NO) - ppb
Janvier

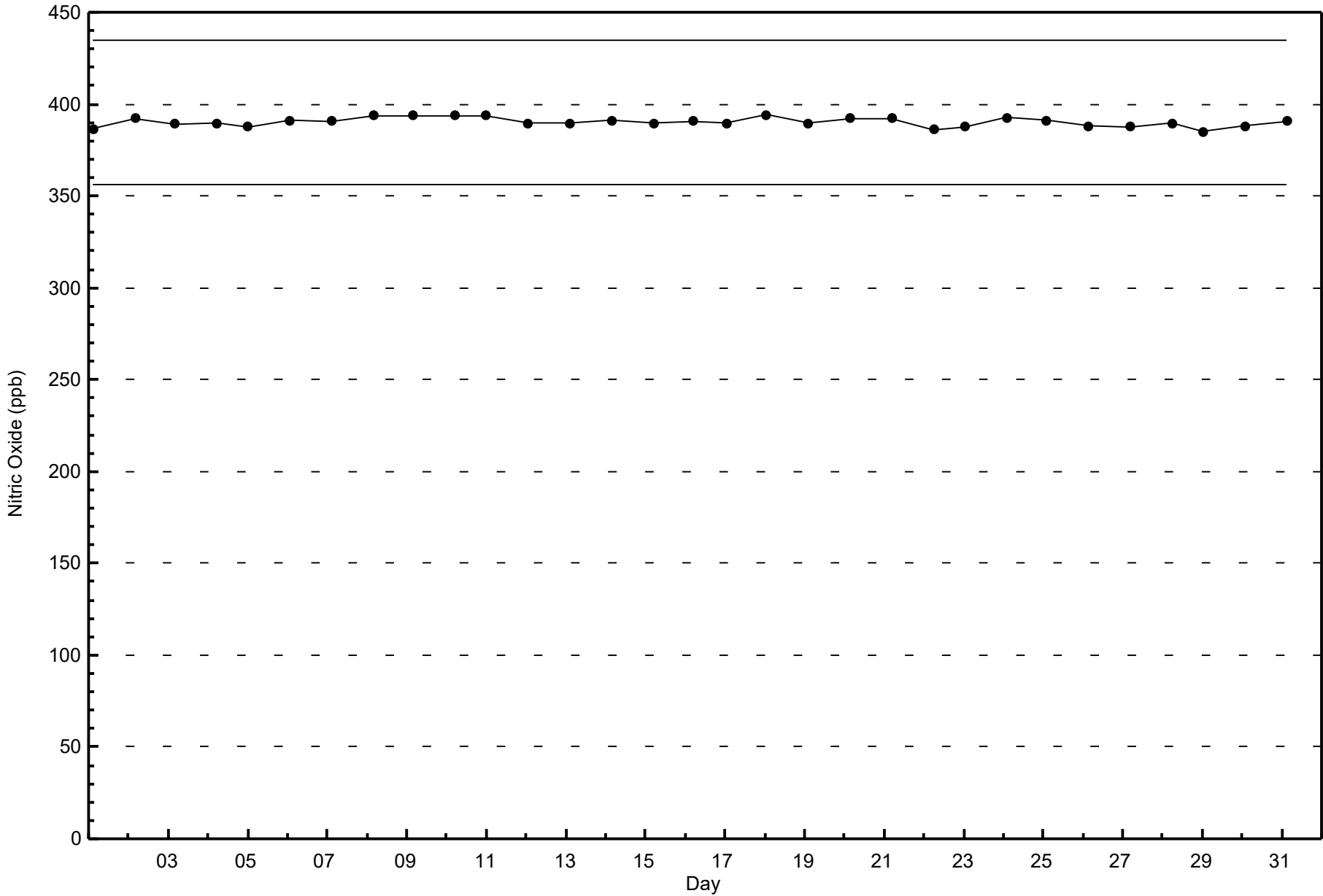






Wood Buffalo Environmental Association
Span Responses

Nitric Oxide (NO) - ppb
Janvier - October 2023





Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

Janvier - October 2023

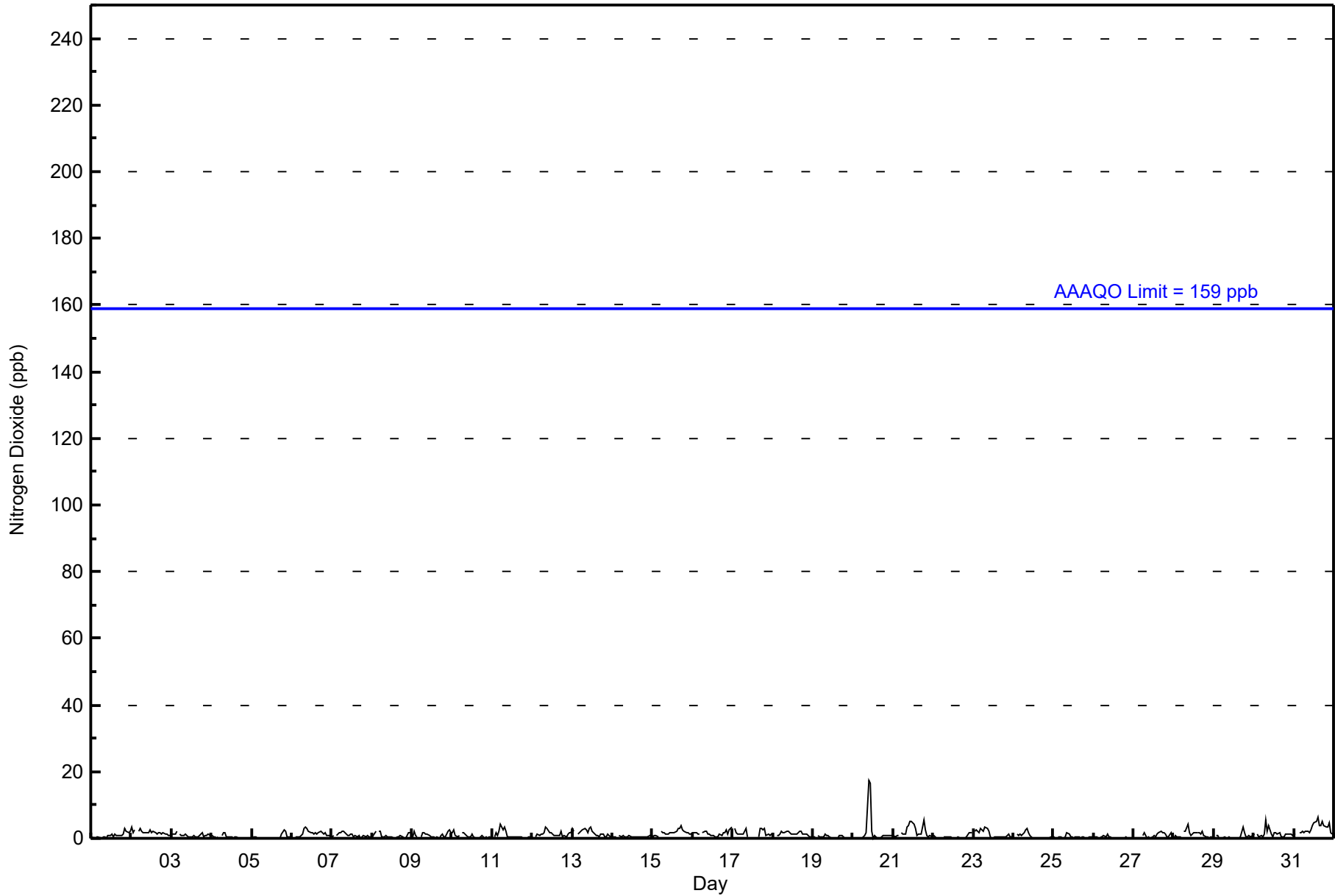
Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 744																	Daily Average		Daily Maximum				
Maximum Value: 17.5 ppb on Oct 20 10:00		Maximum Daily Average: 3.0 ppb on Oct 31		Hours of Data: 708																	Hours of Missing Data: 36		Hours of Calibration: 36				
Minimum Value: 0.0 ppb on Oct 5 10:00		Minimum Daily Average: 0.3 ppb on Oct 26		Hours of Calibration: 36																	Percent Operational Time: 100.0						
Maximum Diurnal Average: 1.8 ppb at hour 10		Minimum Diurnal Average: 0.8 ppb at hour 4		Percentiles: P ₁ = 0.0 P ₁₀ = 0.2 Q ₁ = 0.4 Median = 0.7 Q ₃ = 1.6 P ₉₀ = 2.3 P ₉₉ = 5.1																							
Monthly Average: 1.11 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-Oct	0.4	0.2	Z	0.5	0.3	0.2	0.2	0.3	0.3	0.2	0.9	0.9	1.1	0.6	1.1	0.8	0.9	0.7	1.0	1.1	2.8	2.1	1.6	2.2	0.9	2.8	
2-Oct	3.4	1.9	2.4	Z	2.1	2.8	2.1	1.7	1.7	1.6	1.9	2.4	1.8	2.0	1.5	1.3	1.7	1.8	1.4	1.5	1.3	1.3	1.0	0.9	1.8	3.4	
3-Oct	1.2	1.1	1.3	2.0	Z	1.2	0.9	0.7	1.1	0.8	0.5	0.5	0.4	0.7	0.4	0.3	0.4	0.7	1.5	0.6	0.7	0.7	1.2	0.7	0.9	2.0	
4-Oct	0.7	0.4	0.6	0.2	0.5	Z	1.0	1.5	1.8	0.4	0.5	0.5	0.4	0.2	0.4	0.3	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.5	1.8	
5-Oct	Z	0.3	0.3	0.2	0.2	0.1	0.2	0.1	0.2	0.0	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.0	1.3	2.4	2.0	0.5	0.5	0.5	0.4	2.4	
6-Oct	0.4	Z	0.5	0.5	0.6	0.5	1.3	3.0	3.2	2.9	2.0	1.6	1.6	1.4	1.5	1.3	1.6	2.0	1.6	1.4	1.5	0.7	0.9	0.6	1.4	3.2	
7-Oct	0.6	0.8	Z	0.8	1.5	1.9	2.1	2.1	1.9	0.8	0.9	1.2	1.2	0.6	1.0	0.5	0.8	0.1	0.6	0.9	0.6	0.9	0.5	0.4	1.0	2.1	
8-Oct	0.1	0.9	2.3	Z	2.3	2.3	0.4	0.3	1.0	0.5	0.5	0.4	0.5	0.2	0.0	0.4	0.6	0.9	0.3	0.1	0.1	0.8	1.9	1.5	0.8	2.3	
9-Oct	0.5	2.0	1.0	0.3	Z	0.6	1.9	1.5	1.2	1.1	0.8	0.4	0.3	0.4	0.2	0.4	0.2	0.7	1.1	0.3	0.3	2.2	2.6	1.8	0.9	2.6	
10-Oct	1.6	2.5	1.0	0.4	0.9	Z	1.7	1.6	0.8	0.6	0.4	0.6	1.2	0.6	0.2	0.1	0.2	0.4	0.7	0.1	0.4	0.1	0.3	0.4	0.7	2.5	
11-Oct	Z	0.5	1.8	0.7	2.2	4.3	2.7	3.5	2.1	0.4	0.6	0.4	0.5	0.4	0.3	0.3	0.5	0.4	0.2	0.2	0.2	0.1	0.3	0.4	1.0	4.3	
12-Oct	0.4	Z	0.6	1.1	1.0	1.4	1.4	1.9	3.2	2.8	1.9	1.6	1.1	1.0	0.9	0.9	0.7	2.0	0.5	0.8	0.6	1.4	1.9	1.7	1.3	3.2	
13-Oct	3.0	2.3	Z	1.2	1.6	2.1	2.6	3.0	2.5	1.7	2.8	3.2	2.3	1.3	0.7	0.7	0.5	1.2	1.2	0.6	0.5	1.1	0.9	0.6	1.6	3.2	
14-Oct	0.6	0.5	0.5	Z	0.7	0.6	0.7	0.4	0.6	0.4	0.7	0.5	0.5	0.4	0.3	0.5	0.5	0.5	0.3	0.5	0.3	0.4	0.8	1.1	0.5	1.1	
15-Oct	0.3	0.7	0.7	0.4	Z	2.0	1.6	1.6	1.4	1.2	1.7	1.9	1.6	1.6	2.1	2.9	3.0	4.0	2.4	2.3	1.9	1.6	1.4	1.4	1.7	4.0	
16-Oct	1.5	1.5	1.5	1.4	1.3	Z	1.7	2.0	2.0	1.4	1.4	1.0	0.8	0.6	0.5	0.4	1.1	1.0	1.8	1.7	2.4	1.2	2.6	3.6	1.5	3.6	
17-Oct	Z	2.9	1.7	1.4	1.1	1.4	1.3	2.3	3.0	0.5	C	C	C	C	C	0.5	2.8	3.0	2.6	2.8	0.8	1.1	0.7	1.1	1.7	3.0	
18-Oct	0.7	Z	0.9	0.7	1.1	2.3	1.5	1.8	2.2	2.0	1.5	1.2	1.2	1.2	1.4	1.7	2.0	2.0	1.1	1.1	1.1	1.0	0.5	0.5	1.3	2.3	
19-Oct	0.4	0.3	Z	0.7	0.5	0.4	0.5	1.4	0.9	0.8	0.4	0.2	0.0	0.1	0.2	0.2	0.7	0.8	0.5	0.1	0.1	0.2	0.2	0.1	0.4	1.4	
20-Oct	0.0	0.1	0.0	Z	0.2	0.2	0.3	0.7	1.8	17.5	16.7	2.0	0.2	0.9	0.0	0.1	0.2	0.4	0.9	1.0	0.9	0.7	1.0	0.8	2.0	17.5	
21-Oct	0.9	0.6	0.7	0.9	Z	1.5	1.2	1.4	3.4	3.8	5.1	5.1	4.1	3.1	1.0	1.3	1.2	1.4	5.5	2.7	0.9	0.3	0.8	0.6	2.1	5.5	
22-Oct	0.9	0.3	0.2	0.2	0.2	Z	0.5	0.5	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.0	0.0	0.1	0.3	1.5	1.6	1.6	0.4	1.6	
23-Oct	Z	2.2	2.6	1.9	3.1	2.4	2.2	3.2	2.8	2.1	0.6	0.2	0.1	0.3	0.3	0.3	0.3	0.3	0.5	0.5	0.7	1.1	0.5	0.6	1.3	3.2	
24-Oct	0.7	Z	1.2	0.7	1.2	0.8	1.5	2.5	3.0	1.6	0.9	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.2	0.3	0.4	0.7	3.0	
25-Oct	0.3	0.1	Z	0.5	0.4	0.2	0.1	0.4	1.8	1.3	0.6	0.3	0.0	0.3	0.3	0.4	0.2	0.3	0.3	0.0	0.1	0.3	0.4	0.5	0.4	1.8	
26-Oct	0.0	0.5	0.3	Z	0.5	0.4	0.7	0.5	1.1	0.5	0.4	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.2	0.3	0.1	0.0	0.0	0.0	0.3	1.1	
27-Oct	0.1	0.0	0.0	0.1	Z	0.9	1.5	1.0	0.0	0.5	0.1	0.6	0.7	0.6	1.2	1.8	2.2	1.8	1.8	1.4	0.4	0.5	1.7	0.2	0.8	2.2	
28-Oct	0.2	0.7	0.4	0.6	0.4	Z	2.1	2.0	4.2	1.6	0.8	1.1	1.7	1.9	1.6	1.7	1.1	2.0	1.0	0.4	0.4	0.2	0.4	0.5	1.2	4.2	
29-Oct	Z	0.8	0.7	0.2	0.0	0.2	0.3	0.2	0.2	0.4	0.1	0.1	0.1	0.2	0.2	0.0	0.5	3.4	1.5	0.4	0.5	1.0	0.5	0.8	0.5	3.4	
30-Oct	1.3	Z	1.2	0.5	0.7	0.4	1.4	5.3	2.2	4.0	1.3	0.3	1.5	1.7	1.3	1.9	0.6	0.6	0.6	1.3	1.3	1.2	1.1	0.9	1.4	5.3	
31-Oct	1.1	1.3	Z	1.5	1.8	2.2	1.9	2.0	2.0	1.9	2.5	3.8	4.8	5.0	6.2	4.0	3.9	5.1	3.7	3.4	3.2	4.5	1.8	1.1	3.0	6.2	
																								Diurnal Average		Diurnal Maximum	
																								0.8		3.4	
																								1.0		2.9	
																								1.0		2.6	
																								0.8		2.0	
																								1.0		3.1	
																								1.3		4.3	
																								1.3		2.7	
																								1.6		5.3	
																								1.7		4.2	
																								1.8		17.5	
																								1.6		16.7	
																								1.1		5.1	
																								1.0		4.8	
																								0.9		5.0	
																								0.8		6.2	
																								0.8		4.0	
																								0.9		3.9	
																								1.2		5.1	
																								1.2		5.5	
																								1.0		3.4	
																								0.9		3.2	
																								0.9		4.5	
																								1.0		2.6	
																								0.9		3.6	

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



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Janvier - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Janvier - October 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
Janvier - October 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	33	9	8	12	20	51	52	41	126	86	41	55	61	36	17	670
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	22	33	9	8	12	20	51	52	41	126	86	41	55	61	36	17	670

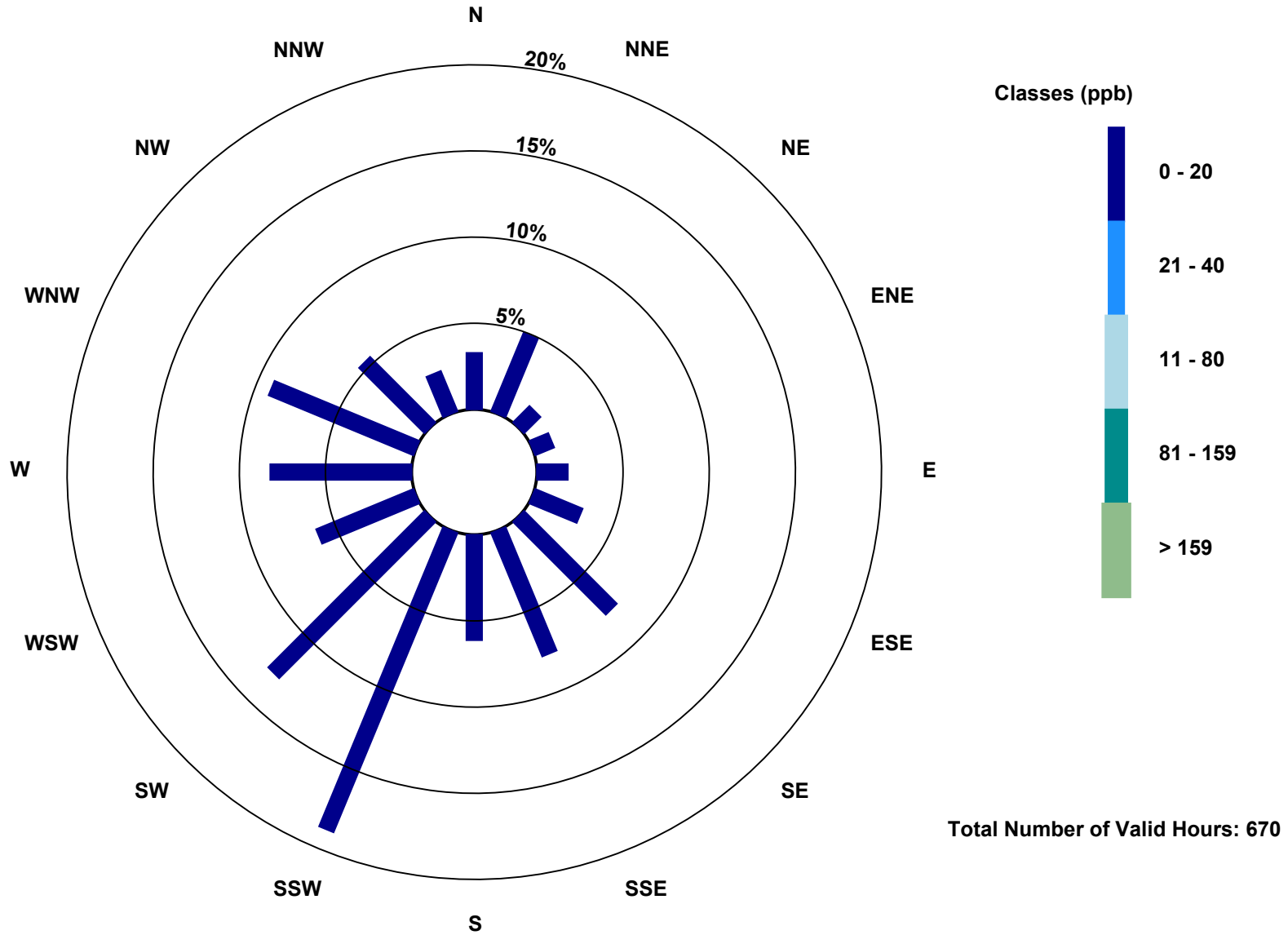
Total Number of Valid Hours: 670

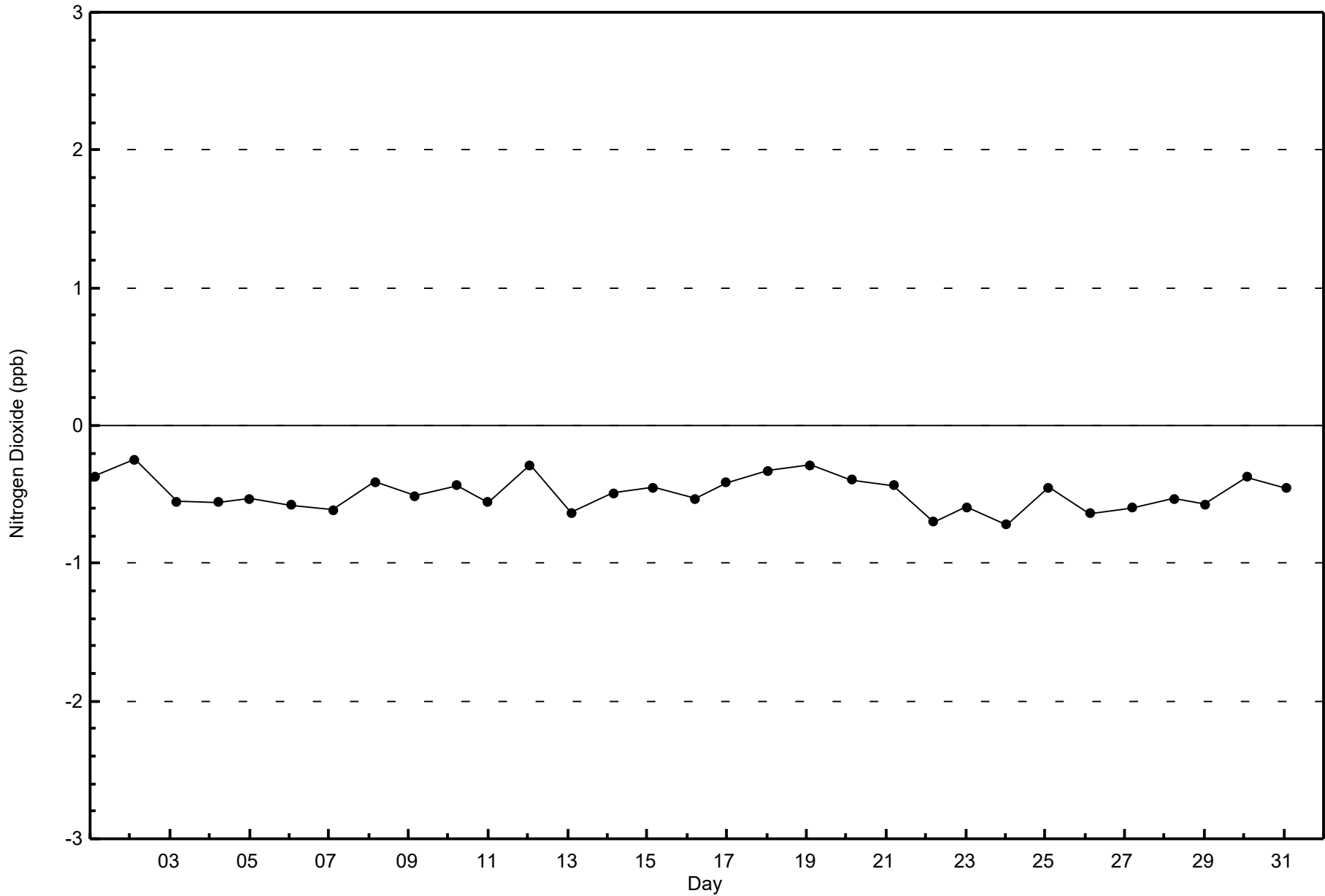
Total Number of Hours: 744

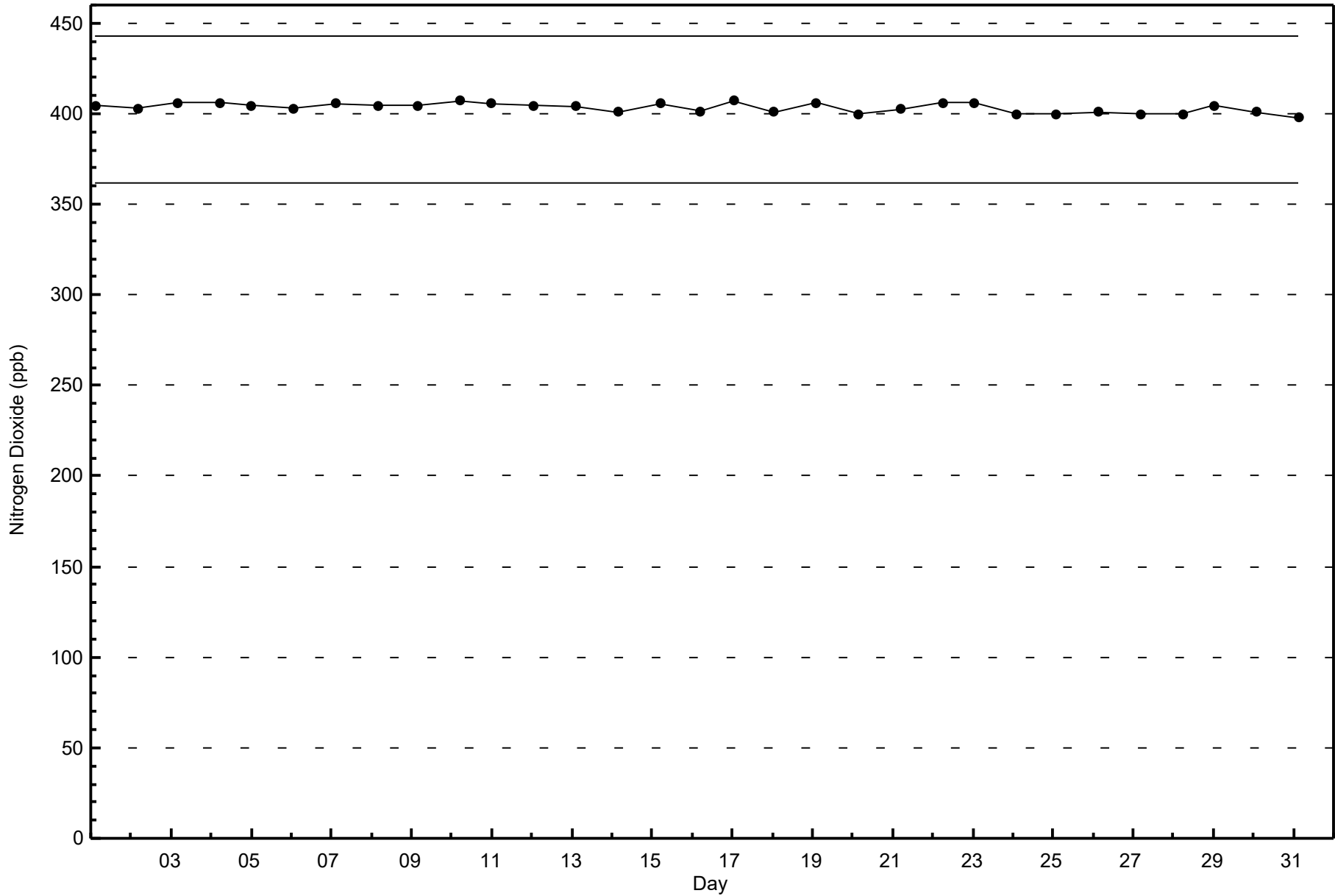


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitrogen Dioxide (NO₂) - ppb
Janvier



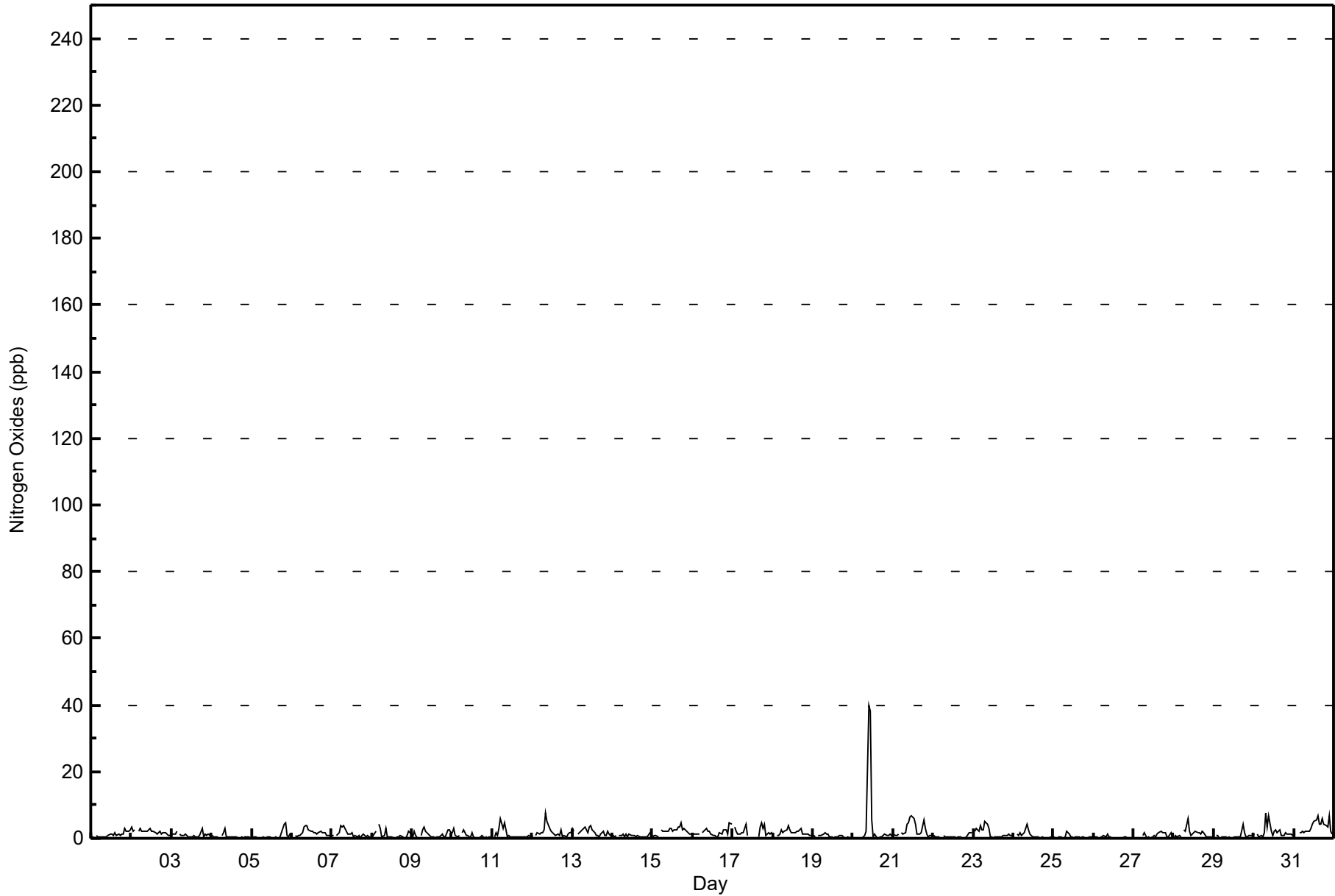






Maximum Value: 39.8 ppb on Oct 20 10:00																				Maximum Daily Average: 4.2 ppb on Oct 20					Hours in Service: 744	
Minimum Value: 0.0 ppb on Oct 8 15:00																				Minimum Daily Average: 0.3 ppb on Oct 26					Hours of Data: 708	
Maximum Diurnal Average: 3.1 ppb at hour 10																				Minimum Diurnal Average: 0.8 ppb at hour 4					Hours of Missing Data: 36	
Monthly Average: 1.43 ppb																				Percentiles: P ₁ = 0.0 P ₁₀ = 0.2 Q ₁ = 0.4 Median = 0.9 Q ₃ = 1.8 P ₉₀ = 2.9 P ₉₉ = 6.6					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-Oct	0.6	0.3	Z	0.7	0.4	0.3	0.5	0.4	0.5	0.2	1.1	1.2	1.3	1.0	1.6	1.0	1.3	0.9	1.2	1.2	3.1	2.2	2.3	2.4	1.1	3.1
2-Oct	3.5	2.0	2.6	Z	2.2	2.8	2.2	2.0	2.0	2.0	2.4	3.1	2.0	2.3	1.6	1.4	1.8	2.1	1.4	1.7	1.6	1.3	1.0	0.9	2.0	3.5
3-Oct	1.2	1.2	1.3	2.0	Z	1.2	0.9	0.7	1.3	0.8	0.5	0.5	0.4	0.8	0.5	0.4	0.6	0.7	3.1	0.6	1.2	0.7	1.4	0.7	1.0	3.1
4-Oct	0.7	0.4	0.6	0.2	0.5	Z	1.0	1.7	2.8	0.4	0.5	0.5	0.4	0.2	0.4	0.5	0.2	0.1	0.2	0.1	0.3	0.2	0.4	0.1	0.5	2.8
5-Oct	Z	0.4	0.3	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.4	0.2	0.0	0.2	1.9	4.4	4.7	1.0	0.6	1.2	0.8	4.7
6-Oct	0.7	Z	0.7	0.6	1.0	0.6	1.8	3.6	3.8	3.7	2.5	2.3	2.2	1.7	1.7	1.4	1.6	2.3	1.7	1.6	1.6	0.7	0.9	0.6	1.7	3.8
7-Oct	1.0	0.9	Z	0.8	1.5	3.7	3.4	3.7	2.9	1.2	1.4	1.3	1.6	0.6	1.0	0.5	0.8	0.1	0.6	1.4	0.6	1.0	0.5	0.4	1.3	3.7
8-Oct	0.1	0.9	2.3	Z	4.2	3.1	0.4	1.0	2.8	0.5	0.5	0.4	0.5	0.2	0.0	0.4	0.6	0.9	0.3	0.1	0.1	0.8	2.3	1.5	1.0	4.2
9-Oct	0.5	2.0	1.0	0.3	Z	0.6	2.7	3.2	2.3	1.7	1.0	0.4	0.3	0.4	0.2	0.4	0.2	0.7	1.5	0.3	0.3	2.6	2.6	1.8	1.2	3.2
10-Oct	1.8	2.9	1.0	0.4	0.9	Z	1.7	2.6	1.0	0.8	0.4	0.6	1.5	0.6	0.2	0.1	0.2	0.4	0.7	0.1	0.4	0.1	0.3	0.4	0.8	2.9
11-Oct	Z	0.5	1.9	0.7	3.0	5.8	2.8	4.8	2.7	0.4	0.7	0.5	0.5	0.5	0.4	0.3	0.6	0.5	0.3	0.3	0.5	0.4	0.7	0.6	1.3	5.8
12-Oct	0.7	Z	0.7	1.6	1.2	1.8	1.6	2.4	7.8	5.2	2.8	2.2	1.5	1.3	1.0	1.2	0.7	2.4	0.5	1.0	0.6	1.4	1.9	1.7	1.9	7.8
13-Oct	3.0	2.3	Z	1.2	1.6	2.1	2.6	3.2	2.5	1.8	3.2	3.8	2.6	1.5	0.9	0.7	0.5	1.4	2.1	0.7	1.0	2.2	1.5	0.9	1.9	3.8
14-Oct	0.8	0.6	0.7	Z	0.7	0.8	1.1	0.5	1.4	0.6	1.3	0.8	0.7	0.6	0.5	0.8	0.6	0.6	0.3	0.5	0.4	0.4	1.7	1.4	0.8	1.7
15-Oct	0.3	0.8	0.7	0.4	Z	2.5	2.1	2.3	2.0	2.1	2.8	3.1	2.2	2.3	2.4	3.5	3.2	4.9	2.4	2.8	2.0	1.6	1.4	1.5	2.1	4.9
16-Oct	1.5	1.5	1.5	1.4	1.3	Z	1.7	2.4	2.8	2.2	2.0	1.4	1.0	0.7	0.5	0.5	1.6	1.5	2.4	2.4	2.7	1.5	4.6	4.2	1.9	4.6
17-Oct	Z	3.2	2.1	1.5	1.3	1.6	1.5	2.8	4.3	0.9	Z	C	C	C	C	0.6	3.2	4.5	3.0	4.1	0.9	1.5	1.4	1.7	2.2	4.5
18-Oct	1.0	Z	0.9	0.7	1.2	2.3	1.8	2.1	2.4	4.0	2.3	1.7	1.6	1.6	2.0	2.1	2.6	2.8	1.1	1.4	1.3	1.2	0.7	0.7	1.7	4.0
19-Oct	0.8	0.6	Z	0.7	0.9	0.8	1.1	1.6	1.3	1.4	0.5	0.4	0.0	0.3	0.4	0.3	0.8	0.8	0.5	0.1	0.1	0.2	0.2	0.1	0.6	1.6
20-Oct	0.0	0.1	0.0	Z	0.2	0.2	0.4	0.9	2.0	39.8	38.0	5.4	0.3	1.3	0.0	0.1	0.3	0.4	1.0	1.3	1.0	0.7	1.3	1.0	4.2	39.8
21-Oct	1.3	0.8	1.0	1.3	Z	1.6	1.3	1.6	4.2	4.7	6.2	7.0	6.0	4.3	1.3	1.4	1.4	1.6	5.7	2.9	1.1	0.4	1.0	0.7	2.5	7.0
22-Oct	1.0	0.4	0.5	0.5	0.4	Z	0.8	0.6	0.4	0.5	0.5	0.5	0.4	0.5	0.2	0.3	0.2	0.0	0.0	0.1	0.3	1.5	1.6	1.6	0.6	1.6
23-Oct	Z	2.2	3.1	1.9	3.7	2.6	2.7	5.1	4.4	2.9	0.6	0.2	0.1	0.4	0.3	0.4	0.5	0.4	0.8	0.7	0.8	1.1	0.6	0.7	1.6	5.1
24-Oct	0.9	Z	1.4	0.7	1.6	0.9	1.8	2.8	4.3	2.7	1.4	0.3	0.3	0.4	0.4	0.4	0.2	0.2	0.1	0.1	0.0	0.2	0.3	0.4	0.9	4.3
25-Oct	0.3	0.1	Z	0.6	0.6	0.2	0.1	0.4	2.3	1.3	0.6	0.5	0.0	0.4	0.3	0.4	0.2	0.3	0.3	0.0	0.1	0.4	0.5	0.5	0.5	2.3
26-Oct	0.0	0.5	0.3	Z	0.5	0.4	0.7	0.5	1.3	0.5	0.4	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.2	0.3	0.1	0.0	0.0	0.0	0.3	1.3
27-Oct	0.1	0.0	0.0	0.1	Z	1.0	1.6	1.0	0.0	0.5	0.1	0.6	0.7	0.6	1.2	1.8	2.2	1.8	1.8	1.6	0.4	0.5	1.7	0.2	0.9	2.2
28-Oct	0.2	0.7	0.4	0.8	0.4	Z	2.6	2.3	5.7	2.1	0.9	1.5	1.8	2.0	1.6	1.7	1.1	2.1	1.8	0.4	0.5	0.2	0.4	0.5	1.4	5.7
29-Oct	Z	0.8	0.9	0.2	0.0	0.3	0.3	0.3	0.2	0.6	0.1	0.1	0.2	0.3	0.3	0.4	0.5	4.4	1.5	0.4	0.6	1.0	0.7	0.9	0.7	4.4
30-Oct	1.3	Z	1.3	0.6	0.7	0.5	1.5	7.8	3.4	6.9	2.3	0.7	2.0	2.7	1.6	2.5	0.8	0.8	0.8	1.6	1.3	1.2	1.2	0.9	1.9	7.8
31-Oct	1.1	1.4	Z	1.5	1.8	2.3	1.9	2.0	2.1	2.1	2.9	4.4	5.3	5.3	6.7	4.0	4.2	6.0	4.4	3.8	3.6	6.8	2.0	1.3	3.3	6.8
																								Diurnal Average		
																								Diurnal Maximum		
																								3.5 4.2		
																								0.9 1.1		

Z - zerospan C - Calibration





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Oxides (NO_x) - ppb
Janvier - October 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	706	99.72	99.72
21 - 40	2	0.28	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Nitrogen Oxides (NO_x) - ppb
Janvier - October 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	33	9	8	12	20	51	52	41	126	86	41	54	60	36	17	668
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	22	33	9	8	12	20	51	52	41	126	86	41	55	61	36	17	670

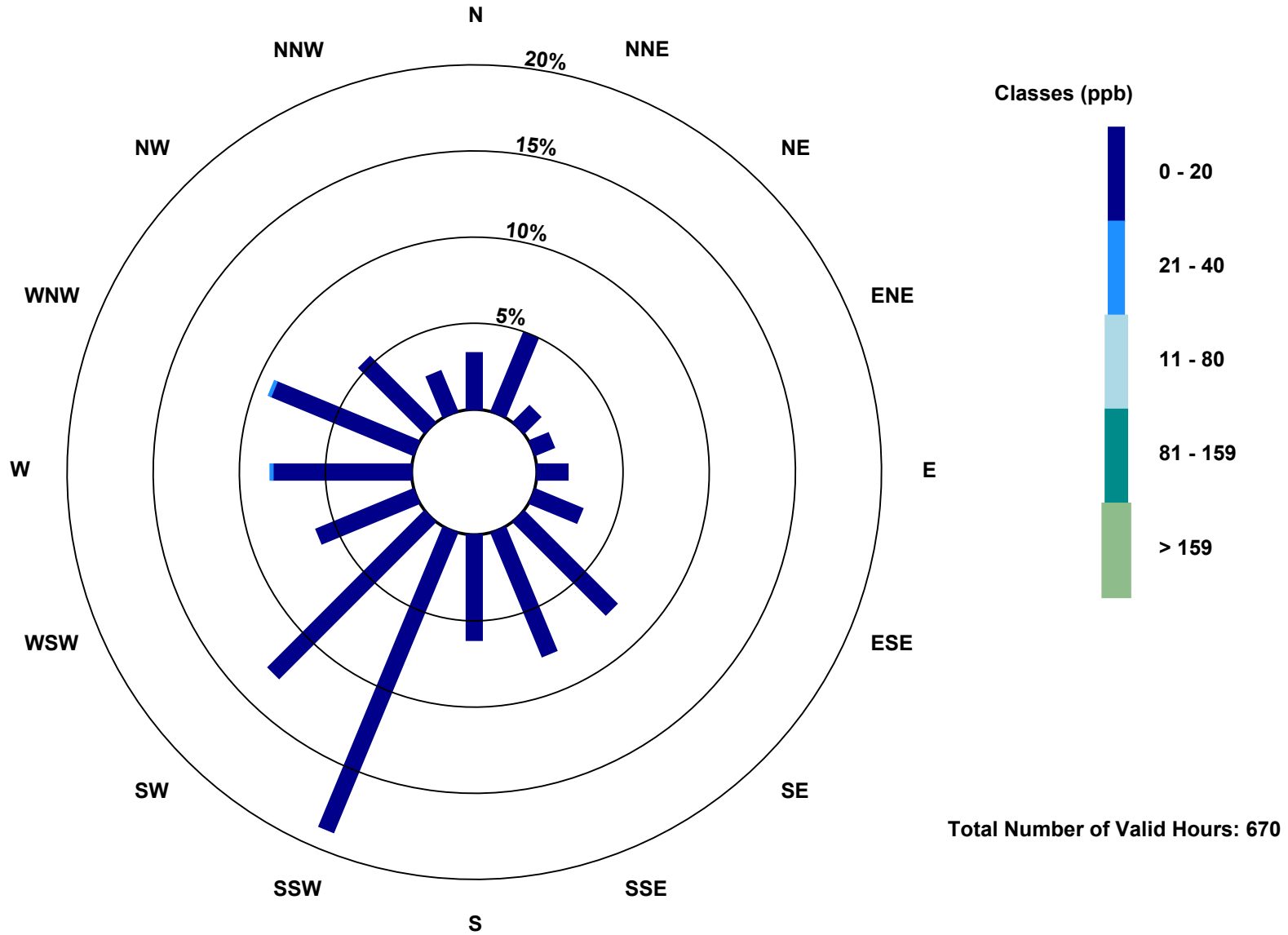
Total Number of Valid Hours: 670

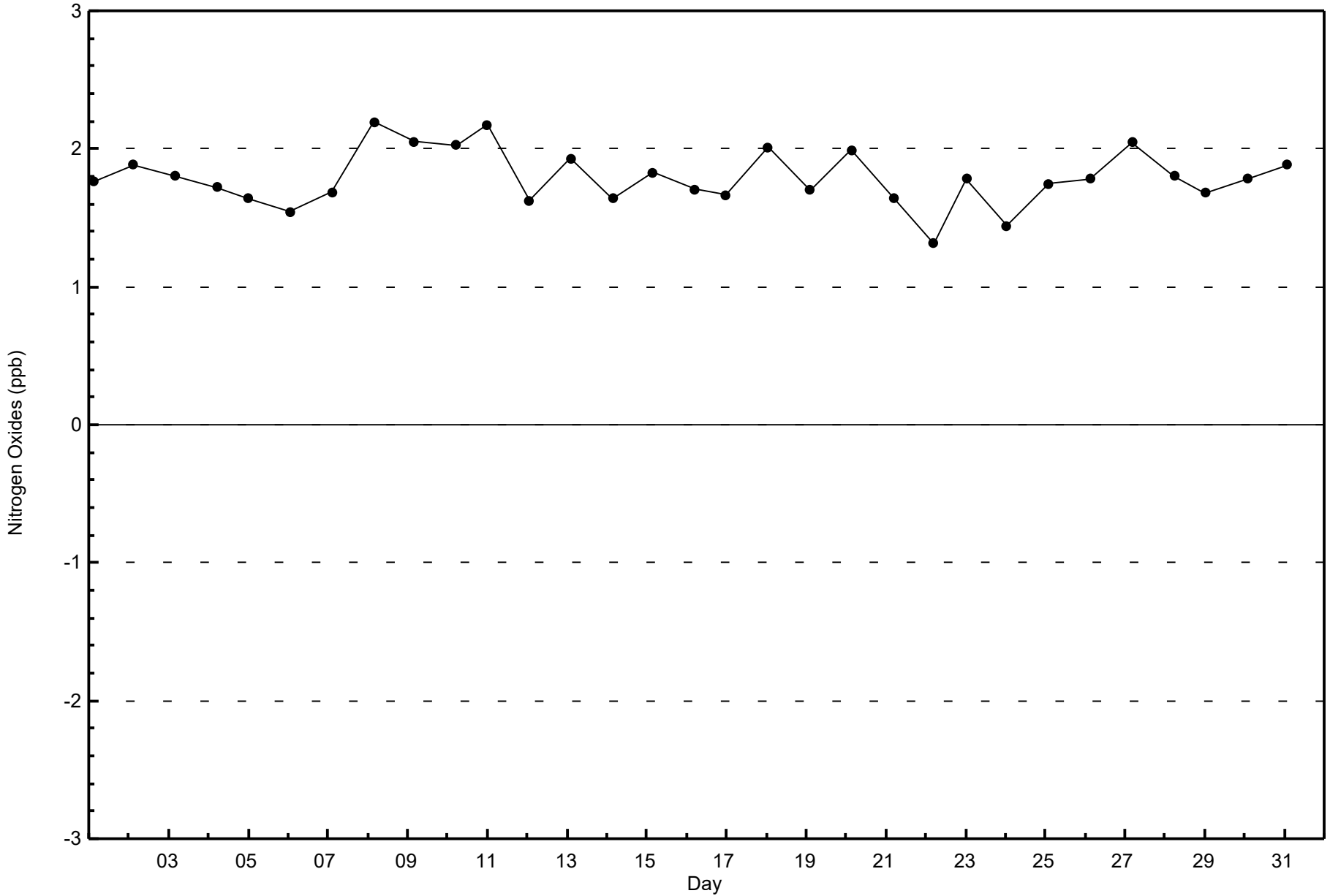
Total Number of Hours: 744

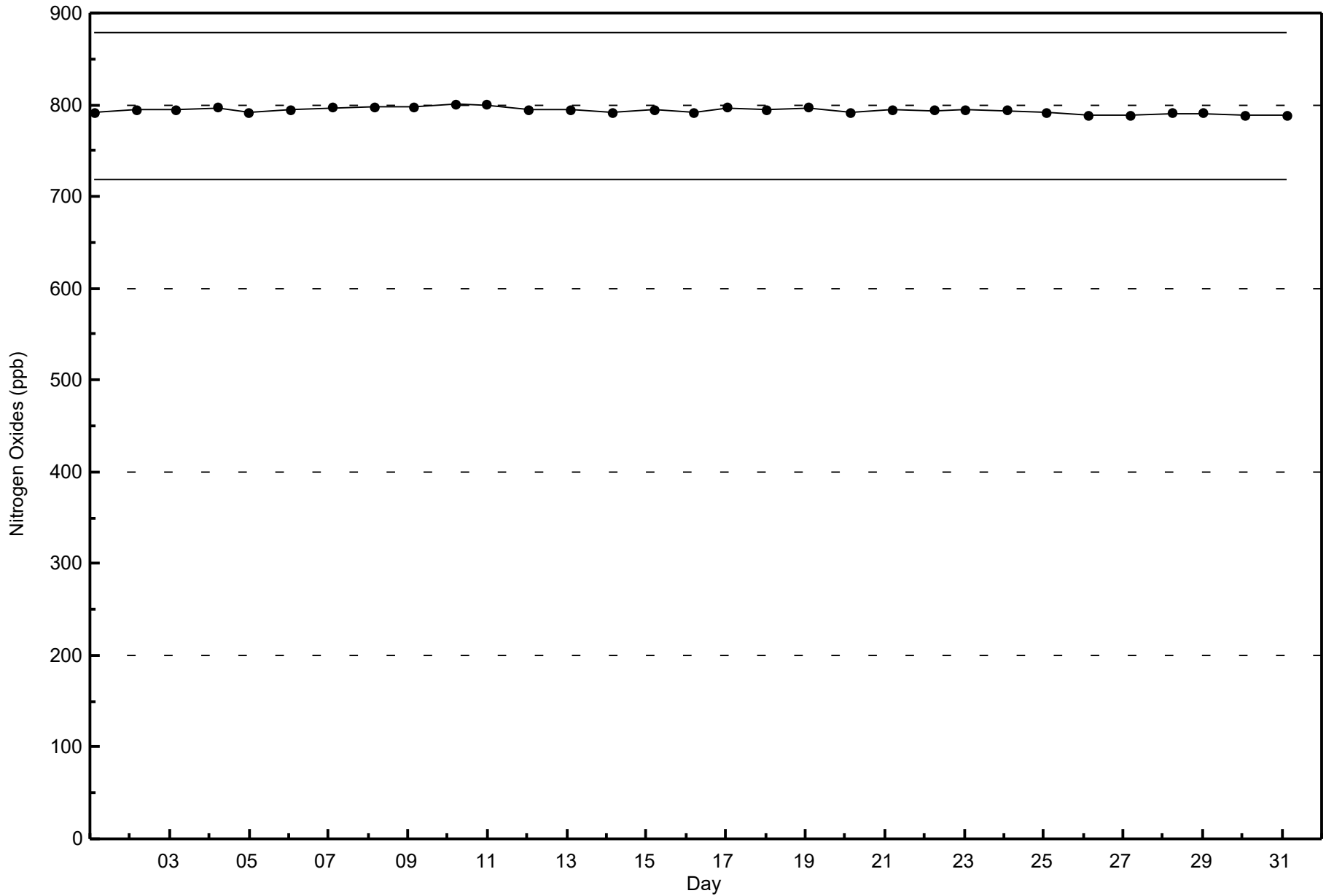


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitrogen Oxides (NO_x) - ppb
Janvier









Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O₃) - ppb

Janvier - October 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 47.1 ppb on Oct 12 17:00	Maximum Daily Average: 35.2 ppb on Oct 19		Hours of Data:	708
Minimum Value: 4.3 ppb on Oct 9 07:00	Minimum Daily Average: 18.2 ppb on Oct 15		Hours of Missing Data:	36
Maximum Diurnal Average: 33.2 ppb at hour 16	Minimum Diurnal Average: 19.7 ppb at hour 7		Hours of Calibration:	35
Monthly Average: 26.77 ppb	Percentiles: P ₁ = 7.4 P ₁₀ = 16.3 Q ₁ = 21.6 Median = 27.7 Q ₃ = 32.5 P ₉₀ = 35.5 P ₉₉ = 42.5		Percent Operational Time:	99.9

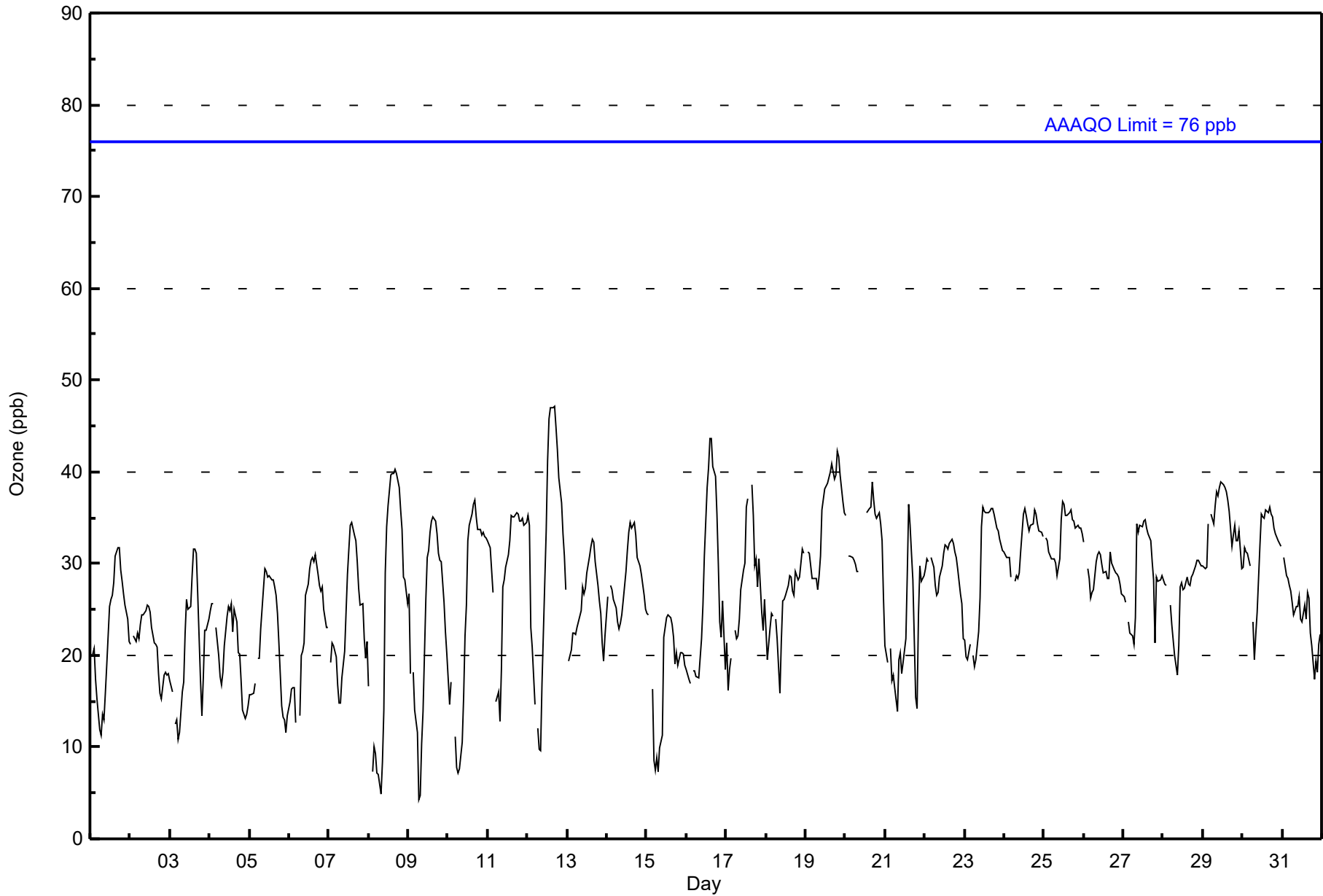
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Oct	Z	20.2	20.8	17.4	15.2	11.9	11.2	13.5	13.0	15.8	18.9	25.4	26.0	26.6	27.9	30.9	31.8	31.7	29.3	28.1	26.7	25.4	24.0	21.4	22.3	31.8																						
2-Oct	21.2	Z	22.1	21.6	22.5	21.9	23.3	24.4	24.4	24.9	25.5	25.4	24.7	23.1	21.3	21.2	20.9	18.0	15.8	15.3	17.8	18.1	17.9	18.0	21.3	25.5																						
3-Oct	17.2	16.0	Z	12.5	12.9	10.9	11.5	16.1	17.1	22.4	26.0	25.0	25.3	28.7	31.6	31.6	31.1	26.7	17.2	13.5	17.6	22.8	22.7	23.9	20.9	31.6																						
4-Oct	24.9	25.6	25.6	Z	23.1	20.0	17.8	16.8	18.2	21.1	24.3	25.4	24.9	25.6	22.5	25.0	23.7	20.3	20.1	17.2	14.0	13.0	13.5	14.5	20.7	25.6																						
5-Oct	15.7	15.7	15.9	16.9	Z	19.7	19.7	22.9	27.4	29.4	29.1	28.5	28.6	28.2	28.2	27.5	26.6	24.5	21.3	14.4	13.3	12.9	11.5	13.5	21.4	29.4																						
6-Oct	14.9	16.3	16.5	16.4	12.6	Z	13.4	20.0	20.4	21.3	26.6	27.8	29.4	30.3	30.6	30.3	31.0	28.8	27.6	27.0	27.5	25.0	23.0	23.0	23.5	31.0																						
7-Oct	Z	19.2	21.4	21.0	19.8	16.7	14.7	14.8	17.6	20.5	24.7	28.8	31.6	34.2	34.4	33.1	32.5	30.2	27.3	25.5	25.7	21.8	19.8	21.5	24.2	34.4																						
8-Oct	16.7	Z	7.4	10.1	9.3	7.1	7.0	4.9	8.4	14.1	29.0	34.0	36.3	39.6	39.8	39.9	40.2	39.8	38.3	35.9	33.6	28.6	28.2	25.7	24.9	40.2																						
9-Oct	26.7	17.9	Z	18.2	14.1	11.5	4.3	4.8	10.4	13.9	26.0	30.7	31.5	33.5	34.7	35.1	34.6	33.3	31.1	30.3	30.1	25.7	22.6	20.1	23.5	35.1																						
10-Oct	17.4	14.6	17.0	Z	11.1	7.8	7.2	7.6	10.6	15.3	22.2	25.4	32.5	34.2	35.4	36.5	36.9	35.2	33.8	33.7	33.1	33.4	32.9	32.7	24.6	36.9																						
11-Oct	32.5	31.8	29.3	26.8	Z	15.0	16.0	12.8	18.5	27.5	28.3	29.6	31.0	32.5	35.2	35.0	35.1	35.5	35.4	34.7	34.6	34.9	34.2	34.5	29.6	35.5																						
12-Oct	35.2	34.1	23.0	20.8	14.6	Z	12.1	9.8	9.5	17.0	28.1	33.5	41.2	45.8	47.0	47.0	47.1	44.9	42.5	39.4	36.5	33.2	30.9	27.2	31.3	47.1																						
13-Oct	Z	19.3	20.6	22.5	22.4	22.3	23.1	24.2	24.9	27.4	26.7	27.4	29.0	30.8	31.8	32.6	32.4	30.2	27.6	26.0	24.5	21.3	19.3	22.1	25.6	32.6																						
14-Oct	26.3	Z	27.7	27.2	26.0	25.1	23.7	22.9	23.5	24.4	26.0	29.1	31.4	33.4	34.4	33.9	34.4	33.2	30.6	30.1	29.8	28.9	26.5	25.1	28.4	34.4																						
15-Oct	24.6	24.4	Z	16.3	8.5	7.4	8.9	7.3	9.9	11.2	21.9	23.1	24.2	24.5	24.1	23.4	22.0	19.0	20.2	18.9	20.3	20.3	20.2	18.9	18.2	24.6																						
16-Oct	18.5	17.4	17.0	Z	18.3	18.4	17.7	17.5	19.6	21.8	25.5	30.9	38.4	40.4	43.7	43.6	40.6	39.5	35.4	29.9	23.7	22.0	25.9	18.4	27.1	43.7																						
17-Oct	21.4	16.2	18.4	19.6	Z	22.7	21.8	22.1	24.0	27.1	29.4	30.0	36.2	37.1	M	38.6	35.2	29.8	30.6	27.4	30.5	24.7	22.8	26.1	26.9	38.6																						
18-Oct	22.9	19.5	23.1	24.6	24.3	Z	24.0	21.7	15.9	21.6	25.9	26.1	26.5	27.5	28.7	28.5	27.0	26.5	29.2	28.3	28.6	30.1	31.6	31.2	25.8	31.6																						
19-Oct	Z	31.3	31.2	29.7	28.4	28.4	28.4	27.2	28.7	30.8	35.9	38.1	38.4	38.7	39.4	40.0	40.9	39.2	39.7	42.3	41.6	39.7	36.8	35.5	35.2	42.3																						
20-Oct	35.3	Z	30.8	30.8	30.6	30.4	29.9	29.1	29.2	C	C	C	C	35.5	35.9	36.1	38.9	36.9	35.4	35.0	35.6	34.4	32.4	26.2	33.1	38.9																						
21-Oct	21.1	19.2	Z	20.8	17.2	17.8	16.5	13.9	19.5	20.2	18.0	19.3	21.8	28.9	36.5	34.2	31.2	28.3	15.4	14.1	24.5	29.7	28.1	28.7	22.8	36.5																						
22-Oct	29.4	30.5	30.2	Z	30.7	29.6	27.6	26.6	26.8	28.6	29.7	31.2	32.1	31.9	31.7	32.2	32.6	32.1	31.3	30.7	29.4	26.7	25.6	21.9	29.5	32.6																						
23-Oct	21.7	19.8	19.6	21.2	Z	20.0	18.8	19.5	22.5	26.3	34.0	36.1	35.6	35.5	35.5	35.8	36.0	36.1	35.4	33.8	33.5	32.6	32.0	31.5	29.2	36.1																						
24-Oct	31.3	30.7	30.7	30.7	28.5	Z	28.0	28.7	28.3	29.0	31.2	35.5	36.0	35.2	34.3	33.6	34.2	34.3	35.8	35.3	34.3	33.6	33.4	33.0	32.4	36.0																						
25-Oct	Z	32.9	32.5	31.3	30.5	30.5	30.5	30.0	28.7	30.6	34.8	36.8	36.4	35.2	35.3	35.6	35.8	34.8	34.7	33.9	34.2	33.9	33.9	33.3	33.3	36.8																						
26-Oct	32.3	Z	29.5	28.4	26.2	26.8	27.1	30.1	31.0	31.3	31.0	29.9	29.0	29.1	28.3	28.4	31.2	30.0	29.3	28.9	28.8	28.5	27.7	26.8	29.1	32.3																						
27-Oct	26.3	25.8	Z	23.6	22.4	22.1	21.3	24.1	34.3	33.4	34.1	34.1	34.7	34.7	33.9	33.2	32.5	30.2	28.2	21.4	28.5	28.0	28.3	28.7	28.9	34.7																						
28-Oct	28.1	27.7	27.6	Z	25.4	23.4	21.7	20.0	17.8	21.1	27.4	28.0	27.2	27.2	28.5	27.7	27.6	28.5	28.9	29.7	30.4	30.3	30.0	29.7	26.7	30.4																						
29-Oct	29.8	29.4	29.6	34.3	Z	35.4	34.3	36.3	37.8	37.4	38.2	38.9	38.6	38.3	37.9	36.9	35.6	31.8	33.2	34.1	32.5	32.5	33.5	29.4	34.6	38.9																						
30-Oct	29.5	31.8	31.3	31.1	29.8	Z	23.6	19.5	22.3	24.8	32.1	35.3	35.1	34.9	35.8	35.6	36.1	35.4	35.1	33.8	33.2	32.5	32.2	31.9	31.4	36.1																						
31-Oct	Z	30.6	28.7	28.4	27.7	27.1	25.8	24.4	25.3	25.3	26.4	23.9	23.7	25.4	24.0	26.8	26.3	22.5	21.0	17.4	19.3	18.1	21.2	22.2	24.4	30.6																						
																								24.8	23.8	24.1	23.2	21.2	20.4	19.7	19.8	21.5	23.9	27.9	29.8	31.2	32.5	32.9	33.2	33.0	31.2	29.6	27.9	28.2	27.2	26.5	25.7	Diurnal Average
																								35.3	34.1	32.5	34.3	30.7	35.4	34.3	36.3	37.8	37.4	38.2	38.9	41.2	45.8	47.0	47.0	47.1	44.9	42.5	42.3	41.6	39.7	36.8	35.5	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 - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ozone (O₃) - ppb
Janvier - October 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	152	21.47	21.47
21 - 50	556	78.53	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 - October 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	16	7	2	2	2	9	8	4	54	14	3	2	8	7	1	147
21 - 50	15	17	5	5	11	18	42	43	36	73	72	38	53	50	29	16	523
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	23	33	12	7	13	20	51	51	40	127	86	41	55	58	36	17	670

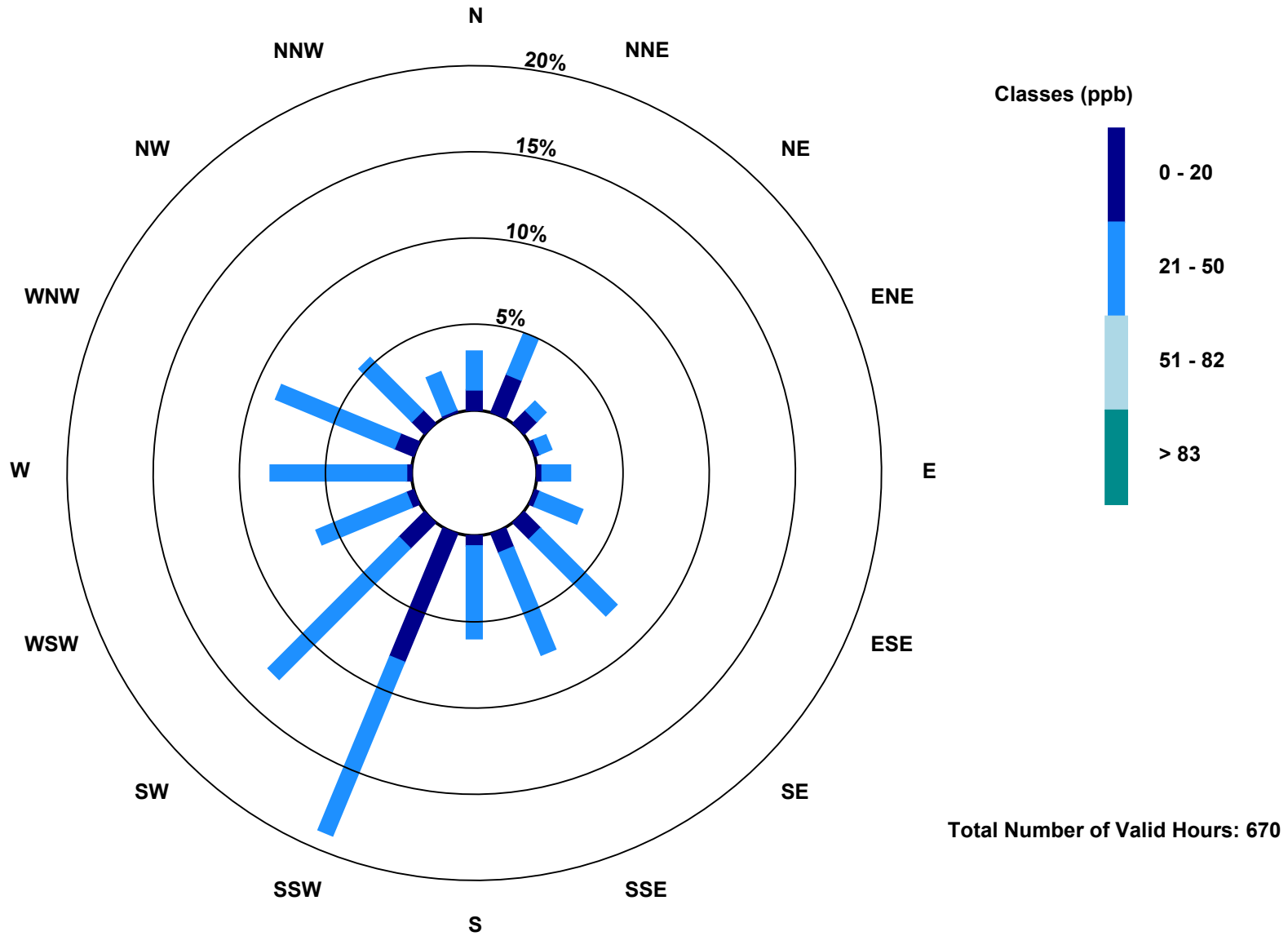
Total Number of Valid Hours: 670

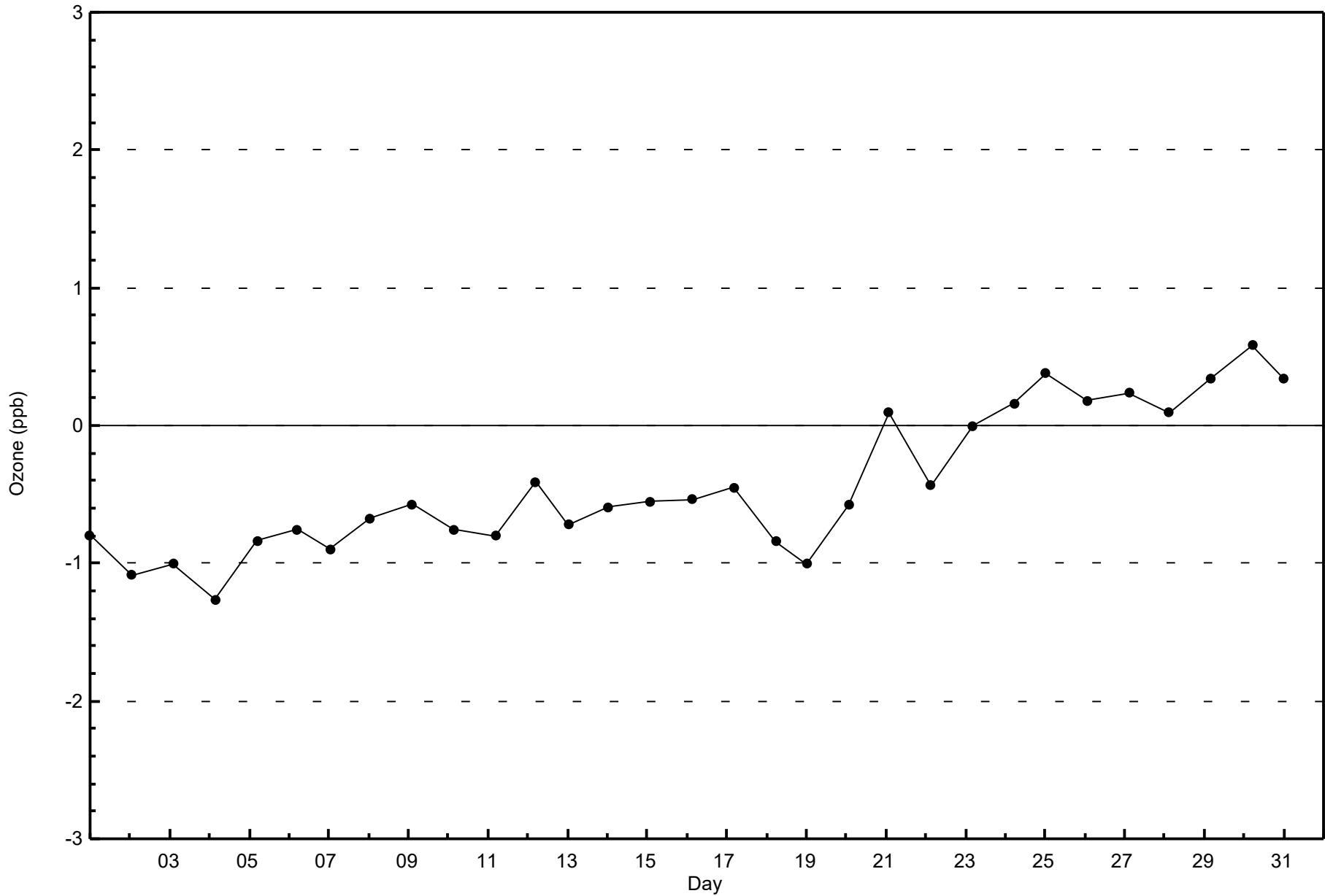
Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

Ozone (O₃) - ppb
Janvier

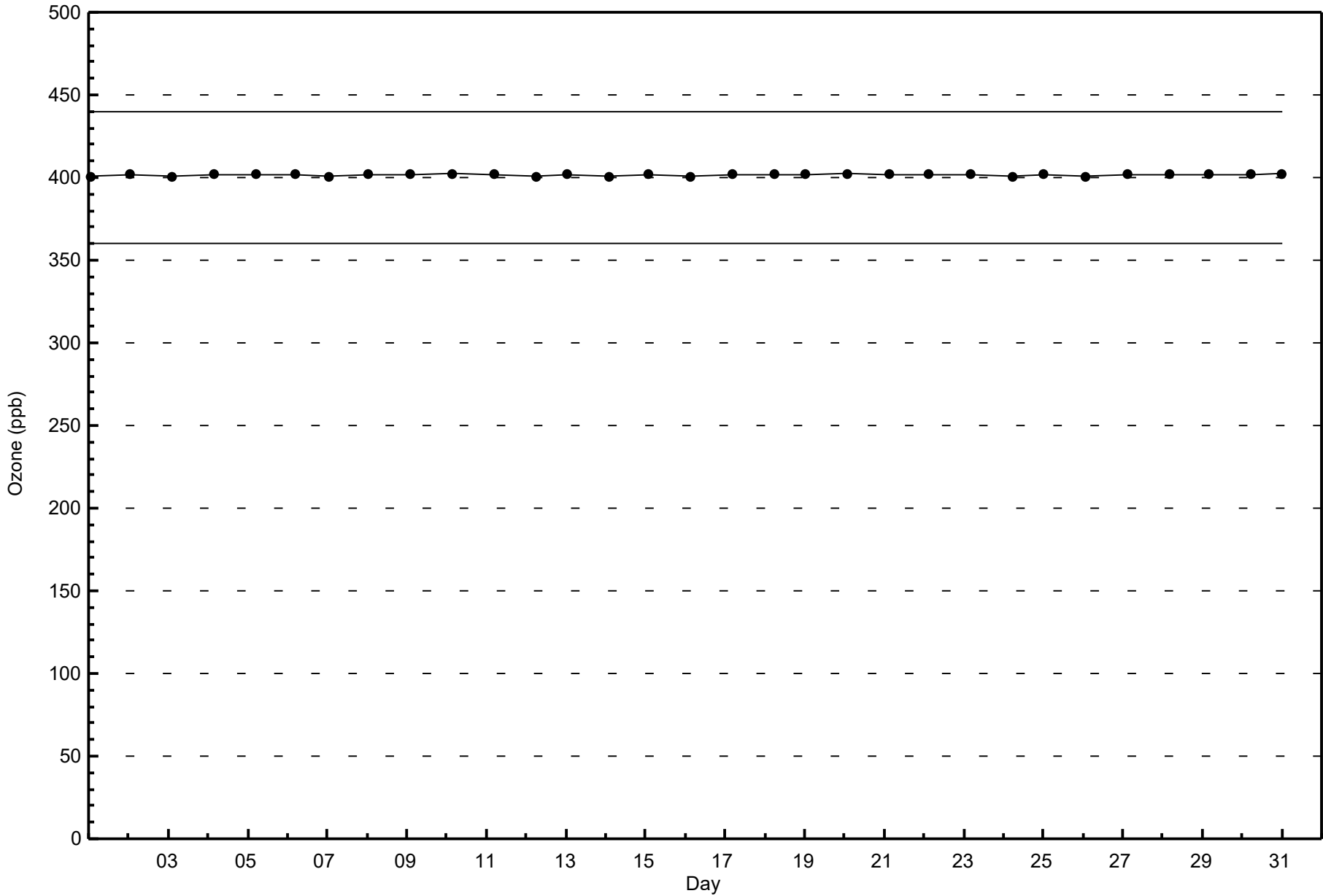






Wood Buffalo Environmental Association
Span Responses

Ozone (O₃) - ppb
Janvier - October 2023

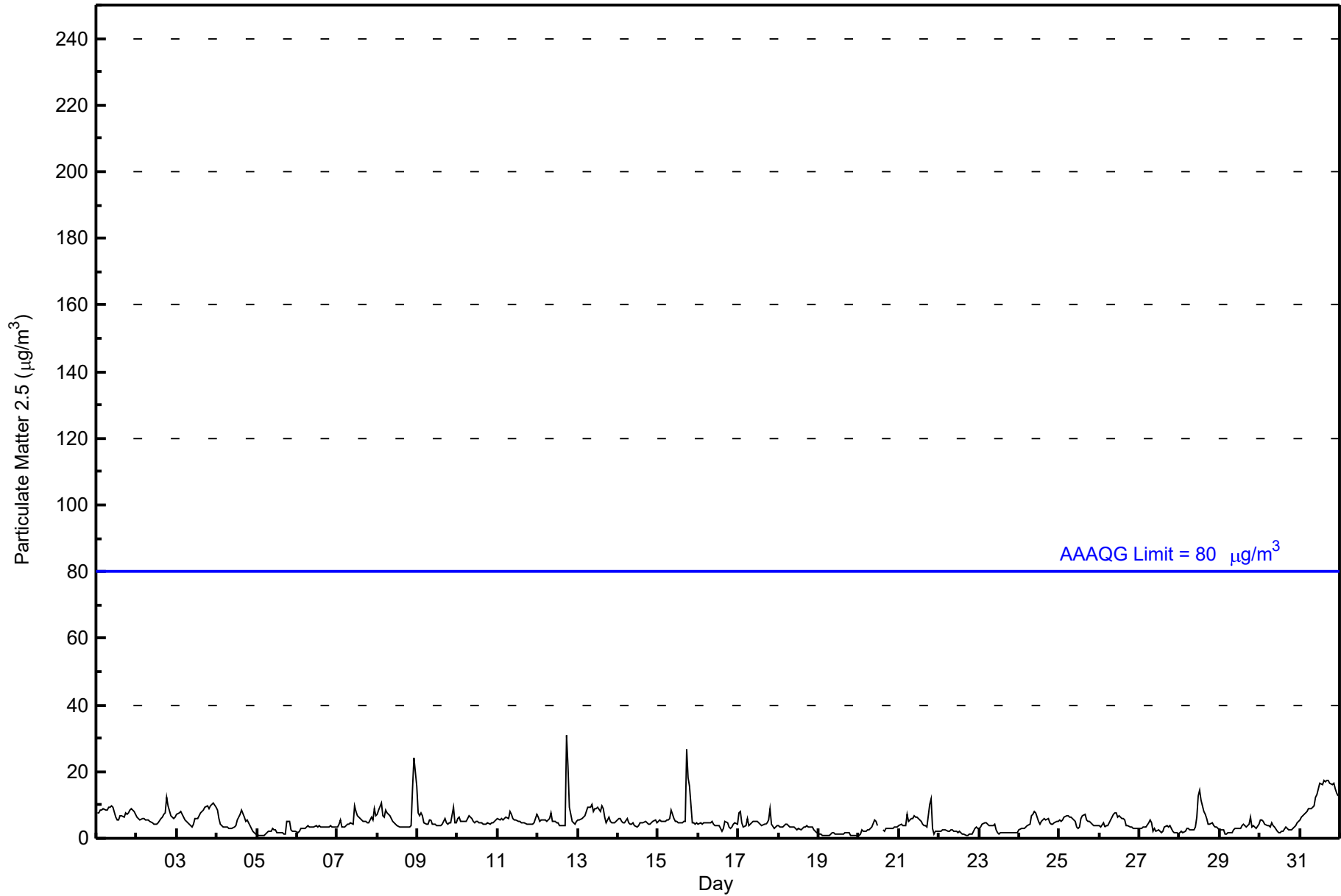




Summary of Hour Averages

Janvier - October 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 744																Daily Average		Daily Maximum																																																	
Maximum Value: 31.0 µg/m ³ on Oct 12 18:00		Maximum Daily Average: 12.7 µg/m ³ on Oct 31		Hours of Data: 742																Hours of Missing Data: 2		Hours of Calibration: 2																																																			
Minimum Value: 0.7 µg/m ³ on Oct 5 04:00		Minimum Daily Average: 1.2 µg/m ³ on Oct 19		Hours of Calibration: 2																Percent Operational Time: 100.0																																																					
Maximum Diurnal Average: 6.3 µg/m ³ at hour 18		Minimum Diurnal Average: 4.4 µg/m ³ at hour 5		Percentiles: P ₁ = 0.9 P ₁₀ = 1.8 Q ₁ = 3.2 Median = 4.4 Q ₃ = 5.8 P ₉₀ = 8.1 P ₉₉ = 17.1																																																																					
Monthly Average: 4.94 µg/m ³																																																																									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																																															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																																																	
1-Oct	7.4	7.6	8.4	8.6	8.7	8.7	8.7	9.3	9.3	9.8	9.2	6.3	5.5	5.7	6.7	6.6	6.5	7.8	7.0	7.5	8.5	9.0	8.2	7.3	7.8	9.8																																															
2-Oct	6.2	5.9	5.6	5.7	5.8	5.5	5.6	5.3	5.0	4.6	4.4	4.2	4.3	4.7	5.9	6.5	7.4	7.7	12.3	9.8	7.0	6.4	5.9	6.5	6.2	12.3																																															
3-Oct	7.1	7.7	8.0	7.2	6.2	5.7	5.2	4.3	3.8	3.5	4.4	5.8	5.8	6.8	7.5	8.1	8.6	9.2	9.8	8.8	9.8	10.3	10.8	9.5	7.2	10.8																																															
4-Oct	8.3	6.1	4.1	3.7	3.5	3.5	3.4	3.1	3.1	3.1	3.4	3.8	5.5	6.4	7.2	8.3	6.5	5.2	5.4	4.8	4.0	2.0	1.6	1.4	4.5	8.3																																															
5-Oct	1.2	0.9	0.9	0.7	0.9	1.1	1.6	2.0	2.3	2.8	2.6	2.7	1.8	1.6	1.7	1.7	1.4	1.3	4.9	5.1	2.7	2.2	2.1	2.3	2.0	5.1																																															
6-Oct	1.7	2.0	2.9	3.0	3.1	3.1	3.7	3.4	3.4	3.3	3.2	3.6	3.5	3.8	3.5	3.5	3.4	3.5	3.4	3.5	3.7	3.5	3.4	3.2	3.3	3.8																																															
7-Oct	3.6	4.3	5.6	3.3	3.4	3.7	4.1	4.2	4.7	4.4	9.7	8.1	7.0	6.3	6.0	5.1	5.1	5.1	4.8	4.7	6.2	5.5	8.9	6.9	5.4	9.7																																															
8-Oct	7.3	8.7	10.7	6.7	6.2	8.5	7.7	6.6	6.1	5.0	4.7	4.4	3.8	3.3	3.3	3.4	3.5	3.3	3.4	3.5	3.9	14.9	24.4	15.7	7.0	24.4																																															
9-Oct	7.5	6.7	7.8	6.9	4.7	4.3	4.4	5.5	5.4	4.4	4.1	3.9	3.9	3.7	3.6	4.2	5.9	4.6	4.1	4.5	4.7	9.3	4.8	4.7	5.2	9.3																																															
10-Oct	5.8	6.3	5.1	5.2	5.2	5.1	6.1	6.6	5.9	4.9	4.8	5.0	5.2	4.7	4.6	4.4	4.3	4.4	4.5	4.4	4.6	4.8	5.1	5.4	5.1	6.6																																															
11-Oct	5.7	5.7	5.8	5.6	5.8	6.6	5.9	8.1	7.0	5.8	5.5	5.4	5.1	4.9	4.7	4.6	4.5	4.3	4.1	4.1	4.4	4.4	4.5	7.1	5.4	8.1																																															
12-Oct	6.2	5.1	5.3	5.6	5.4	5.2	5.4	5.8	7.5	5.0	5.2	4.7	4.5	3.9	3.7	4.0	3.8	31.0	21.6	9.3	5.3	4.5	4.4	5.2	7.0	31.0																																															
13-Oct	5.6	5.6	6.0	6.4	6.8	8.0	9.4	9.3	10.2	8.1	8.9	9.0	9.2	8.0	9.7	8.9	6.4	4.9	6.4	5.3	4.8	4.6	4.7	5.2	7.1	10.2																																															
14-Oct	5.9	5.9	5.3	4.7	4.5	6.1	4.5	4.4	4.2	4.5	3.7	3.4	3.9	4.5	4.8	4.8	4.9	4.8	4.1	4.1	4.5	5.0	5.4	4.9	4.7	6.1																																															
15-Oct	5.1	5.3	5.1	5.1	5.2	5.4	5.4	5.8	8.3	5.9	5.3	5.3	4.9	4.7	4.9	5.0	5.1	26.5	18.4	15.5	4.7	4.5	4.4	4.5	7.1	26.5																																															
16-Oct	4.3	4.5	4.4	4.7	4.5	4.5	4.7	4.8	5.1	4.3	3.9	3.9	3.7	2.8	2.0	2.8	5.1	4.9	3.4	3.1	3.6	4.3	4.8	4.4	4.1	5.1																																															
17-Oct	7.8	7.8	4.8	3.5	3.6	6.1	4.0	4.4	4.5	5.0	5.2	5.0	4.6	4.4	3.9	4.0	4.3	4.7	5.4	8.7	4.2	3.2	3.3	3.9	4.8	8.7																																															
18-Oct	3.7	3.5	3.4	3.9	4.4	4.3	3.8	3.2	3.3	3.2	2.9	2.5	2.8	2.7	3.1	3.3	3.6	3.8	3.2	3.3	3.4	2.6	2.0	1.7	3.2	4.4																																															
19-Oct	1.4	1.1	1.0	0.9	1.0	0.9	1.1	1.4	1.5	1.5	1.2	1.1	1.1	1.2	1.3	1.4	1.6	1.8	1.5	0.9	0.8	0.9	1.0	0.9	1.2	1.8																																															
20-Oct	0.9	1.4	2.4	2.2	2.1	2.4	2.7	3.0	3.2	5.5	5.1	3.8	C	C	2.4	2.3	2.8	3.1	2.9	3.1	2.9	3.4	3.6	3.2	2.9	5.5																																															
21-Oct	4.0	4.1	3.9	3.8	3.8	7.0	5.2	6.1	5.8	6.9	6.5	6.4	5.5	4.9	4.2	4.0	3.7	3.6	10.2	12.0	3.0	1.2	2.3	2.1	5.0	12.0																																															
22-Oct	2.2	2.1	2.5	2.5	2.4	2.2	2.2	2.4	2.3	2.2	2.1	1.7	2.2	1.6	1.4	1.2	1.1	1.0	1.2	1.3	1.4	3.0	3.3	3.0	2.0	3.3																																															
23-Oct	3.0	3.6	4.4	4.8	4.7	4.3	4.0	3.8	3.8	4.4	2.6	1.8	1.5	1.6	1.6	1.5	1.5	1.5	1.6	1.5	1.5	1.8	1.5	1.8	2.7	4.8																																															
24-Oct	2.5	3.0	2.9	3.0	3.6	3.7	4.2	6.7	7.1	7.9	7.4	5.2	4.3	5.0	5.7	6.0	5.5	6.0	4.8	4.4	4.4	4.8	5.1	5.1	4.9	7.9																																															
25-Oct	5.4	5.3	5.4	6.2	6.7	6.7	6.3	6.3	5.9	5.1	3.6	3.0	3.5	5.8	6.9	7.2	5.3	5.2	5.2	4.6	4.0	3.8	3.7	3.6	5.2	7.2																																															
26-Oct	3.9	3.6	4.8	3.6	3.8	3.9	4.8	6.3	7.1	7.4	7.5	6.5	6.7	5.8	6.0	5.5	3.8	3.7	3.4	3.3	3.1	3.0	3.0	3.1	4.7	7.5																																															
27-Oct	3.2	3.1	3.3	3.4	3.6	4.8	5.6	4.8	2.1	2.9	2.1	2.3	1.9	1.5	2.1	3.6	3.6	3.2	3.7	3.0	2.1	1.8	1.7	1.4	3.0	5.6																																															
28-Oct	1.5	2.2	1.6	2.2	3.0	2.9	2.5	2.5	2.5	3.2	6.6	12.5	14.6	11.5	8.0	7.3	5.9	4.4	4.3	4.6	4.0	3.3	3.4	2.9	4.9	14.6																																															
29-Oct	2.7	2.7	2.6	1.4	1.3	1.5	1.7	1.8	2.5	3.0	2.8	3.1	3.2	3.8	4.2	4.0	3.4	4.3	6.5	3.5	3.9	3.4	2.8	4.4	3.1	6.5																																															
30-Oct	5.7	5.3	5.1	4.3	3.9	3.6	3.5	4.7	3.8	3.5	2.2	1.7	1.8	2.1	2.0	3.3	3.0	2.5	2.4	2.5	3.1	3.9	4.6	4.9	3.5	5.7																																															
31-Oct	5.3	6.5	7.1	7.6	8.1	9.0	9.0	8.7	9.9	12.5	13.1	15.0	16.7	16.1	17.5	17.0	17.3	17.3	16.6	16.1	16.3	15.0	13.7	12.6	12.7	17.5																																															
																								4.6		4.6		4.7		4.4		4.4		4.8		4.7		5.0		5.1		5.0		5.0		4.9		4.9		4.8		4.8		4.9		4.8		6.3		6.1		5.5		4.5		4.8		5.1		4.8		Diurnal Average	
																								8.3		8.7		10.7		8.6		8.7		9.0		9.4		9.3		10.2		12.5		13.1		15.0		16.7		16.1		17.5		17.0		17.3		31.0		21.6		16.1		16.3		15.0		24.4		15.7		Diurnal Maximum	
C - Calibration																																																																									
Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 µg/m ³ 24-hr 29 µg/m ³																																																																									





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Janvier - October 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	524	70.62	70.62
6 - 15	202	27.22	97.84
16 - 25	14	1.89	99.73
26 - 80	2	0.27	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 742

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - μg/m³
Janvier - October 2023

Concentration Ranges (μg/m ³)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	12	21	7	3	10	15	39	28	24	86	72	37	41	48	31	10	484
6 - 15	7	15	5	4	3	5	15	21	16	44	18	6	16	14	6	7	202
16 - 25	4	1	0	1	0	0	0	3	1	4	0	0	0	0	0	0	14
26 - 80	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	2
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	23	37	12	8	13	20	54	53	41	135	90	43	57	62	37	17	702

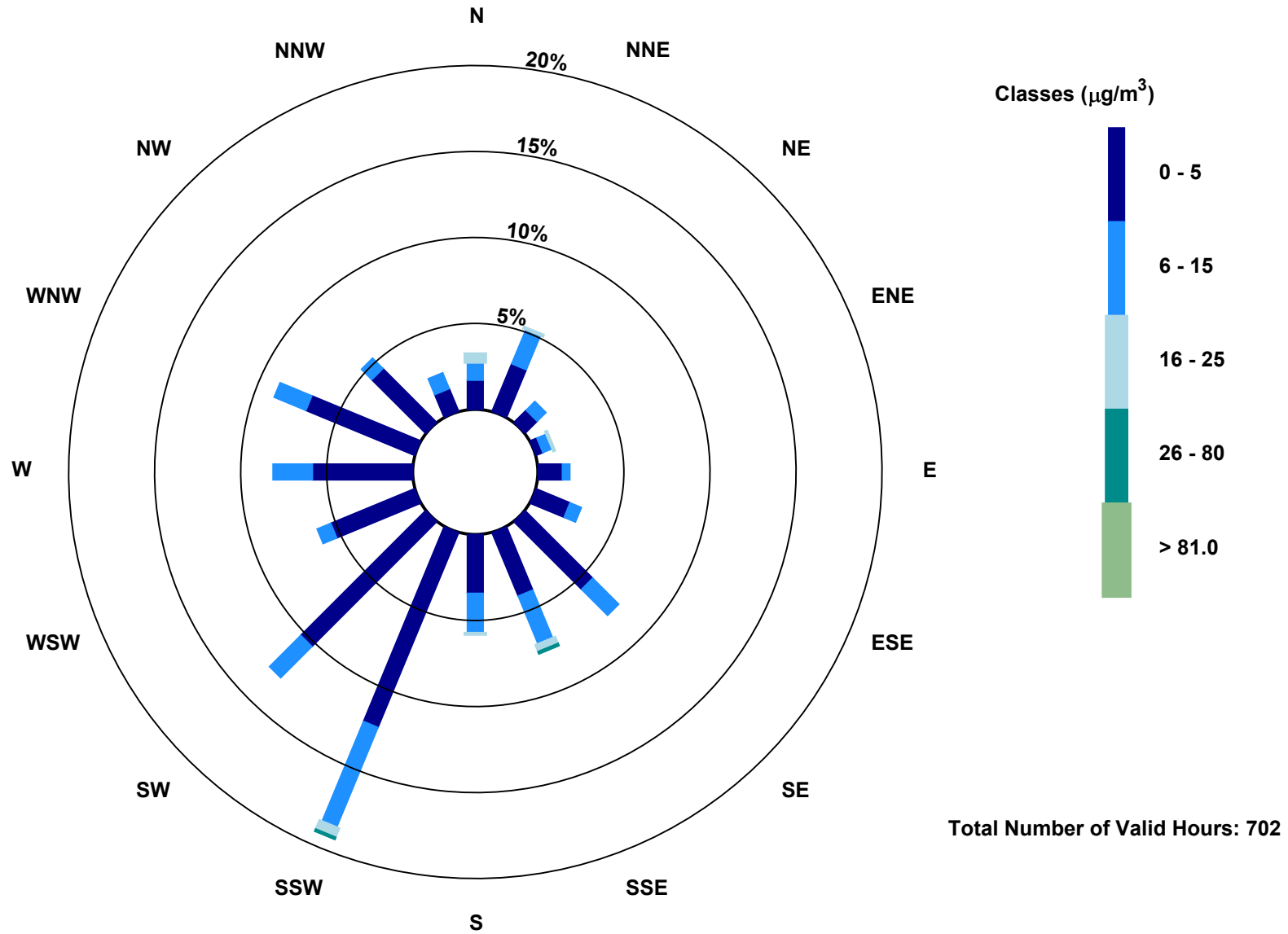
Total Number of Valid Hours: 702

Total Number of Hours: 744



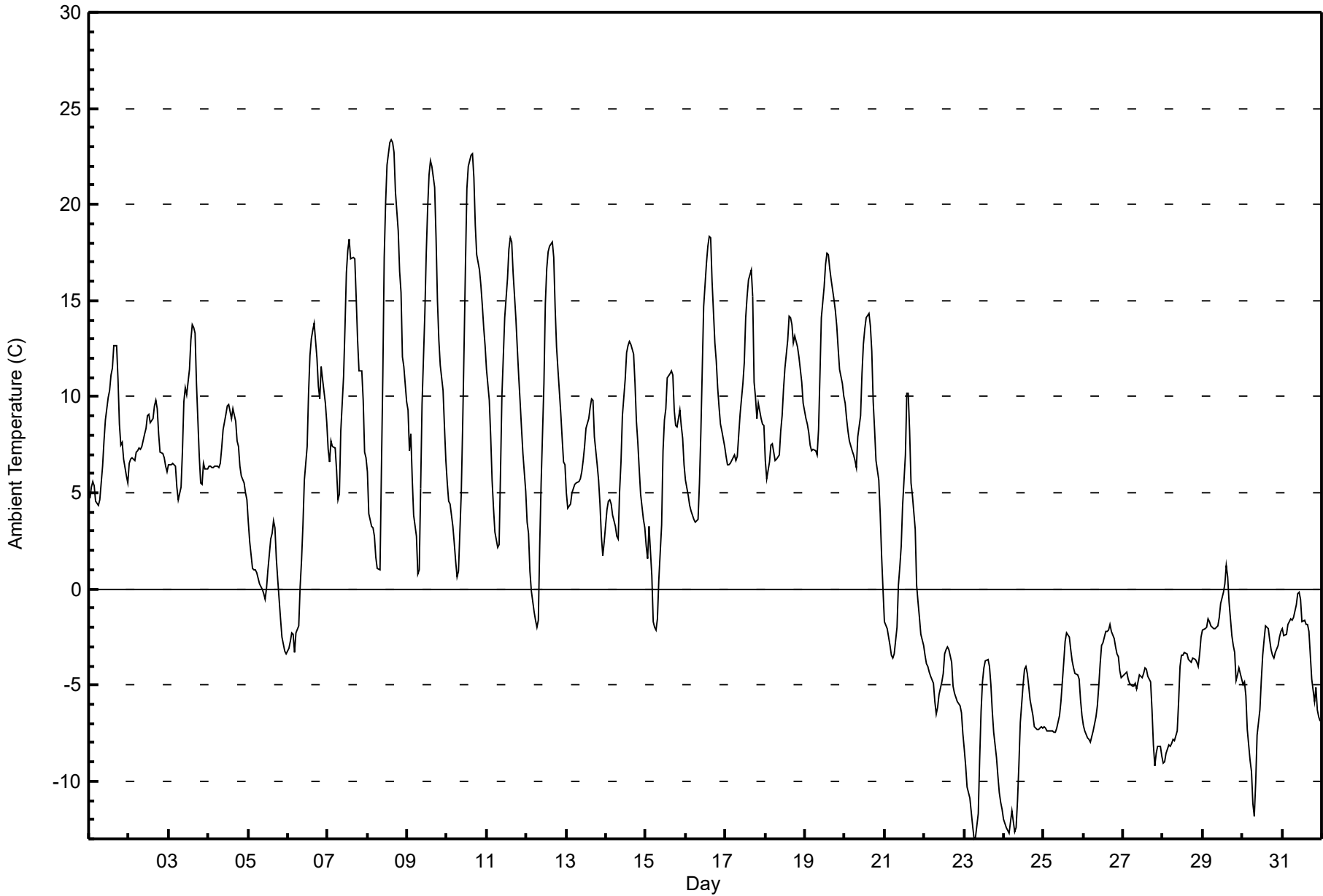
Wood Buffalo Environmental Association
Wind Rose Oct 2023

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





Maximum Value: 23.3 C on Oct 8 15:00		Maximum Daily Average: 12.4 C on Oct 8		Hours in Service: 744																							
Minimum Value: -13.0 C on Oct 23 07:00		Minimum Daily Average: -8.6 C on Oct 23		Hours of Data: 744																							
Maximum Diurnal Average: 9.0 C at hour 15		Minimum Diurnal Average: -0.4 C at hour 7		Hours of Missing Data: 0																							
Monthly Average: 3.81 C		Percentiles: P ₁ = -12.2 P ₁₀ = -6.7 Q ₁ = -3.2 Median = 5.0 Q ₃ = 9.4 P ₉₀ = 14.1 P ₉₉ = 22.0		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-Oct	4.7	5.3	5.6	5.4	4.6	4.3	4.6	5.5	6.4	7.7	8.8	10.0	10.3	11.1	11.5	12.7	12.7	10.9	8.6	7.5	7.6	6.8	5.9	5.5	7.7	12.7	
2-Oct	6.5	6.8	6.8	6.7	7.1	7.2	7.3	7.3	7.4	8.0	8.4	9.0	9.1	8.7	8.9	9.5	9.8	9.4	8.1	7.1	7.0	6.8	6.4	6.1	7.7	9.8	
3-Oct	6.4	6.4	6.6	6.4	6.4	5.3	4.7	5.3	7.2	9.7	10.5	10.1	11.4	12.9	13.7	13.6	13.3	10.7	6.9	5.5	5.4	6.5	6.2	6.2	8.2	13.7	
4-Oct	6.4	6.4	6.3	6.3	6.4	6.4	6.3	6.5	7.4	8.3	9.1	9.5	9.6	9.2	8.8	9.4	8.7	7.7	7.4	6.4	5.9	5.5	5.0	4.6	7.2	9.6	
5-Oct	3.5	2.5	1.1	1.0	1.0	0.9	0.6	0.3	0.0	-0.2	-0.5	0.1	1.0	2.6	2.9	3.5	3.2	1.6	0.5	-1.5	-2.5	-2.9	-3.2	-3.3	0.5	3.5	
6-Oct	-3.1	-2.7	-2.3	-2.3	-3.3	-2.3	-2.0	0.1	1.5	3.3	5.7	7.4	10.2	12.2	13.0	13.5	13.8	12.0	10.5	9.9	11.6	10.9	9.6	8.7	5.7	13.8	
7-Oct	7.3	6.6	7.7	7.4	7.4	6.2	4.7	5.0	8.2	11.0	13.6	16.5	17.6	18.2	17.2	17.2	17.2	15.2	13.0	11.3	11.4	9.8	7.1	6.8	11.0	18.2	
8-Oct	6.1	3.9	3.3	3.1	2.7	1.6	1.1	1.0	6.2	11.0	17.2	20.1	22.1	23.3	23.3	23.2	22.7	20.7	18.7	16.5	15.4	12.1	11.6	9.7	12.4	23.3	
9-Oct	9.3	7.2	8.1	5.7	3.8	2.7	0.8	1.0	5.3	9.6	14.3	17.4	19.8	21.5	22.3	22.0	20.9	18.3	15.0	12.9	11.6	10.3	8.4	6.7	11.5	22.3	
10-Oct	5.5	4.6	4.5	3.2	2.4	1.4	0.6	0.9	5.0	8.5	12.6	16.9	20.8	22.0	22.6	22.6	21.4	18.9	17.4	16.6	15.8	14.8	13.6	12.7	11.9	22.6	
11-Oct	11.4	9.8	7.9	5.7	4.2	3.0	2.2	2.3	6.1	10.0	12.1	14.1	16.1	17.7	18.3	18.0	16.4	14.0	12.5	11.1	9.7	8.4	7.1	5.1	10.1	18.3	
12-Oct	3.5	2.9	0.9	-0.1	-1.2	-1.6	-2.0	-1.6	2.3	5.5	10.7	14.9	16.7	17.5	17.9	18.0	17.2	14.6	12.6	11.4	9.1	7.8	6.6	6.5	7.9	18.0	
13-Oct	5.0	4.2	4.4	5.0	5.2	5.4	5.5	5.6	5.7	6.1	6.7	7.4	8.3	8.9	9.4	9.9	9.8	7.9	6.5	5.7	4.5	2.7	1.7	2.4	6.0	9.9	
14-Oct	4.2	4.5	4.7	4.5	3.9	3.3	2.7	2.6	5.1	6.6	9.0	10.9	12.3	12.7	12.9	12.7	12.2	10.7	8.7	7.6	6.2	5.0	3.6	3.2	7.1	12.9	
15-Oct	2.2	1.6	3.3	0.7	-1.7	-2.0	-2.1	-1.6	0.5	3.3	7.2	8.8	9.4	11.0	11.2	11.4	11.1	9.3	8.5	8.4	9.3	8.5	7.9	6.5	5.5	11.4	
16-Oct	5.6	4.8	4.3	4.1	3.8	3.6	3.5	3.6	5.5	8.2	11.4	14.7	16.9	17.9	18.3	18.3	16.0	12.8	11.8	10.5	9.5	8.6	8.2	7.4	9.6	18.3	
17-Oct	6.9	6.4	6.5	6.5	6.8	7.0	6.7	6.9	8.0	9.1	10.7	11.8	14.1	15.2	16.1	16.6	15.2	10.7	10.0	8.8	9.6	8.9	8.6	8.5	9.8	16.6	
18-Oct	6.7	5.7	6.6	7.5	7.5	7.1	6.7	6.8	6.9	8.2	9.0	10.4	11.5	12.9	14.2	14.1	13.7	12.8	13.2	12.6	12.1	11.4	10.8	9.7	9.9	14.2	
19-Oct	8.9	8.5	8.1	7.4	7.2	7.3	7.2	6.9	8.2	11.1	14.1	15.7	16.9	17.5	17.4	16.7	16.1	15.1	14.5	13.7	12.5	11.4	10.7	10.0	11.8	17.5	
20-Oct	9.7	8.9	8.2	7.7	7.2	7.0	6.6	6.3	7.9	9.0	11.2	12.7	13.5	14.1	14.3	13.7	12.4	9.7	8.3	6.7	5.6	3.9	1.7	-0.1	8.6	14.3	
21-Oct	-1.7	-2.1	-2.5	-2.9	-3.5	-3.6	-3.4	-2.0	0.2	1.2	2.2	4.4	7.0	10.1	10.2	8.2	5.5	4.9	3.1	0.2	-0.7	-1.5	-2.4	-2.9	1.2	10.2	
22-Oct	-3.4	-3.9	-4.1	-4.3	-4.5	-4.9	-5.9	-6.5	-6.2	-5.5	-4.8	-4.4	-3.4	-3.2	-3.0	-3.1	-3.8	-5.1	-5.4	-5.7	-5.8	-6.1	-6.4	-7.5	-4.9	-3.0	
23-Oct	-8.3	-9.2	-10.3	-10.9	-11.6	-12.3	-13.0	-13.0	-11.7	-8.9	-6.3	-4.9	-4.1	-3.8	-3.6	-4.0	-5.0	-6.3	-7.5	-8.8	-9.7	-10.6	-11.1	-11.5	-8.6	-3.6	
24-Oct	-12.0	-12.4	-12.6	-12.7	-12.1	-11.5	-12.7	-12.4	-11.0	-9.1	-7.0	-5.0	-4.2	-4.0	-4.4	-5.0	-5.8	-6.6	-7.1	-7.2	-7.3	-7.3	-7.2	-7.2	-8.5	-4.0	
25-Oct	-7.2	-7.2	-7.4	-7.4	-7.4	-7.4	-7.5	-7.5	-7.2	-6.6	-5.8	-4.8	-3.8	-2.7	-2.3	-2.5	-3.1	-3.7	-4.1	-4.4	-4.5	-4.7	-5.8	-6.6	-5.5	-2.3	
26-Oct	-7.1	-7.4	-7.8	-7.8	-8.0	-7.7	-7.4	-6.7	-6.1	-5.0	-3.9	-2.9	-2.8	-2.2	-2.2	-2.1	-1.8	-2.2	-2.6	-3.0	-3.4	-3.5	-4.3	-4.6	-4.7	-1.8	
27-Oct	-4.5	-4.4	-4.3	-4.7	-4.9	-5.0	-5.0	-4.9	-5.2	-4.9	-4.5	-4.6	-4.4	-4.1	-4.2	-4.5	-4.8	-6.3	-8.1	-9.2	-8.6	-8.2	-8.2	-8.7	-5.7	-4.1	
28-Oct	-9.1	-9.0	-8.6	-8.1	-8.2	-8.1	-7.9	-7.9	-7.4	-5.8	-4.1	-3.5	-3.4	-3.3	-3.4	-3.6	-3.7	-3.8	-3.6	-3.7	-3.8	-4.0	-3.4	-2.5	-5.4	-2.5	
29-Oct	-2.1	-2.1	-2.0	-1.6	-1.7	-1.9	-2.1	-2.0	-2.0	-1.9	-1.5	-0.8	-0.1	0.2	1.2	0.7	-0.7	-2.4	-2.9	-3.3	-4.8	-4.5	-4.1	-4.7	-2.0	1.2	
30-Oct	-5.0	-4.9	-5.5	-7.3	-8.9	-9.5	-11.2	-11.8	-10.1	-7.6	-6.3	-4.8	-3.5	-2.6	-1.9	-2.1	-2.7	-3.2	-3.4	-3.6	-3.3	-3.0	-2.5	-2.2	-5.3	-1.9	
31-Oct	-2.1	-2.5	-2.4	-1.9	-1.7	-1.6	-1.6	-1.5	-0.8	-0.3	-0.2	-0.5	-1.7	-1.6	-1.9	-1.8	-2.2	-3.4	-4.7	-5.9	-5.1	-6.3	-6.7	-6.9	-2.7	-0.2	
		1.7	1.3	1.1	0.7	0.3	0.0	-0.4	-0.2	1.4	3.2	5.1	6.7	7.8	8.7	9.0	8.9	8.2	6.6	5.4	4.3	3.9	3.1	2.4	1.9	Diurnal Average	
		11.4	9.8	8.2	7.7	7.5	7.3	7.3	8.2	11.1	17.2	20.1	22.1	23.3	23.3	23.2	22.7	20.7	18.7	16.6	15.8	14.8	13.6	12.7	Diurnal Maximum		





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Janvier - October 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	274	36.83	36.83
0 - 10	308	41.40	78.23
10 - 20	146	19.62	97.85
> 20	16	2.15	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

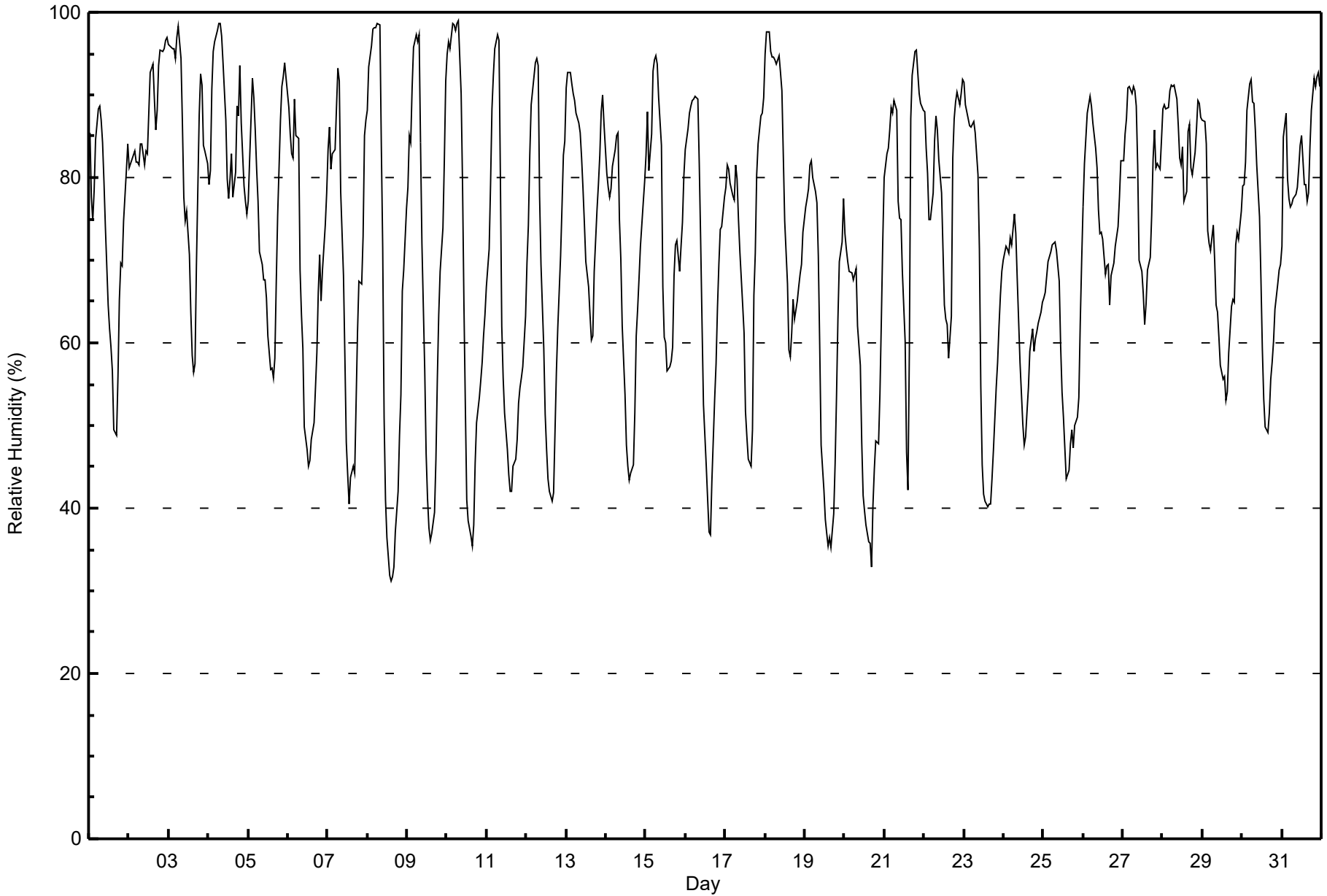
Janvier - October 2023

Maximum Value: 99.0 % on Oct 10 08:00 Maximum Daily Average: 87.5 % on Oct 2																						Hours in Service: 744 Hours of Data: 744				
Minimum Value: 31.2 % on Oct 8 15:00 Minimum Daily Average: 54.9 % on Oct 20 Maximum Diurnal Average: 87.2 % at hour 7 Minimum Diurnal Average: 52.9 % at hour 15 Monthly Average: 72.45 % Percentiles: P ₁ = 35.6 P ₁₀ = 46.8 Q ₁ = 60.8 Median = 75.2 Q ₃ = 86.4 P ₉₀ = 92.3 P ₉₉ = 98.4																						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-Oct	85.5	77.6	74.7	78.5	84.6	88.4	88.6	87.0	84.3	79.5	74.0	64.5	61.6	59.5	56.6	49.5	48.7	55.9	65.3	69.7	69.3	74.8	80.9	84.1	72.6	88.6
2-Oct	81.2	81.6	82.2	83.2	81.8	81.9	81.6	84.0	84.1	81.5	83.3	82.8	87.8	92.7	93.7	89.6	85.7	88.2	93.6	95.5	95.2	95.6	96.5	96.9	87.5	96.9
3-Oct	96.1	95.8	95.5	95.6	94.3	96.9	98.3	94.4	86.6	77.6	74.7	75.9	70.7	63.8	58.5	56.4	57.5	69.4	87.7	92.5	91.2	83.9	83.2	81.7	82.4	98.3
4-Oct	79.1	80.8	90.6	95.3	96.4	97.8	98.6	98.7	97.1	94.0	86.9	79.9	77.5	79.9	82.9	77.6	80.8	88.6	87.5	93.6	86.6	79.0	77.1	75.5	86.7	98.7
5-Oct	77.0	82.2	92.0	89.7	85.8	81.0	77.1	71.0	69.5	67.7	67.6	65.4	60.9	56.7	56.9	55.8	58.1	67.3	75.5	86.9	91.0	92.3	93.9	92.1	75.6	93.9
6-Oct	88.5	85.3	82.8	82.4	89.5	85.1	84.8	68.8	63.5	59.4	49.9	47.2	45.2	45.8	48.4	49.4	50.4	58.8	66.0	70.6	65.1	68.8	74.3	78.1	67.0	89.5
7-Oct	83.4	86.0	81.0	82.9	83.4	88.5	93.3	91.7	78.2	68.1	58.3	48.0	44.0	40.5	43.8	45.1	44.2	52.7	61.2	67.5	67.1	72.8	85.1	86.9	68.9	93.3
8-Oct	88.1	93.4	96.0	97.9	98.2	98.2	98.7	98.4	84.1	71.5	51.1	41.1	36.5	31.9	31.2	31.8	32.9	37.2	42.0	48.8	53.8	66.2	68.9	76.3	65.6	98.7
9-Oct	78.7	85.1	84.2	90.8	95.8	97.3	96.4	97.2	84.2	72.0	56.8	46.6	41.2	37.7	36.2	36.9	39.5	45.9	55.6	63.4	68.6	73.9	82.1	91.8	69.1	97.3
10-Oct	95.0	96.4	95.7	98.7	98.5	97.8	98.6	99.0	90.1	79.1	64.5	52.4	41.0	38.5	36.6	35.4	38.0	45.4	50.3	53.3	55.4	57.6	60.8	63.4	68.4	99.0
11-Oct	66.8	71.3	79.2	88.4	92.4	95.6	97.2	96.6	80.3	62.1	55.8	51.4	47.1	44.1	42.1	42.1	45.2	45.9	48.3	52.7	54.6	55.7	57.2	63.2	64.0	97.2
12-Oct	69.6	74.3	82.7	88.8	92.2	93.8	94.4	93.5	77.7	69.6	59.3	51.4	47.2	43.6	42.0	40.9	41.9	49.2	56.4	61.9	70.5	76.4	82.7	84.4	68.5	94.4
13-Oct	90.8	92.8	92.7	91.4	90.2	89.4	87.8	86.7	85.4	82.4	78.7	74.4	69.9	66.7	63.5	60.3	60.9	68.7	76.1	79.2	82.6	88.0	90.0	86.5	80.6	92.8
14-Oct	80.5	78.8	77.7	78.6	81.3	83.3	85.1	85.4	75.0	70.2	62.0	53.8	47.7	45.0	43.4	44.3	45.2	51.5	60.8	64.0	67.8	71.6	77.0	79.5	67.1	85.4
15-Oct	82.7	87.9	80.9	85.3	93.0	94.2	94.8	93.8	89.7	83.9	66.8	60.7	60.0	56.6	57.1	57.7	59.5	68.2	71.8	72.3	68.7	71.8	74.5	80.1	75.5	94.8
16-Oct	83.4	85.9	87.8	88.7	89.3	89.5	89.9	89.5	81.7	72.3	62.2	52.5	45.0	41.1	37.1	36.9	43.2	53.2	57.4	64.2	69.4	73.7	74.0	77.6	68.6	89.9
17-Oct	78.9	81.5	81.0	79.4	77.7	77.3	81.4	79.9	74.9	71.0	64.5	61.1	51.8	48.7	45.9	45.1	49.6	65.8	70.9	80.4	84.0	87.5	87.8	89.6	71.5	89.6
18-Oct	94.9	97.7	97.6	95.3	94.6	94.6	94.3	93.8	94.7	92.8	90.6	82.7	74.8	67.1	59.1	58.3	61.2	65.2	62.9	65.0	66.8	68.3	69.6	73.4	79.8	97.7
19-Oct	76.5	77.4	78.7	81.6	82.0	80.0	78.4	76.9	70.6	59.7	47.6	42.1	38.7	36.9	35.4	36.5	35.3	39.3	45.4	53.5	62.9	69.8	72.1	77.5	60.6	82.0
20-Oct	73.3	71.3	69.8	68.7	68.4	67.6	68.3	69.0	62.1	57.3	48.0	41.6	39.6	37.9	36.0	35.8	32.9	40.3	44.7	48.2	47.8	53.8	62.7	72.2	54.9	73.3
21-Oct	80.0	82.9	83.5	85.7	88.6	87.9	89.4	88.2	77.1	75.0	74.9	68.6	60.2	46.8	42.3	58.9	87.1	92.3	95.3	95.5	92.8	90.2	88.9	88.1	80.0	95.5
22-Oct	87.9	83.6	80.5	75.0	74.9	78.1	84.5	87.5	85.7	82.2	78.1	71.4	64.6	62.9	62.3	58.1	63.2	82.5	87.2	89.1	90.3	88.9	90.1	91.9	79.2	91.9
23-Oct	91.6	88.9	88.0	86.2	86.0	86.4	86.8	85.5	80.3	71.4	54.7	45.3	41.7	40.8	40.2	40.4	40.5	43.5	46.9	54.7	57.7	62.0	65.8	68.7	64.7	91.6
24-Oct	70.1	71.7	71.4	70.8	72.7	71.8	75.6	73.2	67.8	62.7	57.6	50.1	47.6	48.7	51.7	54.7	59.0	61.6	59.1	60.5	61.4	62.3	63.7	64.9	62.9	75.6
25-Oct	65.4	66.2	67.9	69.9	71.0	71.8	72.0	72.2	71.2	67.4	59.6	54.1	51.1	47.3	43.6	44.6	47.8	49.4	47.2	49.9	51.1	53.4	62.4	69.9	59.4	72.2
26-Oct	76.4	81.7	87.8	88.7	89.8	88.6	86.7	83.5	81.2	76.0	73.2	73.4	72.5	68.3	69.3	69.5	64.5	68.1	69.6	71.7	72.9	74.0	77.7	82.0	77.0	89.8
27-Oct	82.1	85.2	87.1	90.8	91.0	90.2	91.0	90.5	88.6	81.6	70.0	68.7	66.0	62.1	64.7	68.8	70.4	75.4	82.2	85.7	81.2	81.7	80.9	84.6	80.0	91.0
28-Oct	88.3	88.9	88.4	88.5	90.6	91.2	91.1	91.1	89.5	86.4	82.4	81.5	83.7	77.2	78.3	85.6	86.4	81.2	80.3	83.1	85.9	89.2	88.9	87.4	86.0	91.2
29-Oct	86.9	86.8	84.1	73.6	72.1	71.3	74.2	69.8	64.6	63.7	60.8	57.3	55.6	55.9	53.0	54.1	58.8	64.4	65.2	64.9	71.8	73.4	72.6	75.9	67.9	86.9
30-Oct	79.0	79.2	81.8	88.2	91.3	91.9	89.1	88.9	85.8	81.6	75.3	67.8	59.3	53.2	49.8	49.2	51.6	55.5	57.7	60.2	64.0	67.1	68.7	69.5	71.1	91.9
31-Oct	71.7	84.9	87.8	79.8	77.4	76.4	76.7	77.5	78.0	78.7	81.2	83.8	85.0	79.1	79.2	77.1	78.1	83.7	88.2	92.0	91.0	92.3	92.8	91.1	82.6	92.8
81.6 83.3 84.2 85.1 86.3 86.6 87.2 85.9 80.1 74.1 66.8 61.2 57.3 54.1 52.9 53.1 55.4 61.7 66.4 70.7 72.2 74.7 77.5 80.2																								Diurnal Average		
96.1 97.7 97.6 98.7 98.5 98.2 98.7 99.0 97.1 94.0 90.6 83.8 87.8 92.7 93.7 89.6 87.1 92.3 95.3 95.5 95.2 95.6 96.5 96.9																								Diurnal Maximum		



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Janvier - October 2023





Maximum Speed: 22 km/h on Oct 4 22:00	Maximum Daily Speed Average: 12.9 km/h on Oct 19	Hours in Service: 744
Minimum Speed Value: 0 km/h on Oct 30 09:00	Minimum Daily Speed Average: 1.6 km/h on Oct 17	Hours of Data: 704
Maximum Diurnal Speed Average: 5.1 km/h at hour 21	Minimum Diurnal Speed Average: 2.9 km/h at hour 18	Hours of Missing Data: 40
Monthly Average Velocity: 4.1 km/h 227.9 deg	Percentiles: P ₁ = 1 P ₁₀ = 3 Q ₁ = 6 Median = 9 Q ₃ = 11 P ₉₀ = 14 P ₉₉ = 19	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-Oct	SSE5	SE7	SSE6	SSE3	SE3	SE3	SE4	SE5	SSE1	SSW3	S9	SSW13	S13	SSW9	SSW11	SSW12	S11	S9	SSE9	SSE11	S12	S11	SSW11	S9	S7.4	SSW13	
2-Oct	SSW10	SSW10	SSW11	SSW13	SSW12	SSW10	S13	S13	SSW12	SSW14	SSW13	SSW11	SW9	SSW10	SW8	SW9	SSW8	SSW7	SSW8	SSW8	SW10	SSW10	SW10	SW10	SSW10.3	SSW14	
3-Oct	SSW10	SSW10	SSW8	SSW9	SSW7	S5	SSW7	SW8	SW8	WSW8	W11	WNW9	WNW3	W5	W13	WNW14	W8	WSW6	S5	S5	SSW9	SSW10	SW8	SW8	SSW6.7	WNW14	
4-Oct	SW9	SW9	SW11	SW10	SW9	SW7	SW6	WSW6	W7	WNW9	NW10	NW16	NW16	NW15	WNW16	WNW19	NW16	WNW16	NW14	WNW16	WNW17	WNW22	NW17	NW18	WNW11.0	WNW22	
5-Oct	NW19	NW15	WNW13	WNW13	NW15	NW18	NW15	NW14	NW16	NW17	NW14	NW15	NW15	NW14	NW15	NNW12	NNW12	NNW6	NNE4	SSE1	SW5	SSW5	SSW6	SSW7	NW10.4	NW19	
6-Oct	SSW9	SSW10	SSW9	SSW8	SSW5	SSW4	SSW6	SSW10	SSW5	SSW8	SW12	SSW12	SW16	SW12	SSW14	SSW12	SSW14	S8	SSW10	SSW8	SW9	SW9	SW10	SW10	SSW9.4	SW16	
7-Oct	SW9	SSW10	SW11	SW11	SW10	SSW8	SSW7	SW6	SSW7	SSW7	SSW3	SSE2	ENE4	ESE8	E7	E8	E7	E8	ESE8	ESE8	SE8	SE6	ESE1	SSE1	SSW4.0	SW11	
8-Oct	SSE4	SE4	NE3	NNE5	NE3	NNE4	NE3	NNE2	NNW1	W1	SSE8	S14	S16	S19	SSE19	S18	S15	S12	S10	SE9	SSE7	SSE6	S6	SSE5	SSW6.4	S19	
9-Oct	SSE4	SSE4	SSE6	SSE4	E3	ESE4	NE3	NNE2	NW0	N2	ESE3	SE10	SE10	SE10	SE12	SE11	SE10	ESE8	SE4	ESE6	SE6	SE4	ENE4	ENE3	SSW4.8	SE12	
10-Oct	NE1	N4	NNE4	NNE4	NNE3	NNE2	NNE2	N3	N3	NE6	ENE8	E7	SE12	SE16	SE13	SE13	SE12	SE9	ESE9	SE12	SE10	SE11	SE10	SE11	ESE5.8	SE16	
11-Oct	SE8	E6	E5	ENE5	ENE5	NNE3	NNE4	NNE4	ENE3	ESE9	ESE8	E10	E11	ESE13	ESE15	ESE13	E11	ESE9	ESE11	ESE11	SE8	SE8	SSE7	SSE3	ESE7.0	ESE15	
12-Oct	NNE3	NE5	E3	NNE3	N2	NNE3	NNE2	NE1	NNE1	WSW1	SW2	SE5	SSE11	SSE13	SSE12	SSE10	SSE9	SSE8	SSE9	SSE9	SSE6	S6	SW7	SSW9	SSW3.8	SSE13	
13-Oct	SSW7	SSW10	SSW12	SSW10	SSW9	SSW8	SSW10	S8	S9	S12	S11	S11	S11	SSE12	SSE14	SSE13	SSE10	ESE6	ESE8	SE8	SE7	SE6	SSE7	SE9	SSW8.4	SSW14	
14-Oct	SE12	SE13	SE16	SE17	SE14	SE13	SE12	SE10	SE10	SE10	SSE12	SSE17	S19	SSE20	SSE19	SSE18	SSE15	SSE11	SSE9	SSE9	SSE8	SSE7	SSE8	SSE7	SSW12.4	SSW20	
15-Oct	SSW2	ESE4	SE7	SE5	SE4	E1	SE2	SE3	SSE0	SW3	S10	S8	S9	S9	SSW8	SSW9	SSW7	SSW7	SSW8	SSW9	SSW10	SSW11	SSW10	SSW11	SSW5.8	SSW11	
16-Oct	SSW11	SW10	SSW11	SSW12	SSW12	SSW12	SSW14	SSW12	SW12	SW10	SSW9	SW9	SW10	SW8	SW6	SW6	S5	SSE6	SE5	SE2	SSE3	SSW0	NE3	NNE2	SSW7.1	SSW14	
17-Oct	NNE6	NNE4	NNE5	N5	NNE6	NNE5	N4	N4	NNE7	NNE6	NNE5	WNW2	NE1	NE1	NW1	WNW3	N3	W4	W5	SW6	SSW5	S4	SSW6	S7	N1.6	S7	
18-Oct	SSE7	SSW8	SSW11	SSW9	S9	S9	S8	SSW5	SSW4	S5	S7	SSW10	SW9	SW11	SSW13	SSW13	SSW10	SSW11	SSW14	SW13	SW12	SW12	SW12	SW13	SSW9.3	SSW14	
19-Oct	SW13	SW12	SW13	SW14	SW13	SW13	SW13	SW16	SSW12	SW11	WSW16	W16	W17	WSW18	WSW16	WSW13	WSW12	SW9	WSW13	SW14	WSW11	SW12	W14	W14	WSW12.9	WSW18	
20-Oct	WSW15	W15	W15	W15	W15	W15	W10	WSW8	W8	W12	WNW18	WNW20	WNW22	NW19	NW16	NW16	NW10	WNW9	WNW9	NW9	NNW5	NNE5	NNE1	SW1	WNW10.8	WNW22	
21-Oct	SSW5	SSW7	SSW5	S5	S3	SSW7	SSW6	SSW5	SW8	SSW8	SSW2	SW3	SW5	SW9	SW12	SW12	W5	W5	N10	N16	UO	UO	UO	UO	SSW4.3	N16	
22-Oct	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	---	
23-Oct	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	WNW18	
24-Oct	SW9	SW8	WSW9	W7	WSW7	WSW8	SW8	WSW7	W9	WSW10	WSW10	WNW13	WNW14	WNW15	WNW14	WNW15	NW14	NW13	WNW16	W9	WNW9	WNW8	WNW8	WNW8	W9.5	WNW16	
25-Oct	WNW6	WNW9	WNW10	W10	W9	W9	W9	W8	SW6	WSW8	WSW11	WSW11	W9	WNW11	WNW12	W12	W9	W7	W7	W8	WNW9	WNW8	W8	W7	W8.5	WNW12	
26-Oct	W7	WSW6	SW6	WSW7	WSW6	SW8	WSW7	W10	W8	W10	W9	WNW10	WNW10	WNW11	W9	WSW7	WNW10	WNW8	WSW7	WSW8	WSW8	WSW8	WSW9	WSW9	W7.7	WNW11	
27-Oct	SW9	WSW8	SW8	SW7	SW7	SW7	SW7	NNW8	N9	N11	NNE15	N13	N11	NNW9	NNW7	NW8	WNW9	WNW5	WSW3	SW5	SW7	SSW6	SSW7	SSW8	WNW3.6	NNE15	
28-Oct	SSW7	SW9	SSW8	SSW6	SW5	SSW4	SW5	SW5	WSW5	WNW6	NNW6	NNW9	NNW8	NNW9	N9	NW4	WNW6	WNW6	WSW7	WSW9	WSW9	W7	WNW10	W9	W4.7	WNW10	
29-Oct	W9	W8	W10	WNW14	WNW9	WNW7	WNW10	WNW12	NW12	NNW9	NW9	NW10	NW10	NW9	NW9	WNW10	WNW10	WNW6	W8	W8	W6	NNW4	NNW5	NNE10	WNW8.1	WNW14	
30-Oct	NNE8	N6	N7	NNE6	NNE4	NNE6	NNE3	WNW2	NE0	W2	SSW4	SSW8	SW9	SSW10	SSW10	SSW9	SSW10	SSW11	SSW11	SSW11	SSW11	SSW12	SSW13	SW12	SW10	SSW4.2	SSW13
31-Oct	SSW10	SSW11	SSW8	SSW11	SW10	SW9	WSW8	W6	NW6	NNW5	NNW7	N10	N10	N9	N8	N7	NNE4	ENE2	SSE3	SSW4	SW6	SW5	SSW7	SW4	W2.5	SSW11	

SW4.8 SW4.8 SW5.1 SW4.7 SW4.0 SW3.9 SW3.9	SW3.6 SW3.2 SW3.3 SW3.6 SW4.1 SW4.4 SW4.2 SW4.3 SW4.3 SW3.5 SW2.9	SSW3.5 SSW4.0 SSW5.1 SW4.9 SW5.1 SW4.9	Diurnal Average
NW19 W15 SE16 SE17 NW15 NW18 NW15 SW16 NW16	NW17 WNW18 WNW20 WNW22 SSE20 SSE19	NNW19 NW16 WNW16 WNW16 N16 WNW17 WNW22 NW17 NW18	Diurnal Maximum

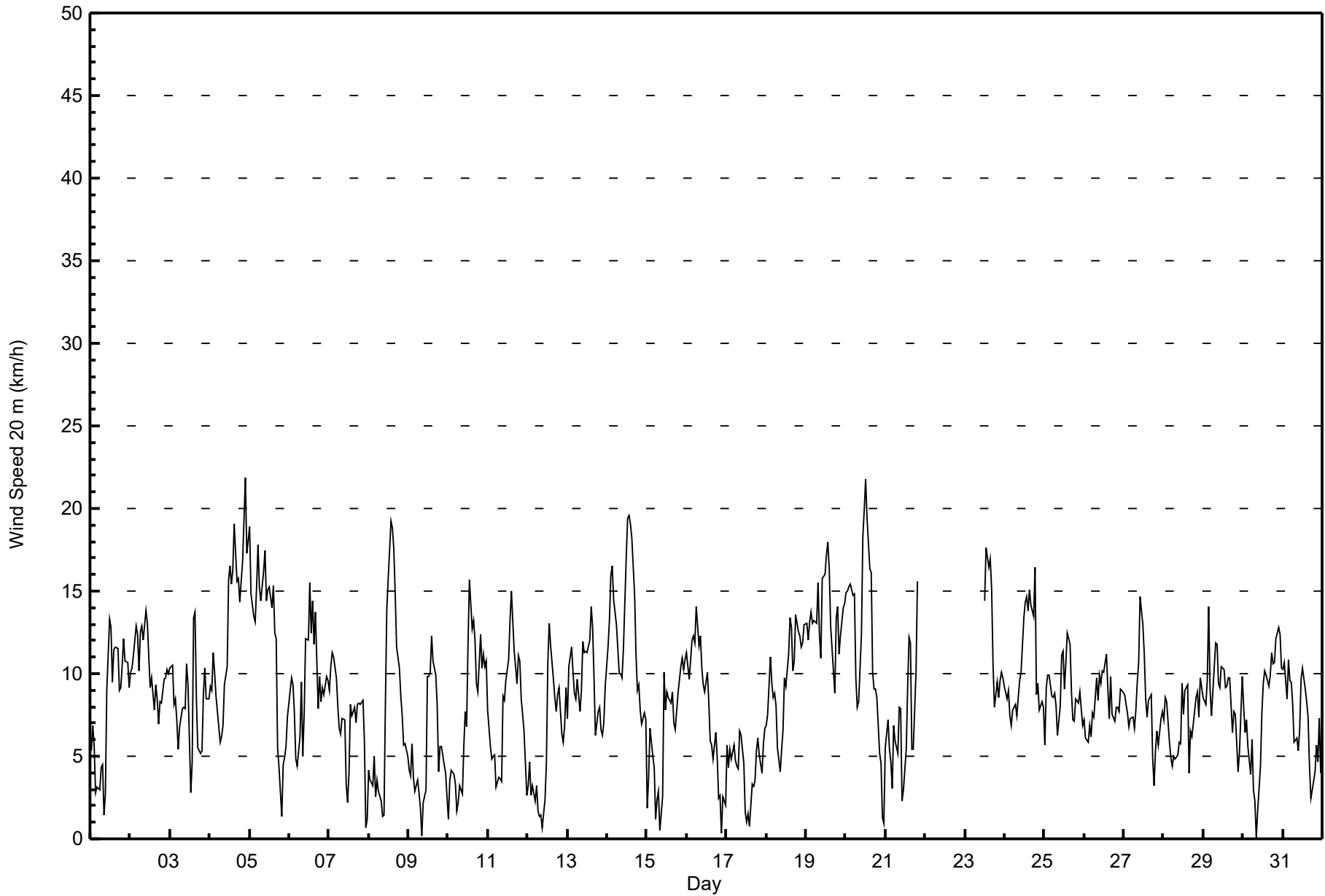
UO - Unstable Operation
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed 20 m (WS20m) - km/h
Janvier - October 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 8 km/h on Oct 20 14:00 Minimum Value: 1 km/h on Oct 31 20:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 2 Q ₃ = 3 P ₉₀ = 5 P ₉₉ = 7																		Hours in Service: 744 Hours of Data: 704 Hours of Missing Data: 40 Hours of Calibration: 0 Percent Operational Time: 94.6							
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-Oct	1	1	1	1	1	1	2	1	1	2	3	4	4	3	4	4	4	3	2	3	3	3	2	2	4
2-Oct	3	2	2	4	4	2	3	3	3	4	3	4	3	3	2	3	2	1	2	1	1	2	2	2	4
3-Oct	2	2	2	2	2	1	2	2	2	3	3	3	2	4	5	4	3	2	1	1	2	1	2	1	5
4-Oct	2	2	3	2	2	2	1	1	2	3	4	5	6	5	5	6	6	7	6	5	6	8	6	6	8
5-Oct	7	5	5	4	5	6	6	7	7	7	7	6	7	5	7	5	4	3	1	1	1	1	1	1	7
6-Oct	1	2	2	2	1	2	3	2	2	2	3	4	4	4	4	4	4	2	2	1	2	2	2	2	4
7-Oct	1	2	2	2	2	2	3	2	2	2	1	1	2	3	2	2	2	2	2	2	2	3	1	2	3
8-Oct	2	1	1	2	1	1	2	1	1	1	4	5	5	6	6	5	5	4	3	2	3	2	2	1	6
9-Oct	2	2	2	2	1	1	1	2	1	1	3	3	3	3	4	4	3	3	2	1	1	2	1	1	4
10-Oct	1	1	1	1	1	1	1	1	2	3	2	2	4	4	4	5	4	2	2	4	4	4	3	3	5
11-Oct	3	2	1	1	1	1	1	2	2	3	3	3	3	4	4	4	3	3	3	2	3	2	2	2	4
12-Oct	2	1	2	1	1	1	2	1	1	1	2	2	4	4	4	3	3	2	2	2	2	2	1	2	4
13-Oct	1	3	3	3	2	2	3	2	3	3	4	3	3	4	5	4	3	1	2	2	2	1	2	2	5
14-Oct	3	3	4	4	4	3	3	2	3	3	5	5	7	6	6	6	6	4	3	3	2	2	2	2	7
15-Oct	2	1	2	2	1	1	2	2	1	1	4	3	3	3	3	2	2	1	1	2	2	2	2	2	4
16-Oct	2	2	2	2	2	2	2	2	3	3	2	2	3	3	3	3	1	1	1	2	1	1	2	3	
17-Oct	1	1	1	1	1	1	2	2	2	1	2	1	1	1	1	2	2	2	3	1	1	1	1	2	3
18-Oct	1	1	3	2	2	3	2	2	2	3	2	3	2	4	4	4	2	3	3	3	3	2	3	3	4
19-Oct	3	3	3	3	3	3	3	3	3	3	6	4	5	6	5	4	4	2	4	4	3	3	4	5	6
20-Oct	4	4	4	4	5	5	4	3	3	5	6	6	7	8	7	6	5	2	2	2	2	2	1	2	8
21-Oct	1	1	2	2	1	1	1	1	2	2	2	1	2	4	4	4	2	2	6	5	UO	UO	UO	UO	6
22-Oct	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
23-Oct	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	5	5	5	5	5	3	2	2	2	2	2	5
24-Oct	2	2	2	2	2	2	2	2	2	2	3	4	4	4	5	4	5	5	5	3	3	2	3	2	5
25-Oct	2	3	3	2	2	2	2	2	2	2	3	3	3	4	4	3	4	2	2	2	2	2	2	1	4
26-Oct	2	1	1	1	1	1	2	3	2	3	3	3	3	4	2	3	3	2	1	2	2	2	2	2	4
27-Oct	2	2	2	1	1	2	1	5	3	4	5	5	3	3	3	3	2	1	1	1	2	1	1	1	5
28-Oct	1	2	2	1	1	1	1	1	1	2	2	3	3	4	3	2	2	2	1	2	2	1	2	2	4
29-Oct	2	1	2	4	3	2	3	3	4	4	3	3	4	4	3	3	2	1	2	2	1	2	2	3	4
30-Oct	2	2	2	1	1	1	2	1	1	2	2	2	3	3	3	3	2	2	2	3	3	3	3	3	3
31-Oct	2	2	2	3	2	2	2	2	2	2	2	4	4	3	3	2	2	1	1	1	1	1	2	2	4
Diurnal Maximum																									
7 5 5 4 5 6 6 7 7 7 7 6 7 8 7 6 6 7 6 5 6 8 6 6																									
UO - Unstable Operation																									





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Wind Speed 20 m (WS20m) - km/h
Janvier - October 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	153	21.73	21.73
6 - 11	389	55.26	76.99
12 - 19	158	22.44	99.43
20 - 28	4	0.57	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 704

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Wind Speed 20 m (WS20m) - km/h
Janvier - October 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	28	11	7	4	4	14	15	7	19	12	3	7	5	3	5	153
6 - 11	12	8	1	1	9	13	26	26	23	92	56	33	39	30	10	10	389
12 - 19	2	1	0	0	0	3	14	11	11	24	22	7	11	25	25	2	158
20 - 28	0	0	0	0	0	0	0	1	0	0	0	0	0	3	0	0	4
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	23	37	12	8	13	20	54	53	41	135	90	43	57	63	38	17	704

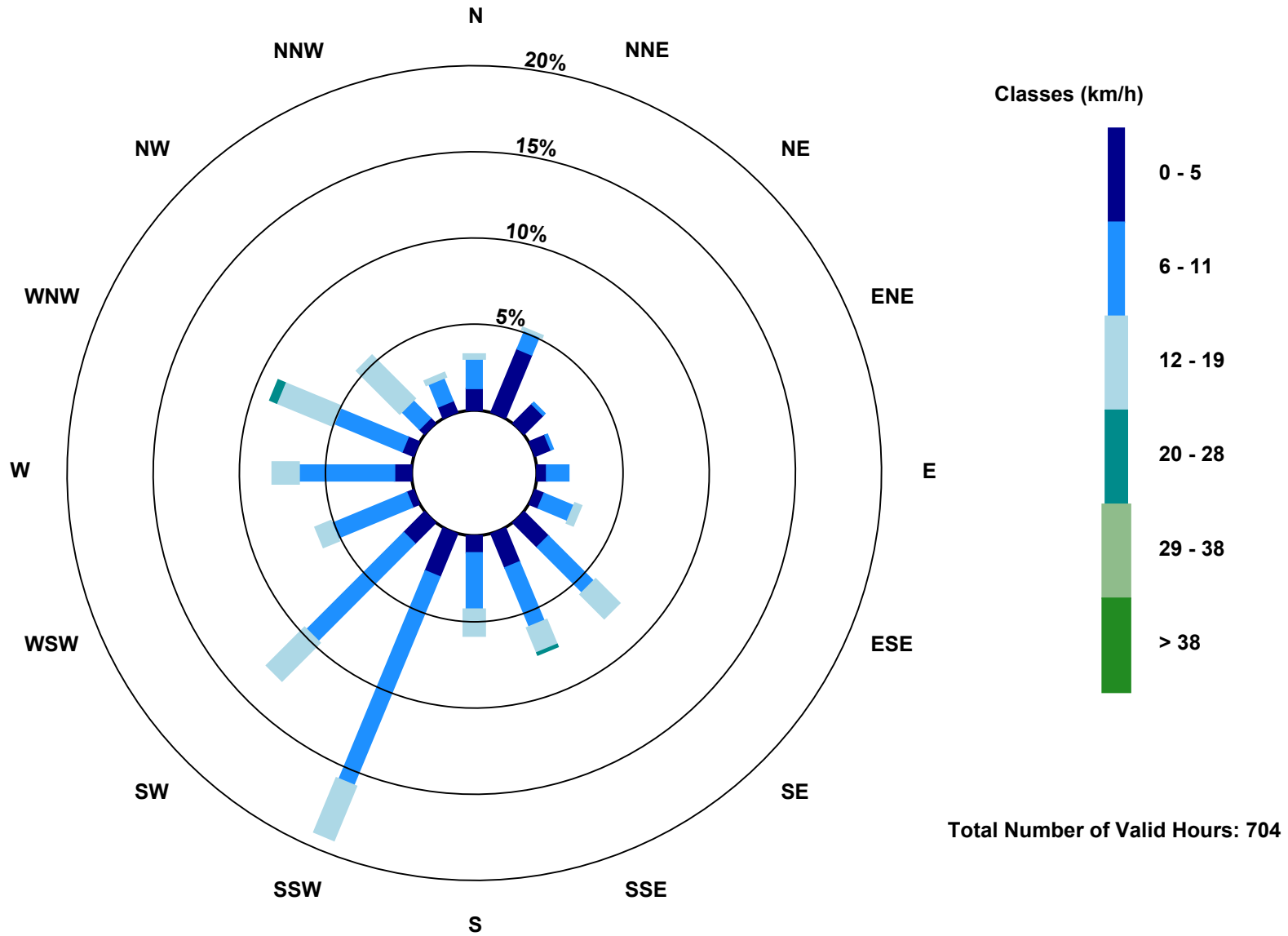
Total Number of Valid Hours: 704

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

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





Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction 20 m (WD20m) - deg

Janvier - October 2023

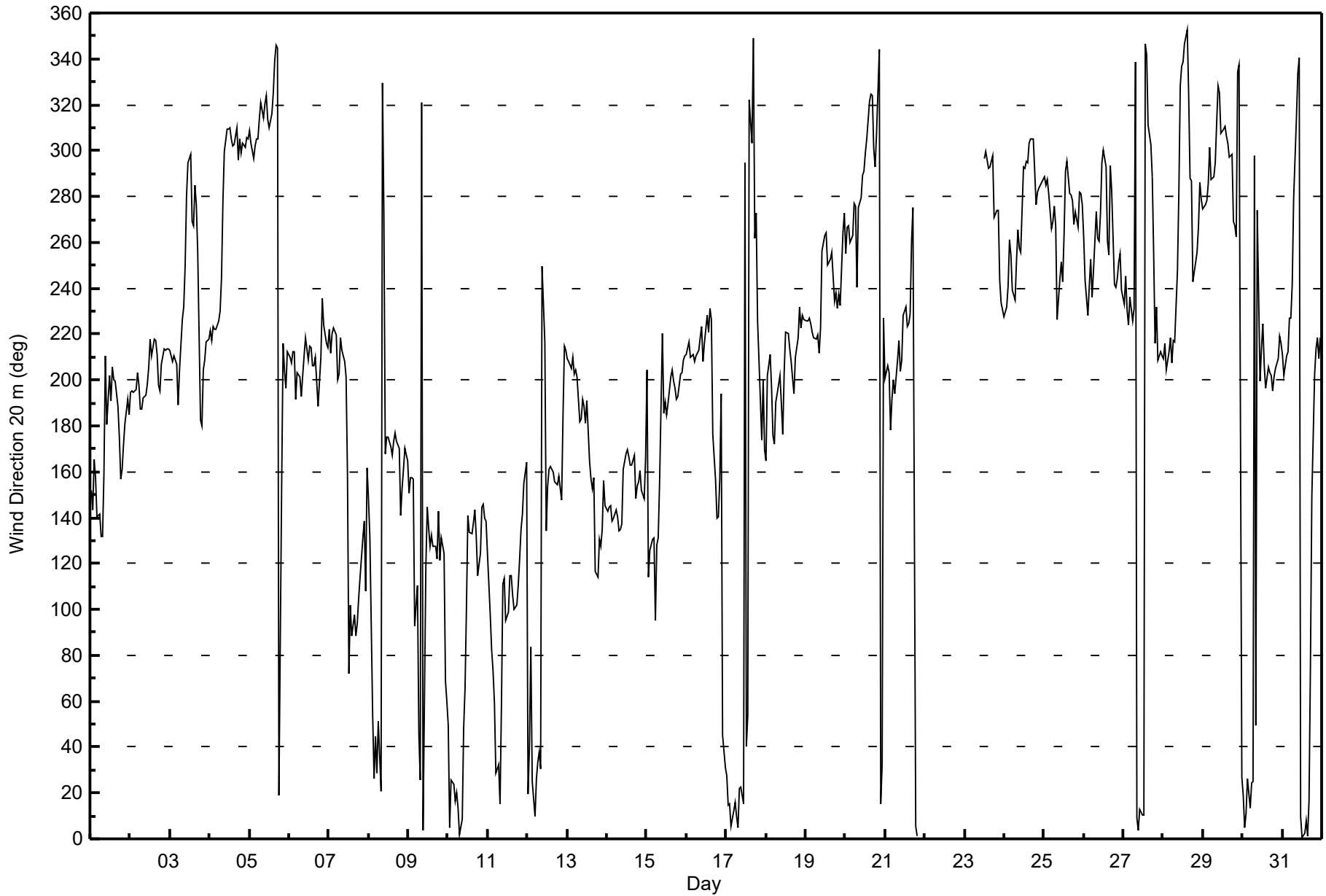
Direction of Maximum Speed: 301 deg on Oct 4 22:00																					Hours in Service: 744				
Direction of Maximum Daily Speed Average: 239.4 deg on Oct 19																					Hours of Data: 704				
Direction of Minimum Speed: 49 deg on Oct 30 09:00										Direction of Minimum Daily Speed Average: 1.6 deg on Oct 17											Hours of Missing Data: 40				
Monthly Average Direction: 227.9 deg																					Percent Operational Time: 94.6				
Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Oct	152	143	166	158	140	142	132	132	159	210	180	202	191	206	200	200	189	175	157	161	172	181	192	185	178.8
2-Oct	194	195	195	196	203	198	187	188	192	194	198	206	218	211	218	217	211	198	195	207	214	213	214	214	202.2
3-Oct	213	208	210	209	207	189	205	226	232	250	280	295	298	269	267	285	276	256	182	180	204	209	216	218	234.0
4-Oct	221	217	223	222	222	226	230	245	277	299	309	310	310	305	302	303	310	296	305	299	303	301	305	305	289.2
5-Oct	309	304	297	302	305	305	314	321	314	320	324	313	310	316	326	339	346	345	19	156	216	204	197	213	311.5
6-Oct	210	207	212	212	192	203	201	193	202	211	219	208	215	214	207	206	210	189	199	210	236	224	216	214	209.7
7-Oct	222	212	220	223	220	200	202	219	213	208	201	159	72	102	89	98	89	94	105	114	131	139	108	162	168.6
8-Oct	148	131	54	26	44	29	51	21	330	272	168	175	175	171	167	173	177	173	170	141	152	161	170	165	163.1
9-Oct	151	157	157	157	93	110	46	26	321	3	119	144	136	128	132	127	128	122	143	122	131	124	69	60	126.5
10-Oct	49	5	26	24	17	20	13	2	9	48	66	100	141	133	133	138	143	132	115	125	145	146	139	138	119.7
11-Oct	124	98	82	73	59	29	32	15	58	111	113	95	99	115	115	106	100	102	110	122	135	141	155	164	106.3
12-Oct	19	40	84	25	10	26	33	38	31	250	217	134	154	161	162	160	155	155	155	158	148	185	215	213	156.1
13-Oct	210	208	205	210	202	204	202	182	183	191	189	181	191	164	157	153	157	117	114	131	128	135	156	145	174.6
14-Oct	143	145	145	139	140	143	140	134	135	137	161	168	170	166	163	163	167	148	154	156	161	152	148	166	153.1
15-Oct	204	114	125	131	131	95	128	131	155	220	185	190	185	190	201	204	200	196	192	193	203	203	209	210	187.8
16-Oct	211	217	210	211	211	208	211	213	218	223	208	216	228	221	231	226	176	156	140	140	157	194	45	31	209.2
17-Oct	28	15	15	6	12	16	10	5	22	22	15	295	40	54	322	303	349	262	272	226	209	174	200	169	353.6
18-Oct	165	202	211	197	176	172	191	194	202	190	177	203	221	220	213	208	201	194	210	218	232	223	228	226	206.5
19-Oct	226	226	227	224	221	219	218	220	212	223	256	263	264	250	251	252	256	234	238	231	237	232	264	273	239.4
20-Oct	255	267	267	260	263	277	276	240	275	280	289	291	299	305	322	325	324	301	293	307	344	15	32	227	288.9
21-Oct	201	206	203	178	191	200	194	209	217	204	208	228	232	223	225	229	260	275	6	1	UO	UO	UO	UO	226.3
22-Oct	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
23-Oct	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
24-Oct	228	232	241	261	255	239	235	252	265	257	255	293	292	295	295	303	305	305	291	276	282	284	286	287	276.9
25-Oct	289	285	287	281	266	269	276	267	226	244	251	243	264	291	295	281	281	278	268	273	266	282	281	276	272.6
26-Oct	262	244	228	241	253	236	248	273	261	261	273	295	300	293	261	254	294	283	242	240	244	252	255	239	262.0
27-Oct	233	245	230	224	236	226	231	338	9	4	13	11	11	347	341	311	303	289	255	216	232	209	212	210	293.0
28-Oct	209	216	204	212	219	207	217	216	248	282	328	337	339	347	353	325	288	287	243	251	255	267	286	279	269.6
29-Oct	275	277	279	285	301	287	288	295	312	328	325	307	309	311	306	303	297	298	269	267	262	335	337	27	300.4
30-Oct	19	5	11	26	13	24	25	298	49	274	199	213	224	206	196	205	203	202	195	201	205	209	219	216	213.2
31-Oct	211	202	211	212	227	227	242	279	315	334	341	10	1	2	8	1	17	75	149	202	214	219	209	218	260.1
220.7 220.6 219.9 224.5 226.3 225.9 226.0 238.0 247.3 250.1 245.1 245.2 245.4 235.4 232.3 236.6 236.4 219.1 209.2 207.2 213.2 215.5 224.1 222.7																									
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 20 m (WD20m) - deg
Janvier - October 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0											Hours in Service: 744															
Maximum Value: 98 deg on Oct 15 01:00											Hours of Data: 704															
Minimum Value: 6 deg on Oct 21 02:00											Hours of Missing Data: 40															
Percentiles: P ₁ = 9 P ₁₀ = 13 Q ₁ = 16 Median = 20 Q ₃ = 26 P ₉₀ = 35 P ₉₉ = 87											Hours of Calibration: 0															
											Percent Operational Time: 94.6															
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-Oct	15	16	17	55	42	35	32	17	82	66	25	22	20	30	24	21	23	20	16	18	19	16	12	15	82	
2-Oct	15	14	15	15	18	16	16	17	17	18	17	23	24	18	21	21	17	12	11	10	10	12	12	13	24	
3-Oct	14	12	15	14	14	25	26	16	18	27	22	25	83	87	22	20	24	15	26	14	9	9	12	14	87	
4-Oct	17	17	17	16	16	15	16	14	26	22	29	25	29	25	20	22	27	21	25	21	23	21	26	23	29	
5-Oct	28	27	21	24	23	24	28	32	32	32	32	30	34	34	37	39	33	34	18	64	11	15	8	7	64	
6-Oct	9	10	12	11	15	30	16	13	23	21	19	19	20	21	18	19	17	16	12	12	18	12	20	13	30	
7-Oct	12	13	11	12	13	11	15	14	17	22	33	70	58	30	21	19	20	15	12	14	18	23	85	90	90	
8-Oct	29	34	28	13	22	18	40	17	43	67	30	25	25	23	23	23	20	20	20	22	34	25	18	20	67	
9-Oct	32	33	22	33	19	24	33	31	62	34	83	26	30	32	24	19	19	20	34	16	14	27	28	23	83	
10-Oct	31	15	10	16	18	24	19	11	26	27	24	35	26	21	25	23	22	17	18	17	22	21	20	22	35	
11-Oct	30	28	19	16	13	22	28	16	49	28	37	28	27	26	21	24	20	21	18	16	21	20	25	72	72	
12-Oct	39	26	43	17	25	13	19	33	36	79	81	48	27	26	28	30	23	17	16	19	41	34	19	13	81	
13-Oct	12	13	16	17	16	17	19	22	24	19	20	21	21	28	28	27	23	21	20	16	15	17	17	16	28	
14-Oct	16	17	17	15	16	15	15	14	16	21	27	24	25	25	24	25	24	23	21	20	19	19	17	22	27	
15-Oct	98	44	16	21	18	45	57	76	88	34	27	33	22	26	22	18	14	9	11	15	12	12	12	11	98	
16-Oct	11	12	11	11	11	11	11	11	14	19	18	22	23	30	46	45	32	13	18	49	40	91	56	63	91	
17-Oct	11	9	13	17	14	13	22	30	17	22	40	88	97	84	81	56	45	36	24	11	22	14	13	28	97	
18-Oct	16	16	16	16	17	20	19	16	40	36	27	23	21	20	20	22	15	14	13	14	16	14	14	14	40	
19-Oct	14	16	14	14	12	14	14	14	14	19	24	23	24	24	24	22	20	20	20	18	19	21	22	21	24	
20-Oct	17	18	20	19	21	23	30	26	30	20	19	19	23	26	33	34	31	13	12	17	33	46	65	93	93	
21-Oct	15	6	10	28	46	8	9	21	15	16	46	31	23	26	19	17	29	25	45	26	UO	UO	UO	UO	46	
22-Oct	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	
23-Oct	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	24	22	22	18	17	15	13	13	14	14	13	14	24
24-Oct	13	15	16	20	23	18	14	21	20	20	25	23	24	20	25	21	22	27	17	18	19	18	20	22	27	
25-Oct	25	20	18	16	20	19	18	18	22	20	20	21	35	30	25	20	15	15	18	17	16	20	18	14	35	
26-Oct	17	18	16	11	14	14	16	18	19	20	24	27	26	26	21	29	17	16	13	16	16	18	17	17	29	
27-Oct	15	17	16	16	14	13	16	53	24	27	22	25	23	39	38	31	22	24	33	10	15	14	9	12	53	
28-Oct	12	14	16	17	15	17	16	12	14	25	40	33	38	38	29	34	17	20	19	15	15	21	12	12	40	
29-Oct	13	13	15	16	21	15	14	17	31	35	34	28	28	33	32	20	16	13	13	16	19	40	39	14	40	
30-Oct	18	24	20	12	18	10	15	45	86	72	39	25	25	25	24	19	12	13	14	13	13	14	17	16	86	
31-Oct	14	13	14	16	17	18	15	27	25	34	37	22	27	28	28	27	24	31	11	18	13	12	9	16	37	
98 44 43 55 46 45 57 76 88 79 83 88 97 87 81 56 45 36 45 64 41 91 85 93																										
Diurnal Maximum																										
UO - Unstable Operation																										





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS23
FORT HILLS
OCTOBER 2023

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

November 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT HILLS (AMS23)
OCTOBER 2023

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

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2(ppb) Average	707	35	37	99.73	18.9	0	4.2	0
TRS(ppb) Average	707	36	37	99.87	2.3	0	0.4	0
THC(ppm) Average	708	34	36	99.73	9	-	3.6	-
NMHC(ppm) Average	708	34	36	99.73	1.739	-	0.656	-
CH4(ppm) Average	708	34	36	99.73	7.2	-	2.9	-
NO2 (ppb) Average	706	36	38	99.73	40.7	0	21	-
NO (ppb) Average	706	36	38	99.73	213.9	-	70	-
NOX (ppb) Average	706	36	38	99.73	246.4	-	91	-
PM2.5 (ug/m3) Average	739	2	5	99.6	124.1	3	27	0
Temperature 2 m (C) Average	743	0	1	99.87	22.1	-	12.8	-
Relative Humidity (%) Average	743	0	1	99.87	99.4	-	89.8	-
Wind Speed 10 m (km/h) Average	742	1	2	99.87	39	-	20	-
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 - FORT HILLS (AMS23)
OCTOBER 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	707	0.73	2	-	0	0	0	0.1	0.4	1.4	18.9
TRS (ppb) Average	707	0.18	0.2	-	0	0.1	0.1	0.1	0.2	0.4	2.3
THC (ppm) Average	708	2.43	0.6	-	2	2	2.1	2.2	2.6	3.1	9
NMHC(ppm) Average	708	0.152	0.217	-	0	0	0	0.1	0.2	0.4	1.739
CH4(ppm) Average	708	2.28	0.4	-	2	2	2	2.1	2.4	2.7	7.2
NO2 (ppb) Average	706	10.68	8.6	-	0.1	0.7	3.5	8.9	16.4	23.5	40.7
NO (ppb) Average	706	11.43	26.6	-	0	0	0.2	1.9	10	30.1	213.9
NOX (ppb) Average	706	22.11	32.4	-	0.1	0.8	4.2	11.4	27.5	52.4	246.4
PM2.5 (ug/m3) Average	739	9.92	9.7	-	0.3	3.1	5.3	7.5	11.4	18.9	124.1
Temperature 2 m (C) Average	743	4.56	7.1	-	-10.9	-4.8	-1.6	5.4	9.9	13.4	22.1
Relative Humidity (%) Average	743	71.86	15.1	-	35.5	51.4	60.2	73.7	83.5	91.2	99.4
Wind Speed 10 m (km/h) Average	742	10.4	6	-	0	4	6	10	14	18	39
Wind Direction 10 m (deg) Average	742	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT HILLS (AMS23)
OCTOBER 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL PARAMETERS	27 Oct 2023 16:00	27 Oct 2023 16:00	1	DAS Failure - data not recorded
NO2,TRS, THC/NMC/CH4, SO2	02 Oct 2023 10:00	02 Oct 2023 10:00	1	Maintenance - sample manifold cleaned
PM2.5	27 Oct 2023 21:00	27 Oct 2023 22:00	2	DAS Failure - data not recorded



Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 18.9 ppb on Oct 15 15:00	Maximum Daily Average: 4.2 ppb on Oct 15		Hours of Data:	707
Minimum Value: 0.0 ppb on Oct 1 01:00	Minimum Daily Average: 0.0 ppb on Oct 25		Hours of Missing Data:	37
Maximum Diurnal Average: 1.8 ppb at hour 15	Minimum Diurnal Average: 0.2 ppb at hour 3		Hours of Calibration:	35
Monthly Average: 0.73 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.4 P ₉₀ = 1.4 P ₉₉ = 10.9		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-Oct	0.0	0.0	0.0	0.0	Z	0.3	0.6	0.6	2.7	5.5	8.3	2.2	0.4	0.9	2.8	4.1	3.3	1.5	1.0	0.3	0.5	0.9	3.4	6.3	2.0	8.3
2-Oct	6.0	3.2	1.7	1.4	0.9	Z	0.6	0.4	0.4	M	1.4	0.6	0.3	0.2	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.8	6.0
3-Oct	Z	0.2	0.0	0.0	0.0	0.0	0.1	0.3	0.3	0.4	0.5	1.2	0.6	0.5	0.3	0.3	0.3	0.2	0.1	0.2	0.2	0.2	0.2	0.3	0.3	1.2
4-Oct	0.5	Z	0.5	0.5	0.2	0.3	0.4	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	0.0	0.0	0.0	0.2	0.5
5-Oct	0.0	0.1	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.0	0.0	0.2
6-Oct	0.0	0.0	0.0	Z	0.4	2.2	2.6	4.3	4.6	8.4	8.8	2.5	0.3	2.7	0.4	0.3	0.4	1.2	2.1	1.1	0.4	0.4	0.5	0.2	1.9	8.8
7-Oct	0.3	0.2	0.3	0.2	Z	0.8	0.5	0.9	0.3	0.1	0.3	0.5	0.8	1.1	3.8	4.7	2.1	1.4	0.9	1.0	0.7	1.4	0.9	0.5	1.0	4.7
8-Oct	0.5	0.4	0.2	0.1	0.2	Z	0.2	0.3	0.8	1.2	2.1	5.0	5.3	4.7	7.4	10.9	5.9	1.2	0.8	1.7	0.6	0.2	0.2	0.2	2.2	10.9
9-Oct	Z	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.3	0.6	0.3	0.5	0.4	0.5	0.5	0.5	0.6	0.4	0.2	0.3	0.2	0.2	0.1	0.3	0.6
10-Oct	0.1	Z	0.0	0.5	1.0	0.1	0.1	0.2	0.5	0.7	0.2	0.2	0.3	0.3	0.2	0.2	0.3	0.4	0.2	0.3	0.1	0.1	0.0	0.0	0.3	1.0
11-Oct	0.1	0.0	Z	0.4	0.1	0.2	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.1	0.0	0.0	0.0	0.1	0.4
12-Oct	0.0	0.0	0.0	Z	0.1	0.0	0.0	0.0	0.0	3.4	6.1	5.8	10.3	15.2	9.5	9.5	13.8	7.5	2.1	0.7	0.2	0.1	0.1	0.1	3.7	15.2
13-Oct	0.1	0.1	0.1	0.1	Z	0.2	0.4	0.8	2.3	5.1	1.2	3.2	3.4	2.7	2.1	0.6	0.2	0.1	0.1	0.2	0.0	0.0	0.0	0.0	1.0	5.1
14-Oct	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.1	0.1	0.2	0.7	0.4	0.2	0.2	0.2	0.1	0.2	0.4	0.2	0.9	0.2	0.2	0.2	0.9
15-Oct	Z	0.2	0.2	0.2	0.3	0.2	0.1	0.1	0.2	1.0	9.0	13.8	2.8	12.9	18.9	14.9	11.8	4.2	2.1	1.1	0.9	0.7	0.6	0.4	4.2	18.9
16-Oct	0.5	Z	0.3	0.3	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.3	0.2	0.3	0.3	0.3	0.2	0.1	0.3	1.2	1.3	1.4	1.3	1.0	0.5	1.4
17-Oct	0.5	0.6	Z	0.2	0.2	0.2	0.2	0.2	0.2	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	0.1	0.6
18-Oct	0.1	0.0	0.1	Z	0.6	1.2	1.1	0.8	0.7	1.1	0.6	1.3	3.9	6.7	8.6	5.5	4.5	2.9	2.6	2.4	1.3	0.7	0.5	0.3	2.0	8.6
19-Oct	0.3	0.2	0.2	0.2	Z	0.2	0.1	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	0.2	0.3
20-Oct	0.1	0.1	0.1	0.3	0.1	Z	0.2	0.2	0.2	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.3	0.3	0.3	0.1	0.2	0.2	0.2	0.4
21-Oct	Z	0.1	0.2	0.2	0.2	0.6	0.5	0.6	0.8	1.6	1.8	2.2	0.5	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.4	2.2
22-Oct	0.0	Z	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.3	0.1	0.0	0.5	0.6	0.6	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6
23-Oct	0.0	0.0	Z	0.0	0.1	0.2	0.1	0.1	0.2	0.2	0.2	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	0.1	0.2
24-Oct	0.1	0.3	0.4	Z	0.0	0.0	0.0	0.0	0.0	0.3	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	0.4
25-Oct	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
26-Oct	0.0	0.1	0.1	0.0	0.1	Z	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	0.1
27-Oct	Z	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	DF	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.2
28-Oct	0.0	Z	0.0	0.1	0.2	0.1	0.0	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
29-Oct	0.2	0.2	Z	0.1	0.2	0.2	0.1	0.1	0.2	0.1	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	0.0	0.1	0.2
30-Oct	0.1	0.1	0.0	Z	0.0	0.1	0.4	0.0	0.1	0.0	1.4	2.4	1.2	0.5	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	2.4
31-Oct	0.1	0.1	0.2	0.1	Z	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.3

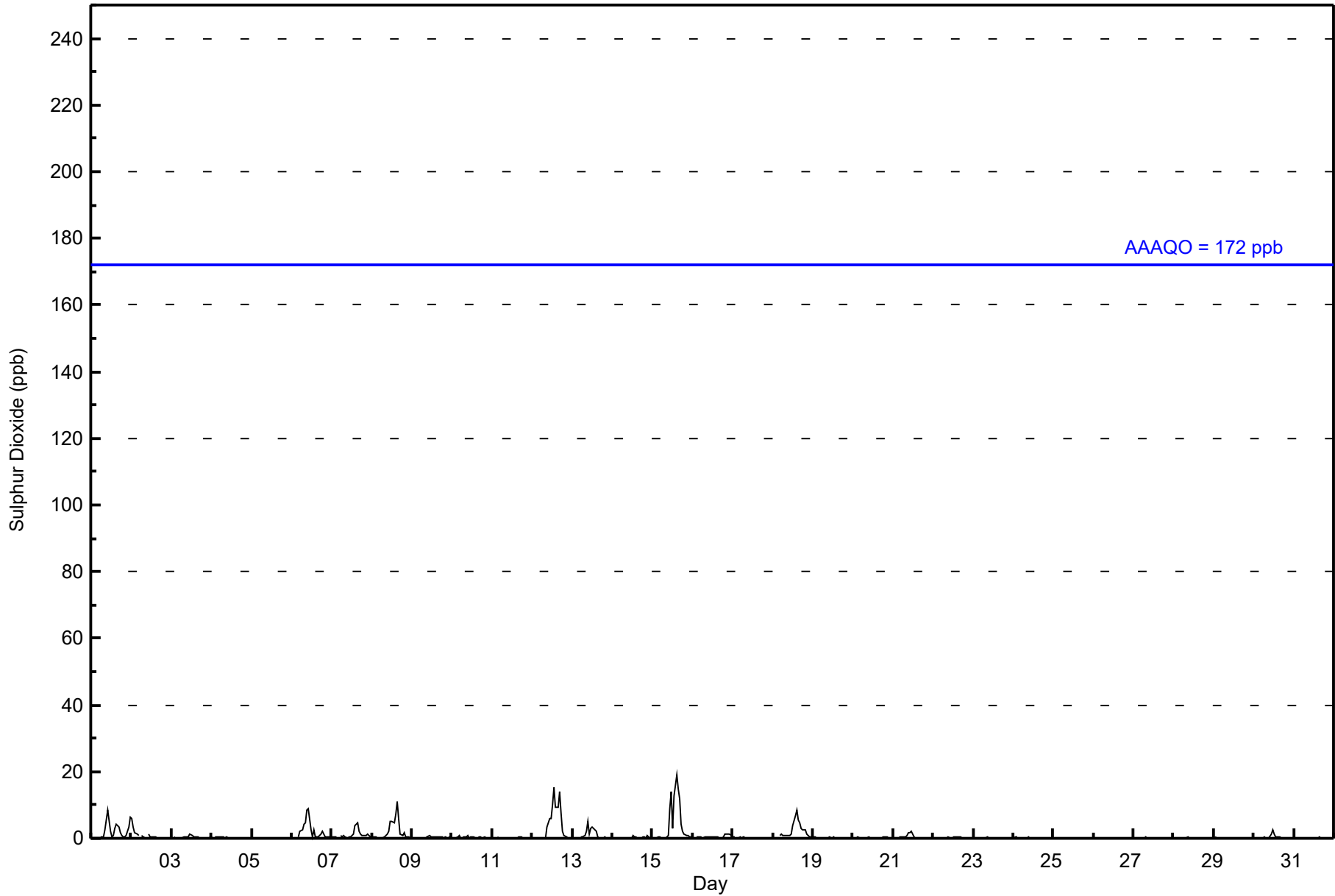
0.4	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.5	1.1	1.5	1.4	1.1	1.6	1.8	1.8	1.4	0.7	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	Diurnal Average
6.0	3.2	1.7	1.4	1.0	2.2	2.6	4.3	4.6	8.4	9.0	13.8	10.3	15.2	18.9	14.9	13.8	7.5	2.6	2.4	1.3	1.4	3.4	6.3	0.3	6.3	Diurnal Maximum

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
Fort Hills - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	699	98.87	98.87
11 - 20	8	1.13	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

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

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	42	27	7	3	3	19	43	133	105	69	54	38	21	45	53	36	698
11 - 20	0	0	0	0	0	0	1	0	7	0	0	0	0	0	0	0	8
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	42	27	7	3	3	19	44	133	112	69	54	38	21	45	53	36	706

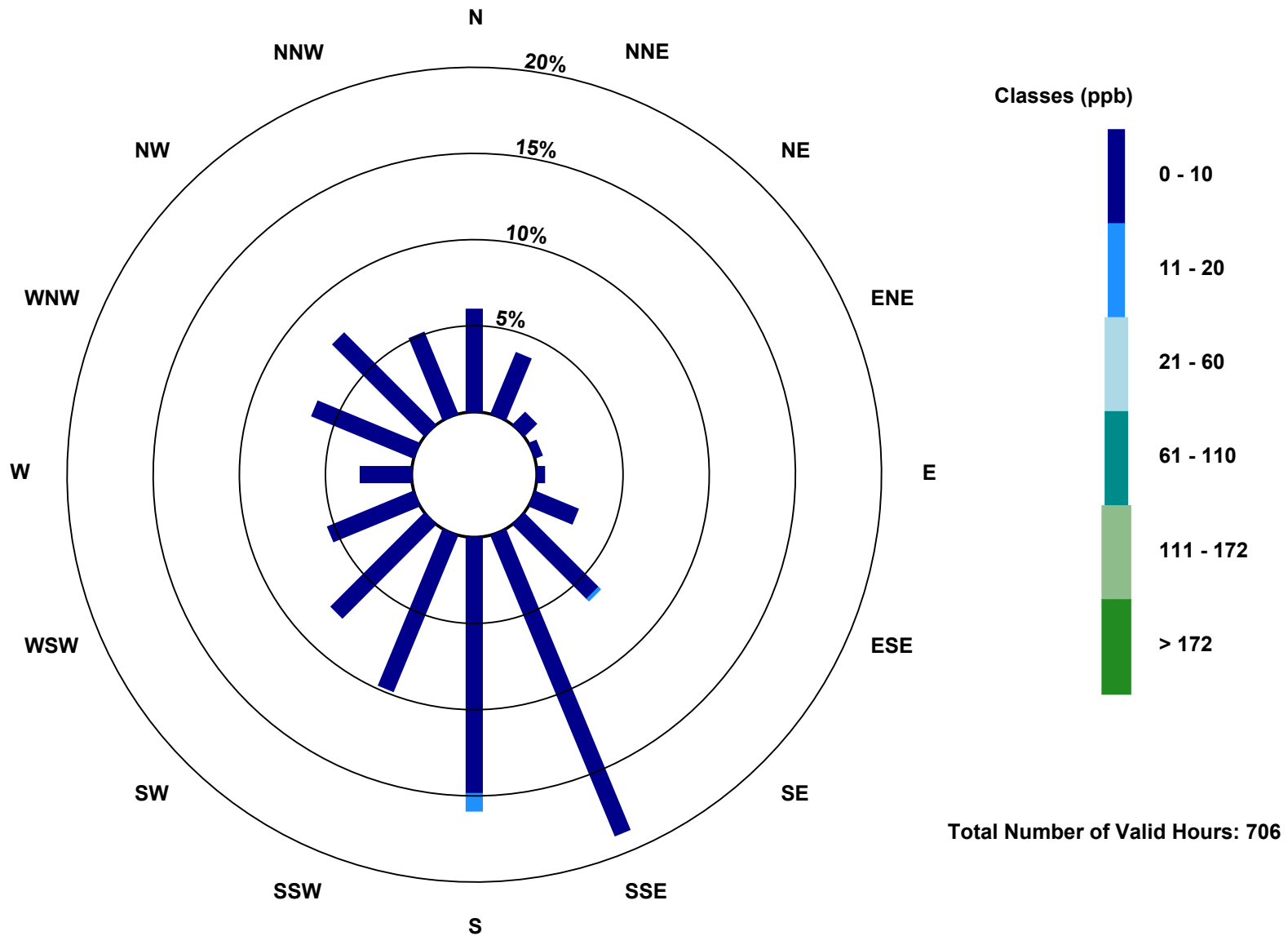
Total Number of Valid Hours: 706

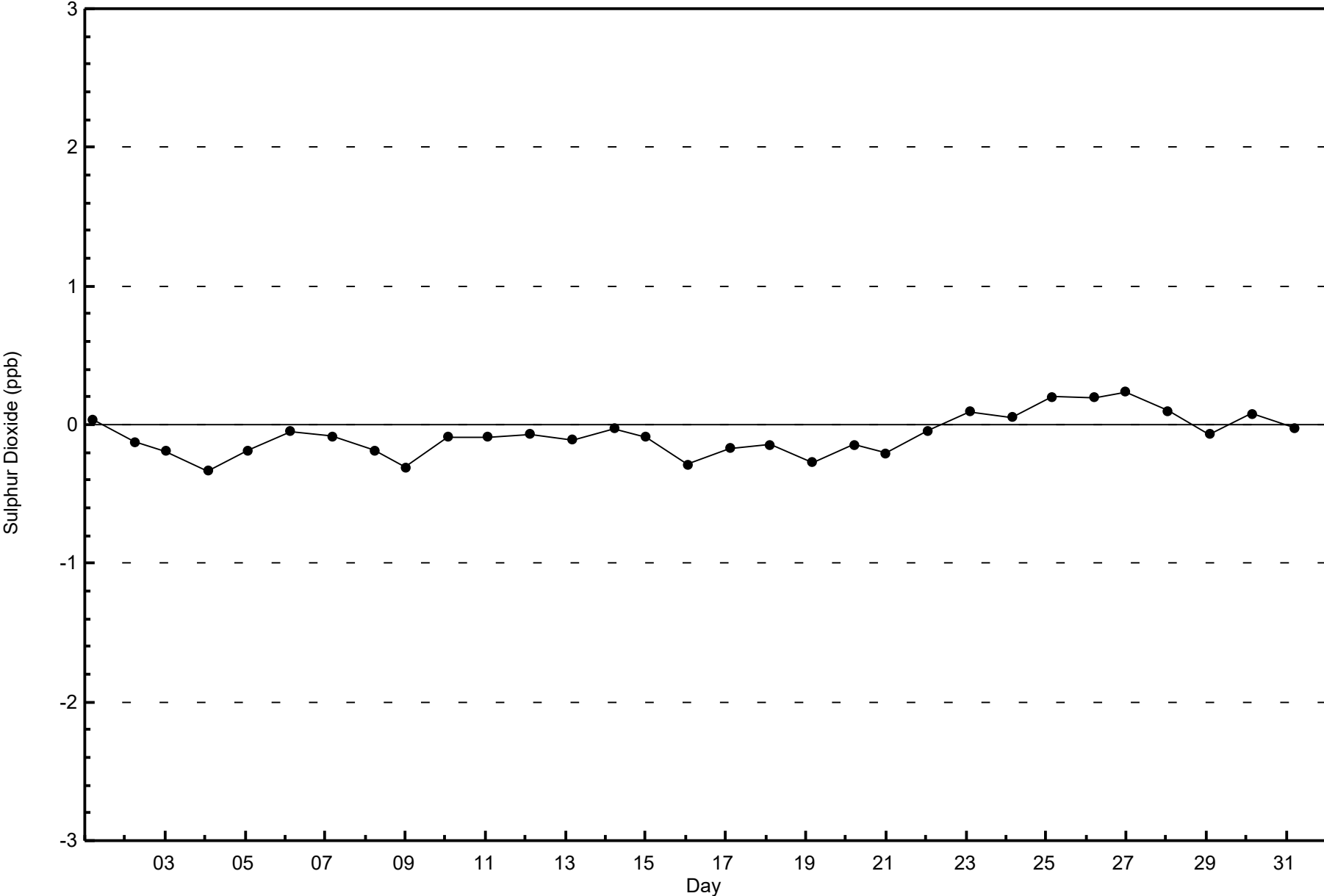
Total Number of Hours: 744

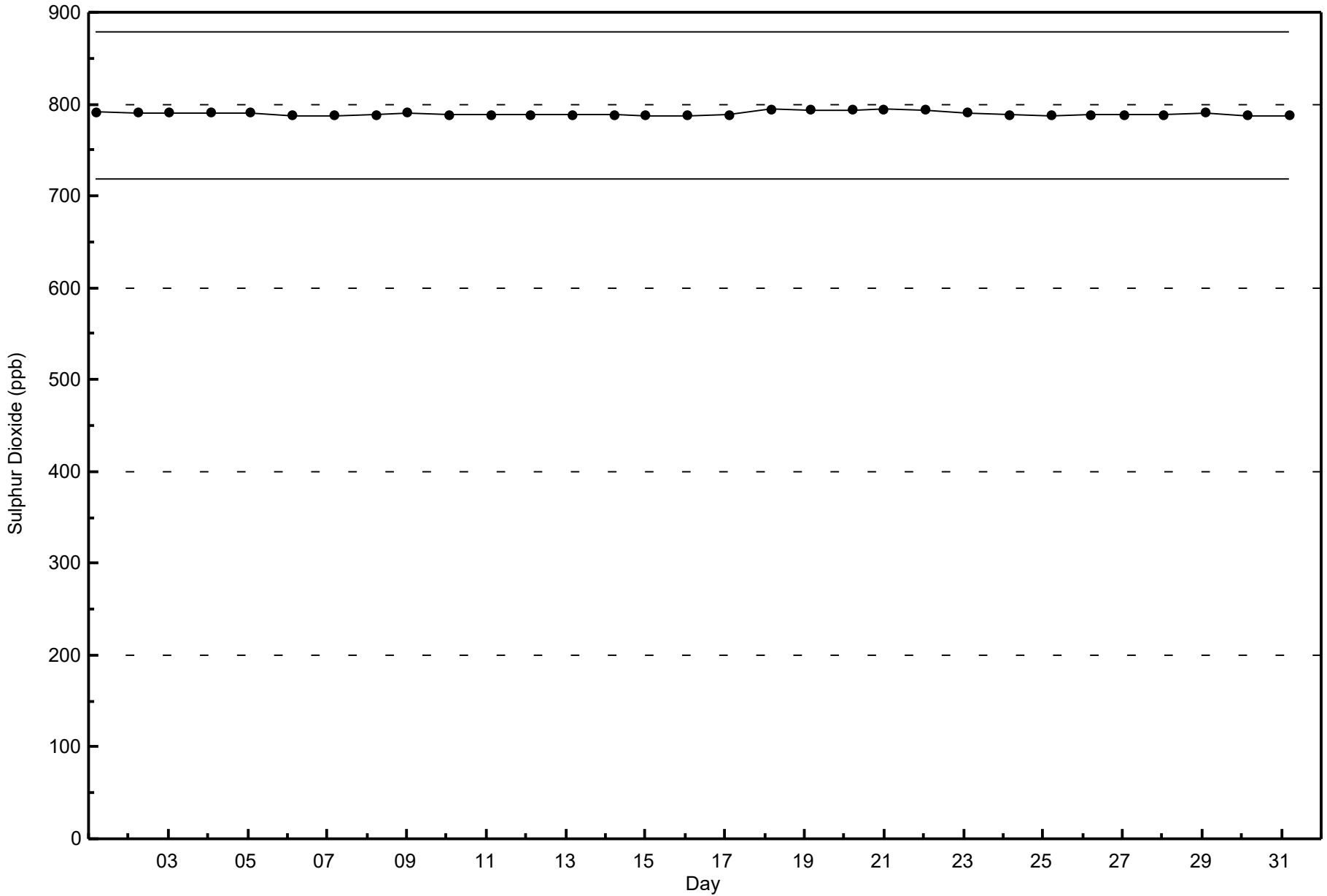


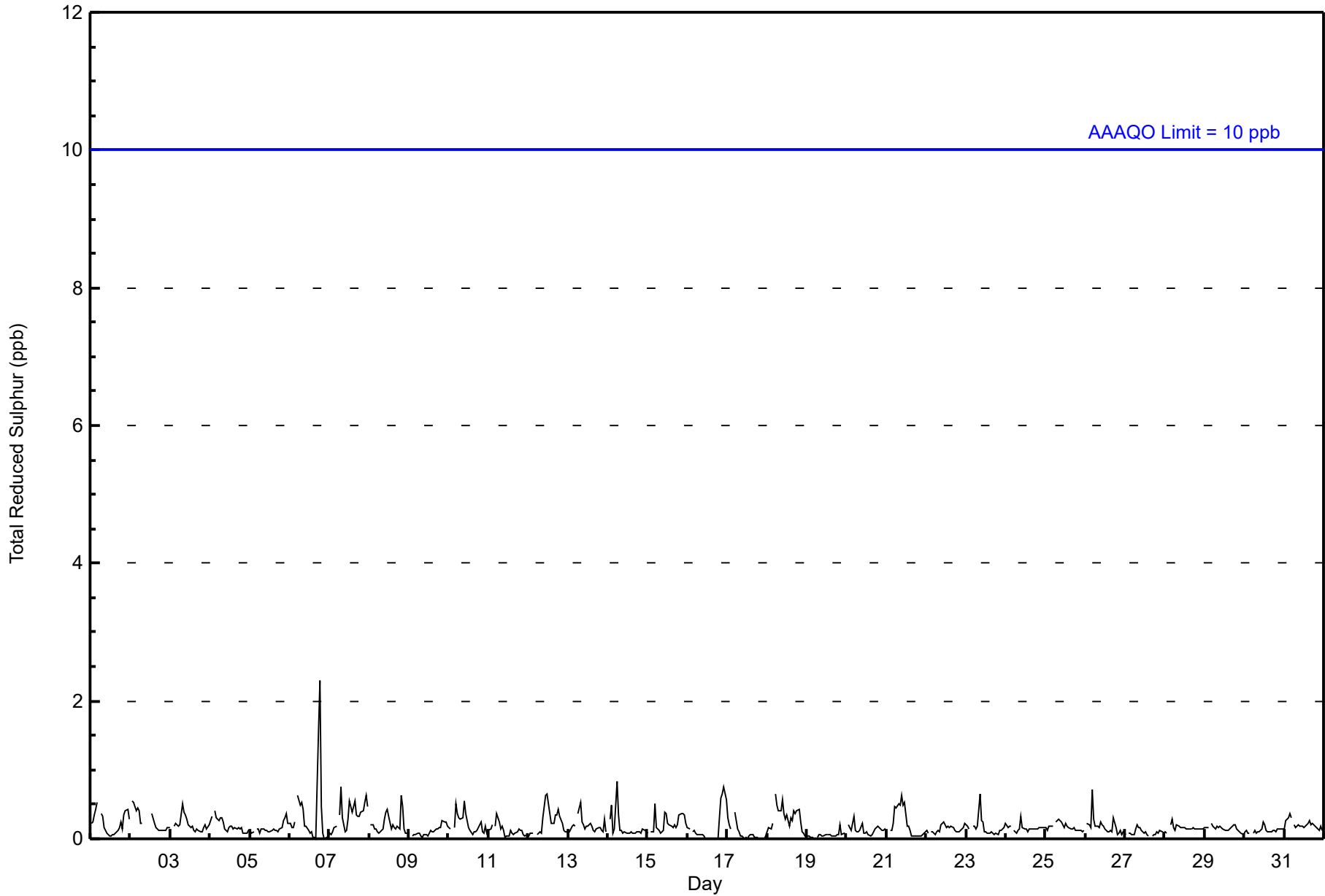
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Sulphur Dioxide (SO₂) - ppb
Fort Hills











**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Fort Hills - October 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
Fort Hills - October 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	31	7	3	3	19	45	134	108	66	54	39	20	48	54	34	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	42	31	7	3	3	19	45	134	108	66	54	39	20	48	54	34	707

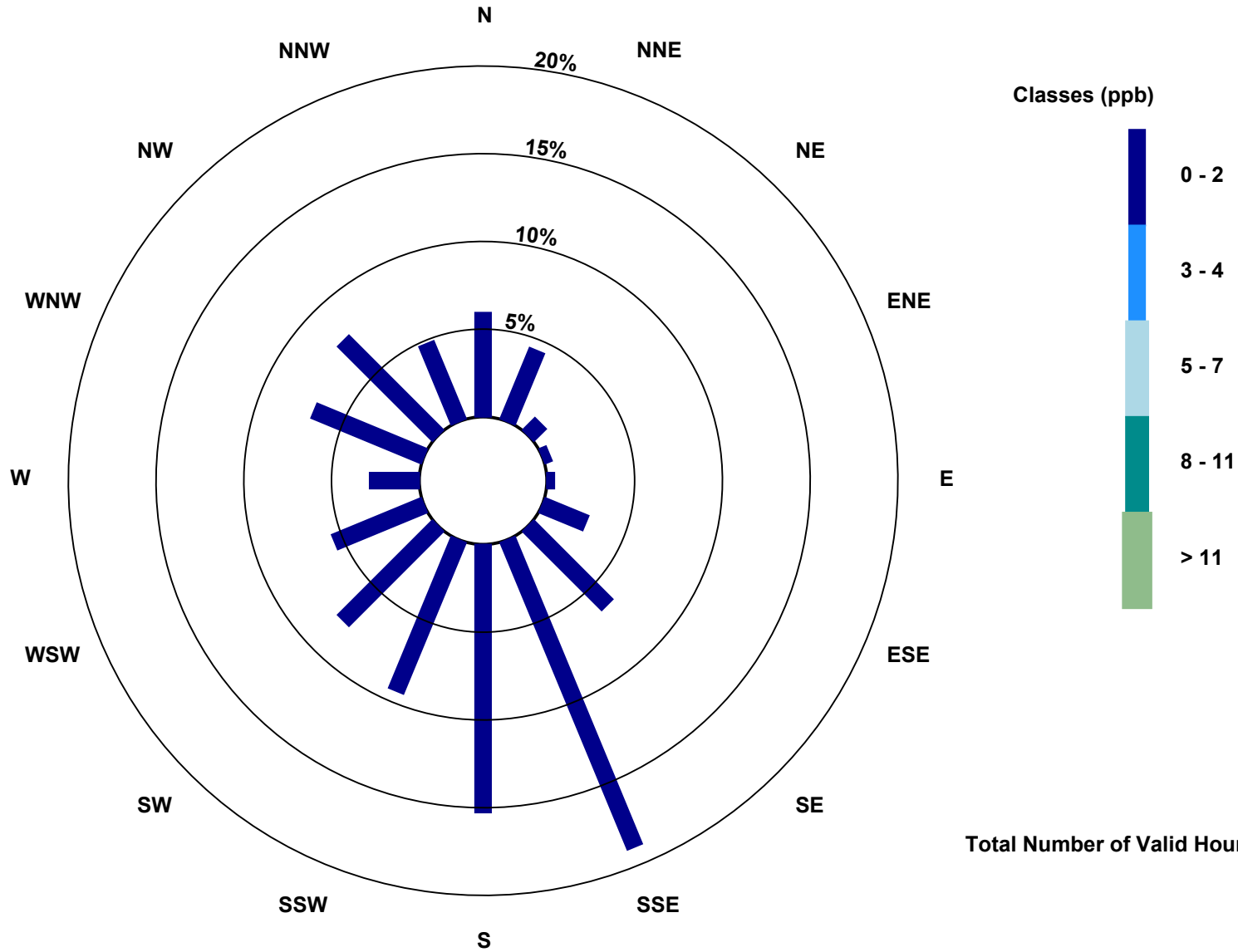
Total Number of Valid Hours: 707

Total Number of Hours: 744

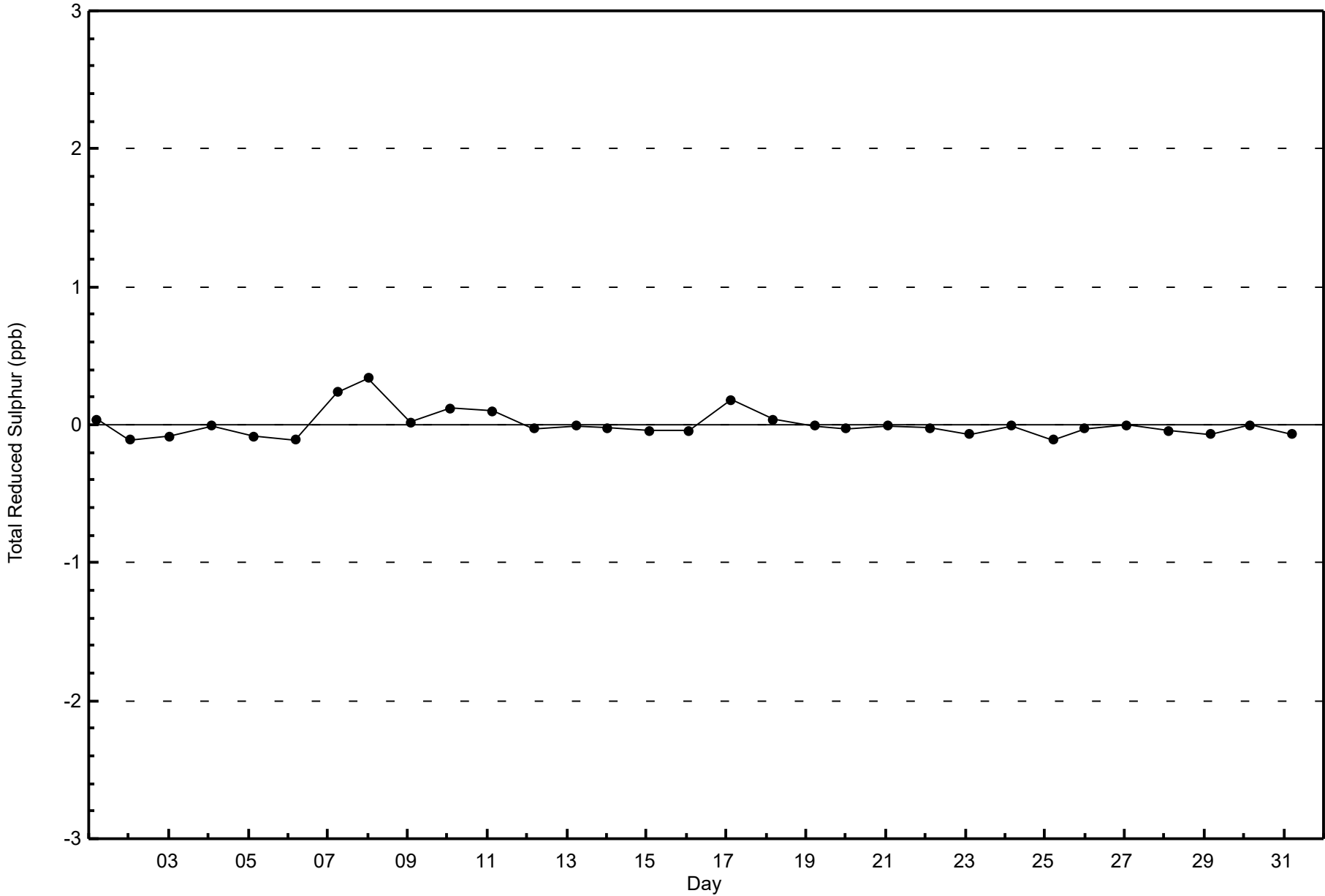


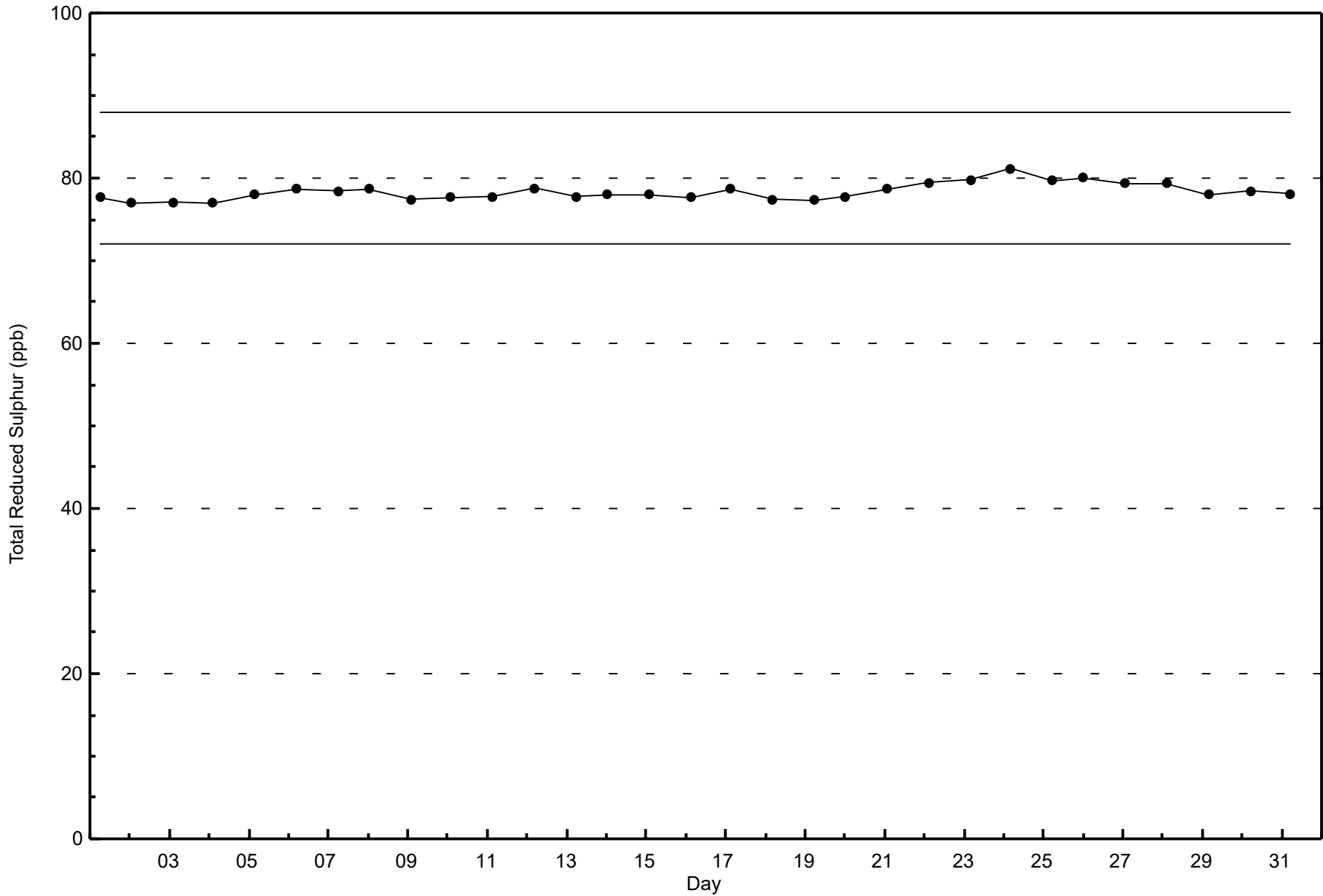
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Total Reduced Sulphur (TRS) - ppb
Fort Hills



Total Number of Valid Hours: 707







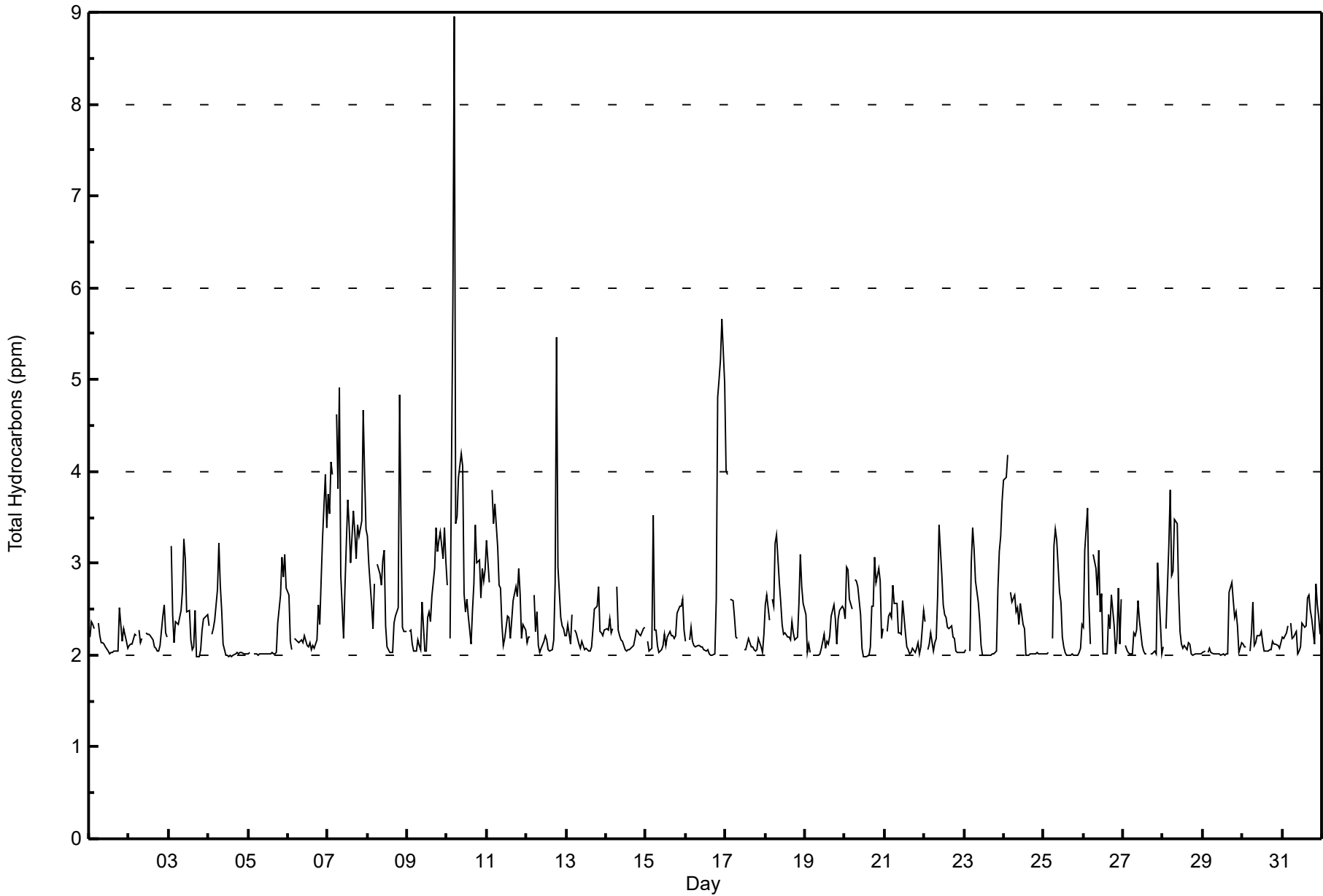
Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Fort Hills - October 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 744														744																													
Maximum Value: 9.0 ppm on Oct 10 05:00		Maximum Daily Average: 3.6 ppm on Oct 7		Hours of Data: 708														708																															
Minimum Value: 2.0 ppm on Oct 4 15:00		Minimum Daily Average: 2.1 ppm on Oct 30		Hours of Missing Data: 36														36																															
Maximum Diurnal Average: 2.8 ppm at hour 5		Minimum Diurnal Average: 2.1 ppm at hour 15		Hours of Calibration: 34														34																															
Monthly Average: 2.43 ppm		Percentiles: P ₁ = 2.0 P ₁₀ = 2.0 Q ₁ = 2.1 Median = 2.2 Q ₃ = 2.6 P ₉₀ = 3.1 P ₉₉ = 4.9		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-Oct	2.2	2.4	2.3	2.3	Z	2.4	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.5	2.3	2.2	2.3	2.1	2.1	2.2	2.2	2.5																						
2-Oct	2.1	2.1	2.1	2.2	2.2	Z	2.3	2.1	2.2	M	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.0	2.0	2.1	2.4	2.5	2.2	2.2	2.2	2.2	2.2	2.5																					
3-Oct	Z	3.2	2.4	2.1	2.4	2.4	2.3	2.5	2.7	3.3	3.1	2.5	2.5	2.2	2.1	2.1	2.5	2.0	2.0	2.1	2.3	2.4	2.4	2.4	2.4	2.4	2.4	3.3																					
4-Oct	2.3	Z	2.2	2.3	2.4	2.7	3.2	2.8	2.5	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	3.2																					
5-Oct	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	2.4	2.6	3.1	2.9	3.1	2.7	2.2	2.2	3.1	3.1																					
6-Oct	2.7	2.1	2.1	Z	2.2	2.2	2.1	2.1	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.5	2.3	2.8	3.3	4.0	3.4	2.4	2.4	4.0	4.0																					
7-Oct	3.8	3.5	4.1	4.0	Z	4.6	3.8	4.9	2.9	2.2	2.8	3.2	3.7	3.4	3.0	3.6	3.3	3.1	3.4	3.3	3.5	4.7	4.0	3.4	3.6	3.6	4.9	4.9																					
8-Oct	3.3	3.0	2.5	2.3	2.8	Z	3.0	2.9	2.8	3.0	3.1	2.3	2.1	2.0	2.0	2.0	2.4	2.4	2.5	4.8	3.4	2.3	2.3	2.3	2.7	2.7	4.8	4.8																					
9-Oct	Z	2.3	2.3	2.1	2.0	2.1	2.2	2.1	2.1	2.6	2.0	2.0	2.4	2.5	2.4	2.6	2.9	3.4	3.1	3.3	3.3	3.0	3.4	3.0	2.6	2.6	3.4	3.4																					
10-Oct	2.8	Z	2.2	5.8	9.0	3.4	3.5	3.9	4.2	4.1	2.7	2.5	2.6	2.4	2.1	2.5	2.8	3.4	3.0	3.0	2.6	3.0	2.8	2.9	3.4	3.4	9.0	9.0																					
11-Oct	3.3	2.8	Z	3.8	3.4	3.7	3.2	2.8	2.7	2.3	2.1	2.2	2.4	2.4	2.2	2.4	2.6	2.7	2.6	2.9	2.7	2.2	2.3	2.3	2.7	2.7	3.8	3.8																					
12-Oct	2.1	2.2	2.2	Z	2.7	2.3	2.5	2.1	2.0	2.1	2.2	2.2	2.2	2.1	2.0	2.1	2.2	2.8	5.5	3.0	2.4	2.3	2.3	2.2	2.4	2.4	5.5	5.5																					
13-Oct	2.2	2.3	2.1	2.4	Z	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.3	2.5	2.5	2.7	2.3	2.2	2.2	2.3	2.2	2.2	2.7	2.7																					
14-Oct	2.3	2.3	2.4	2.2	2.3	Z	2.7	2.3	2.2	2.2	2.2	2.1	2.0	2.1	2.1	2.1	2.1	2.2	2.3	2.3	2.2	2.2	2.3	2.3	2.2	2.2	2.3	2.3																					
15-Oct	Z	2.1	2.0	2.1	3.5	2.3	2.3	2.1	2.0	2.1	2.1	2.2	2.1	2.2	2.1	2.2	2.2	2.2	2.2	2.5	2.5	2.5	2.6	2.3	2.3	2.3	3.5	3.5																					
16-Oct	2.1	Z	2.2	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.6	4.8	5.0	5.2	5.7	5.0	2.8	2.8	5.7	5.7																					
17-Oct	4.0	4.0	Z	2.6	2.6	2.4	2.2	2.2	C	C	C	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.0	2.1	2.2	2.1	2.0	2.2	2.4	2.4	4.0	4.0																					
18-Oct	2.5	2.6	2.4	Z	2.6	2.5	3.2	3.3	2.8	2.6	2.3	2.2	2.2	2.2	2.2	2.2	2.4	2.2	2.2	2.2	2.6	3.1	2.7	2.6	2.5	2.5	3.3	3.3																					
19-Oct	2.4	2.0	2.1	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.1	2.1	2.1	2.2	2.4	2.6	2.4	2.1	2.4	2.5	2.5	2.5	2.2	2.2	2.6	2.6																					
20-Oct	2.4	3.0	2.9	2.6	2.5	Z	2.8	2.8	2.7	2.4	2.1	2.0	2.0	2.0	2.0	2.1	2.5	2.5	3.1	2.8	2.9	2.8	2.2	2.3	2.5	2.5	3.1	3.1																					
21-Oct	Z	2.3	2.4	2.4	2.4	2.8	2.6	2.6	2.2	2.2	2.2	2.6	2.2	2.1	2.1	2.0	2.0	2.1	2.0	2.1	2.1	2.0	2.1	2.5	2.3	2.3	2.8	2.8																					
22-Oct	2.4	Z	2.1	2.1	2.2	2.1	2.1	2.2	2.6	3.4	2.9	2.5	2.4	2.4	2.3	2.3	2.3	2.2	2.2	2.0	2.0	2.0	2.0	2.0	2.3	2.3	3.4	3.4																					
23-Oct	2.0	2.1	Z	2.0	3.0	3.4	3.2	2.8	2.6	2.4	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.7	3.1	3.3	3.7	2.5	2.5	3.7	3.7																					
24-Oct	3.9	3.9	4.2	Z	2.7	2.6	2.6	2.5	2.5	2.3	2.6	2.3	2.3	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.5	2.5	4.2	4.2																					
25-Oct	2.0	2.0	2.0	2.0	Z	2.2	3.2	3.4	3.2	2.7	2.6	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.3	2.3	2.3	3.4	3.4																					
26-Oct	2.3	3.1	3.6	2.5	2.1	Z	3.1	2.9	2.7	3.1	2.5	2.7	2.0	2.0	2.0	2.4	2.3	2.7	2.3	2.0	2.2	2.7	2.1	2.6	2.5	2.5	3.6	3.6																					
27-Oct	Z	2.1	2.1	2.0	2.0	2.0	2.2	2.2	2.3	2.6	2.4	2.1	2.0	2.0	2.0	DF	2.0	2.0	2.0	2.0	2.0	3.0	2.3	2.0	2.2	2.2	3.0	3.0																					
28-Oct	2.1	Z	2.3	3.2	3.8	2.9	2.9	3.5	3.4	2.7	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.4	2.4	2.4	3.8	3.8																					
29-Oct	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	2.7	2.8	2.6	2.4	2.5	2.3	2.0	2.1	2.2	2.2	2.8	2.8																					
30-Oct	2.1	2.1	2.1	Z	2.0	2.2	2.6	2.1	2.1	2.2	2.2	2.3	2.1	2.0	2.0	2.0	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.6	2.6																					
31-Oct	2.2	2.2	2.2	2.3	Z	2.3	2.2	2.2	2.3	2.0	2.0	2.1	2.3	2.3	2.3	2.6	2.7	2.5	2.4	2.1	2.8	2.5	2.4	2.2	2.3	2.3	2.8	2.8																					
																								2.5	2.5	2.4	2.5	2.8	2.5	2.6	2.6	2.5	2.5	2.3	2.2	2.2	2.2	2.1	2.2	2.3	2.3	2.5	2.5	2.6	2.6	2.6	2.5	Diurnal Average	
																								4.0	4.0	4.2	5.8	9.0	4.6	3.8	4.9	4.2	4.1	3.1	3.2	3.7	3.4	3.0	3.6	3.3	3.4	5.5	4.8	5.0	5.2	5.7	5.0	Diurnal Maximum	
Z - zerospan		C - Calibration				M - Maintenance				DF - DAS Failure																																							





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	161	22.74	22.74
2.1 - 3.0	464	65.54	88.28
3.1 - 10.0	83	11.72	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 Hills - October 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	1	0	0	0	0	0	6	23	9	2	1	13	36	43	17	161
2.1 - 3.0	29	26	5	2	3	12	31	120	83	51	33	28	6	9	9	16	463
3.1 - 10.0	3	1	2	1	0	7	13	7	6	9	19	9	2	0	1	3	83
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	42	28	7	3	3	19	44	133	112	69	54	38	21	45	53	36	707

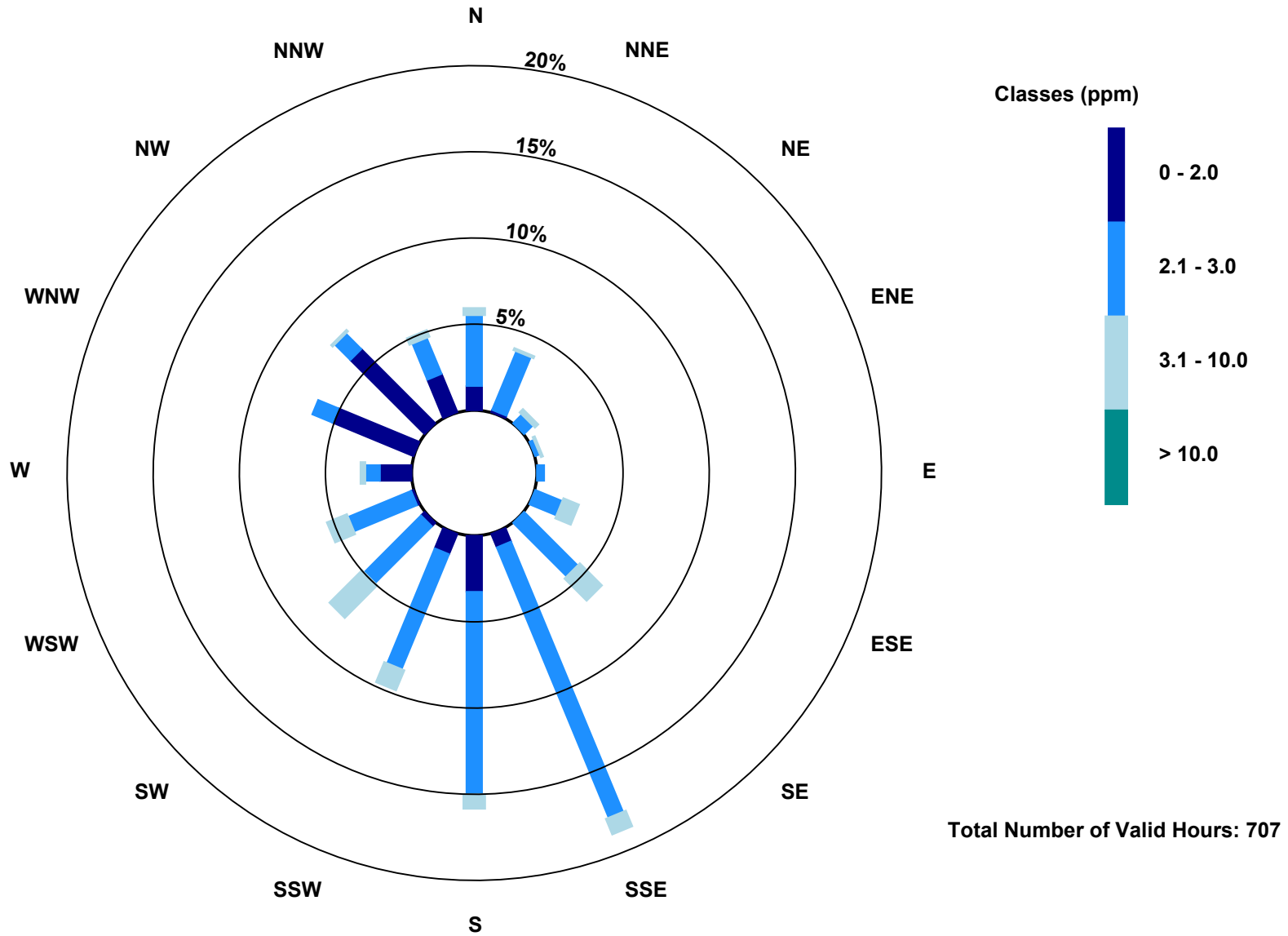
Total Number of Valid Hours: 707

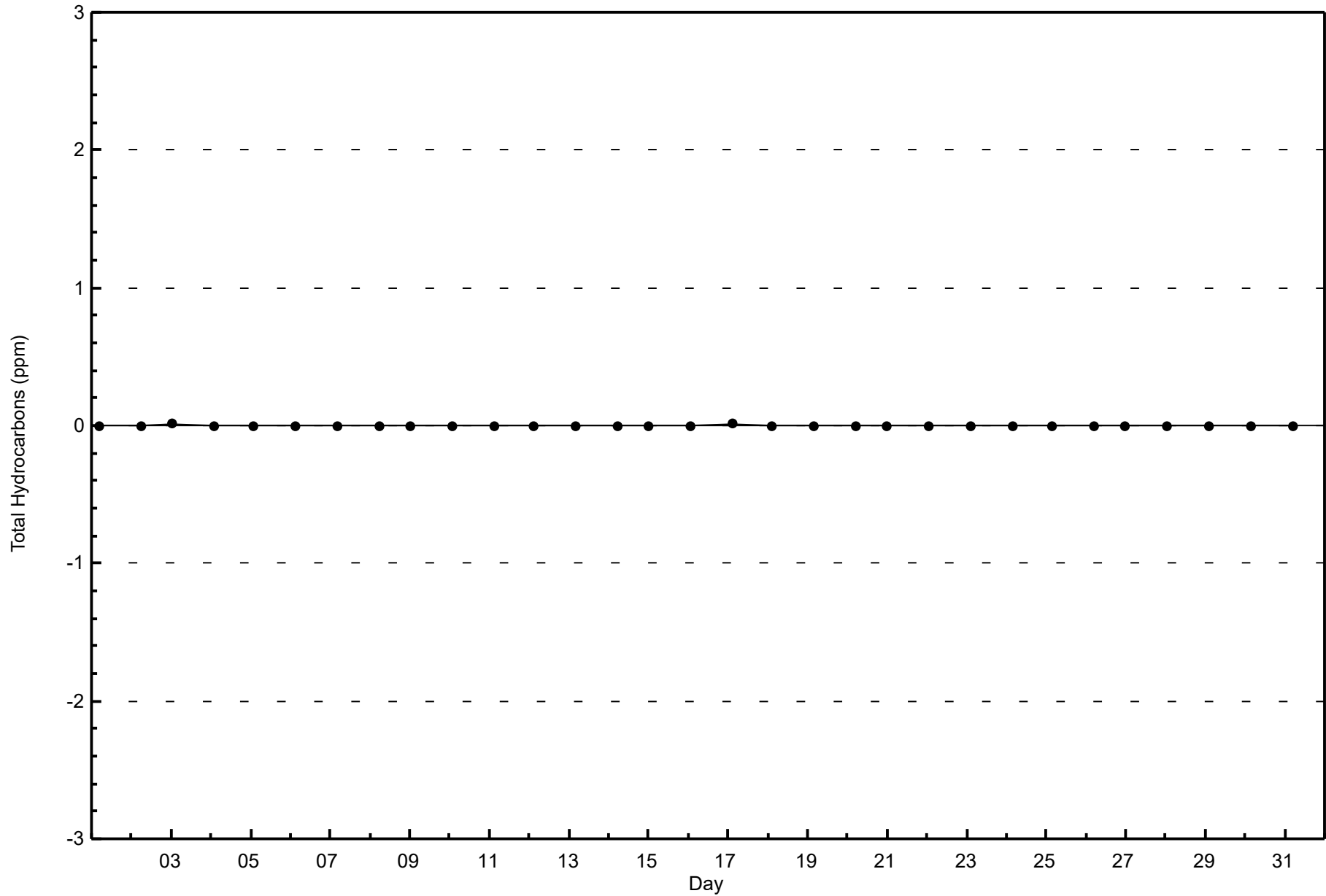
Total Number of Hours: 744

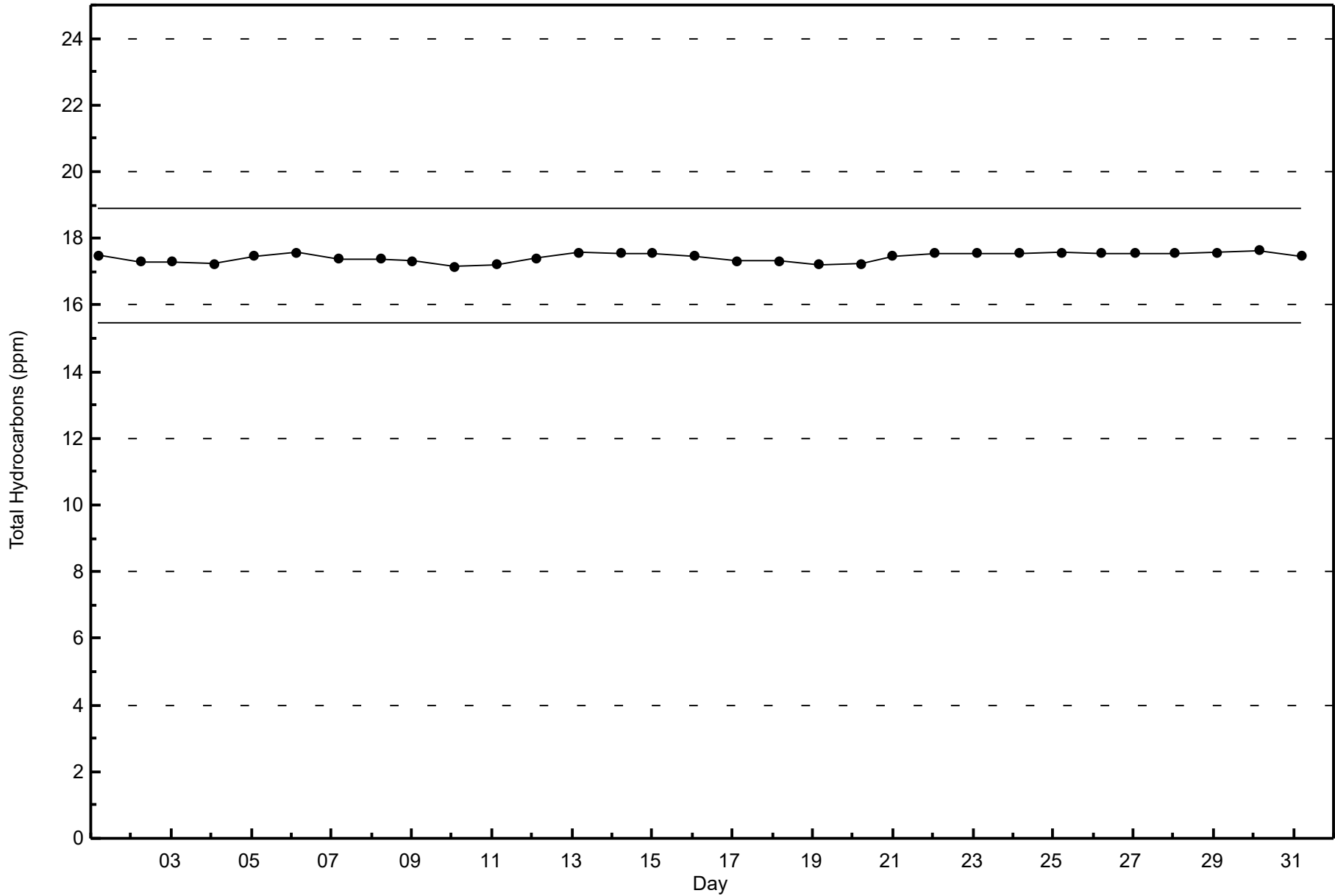


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Total Hydrocarbons (THC) - ppm
Fort Hills





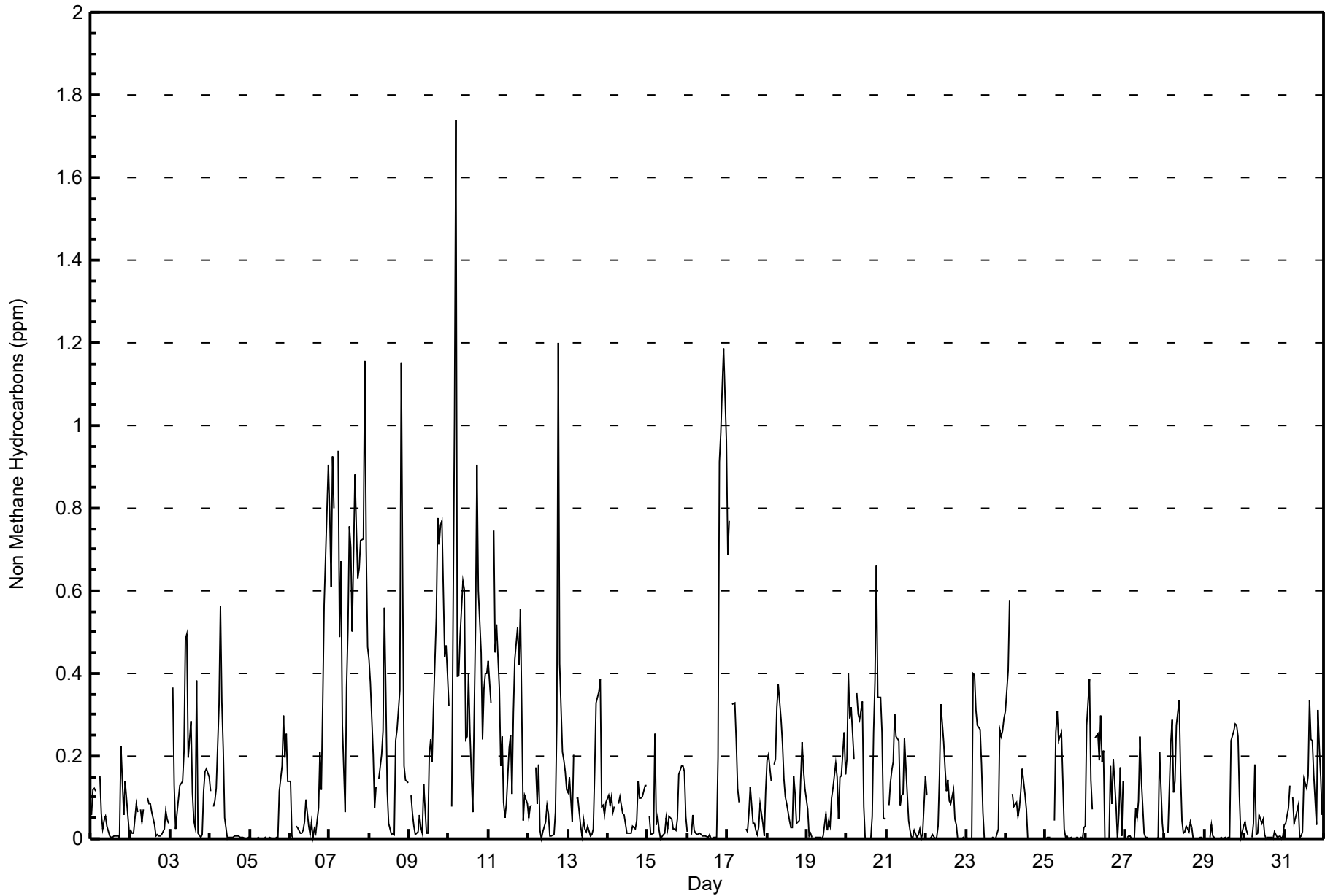




Summary of Hour Averages

Fort Hills - October 2023

Maximum Value: 1.739 ppm on Oct 10 05:00																				Maximum Daily Average: 0.656 ppm on Oct 7					Hours in Service: 744	
Minimum Value: 0.000 ppm on Oct 4 23:00																				Minimum Daily Average: 0.023 ppm on Oct 30					Hours of Data: 708	
Maximum Diurnal Average: 0.222 ppm at hour 20																				Minimum Diurnal Average: 0.049 ppm at hour 15					Hours of Missing Data: 36	
Monthly Average: 0.152 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: 34	
																									Percent Operational Time: 99.7	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Oct	0.059	0.118	0.123	0.115	Z	0.153	0.062	0.025	0.045	0.054	0.031	0.005	0.002	0.003	0.007	0.006	0.006	0.003	0.225	0.143	0.059	0.139	0.055	0.013	0.063	0.225
2-Oct	0.020	0.015	0.012	0.084	0.063	Z	0.070	0.040	0.070	M	0.098	0.086	0.083	0.063	0.035	0.008	0.011	0.006	0.006	0.009	0.024	0.068	0.047	0.037	0.043	0.098
3-Oct	Z	0.365	0.130	0.023	0.062	0.095	0.130	0.137	0.211	0.480	0.497	0.198	0.284	0.111	0.045	0.028	0.383	0.012	0.002	0.010	0.115	0.163	0.170	0.148	0.165	0.497
4-Oct	0.115	Z	0.080	0.093	0.124	0.325	0.562	0.331	0.216	0.051	0.000	0.005	0.004	0.004	0.002	0.007	0.007	0.006	0.005	0.005	0.002	0.002	0.000	0.002	0.085	0.562
5-Oct	0.000	0.005	Z	0.001	0.002	0.002	0.000	0.000	0.000	0.002	0.001	0.000	0.002	0.001	0.001	0.002	0.002	0.003	0.116	0.176	0.300	0.197	0.253	0.137	0.052	0.300
6-Oct	0.138	0.007	0.002	Z	0.030	0.028	0.015	0.014	0.022	0.040	0.096	0.030	0.011	0.042	0.003	0.023	0.015	0.074	0.210	0.119	0.328	0.568	0.794	0.904	0.153	0.904
7-Oct	0.787	0.610	0.925	0.800	Z	0.939	0.488	0.671	0.276	0.066	0.366	0.507	0.756	0.705	0.503	0.881	0.750	0.631	0.656	0.723	0.725	1.156	0.701	0.465	0.656	1.156
8-Oct	0.433	0.377	0.205	0.075	0.126	Z	0.144	0.203	0.260	0.560	0.351	0.114	0.036	0.012	0.015	0.011	0.239	0.263	0.360	1.151	0.633	0.176	0.143	0.135	0.262	1.151
9-Oct	Z	0.106	0.061	0.032	0.010	0.016	0.057	0.027	0.014	0.132	0.014	0.014	0.200	0.242	0.185	0.318	0.535	0.775	0.711	0.758	0.770	0.440	0.466	0.397	0.273	0.775
10-Oct	0.322	Z	0.077	1.018	1.739	0.393	0.395	0.492	0.623	0.604	0.242	0.249	0.401	0.256	0.065	0.290	0.515	0.906	0.599	0.452	0.241	0.364	0.400	0.399	0.480	1.739
11-Oct	0.432	0.328	Z	0.747	0.452	0.518	0.364	0.176	0.246	0.089	0.050	0.084	0.222	0.251	0.110	0.305	0.435	0.511	0.420	0.556	0.303	0.044	0.103	0.085	0.297	0.747
12-Oct	0.050	0.079	0.081	Z	0.174	0.085	0.179	0.019	0.001	0.017	0.040	0.083	0.061	0.007	0.007	0.011	0.063	0.286	1.200	0.422	0.211	0.190	0.161	0.118	0.154	1.200
13-Oct	0.113	0.151	0.042	0.202	Z	0.099	0.100	0.029	0.007	0.048	0.024	0.018	0.030	0.008	0.010	0.025	0.164	0.330	0.357	0.387	0.080	0.082	0.057	0.088	0.106	0.387
14-Oct	0.105	0.083	0.102	0.064	0.079	Z	0.085	0.101	0.081	0.061	0.058	0.015	0.013	0.014	0.013	0.031	0.025	0.044	0.139	0.099	0.099	0.100	0.130	0.130	0.073	0.139
15-Oct	Z	0.054	0.009	0.015	0.255	0.033	0.053	0.020	0.002	0.011	0.014	0.051	0.024	0.056	0.049	0.024	0.025	0.019	0.047	0.155	0.175	0.175	0.164	0.056	0.064	0.255
16-Oct	0.016	Z	0.011	0.057	0.020	0.014	0.011	0.013	0.010	0.007	0.008	0.006	0.003	0.012	0.001	0.001	0.002	0.003	0.197	0.912	0.983	1.091	1.186	0.964	0.240	1.186
17-Oct	0.689	0.770	Z	0.326	0.327	0.238	0.121	0.090	C	C	C	0.022	0.018	0.060	0.124	0.036	0.036	0.022	0.009	0.026	0.086	0.036	0.008	0.114	0.158	0.770
18-Oct	0.191	0.204	0.138	Z	0.181	0.195	0.320	0.373	0.288	0.231	0.146	0.101	0.083	0.045	0.028	0.027	0.154	0.108	0.037	0.043	0.146	0.235	0.165	0.123	0.155	0.373
19-Oct	0.071	0.008	0.013	0.002	Z	0.002	0.004	0.004	0.002	0.002	0.007	0.060	0.022	0.043	0.029	0.099	0.121	0.183	0.148	0.049	0.148	0.152	0.258	0.155	0.069	0.258
20-Oct	0.192	0.400	0.293	0.318	0.193	Z	0.352	0.301	0.289	0.331	0.079	0.001	0.000	0.000	0.000	0.053	0.258	0.383	0.660	0.342	0.342	0.258	0.050	0.049	0.224	0.660
21-Oct	Z	0.080	0.135	0.167	0.187	0.302	0.246	0.236	0.081	0.105	0.108	0.243	0.108	0.043	0.020	0.004	0.005	0.019	0.003	0.011	0.024	0.000	0.013	0.151	0.100	0.302
22-Oct	0.105	Z	0.000	0.005	0.011	0.001	0.002	0.030	0.153	0.327	0.234	0.169	0.117	0.142	0.091	0.084	0.118	0.048	0.033	0.001	0.000	0.001	0.002	0.001	0.073	0.327
23-Oct	0.001	0.003	Z	0.001	0.400	0.397	0.311	0.274	0.263	0.181	0.064	0.000	0.001	0.000	0.000	0.000	0.003	0.000	0.001	0.022	0.264	0.248	0.259	0.293	0.130	0.400
24-Oct	0.310	0.407	0.576	Z	0.108	0.078	0.088	0.054	0.073	0.116	0.168	0.107	0.071	0.001	0.000	0.001	0.000	0.001	0.001	0.000	0.001	0.000	0.001	0.002	0.094	0.576
25-Oct	0.001	0.002	0.002	0.003	Z	0.045	0.258	0.309	0.236	0.257	0.142	0.024	0.004	0.007	0.000	0.002	0.001	0.001	0.001	0.002	0.001	0.002	0.001	0.026	0.058	0.309
26-Oct	0.029	0.276	0.387	0.142	0.071	Z	0.242	0.255	0.190	0.300	0.187	0.215	0.001	0.002	0.000	0.177	0.086	0.192	0.078	0.000	0.060	0.174	0.007	0.140	0.140	0.387
27-Oct	Z	0.004	0.005	0.005	0.000	0.000	0.075	0.052	0.092	0.248	0.145	0.013	0.005	0.003	0.000	DF	0.000	0.001	0.001	0.000	0.002	0.212	0.036	0.000	0.041	0.248
28-Oct	0.002	Z	0.015	0.230	0.288	0.112	0.138	0.275	0.335	0.161	0.044	0.015	0.016	0.032	0.016	0.039	0.027	0.000	0.001	0.002	0.001	0.002	0.004	0.000	0.076	0.335
29-Oct	0.002	0.001	Z	0.004	0.034	0.008	0.000	0.001	0.001	0.001	0.004	0.000	0.003	0.000	0.004	0.004	0.239	0.263	0.278	0.275	0.248	0.101	0.005	0.031	0.066	0.278
30-Oct	0.042	0.022	0.011	Z	0.002	0.037	0.180	0.010	0.013	0.058	0.036	0.048	0.010	0.001	0.002	0.003	0.002	0.000	0.018	0.011	0.003	0.006	0.002	0.007	0.023	0.180
31-Oct	0.033	0.037	0.074	0.128	Z	0.103	0.038	0.050	0.080	0.004	0.006	0.016	0.145	0.121	0.154	0.335	0.242	0.236	0.156	0.035	0.312	0.222	0.151	0.058	0.119	0.335
																				0.164 0.173 0.135 0.179 0.197 0.162 0.164 0.149 0.139 0.157 0.109 0.081 0.088 0.074 0.049 0.095 0.144 0.172 0.215 0.222 0.216 0.213 0.187 0.169					Diurnal Average	
																				0.787 0.770 0.925 1.018 1.739 0.939 0.562 0.671 0.623 0.604 0.497 0.507 0.756 0.705 0.503 0.881 0.750 0.906 1.200 1.151 0.983 1.156 1.186 0.964					Diurnal Maximum	
Z - zerospan		C - Calibration				M - Maintenance				DF - DAS Failure																





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	150	21.19	21.19
0.006 - 0.05	181	25.56	46.75
0.06 - 0.1	148	20.90	67.66
> 0.1	229	32.34	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



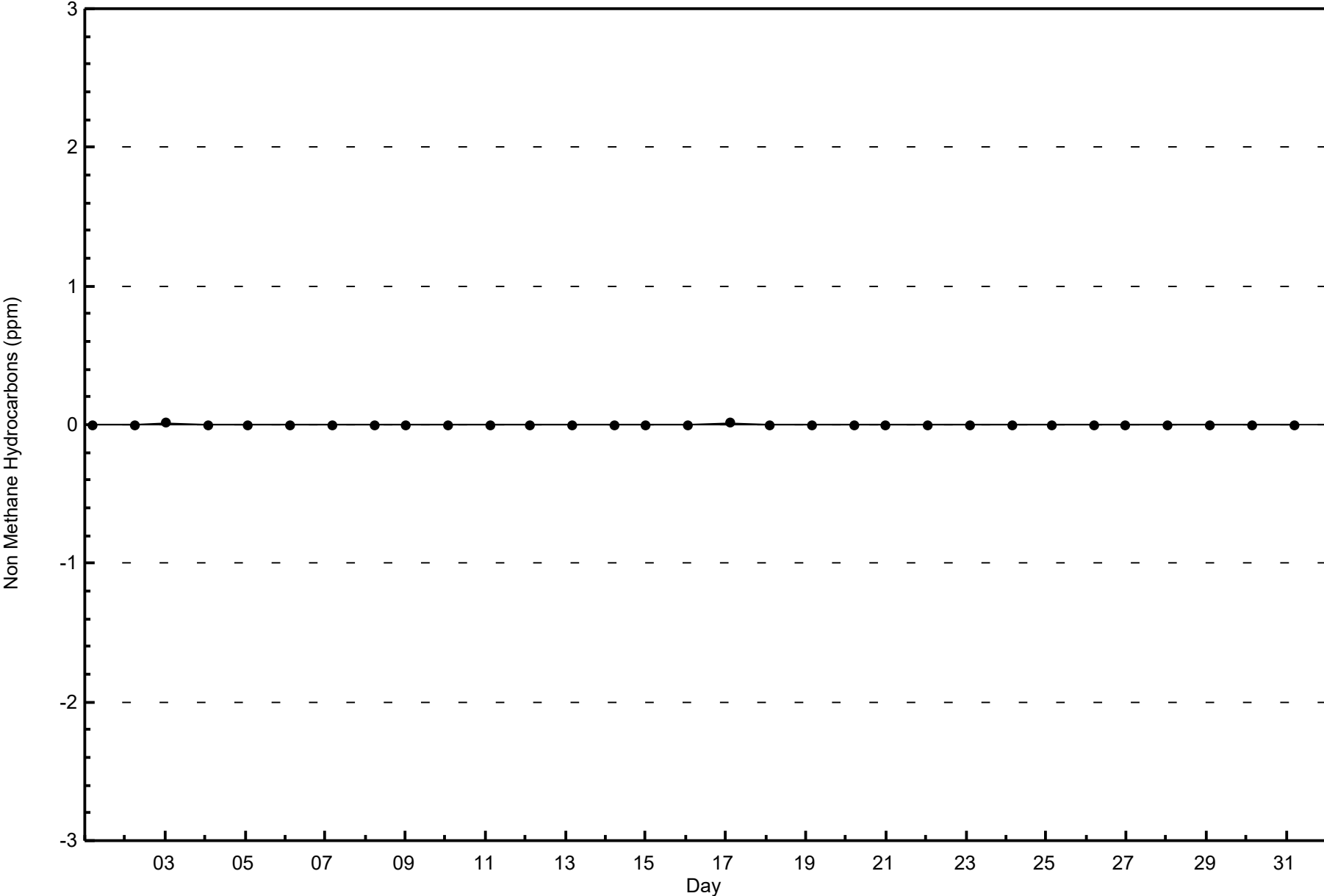
Wood Buffalo Environmental Association
Frequency Distribution

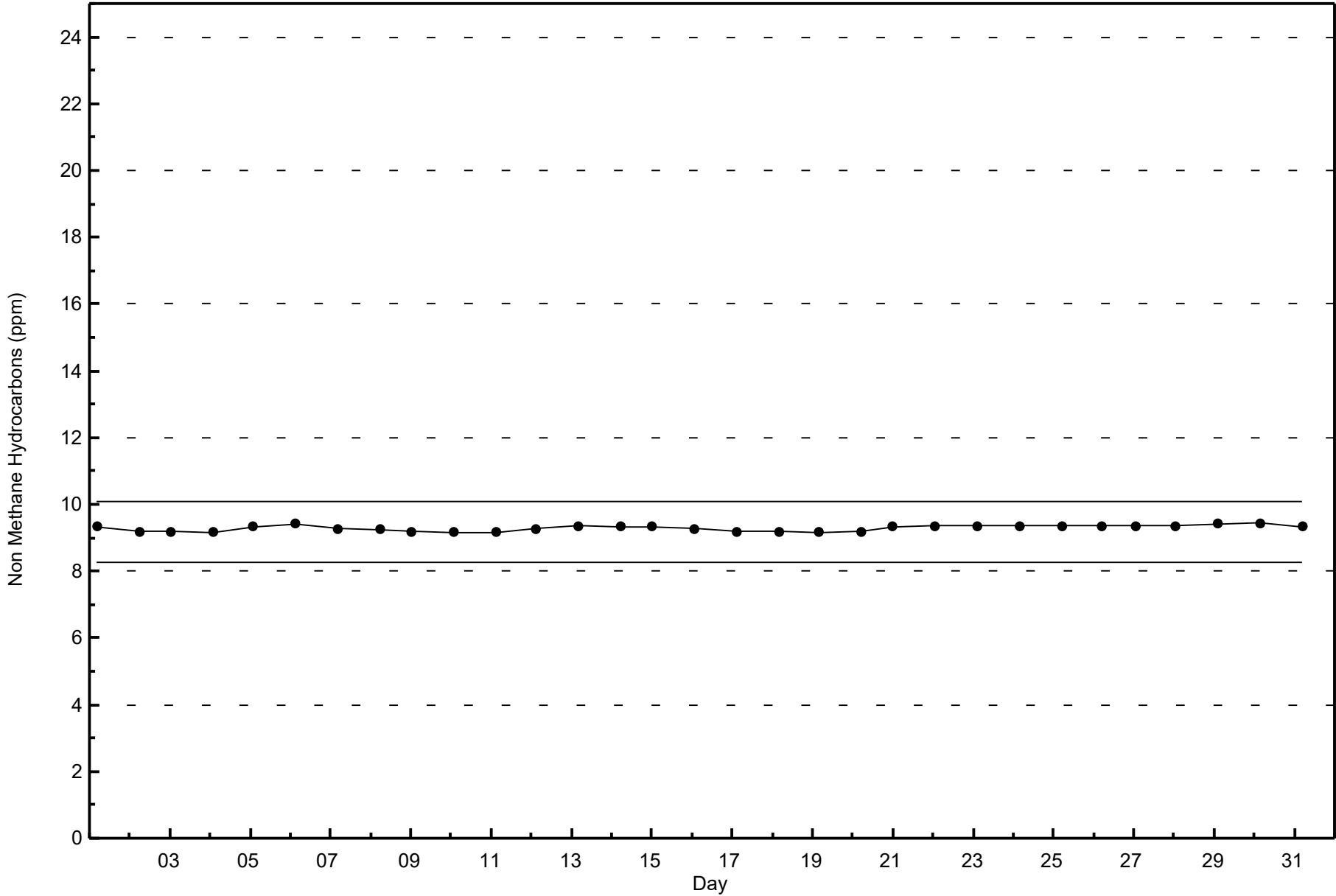
Non Methane Hydrocarbons (NMHC) - ppm
Fort Hills - October 2023

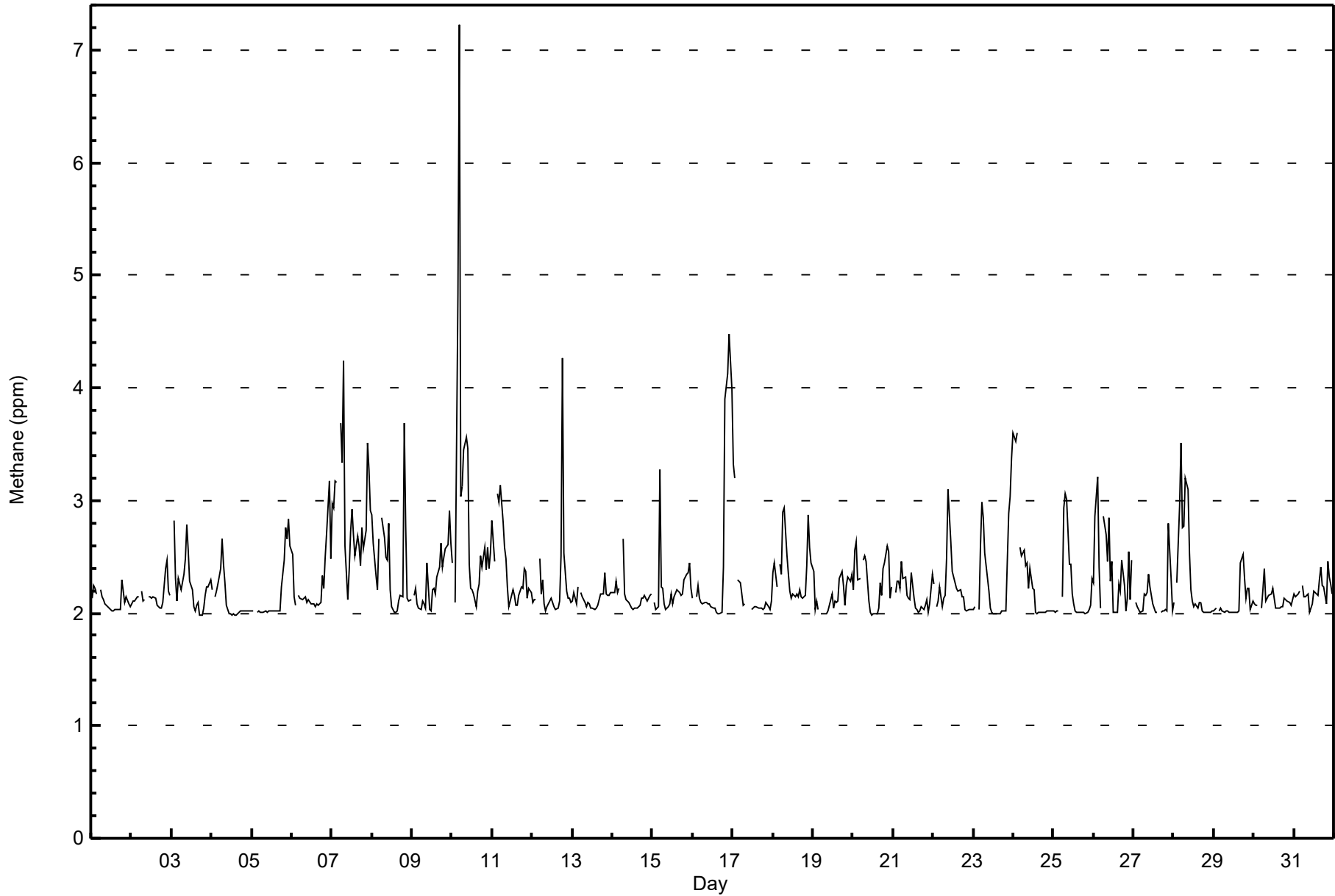
Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	9	1	0	0	0	0	0	3	16	11	1	2	11	34	42	20	150
0.006 - 0.05	15	15	0	0	0	0	2	37	57	22	10	3	4	4	5	7	181
0.06 - 0.1	7	5	1	0	0	2	6	57	24	18	8	9	2	2	3	3	147
> 0.1	11	7	6	3	3	17	36	36	15	18	35	24	4	5	3	6	229
Totals	42	28	7	3	3	19	44	133	112	69	54	38	21	45	53	36	707

Total Number of Valid Hours: 707

Total Number of Hours: 744









Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Fort Hills - October 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	186	26.27	26.27
2.1 - 3.0	486	68.64	94.92
3.1 - 10.0	36	5.08	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



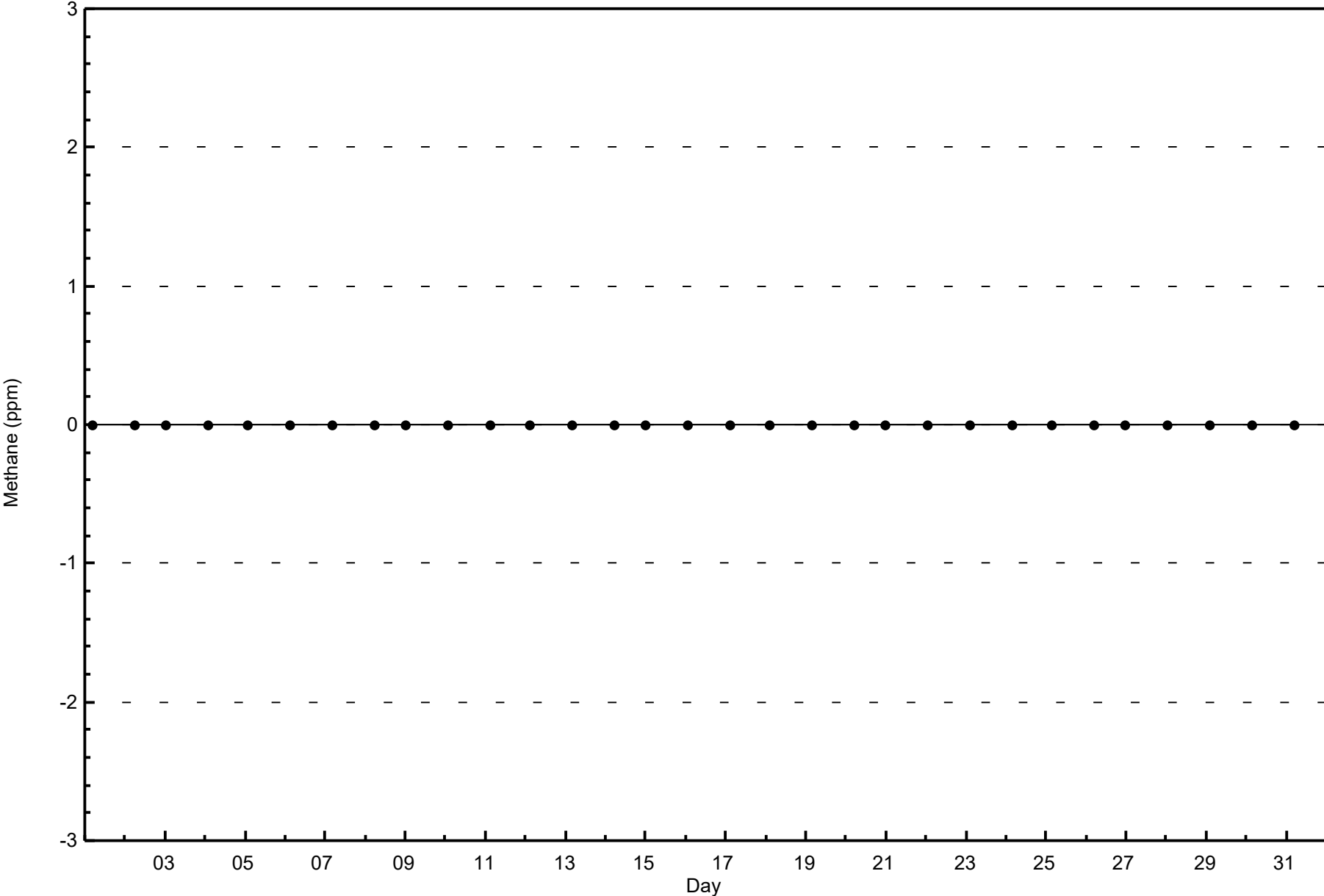
**Wood Buffalo Environmental Association
Frequency Distribution**

**Methane (CH₄) - ppm
Fort Hills - October 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	7	0	0	0	0	0	12	26	12	2	2	15	37	43	17	186
2.1 - 3.0	28	21	7	3	3	19	35	118	83	53	42	33	5	8	9	18	485
3.1 - 10.0	1	0	0	0	0	0	9	3	3	4	10	3	1	0	1	1	36
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	42	28	7	3	3	19	44	133	112	69	54	38	21	45	53	36	707

Total Number of Valid Hours: 707

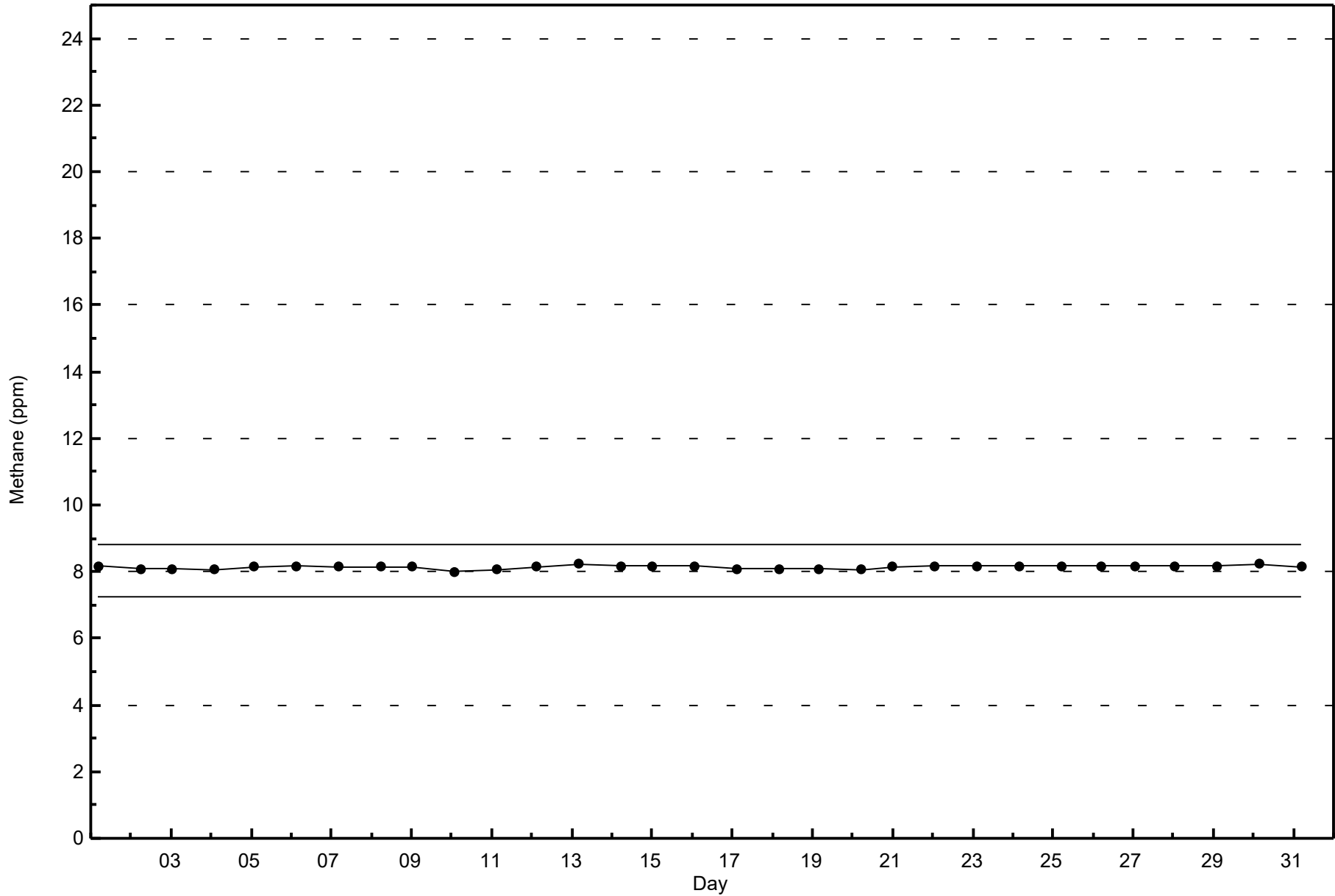
Total Number of Hours: 744





Wood Buffalo Environmental Association
Span Responses

Methane (CH₄) - ppm
Fort Hills - October 2023





Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

Fort Hills - October 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 213.9 ppb on Oct 16 22:00	Maximum Daily Average: 70.0 ppb on Oct 7		Hours of Data:	706
Minimum Value: 0.0 ppb on Oct 1 18:00	Minimum Daily Average: 0.5 ppb on Oct 19		Hours of Missing Data:	38
Maximum Diurnal Average: 20.3 ppb at hour 20	Minimum Diurnal Average: 2.3 ppb at hour 15		Hours of Calibration:	36
Monthly Average: 11.43 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.2 Median = 1.9 Q ₃ = 10.0 P ₉₀ = 30.1 P ₉₉ = 169.6		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-Oct	0.8	10.4	Z	4.7	5.6	5.8	1.3	3.7	1.5	1.9	1.8	0.6	0.4	0.2	0.3	0.4	0.3	0.0	3.5	0.8	0.0	0.2	0.0	0.0	1.9	10.4
2-Oct	0.0	0.0	0.0	Z	0.0	1.0	0.0	0.8	1.4	M	1.7	1.0	1.2	1.4	0.9	0.3	0.2	0.0	0.6	1.0	3.4	1.0	0.3	0.3	0.8	3.4
3-Oct	6.1	29.8	6.7	0.1	Z	6.2	3.7	22.9	28.8	43.0	19.0	7.9	6.0	1.7	0.5	0.8	1.2	0.1	0.0	0.0	0.2	4.8	2.4	2.8	8.5	43.0
4-Oct	0.7	0.0	0.0	0.0	0.9	Z	32.8	18.5	9.4	1.0	0.1	0.4	0.5	0.1	0.1	0.0	0.5	0.0	0.1	0.0	0.4	0.2	0.0	0.0	2.9	32.8
5-Oct	Z	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.3	0.3	0.0	0.1	0.0	0.1	0.5	0.1	0.0	0.0	4.9	4.5	29.4	7.6	22.1	7.7	3.4	29.4
6-Oct	8.8	Z	0.0	1.2	0.0	0.0	0.0	0.5	0.8	1.8	1.4	1.3	1.3	1.5	0.4	0.7	0.1	0.0	11.8	1.9	11.7	30.9	58.0	16.3	6.5	58.0
7-Oct	52.6	35.6	Z	41.6	36.5	147.5	102.7	169.9	49.5	6.6	30.3	67.3	117.3	64.3	22.7	75.6	29.0	37.4	41.6	41.5	62.4	191.8	122.6	64.3	70.0	191.8
8-Oct	47.1	45.2	17.3	Z	16.7	10.0	18.4	23.7	12.2	17.2	27.0	8.0	3.0	0.8	1.0	0.8	2.0	0.5	11.0	152.2	57.1	0.4	0.4	0.1	20.5	152.2
9-Oct	0.0	0.9	0.9	0.0	Z	0.0	0.2	0.8	1.4	12.3	2.5	2.2	13.9	12.9	8.5	17.2	26.6	61.2	63.3	32.2	48.1	34.1	48.6	34.6	18.4	63.3
10-Oct	27.3	11.0	1.1	112.0	190.7	Z	30.0	45.6	45.3	107.4	21.7	15.7	17.3	8.8	1.5	8.1	26.1	55.0	29.2	41.2	6.6	15.3	12.1	11.7	36.6	190.7
11-Oct	Z	12.5	33.5	74.9	30.1	39.5	28.0	C	C	C	C	C	9.1	9.3	3.0	3.3	14.3	24.3	31.7	27.9	13.9	0.0	0.1	0.0	19.7	74.9
12-Oct	0.0	Z	0.0	24.9	12.1	0.0	0.8	0.1	0.4	2.6	6.3	4.5	3.4	2.7	1.1	0.8	1.4	20.2	181.7	30.3	10.3	0.0	0.0	0.1	13.2	181.7
13-Oct	0.0	0.7	Z	1.2	0.8	6.5	3.1	0.8	0.8	3.3	2.6	2.0	1.4	0.7	0.9	1.5	4.5	2.3	8.9	33.7	3.4	0.3	0.0	2.3	3.5	33.7
14-Oct	0.9	3.1	7.5	Z	0.5	14.1	2.9	7.0	5.6	4.1	4.8	2.1	1.3	1.6	1.0	1.0	0.4	0.1	0.1	0.4	0.0	0.8	0.9	1.0	2.7	14.1
15-Oct	3.1	1.0	2.6	0.4	Z	0.5	1.1	0.5	0.8	1.7	5.5	5.6	2.8	3.3	2.0	1.7	1.1	0.0	0.2	50.8	5.9	12.1	29.9	9.9	6.2	50.8
16-Oct	17.4	13.9	2.5	10.2	1.1	Z	9.1	19.1	8.7	1.6	1.9	0.8	1.1	0.9	0.1	0.9	0.2	0.0	18.5	171.1	184.8	213.9	197.8	164.2	45.2	213.9
17-Oct	Z	96.5	45.7	25.5	23.1	6.7	8.8	8.5	9.7	12.1	5.1	3.1	2.9	5.6	5.8	4.8	1.7	1.6	1.7	1.9	4.3	1.5	0.1	4.4	12.2	96.5
18-Oct	15.0	Z	3.6	3.9	4.3	6.2	18.7	22.6	23.7	16.0	9.1	6.6	4.0	1.5	1.4	1.2	7.2	2.0	0.1	0.2	5.2	13.1	3.0	1.0	7.4	23.7
19-Oct	0.4	0.0	Z	0.0	0.2	0.0	0.0	0.0	0.0	1.2	1.5	2.5	0.9	1.0	0.5	0.5	0.1	0.0	0.1	0.1	1.0	1.8	0.5	0.0	0.5	2.5
20-Oct	0.1	5.1	2.0	Z	1.7	2.1	12.2	14.4	11.2	6.2	0.3	0.0	0.1	0.3	0.4	3.6	2.2	7.9	38.1	30.8	25.1	5.1	8.2	13.8	8.3	38.1
21-Oct	10.5	3.3	10.9	6.0	Z	16.2	16.7	9.5	1.3	2.1	3.8	13.2	10.0	4.8	2.0	0.7	0.2	0.2	0.6	0.7	0.9	1.0	2.0	27.8	6.3	27.8
22-Oct	9.1	3.6	0.2	1.6	4.9	Z	0.3	0.8	19.7	55.4	20.9	13.1	10.8	5.1	3.5	2.5	4.3	0.3	0.1	0.4	0.1	0.3	0.4	0.0	6.8	55.4
23-Oct	Z	0.0	0.0	0.0	27.0	48.3	27.0	20.7	9.0	7.0	1.1	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	16.5	5.2	5.7	18.2	8.1	48.3
24-Oct	17.7	Z	58.4	33.2	1.8	2.4	1.6	0.5	4.1	4.2	12.9	5.1	2.6	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	6.3	58.4
25-Oct	0.0	0.0	Z	0.0	0.0	0.1	2.8	19.2	10.5	12.8	13.0	2.7	1.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7	2.8	19.2
26-Oct	0.7	20.3	26.4	Z	0.0	6.6	10.6	15.8	13.5	21.4	7.7	7.6	0.1	0.1	0.0	8.2	2.1	12.5	4.3	0.0	1.6	7.8	0.5	6.4	7.6	26.4
27-Oct	4.3	1.1	0.2	0.4	Z	0.2	43.2	53.1	41.0	32.4	21.4	4.6	1.8	0.3	0.5	DF	0.0	0.0	0.0	0.0	0.0	5.9	0.4	0.0	9.6	53.1
28-Oct	0.1	0.1	0.1	14.3	22.4	Z	1.8	20.9	35.9	8.7	6.0	1.7	2.9	4.2	2.2	5.0	0.6	0.0	0.0	0.1	0.2	0.2	0.2	0.0	5.6	35.9
29-Oct	Z	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.4	0.1	0.3	0.1	0.2	0.2	0.4	1.2	17.1	9.3	3.3	3.6	4.8	4.5	0.2	2.2	2.1	17.1
30-Oct	2.5	Z	0.3	0.1	0.5	7.8	63.6	8.3	4.5	4.9	5.9	8.9	2.8	0.6	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.8	63.6
31-Oct	0.0	0.0	Z	0.0	3.3	7.8	0.5	9.0	9.7	1.2	2.4	9.2	13.6	9.1	9.9	44.6	8.0	4.1	2.2	2.8	15.6	4.6	7.3	1.4	7.2	44.6

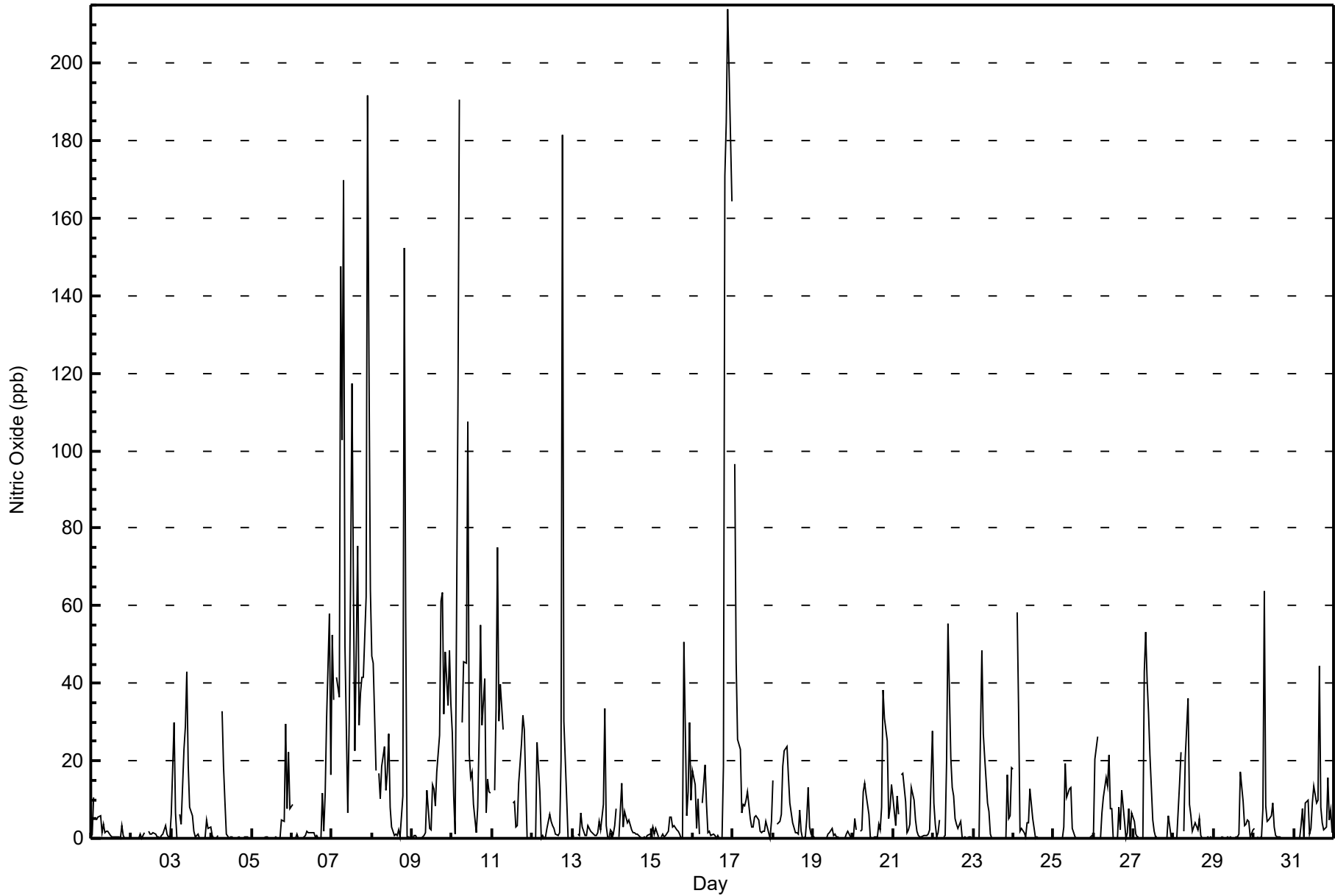
8.7	11.3	8.8	13.7	14.8	12.9	14.3	17.2	12.0	13.5	7.9	6.6	7.6	4.6	2.3	6.2	4.9	7.7	14.8	20.3	16.5	18.2	16.9	12.6	Diurnal Average	
52.6	96.5	58.4	112.0	190.7	147.5	102.7	169.9	49.5	107.4	30.3	67.3	117.3	64.3	22.7	75.6	29.0	61.2	181.7	171.1	184.8	213.9	197.8	164.2	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	600	84.99	84.99
21 - 40	55	7.79	92.78
41 - 80	34	4.82	97.59
81 - 159	8	1.13	98.73
> 159	9	1.27	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

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

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	36	26	3	2	2	10	24	113	105	60	40	31	16	48	52	31	599
21 - 40	3	2	3	0	0	3	8	10	5	2	9	5	3	0	0	2	55
11 - 80	3	2	1	1	1	5	4	5	2	3	2	2	1	0	0	2	34
81 - 159	0	0	0	0	0	1	4	0	1	0	1	0	0	0	0	1	8
> 159	0	0	0	0	0	0	4	1	1	1	1	0	0	0	1	0	9
Totals	42	30	7	3	3	19	44	129	114	66	53	38	20	48	53	36	705

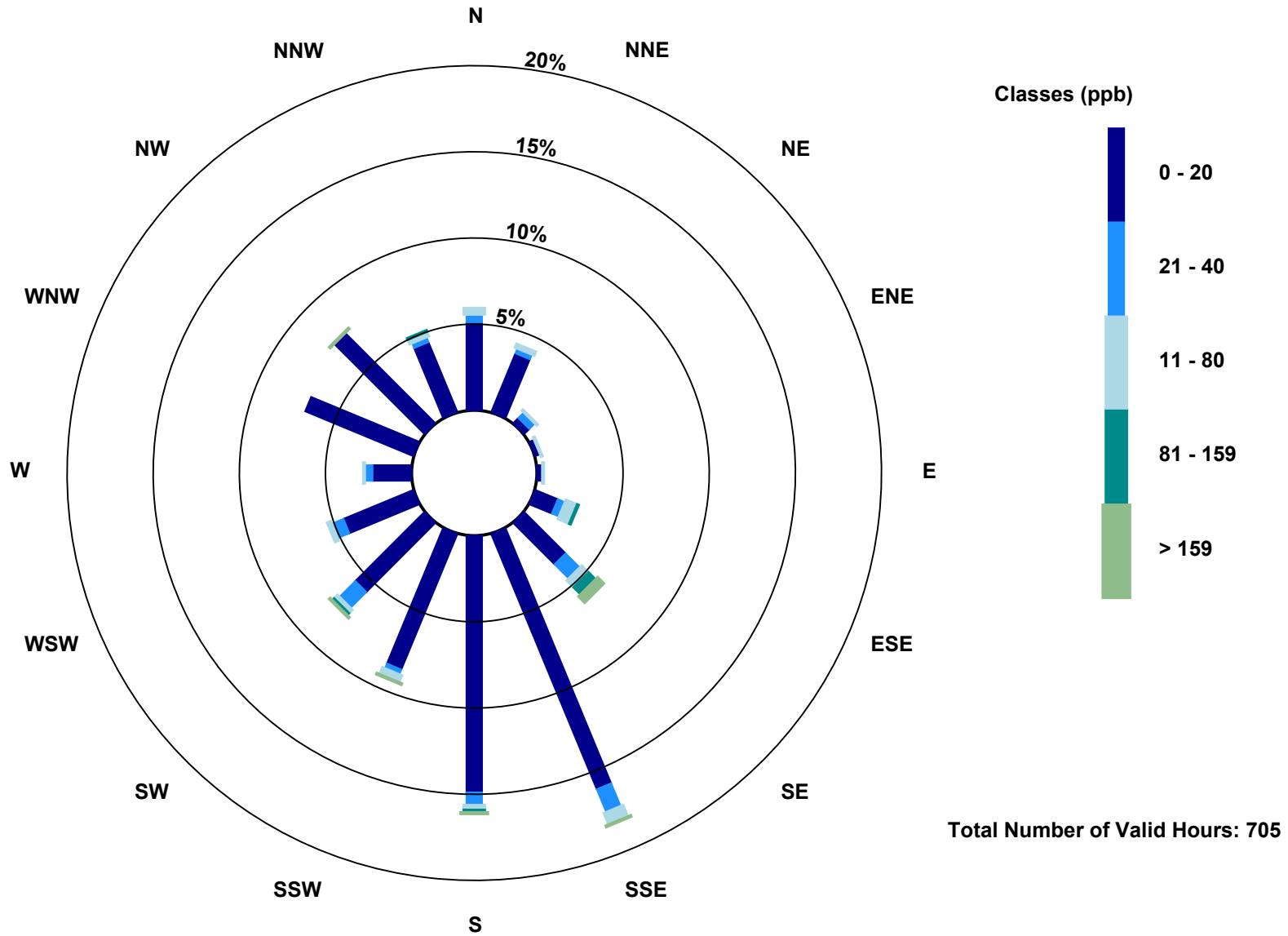
Total Number of Valid Hours: 705

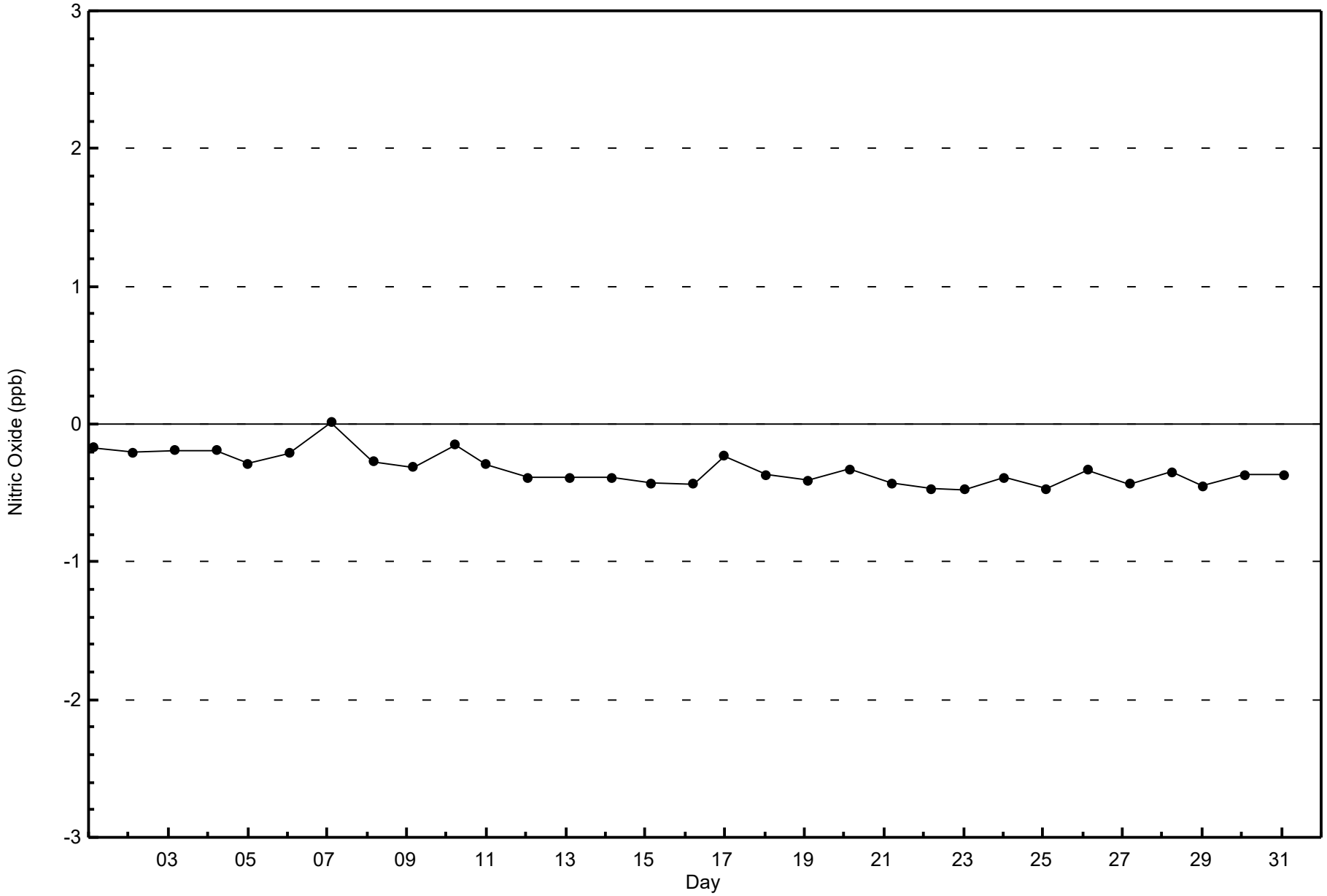
Total Number of Hours: 744

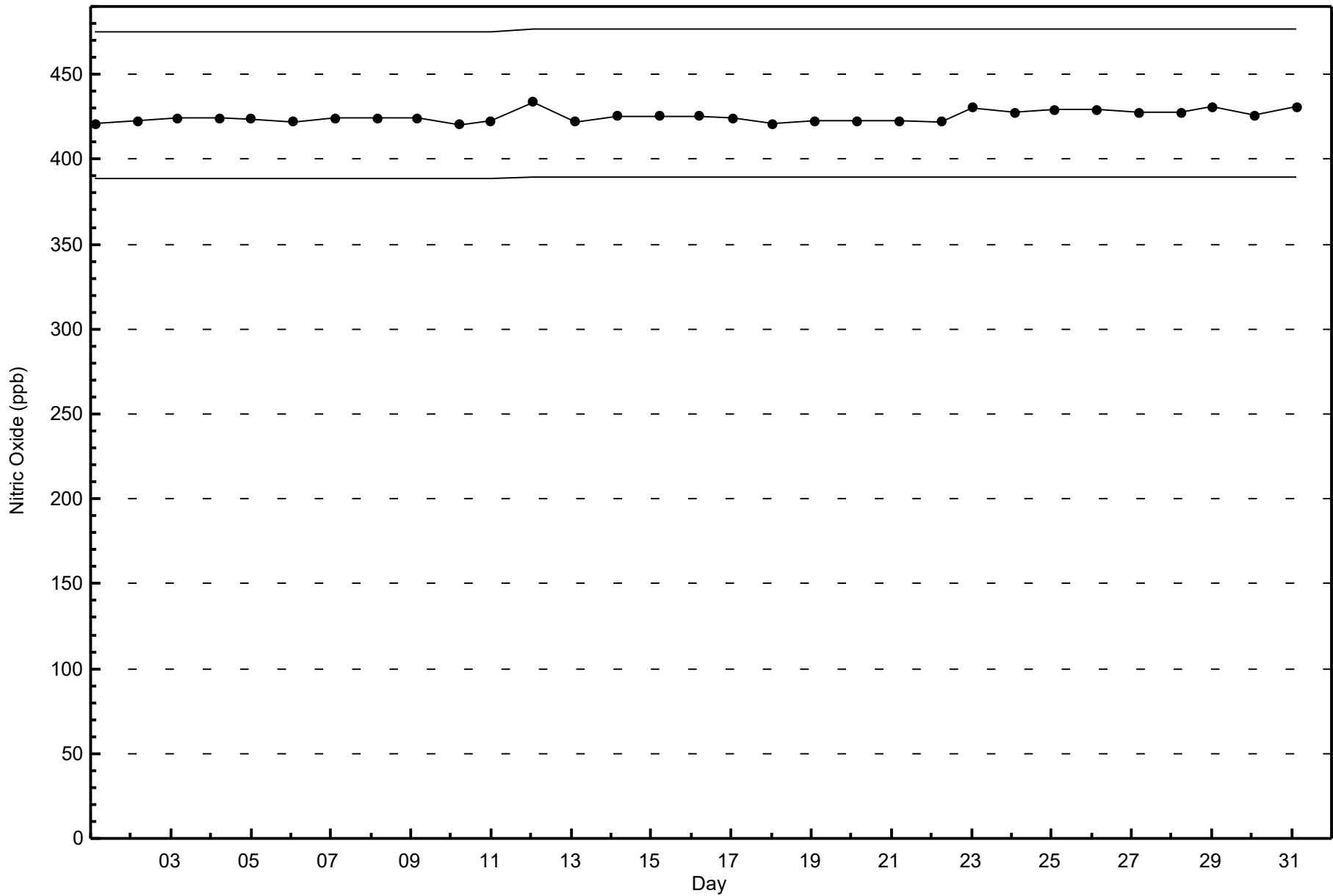


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitric Oxide (NO) - ppb
Fort Hills









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

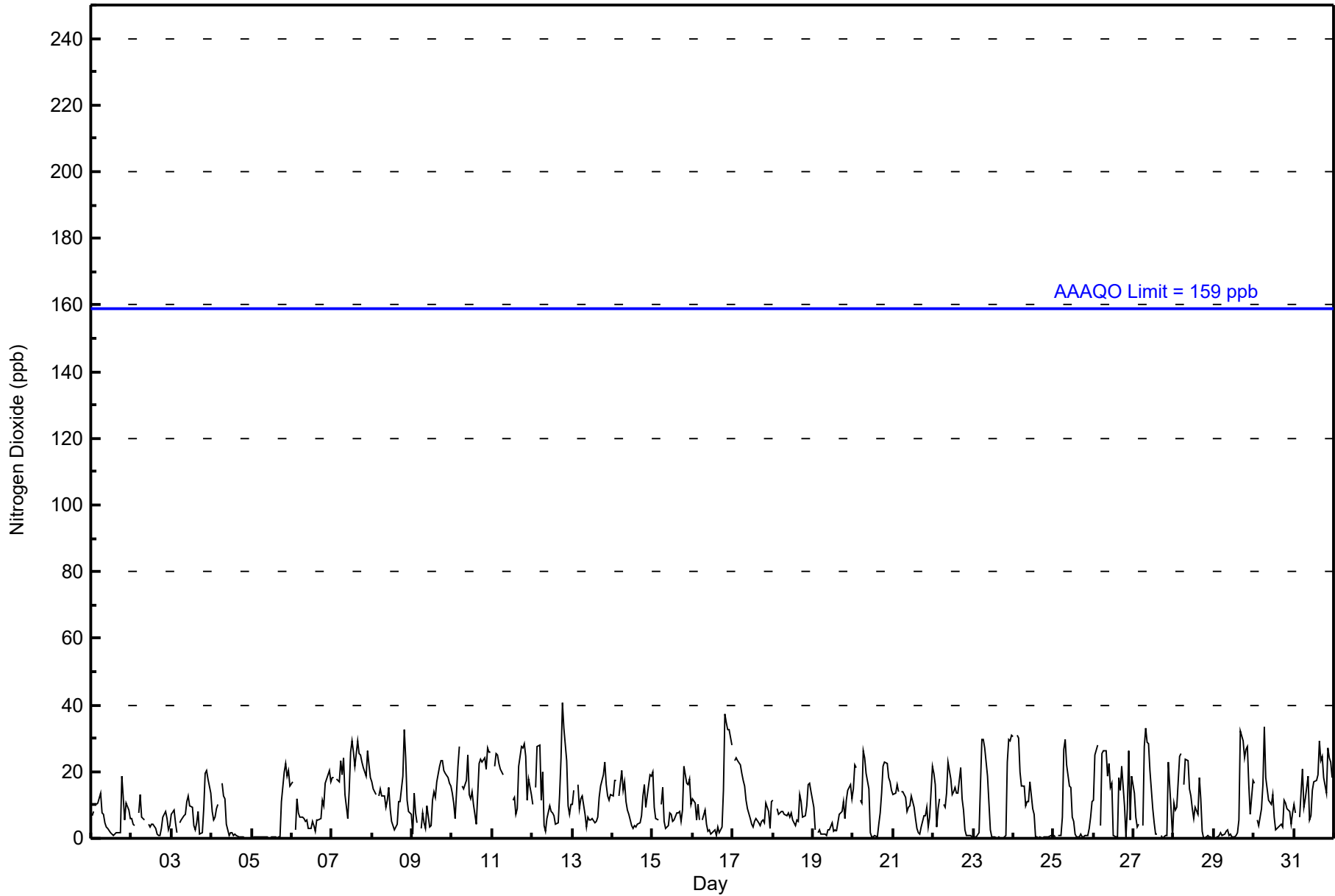
Fort Hills - October 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 744																	744									
Maximum Value: 40.7 ppb on Oct 12 19:00		Maximum Daily Average: 21.0 ppb on Oct 7																	706											
Minimum Value: 0.1 ppb on Oct 4 23:00		Minimum Daily Average: 4.1 ppb on Oct 4																	38											
Maximum Diurnal Average: 14.4 ppb at hour 7		Minimum Diurnal Average: 4.7 ppb at hour 15																	36											
Monthly Average: 10.68 ppb		Percentiles: P ₁ = 0.2 P ₁₀ = 0.7 Q ₁ = 3.5 Median = 8.9 Q ₃ = 16.4 P ₉₀ = 23.5 P ₉₉ = 32.8																	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-Oct	6.8	7.9	Z	10.0	10.7	13.5	7.6	7.1	4.5	3.2	3.0	1.5	1.2	1.0	1.1	1.5	1.9	1.7	18.8	12.2	5.4	10.6	8.4	5.8	6.3	18.8				
2-Oct	5.9	4.2	3.7	Z	7.8	13.2	6.2	5.9	5.6	M	4.1	3.3	4.1	4.1	3.1	1.1	1.0	0.8	2.9	6.3	8.0	6.1	2.7	3.7	4.7	13.2				
3-Oct	7.1	8.5	4.6	1.8	Z	4.8	5.7	6.8	7.1	11.2	12.7	9.7	9.5	3.7	2.7	4.6	8.2	1.4	1.6	8.7	19.5	20.4	17.7	13.4	8.3	20.4				
4-Oct	8.2	5.7	6.3	9.0	10.1	Z	16.4	12.9	11.7	4.1	1.0	1.8	1.7	0.9	1.1	0.8	0.6	0.3	0.4	0.5	0.2	0.2	0.1	0.1	4.1	16.4				
5-Oct	Z	0.3	0.3	0.4	0.4	0.4	0.3	0.4	0.6	0.4	0.2	0.2	0.3	0.3	0.3	0.2	0.3	0.4	11.2	19.8	22.3	18.8	20.2	15.6	4.9	22.3				
6-Oct	16.8	Z	2.4	12.0	7.7	6.3	6.3	5.9	5.2	5.3	2.8	2.9	5.2	3.7	2.3	5.3	5.5	6.0	11.6	9.6	16.6	18.0	20.4	16.8	8.5	20.4				
7-Oct	18.2	18.4	Z	17.8	17.0	23.3	19.2	24.0	13.0	6.1	14.6	25.7	29.2	25.8	21.4	29.4	25.5	25.2	22.7	21.3	18.8	26.4	22.1	18.2	21.0	29.4				
8-Oct	16.9	14.7	13.3	Z	12.5	14.9	12.6	12.8	9.3	11.4	15.4	8.7	5.0	2.5	3.4	4.1	11.0	11.0	18.7	32.8	24.2	11.4	8.2	7.4	12.3	32.8				
9-Oct	1.3	13.7	7.8	4.5	Z	3.0	7.8	4.6	3.1	9.6	3.6	3.8	11.5	14.0	12.4	17.1	21.6	23.2	23.2	20.3	19.3	18.4	16.6	15.7	12.0	23.2				
10-Oct	13.4	10.4	5.8	21.7	27.6	Z	15.5	15.0	17.5	24.9	13.1	11.9	14.1	10.0	4.2	13.3	22.4	23.6	23.0	24.0	20.9	27.3	26.0	26.0	17.9	27.6				
11-Oct	Z	21.6	25.3	25.0	22.6	20.6	19.0	C	C	C	C	C	11.4	12.1	7.0	9.0	21.6	27.5	27.1	28.5	24.7	11.5	17.9	13.0	19.2	28.5				
12-Oct	10.2	Z	15.1	27.4	28.1	11.6	20.1	4.0	2.2	5.9	9.9	8.2	7.5	6.9	4.3	4.6	13.0	24.2	40.7	33.2	23.2	9.9	7.2	10.0	14.2	40.7				
13-Oct	10.0	14.3	Z	16.1	8.8	11.8	12.8	7.1	3.3	6.2	5.6	5.5	6.0	4.6	5.0	6.3	12.2	15.6	19.2	22.9	16.2	12.9	11.4	13.1	10.7	22.9				
14-Oct	12.8	17.2	17.4	Z	12.9	20.4	14.4	17.1	11.0	8.6	7.2	3.8	3.0	3.8	3.2	4.4	4.8	6.6	12.6	16.1	9.4	12.8	19.1	18.8	11.2	20.4				
15-Oct	19.9	9.5	6.0	5.4	Z	10.1	15.3	5.2	3.0	3.7	7.8	7.0	4.9	5.5	7.5	7.6	7.9	5.2	8.6	21.6	16.6	16.0	17.6	10.2	9.7	21.6				
16-Oct	11.7	10.7	5.5	10.3	5.6	Z	5.3	8.4	4.3	2.1	2.4	1.4	2.2	2.4	1.0	3.3	1.8	3.3	14.5	37.4	34.9	32.5	32.8	28.0	11.4	37.4				
17-Oct	Z	23.4	24.0	23.4	22.2	19.6	17.5	15.8	11.5	8.9	6.0	4.2	3.5	4.9	5.9	4.7	4.0	5.1	5.4	4.8	10.4	8.2	3.1	11.0	10.8	24.0				
18-Oct	11.3	Z	8.8	7.4	7.7	7.9	8.0	7.0	6.9	7.7	6.3	7.5	5.3	3.9	5.6	4.9	13.2	11.1	6.4	6.7	9.8	16.0	16.5	13.9	8.7	16.5				
19-Oct	9.5	2.6	Z	1.5	2.6	1.3	1.2	1.1	0.8	2.4	2.6	4.5	2.2	2.7	2.3	4.5	7.2	8.1	10.9	6.0	11.5	14.4	16.2	11.9	5.6	16.2				
20-Oct	15.0	22.0	21.3	Z	11.5	10.6	26.2	24.0	19.3	15.0	1.8	0.3	0.4	0.8	0.6	4.3	7.8	13.4	21.6	22.8	22.3	18.4	16.8	14.6	13.5	26.2				
21-Oct	13.3	13.5	16.0	14.0	Z	13.8	14.1	12.4	8.0	9.2	9.9	12.6	9.5	5.8	2.9	1.5	1.1	3.3	6.9	6.7	9.2	3.2	6.2	21.7	9.3	21.7				
22-Oct	19.4	16.3	3.5	8.7	12.0	Z	10.3	9.5	13.7	22.7	18.0	13.3	14.1	15.2	13.4	13.4	21.3	11.9	8.6	2.7	0.7	0.7	0.9	0.3	10.9	22.7				
23-Oct	Z	0.6	0.5	1.6	16.3	29.6	29.5	27.3	18.8	10.8	2.5	0.3	0.3	0.3	0.2	0.3	0.2	0.2	0.2	1.0	23.0	29.8	29.2	31.1	11.0	31.1				
24-Oct	30.3	Z	30.9	29.9	20.0	15.8	15.6	9.7	11.1	11.0	17.1	9.0	7.2	0.5	0.6	0.2	0.5	0.2	0.3	0.3	0.6	0.5	0.8	0.6	9.2	30.9				
25-Oct	0.8	0.6	Z	1.0	1.0	6.3	26.5	29.8	22.0	15.6	15.4	6.5	5.0	1.3	0.4	0.5	1.1	0.4	0.6	0.8	0.8	2.8	6.3	11.2	6.8	29.8				
26-Oct	11.5	24.9	27.9	Z	4.0	25.3	26.1	26.3	18.7	22.3	15.1	16.4	0.8	0.6	0.6	18.4	14.4	21.5	9.7	0.5	9.1	26.2	5.5	18.8	15.0	27.9				
27-Oct	13.6	6.3	3.2	4.1	Z	3.7	27.4	33.1	28.9	28.6	20.3	9.0	4.8	1.1	1.1	DF	0.8	0.1	0.4	1.0	0.8	23.0	8.4	0.3	10.0	33.1				
28-Oct	10.5	8.4	9.2	24.6	25.4	Z	15.9	23.7	23.4	15.0	12.9	8.7	6.0	9.5	7.0	18.4	11.8	2.0	0.2	0.6	0.7	0.5	0.6	0.1	10.2	25.4				
29-Oct	Z	0.6	0.5	1.0	1.5	0.9	1.2	2.3	2.6	0.9	1.1	0.5	0.5	0.7	1.7	5.4	32.3	29.2	24.2	26.6	27.4	16.3	7.0	17.4	8.8	32.3				
30-Oct	16.4	Z	5.3	3.9	9.0	16.0	33.5	18.1	14.9	11.5	10.3	13.2	6.2	2.4	2.9	3.7	4.2	3.4	11.3	10.4	8.9	8.1	4.4	7.7	9.8	33.5				
31-Oct	10.2	7.8	Z	6.2	13.7	20.8	9.5	12.0	18.5	5.6	6.9	14.3	16.9	17.2	19.0	29.4	23.5	24.4	18.3	13.4	27.1	24.2	23.0	18.2	16.5	29.4				
		12.3	10.9	10.6	11.1	12.3	12.5	14.4	13.0	10.7	10.0	8.3	7.2	6.4	5.4	4.7	7.4	9.8	10.0	12.3	13.5	14.3	14.4	12.7	12.7	Diurnal Average				
		30.3	24.9	30.9	29.9	28.1	29.6	33.5	33.1	28.9	28.6	20.3	25.7	29.2	25.8	21.4	29.4	32.3	29.2	40.7	37.4	34.9	32.5	32.8	31.1	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
Fort Hills - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	596	84.42	84.42
21 - 40	109	15.44	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: 706

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

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

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	35	26	3	1	0	10	19	117	111	60	32	29	19	48	52	33	595
21 - 40	7	4	4	2	3	9	24	12	3	6	21	9	1	0	1	3	109
11 - 80	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	42	30	7	3	3	19	44	129	114	66	53	38	20	48	53	36	705

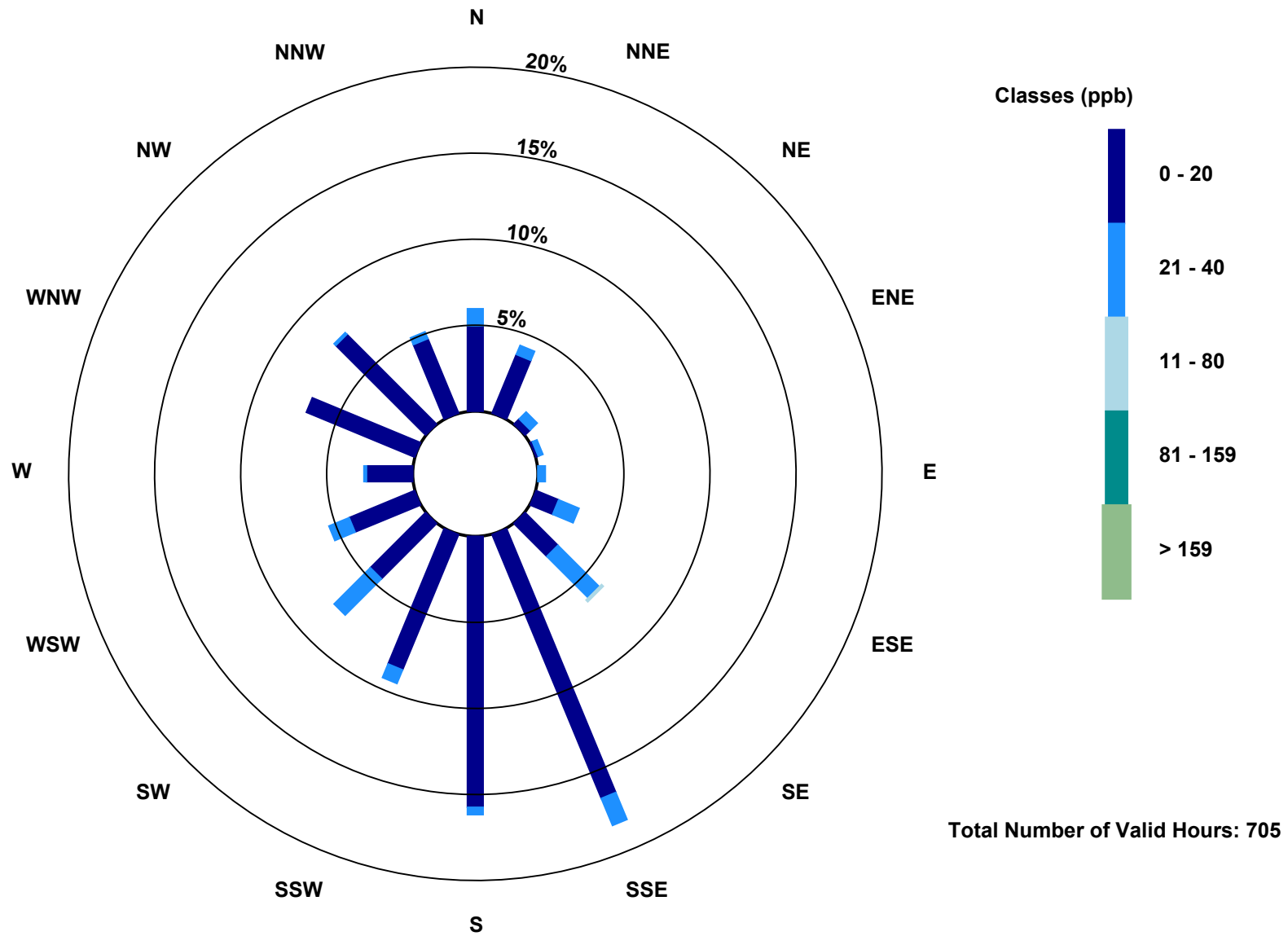
Total Number of Valid Hours: 705

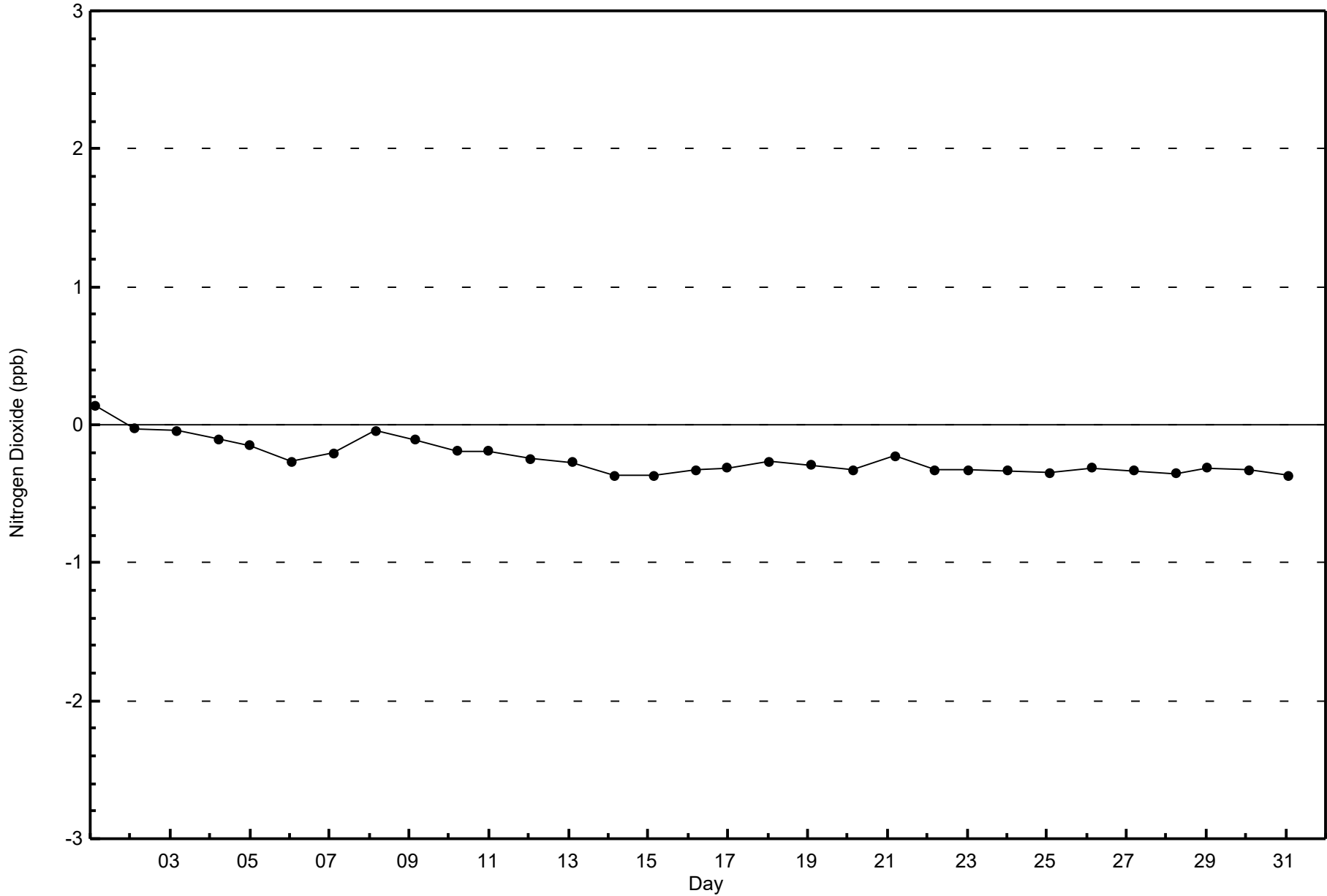
Total Number of Hours: 744

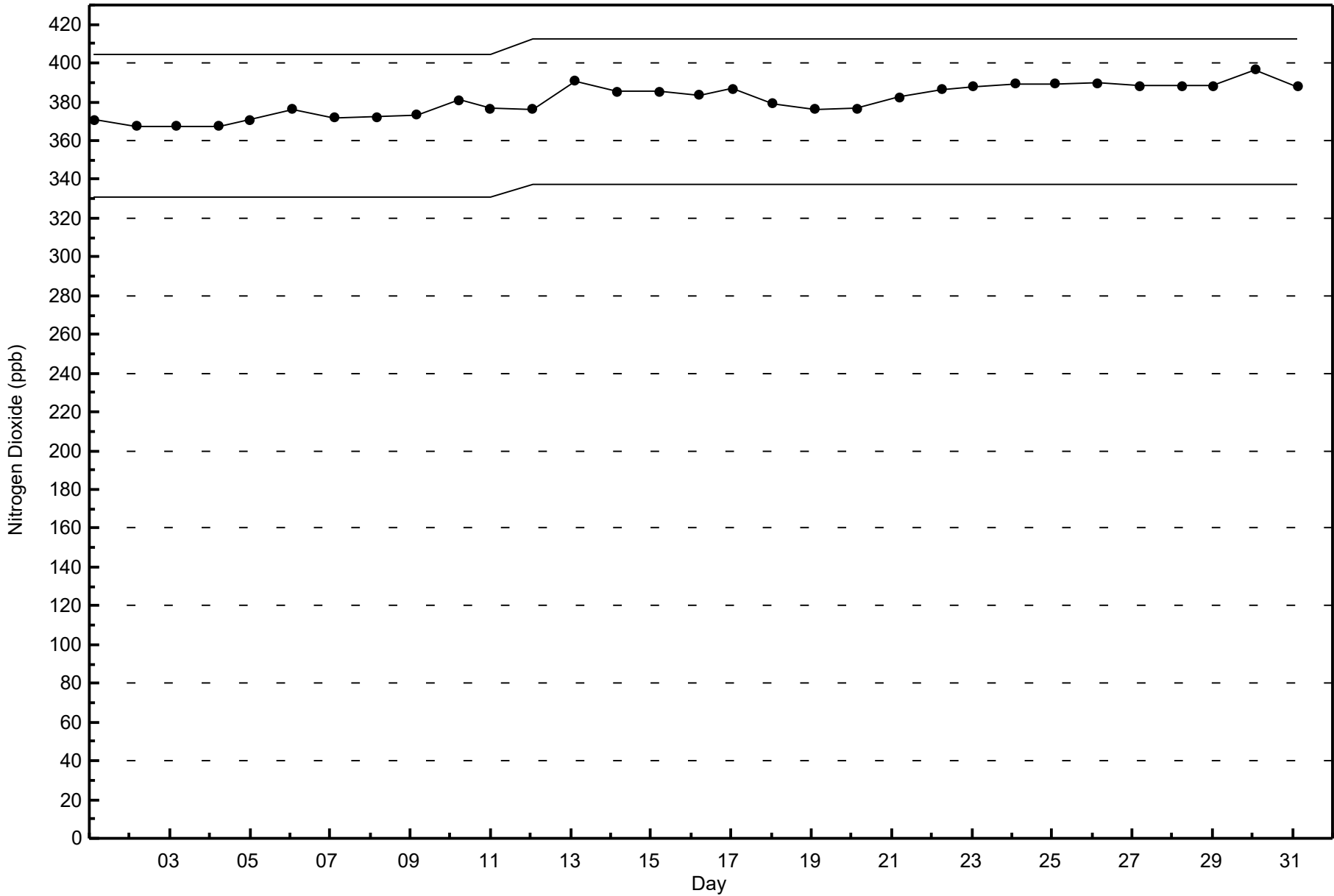


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitrogen Dioxide (NO₂) - ppb
Fort Hills





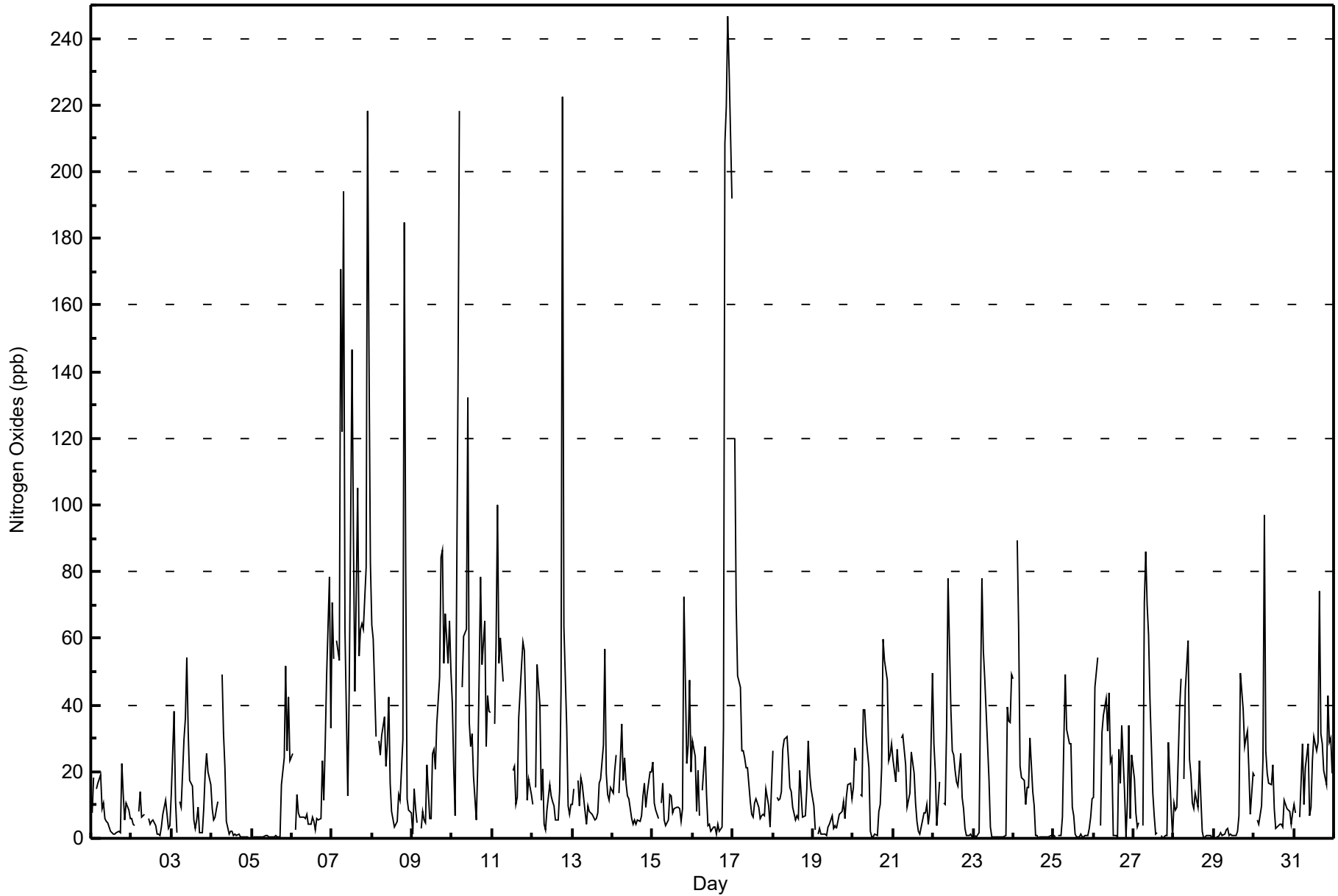




Wood Buffalo Environmental Association
Summary of Hour Averages

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

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service:																	744						
Maximum Value: 246.4 ppb on Oct 16 22:00		Maximum Daily Average: 91.0 ppb on Oct 7		Hours of Data:																	706						
Minimum Value: 0.1 ppb on Oct 5 00:00		Minimum Daily Average: 5.5 ppb on Oct 2		Hours of Missing Data:																	38						
Maximum Diurnal Average: 33.9 ppb at hour 20		Minimum Diurnal Average: 7.0 ppb at hour 15		Hours of Calibration:																	36						
Monthly Average: 22.11 ppb		Percentiles: P ₁ = 0.2 P ₁₀ = 0.8 Q ₁ = 4.2 Median = 11.4 Q ₃ = 27.5 P ₉₀ = 52.4 P ₉₉ = 193.8		Percent Operational Time:																	99.7						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Oct	7.6	18.3	Z	14.7	16.3	19.3	8.9	10.8	6.0	5.1	4.8	2.1	1.6	1.2	1.4	1.9	2.2	1.7	22.3	13.0	5.4	10.8	8.4	5.8	8.2	22.3	
2-Oct	5.9	4.2	3.7	Z	7.8	14.2	6.2	6.7	7.0	M	5.8	4.3	5.3	5.5	4.0	1.4	1.2	0.8	3.5	7.3	11.4	7.1	3.0	4.0	5.5	14.2	
3-Oct	13.2	38.3	11.3	1.9	Z	11.0	9.4	29.7	35.9	54.2	31.7	17.6	15.5	5.4	3.2	5.4	9.4	1.5	1.6	8.7	19.7	25.2	20.1	16.2	16.8	54.2	
4-Oct	8.9	5.7	6.3	9.0	11.0	Z	49.2	31.4	21.1	5.1	1.1	2.2	2.2	1.0	1.2	0.8	1.1	0.3	0.5	0.6	0.4	0.1	0.1	0.1	7.0	49.2	
5-Oct	Z	0.4	0.3	0.4	0.5	0.4	0.3	0.4	0.9	0.7	0.2	0.3	0.3	0.4	0.8	0.3	0.3	0.4	16.1	24.3	51.7	26.4	42.3	23.3	8.3	51.7	
6-Oct	25.6	Z	2.4	13.2	7.7	6.3	6.3	6.4	6.0	7.1	4.2	4.2	6.5	5.2	2.7	6.0	5.6	6.0	23.4	11.5	28.3	48.9	78.4	33.1	15.0	78.4	
7-Oct	70.8	54.0	Z	59.4	53.5	170.8	121.9	193.9	62.5	12.7	44.9	93.0	146.5	90.1	44.1	105.0	54.5	62.6	64.3	62.8	81.2	218.2	144.7	82.5	91.0	218.2	
8-Oct	64.0	59.9	30.6	Z	29.2	24.9	31.0	36.5	21.5	28.6	42.4	16.7	8.0	3.3	4.4	4.9	13.0	11.5	29.7	185.0	81.3	11.8	8.6	7.5	32.8	185.0	
9-Oct	1.3	14.6	8.7	4.5	Z	3.0	8.0	5.4	4.5	21.9	6.1	6.0	25.4	26.9	20.9	34.3	48.2	84.4	86.5	52.5	67.4	52.5	65.2	50.3	30.4	86.5	
10-Oct	40.7	21.4	6.9	133.7	218.3	Z	45.5	60.6	62.8	132.3	34.8	27.6	31.4	18.8	5.7	21.4	48.5	78.6	52.2	65.2	27.5	42.6	38.1	37.7	54.5	218.3	
11-Oct	Z	34.1	58.8	99.9	52.7	60.1	47.0	C	C	C	C	C	20.5	21.4	10.0	12.3	35.9	51.8	58.8	56.4	38.6	11.5	18.0	13.0	38.9	99.9	
12-Oct	10.2	Z	15.1	52.3	40.2	11.6	20.9	4.1	2.6	8.5	16.2	12.7	10.9	9.6	5.4	5.4	14.4	44.4	222.4	63.5	33.5	9.9	7.2	10.1	27.4	222.4	
13-Oct	10.0	15.0	Z	17.3	9.6	18.3	15.9	7.9	4.1	9.5	8.2	7.5	7.4	5.3	5.9	7.8	16.7	17.9	28.1	56.6	19.6	13.2	11.4	15.4	14.3	56.6	
14-Oct	13.7	20.3	24.9	Z	13.4	34.5	17.3	24.1	16.6	12.7	12.0	5.9	4.3	5.4	4.2	5.4	5.2	6.7	12.7	16.5	9.4	13.6	20.0	19.8	13.8	34.5	
15-Oct	23.0	10.5	8.6	5.8	Z	10.6	16.4	5.7	3.8	5.4	13.3	12.6	7.7	8.8	9.5	9.3	9.0	5.2	8.8	72.4	22.5	28.1	47.5	20.1	15.9	72.4	
16-Oct	29.1	24.6	8.0	20.5	6.7	Z	14.4	27.5	13.0	3.7	4.3	2.2	3.3	3.3	1.1	4.2	2.0	3.3	33.0	208.5	219.7	246.4	230.6	192.2	56.6	246.4	
17-Oct	Z	119.9	69.7	48.9	45.3	26.3	26.3	24.3	21.2	21.0	11.1	7.3	6.4	10.5	11.7	9.5	5.7	6.7	7.1	6.7	14.7	9.7	3.2	15.4	23.0	119.9	
18-Oct	26.3	Z	12.4	11.3	12.0	14.1	26.7	29.6	30.6	23.7	15.4	14.1	9.3	5.4	7.0	6.1	20.4	13.1	6.5	6.9	15.0	29.1	19.5	14.9	16.1	30.6	
19-Oct	9.9	2.6	Z	1.5	2.8	1.3	1.2	1.1	0.8	3.6	4.1	7.0	3.1	3.7	2.8	5.0	7.3	8.1	11.0	6.1	12.5	16.2	16.7	11.9	6.1	16.7	
20-Oct	15.1	27.1	23.3	Z	13.2	12.7	38.4	38.4	30.5	21.2	2.1	0.3	0.5	1.1	1.0	7.9	10.0	21.3	59.7	53.6	47.4	23.5	25.0	28.4	21.8	59.7	
21-Oct	23.8	16.8	26.9	20.0	Z	30.0	30.8	21.9	9.3	11.3	13.7	25.8	19.5	10.6	4.9	2.2	1.3	3.5	7.5	7.4	10.1	4.2	8.2	49.5	15.6	49.5	
22-Oct	28.5	19.9	3.7	10.3	16.9	Z	10.6	10.3	33.4	78.1	38.9	26.4	24.9	20.3	16.9	15.9	25.6	12.2	8.7	3.1	0.8	1.0	1.3	0.3	17.7	78.1	
23-Oct	Z	0.6	0.5	1.6	43.3	77.9	56.5	48.0	27.8	17.8	3.6	0.3	0.3	0.5	0.2	0.3	0.2	0.2	0.2	1.0	39.5	35.0	34.9	49.3	19.1	77.9	
24-Oct	48.0	Z	89.3	63.1	21.8	18.2	17.2	10.2	15.2	15.2	30.0	14.1	9.8	0.7	0.8	0.2	0.5	0.2	0.3	0.3	0.6	0.5	0.8	0.7	15.5	89.3	
25-Oct	0.8	0.6	Z	1.0	1.0	6.4	29.3	49.0	32.5	28.4	28.4	9.2	6.6	1.5	0.4	0.5	1.1	0.4	0.6	0.8	0.8	2.8	6.5	11.9	9.6	49.0	
26-Oct	12.2	45.2	54.3	Z	4.0	31.9	36.7	42.1	32.2	43.7	22.8	24.0	0.9	0.7	0.6	26.6	16.5	34.0	14.0	0.5	10.7	34.0	6.0	25.2	22.6	54.3	
27-Oct	17.9	7.4	3.4	4.5	Z	3.9	70.6	86.2	69.9	61.0	41.7	13.6	6.6	1.4	1.6	DF	0.8	0.1	0.4	1.0	0.8	28.9	8.8	0.3	19.6	86.2	
28-Oct	10.6	8.5	9.3	38.9	47.8	Z	17.7	44.6	59.3	23.7	18.9	10.4	8.9	13.7	9.2	23.4	12.4	2.0	0.2	0.7	0.9	0.7	0.8	0.1	15.8	59.3	
29-Oct	Z	0.6	0.5	1.0	1.5	1.1	1.2	2.3	3.0	1.0	1.4	0.6	0.7	0.9	2.1	6.6	49.4	38.5	27.5	30.2	32.2	20.8	7.2	19.6	10.9	49.4	
30-Oct	18.9	Z	5.6	4.0	9.5	23.8	97.1	26.4	19.4	16.4	16.2	22.1	9.0	3.0	3.3	4.0	4.2	3.4	11.3	10.4	8.9	8.1	4.4	7.7	14.7	97.1	
31-Oct	10.2	7.8	Z	6.2	17.0	28.6	10.0	21.0	28.2	6.8	9.3	23.5	30.5	26.3	28.9	74.0	31.5	28.5	20.5	16.2	42.7	28.8	30.3	19.6	23.8	74.0	
		21.0	22.2	19.4	24.8	27.0	25.4	28.7	30.2	22.7	23.5	16.3	13.8	14.0	10.1	7.0	13.6	14.6	17.7	27.1	33.9	30.8	32.6	29.6	25.3	Diurnal Average	
		70.8	119.9	89.3	133.7	218.3	170.8	121.9	193.9	69.9	132.3	44.9	93.0	146.5	90.1	44.1	105.0	54.5	84.4	222.4	208.5	219.7	246.4	230.6	192.2	Diurnal Maximum	
Z - zerospan		C - Calibration			M - Maintenance			DF - DAS Failure																			





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	470	66.57	66.57
21 - 40	129	18.27	84.84
41 - 80	78	11.05	95.89
81 - 159	16	2.27	98.16
> 159	11	1.56	99.72

Total Number of Valid Hours: 706

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

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

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	25	17	1	0	0	4	10	95	97	49	21	17	15	42	48	28	469
21 - 40	12	8	2	2	1	6	12	20	10	12	16	13	2	6	4	3	129
11 - 80	4	4	3	1	2	4	12	12	5	4	13	8	2	0	0	4	78
81 - 159	1	1	0	0	0	5	3	1	1	0	2	0	1	0	0	1	16
> 159	0	0	0	0	0	0	6	1	1	1	1	0	0	0	1	0	11
Totals	42	30	6	3	3	19	43	129	114	66	53	38	20	48	53	36	703

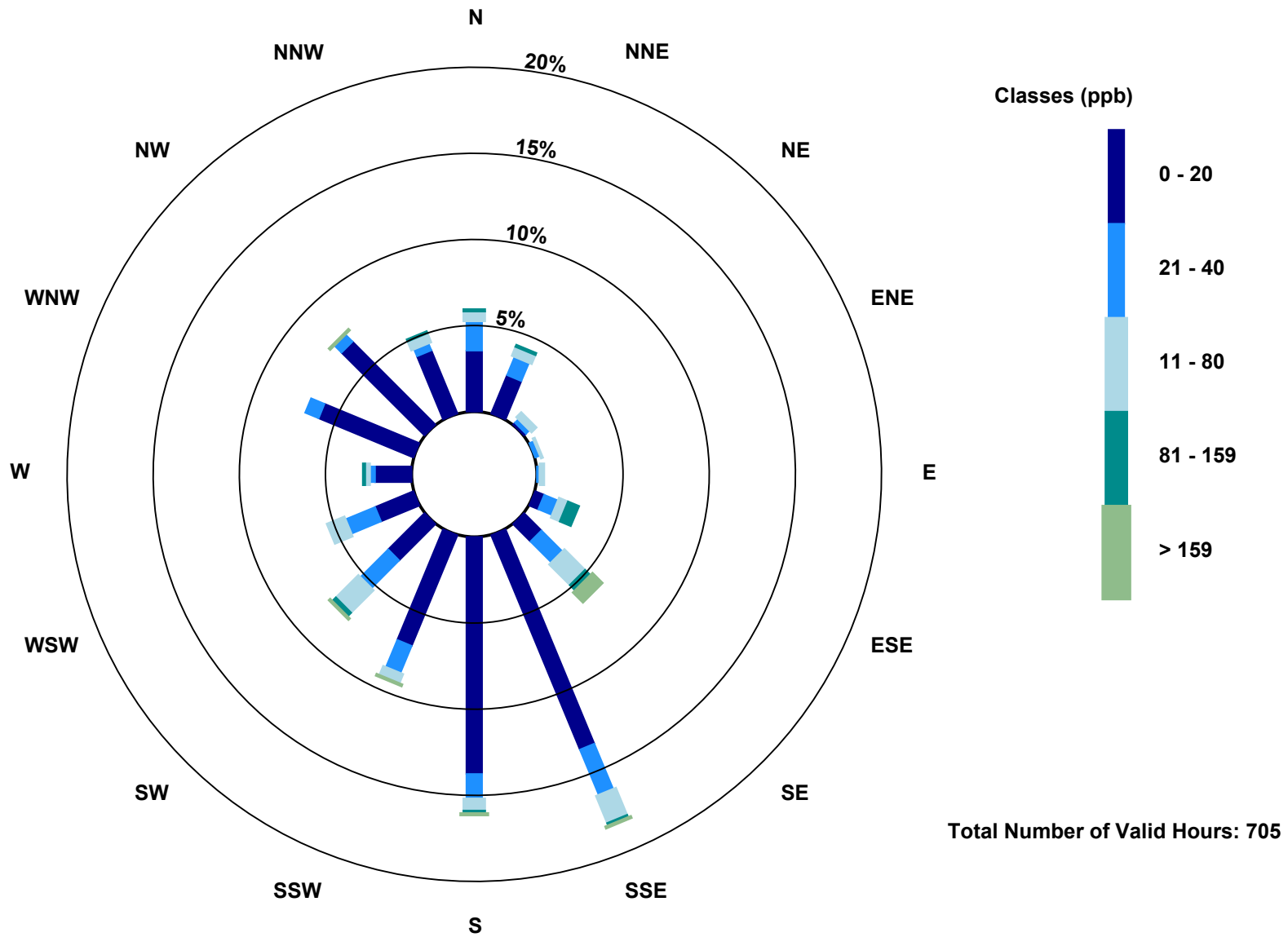
Total Number of Valid Hours: 705

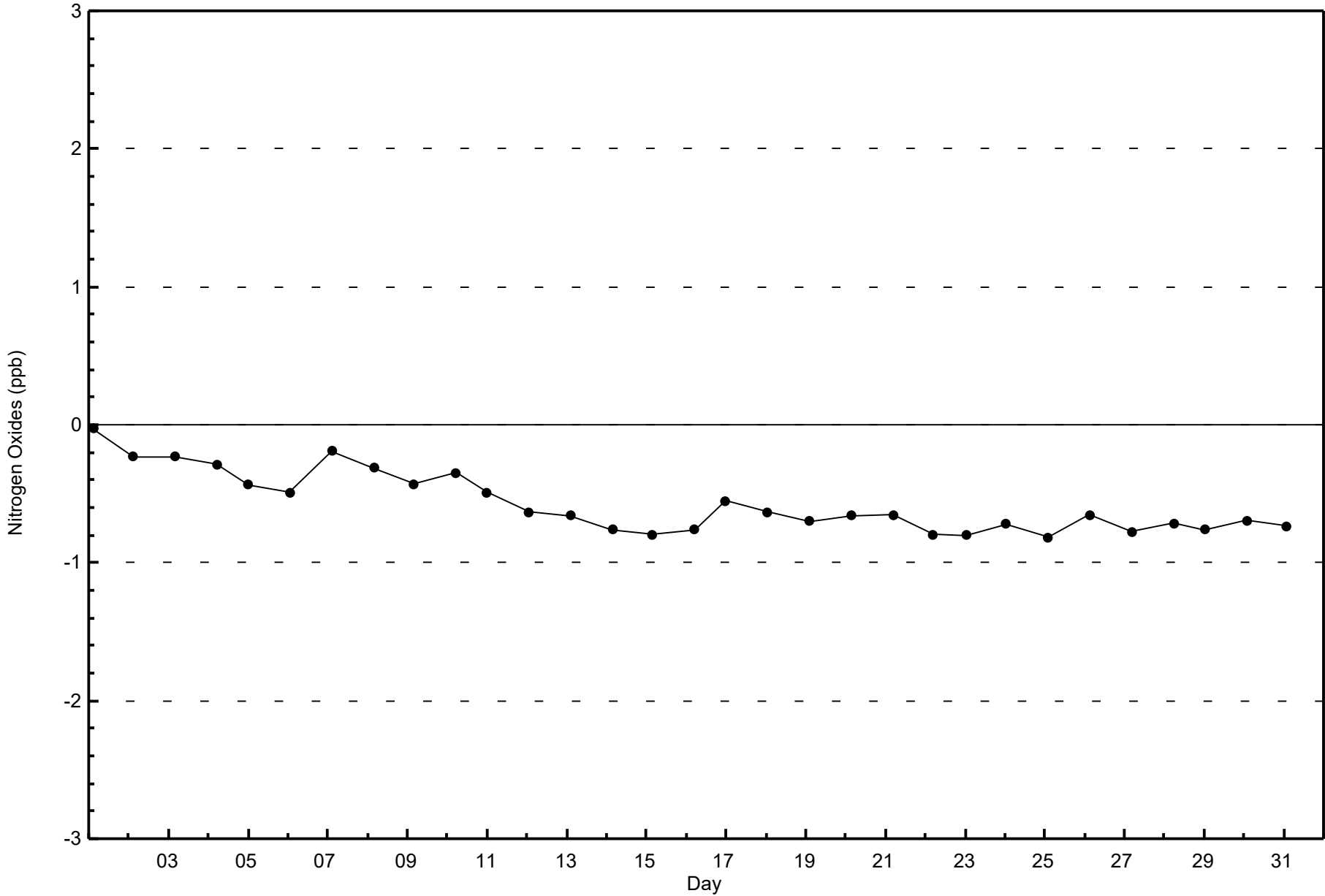
Total Number of Hours: 744

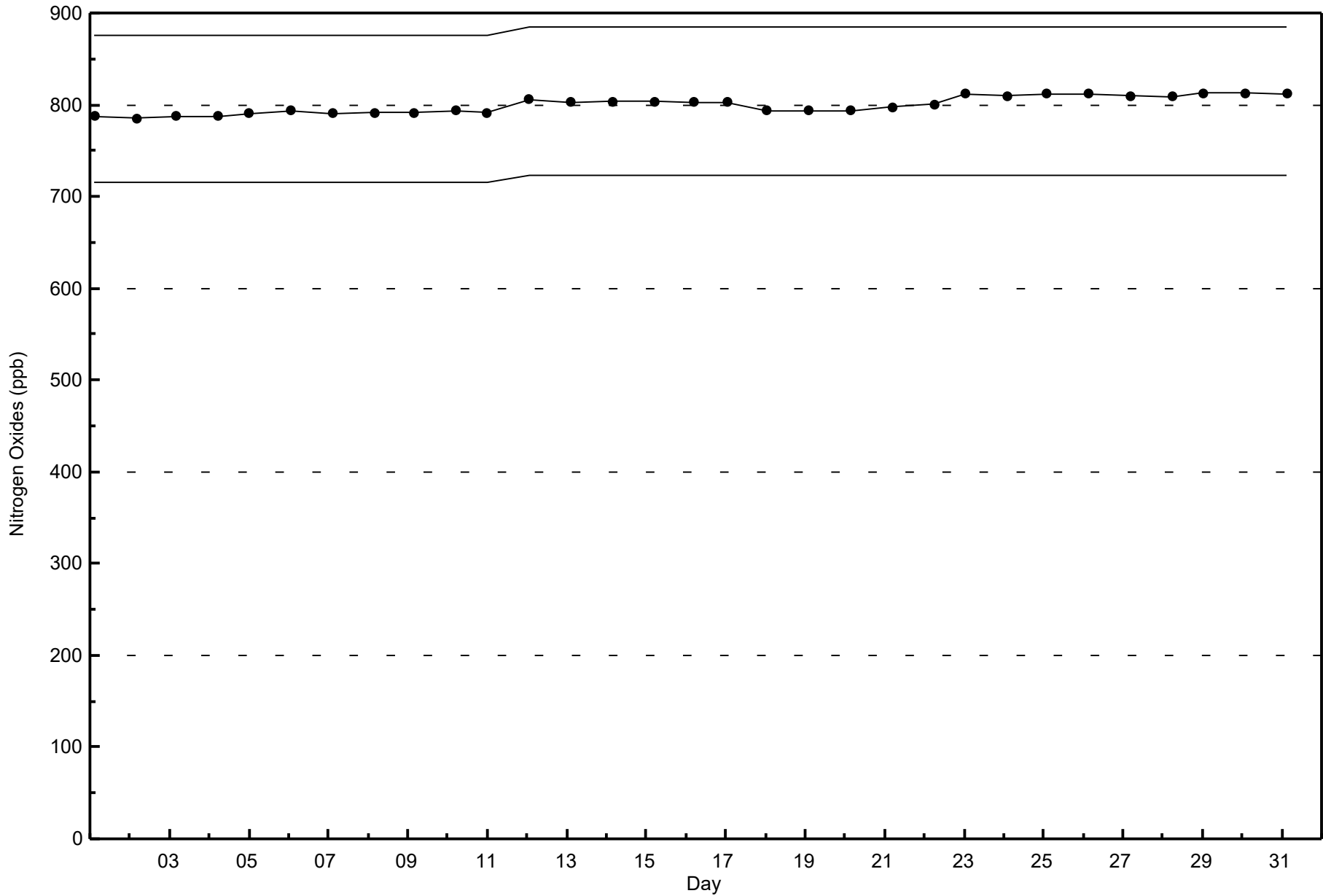


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitrogen Oxides (NO_x) - ppb
Fort Hills

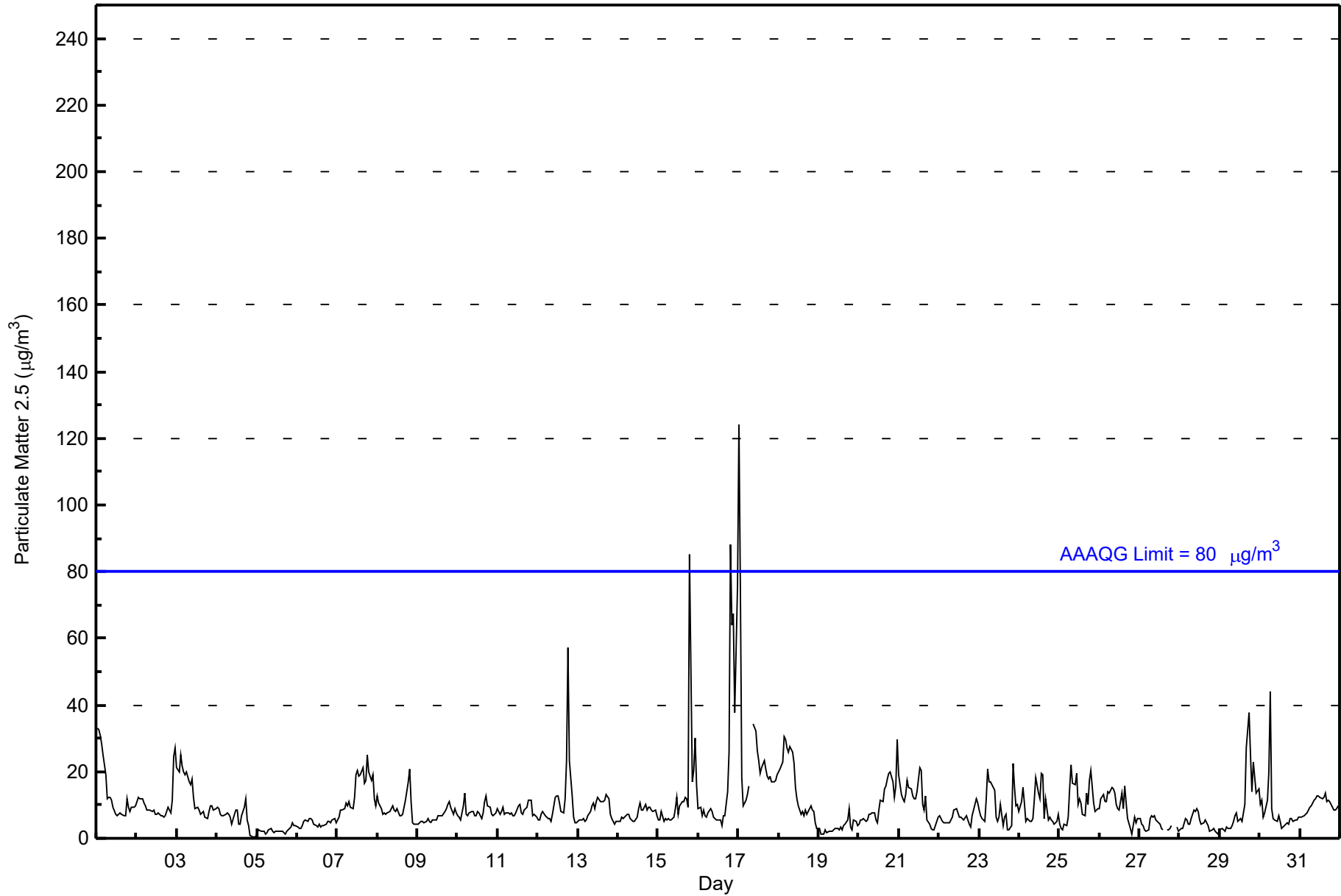








Number of Exceedences (AAAQO):		1-hr: 3	24-hr: 0	Hours in Service: 744																	Daily Average		Daily Maximum						
Maximum Value: 124.1 µg/m ³ on Oct 17 01:00		Maximum Daily Average: 27.0 µg/m ³ on Oct 17																	Hours of Data: 739		Hours of Missing Data: 5								
Minimum Value: 0.3 µg/m ³ on Oct 4 23:00		Minimum Daily Average: 2.3 µg/m ³ on Oct 5																	Hours of Calibration: 2		Percent Operational Time: 99.6								
Maximum Diurnal Average: 14.4 µg/m ³ at hour 20		Minimum Diurnal Average: 8.0 µg/m ³ at hour 15																											
Monthly Average: 9.92 µg/m ³		Percentiles: P ₁ = 1.4 P ₁₀ = 3.1 Q ₁ = 5.3 Median = 7.5 Q ₃ = 11.4 P ₉₀ = 18.9 P ₉₉ = 52.2																											
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-Oct	33.2	32.5	30.9	28.4	25.1	19.0	11.7	12.5	12.3	11.4	9.5	7.3	6.9	7.1	7.6	7.3	6.9	6.8	11.9	9.4	8.2	9.4	9.5	9.8	13.9	33.2			
2-Oct	11.0	12.3	11.9	11.7	10.4	9.9	8.7	8.5	8.5	7.9	8.4	7.1	7.1	7.8	6.9	6.9	6.5	6.7	8.0	9.4	7.7	11.6	24.5	26.9	10.3	26.9			
3-Oct	21.0	19.9	25.2	21.6	19.9	18.9	19.7	16.7	16.2	17.7	12.4	9.1	9.3	8.3	7.2	7.7	7.9	6.5	6.1	8.0	9.6	9.9	8.4	8.7	13.2	25.2			
4-Oct	9.3	9.0	7.3	6.7	6.6	7.2	7.7	7.3	6.3	4.3	7.1	8.3	8.6	4.2	4.2	6.8	9.5	12.0	5.6	4.0	1.0	0.4	0.3	0.5	6.0	12.0			
5-Oct	1.5	2.4	2.2	2.1	2.1	1.3	1.7	2.7	3.0	2.0	1.8	2.0	2.1	2.1	2.0	1.6	1.4	2.2	2.8	3.2	4.5	3.7	3.7	2.3	4.5				
6-Oct	3.4	2.8	2.8	3.9	5.1	5.5	5.2	6.1	6.0	5.4	4.2	3.8	3.5	4.4	3.4	3.6	3.7	4.2	5.0	5.0	4.6	5.3	5.9	4.8	4.5	6.1			
7-Oct	5.5	6.4	8.4	8.7	9.1	10.6	9.9	11.2	9.5	9.1	12.3	19.1	20.3	18.8	18.9	21.2	16.4	17.4	25.2	19.9	17.5	19.1	11.9	9.9	14.0	25.2			
8-Oct	12.7	10.8	9.0	7.4	7.7	7.4	7.7	7.9	9.1	9.8	8.6	8.1	9.0	6.6	6.8	7.2	9.3	11.5	16.9	20.7	10.9	4.6	4.4	4.4	9.1	20.7			
9-Oct	4.3	4.5	4.9	4.9	4.7	5.0	5.8	5.2	4.9	5.6	5.4	5.7	6.6	6.6	6.6	6.9	8.1	9.1	10.0	11.0	9.3	7.1	8.9	7.8	6.6	11.0			
10-Oct	6.7	6.3	5.6	9.8	13.5	7.2	6.7	7.7	8.0	8.0	6.7	6.9	8.0	7.7	6.1	7.8	11.1	12.7	9.7	9.3	7.4	6.8	7.1	7.4	8.1	13.5			
11-Oct	8.9	7.3	8.1	9.2	7.1	7.5	7.5	7.4	7.5	6.8	6.7	7.4	9.5	10.3	7.7	7.3	8.5	9.5	11.4	11.2	11.4	6.6	7.0	6.5	8.3	11.4			
12-Oct	5.5	5.6	7.2	8.0	6.8	6.3	6.0	5.9	5.2	7.4	12.5	12.7	12.8	10.5	8.2	7.5	11.7	23.1	57.2	23.3	12.9	6.6	4.8	4.7	11.4	57.2			
13-Oct	5.0	5.4	5.4	6.0	5.3	5.5	6.6	8.1	9.9	10.6	8.9	11.0	12.3	11.1	11.0	11.2	11.3	13.0	11.7	7.2	5.9	5.1	4.3	5.3	8.2	13.0			
14-Oct	4.9	5.2	6.4	6.1	6.5	7.2	7.1	6.1	5.6	5.0	5.3	6.4	8.9	10.5	8.6	8.4	10.2	8.3	9.5	9.4	8.6	8.2	8.4	6.8	7.4	10.5			
15-Oct	5.5	5.5	7.9	5.2	6.1	5.7	5.9	5.5	5.5	6.3	8.7	12.1	7.3	9.6	11.2	11.1	12.4	11.7	9.5	85.0	16.9	20.5	30.2	16.2	13.4	85.0			
16-Oct	9.0	9.2	7.0	8.4	6.6	6.3	7.4	8.8	8.0	6.5	6.0	5.5	5.5	5.4	4.0	6.9	6.8	13.8	26.0	88.0	63.9	67.2	37.6	75.7	20.4	88.0			
17-Oct	124.1	75.4	18.3	9.6	11.5	13.2	15.6	C	C	34.4	32.0	26.3	23.1	19.6	21.0	23.2	20.8	18.8	17.9	18.4	16.8	17.0	17.4	19.0	27.0	124.1			
18-Oct	20.0	20.7	23.0	30.3	29.7	27.2	25.9	27.4	25.8	22.4	15.2	12.0	9.9	7.2	8.1	6.9	8.4	7.0	8.1	9.9	8.6	8.3	4.8	3.0	15.4	30.3			
19-Oct	2.9	1.4	1.4	1.4	2.3	1.8	1.9	2.1	2.1	2.6	3.1	3.1	2.7	3.3	2.4	3.7	4.3	5.4	9.1	3.4	2.4	5.5	5.0	4.0	3.2	9.1			
20-Oct	4.1	5.6	5.3	5.9	5.2	5.4	7.2	7.3	7.7	7.4	5.4	4.9	8.4	11.5	11.1	15.0	15.5	17.7	19.4	19.9	16.7	12.4	15.8	29.7	11.0	29.7			
21-Oct	19.1	13.3	12.0	11.2	13.1	17.2	15.4	14.9	12.5	11.7	11.9	14.2	21.4	20.4	10.3	8.7	12.5	5.5	4.1	2.8	2.4	2.4	3.8	6.3	11.1	21.4			
22-Oct	6.9	5.9	5.1	4.8	4.8	4.7	4.6	5.6	6.2	8.5	9.0	7.7	6.3	6.5	5.8	5.6	6.8	5.6	4.0	3.5	6.6	10.1	11.8	10.5	6.5	11.8			
23-Oct	8.4	6.7	6.0	5.3	11.9	20.8	17.0	16.8	15.1	14.3	6.2	5.1	6.5	10.3	4.0	6.5	7.2	2.6	2.7	3.7	22.5	15.4	9.9	10.4	9.8	22.5			
24-Oct	7.9	11.1	15.1	10.7	5.0	6.0	4.9	5.2	6.1	11.3	18.2	13.6	11.9	19.6	18.9	6.0	11.9	5.6	6.5	5.6	5.2	4.2	5.0	7.4	9.3	19.6			
25-Oct	4.2	3.0	2.7	4.1	3.7	6.3	14.9	22.1	16.4	16.0	19.4	10.1	11.9	10.8	7.2	6.9	13.5	10.1	17.2	20.3	10.4	8.2	8.4	8.9	10.7	22.1			
26-Oct	8.9	11.8	13.1	10.9	11.2	13.9	13.6	15.2	14.7	13.5	10.2	8.9	8.7	13.7	9.1	15.8	10.6	6.1	3.0	1.5	3.7	6.5	4.8	5.9	9.8	15.8			
27-Oct	5.8	4.1	3.6	2.6	2.2	2.7	6.1	6.7	6.4	6.6	5.6	4.5	4.2	2.9	2.6	DF	2.4	2.4	3.1	3.7	DF	DF	3.3	2.2	4.0	6.7			
28-Oct	2.6	2.9	2.9	5.7	5.6	4.1	4.4	5.9	8.3	8.3	8.8	8.1	5.4	4.2	4.7	5.4	4.5	3.7	2.0	2.7	3.0	2.2	1.6	1.3	4.5	8.8			
29-Oct	2.4	2.9	2.7	2.2	3.3	3.1	2.9	3.9	5.2	6.8	7.7	5.0	5.8	5.2	7.8	10.0	27.0	37.7	24.9	13.9	22.7	18.3	13.7	14.7	10.4	37.7			
30-Oct	10.0	11.6	6.5	7.7	11.4	19.8	44.1	8.9	6.1	5.3	5.1	6.9	5.2	3.1	3.2	4.3	4.6	4.4	6.1	5.7	5.1	5.6	5.3	6.3	8.4	44.1			
31-Oct	6.3	6.3	6.7	7.4	7.5	8.6	9.5	9.7	11.3	12.1	12.5	12.6	12.2	12.0	12.5	13.6	11.1	11.4	11.0	9.2	8.6	8.4	8.7	9.8	10.0	13.6			
		12.3	10.6	8.9	8.6	8.7	9.2	10.1	9.3	9.0	9.8	9.5	8.9	9.1	9.1	8.0	8.7	9.8	10.1	11.8	14.4	11.1	10.6	9.5	10.9	Diurnal Average			
		124.1	75.4	30.9	30.3	29.7	27.2	44.1	27.4	25.8	34.4	32.0	26.3	23.1	20.4	21.0	23.2	27.0	37.7	57.2	88.0	63.9	67.2	37.6	75.7	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}) - $\mu\text{g}/\text{m}^3$
Fort Hills - October 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	205	27.74	27.74
6 - 15	428	57.92	85.66
16 - 25	77	10.42	96.08
26 - 80	26	3.52	99.59
> 81.0	3	0.41	100.00

Total Number of Valid Hours: 739

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 Hills - October 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	10	2	0	0	0	0	2	24	35	26	22	6	11	28	24	15	205
6 - 15	24	14	1	2	2	13	35	104	72	36	30	26	9	19	23	17	427
16 - 25	7	11	5	1	0	6	6	9	6	3	4	6	1	2	6	4	77
26 - 80	1	3	1	0	1	0	3	4	3	4	1	2	0	0	1	2	26
> 81.0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	3
Totals	43	30	7	3	3	19	47	142	116	69	57	40	21	49	54	38	738

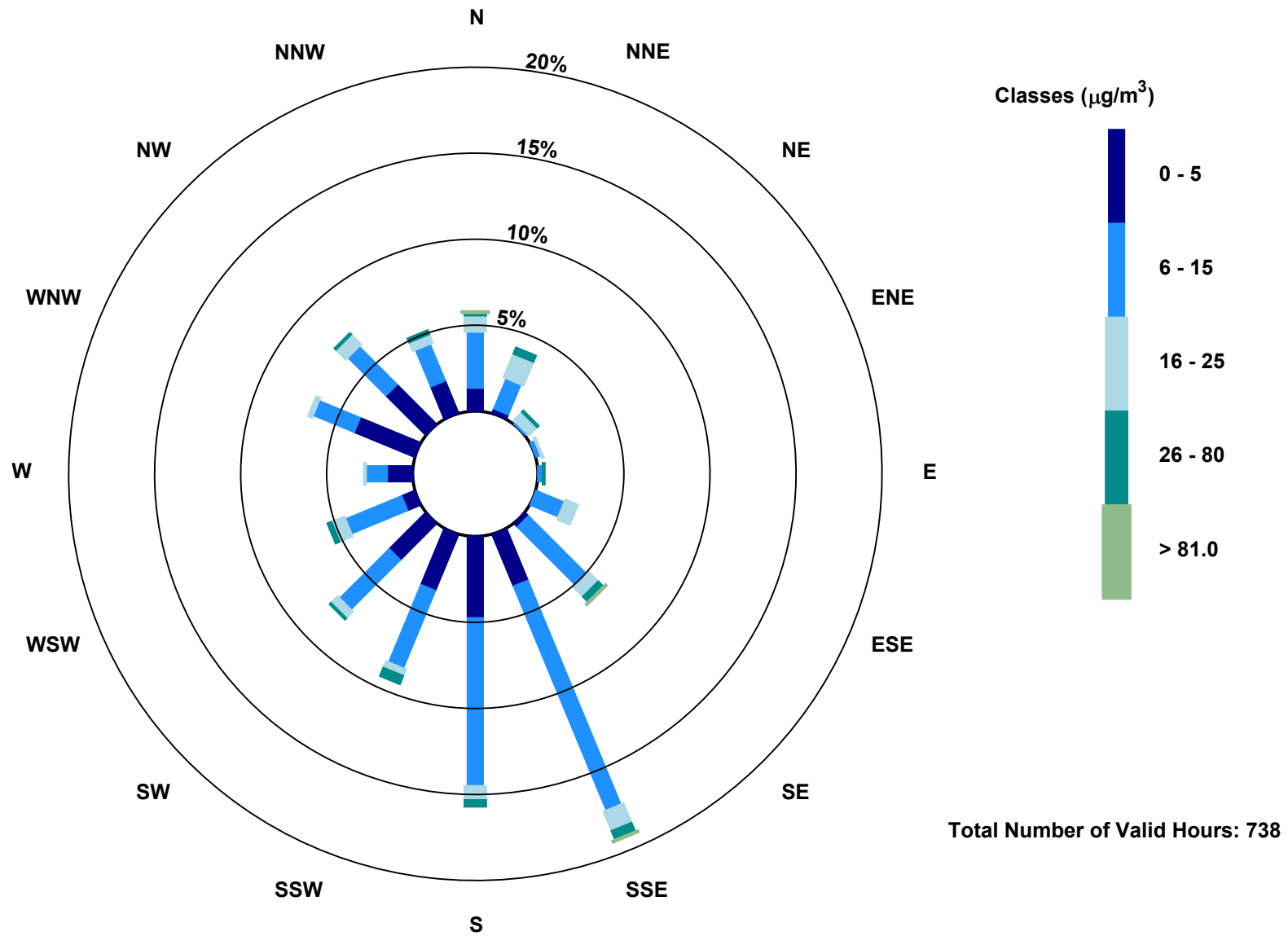
Total Number of Valid Hours: 738

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

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



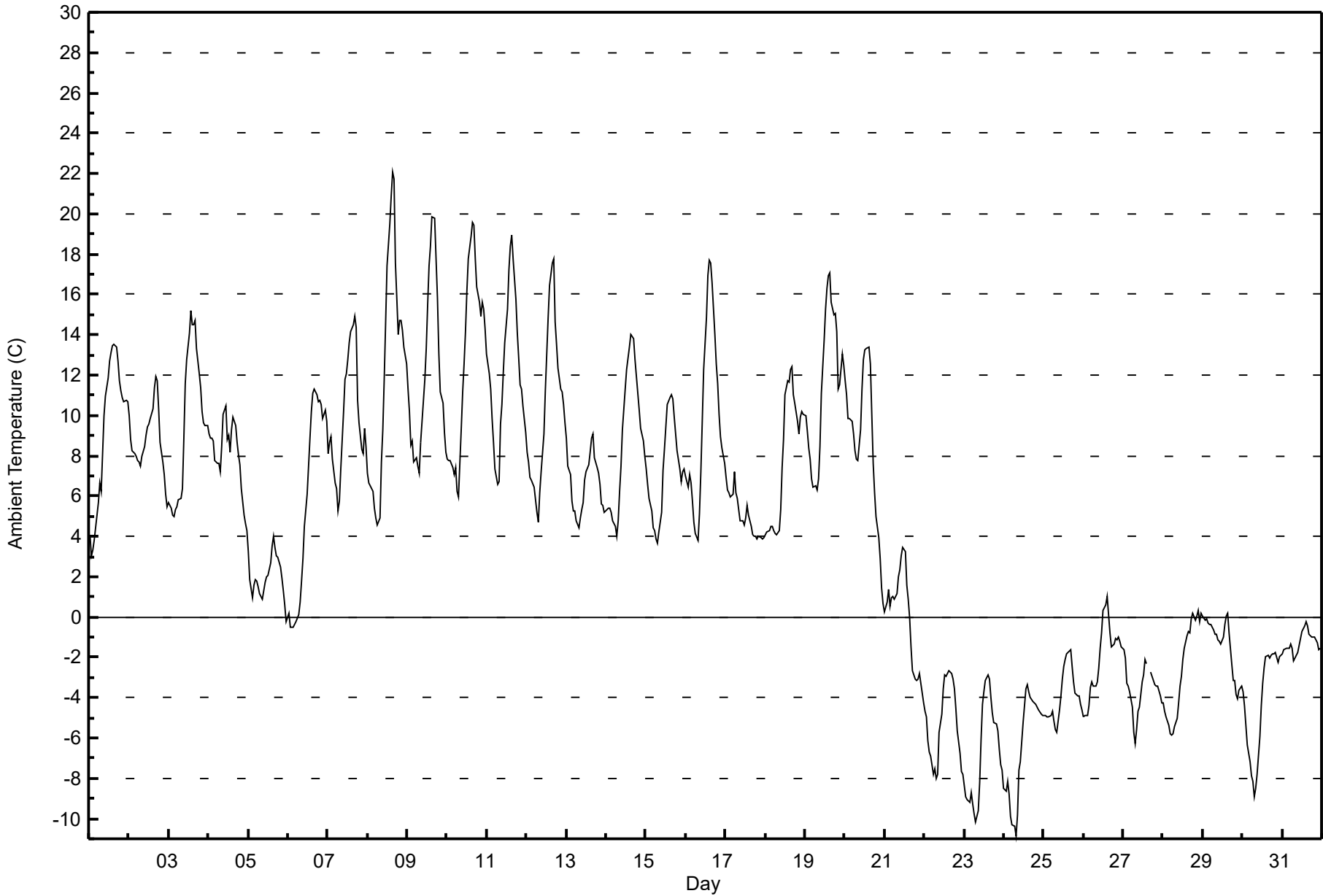
Total Number of Valid Hours: 738



Wood Buffalo Environmental Association
Summary of Hour Averages

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

Maximum Value: 22.1 C on Oct 8 16:00		Maximum Daily Average: 12.8 C on Oct 10		Hours in Service: 744																						
Minimum Value: -10.9 C on Oct 24 08:00		Minimum Daily Average: -6.7 C on Oct 23		Hours of Data: 743																						
Maximum Diurnal Average: 8.7 C at hour 16		Minimum Diurnal Average: 1.4 C at hour 8		Hours of Missing Data: 1																						
Monthly Average: 4.56 C		Percentiles: P ₁ = -9.5 P ₁₀ = -4.8 Q ₁ = -1.6 Median = 5.4 Q ₃ = 9.9 P ₉₀ = 13.4 P ₉₉ = 19.2		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-Oct	4.1	3.0	3.3	3.8	4.4	5.7	6.6	6.2	8.1	10.0	10.9	11.9	12.7	13.1	13.5	13.6	13.4	12.7	11.7	11.2	10.9	10.7	10.8	10.7	9.3	13.6
2-Oct	10.0	8.8	8.3	8.1	7.9	7.8	7.7	7.5	7.9	8.4	9.0	9.4	9.5	9.9	10.4	11.3	11.9	11.7	10.4	8.7	7.7	7.1	6.1	5.5	8.8	11.9
3-Oct	5.7	5.4	5.0	5.0	5.3	5.5	5.8	5.9	6.3	8.9	11.6	12.8	14.1	15.2	14.5	14.5	14.7	13.3	12.1	11.4	10.2	9.6	9.5	9.5	9.7	15.2
4-Oct	9.1	8.9	8.9	8.8	7.7	7.7	7.6	7.2	8.5	10.1	10.5	8.8	9.0	8.2	9.3	9.9	9.5	8.7	8.0	7.6	6.4	5.1	4.6	4.3	8.1	10.5
5-Oct	3.2	1.9	1.0	1.6	1.8	1.8	1.5	1.1	0.9	1.3	1.7	2.0	2.1	2.7	3.5	4.0	3.5	3.1	2.9	2.5	1.9	1.3	0.6	-0.3	2.0	4.0
6-Oct	0.2	-0.5	-0.5	-0.5	-0.4	-0.2	0.1	0.7	1.8	2.9	4.5	6.1	7.5	8.9	10.2	11.1	11.3	11.0	10.7	10.8	10.5	9.8	10.3	9.7	5.7	11.3
7-Oct	8.1	8.6	9.0	7.8	6.7	6.4	5.3	5.8	7.3	10.2	11.8	12.0	12.8	13.6	14.2	14.5	14.9	14.3	10.8	9.7	8.3	8.1	9.3	8.5	9.9	14.9
8-Oct	7.1	6.7	6.4	6.3	5.4	4.9	4.6	4.9	7.7	9.3	11.8	14.6	17.4	19.5	20.9	22.1	21.7	17.5	14.0	14.7	14.7	14.2	13.4	12.6	12.2	22.1
9-Oct	11.3	10.2	8.5	8.7	7.7	7.9	7.5	7.1	8.6	9.7	11.8	13.3	15.5	17.4	18.4	19.9	19.8	17.8	15.8	13.1	11.2	10.6	9.2	8.2	12.1	19.9
10-Oct	7.9	7.8	7.7	7.4	7.1	7.4	6.2	5.9	9.3	11.2	12.6	14.2	16.1	17.8	18.9	19.6	19.4	17.8	16.4	15.6	14.9	15.6	15.3	14.3	12.8	19.6
11-Oct	13.0	12.1	11.3	9.8	8.7	7.3	6.6	6.7	9.6	10.5	12.1	13.6	15.3	17.2	18.4	18.9	17.8	15.8	14.1	12.9	11.5	11.3	10.5	9.2	12.3	18.9
12-Oct	8.2	7.7	6.9	6.8	6.4	5.8	5.2	4.7	6.1	7.2	9.0	11.2	13.1	14.8	16.5	17.5	17.8	14.6	13.5	12.4	11.3	11.2	10.5	9.6	10.3	17.8
13-Oct	8.9	7.5	7.1	5.8	5.3	5.3	4.8	4.4	4.9	5.4	5.7	6.8	7.2	7.6	8.2	8.9	9.1	7.9	7.4	7.2	6.6	5.6	5.5	5.2	6.6	9.1
14-Oct	5.3	5.4	5.4	5.2	4.8	4.5	4.0	4.7	6.2	7.5	9.3	11.3	12.3	12.8	13.4	14.0	13.8	12.7	11.9	11.1	10.2	9.3	8.7	8.0	8.8	14.0
15-Oct	7.4	6.6	5.9	5.2	4.4	4.3	3.9	3.6	4.2	5.2	7.3	8.3	9.4	10.5	10.9	11.0	10.9	9.9	9.1	8.3	7.3	6.7	7.2	7.3	7.3	11.0
16-Oct	7.0	6.5	7.1	6.7	5.7	4.7	4.2	3.8	5.1	7.2	9.7	12.3	14.8	16.9	17.7	17.6	16.6	14.0	12.6	11.6	10.0	8.9	8.4	7.6	9.9	17.7
17-Oct	6.9	6.3	6.2	5.9	6.1	7.2	6.2	5.9	5.3	4.7	4.7	4.6	4.9	5.5	5.0	4.5	4.1	4.0	4.0	3.9	4.0	4.0	3.9	3.9	5.1	7.2
18-Oct	4.1	4.2	4.3	4.5	4.5	4.3	4.2	4.1	4.3	5.3	7.4	8.8	11.0	11.8	11.6	12.3	12.4	11.0	10.6	9.7	9.1	9.9	10.2	10.1	7.9	12.4
19-Oct	10.0	9.2	8.4	7.8	6.8	6.4	6.5	6.3	6.9	8.5	11.1	13.7	15.3	16.3	16.9	17.1	15.6	15.0	15.1	14.2	11.3	11.5	13.0	12.5	11.5	17.1
20-Oct	11.7	11.1	9.9	9.8	9.7	9.1	8.2	7.8	7.8	9.3	11.3	12.8	13.3	13.3	13.4	12.6	10.0	7.6	6.2	5.0	3.9	2.9	1.4	0.7	8.7	13.4
21-Oct	0.2	0.7	1.4	0.5	1.0	1.0	0.9	1.2	2.0	2.4	3.1	3.5	3.3	1.6	0.9	0.0	-1.5	-2.6	-3.0	-3.2	-3.1	-2.8	-3.3	-4.2	0.0	3.5
22-Oct	-4.7	-5.0	-6.1	-6.7	-6.9	-7.8	-7.5	-8.0	-7.8	-5.7	-4.8	-3.6	-2.9	-2.9	-2.8	-2.7	-2.8	-3.1	-3.5	-4.6	-5.7	-6.8	-7.7	-7.8	-5.3	-2.7
23-Oct	-8.4	-8.9	-9.1	-9.2	-8.7	-9.3	-9.8	-10.2	-9.6	-8.2	-6.1	-4.4	-3.7	-3.2	-2.9	-3.1	-3.9	-4.7	-5.2	-5.3	-5.6	-6.5	-7.3	-7.6	-6.7	-2.9
24-Oct	-8.5	-8.6	-8.2	-8.8	-9.9	-10.3	-10.4	-10.9	-9.8	-7.6	-7.2	-5.2	-4.4	-3.5	-3.4	-3.7	-4.0	-4.2	-4.3	-4.4	-4.5	-4.6	-4.8	-4.9	-6.5	-3.4
25-Oct	-4.9	-4.9	-4.9	-5.0	-4.9	-4.7	-5.2	-5.6	-5.7	-4.6	-3.9	-3.1	-2.5	-2.1	-1.9	-1.7	-1.6	-2.4	-3.2	-3.8	-3.9	-3.9	-4.3	-4.6	-3.9	-1.6
26-Oct	-4.9	-4.9	-4.9	-4.4	-3.5	-3.2	-3.4	-3.4	-3.2	-2.5	-1.6	-0.8	0.3	0.6	1.0	0.1	-0.8	-1.5	-1.4	-1.0	-1.2	-1.0	-1.2	-1.5	-2.0	1.0
27-Oct	-1.6	-2.0	-3.3	-3.4	-3.7	-4.5	-5.7	-6.3	-5.6	-4.6	-4.4	-3.2	-2.9	-2.1	-2.3	DF	-2.8	-2.9	-3.1	-3.3	-3.5	-3.4	-3.9	-4.3	-3.6	-1.6
28-Oct	-4.3	-4.6	-5.0	-5.4	-5.8	-5.9	-5.8	-5.5	-5.0	-4.2	-3.4	-3.0	-2.1	-1.5	-1.0	-0.7	-0.8	-0.1	0.2	-0.1	0.1	0.3	-0.2	0.2	-2.7	0.3
29-Oct	0.1	-0.1	-0.1	-0.3	-0.4	-0.3	-0.6	-0.8	-0.9	-1.1	-1.2	-1.4	-1.0	-0.4	0.1	0.2	-0.8	-2.4	-3.2	-3.2	-3.8	-4.0	-3.7	-3.4	-1.4	0.2
30-Oct	-3.7	-4.4	-5.4	-6.4	-7.2	-7.9	-8.2	-8.9	-8.5	-7.8	-5.9	-4.4	-3.3	-2.5	-2.0	-1.9	-2.0	-1.9	-1.9	-1.8	-1.8	-2.3	-2.0	-1.9	-4.3	-1.8
31-Oct	-1.8	-1.6	-1.5	-1.6	-1.6	-1.4	-1.6	-2.2	-1.9	-1.7	-1.4	-1.1	-0.7	-0.4	-0.2	-0.4	-0.9	-0.9	-1.0	-1.0	-1.1	-1.3	-1.6	-1.6	-1.3	-0.2
3.4 3.0 2.7 2.4 2.1 1.9 1.6 1.4 2.3 3.5 4.7 5.9 6.9 7.6 8.1 8.7 7.9 6.9 6.1 5.5 4.8 4.4 4.1 3.7																								Diurnal Average		
13.0 12.1 11.3 9.8 9.7 9.1 8.2 7.8 9.6 11.2 12.6 14.6 17.4 19.5 20.9 22.1 21.7 17.8 16.4 15.6 14.9 15.6 15.3 14.3																								Diurnal Maximum		
DF - DAS Failure																										





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	243	32.71	32.71
0 - 10	321	43.20	75.91
10 - 20	176	23.69	99.60
> 20	3	0.40	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

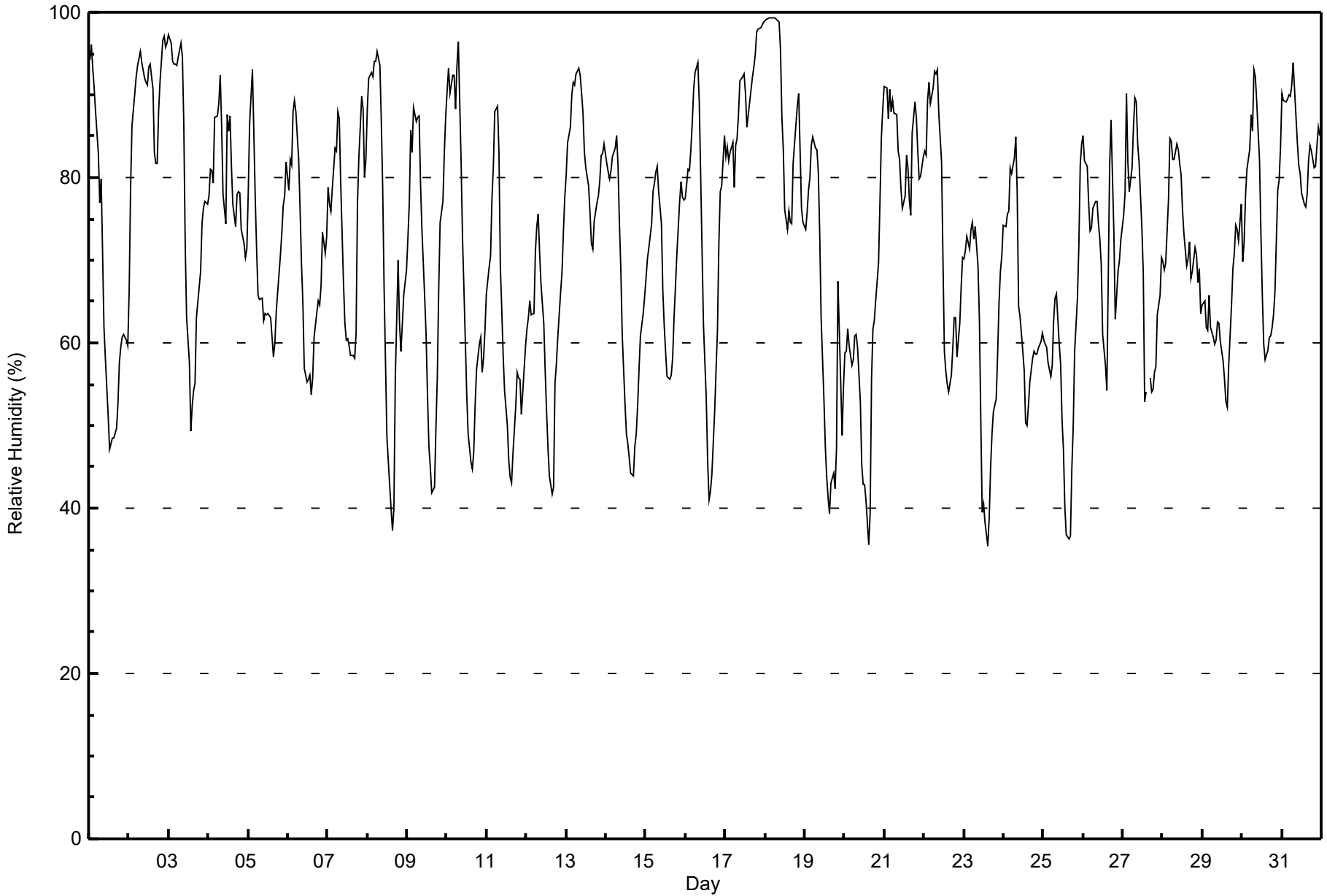
Relative Humidity (RH) - %
Fort Hills - October 2023

Maximum Value: 99.4 % on Oct 18 05:00																						Maximum Daily Average: 89.8 % on Oct 2																						Hours in Service: 744			
Minimum Value: 35.5 % on Oct 23 15:00																						Minimum Daily Average: 56.9 % on Oct 25																						Hours of Data: 743			
Maximum Diurnal Average: 84.1 % at hour 8																						Minimum Diurnal Average: 56.3 % at hour 16																						Hours of Missing Data: 1			
Monthly Average: 71.86 %																						Percentiles: P ₁ = 39.0 P ₁₀ = 51.4 Q ₁ = 60.2 Median = 73.7 Q ₃ = 83.5 P ₉₀ = 91.2 P ₉₉ = 98.9																						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-Oct	94.3	96.2	93.3	90.8	88.0	82.9	77.0	79.9	71.1	61.9	58.2	51.1	47.2	47.9	48.5	48.5	49.6	52.6	57.7	59.5	60.7	61.0	60.3	59.7	66.6	96.2																					
2-Oct	66.3	78.6	86.3	90.2	92.3	93.6	94.3	95.2	93.8	92.1	91.5	91.2	93.4	93.8	90.7	83.0	81.7	81.7	88.0	91.5	96.6	97.1	95.8	96.3	89.8	97.1																					
3-Oct	97.3	96.2	94.0	93.8	93.7	93.6	94.5	96.3	94.6	86.5	71.9	63.1	57.5	49.3	52.5	54.3	55.1	63.0	66.8	68.7	74.4	76.3	77.2	76.8	77.0	97.3																					
4-Oct	77.8	81.1	80.8	79.4	87.2	87.5	89.1	92.3	86.3	78.0	74.4	87.7	85.6	87.5	81.4	76.8	74.0	78.0	78.3	78.1	73.7	72.0	70.3	71.4	80.4	92.3																					
5-Oct	78.2	86.6	93.1	85.4	77.5	71.1	65.7	65.3	65.4	62.8	63.5	63.4	63.6	63.1	60.6	58.3	60.0	63.7	68.1	70.7	73.3	76.7	77.9	81.8	70.6	93.1																					
6-Oct	78.5	82.2	81.6	88.0	89.4	87.9	82.3	76.3	69.7	64.9	57.0	55.3	55.6	56.1	53.7	55.8	60.7	63.7	65.0	64.6	67.0	73.5	70.8	72.8	69.7	89.4																					
7-Oct	78.8	76.8	75.9	78.7	83.6	83.3	87.9	87.1	79.5	67.2	62.3	60.3	60.4	59.7	58.5	58.5	58.1	61.1	76.9	82.6	89.9	88.4	79.9	82.1	74.1	89.9																					
8-Oct	88.4	92.0	92.7	92.2	94.2	94.0	95.2	93.6	86.8	78.7	66.7	57.6	48.7	42.7	39.8	37.2	40.0	55.8	70.1	62.4	59.0	62.2	65.8	68.9	70.2	95.2																					
9-Oct	72.6	76.9	85.8	83.0	88.5	86.8	87.3	87.5	79.4	73.7	65.5	60.8	53.6	47.5	44.9	41.9	42.5	49.6	55.9	66.7	74.6	77.1	83.1	87.5	69.7	88.5																					
10-Oct	90.5	93.3	90.2	92.4	92.4	88.2	93.6	96.4	81.8	72.5	66.5	60.2	53.8	48.9	45.6	44.7	46.8	52.6	56.8	59.7	60.7	56.5	58.1	61.5	69.3	96.4																					
11-Oct	66.0	69.2	70.5	77.5	81.3	87.9	88.7	83.1	69.1	64.0	58.5	54.3	50.0	45.7	43.7	43.0	46.6	52.3	56.4	55.7	55.5	51.4	54.1	59.6	61.8	88.7																					
12-Oct	61.6	63.0	65.0	63.4	63.6	71.0	74.1	75.7	71.0	67.2	62.3	56.6	51.6	47.2	43.9	41.7	42.5	55.1	57.5	60.7	66.0	68.5	73.4	77.6	61.7	77.6																					
13-Oct	80.3	84.2	86.1	90.0	91.6	91.3	92.6	93.2	92.3	90.2	87.8	83.1	81.2	78.9	75.7	72.0	71.4	74.8	76.9	77.9	79.6	82.8	82.8	84.1	83.4	93.2																					
14-Oct	81.8	80.7	79.8	80.8	82.6	83.5	85.0	81.5	74.3	69.0	61.0	52.5	49.0	47.7	46.2	44.2	43.8	47.4	49.1	52.4	56.8	60.9	63.5	65.6	64.1	85.0																					
15-Oct	67.8	70.1	71.5	74.4	78.3	79.3	80.6	81.4	78.3	74.5	66.3	62.1	58.8	55.9	55.6	56.1	58.2	63.1	66.8	70.8	77.1	79.4	77.6	77.2	70.0	81.4																					
16-Oct	77.5	81.0	80.9	83.4	86.6	90.6	92.7	94.0	89.2	80.3	71.2	62.1	53.2	45.5	41.0	42.0	44.1	51.7	56.8	61.5	72.0	78.3	79.1	85.1	70.8	94.0																					
17-Oct	82.6	83.7	82.0	83.0	84.2	78.8	83.9	84.8	87.6	91.6	92.1	92.5	90.2	86.1	87.7	90.7	92.3	93.5	95.0	97.6	98.0	98.1	98.5	98.8	89.7	98.8																					
18-Oct	99.0	99.2	99.3	99.4	99.4	99.4	99.3	99.2	98.8	95.4	87.3	83.4	76.1	73.7	76.0	74.5	74.5	81.7	84.1	88.7	90.2	83.2	76.2	74.5	88.0	99.4																					
19-Oct	73.7	75.7	78.6	80.0	83.8	84.8	83.5	83.4	80.7	73.2	63.1	53.2	47.5	43.8	41.2	39.4	43.1	44.3	42.4	47.3	67.5	61.4	48.8	54.9	62.3	84.8																					
20-Oct	58.7	58.9	61.8	59.6	57.2	57.9	60.8	61.0	59.5	52.9	45.3	42.8	42.9	41.0	35.5	39.3	55.6	61.7	62.7	65.3	69.6	76.9	84.7	88.3	58.3	88.3																					
21-Oct	91.0	90.9	87.1	90.7	87.9	89.4	87.9	87.6	83.2	82.1	78.6	76.2	77.8	82.7	81.1	77.3	75.4	85.4	89.2	87.3	83.2	79.8	80.2	82.5	83.9	91.0																					
22-Oct	83.2	82.7	89.3	91.5	89.0	90.9	92.9	92.6	93.0	87.8	81.9	70.0	58.9	56.6	55.1	54.1	56.1	59.3	63.1	63.1	58.4	62.3	66.9	70.3	73.7	93.0																					
23-Oct	70.3	71.2	72.9	71.3	73.8	74.6	72.5	74.1	69.4	62.8	50.7	39.5	40.5	38.3	35.5	38.8	44.9	49.1	51.6	53.2	58.5	64.7	68.6	70.6	59.0	74.6																					
24-Oct	74.3	74.1	75.6	75.9	81.2	80.5	82.3	84.9	78.1	64.4	63.2	59.0	56.7	50.3	50.0	52.4	55.2	58.1	59.0	58.6	59.3	60.2	61.1	61.1	65.5	84.9																					
25-Oct	60.3	59.8	59.5	57.6	56.0	57.3	62.6	65.4	65.9	59.8	57.5	50.7	47.2	40.1	36.7	36.3	36.6	44.8	49.9	59.0	65.4	71.7	81.5	84.1	56.9	84.1																					
26-Oct	85.1	82.1	81.4	77.0	73.5	73.9	76.3	77.2	77.1	74.3	72.5	69.5	61.0	57.3	54.2	67.8	81.5	86.9	73.4	62.8	65.7	68.6	69.9	72.5	72.6	86.9																					
27-Oct	75.4	78.1	90.3	81.9	78.3	81.2	86.1	89.7	89.2	84.1	81.9	73.9	68.5	53.0	54.1	DF	55.8	54.1	54.5	56.5	57.2	63.3	65.7	70.3	71.4	90.3																					
28-Oct	69.8	68.8	69.7	77.3	84.8	84.5	82.2	82.2	84.0	83.4	81.7	80.4	76.1	73.3	69.4	70.2	72.3	67.7	68.6	71.5	70.7	67.3	68.9	63.6	74.5	84.8																					
29-Oct	64.6	65.1	61.9	61.5	65.7	61.9	60.7	59.9	60.4	62.5	62.4	60.2	57.7	55.6	52.9	52.2	57.3	64.7	69.0	70.8	74.3	73.8	72.4	76.8	63.5	76.8																					
30-Oct	69.8	72.2	77.8	81.1	83.4	87.6	85.6	93.0	92.2	89.1	82.0	73.2	65.7	59.8	58.0	59.1	60.7	60.9	61.9	63.5	66.1	78.4	79.6	83.8	74.4	93.0																					
31-Oct	90.1	89.3	89.2	89.6	90.0	89.8	91.2	93.9	87.5	84.2	81.5	80.5	78.2	76.7	76.5	78.0	82.0	83.8	83.2	81.1	81.3	84.0	86.2	85.1	84.7	93.9																					
																						77.6	79.4	80.8	81.3	82.5	82.7	83.5	84.1	80.3	75.2	69.9	65.4	61.6	58.3	56.3	56.3	58.7	63.3	66.2	68.1	71.0	72.7	73.5	75.7	Diurnal Average	
																						99.0	99.2	99.3	99.4	99.4	99.4	99.3	99.2	98.8	95.4	92.1	92.5	93.4	93.8	90.7	90.7	92.3	93.5	95.0	97.6	98.0	98.1	98.5	98.8	Diurnal Maximum	
DF - DAS Failure																																															



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	12	1.62	1.62
40 - 60	172	23.15	24.76
60 - 80	295	39.70	64.47
80 - 100	264	35.53	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

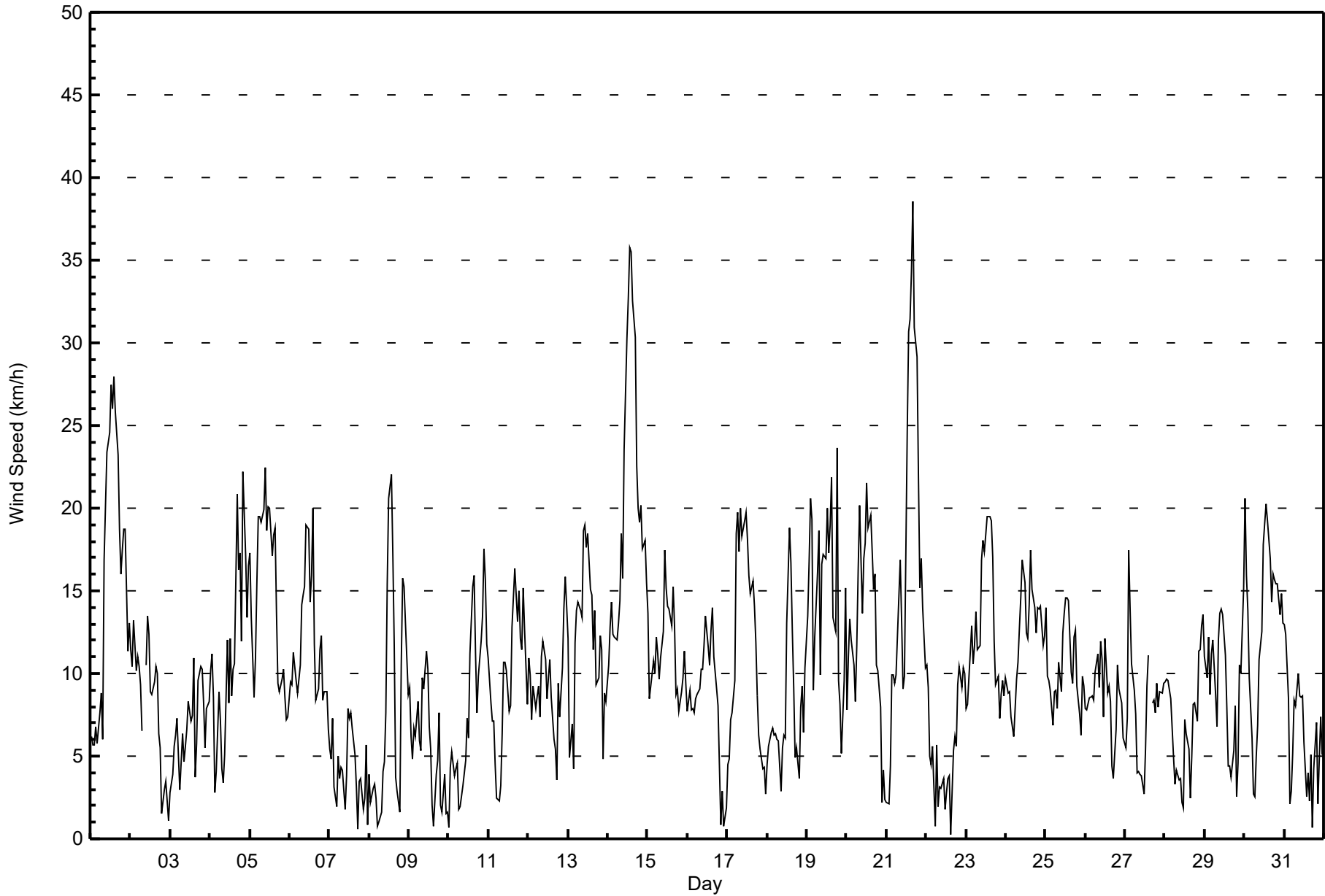
Wind Speed (WS) - km/h
Fort Hills - October 2023

Maximum Speed: 39 km/h on Oct 21 17:00 Minimum Speed Value: 0 km/h on Oct 22 16:00 Maximum Diurnal Speed Average: 6.3 km/h at hour 11 Monthly Average Velocity: 3.6 km/h 203.6 deg		Maximum Daily Speed Average: 20.4 km/h on Oct 14 Minimum Daily Speed Average: 1.2 km/h on Oct 31 Minimum Diurnal Speed Average: 0.9 km/h at hour 18 Percentiles: P ₁ = 1 P ₁₀ = 4 Q ₁ = 6 Median = 10 Q ₃ = 14 P ₉₀ = 18 P ₉₉ = 31		Hours in Service: 744 Hours of Data: 742 Hours of Missing Data: 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-Oct	S6	SSW6	SSE6	S7	SSE6	SSE8	SSE9	SSW6	S17	S20	SSE23	S25	SSW27	S26	S28	S26	S23	SSE19	SSE16	SSE17	SSE19	SSE19	S11	SSE13	\$15.5	S28	
2-Oct	S11	S10	SSE13	SSE10	SSE11	SE10	SSE9	S6	C	S10	S13	S12	S9	S9	S9	S10	S10	S6	SSW6	W2	NW3	NW4	NW2	WSW1	\$7.3	S13	
3-Oct	SSE3	SSE4	SSE6	SSE6	SSE7	SE5	SE3	S6	S5	S6	SSW7	SW8	SW7	SW7	SSW11	NNW4	ESE6	S10	S10	S10	SSW8	S5	SSE8	SSE8	\$5.7	SSW11	
4-Oct	SSE10	SSE11	SSE9	SSW3	NW4	N9	NNW7	NW4	WNW3	WNW5	WNW12	NW8	NW12	NNW9	NW10	WNW11	NW21	NW16	NW17	WNW12	WNW22	NW17	WNW13	NW17	NW8.2	WNW22	
5-Oct	NNW17	NW13	WNW9	WNW11	NW15	NW19	NW19	NW19	NW19	NW20	NW22	NW19	NW20	NW20	NW17	NW18	NW19	WNW14	W9	WSW9	SW10	SW10	SW9	SW7	SSW7	WNW12.7	NW22
6-Oct	SSW9	SSE9	S11	S10	S10	S9	S11	S14	SSW15	S15	S19	SSW19	SSW14	S16	SSW20	S12	SSE8	S9	SSE11	S12	S8	S9	WSW9	WSW7	\$11.3	SSW20	
7-Oct	SSE5	SW5	SW7	SSW3	SSE2	SE5	SE4	S4	SSE4	SSE2	SE4	SE8	ESE7	ESE8	ESE7	ESE5	ESE3	WSW1	N4	N4	NE2	SE2	SE6	W1	\$E2.9	SE8	
8-Oct	NNW4	SW2	SW3	SW3	NW2	WNW1	NNW1	N2	NNW4	WNW5	SSW8	S15	SSW21	S22	S17	S12	WNW4	NNE3	ESE2	SE10	SE16	SSE15	SSE13	SSE9	\$5.7	S22	
9-Oct	SSE9	S6	SW5	S7	SSW6	SSW8	SSW6	S5	SSW10	SSW9	S11	SSE10	SE7	ESE5	S2	ESE1	SSE4	ESE5	ESE8	NNE2	ENE2	SSE4	SE2	N2	\$4.5	S11	
10-Oct	S1	S4	SW5	SW4	SW4	SSW5	SW2	SSW2	S3	S4	S5	SSE7	SE6	SSE11	SSE15	SE16	SE11	ESE8	ESE10	SE12	SSE13	SE18	SE16	SE12	\$SE7.2	SE18	
11-Oct	SE11	SSE8	SE7	SSE7	SSE5	SSE2	S2	SSE3	SSE6	SSE11	SSE11	SSE10	SE8	SE8	SE13	ESE15	SE16	SE13	SE15	SE12	SSE11	SSE15	SSE13	SSE8	\$E9.3	SE16	
12-Oct	SSE11	SSE10	SSE7	SE9	SE8	SSE9	SSE9	SSE7	S11	S12	SSW11	S8	S10	S11	S9	SSE6	SE5	SE4	SE9	SSE7	SE10	SSE14	SSE16	SSE14	\$SE9.0	SSE16	
13-Oct	SSE12	SSE5	S7	SSE4	SSE12	SSE14	SSE14	SSE14	S13	SSE19	SSE19	S18	SSE18	S15	S15	SSE11	SE14	ESE9	ESE10	SE12	SSE11	SSE5	SSE9	S8	\$SE11.5	SSE19	
14-Oct	SSE11	SSE13	SSE14	SSE12	SSE12	SSE12	SSE13	SSE14	SSE18	SSE16	SSE24	SSE30	SSE33	SSE36	SSE36	SSE33	SSE30	SSE23	SSE20	SSE19	SSE20	SSE18	SSE18	SSE15	\$SE20.4	SSE36	
15-Oct	SSE14	SSE8	SSE9	SSE11	SE10	SSE12	SSE11	S10	S11	S13	S17	S15	SSW14	S14	S13	S15	S13	S9	S9	SSE8	S9	S10	SSE11	S9	\$11.1	S17	
16-Oct	SSE8	SSE9	S8	S8	SSE8	SSE8	SSE9	SSE9	S10	SSE10	S12	S13	S12	S11	SSW13	S14	SSE11	SSE9	SE8	SE4	SE1	SSE3	SSW1	NW2	\$7.8	S14	
17-Oct	N5	NNW5	N7	NNW8	N10	N18	N20	N17	NNE20	NNE18	NNE19	NNE20	NNE18	NNE16	NE15	NNE16	NNE14	NNE12	N9	N6	NNW5	NNW4	WNW4	NNW3	\$11.6	NNE20	
18-Oct	W5	SSW6	S6	S7	SSW6	SSW6	SW6	SSE6	WSW3	SSW5	S6	SSW6	S13	S19	S17	SSE13	SSE9	SSW5	SE6	S4	SSW8	SSW9	SSE6	S10	\$7.2	S19	
19-Oct	SSW13	SW17	SW21	SW19	SSW9	SSW12	SSW16	SSW19	S10	SSW17	SW17	SW17	SW20	SW17	SW19	SW22	SW13	SW13	WSW24	SW10	SE8	WSW5	WSW10	SW15	\$W14.4	WSW24	
20-Oct	SW8	SW11	SW13	WSW12	WSW11	WSW8	WSW12	WSW16	WSW20	WSW14	WNW17	NW18	NNW22	NNW19	NNW20	N17	NE15	NNE16	NE10	NE10	NE8	NNE2	NW4	NNW2	\$W6.5	NNW22	
21-Oct	WNW2	SSE2	SSE4	S10	SE10	SSE9	SSE10	SSE15	SSE17	S13	S9	N10	NNE25	NNE31	N31	N34	N39	N31	N29	N22	N15	N17	N14	NNE10	\$NNE9.2	N39	
22-Oct	NNE10	N9	NNW5	NNW4	N6	NW1	S6	SW2	WNW3	SSW3	W4	NW2	N3	SSE4	SSE4	SE0	N5	NNE6	NNW6	NNW9	NW10	NW9	NW10	NW10	\$NNW3.6	NNE10	
23-Oct	WNW8	WNW8	WNW10	W13	WSW11	WSW12	WSW14	SW11	WSW12	WSW17	W18	WNW17	NW18	NW19	WNW19	NW19	NW17	WNW12	WNW9	W10	SW7	SSW9	SW10	SW9	\$W11.2	NW19	
24-Oct	SW10	SW9	SW9	SW7	SSW7	SSW6	SSW10	SSW11	SSW13	WSW15	WSW17	WSW15	WSW12	NW12	NW14	WNW17	WNW15	WNW14	WNW12	WNW14	WNW14	WNW14	WNW12	WNW12	\$W9.7	WNW17	
25-Oct	WNW14	W10	W10	WNW9	W7	WSW9	SW9	WSW8	SW11	WSW9	SW12	SW14	WSW15	W15	W14	W10	WNW9	NW12	NW13	NW9	WNW8	WSW6	SSW10	SSW9	\$W9.0	WSW15	
26-Oct	SSW8	WSW8	SW9	WSW9	WSW9	SW8	SW10	SW11	SW9	SW12	WSW11	SW7	NW12	NW9	NW9	NNE8	ESE4	SE4	WNW7	WNW11	WSW9	SW9	SSW8	WSW6	\$WSW6.1	NW12	
27-Oct	WSW6	NNW7	N17	N14	NNW11	NNW9	NNE8	NNE4	SSE4	SSE4	W4	NNW3	WNW5	NNW9	NNW11	DF	NW8	WNW8	WNW8	W9	W8	SSW9	SSW9	S9	\$NW4.2	N17	
28-Oct	SSW9	SW10	SW10	WSW8	SW7	SSW5	SSE3	WSW4	W4	WNW4	NNW2	NNW2	N7	NNE6	NNE5	SE2	SSW5	W8	WNW8	WNW7	NNW11	NW11	NW13	NW14	\$W3.8	NW14	
29-Oct	W11	WNW10	NW12	W9	W11	WNW12	WNW9	WNW7	NW12	NNW14	NNW14	NNW14	NNW11	NNW8	NNW4	NNE4	E4	NE5	ENE8	E3	N5	N10	N10	NNE15	\$NNW7.0	NNE15	
30-Oct	NNE21	NNE16	N14	N10	N6	NNE3	N3	WSW5	SSW7	SSW11	S13	S18	S19	S20	SSW19	S17	S14	S16	SSW16	SSW15	SSW15	SSW14	S15	SSE13	\$7.2	NNE21	
31-Oct	S13	S12	SSE8	SSE2	NNW3	N5	N8	N8	N10	N9	N9	NNE9	NE6	ESE3	ESE4	E2	ENE5	S1	NNW4	N7	NNE2	SSW5	SSW7	SSW5	\$NE1.2	S13	
SSW3.5SSW3.7SSW4.0 SW3.9SSW3.0SSW3.1SSW3.4SSW4.6SSW5.2SSW5.8SSW6.3SSW5.7 SW4.5SSW3.7SSW4.3 S2.9 SSE1.7SSW0.9SSW1.3SSW2.0SSW2.9SSW4.0SSW4.3SSW3.4																								Diurnal Average			
NNE21 SW17 SW21 SW19 NW15 NW19 N20 NW19WSW20 NW22 SSE24 SSE30 SSE33 SSE36 SSE36 N34 N39 N31 N29 N22WNW22 SSE19 SSE18 NW17																								Diurnal Maximum			
C - Calibration 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
Fort Hills - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	155	20.89	20.89
6 - 11	323	43.53	64.42
12 - 19	217	29.25	93.67
20 - 28	35	4.72	98.38
29 - 38	11	1.48	99.87
> 38	1	0.13	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 - October 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	8	2	2	3	9	14	23	12	13	10	6	6	10	10	17	155
6 - 11	18	7	4	1	0	9	20	64	56	38	31	19	12	19	11	14	323
12 - 19	9	11	1	0	0	1	13	44	40	16	13	13	4	19	28	5	217
20 - 28	2	4	0	0	0	0	0	5	8	3	3	2	0	1	5	2	35
29 - 38	4	1	0	0	0	0	0	6	0	0	0	0	0	0	0	0	11
> 38	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Totals	44	31	7	3	3	19	47	142	116	70	57	40	22	49	54	38	742

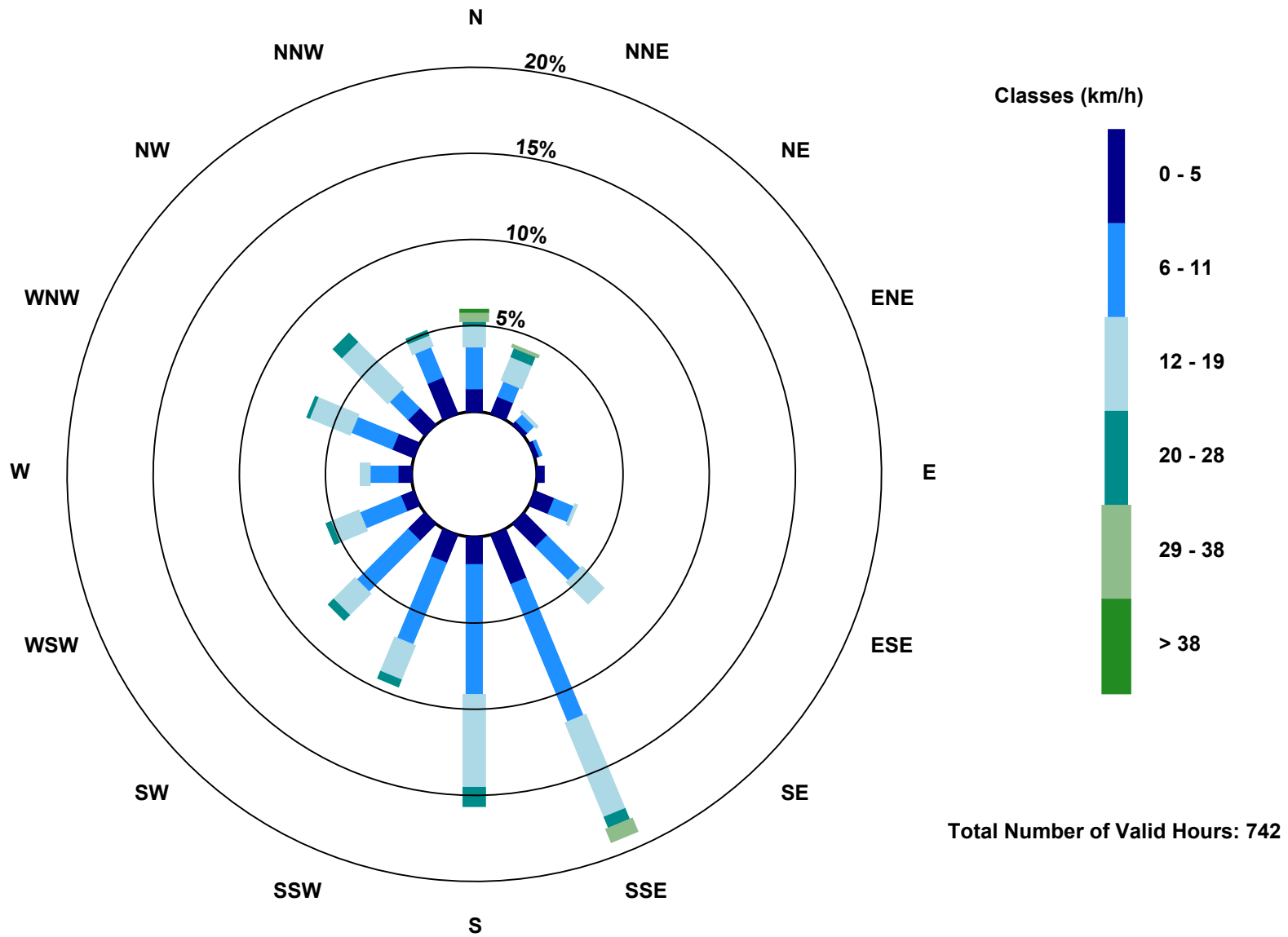
Total Number of Valid Hours: 742

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

Wind Speed (WS) - km/h
Fort Hills





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 9 km/h on Oct 19 19:00 Minimum Value: 1 km/h on Oct 8 03:00 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: 742 Hours of Missing Data: 2 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-Oct	1	2	2	1	2	2	1	1	4	3	4	4	5	5	5	4	4	3	2	2	2	2	3	3	5
2-Oct	2	2	2	2	1	1	2	1	C	1	2	2	1	1	2	1	1	1	1	1	1	1	1	1	2
3-Oct	1	2	1	2	2	2	2	1	1	1	2	2	3	3	3	3	2	1	1	1	2	2	1	1	3
4-Oct	2	2	3	1	3	2	1	1	1	2	3	4	6	3	3	3	6	5	4	2	6	4	5	4	6
5-Oct	4	3	3	4	3	7	5	5	5	6	5	5	4	4	5	4	4	2	1	2	1	1	1	2	7
6-Oct	1	1	1	2	1	1	2	2	3	2	3	3	2	3	4	4	2	1	1	2	2	1	1	2	4
7-Oct	2	1	1	1	1	1	2	1	1	1	2	2	2	2	1	1	2	1	1	1	1	1	2	1	2
8-Oct	2	1	1	1	1	1	1	1	2	2	4	3	3	4	4	3	1	1	1	4	3	2	1	1	4
9-Oct	1	3	2	2	1	2	2	1	3	2	3	2	3	2	2	1	3	1	2	1	1	1	1	1	3
10-Oct	1	1	1	1	1	1	1	1	2	2	3	3	2	4	3	3	2	2	2	1	2	2	2	2	4
11-Oct	2	3	2	2	2	1	2	1	4	2	2	3	3	4	3	4	3	2	2	2	3	2	3	1	4
12-Oct	1	1	3	2	2	1	1	1	2	2	3	3	3	3	2	2	1	1	3	4	5	2	2	2	5
13-Oct	3	2	2	1	3	1	1	2	1	4	3	3	3	2	3	2	3	2	3	2	3	2	1	2	4
14-Oct	1	1	1	2	1	2	2	3	2	2	4	4	5	5	5	5	5	3	2	3	2	2	3	2	5
15-Oct	2	2	1	1	2	1	1	1	2	2	3	2	3	4	2	2	3	1	1	1	1	1	1	2	4
16-Oct	1	1	1	1	2	1	1	1	1	1	1	2	3	2	3	2	2	2	2	2	1	1	1	1	3
17-Oct	1	3	2	2	4	3	3	4	6	4	4	3	3	3	3	3	3	2	2	2	1	1	2	1	6
18-Oct	2	2	1	1	1	1	2	1	1	2	2	3	5	3	3	2	2	2	3	2	2	2	1	2	5
19-Oct	2	1	2	3	2	2	3	3	3	2	3	3	3	3	3	4	4	4	9	6	2	2	5	3	9
20-Oct	4	2	2	2	3	2	2	3	3	5	4	4	5	4	4	4	2	3	3	3	3	2	2	1	5
21-Oct	1	2	2	2	1	2	1	3	2	2	4	4	5	6	6	7	7	6	5	4	3	3	3	2	7
22-Oct	2	2	1	1	1	2	1	1	1	2	1	1	2	2	2	2	2	2	2	2	2	2	2	3	3
23-Oct	2	2	2	2	2	2	2	2	3	3	3	4	5	5	4	4	4	3	2	2	1	1	2	1	5
24-Oct	1	1	2	1	1	2	2	3	2	3	2	3	3	3	3	4	4	3	3	3	3	3	3	3	4
25-Oct	3	2	2	2	2	1	1	2	1	3	2	3	3	4	3	2	3	3	3	2	2	2	1	1	4
26-Oct	1	1	1	2	2	1	2	2	3	2	2	3	3	3	2	3	1	2	4	2	2	1	1	1	4
27-Oct	1	7	3	3	2	2	2	1	1	1	1	2	3	3	3	DF	2	2	2	2	1	1	1	1	7
28-Oct	2	1	1	1	1	2	1	1	1	1	1	1	2	3	3	2	1	2	2	1	3	3	3	3	3
29-Oct	2	2	3	2	2	2	2	1	4	3	3	4	3	3	2	2	1	4	2	1	2	2	3	3	4
30-Oct	4	3	3	2	2	1	2	1	3	1	2	2	3	3	3	2	2	2	2	2	2	2	2	2	4
31-Oct	2	2	1	2	1	1	1	1	2	2	2	1	2	1	1	1	2	1	2	1	1	1	1	1	2
Diurnal Maximum																									
C - Calibration		DF - DAS Failure																							



Wood Buffalo Environmental Association
Summary of Hour Averages

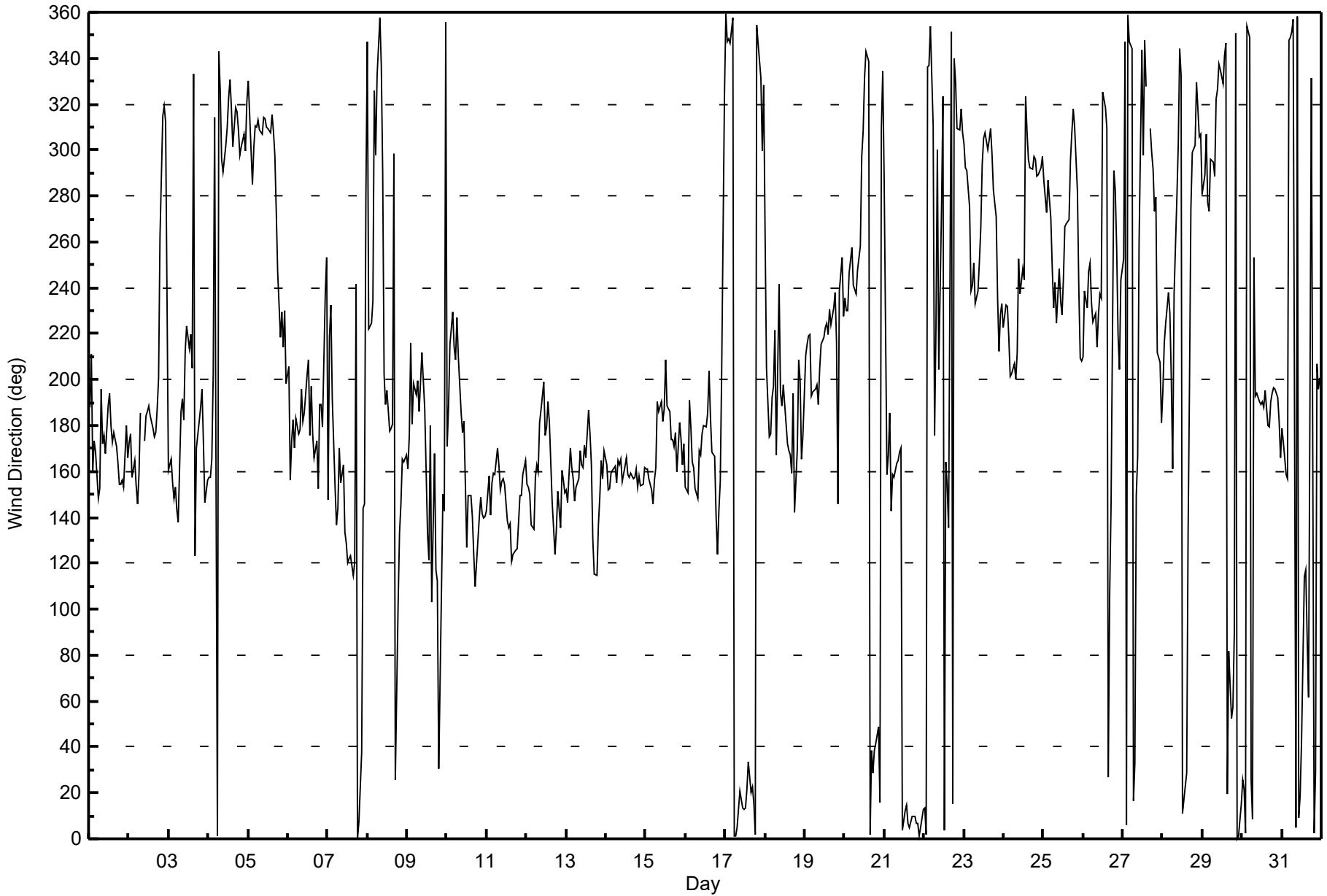
Wind Direction (WD) - deg
Fort Hills - October 2023

Direction of Maximum Speed: 7 deg on Oct 21 17:00																					Hours in Service: 744				
Direction of Maximum Daily Speed Average: 159.0 deg on Oct 14																					Hours of Data: 742				
Direction of Minimum Speed: 135 deg on Oct 22 16:00										Direction of Minimum Daily Speed Average: 1.2 deg on Oct 31											Hours of Missing Data: 2				
Monthly Average Direction: 203.6 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-Oct	188	211	160	173	168	148	152	196	172	176	168	189	194	180	173	177	171	164	154	155	156	153	180	166	171.9
2-Oct	173	176	157	165	154	146	159	185	C	173	184	186	189	184	179	175	177	187	201	262	315	319	312	237	176.3
3-Oct	160	165	155	148	153	143	138	186	191	183	212	223	214	220	205	333	123	171	182	188	196	173	147	156	179.8
4-Oct	157	157	165	203	314	1	343	326	296	290	302	310	323	331	318	301	318	317	309	298	301	307	299	321	308.4
5-Oct	330	315	285	302	310	310	313	309	307	314	314	310	309	308	315	308	298	273	247	218	230	214	230	199	299.9
6-Oct	206	156	173	183	170	183	176	178	196	182	186	202	209	176	197	176	166	174	152	189	189	180	237	253	186.4
7-Oct	148	219	232	192	153	137	144	170	155	163	134	129	120	122	123	115	120	242	0	7	38	144	146	280	142.2
8-Oct	347	222	224	234	326	298	333	357	337	290	202	189	195	178	179	181	298	26	102	133	146	165	164	167	179.8
9-Oct	161	176	216	181	199	193	199	186	199	212	187	160	133	122	180	103	168	117	112	31	69	150	143	356	171.5
10-Oct	171	188	215	229	214	209	227	210	186	177	182	155	127	149	150	141	124	110	120	140	149	142	140	141	150.0
11-Oct	143	158	141	155	159	159	170	163	152	155	157	154	139	135	137	121	124	125	127	138	149	150	159	165	143.4
12-Oct	154	153	150	137	135	158	163	160	181	187	199	176	180	191	181	147	135	124	135	151	136	161	156	151	160.5
13-Oct	152	147	170	161	157	147	153	157	169	163	162	172	166	186	177	163	131	115	115	137	149	165	157	169	157.3
14-Oct	163	152	153	159	161	163	155	165	163	165	156	162	166	159	157	159	157	157	161	153	158	154	155	162	159.0
15-Oct	161	161	157	152	146	156	162	190	186	190	182	187	209	188	186	174	174	171	177	160	181	174	163	172	174.6
16-Oct	153	151	191	180	164	162	153	148	169	167	176	180	179	185	204	184	168	167	141	124	143	156	203	324	170.3
17-Oct	359	347	349	347	357	1	1	5	13	21	13	13	13	21	34	20	23	15	2	354	347	331	300	328	8.4
18-Oct	263	205	175	176	192	197	221	167	242	194	189	198	189	172	169	167	159	194	142	170	209	199	165	176	183.4
19-Oct	210	216	219	220	193	195	196	198	189	205	216	218	222	225	220	230	224	231	238	217	146	239	253	227	216.5
20-Oct	235	230	230	246	257	241	239	237	248	258	297	308	331	343	339	2	38	29	38	42	49	16	309	334	304.6
21-Oct	287	159	167	185	143	159	158	163	165	169	170	4	12	15	7	5	7	10	10	7	6	1	5	13	18.0
22-Oct	14	2	336	337	354	311	176	222	300	204	276	324	4	164	154	135	351	15	340	329	309	309	318	307	328.9
23-Oct	303	292	291	275	239	241	251	233	238	252	266	293	305	307	300	305	309	298	282	271	236	213	228	233	274.7
24-Oct	223	233	232	218	201	203	207	200	212	252	237	248	243	324	308	296	293	292	297	296	289	289	292	297	264.6
25-Oct	287	279	273	287	270	249	231	242	225	249	234	228	244	267	268	270	295	307	318	310	282	239	210	208	262.0
26-Oct	210	239	231	247	251	234	225	229	214	228	237	236	325	318	309	27	106	145	291	282	258	219	205	244	247.3
27-Oct	253	347	6	359	347	344	17	33	149	167	259	343	298	348	327	DF	309	299	292	273	279	212	207	181	316.5
28-Oct	196	216	224	238	229	201	161	237	280	302	344	333	11	17	29	133	198	275	299	302	330	318	306	307	281.1
29-Oct	280	289	307	277	273	296	295	288	322	327	338	335	329	341	347	19	81	52	58	90	351	0	1	15	328.8
30-Oct	26	21	2	354	349	25	9	253	193	194	190	189	190	188	195	180	179	190	194	196	196	192	182	166	188.7
31-Oct	179	173	159	157	348	349	351	357	5	358	9	19	42	114	117	88	61	190	331	3	29	207	196	201	34.9
197.2 202.9 208.7 213.8 205.5 199.9 199.7 204.9 206.2 209.3 209.1 210.7 221.2 199.9 203.9 188.6 156.9 191.3 194.8 198.7 202.0 194.8 198.6 202.9																									
Diurnal Average																									
C - Calibration 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
Fort Hills - October 2023





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0											Hours in Service: 744																								
Maximum Value: 94 deg on Oct 9 16:00											Hours of Data: 742																								
Minimum Value: 5 deg on Oct 12 01:00											Hours of Missing Data: 2																								
Percentiles: P ₁ = 6 P ₁₀ = 9 Q ₁ = 11 Median = 14 Q ₃ = 21 P ₉₀ = 38 P ₉₉ = 81											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-Oct	12	37	39	28	32	13	9	26	10	11	12	15	15	14	13	14	11	8	6	7	7	7	20	13	39										
2-Oct	9	11	7	9	8	9	15	21	C	9	9	11	13	15	15	15	13	11	13	58	31	20	41	78	78										
3-Oct	42	37	33	25	21	27	69	24	18	23	22	25	29	37	18	62	28	13	10	9	10	27	9	12	69										
4-Oct	25	14	17	66	69	13	15	12	19	20	16	18	22	16	13	14	17	18	12	14	15	14	16	15	69										
5-Oct	13	16	19	21	11	13	16	14	12	14	14	16	13	15	15	15	17	14	25	12	10	12	21	21	25										
6-Oct	12	24	12	12	17	20	10	9	10	9	10	14	14	13	10	16	14	11	11	12	29	10	17	39	39										
7-Oct	35	23	12	44	42	29	33	22	24	77	33	16	21	15	12	17	35	83	20	17	46	69	16	81	83										
8-Oct	14	61	18	20	19	26	22	30	21	41	24	11	13	13	12	12	50	38	82	16	9	11	8	9	82										
9-Oct	9	26	43	11	8	9	17	17	13	14	14	15	29	32	77	94	59	21	18	54	64	19	49	52	94										
10-Oct	80	25	15	16	10	9	50	60	22	38	44	26	37	22	13	10	13	23	17	7	5	7	8	9	80										
11-Oct	10	24	17	10	19	29	37	21	22	15	17	21	39	33	17	19	11	9	9	10	10	7	6	6	39										
12-Oct	5	5	12	8	12	9	7	11	13	12	18	32	29	17	21	32	12	24	13	34	21	11	8	8	34										
13-Oct	6	24	12	12	6	6	7	7	8	14	11	14	13	10	15	18	16	17	20	10	8	15	10	9	24										
14-Oct	8	7	7	8	7	12	10	14	7	10	9	9	10	9	9	8	7	7	7	7	7	6	7	6	7	14									
15-Oct	7	8	8	6	7	6	9	8	10	8	12	20	17	17	12	8	9	12	6	6	7	13	15	15	20										
16-Oct	15	12	14	17	14	12	11	8	17	10	10	12	16	26	18	13	9	19	17	20	83	47	84	48	84										
17-Oct	18	22	23	18	14	14	14	14	12	13	11	10	14	15	17	16	15	15	19	21	22	31	34	28	34										
18-Oct	39	21	21	16	15	18	24	15	44	31	35	35	29	13	10	12	10	38	52	25	14	10	18	11	52										
19-Oct	10	5	6	5	15	7	7	7	15	11	13	15	12	14	11	11	10	9	15	49	24	36	19	9	49										
20-Oct	23	11	12	13	25	29	10	10	11	20	13	15	18	22	14	27	10	9	11	14	23	79	34	30	79										
21-Oct	55	39	28	10	9	15	13	9	8	7	78	20	10	12	14	15	15	12	13	12	13	14	14	11	78										
22-Oct	10	13	11	10	10	82	26	59	30	66	40	70	73	58	54	91	28	26	14	11	12	12	12	12	91										
23-Oct	11	12	11	10	17	8	8	11	16	14	16	17	17	17	19	16	13	12	14	11	20	11	10	9	20										
24-Oct	7	10	17	16	26	30	13	14	9	13	11	17	35	17	18	13	13	13	13	11	11	12	13	13	35										
25-Oct	12	12	12	15	19	13	9	10	10	17	15	18	17	16	13	14	18	17	13	14	15	25	9	9	25										
26-Oct	16	9	10	18	17	10	11	9	27	11	15	37	16	19	18	29	38	41	70	15	18	12	12	15	70										
27-Oct	11	36	13	14	10	14	15	15	33	46	27	44	48	21	16	DF	15	16	14	11	14	14	11	11	48										
28-Oct	19	10	10	10	19	43	48	20	14	16	48	57	19	24	32	68	24	19	11	18	11	12	11	15	68										
29-Oct	14	10	18	17	10	15	12	15	17	13	15	15	19	38	51	26	30	22	15	52	37	12	14	10	52										
30-Oct	10	14	13	12	17	60	50	16	19	10	15	11	12	11	12	11	8	9	8	7	8	13	8	12	60										
31-Oct	12	20	12	80	27	21	13	15	12	14	14	15	26	80	28	56	29	84	26	14	59	17	8	21	84										
											80	61	43	80	69	82	69	60	44	77	78	70	73	80	77	94	59	84	82	58	83	79	84	81	
											Diurnal Maximum																								
C - Calibration											DF - DAS Failure																								



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS25 WASKŌW OHCI PIMÂTISIWIN OCTOBER 2023

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

November 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WASKŌW OHCI PIMĀTISIWIN (AMS25)
OCTOBER 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	20.5	0	4.3	0
H2S(ppb) Average	707	37	37	100	2.8	0	0.5	0
Temperature 2 m (C) Average	744	0	0	100	24.2	0	12	0
Relative Humidity (%) Average	744	0	0	100	100	-	92	-
Wind Speed 10 m (km/h) Average	743	0	1	99.87	20	0	8	0
Wind Direction 10 m (deg) Average	743	0	1	99.87	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WASKŌW OHCI PIMĀTISIWIN (AMS25)
OCTOBER 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	0.91	2.6	-	0	0	0	0.1	0.5	2.1	20.5
H2S (ppb) Average	707	0.21	0.2	-	0	0	0.1	0.1	0.3	0.5	2.8
Temperature 2 m (C) Average	744	3.9	7.4	-	-13.5	-5.3	-2	3.9	9.4	13.6	24.2
Relative Humidity (%) Average	744	73.89	16.8	-	32.5	50.4	61.2	75.2	88.1	96	100
Wind Speed 10 m (km/h) Average	743	5	3	-	0	1	2	4	7	9	20
Wind Direction 10 m (deg) Average	743	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WASKŌW OHCI PIMĀTISIWIN (AMS25)

OCTOBER 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
Wind Speed, Wind Direction	01 Oct 2023 01:00	01 Oct 2023 01:00	1	Intermittent unstable operation



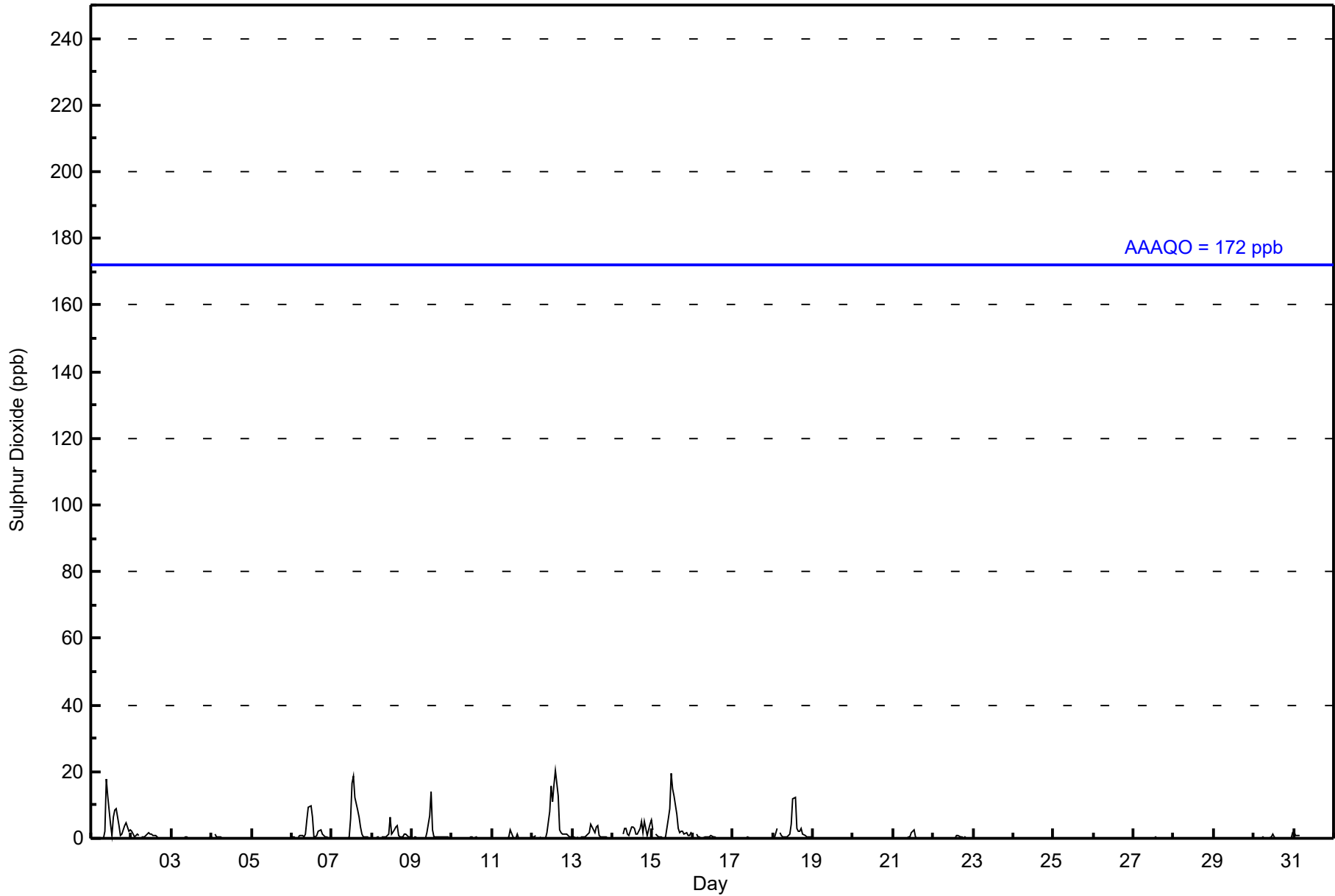
Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb

Waskow ohci Pimatisiwin - October 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	744																											
Maximum Value: 20.5 ppb on Oct 12 15:00		Maximum Daily Average: 4.3 ppb on Oct 12																	Hours of Data:	709																													
Minimum Value: 0.0 ppb on Oct 1 01:00		Minimum Daily Average: 0.0 ppb on Oct 25																	Hours of Missing Data:	35																													
Maximum Diurnal Average: 3.1 ppb at hour 12		Minimum Diurnal Average: 0.2 ppb at hour 6																	Hours of Calibration:	35																													
Monthly Average: 0.91 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.5 P ₉₀ = 2.1 P ₉₉ = 14.7																	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-Oct	0.0	0.0	0.0	0.0	Z	0.1	0.0	0.2	2.1	17.8	12.5	4.3	1.0	6.3	8.3	9.0	3.7	0.7	1.5	2.3	3.8	4.6	1.9	2.4	3.6	17.8																							
2-Oct	2.1	1.5	0.5	1.1	1.0	Z	0.4	0.4	0.5	1.2	1.6	1.1	1.2	0.9	0.7	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	2.1																							
3-Oct	Z	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.3	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.3	0.1	0.3																							
4-Oct	0.2	Z	1.1	0.4	0.3	0.2	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	0.0	0.0	0.0	0.1	1.1																							
5-Oct	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	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.2	0.0	0.2																							
6-Oct	0.4	0.2	0.1	Z	0.6	0.9	1.0	0.4	1.2	5.4	9.2	9.9	6.2	0.6	0.5	0.8	2.1	2.3	1.2	0.7	0.5	0.2	0.2	0.1	2.0	9.9																							
7-Oct	0.1	0.0	0.0	0.0	Z	0.1	0.0	0.0	0.1	0.2	0.3	5.8	16.4	18.7	12.1	8.6	6.4	3.3	1.4	0.6	0.4	0.3	0.2	0.1	3.3	18.7																							
8-Oct	0.2	0.1	0.2	0.3	0.5	Z	0.5	0.5	0.5	0.9	1.5	6.4	1.2	2.6	3.2	3.6	0.7	0.5	0.6	1.1	1.2	0.6	0.5	0.4	1.2	6.4																							
9-Oct	Z	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	1.7	6.8	13.9	2.7	0.6	0.6	0.4	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.1	1.3	13.9																							
10-Oct	0.1	Z	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.5	0.2	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.5																							
11-Oct	0.2	0.2	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.4	2.5	0.2	0.1	0.2	1.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.3	2.5																							
12-Oct	0.2	0.6	0.9	Z	0.4	0.1	0.0	0.1	0.2	1.8	8.2	15.8	11.0	15.9	20.5	12.7	2.4	1.7	1.2	1.3	1.3	0.7	0.5	0.4	4.3	20.5																							
13-Oct	0.2	0.3	0.2	0.3	Z	0.3	0.3	0.3	0.7	1.4	1.6	4.2	3.5	1.8	3.4	3.8	0.9	0.4	0.3	0.2	0.2	0.2	0.1	0.1	1.1	4.2																							
14-Oct	0.0	0.0	0.0	0.0	0.1	Z	1.4	3.2	3.0	1.2	0.7	3.2	3.3	2.8	1.3	1.3	3.1	5.3	1.5	4.9	2.9	0.9	4.1	5.4	2.2	5.4																							
15-Oct	2.4	Z	1.4	0.6	0.3	0.2	0.2	0.1	0.3	6.1	9.1	19.5	14.8	12.8	7.1	3.0	1.6	2.3	2.1	1.4	1.5	0.9	1.1	1.6	3.9	19.5																							
16-Oct	1.2	Z	1.3	0.5	0.4	0.2	0.2	0.3	0.3	0.3	0.5	1.0	0.4	0.3	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.3	1.3																							
17-Oct	0.0	0.0	Z	0.1	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2																							
18-Oct	0.0	0.1	2.8	Z	1.5	0.9	0.5	0.4	0.6	0.8	1.2	4.3	12.0	12.2	2.9	2.2	2.1	3.0	1.3	0.7	0.5	0.5	0.4	0.3	2.2	12.2																							
19-Oct	0.2	0.1	0.1	0.1	Z	0.1	0.0	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.2																							
20-Oct	0.0	0.0	0.1	0.1	0.1	Z	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2																							
21-Oct	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.6	1.7	2.4	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	2.4																							
22-Oct	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.8	0.8	0.5	0.2	0.1	0.4	0.2	0.1	0.1	0.1	0.2	0.8																							
23-Oct	0.0	0.1	Z	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1																						
24-Oct	0.1	0.1	0.0	Z	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	0.0	0.1	0.1																						
25-Oct	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																						
26-Oct	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.1																						
27-Oct	Z	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.2																							
28-Oct	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1																						
29-Oct	0.0	0.0	Z	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	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2																						
30-Oct	0.2	0.2	0.1	Z	0.2	0.2	0.2	0.1	0.1	0.1	0.3	1.4	0.5	0.2	0.2	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	1.7	0.3	1.7																							
31-Oct	2.1	0.6	0.9	0.6	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	0.2	2.1																							
																								0.4	0.2	0.4	0.2	0.2	0.2	0.2	0.2	0.4	1.3	1.8	3.1	2.5	2.0	1.6	0.8	0.7	0.4	0.5	0.4	0.3	0.3	0.4	Diurnal Average		
																								2.4	1.5	2.8	1.1	1.5	0.9	1.4	3.2	3.0	17.8	12.5	19.5	16.4	18.7	20.5	12.7	6.4	5.3	2.1	4.9	3.8	4.6	4.1	5.4	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
Waskow ohci Pimatisiwin - October 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	693	97.74	97.74
11 - 20	16	2.26	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 - October 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	17	5	9	9	16	119	115	37	18	32	65	90	80	34	23	692
11 - 20	0	0	0	0	1	0	11	3	1	0	0	0	0	0	0	0	16
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	23	17	5	9	10	16	130	118	38	18	32	65	90	80	34	23	708

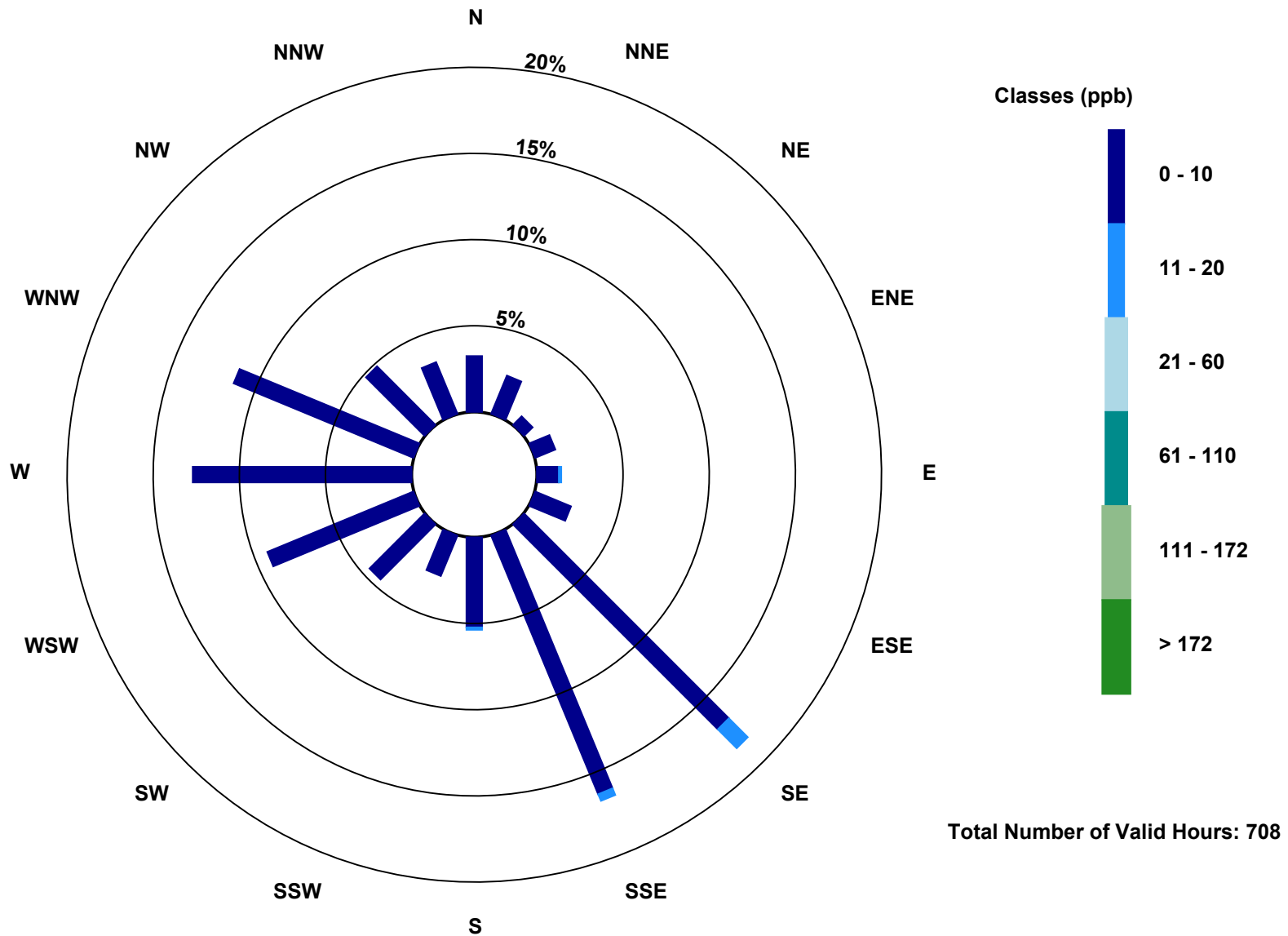
Total Number of Valid Hours: 708

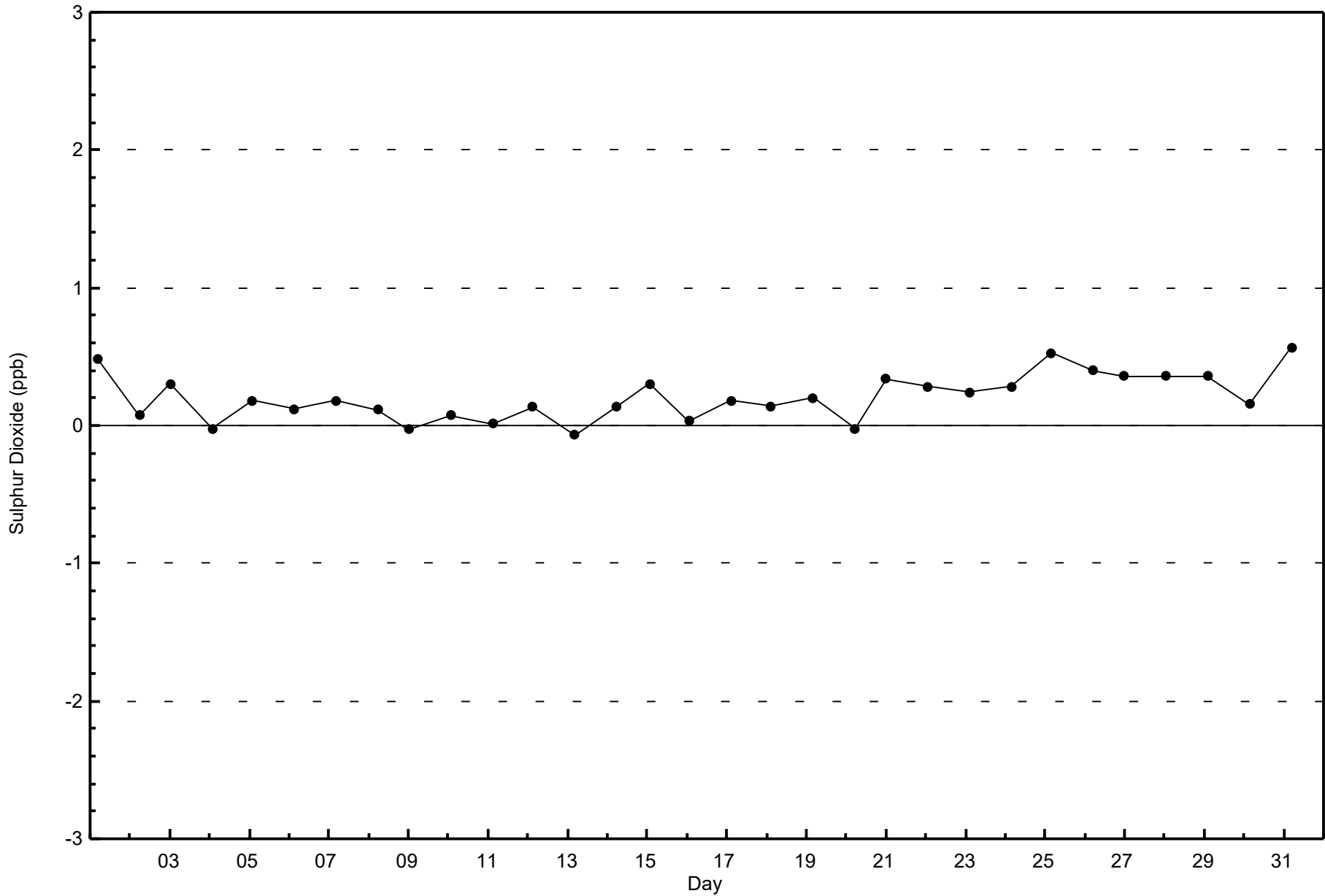
Total Number of Hours: 744

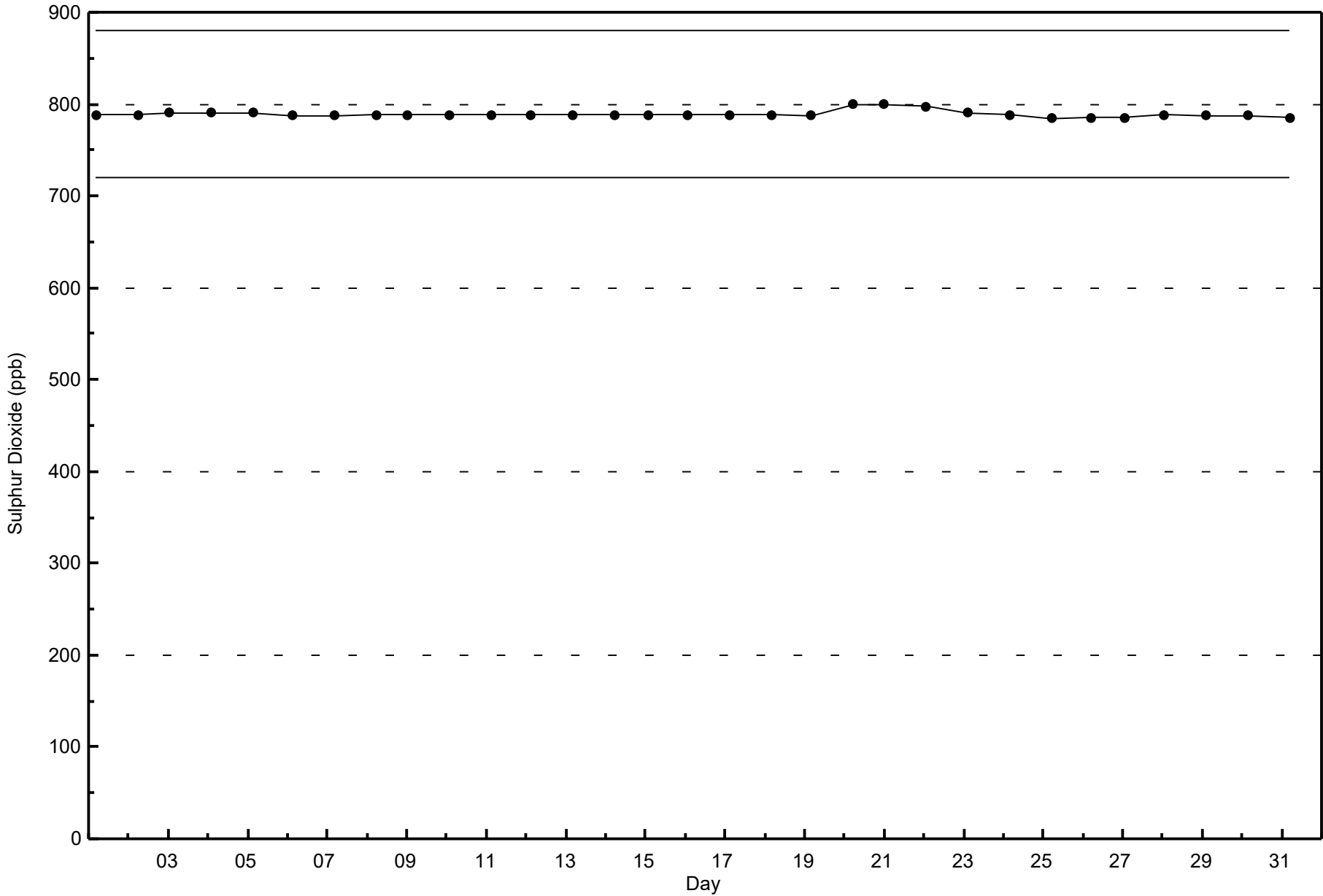


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Sulphur Dioxide (SO₂) - ppb
Waskow ohci Pimatisiwin

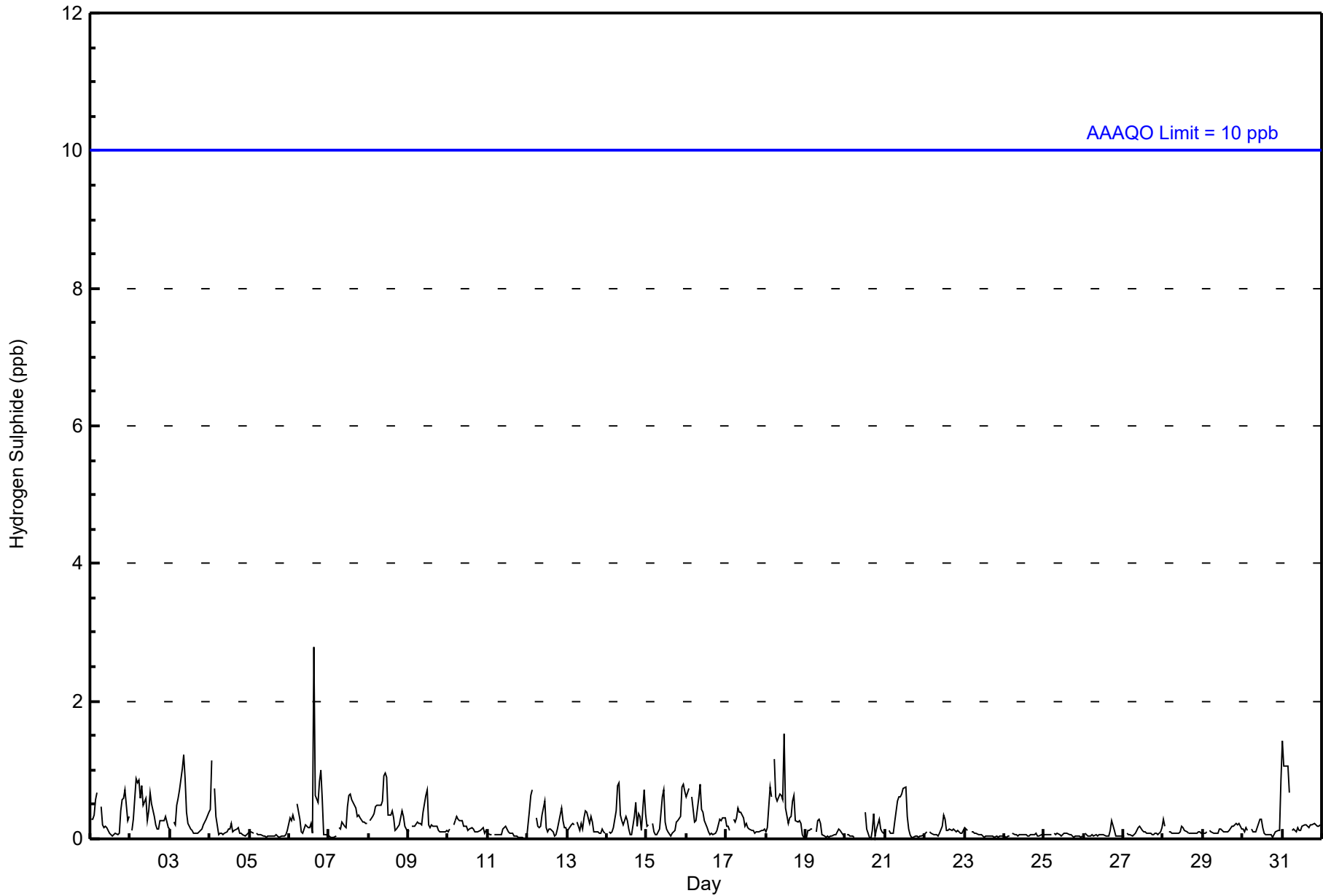








Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:														744							
Maximum Value: 2.8 ppb on Oct 6 16:00		Maximum Daily Average: 0.5 ppb on Oct 18														Hours of Data:		707									
Minimum Value: 0.0 ppb on Oct 20 16:00		Minimum Daily Average: 0.1 ppb on Oct 5														Hours of Missing Data:		37									
Maximum Diurnal Average: 0.3 ppb at hour 4		Minimum Diurnal Average: 0.1 ppb at hour 15														Hours of Calibration:		37									
Monthly Average: 0.21 ppb		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 = 1.0														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-Oct	0.3	0.3	0.3	0.6	0.7	Z	0.5	0.2	0.2	0.2	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.4	0.6	0.6	0.7	0.3	0.3	0.3	0.7	0.9
2-Oct	Z	0.1	0.3	0.9	0.8	0.9	0.6	0.8	0.5	0.6	0.3	0.4	0.7	0.5	0.3	0.2	0.1	0.1	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.4	0.9
3-Oct	0.1	Z	0.2	0.2	0.5	0.6	0.7	1.0	1.2	0.9	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.4	0.4	0.4	1.2	
4-Oct	0.4	1.1	Z	0.7	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.2	1.1	
5-Oct	0.1	0.1	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	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	
6-Oct	0.3	0.3	0.4	0.3	Z	0.5	0.3	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	2.8	0.6	0.5	0.8	1.0	0.6	0.1	0.1	0.0	0.4	2.8	
7-Oct	0.0	0.0	0.0	0.0	0.0	Z	0.2	0.1	0.2	0.2	0.2	0.5	0.6	0.6	0.6	0.5	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.6	
8-Oct	Z	0.3	0.3	0.4	0.5	0.5	0.5	0.5	0.6	0.9	1.0	0.9	0.3	0.3	0.4	0.3	0.1	0.2	0.2	0.3	0.4	0.3	0.2	0.1	0.4	1.0	
9-Oct	0.1	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.6	0.7	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	0.7	
10-Oct	0.1	0.1	Z	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.3	
11-Oct	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	
12-Oct	0.2	0.4	0.6	0.7	Z	0.3	0.2	0.2	0.2	0.4	0.6	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.3	0.4	0.3	0.2	0.2	0.3	0.7	
13-Oct	0.1	0.1	0.2	0.2	0.2	Z	0.2	0.1	0.2	0.1	0.3	0.4	0.4	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.4	
14-Oct	Z	0.1	0.1	0.1	0.2	0.4	0.8	0.8	0.3	0.3	0.2	0.3	0.3	0.1	0.1	0.1	0.3	0.5	0.2	0.4	0.3	0.1	0.7	0.4	0.8		
15-Oct	0.2	0.2	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.6	0.7	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.3	0.3	0.7	0.8	0.7	0.3	0.8	
16-Oct	0.6	0.7	Z	0.6	0.4	0.2	0.3	0.6	0.8	0.4	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.8	
17-Oct	0.2	0.2	0.1	Z	0.3	0.2	0.3	0.4	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	0.1	0.1	0.2	0.4	
18-Oct	0.1	0.2	0.8	0.6	Z	1.2	0.6	0.6	0.6	0.6	0.6	1.5	0.4	0.2	0.3	0.3	0.5	0.6	0.3	0.2	0.3	0.2	0.1	0.0	1.5		
19-Oct	0.0	0.1	0.1	0.2	0.1	Z	0.1	0.3	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.3		
20-Oct	Z	0.1	0.1	0.0	0.0	0.0	C	C	C	C	C	C	0.4	0.1	0.0	0.0	0.1	0.4	0.0	0.1	0.3	0.1	0.1	0.1	0.4		
21-Oct	0.1	Z	0.1	0.1	0.1	0.1	0.2	0.5	0.6	0.6	0.7	0.7	0.7	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7		
22-Oct	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.2	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	
23-Oct	0.2	0.1	0.1	Z	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	0.0	0.0	0.0	0.0	0.1	0.2		
24-Oct	0.0	0.0	0.0	0.0	Z	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	0.0	0.0	0.1	0.0	0.1		
25-Oct	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	
26-Oct	Z	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.3	
27-Oct	0.0	Z	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	
28-Oct	0.3	0.2	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	
29-Oct	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	
30-Oct	0.1	0.1	0.2	0.1	Z	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.9	0.9	
31-Oct	1.4	1.0	1.0	1.1	0.7	Z	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	0.2	0.2	0.2	0.2	0.2	0.4	1.4	
																								Diurnal Average		0.2	
																								Diurnal Maximum		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 - October 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
Waskow ohci Pimatisiwin - October 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	24	17	6	9	10	16	130	118	38	18	33	64	83	80	33	26	705
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	24	17	6	9	10	16	130	119	38	18	33	64	83	80	33	26	706

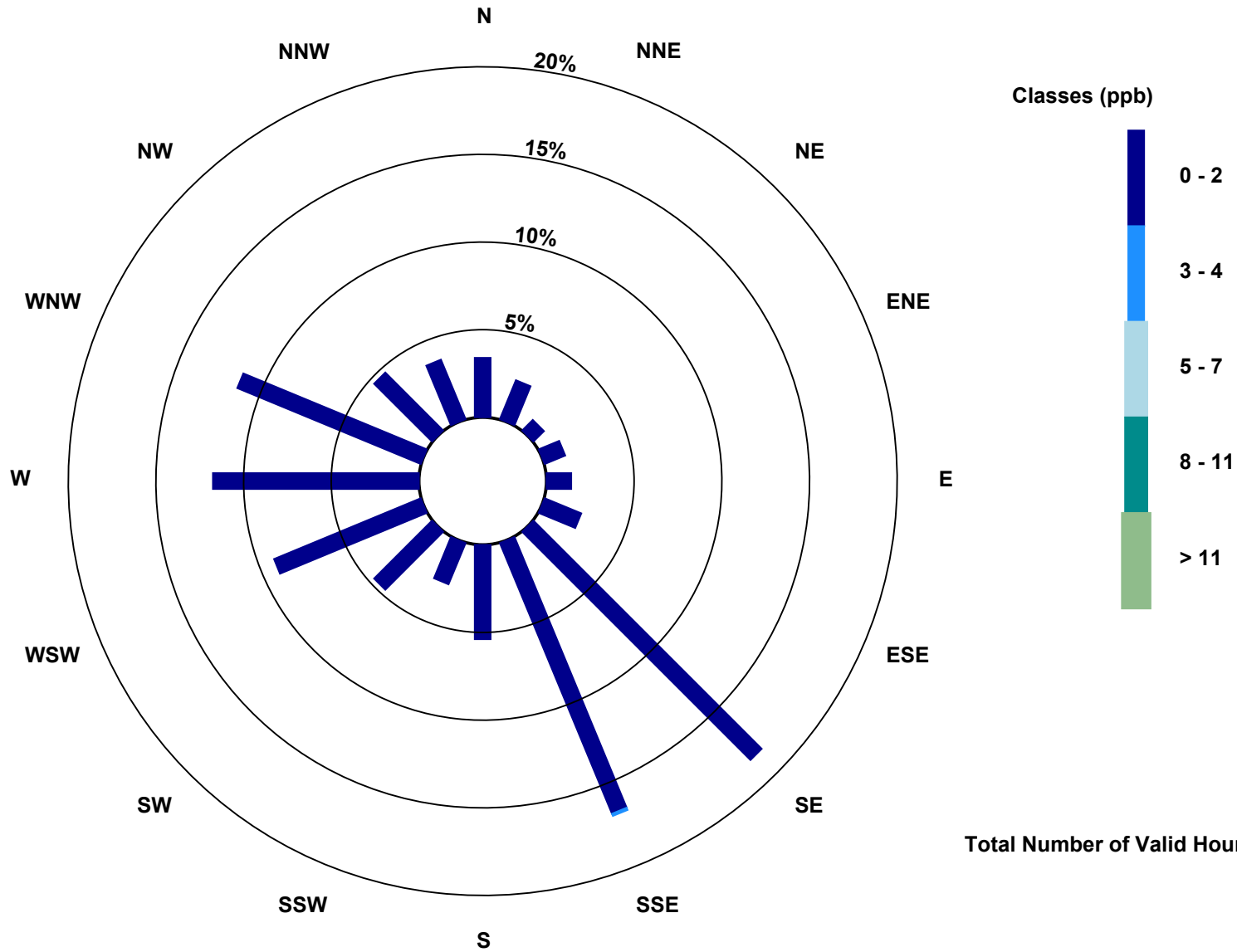
Total Number of Valid Hours: 706

Total Number of Hours: 744

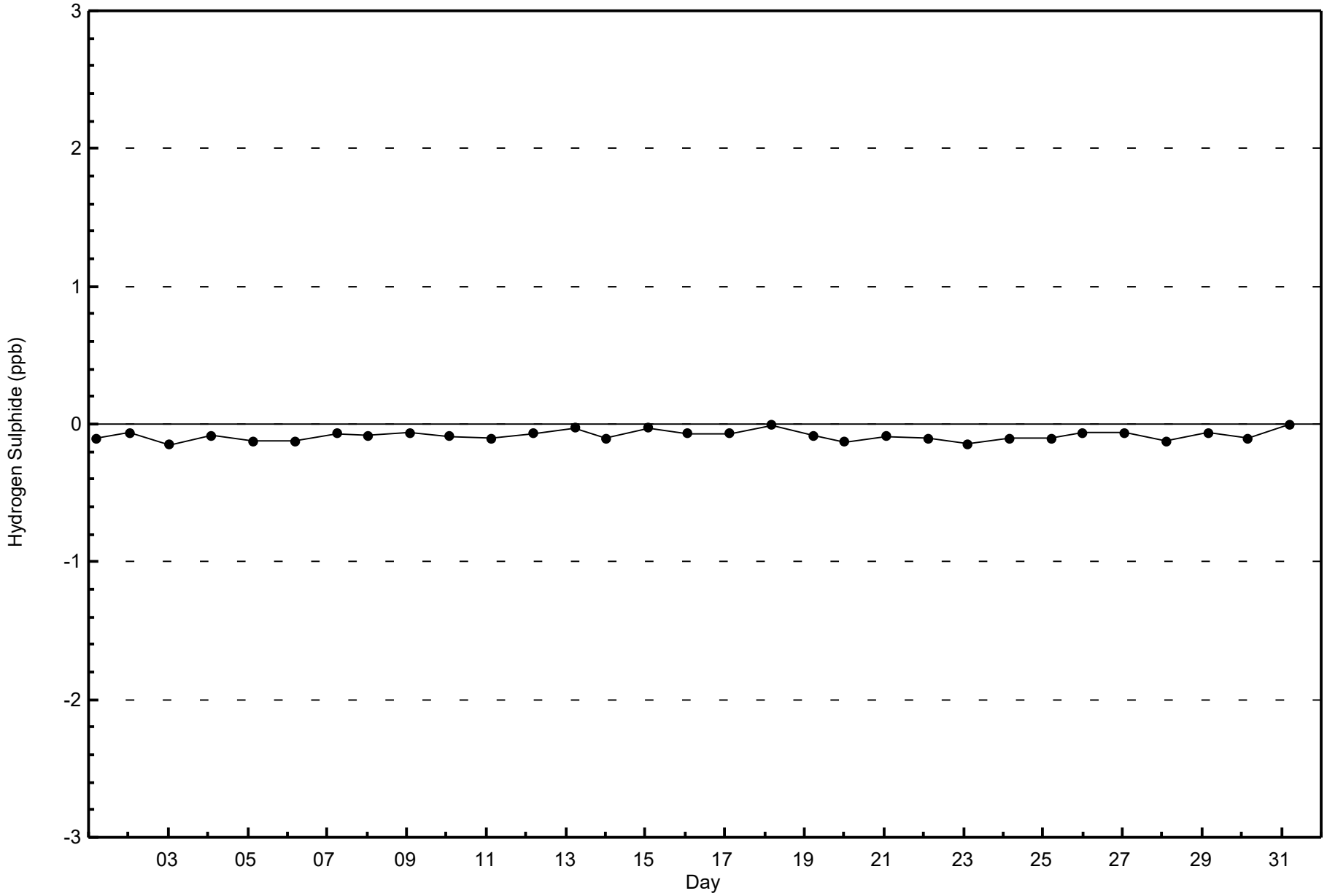


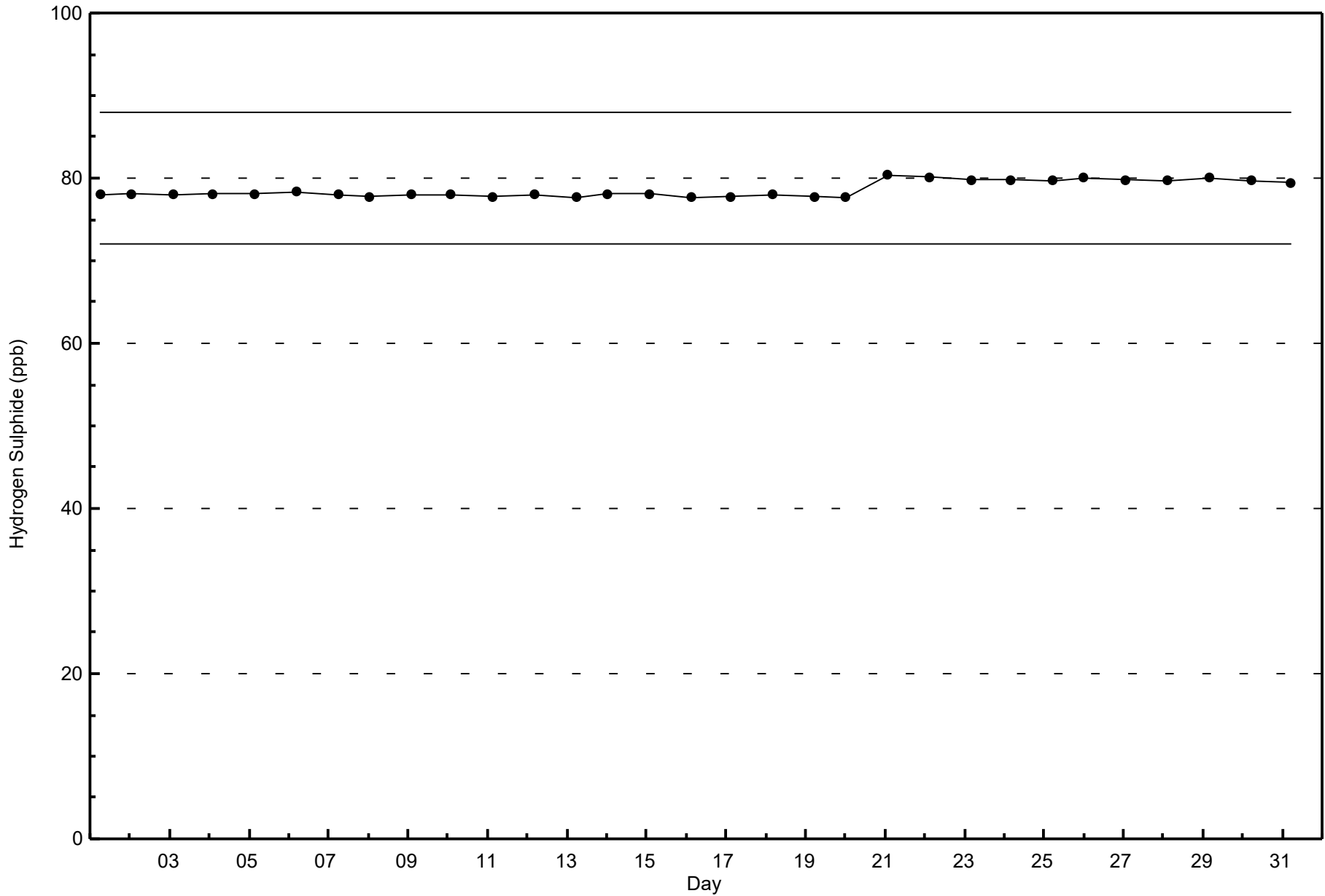
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Hydrogen Sulphide (H₂S) - ppb
Waskow ohci Pimatisiwin



Total Number of Valid Hours: 706





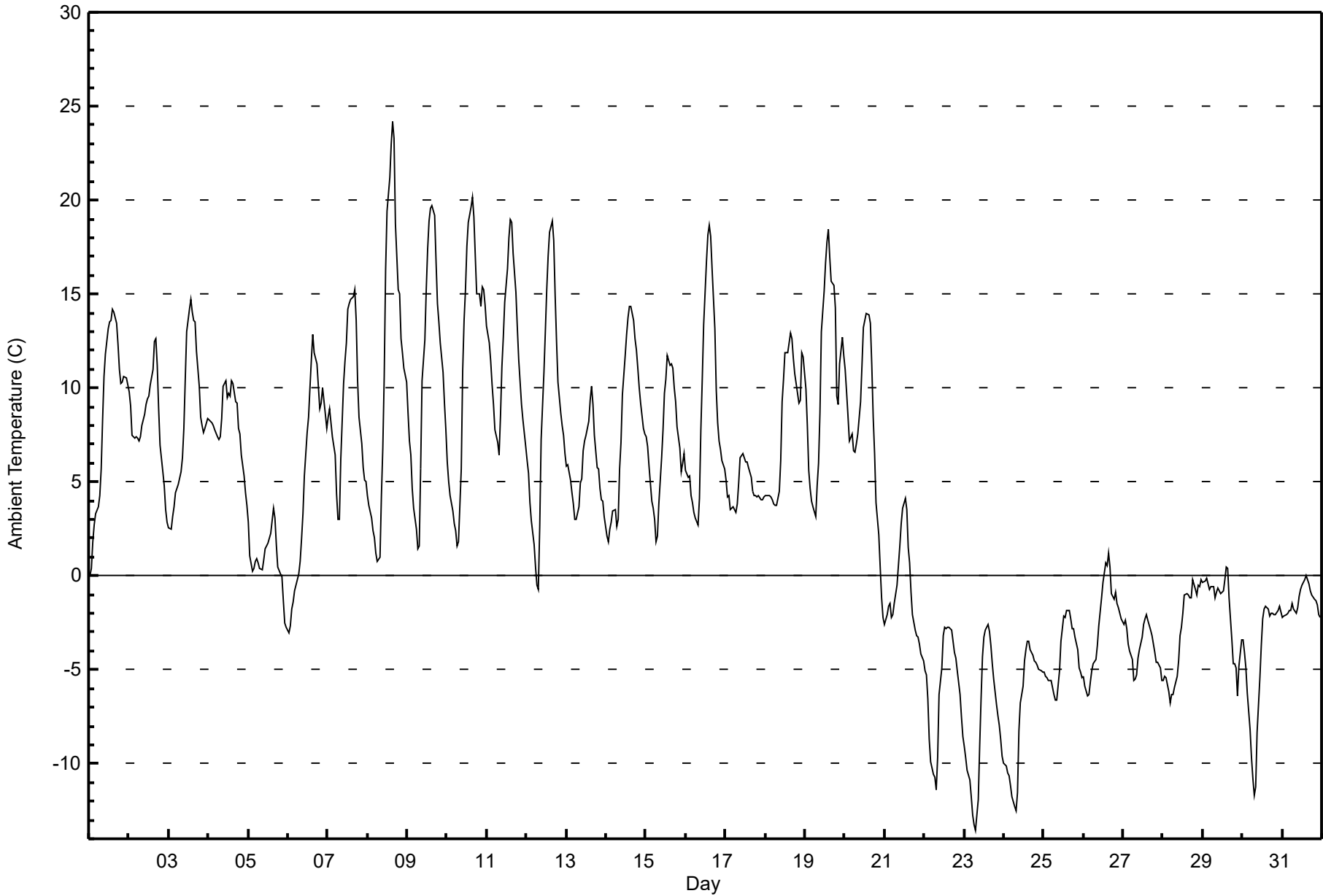


Maximum Value: 24.2 C on Oct 8 16:00		Maximum Daily Average: 12.0 C on Oct 11		Hours in Service: 744																																												
Minimum Value: -13.5 C on Oct 23 08:00		Minimum Daily Average: -7.9 C on Oct 23		Hours of Data: 744																																												
Maximum Diurnal Average: 8.8 C at hour 16		Minimum Diurnal Average: -0.3 C at hour 7		Hours of Missing Data: 0																																												
Monthly Average: 3.90 C		Percentiles: P ₁ = -11.8 P ₁₀ = -5.3 Q ₁ = -2.0 Median = 3.9 Q ₃ = 9.4 P ₉₀ = 13.6 P ₉₉ = 19.5		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-Oct	0.0	0.4	1.8	2.7	3.3	3.7	4.2	5.7	8.3	10.6	11.8	13.2	13.5	13.6	14.2	14.0	13.5	12.3	11.0	10.3	10.3	10.6	10.5	10.2	8.7	14.2																						
2-Oct	9.8	9.0	7.5	7.3	7.4	7.3	7.2	7.4	8.0	8.6	9.1	9.4	9.6	10.2	11.0	12.4	12.6	11.2	8.9	7.0	5.6	4.8	3.5	2.8	8.2	12.6																						
3-Oct	2.6	2.5	3.2	3.7	4.4	4.7	4.9	5.6	6.3	7.8	10.5	13.0	14.2	14.7	14.0	13.6	13.5	11.9	10.1	8.4	8.0	7.6	7.8	8.3	8.4	14.7																						
4-Oct	8.3	8.2	8.2	8.0	7.7	7.4	7.3	7.4	8.4	10.1	10.4	9.5	9.7	9.6	10.4	10.2	9.3	9.2	7.9	7.6	6.5	5.3	4.4	3.7	8.1	10.4																						
5-Oct	2.8	1.0	0.2	0.4	0.8	1.0	0.7	0.4	0.4	0.9	1.4	1.6	1.7	2.3	3.0	3.6	3.0	1.7	0.5	0.1	0.0	-1.3	-2.5	-2.7	0.9	3.6																						
6-Oct	-3.0	-2.6	-1.8	-1.4	-0.8	-0.5	0.1	0.8	2.0	3.3	5.3	7.6	8.5	10.0	11.5	12.8	11.9	11.3	10.1	8.9	9.2	10.0	8.6	7.9	5.4	12.8																						
7-Oct	8.4	8.9	8.1	7.4	6.5	4.4	3.0	3.0	6.2	10.3	11.4	12.4	14.2	14.5	14.7	14.9	15.3	13.6	10.4	8.5	7.0	5.8	5.1	5.0	9.1	15.3																						
8-Oct	4.3	3.7	3.1	2.4	2.0	1.2	0.8	1.0	4.3	6.8	10.6	16.2	19.4	21.2	23.0	24.2	23.3	18.7	15.2	15.0	12.6	11.9	11.0	10.3	10.9	24.2																						
9-Oct	8.7	7.2	6.5	4.7	3.6	2.4	1.4	1.6	5.7	10.4	12.6	15.2	17.4	18.9	19.6	19.7	19.2	16.7	14.5	13.5	12.4	10.8	9.2	7.8	10.8	19.7																						
10-Oct	6.0	5.0	4.2	3.4	2.8	2.4	1.6	1.8	5.7	10.9	13.6	15.2	17.6	18.8	19.6	20.1	19.1	17.0	15.0	15.0	14.3	15.3	15.2	14.4	11.4	20.1																						
11-Oct	13.3	12.4	11.4	10.1	9.1	7.7	7.1	6.5	8.6	11.1	12.7	14.5	16.3	18.0	19.0	18.9	17.2	15.1	13.2	11.5	10.3	9.1	8.3	6.9	12.0	19.0																						
12-Oct	6.1	5.5	3.9	2.9	1.6	0.5	-0.5	-0.7	2.6	7.3	10.8	13.0	15.3	17.0	18.3	18.9	17.9	14.9	12.5	10.3	8.6	8.0	7.5	6.5	8.7	18.9																						
13-Oct	5.9	5.9	5.1	4.4	3.8	3.0	3.0	3.7	5.0	5.2	6.7	7.2	7.5	8.2	9.3	10.1	9.2	7.5	5.8	5.7	4.6	4.0	3.9	3.1	5.7	10.1																						
14-Oct	2.1	1.8	2.5	2.9	3.5	3.5	2.6	3.0	5.7	7.1	9.6	11.7	12.9	13.8	14.4	14.3	13.6	12.6	12.0	11.0	10.0	9.2	7.9	7.6	8.1	14.4																						
15-Oct	7.4	6.9	5.8	4.0	3.6	3.0	1.8	2.1	3.8	6.3	7.8	9.7	10.5	11.7	12.9	11.2	11.3	11.1	10.0	9.3	8.0	6.8	5.5	6.0	6.5	7.1	11.7																					
16-Oct	5.6	5.2	5.3	4.3	3.9	3.4	3.1	2.7	4.1	7.8	10.5	13.4	16.7	18.1	18.6	18.1	16.3	13.1	9.9	8.2	7.2	6.7	6.1	5.7	8.9	18.6																						
17-Oct	5.1	4.2	4.2	3.6	3.7	3.5	3.4	3.9	4.9	6.3	6.5	6.3	6.1	6.1	5.7	5.2	4.5	4.3	4.3	4.2	4.2	4.1	4.0	4.2	4.7	6.5																						
18-Oct	4.3	4.3	4.3	4.2	4.0	3.8	3.7	3.7	4.5	6.1	9.3	10.5	11.9	11.9	12.4	12.9	12.6	11.6	10.8	9.7	9.2	9.3	11.9	11.6	8.3	12.9																						
19-Oct	9.9	8.0	5.6	4.6	4.0	3.7	3.2	4.8	6.0	8.6	13.0	15.2	16.7	17.8	18.5	17.0	15.7	15.4	14.2	9.6	9.1	11.3	12.7	11.7	10.7	18.5																						
20-Oct	11.0	9.8	8.6	7.1	7.6	6.6	6.6	7.0	7.5	9.3	11.2	13.2	13.6	14.0	13.9	13.4	11.2	8.4	6.5	3.9	2.2	0.5	-1.2	-2.2	7.9	14.0																						
21-Oct	-2.6	-2.1	-1.6	-1.5	-2.2	-2.1	-1.5	-0.5	0.5	1.6	2.8	3.6	4.1	3.5	1.5	0.7	-0.9	-2.1	-2.9	-3.2	-3.3	-3.7	-4.2	-4.5	-0.9	4.1																						
22-Oct	-5.0	-5.2	-6.6	-8.7	-9.9	-10.6	-10.7	-11.4	-9.7	-6.3	-4.9	-3.2	-2.7	-2.8	-2.7	-2.7	-2.9	-3.5	-4.1	-4.4	-5.1	-6.3	-7.5	-8.5	-6.1	-2.7																						
23-Oct	-9.1	-9.6	-10.3	-10.9	-11.8	-12.7	-13.2	-13.5	-11.9	-9.0	-6.6	-4.3	-3.3	-2.9	-2.6	-3.0	-3.7	-4.6	-5.5	-6.8	-7.4	-7.9	-8.7	-9.6	-7.9	-2.6																						
24-Oct	-10.0	-10.1	-10.5	-10.7	-11.2	-11.8	-12.2	-12.5	-11.5	-8.3	-6.8	-5.9	-4.5	-3.9	-3.5	-3.5	-3.9	-4.2	-4.5	-4.6	-4.7	-4.9	-5.0	-5.1	-7.2	-3.5																						
25-Oct	-5.1	-5.3	-5.4	-5.6	-5.6	-5.9	-6.3	-6.6	-6.7	-5.0	-3.5	-2.8	-2.2	-2.2	-1.9	-1.9	-2.3	-2.8	-2.8	-3.2	-3.9	-4.9	-5.1	-5.4	-4.3	-1.9																						
26-Oct	-5.3	-5.8	-6.4	-6.3	-5.6	-5.0	-4.7	-4.5	-3.7	-2.7	-1.9	-1.2	-0.3	0.7	0.5	1.2	0.5	-0.9	-1.2	-0.9	-1.5	-1.7	-2.0	-2.3	-2.5	1.2																						
27-Oct	-2.6	-2.3	-2.8	-3.7	-4.0	-4.4	-5.6	-5.5	-5.3	-4.4	-3.9	-3.2	-2.6	-2.3	-2.0	-2.4	-2.9	-3.2	-3.6	-4.1	-4.6	-4.6	-4.9	-5.6	-3.8	-2.0																						
28-Oct	-5.6	-5.3	-5.5	-6.2	-6.8	-6.3	-6.3	-5.9	-5.3	-4.5	-3.2	-2.8	-2.0	-1.1	-0.9	-1.0	-1.2	-1.2	-0.2	-0.7	-1.0	-0.5	-0.6	-0.2	-3.1	-0.2																						
29-Oct	-0.4	-0.3	-0.1	-0.5	-0.8	-0.6	-0.6	-1.2	-0.9	-0.6	-0.8	-1.0	-0.8	-0.2	0.4	0.4	-1.2	-3.4	-4.7	-4.7	-4.9	-6.4	-4.8	-3.4	-1.7	0.4																						
30-Oct	-3.4	-4.1	-4.9	-6.2	-8.1	-9.7	-10.8	-11.7	-11.3	-8.3	-5.4	-3.7	-2.3	-1.8	-1.6	-1.7	-2.2	-2.0	-2.0	-2.0	-2.0	-1.9	-1.6	-1.9	-4.6	-1.6																						
31-Oct	-2.2	-2.2	-2.1	-2.0	-1.9	-1.8	-1.5	-1.8	-2.0	-1.7	-1.1	-0.7	-0.5	-0.2	0.1	-0.2	-0.4	-0.8	-1.0	-1.2	-1.4	-1.6	-2.1	-2.3	-1.3	0.1																						
																								2.2	1.8	1.3	0.8	0.5	0.1	-0.3	-0.1	1.3	3.4	5.1	6.5	7.6	8.3	8.7	8.8	8.0	6.7	5.5	4.5	3.8	3.4	3.0	2.6	Diurnal Average
																								13.3	12.4	11.4	10.1	9.1	7.7	7.3	7.4	8.6	11.1	13.6	16.2	19.4	21.2	23.0	24.2	23.3	18.7	15.2	15.0	14.3	15.3	15.2	14.4	Diurnal Maximum



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Waskow ohci Pimatisiwin - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Waskow ohci Pimatisiwin - October 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	263	35.35	35.35
0 - 10	309	41.53	76.88
10 - 20	167	22.45	99.33
> 20	5	0.67	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



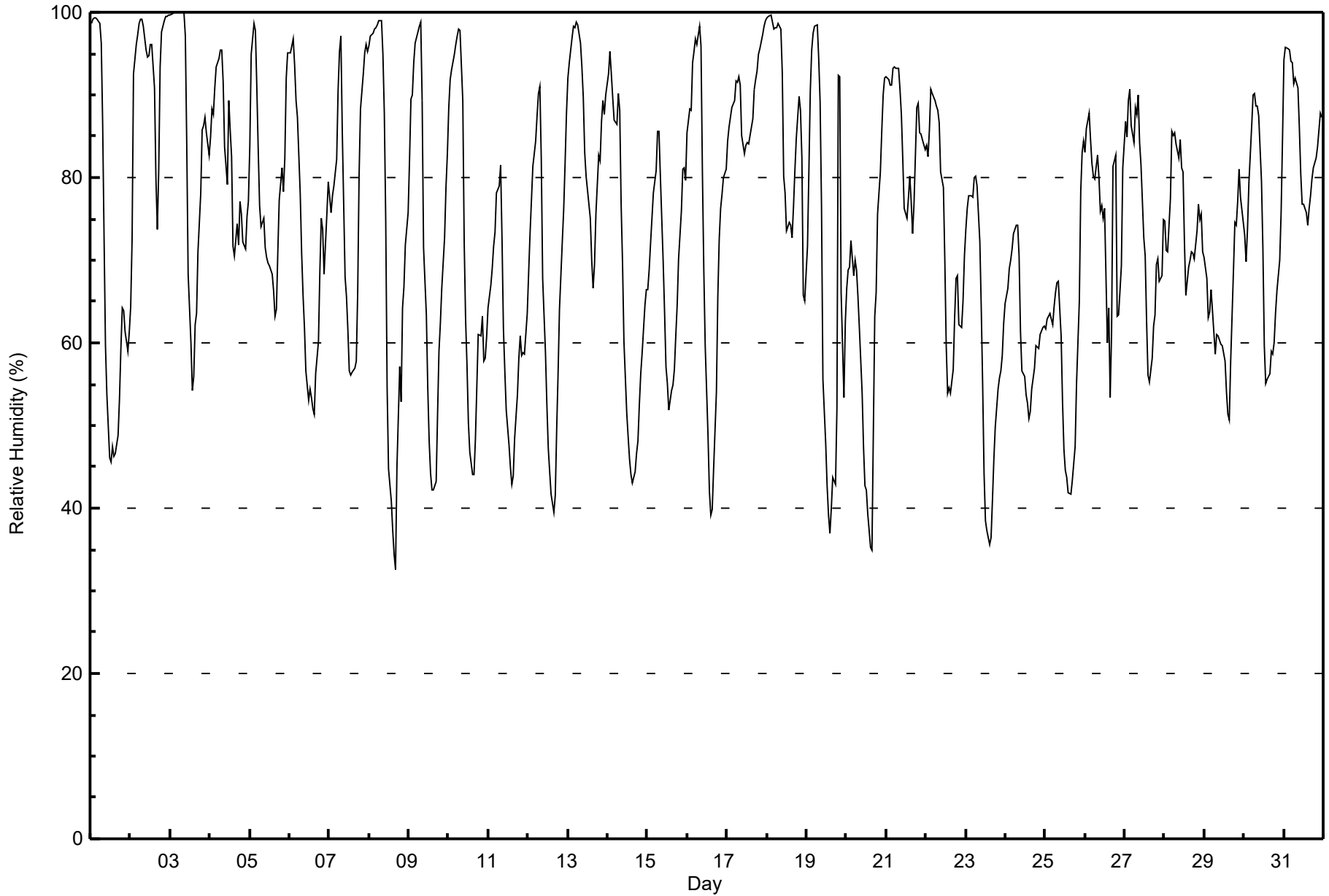
Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Waskow ohci Pimatisiwin - October 2023

Maximum Value: 100.0 % on Oct 3 05:00																						Maximum Daily Average: 92.0 % on Oct 2																						Hours in Service: 744	
Minimum Value: 32.5 % on Oct 8 17:00																						Minimum Daily Average: 58.9 % on Oct 25																						Hours of Data: 744	
Maximum Diurnal Average: 88.1 % at hour 6																						Minimum Diurnal Average: 54.7 % at hour 16																						Hours of Missing Data: 0	
Monthly Average: 73.89 %																						Percentiles: P ₁ = 37.3 P ₁₀ = 50.4 Q ₁ = 61.2 Median = 75.2 Q ₃ = 88.1 P ₉₀ = 96.0 P ₉₉ = 99.7																						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-Oct	98.7	99.1	99.3	99.4	99.2	98.6	96.2	86.5	72.7	59.7	53.7	46.0	45.6	47.4	46.3	46.6	48.9	53.2	59.4	64.3	64.0	61.3	59.0	61.4	69.4	99.4																			
2-Oct	64.5	72.5	92.6	96.2	97.2	98.6	99.1	99.1	98.3	95.4	94.6	94.8	96.2	96.2	90.8	80.0	73.8	80.8	93.4	97.7	99.0	99.4	99.5	99.6	92.0	99.6																			
3-Oct	99.7	99.8	99.9	100.0	100.0	100.0	100.0	100.0	100.0	97.1	84.0	68.2	60.0	54.3	56.0	62.2	63.6	71.1	78.1	85.7	86.2	87.3	85.4	82.8	84.2	100.0																			
4-Oct	84.9	88.4	87.6	90.9	93.5	94.5	95.5	95.3	91.6	83.7	79.2	89.3	85.7	82.5	71.8	70.6	74.3	71.9	77.1	75.5	72.2	71.4	75.3	77.1	82.5	95.5																			
5-Oct	83.7	95.0	98.6	97.9	91.0	83.5	74.1	75.1	71.5	70.3	69.7	69.3	68.3	66.3	63.1	64.1	71.0	77.2	81.2	78.3	82.4	92.0	95.0	79.0	98.6																				
6-Oct	95.0	96.0	96.8	93.6	89.3	87.3	77.9	70.8	65.7	61.8	56.6	53.0	54.5	53.4	52.0	51.4	56.2	60.2	68.7	75.0	73.8	68.3	75.5	79.5	71.3	96.8																			
7-Oct	77.6	75.7	77.8	79.0	82.2	90.6	95.2	97.0	85.7	68.0	65.6	61.4	56.6	56.1	56.4	56.9	57.8	66.0	80.3	88.2	92.5	95.2	96.2	95.3	77.2	97.0																			
8-Oct	96.0	97.0	97.4	97.9	98.2	98.5	99.0	98.9	94.9	87.9	74.9	54.6	44.7	40.9	37.3	34.4	32.5	44.9	57.1	52.9	64.2	66.7	71.8	75.7	71.6	99.0																			
9-Oct	82.3	89.5	89.9	93.9	96.2	97.6	98.2	98.8	89.2	71.4	63.3	54.7	48.1	44.3	42.1	42.3	43.3	51.3	58.9	62.4	66.5	72.7	78.9	82.8	71.6	98.8																			
10-Oct	88.5	91.9	93.1	94.9	96.1	97.2	98.0	97.9	89.4	72.1	62.8	57.2	50.3	46.8	44.0	44.0	48.3	54.6	61.0	60.8	63.1	57.7	58.2	60.6	70.4	98.0																			
11-Oct	64.3	67.0	68.9	71.7	73.5	78.1	78.9	81.5	72.6	61.7	56.6	51.9	47.7	44.9	42.8	43.9	48.5	53.8	58.2	60.8	58.4	58.7	58.7	63.5	61.1	81.5																			
12-Oct	68.4	73.2	77.3	81.4	84.3	87.5	90.2	91.1	82.3	67.9	58.8	52.5	47.4	44.4	41.6	39.5	41.5	49.4	56.2	64.1	72.2	76.1	81.6	87.8	67.4	91.1																			
13-Oct	92.0	93.9	97.0	98.3	98.1	98.8	98.6	96.3	93.4	89.6	83.1	80.2	78.6	75.2	70.0	66.6	69.5	75.5	82.7	82.1	86.7	89.4	87.6	90.0	86.4	98.8																			
14-Oct	92.5	95.3	92.5	89.7	86.9	86.5	90.1	88.1	76.8	69.6	60.1	51.6	48.6	46.0	44.1	43.1	44.3	46.7	48.1	52.6	56.3	58.8	64.5	66.5	66.6	95.3																			
15-Oct	66.4	68.9	72.0	78.2	79.5	80.8	85.6	85.5	80.2	69.8	63.8	57.1	55.2	51.9	54.3	55.0	56.8	60.9	64.5	70.1	75.9	81.0	81.1	79.7	69.8	85.6																			
16-Oct	85.4	88.2	88.1	94.0	95.3	96.8	96.2	98.3	96.0	80.7	68.7	59.6	48.8	42.1	39.2	39.8	44.7	54.1	65.7	72.5	76.3	78.0	80.0	81.1	73.7	98.3																			
17-Oct	84.5	86.1	87.3	88.4	89.2	91.7	91.5	92.2	91.1	85.1	82.8	83.9	84.2	84.1	85.1	87.1	90.7	91.9	92.9	94.9	95.6	97.3	98.4	99.0	89.8	99.0																			
18-Oct	99.3	99.5	99.7	98.9	98.0	98.2	98.2	98.6	98.0	92.7	80.2	78.1	73.5	74.6	74.3	72.7	76.5	80.9	84.8	89.9	88.2	82.4	65.8	65.2	86.2	99.7																			
19-Oct	71.7	80.8	90.5	95.5	97.5	98.3	98.5	94.5	89.2	76.6	55.6	47.8	42.7	39.2	36.9	40.0	43.7	42.9	52.1	92.4	92.1	66.0	53.4	62.5	69.2	98.5																			
20-Oct	66.6	68.8	69.1	72.3	68.1	69.9	68.8	65.7	61.8	53.8	47.3	42.7	42.3	39.3	35.3	34.8	49.3	63.3	66.1	75.6	80.7	85.6	90.0	92.1	62.9	92.1																			
21-Oct	92.3	91.8	91.2	91.1	93.2	93.3	93.2	93.2	90.7	87.6	82.1	76.2	75.1	77.4	80.2	77.2	73.2	76.8	88.4	88.9	85.4	85.2	84.6	83.5	85.5	93.3																			
22-Oct	83.9	82.6	85.8	90.8	90.2	89.3	88.6	88.2	86.7	80.7	78.7	69.9	59.6	53.9	54.6	53.9	56.7	63.1	67.8	68.1	62.2	61.9	65.1	70.5	73.0	90.8																			
23-Oct	73.7	76.3	77.7	77.9	77.6	80.0	80.2	79.0	72.2	64.3	55.0	44.2	38.4	37.3	35.5	36.4	41.0	45.9	49.8	54.4	55.7	56.6	58.5	62.3	59.6	80.2																			
24-Oct	64.7	66.6	69.0	70.0	71.4	73.2	74.3	74.3	70.5	61.3	56.6	55.9	53.7	52.7	50.8	51.7	54.4	57.0	59.7	59.5	59.4	61.0	61.9	62.0	62.1	74.3																			
25-Oct	61.7	62.8	63.3	63.5	62.1	64.4	66.0	67.3	67.4	60.9	52.9	47.1	44.5	43.7	41.8	41.6	43.4	45.4	47.4	55.0	65.0	78.4	83.1	84.4	58.9	84.4																			
26-Oct	83.1	85.9	87.9	84.6	81.7	80.2	79.9	82.7	79.9	75.9	76.7	75.1	76.2	60.1	64.2	53.3	61.3	81.3	82.7	63.3	63.5	66.3	69.2	81.1	74.8	87.9																			
27-Oct	86.8	84.9	89.3	90.7	86.3	84.2	88.5	87.6	90.0	84.3	81.6	72.7	70.5	62.6	56.1	55.3	58.1	62.0	63.4	69.4	70.1	67.4	68.2	74.9	75.2	90.7																			
28-Oct	74.7	71.2	71.1	77.5	85.5	85.1	85.4	84.1	82.4	84.5	81.2	80.7	72.2	65.7	69.2	70.0	71.1	70.8	70.2	73.5	76.8	74.9	75.5	71.0	76.0	85.5																			
29-Oct	70.4	67.9	63.0	63.7	66.5	64.0	58.7	61.0	60.9	60.4	59.8	59.6	57.8	54.0	51.3	50.7	57.9	68.7	74.5	74.2	77.1	81.0	77.6	74.6	64.8	81.0																			
30-Oct	73.1	69.8	73.7	79.4	86.3	90.0	90.2	88.6	88.6	87.5	79.4	71.3	59.7	55.1	55.5	56.2	59.0	58.7	60.0	63.5	66.3	70.0	75.7	84.8	72.6	90.2																			
31-Oct	94.3	95.8	95.5	95.5	94.1	93.9	91.4	92.1	90.9	86.1	80.6	76.8	76.7	75.7	74.3	76.2	77.8	79.7	81.2	82.4	83.7	85.7	87.7	87.3	85.6	95.8																			
81.3 83.3 85.3 87.0 87.4 88.1 88.0 87.3 83.4 75.8 69.2 64.0 60.1 57.1 55.5 54.7 57.5 63.0 68.6 72.6 74.4 75.0 76.1 78.5																						Diurnal Average																							
99.7 99.8 99.9 100.0 100.0 100.0 100.0 100.0 100.0 100.0 97.1 94.6 94.8 96.2 96.2 90.8 87.1 90.7 91.9 93.4 97.7 99.0 99.4 99.5 99.6																						Diurnal Maximum																							





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Waskow ohci Pimatisiwin - October 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	15	2.02	2.02
40 - 60	156	20.97	22.98
60 - 80	267	35.89	58.87
80 - 100	301	40.46	99.33

Total Number of Valid Hours: 744

Total Number of Hours: 744

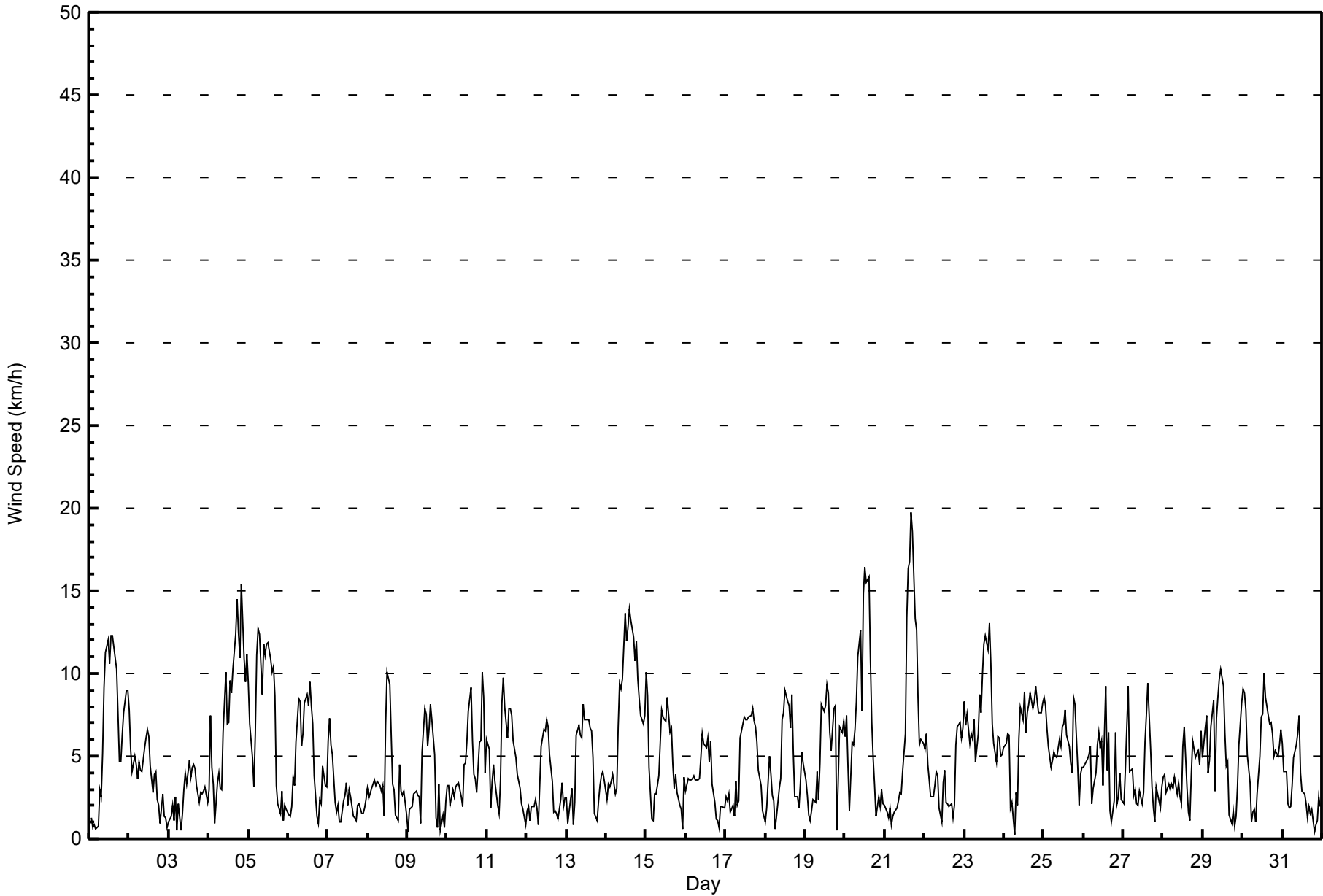


Maximum Speed: 20 km/h on Oct 21 17:00	Maximum Daily Speed Average: 8.2 km/h on Oct 14	Hours in Service: 744
Minimum Speed Value: 0 km/h on Oct 24 07:00	Minimum Daily Speed Average: 0.7 km/h on Oct 31	Hours of Data: 743
Maximum Diurnal Speed Average: 2.1 km/h at hour 11	Minimum Diurnal Speed Average: 0.5 km/h at hour 17	Hours of Missing Data: 1
Monthly Average Velocity: 1.3 km/h 222.3 deg	Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 4 Q ₃ = 7 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-Oct	UO	SW1	SSW1	S1	WSW1	SE1	SSE3	SSE3	SE5	SSE9	SSE11	SSE12	SSE11	SSE12	SE12	SSE12	SSE10	SE8	SE5	SE5	SE6	SE8	SE9	SSE9	SSE6.5	SSE12	
2-Oct	SSE8	SSE5	SSE4	SSE5	SE4	SE4	SE5	SSE4	SE4	SSE6	SE6	SE7	SE6	SE4	SSE3	SE4	S4	SSE2	S2	WNN1	W3	WSW1	WSW1	W1	SSE3.5	SSE8	
3-Oct	S1	SSW1	SE2	S1	SSE3	SSE1	S2	SSE1	SE2	SSE3	SSE4	WSW3	WSW5	SW4	S4	SSE4	SSE4	SSE3	SE2	S3	SSE3	SSE3	SSE3	SE2	S2.2	WSW5	
4-Oct	SSE3	SSE7	SSE4	SSE3	WSW1	WNN3	WNN4	NW3	WNN3	W6WNN10	WNN7	WNN7	NW10	NW9WNN10	WNN12	WNN15	WNN12	WNN11	WNN15	WNN11	WNN9	WNN11	WNN6.5	WNN15	WNN6.5	WNN15	
5-Oct	WNN9	WNN7	WNN5	WNN3	WNN6	WNN11	WNN13	WNN12	WNN9	WNN12	WNN11	WNN12	WNN10	WNN9	WSW3	S2	SSW2	WSW3	S1	SW2	WSW2	WNN7.0	WNN13	WNN7.0	WNN13		
6-Oct	WSW1	SSW1	SSE2	SSE4	SE3	SSE6	SSE8	SSE8	SSE6	SSE6	SE8	SE9	SE8	SSE10	S8	SSE7	SSE4	SW1	SW1	SW2	SW2	WSW4	W3	W3	SSE4.0	SSE10	
7-Oct	WSW6	W7	W6	W5	N2	WSW2	SSE2	SSW1	E1	ENE2	ESE3	SE3	E2	S3	SE3	NNE1	NW1	WNN1	W2	WNN2	W2	W2	WNN2	W2	WSW1.1	W7	
8-Oct	W3	WNN2	NW3	WNN3	WNN4	WNN3	WNN4	WNN3	NW3	N3	NE1	SE7	SE10	SE9	SE6	SE3	S3	SSE1	SSE1	SSE4	SE3	SSE3	SE3	SE1	SSE1.2	SE10	
9-Oct	SSW0	SSE2	W2	WSW2	WNN3	W3	W3	W3	W1	SE5	SSE8	SSE8	SE6	SSE7	SSE8	SSE7	SSE5	NE1	NE1	ESE3	WSW0	WNN1	S1	NW2	SSE2.0	SSE8	
10-Oct	WNN3	WNN3	WNN2	W3	W3	WNN3	W3	WNN3	NW3	S2	SE5	SE5	SE6	SE8	SSE9	SE6	E4	E4	ESE3	SE6	SE6	SE10	SE9	SE4	SSE2.5	SE10	
11-Oct	SE6	SE5	ESE2	ESE3	ESE5	E3	ENE2	N2	SE4	SE8	SSE10	SSE8	SSE6	SSE8	SSE8	SE7	E6	E5	E4	ESE3	ESE3	ESE2	ESE2	SE1	SE4.3	SSE10	
12-Oct	SE2	SE2	NW1	NW2	W2	W2	WSW2	WSW1	SE3	SSE6	SE7	SE7	SE7	SE7	SE5	SE3	SE2	SSE2	SE2	SE1	SSE2	SSE3	SE2	SE2	SE2.4	SE7	
13-Oct	SE2	SE1	SSE2	SSE3	NE1	SSE2	SSE6	SSE7	SE6	SE6	SE8	SE7	SE7	SE7	SE7	SE7	ESE5	ENE2	N1	E2	SE3	SSE4	SE4	SE4	SE4.1	SE8	
14-Oct	S2	SE3	SE3	SE3	ESE4	SE3	SSE3	SE7	SE9	SE9	SE10	SE14	SE12	SE13	SE14	SE13	SE12	SE11	SE10	SE10	SSE8	SE7	SE7	SE7	SE8.2	SE14	
15-Oct	SE10	SE9	SE4	SE1	ENE1	ESE3	SE3	SSE3	SE4	SE8	SE7	SE7	SE7	SE9	SE6	SE7	SSE5	SSW3	SE4	SSE3	S2	SSE2	SSW1	SSE4	SE4.5	SE10	
16-Oct	S3	S4	S4	SSE4	SSE4	SSE4	SE4	SE4	SE4	SE5	SE6	SE6	S5	SSW6	SSW5	SSE6	SE3	SSE2	SSE1	SSW1	NW1	WNN2	WSW2	WSW2	SSE3.0	SE6	
17-Oct	NW3	W2	NW3	NW2	NNW2	NNW1	NW4	NNW2	N2	NNE6	NNE7	NNE7	NNE7	NNE7	N7	N7	N8	NNW7	NNW7	NNW6	WNN4	WNN3	W2	E1	N3.8	N8	
18-Oct	W1	S2	SSE5	SE4	SE3	SSE2	N1	ESE1	SE3	S4	SSE7	SE8	SE9	SE8	SE8	SE7	SE9	SE5	SSE3	SSE3	S2	SW3	SW5	SW5	SSE3.9	SE9	
19-Oct	S4	SSE3	SE1	SSE1	SSE2	S2	S2	S4	SSE2	S5	SW8	SW8	SW8	SW9	SW9	SSW6	S5	SSW8	SW8	S1	S3	W7	WSW6	SSW7	SSW4.4	SW9	
20-Oct	WSW6	WSW7	WNN4	SW2	W6	WSW6	W7	WSW8	WSW11	W13	WNN8	NW15	NW16	NW16	NW16	NNW11	N7	NNE5	NNE3	N1	NW3	WSW2	W3	WSW2	WNN5.8	NW16	
21-Oct	W2	SSW2	SW1	SW2	SSW1	SW1	SSE2	S2	SSE2	S3	S3	NNW4	NNW6	N13	N16	N17	N20	N19	N13	N13	N9	NW6	NW6	NW6	NNW5.4	N20	
22-Oct	NW5	NNW6	NW5	W4	SW3	WSW3	W3	W4	W4	S2	NW1	NNE3	N4	NNE2	NNE2	WSW2	W2	WSW1	SW2	WNN6	WNN7	WNN7	W6	W7	WNN2.8	WNN7	
23-Oct	W8	W7	W8	W6	W6	WSW6	WSW7	W5	W6	W9	W8	W10	W12	WNN12	WNN11	WNN13	WNN11	WNN7	W6	WSW5	WSW6	W6	W5	W5	W7.5	WNN13	
24-Oct	W5	W6	W6	W6	W2	SSE2	SSE0	SSW3	SW2	WSW6	WSW8	WSW7	WSW9	WSW6	W8	W8	W9	W8	W8	W9	W8	W8	W8	W8	W8	W6.0	W9
25-Oct	W9	W8	W7	W6	WSW4	WSW5	WSW5	WSW5	WSW6	SW6	SSW7	WSW7	WSW8	SW6	SW6	SW5	WSW4	WNN9	NW8	WNN4	S2	SW4	WSW4	WSW5.1	W9		
26-Oct	WSW4	WSW5	WSW5	WSW5	W6	SSW2	S3	SW4	WSW6	WSW6	WSW5	WSW6	WSW3	NW9	WNN4	W6	NW2	E1	SSE2	WNN6	WSW2	SSW3	SW4	SW2	WSW3.5	NW9	
27-Oct	WSW2	W4	NNW7	NNW9	NNW4	NNW4	WNN3	NW3	WSW2	WNN2	W3	NW2	NNE3	NW6	NW8	WNN9	WNN5	W3	W2	WSW1	SW3	SW3	SSE2	SSE3	WNN2.8	WNN9	
28-Oct	SSE4	SSE4	S3	WSW3	WSW3	WSW3	W3	W4	WNN3	WNN3	N3	NE2	NW6	NNW7	NE3	ESE2	S1	W4	W6	W5	W5	W5	W4	WNN7	W2.3	NNW7	
29-Oct	WNN5	W7	WNN7	W4	W5	W7	WNN8	WSW3	WNN7	NW9	NW10	NW10	NW9	NW6	WNN4	WNN5	NNE1	WNN1	N2	NW1	NNW1	WNN3	NNW6	N8	NW4.9	NW10	
30-Oct	N9	NNE9	N8	NNW5	WNN3	WSW1	WSW2	WSW2	S1	SSE3	SE5	SSE7	SSE8	SSE10	SSE9	SSE7	SSE7	SSE7	SSE6	SSE5	SSE5	SSE5	SSE5	SSE6	SSE7	SSE2.8	SSE10
31-Oct	SSE6	SE4	SSE4	SSE2	NNW2	W2	WNN3	NNW5	NNW6	NNW6	NNW7	NNE4	NE3	ENE3	ESE2	SE1	NNE2	ENE2	ENE2	SE0	W1	SE1	S3	SSE2	NNE0.7	NNW7	

WSW1.7 SW1.8 WSW1.5 WSW1.3 WSW1.0 WSW1.7 SW1.6 SW1.3 SSW1.7 S2.1 S2.0 SSW1.7 SSW1.5 S1.5 SSW1.2 SSW0.5 WSW0.0 WSW0.9 WSW1.0 WSW1.5 SW1.9 SW1.9 SW1.6	Diurnal Average
SE10 NNE9 N8 NNW9 WNN6 WNN11 WNN13 WNN12 WSW11 W13 SSE11 NW15 NW16 NW16 N16 N17 N20 N19 N13 N13 WNN15 WNN11 WNN9 WNN11	Diurnal Maximum

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Wind Speed (WS) - km/h
Waskow ohci Pimatisiwin - October 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	450	60.57	60.57
6 - 11	258	34.72	95.29
12 - 19	34	4.58	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
Waskow ohci Pimatisiwin - October 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	10	6	9	9	17	65	75	41	15	24	49	49	41	17	13	450
6 - 11	7	7	0	0	1	0	61	45	1	5	9	21	41	32	15	13	258
12 - 19	6	0	0	0	0	0	8	3	0	0	0	0	2	11	4	0	34
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	24	17	6	9	10	17	134	123	42	20	33	70	92	84	36	26	743

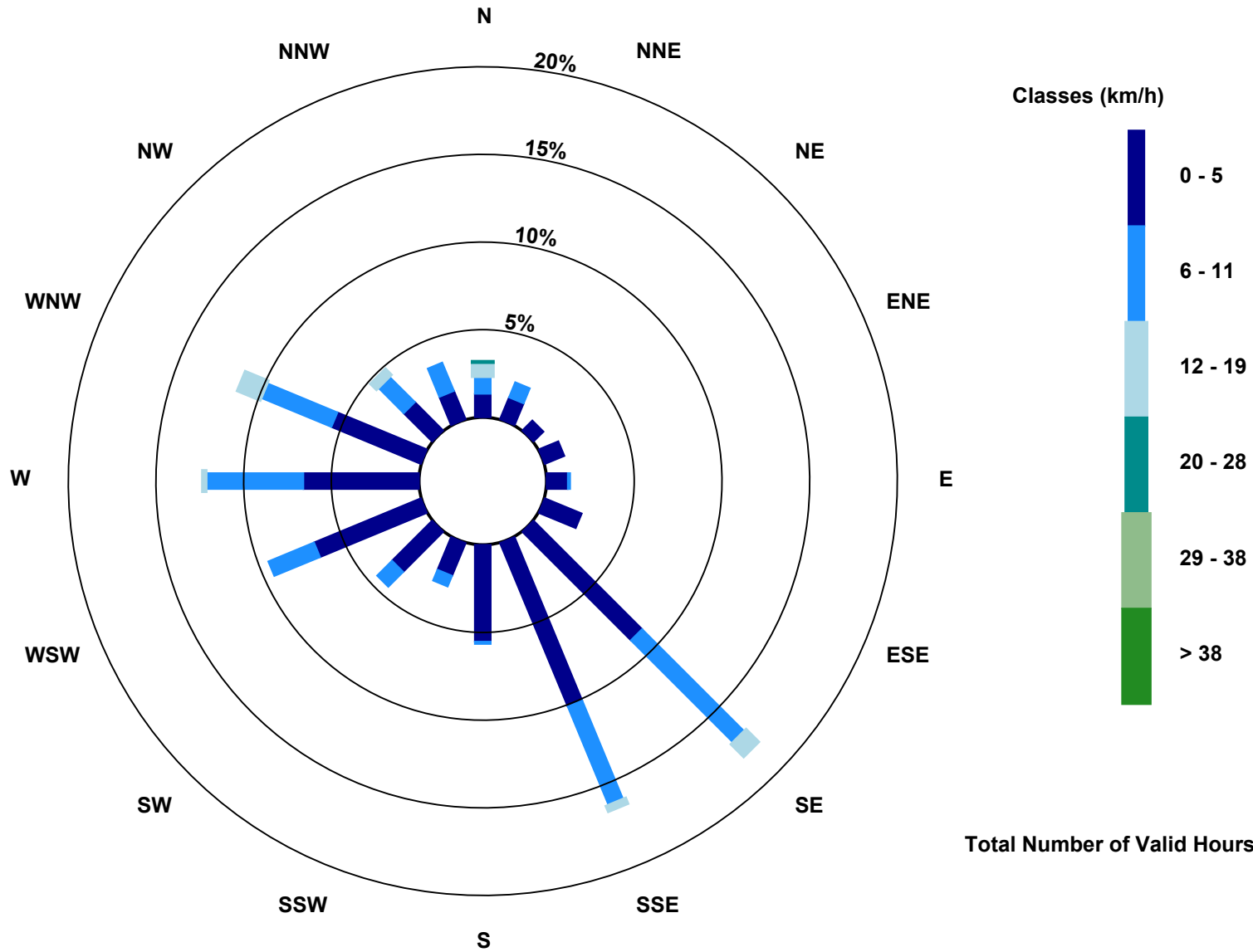
Total Number of Valid Hours: 743

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 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 - October 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Oct 21 17:00 Minimum Value: 0 km/h on Oct 8 06:00 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: 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-Oct	UO	1	1	1	1	1	2	1	3	3	5	4	4	5	5	5	4	3	2	1	2	3	3	3	5
2-Oct	3	2	1	1	2	2	2	2	2	2	2	2	2	2	1	2	2	1	1	1	1	1	1	1	3
3-Oct	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	1	1	1	1	1	1	1	1	2
4-Oct	2	2	2	1	2	1	1	1	2	3	4	3	3	3	4	4	5	5	4	4	6	5	3	4	6
5-Oct	3	3	2	2	2	4	5	4	3	4	4	4	4	4	4	4	5	1	1	1	1	1	1	1	5
6-Oct	1	1	1	1	2	2	3	3	2	2	3	3	3	3	3	2	1	1	1	1	1	2	2	1	3
7-Oct	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
8-Oct	1	1	1	1	1	0	1	1	1	1	1	3	4	3	2	2	2	1	1	1	2	1	1	1	4
9-Oct	1	1	1	1	1	1	1	1	1	2	3	3	2	3	3	3	2	1	1	1	1	1	1	1	3
10-Oct	1	1	1	1	1	1	1	1	0	2	2	2	2	3	3	3	2	2	2	2	2	4	4	2	4
11-Oct	2	2	1	2	2	1	1	1	2	3	3	3	2	3	3	3	2	1	2	2	1	1	1	1	3
12-Oct	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	2
13-Oct	1	1	1	1	1	1	3	3	2	2	3	2	3	2	3	2	2	1	1	1	1	2	2	1	3
14-Oct	1	1	1	1	2	1	1	2	3	3	4	5	4	5	5	5	4	4	4	4	3	3	2	3	5
15-Oct	3	3	2	1	1	1	1	1	2	3	3	2	2	3	2	2	2	1	1	1	1	1	1	1	3
16-Oct	1	1	1	1	1	1	1	1	1	2	2	2	2	3	2	2	2	1	1	1	1	1	1	1	3
17-Oct	1	1	1	1	1	1	1	2	1	2	2	3	3	3	3	3	3	2	2	2	1	1	1	1	3
18-Oct	1	1	2	1	1	1	1	1	2	1	3	3	3	3	3	2	3	2	1	1	2	2	2	2	3
19-Oct	2	1	1	1	1	1	1	1	1	2	4	3	4	4	4	3	2	3	4	1	1	3	3	3	4
20-Oct	2	3	2	1	3	2	2	3	4	5	4	5	5	5	4	3	3	2	2	1	1	1	1	1	5
21-Oct	1	1	1	1	1	1	1	1	1	1	1	2	3	5	5	6	7	6	5	5	3	2	1	1	7
22-Oct	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	2	2	2	2	2	2
23-Oct	2	2	2	1	2	1	2	1	2	3	3	5	4	4	4	5	4	3	3	1	2	2	2	2	5
24-Oct	2	2	2	2	2	1	1	1	2	3	3	3	4	3	3	3	3	3	3	3	3	2	3	3	4
25-Oct	3	3	3	2	2	2	2	2	2	2	2	2	3	3	3	2	2	2	4	2	2	1	1	1	4
26-Oct	2	2	2	2	2	1	1	2	2	2	2	2	2	3	2	3	2	1	1	2	1	1	1	1	3
27-Oct	1	1	4	4	1	1	1	1	1	1	1	1	2	2	3	3	2	1	1	1	1	1	1	1	4
28-Oct	1	1	1	1	1	1	1	2	1	1	1	1	2	4	1	1	1	2	2	1	1	1	2	2	4
29-Oct	2	3	3	1	2	2	3	1	3	3	3	3	3	3	2	2	1	1	1	1	1	1	2	3	3
30-Oct	4	3	3	1	1	1	1	1	1	1	2	3	3	3	3	2	2	2	2	2	2	1	2	2	4
31-Oct	2	1	1	2	1	1	1	1	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	2
Diurnal Maximum																									
UO - Unstable Operation																									



Wood Buffalo Environmental Association
Summary of Hour Averages

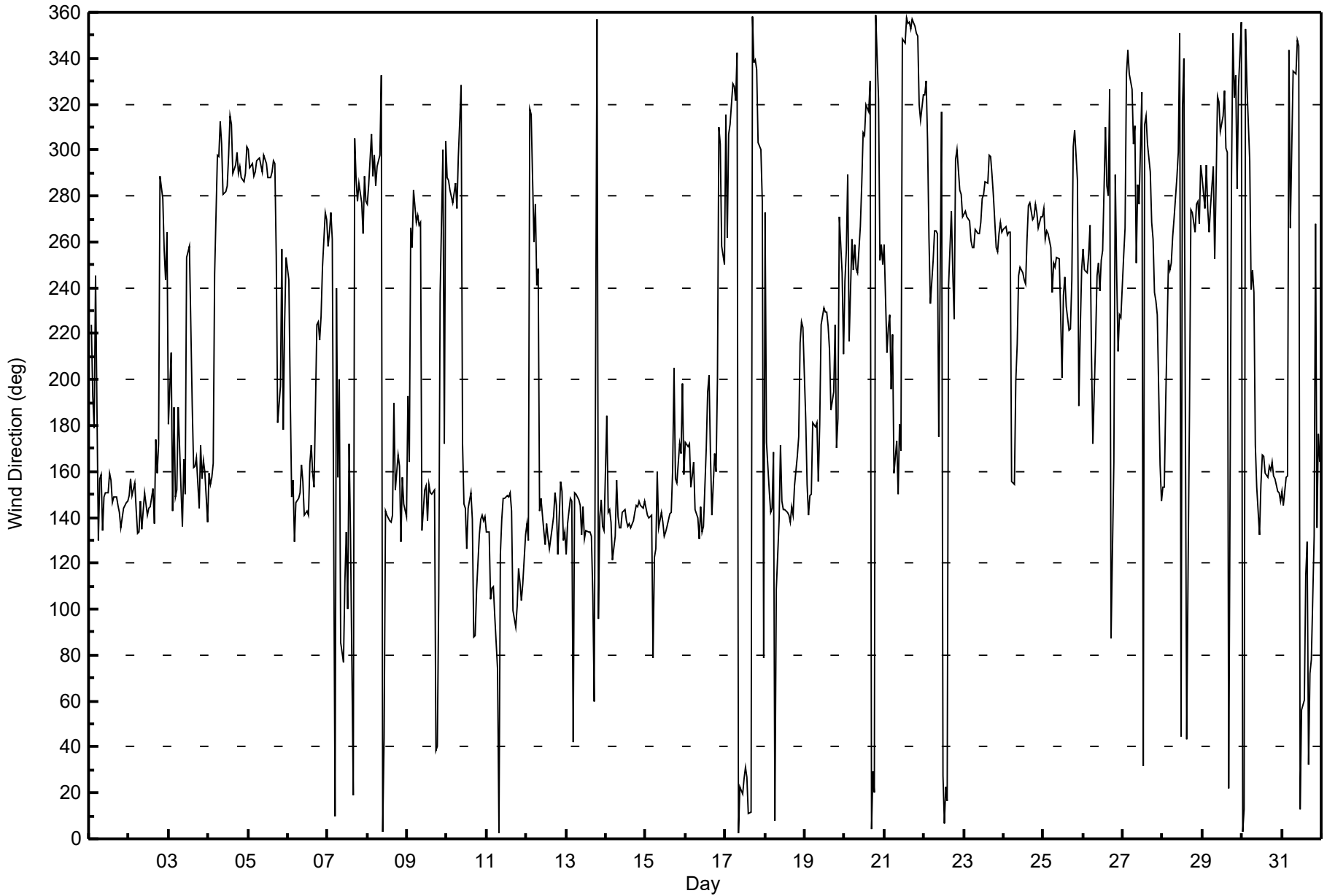
Wind Direction (WD) - deg
Waskow ohci Pimatisiwin - October 2023

Direction of Maximum Speed: 353 deg on Oct 21 17:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 140.8 deg on Oct 14	Hours of Data: 743
Direction of Minimum Speed: 154 deg on Oct 24 07:00	Hours of Missing Data: 1
Direction of Minimum Daily Speed Average: 0.7 deg on Oct 31	Percent Operational Time: 99.9
Monthly Average Direction: 222.3 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-Oct	UO	224	193	179	245	130	157	158	134	149	151	151	160	156	146	149	149	145	142	136	139	144	146	147	149.4
2-Oct	149	157	149	155	143	133	134	147	135	150	146	141	144	145	153	137	174	159	172	289	279	256	244	264	151.5
3-Oct	180	212	143	188	149	152	188	152	136	166	150	253	258	224	189	162	163	166	144	172	157	165	160	138	175.6
4-Oct	159	154	158	163	246	298	297	312	303	281	282	284	298	315	311	290	293	299	290	293	288	286	290	302	289.4
5-Oct	300	292	294	289	291	295	296	297	290	298	296	294	288	288	291	295	294	254	181	197	257	178	225	253	289.9
6-Oct	243	193	149	156	129	147	148	150	163	155	141	143	141	164	171	160	153	224	225	217	227	249	273	270	163.2
7-Oct	258	264	273	261	10	240	158	200	85	77	112	134	100	172	133	19	305	288	278	286	277	263	289	277	252.8
8-Oct	276	285	307	289	298	285	293	298	333	3	44	143	141	138	138	141	190	152	167	162	129	158	146	140	166.4
9-Oct	193	164	266	258	283	268	271	267	268	134	152	154	138	154	151	150	152	38	40	106	237	300	172	304	164.0
10-Oct	288	287	282	277	281	285	275	297	328	172	146	144	126	144	151	139	88	88	108	133	139	141	139	141	147.6
11-Oct	134	134	104	109	110	97	74	2	124	139	148	148	150	149	150	143	100	92	101	118	112	104	111	132	128.2
12-Oct	137	130	318	316	260	276	241	248	143	148	134	128	137	131	127	135	140	151	145	124	155	151	130	133	142.7
13-Oct	124	137	148	147	42	151	150	148	145	133	144	131	135	134	134	132	106	60	357	96	140	147	136	134	134.9
14-Oct	185	142	143	138	122	132	156	140	135	135	142	143	139	136	137	135	138	142	145	145	147	145	144	147	140.8
15-Oct	144	141	140	141	78	122	126	160	136	142	138	132	133	136	142	142	161	205	157	155	172	168	199	158	143.8
16-Oct	172	171	172	153	158	164	143	140	131	145	134	136	170	195	202	167	141	168	160	201	310	303	258	250	163.8
17-Oct	316	262	307	311	329	328	322	342	2	23	19	26	31	27	11	11	358	338	340	335	303	300	278	79	354.7
18-Oct	273	173	151	142	144	168	8	109	139	172	147	144	143	142	141	138	145	141	154	167	175	216	225	223	154.7
19-Oct	183	154	141	150	150	181	179	181	156	180	224	231	230	229	223	213	187	194	224	171	183	271	247	211	211.4
20-Oct	243	256	290	217	261	247	259	248	246	267	285	307	306	320	317	330	4	30	20	359	322	252	259	250	292.0
21-Oct	259	212	223	228	196	219	159	173	150	181	169	348	346	358	355	356	353	357	354	351	349	320	313	324	346.9
22-Oct	324	330	304	262	233	252	265	265	264	175	317	28	6	23	16	241	274	247	226	296	300	282	280	271	291.2
23-Oct	272	273	271	269	261	257	258	265	263	268	279	281	286	285	298	297	289	280	258	256	264	268	264	264	274.8
24-Oct	265	267	263	264	264	156	154	200	215	245	249	247	244	242	261	276	277	270	271	276	273	266	271	271	261.1
25-Oct	275	261	265	264	257	238	251	249	253	253	229	201	237	245	232	221	222	243	301	309	287	189	221	248	252.0
26-Oct	257	248	247	255	267	212	172	218	245	251	238	252	257	310	285	280	326	87	164	289	246	212	228	227	255.0
27-Oct	254	266	333	344	333	327	303	311	251	285	277	325	32	311	315	303	291	269	261	238	234	228	163	147	301.9
28-Oct	153	153	190	252	248	251	263	270	288	299	351	44	319	340	44	118	186	274	273	264	276	278	268	294	278.4
29-Oct	288	275	294	275	264	275	293	252	286	323	321	308	315	326	301	299	22	289	351	323	332	283	328	355	304.2
30-Oct	3	13	353	328	295	239	248	238	172	153	133	154	167	167	159	158	162	161	164	158	157	151	151	147	154.5
31-Oct	151	145	157	158	343	266	301	335	333	348	345	13	56	61	115	130	32	72	78	132	268	136	177	164	28.8

239.7 230.7 255.6 245.5 255.1 241.9 242.2 232.2 215.7 199.9 182.3 178.0 191.4 196.8 191.2 199.1 203.1 242.1 249.4 256.6 244.9 228.5 225.7 232.3
 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
Waskow ohci Pimatisiwin - October 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0																			Hours in Service: 744						
Maximum Value: 113 deg on Oct 24 07:00																			Hours of Data: 743						
Minimum Value: 10 deg on Oct 2 21:00																			Hours of Missing Data: 1						
Percentiles: P ₁ = 13 P ₁₀ = 21 Q ₁ = 25 Median = 30 Q ₃ = 44 P ₉₀ = 64 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-Oct	UO	69	83	64	102	97	60	34	31	29	30	31	34	30	31	29	27	24	27	24	23	24	22	21	102
2-Oct	24	25	21	21	28	28	26	33	39	23	25	26	25	30	43	41	38	30	34	63	10	47	44	67	67
3-Oct	76	61	32	75	46	74	39	71	45	40	42	79	58	55	44	28	22	17	26	18	21	25	27	31	79
4-Oct	61	21	25	32	87	29	18	33	46	42	29	28	25	22	25	30	24	24	28	26	26	30	28	24	87
5-Oct	23	23	25	71	27	23	26	25	28	23	25	26	27	27	27	28	37	32	37	57	60	60	40	29	71
6-Oct	59	56	41	29	28	19	23	25	27	28	26	29	26	27	36	31	40	80	74	50	73	48	53	31	80
7-Oct	25	22	32	32	50	64	52	89	69	30	38	34	78	36	33	44	73	58	17	51	33	75	49	28	89
8-Oct	22	18	18	21	13	13	24	28	50	25	72	29	26	29	30	44	63	47	85	23	44	39	39	39	85
9-Oct	82	47	41	47	21	18	30	30	95	31	24	30	40	31	26	25	27	52	38	26	95	80	89	35	95
10-Oct	20	16	45	16	16	26	12	20	19	72	39	45	32	29	27	36	36	24	39	23	18	24	33	44	72
11-Oct	31	37	56	47	30	30	49	25	39	28	28	30	39	29	29	28	24	18	29	34	25	42	41	52	56
12-Oct	47	62	49	34	34	12	30	44	46	29	30	27	28	31	34	40	39	38	33	36	47	26	37	23	62
13-Oct	52	43	12	20	61	39	28	22	25	26	25	26	26	28	30	28	27	57	88	45	27	19	31	36	88
14-Oct	40	26	29	31	36	45	40	21	24	25	26	26	26	27	27	25	21	24	24	24	25	25	23	22	45
15-Oct	22	23	27	86	64	26	27	21	30	24	30	27	27	25	25	24	32	32	31	28	20	35	96	26	96
16-Oct	25	19	27	19	20	29	32	22	25	25	25	31	48	50	63	29	34	35	35	55	65	52	42	25	65
17-Oct	57	61	53	79	30	70	19	58	28	24	28	29	28	27	33	30	31	19	19	22	27	35	76	49	79
18-Oct	78	65	33	30	35	52	85	57	48	36	34	25	25	25	24	24	22	27	34	28	71	39	40	36	85
19-Oct	35	26	37	76	54	59	34	22	37	28	48	46	48	43	45	45	29	36	49	97	37	32	47	40	97
20-Oct	36	46	52	81	45	41	38	37	34	29	44	23	22	21	19	21	34	22	41	51	29	55	25	21	81
21-Oct	63	68	57	50	76	69	70	54	67	60	56	69	29	23	23	24	23	22	21	21	22	19	13	15	76
22-Oct	18	16	24	18	32	22	13	13	21	64	109	58	50	54	58	47	45	37	25	24	16	16	16	18	109
23-Oct	16	18	17	16	17	16	14	21	25	34	47	39	32	28	31	28	22	23	23	22	27	25	20	47	47
24-Oct	22	19	20	24	93	59	113	69	100	54	37	38	43	42	39	31	25	28	28	26	25	28	26	26	113
25-Oct	28	30	28	25	39	34	35	27	30	36	48	39	45	40	48	47	44	35	24	20	44	46	34	30	48
26-Oct	33	34	28	34	31	84	51	51	38	36	47	40	66	29	50	29	77	76	67	21	41	66	31	62	84
27-Oct	77	24	34	19	17	14	21	24	21	31	42	68	67	35	29	25	21	21	26	72	22	31	30	21	77
28-Oct	23	26	36	31	57	33	39	39	59	39	54	35	26	38	31	57	67	23	21	19	19	21	23	19	67
29-Oct	25	24	25	23	25	27	22	43	23	27	25	21	25	34	48	33	28	66	39	97	69	19	25	25	97
30-Oct	26	25	20	21	19	71	37	37	86	30	28	31	37	30	29	25	22	23	25	22	21	19	21	22	86
31-Oct	26	27	27	54	73	44	33	21	20	21	18	39	26	24	48	55	18	42	20	70	64	41	24	25	73
																			82 69 83 86 102 97 113 89 100 72 109 79 78 55 63 57 77 80 88 97 95 80 96 67						
Diurnal Maximum																									
UO - Unstable Operation																									



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS26 CHRISTINA LAKE OCTOBER 2023

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

November 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CHRISTINA LAKE (AMS26)
OCTOBER 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	7.1	0
H2S (ppb) Average	706	36	38	99.73	1.2	0	0.4	0
NO2 (ppb) Average	707	37	37	100	17.1	0	7.1	-
NO (ppb) Average	707	37	37	100	34.8	-	15.1	-
NOX (ppb) Average	707	37	37	100	42.8	-	22.3	-
Temperature 2 m (C) Average	744	0	0	100	22.6	-	15.3	-
Relative Humidity (%) Average	744	0	0	100	96.8	-	85.3	-
Wind Speed 10 m (km/h) Average	744	0	0	100	31	-	20	-
Wind Direction 10 m (deg) Average	744	0	0	100	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CHRISTINA LAKE (AMS26)
 OCTOBER 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	1.15	2.3	-	0	0.1	0.2	0.3	0.9	2.8	16.3
H2S (ppb) Average	706	0.17	0.2	-	0	0	0.1	0.1	0.2	0.4	1.2
NO2 (ppb) Average	707	3.04	2.6	-	0.2	0.8	1.3	2.1	3.8	6	17.1
NO (ppb) Average	707	1.69	4	-	0	0	0.1	0.4	1.2	3.7	34.8
NOX (ppb) Average	707	4.73	6.1	-	0.2	1	1.6	2.8	5.1	10	42.8
Temperature 2 m (C) Average	744	4.34	7.9	-	-12.4	-6.3	-3.2	5.9	10.1	13.9	22.6
Relative Humidity (%) Average	744	69.27	14.8	-	31.4	47.4	58.6	71.1	81.2	87.8	96.8
Wind Speed 10 m (km/h) Average	744	12.4	5	-	1	6	9	12	15	20	31
Wind Direction 10 m (deg) Average	744	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CHRISTINA LAKE (AMS26)
OCTOBER 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
H2S	26 Oct 2023 15:00	26 Oct 2023 16:00	2	Maintenance - sample manifold cleaned



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb

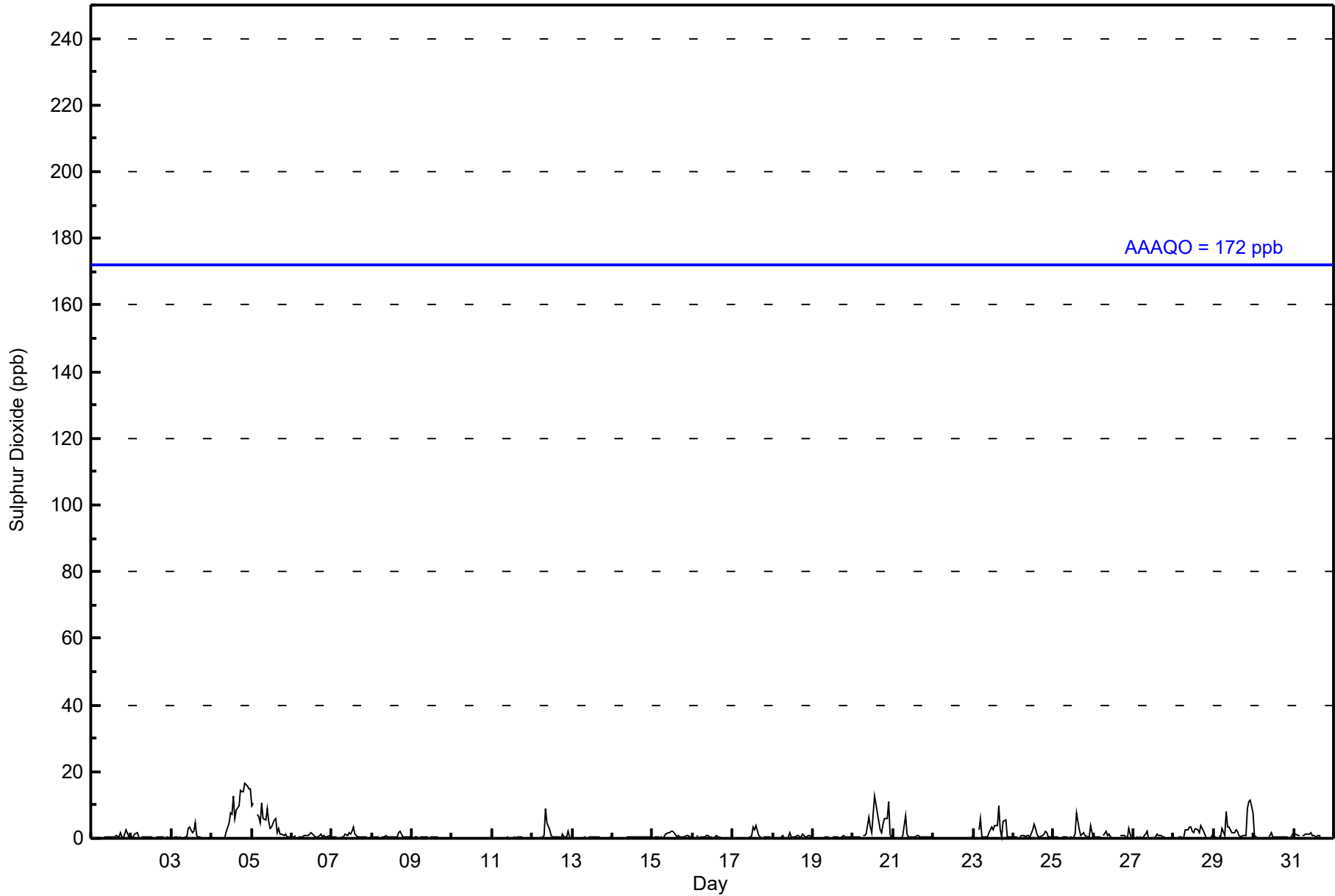
Christina Lake - October 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		744																																									
Maximum Value: 16.3 ppb on Oct 4 21:00		Maximum Daily Average: 7.1 ppb on Oct 4		Minimum Value: 0.0 ppb on Oct 9 20:00		Minimum Daily Average: 0.1 ppb on Oct 10		Hours of Data: 709																																									
Maximum Diurnal Average: 2.0 ppb at hour 14		Minimum Diurnal Average: 0.3 ppb at hour 3		Hours of Missing Data: 35		Hours of Calibration: 35		Percent Operational Time: 100.0																																									
Monthly Average: 1.15 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.2 Median = 0.3 Q ₃ = 0.9 P ₉₀ = 2.8 P ₉₉ = 12.9																																															
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-Oct	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.3	0.4	0.5	0.6	0.5	0.4	0.3	0.7	0.5	1.5	0.3	0.2	1.2	2.6	0.5	0.6	0.5	2.6																							
2-Oct	0.2	0.4	1.1	1.7	0.4	Z	0.6	0.3	0.5	0.4	0.3	0.2	0.2	0.2	0.1	0.2	0.3	0.3	0.3	0.3	0.1	0.2	0.1	0.3	0.4	1.7																							
3-Oct	Z	0.4	0.3	0.3	0.2	0.4	0.1	0.2	0.5	0.6	2.8	3.4	1.7	2.3	4.7	0.9	0.5	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.9	4.7																							
4-Oct	0.3	Z	0.2	0.2	0.1	0.1	0.2	0.1	0.6	2.1	4.5	7.5	7.2	12.9	6.1	8.5	9.9	14.3	14.0	14.2	16.3	15.5	14.7	14.8	7.1	16.3																							
5-Oct	9.9	10.7	Z	7.3	6.3	4.8	10.6	6.0	5.5	9.0	5.1	2.9	3.5	5.7	6.0	1.9	2.8	1.4	1.4	0.8	1.5	0.4	0.3	0.2	4.5	10.7																							
6-Oct	0.2	0.5	0.9	Z	0.3	0.3	0.4	0.7	0.7	1.0	0.7	1.6	1.2	0.9	0.5	0.3	0.6	1.2	0.5	0.9	0.4	0.3	0.7	0.5	0.7	1.6																							
7-Oct	0.4	0.2	0.3	0.4	Z	0.1	0.3	0.4	1.5	1.1	1.6	1.4	2.1	3.2	1.4	0.5	0.6	0.3	0.3	0.3	0.2	0.1	0.1	0.3	0.7	3.2																							
8-Oct	0.4	0.4	0.5	0.5	0.5	Z	0.3	0.6	0.6	0.6	0.5	0.4	0.4	0.4	0.6	0.4	1.6	1.9	0.4	0.4	0.4	0.4	0.5	0.3	0.6	1.9																							
9-Oct	Z	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.2	0.4	0.3	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.2	0.4																							
10-Oct	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	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1																							
11-Oct	0.1	0.1	Z	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	0.2	0.3	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.3																							
12-Oct	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.8	9.0	4.8	2.4	0.9	0.4	0.3	0.6	0.4	0.3	0.2	1.1	0.4	0.2	2.0	0.3	0.1	1.1	9.0																							
13-Oct	0.0	0.1	0.1	0.0	Z	0.2	0.2	0.3	0.1	0.1	0.3	0.3	0.3	0.2	0.4	0.4	0.3	0.2	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.4																							
14-Oct	0.1	0.1	0.0	0.0	0.0	Z	0.0	0.1	0.2	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.4	0.3	0.4	0.2	0.4																							
15-Oct	Z	0.3	0.3	0.3	0.2	0.3	0.2	0.3	1.3	1.6	1.8	2.1	2.1	1.5	0.6	0.9	0.5	0.5	0.3	0.3	0.7	0.7	0.6	0.4	0.8	2.1																							
16-Oct	0.4	Z	0.6	0.2	0.1	0.2	0.2	0.4	1.0	0.7	0.6	0.4	0.2	0.3	0.8	0.4	0.3	0.0	0.1	0.1	0.1	0.0	0.1	0.0	0.3	1.0																							
17-Oct	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.4	0.8	3.5	2.5	3.6	0.8	0.2	0.1	0.1	0.3	0.3	0.3	0.3	0.0	0.6	3.6																							
18-Oct	0.0	0.0	0.0	Z	0.0	0.3	0.8	0.1	0.1	0.2	1.6	0.4	0.2	0.5	1.0	0.8	0.6	0.3	1.5	0.6	0.5	0.8	0.9	0.3	0.5	1.6																							
19-Oct	0.1	0.0	0.1	0.0	Z	0.1	0.2	0.3	0.2	0.3	0.2	0.2	0.3	0.2	0.3	0.3	0.2	0.3	0.8	0.3	0.6	0.4	0.3	0.3	0.3	0.8																							
20-Oct	0.3	0.2	0.3	0.3	0.3	Z	0.7	0.8	1.1	6.2	3.5	1.8	7.1	12.7	7.4	5.1	2.4	1.5	4.2	5.9	5.9	10.8	1.1	0.2	3.5	12.7																							
21-Oct	Z	0.0	0.0	0.0	0.0	0.1	1.0	6.7	1.2	0.6	0.4	0.4	0.4	0.5	0.8	0.7	0.6	0.4	0.3	0.3	0.4	0.3	0.3	0.2	0.7	6.7																							
22-Oct	0.2	Z	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.0	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2																							
23-Oct	0.1	0.4	Z	2.8	5.9	0.5	0.5	0.4	0.6	1.7	2.6	3.5	2.5	4.0	3.9	9.8	2.4	0.3	5.2	5.7	0.4	0.3	0.5	0.3	2.4	9.8																							
24-Oct	0.5	0.5	0.3	Z	0.4	0.7	0.7	0.5	0.8	0.7	0.2	2.5	4.1	3.0	1.1	0.4	0.4	0.9	1.5	2.2	1.6	0.3	0.3	0.3	1.0	4.1																							
25-Oct	0.2	0.3	0.3	0.2	Z	0.3	0.4	0.5	0.6	0.2	0.3	0.2	0.3	1.1	7.6	2.5	1.0	1.2	1.7	0.8	0.3	0.5	3.6	1.7	1.1	7.6																							
26-Oct	0.3	0.3	0.4	0.4	0.3	Z	1.0	1.9	0.9	1.2	0.5	0.4	C	C	C	C	0.7	0.7	0.7	0.3	0.1	2.9	1.2	0.1	0.8	2.9																							
27-Oct	Z	0.0	0.3	0.1	0.4	0.2	0.7	1.1	2.1	0.0	0.0	0.1	0.1	0.5	1.2	0.9	0.9	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.4	2.1																							
28-Oct	0.0	Z	0.0	0.3	0.3	0.0	0.3	2.5	2.3	3.3	3.2	2.2	1.9	3.2	2.5	1.6	3.6	2.9	2.0	0.1	0.0	0.1	0.1	0.8	1.4	3.6																							
29-Oct	0.6	0.2	Z	0.7	0.2	3.0	0.9	7.9	3.4	3.2	2.6	1.7	1.7	2.6	2.2	0.7	0.3	0.8	0.7	0.9	9.0	11.1	11.4	7.4	3.2	11.4																							
30-Oct	1.0	0.6	0.4	Z	0.2	0.2	0.2	0.2	0.2	0.2	1.5	0.5	0.4	0.5	0.4	0.5	0.4	0.2	0.3	0.2	0.3	0.2	0.3	1.2	0.4	1.5																							
31-Oct	1.1	1.4	0.8	1.0	Z	0.9	0.7	1.4	1.4	1.4	1.8	0.7	0.7	0.5	0.9	0.8	0.2	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.7	1.8																							
																								0.6	0.7	0.3	0.7	0.7	0.5	0.7	1.1	1.2	1.4	1.3	1.2	1.5	2.0	1.9	1.4	1.1	1.1	1.2	1.2	1.3	1.7	1.3	1.0	Diurnal Average	
																								9.9	10.7	1.1	7.3	6.3	4.8	10.6	7.9	9.0	9.0	5.1	7.5	7.2	12.9	7.6	9.8	9.9	14.3	14.0	14.2	16.3	15.5	14.7	14.8	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
Christina Lake - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Christina Lake - October 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	695	98.03	98.03
11 - 20	14	1.97	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
Christina Lake - October 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	9	19	11	10	15	16	40	106	51	102	52	85	66	45	54	14	695
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	1	13	0	14
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	9	19	11	10	15	16	40	106	51	102	52	85	66	46	67	14	709

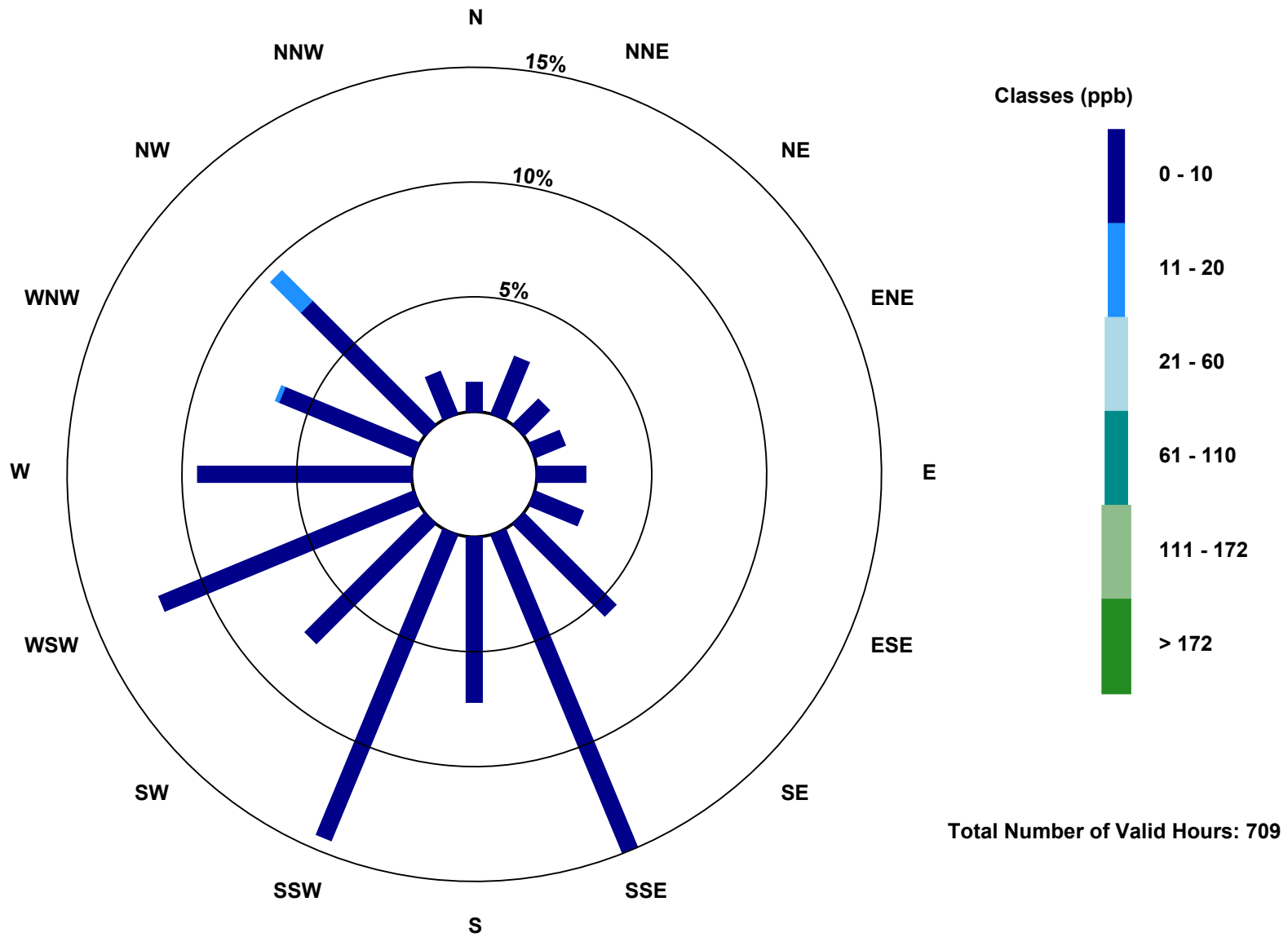
Total Number of Valid Hours: 709

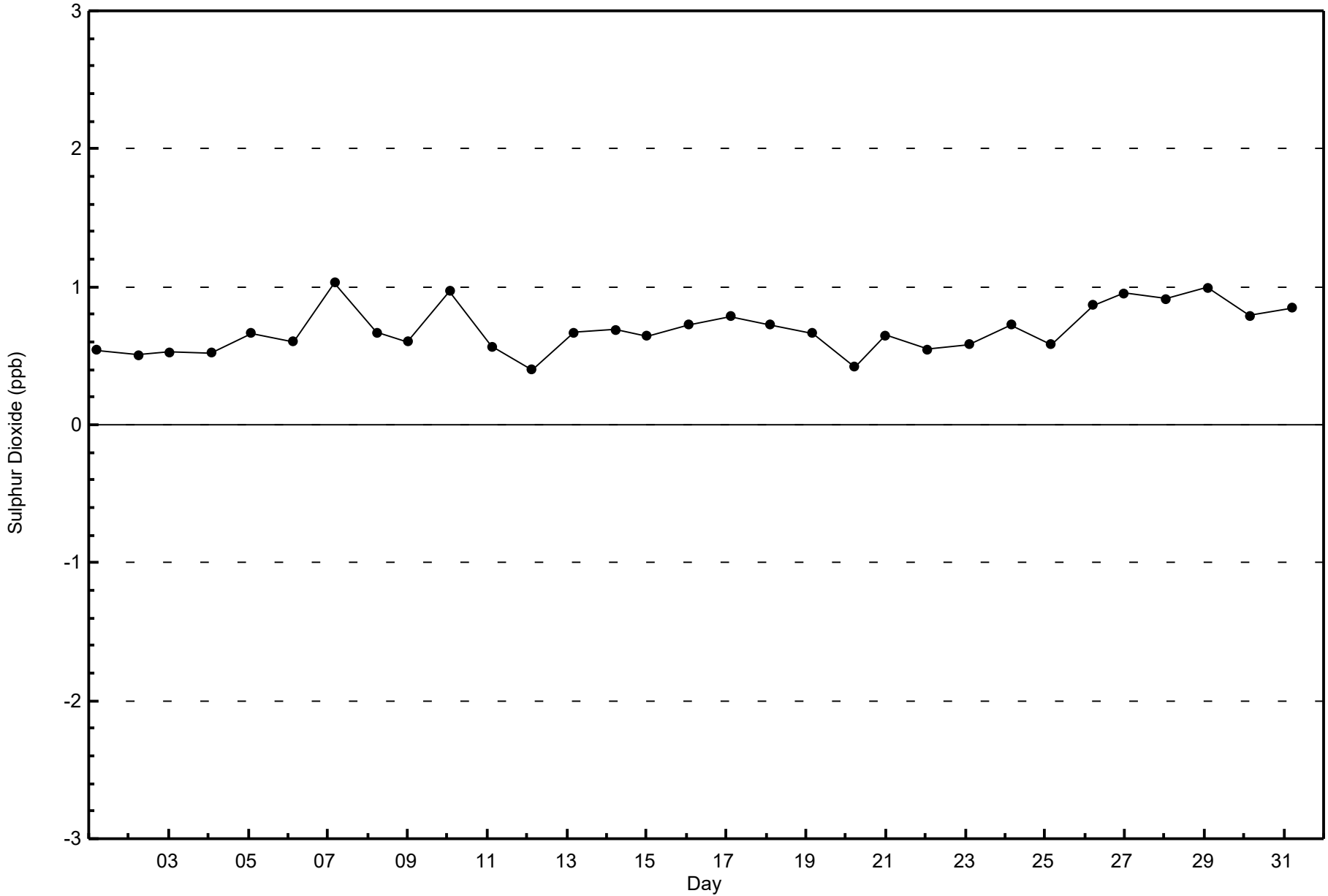
Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

Sulphur Dioxide (SO₂) - ppb
Christina Lake

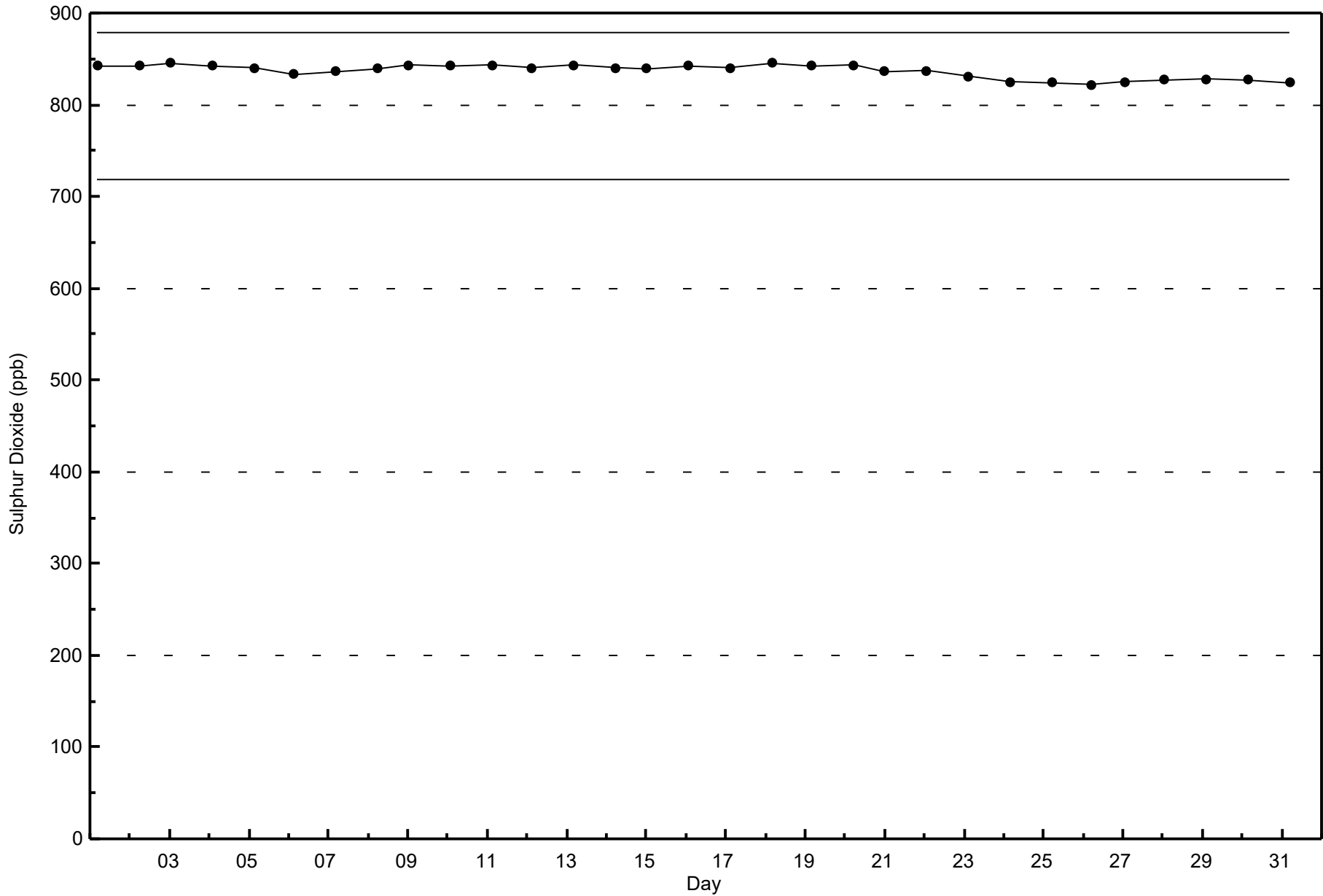






Wood Buffalo Environmental Association
Span Responses

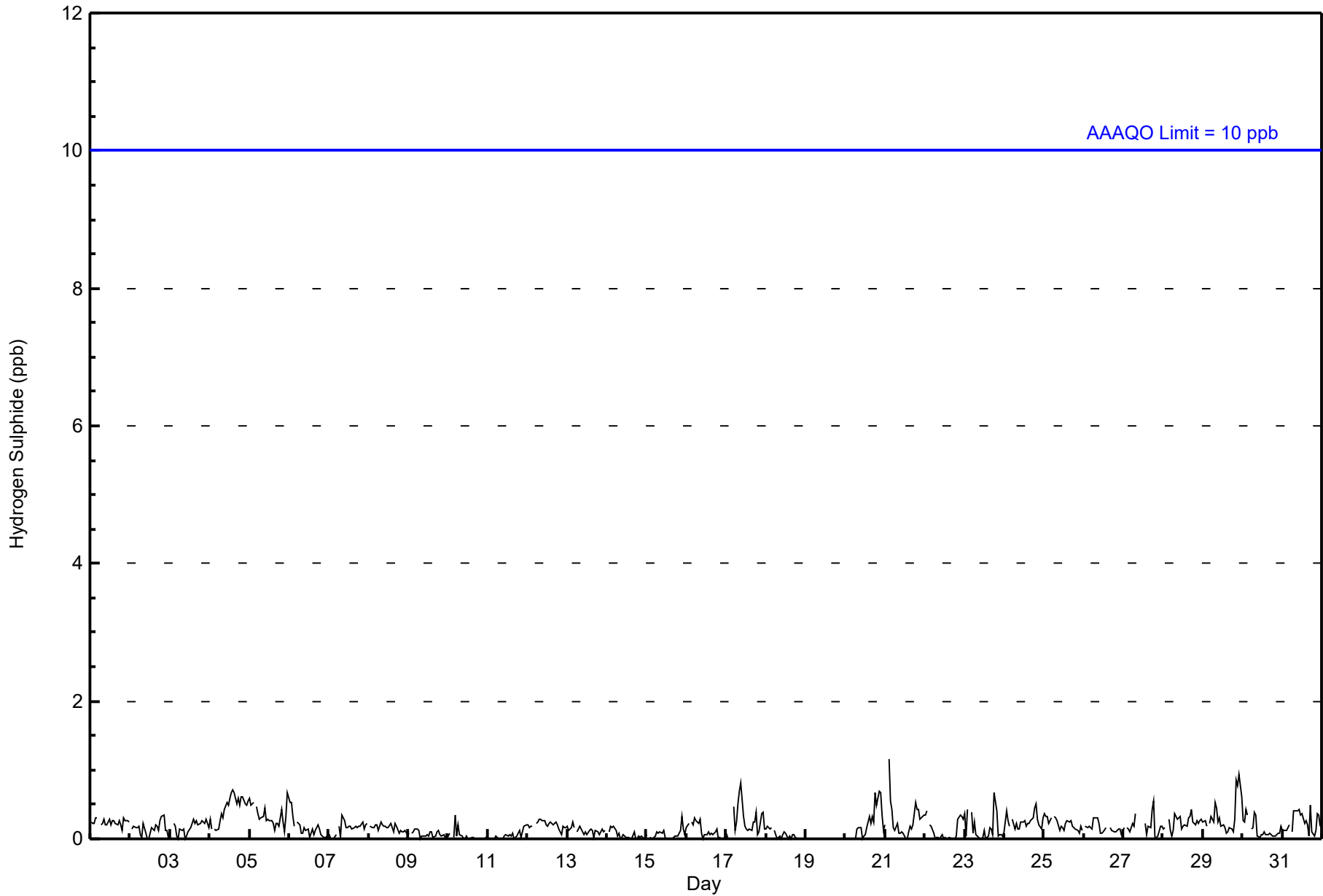
Sulphur Dioxide (SO₂) - ppb
Christina Lake - October 2023





Wood Buffalo Environmental Association
Hourly Averages

Hydrogen Sulphide (H₂S) - ppb
Christina Lake - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Christina Lake - October 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
Christina Lake - October 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	6	18	9	10	16	16	40	106	49	104	52	85	67	47	66	15	706
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	6	18	9	10	16	16	40	106	49	104	52	85	67	47	66	15	706

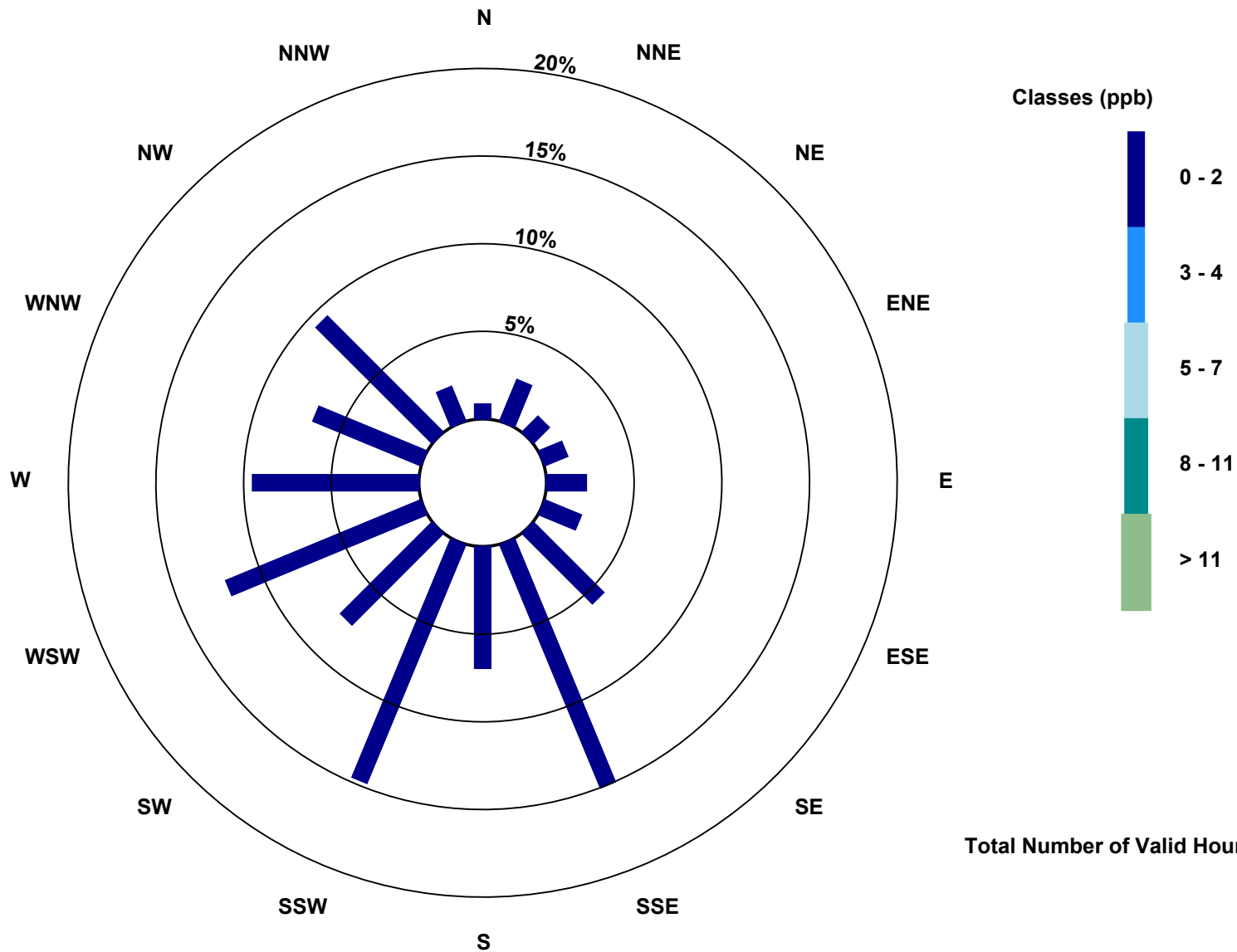
Total Number of Valid Hours: 706

Total Number of Hours: 744

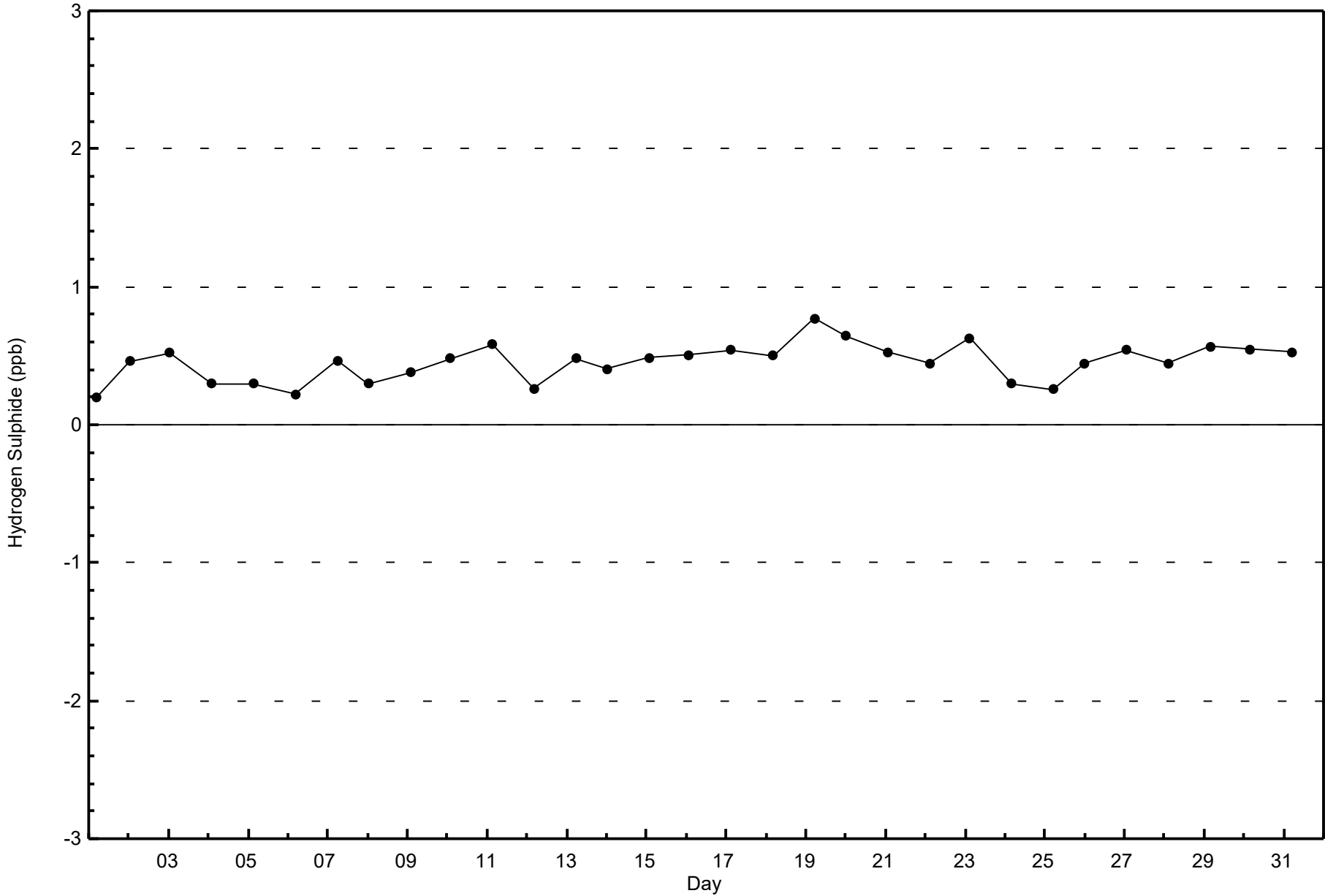


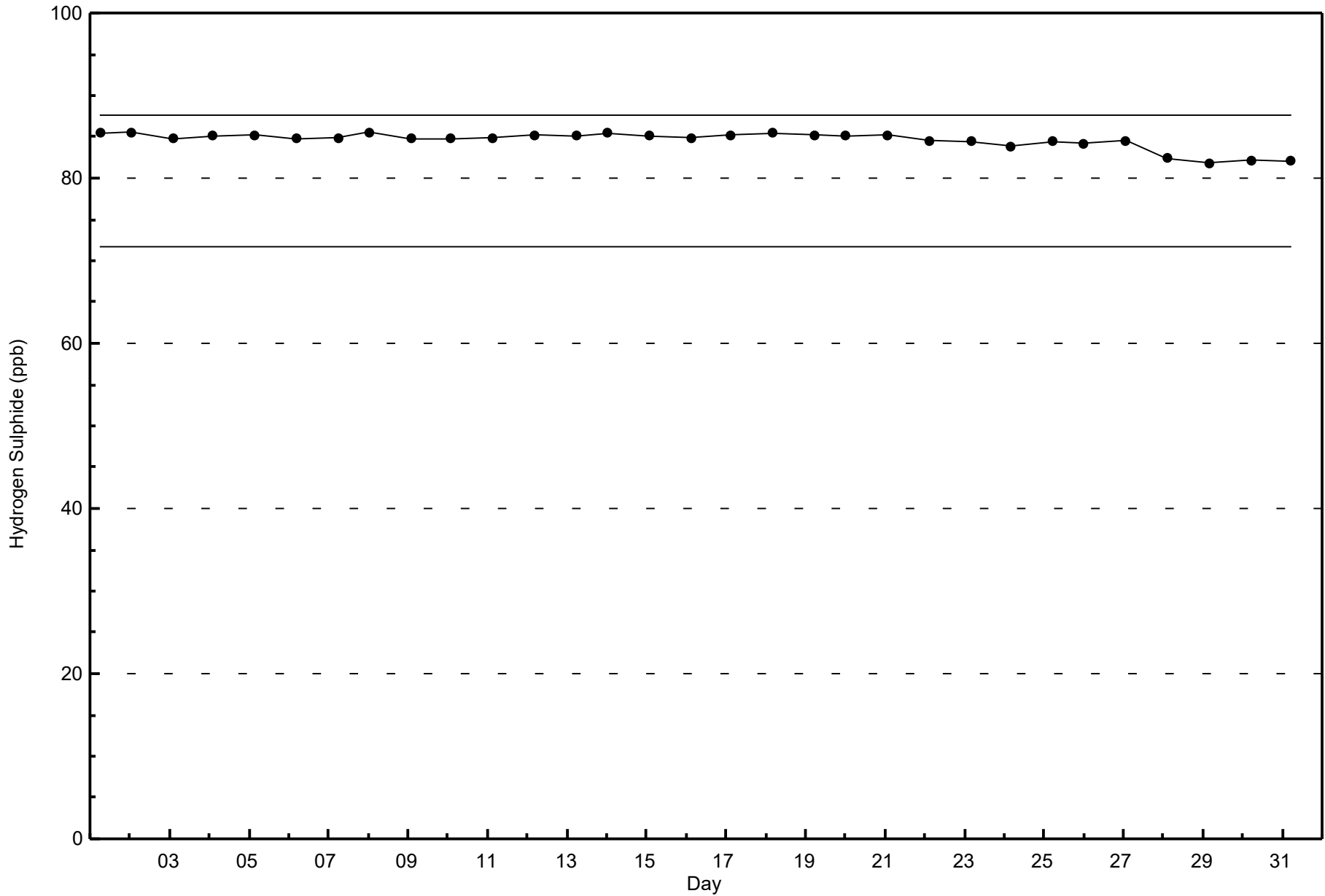
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Hydrogen Sulphide (H₂S) - ppb
Christina Lake



Total Number of Valid Hours: 706





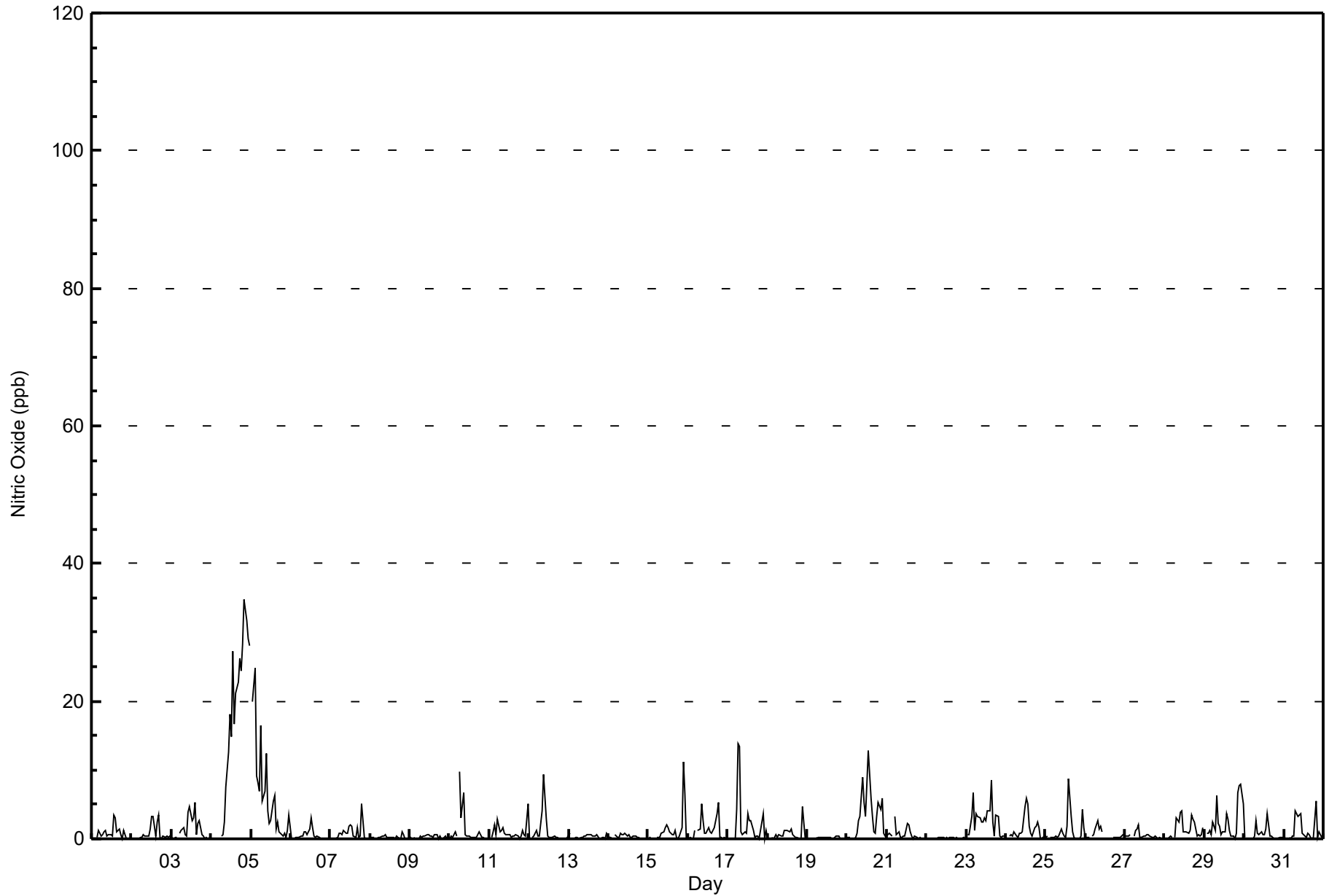


Maximum Value: 34.8 ppb on Oct 4 21:00		Maximum Daily Average: 15.1 ppb on Oct 4		Hours in Service: 744																							
Minimum Value: 0.0 ppb on Oct 6 20:00		Minimum Daily Average: 0.1 ppb on Oct 22		Hours of Data: 707																							
Maximum Diurnal Average: 2.9 ppb at hour 14		Minimum Diurnal Average: 0.2 ppb at hour 1		Hours of Missing Data: 37																							
Monthly Average: 1.69 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.4 Q ₃ = 1.2 P ₉₀ = 3.7 P ₉₉ = 24.9		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-Oct	0.0	0.1	Z	0.2	1.1	0.4	0.5	1.0	1.2	0.4	0.7	0.5	0.3	3.5	3.0	1.0	1.4	0.6	0.1	1.2	0.6	0.1	0.0	0.0	0.8	3.5	
2-Oct	0.0	0.0	0.1	Z	0.1	0.3	0.2	0.6	0.4	0.5	0.5	1.5	3.3	3.3	0.5	2.4	3.4	0.1	0.0	0.4	0.1	0.4	0.2	0.4	0.8	3.4	
3-Oct	0.1	0.0	0.3	0.2	Z	0.8	1.1	1.6	0.7	0.5	4.0	4.6	2.5	3.0	5.2	0.6	2.3	2.6	0.7	0.4	0.0	0.1	0.1	0.1	1.4	5.2	
4-Oct	0.1	0.1	0.1	0.1	0.1	Z	0.8	0.3	0.7	2.5	7.5	12.5	18.1	14.8	27.3	16.8	21.2	22.7	26.3	24.4	28.4	34.8	31.7	29.0	28.1	15.1	34.8
5-Oct	Z	19.8	24.9	9.2	8.2	6.9	16.5	5.5	7.0	12.4	4.1	2.2	2.6	5.5	6.2	1.4	2.4	1.0	0.9	0.4	0.8	0.2	1.2	3.5	6.2	24.9	
6-Oct	0.0	Z	0.1	0.2	0.2	0.2	0.3	0.5	1.0	1.1	0.6	1.5	3.0	1.6	0.3	0.2	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.5	3.0	
7-Oct	0.0	0.0	Z	0.0	0.2	0.8	0.8	0.6	1.2	0.9	0.9	1.9	2.1	1.9	0.4	0.3	1.5	0.1	0.5	5.2	0.1	0.1	0.1	0.0	0.9	5.2	
8-Oct	0.1	0.1	0.1	Z	0.1	0.2	0.2	0.4	0.4	0.6	0.3	0.2	0.2	0.2	0.1	0.1	0.4	0.2	0.0	1.0	0.5	0.0	0.0	0.0	0.2	1.0	
9-Oct	0.1	0.0	0.0	0.3	Z	0.1	0.3	0.2	0.4	0.3	0.6	0.7	0.5	0.5	0.3	0.6	0.5	0.1	0.5	0.0	0.1	0.5	0.1	0.0	0.3	0.7	
10-Oct	0.0	0.4	0.1	1.1	0.4	Z	9.8	3.1	6.7	0.7	0.4	0.4	0.3	0.2	0.2	0.1	0.3	0.5	1.0	0.1	0.1	0.0	0.1	0.1	1.1	9.8	
11-Oct	Z	0.3	1.1	2.1	0.7	2.9	1.1	1.2	1.6	0.9	0.6	0.6	0.6	0.3	0.3	0.5	0.6	0.5	0.1	0.5	1.2	0.6	0.4	5.1	1.0	5.1	
12-Oct	0.0	Z	0.2	0.5	1.2	0.4	0.4	2.3	4.1	9.3	2.8	0.3	0.2	0.2	0.2	0.5	0.3	0.2	0.1	0.0	0.1	0.1	0.1	0.1	1.0	9.3	
13-Oct	0.7	0.8	Z	0.0	0.1	0.3	0.1	0.2	0.2	0.4	0.5	0.6	0.6	0.6	0.5	0.3	0.3	0.6	0.0	0.0	0.1	0.1	0.1	0.7	0.3	0.8	
14-Oct	0.2	0.2	0.0	Z	0.6	0.3	0.1	0.9	0.6	0.5	0.9	0.4	0.6	0.3	0.2	0.4	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.9	
15-Oct	0.0	0.1	0.0	0.0	Z	0.3	0.1	0.2	0.9	1.0	1.6	2.1	1.7	1.1	0.7	0.7	1.3	0.3	0.1	0.5	1.7	11.2	6.5	0.0	1.4	11.2	
16-Oct	0.0	0.2	0.0	0.1	1.2	Z	1.2	1.5	5.2	2.6	0.9	0.8	1.7	1.0	0.9	1.3	1.5	3.6	5.2	0.1	0.1	0.1	0.1	0.1	1.3	5.2	
17-Oct	Z	0.1	0.0	0.1	0.1	4.2	13.9	13.4	1.1	0.7	0.9	0.7	3.7	2.6	2.7	1.2	0.3	0.4	0.4	0.0	1.2	3.6	0.0	1.2	2.3	13.9	
18-Oct	0.1	Z	0.1	0.1	0.1	0.5	0.2	0.7	0.4	0.3	1.2	1.2	1.1	1.0	1.5	0.6	0.4	0.1	0.1	0.0	0.0	4.8	2.3	0.0	0.7	4.8	
19-Oct	0.0	0.0	Z	0.1	0.0	0.1	0.3	0.2	0.3	0.2	0.1	0.1	0.2	0.2	0.1	0.0	0.1	0.4	0.4	0.4	0.0	0.0	0.0	0.1	0.2	0.4	
20-Oct	0.1	0.2	0.2	Z	0.1	0.2	0.9	2.7	3.3	9.0	5.2	3.2	8.0	12.8	6.0	3.2	1.1	0.7	3.3	5.4	4.2	5.8	0.8	0.5	3.3	12.8	
21-Oct	0.3	0.8	0.6	0.3	Z	3.2	0.5	1.1	0.2	0.3	0.4	0.3	2.2	2.0	1.0	0.4	0.1	0.4	0.2	0.1	0.1	0.0	0.0	0.0	0.6	3.2	
22-Oct	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.1	0.2	0.3	0.2	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.3	
23-Oct	Z	0.7	0.5	3.3	6.6	1.1	3.8	3.3	3.1	2.4	2.4	3.0	2.7	4.1	4.2	8.5	2.5	0.5	3.5	3.2	0.3	0.3	0.4	0.4	2.6	8.5	
24-Oct	0.4	Z	0.3	0.5	0.4	1.0	0.4	0.2	0.8	0.9	1.0	4.7	5.8	5.1	1.9	0.8	0.4	1.6	1.9	2.5	1.7	0.0	0.2	0.5	1.4	5.8	
25-Oct	0.1	0.4	Z	0.1	0.1	0.1	0.5	0.2	0.5	1.4	0.7	0.4	0.2	1.9	8.7	3.3	0.9	0.2	0.1	0.0	0.0	0.4	4.3	1.7	1.1	8.7	
26-Oct	0.2	0.1	0.2	Z	0.3	0.5	1.5	2.6	1.4	1.8	1.1	C	C	C	C	C	C	0.1	0.2	0.1	0.2	0.2	0.3	0.5	--	2.6	
27-Oct	0.4	0.5	0.4	0.5	Z	0.4	1.3	1.4	2.0	0.2	0.3	0.4	0.5	0.6	0.6	0.5	0.3	0.1	0.3	0.1	0.0	0.2	0.1	0.1	0.5	2.0	
28-Oct	0.0	0.1	0.1	0.4	0.3	Z	0.2	3.1	2.5	3.8	4.1	1.1	1.1	1.0	0.8	1.3	3.4	2.8	2.5	0.5	0.6	0.4	0.7	1.7	1.4	4.1	
29-Oct	Z	0.9	0.9	1.2	0.6	2.4	1.3	6.4	2.3	1.7	0.7	1.0	1.0	3.7	2.8	1.3	0.4	0.3	0.1	0.7	6.7	7.8	7.8	5.1	2.5	7.8	
30-Oct	0.2	Z	0.1	0.1	0.1	0.0	0.4	2.6	0.8	0.7	1.1	0.6	0.6	1.4	3.6	0.4	0.5	0.3	0.1	0.0	0.1	0.1	0.1	0.3	0.6	3.6	
31-Oct	0.2	0.1	Z	0.3	0.1	0.3	0.4	4.1	3.3	3.5	3.6	0.9	0.7	0.3	0.8	0.5	0.1	0.0	0.2	5.5	0.2	0.9	0.6	0.1	1.2	5.5	
		0.2	1.0	1.2	0.8	0.9	1.1	1.9	2.0	1.8	2.2	1.8	1.8	2.1	2.9	2.4	1.8	1.7	1.5	1.5	1.8	1.8	2.2	1.8	1.6	Diurnal Average	
		0.7	19.8	24.9	9.2	8.2	6.9	16.5	13.4	7.0	12.4	12.5	18.1	14.8	27.3	16.8	21.2	22.7	26.3	24.4	28.4	34.8	31.7	29.0	28.1	Diurnal Maximum	
Z - zerospan		C - Calibration																									



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Christina Lake - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb
Christina Lake - October 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	696	98.44	98.44
21 - 40	11	1.56	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
Christina Lake - October 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	9	18	11	9	15	16	42	105	49	106	53	84	63	44	57	15	696
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	1	10	0	11
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	9	18	11	9	15	16	42	105	49	106	53	84	63	45	67	15	707

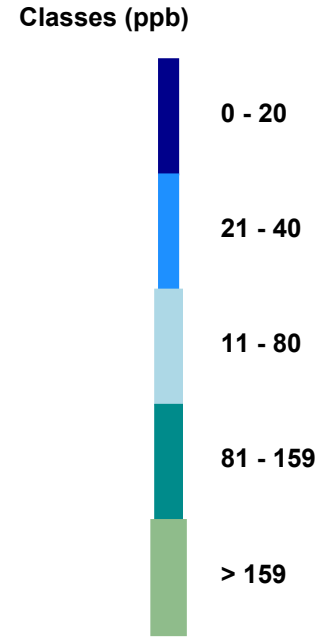
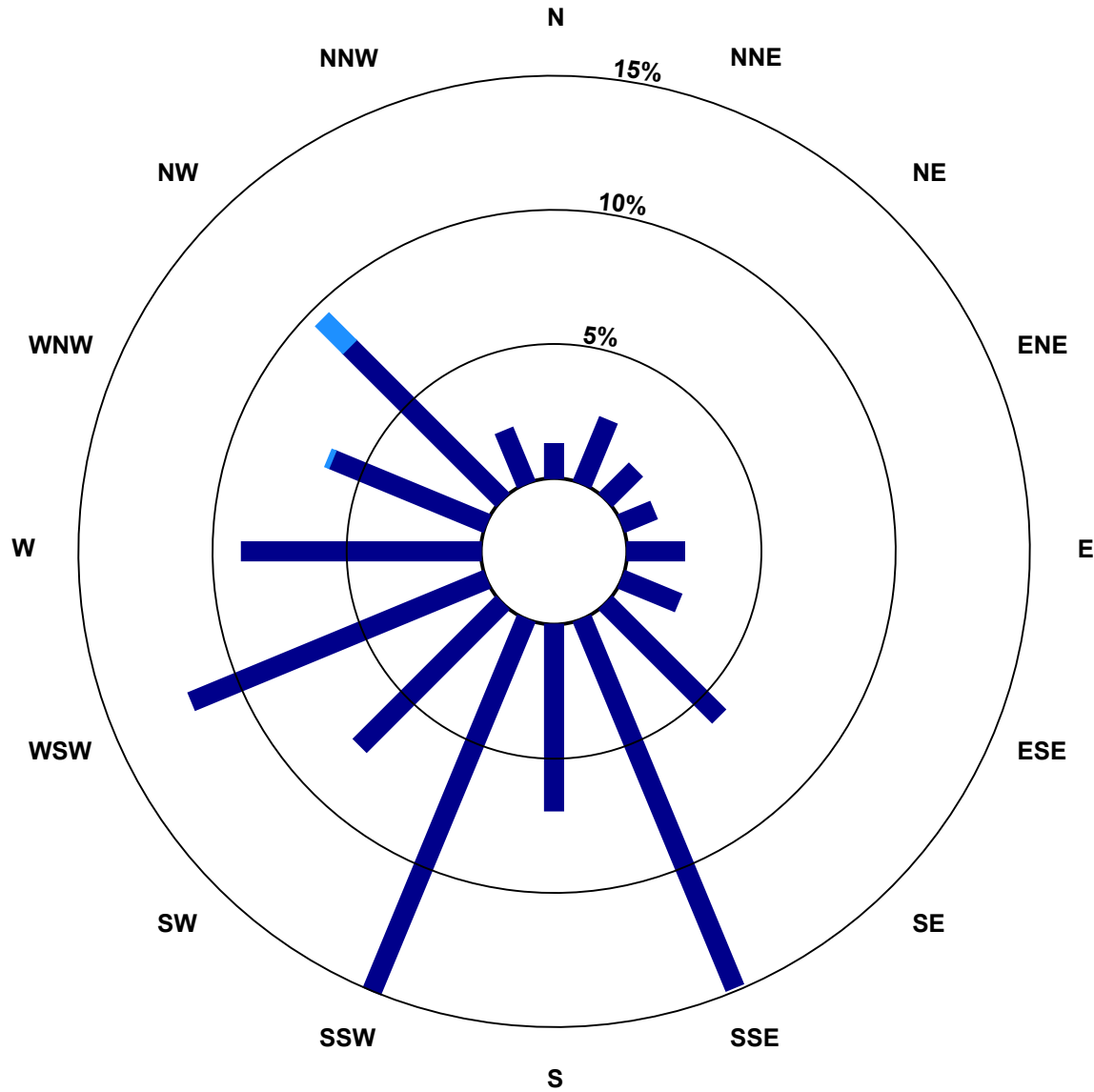
Total Number of Valid Hours: 707

Total Number of Hours: 744

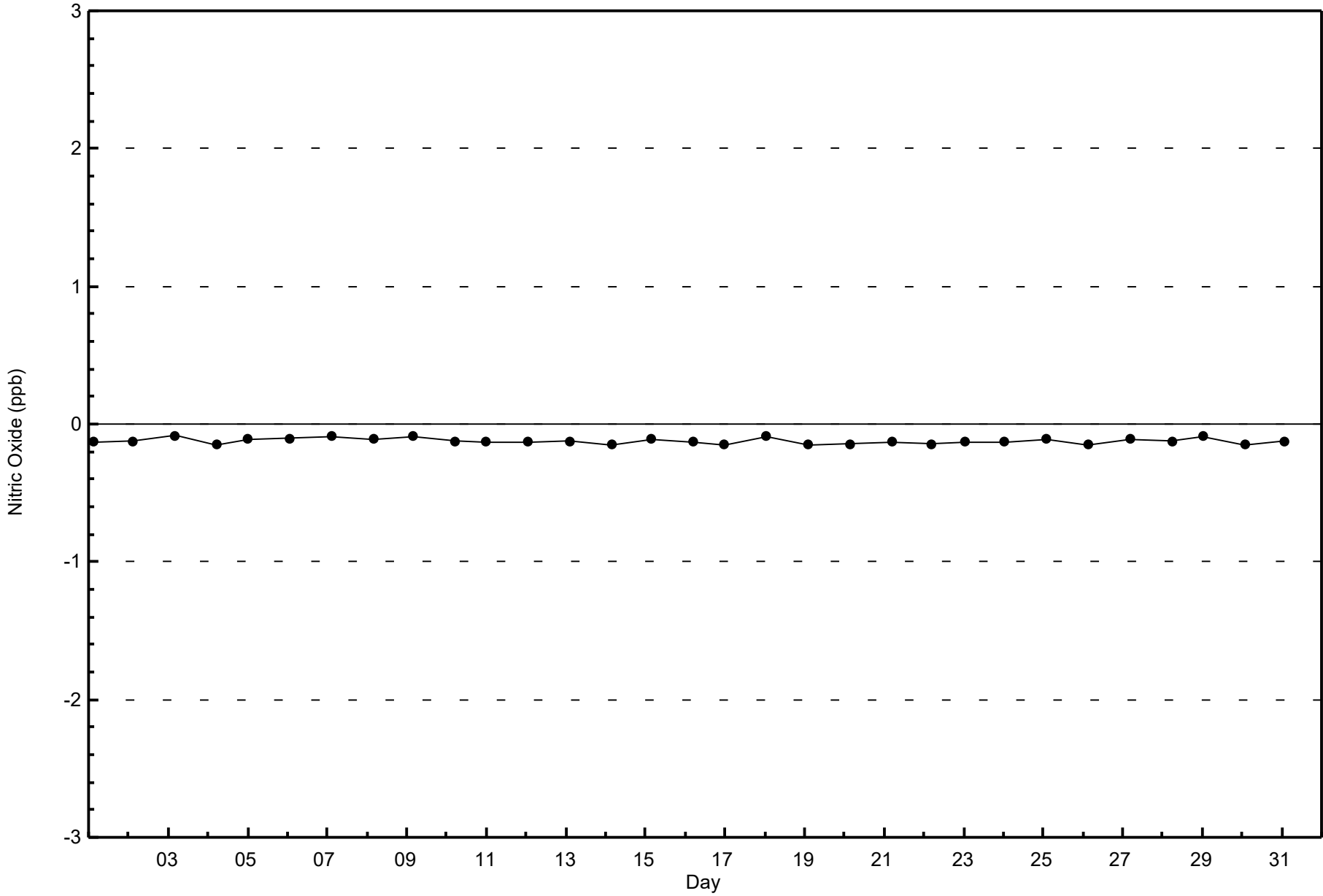


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitric Oxide (NO) - ppb
Christina Lake



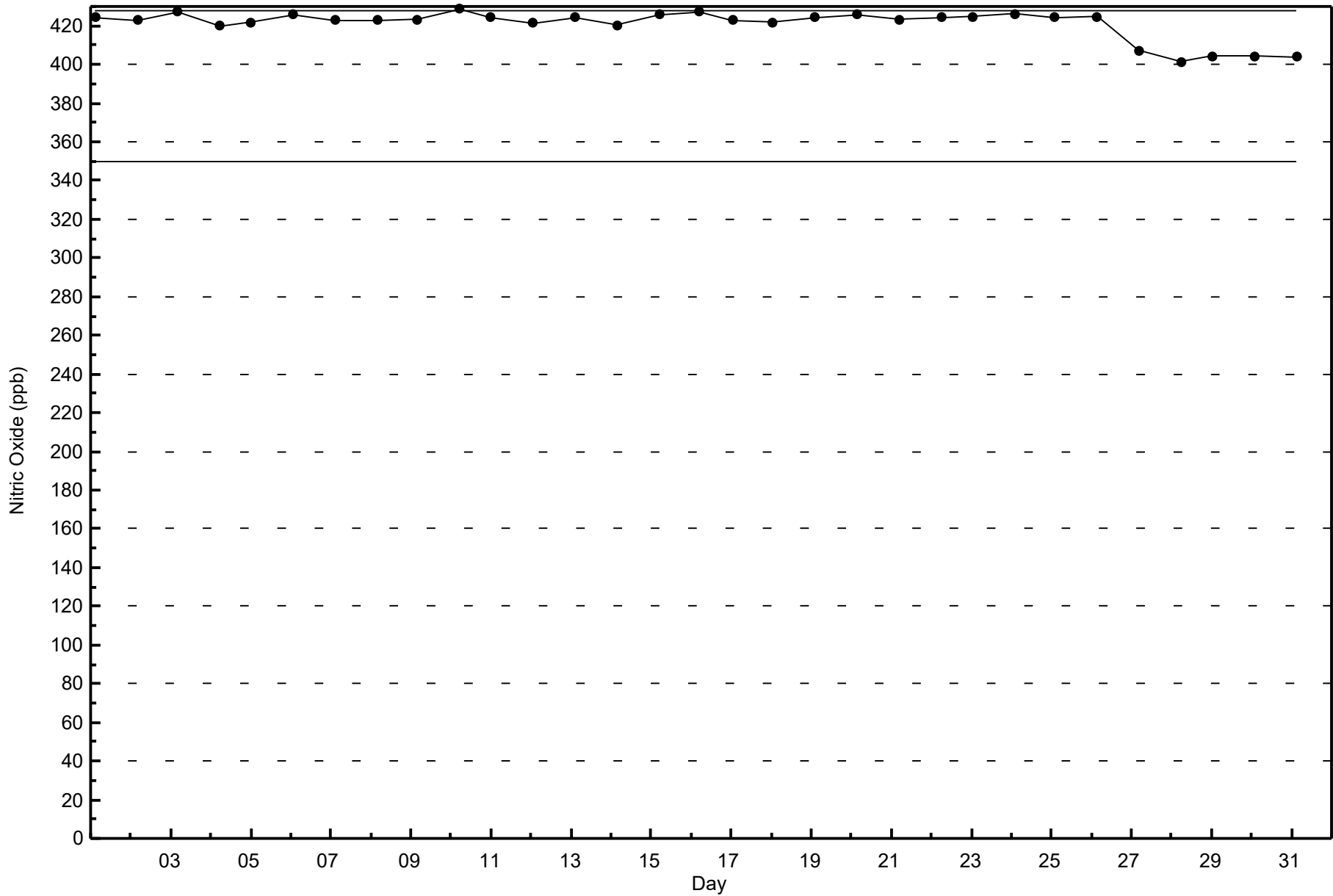
Total Number of Valid Hours: 707





Wood Buffalo Environmental Association
Span Responses

Nitric Oxide (NO) - ppb
Christina Lake - October 2023





Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

Christina Lake - October 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 17.1 ppb on Oct 12 00:00	Maximum Daily Average: 7.1 ppb on Oct 4		Hours of Data:	707
Minimum Value: 0.2 ppb on Oct 22 04:00	Minimum Daily Average: 0.7 ppb on Oct 22		Hours of Missing Data:	37
Maximum Diurnal Average: 4.7 ppb at hour 8	Minimum Diurnal Average: 1.8 ppb at hour 1		Hours of Calibration:	37
Monthly Average: 3.04 ppb	Percentiles: P ₁ = 0.4 P ₁₀ = 0.8 Q ₁ = 1.3 Median = 2.1 Q ₃ = 3.8 P ₉₀ = 6.0 P ₉₉ = 13.3		Percent Operational Time:	100.0

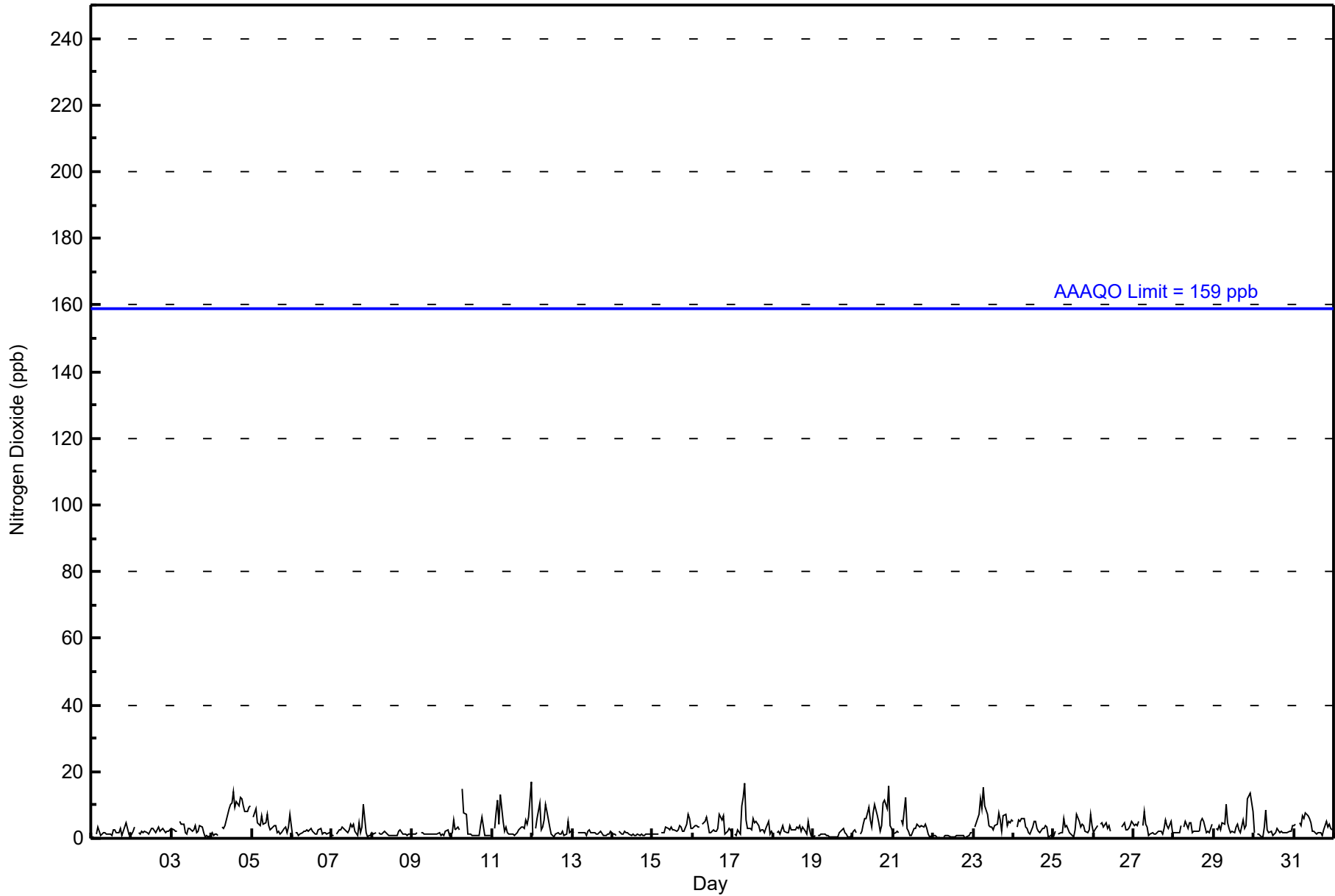
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Oct	0.3	0.3	Z	1.3	3.3	0.8	1.1	1.7	1.6	1.2	1.3	1.1	0.9	2.6	2.5	1.5	1.6	3.1	0.9	2.1	3.4	4.7	1.3	1.6	1.7	4.7																							
2-Oct	1.4	2.1	3.6	Z	1.7	1.4	2.2	1.6	2.1	1.6	1.3	2.1	2.8	2.9	1.7	2.7	3.5	2.2	2.5	2.9	1.9	2.0	2.0	2.5	2.2	3.6																							
3-Oct	2.9	2.5	2.2	2.3	Z	5.2	4.4	4.2	1.7	1.2	3.1	3.0	2.0	2.7	3.9	1.5	2.0	4.0	3.4	1.6	0.5	0.7	0.6	0.8	2.5	5.2																							
4-Oct	1.6	0.8	1.3	1.3	0.9	Z	3.2	2.9	3.7	5.3	9.1	10.3	10.6	13.9	9.5	11.2	9.9	12.4	11.7	9.6	8.0	8.0	9.5	9.7	7.1	13.9																							
5-Oct	Z	6.4	8.8	4.7	4.1	3.8	6.8	4.2	4.8	7.4	3.9	2.7	2.9	3.8	3.7	1.6	2.3	1.2	1.6	2.9	3.4	1.7	3.6	7.0	4.1	8.8																							
6-Oct	0.6	Z	1.5	1.7	0.8	1.2	1.5	2.0	2.1	2.4	2.0	3.1	2.3	1.9	1.3	1.4	2.4	2.9	1.2	1.6	1.5	1.3	1.6	1.5	1.7	3.1																							
7-Oct	1.0	0.8	Z	1.3	2.6	2.5	3.6	2.8	2.7	1.8	2.5	4.2	3.6	4.1	2.1	1.0	4.8	1.8	3.3	10.0	1.5	0.4	0.7	1.0	2.6	10.0																							
8-Oct	1.9	1.4	1.5	Z	1.6	1.4	1.4	2.1	1.7	1.3	0.9	0.8	0.8	0.8	0.9	0.8	2.1	2.7	1.2	1.4	1.3	1.0	1.1	1.2	1.4	2.7																							
9-Oct	1.3	1.4	1.4	1.5	Z	1.5	1.7	1.3	1.1	1.1	1.4	1.4	1.4	1.3	1.2	1.4	1.5	0.8	1.4	1.0	2.2	2.4	1.0	0.9	1.4	2.4																							
10-Oct	1.6	5.4	2.6	3.4	2.7	Z	15.0	7.8	7.1	1.4	1.3	1.2	1.0	1.0	0.7	0.7	0.8	3.9	6.3	0.8	0.7	0.7	0.8	0.8	2.9	15.0																							
11-Oct	Z	3.0	7.5	11.6	4.4	13.3	5.1	2.1	3.3	1.7	1.1	1.2	1.1	0.8	1.1	1.5	2.7	3.2	3.3	3.0	5.4	4.2	6.4	17.1	4.5	17.1																							
12-Oct	0.7	Z	2.8	6.1	10.4	2.5	3.5	5.3	10.2	7.9	3.3	1.2	0.8	0.6	1.1	1.5	1.4	1.4	2.1	0.9	1.1	4.9	1.8	2.1	3.2	10.4																							
13-Oct	2.0	1.9	Z	1.6	1.5	1.7	1.5	1.6	1.0	2.0	2.7	1.8	1.7	1.5	1.3	1.2	1.6	2.1	0.9	0.7	0.9	1.1	1.3	2.0	1.5	2.7																							
14-Oct	1.3	1.2	1.0	Z	2.0	1.1	1.2	2.2	1.5	1.6	1.2	1.0	1.1	0.8	0.9	1.1	1.0	1.2	0.9	0.8	1.2	1.4	1.4	1.3	1.2	2.2																							
15-Oct	1.3	1.2	1.1	1.4	Z	1.7	1.7	1.9	3.4	3.0	2.7	3.2	2.7	2.5	2.1	2.6	3.7	3.5	2.0	2.3	4.1	7.2	5.8	3.0	2.8	7.2																							
16-Oct	2.8	3.7	3.9	3.2	3.3	Z	4.3	5.0	6.5	4.3	1.6	1.6	2.4	2.0	2.1	2.9	7.3	5.5	6.7	1.3	1.9	2.0	3.0	1.8	3.4	7.3																							
17-Oct	Z	1.3	0.8	2.6	1.2	9.7	12.4	16.6	5.6	3.1	2.8	2.6	5.8	4.7	5.0	3.7	2.1	2.4	2.6	1.5	2.9	5.2	1.4	2.1	4.3	16.6																							
18-Oct	1.3	Z	1.7	2.1	1.3	2.7	3.7	2.0	1.7	1.9	3.7	2.7	2.5	2.5	3.4	3.0	3.8	2.3	3.3	2.0	1.3	5.2	2.7	0.8	2.5	5.2																							
19-Oct	0.6	0.7	Z	0.8	0.8	1.2	1.3	1.1	1.0	0.7	0.6	0.5	0.6	0.6	0.6	0.6	1.9	2.4	3.0	1.6	1.4	0.6	0.6	1.3	1.1	3.0																							
20-Oct	2.1	2.4	1.9	Z	1.3	2.3	4.3	6.1	5.9	9.3	5.5	3.5	7.5	10.1	6.6	4.5	2.2	3.8	10.7	11.3	9.1	15.7	3.7	2.9	5.8	15.7																							
21-Oct	1.1	1.8	2.3	1.7	Z	5.6	4.3	12.1	3.1	2.1	0.9	0.9	2.8	2.8	4.3	3.9	3.3	4.0	3.2	4.2	2.9	1.1	0.6	0.8	3.0	12.1																							
22-Oct	0.8	1.0	0.3	0.2	0.5	Z	0.6	0.9	1.0	0.7	0.6	0.4	0.5	0.3	1.0	0.8	0.8	0.7	0.7	0.2	0.3	0.9	1.8	1.5	0.7	1.8																							
23-Oct	Z	3.3	4.5	7.0	11.7	8.8	15.1	9.9	7.0	3.7	3.3	3.4	2.6	3.9	4.3	7.7	5.3	2.1	6.8	7.2	3.9	5.0	4.7	5.3	5.9	15.1																							
24-Oct	4.9	Z	3.5	5.7	5.2	5.8	5.8	3.3	3.1	1.9	1.4	3.6	5.1	5.1	3.0	2.1	1.9	2.9	3.0	3.7	3.2	0.6	0.8	1.6	3.4	5.8																							
25-Oct	0.9	2.0	Z	1.1	1.5	1.5	5.8	3.6	3.7	1.8	1.3	0.9	0.6	2.4	7.2	5.0	3.2	4.4	3.8	2.3	1.7	2.5	7.2	4.0	3.0	7.2																							
26-Oct	1.9	2.4	4.0	Z	4.1	4.5	3.4	4.7	3.1	3.7	2.1	C	C	C	C	C	C	3.5	4.5	2.5	2.4	3.0	3.9	4.9	--	4.9																							
27-Oct	3.7	4.4	3.9	4.9	Z	3.9	8.2	4.4	3.4	0.9	1.1	1.5	1.3	1.1	1.8	2.0	2.1	1.1	3.0	5.4	3.7	2.9	4.9	1.8	3.1	8.2																							
28-Oct	1.9	1.8	1.5	1.9	3.9	Z	3.2	5.1	3.1	4.5	4.5	1.8	2.0	2.0	2.1	2.2	4.9	5.8	4.9	1.9	2.1	1.7	3.1	4.3	3.1	5.8																							
29-Oct	Z	3.0	2.7	3.9	2.5	4.8	4.1	10.0	4.7	3.1	1.8	2.0	1.7	3.5	4.2	2.6	1.6	5.4	2.9	3.7	11.9	12.8	13.7	8.0	5.0	13.7																							
30-Oct	1.9	Z	1.3	1.3	0.4	0.5	3.4	8.3	2.4	1.6	2.0	0.8	1.2	1.8	3.1	1.8	2.2	1.6	1.7	1.7	1.9	2.1	2.1	3.9	2.1	8.3																							
31-Oct	3.8	4.2	Z	4.8	4.0	6.8	6.0	7.6	6.7	5.8	4.5	2.2	2.0	1.4	1.7	1.8	1.7	0.7	2.5	5.1	3.4	4.4	3.0	2.7	3.8	7.6																							
																								1.8	2.3	2.7	3.1	3.0	3.7	4.5	4.7	3.5	2.9	2.4	2.2	2.5	2.8	2.8	2.5	2.9	3.1	3.4	3.1	2.9	3.5	3.1	3.2	Diurnal Average	
																								4.9	6.4	8.8	11.6	11.7	13.3	15.1	16.6	10.2	9.3	9.1	10.3	10.6	13.9	9.5	11.2	9.9	12.4	11.7	11.3	11.9	15.7	13.7	17.1	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
Christina Lake - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Christina Lake - October 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
Christina Lake - October 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	9	18	11	9	15	16	42	105	49	106	53	84	63	45	67	15	707
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	9	18	11	9	15	16	42	105	49	106	53	84	63	45	67	15	707

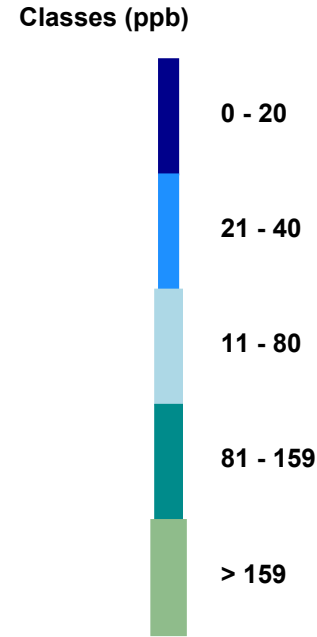
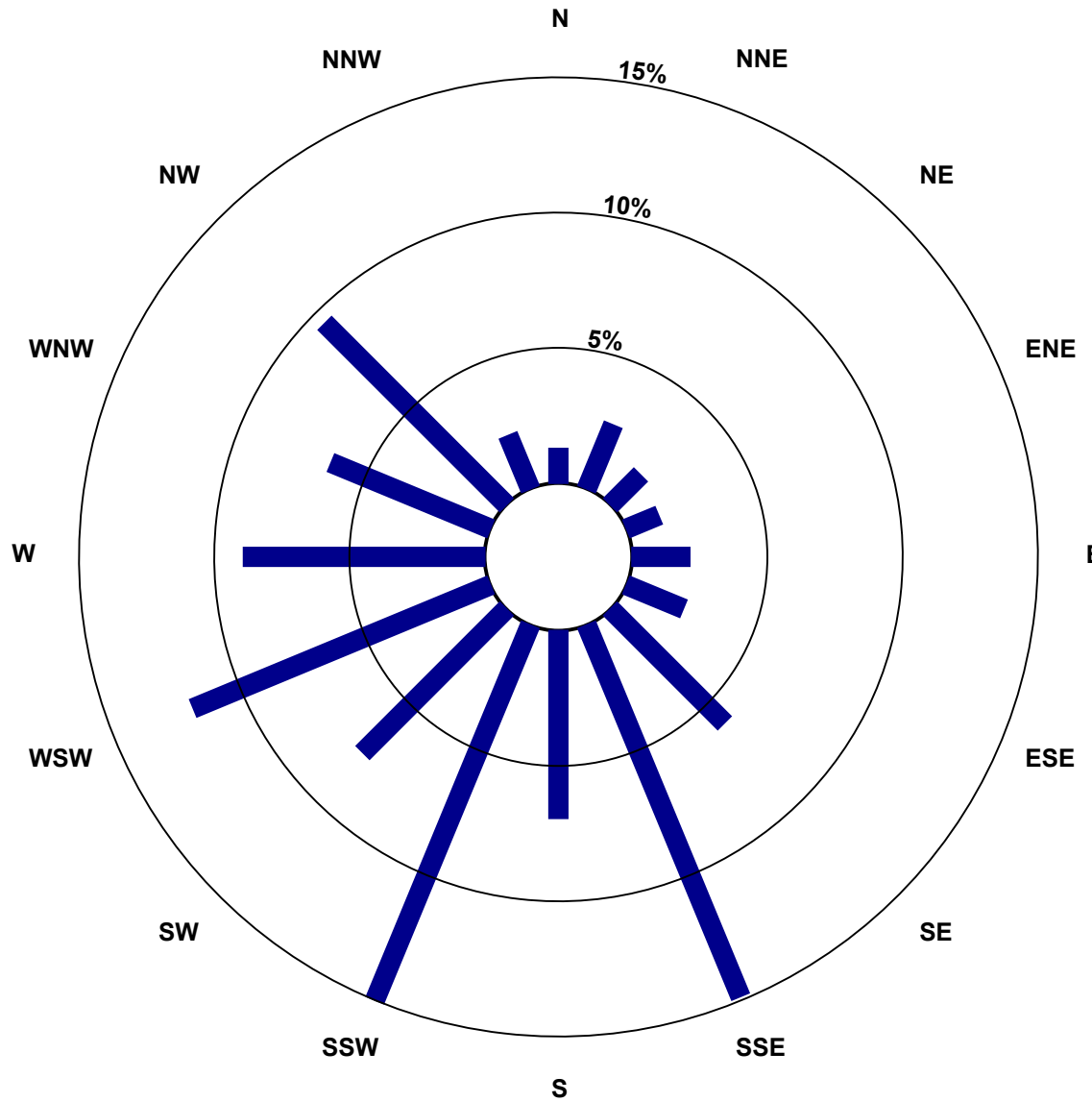
Total Number of Valid Hours: 707

Total Number of Hours: 744

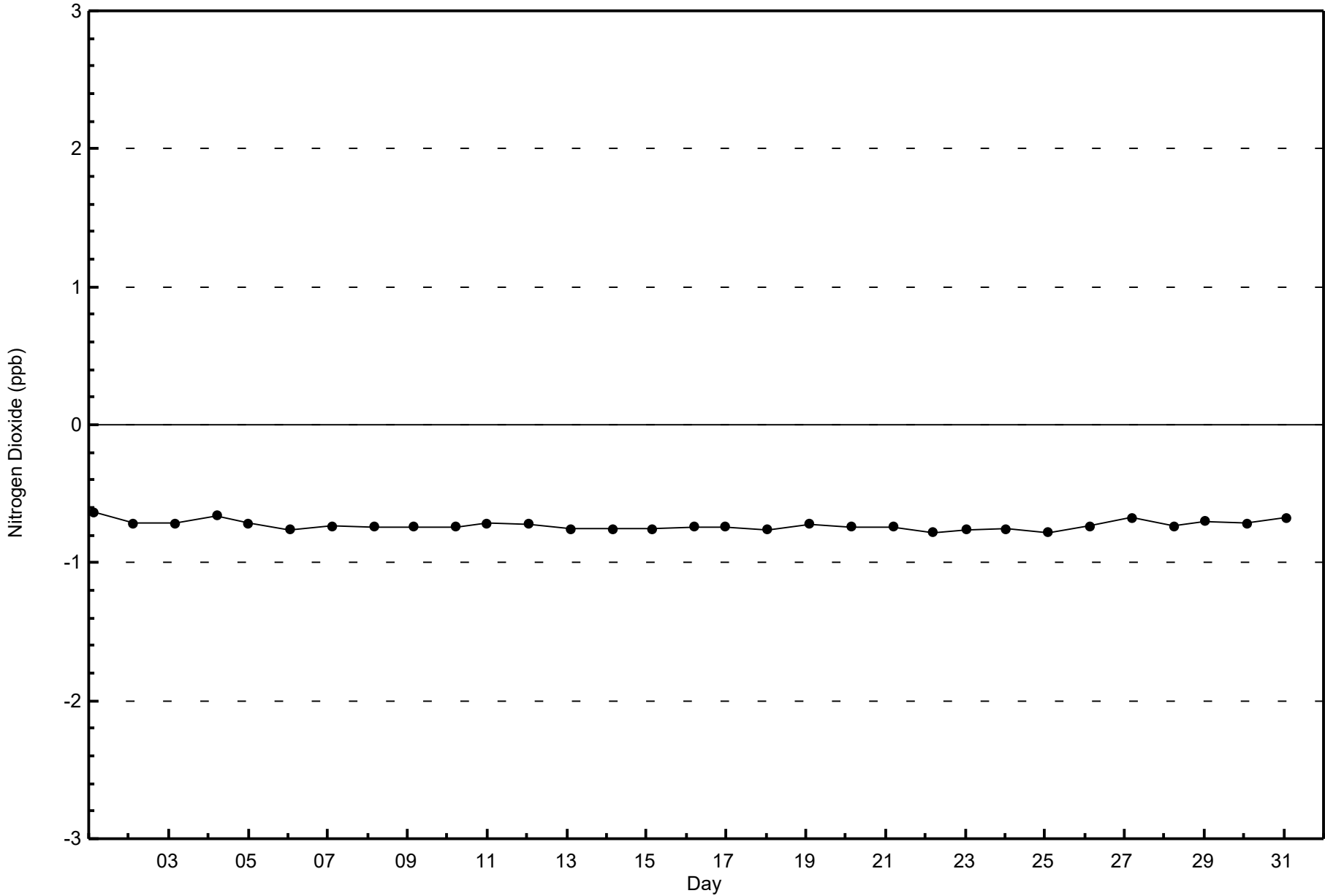


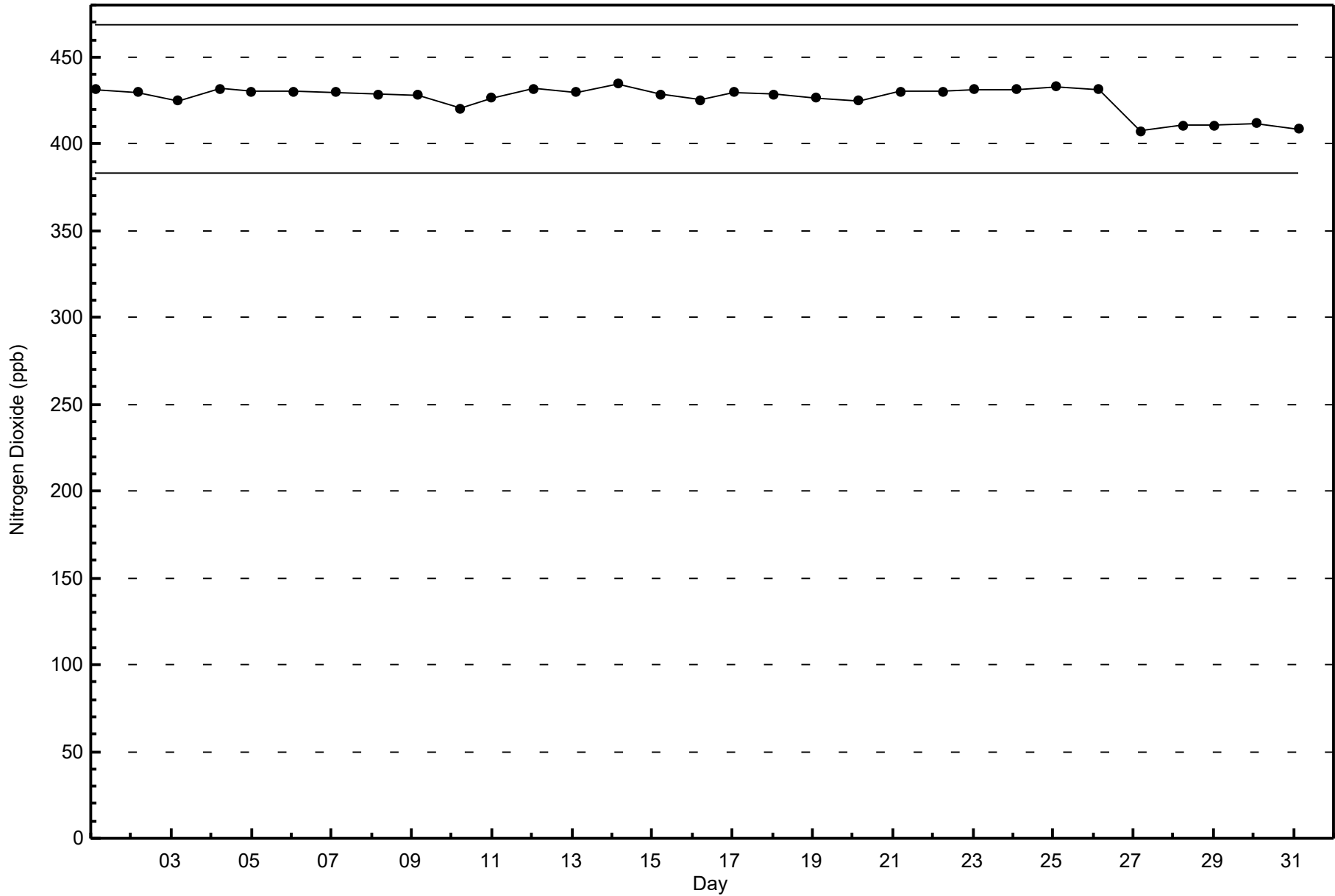
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitrogen Dioxide (NO₂) - ppb
Christina Lake



Total Number of Valid Hours: 707







Wood Buffalo Environmental Association
Summary of Hour Averages

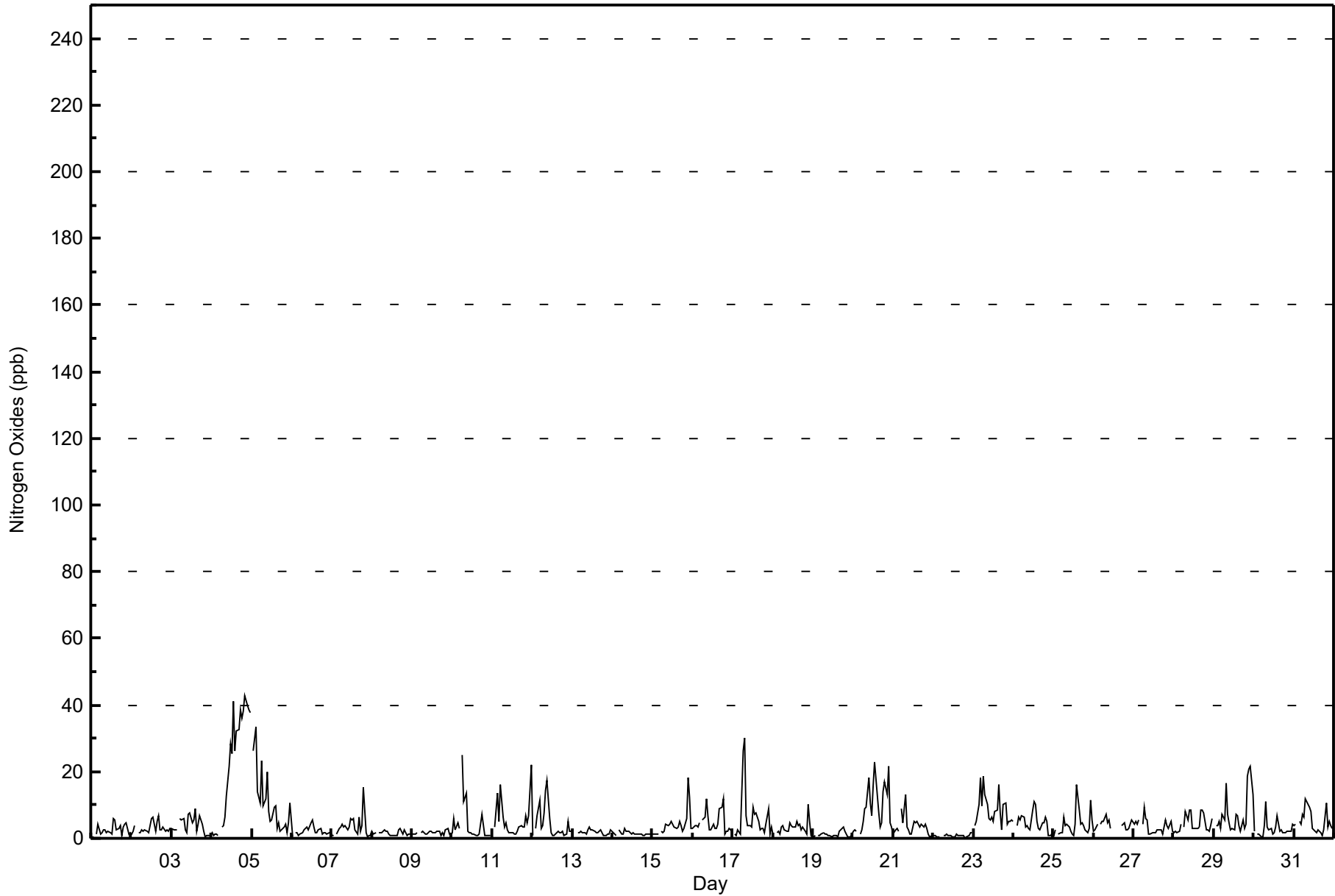
Nitrogen Oxides (NO_x) - ppb
Christina Lake - October 2023

Maximum Value: 42.8 ppb on Oct 4 21:00		Maximum Daily Average: 22.3 ppb on Oct 4		Hours in Service: 744																						
Minimum Value: 0.2 ppb on Oct 22 20:00		Minimum Daily Average: 0.8 ppb on Oct 22		Hours of Data: 707																						
Maximum Diurnal Average: 6.7 ppb at hour 8		Minimum Diurnal Average: 1.9 ppb at hour 1		Hours of Missing Data: 37																						
Monthly Average: 4.73 ppb		Percentiles: P ₁ = 0.5 P ₁₀ = 1.0 Q ₁ = 1.6 Median = 2.8 Q ₃ = 5.1 P ₉₀ = 10.0 P ₉₉ = 36.0		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-Oct	0.3	0.4	Z	1.5	4.4	1.2	1.6	2.7	2.8	1.6	2.0	1.6	1.2	6.1	5.5	2.5	3.0	3.7	1.0	3.3	4.0	4.8	1.3	1.6	2.5	6.1
2-Oct	1.4	2.1	3.7	Z	1.8	1.7	2.4	2.2	2.5	2.1	1.8	3.6	6.1	6.2	2.2	5.1	6.9	2.3	2.5	3.3	2.0	2.4	2.2	2.9	3.0	6.9
3-Oct	3.0	2.5	2.5	2.5	Z	6.0	5.5	5.8	2.4	1.7	7.1	7.6	4.5	5.7	9.1	2.1	4.3	6.6	4.1	2.0	0.5	0.8	0.7	0.9	3.8	9.1
4-Oct	1.7	0.9	1.4	1.4	1.0	Z	3.5	3.6	6.2	12.8	21.6	28.4	25.4	41.2	26.3	32.4	32.6	38.7	36.1	38.0	42.8	39.7	38.5	37.8	22.3	42.8
5-Oct	Z	26.2	33.7	13.9	12.3	10.7	23.3	9.7	11.8	19.8	8.0	4.9	5.5	9.3	9.9	3.0	4.7	2.2	2.5	3.3	4.2	1.9	4.8	10.5	10.3	33.7
6-Oct	0.6	Z	1.6	1.9	1.0	1.4	1.8	2.5	3.1	3.5	2.6	4.6	5.3	3.5	1.6	1.6	2.7	3.1	1.2	1.6	1.5	1.3	1.6	1.5	2.2	5.3
7-Oct	1.0	0.8	Z	1.3	2.8	3.3	4.4	3.4	3.9	2.7	3.4	6.1	5.7	6.0	2.5	1.3	6.3	1.9	3.8	15.2	1.6	0.5	0.8	1.0	3.5	15.2
8-Oct	2.0	1.5	1.6	Z	1.7	1.6	1.6	2.5	2.1	1.9	1.2	1.0	1.0	1.0	0.9	2.5	2.9	1.2	2.4	1.8	1.0	1.1	1.2	1.6	1.6	2.9
9-Oct	1.4	1.4	1.4	1.8	Z	1.6	2.0	1.5	1.5	1.4	2.0	2.1	1.9	1.8	1.5	2.0	2.0	0.9	1.9	1.0	2.3	2.9	1.1	0.9	1.7	2.9
10-Oct	1.6	5.8	2.7	4.5	3.1	Z	24.8	10.9	13.8	2.1	1.7	1.6	1.3	1.2	0.9	0.8	1.1	4.4	7.3	0.9	0.8	0.7	0.9	0.9	4.1	24.8
11-Oct	Z	3.3	8.6	13.7	5.1	16.2	6.2	3.3	4.9	2.6	1.7	1.8	1.7	1.1	1.4	2.0	3.3	3.7	3.4	3.5	6.6	4.8	6.8	22.2	5.6	22.2
12-Oct	0.7	Z	3.0	6.6	11.6	2.9	3.9	7.6	14.3	17.2	6.1	1.5	1.0	0.8	1.3	2.0	1.7	1.6	2.2	0.9	1.2	5.0	1.9	2.2	4.2	17.2
13-Oct	2.7	2.7	Z	1.6	1.6	2.0	1.6	1.8	1.2	2.4	3.2	2.4	2.3	2.1	1.8	1.5	1.9	2.7	0.9	0.7	1.0	1.2	1.4	2.7	1.9	3.2
14-Oct	1.5	1.4	1.0	Z	2.6	1.4	1.3	3.1	2.1	2.1	2.1	1.4	1.7	1.1	1.1	1.5	1.3	1.4	1.0	0.8	1.2	1.4	1.4	1.3	1.5	3.1
15-Oct	1.3	1.3	1.1	1.4	Z	2.0	1.8	2.1	4.3	4.0	4.3	5.3	4.4	3.6	2.8	3.3	5.0	3.8	2.1	2.8	5.8	18.4	12.3	3.0	4.2	18.4
16-Oct	2.8	3.9	3.9	3.3	4.5	Z	5.5	6.5	11.7	6.9	2.5	2.4	4.1	3.0	3.0	4.2	8.8	9.1	11.9	1.4	2.0	2.1	3.1	1.9	4.7	11.9
17-Oct	Z	1.4	0.8	2.7	1.3	13.9	26.3	30.0	6.7	3.8	3.7	3.3	9.5	7.3	7.7	4.9	2.4	2.8	3.0	1.5	4.1	8.8	1.4	3.3	6.5	30.0
18-Oct	1.4	Z	1.8	2.2	1.4	3.2	3.9	2.7	2.1	2.2	4.9	3.9	3.6	3.5	4.9	3.6	4.2	2.4	3.4	2.0	1.3	10.0	5.0	0.8	3.2	10.0
19-Oct	0.6	0.7	Z	0.9	0.8	1.3	1.6	1.3	1.3	0.9	0.7	0.6	0.8	0.8	0.7	0.6	2.0	2.8	3.4	2.0	1.4	0.6	0.6	1.4	1.2	3.4
20-Oct	2.2	2.6	2.1	Z	1.4	2.5	5.2	8.8	9.2	18.3	10.7	6.7	15.5	22.9	12.6	7.7	3.3	4.5	14.0	16.7	13.3	21.5	4.5	3.4	9.1	22.9
21-Oct	1.4	2.6	2.9	2.0	Z	8.8	4.8	13.2	3.3	2.4	1.3	1.2	5.0	4.8	5.3	4.3	3.4	4.4	3.4	4.3	3.0	1.1	0.6	0.8	3.7	13.2
22-Oct	0.8	1.0	0.3	0.2	0.5	Z	0.7	1.0	1.2	1.0	0.8	0.5	0.6	0.4	1.2	0.9	1.0	0.8	0.8	0.2	0.3	0.9	1.9	1.6	0.8	1.9
23-Oct	Z	4.0	5.0	10.3	18.3	9.9	18.9	13.2	10.1	6.1	5.7	6.4	5.3	8.0	8.5	16.2	7.8	2.6	10.3	10.4	4.2	5.3	5.0	5.7	8.6	18.9
24-Oct	5.3	Z	3.8	6.2	5.6	6.8	6.2	3.5	3.9	2.8	2.4	8.3	10.9	10.2	4.9	2.9	2.3	4.5	4.9	6.2	4.9	0.6	1.0	2.1	4.8	10.9
25-Oct	1.0	2.4	Z	1.2	1.6	1.6	6.3	3.8	4.2	3.2	2.0	1.3	0.8	4.3	15.9	8.3	4.1	4.6	3.9	2.3	1.7	2.9	11.5	5.7	4.1	15.9
26-Oct	2.1	2.5	4.2	Z	4.4	5.0	4.9	7.3	4.5	5.5	3.2	C	C	C	C	C	C	3.6	4.7	2.6	2.6	3.2	4.2	5.4	--	7.3
27-Oct	4.1	4.9	4.3	5.4	Z	4.3	9.5	5.8	5.4	1.1	1.4	1.9	1.8	1.7	2.4	2.5	2.4	1.2	3.3	5.5	3.7	3.1	5.0	1.9	3.6	9.5
28-Oct	1.9	1.9	1.6	2.3	4.2	Z	3.4	8.2	5.6	8.3	8.6	2.9	3.1	3.0	2.9	3.5	8.3	8.6	7.4	2.4	2.7	2.1	3.8	6.0	4.5	8.6
29-Oct	Z	3.9	3.6	5.1	3.1	7.2	5.4	16.4	7.0	4.8	2.5	3.0	2.7	7.2	7.0	3.9	2.0	5.7	3.0	4.4	18.6	20.6	21.5	13.1	7.5	21.5
30-Oct	2.1	Z	1.4	1.4	0.5	0.5	3.8	10.9	3.2	2.3	3.1	1.4	1.8	3.2	6.7	2.2	2.7	1.9	1.8	1.7	2.0	2.2	2.2	4.2	2.8	10.9
31-Oct	4.0	4.3	Z	5.1	4.1	7.1	6.4	11.7	10.0	9.3	8.1	3.1	2.7	1.7	2.5	2.3	1.8	0.7	2.7	10.6	3.6	5.3	3.6	2.8	4.9	11.7
1.9 3.3 3.9 3.9 3.9 4.8 6.4 6.7 5.4 5.1 4.2 4.0 4.6 5.8 5.2 4.3 4.5 4.5 4.9 5.0 4.7 5.7 4.9 4.9																								Diurnal Average		
5.3 26.2 33.7 13.9 18.3 16.2 26.3 30.0 14.3 19.8 21.6 28.4 25.4 41.2 26.3 32.4 32.6 38.7 36.1 38.0 42.8 39.7 38.5 37.8																								Diurnal Maximum		
Z - zerospan C - Calibration																										



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Christina Lake - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Christina Lake - October 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	682	96.46	96.46
21 - 40	23	3.25	99.72
41 - 80	2	0.28	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Christina Lake - October 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	9	18	11	9	14	16	41	104	49	106	53	84	63	42	48	15	682
21 - 40	0	0	0	0	1	0	1	1	0	0	0	0	0	3	17	0	23
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	9	18	11	9	15	16	42	105	49	106	53	84	63	45	67	15	707

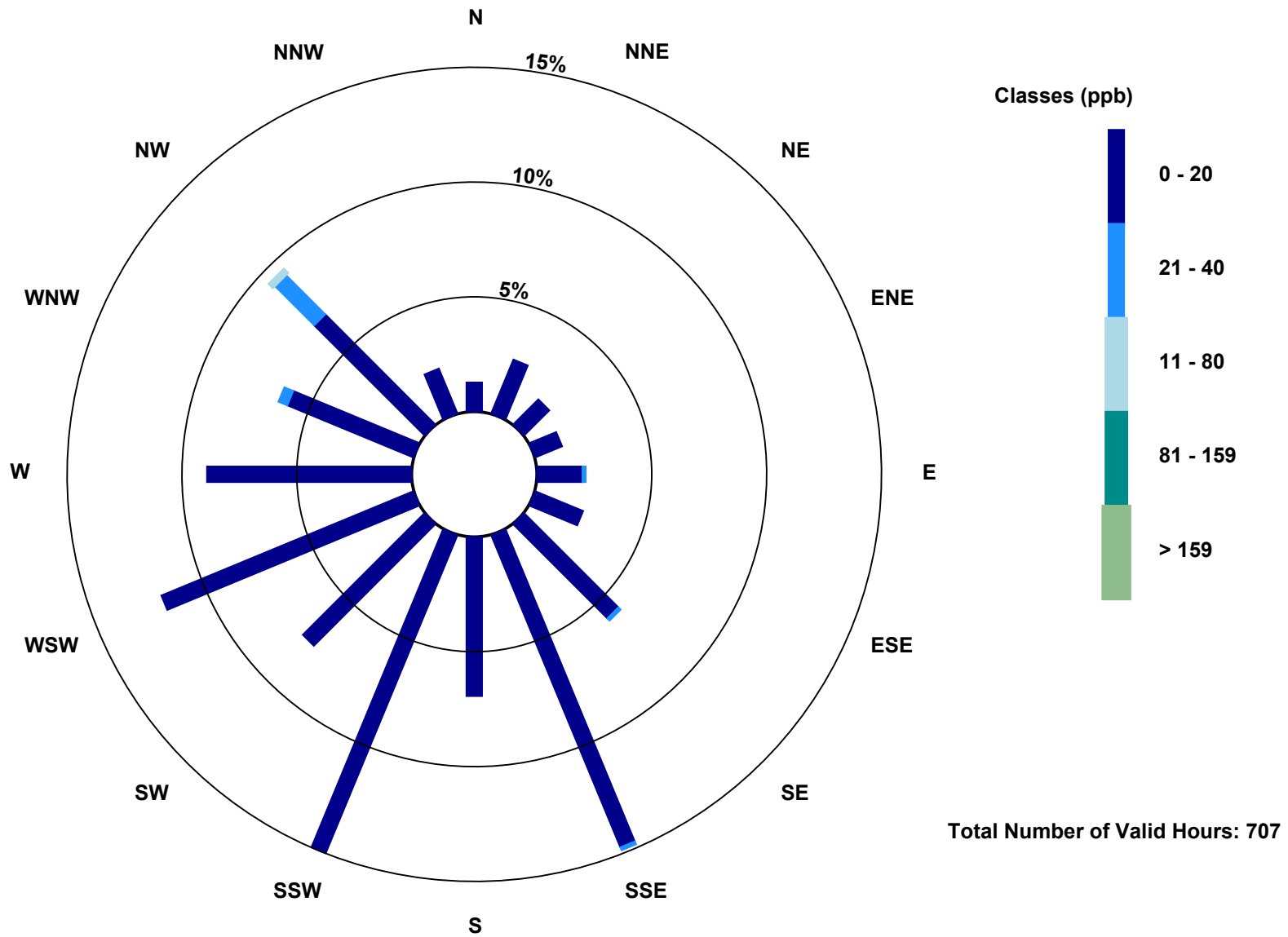
Total Number of Valid Hours: 707

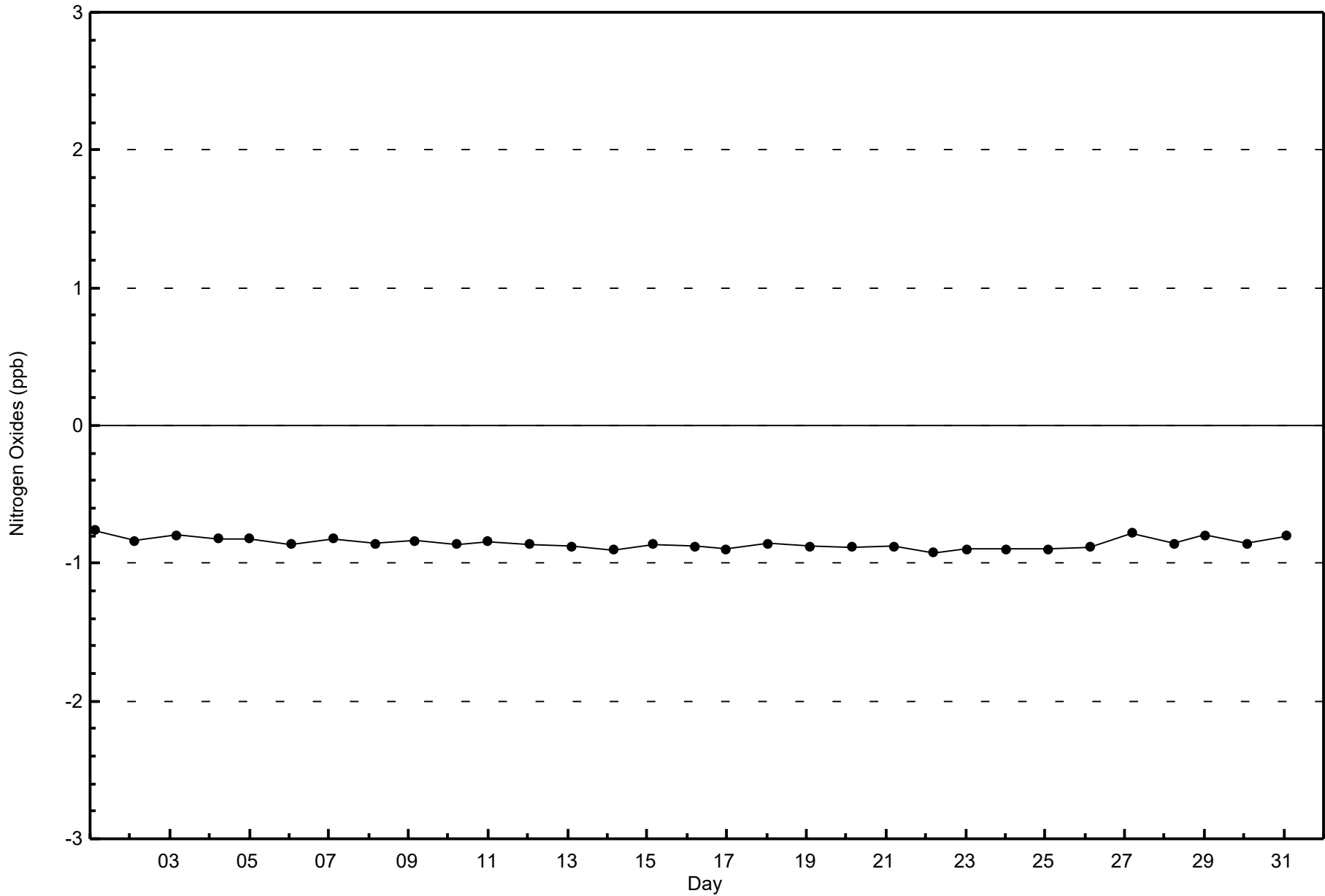
Total Number of Hours: 744

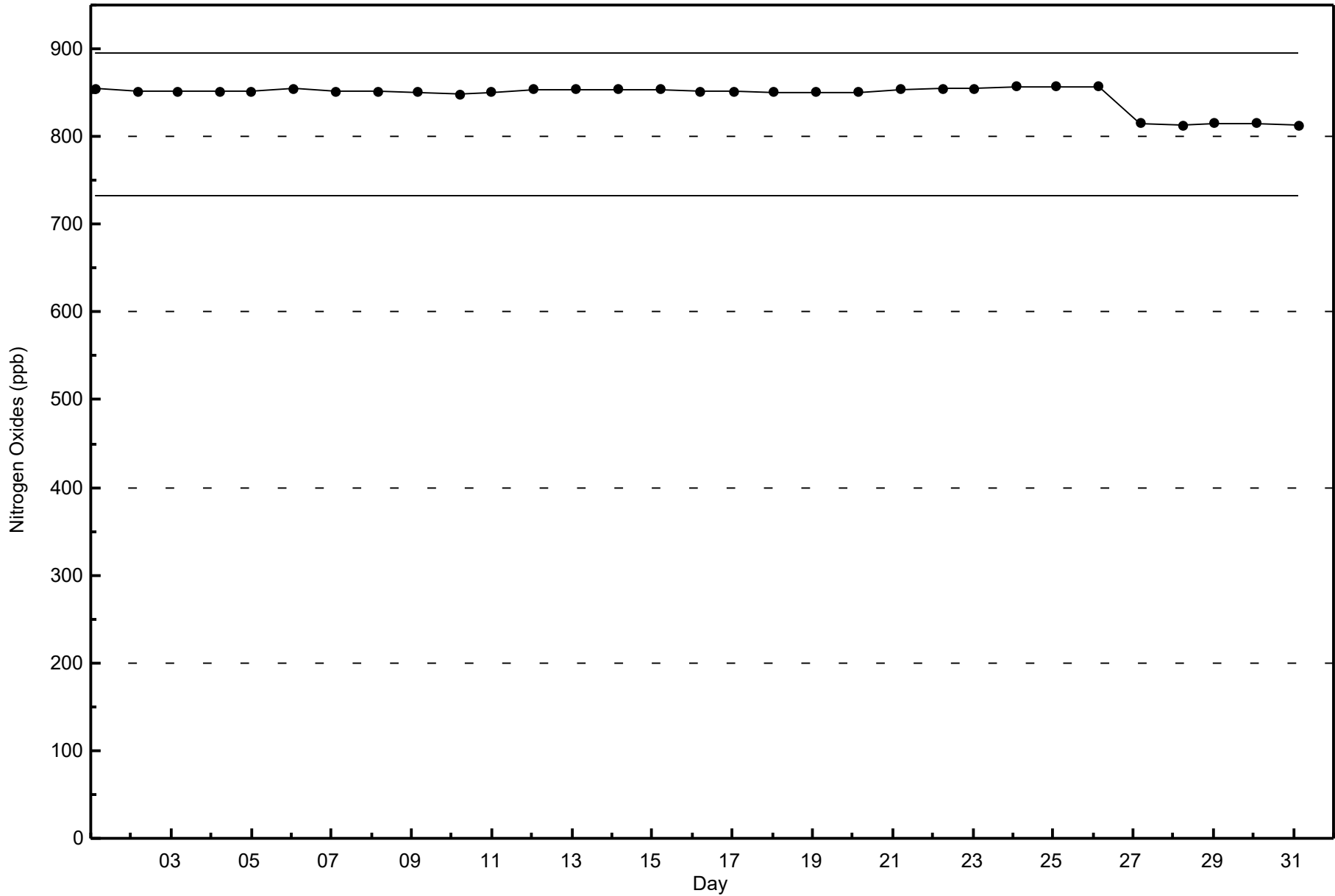


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitrogen Oxides (NO_x) - ppb
Christina Lake









Wood Buffalo Environmental Association
Summary of Hour Averages

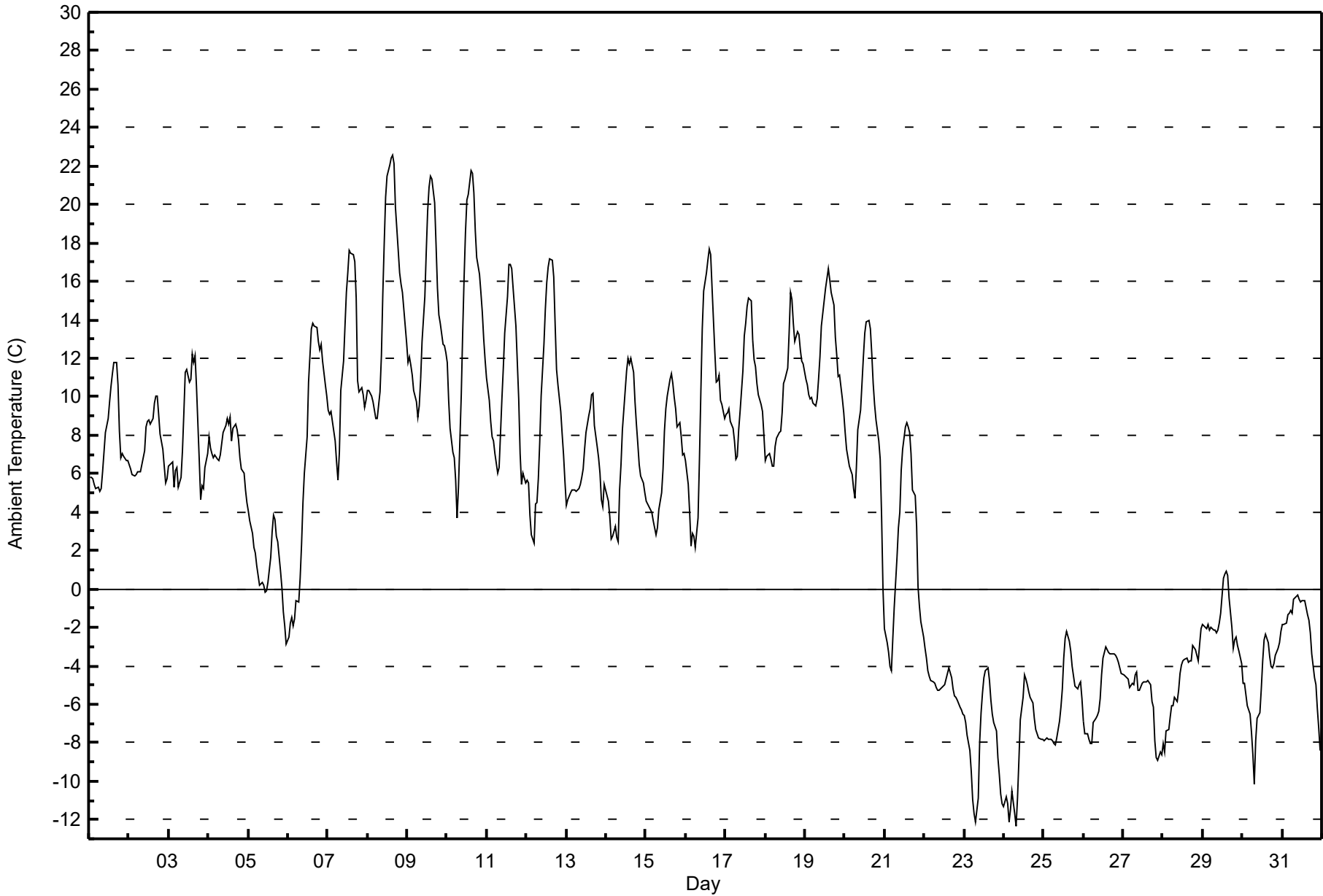
Ambient Temperature (AT) - C
Christina Lake - October 2023

Maximum Value: 22.6 C on Oct 8 16:00 Maximum Daily Average: 15.3 C on Oct 8																						Hours in Service: 744 Hours of Data: 744				
Minimum Value: -12.4 C on Oct 24 08:00 Minimum Daily Average: -8.3 C on Oct 24 Maximum Diurnal Average: 8.5 C at hour 16 Minimum Diurnal Average: 1.1 C at hour 7 Monthly Average: 4.34 C Percentiles: P ₁ = -11.2 P ₁₀ = -6.3 Q ₁ = -3.2 Median = 5.9 Q ₃ = 10.1 P ₉₀ = 13.9 P ₉₉ = 21.4																						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-Oct	5.8	5.8	5.7	5.5	5.2	5.3	5.1	5.2	6.1	7.1	8.1	8.9	9.7	10.5	11.2	11.8	11.8	10.6	8.2	6.8	7.0	6.9	6.7	6.7	7.6	11.8
2-Oct	6.4	6.2	6.0	5.9	5.9	6.1	6.1	6.1	6.4	7.2	8.5	8.7	8.8	8.6	8.9	9.7	10.1	10.0	9.1	8.0	7.2	6.4	5.5	5.7	7.4	10.1
3-Oct	6.4	6.5	6.6	5.3	6.2	6.3	5.3	5.8	7.2	9.1	11.3	11.4	10.8	10.9	12.2	11.8	12.2	10.6	6.7	4.6	5.4	5.2	6.3	7.1	8.0	12.2
4-Oct	7.9	7.3	7.0	6.8	7.0	6.8	6.7	6.9	7.5	8.1	8.5	8.8	8.6	8.9	7.7	8.4	8.6	8.3	7.8	6.9	6.2	6.0	5.2	4.5	7.4	8.9
5-Oct	4.1	3.5	2.9	2.2	1.9	1.2	0.7	0.2	0.3	0.2	-0.2	-0.1	0.3	1.7	3.0	3.8	3.6	2.8	2.4	0.9	0.0	-1.2	-1.9	-2.9	1.2	4.1
6-Oct	-2.5	-1.8	-1.5	-1.9	-1.6	-0.6	-0.7	0.6	2.3	4.5	6.0	7.9	10.8	12.1	13.5	13.8	13.7	13.6	12.9	12.5	12.8	11.9	10.6	10.0	6.6	13.8
7-Oct	9.3	9.1	9.2	8.7	7.7	6.6	5.7	7.1	10.3	11.9	13.7	15.4	16.4	17.6	17.5	17.4	17.0	15.1	10.9	10.2	10.5	10.1	9.5	9.8	11.5	17.6
8-Oct	10.3	10.3	10.1	9.7	9.3	8.9	8.9	10.3	12.2	15.3	18.0	20.4	21.5	22.1	22.4	22.6	22.2	19.9	17.6	16.5	15.9	15.5	14.6	12.8	15.3	22.6
9-Oct	11.8	12.1	11.6	11.1	10.3	9.7	9.0	9.5	10.9	12.9	15.2	17.5	19.6	20.9	21.5	21.3	20.1	17.9	15.6	14.3	13.8	12.7	12.7	12.3	14.4	21.5
10-Oct	11.8	9.8	8.4	7.1	6.8	5.6	3.7	5.3	10.1	13.3	16.1	18.6	20.2	20.6	21.8	21.6	20.6	18.7	17.2	16.4	15.4	14.4	13.0	11.9	13.7	21.8
11-Oct	11.0	9.8	8.7	7.9	7.7	7.1	6.0	6.3	8.1	9.9	11.5	13.3	15.2	16.9	16.9	16.7	15.7	13.6	11.8	9.9	7.0	5.4	6.0	5.5	10.3	16.9
12-Oct	5.7	5.5	3.9	2.8	2.4	4.4	4.5	5.7	7.6	10.0	12.7	14.6	15.9	16.7	17.2	17.1	16.2	13.7	11.4	10.6	9.2	8.1	6.9	5.6	9.5	17.2
13-Oct	4.4	4.7	5.0	5.1	5.1	5.2	5.1	5.2	5.4	5.8	6.2	7.3	8.1	9.0	9.4	10.1	10.1	8.5	7.4	6.8	6.0	4.6	4.3	5.4	6.4	10.1
14-Oct	4.8	4.6	3.7	2.6	2.8	3.3	2.7	2.4	5.2	6.5	8.3	10.4	11.4	12.0	11.7	12.0	11.3	9.7	8.5	7.6	6.4	5.9	5.5	5.0	6.8	12.0
15-Oct	4.6	4.4	4.2	4.0	3.6	3.2	2.8	3.2	4.1	5.0	6.3	8.2	9.4	10.0	10.9	11.2	10.7	9.9	9.4	8.4	8.6	7.9	7.0	7.1	6.8	11.2
16-Oct	6.7	5.4	3.9	2.2	2.9	2.7	2.2	3.7	6.8	10.3	13.6	15.5	16.4	17.1	17.7	17.4	15.6	12.3	10.8	10.9	11.1	9.8	9.6	8.9	9.7	17.7
17-Oct	9.1	9.2	9.4	8.7	8.4	7.7	6.8	6.9	8.2	9.3	11.3	13.2	13.8	14.7	15.2	15.0	13.0	11.9	11.6	10.7	10.1	9.6	9.2	8.0	10.5	15.2
18-Oct	6.7	6.9	7.1	6.8	6.4	6.4	7.4	7.8	8.2	8.2	9.1	10.7	10.9	11.5	13.3	15.4	15.0	13.9	12.9	13.4	13.2	12.4	11.9	11.7	10.3	15.4
19-Oct	10.9	10.6	10.1	9.9	9.9	9.7	9.5	9.9	10.9	12.1	13.7	15.0	15.6	16.1	16.7	16.1	15.4	14.8	13.1	12.1	11.1	11.1	9.9	9.2	12.2	16.7
20-Oct	8.1	7.3	6.8	6.4	5.9	5.2	4.7	6.3	8.3	9.3	10.7	12.1	13.3	13.9	14.0	13.5	12.2	10.7	9.6	8.8	7.7	6.7	3.7	0.0	8.6	14.0
21-Oct	-2.0	-2.8	-3.3	-4.0	-4.2	-2.6	-1.0	1.7	3.1	4.0	6.1	7.3	8.4	8.7	8.4	8.1	7.0	5.2	4.9	3.2	0.1	-0.9	-1.7	-2.5	2.1	8.7
22-Oct	-3.1	-3.6	-4.2	-4.6	-4.8	-4.9	-4.9	-5.1	-5.3	-5.3	-5.1	-5.1	-5.0	-4.7	-4.4	-4.1	-4.6	-5.2	-5.5	-5.6	-5.8	-6.2	-6.3	-6.5	-5.0	-3.1
23-Oct	-6.6	-7.0	-7.6	-8.4	-9.5	-11.0	-11.7	-12.2	-10.9	-8.0	-6.5	-5.4	-4.6	-4.2	-4.1	-4.8	-5.8	-6.5	-6.9	-7.4	-8.8	-9.7	-10.7	-11.2	-7.9	-4.1
24-Oct	-11.3	-10.8	-11.2	-12.1	-11.5	-10.6	-11.7	-12.4	-10.9	-8.9	-6.8	-5.7	-4.5	-4.7	-5.0	-5.3	-5.6	-5.9	-6.7	-7.3	-7.5	-7.8	-7.9	-7.9	-8.3	-4.5
25-Oct	-7.9	-7.8	-7.8	-7.8	-7.9	-7.9	-8.1	-8.1	-7.8	-6.9	-6.1	-5.2	-3.6	-2.6	-2.2	-2.7	-3.2	-4.0	-4.6	-5.1	-5.2	-5.0	-4.8	-5.7	-5.7	-2.2
26-Oct	-6.8	-7.5	-7.5	-7.8	-8.0	-8.0	-6.9	-6.7	-6.6	-6.4	-5.7	-4.5	-3.6	-3.0	-3.2	-3.3	-3.4	-3.4	-3.4	-3.4	-3.6	-3.8	-4.1	-4.4	-5.2	-3.0
27-Oct	-4.5	-4.6	-4.6	-4.7	-5.1	-4.9	-5.0	-4.4	-4.3	-5.3	-5.3	-4.9	-4.8	-4.8	-4.8	-4.8	-5.0	-5.8	-6.1	-7.9	-8.8	-8.9	-8.5	-8.6	-5.7	-4.3
28-Oct	-8.1	-8.5	-7.4	-7.3	-6.6	-6.1	-6.1	-5.6	-5.8	-5.3	-4.4	-4.0	-3.8	-3.7	-3.6	-3.8	-3.8	-3.7	-2.9	-3.1	-3.5	-3.8	-2.9	-2.0	-4.8	-2.0
29-Oct	-1.9	-2.0	-2.1	-1.8	-2.1	-2.0	-2.1	-2.2	-2.3	-2.1	-1.7	-1.3	0.6	0.8	0.9	0.7	-0.5	-2.0	-3.1	-2.7	-2.5	-2.9	-3.2	-3.9	-1.7	0.9
30-Oct	-4.9	-4.9	-5.5	-6.1	-6.5	-7.5	-8.6	-10.2	-7.9	-6.8	-6.4	-5.2	-3.7	-2.6	-2.4	-2.8	-3.5	-4.0	-4.1	-3.9	-3.5	-3.1	-2.8	-2.2	-5.0	-2.2
31-Oct	-1.8	-1.8	-1.7	-1.3	-1.3	-1.1	-1.3	-0.6	-0.4	-0.3	-0.5	-0.7	-0.6	-0.6	-1.0	-1.3	-1.6	-2.3	-3.4	-4.6	-5.0	-6.2	-7.2	-8.4	-2.3	-0.3
2.7 2.5 2.1 1.6 1.5 1.4 1.1 1.6 2.8 4.0 5.4 6.6 7.5 8.1 8.4 8.5 7.9 6.7 5.6 4.8 4.2 3.6 3.1 2.6																								Diurnal Average		
11.8 12.1 11.6 11.1 10.3 9.7 9.5 10.3 12.2 15.3 18.0 20.4 21.5 22.1 22.4 22.6 22.2 19.9 17.6 16.5 15.9 15.5 14.6 12.8																								Diurnal Maximum		



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Christina Lake - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Christina Lake - October 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	259	34.81	34.81
0 - 10	292	39.25	74.06
10 - 20	178	23.92	97.98
> 20	15	2.02	100.00

Total Number of Valid Hours: 744

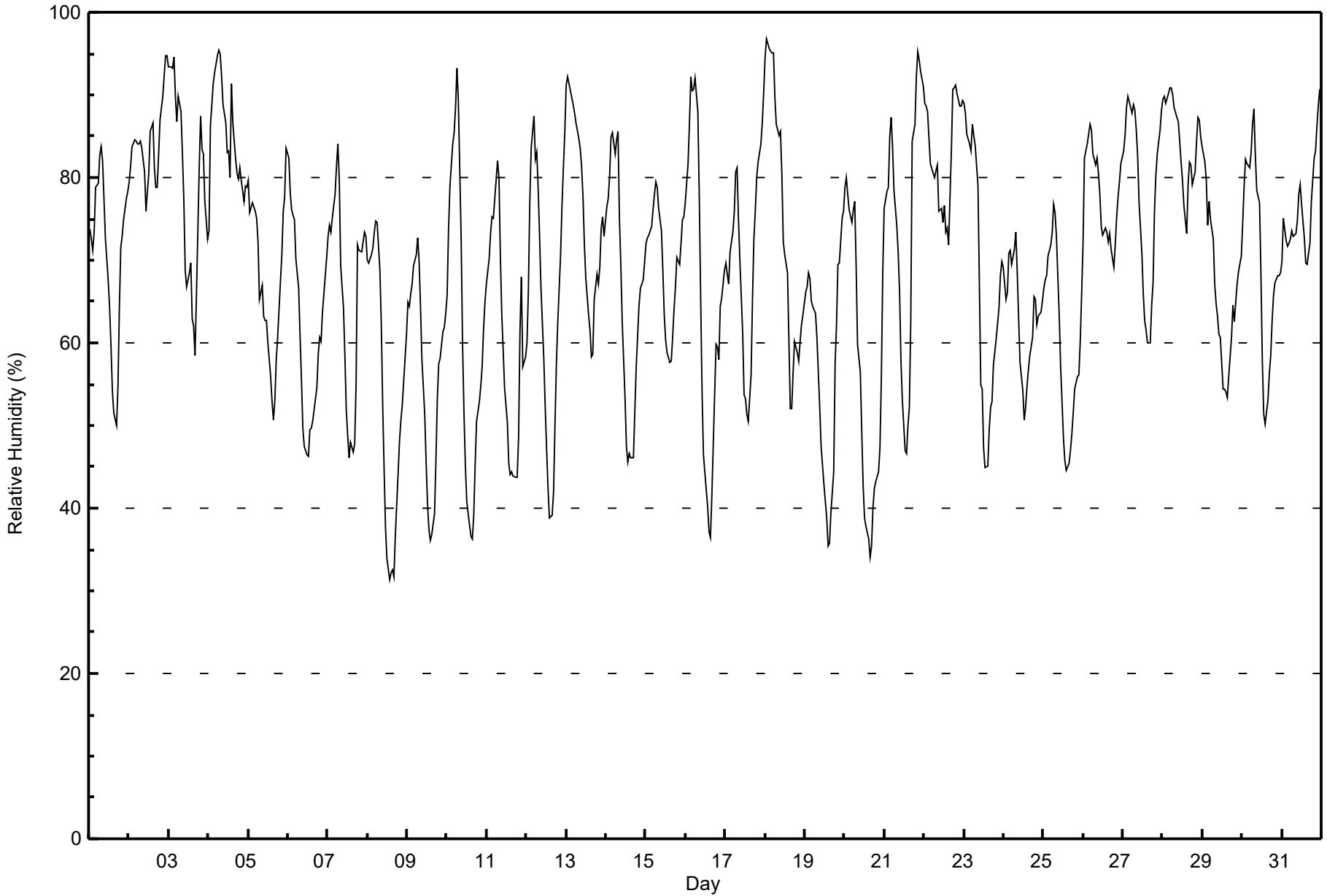
Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

Relative Humidity (RH) - %
Christina Lake - October 2023

Maximum Value: 96.8 % on Oct 18 02:00 Maximum Daily Average: 85.3 % on Oct 4 Minimum Value: 31.4 % on Oct 8 14:00 Minimum Daily Average: 53.4 % on Oct 8 Maximum Diurnal Average: 81.3 % at hour 7 Minimum Diurnal Average: 53.5 % at hour 16 Monthly Average: 69.27 % Percentiles: P ₁ = 35.6 P ₁₀ = 47.4 Q ₁ = 58.6 Median = 71.1 Q ₃ = 81.2 P ₉₀ = 87.8 P ₉₉ = 94.9																								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-Oct	73.8	72.6	71.2	73.4	78.9	79.4	82.7	83.7	82.0	77.5	72.7	67.7	64.4	59.6	54.3	51.5	50.0	54.8	64.2	71.5	72.9	75.0	77.4	78.2	70.4	83.7																							
2-Oct	79.5	81.4	83.7	84.6	84.3	84.1	84.1	84.3	83.6	80.6	75.9	78.3	80.5	85.6	86.6	81.3	78.8	78.8	82.7	86.9	89.9	92.3	94.8	94.7	84.1	94.8																							
3-Oct	93.4	93.4	93.3	94.5	89.8	86.7	89.9	88.0	82.9	77.4	68.8	66.8	68.4	69.6	62.8	62.0	58.5	65.6	81.2	87.5	83.4	82.8	77.2	72.6	79.0	94.5																							
4-Oct	73.5	86.2	88.9	91.4	92.7	94.7	95.4	94.9	92.2	88.9	86.7	83.1	83.3	80.0	91.4	86.5	82.1	80.4	79.8	81.2	79.7	77.0	78.9	78.7	85.3	95.4																							
5-Oct	79.7	75.7	77.0	76.4	75.9	75.0	72.2	65.3	66.9	63.3	62.8	62.7	59.9	55.9	52.9	50.8	53.0	57.9	60.7	67.5	70.6	75.9	77.6	83.5	67.5	83.5																							
6-Oct	82.4	78.2	76.2	75.4	74.8	70.1	66.7	60.8	55.6	49.7	47.4	46.4	46.3	49.5	49.6	50.6	51.9	54.5	58.6	60.7	60.2	63.7	68.2	70.4	61.2	82.4																							
7-Oct	72.9	74.2	73.4	75.0	77.9	81.3	84.0	79.6	69.3	64.3	58.6	51.9	48.8	46.0	47.9	46.8	47.8	55.1	71.9	71.1	71.1	72.2	73.4	72.9	66.1	84.0																							
8-Oct	70.0	69.7	70.6	71.6	73.4	74.8	74.5	68.9	62.1	52.4	44.7	37.6	33.9	31.4	32.2	32.6	31.7	36.7	44.2	48.1	50.6	52.6	55.5	61.1	53.4	74.8																							
9-Oct	64.8	64.3	65.9	67.1	69.3	70.7	72.7	69.9	64.2	58.0	51.3	45.5	40.5	37.4	36.2	36.8	39.3	45.8	53.1	57.5	58.2	61.4	61.8	63.5	56.5	72.7																							
10-Oct	65.7	73.7	79.0	84.1	85.4	88.5	93.2	89.3	72.8	60.1	51.6	45.2	40.8	39.3	36.7	36.2	39.1	45.3	50.5	52.9	54.7	57.1	61.6	64.9	61.2	93.2																							
11-Oct	67.0	70.2	73.3	75.3	75.2	77.5	82.0	80.0	70.5	63.6	59.1	54.6	50.4	45.4	44.1	44.4	43.9	43.6	43.7	48.4	61.3	67.9	57.1	58.3	60.7	82.0																							
12-Oct	60.0	66.3	76.9	83.6	87.5	82.3	83.0	78.7	72.9	66.6	58.2	52.3	47.3	42.5	38.8	39.1	42.0	50.1	57.4	62.5	70.6	76.7	81.1	85.5	65.1	87.5																							
13-Oct	91.2	92.1	90.6	89.7	88.8	87.9	86.6	84.8	83.6	81.4	77.6	71.9	67.8	63.4	61.6	58.3	58.6	65.2	68.3	67.1	69.1	73.9	75.3	72.9	76.2	92.1																							
14-Oct	76.4	77.4	80.1	84.9	85.3	82.8	84.6	85.6	75.1	69.5	62.5	53.5	47.5	45.6	46.6	46.2	46.2	51.7	57.0	60.8	64.7	66.6	67.7	69.9	66.2	85.6																							
15-Oct	72.0	72.6	73.1	74.0	76.1	78.0	79.6	78.8	76.3	73.5	68.9	63.4	60.4	58.9	57.6	57.8	60.6	64.1	66.7	70.4	69.5	72.0	75.0	75.2	69.8	79.6																							
16-Oct	76.9	81.6	86.6	92.2	90.5	90.8	92.0	88.0	77.7	65.6	54.0	46.5	42.2	40.1	37.2	36.4	41.5	54.0	59.9	59.5	57.9	64.4	65.4	68.7	65.4	92.2																							
17-Oct	69.7	68.2	67.1	71.1	73.4	75.8	80.6	81.2	74.9	70.0	61.1	53.7	53.2	51.3	50.4	56.0	65.3	72.6	75.9	80.0	81.8	84.0	86.6	90.4	70.6	90.4																							
18-Oct	94.5	96.8	95.5	95.2	95.0	95.2	89.7	86.4	85.1	85.6	80.2	72.2	70.7	68.5	60.4	52.0	52.0	56.4	60.1	58.9	57.8	60.1	62.3	63.5	74.7	96.8																							
19-Oct	66.1	66.8	68.6	67.8	65.0	64.4	63.6	60.7	56.5	52.2	47.5	42.9	40.8	38.7	35.5	35.7	39.4	44.4	57.5	62.2	69.5	69.6	75.1	75.9	56.9	75.9																							
20-Oct	78.8	80.0	77.9	76.1	74.6	76.0	77.1	69.3	59.8	56.4	49.3	42.7	38.8	37.8	36.3	34.1	35.4	40.0	42.3	43.2	44.4	47.2	55.8	68.5	55.9	80.0																							
21-Oct	76.3	78.3	78.8	84.8	87.3	83.7	78.5	74.2	71.0	66.4	57.8	53.1	47.0	46.6	50.0	52.1	62.5	84.3	86.5	92.2	95.2	94.2	92.8	91.1	74.4	95.2																							
22-Oct	88.9	88.6	88.0	84.8	81.6	80.5	80.0	80.8	81.6	76.0	76.3	74.5	76.6	73.4	73.9	71.9	83.2	90.6	90.8	91.1	90.1	88.7	88.7	89.4	82.9	91.1																							
23-Oct	89.0	87.8	85.2	84.1	83.3	86.5	85.1	84.0	79.0	66.9	54.9	54.3	47.2	45.0	45.1	49.5	52.3	52.8	57.3	60.5	62.5	64.3	68.1	69.8	67.3	89.0																							
24-Oct	69.2	65.3	66.1	70.9	71.1	69.5	71.4	73.5	68.6	63.0	57.6	54.3	50.7	52.1	54.8	56.8	58.5	60.7	65.6	65.3	62.3	63.2	63.7	65.1	63.3	73.5																							
25-Oct	66.6	67.7	68.1	70.5	71.8	73.4	76.8	75.8	72.8	63.2	57.1	52.9	48.5	45.7	44.5	45.4	46.9	49.0	51.5	54.4	56.0	56.1	60.1	65.9	60.0	76.8																							
26-Oct	72.0	82.4	84.1	85.3	86.5	85.7	82.8	81.5	82.3	80.5	77.9	74.2	73.1	73.9	73.4	72.3	73.2	71.3	69.1	71.8	75.3	77.6	79.4	81.7	77.8	86.5																							
27-Oct	83.2	85.0	88.5	89.9	89.1	87.8	88.9	88.1	85.8	82.6	77.0	70.8	66.0	62.8	61.6	59.9	60.0	64.6	67.2	76.0	80.3	82.9	85.8	88.1	78.0	89.9																							
28-Oct	89.5	89.9	88.9	90.1	90.9	90.9	90.1	88.5	87.3	86.8	84.4	81.8	79.6	76.6	73.2	79.2	81.9	81.5	79.2	80.7	84.2	87.3	86.9	84.9	84.8	90.9																							
29-Oct	83.7	81.9	79.7	74.3	77.1	74.9	72.5	67.1	64.8	63.3	61.0	60.8	54.4	54.3	54.0	53.4	56.0	60.7	64.6	62.6	64.9	67.1	68.6	70.6	66.3	83.7																							
30-Oct	74.6	79.0	82.1	81.7	81.2	83.1	86.4	88.3	82.6	78.5	76.9	68.5	57.8	51.3	50.2	53.0	56.2	58.5	62.7	65.8	67.3	68.1	68.1	68.5	70.4	88.3																							
31-Oct	69.9	75.1	72.4	71.7	72.1	72.5	73.5	72.9	73.3	74.8	77.9	79.1	76.7	72.7	69.6	69.6	70.8	72.1	77.1	82.4	83.3	86.4	88.9	90.6	76.1	90.6																							
																								76.5	78.1	79.1	80.4	80.8	80.8	81.3	79.1	74.6	69.6	64.4	60.1	56.9	54.9	53.8	53.5	55.4	60.1	64.7	67.8	69.6	71.9	73.5	75.3	Diurnal Average	
																								94.5	96.8	95.5	95.2	95.0	95.2	95.4	94.9	92.2	88.9	86.7	83.1	83.3	85.6	91.4	86.5	83.2	90.6	90.8	92.2	95.2	94.2	94.8	94.7	Diurnal Maximum	





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Christina Lake - October 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	29	3.90	3.90
40 - 60	168	22.58	26.48
60 - 80	343	46.10	72.58
80 - 100	204	27.42	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

Christina Lake - October 2023

Maximum Speed: 31 km/h on Oct 4 20:00	Maximum Daily Speed Average: 18.8 km/h on Oct 5	Hours in Service: 744
Minimum Speed Value: 1 km/h on Oct 17 07:00	Minimum Daily Speed Average: 2.9 km/h on Oct 21	Hours of Data: 744
Maximum Diurnal Speed Average: 6.8 km/h at hour 14	Minimum Diurnal Speed Average: 4.0 km/h at hour 19	Hours of Missing Data: 0
Monthly Average Velocity: 5.1 km/h 235.7 deg	Percentiles: P ₁ = 3 P ₁₀ = 6 Q ₁ = 9 Median = 12 Q ₃ = 15 P ₉₀ = 20 P ₉₉ = 26	Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Oct	S7	SSE6	SE7	SSE7	SE6	SE7	SSE5	SE6	SSE8	SSE11	S15	S16	SSW13	SSW14	SSW12	S15	SSW15	S10	SSE8	SSE9	S11	S14	SSW15	SSW17	S10.0	SSW17
2-Oct	SSW20	SSW20	SSW17	SSW18	SSW19	SSW19	SSW19	SSW18	SSW19	SSW21	SSW20	SSW18	SSW15	SW14	SW13	SW14	SW11	SW9	SW8	SSW8	SW10	SSW8	SSW8	SSW7	SSW14.4	SSW21
3-Oct	SSW8	SW6	SSW8	SSW7	WSW9	WSW11	SW9	SW9	WSW10	W10	WNW13	WNW16	W16	WNW13	NW14	NNW13	WNW8	SW7	SSW8	SSW8	SSW9	SSW8	SSW9	SSW10	WSW7.6	WNW16
4-Oct	WSW11	WSW8	SW10	WSW12	WSW11	WSW10	W10	W13	WNW14	WNW16	NW17	NW21	NW19	NW23	NW16	NW20	WNW22	NW24	NW24	NW31	NW26	NW26	NW26	NW22	WNW16.6	NW31
5-Oct	NW20	NW26	NW25	NW24	NW26	NW26	NW28	NW27	NW25	NW31	NW28	NW26	NNW25	NW24	NW25	NNW21	NW21	NW18	NW14	W5	WSW3	S5	SE4	SSW4	NW18.8	NW31
6-Oct	SSW9	SW9	SSW8	SSW9	SSW10	SSW13	SSW11	SSW12	SSW16	SW17	SW15	SW14	SW18	SW19	SW18	SW17	SW14	SW14	SW14	SW14	W11	WSW11	WSW11	WSW13	SW12.7	SW19
7-Oct	WSW12	WSW11	WSW10	WSW7	SW6	SW10	SSW9	SSW5	NE2	SW5	S2	E2	E6	ESE4	E8	ESE11	SE7	SE6	ESE5	SE7	SE9	SSE8	SSE6	SSE10	S3.9	WSW12
8-Oct	SSE12	SSE12	SSE13	SSE12	SSE13	SSE13	SSE10	SSE14	SSE14	SSE17	SSE22	S24	S26	S27	S25	S22	S17	SSE10	SSE11	S11	SSE12	SSE14	SSE12	SSE8	SSE15.3	S27
9-Oct	SSE9	SSE10	SSE12	SSE12	SSE11	SSE9	SSE9	SSE10	SSE11	SSE12	SSE12	SE12	SE13	SSE15	SSE15	SSE14	SSE15	SSE11	SSE9	SSE9	SSE7	SSE7	SSE11	SSE12	SSE11.2	SSE15
10-Oct	SSE8	ESE5	ESE6	E6	ENE6	ENE5	E7	E9	SE6	SSE14	SSE17	SSE18	SSE22	SSE22	SSE21	SSE23	SSE16	SE12	SE13	SE16	SSE15	SSE16	SE14	SE14	SE12.0	SSE23
11-Oct	SSE13	SE11	SE10	SE7	SE10	SE9	ESE7	ESE6	SE10	SE13	ESE14	ESE15	ESE16	SE17	SE21	ESE20	ESE16	SE10	SE7	ESE7	ESE7	ESE6	SE7	SE10	SE11.1	SE21
12-Oct	SSE11	SSE8	SE6	SE4	SE7	SSE10	SSE7	SSE3	S7	SSW11	S10	S13	SSE14	S16	S12	S11	SSE11	S9	S10	SSW13	S12	S13	SSW14	SSW9	S9.6	S16
13-Oct	SSW12	SSW13	SSW11	SSW12	SSW12	SSW10	SSW9	S12	S13	SSE14	S17	SSE15	S15	SSE15	SSE15	SSE14	SSE11	SE9	SE12	SE11	SE11	SE9	SSE8	SSE11	S11.3	S17
14-Oct	SSE11	SSE10	SE9	ESE7	SE5	SSE10	SE8	ESE7	SSE13	SSE14	SSW17	SSE22	SSE26	S23	SSE24	SSE21	SSE22	SSE15	SSE14	SSE13	SSE12	SSE12	SSE13	SSE12	SSE13.8	SSE26
15-Oct	SSE13	SSE14	SSE13	SSE12	SSE11	SSE9	SSE8	SSE9	S9	S12	SSW13	SSW11	S11	S9	SSW9	SSW9	SSW7	SSW7	SSW8	SSW9	SW11	SW9	SSW6	WSW4	S8.9	SSE14
16-Oct	SW8	SSW7	SSW6	SSW5	S4	SSW7	S5	SSW8	SSW8	SW9	WSW8	W9	WSW11	WSW9	WSW9	WSW7	SW4	SSE5	SSE6	SSE8	SSE6	E7	E6	E6	SSW4.7	WSW11
17-Oct	E6	E7	E7	NE3	NE4	E1	SSE1	WNW2	W4	NW4	W4	W11	W14	W12	WNW14	WNW16	W13	W13	W11	WSW10	WSW7	SW8	SW9	S8	W4.7	WNW16
18-Oct	S8	SSW10	SSW10	SSW11	S6	SSE9	S10	SSW11	SSW14	S16	SSW17	SSW15	SSW15	SSW13	SSW11	WSW10	SW10	SW12	SW15	SW18	WSW16	SW14	WSW18	WSW19	SSW11.9	WSW19
19-Oct	WSW18	WSW18	WSW16	WSW17	WSW20	WSW20	WSW22	WSW21	WSW22	WSW20	W21	W21	WSW21	WSW20	W17	WSW17	WSW14	W16	W8	SW9	WSW10	WSW20	WSW18	W14	WSW17.2	WSW22
20-Oct	WSW13	WSW13	WSW13	W12	W13	WSW13	W12	W15	WNW17	WNW19	WNW21	WNW22	WNW25	NW26	NW24	NW25	NW23	WNW13	WNW11	WNW13	NW17	WNW11	SW4	S3	WNW14.3	NW26
21-Oct	SSW5	S4	SSW5	SE2	S3	S7	SSE6	S11	SSW15	SSW17	SSW19	SSW15	SSW19	SSW16	SSW10	SSW9	SW7	S5	NNW12	NNE13	NNE19	NNE19	NNE19	NNE19	SSW2.9	NNE19
22-Oct	NNE21	NNE19	NNE19	NNE18	NNE15	NNE13	NE11	NE14	ENE11	ENE11	E11	E10	ENE9	ENE10	ENE11	ENE10	NE12	NE10	ENE10	NE11	NNE12	NNE12	N10	NNE9	NE11.3	NNE21
23-Oct	NNE10	NNW15	NNW12	NW12	WNW5	SW5	SW4	SSW3	WSW9	WNW7	NW14	NW13	NW16	WNW16	WNW16	NW19	WNW13	W12	NW14	WNW12	WSW12	WSW12	WSW13	WSW12	WNW9.5	NW19
24-Oct	WSW11	W14	W11	WSW12	WSW10	W10	WSW12	WSW13	W12	W11	W14	WNW18	WNW18	WNW20	W16	W15	W13	WNW16	NW22	NW22	WNW14	W12	W12	W13	W13.4	NW22
25-Oct	W12	W12	W12	W11	W11	W11	WSW11	WSW10	WSW11	SW10	WSW11	WSW11	W15	WNW16	WNW18	WNW15	WNW12	W10	W10	WSW10	WSW11	W12	WNW15	W12	W11.5	WNW18
26-Oct	W11	WSW12	WSW12	WSW11	WSW11	W12	NW13	WNW12	WNW11	WNW12	W12	W11	W12	WNW14	NW19	W11	W10	WSW9	WSW10	WSW11	WSW11	W11	WSW10	WSW10	W10.7	NW19
27-Oct	WSW10	WSW10	WSW9	WSW9	W11	WSW11	WSW11	W11	N16	NNE19	NNE18	N17	N16	N19	NNW18	N14	N15	NW14	NW9	SW7	WSW8	SW8	SW5	SSW4	NW7.3	NNE19
28-Oct	SW5	SSW5	SSW6	S7	SW5	WSW8	WSW10	NW15	NW18	NW14	NW16	NNW19	NNW20	NNW20	NNW18	NW18	NW17	WNW13	WNW15	W12	W11	W12	W13	W13	WNW10.4	NNW20
29-Oct	WNW13	W13	W13	W13	W12	WNW13	W14	NW17	NW16	NW19	NNW18	NW15	WNW13	WNW15	WNW13	W15	W12	WSW11	WSW11	W14	NW15	NW16	NW15	NNW16	WNW13.2	NW19
30-Oct	N14	NNE15	NNE13	NNE13	NE10	NE9	E4	NNE5	ENE4	SE5	S9	SSW9	SSW10	SSW11	SSW13	SSW12	SSW9	SSW10	SSW12	SSW11	SSW11	SSW12	SSW14	SW12	S3.2	NNE15
31-Oct	SW11	SSW6	S5	SW9	SW11	WSW11	WSW11	WNW12	NW13	NW16	NW19	NW18	NW18	NW18	NW21	NNW18	NNW16	N10	NE9	S3	SSW5	SSW7	SW7	S3	WNW7.3	NW21

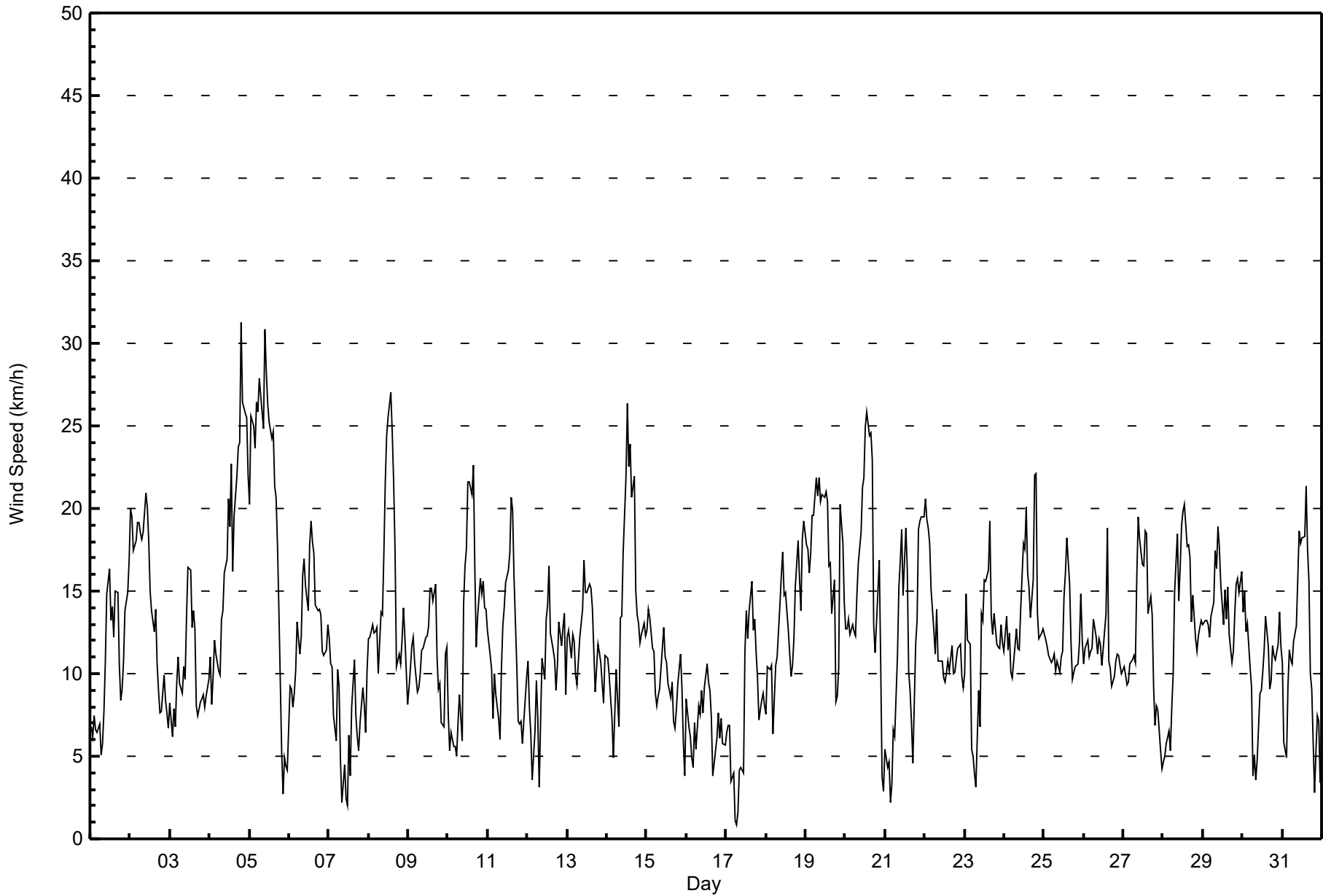
SW5.0 SW4.6 SW4.4 SW4.4 SW4.5 SW5.3 SW5.4	SW4.5 SW5.0 SW5.1 SW5.4	SW5.8 SW6.5 SW6.8 SW6.8	SW5.7 SW5.4	SW5.1 SW5.8	SW5.4 SW5.0 SW5.0 SW5.3 SW5.4 SW4.6	Diurnal Average
NNE21 NW26 NW25 NW24 NW26 NW26 NW28 NW27 NW25 NW31 NW28 NW26 SSE26 S27 NW25 NW25 NW23 NW24 NW24 NW31 NW26 NW26 NW26 NW22						Diurnal Maximum

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Christina Lake - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Christina Lake - October 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	57	7.66	7.66
6 - 11	297	39.92	47.58
12 - 19	315	42.34	89.92
20 - 28	73	9.81	99.73
29 - 38	2	0.27	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
Christina Lake - October 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	0	1	3	2	3	3	5	4	11	9	8	2	3	2	1	0	57
6 - 11	2	2	6	8	13	9	27	47	20	55	27	52	23	5	1	0	297
12 - 19	7	17	2	0	0	4	10	49	14	42	19	27	43	35	35	11	315
20 - 28	0	1	0	0	0	1	1	10	6	4	0	9	2	5	30	4	73
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	9	21	11	10	16	17	43	110	51	110	54	90	71	47	69	15	744

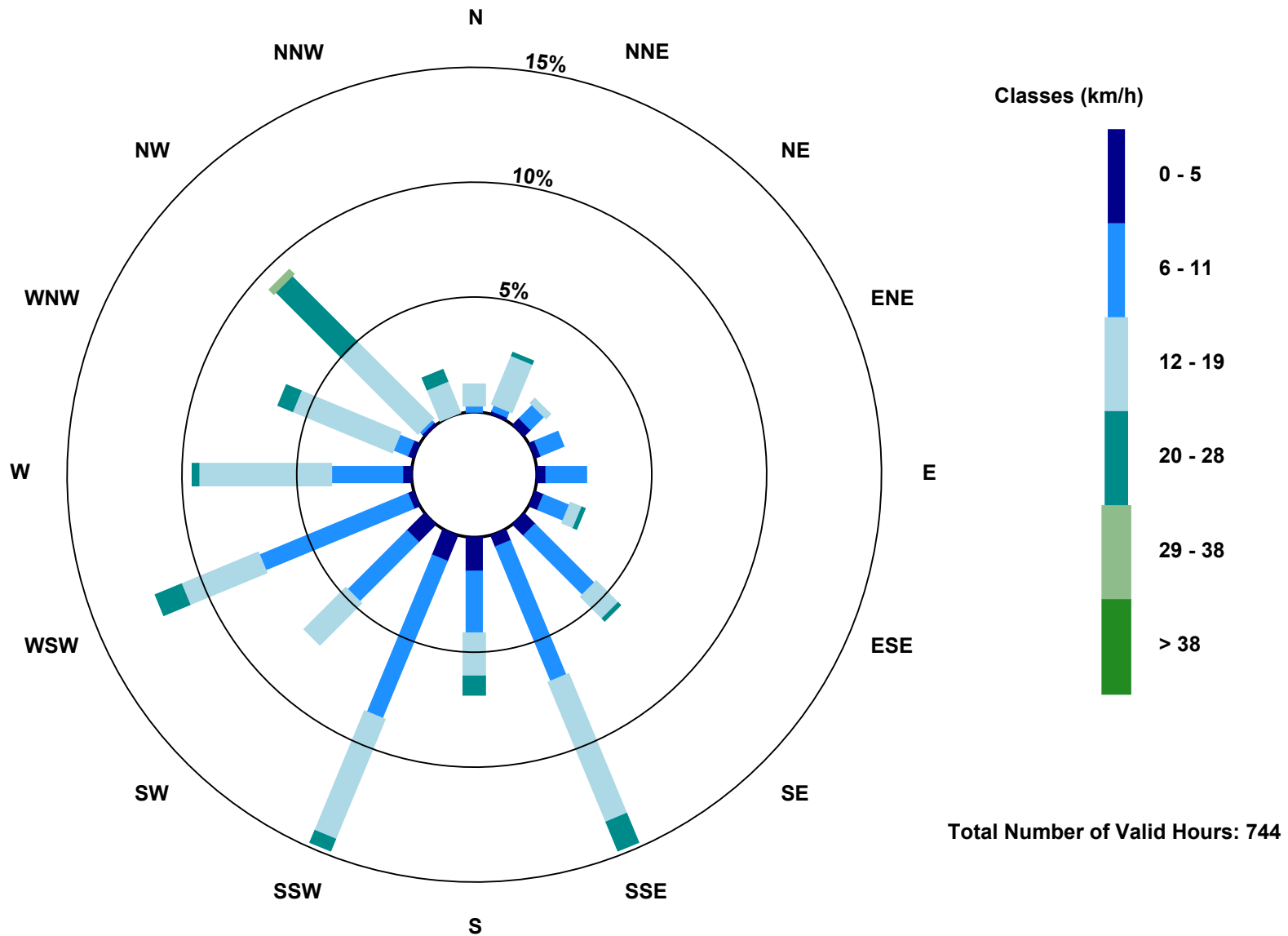
Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

Wind Speed (WS) - km/h
Christina Lake





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Christina Lake - October 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 8 km/h on Oct 4 20:00 Minimum Value: 1 km/h on Oct 10 07:00 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-Oct	1	1	1	1	1	1	1	1	2	2	3	3	4	3	4	4	3	2	1	1	2	3	3	4	4
2-Oct	4	3	4	4	4	4	4	4	4	4	4	4	3	3	3	2	2	2	1	1	1	1	1	1	4
3-Oct	1	1	1	1	2	2	1	2	2	3	5	4	4	4	4	3	1	1	3	2	2	2	1	5	
4-Oct	3	2	2	2	2	2	2	3	4	4	5	5	5	6	4	6	6	6	8	7	6	7	7	8	
5-Oct	5	7	6	6	6	6	7	7	6	7	6	6	6	6	6	5	5	4	3	3	2	2	1	7	
6-Oct	1	1	2	2	2	3	2	3	4	4	4	3	4	5	4	4	3	3	2	3	3	2	2	5	
7-Oct	3	2	2	3	3	1	2	1	1	2	2	2	3	2	3	2	2	1	1	1	2	2	2	3	
8-Oct	3	3	2	2	2	2	2	3	3	4	4	7	6	6	5	5	5	2	2	2	2	3	3	7	
9-Oct	1	2	2	2	3	3	2	2	3	2	3	3	3	4	4	3	3	2	1	2	3	2	2	4	
10-Oct	2	1	1	1	2	1	1	1	2	5	4	4	6	5	5	6	6	2	4	3	4	4	3	6	
11-Oct	3	2	3	1	2	2	1	1	4	3	3	4	4	4	4	4	4	2	2	2	1	1	1	4	
12-Oct	1	2	3	1	1	2	3	1	2	3	3	3	3	3	4	3	3	1	1	2	2	2	2	4	
13-Oct	3	4	3	3	3	3	2	3	3	3	4	4	4	4	3	3	1	2	2	2	2	2	2	4	
14-Oct	2	2	2	2	2	3	2	1	4	4	4	6	6	5	5	5	4	3	2	2	2	2	2	6	
15-Oct	2	3	3	3	3	3	2	2	2	3	3	3	2	3	2	2	1	1	1	2	2	2	1	3	
16-Oct	1	2	2	2	2	2	1	1	2	2	2	2	3	3	3	3	1	1	1	1	1	1	1	3	
17-Oct	1	1	1	1	2	1	1	2	2	2	2	3	4	3	4	5	3	3	3	2	2	2	2	5	
18-Oct	1	3	3	2	1	2	3	3	3	4	4	4	3	3	3	6	3	2	3	4	3	2	4	6	
19-Oct	4	4	3	3	4	4	4	5	5	6	6	6	6	6	5	4	3	6	5	3	3	5	5	6	
20-Oct	3	3	3	3	3	3	3	4	5	5	6	6	7	6	6	5	4	4	3	4	4	4	2	7	
21-Oct	1	1	1	2	1	1	2	3	3	3	4	4	4	4	3	2	2	2	4	8	4	5	5	8	
22-Oct	4	5	4	4	4	2	2	2	2	3	3	3	3	3	2	2	2	2	2	2	3	2	2	5	
23-Oct	2	3	3	2	3	2	2	2	3	3	4	4	4	4	5	5	4	3	5	3	2	2	1	5	
24-Oct	2	3	2	2	3	3	2	2	3	3	4	5	5	5	4	4	4	4	5	4	5	3	3	5	
25-Oct	3	3	3	3	2	2	2	2	2	2	3	3	5	4	5	4	4	2	2	2	2	4	4	5	
26-Oct	3	2	2	2	2	3	5	5	4	4	3	2	3	4	4	3	2	2	2	2	3	3	2	5	
27-Oct	2	2	2	2	3	2	2	3	4	4	3	4	4	4	4	4	5	3	3	3	1	1	1	5	
28-Oct	2	1	1	1	2	2	2	4	3	4	4	5	4	4	4	3	4	3	4	3	3	3	4	5	
29-Oct	4	4	4	3	3	4	4	5	4	4	5	4	4	5	4	4	3	2	2	4	5	3	4	5	
30-Oct	3	3	3	2	2	2	1	1	2	2	2	3	3	3	3	2	2	2	3	3	3	3	3	3	
31-Oct	2	1	2	3	2	2	2	3	4	4	5	3	4	4	5	4	4	3	1	2	1	2	2	5	
Diurnal Maximum																									



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Christina Lake - October 2023

Direction of Maximum Speed: 310 deg on Oct 4 20:00 Direction of Maximum Daily Speed Average: 317.2 deg on Oct 5	Hours in Service: 744 Hours of Data: 744 Hours of Missing Data: 0
Direction of Minimum Speed: 164 deg on Oct 17 07:00 Direction of Minimum Daily Speed Average: 2.9 deg on Oct 21	Percent Operational Time: 100.0
Monthly Average Direction: 235.7 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-Oct	169	151	141	147	136	145	160	146	150	167	174	184	195	202	206	191	197	182	158	160	186	189	197	196	178.8
2-Oct	194	194	193	192	194	194	192	197	193	196	201	204	207	218	214	226	226	219	215	213	214	205	206	196	202.0
3-Oct	206	217	205	211	249	248	224	234	254	259	300	302	280	287	310	332	287	222	211	205	203	208	202	211	251.8
4-Oct	252	238	234	237	244	255	262	271	287	294	305	305	311	305	306	304	302	309	305	310	310	306	307	307	295.3
5-Oct	312	308	308	320	321	316	308	321	318	318	321	324	329	319	319	331	322	324	324	278	238	172	139	201	317.2
6-Oct	212	219	210	208	198	195	192	200	206	219	226	217	230	232	235	230	215	220	227	235	259	256	252	250	223.4
7-Oct	252	252	251	243	225	214	213	208	43	233	189	85	89	104	83	114	130	146	110	130	144	156	151	164	176.1
8-Oct	167	157	157	163	160	160	167	165	162	165	165	171	176	177	177	171	179	165	154	169	162	162	168	149	167.3
9-Oct	154	160	150	157	158	152	150	153	156	150	150	142	144	156	154	147	157	159	150	151	153	154	153	155	152.6
10-Oct	150	106	112	91	64	77	96	91	124	149	159	152	152	152	147	157	152	131	137	146	152	149	144	144	141.5
11-Oct	147	133	129	132	134	132	116	111	129	124	111	117	116	131	130	123	122	135	135	116	106	110	128	130	125.2
12-Oct	151	156	129	131	141	159	158	162	182	196	180	169	168	169	174	173	164	175	187	194	190	187	192	199	173.7
13-Oct	203	202	196	208	192	203	198	176	179	162	171	167	174	163	157	164	152	131	139	146	140	140	147	153	169.8
14-Oct	148	148	126	120	131	151	135	105	159	158	156	167	168	169	159	164	165	159	156	158	163	167	163	159	157.4
15-Oct	157	163	160	158	162	155	166	158	186	174	196	199	183	182	197	201	197	197	206	200	223	218	209	242	183.5
16-Oct	220	205	196	194	184	204	191	205	212	234	254	265	252	258	256	245	222	163	152	167	147	91	89	94	209.5
17-Oct	84	94	97	46	49	99	164	284	273	325	271	260	280	280	289	282	267	266	264	241	238	224	225	171	263.1
18-Oct	172	210	202	199	172	157	186	192	195	190	198	212	211	208	207	239	233	224	222	234	242	232	238	247	213.3
19-Oct	250	247	241	244	245	245	245	247	251	251	259	262	254	258	259	251	241	267	269	222	241	246	253	265	250.8
20-Oct	255	258	258	259	259	258	261	275	285	297	290	284	293	304	315	323	323	296	294	300	312	302	215	188	289.8
21-Oct	198	189	195	129	181	183	164	184	199	196	196	200	201	200	213	209	229	187	345	14	20	14	18	16	202.2
22-Oct	17	16	17	19	25	31	40	44	60	78	85	91	69	67	57	65	54	53	63	38	18	19	10	13	39.6
23-Oct	13	336	329	319	290	214	227	196	248	282	322	318	307	296	299	306	284	268	315	293	258	256	248	251	293.7
24-Oct	255	275	262	247	258	265	249	247	260	267	281	291	298	290	280	275	270	288	314	316	282	266	266	268	277.5
25-Oct	263	267	267	263	262	263	254	253	239	235	249	247	263	287	297	295	284	261	260	248	250	265	296	279	266.7
26-Oct	267	248	249	252	253	260	310	297	299	295	267	260	259	291	320	264	260	253	255	255	255	262	257	254	270.2
27-Oct	253	254	257	256	260	254	251	278	353	17	22	8	6	349	334	352	349	320	304	230	239	231	226	211	315.6
28-Oct	224	208	203	184	228	257	255	311	325	321	321	334	333	335	339	322	323	297	289	268	268	266	272	281	301.7
29-Oct	283	277	275	281	270	287	281	315	320	324	329	325	297	297	289	281	267	250	253	280	317	319	317	335	297.5
30-Oct	7	29	30	30	43	46	85	31	70	138	184	194	204	207	206	200	198	195	196	200	205	209	210	222	188.0
31-Oct	222	196	190	228	232	246	258	296	305	313	322	321	319	323	322	327	339	6	45	173	203	211	219	184	297.7

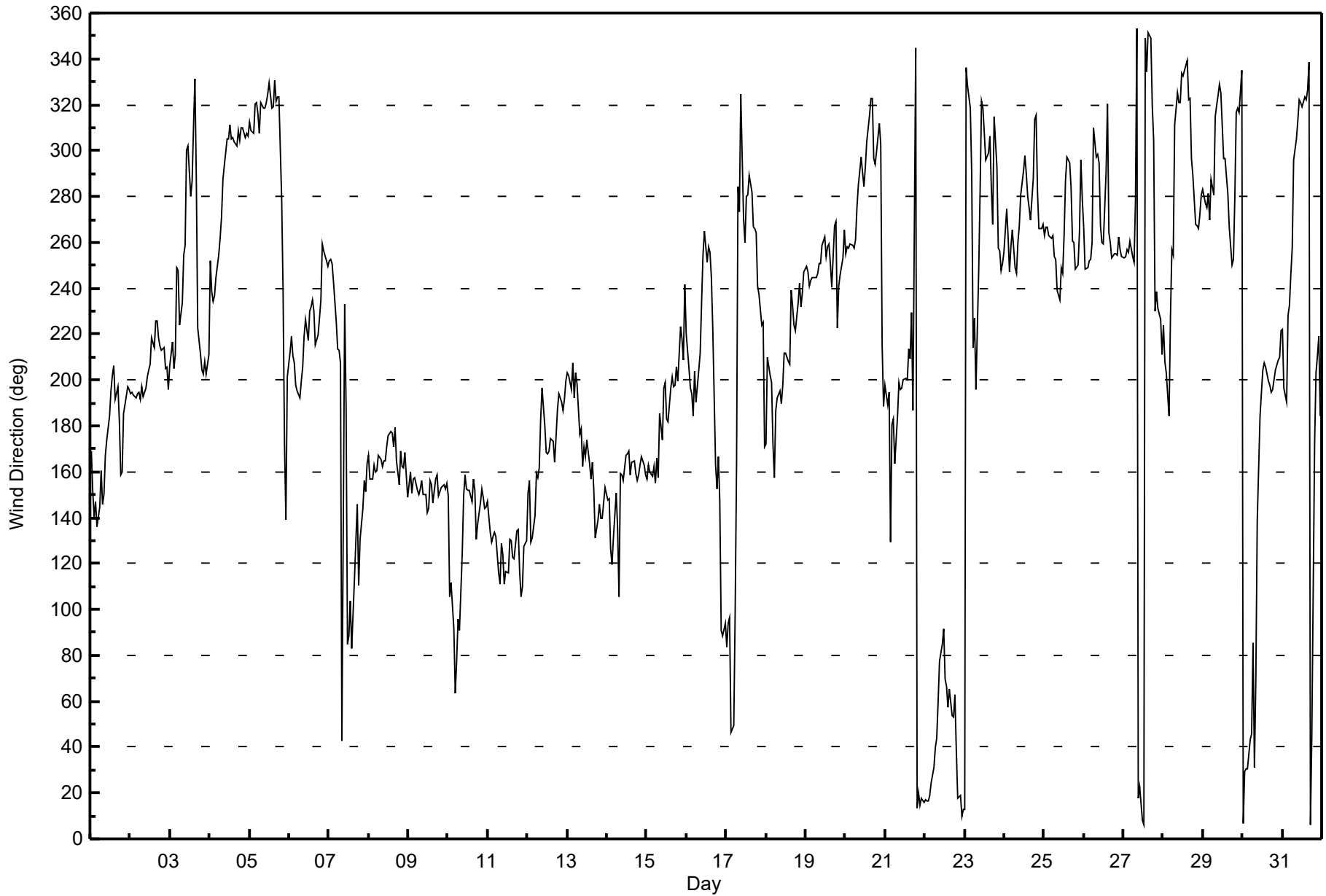
222.9 227.1 220.0 226.6 224.7 222.4 226.0 239.8 239.7 235.2 238.7 242.7 242.4 248.9 257.0 249.3 243.9 239.8 244.1 232.1 234.9 230.1 229.1 227.0
 Diurnal Average

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Christina Lake - October 2023





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Christina Lake - October 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 82 deg on Oct 7 12:00 Minimum Value: 5 deg on Oct 10 07:00 Percentiles: P ₁ = 6 P ₁₀ = 11 Q ₁ = 12 Median = 15 Q ₃ = 19 P ₉₀ = 25 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-Oct	6	13	8	23	17	15	23	11	12	13	13	17	23	21	22	21	15	11	8	8	13	12	11	11	23
2-Oct	10	10	11	12	12	12	11	12	12	13	13	13	14	13	15	15	12	12	11	8	7	8	9	10	15
3-Oct	8	14	6	14	13	15	12	14	16	21	28	25	19	26	25	24	40	17	6	14	7	10	12	11	40
4-Oct	20	18	20	12	14	15	21	16	18	20	18	17	17	16	18	16	16	16	17	15	14	15	16	15	21
5-Oct	16	17	16	13	12	14	18	14	15	13	13	17	17	17	14	18	13	12	14	53	71	38	18	46	71
6-Oct	8	10	12	10	13	11	12	14	15	14	14	15	16	14	15	13	13	12	11	13	18	15	12	10	18
7-Oct	14	14	11	58	60	6	6	14	67	41	55	82	34	69	20	11	14	6	18	8	12	12	13	12	82
8-Oct	12	14	12	12	13	12	12	13	14	13	13	15	14	14	15	13	16	20	13	9	11	11	12	10	20
9-Oct	10	15	13	12	13	17	13	14	15	15	18	19	18	20	16	15	13	10	9	12	18	14	9	12	20
10-Oct	18	13	10	14	23	21	5	5	21	17	16	17	16	14	15	14	12	13	12	12	13	14	12	13	23
11-Oct	13	11	11	14	12	9	6	11	19	17	18	15	17	20	17	15	13	12	11	19	13	22	9	6	22
12-Oct	9	19	28	20	14	9	18	31	16	18	21	20	23	20	22	25	13	8	10	10	10	12	10	19	31
13-Oct	14	14	14	16	12	14	16	16	15	13	15	20	20	21	19	16	14	9	9	10	12	10	16	12	21
14-Oct	12	13	21	17	26	13	20	12	17	16	16	15	17	15	17	14	14	12	11	11	11	10	11	11	26
15-Oct	11	12	13	15	14	17	14	13	19	13	16	20	20	25	22	17	9	12	12	9	11	10	16	32	32
16-Oct	11	12	16	26	39	10	13	5	12	11	20	25	20	27	23	20	30	12	15	6	11	17	12	14	39
17-Oct	6	13	8	22	29	39	68	78	41	39	46	23	20	22	23	17	17	16	18	13	18	14	14	14	78
18-Oct	14	16	12	15	28	20	17	14	12	12	17	15	14	16	15	34	14	12	12	14	11	10	11	12	34
19-Oct	13	14	12	12	12	12	12	14	14	16	18	18	17	19	19	15	14	21	42	18	18	14	16	17	42
20-Oct	16	16	17	17	16	16	16	20	16	20	16	16	15	17	14	15	13	27	20	21	11	27	60	81	81
21-Oct	14	22	12	60	25	8	20	14	11	11	12	14	13	13	15	15	19	51	21	28	14	16	14	13	60
22-Oct	14	14	14	14	13	13	10	10	20	24	24	29	25	23	19	13	13	12	13	12	12	12	17	14	29
23-Oct	14	11	17	13	66	40	51	45	19	29	22	21	22	23	24	20	18	16	19	29	16	15	8	10	66
24-Oct	13	16	17	8	22	24	12	11	16	18	19	22	22	16	17	17	17	22	10	11	22	16	16	17	24
25-Oct	16	17	16	16	16	17	13	13	16	14	20	23	20	23	19	23	25	16	16	11	12	18	19	20	25
26-Oct	17	13	10	11	12	17	27	29	27	24	19	18	17	27	18	17	16	14	14	16	15	17	15	14	29
27-Oct	14	14	16	15	16	14	11	27	30	13	14	20	23	22	18	23	20	13	25	29	8	13	10	21	30
28-Oct	63	42	20	15	19	17	14	24	10	17	14	18	17	15	16	11	13	19	16	18	16	16	16	18	63
29-Oct	17	16	18	20	16	22	17	17	14	15	16	18	27	28	26	17	16	10	11	19	14	10	11	26	28
30-Oct	27	11	12	13	10	8	29	15	25	33	21	25	21	22	14	13	13	13	13	14	13	13	13	14	33
31-Oct	13	26	30	21	11	16	15	25	21	19	12	11	12	12	11	16	13	22	8	47	12	12	19	35	47
											63 42 30 60 66 40 68 78 67 41 55 82 34 69 26 34 40 51 42 53 71 38 60 81														
Diurnal Maximum																									



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS27
JACKFISH 2/3
OCTOBER 2023

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

November 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JACKFISH 2/3 (AMS27)
OCTOBER 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	7.9	0	2.1	0
H2S (ppb) Average	708	35	36	99.87	0.9	0	0.5	0
NO2 (ppb) Average	707	37	37	100	5.7	0	1.5	-
NO (ppb) Average	707	37	37	100	8.3	-	0.5	-
NOX (ppb) Average	707	37	37	100	13.7	-	1.9	-
Temperature 2 m (C) Average	737	0	7	99.06	22.2	-	13.8	-
Relative Humidity (%) Average	744	0	0	100	98.8	-	92.1	-
Wind Speed 10 m (km/h) Average	744	0	0	100	17	-	13	-
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 - JACKFISH 2/3 (AMS27)
 OCTOBER 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	0.46	0.8	-	0	0	0.1	0.2	0.4	1.1	7.9
H2S (ppb) Average	708	0.2	0.1	-	0	0.1	0.1	0.2	0.3	0.4	0.9
NO2 (ppb) Average	707	0.77	0.8	-	0	0	0.2	0.5	1.1	1.8	5.7
NO (ppb) Average	707	0.14	0.4	-	0	0	0	0	0.1	0.4	8.3
NOX (ppb) Average	707	0.91	1.1	-	0	0	0.2	0.6	1.2	2.2	13.7
Temperature 2 m (C) Average	737	3.34	8.1	-	-14.5	-7.5	-4.5	5	9.2	13.1	22.2
Relative Humidity (%) Average	744	72.94	15.5	-	31.9	49.8	61.6	75.7	85.8	91.1	98.8
Wind Speed 10 m (km/h) Average	744	7.6	3	-	0	5	6	7	9	11	17
Wind Direction 10 m (deg) Average	744	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JACKFISH 2/3 (AMS27)
OCTOBER 2023

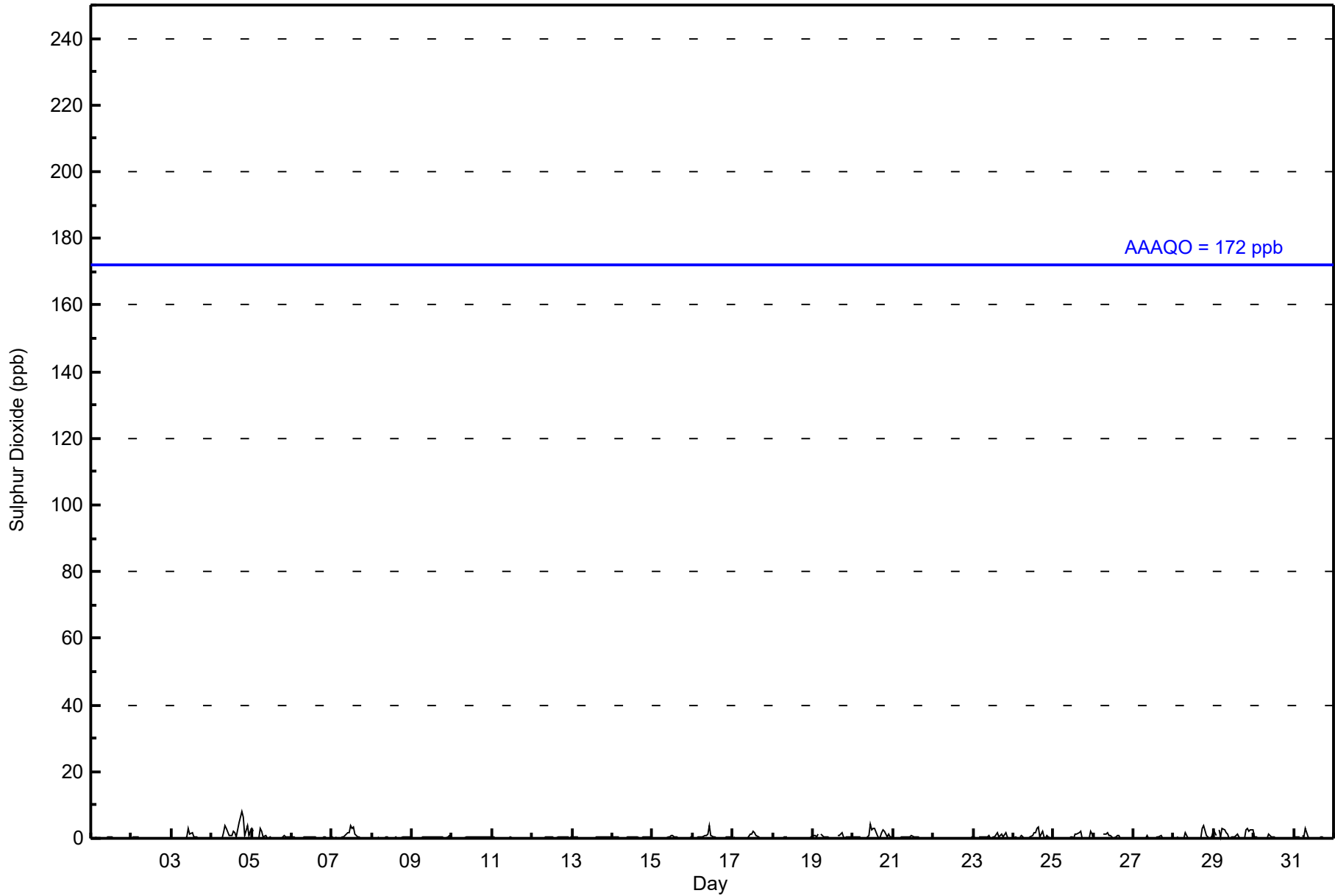
OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
H2S, SO2	19 Oct 2023 15:00	19 Oct 2023 15:00	1	Maintenance - sample manifold cleaned
Temperature 2 m	02 Oct 2023 05:00	02 Oct 2023 07:00	3	Flat line in sensor output signal
Temperature 2 m	04 Oct 2023 04:00	04 Oct 2023 07:00	4	Flat line in sensor output signal



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Jackfish 2/3 - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Jackfish 2/3 - October 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 - October 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	9	19	11	10	15	16	40	106	50	99	52	85	67	47	68	14	708
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	9	19	11	10	15	16	40	106	50	99	52	85	67	47	68	14	708

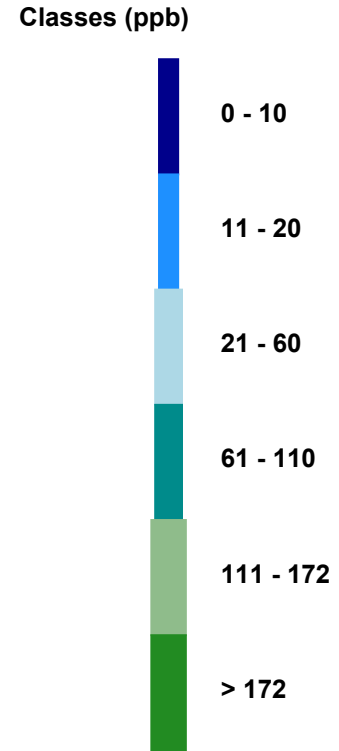
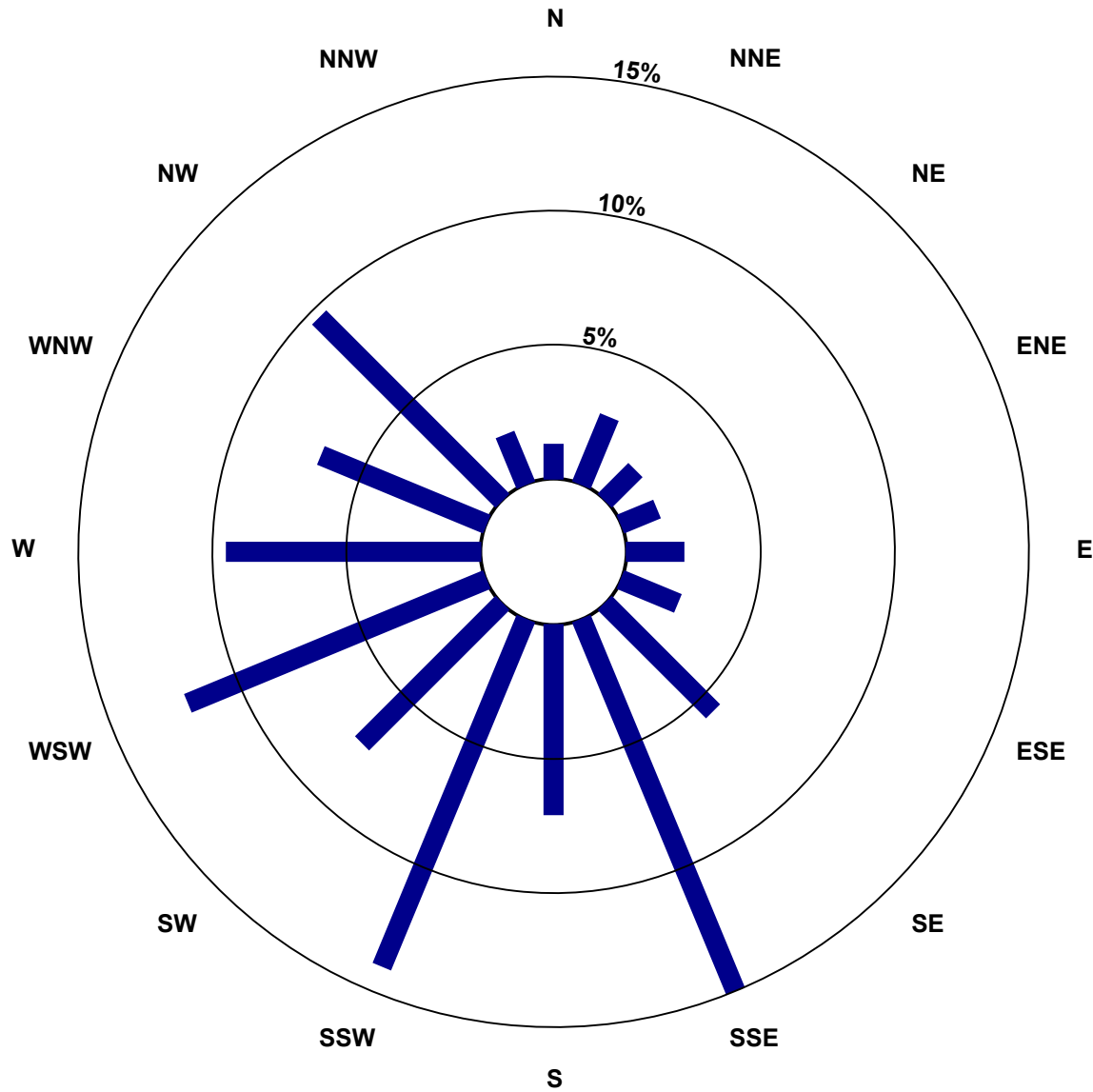
Total Number of Valid Hours: 708

Total Number of Hours: 744

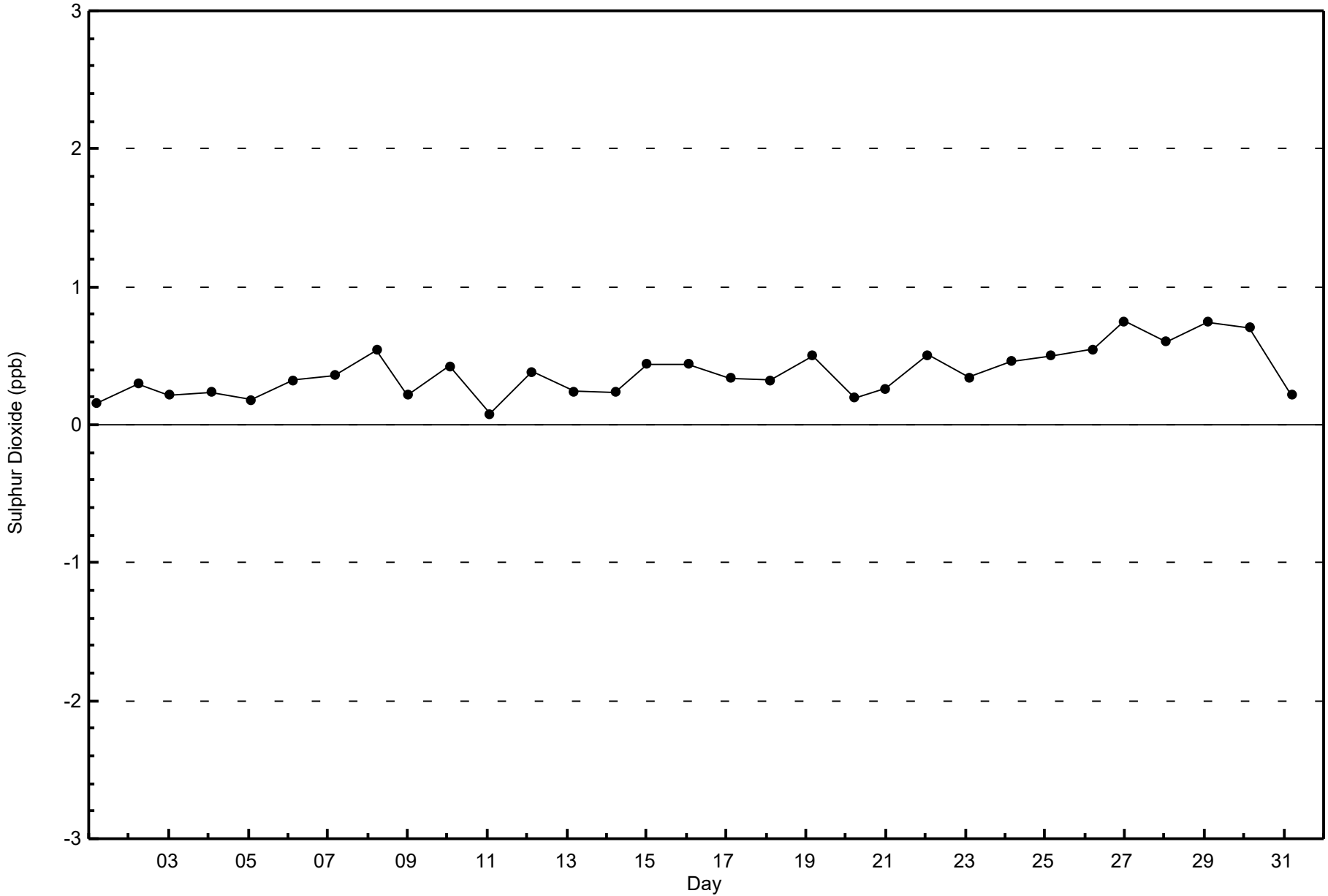


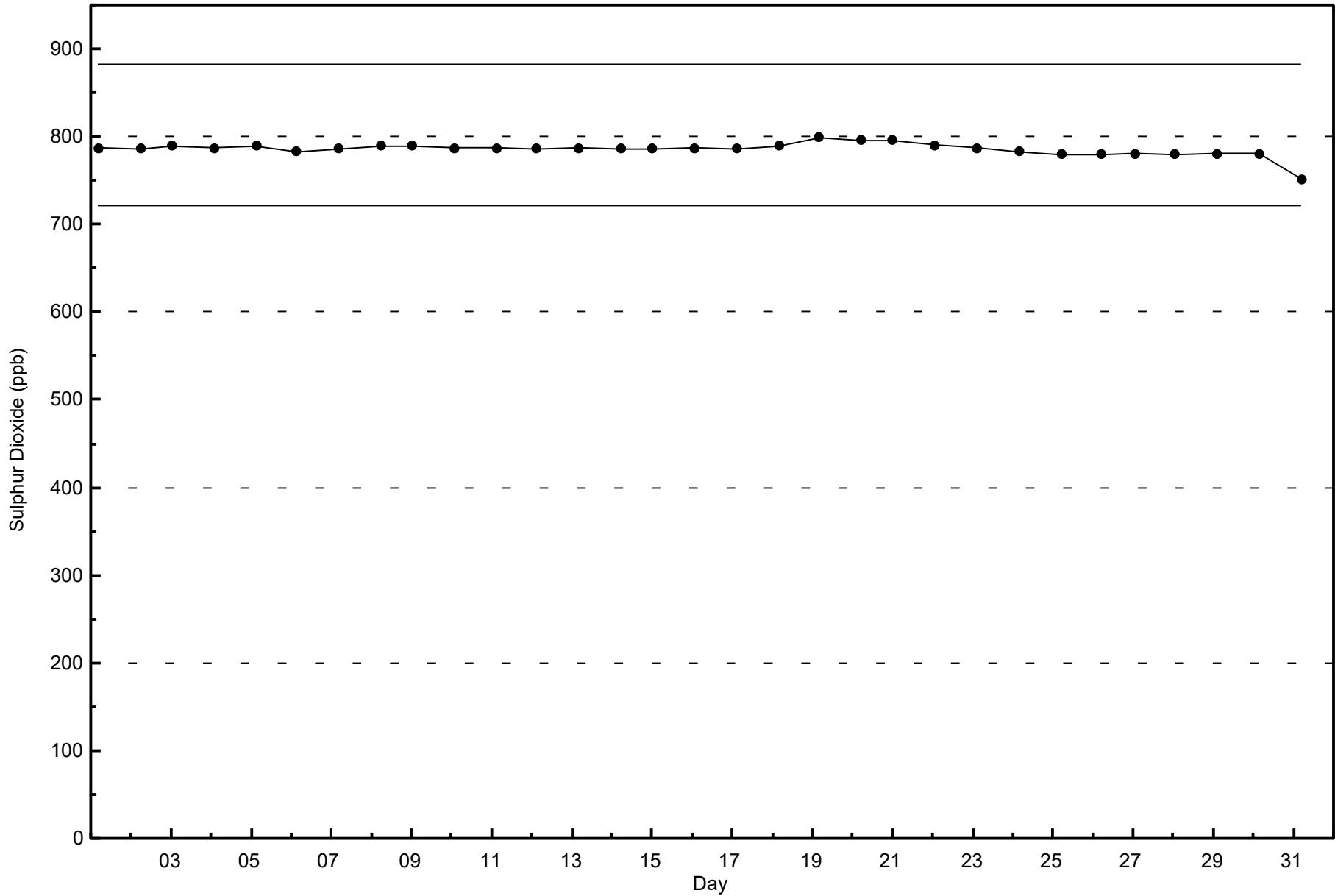
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Sulphur Dioxide (SO₂) - ppb
Jackfish 2/3



Total Number of Valid Hours: 708







Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H2S) - ppb

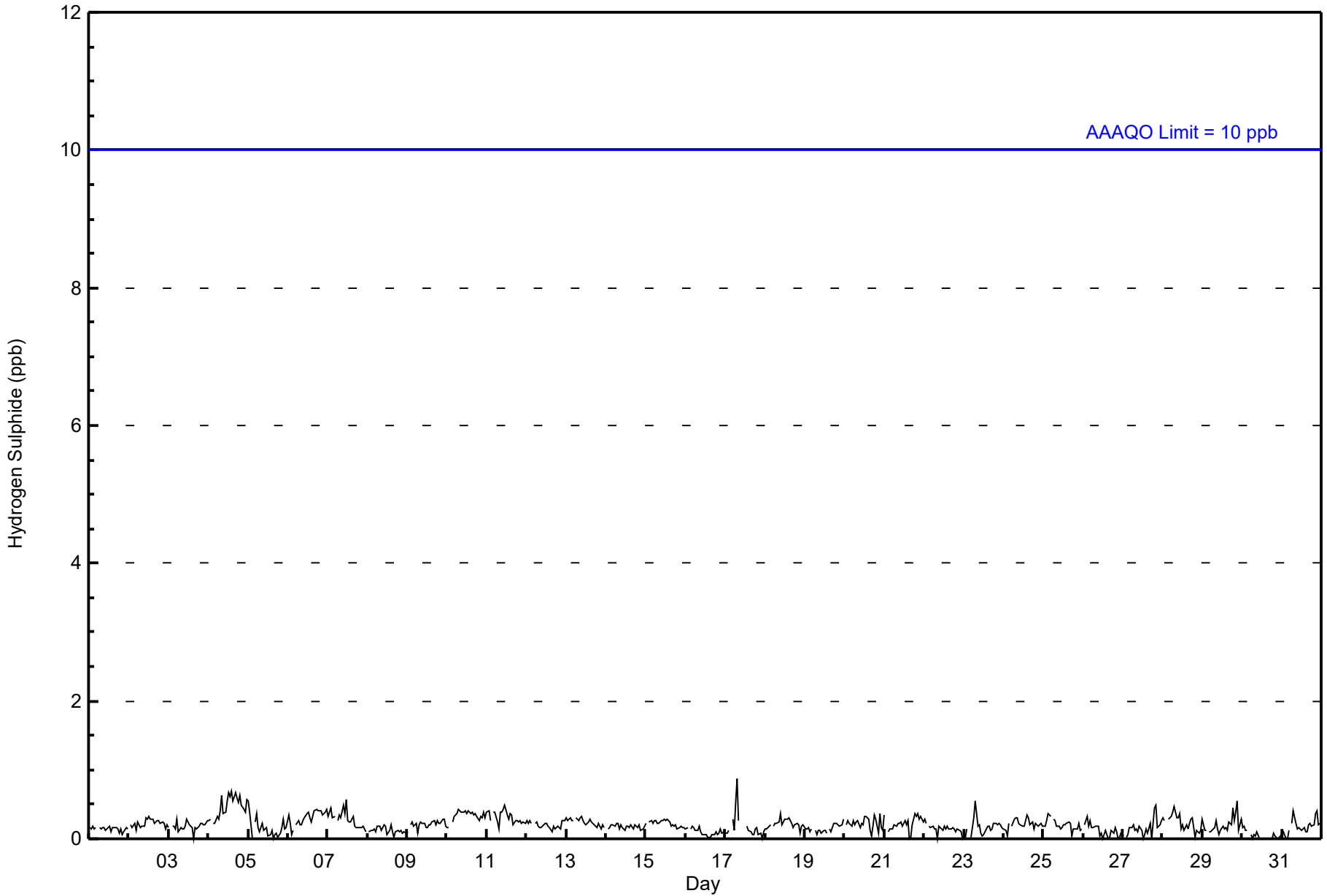
Jackfish 2/3 - October 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		744																		
Maximum Value: 0.9 ppb on Oct 17 08:00		Maximum Daily Average: 0.5 ppb on Oct 4				Hours of Data:		708																		
Minimum Value: 0.0 ppb on Oct 3 16:00		Minimum Daily Average: 0.0 ppb on Oct 30				Hours of Missing Data:		36																		
Maximum Diurnal Average: 0.3 ppb at hour 8		Minimum Diurnal Average: 0.2 ppb at hour 3				Hours of Calibration:		35																		
Monthly Average: 0.20 ppb		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 = 0.6				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-Oct	0.2	0.1	0.2	0.1	0.2	Z	0.2	0.1	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2
2-Oct	Z	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.1	0.2	0.2	0.2
3-Oct	0.2	Z	0.2	0.2	0.1	0.3	0.1	0.2	0.1	0.1	0.2	0.3	0.2	0.2	0.2	0.0	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2
4-Oct	0.3	0.3	Z	0.2	0.2	0.3	0.3	0.4	0.6	0.4	0.4	0.5	0.7	0.6	0.7	0.5	0.7	0.6	0.5	0.6	0.5	0.4	0.4	0.6	0.5	0.6
5-Oct	0.6	0.4	0.0	Z	0.2	0.4	0.2	0.1	0.2	0.1	0.2	0.2	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.2	0.3	0.1	0.2	0.2	0.6
6-Oct	0.3	0.2	0.1	0.1	Z	0.2	0.3	0.2	0.2	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.3	0.4
7-Oct	0.3	0.4	0.4	0.3	0.3	Z	0.3	0.3	0.3	0.5	0.4	0.6	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.3	0.6
8-Oct	Z	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
9-Oct	0.1	Z	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.2	0.3	0.3	0.2	0.2	0.3
10-Oct	0.2	0.2	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	0.3	0.4	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.4
11-Oct	0.4	0.4	0.3	Z	0.4	0.4	0.2	0.1	0.4	0.4	0.4	0.5	0.3	0.3	0.4	0.3	0.2	0.3	0.3	0.2	0.3	0.2	0.3	0.2	0.3	0.5
12-Oct	0.3	0.2	0.3	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.1	0.3	0.3	0.3	0.2	0.3
13-Oct	0.3	0.3	0.3	0.3	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.3
14-Oct	Z	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2
15-Oct	0.2	Z	0.2	0.3	0.2	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.3
16-Oct	0.1	0.2	Z	0.1	0.2	0.2	0.1	0.1	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	0.1	0.2
17-Oct	0.1	0.1	0.1	Z	0.3	0.1	0.5	0.9	0.3	C	C	C	C	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.1	0.2	0.9
18-Oct	0.1	0.1	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.4	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.4
19-Oct	0.1	0.1	0.2	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	M	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	
20-Oct	Z	0.2	0.3	0.2	0.2	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.1	0.0	0.2	0.3	0.3	0.1	0.4	0.2	0.1	0.2	0.4
21-Oct	0.3	Z	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.3	0.0	0.0	0.2	0.4	0.3	0.4	0.3	0.3	0.3	0.2	0.4
22-Oct	0.3	0.2	Z	0.2	0.2	0.2	0.1	0.1	0.0	0.2	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.3
23-Oct	0.0	0.0	0.1	Z	0.0	0.2	0.3	0.6	0.2	0.2	0.1	0.0	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
24-Oct	0.2	0.1	0.0	0.2	Z	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3
25-Oct	0.2	0.2	0.3	0.4	0.3	Z	0.3	0.3	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.0	0.2	0.1	0.2	0.2	0.1	0.1	0.4
26-Oct	Z	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.2	0.1	0.0	0.0	0.1	0.1	0.3
27-Oct	0.0	Z	0.0	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.0	0.1	0.1	0.1	0.2	0.0	0.2	0.5	0.5	0.2	0.2	0.3	0.2	0.5
28-Oct	0.3	0.3	Z	0.3	0.3	0.3	0.4	0.5	0.3	0.3	0.4	0.1	0.2	0.1	0.2	0.1	0.2	0.3	0.3	0.0	0.1	0.1	0.1	0.1	0.2	0.5
29-Oct	0.3	0.1	0.1	Z	0.1	0.1	0.1	0.2	0.3	0.2	0.1	0.1	0.2	0.1	0.2	0.1	0.2	0.2	0.4	0.3	0.4	0.6	0.1	0.3	0.2	0.6
30-Oct	0.2	0.2	0.1	0.1	Z	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	0.1	0.0	0.0	0.0	0.0	0.0	0.2
31-Oct	0.1	0.1	0.0	0.0	0.1	Z	0.2	0.4	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.4	0.4	0.2	0.2	0.2	0.4
																								Diurnal Average		
																								Diurnal Maximum		
																								0.2		
																								0.6		
Z - zerospan C - Calibration M - Maintenance																										
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb																										



Wood Buffalo Environmental Association
Hourly Averages

Hydrogen Sulphide (H₂S) - ppb
Jackfish 2/3 - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Jackfish 2/3 - October 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
Jackfish 2/3 - October 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	8	18	11	9	3	10	25	74	112	80	57	83	66	68	64	20	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	8	18	11	9	3	10	25	74	112	80	57	83	66	68	64	20	708

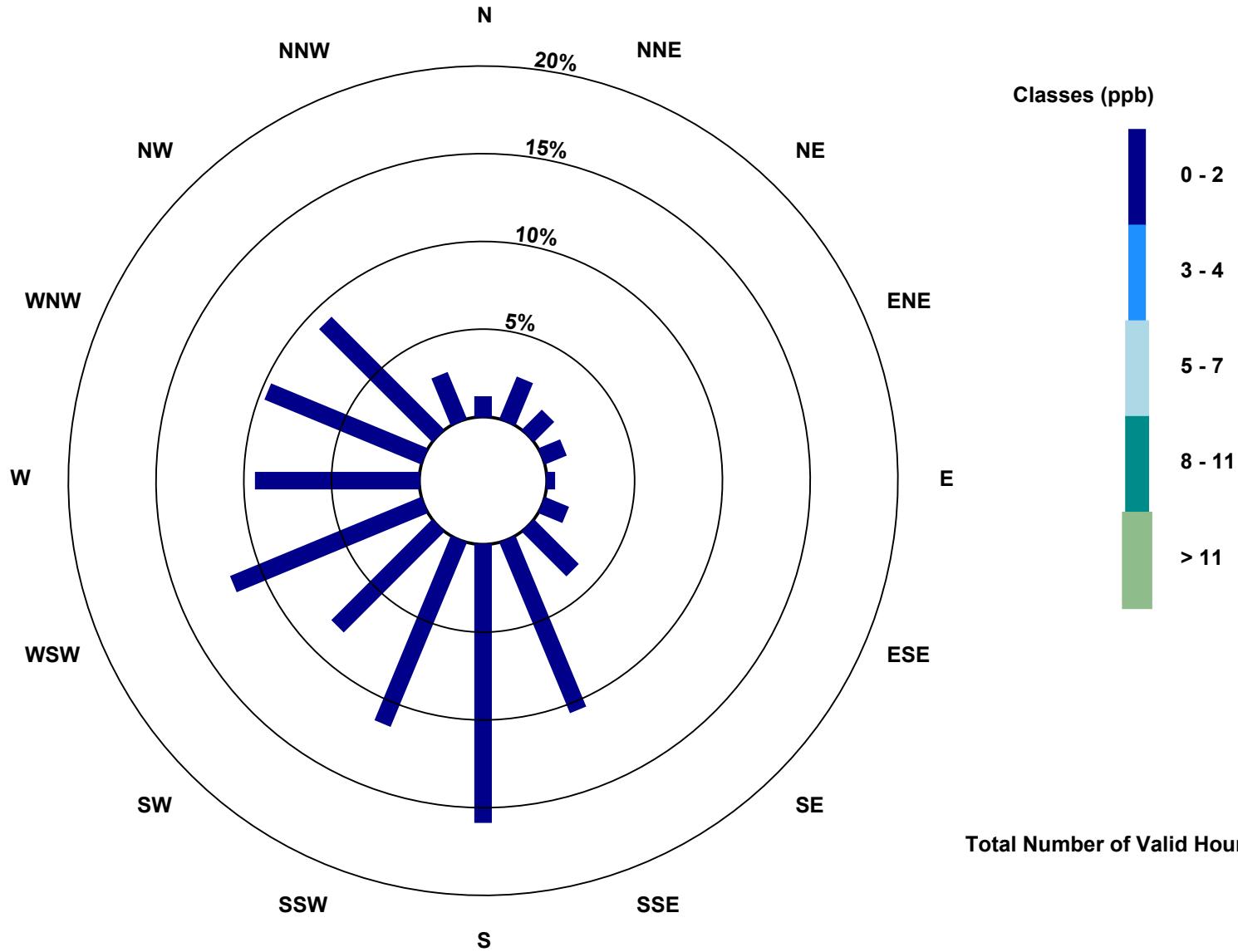
Total Number of Valid Hours: 708

Total Number of Hours: 744

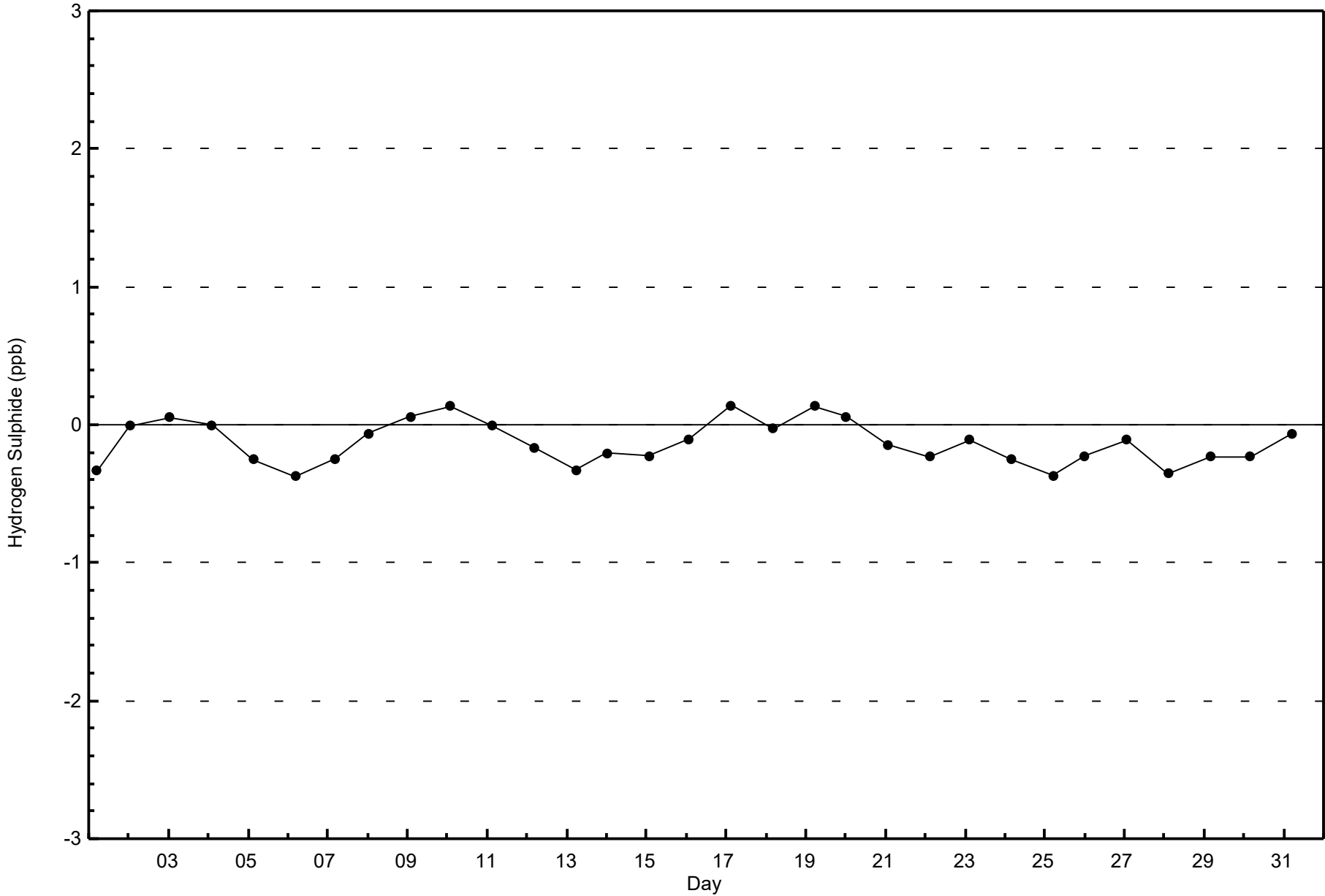


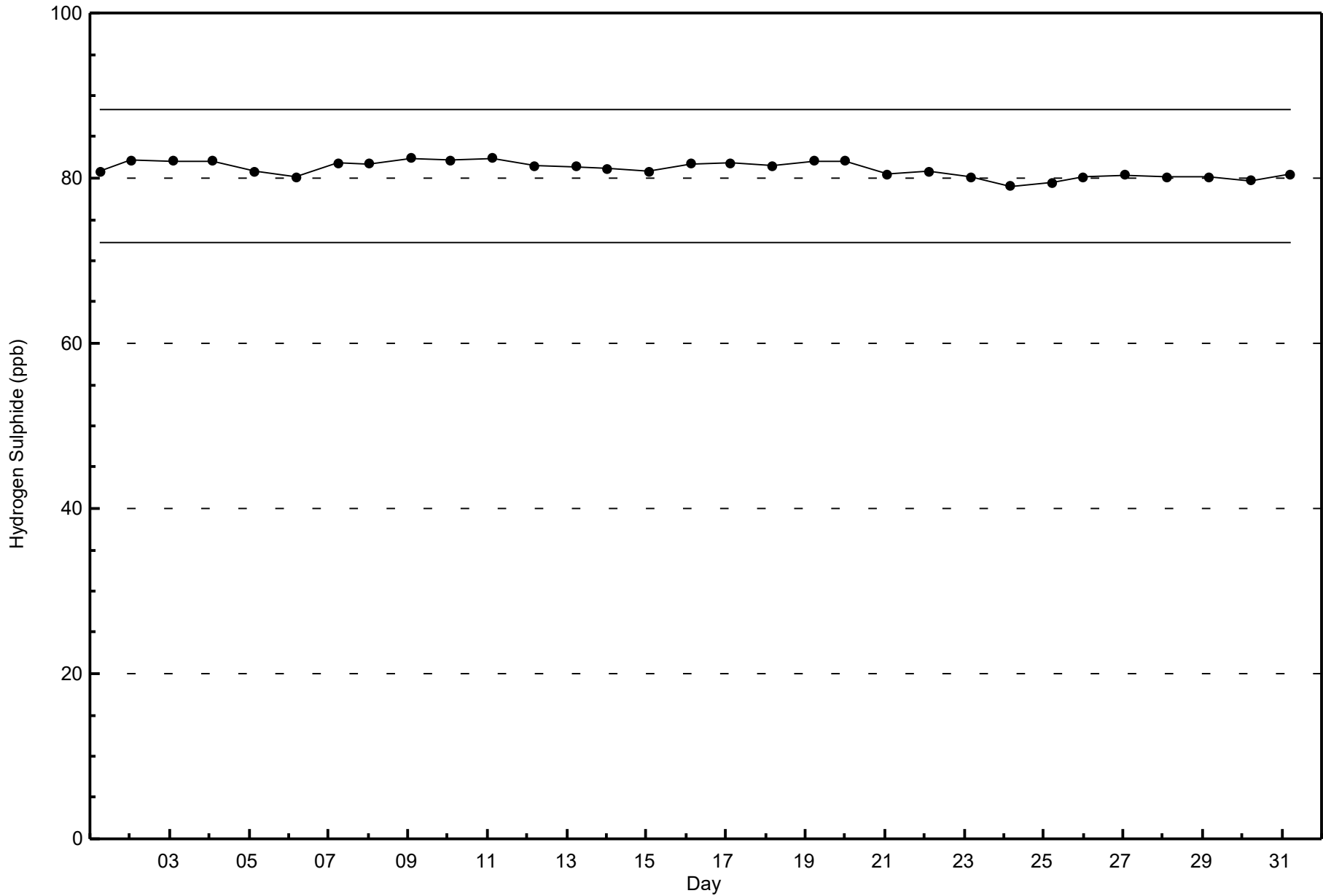
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Hydrogen Sulphide (H₂S) - ppb
Jackfish 2/3



Total Number of Valid Hours: 708







Wood Buffalo Environmental Association
Summary of Hour Averages

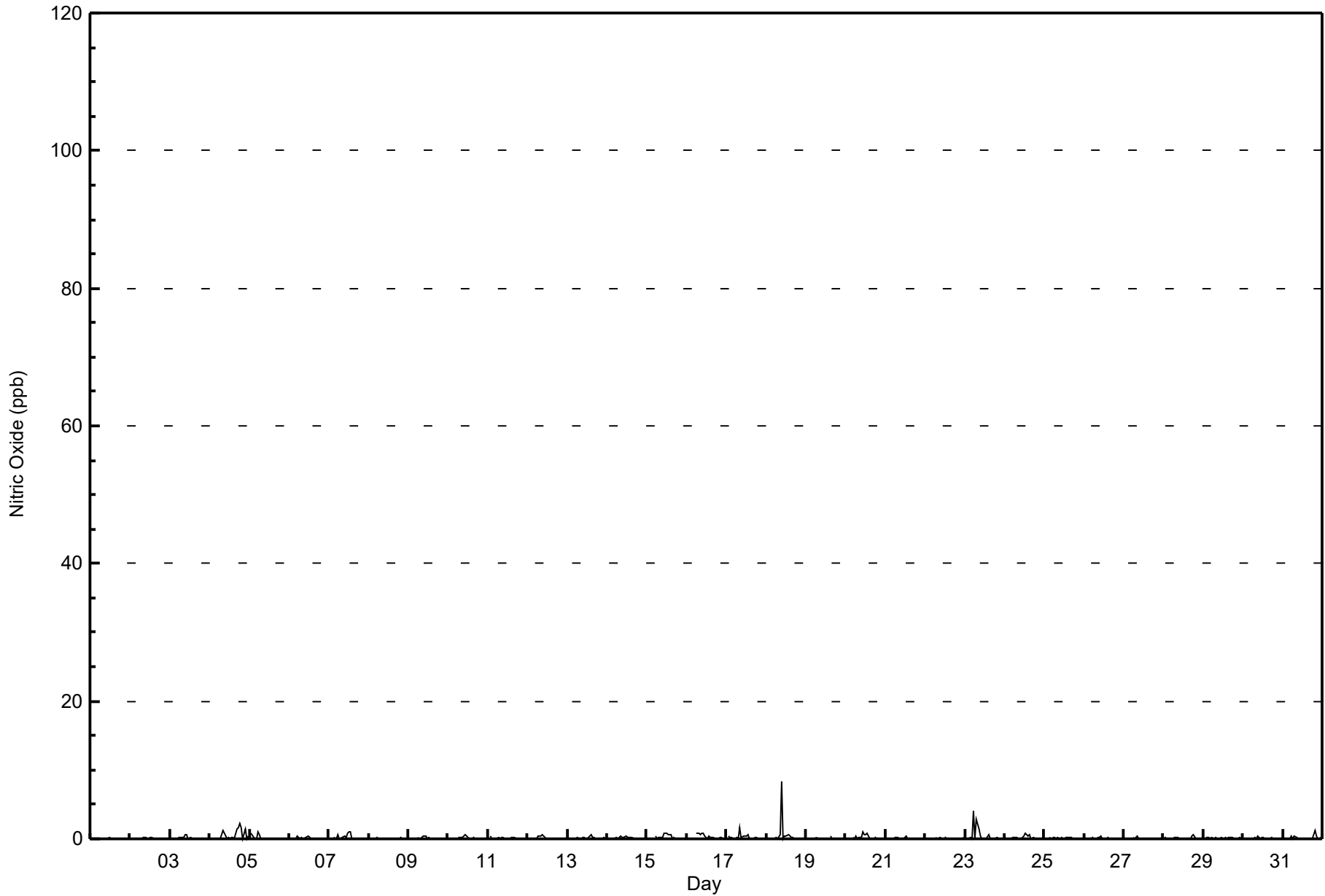
Nitric Oxide (NO) - ppb
Jackfish 2/3 - October 2023

Maximum Value: 8.3 ppb on Oct 18 10:00 Maximum Daily Average: 0.5 ppb on Oct 4																				Hours in Service: 744 Hours of Data: 707 Hours of Missing Data: 37 Hours of Calibration: 37 Percent Operational Time: 100.0													
Minimum Value: 0.0 ppb on Oct 1 01:00 Minimum Daily Average: 0.0 ppb on Oct 1 Maximum Diurnal Average: 0.5 ppb at hour 10 Minimum Diurnal Average: 0.0 ppb at hour 1 Monthly Average: 0.14 ppb Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.1 P ₉₀ = 0.4 P ₉₉ = 1.5																																	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24									
1-Oct	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	
3-Oct	0.0	0.0	0.0	0.0	Z	0.2	0.1	0.2	0.2	0.6	0.6	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	0.6	
4-Oct	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.6	1.1	0.8	0.0	0.1	0.0	0.2	0.2	0.0	1.4	1.6	2.2	1.6	0.0	1.4	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.4	2.2	
5-Oct	Z	0.7	0.2	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	
6-Oct	0.0	Z	0.0	0.0	0.0	0.4	0.0	0.1	0.0	0.0	0.2	0.4	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	
7-Oct	0.0	0.0	Z	0.2	0.1	0.6	0.0	0.0	0.2	0.4	0.3	0.8	0.9	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	0.0	0.0	0.0	0.0	1.1
8-Oct	0.0	0.0	0.0	Z	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	
9-Oct	0.0	0.0	0.0	0.0	Z	0.3	0.0	0.0	0.3	0.3	0.3	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
10-Oct	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.1	0.3	0.4	0.6	0.4	0.2	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6
11-Oct	Z	0.3	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.2	0.0	0.1	0.0	0.0	0.2	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.3
12-Oct	0.0	Z	0.1	0.0	0.0	0.0	0.5	0.4	0.4	0.6	0.3	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	0.0	0.0	0.6
13-Oct	0.0	0.1	Z	0.0	0.0	0.0	0.2	0.0	0.0	0.2	0.3	0.0	0.0	0.5	0.5	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.5
14-Oct	0.0	0.0	0.0	Z	0.1	0.1	0.0	0.1	0.4	0.2	0.2	0.3	0.2	0.2	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.4
15-Oct	0.0	0.1	0.0	0.0	Z	0.4	0.0	0.1	0.2	0.3	0.8	0.9	0.8	0.6	0.6	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	0.9
16-Oct	0.0	0.0	0.0	0.0	0.0	Z	0.9	0.7	0.5	0.8	0.8	0.3	0.0	0.4	0.3	0.2	0.1	0.1	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	0.9
17-Oct	Z	0.4	0.2	0.2	0.0	0.0	0.2	0.0	1.6	0.2	0.5	0.4	0.5	0.6	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	1.6
18-Oct	0.1	Z	0.0	0.0	0.0	0.0	0.1	0.0	0.6	8.3	0.0	0.4	0.5	0.6	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	0.0	8.3
19-Oct	0.0	0.1	Z	0.0	0.0	0.1	0.1	0.0	0.0	C	C	C	C	C	C	0.5	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	0.5
20-Oct	0.0	0.0	0.0	Z	0.2	0.0	0.3	0.0	0.3	0.2	1.1	0.6	0.7	0.8	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	0.0	0.0	0.0	0.0	0.0	1.1
21-Oct	0.0	0.0	0.0	0.0	Z	0.0	0.3	0.3	0.1	0.1	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	0.4
22-Oct	0.0	0.0	0.0	0.0	0.0	Z	0.2	0.1	0.1	0.1	0.0	0.0	0.1	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	0.1	0.0	0.0	0.2
23-Oct	Z	0.1	0.0	0.2	0.0	4.0	0.0	2.8	1.5	0.4	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.1	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	4.0
24-Oct	0.0	Z	0.0	0.0	0.0	0.1	0.2	0.3	0.0	0.0	0.0	0.3	0.9	0.6	0.4	0.6	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	0.9
25-Oct	0.1	0.0	Z	0.1	0.0	0.2	0.3	0.0	0.1	0.0	0.2	0.0	0.0	0.3	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
26-Oct	0.0	0.0	0.0	Z	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.0	0.0	0.0	0.3	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	0.4
27-Oct	0.0	0.0	0.0	0.0	Z	0.2	0.0	0.3	0.4	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
28-Oct	0.0	0.2	0.0	0.0	0.0	Z	0.1	0.3	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.4	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	0.5
29-Oct	Z	0.2	0.3	0.2	0.0	0.2	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.2	0.1	0.2	0.2	0.2	0.2	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	0.3
30-Oct	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.3	0.0	0.5	0.1	0.2	0.3	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5
31-Oct	0.0	0.0	Z	0.0	0.0	0.4	0.0	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.1	0.3	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1
																								Diurnal Average									
																								Diurnal Maximum									
Z - zerospan C - Calibration																																	



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Jackfish 2/3 - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb
Jackfish 2/3 - October 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 - October 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	9	17	12	9	3	10	24	75	112	80	59	81	63	67	66	20	707
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	9	17	12	9	3	10	24	75	112	80	59	81	63	67	66	20	707

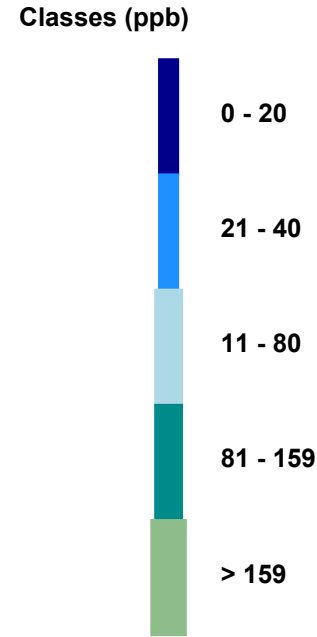
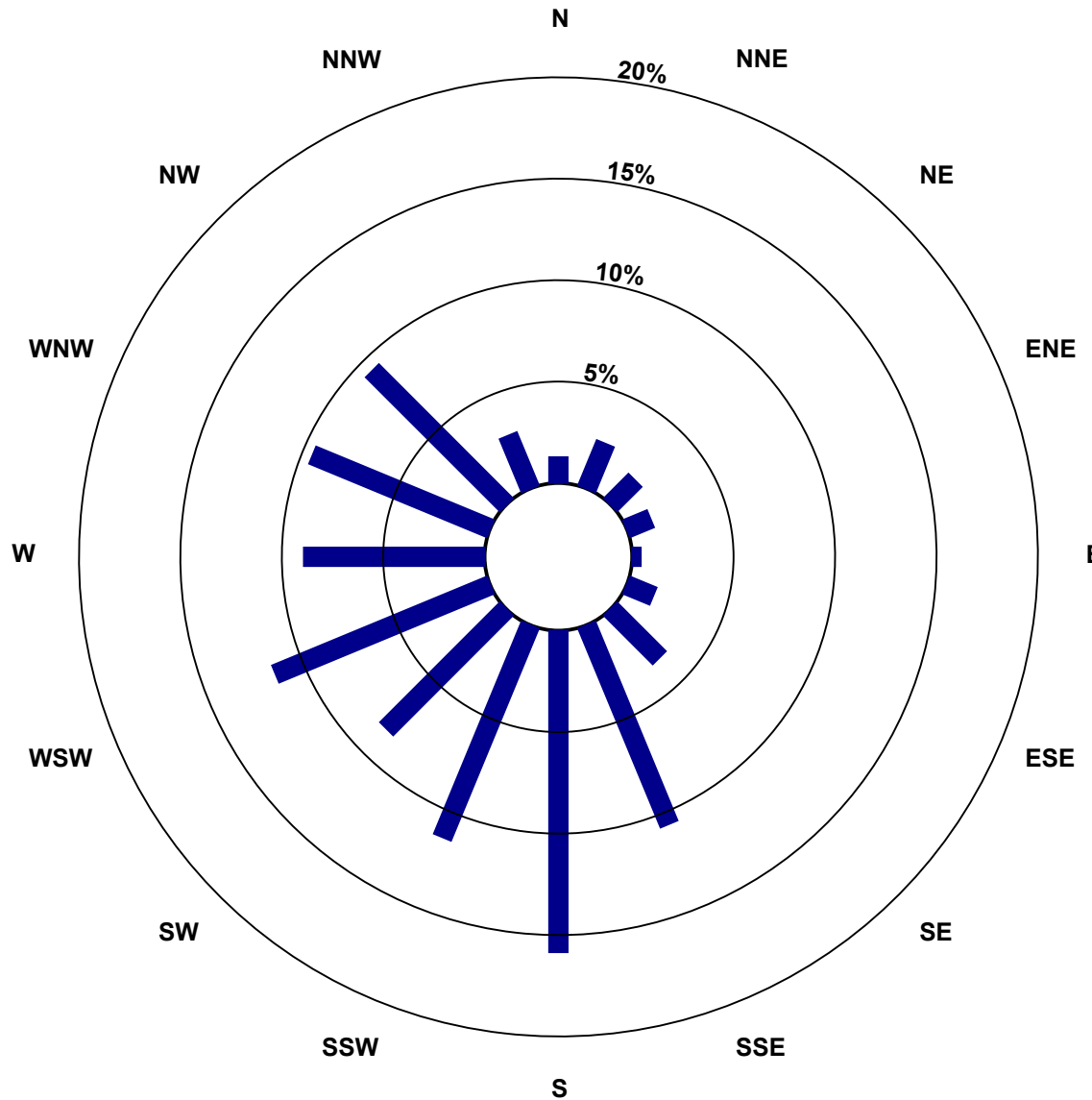
Total Number of Valid Hours: 707

Total Number of Hours: 744

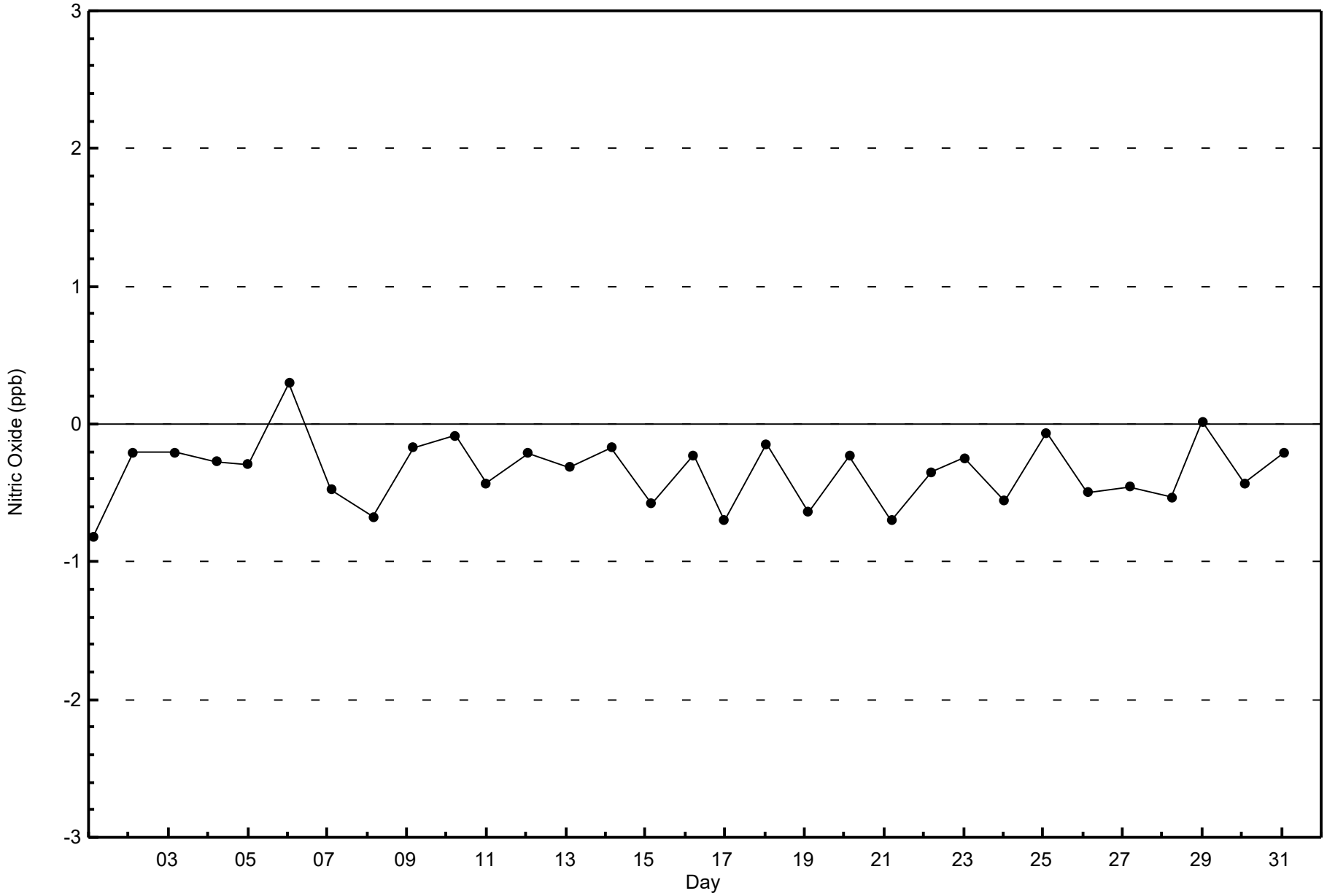


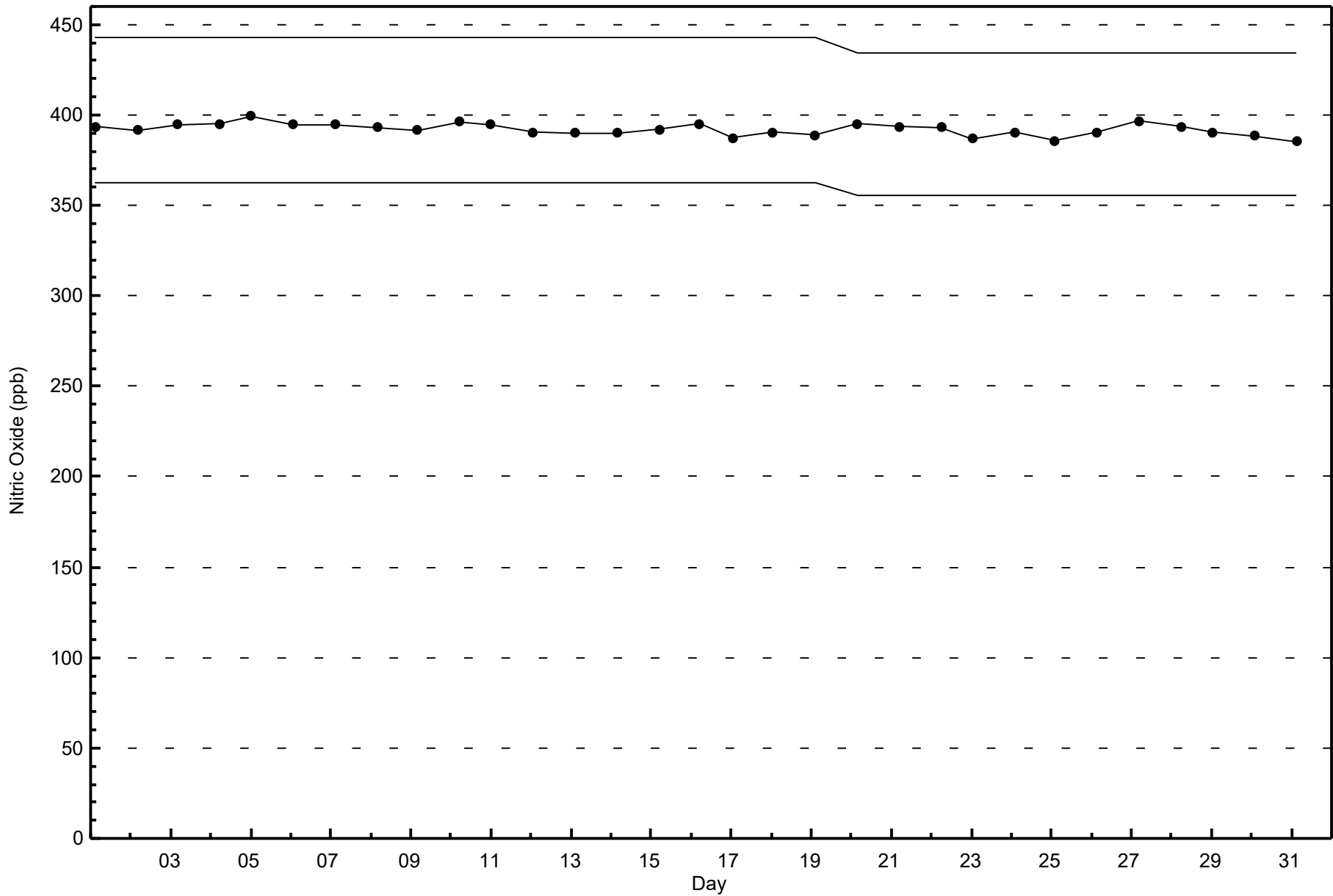
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitric Oxide (NO) - ppb
Jackfish 2/3



Total Number of Valid Hours: 707







Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

Jackfish 2/3 - October 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 744														744						
Maximum Value: 5.7 ppb on Oct 31 08:00		Maximum Daily Average: 1.5 ppb on Oct 31		Hours of Data: 707														707								
Minimum Value: 0.0 ppb on Oct 1 01:00		Minimum Daily Average: 0.1 ppb on Oct 5		Hours of Missing Data: 37														37								
Maximum Diurnal Average: 1.4 ppb at hour 8		Minimum Diurnal Average: 0.5 ppb at hour 1		Hours of Calibration: 37														37								
Monthly Average: 0.77 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.2 Median = 0.5 Q ₃ = 1.1 P ₉₀ = 1.8 P ₉₉ = 4.0		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-Oct	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.5	0.8	0.5	0.4	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.4	0.2	0.8
2-Oct	0.5	1.3	2.3	Z	1.7	1.7	0.7	1.1	1.2	1.5	1.2	0.8	1.0	0.9	0.9	0.9	1.0	1.1	0.8	0.7	0.7	0.7	0.8	0.6	1.0	2.3
3-Oct	0.7	0.8	0.7	0.6	Z	0.8	0.6	0.5	0.3	0.8	1.5	0.5	1.2	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.1	0.0	0.0	0.4	1.5	
4-Oct	0.0	0.1	0.0	0.4	0.3	Z	0.3	3.4	4.7	2.7	0.3	0.6	0.2	1.4	1.4	0.0	3.0	3.5	4.7	2.8	0.0	1.0	0.0	0.8	4.7	
5-Oct	Z	0.6	0.0	0.0	0.0	1.4	0.8	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	1.4	
6-Oct	0.0	Z	0.0	0.3	0.8	0.5	0.0	0.4	0.2	0.7	1.2	1.2	1.0	0.6	0.7	0.8	0.5	0.5	0.3	0.5	0.5	0.5	0.3	0.2	0.5	1.2
7-Oct	0.0	0.0	Z	0.0	0.0	1.1	0.6	0.7	0.8	0.9	0.7	2.5	2.0	2.6	1.1	0.8	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.6	2.6	
8-Oct	0.5	0.5	0.2	Z	1.3	1.2	0.9	0.8	0.9	0.8	0.4	0.1	0.4	0.4	0.3	0.3	0.3	0.1	0.2	0.4	0.3	0.4	0.5	0.4	0.5	1.3
9-Oct	0.3	0.3	0.2	0.3	Z	1.0	0.8	0.9	0.7	0.9	0.6	0.2	0.6	0.5	0.4	0.3	0.8	0.6	1.1	0.6	0.5	1.5	2.1	0.8	0.7	2.1
10-Oct	1.1	0.6	0.4	0.6	0.6	Z	1.2	1.0	1.0	1.1	1.1	0.8	0.9	0.7	0.4	0.5	0.7	0.4	0.0	0.0	0.2	0.1	0.2	0.1	0.6	1.2
11-Oct	Z	0.4	0.2	0.2	0.2	0.3	0.8	0.4	0.5	0.3	0.5	0.7	0.2	0.4	0.4	0.7	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.8
12-Oct	0.0	Z	0.7	0.4	0.2	0.8	1.9	2.1	1.7	1.5	1.0	0.6	0.3	0.0	0.0	0.3	0.2	0.7	0.3	0.0	0.8	1.3	0.9	2.4	0.8	2.4
13-Oct	1.6	0.8	Z	2.2	1.6	1.7	0.8	0.2	0.3	0.6	1.0	0.2	0.3	0.4	1.1	1.0	0.6	0.9	0.4	0.3	0.3	0.5	0.7	0.8	0.8	2.2
14-Oct	0.6	0.3	0.7	Z	0.9	0.9	0.8	0.7	0.7	0.7	0.5	0.5	0.3	0.6	0.2	0.3	0.2	0.2	0.4	0.4	0.6	0.4	0.6	0.6	0.5	0.9
15-Oct	0.9	1.0	0.9	0.9	Z	2.0	1.5	1.0	0.9	1.0	1.1	2.0	1.5	1.4	1.4	0.7	0.8	0.9	0.8	1.2	1.5	1.8	1.3	1.5	1.2	2.0
16-Oct	1.5	1.2	1.3	1.5	1.5	Z	2.1	2.0	1.1	1.4	1.6	0.3	0.2	0.0	0.1	0.2	0.7	2.2	1.0	0.1	0.3	1.1	1.1	0.8	1.0	2.2
17-Oct	Z	0.4	0.2	0.1	0.2	0.7	1.4	1.1	5.0	2.4	2.5	1.5	2.0	1.2	0.9	0.5	0.4	0.3	0.5	0.0	0.2	0.1	0.0	0.1	0.9	5.0
18-Oct	0.2	Z	0.2	0.1	0.7	0.5	1.1	1.8	1.5	5.4	1.3	1.2	1.0	1.1	0.8	0.8	0.7	0.7	0.8	1.0	0.5	0.3	0.2	0.5	1.0	5.4
19-Oct	0.5	0.5	Z	0.8	0.9	0.8	0.4	0.4	0.4	C	C	C	C	C	C	0.2	0.4	1.0	0.6	0.2	0.2	0.4	0.2	0.2	--	1.0
20-Oct	0.1	0.3	0.3	Z	0.2	0.3	0.2	0.9	0.7	0.8	3.0	1.8	2.1	1.7	0.5	0.1	0.0	1.4	2.5	2.8	0.3	1.4	0.1	0.4	1.0	3.0
21-Oct	0.6	0.7	0.2	0.3	Z	0.8	1.2	1.8	1.7	0.8	0.6	1.2	0.6	0.7	0.9	1.3	1.5	1.6	1.5	1.4	3.3	1.1	0.5	0.5	1.1	3.3
22-Oct	0.2	0.8	0.2	0.0	0.0	Z	0.2	0.1	0.5	0.2	0.0	0.0	0.1	0.1	0.1	0.6	0.2	0.2	0.0	0.0	0.0	0.0	0.6	1.2	0.2	1.2
23-Oct	Z	1.2	2.7	1.8	1.4	4.4	2.9	4.5	2.9	1.3	0.3	0.1	0.1	0.1	1.8	0.6	1.1	1.9	1.4	2.4	0.7	0.4	0.0	0.0	1.5	4.5
24-Oct	0.0	Z	0.0	0.0	0.6	1.9	0.9	1.4	0.2	0.4	0.3	0.9	1.7	1.9	3.0	3.6	0.8	2.3	0.4	0.0	1.2	0.0	0.0	0.0	0.9	3.6
25-Oct	0.0	0.0	Z	0.1	0.0	0.9	0.7	0.0	0.5	0.2	0.3	0.2	0.0	0.8	1.0	1.4	1.6	0.2	0.3	0.2	0.1	0.0	1.7	1.5	0.5	1.7
26-Oct	0.0	0.0	0.0	Z	0.2	2.4	2.2	1.8	2.1	0.9	0.9	0.2	0.1	0.3	0.5	1.1	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.6	2.4
27-Oct	0.0	0.0	0.0	0.0	Z	0.7	0.4	1.1	1.7	0.7	1.0	1.0	0.6	0.3	0.4	0.7	1.3	0.2	0.9	0.3	0.2	0.1	0.5	0.7	0.6	1.7
28-Oct	0.5	0.6	0.6	0.3	0.6	Z	0.8	2.6	0.9	0.7	0.5	0.5	0.3	0.4	0.2	0.4	0.4	3.8	4.0	0.5	0.4	0.0	0.0	1.1	0.9	4.0
29-Oct	Z	0.8	0.4	3.3	0.5	3.4	2.5	1.8	1.5	0.0	0.1	0.1	0.4	0.6	0.9	0.7	0.2	0.3	0.3	2.8	3.2	2.8	2.6	3.6	1.4	3.6
30-Oct	0.6	Z	0.6	0.3	0.0	0.2	0.4	2.0	0.5	1.8	0.4	0.5	0.4	0.1	0.0	0.0	0.1	0.5	1.3	1.1	0.8	0.9	1.1	1.4	0.7	2.0
31-Oct	1.3	1.8	Z	2.1	2.3	3.1	2.3	5.7	1.7	1.4	1.4	0.8	0.5	0.5	0.2	0.2	0.4	1.5	1.1	2.5	2.1	1.2	0.5	0.8	1.5	5.7
																								Diurnal Average		
																								Diurnal Maximum		
																								0.5 1.6		
																								0.6 1.8		
																								0.5 2.7		
																								0.6 3.3		
																								0.6 2.3		
																								1.3 4.4		
																								1.0 2.9		
																								1.4 5.7		
																								1.2 5.0		
																								1.1 5.4		
																								0.9 3.0		
																								0.7 2.5		
																								0.7 2.1		
																								0.7 2.6		
																								0.7 3.0		
																								0.6 3.6		
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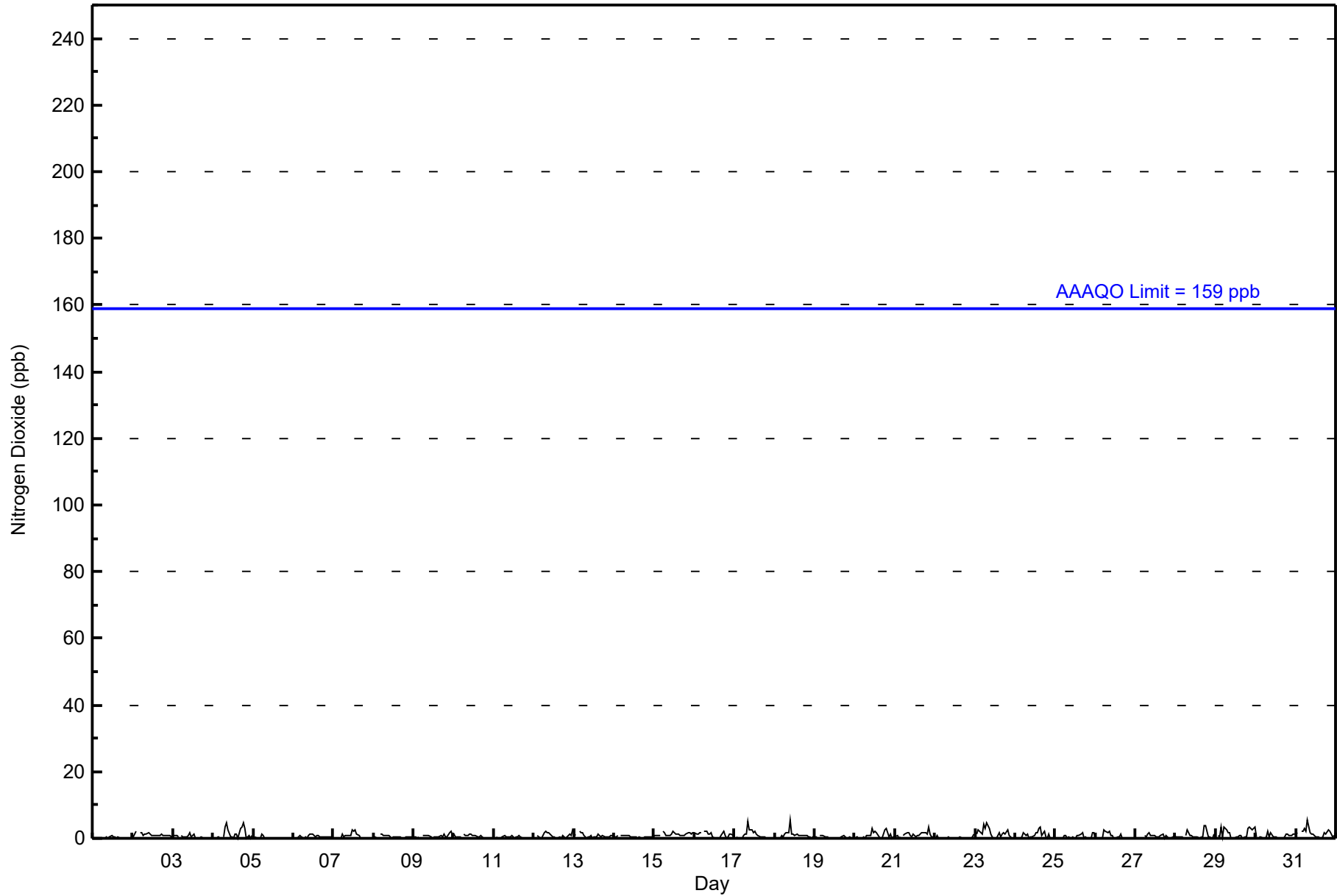
Z - zerospan C - Calibration

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Jackfish 2/3 - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Jackfish 2/3 - October 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 - October 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	9	17	12	9	3	10	24	75	112	80	59	81	63	67	66	20	707
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	9	17	12	9	3	10	24	75	112	80	59	81	63	67	66	20	707

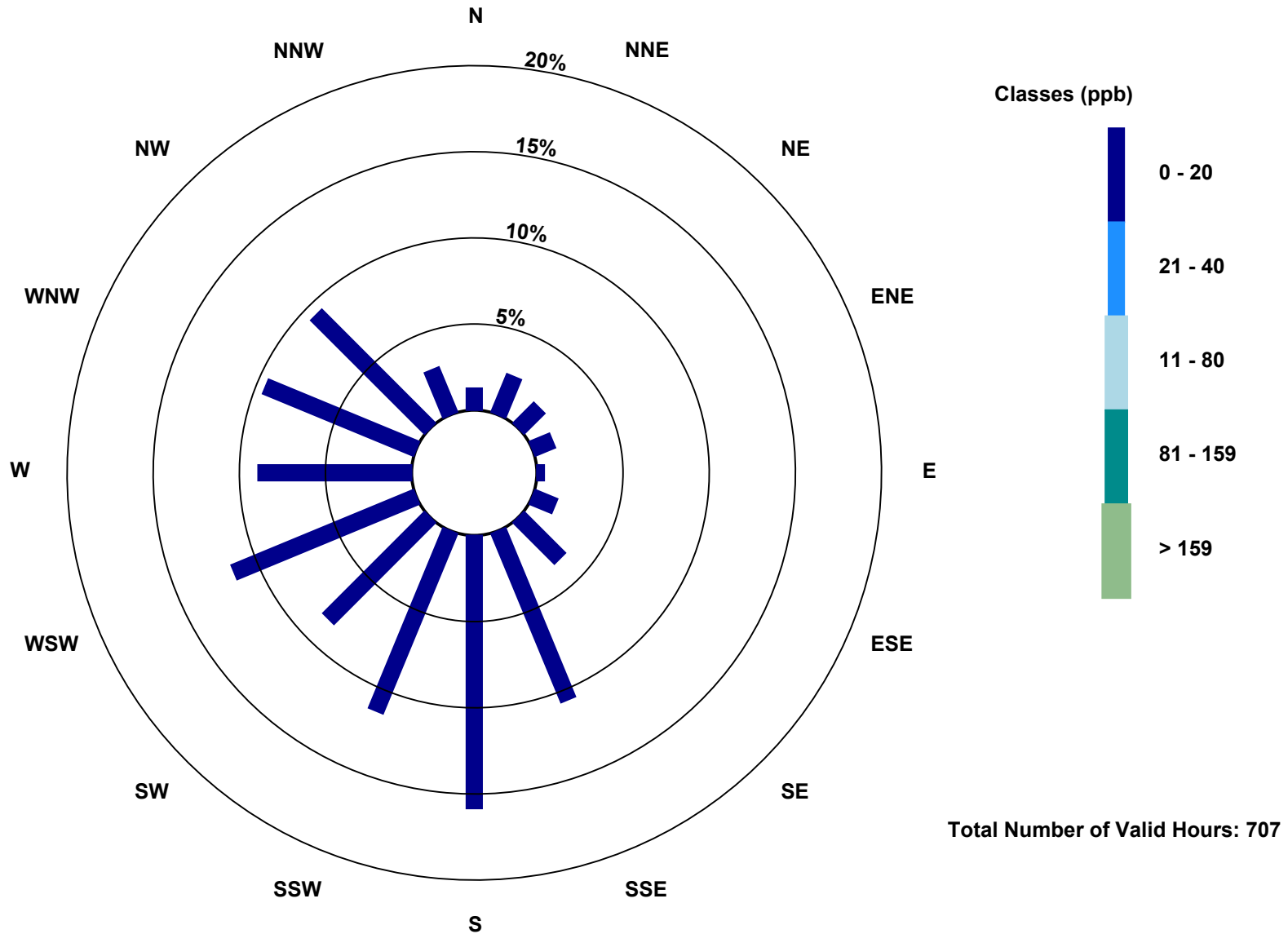
Total Number of Valid Hours: 707

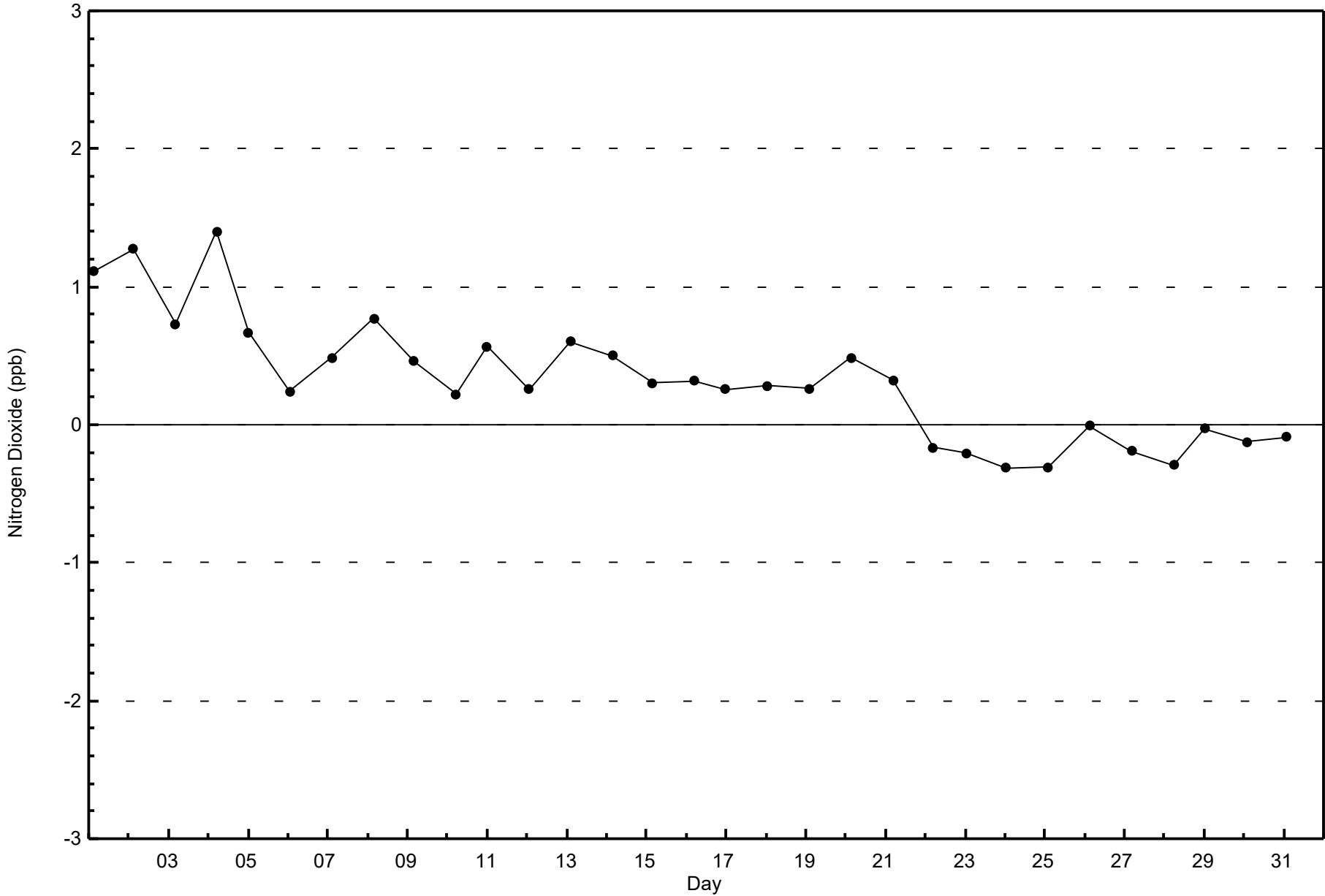
Total Number of Hours: 744

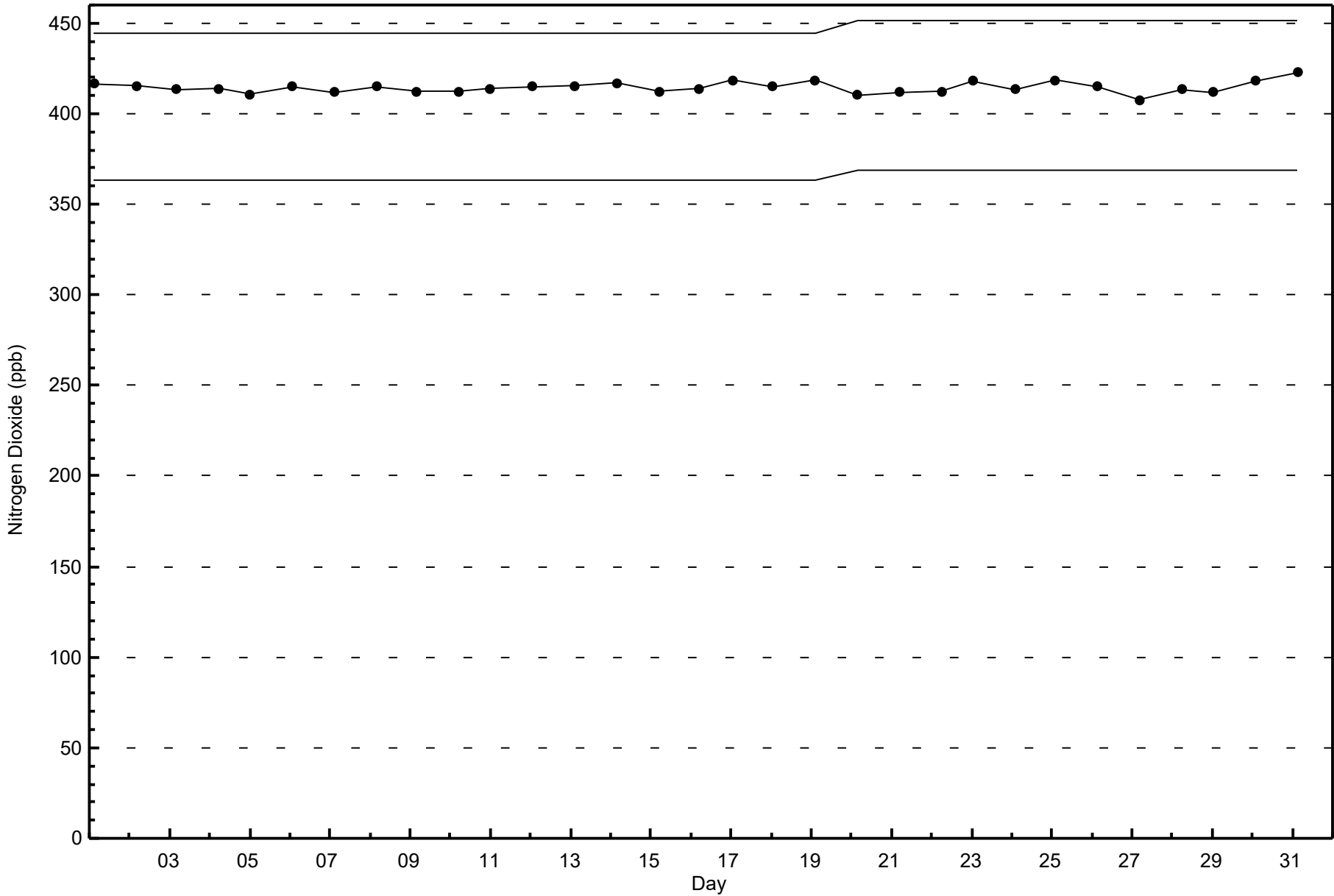


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitrogen Dioxide (NO₂) - ppb
Jackfish 2/3









Wood Buffalo Environmental Association
Summary of Hour Averages

Nitrogen Oxides (NO_x) - ppb
Jackfish 2/3 - October 2023

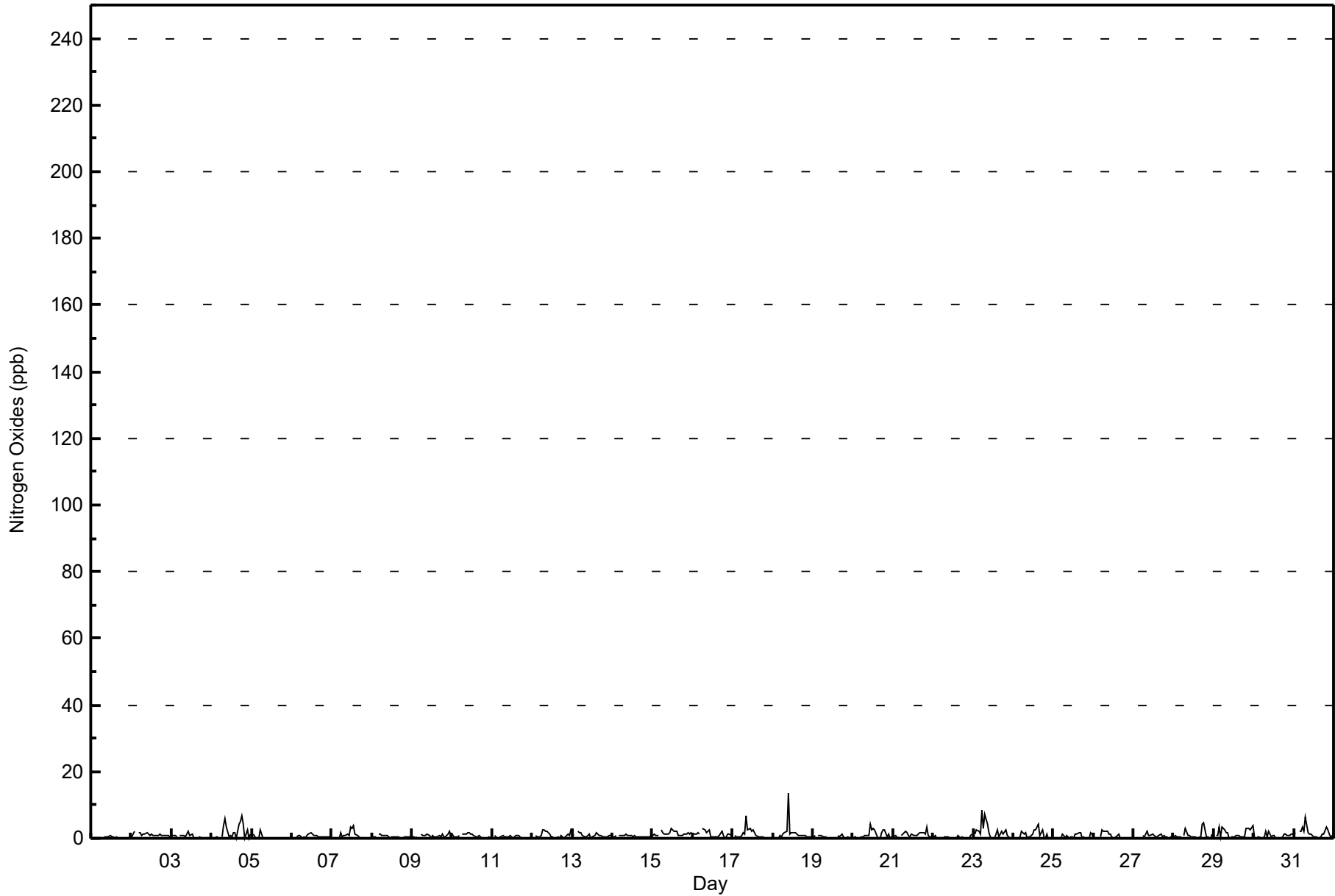
Maximum Value: 13.7 ppb on Oct 18 10:00		Maximum Daily Average: 1.9 ppb on Oct 23		Hours in Service: 744																						
Minimum Value: 0.0 ppb on Oct 1 01:00		Minimum Daily Average: 0.2 ppb on Oct 1		Hours of Data: 707																						
Maximum Diurnal Average: 1.6 ppb at hour 6		Minimum Diurnal Average: 0.5 ppb at hour 1		Hours of Missing Data: 37																						
Monthly Average: 0.91 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.2 Median = 0.6 Q ₃ = 1.2 P ₉₀ = 2.2 P ₉₉ = 5.1		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-Oct	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.5	0.9	0.5	0.4	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.4	0.2	0.9
2-Oct	0.5	1.3	2.3	Z	1.7	1.7	0.7	1.1	1.3	1.7	1.2	0.8	1.1	1.0	0.9	1.0	1.0	1.1	0.8	0.7	0.7	0.7	0.8	0.6	1.1	2.3
3-Oct	0.7	0.8	0.7	0.6	Z	1.0	0.7	0.7	0.5	1.4	2.1	0.6	1.3	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.1	0.0	0.0	0.5	2.1	
4-Oct	0.0	0.1	0.0	0.4	0.3	Z	0.3	4.0	5.8	3.5	0.3	0.7	0.2	1.6	1.6	0.0	4.4	5.1	6.9	4.4	0.0	2.4	0.0	1.2	1.9	6.9
5-Oct	Z	1.3	0.2	0.0	0.0	2.4	1.3	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	0.2	2.4	
6-Oct	0.0	Z	0.0	0.3	0.8	0.9	0.0	0.5	0.2	0.7	1.4	1.6	1.3	0.7	0.7	0.8	0.5	0.5	0.3	0.5	0.5	0.5	0.3	0.2	0.6	1.6
7-Oct	0.0	0.0	Z	0.2	0.1	1.7	0.6	0.7	1.0	1.3	1.0	3.3	2.9	3.7	1.1	0.8	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.8	3.7	
8-Oct	0.5	0.5	0.2	Z	1.3	1.4	0.9	0.8	0.9	0.8	0.4	0.1	0.5	0.4	0.3	0.3	0.3	0.1	0.2	0.5	0.3	0.4	0.5	0.4	0.5	1.4
9-Oct	0.3	0.3	0.2	0.3	Z	1.3	0.8	0.9	1.0	1.2	0.9	0.2	0.7	0.5	0.4	0.3	0.8	0.6	1.1	0.6	0.5	1.5	2.1	0.8	0.8	2.1
10-Oct	1.1	0.6	0.4	0.6	0.6	Z	1.3	1.1	1.3	1.5	1.7	1.2	1.1	0.7	0.4	0.6	0.7	0.4	0.0	0.0	0.2	0.1	0.2	0.1	0.7	1.7
11-Oct	Z	0.7	0.2	0.2	0.2	0.3	1.0	0.4	0.6	0.5	0.5	0.8	0.2	0.4	0.6	0.8	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	1.0
12-Oct	0.0	Z	0.8	0.4	0.2	0.8	2.4	2.5	2.1	2.1	1.3	0.6	0.3	0.1	0.1	0.3	0.2	0.7	0.3	0.0	0.8	1.3	0.9	2.5	0.9	2.5
13-Oct	1.6	0.9	Z	2.2	1.6	1.7	1.0	0.2	0.3	0.8	1.3	0.2	0.3	0.9	1.6	1.1	0.7	0.9	0.4	0.3	0.3	0.5	0.8	0.8	0.9	2.2
14-Oct	0.6	0.3	0.7	Z	1.0	1.0	0.8	0.8	1.1	0.9	0.7	0.8	0.5	0.8	0.5	0.4	0.3	0.2	0.4	0.4	0.6	0.4	0.6	0.7	0.6	1.1
15-Oct	0.9	1.1	0.9	0.9	Z	2.4	1.5	1.1	1.1	1.3	1.9	2.9	2.3	2.0	2.0	0.7	1.0	0.9	0.8	1.2	1.5	1.8	1.3	1.5	1.4	2.9
16-Oct	1.5	1.2	1.3	1.5	1.5	Z	3.0	2.7	1.6	2.2	2.4	0.6	0.2	0.4	0.4	0.4	0.8	2.3	1.0	0.1	0.5	1.3	1.1	0.8	1.3	3.0
17-Oct	Z	0.8	0.4	0.3	0.2	0.7	1.6	1.1	6.6	2.6	3.0	1.9	2.5	1.8	1.0	0.5	0.4	0.4	0.6	0.0	0.2	0.1	0.0	0.1	1.2	6.6
18-Oct	0.3	Z	0.2	0.1	0.7	0.5	1.2	1.8	2.1	13.7	1.3	1.6	1.5	1.7	1.2	1.0	0.8	0.7	0.8	1.0	0.5	0.3	0.2	0.5	1.5	13.7
19-Oct	0.5	0.6	Z	0.8	0.9	0.9	0.5	0.4	0.4	C	C	C	C	C	C	0.7	0.4	1.1	0.6	0.2	0.2	0.4	0.2	0.2	--	1.1
20-Oct	0.1	0.3	0.3	Z	0.4	0.3	0.5	0.9	1.0	1.0	4.1	2.4	2.8	2.5	0.5	0.2	0.0	1.5	2.6	2.8	0.3	1.4	0.1	0.4	1.1	4.1
21-Oct	0.6	0.7	0.2	0.3	Z	0.8	1.5	2.1	1.8	0.9	0.6	1.2	1.0	0.7	0.9	1.3	1.5	1.6	1.5	1.4	3.3	1.1	0.5	0.5	1.1	3.3
22-Oct	0.2	0.8	0.2	0.0	0.0	Z	0.4	0.2	0.6	0.3	0.0	0.0	0.2	0.1	0.1	0.7	0.2	0.2	0.0	0.0	0.0	0.0	0.6	1.3	0.3	1.3
23-Oct	Z	1.3	2.7	2.0	1.4	8.4	2.9	7.3	4.4	1.7	0.3	0.1	0.1	0.1	2.4	0.6	1.1	2.0	1.4	2.6	0.7	0.4	0.0	0.0	1.9	8.4
24-Oct	0.0	Z	0.0	0.0	0.6	2.0	1.1	1.7	0.2	0.4	0.3	1.2	2.6	2.5	3.4	4.2	0.9	2.4	0.4	0.0	1.2	0.0	0.0	0.0	1.1	4.2
25-Oct	0.1	0.0	Z	0.2	0.0	1.1	1.1	0.0	0.6	0.2	0.5	0.2	0.0	1.1	1.3	1.6	1.7	0.2	0.3	0.2	0.1	0.0	1.7	1.5	0.6	1.7
26-Oct	0.0	0.0	0.0	Z	0.3	2.5	2.3	1.9	2.3	1.1	1.3	0.2	0.1	0.3	0.8	1.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.6	2.5
27-Oct	0.0	0.0	0.0	0.0	Z	0.9	0.4	1.4	2.1	0.7	1.0	1.1	0.7	0.3	0.4	0.8	1.3	0.2	1.0	0.4	0.3	0.1	0.5	1.0	0.6	2.1
28-Oct	0.5	0.8	0.6	0.3	0.6	Z	0.9	2.9	1.0	0.8	0.5	0.5	0.3	0.5	0.2	0.4	0.4	4.2	4.5	0.5	0.4	0.0	0.0	1.1	1.0	4.5
29-Oct	Z	1.0	0.7	3.5	0.5	3.6	2.5	1.9	1.5	0.0	0.1	0.3	0.4	0.8	1.0	0.9	0.4	0.5	0.3	2.8	3.2	2.8	2.7	3.6	1.5	3.6
30-Oct	0.6	Z	0.6	0.3	0.0	0.2	0.5	2.3	0.5	2.3	0.5	0.7	0.7	0.2	0.0	0.0	0.1	0.6	1.3	1.1	0.8	0.9	1.1	1.4	0.7	2.3
31-Oct	1.3	1.8	Z	2.1	2.3	3.5	2.3	6.2	1.8	1.4	1.4	0.8	0.5	0.5	0.2	0.2	0.4	1.5	1.2	3.6	2.4	1.2	0.5	0.9	1.7	6.2
																								Diurnal Average		
																								Diurnal Maximum		
																								Diurnal Average		
																								Diurnal Maximum		

Z - zerospan C - Calibration



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Jackfish 2/3 - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Jackfish 2/3 - October 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 - October 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	9	17	12	9	3	10	24	75	112	80	59	81	63	67	66	20	707
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	9	17	12	9	3	10	24	75	112	80	59	81	63	67	66	20	707

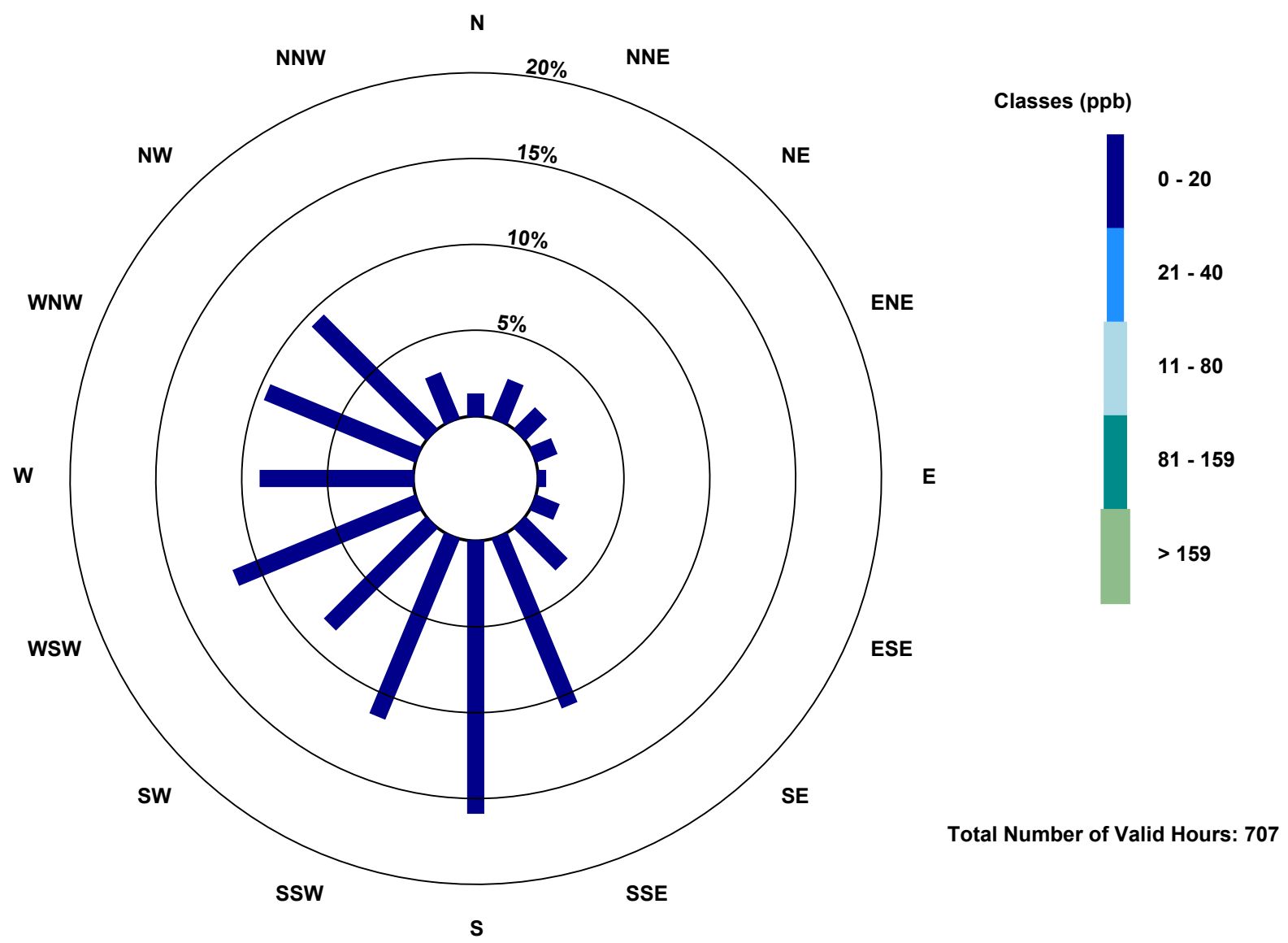
Total Number of Valid Hours: 707

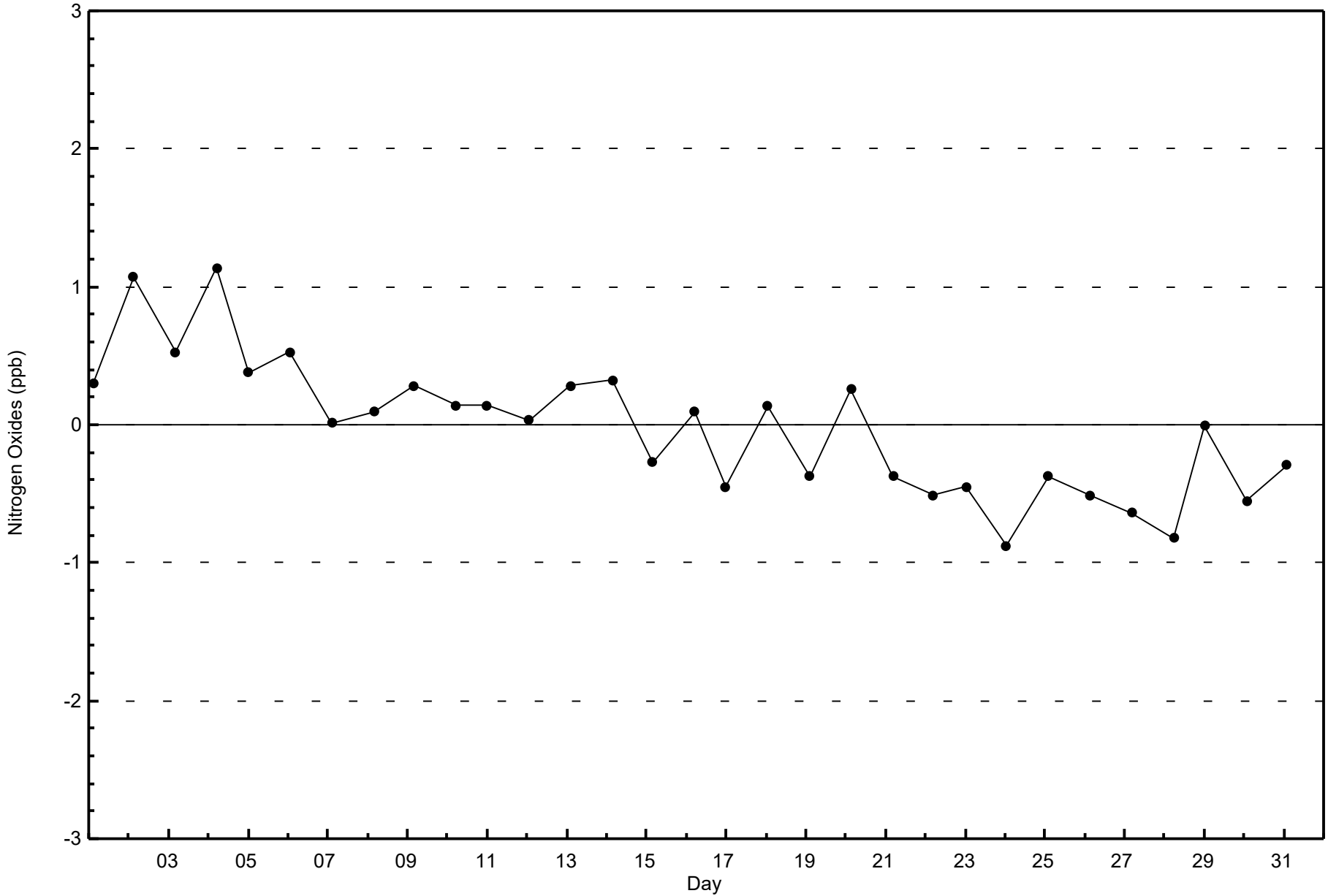
Total Number of Hours: 744

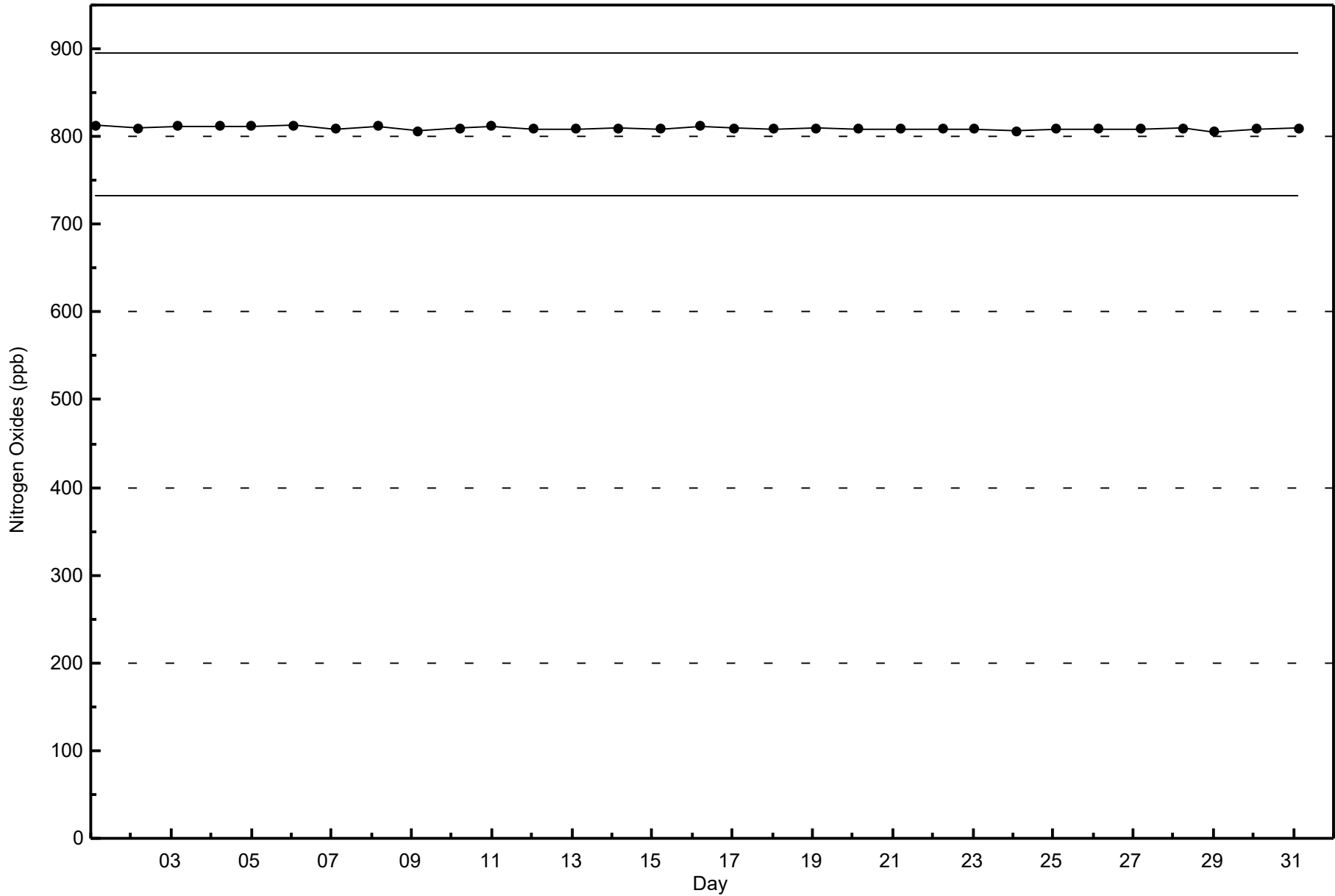


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitrogen Oxides (NO_x) - ppb
Jackfish 2/3









Wood Buffalo Environmental Association
Summary of Hour Averages

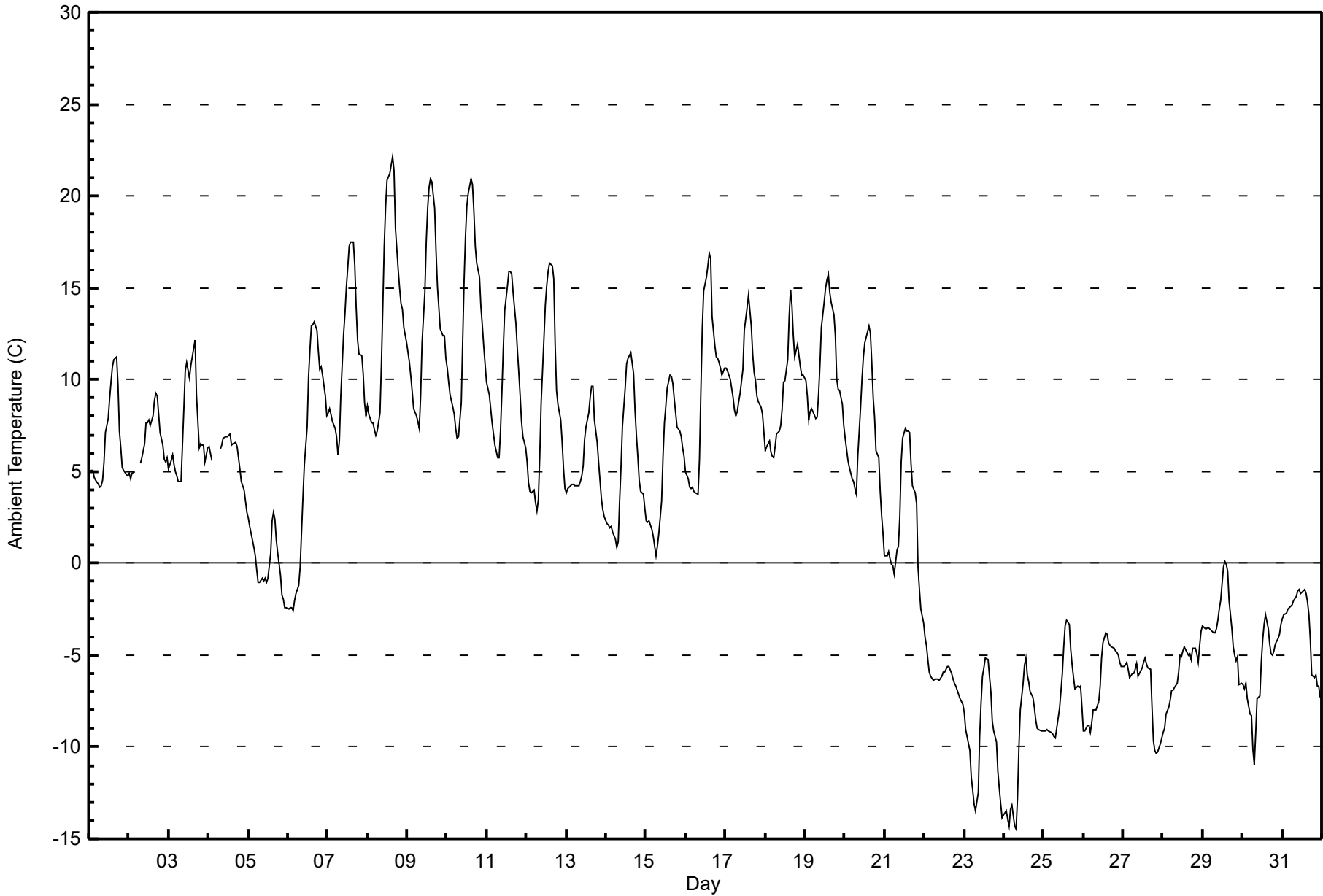
Ambient Temperature (AT) - C
Jackfish 2/3 - October 2023

Maximum Value: 22.2 C on Oct 8 16:00		Maximum Daily Average: 13.8 C on Oct 8		Hours in Service: 744																																												
Minimum Value: -14.5 C on Oct 24 08:00		Minimum Daily Average: -9.9 C on Oct 24		Hours of Data: 737																																												
Maximum Diurnal Average: 7.7 C at hour 15		Minimum Diurnal Average: -0.1 C at hour 7		Hours of Missing Data: 7																																												
Monthly Average: 3.34 C		Percentiles: P ₁ = -13.4 P ₁₀ = -7.5 Q ₁ = -4.5 Median = 5.0 Q ₃ = 9.2 P ₉₀ = 13.1 P ₉₉ = 20.7		Hours of Calibration: 0																																												
				Percent Operational Time: 99.1																																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Oct	5.0	5.1	5.1	4.6	4.5	4.3	4.2	4.3	4.6	5.5	7.1	7.9	8.9	9.8	10.7	11.1	11.3	9.7	7.2	6.3	5.2	5.1	4.8	4.8	6.5	11.3																						
2-Oct	4.9	4.6	4.9	5.0	UO	UO	UO	5.5	5.7	6.5	7.7	7.6	7.8	7.5	8.0	8.9	9.3	9.1	8.1	7.1	6.4	5.7	5.5	5.7	6.7	9.3																						
3-Oct	5.1	5.6	5.9	5.4	5.0	4.8	4.5	4.4	6.4	8.4	10.5	10.9	10.1	10.8	11.2	11.7	12.2	9.2	6.2	6.5	6.4	6.4	5.5	6.3	7.5	12.2																						
4-Oct	6.4	5.9	5.6	UO	UO	UO	UO	6.2	6.4	6.8	6.9	6.9	6.9	7.0	6.5	6.5	6.6	6.3	5.7	5.1	4.5	4.0	3.4	2.7	5.8	7.0																						
5-Oct	2.5	2.0	1.3	0.9	0.4	-0.4	-1.0	-1.0	-0.8	-1.0	-0.8	-1.1	-0.8	0.6	2.3	2.8	2.4	1.2	0.6	-0.7	-1.7	-2.0	-2.4	-2.4	0.0	2.8																						
6-Oct	-2.5	-2.4	-2.4	-2.6	-2.0	-1.7	-1.2	-0.2	1.7	3.6	5.4	7.4	10.1	11.6	12.9	13.0	13.1	12.7	11.6	10.5	10.7	10.3	9.1	8.1	5.7	13.1																						
7-Oct	8.2	8.4	8.1	7.7	7.4	6.9	5.9	6.7	9.1	12.5	13.6	15.0	16.2	17.3	17.5	17.5	16.2	13.9	12.1	11.4	11.3	10.3	8.7	8.0	11.2	17.5																						
8-Oct	8.6	8.1	7.7	7.6	7.2	7.0	7.2	8.2	10.8	14.0	17.3	19.4	20.8	21.2	21.7	22.2	21.4	18.3	15.9	15.0	14.1	13.8	12.9	12.0	13.8	22.2																						
9-Oct	11.5	10.9	10.2	9.3	8.4	8.1	7.7	7.4	9.1	12.0	14.7	17.5	19.3	20.5	20.9	20.8	19.3	16.9	15.0	13.9	12.8	12.4	12.4	11.2	13.4	20.9																						
10-Oct	10.6	9.8	9.2	8.5	8.1	7.3	6.8	6.9	8.7	12.0	15.4	17.8	19.5	20.1	20.9	20.6	19.1	17.2	16.3	15.6	14.0	13.0	11.9	10.9	13.3	20.9																						
11-Oct	9.9	9.2	8.4	7.7	7.1	6.4	5.8	5.7	7.2	9.4	11.7	13.8	15.1	15.9	15.9	15.7	14.7	13.0	11.7	10.5	9.2	7.7	6.9	6.3	10.2	15.9																						
12-Oct	5.5	4.4	3.9	3.8	4.0	3.3	2.9	3.4	5.7	8.7	12.2	14.1	15.1	15.9	16.4	16.2	15.5	11.9	9.4	8.7	7.8	6.6	5.1	4.1	8.5	16.4																						
13-Oct	3.8	4.1	4.2	4.3	4.3	4.2	4.2	4.2	4.5	4.7	5.3	6.7	7.4	8.2	9.0	9.6	9.7	7.8	6.6	5.5	4.6	3.5	2.9	2.5	5.5	9.7																						
14-Oct	2.2	2.1	1.9	2.0	1.7	1.4	0.9	1.2	3.4	5.2	7.5	9.5	10.8	11.1	11.3	11.5	10.3	8.3	7.0	5.8	4.5	3.9	3.8	3.0	5.4	11.5																						
15-Oct	2.3	2.2	2.3	1.8	1.5	1.0	0.4	1.0	1.6	3.4	5.9	7.6	8.6	9.6	10.3	10.2	9.8	9.0	8.2	7.4	7.2	6.9	6.3	5.8	5.4	10.3																						
16-Oct	5.0	4.6	4.1	4.1	4.1	3.9	3.9	3.7	5.7	9.4	12.8	14.8	15.6	16.2	16.8	16.6	13.5	11.8	11.3	11.1	10.9	10.6	10.2	10.6	9.6	16.8																						
17-Oct	10.6	10.5	10.3	10.0	9.0	8.3	8.0	8.3	8.8	9.3	10.6	12.7	13.3	13.9	14.6	12.9	11.4	10.4	9.9	9.1	8.8	8.5	8.1	7.1	10.2	14.6																						
18-Oct	6.1	6.3	6.7	6.1	5.8	5.7	6.3	7.1	7.2	7.5	8.4	9.9	9.9	11.0	13.4	14.9	14.1	12.4	11.3	11.9	11.3	10.7	10.2	10.2	9.3	14.9																						
19-Oct	9.9	9.1	7.8	8.2	8.4	8.3	7.9	8.0	9.2	10.8	12.8	14.2	15.0	15.4	15.7	14.8	14.2	13.6	12.4	10.0	9.5	9.4	8.6	7.5	10.9	15.7																						
20-Oct	6.8	6.2	5.6	5.2	4.6	4.4	4.0	3.8	5.8	8.5	10.0	11.3	12.0	12.3	12.9	12.6	10.9	9.0	8.0	6.2	5.8	3.9	2.6	1.7	7.3	12.9																						
21-Oct	0.4	0.4	0.6	0.2	0.0	-0.2	-0.6	0.7	0.9	2.5	5.5	6.8	7.3	7.2	7.2	7.1	5.5	4.2	3.8	3.3	-0.2	-1.4	-2.5	-3.2	2.3	7.3																						
22-Oct	-4.0	-4.5	-5.3	-5.9	-6.2	-6.4	-6.3	-6.3	-6.3	-6.4	-6.1	-6.0	-5.9	-5.8	-5.6	-5.6	-6.0	-6.3	-6.5	-6.7	-6.9	-7.4	-7.5	-7.7	-6.1	-4.0																						
23-Oct	-8.1	-9.1	-9.4	-10.2	-11.7	-12.4	-13.1	-13.5	-12.5	-9.4	-7.6	-6.2	-5.7	-5.2	-5.2	-6.1	-7.0	-8.6	-9.1	-9.8	-11.3	-12.3	-13.1	-13.9	-9.6	-5.2																						
24-Oct	-13.7	-13.5	-13.9	-14.3	-13.4	-13.2	-14.3	-14.5	-12.8	-10.0	-8.0	-6.5	-5.6	-5.1	-6.1	-6.5	-7.0	-7.3	-7.8	-8.5	-8.9	-9.0	-9.1	-9.1	-9.9	-5.1																						
25-Oct	-9.1	-9.1	-9.0	-9.1	-9.2	-9.3	-9.5	-9.5	-8.9	-7.9	-7.0	-6.0	-4.6	-3.4	-3.1	-3.3	-4.7	-5.6	-6.2	-6.8	-6.7	-6.8	-6.7	-7.8	-7.1	-3.1																						
26-Oct	-9.1	-9.1	-8.8	-8.8	-9.2	-8.7	-8.0	-8.0	-7.7	-7.5	-6.7	-5.2	-4.3	-3.8	-3.9	-4.3	-4.5	-4.5	-4.6	-4.8	-4.9	-5.0	-5.4	-5.6	-6.4	-3.8																						
27-Oct	-5.6	-5.5	-5.4	-5.8	-6.2	-6.0	-6.0	-5.7	-5.4	-6.1	-6.0	-5.7	-5.4	-5.2	-5.4	-5.7	-5.8	-7.8	-9.7	-10.2	-10.3	-10.3	-9.8	-9.5	-6.9	-5.2																						
28-Oct	-9.2	-9.0	-8.2	-7.8	-7.4	-6.9	-6.9	-6.7	-6.5	-6.0	-5.0	-5.1	-4.8	-4.6	-4.9	-5.0	-4.9	-5.2	-4.6	-4.6	-4.9	-5.4	-4.5	-3.7	-5.9	-3.7																						
29-Oct	-3.4	-3.5	-3.6	-3.5	-3.5	-3.6	-3.8	-3.8	-3.6	-3.1	-2.5	-2.0	-0.2	0.1	-0.1	-0.4	-2.0	-3.6	-4.6	-5.0	-5.3	-5.1	-6.6	-6.5	-3.3	0.1																						
30-Oct	-6.6	-6.9	-6.5	-7.4	-8.2	-8.3	-10.1	-10.9	-9.3	-7.4	-7.2	-5.4	-4.2	-3.3	-2.8	-3.6	-4.4	-4.9	-5.0	-4.8	-4.4	-4.1	-3.9	-3.3	-6.0	-2.8																						
31-Oct	-3.0	-2.8	-2.7	-2.5	-2.4	-2.4	-2.3	-2.1	-1.8	-1.5	-1.4	-1.7	-1.6	-1.4	-1.6	-2.1	-2.8	-4.2	-6.1	-6.2	-6.1	-6.7	-6.7	-7.3	-3.3	-1.4																						
																								1.7	1.4	1.2	0.8	0.4	0.2	-0.1	0.5	1.5	3.0	4.6	5.8	6.7	7.3	7.7	7.6	6.8	5.4	4.3	3.6	3.0	2.5	2.0	1.6	Diurnal Average
																								11.5	10.9	10.3	10.0	9.0	8.3	8.0	8.3	10.8	14.0	17.3	19.4	20.8	21.2	21.7	22.2	21.4	18.3	16.3	15.6	14.1	13.8	12.9	12.0	Diurnal Maximum
UO - Unstable Operation																																																



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Jackfish 2/3 - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ambient Temperature (AT) - C
Jackfish 2/3 - October 2023

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	267	36.23	36.23
0 - 10	307	41.66	77.88
10 - 20	152	20.62	98.51
> 20	11	1.49	100.00

Total Number of Valid Hours: 737

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

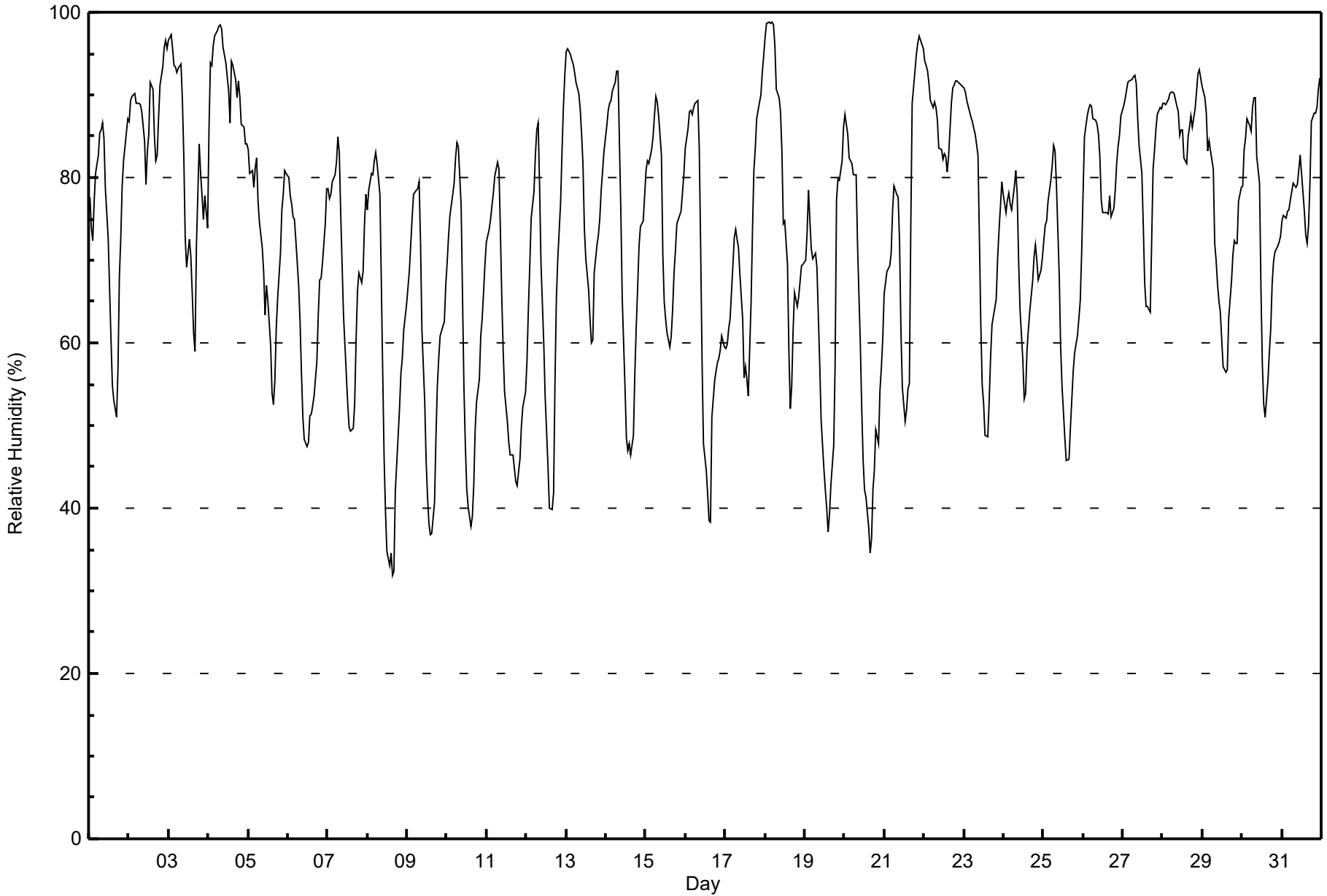
Relative Humidity (RH) - %
Jackfish 2/3 - October 2023

Maximum Value: 98.8 % on Oct 18 03:00																						Hours in Service: 744				
Maximum Daily Average: 92.1 % on Oct 4																						Hours of Data: 744				
Minimum Value: 31.9 % on Oct 8 16:00																						Hours of Missing Data: 0				
Minimum Daily Average: 58.3 % on Oct 8																						Hours of Calibration: 0				
Maximum Diurnal Average: 84.7 % at hour 7																						Percent Operational Time: 100.0				
Minimum Diurnal Average: 56.2 % at hour 15																										
Monthly Average: 72.94 %																										
Percentiles: P ₁ = 36.9 P ₁₀ = 49.8 Q ₁ = 61.6 Median = 75.7 Q ₃ = 85.8 P ₉₀ = 91.1 P ₉₉ = 97.9																										
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-Oct	77.7	73.9	72.4	77.1	80.6	82.7	85.4	85.8	86.6	84.8	78.6	72.8	66.7	60.5	54.9	53.0	51.1	56.7	68.0	72.7	78.9	82.0	85.4	87.2	74.0	87.2
2-Oct	86.9	89.3	89.9	90.1	89.0	89.0	89.0	88.8	88.0	84.4	79.2	83.2	85.2	91.6	90.8	85.1	82.0	82.8	87.2	91.2	93.4	95.8	96.6	95.6	88.5	96.6
3-Oct	96.6	97.3	95.6	93.5	93.4	92.6	93.3	93.7	89.3	82.5	72.8	72.5	70.5	66.2	61.2	59.0	71.7	84.0	80.4	77.8	74.9	77.9	73.9	80.8	97.3	
4-Oct	85.9	93.8	93.6	96.0	97.2	97.8	98.3	98.5	98.0	95.7	94.0	92.2	90.6	86.6	94.0	93.5	91.9	89.6	91.6	89.9	86.5	86.2	84.0	84.1	92.1	98.5
5-Oct	83.5	80.5	80.8	78.8	81.3	82.3	77.1	74.6	71.5	68.6	63.4	66.9	65.1	59.6	53.8	52.5	55.5	61.8	65.4	70.9	76.0	77.9	80.9	80.5	71.2	83.5
6-Oct	80.0	77.8	76.7	75.3	74.8	72.4	67.0	62.6	56.2	51.0	48.4	47.4	47.9	51.2	51.4	52.4	53.6	57.9	63.5	67.6	67.9	69.7	74.4	78.7	63.6	80.0
7-Oct	78.7	77.4	78.0	79.4	80.3	81.8	85.0	83.0	75.7	63.5	59.9	56.3	52.7	49.8	49.3	49.6	52.8	60.4	66.3	68.5	67.3	68.7	74.4	78.0	68.2	85.0
8-Oct	76.2	78.4	80.5	80.4	82.1	83.1	81.7	77.9	67.5	56.5	46.2	39.4	34.7	33.0	34.5	31.9	32.3	42.0	48.6	52.1	56.2	58.2	61.6	64.7	58.3	83.1
9-Oct	66.6	68.7	71.9	75.1	78.0	78.5	78.7	79.5	72.2	61.6	52.8	45.8	41.3	38.2	36.8	36.9	40.6	48.4	54.8	58.1	60.8	62.0	62.5	67.0	59.9	79.5
10-Oct	69.7	72.8	75.5	78.0	79.3	82.3	84.2	83.7	76.6	65.4	54.6	47.7	42.4	40.1	37.9	38.9	42.7	49.4	52.9	55.6	60.8	62.9	66.1	69.5	62.0	84.2
11-Oct	72.3	73.7	74.8	76.6	78.2	80.2	81.9	81.0	73.7	65.6	59.1	54.0	50.5	47.9	46.5	46.4	46.4	43.2	42.8	44.4	46.0	49.8	52.2	54.0	60.1	81.9
12-Oct	57.7	64.1	69.3	75.0	78.4	82.7	85.8	86.6	79.0	69.7	59.9	53.5	49.3	45.2	40.0	39.8	41.9	55.2	65.4	70.2	76.9	83.0	88.5	92.4	67.1	92.4
13-Oct	95.3	95.7	95.0	94.2	93.8	92.7	91.5	90.2	88.4	85.3	81.5	73.7	70.2	66.4	62.9	60.0	60.4	68.5	71.9	73.1	75.2	78.5	80.8	83.3	80.3	95.7
14-Oct	86.4	88.2	89.0	89.3	90.5	91.6	92.9	92.8	84.2	76.1	65.4	54.6	48.4	47.0	47.8	46.4	48.8	56.3	61.9	66.7	71.7	74.0	74.7	77.7	71.8	92.9
15-Oct	80.9	82.1	81.7	83.3	84.9	87.4	89.9	89.1	87.5	82.8	70.8	64.9	62.9	61.2	59.5	60.8	64.0	68.4	71.2	74.4	75.4	76.0	78.2	80.4	75.7	89.9
16-Oct	83.6	85.9	87.9	88.2	87.7	88.5	89.0	89.3	83.6	71.5	57.8	47.8	44.6	41.7	38.5	38.4	51.0	55.5	56.6	57.6	58.1	59.1	60.9	59.5	65.9	89.3
17-Oct	59.3	59.8	61.6	62.9	69.3	72.7	73.8	72.5	71.5	68.2	62.8	55.8	57.1	55.6	53.6	65.0	73.6	80.8	83.6	87.1	88.1	90.1	92.7	94.8	71.3	94.8
18-Oct	97.0	98.6	98.8	98.7	98.8	98.4	95.9	90.6	89.6	87.9	83.2	74.4	74.8	69.5	58.9	52.0	54.8	61.5	66.2	64.4	65.6	67.5	69.3	69.6	78.6	98.8
19-Oct	70.1	73.4	78.5	74.7	71.3	70.1	70.8	69.2	63.5	57.5	50.6	44.7	42.2	40.0	37.2	39.3	42.9	47.7	57.5	77.2	79.8	79.6	82.1	86.1	62.8	86.1
20-Oct	87.6	86.5	85.2	82.3	81.6	80.4	80.3	80.3	71.8	59.8	52.0	45.8	42.2	41.3	37.6	34.6	36.3	42.3	44.6	49.5	47.8	54.2	56.9	60.5	60.1	87.6
21-Oct	65.9	68.6	69.0	69.3	70.9	75.9	79.0	78.0	77.7	72.3	61.4	54.6	50.5	51.9	54.4	55.1	73.5	88.9	92.9	95.0	96.2	97.1	96.7	95.6	74.6	97.1
22-Oct	94.2	93.5	92.8	91.4	89.3	88.5	89.1	88.5	86.9	83.6	83.3	82.3	82.8	82.5	80.6	82.5	89.0	90.9	91.1	91.8	91.6	91.3	91.3	91.1	88.3	94.2
23-Oct	90.8	90.3	89.3	88.0	87.3	86.8	86.0	85.3	82.8	72.7	62.3	54.9	52.7	48.8	48.7	53.0	58.3	62.2	63.2	65.2	70.1	73.6	76.5	79.4	72.0	90.8
24-Oct	78.0	75.8	77.3	78.1	76.8	76.2	79.0	80.9	77.9	69.9	64.1	57.9	53.1	53.9	59.1	61.6	63.9	67.5	70.3	71.8	70.0	67.6	68.9	70.3	69.6	80.9
25-Oct	72.4	74.3	74.7	77.1	79.7	81.5	83.9	83.2	79.1	68.1	59.5	54.7	51.8	48.4	45.7	46.0	49.9	53.2	56.6	58.8	60.9	62.9	65.0	70.9	64.9	83.9
26-Oct	78.0	85.0	87.5	88.3	88.8	88.7	87.1	87.0	86.5	85.2	82.5	77.3	75.8	75.7	75.7	75.6	77.7	75.3	76.2	78.4	81.7	83.8	85.1	87.4	82.1	88.8
27-Oct	88.6	89.5	90.5	91.5	91.7	91.9	92.3	92.3	91.4	87.3	83.8	80.6	74.3	67.4	64.4	64.5	63.8	72.4	81.1	83.2	85.8	87.6	88.4	88.3	83.0	92.3
28-Oct	88.9	89.0	88.9	89.5	90.2	90.4	90.3	90.1	88.6	88.0	85.1	85.8	85.8	82.4	81.7	84.9	86.1	87.4	86.1	88.3	90.4	92.6	93.1	92.1	88.1	93.1
29-Oct	91.0	89.6	87.7	83.2	84.3	83.3	81.0	72.1	70.0	67.1	65.0	63.7	57.2	56.8	56.4	56.8	63.0	67.4	70.7	72.4	72.1	72.0	77.2	78.8	72.5	91.0
30-Oct	78.9	83.4	84.8	87.2	86.3	85.6	88.5	89.7	89.7	82.6	79.3	66.7	57.5	52.6	51.0	55.3	58.8	61.7	67.2	69.8	71.1	71.7	72.2	72.9	73.5	89.7
31-Oct	74.7	75.4	75.1	75.9	76.2	77.3	78.3	79.2	78.9	79.2	80.9	82.7	80.4	76.0	73.0	72.1	74.3	79.3	86.8	87.9	87.8	88.4	90.7	92.0	80.1	92.0
80.4 81.7 82.4 82.9 83.6 84.3 84.7 83.7 80.1 74.0 67.7 62.9 60.1 57.8 56.2 56.3 59.3 64.7 69.2 72.1 73.8 75.4 77.6 79.2																								Diurnal Average		
97.0 98.6 98.8 98.7 98.8 98.4 98.3 98.5 98.0 95.7 94.0 92.2 90.6 91.6 94.0 93.5 91.9 90.9 92.9 95.0 96.2 97.1 96.7 95.6																								Diurnal Maximum		



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Jackfish 2/3 - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Jackfish 2/3 - October 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	19	2.55	2.55
40 - 60	151	20.30	22.85
60 - 80	282	37.90	60.75
80 - 100	292	39.25	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

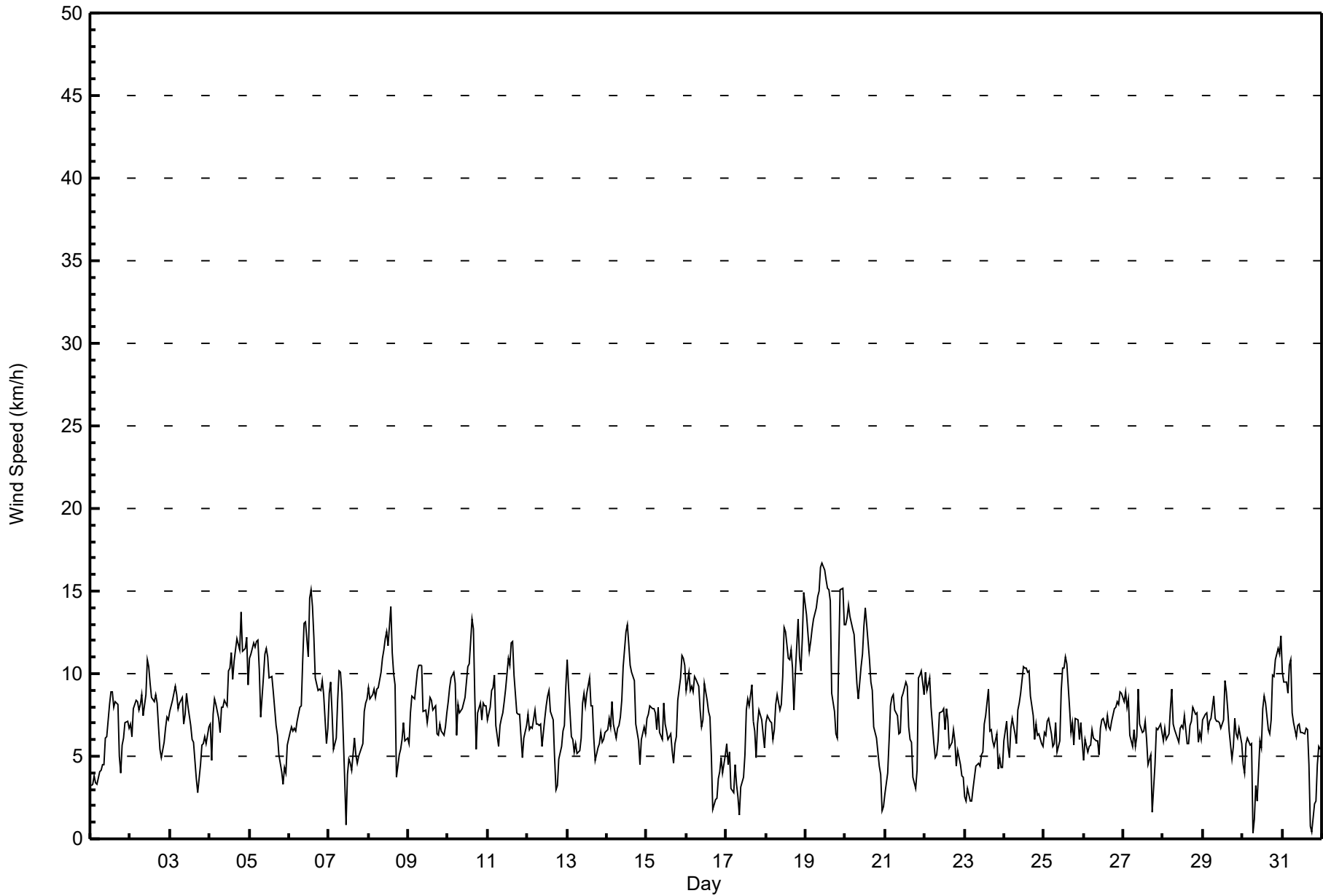
Jackfish 2/3 - October 2023

Maximum Speed: 17 km/h on Oct 19 11:00 Minimum Speed Value: 0 km/h on Oct 30 07:00 Maximum Diurnal Speed Average: 4.7 km/h at hour 7 Monthly Average Velocity: 3.9 km/h 230.4 deg		Maximum Daily Speed Average: 12.9 km/h on Oct 19 Minimum Daily Speed Average: 2.4 km/h on Oct 17 Minimum Diurnal Speed Average: 2.5 km/h at hour 18 Percentiles: P ₁ = 2 P ₁₀ = 5 Q ₁ = 6 Median = 7 Q ₃ = 9 P ₉₀ = 11 P ₉₉ = 15		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-Oct	S3	SE3	SE4	SSE3	SSE3	S4	S4	SSE4	S5	S6	S6	S8	SSW9	SSW9	SSW8	S8	SSW8	SSW5	SSW4	S6	S6	S7	S7	S7	S5.5	SSW9
2-Oct	S7	S6	SSW8	S8	SSW8	S8	S8	S9	S7	SSW9	SSW11	SSW10	SSW9	S9	S8	S9	S8	S7	SSW5	SSW5	SSW6	SSW7	SSW7	SSW7	SSW7.6	SSW11
3-Oct	SSW8	SW8	SW9	WSW9	WSW9	WSW8	SW8	WSW9	W7	W8	WNW9	WNW8	WNW7	NW6	NNW6	NNW5	NNW4	SSW3	SSW5	SSW6	S6	SSW6	SSW6	SSW7	WSW5.0	WSW9
4-Oct	WSW7	WSW5	SW8	WSW8	WSW8	WSW7	W6	WNW8	WNW8	NW8	NW8	NW10	NW10	NW11	NW10	NW11	NW10	NW11	NW12	WNW12	WNW11	NW14	NW11	WNW12	WNW8.7	NW14
5-Oct	NW11	NW11	NW12	NW12	NW12	NW12	NW10	NW7	NW10	NW11	NW12	NW11	NW10	NW10	NW9	NW8	NW7	NW6	NW5	W4	W3	WSW4	SSW4	SSW6	NW7.9	NW12
6-Oct	SW6	SW7	SSW7	SSW7	SSW7	SSW7	SSW8	SSW8	SSW11	SW13	SW13	SW11	SW15	WSW15	WSW14	SW12	SW10	SW9	SW9	SW9	WSW10	W9	W6	W7	SW9.0	WSW15
7-Oct	WSW9	WSW10	WSW8	W5	WSW6	WSW8	SW10	WSW10	WSW9	W4	SSE1	ENE4	NE5	ENE5	E4	ESE6	ESE5	SE5	SE5	SE5	SSE6	SSE8	SSE8	S8	SSW3.0	SW10
8-Oct	S9	S8	S9	S9	S9	S9	S9	S10	S11	S11	S12	S13	S12	S14	S11	S10	S9	SSE4	SSE5	S5	S6	S7	S6	S6	S8.9	S14
9-Oct	S6	S8	S9	S9	S8	S10	S10	S11	S11	S8	S8	SSE7	SSE8	SSE9	SSE8	SSE8	SSE8	SSE6	S6	S7	S7	S6	S7	S8	S7.8	S11
10-Oct	S8	SSE9	S10	S10	S9	SSE6	S8	SSE8	S8	SSE8	SSE9	SSE10	SSE10	SSE11	SSE13	SSE13	SSE9	SE5	SE8	SSE8	SE7	SSE8	SSE8	SE8	SSE8.6	SSE13
11-Oct	SSE7	SE8	SSE9	SSE9	SSE10	SE7	SE6	SE7	SE7	SE8	ESE8	ESE9	SE11	ESE10	ESE12	ESE12	ESE10	SE8	SE8	SE8	SE6	SSE5	SSE6	SSE7	SE7.9	ESE12
12-Oct	SSE8	S7	S7	S7	S8	S7	S7	S7	S7	S6	S7	S8	SSE9	SSE9	S8	SSW7	S5	SSE3	S3	S5	SSW6	S6	SSW7	SSW9	S6.6	SSW9
13-Oct	SSW11	SSW9	SSW6	SSW6	SSW5	SSW6	S5	S5	S6	S8	S9	S8	SSE9	SSE10	SSE8	SSE8	SSE6	SE5	SE5	SSE6	SSE6	SSE6	SSE6	SSE6	S6.4	SSW11
14-Oct	SSE7	SSE7	SSE7	SSE8	SSE7	SSE6	SSE7	SSE7	SSE7	S8	S10	S13	S13	S12	SSE10	SSE10	SSE10	SSE7	SSE6	SSE6	SSE4	S6	S7	SSE6	SSE7.9	S13
15-Oct	SSE7	SSE8	S8	S8	S8	S8	SSW7	S8	S6	S6	SSW8	SSW7	S7	SSW6	SSW6	SSW5	SSW5	SSW6	SSW6	SSW8	SW10	SW11	WSW11	WSW11	SSW6.9	SW11
16-Oct	SW9	SW10	SW9	SW9	SW9	SW10	SW10	SW9	SW8	SW7	WSW7	WSW9	WSW8	WSW8	WSW7	WSW5	SSW2	S2	S2	SSE4	S4	SSE5	SE4	ESE5	SW5.8	WSW10
17-Oct	SE6	SSE5	SSE5	SE3	ENE3	ENE4	E3	E3	WNW1	N3	NNW4	NW5	W8	W8	WNW8	W9	W7	W6	W5	WSW7	WSW8	SW7	SW6	S6	WSW2.4	W9
18-Oct	S7	SSW7	SSW7	SSW7	SSW6	S7	SSW8	SSW9	S8	S8	SSW10	SW13	SW13	SW11	SW11	WSW11	WSW10	SW8	SW10	WSW13	WSW11	SW10	WSW12	WSW15	SW9.1	WSW15
19-Oct	WSW14	WSW12	WSW11	WSW12	WSW13	WSW13	WSW14	WSW15	WSW15	WSW16	W17	W16	W16	W15	WSW15	WSW14	WSW9	W8	WSW6	SW6	WSW11	WSW15	WSW15	WSW13	WSW12.9	W17
20-Oct	WSW13	WSW13	WSW14	WSW13	WSW13	W12	W11	W9	W8	W10	WNW11	WNW13	WNW14	WNW13	NW11	NW10	NW9	NW7	WNW6	WNW6	WNW4	W4	SSW2	NE2	W8.6	WSW14
21-Oct	SE3	SSE4	SSE6	S8	S9	S9	S8	S7	SSW6	SSW6	S9	SSW9	SSW9	SSW9	SSW7	SW6	SW6	SSW4	NNW3	N4	NNE10	NNE10	NNE10	NNE9	S3.1	NNE10
22-Oct	NNE10	NNE9	NNE9	NNE10	NNE8	NNE6	NNE5	NE5	ENE6	ENE8	NE8	NE8	ENE7	NE8	ENE7	NE5	NE6	NE7	NE6	NNE4	NNE5	NNE5	NNE4	N4	NE6.2	NNE10
23-Oct	NNW3	NW2	NW3	NW2	WSW2	WSW3	WSW4	WSW4	WSW5	WNW4	NW5	NW5	NW7	NW7	NW9	NW7	WNW7	WNW6	NW6	WNW6	W4	W5	W4	W4	WNW4.4	NW9
24-Oct	WNW6	WNW7	WNW6	W5	W7	WNW7	W6	W6	W8	W8	WNW9	WNW10	WNW10	WNW10	WNW10	WNW9	WNW7	WNW7	NW6	NW7	WNW6	W6	W6	W6	WNW7.2	WNW10
25-Oct	W6	W6	W7	W7	W6	W6	WSW6	WSW7	SW5	SW6	WSW9	WSW10	W10	W11	WNW11	WNW8	WNW6	WNW6	W7	W6	WSW7	WSW7	W6	WNW7	W7.0	WNW11
26-Oct	W5	W6	W5	W6	W6	WNW7	NW6	WNW6	NW6	NW5	W7	W7	WNW7	WNW7	NW7	WNW7	W7	W7	WSW8	WSW8	WSW8	W8	WSW9	WSW9	W6.5	WSW9
27-Oct	WSW8	WSW9	WSW8	WSW8	W6	W6	W7	WNW6	NNW6	N9	N7	N6	NNW7	NNW7	NNW6	NW5	NW5	NNW2	SW3	WSW5	WSW7	SW7	SW7	WSW6	WNW4.3	N9
28-Oct	SW6	WSW7	SW6	SW6	WSW8	WSW9	W7	WNW7	NW6	NW6	NW7	NNW7	NNW7	NNW7	NNW6	NW6	NW7	WNW7	WNW8	WNW8	WNW8	W6	WNW6	WNW6	WNW5.6	WSW9
29-Oct	WNW7	WNW8	WNW8	WNW7	W7	WNW7	WNW9	NW7	NW7	NW7	NW7	NW7	NW7	NW7	NW7	NW7	WNW10	WNW9	WNW8	W6	W5	WNW6	WNW7	WNW6	WNW6.8	WNW10
30-Oct	N4	NNE4	NNE6	NNE6	NE6	NE6	S0	N1	ENE3	E2	SW6	SSW5	SW8	SSW9	SSW8	SSW7	SW6	SSW7	SSW10	SSW10	SSW11	SSW12	SSW11	SW12	SSW3.6	SW12
31-Oct	SSW10	SSW10	SSW9	SW9	SW11	WSW11	W8	WNW7	NW6	NW7	NW7	NNW6	NNW6	NW6	NNW7	NNW7	N5	NNE1	SSE0	SW2	SSW2	SW5	WSW6	WSW5	W3.9	WSW11
SW4.2 SW4.5 SW4.5 SW4.5 SW4.5 SW4.5 SW4.7 SW4.2 SW3.8 SW3.3 SW3.9 SW4.0 SW4.1 SW4.2 SW3.5 SW3.4 SW3.1 SW2.5 SW2.7 SW3.7 SW3.9 SW4.3 SW4.3 SW4.3																								Diurnal Average		
WSW14 WSW13 WSW14 WSW13 WSW13 WSW13 WSW14 WSW15 WSW15 WSW16 W17 W16 W16 W15 WSW15 WSW14 NW12 WNW12 WNW11 NW14 NW11 WSW15 WSW15 WSW15																								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
Jackfish 2/3 - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Wind Speed (WS) - km/h
Jackfish 2/3 - October 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	130	17.47	17.47
6 - 11	553	74.33	91.80
12 - 19	61	8.20	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: 744

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Jackfish 2/3 - October 2023**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	6	7	4	5	3	3	11	16	13	15	4	10	14	3	10	6	130
6 - 11	3	12	8	4	0	5	15	60	98	67	50	55	51	61	49	15	553
12 - 19	0	0	0	0	0	2	0	2	7	1	7	24	5	5	8	0	61
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	9	19	12	9	3	10	26	78	118	83	61	89	70	69	67	21	744

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Jackfish 2/3 - October 2023

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



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Jackfish 2/3 - October 2023

Direction of Maximum Speed: 260 deg on Oct 19 11:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 252.1 deg on Oct 19	Hours of Data: 744
Direction of Minimum Speed: 175 deg on Oct 30 07:00	Hours of Missing Data: 0
Direction of Minimum Daily Speed Average: 2.4 deg on Oct 17	Percent Operational Time: 100.0
Monthly Average Direction: 230.4 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-Oct	174	140	140	164	150	173	169	164	169	180	187	191	198	207	200	191	200	197	198	182	183	187	190	191	185.1
2-Oct	187	183	192	190	192	191	187	185	189	193	199	203	209	215	217	220	229	225	211	209	210	194	210	204	201.7
3-Oct	213	227	233	238	247	246	236	247	273	271	287	301	300	325	337	334	342	202	206	207	190	194	192	210	249.0
4-Oct	257	238	236	239	246	257	267	292	296	306	309	308	309	305	307	311	305	299	297	304	312	303	314	309	294.1
5-Oct	306	306	314	317	317	304	314	320	312	318	320	317	320	325	320	324	321	325	315	268	265	243	203	218	310.1
6-Oct	228	221	204	201	197	197	202	201	209	220	230	216	232	242	238	229	221	225	224	234	250	263	274	264	226.6
7-Oct	256	255	256	260	256	237	236	239	241	272	152	78	37	74	101	113	115	130	129	127	159	163	167	172	201.9
8-Oct	173	173	174	171	173	175	174	176	180	175	176	177	177	179	172	187	191	156	151	170	172	174	177	181	175.5
9-Oct	185	178	180	181	181	178	178	181	183	180	171	155	147	166	167	156	164	161	176	177	179	174	172	171	173.0
10-Oct	170	168	169	171	173	167	169	167	171	162	153	153	155	156	152	149	160	130	134	148	142	147	153	146	157.4
11-Oct	153	145	148	152	153	144	139	125	134	130	117	118	129	119	114	113	120	130	128	134	141	147	154	155	133.4
12-Oct	161	177	175	171	174	176	176	180	175	180	185	180	161	167	178	195	186	168	179	185	193	188	199	202	179.5
13-Oct	211	212	206	209	200	192	189	182	177	178	187	173	163	154	151	162	151	131	137	149	152	156	162	162	173.8
14-Oct	157	147	154	155	154	157	153	168	168	171	172	173	180	170	159	163	153	155	161	160	164	178	173	157	163.6
15-Oct	160	165	171	177	175	178	192	185	187	182	202	201	180	210	198	202	204	204	209	208	219	235	237	237	198.5
16-Oct	236	236	231	232	228	229	232	223	224	231	245	251	254	247	255	256	209	175	179	164	175	160	128	119	226.9
17-Oct	124	149	152	130	75	67	96	88	295	349	331	313	280	277	290	278	279	281	274	248	244	235	220	179	257.6
18-Oct	179	213	209	203	202	185	194	198	184	186	193	219	214	220	232	241	239	221	219	238	239	234	240	249	218.6
19-Oct	254	248	241	248	247	246	243	246	245	251	260	265	263	261	256	250	242	274	253	228	248	251	256	258	252.1
20-Oct	253	250	251	255	257	261	268	270	278	281	290	287	298	301	318	317	320	312	300	292	300	273	206	47	280.2
21-Oct	135	153	168	178	178	178	183	185	193	192	191	199	198	208	210	219	227	192	343	350	27	21	13	14	188.7
22-Oct	22	20	19	24	32	32	23	47	76	66	52	51	68	49	63	44	56	52	49	27	18	18	13	3	39.1
23-Oct	341	321	322	312	252	245	255	254	253	297	320	317	315	317	304	321	293	293	312	286	277	278	269	275	295.2
24-Oct	285	285	286	278	280	282	267	267	265	273	284	284	293	298	292	294	283	293	325	325	297	276	279	270	286.4
25-Oct	277	275	270	263	264	271	258	250	233	229	242	248	265	281	282	296	290	280	271	251	256	266	286	279	266.5
26-Oct	276	267	272	267	278	295	308	299	304	305	279	271	282	288	312	282	274	263	255	256	258	267	258	256	276.3
27-Oct	258	256	256	258	271	274	260	284	338	8	10	7	344	331	341	324	323	332	236	257	242	232	236	237	287.5
28-Oct	232	238	227	215	242	254	273	303	322	317	321	328	331	331	330	321	315	303	300	285	284	279	284	284	289.1
29-Oct	292	286	284	291	281	290	287	317	313	321	326	314	308	286	290	286	272	271	282	287	284	295	281	292	293.3
30-Oct	358	18	22	29	36	40	175	4	57	87	215	212	214	213	209	211	220	202	206	204	210	211	213	220	211.8
31-Oct	212	208	209	220	230	246	264	302	320	319	319	332	327	326	343	345	1	28	158	217	203	223	241	249	268.4

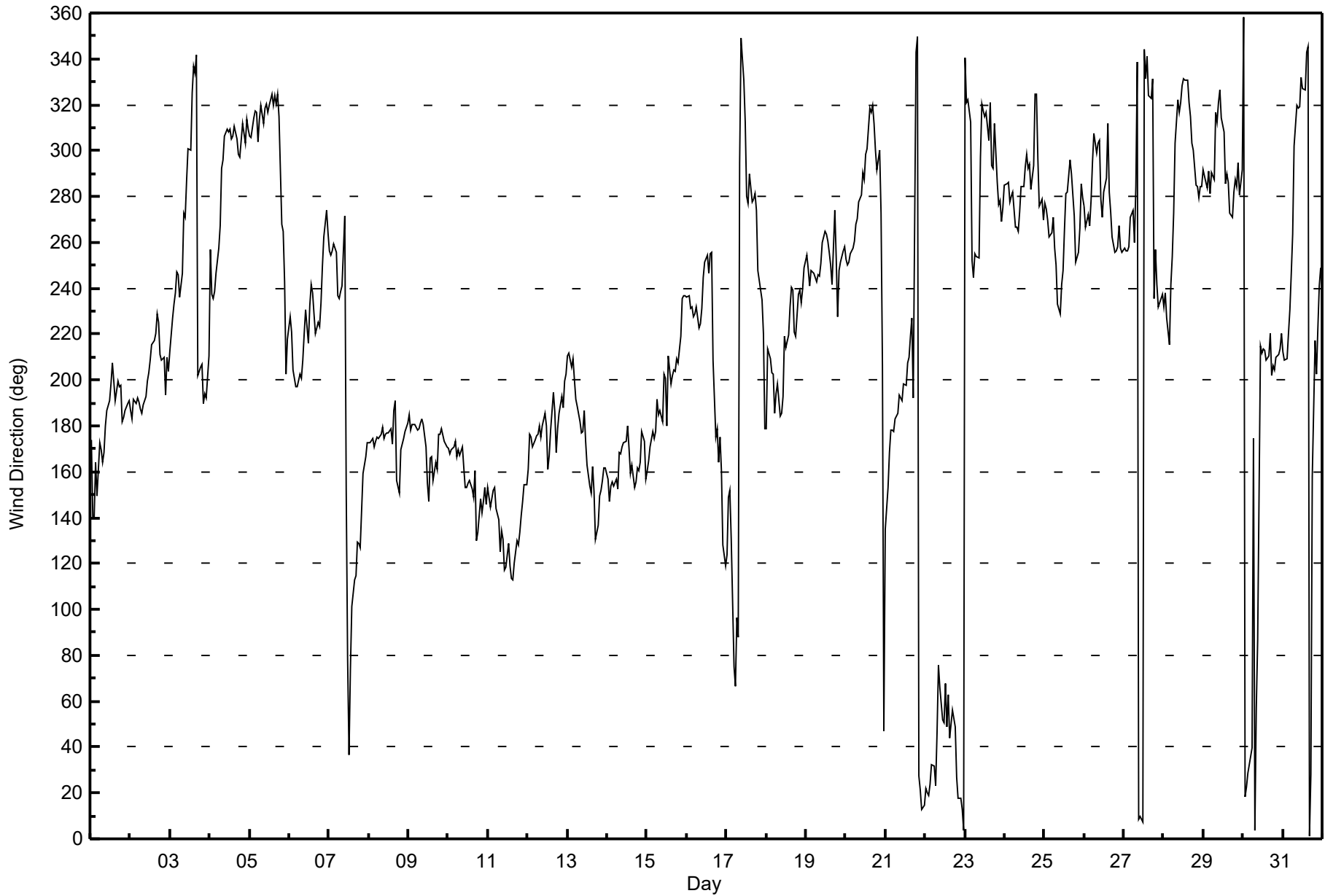
224.1 223.5 220.2 219.6 222.4 225.8 225.3 225.8 227.6 233.1 237.1 238.7 240.6 245.4 244.9 242.8 240.8 237.0 230.1 229.1 229.8 227.4 228.4 225.5
 Diurnal Average

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Jackfish 2/3 - October 2023





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Jackfish 2/3 - October 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 99 deg on Oct 31 18:00																			Hours in Service: 744 Hours of Data: 744 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0						
Minimum Value: 11 deg on Oct 23 08:00																									
Percentiles: P ₁ = 14 P ₁₀ = 17 Q ₁ = 24 Median = 34 Q ₃ = 43 P ₉₀ = 48 P ₉₉ = 74																									
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-Oct	44	58	48	49	55	49	46	48	41	30	47	42	36	37	36	43	35	37	47	41	35	31	34	39	58
2-Oct	35	34	33	32	36	34	34	34	36	32	33	31	31	27	29	26	26	22	21	16	17	17	18	17	36
3-Oct	15	16	17	16	16	16	19	23	41	38	40	44	50	61	52	61	68	61	14	16	14	17	17	24	68
4-Oct	31	32	19	19	19	24	31	34	38	42	45	43	43	41	44	43	38	39	38	41	44	42	43	46	46
5-Oct	43	44	45	45	44	36	48	51	47	44	44	45	49	49	51	50	46	45	48	29	26	30	42	21	51
6-Oct	15	20	19	22	27	24	23	25	26	25	21	26	23	23	23	24	27	23	20	16	15	18	26	22	27
7-Oct	17	12	14	19	14	17	14	13	32	53	91	46	46	59	40	30	27	25	21	20	33	36	34	29	91
8-Oct	35	35	32	37	35	35	37	37	35	38	39	39	44	38	42	43	38	56	55	57	54	50	48	47	57
9-Oct	48	32	31	24	27	25	26	25	27	42	45	43	47	44	43	43	42	44	35	32	31	43	43	33	48
10-Oct	28	29	28	29	28	46	30	37	39	44	50	45	43	46	39	40	44	35	39	47	45	48	45	42	50
11-Oct	42	42	39	40	34	42	44	41	44	44	37	39	39	41	37	33	37	41	40	38	45	54	47	39	54
12-Oct	43	34	27	26	27	25	23	25	26	38	35	41	48	42	44	38	44	53	41	31	21	20	21	22	53
13-Oct	21	23	30	26	36	37	43	36	50	38	39	43	41	41	45	41	44	40	49	53	46	49	48	41	53
14-Oct	44	40	46	42	46	51	48	48	48	41	37	42	40	45	47	46	47	45	48	50	62	44	48	46	62
15-Oct	37	36	34	24	24	28	23	23	28	33	39	36	36	37	34	31	26	22	20	17	19	16	15	14	39
16-Oct	14	14	14	15	15	16	15	16	15	18	23	26	30	37	35	30	43	38	29	34	44	41	45	29	45
17-Oct	33	51	43	55	54	22	25	60	81	54	44	54	39	36	40	34	35	34	29	14	17	19	21	20	81
18-Oct	27	26	27	29	29	32	29	26	32	31	29	25	24	24	26	23	20	22	24	21	19	19	18	16	32
19-Oct	16	18	18	18	18	18	18	19	20	21	25	29	28	27	22	18	19	38	37	30	19	18	18	20	38
20-Oct	16	15	15	16	17	20	26	28	34	35	39	38	38	38	44	46	47	41	36	30	43	34	77	55	77
21-Oct	30	28	20	17	18	19	21	29	27	32	33	31	32	27	29	23	23	23	58	49	40	46	43	46	58
22-Oct	40	43	44	41	40	40	36	35	35	36	30	27	29	28	32	32	28	25	26	35	42	42	40	45	45
23-Oct	55	67	48	77	25	15	13	11	15	47	51	52	42	44	39	44	39	28	40	27	21	19	16	19	77
24-Oct	21	24	28	26	27	25	22	25	24	33	35	38	38	42	38	34	34	38	42	42	45	31	36	37	45
25-Oct	35	33	28	23	25	28	27	15	30	26	25	26	33	35	34	42	34	30	25	12	12	26	32	32	42
26-Oct	27	24	26	26	28	32	45	39	38	48	39	32	41	42	43	41	29	22	15	16	19	27	19	16	48
27-Oct	17	17	20	19	31	31	17	31	48	43	43	46	47	49	56	44	52	97	17	20	16	16	15	15	97
28-Oct	14	15	18	20	17	16	33	39	39	44	45	43	48	47	51	41	42	37	34	32	32	30	31	33	51
29-Oct	35	32	33	34	32	31	35	43	45	46	45	49	50	39	38	35	34	24	23	24	23	29	18	38	50
30-Oct	43	41	42	36	31	31	92	70	46	54	38	40	38	30	31	29	23	29	23	23	22	22	21	20	92
31-Oct	20	16	17	19	20	16	28	34	43	43	42	50	46	47	47	47	56	99	86	31	19	18	16	15	99
																			55 67 48 77 55 51 92 70 81 54 91 54 50 61 56 61 68 99 86 57 62 54 77 55						
Diurnal Maximum																									



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

**AMS29
SURMONT 2
OCTOBER 2023**

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

November 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - SURMONT2 (AMS29)
OCTOBER 2023

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	708	34	36	99.73	4.4	0	1.2	0
H2S (ppb) Average	706	38	38	100	0.2	0	0.1	0
THC(ppm) Average	708	34	36	99.73	2.7	-	2.4	-
NO2 (ppb) Average	705	37	39	99.73	8.5	0	3.4	-
NO (ppb) Average	705	37	39	99.73	2.5	-	0.5	-
NOX (ppb) Average	705	37	39	99.73	8.8	-	3.8	-
PM2.5 (ug/m3) Average	741	3	3	100	51.5	0	12.3	0
Temperature 2 m (C) Average	744	0	0	100	22.9	-	13.1	-
Relative Humidity (%) Average	744	0	0	100	99.6	-	90.2	-
Wind Speed 10 m (km/h) Average	743	0	1	99.87	15	-	9	-
Wind Direction 10 m (deg) Average	743	0	1	99.87	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - SURMONT 2 (AMS29)
OCTOBER 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	0.28	0.5	-	0	0	0	0.1	0.3	0.7	4.4
H2S (ppb) Average	706	0.07	0	-	0	0	0	0.1	0.1	0.1	0.2
THC (ppm) Average	708	2.25	0.1	-	2.1	2.2	2.2	2.2	2.3	2.3	2.7
NO2 (ppb) Average	705	1.1	1.2	-	0.1	0.3	0.4	0.6	1.3	2.4	8.5
NO (ppb) Average	705	0.19	0.2	-	0	0	0.1	0.1	0.2	0.4	2.5
NOX (ppb) Average	705	1.29	1.3	-	0.2	0.4	0.5	0.8	1.6	2.8	8.8
PM2.5 (ug/m3) Average	741	5.05	3.7	-	0.4	2	3.1	4.3	5.7	8.6	51.5
Temperature 2 m (C) Average	744	3.38	7.9	-	-14.3	-7.1	-3.8	4.7	9	13	22.9
Relative Humidity (%) Average	744	73.61	16	-	29.9	49.1	62.6	77.1	86.4	92.3	99.6
Wind Speed 10 m (km/h) Average	743	6.3	3	-	0	2	4	6	8	11	15
Wind Direction 10 m (deg) Average	743	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - SURMONT 2 (AMS29)
OCTOBER 2023

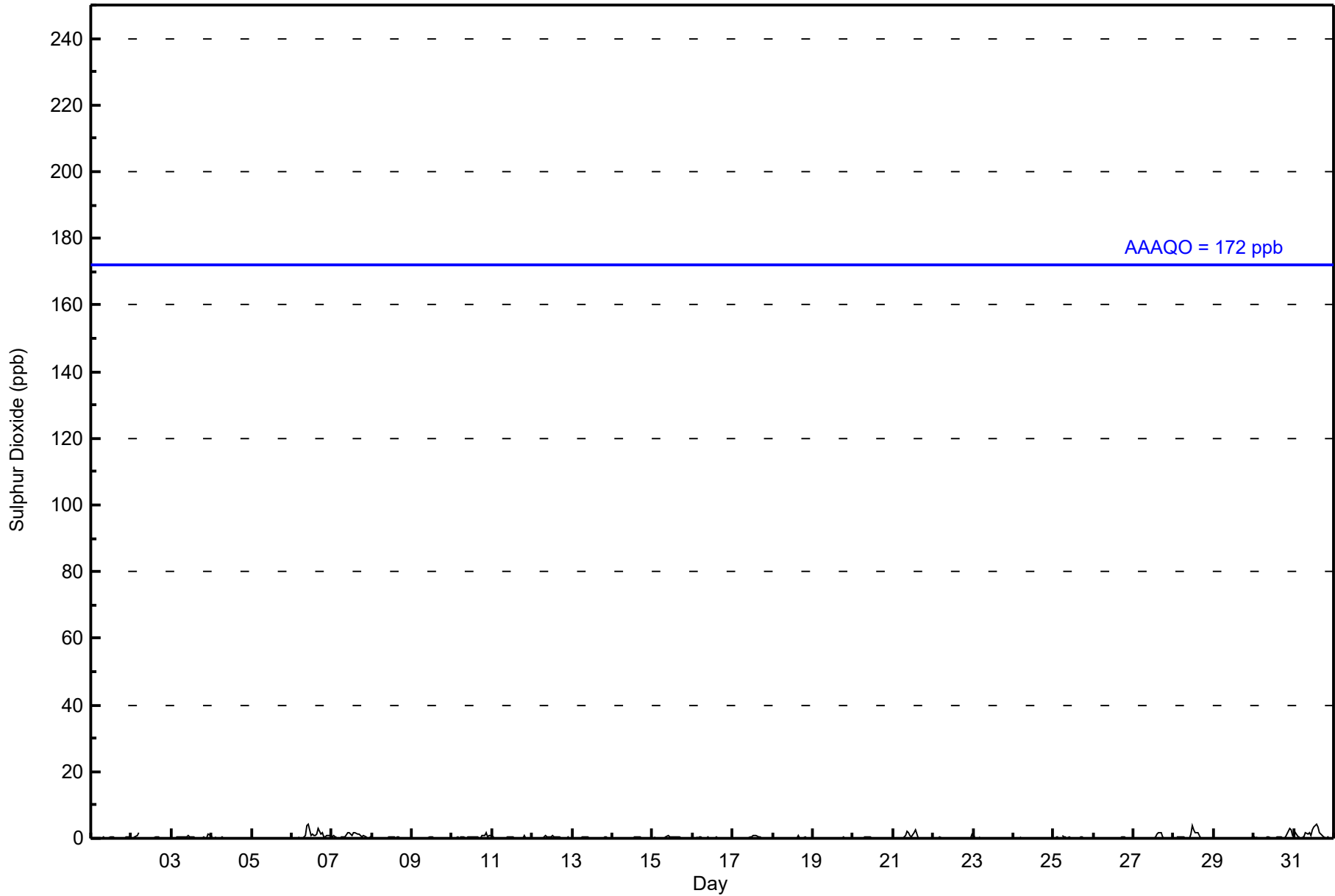
OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2, THC, NO2	24 Oct 2023 12:00	24 Oct 2023 13:00	2	Maintenance - sample manifold cleaned
Wind Speed, Wind Direction	31 Oct 2023 22:00	31 Oct 2023 22:00	1	Flat line in sensor output signal



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Surmont 2 - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Surmont 2 - October 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
Surmont 2 - October 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	7	4	4	2	6	68	100	53	27	33	54	105	113	78	25	28	707
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	7	4	4	2	6	68	100	53	27	33	54	105	113	78	25	28	707

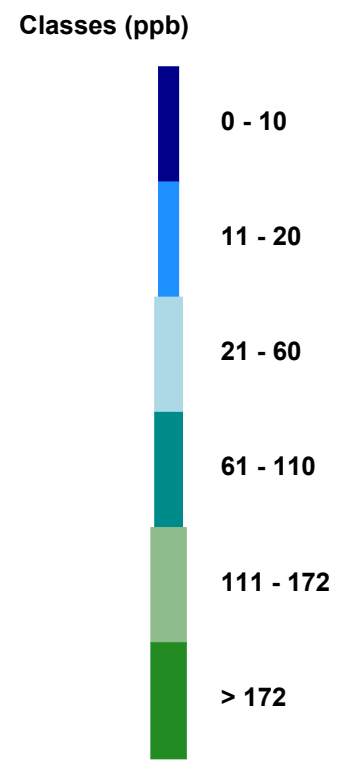
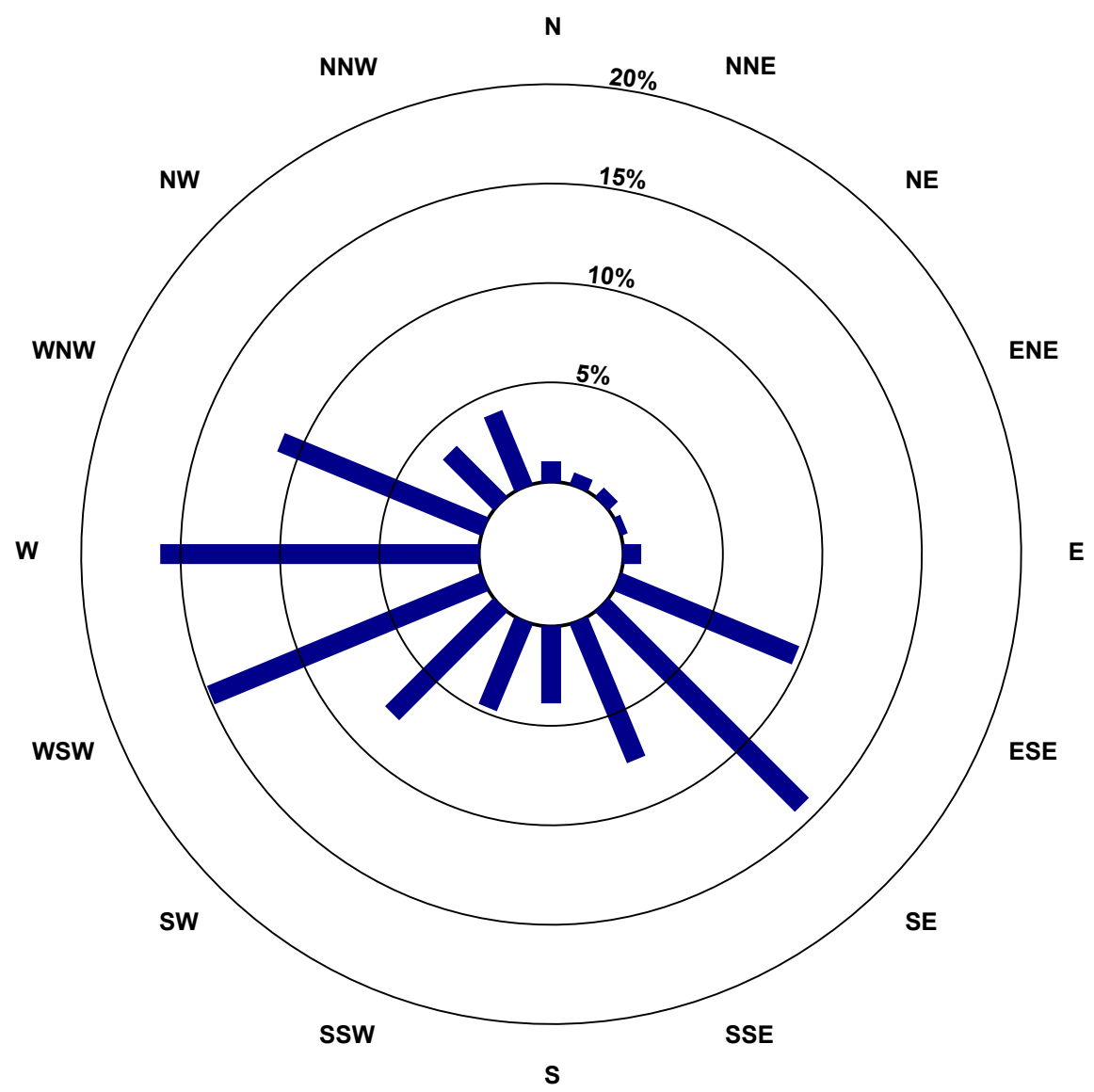
Total Number of Valid Hours: 707

Total Number of Hours: 744

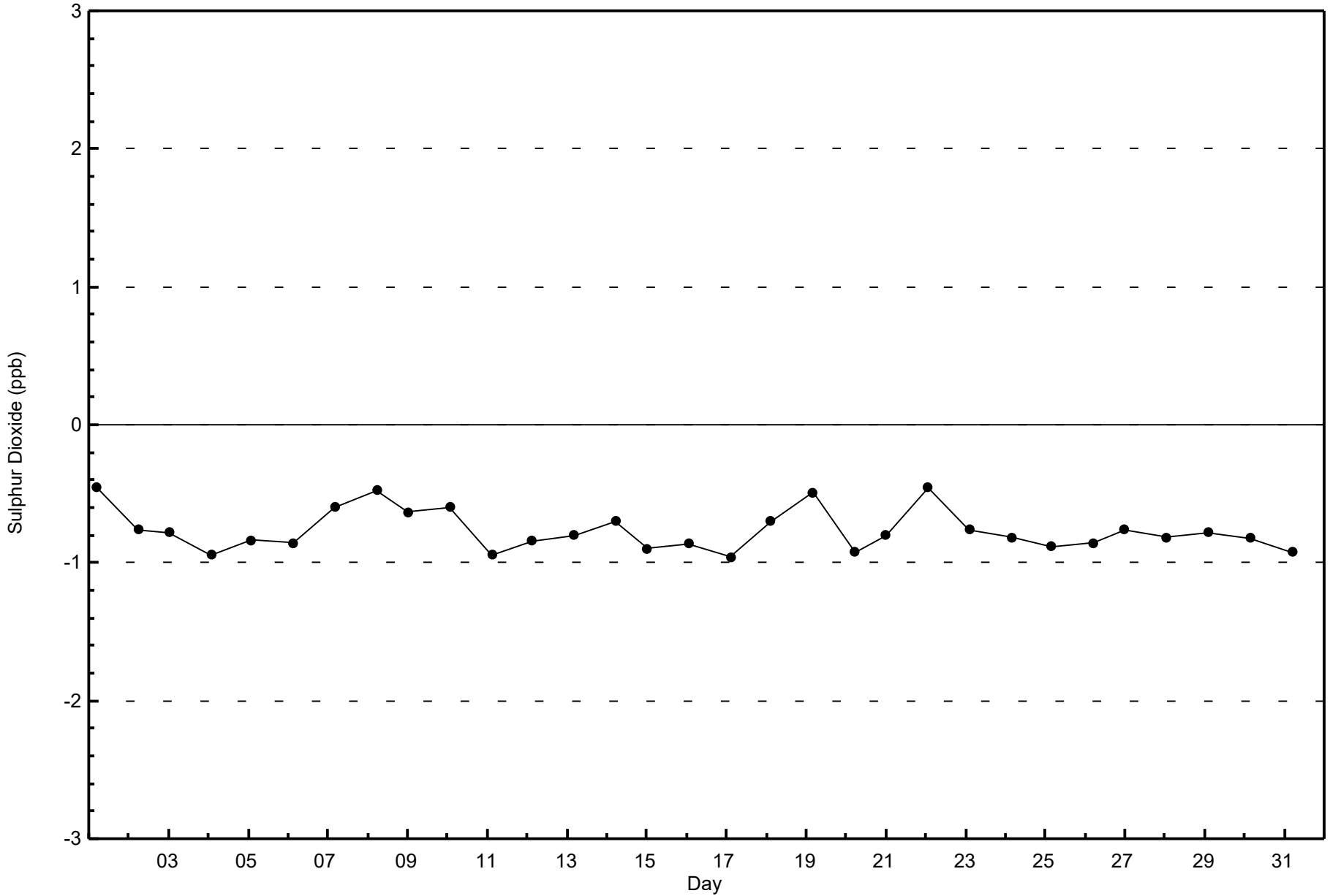


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Sulphur Dioxide (SO₂) - ppb
Surmont 2



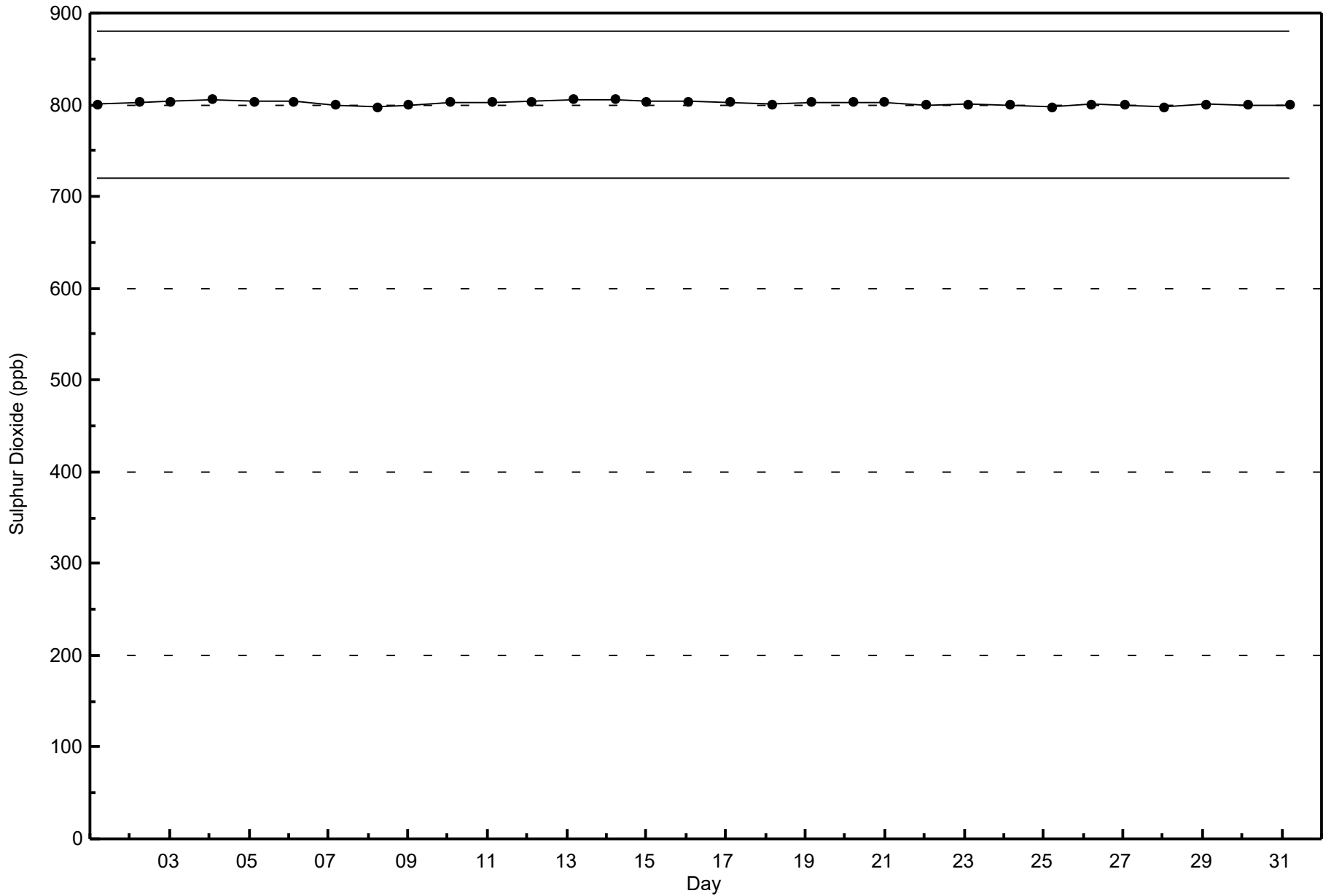
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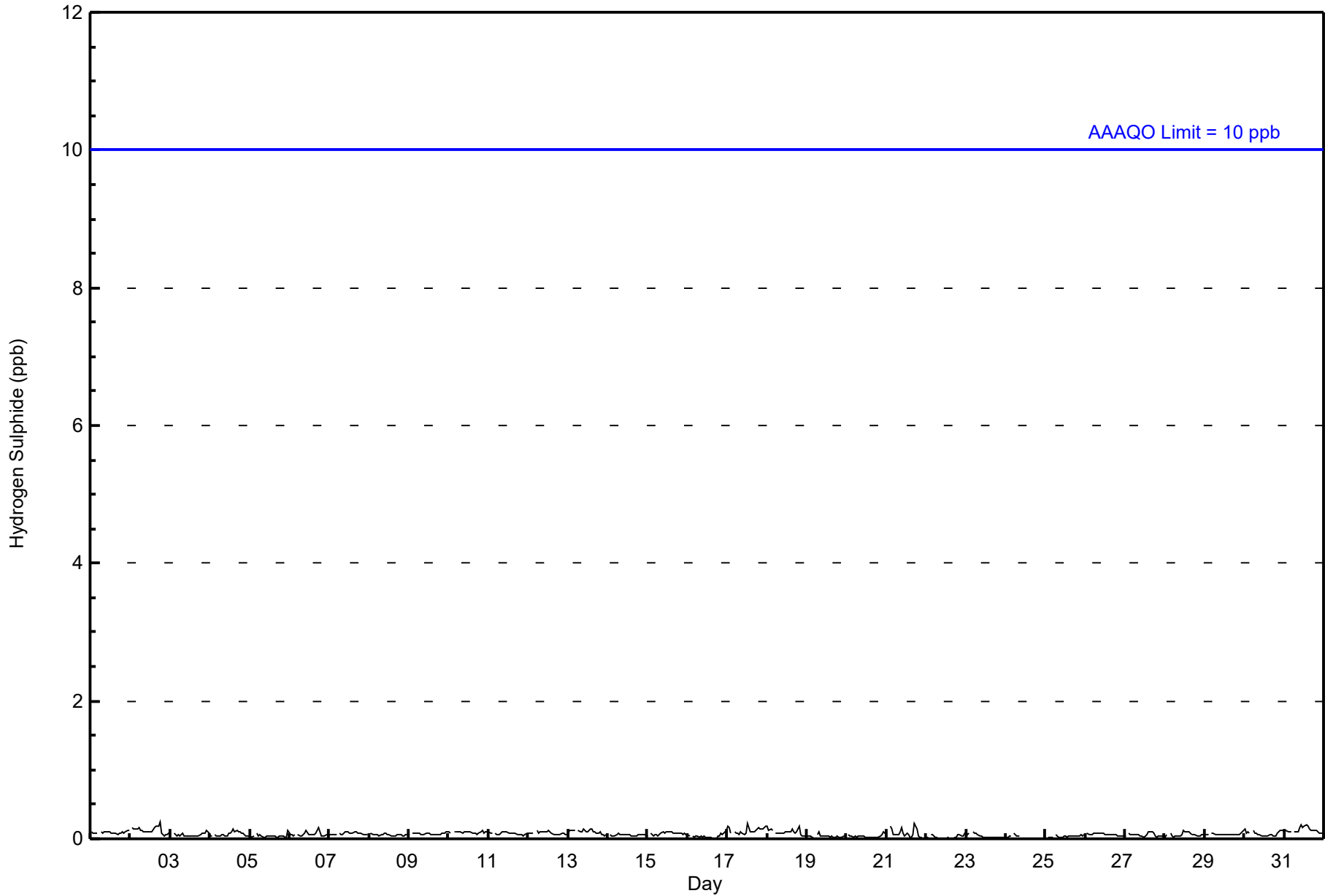




Wood Buffalo Environmental Association
Span Responses

Sulphur Dioxide (SO₂) - ppb
Surmont 2 - October 2023







**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Surmont 2 - October 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 - October 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	7	4	4	2	6	70	100	51	28	33	54	102	111	79	26	28	705
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	7	4	4	2	6	70	100	51	28	33	54	102	111	79	26	28	705

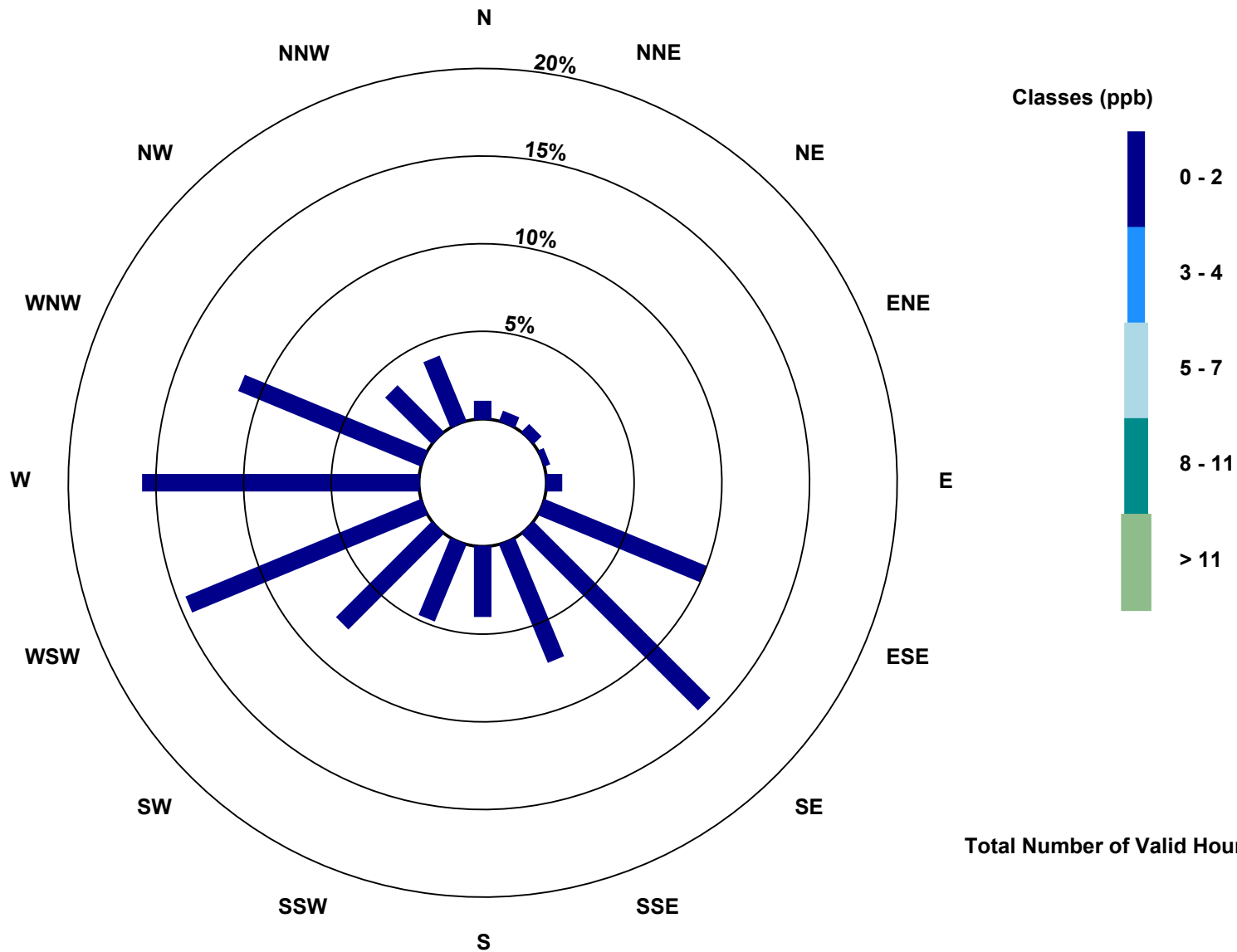
Total Number of Valid Hours: 705

Total Number of Hours: 744

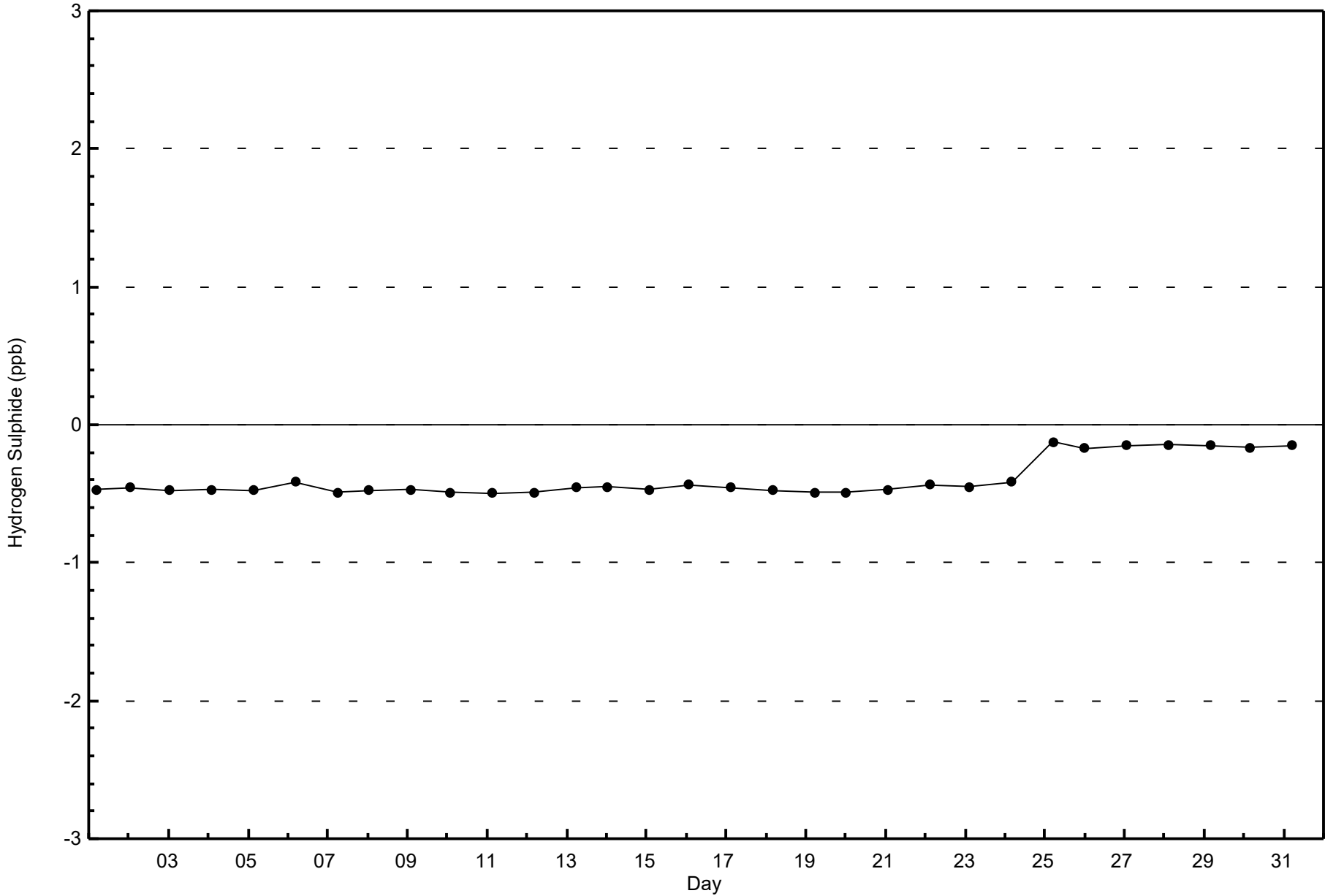


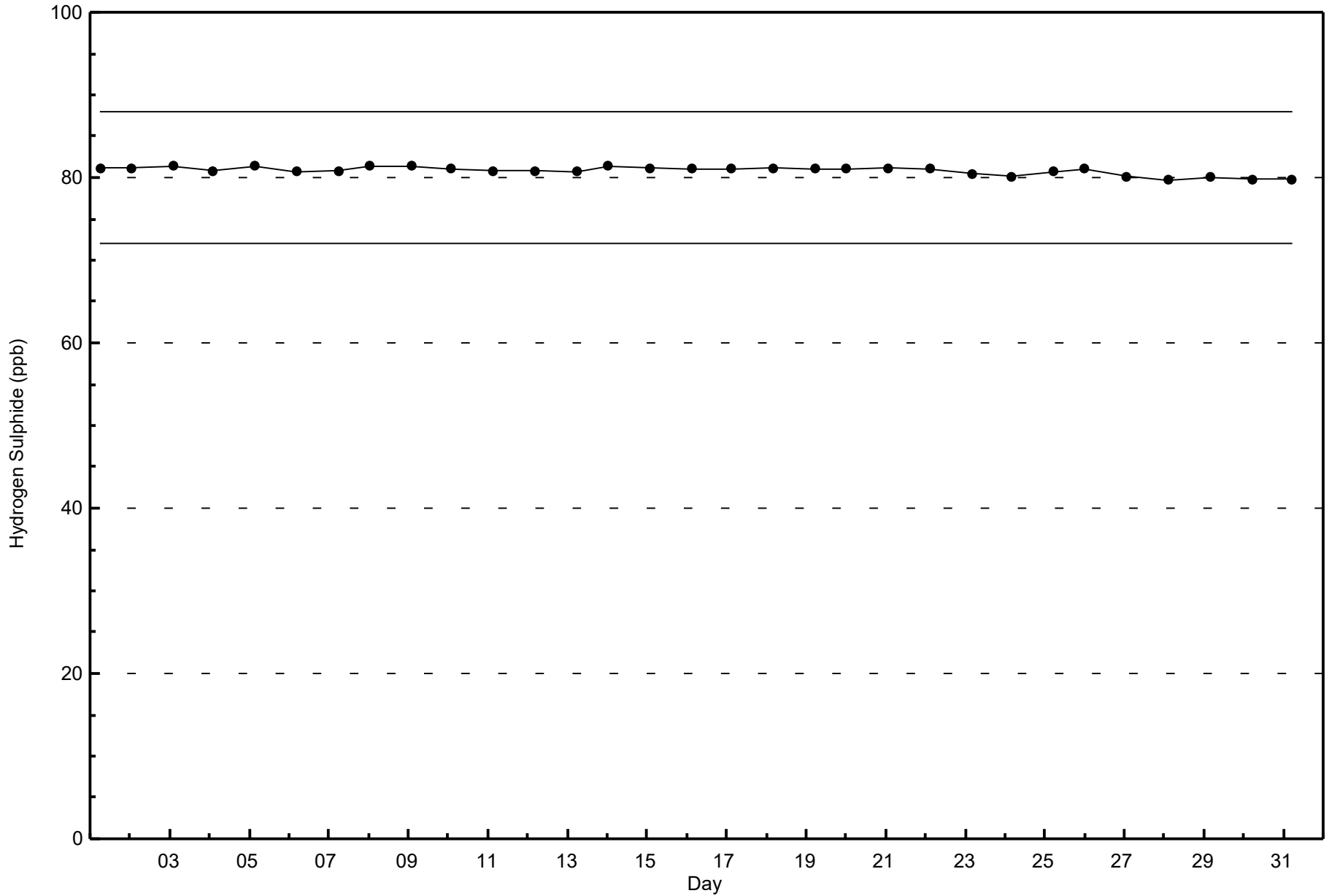
Wood Buffalo Environmental Association
Wind Rose Oct 2023

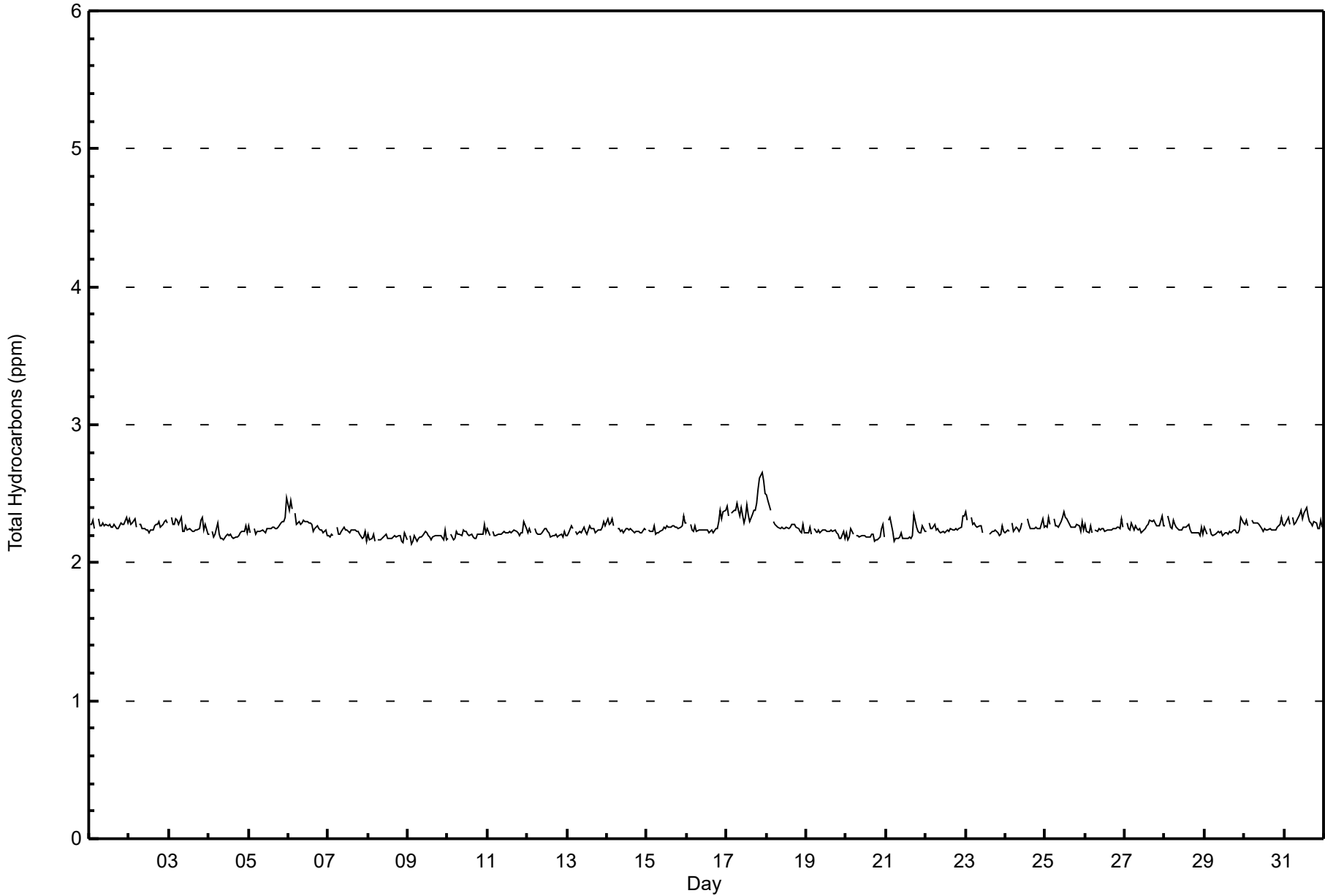
Hydrogen Sulphide (H₂S) - ppb
Surmont 2



Total Number of Valid Hours: 705









Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Surmont 2 - October 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	0	0.00	0.00
2.1 - 3.0	708	100.00	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Total Hydrocarbons (THC) - ppm
Surmont 2 - October 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	7	4	4	2	6	68	100	53	27	33	54	105	113	78	25	28	707
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	7	4	4	2	6	68	100	53	27	33	54	105	113	78	25	28	707

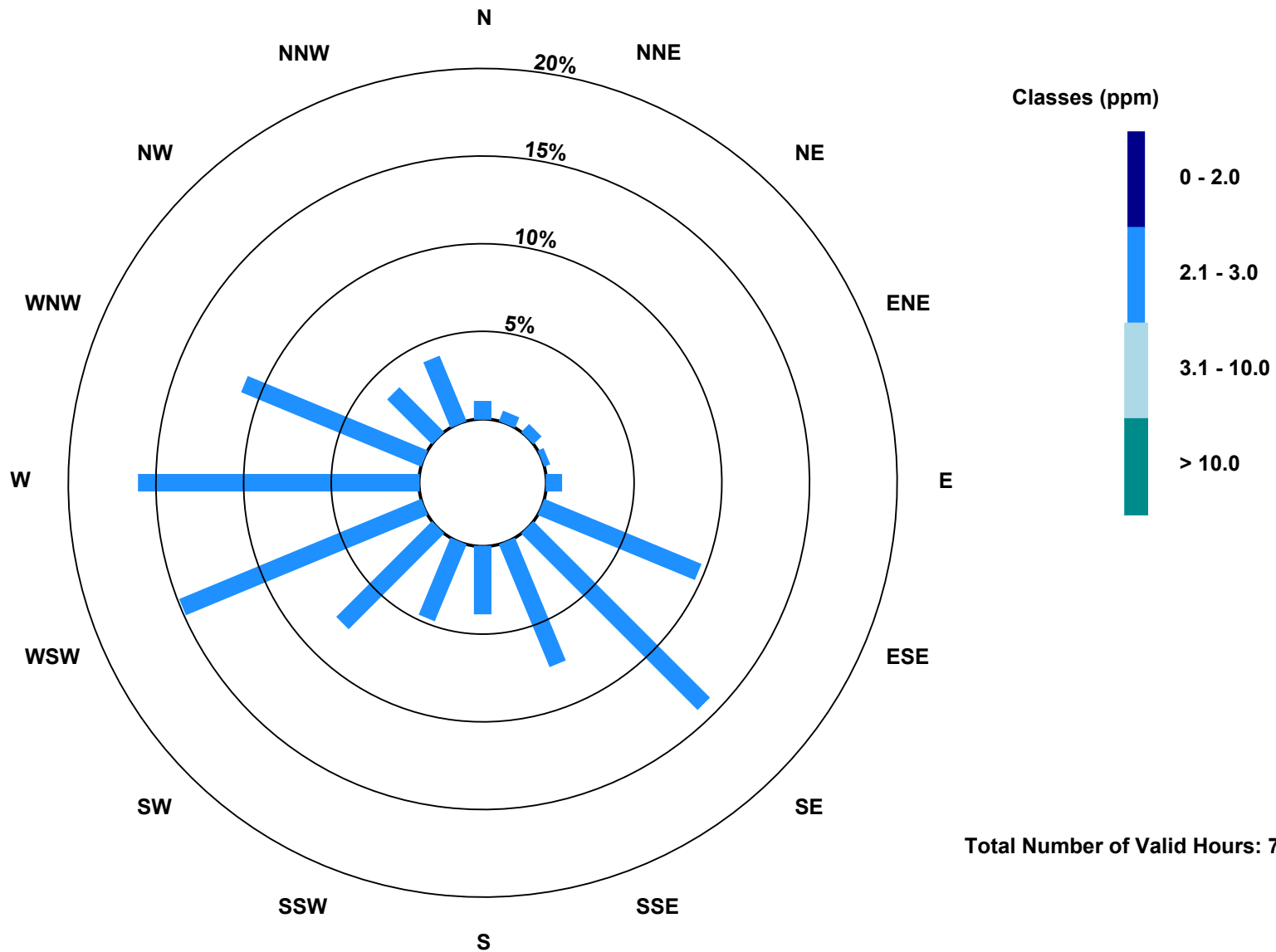
Total Number of Valid Hours: 707

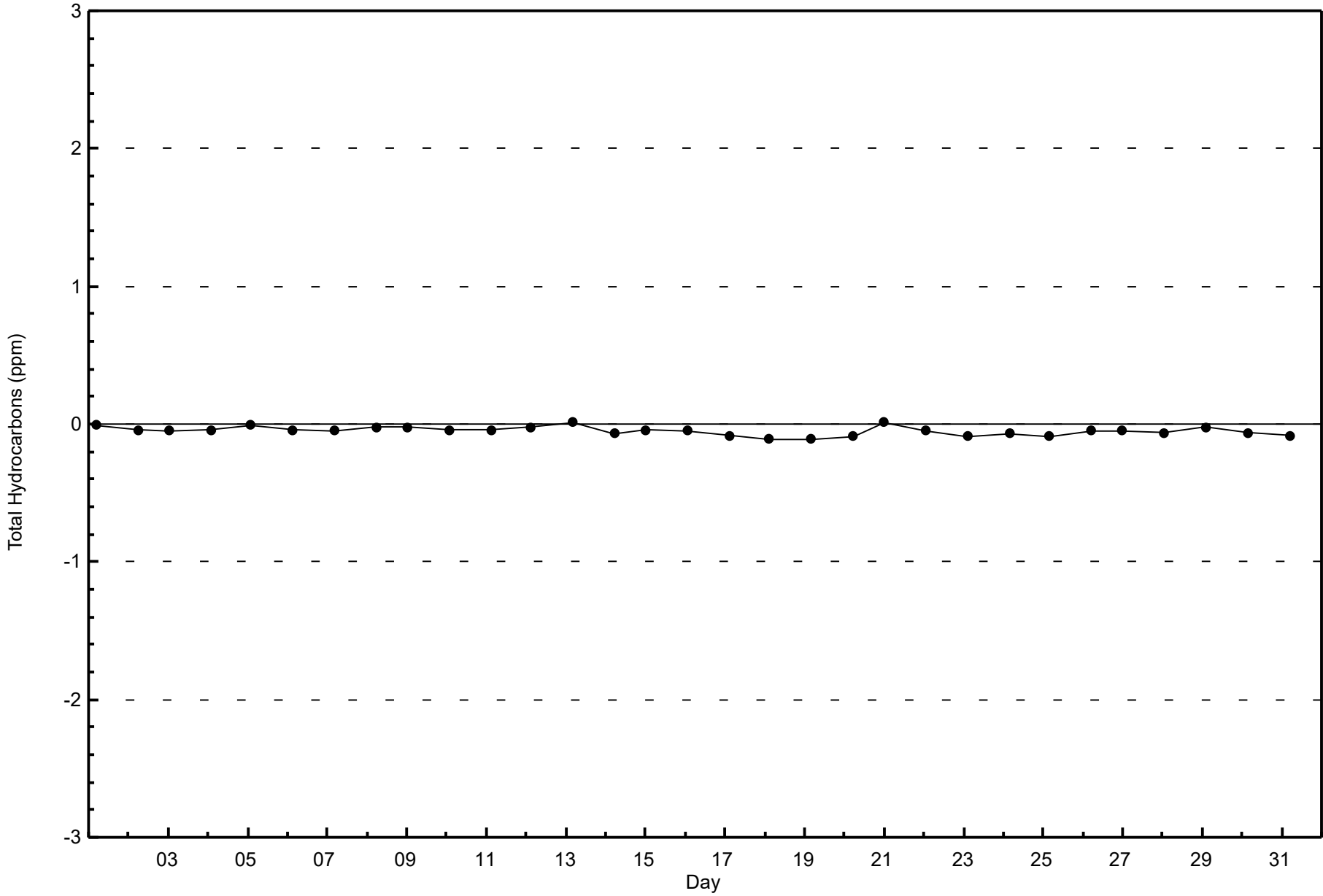
Total Number of Hours: 744

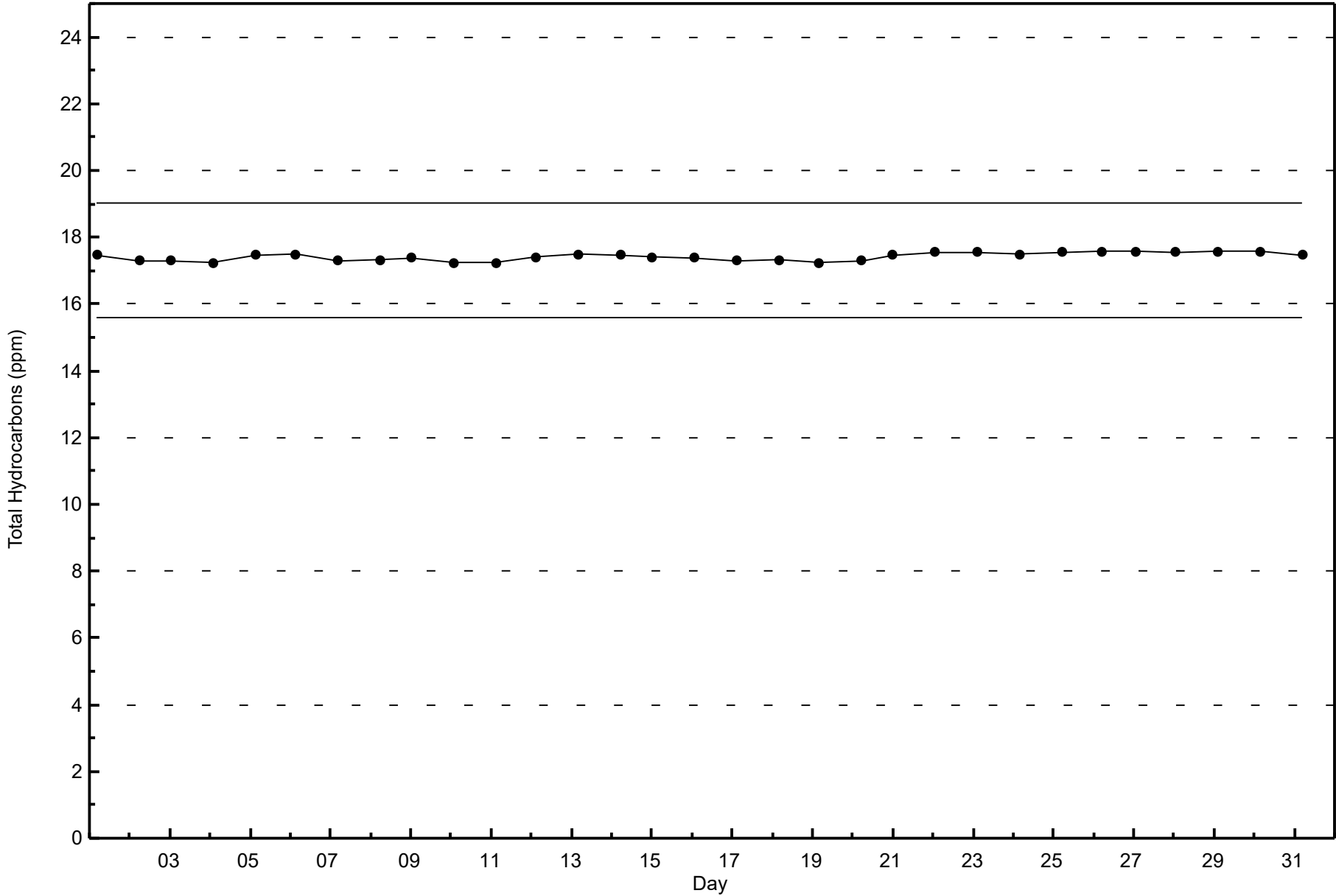


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Total Hydrocarbons (THC) - ppm
Surmont 2









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

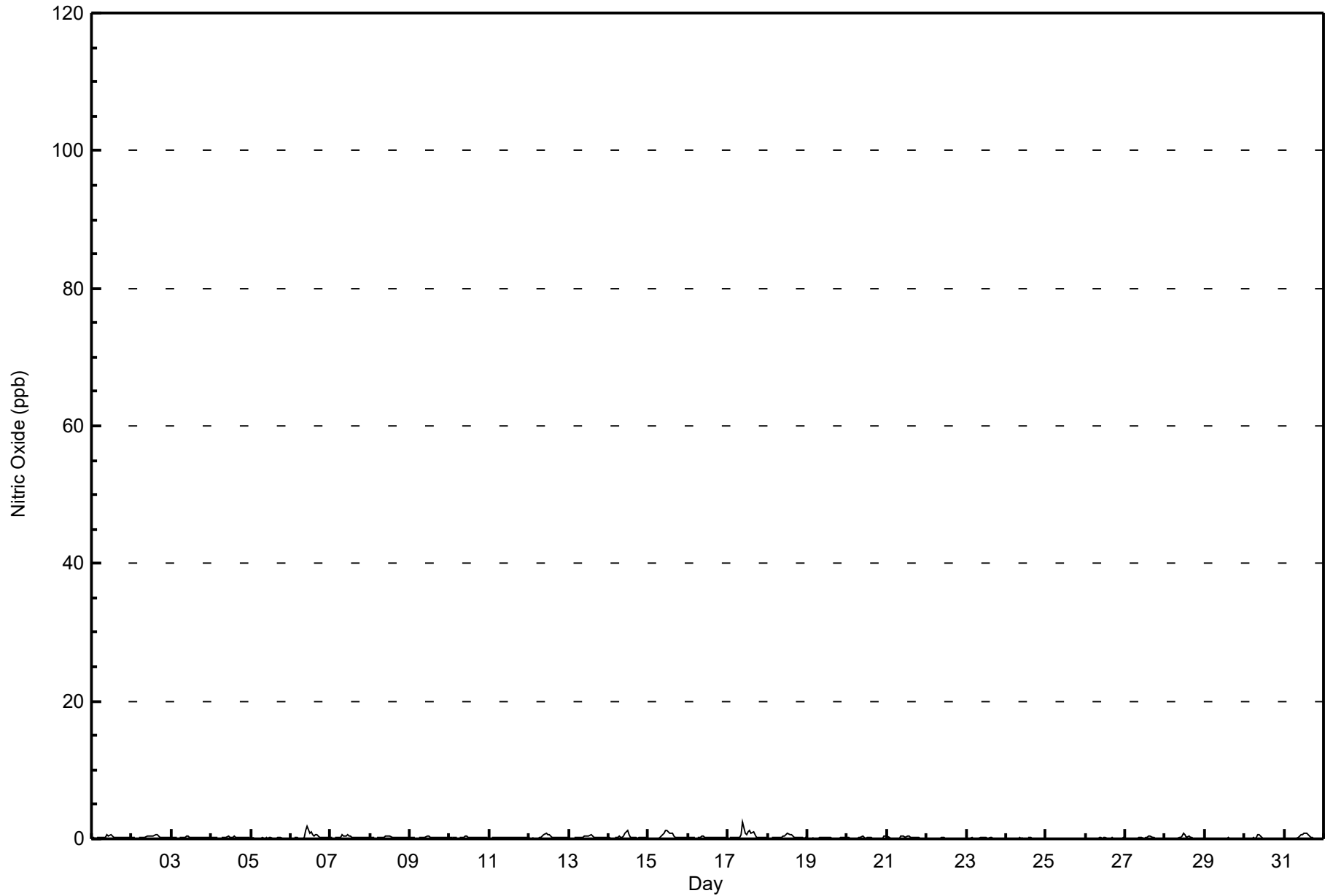
Surmont 2 - October 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0		Hours in Service: 744																								
Maximum Value: 2.5 ppb on Oct 17 10:00		Maximum Daily Average: 0.5 ppb on Oct 17																								
Minimum Value: 0.0 ppb on Oct 23 19:00		Hours of Data: 705																								
Maximum Diurnal Average: 0.4 ppb at hour 10		Hours of Missing Data: 39																								
Monthly Average: 0.19 ppb		Hours of Calibration: 37																								
Minimum Daily Average: 0.1 ppb on Oct 29		Percent Operational Time: 99.7																								
Minimum Diurnal Average: 0.1 ppb at hour 5		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.1 Q ₃ = 0.2 P ₉₀ = 0.4 P ₉₉ = 1.0																								
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Oct	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.4	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	0.2	0.5
2-Oct	0.1	0.1	0.2	Z	0.3	0.2	0.2	0.2	0.2	0.4	0.4	0.4	0.3	0.4	0.6	0.6	0.4	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.6
3-Oct	0.2	0.2	0.2	0.2	Z	0.2	0.2	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	0.2	0.2	0.2	0.4
4-Oct	0.1	0.1	0.1	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.3	0.2	0.4	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.4
5-Oct	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.0	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
6-Oct	0.1	Z	0.1	0.2	0.1	0.1	0.1	0.1	0.2	1.2	1.8	0.8	1.0	0.5	0.4	0.6	0.6	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	1.8
7-Oct	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.5	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	0.2	0.2	0.6
8-Oct	0.2	0.2	0.2	Z	0.2	0.2	0.1	0.2	0.2	0.4	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.5
9-Oct	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.3	0.4	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	0.5
10-Oct	0.2	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.3	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4
11-Oct	Z	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
12-Oct	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.2	0.5	0.6	0.7	0.6	0.6	0.4	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.7
13-Oct	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.3	0.4	0.7	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.7
14-Oct	0.1	0.1	0.1	Z	0.1	0.1	0.3	0.1	0.2	0.4	0.8	1.2	0.7	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.2
15-Oct	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.4	0.9	1.2	1.2	0.9	0.8	0.7	0.4	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	1.2
16-Oct	0.2	0.2	0.2	0.1	0.1	Z	0.1	0.2	0.4	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.3	0.4	
17-Oct	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.7	2.5	0.7	0.7	1.0	1.1	0.8	1.0	0.5	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	2.5
18-Oct	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.6	0.8	0.5	0.6	0.4	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.8
19-Oct	0.1	0.1	Z	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	0.2
20-Oct	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.2	0.2	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.4	0.5	0.5	
21-Oct	0.3	0.2	0.0	0.0	Z	0.1	0.1	0.1	0.5	0.5	0.3	0.3	0.5	0.5	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.5
22-Oct	0.0	0.0	0.0	0.1	0.1	Z	0.0	0.0	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.2
23-Oct	Z	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
24-Oct	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.1	M	M	0.1	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	
25-Oct	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.0	C	C	C	C	C	C	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
26-Oct	0.0	0.1	0.0	Z	0.1	0.1	0.1	0.1	0.3	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3
27-Oct	0.1	0.1	0.0	0.0	Z	0.0	0.1	0.1	0.1	0.2	0.1	0.1	0.3	0.2	0.4	0.5	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5
28-Oct	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.1	0.1	0.1	0.5	0.9	0.5	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.9
29-Oct	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
30-Oct	0.0	Z	0.0	0.0	0.0	0.1	0.0	0.1	0.6	0.7	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.7
31-Oct	0.0	0.0	Z	0.1	0.0	0.0	0.0	0.1	0.2	0.3	0.6	0.5	0.8	0.7	0.5	0.3	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.8
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan C - Calibration M - Maintenance																										



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Surmont 2 - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Surmont 2 - October 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 - October 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	7	4	4	2	6	69	102	52	29	34	51	104	105	82	26	27	704
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	7	4	4	2	6	69	102	52	29	34	51	104	105	82	26	27	704

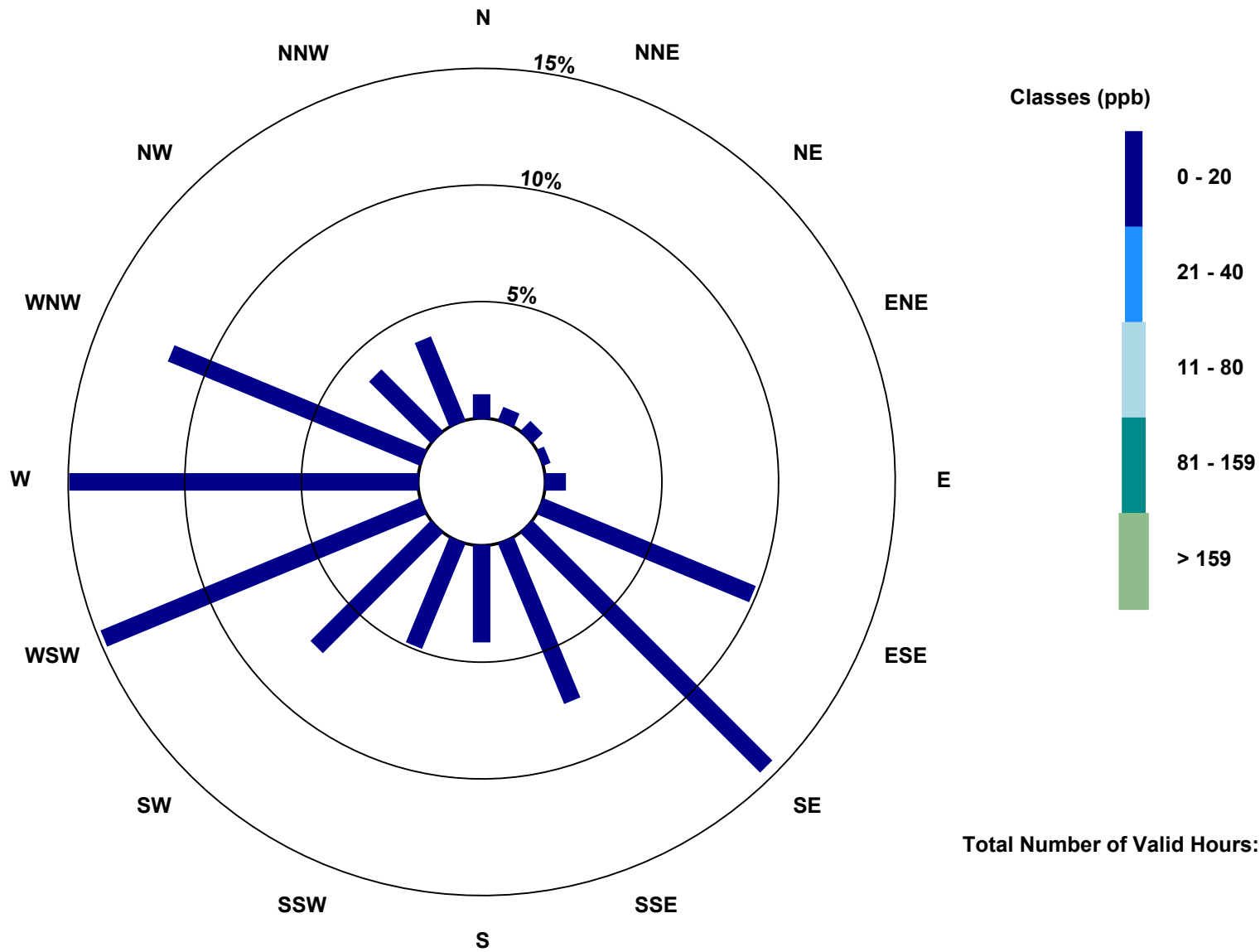
Total Number of Valid Hours: 704

Total Number of Hours: 744

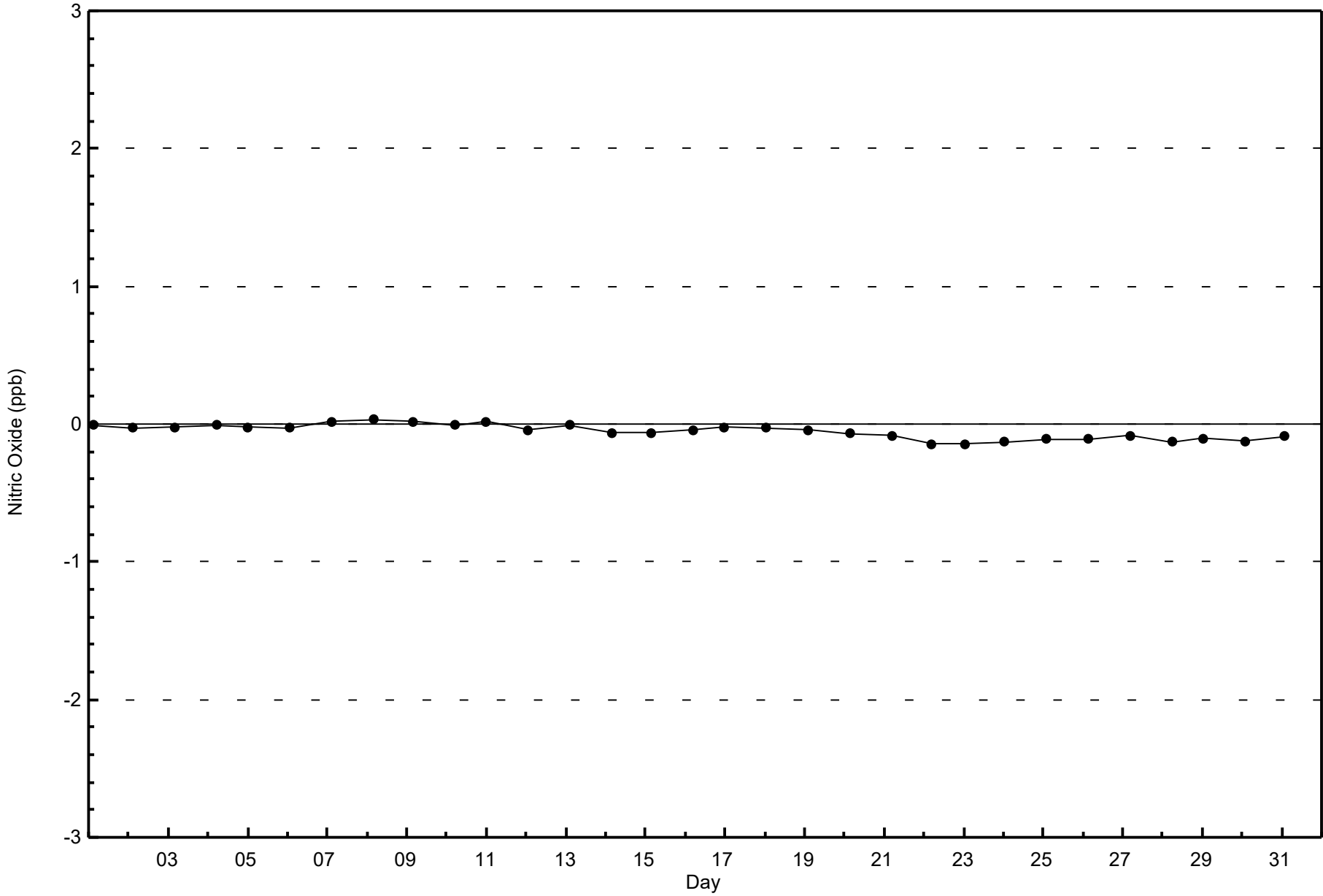


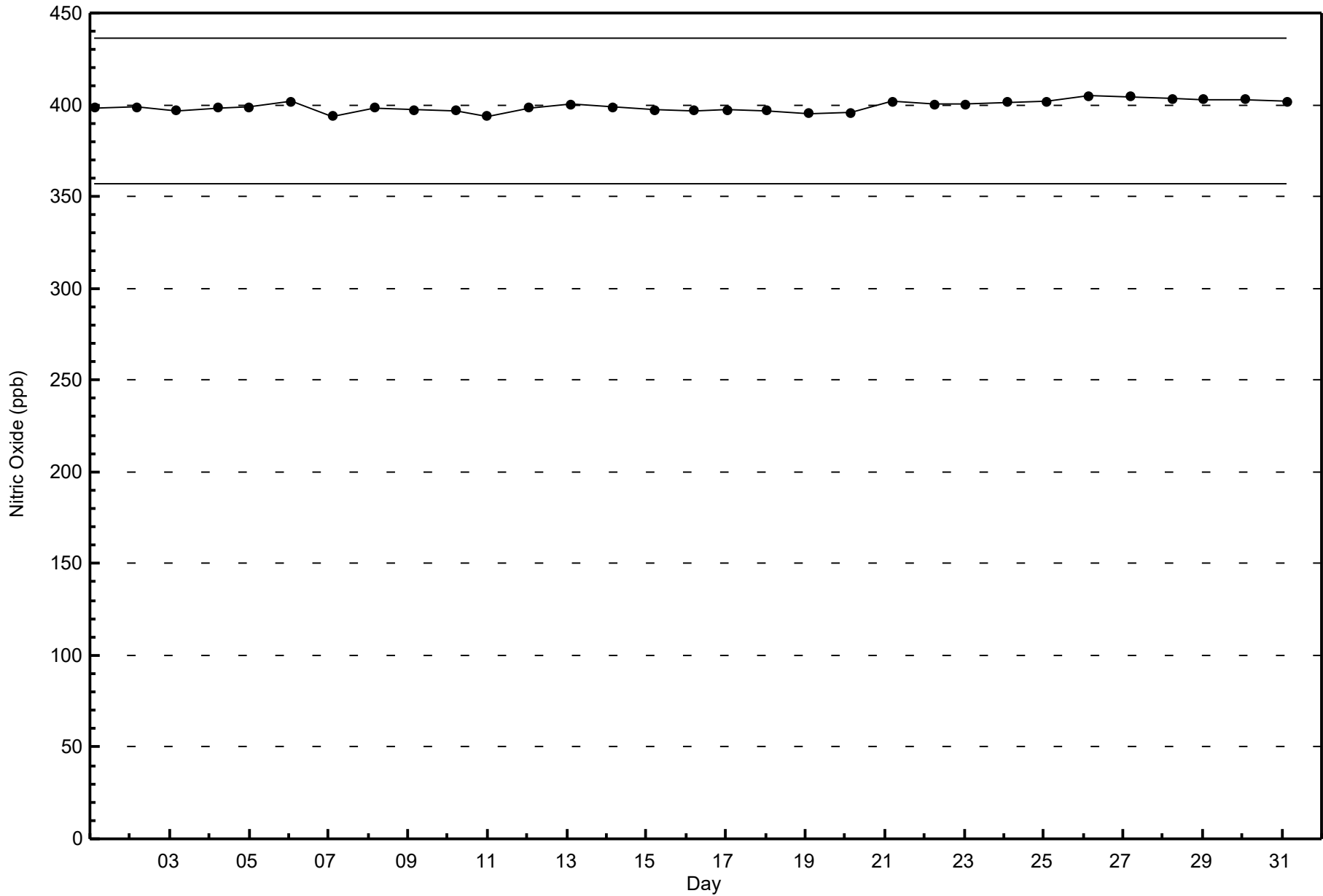
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitric Oxide (NO) - ppb
Surmont 2



Total Number of Valid Hours: 704







Wood Buffalo Environmental Association

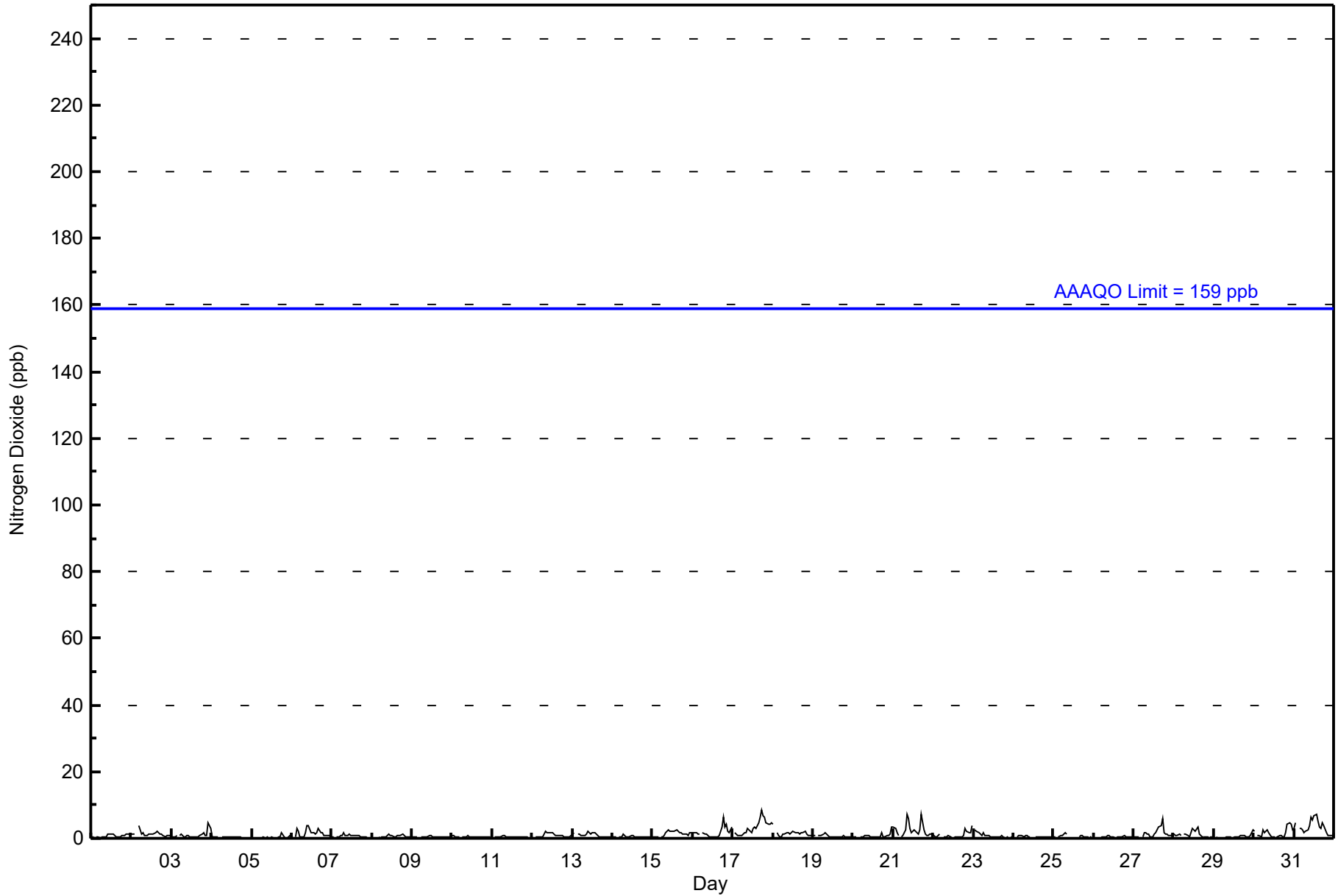
Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

Surmont 2 - October 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 744																Daily Average		Daily Maximum			
Maximum Value: 8.5 ppb on Oct 17 18:00		Maximum Daily Average: 3.4 ppb on Oct 31		Hours of Data: 705																Hours of Missing Data: 39		Hours of Calibration: 37		Percent Operational Time: 99.7			
Minimum Value: 0.1 ppb on Oct 4 20:00		Minimum Daily Average: 0.3 ppb on Oct 5		Hours of Calibration: 37																Hours of Missing Data: 39		Hours of Calibration: 37		Percent Operational Time: 99.7			
Maximum Diurnal Average: 1.6 ppb at hour 18		Minimum Diurnal Average: 0.7 ppb at hour 3		Hours of Calibration: 37																Hours of Missing Data: 39		Hours of Calibration: 37		Percent Operational Time: 99.7			
Monthly Average: 1.10 ppb		Percentiles: P ₁ = 0.1 P ₁₀ = 0.3 Q ₁ = 0.4 Median = 0.6 Q ₃ = 1.3 P ₉₀ = 2.4 P ₉₉ = 6.3		Hours of Calibration: 37																Hours of Missing Data: 39		Hours of Calibration: 37		Percent Operational Time: 99.7			
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Oct	0.4	0.3	Z	0.3	0.3	0.2	0.3	0.3	0.4	0.6	1.1	1.1	1.3	1.1	0.7	0.5	0.5	0.6	0.7	1.0	1.0	1.2	1.2	1.0	0.7	1.3	
2-Oct	1.1	1.2	1.2	Z	4.0	2.5	1.1	1.5	1.0	1.0	1.1	1.2	1.3	1.2	1.9	2.0	1.5	1.3	1.4	0.7	0.3	0.8	0.7	0.8	1.3	4.0	
3-Oct	0.5	0.5	0.4	0.9	Z	0.9	1.4	0.5	0.6	0.7	0.7	0.6	0.6	0.4	0.5	0.4	0.4	0.7	1.3	1.8	0.8	0.9	4.6	2.9	1.0	4.6	
4-Oct	0.6	0.5	0.4	0.4	0.6	Z	0.6	0.5	0.5	0.4	0.5	0.3	0.3	0.3	0.5	0.4	0.3	0.3	0.2	0.1	0.1	0.2	0.1	0.1	0.4	0.6	
5-Oct	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.3	0.2	0.2	0.3	0.1	0.1	0.2	0.3	0.5	1.8	0.5	0.2	0.1	0.3	0.8	0.3	1.8	
6-Oct	0.4	Z	0.6	3.1	2.3	0.5	0.5	0.5	1.5	4.0	3.9	1.8	1.8	1.5	1.3	1.6	3.1	1.9	1.9	0.7	0.8	0.8	0.8	0.6	1.6	4.0	
7-Oct	0.5	0.6	Z	0.6	0.4	0.9	0.7	1.8	0.7	0.8	1.2	0.9	0.9	1.0	0.9	0.7	0.8	0.6	0.5	0.4	0.3	0.2	0.2	0.2	0.7	1.8	
8-Oct	0.2	0.2	0.2	Z	0.3	0.2	0.3	0.3	0.5	0.9	1.1	0.8	0.9	0.6	0.6	0.7	0.8	0.8	1.3	0.8	0.4	0.3	0.3	0.4	0.6	1.3	
9-Oct	0.4	0.4	0.4	0.5	Z	0.6	0.5	0.4	0.4	0.5	0.9	1.0	0.5	0.5	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5	1.0	
10-Oct	1.0	0.9	0.6	0.5	0.4	Z	0.6	0.6	0.5	0.7	0.6	0.6	0.6	0.6	0.5	0.5	0.4	0.4	0.5	0.6	0.5	0.5	0.5	0.5	0.6	1.0	
11-Oct	Z	0.6	0.5	0.6	0.6	0.6	0.7	0.7	0.5	0.6	0.6	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.3	0.3	0.2	0.2	0.5	0.7	
12-Oct	0.3	Z	0.4	0.3	0.3	0.3	0.4	1.4	2.0	1.8	1.8	1.5	1.5	1.1	0.9	0.9	0.8	0.7	0.7	0.6	0.4	0.3	0.4	0.7	0.8	2.0	
13-Oct	0.8	1.8	Z	1.4	1.1	0.8	1.0	1.0	1.2	2.2	1.6	1.4	1.6	1.7	1.2	0.7	0.6	0.5	0.6	0.5	0.4	0.4	0.4	0.4	1.0	2.2	
14-Oct	0.4	0.3	0.3	Z	0.6	0.6	1.1	0.8	0.6	0.6	0.5	0.9	1.0	0.6	0.5	0.6	0.5	0.5	0.4	0.5	0.5	0.5	0.4	0.4	0.6	1.1	
15-Oct	0.4	0.4	0.4	0.4	Z	0.5	0.6	0.8	1.5	2.4	2.2	2.0	2.2	2.3	2.6	2.1	1.7	1.8	1.4	1.4	1.4	1.0	1.7	1.8	1.4	2.6	
16-Oct	1.9	1.8	1.6	1.3	1.3	Z	1.5	1.4	1.2	0.9	0.6	0.6	0.4	0.4	0.6	0.5	0.9	3.3	6.3	3.2	4.1	2.2	1.8	3.5	1.8	6.3	
17-Oct	Z	1.7	1.2	1.0	0.9	0.8	1.1	1.5	1.7	3.1	2.2	1.9	3.1	3.4	3.0	4.8	6.2	8.5	6.9	6.3	4.5	4.4	4.3	4.5	3.3	8.5	
18-Oct	4.2	Z	1.8	0.9	0.6	0.6	1.1	1.4	1.5	1.5	1.2	1.8	2.3	1.6	1.7	1.8	1.4	1.6	1.8	2.2	1.1	0.9	0.7	0.7	1.5	4.2	
19-Oct	0.7	0.7	Z	1.0	0.8	1.0	1.3	1.5	1.1	0.7	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.9	0.3	0.3	0.5	0.5	0.4	0.7	1.5	
20-Oct	0.4	0.5	0.4	Z	0.5	0.4	0.4	1.0	0.8	0.7	0.4	0.3	0.4	0.4	0.4	0.3	0.6	1.8	0.4	0.3	1.0	1.0	1.4	3.4	0.7	3.4	
21-Oct	3.5	2.9	1.7	0.7	Z	0.4	0.9	2.5	7.1	5.8	3.0	1.7	2.4	2.3	1.8	1.2	2.7	7.3	2.7	1.2	0.8	0.9	1.1	1.4	2.4	7.3	
22-Oct	0.9	0.4	0.3	0.8	1.2	Z	0.4	0.4	0.5	0.8	0.3	0.1	0.2	0.3	0.3	0.5	0.4	0.4	0.7	3.0	2.2	1.9	1.8	4.0	0.9	4.0	
23-Oct	Z	2.7	2.1	1.7	1.1	1.0	1.5	0.8	1.0	0.7	0.5	0.3	0.4	0.3	0.4	0.4	0.6	0.7	0.4	0.2	0.3	0.2	0.2	0.6	0.8	2.7	
24-Oct	0.3	Z	0.4	0.9	0.7	0.7	0.6	0.8	0.8	0.5	0.5	M	M	0.5	0.5	0.6	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.3	0.5	0.9	
25-Oct	0.5	0.6	Z	0.6	0.7	0.8	1.2	1.6	1.1	C	C	C	C	C	C	0.6	0.7	0.7	0.4	0.4	0.6	0.2	0.3	0.2	--	1.6	
26-Oct	0.2	0.1	0.2	Z	0.2	0.3	0.3	0.3	1.0	0.7	0.4	0.4	0.3	0.2	0.3	0.3	0.5	0.6	0.7	0.5	0.5	0.6	0.5	0.5	0.4	1.0	
27-Oct	0.3	0.4	0.4	0.4	Z	0.5	1.9	1.6	1.3	1.3	0.6	0.4	1.4	1.6	2.6	3.3	3.8	5.8	1.7	1.2	1.2	1.0	0.9	1.1	1.5	5.8	
28-Oct	1.3	1.0	0.7	1.2	0.9	Z	1.4	1.2	0.8	0.6	1.7	3.0	2.6	2.1	3.2	1.1	0.7	0.5	0.4	0.3	0.3	0.2	0.3	0.3	1.1	3.2	
29-Oct	Z	0.3	0.2	0.2	0.2	0.2	0.2	0.5	0.3	0.3	0.3	0.2	0.3	0.4	0.4	0.4	0.9	1.0	0.9	0.5	0.4	0.4	1.0	2.4	0.5	2.4	
30-Oct	2.1	Z	0.8	0.7	0.4	2.5	1.5	2.1	2.6	1.8	0.5	0.3	0.3	0.2	0.4	0.9	0.8	0.5	0.3	1.9	4.2	4.7	4.1	2.6	1.6	4.7	
31-Oct	2.9	4.6	Z	2.8	2.8	2.6	1.9	2.2	2.7	4.0	6.2	5.4	6.9	7.4	4.9	3.2	3.0	4.8	3.9	1.8	1.0	0.9	1.0	1.0	3.4	7.4	
																								Diurnal Average		Diurnal Maximum	
																								1.0		4.2	
																								1.0		4.6	
																								0.7		2.1	
																								0.9		3.1	
																								0.9		4.0	
																								0.8		2.6	
																								0.9		1.9	
																								1.0		2.5	
																								1.2		7.1	
																								1.4		5.8	
																								1.2		6.2	
																								1.1		5.4	
																								1.3		6.9	
																								1.2		7.4	
																								1.1		4.9	
																								1.1		4.8	
																								1.2		6.2	
																								1.6		8.5	
																								1.4		6.9	
																								1.1		6.3	
																								1.0		4.5	
																								0.9		4.7	
																								1.1		4.6	
																								1.2		4.5	

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Surmont 2 - October 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 - October 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	7	4	4	2	6	69	102	52	29	34	51	104	105	82	26	27	704
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	7	4	4	2	6	69	102	52	29	34	51	104	105	82	26	27	704

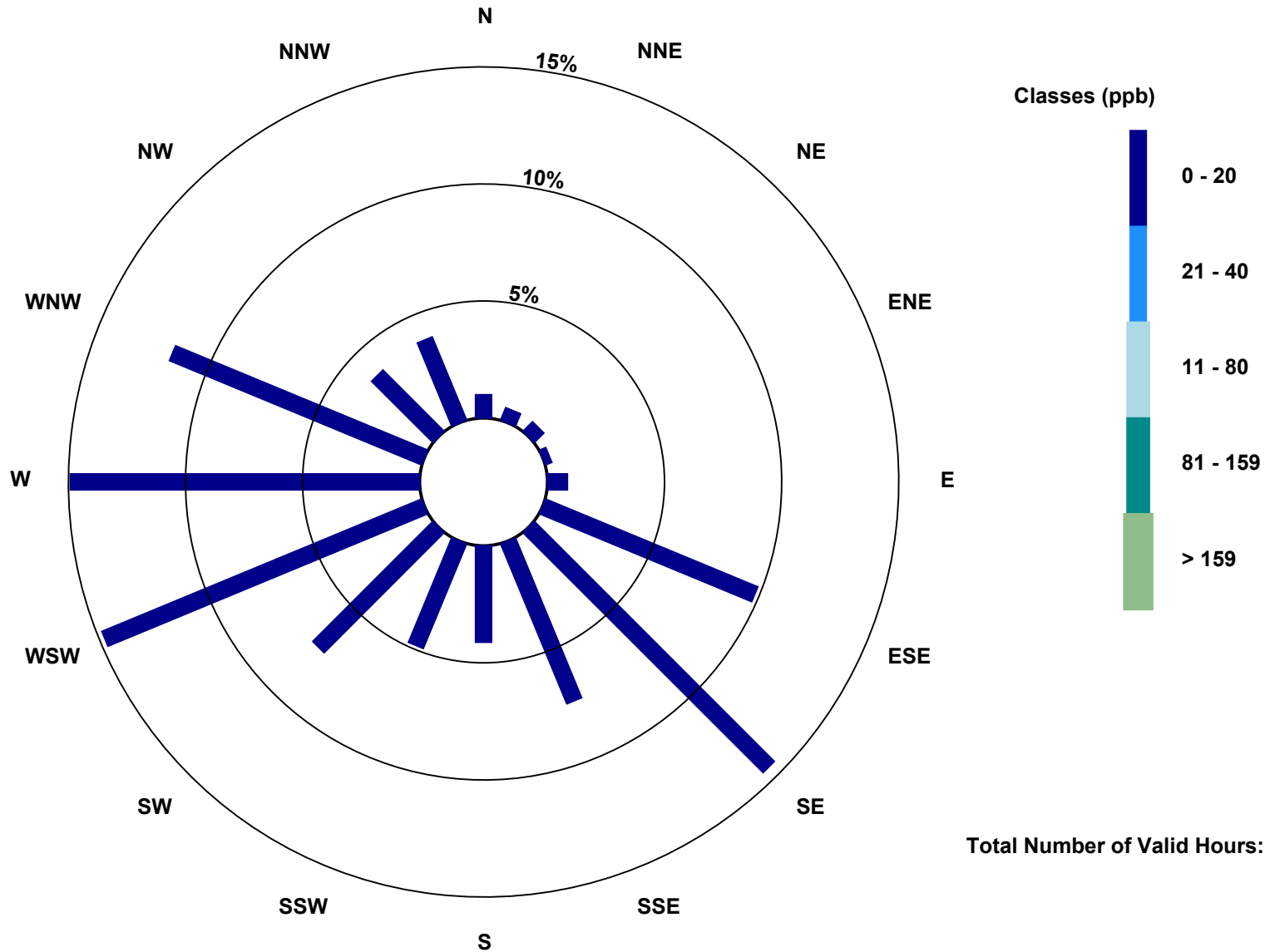
Total Number of Valid Hours: 704

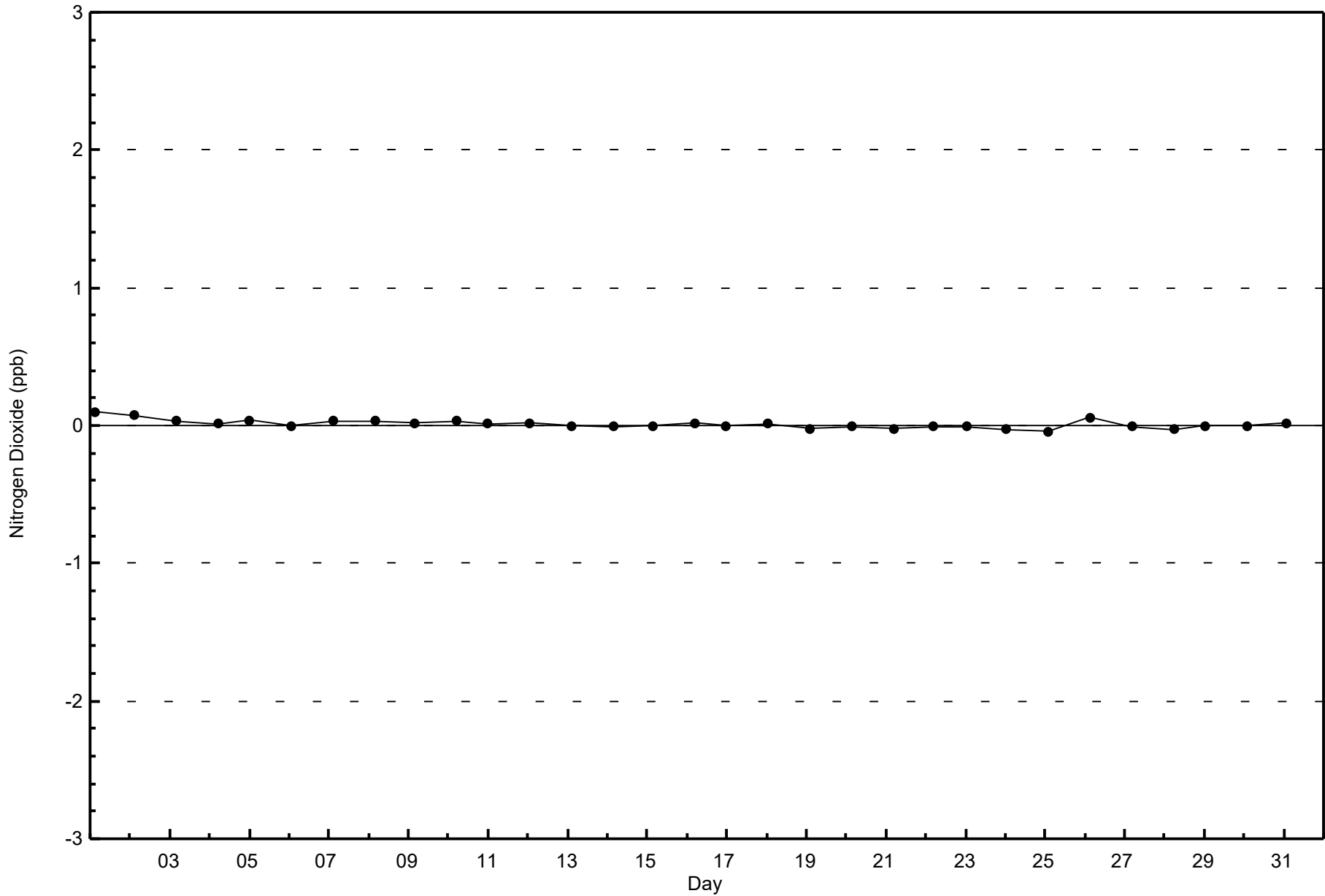
Total Number of Hours: 744

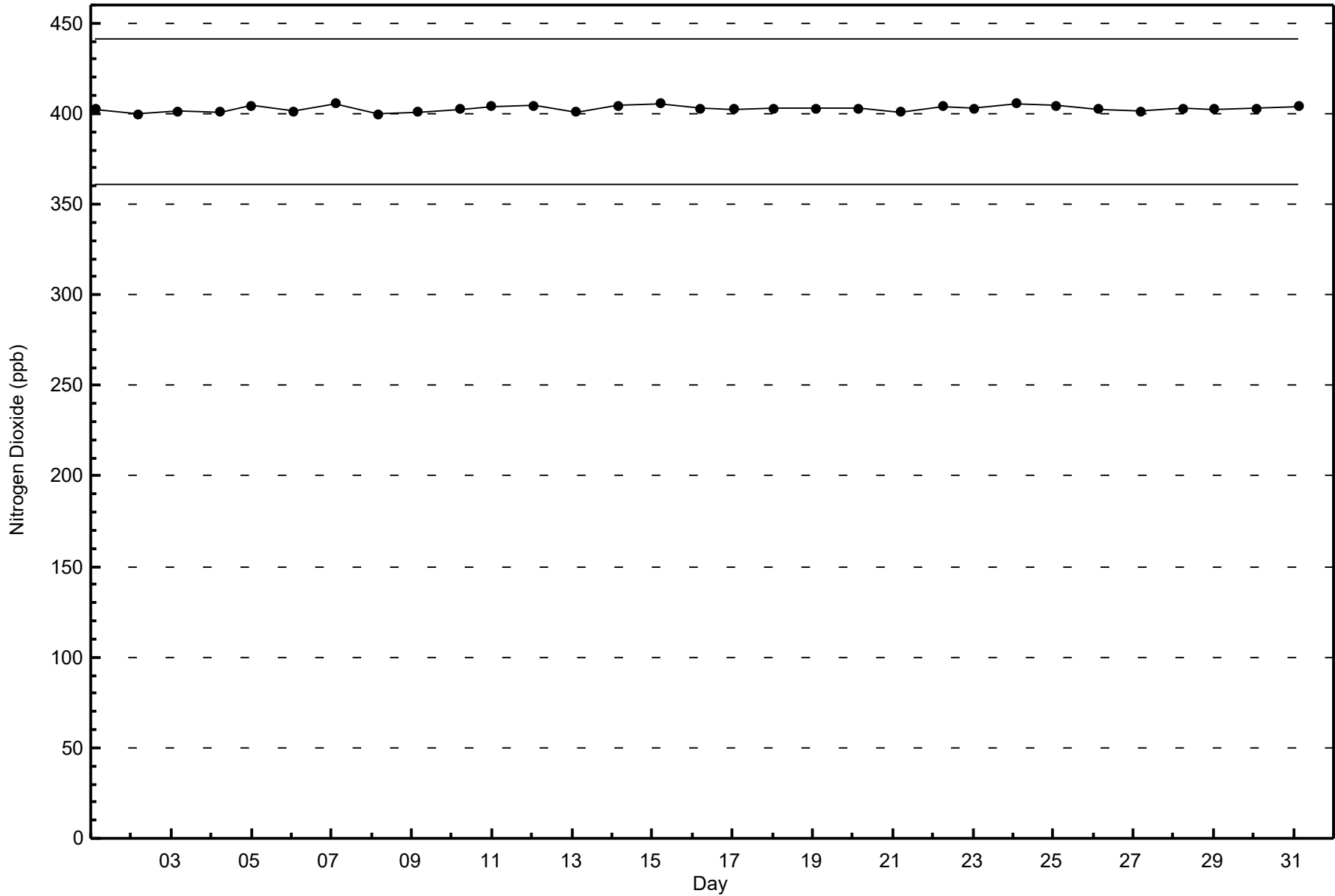


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitrogen Dioxide (NO₂) - ppb
Surmont 2









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_x) - ppb

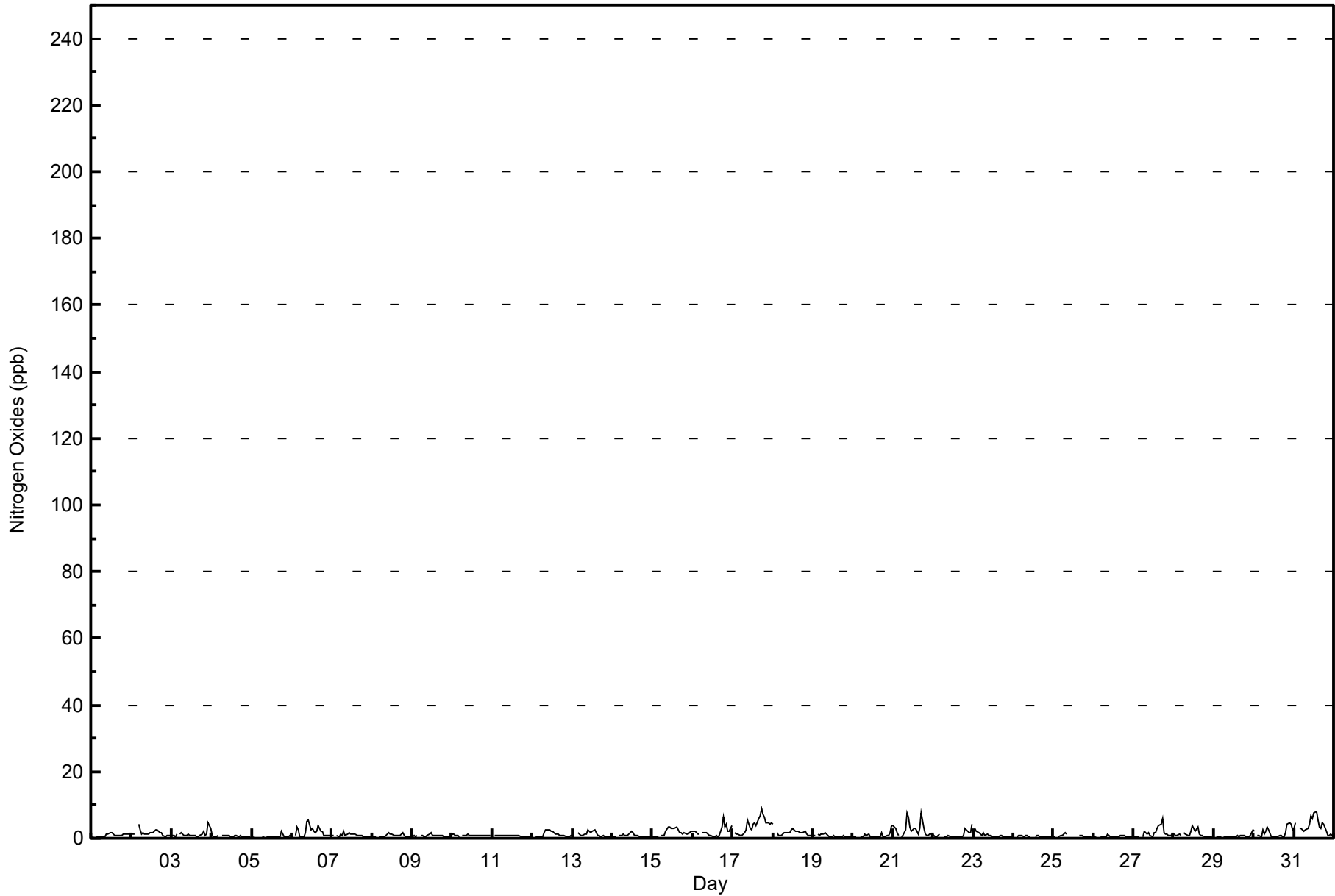
Surmont 2 - October 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 744														Daily Average		Daily Maximum					
Maximum Value: 8.8 ppb on Oct 17 18:00		Maximum Daily Average: 3.8 ppb on Oct 17		Hours of Data: 705														Hours of Missing Data: 39		Hours of Calibration: 37		Percent Operational Time: 99.7					
Minimum Value: 0.2 ppb on Oct 5 04:00		Minimum Daily Average: 0.4 ppb on Oct 5		Hours of Calibration: 37														Hours of Missing Data: 39		Percent Operational Time: 99.7							
Maximum Diurnal Average: 1.8 ppb at hour 10		Minimum Diurnal Average: 0.8 ppb at hour 3		Percentiles: P ₁ = 0.2 P ₁₀ = 0.4 Q ₁ = 0.5 Median = 0.8 Q ₃ = 1.6 P ₉₀ = 2.8 P ₉₉ = 6.7														Hours of Calibration: 37		Percent Operational Time: 99.7							
Monthly Average: 1.29 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-Oct	0.5	0.4	Z	0.4	0.4	0.3	0.4	0.4	0.5	1.1	1.5	1.6	1.8	1.4	0.9	0.7	0.7	0.7	0.8	1.1	1.1	1.3	1.3	1.1	0.9	1.8	
2-Oct	1.2	1.3	1.4	Z	4.3	2.7	1.3	1.7	1.2	1.4	1.5	1.6	1.6	1.6	2.5	2.6	1.9	1.6	1.6	0.9	0.6	1.0	0.9	1.0	1.6	4.3	
3-Oct	0.7	0.7	0.6	1.1	Z	1.1	1.6	0.8	0.8	1.0	1.1	0.9	0.8	0.6	0.7	0.6	0.6	0.9	1.5	2.0	1.0	1.1	4.8	3.1	1.2	4.8	
4-Oct	0.7	0.6	0.5	0.6	0.8	Z	0.8	0.7	0.7	0.7	0.8	0.5	0.6	0.5	0.9	0.7	0.6	0.6	0.4	0.3	0.3	0.3	0.2	0.2	0.6	0.9	
5-Oct	Z	0.3	0.2	0.2	0.2	Z	0.2	0.2	0.5	0.2	0.4	0.3	0.4	0.2	0.2	0.3	0.4	0.6	1.9	0.6	0.3	0.2	0.4	0.9	0.4	1.9	
6-Oct	0.5	Z	0.7	3.3	2.4	0.6	0.6	0.6	1.7	5.2	5.7	2.6	2.8	2.0	1.7	2.2	3.7	2.1	2.1	0.9	1.0	1.0	1.0	0.8	2.0	5.7	
7-Oct	0.7	0.8	Z	0.8	0.6	1.1	0.9	2.3	1.0	1.2	1.8	1.3	1.2	1.3	1.1	0.9	1.0	0.8	0.7	0.6	0.5	0.4	0.4	0.4	0.9	2.3	
8-Oct	0.4	0.4	0.4	Z	0.5	0.4	0.4	0.5	0.7	1.3	1.6	1.2	1.2	0.9	0.8	0.9	1.0	1.0	1.5	1.0	0.6	0.5	0.5	0.6	0.8	1.6	
9-Oct	0.6	0.6	0.6	0.7	Z	0.8	0.7	0.6	0.6	0.8	1.3	1.5	0.8	0.7	0.6	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.7	1.5	
10-Oct	1.2	1.1	0.8	0.7	0.6	Z	0.8	0.8	0.8	1.1	0.9	0.9	0.9	0.9	0.7	0.7	0.6	0.6	0.7	0.8	0.7	0.7	0.7	0.7	0.8	1.2	
11-Oct	Z	0.8	0.7	0.7	0.7	0.7	0.8	0.8	0.7	0.8	0.8	0.7	0.7	0.6	0.6	0.7	0.7	0.6	0.5	0.5	0.4	0.4	0.3	0.3	0.6	0.8	
12-Oct	0.4	Z	0.5	0.4	0.4	0.4	0.5	1.6	2.5	2.4	2.5	2.1	2.1	1.5	1.1	1.2	1.0	0.8	0.8	0.7	0.5	0.4	0.5	0.8	1.1	2.5	
13-Oct	0.9	1.9	Z	1.5	1.2	0.9	1.1	1.1	1.4	2.5	1.9	1.7	2.0	2.4	1.6	0.9	0.7	0.6	0.7	0.6	0.5	0.5	0.5	0.5	1.2	2.5	
14-Oct	0.5	0.4	0.4	Z	0.7	0.7	1.4	0.9	0.8	1.0	1.3	2.1	1.7	0.9	0.7	0.7	0.6	0.6	0.6	0.5	0.6	0.6	0.5	0.5	0.8	2.1	
15-Oct	0.5	0.5	0.5	0.5	Z	0.6	0.7	0.9	1.9	3.3	3.4	3.2	3.1	3.1	3.3	2.5	1.9	1.9	1.5	1.5	1.5	1.2	1.9	2.0	1.8	3.4	
16-Oct	2.1	2.0	1.8	1.4	1.4	Z	1.6	1.6	1.6	1.2	0.8	0.8	0.6	0.6	0.7	0.6	1.0	3.4	6.4	3.4	4.2	2.3	2.0	3.8	2.0	6.4	
17-Oct	Z	1.8	1.3	1.1	1.0	0.9	1.2	1.7	2.4	5.6	2.9	2.6	4.1	4.5	3.8	5.8	6.7	8.8	7.1	6.4	4.6	4.5	4.4	4.6	3.8	8.8	
18-Oct	4.3	Z	1.9	1.0	0.7	0.7	1.2	1.5	1.7	1.8	1.6	2.4	3.1	2.1	2.3	2.2	1.6	1.8	1.9	2.3	1.2	1.0	0.8	0.8	1.7	4.3	
19-Oct	0.8	0.8	Z	1.1	0.9	1.1	1.4	1.6	1.3	0.9	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	1.0	0.4	0.4	0.6	0.6	0.5	0.8	1.6	
20-Oct	0.5	0.6	0.5	Z	0.6	0.5	0.5	1.2	1.0	1.1	0.5	0.4	0.5	0.5	0.5	0.4	0.6	1.9	0.4	0.3	1.0	1.0	1.8	3.9	0.9	3.9	
21-Oct	3.8	3.1	1.7	0.7	Z	0.5	1.0	2.6	7.6	6.3	3.3	2.0	2.9	2.8	2.0	1.3	2.9	7.5	2.8	1.3	0.9	1.0	1.2	1.4	2.6	7.6	
22-Oct	0.9	0.4	0.3	0.9	1.3	Z	0.4	0.4	0.6	1.0	0.4	0.2	0.3	0.4	0.3	0.5	0.5	0.5	0.8	3.1	2.3	1.9	1.8	4.1	1.0	4.1	
23-Oct	Z	2.8	2.2	1.8	1.1	1.0	1.6	0.9	1.3	0.9	0.7	0.5	0.5	0.4	0.5	0.5	0.7	0.7	0.4	0.2	0.3	0.2	0.2	0.6	0.9	2.8	
24-Oct	0.3	Z	0.4	0.9	0.7	0.7	0.6	0.8	1.0	0.6	0.6	M	M	0.6	0.6	0.8	0.4	0.4	0.4	0.3	0.3	0.4	0.5	0.3	0.5	1.0	
25-Oct	0.5	0.6	Z	0.6	0.7	0.8	1.2	1.7	1.1	C	C	C	C	C	C	0.7	0.8	0.7	0.4	0.4	0.6	0.2	0.3	0.2	--	1.7	
26-Oct	0.2	0.2	0.2	Z	0.3	0.4	0.4	0.4	1.3	0.9	0.5	0.5	0.5	0.3	0.4	0.4	0.6	0.7	0.7	0.5	0.5	0.6	0.5	0.6	0.5	1.3	
27-Oct	0.4	0.5	0.4	0.4	Z	0.5	2.0	1.7	1.4	1.5	0.7	0.5	1.7	1.8	3.0	3.8	4.1	6.0	1.7	1.2	1.2	1.0	0.9	1.1	1.6	6.0	
28-Oct	1.3	1.0	0.7	1.2	0.9	Z	1.5	1.3	0.9	0.7	2.2	3.9	3.1	2.3	3.5	1.3	0.9	0.6	0.5	0.4	0.3	0.3	0.3	0.4	1.3	3.9	
29-Oct	Z	0.3	0.2	0.2	0.2	0.2	0.2	0.6	0.3	0.3	0.4	0.3	0.3	0.5	0.6	0.5	1.0	1.0	0.9	0.5	0.4	0.4	1.0	2.4	0.6	2.4	
30-Oct	2.1	Z	0.8	0.7	0.4	2.6	1.5	2.2	3.2	2.5	0.6	0.4	0.3	0.2	0.5	1.0	0.8	0.5	0.3	1.9	4.2	4.8	4.1	2.6	1.7	4.8	
31-Oct	2.9	4.6	Z	2.9	2.8	2.6	1.9	2.3	2.9	4.3	6.8	5.9	7.7	8.1	5.4	3.5	3.1	4.9	4.0	1.9	1.0	0.9	1.1	1.0	3.6	8.1	
1.1																								Diurnal Average			
4.3																								Diurnal Maximum			
Z - zerospan		C - Calibration				M - Maintenance																					



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Surmont 2 - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Surmont 2 - October 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 - October 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	7	4	4	2	6	69	102	52	29	34	51	104	105	82	26	27	704
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	7	4	4	2	6	69	102	52	29	34	51	104	105	82	26	27	704

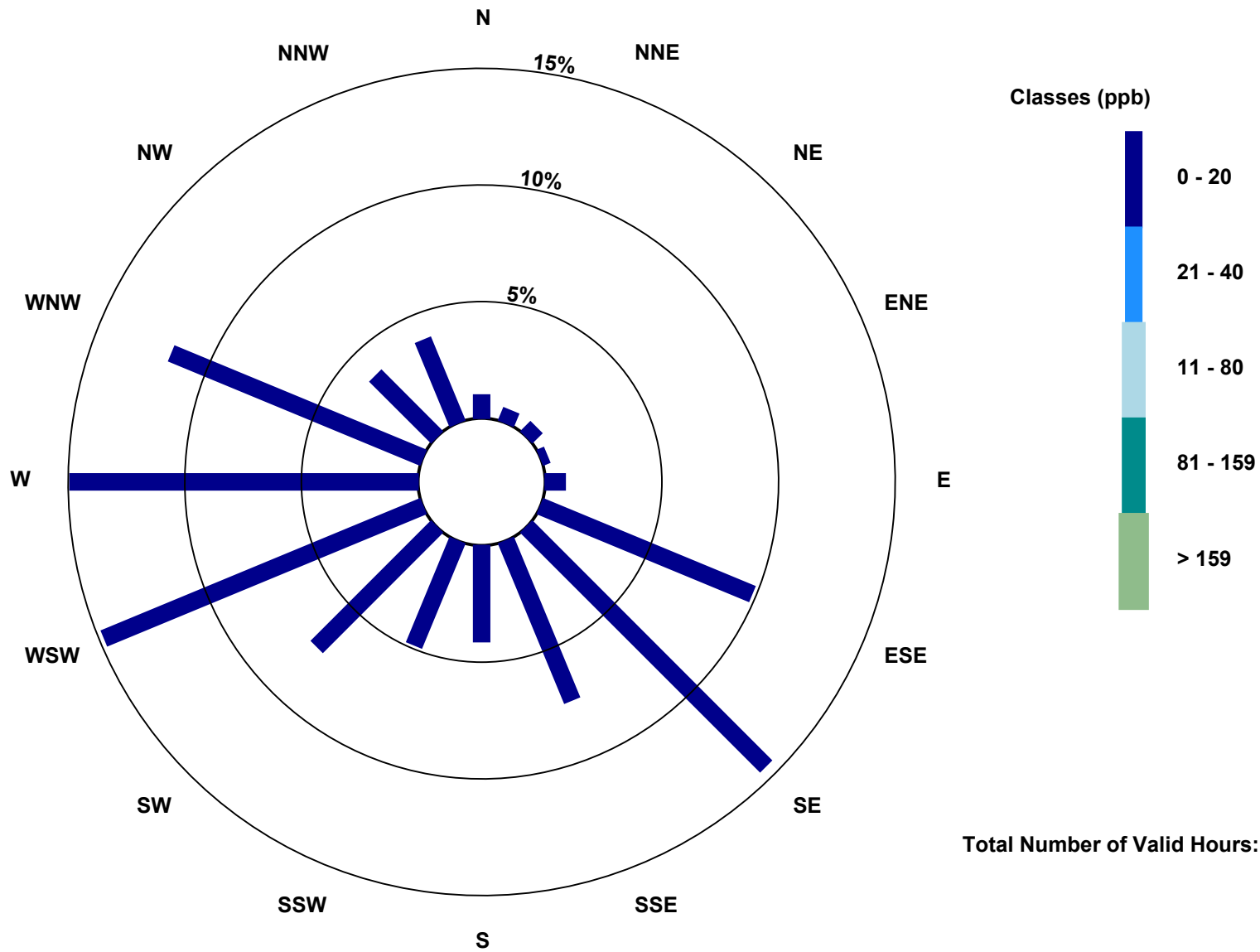
Total Number of Valid Hours: 704

Total Number of Hours: 744

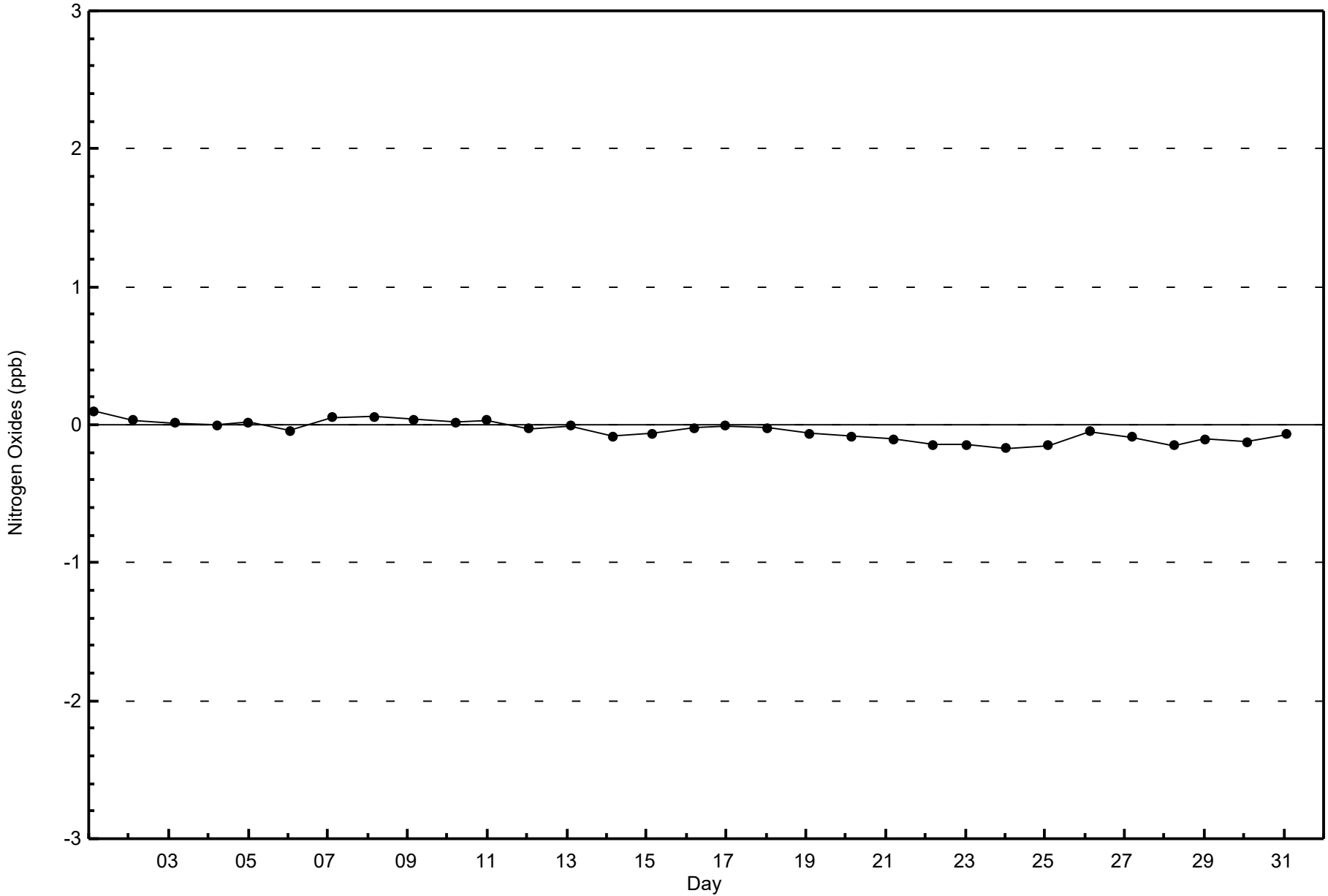


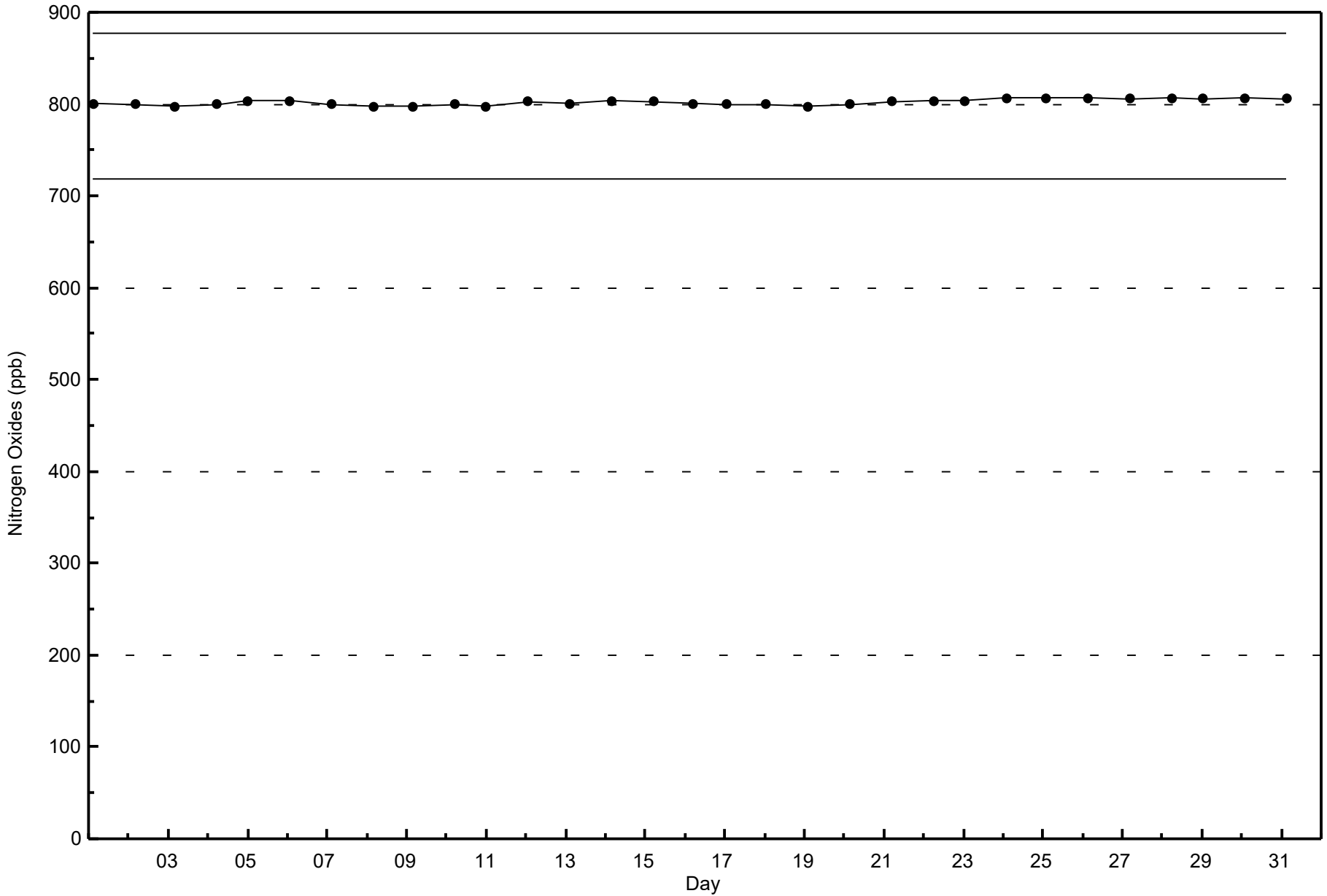
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitrogen Oxides (NO_x) - ppb
Surmont 2



Total Number of Valid Hours: 704



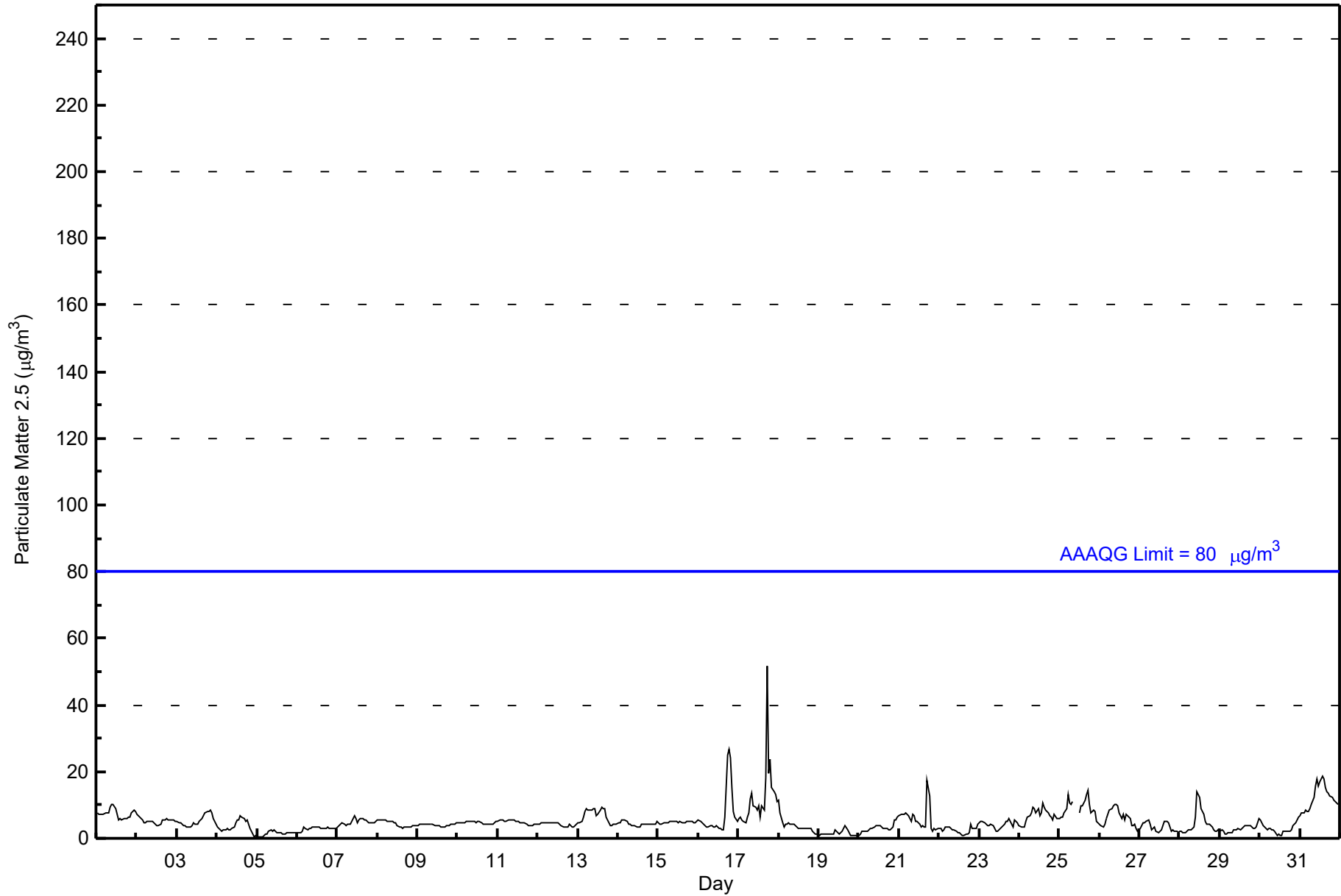




Summary of Hour Averages

Surmont 2 - October 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 744																	744																											
Maximum Value: 51.5 µg/m ³ on Oct 17 18:00		Maximum Daily Average: 12.3 µg/m ³ on Oct 17																	Hours of Data: 741																													
Minimum Value: 0.4 µg/m ³ on Oct 5 03:00		Minimum Daily Average: 1.4 µg/m ³ on Oct 5																	Hours of Missing Data: 3																													
Maximum Diurnal Average: 7.6 µg/m ³ at hour 18		Minimum Diurnal Average: 4.2 µg/m ³ at hour 3																	Hours of Calibration: 3																													
Monthly Average: 5.05 µg/m ³		Percentiles: P ₁ = 0.8 P ₁₀ = 2.0 Q ₁ = 3.1 Median = 4.3 Q ₃ = 5.7 P ₉₀ = 8.6 P ₉₉ = 18.1																	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-Oct	7.6	7.2	7.0	7.1	7.2	7.5	7.6	7.8	9.2	10.2	10.1	9.0	7.0	5.5	6.0	5.7	6.0	6.1	6.1	6.3	6.5	7.7	8.6	8.1	7.4	10.2																						
2-Oct	7.4	6.7	6.2	5.4	4.8	4.7	5.0	5.3	5.1	5.0	4.7	4.2	4.0	3.9	4.3	5.6	5.4	5.6	5.8	5.6	5.6	5.6	5.4	5.1	5.3	7.4																						
3-Oct	4.9	4.8	4.5	4.3	3.9	3.9	3.6	3.5	3.3	3.7	4.9	4.4	4.4	5.2	5.3	5.9	6.9	7.5	7.9	8.2	8.3	7.5	6.0	4.4	5.3	8.3																						
4-Oct	3.6	2.8	2.4	2.1	2.6	2.7	2.8	2.5	2.5	3.1	3.2	4.5	5.3	5.7	6.7	6.4	6.1	5.3	5.4	4.1	2.8	1.1	0.6	0.7	3.5	6.7																						
5-Oct	0.5	0.4	0.4	0.4	0.8	1.1	1.1	1.9	2.4	2.2	2.3	2.1	1.5	1.5	1.6	1.4	1.3	1.3	1.5	1.5	1.6	1.6	1.7	1.8	1.4	2.4																						
6-Oct	1.7	1.8	1.8	2.3	3.4	2.9	2.6	3.0	3.1	3.4	3.4	3.2	3.3	3.2	3.2	3.1	3.0	3.3	3.0	3.0	3.0	2.9	3.0	2.9	3.4	3.4																						
7-Oct	3.6	3.8	4.3	4.5	4.0	3.8	4.1	4.3	4.3	5.8	6.8	6.0	4.8	5.7	6.0	5.8	5.5	5.3	5.2	4.7	4.6	4.7	4.8	5.3	4.9	6.8																						
8-Oct	5.3	5.4	5.7	5.6	5.7	5.5	5.1	5.1	5.0	5.0	4.7	4.5	3.8	3.5	3.2	3.2	3.3	3.4	3.4	3.5	3.5	3.7	3.9	4.0	4.4	5.7																						
9-Oct	4.0	4.0	4.2	4.3	4.2	4.3	4.1	4.2	4.2	4.1	3.9	3.8	3.8	3.8	3.6	3.5	3.6	3.7	3.9	4.0	4.1	4.1	4.3	4.5	4.0	4.5																						
10-Oct	4.5	4.6	4.7	4.7	4.7	5.0	5.2	5.2	5.2	5.0	4.9	4.9	4.9	5.0	4.7	4.4	4.3	4.3	4.3	4.3	4.3	4.4	4.6	4.9	4.7	5.2																						
11-Oct	5.2	5.4	5.6	5.5	5.2	5.2	5.4	5.6	5.6	5.5	5.4	5.1	4.9	4.7	4.6	4.8	4.8	4.2	3.9	4.0	4.0	4.0	4.0	4.1	4.9	5.6																						
12-Oct	4.1	4.3	4.6	4.6	4.6	4.6	4.7	4.6	4.7	4.8	4.7	4.5	4.5	4.2	3.7	3.5	3.5	3.4	3.3	4.3	3.4	3.3	3.8	4.2	4.2	4.8																						
13-Oct	4.5	4.8	5.0	6.2	8.0	8.8	8.6	8.3	8.3	9.0	8.8	6.7	7.1	8.4	9.3	8.8	9.0	6.4	4.6	3.6	3.6	4.0	4.1	4.3	6.7	9.3																						
14-Oct	4.5	4.8	5.3	5.3	5.4	4.9	4.3	4.2	3.9	3.8	3.7	3.4	3.3	3.5	4.1	4.4	4.3	4.2	4.2	4.0	4.1	4.2	4.3	4.9	4.3	5.4																						
15-Oct	4.5	4.3	4.3	4.7	4.8	4.8	4.8	5.0	5.1	5.0	5.1	5.0	4.9	5.0	4.8	4.6	4.6	4.9	5.1	5.0	4.9	4.6	4.8	5.0	4.8	5.1																						
16-Oct	5.3	5.1	4.5	4.4	3.8	3.5	3.5	3.6	3.6	3.6	3.4	3.6	2.9	3.0	2.6	2.5	6.2	25.1	26.8	24.1	15.2	8.0	6.4	5.3	7.3	26.8																						
17-Oct	5.9	6.5	5.6	5.0	4.7	6.4	7.6	11.7	13.6	9.9	9.2	8.3	9.8	6.4	9.7	8.4	18.3	51.5	19.6	23.6	15.3	13.9	13.2	11.1	12.3	51.5																						
18-Oct	11.3	7.4	4.8	3.6	4.1	4.1	4.7	4.4	4.2	4.2	3.9	3.4	3.2	3.1	3.0	3.0	3.1	3.2	3.1	2.8	2.2	1.8	1.4	1.1	3.8	11.3																						
19-Oct	1.0	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.1	1.3	2.4	1.8	1.3	1.8	2.2	3.1	3.9	2.6	1.6	0.9	0.9	0.7	0.8	0.9	1.5	3.9																						
20-Oct	0.9	1.4	2.0	2.1	2.3	2.3	2.6	2.8	3.0	3.4	3.7	3.7	3.7	3.7	3.0	3.0	3.1	2.9	2.6	2.5	3.4	5.6	5.4	6.2	3.1	6.2																						
21-Oct	6.8	7.2	7.0	7.0	7.5	7.1	6.6	5.2	7.2	6.7	5.2	4.9	4.3	3.6	3.9	3.6	3.5	17.5	12.6	3.0	2.1	2.8	2.7	2.8	5.9	17.5																						
22-Oct	3.2	3.0	2.2	2.5	3.4	3.3	3.2	2.8	2.4	2.7	2.0	1.7	1.5	1.3	1.0	0.9	1.3	1.4	1.6	4.1	3.0	2.8	3.2	4.4	2.5	4.4																						
23-Oct	4.5	5.0	5.1	4.5	4.2	3.9	4.0	4.3	3.9	3.0	2.3	2.1	2.7	2.8	4.0	4.3	4.9	5.0	5.9	4.2	3.4	5.3	5.3	4.6	4.1	5.9																						
24-Oct	3.7	3.4	3.3	3.5	5.3	6.6	6.6	7.5	9.2	8.9	7.7	8.7	6.7	7.7	10.7	9.5	8.4	7.4	6.8	6.2	5.7	7.1	5.9	6.0	6.8	10.7																						
25-Oct	5.9	6.2	6.3	7.4	9.1	13.3	10.8	10.1	11.0	C	C	C	7.4	9.5	9.7	11.4	13.0	14.4	10.0	7.7	8.6	8.0	5.0	4.5	9.0	14.4																						
26-Oct	4.4	3.6	3.4	4.3	6.0	7.3	8.5	8.7	9.7	10.3	10.1	10.0	7.6	6.1	7.1	5.6	7.1	6.8	5.8	3.6	3.7	4.1	2.8	2.3	6.2	10.3																						
27-Oct	3.0	4.0	4.6	4.5	5.1	5.6	4.1	2.4	3.2	3.5	2.2	1.6	1.9	2.4	3.9	5.0	5.0	4.9	3.5	2.2	2.4	2.1	2.1	1.7	3.4	5.6																						
28-Oct	2.0	2.2	1.6	1.9	2.2	2.4	2.6	2.7	3.3	6.2	13.9	13.3	12.2	9.1	7.2	5.1	4.2	4.1	4.0	3.2	2.4	2.1	2.3	2.3	4.7	13.9																						
29-Oct	2.2	2.4	2.0	1.3	1.3	1.5	1.7	1.8	2.6	2.5	2.4	3.0	2.7	3.0	3.4	3.6	3.8	3.7	3.6	3.3	3.0	3.0	3.5	5.8	2.8	5.8																						
30-Oct	5.4	4.5	3.8	3.2	2.4	2.8	2.9	2.5	2.5	2.0	1.0	1.1	1.0	1.0	2.0	2.2	2.2	2.1	2.1	2.5	3.6	4.8	5.6	6.3	2.9	6.3																						
31-Oct	6.9	7.5	7.4	8.3	8.2	7.9	8.7	10.3	12.1	15.6	17.7	15.9	17.1	18.6	17.6	15.4	14.0	13.6	12.9	12.3	11.3	11.0	10.5	10.3	12.1	18.6																						
																								4.5	4.4	4.2	4.2	4.5	4.8	4.8	4.9	5.3	5.3	5.5	5.1	5.0	4.9	5.2	5.1	5.6	7.6	6.1	5.6	4.9	4.7	4.5	4.5	Diurnal Average
																								11.3	7.5	7.4	8.3	9.1	13.3	10.8	11.7	13.6	15.6	17.7	15.9	17.1	18.6	17.6	15.4	18.3	51.5	26.8	24.1	15.3	13.9	13.2	11.1	Diurnal Maximum
C - Calibration																																																
Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 µg/m ³ 24-hr 29 µg/m ³																																																





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Surmont 2 - October 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	537	72.47	72.47
6 - 15	190	25.64	98.11
16 - 25	12	1.62	99.73
26 - 80	2	0.27	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 741

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - μg/m³
Surmont 2 - October 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	7	3	3	1	4	59	87	43	22	22	28	79	81	66	15	17	537
6 - 15	1	1	1	1	2	12	18	10	8	14	27	24	36	19	10	5	189
16 - 25	0	0	0	0	0	0	0	0	0	0	0	4	0	1	1	6	12
26 - 80	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	2
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	8	4	4	2	6	71	105	53	30	36	56	108	117	86	26	28	740

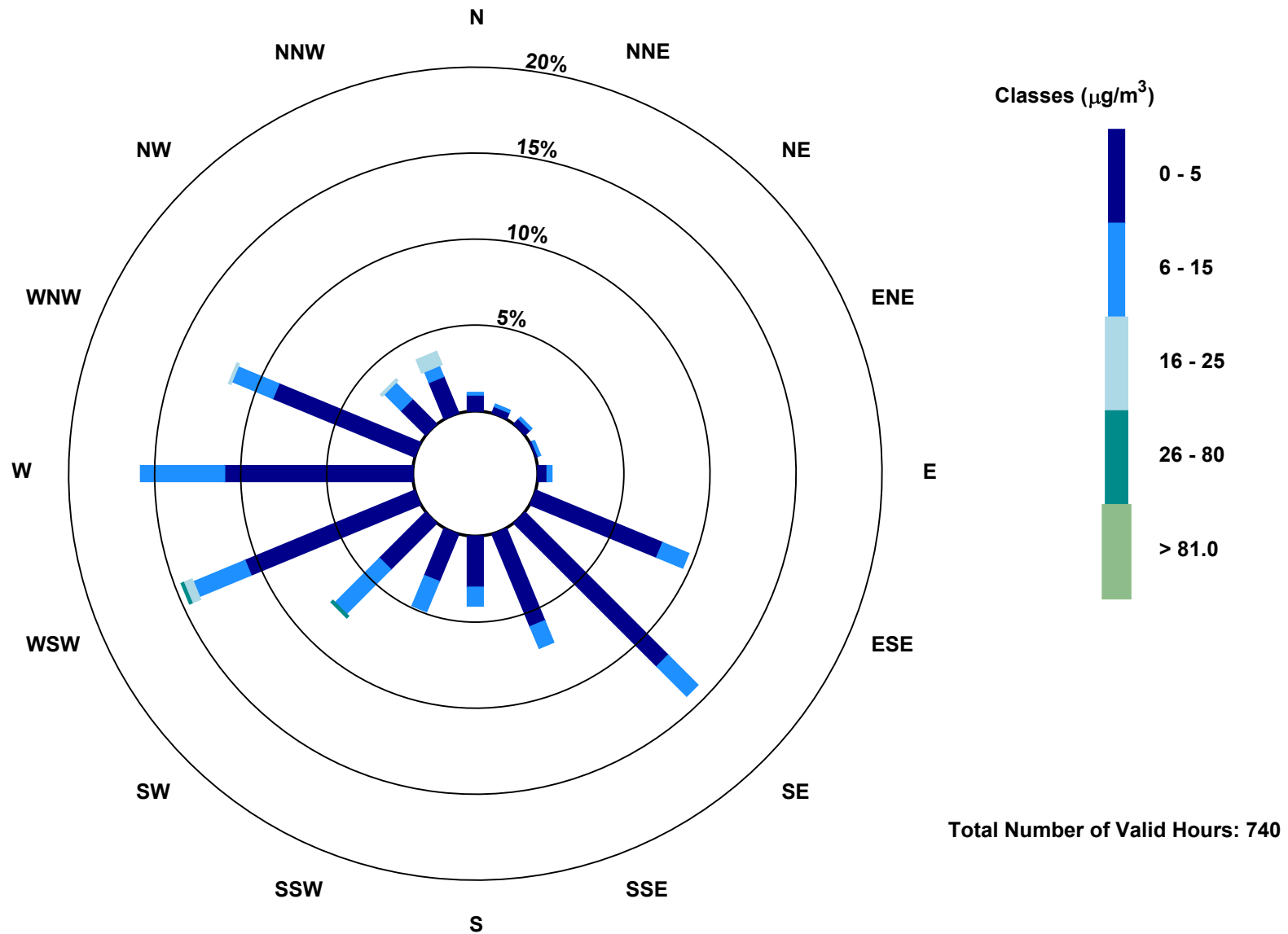
Total Number of Valid Hours: 740

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

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





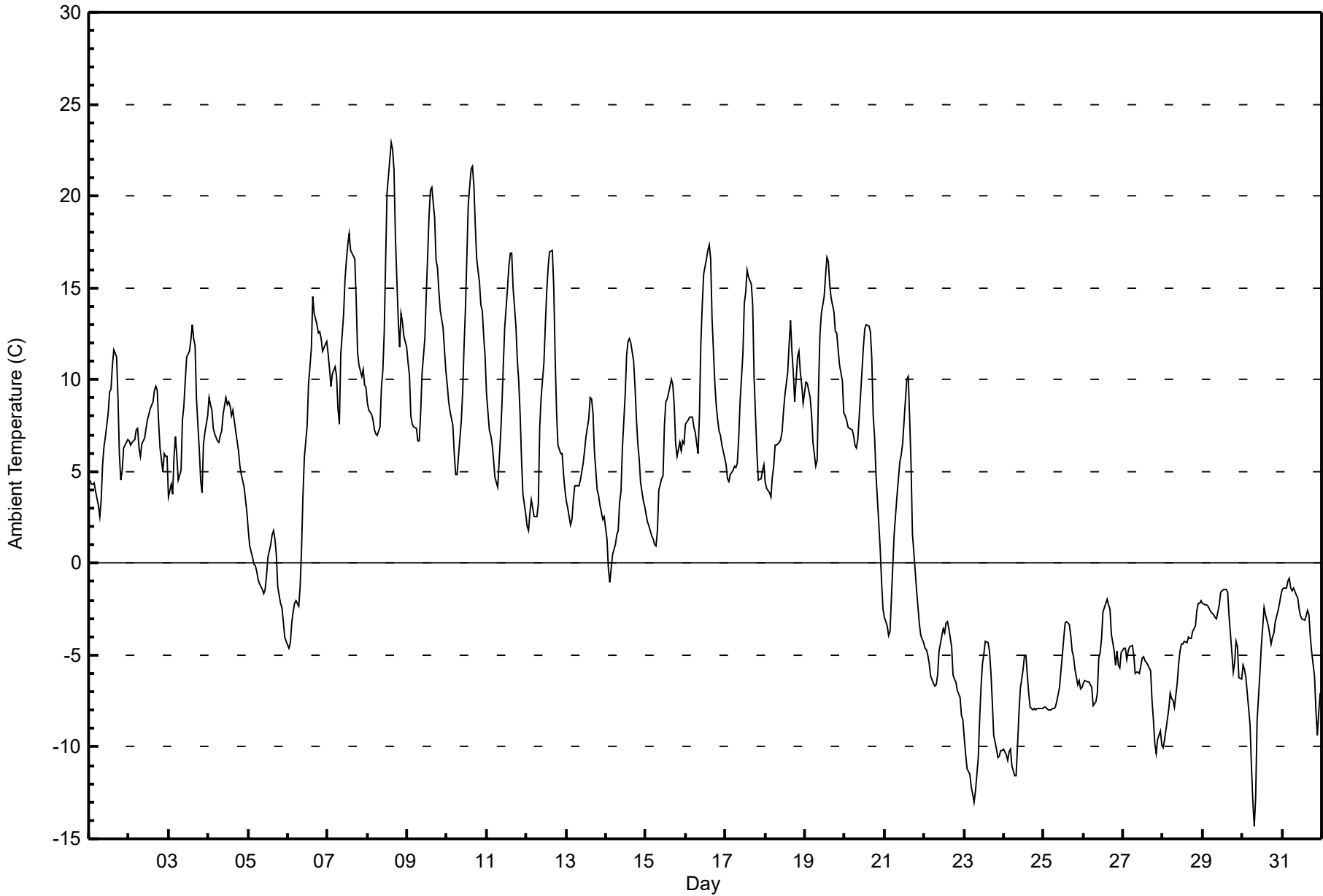
Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature (AT) - C

Surmont 2 - October 2023

Maximum Value: 22.9 C on Oct 8 15:00		Maximum Daily Average: 13.1 C on Oct 8		Hours in Service: 744																																												
Minimum Value: -14.3 C on Oct 30 08:00		Minimum Daily Average: -9.0 C on Oct 23		Hours of Data: 744																																												
Maximum Diurnal Average: 8.0 C at hour 15		Minimum Diurnal Average: 0.4 C at hour 7		Hours of Missing Data: 0																																												
Monthly Average: 3.38 C		Percentiles: P ₁ = -11.6 P ₁₀ = -7.1 Q ₁ = -3.8 Median = 4.7 Q ₃ = 9.0 P ₉₀ = 13.0 P ₉₉ = 20.4		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-Oct	4.6	4.3	4.3	4.4	3.9	3.1	2.6	3.4	5.4	6.3	6.9	8.2	9.3	9.5	10.8	11.6	11.2	8.9	5.9	4.5	5.1	6.3	6.6	6.8	6.4	11.6																						
2-Oct	6.6	6.4	6.6	6.8	7.3	7.3	6.3	5.8	6.5	6.8	7.4	7.8	8.1	8.5	8.8	9.4	9.6	9.4	7.7	6.3	5.0	6.0	5.8	5.8	7.2	9.6																						
3-Oct	3.6	4.3	3.8	5.8	6.9	5.8	4.5	5.0	7.8	8.6	10.0	11.2	11.6	12.1	13.0	12.2	11.9	8.9	6.2	4.5	3.9	6.5	7.1	8.0	7.6	13.0																						
4-Oct	9.0	8.6	8.3	7.3	7.0	6.7	6.6	6.9	7.2	8.1	9.0	8.7	8.8	8.6	8.0	8.4	7.2	6.6	6.2	5.3	4.8	4.1	3.4	2.8	7.0	9.0																						
5-Oct	1.8	0.9	0.3	0.0	-0.1	-0.4	-0.9	-1.1	-1.5	-1.7	-1.4	-0.7	0.3	1.0	1.6	1.8	1.3	0.5	-1.3	-2.2	-2.5	-3.1	-4.0	-4.2	-0.6	1.8																						
6-Oct	-4.6	-4.3	-3.3	-2.6	-2.2	-2.0	-2.4	-1.2	0.8	3.7	5.8	7.5	9.8	10.7	11.7	14.5	13.6	13.0	12.5	12.6	12.2	11.5	12.0	12.1	5.9	14.5																						
7-Oct	11.4	10.5	9.7	10.4	10.7	10.2	8.4	7.5	11.4	13.5	15.5	16.5	17.3	17.9	17.0	16.8	16.6	14.3	11.5	10.8	10.2	10.5	9.7	9.6	12.4	17.9																						
8-Oct	8.7	8.3	8.1	7.8	7.3	7.0	7.0	7.4	9.6	10.4	12.5	16.5	20.1	22.0	22.9	22.6	21.4	17.7	13.3	11.8	13.6	13.1	12.4	11.8	13.1	22.9																						
9-Oct	10.9	10.2	8.1	7.6	7.5	7.3	6.7	6.7	8.2	10.3	12.2	14.6	16.7	19.0	20.3	20.5	18.8	16.5	16.1	14.8	13.8	12.8	11.7	10.5	12.6	20.5																						
10-Oct	9.7	8.8	8.3	7.5	6.0	4.9	4.8	5.8	7.8	9.3	11.8	13.9	16.7	19.5	21.5	21.6	20.5	18.4	16.6	15.2	14.1	13.7	12.4	11.3	12.5	21.6																						
11-Oct	9.2	7.3	6.9	6.5	5.7	4.7	4.2	5.5	6.9	8.6	10.8	12.9	15.0	16.2	16.9	16.8	15.0	12.9	11.1	10.0	8.1	5.7	3.7	2.7	9.3	16.9																						
12-Oct	2.0	1.8	2.8	3.5	2.6	2.6	2.6	3.2	7.4	9.0	11.0	13.0	14.8	16.1	17.0	17.0	15.1	11.3	8.3	6.4	6.0	5.9	4.8	4.0	7.8	17.0																						
13-Oct	3.4	3.0	2.1	2.4	3.4	4.2	4.2	4.2	4.5	5.0	5.5	6.1	6.9	7.9	9.0	9.0	8.2	6.1	4.0	3.7	3.2	2.7	2.4	2.5	4.7	9.0																						
14-Oct	1.3	-0.3	-1.1	-0.3	0.5	1.0	1.6	1.8	3.3	3.9	6.3	9.2	11.3	12.1	12.2	12.0	11.0	9.6	7.9	6.5	5.6	4.3	3.4	3.1	5.3	12.2																						
15-Oct	2.7	2.2	2.0	1.5	1.3	1.0	0.9	1.8	4.0	4.6	4.7	7.5	8.8	8.9	9.6	10.0	9.7	8.6	6.5	5.8	6.6	6.1	6.7	6.5	5.3	10.0																						
16-Oct	7.6	7.8	8.0	8.0	8.0	7.4	7.1	6.0	8.1	12.0	14.0	15.8	16.6	17.1	17.4	16.5	13.3	9.8	8.5	7.8	7.2	7.0	6.4	5.7	10.1	17.4																						
17-Oct	5.3	4.6	4.5	4.8	5.0	5.3	5.2	5.4	6.8	8.8	11.4	14.1	14.7	16.0	15.6	15.2	14.1	10.1	8.0	6.1	4.6	4.6	5.1	5.4	8.4	16.0																						
18-Oct	4.4	4.1	3.8	3.6	4.7	5.3	6.4	6.4	6.6	6.8	7.2	8.2	9.2	10.4	11.9	13.2	11.5	10.3	8.8	11.2	11.5	10.4	9.7	8.7	8.1	13.2																						
19-Oct	9.8	9.8	9.4	9.0	8.1	6.6	5.3	5.6	9.5	12.5	13.6	14.5	15.6	16.7	16.4	15.1	14.4	13.7	12.6	12.5	11.6	10.8	9.9	8.2	11.3	16.7																						
20-Oct	8.0	7.8	7.4	7.3	7.3	7.0	6.4	6.3	6.8	9.2	10.5	11.8	12.7	13.0	12.9	12.6	11.1	8.0	6.9	4.8	2.2	0.8	-1.1	-2.5	7.4	13.0																						
21-Oct	-3.0	-3.4	-3.9	-3.7	-1.9	-0.1	1.6	3.7	4.6	5.5	5.9	6.5	8.8	10.0	10.1	7.9	5.4	1.6	-0.4	-1.5	-2.4	-3.4	-3.9	-4.3	1.7	10.1																						
22-Oct	-4.6	-4.7	-5.0	-5.5	-6.2	-6.5	-6.7	-6.6	-6.1	-4.8	-4.0	-3.6	-3.8	-3.2	-3.1	-3.5	-4.6	-6.1	-6.3	-6.5	-6.9	-7.3	-8.3	-8.5	-5.5	-3.1																						
23-Oct	-9.5	-10.4	-11.2	-11.5	-12.2	-12.6	-13.0	-12.4	-10.6	-8.4	-6.7	-5.4	-4.9	-4.2	-4.3	-4.8	-5.9	-7.6	-9.3	-10.1	-10.5	-10.5	-10.2	-10.2	-9.0	-4.2																						
24-Oct	-10.2	-10.4	-10.8	-10.3	-10.1	-11.1	-11.5	-11.6	-10.0	-8.2	-6.8	-5.8	-5.0	-5.0	-6.1	-7.1	-7.8	-8.0	-7.9	-8.0	-7.9	-7.9	-7.9	-7.9	-8.5	-5.0																						
25-Oct	-7.8	-7.8	-7.9	-8.0	-8.0	-7.9	-7.9	-7.8	-7.5	-6.7	-5.8	-5.0	-4.1	-3.2	-3.2	-3.3	-3.9	-4.8	-5.1	-5.7	-6.6	-6.4	-6.9	-6.8	-6.2	-3.2																						
26-Oct	-6.5	-6.4	-6.5	-6.5	-6.6	-6.8	-7.7	-7.5	-7.1	-5.1	-4.9	-4.1	-2.6	-2.2	-2.0	-2.3	-2.5	-3.8	-4.8	-5.5	-4.8	-5.5	-5.7	-4.9	-5.1	-2.0																						
27-Oct	-4.7	-4.6	-5.2	-4.8	-4.5	-4.5	-5.0	-6.0	-5.9	-6.0	-5.1	-5.1	-5.3	-5.4	-5.5	-5.9	-7.5	-8.5	-9.8	-10.4	-9.6	-9.2	-9.9	-6.4	-4.5																							
28-Oct	-10.1	-9.5	-9.0	-7.9	-7.1	-7.4	-7.5	-7.8	-6.6	-5.4	-4.8	-4.4	-4.4	-4.2	-4.3	-4.0	-4.1	-4.1	-3.7	-3.4	-2.6	-2.2	-2.2	-2.0	-5.4	-2.0																						
29-Oct	-2.2	-2.2	-2.2	-2.4	-2.5	-2.6	-2.8	-2.9	-3.0	-2.7	-2.2	-1.6	-1.4	-1.4	-1.4	-1.6	-2.9	-4.8	-5.9	-5.4	-4.3	-4.6	-6.2	-6.3	-3.1	-1.4																						
30-Oct	-5.5	-5.7	-6.3	-7.1	-8.8	-11.1	-13.0	-14.3	-12.7	-8.6	-6.0	-4.6	-3.5	-2.4	-2.8	-3.4	-3.9	-4.4	-4.0	-3.8	-3.2	-2.6	-2.2	-1.7	-5.9	-1.7																						
31-Oct	-1.5	-1.4	-1.4	-1.0	-0.8	-1.3	-1.5	-1.3	-1.7	-1.9	-2.5	-2.8	-3.0	-3.1	-2.9	-2.6	-2.8	-4.0	-4.9	-6.2	-8.0	-9.3	-8.1	-7.1	-3.4	-0.8																						
																								1.6	1.3	1.0	1.1	1.0	0.7	0.4	0.6	2.0	3.3	4.5	5.8	6.9	7.7	8.0	8.0	7.0	5.2	3.8	3.0	2.6	2.3	1.9	1.6	Diurnal Average
																								11.4	10.5	9.7	10.4	10.7	10.2	8.4	7.5	11.4	13.5	15.5	16.5	20.1	22.0	22.9	22.6	21.4	18.4	16.6	15.2	14.1	13.7	12.4	12.1	Diurnal Maximum





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Surmont 2 - October 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	280	37.63	37.63
0 - 10	311	41.80	79.44
10 - 20	143	19.22	98.66
> 20	10	1.34	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

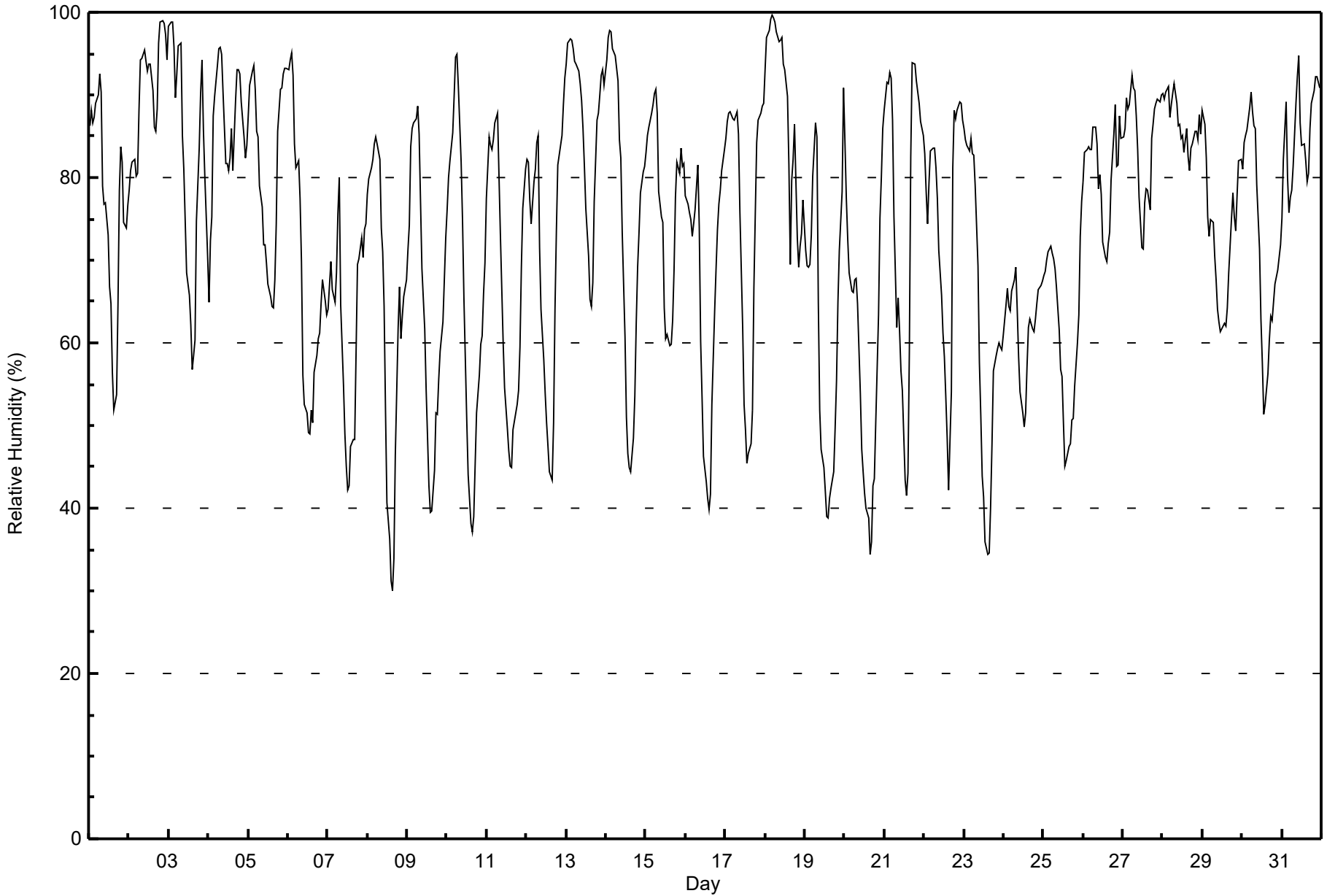
Relative Humidity (RH) - %
Surmont 2 - October 2023

Maximum Value: 99.6 % on Oct 18 05:00 Maximum Daily Average: 90.2 % on Oct 2 Minimum Value: 29.9 % on Oct 8 16:00 Minimum Daily Average: 58.9 % on Oct 20 Maximum Diurnal Average: 85.0 % at hour 7 Minimum Diurnal Average: 55.4 % at hour 16 Monthly Average: 73.61 % Percentiles: P ₁ = 36.1 P ₁₀ = 49.1 Q ₁ = 62.6 Median = 77.1 Q ₃ = 86.4 P ₉₀ = 92.3 P ₉₉ = 98.7																								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-Oct	86.2	88.1	86.7	87.3	89.0	90.0	92.5	90.4	79.0	76.8	76.9	73.1	66.7	64.7	56.5	51.9	53.8	64.5	78.5	83.7	81.8	74.6	73.9	76.6	76.8	92.5
2-Oct	78.5	80.9	81.9	82.2	80.2	80.6	88.2	94.3	94.4	95.5	94.1	92.8	93.7	93.7	90.5	86.1	85.5	88.3	96.3	98.8	99.0	98.6	97.2	94.2	90.2	99.0
3-Oct	98.3	98.9	98.8	95.7	89.7	92.5	96.0	96.3	85.1	81.1	74.8	68.5	65.7	62.2	56.7	58.6	60.4	74.8	83.6	90.1	94.2	85.7	80.2	70.5	81.6	98.9
4-Oct	65.0	72.4	75.2	87.5	89.8	93.5	95.5	95.7	95.0	90.4	81.8	81.7	80.9	82.5	85.9	80.8	89.5	93.1	93.1	92.6	89.2	84.9	82.3	84.0	85.9	95.7
5-Oct	87.4	91.1	93.0	93.6	90.6	85.6	84.9	79.0	76.5	71.9	69.7	67.1	65.6	64.5	64.3	67.7	74.5	85.6	90.6	90.8	92.6	93.3	93.3	81.0	93.6	93.6
6-Oct	93.0	94.3	95.0	92.4	84.1	81.2	82.0	77.4	69.9	56.2	52.5	51.6	49.1	49.0	51.8	50.3	56.4	58.5	60.5	61.2	64.8	67.6	65.1	63.4	67.8	95.0
7-Oct	64.1	66.9	69.8	66.4	64.9	68.5	75.6	80.0	64.6	54.9	48.9	45.2	42.2	42.8	47.4	48.3	48.3	59.0	69.5	70.2	72.8	70.3	73.7	74.4	62.0	80.0
8-Oct	78.0	79.9	81.2	82.3	84.1	85.0	84.1	82.2	73.9	71.0	64.5	51.8	40.7	36.2	31.2	29.9	34.0	46.5	61.7	66.9	60.4	63.2	65.5	67.7	63.4	85.0
9-Oct	71.2	74.2	83.7	85.9	86.7	87.2	88.7	85.3	77.1	68.9	61.6	54.4	48.6	42.6	39.6	39.6	44.7	51.4	51.3	55.6	59.1	62.6	67.6	72.8	65.0	88.7
10-Oct	76.1	79.9	82.1	85.4	89.9	94.6	94.9	91.1	81.9	74.7	65.3	58.0	50.7	44.0	38.2	37.1	38.9	45.3	51.6	56.2	59.8	60.8	66.0	69.7	66.3	94.9
11-Oct	77.4	85.0	83.9	83.4	84.6	86.6	87.9	80.4	73.3	66.6	60.0	54.5	49.7	46.9	45.2	44.9	49.6	51.5	52.5	54.3	59.5	69.1	76.2	81.1	66.8	87.9
12-Oct	82.3	81.9	77.2	74.4	79.6	81.1	84.2	85.0	71.6	64.1	58.0	53.9	50.3	47.4	44.4	43.3	50.3	64.0	73.6	81.5	83.9	85.2	88.8	92.0	70.8	92.0
13-Oct	93.8	96.3	96.8	96.7	95.5	94.2	93.8	92.8	91.4	89.4	85.9	81.4	76.3	70.6	65.3	64.4	67.2	77.2	86.9	87.8	89.9	92.3	93.1	91.1	86.3	96.8
14-Oct	94.2	96.9	97.8	97.6	95.6	94.7	93.1	91.6	84.6	82.4	73.3	60.6	51.0	46.6	45.0	44.4	48.4	53.6	62.4	69.2	73.4	78.1	80.6	81.4	74.8	97.8
15-Oct	83.1	85.1	86.1	87.8	88.8	90.1	90.6	87.8	78.2	75.2	74.5	64.2	60.5	61.0	59.7	59.9	62.6	68.7	77.6	81.9	80.4	83.6	81.3	81.7	77.1	90.6
16-Oct	77.8	76.7	75.8	74.9	72.8	74.4	76.1	81.5	74.1	60.2	53.4	46.3	43.1	41.2	39.8	41.6	52.6	63.8	69.0	73.7	76.8	78.4	80.8	83.3	66.2	83.3
17-Oct	84.7	86.8	87.8	87.9	87.1	86.9	87.5	87.9	85.3	76.0	61.8	52.6	49.5	45.4	46.7	47.7	51.9	66.7	75.6	84.3	86.9	87.7	88.7	89.0	74.7	89.0
18-Oct	93.0	97.0	97.8	99.1	99.6	99.4	98.8	97.6	96.4	96.6	97.0	93.8	93.0	89.8	81.5	69.6	79.6	82.3	86.5	72.7	69.2	71.7	73.2	77.2	88.0	99.6
19-Oct	71.1	69.3	69.1	69.5	73.1	80.3	86.6	84.8	65.0	51.8	47.2	45.0	42.0	38.9	38.9	41.2	42.5	44.5	49.6	55.5	64.9	71.2	78.2	90.8	61.3	90.8
20-Oct	84.4	77.4	72.6	68.5	66.3	66.0	67.6	67.8	64.7	53.8	47.1	44.4	41.9	40.0	38.9	34.4	35.9	42.7	43.6	50.3	63.4	75.0	80.1	86.0	58.9	86.0
21-Oct	88.2	91.4	91.3	92.7	92.0	87.0	75.2	61.8	65.4	61.6	56.6	54.3	43.5	41.5	44.3	59.0	82.6	93.8	93.8	91.8	90.4	89.0	86.8	85.1	75.8	93.8
22-Oct	82.9	78.4	74.5	79.4	83.3	83.6	83.6	81.1	77.4	71.2	65.8	61.2	58.3	53.6	48.5	42.2	54.1	81.2	88.2	87.1	88.1	89.1	88.9	86.9	74.5	89.1
23-Oct	86.0	84.6	83.9	83.3	84.7	82.9	82.8	79.0	69.3	57.7	51.1	43.9	41.4	36.0	34.5	34.6	40.1	47.9	56.6	58.6	59.3	60.0	59.4	59.2	61.5	86.0
24-Oct	60.9	64.5	66.6	64.4	64.0	66.3	67.6	69.2	64.1	58.2	54.1	51.5	49.8	51.6	57.0	61.9	62.9	61.6	61.4	62.9	64.8	66.4	67.0	67.5	61.9	69.2
25-Oct	68.1	68.6	70.0	71.0	71.7	70.9	70.1	68.9	66.8	61.6	56.8	55.9	50.3	45.0	45.8	47.4	47.8	50.6	50.8	54.7	60.0	63.4	72.9	77.1	61.1	77.1
26-Oct	79.4	83.0	83.4	83.7	83.3	83.4	86.1	86.1	84.0	78.7	80.4	77.9	72.2	70.4	69.8	72.0	73.3	79.7	85.3	88.8	81.3	81.6	87.4	84.8	80.7	88.8
27-Oct	85.0	86.0	89.6	88.3	88.8	92.3	90.8	90.6	87.5	83.3	77.7	71.5	71.4	76.9	78.6	78.4	76.1	84.8	86.5	88.3	88.9	89.6	89.2	90.1	84.6	92.3
28-Oct	90.1	89.5	90.3	91.1	87.3	88.9	90.2	91.4	88.9	86.3	86.4	84.7	85.0	83.0	85.9	82.6	80.9	83.5	84.1	85.7	85.6	84.6	87.7	85.3	86.6	91.4
29-Oct	88.1	86.5	82.4	75.3	72.8	75.0	74.5	70.4	67.6	64.0	62.6	61.4	62.0	62.4	62.0	64.2	68.5	75.0	78.1	75.3	73.6	78.0	82.1	82.1	72.7	88.1
30-Oct	81.0	84.2	85.1	85.8	88.5	90.3	87.9	86.3	85.9	79.1	71.3	62.8	57.7	51.4	52.5	56.2	60.4	63.3	62.6	64.8	67.0	68.9	70.4	71.8	72.3	90.3
31-Oct	75.1	82.3	89.2	80.0	75.7	77.7	78.5	81.3	89.0	92.3	94.8	86.7	83.8	84.0	82.0	79.6	80.5	85.9	88.9	90.6	92.2	92.2	91.6	90.9	85.2	94.8
81.4 83.2 83.8 83.7 83.4 84.2 85.0 83.7 78.3 72.6 68.0 63.1 59.3 57.0 55.8 55.4 59.6 67.0 72.4 75.0 76.5 77.9 79.7 80.7																								Diurnal Average		
98.3 98.9 98.8 99.1 99.6 99.4 98.8 97.6 96.4 96.6 97.0 93.8 93.7 93.7 90.5 86.1 89.5 93.8 96.3 98.8 99.0 98.6 97.2 94.2																								Diurnal Maximum		



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Surmont 2 - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Surmont 2 - October 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	18	2.42	2.42
40 - 60	139	18.68	21.10
60 - 80	256	34.41	55.51
80 - 100	331	44.49	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

Surmont 2 - October 2023

Maximum Speed: 15 km/h on Oct 20 11:00	Maximum Daily Speed Average: 8.8 km/h on Oct 4	Hours in Service: 744
Minimum Speed Value: 0 km/h on Oct 28 03:00	Minimum Daily Speed Average: 1.3 km/h on Oct 17	Hours of Data: 743
Maximum Diurnal Speed Average: 3.2 km/h at hour 1	Minimum Diurnal Speed Average: 0.9 km/h at hour 14	Hours of Missing Data: 1
Monthly Average Velocity: 2.0 km/h 236.4 deg	Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 4 Median = 6 Q ₃ = 8 P ₉₀ = 11 P ₉₉ = 13	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-Oct	SW2	SSW2	SW2	SSW1	SSW1	SSW2	SSW2	SSE2	ESE5	ESE6	ESE7	SE7	SE8	SSE8	SE8	SSE7	SE7	SSE3	SSW2	SW2	SSE2	SE6	SSE7	SE7	SSE3.9	SSE8
2-Oct	SE7	SE6	SE6	SSE5	SE6	SE6	ESE7	SE6	SE5	ESE6	SSE6	SSE6	SSE4	SSE5	SSE5	SSW5	S4	SSW3	SW2	WSW2	SW3	WSW5	WSW4	WSW5	SSE3.9	SE7
3-Oct	ESE0	WSW1	SW1	WNW4	W5	WSW5	WSW2	WSW2	W5	WNW6	WSW5	NW4	W7	NW4	W7	W7	WSW5	SW3	WSW3	SW2	SW2	SW3	SSW3	WSW5	W3.4	W7
4-Oct	WSW10	W9	WSW5	WSW5	WSW6	W5	W5	WNW4	WNW5	WNW8	WNW10	WNW12	WNW11	WNW11	WNW11	WNW12	WNW10	NW10	WNW10	WNW12	WNW13	WNW12	W12	W11	WNW8.8	WNW13
5-Oct	W11	WNW12	WNW10	WNW10	WNW12	WNW13	WNW10	WNW12	WNW13	WNW14	WNW13	WNW13	WNW13	WNW12	WNW11	NW10	NW7	WNW4	WSW2	SW2	WSW3	SW2	SW1	SW2	WNW8.6	WNW14
6-Oct	SW2	SW1	SSW1	SSW2	SSE2	ESE6	E5	E5	ESE5	SSE5	S4	SE6	SE6	SE7	SSE5	SSW7	SW4	SSW5	WSW8	WSW10	WSW7	WSW8	W8	W11	SSW2.8	W11
7-Oct	W8	W6	W5	W6	W8	WSW8	W4	W3	NW3	NW5	ENE1	E4	E5	ESE7	ESE7	ESE8	ESE7	SE3	SSW2	S4	S4	SSE5	SE5	SE6	S1.6	W8
8-Oct	SE6	SE6	SE6	SE7	SE7	SE7	SE9	SE8	ESE9	ESE10	SE10	SE11	SE12	SE12	SE11	SSE11	SE8	SSE3	SSW2	SSW2	SSE5	SE6	SE6	SE7	SE7.4	SE12
9-Oct	ESE6	SE6	SE4	SE4	SE5	SE6	SE6	SE7	SE8	ESE8	SE10	SE9	ESE10	ESE10	ESE10	ESE10	ESE6	SE6	SSE8	SSE6	SSE6	SSE6	SSE5	S5	SE6.7	ESE10
10-Oct	SE6	SE5	SE6	SSE4	SE3	SE3	SSW2	SE4	SE7	SE7	ESE11	ESE12	ESE11	ESE13	ESE14	ESE12	ESE11	ESE9	ESE8	ESE9	ESE10	ESE10	ESE9	ESE7	ESE7.9	ESE14
11-Oct	ESE5	ESE4	ESE7	ESE7	ESE7	ESE6	ESE6	ESE9	ESE11	ESE10	ESE10	ESE11	ESE10	ESE12	ESE13	ESE12	ESE14	ESE11	ESE10	ESE8	SSE4	SW2	SW2	SSW3	ESE7.8	ESE14
12-Oct	SSW3	SW3	SSW4	S5	S4	SSW4	S4	SE4	SE5	SE7	SE7	SE9	SE10	SE8	SE7	SE6	SE5	SW2	SW3	SW3	S3	S3	SSW2	SSW2	SSE3.9	SE10
13-Oct	S3	SSW3	S2	SSW4	S4	S6	S6	SSE6	SSE7	SE6	SE7	SE9	SSE7	SE9	ESE10	ESE11	ESE9	SE5	SE4	SSE4	SSE4	SSE3	SSE3	S4	SSE5.2	ESE11
14-Oct	SSW3	WSW3	WSW3	SSW3	SSE5	SE5	SE6	SE8	SE11	SE10	ESE10	SE12	SE14	SE13	SE14	SE13	ESE12	ESE10	SE7	SE6	SE6	ESE6	ESE6	SSE5	SE7.2	SE14
15-Oct	SE6	SE6	SE6	SE6	ESE5	ESE5	ESE5	ESE6	ESE7	SE5	SE8	SE9	SE8	SE8	SE7	SSE5	SSE3	S2	S2	SSE3	S3	S2	WNW3	W5	SE4.4	SE9
16-Oct	WSW11	WSW10	WSW8	WSW10	WSW11	WSW9	W6	NW4	WSW1	WNW4	WNW6	W8	W7	WSW6	SW4	WSW4	WSW2	WSW3	SW2	WSW2	SW2	WSW2	WSW2	WSW2	WSW5.0	WSW11
17-Oct	SW2	SW2	SW1	SW1	SW1	SW2	SSW1	WSW1	WSW1	E2	NW3	NE6	N5	NNE7	NNW6	NW5	WNW3	WSW4	WSW4	WSW2	SW1	SW1	SW2	SE1	WNW1.3	NNE7
18-Oct	WSW3	SW3	SW1	S2	SSE3	SE4	SE5	SE4	ESE6	SE6	SE7	SE6	SE5	SE5	ESE5	SSW4	SSE3	SSE3	S3	SW5	WSW7	WSW6	WSW6	WSW5	SSE2.8	SE7
19-Oct	WSW9	WSW11	WSW10	WSW9	WSW6	WSW4	S3	SW3	WSW5	WSW10	W13	W13	W11	W11	WSW12	WSW10	WSW8	W7	SW5	WSW12	WSW13	W12	W11	W6	WSW8.7	W13
20-Oct	WSW12	W12	W13	W12	W11	WNW10	W11	W10	W8	W13	WNW15	W13	WNW13	WNW13	WNW12	NW11	WNW6	W4	W4	W3	WSW3	WSW3	WSW3	SW2	W8.8	WNW15
21-Oct	SW3	SW2	SSW2	SW2	SSW3	S4	S5	SSE7	SSE5	S7	SSE7	SSE6	SSW8	SW9	WSW10	WSW8	WNW5	NW9	NNW10	NNW13	NNW11	NNW12	NNW10	NNW11	W2.4	NNW13
22-Oct	NNW9	N9	N8	N7	NNW7	N5	N4	NE4	NE4	NNE5	E7	ESE7	ENE2	NNE5	NNE4	NE6	N6	NNW3	WNW3	NW5	NW4	W3	WSW4	WSW4	N3.4	NNW9
23-Oct	WSW4	WSW5	WSW5	WSW6	WSW5	WSW5	W5	W7	W7	WNW9	WNW9	WNW11	WNW14	WNW12	WNW12	WNW10	WNW9	W6	WSW5	WSW6	WSW5	W5	WNW5	WNW6	W6.8	WNW14
24-Oct	W7	W7	W7	W8	WNW5	WNW6	W8	W7	W8	WNW10	WNW11	WNW11	WNW11	WNW11	W12	W11	W10	W9	W9	W9	W8	W7	W8	W6	W8.5	W12
25-Oct	W5	W8	WSW7	W5	W3	W4	WSW6	WSW6	WSW7	WSW7	W7	W8	W9	WNW10	W8	W8	W7	WSW4	WSW4	WSW5	WSW5	WNW7	W6	W6	W6.3	WNW10
26-Oct	W6	W5	W6	W8	W7	W7	W5	W6	W7	W9	W8	W8	WNW9	WNW8	WNW9	WNW8	WNW7	WSW4	WSW3	WSW4	WSW6	WSW6	W5	W7	W6.5	W9
27-Oct	W7	W7	WSW5	W6	W4	W3	NNW8	NNW6	NNW8	NNW9	NNW9	NNW8	NW8	NW7	WNW6	WNW5	WNW3	WSW3	WSW5	WSW3	WSW2	SW2	SW2	SW2	WNW4.1	NNW9
28-Oct	SW2	SSW1	SSW0	WSW2	W4	W3	W3	WSW2	W5	NW6	NW7	NW8	NW9	NNW9	NNW6	WNW6	WNW6	W6	WNW7	W9	W9	W9	WNW7	WNW7	WNW5.0	W9
29-Oct	WNW6	WNW7	W7	W8	WNW7	W7	W8	WNW8	WNW8	NW7	WNW7	WNW8	WNW9	NW7	W8	WNW5	W4	WSW4	W4	W5	W5	W1	N1	WNW2	WNW5.7	WNW9
30-Oct	NNW6	NNW6	NNW5	NW3	W3	WSW3	SW2	SW1	SW2	SSE3	SE5	SE7	SSE6	SSE6	SSE7	SSE6	SSE5	SE5	SSE5	SSW6	S6	S5	S4	SW5	S2.5	SE7
31-Oct	SW5	S3	W2	WSW6	WNW7	W5	W7	NW7	NW7	NNW9	NNW8	NNW9	NNW9	NNW9	NNW7	NNW5	NW2	W2	WSW3	SW3	SW3	UO	SW2	SW1	WNW4.0	NNW9

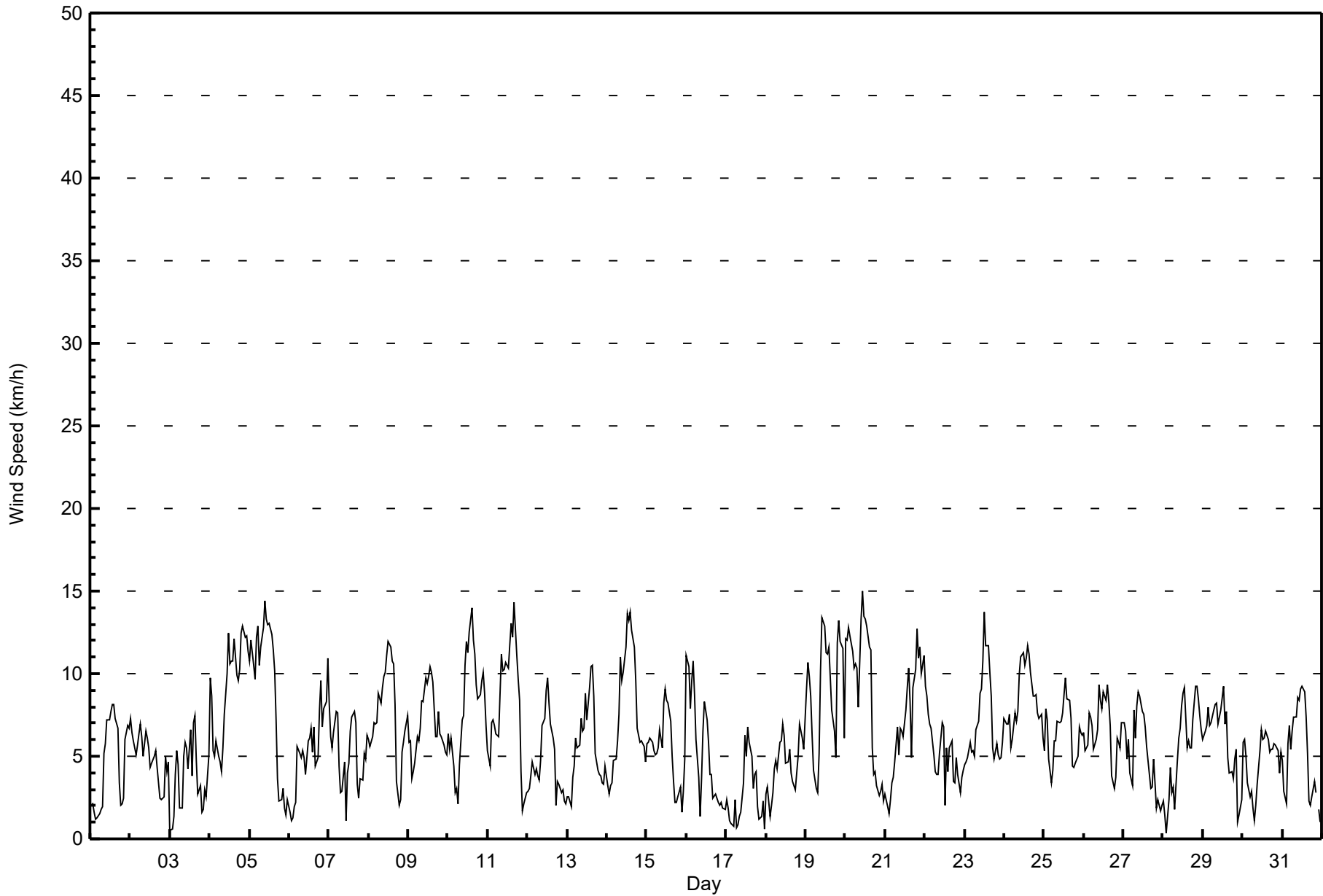
WSW3.2WSW3.0WSW2.6WSW3.0WSW2.9 SW2.3 SW1.7 SW1.2SSW1.0WSW1.2 SW1.1SSW1.1 SW1.5 SW0.9 SW1.5 SW1.8SSW1.2 SW1.7 SW2.3WSW2.9WSW2.8WSW2.7WSW2.5WSW2.8	Diurnal Average
WSW12WNW12 W13 W12WNW12WNW13 W11WNW12WNW13WNW14WNW15 W13WNW14 SE13 ESE14 SE13 ESE14 ESE11WNW10NNW13 WSW13WNW12 W12 W11	Diurnal Maximum

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 - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Surmont 2 - October 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	326	43.88	43.88
6 - 11	363	48.86	92.73
12 - 19	54	7.27	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: 743

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Surmont 2 - October 2023**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	4	3	2	2	5	9	25	32	26	33	55	66	35	15	11	3	326
6 - 11	4	1	2	0	1	53	73	21	4	3	1	38	75	49	15	23	363
12 - 19	0	0	0	0	0	9	7	0	0	0	0	5	9	22	0	2	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	8	4	4	2	6	71	105	53	30	36	56	109	119	86	26	28	743

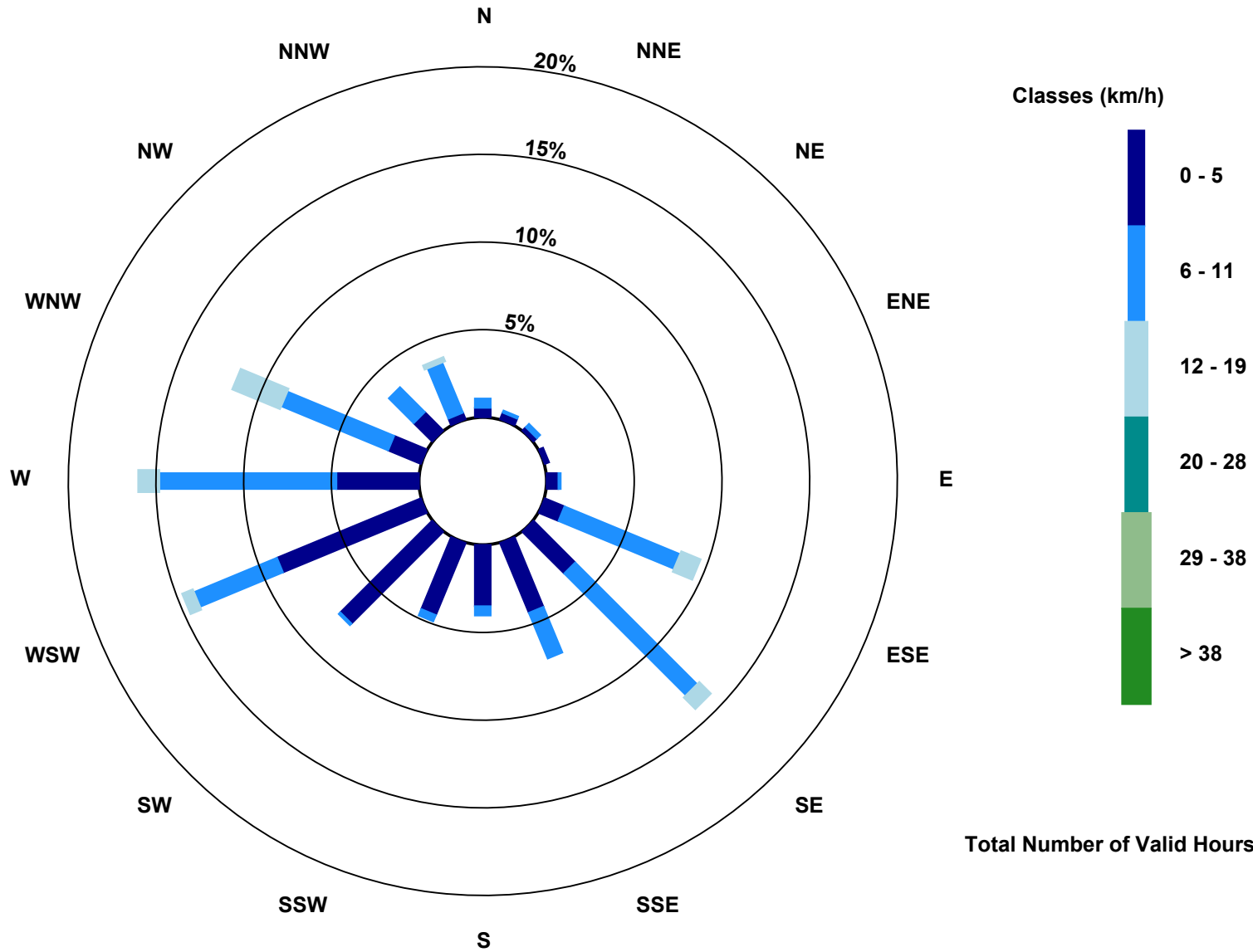
Total Number of Valid Hours: 743

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

Wind Speed (WS) - km/h
Surmont 2



Total Number of Valid Hours: 743



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Surmont 2 - October 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 6 km/h on Oct 5 10:00 Minimum Value: 1 km/h on Oct 19 07:00 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: 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-Oct	1	1	1	1	1	1	1	1	2	2	2	3	3	3	3	3	3	2	1	1	1	3	3	3	3	
2-Oct	3	2	2	2	3	2	2	2	2	2	3	2	2	2	3	2	2	2	1	1	1	2	1	2	3	
3-Oct	1	1	1	2	2	2	2	2	2	2	2	3	2	3	3	2	1	1	1	1	1	1	1	3	3	
4-Oct	4	3	2	2	2	2	1	1	2	3	4	4	4	4	4	5	5	4	4	5	5	5	4	4	5	
5-Oct	4	4	4	4	5	5	5	5	5	6	6	5	5	5	4	4	3	2	1	1	1	1	1	1	6	
6-Oct	1	1	1	1	1	1	1	2	2	3	2	2	2	2	2	4	2	2	3	3	3	2	3	3	4	
7-Oct	3	2	2	2	2	2	2	1	1	2	2	2	2	2	2	2	2	1	1	1	2	2	2	2	3	
8-Oct	2	2	2	3	2	3	3	3	3	3	3	4	4	4	4	4	3	2	1	1	2	2	2	3	4	
9-Oct	2	2	1	2	2	2	2	2	2	3	3	3	3	4	4	3	3	2	3	3	3	2	2	2	4	
10-Oct	2	2	2	2	1	1	1	2	2	3	3	4	4	4	5	4	4	4	3	3	3	3	3	2	5	
11-Oct	2	2	2	2	2	2	2	3	3	3	3	3	4	4	4	4	4	3	3	3	2	1	1	1	4	
12-Oct	1	1	2	2	1	2	2	2	2	2	2	3	3	3	3	3	2	1	1	1	1	1	1	1	3	
13-Oct	1	1	1	2	2	3	2	3	3	3	3	4	3	3	4	4	3	2	2	2	2	1	1	2	4	
14-Oct	1	1	1	2	2	2	2	3	3	3	4	4	5	5	5	5	4	4	3	2	2	2	2	2	5	
15-Oct	2	2	2	2	2	2	2	2	2	2	2	3	3	3	2	2	1	1	1	1	1	1	1	2	3	
16-Oct	3	3	2	3	3	3	2	1	1	1	3	2	3	2	2	2	1	1	1	1	1	1	1	1	3	
17-Oct	1	1	1	1	1	1	1	1	1	1	1	2	2	2	3	2	1	1	2	1	1	1	1	1	3	
18-Oct	1	1	1	1	1	2	2	1	2	2	2	2	2	1	2	2	1	1	1	3	3	2	2	2	3	
19-Oct	3	3	2	3	2	1	1	1	2	4	5	4	4	4	5	4	3	4	3	5	5	5	4	3	5	
20-Oct	4	4	4	4	4	4	3	3	3	5	5	5	5	5	5	5	2	1	1	1	1	1	2	1	5	
21-Oct	1	1	1	1	2	2	2	3	2	3	3	2	4	4	4	4	3	4	4	5	4	4	4	4	5	
22-Oct	3	4	3	3	3	2	2	2	2	2	3	3	2	2	2	2	2	1	1	2	2	1	1	1	4	
23-Oct	1	1	1	1	1	1	1	2	2	3	4	4	5	4	5	4	3	2	1	1	2	1	1	2	5	
24-Oct	2	2	2	2	2	2	2	2	3	3	4	4	4	4	4	4	4	3	3	3	3	2	2	2	4	
25-Oct	2	3	2	2	2	2	2	2	2	2	3	3	3	4	3	3	3	2	2	1	1	3	2	2	4	
26-Oct	2	2	2	3	3	2	2	2	3	3	3	2	3	3	4	3	2	1	1	2	2	2	2	2	4	
27-Oct	2	2	1	2	1	1	3	2	3	3	4	3	3	3	2	2	1	1	1	1	1	1	1	1	4	
28-Oct	1	1	1	2	1	1	1	1	2	2	3	4	4	3	3	2	2	2	3	3	3	3	3	3	4	
29-Oct	2	2	3	3	3	2	3	3	3	3	3	3	3	3	3	2	1	1	2	2	2	1	1	2	3	
30-Oct	2	2	2	2	1	1	1	1	1	2	2	2	3	2	3	3	2	2	2	3	3	2	2	4	4	
31-Oct	3	2	1	3	3	2	2	3	3	3	3	4	4	4	3	2	2	1	1	1	1	UO	1	1	4	
																	Diurnal Maximum									
UO - Unstable Operation																										



Wood Buffalo Environmental Association
Summary of Hour Averages

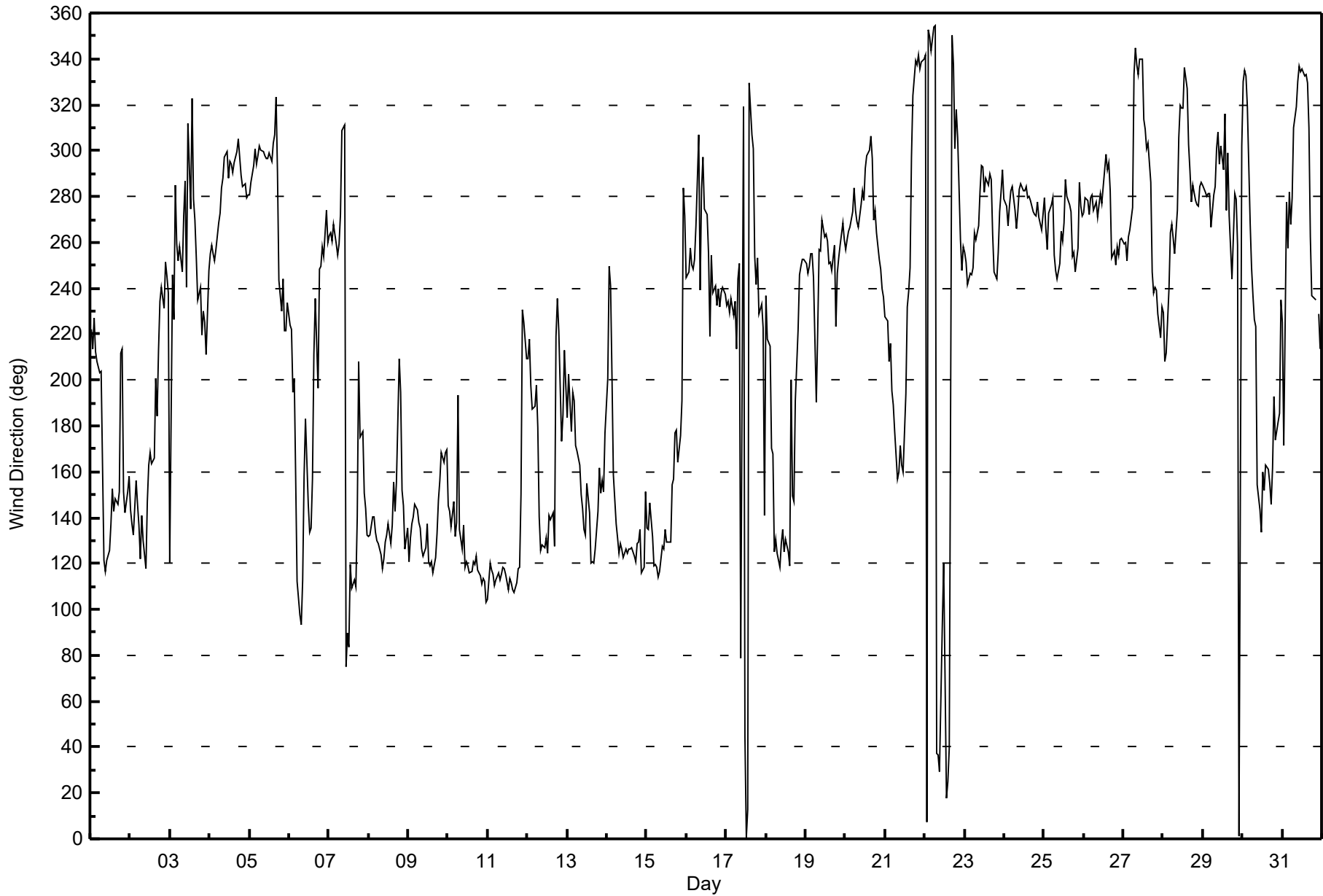
Wind Direction (WD) - deg
Surmont 2 - October 2023

Direction of Maximum Speed: 283 deg on Oct 20 11:00 Direction of Maximum Daily Speed Average: 284.7 deg on Oct 4																						Hours in Service: 744			
Direction of Minimum Speed: 212 deg on Oct 28 03:00											Direction of Minimum Daily Speed Average: 1.3 deg on Oct 17											Hours of Data: 743			
Monthly Average Direction: 236.4 deg																						Hours of Missing Data: 1			
																						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-Oct	222	213	227	212	208	203	204	162	121	116	122	126	138	153	143	148	146	151	212	214	151	142	151	158	149.8
2-Oct	143	137	133	156	146	137	122	141	130	118	147	163	168	163	166	201	185	213	234	241	231	251	246	238	162.6
3-Oct	120	246	227	285	259	252	258	247	271	287	240	312	274	323	279	270	253	235	240	220	230	225	211	248	262.5
4-Oct	255	259	255	252	257	269	273	284	288	297	300	288	295	294	290	295	299	305	297	289	284	286	279	280	284.7
5-Oct	280	286	294	301	294	298	302	300	300	298	297	297	299	295	303	307	323	291	244	230	244	221	221	234	294.3
6-Oct	224	222	195	201	158	112	98	94	113	158	183	146	134	135	157	211	236	197	249	249	258	254	274	260	200.7
7-Oct	263	264	261	268	259	255	259	272	309	311	75	90	84	119	109	113	110	140	208	175	177	150	144	132	190.1
8-Oct	132	132	141	141	134	130	129	124	118	122	129	132	137	129	137	156	143	155	209	195	152	145	126	135	135.8
9-Oct	121	131	137	140	146	143	138	136	126	123	127	138	121	119	121	116	123	133	148	156	168	164	168	169	135.2
10-Oct	145	143	136	147	132	138	193	135	126	137	119	121	119	116	117	121	120	123	117	114	111	114	112	103	122.3
11-Oct	104	120	117	115	111	113	116	113	115	118	118	115	108	113	111	109	107	112	118	118	150	231	225	209	116.0
12-Oct	209	218	198	187	188	198	180	141	126	128	127	131	125	141	139	142	128	219	235	222	173	185	213	197	157.8
13-Oct	183	202	178	195	191	171	169	163	150	144	135	133	155	142	120	121	120	126	143	162	151	156	152	177	147.9
14-Oct	201	250	241	202	159	137	131	124	129	126	123	127	125	126	126	127	123	121	129	130	135	116	119	152	131.4
15-Oct	135	135	146	132	119	120	119	114	117	128	126	135	129	129	129	154	157	177	178	164	176	191	284	271	136.9
16-Oct	245	247	258	250	248	253	267	307	239	283	297	274	272	255	219	255	238	241	232	240	232	238	240	237	255.8
17-Oct	232	235	229	236	228	234	213	244	251	79	319	44	1	13	329	307	301	254	242	253	229	233	223	141	298.0
18-Oct	237	218	215	170	168	125	131	124	118	129	135	125	130	125	119	200	150	147	191	222	246	249	253	253	168.6
19-Oct	251	246	250	255	255	244	190	222	257	256	270	262	264	261	251	251	248	259	223	247	253	259	268	261	254.3
20-Oct	257	261	265	267	273	284	274	269	267	276	283	278	292	298	300	306	296	270	274	264	253	248	240	236	276.8
21-Oct	228	226	208	216	195	189	178	157	160	171	163	160	194	232	239	249	297	324	339	338	341	336	339	340	272.4
22-Oct	341	7	353	350	344	354	354	37	37	30	92	120	69	18	25	40	350	337	301	318	306	261	248	258	0.1
23-Oct	256	251	242	246	246	249	264	261	267	283	294	293	282	288	285	290	287	264	247	244	256	273	282	292	273.2
24-Oct	279	276	267	276	282	284	274	266	274	283	285	283	283	284	280	280	278	273	272	278	271	266	272	272	277.2
25-Oct	279	266	257	273	276	280	254	247	244	251	265	260	269	288	280	276	273	254	256	247	257	286	276	271	266.9
26-Oct	273	280	278	272	279	281	274	278	271	277	281	277	285	298	292	295	282	253	256	250	258	255	261	262	276.1
27-Oct	260	260	252	263	265	275	333	344	338	333	340	340	314	309	301	303	286	247	238	240	239	229	218	232	296.9
28-Oct	229	208	212	240	264	268	262	255	274	306	320	318	318	336	327	303	291	278	285	278	277	276	284	286	291.3
29-Oct	285	282	280	281	282	267	280	284	301	308	294	302	292	316	274	299	272	244	263	281	279	259	1	302	286.6
30-Oct	330	335	333	319	269	249	236	227	223	154	143	134	160	152	163	161	155	146	162	193	174	182	186	235	179.3
31-Oct	225	172	278	258	282	268	280	310	319	330	337	335	336	333	333	329	310	263	237	236	235	UO	229	214	302.9
245.6 247.1 245.5 246.5 245.2 235.9 233.8 216.8 203.6 244.3 230.8 205.0 235.6 232.6 215.5 231.2 211.0 218.1 232.1 240.1 239.0 238.5 243.6 244.9																									
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 - October 2023





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Surmont 2 - October 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 110 deg on Oct 7 11:00 Minimum Value: 9 deg on Oct 27 20:00 Percentiles: P ₁ = 12 P ₁₀ = 22 Q ₁ = 29 Median = 37 Q ₃ = 46 P ₉₀ = 55 P ₉₉ = 79																		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-Oct	16	27	31	20	56	30	28	44	37	36	37	45	51	51	45	55	54	48	29	45	73	53	55	55	73
2-Oct	56	46	48	64	57	60	40	51	52	41	66	52	58	60	71	58	64	54	35	24	19	20	20	58	71
3-Oct	105	93	73	39	23	25	57	43	32	40	59	61	47	69	65	33	27	22	14	24	24	43	51	40	105
4-Oct	26	30	29	26	22	24	25	39	35	40	42	34	41	39	37	41	41	45	38	36	31	34	32	31	45
5-Oct	33	32	38	43	36	40	42	43	41	42	39	37	38	37	42	43	49	37	18	14	14	25	57	11	57
6-Oct	42	30	57	54	59	18	17	25	41	66	75	38	41	39	45	58	47	65	36	22	27	20	32	29	75
7-Oct	25	26	29	29	29	25	30	42	50	49	110	52	57	45	25	25	25	45	37	50	52	50	50	42	110
8-Oct	42	45	49	43	40	48	39	40	36	36	37	41	41	36	45	55	47	58	37	45	52	50	42	45	58
9-Oct	43	48	46	55	47	42	50	46	32	39	36	40	34	32	32	29	39	42	47	53	47	50	52	46	55
10-Oct	43	46	48	63	73	54	61	48	35	44	33	29	29	26	27	32	35	34	29	28	22	24	24	33	73
11-Oct	36	46	23	17	18	23	25	25	22	30	31	29	27	26	26	23	16	19	22	29	52	59	16	19	59
12-Oct	30	31	54	47	50	49	58	56	37	32	36	33	36	48	43	49	42	46	14	34	46	48	33	32	58
13-Oct	43	39	60	46	66	57	54	55	50	52	53	42	51	41	38	34	32	44	40	48	49	50	61	48	66
14-Oct	42	17	25	54	51	58	48	44	36	36	38	39	40	43	42	37	36	35	48	42	47	34	42	51	58
15-Oct	49	47	48	42	44	34	39	34	41	43	34	39	34	41	38	55	55	57	40	33	30	62	51	30	62
16-Oct	17	20	23	19	19	21	26	34	82	44	44	33	38	47	60	43	28	16	25	23	38	17	25	38	82
17-Oct	10	9	39	38	40	32	66	35	68	73	48	42	50	50	51	38	40	17	34	12	47	44	43	98	98
18-Oct	23	51	71	58	46	47	53	43	33	42	45	48	41	27	38	59	39	43	50	66	27	28	22	25	71
19-Oct	23	21	21	23	21	26	20	51	30	30	31	29	35	33	30	31	31	35	49	30	29	30	29	29	51
20-Oct	25	26	26	27	31	37	28	25	27	33	32	34	39	41	41	41	41	25	29	25	34	15	16	13	41
21-Oct	15	11	33	30	36	44	45	58	58	53	51	50	58	46	34	31	45	40	42	33	38	35	35	38	58
22-Oct	37	45	46	36	42	42	37	45	42	50	37	46	90	45	63	42	45	44	41	46	40	26	20	17	90
23-Oct	16	16	12	12	12	16	21	23	26	31	43	39	32	35	35	37	34	22	17	14	20	29	29	32	43
24-Oct	27	28	26	29	31	30	31	25	30	33	34	33	35	36	29	31	30	28	27	25	29	28	24	29	36
25-Oct	35	25	25	50	26	34	22	25	24	28	34	32	39	34	32	32	31	23	24	17	24	31	25	25	50
26-Oct	26	31	29	30	28	30	28	28	38	28	30	30	36	38	36	32	28	23	29	21	20	20	28	24	38
27-Oct	25	23	17	23	22	31	46	42	39	35	45	45	44	45	43	45	37	14	9	9	36	16	19	13	46
28-Oct	16	38	64	29	23	24	21	32	24	37	46	49	42	37	50	41	36	32	40	32	27	30	32	34	64
29-Oct	33	30	34	32	31	27	33	29	39	44	40	39	32	44	27	43	29	14	34	39	31	91	87	57	91
30-Oct	45	39	43	54	40	23	29	32	25	44	40	40	57	52	46	49	48	47	60	46	63	63	54	75	75
31-Oct	59	57	66	33	32	25	30	43	39	37	41	40	41	36	40	37	46	18	23	13	24	UO	75	58	75
Diurnal Maximum																									
105 93 73 64 73 60 66 58 82 73 110 61 90 69 71 59 64 65 60 66 73 91 87 98																									
UO - Unstable Operation																									



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

**AMS30
ELLS RIVER
OCTOBER 2023**

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

November 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ELLS RIVER (AMS30)
OCTOBER 2023

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

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	709	35	35	100	54.5	0	6.4	0
TRS (ppb) Average	709	35	35	100	2.3	0	0.8	0
THC (ppm) Average	686	34	58	96.77	3.9	-	2.4	-
NMHC (ppm) Average	686	34	58	96.77	0.208	-	0.027	-
CH4 (ppm) Average	686	34	58	96.77	3.7	-	2.4	-
NO2 (ppb) Average	708	36	36	100	27.8	0	14.1	-
NO (ppb) Average	708	36	36	100	59.3	-	9.5	-
NOX (ppb) Average	708	36	36	100	75.5	-	20.3	-
PM2.5 (ug/m3) Average	743	1	1	100	37.5	0	19.9	0
Temperature 2 m (C) Average	744	0	0	100	23.4	-	11.7	-
Relative Humidity (%) Average	744	0	0	100	97	-	88.4	-
Wind Speed 10 m (km/h) Average	732	0	12	98.39	36	-	19	-
Wind Direction 10 m (deg) Average	732	0	12	98.39	-	-	-	-
Global Solar Radiation (W/m2) Average	744	0	0	100	451.9	-	113.4	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ELLS RIVER (AMS30)
OCTOBER 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	0.97	3.5	-	0	0	0	0.1	0.3	2	54.5
TRS (ppb) Average	709	0.47	0.2	-	0.2	0.3	0.4	0.4	0.5	0.7	2.3
THC (ppm) Average	686	2.13	0.2	-	2	2	2	2.1	2.2	2.3	3.9
NMHC(ppm) Average	686	0.003	0.019	-	0	0	0	0	0	0	0.208
CH4(ppm) Average	686	2.13	0.2	-	2	2	2	2.1	2.2	2.3	3.7
NO2 (ppb) Average	708	4.33	5	-	0.1	0.2	0.4	2.4	6.5	11.8	27.8
NO (ppb) Average	708	1.74	4.7	-	0	0	0	0.1	1.2	4.5	59.3
NOX (ppb) Average	708	6.07	8.3	-	0.1	0.2	0.5	3	9	15.5	75.5
PM2.5 (ug/m3) Average	743	7.89	5.7	-	0.3	2.2	4.1	6.7	10.1	14.4	37.5
Temperature 2 m (C) Average	744	3.8	7.4	-	-12.8	-5.5	-1.9	3.9	9.5	13.6	23.4
Relative Humidity (%) Average	744	70.41	15.7	-	33	49	58.3	72	83.8	91	97
Wind Speed 10 m (km/h) Average	732	9.1	6	-	0	2	5	8	12	17	36
Wind Direction 10 m (deg) Average	732	226.2	-	-	-	-	-	-	-	-	-
Global Solar Radiation (W/m2) Average	744	66.05	107	-	0	0	0	0.2	102.5	251.1	451.9

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ELLS RIVER (AMS30)
OCTOBER 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
THC/NMHC/CH4	02 Oct 2023 10:00	03 Oct 2023 09:00	24	Unstable Operation - flatline in analyzer output signal
Wind Speed, Wind Direction	09 Oct 2023 22:00	09 Oct 2023 22:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	12 Oct 2023 05:00	12 Oct 2023 09:00	5	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	13 Oct 2023 05:00	13 Oct 2023 05:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	15 Oct 2023 05:00	15 Oct 2023 07:00	3	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	20 Oct 2023 23:00	21 Oct 2023 00:00	2	Flat line in sensor output signal - Sensor frozen



Wood Buffalo Environmental Association

Summary of Hour Averages

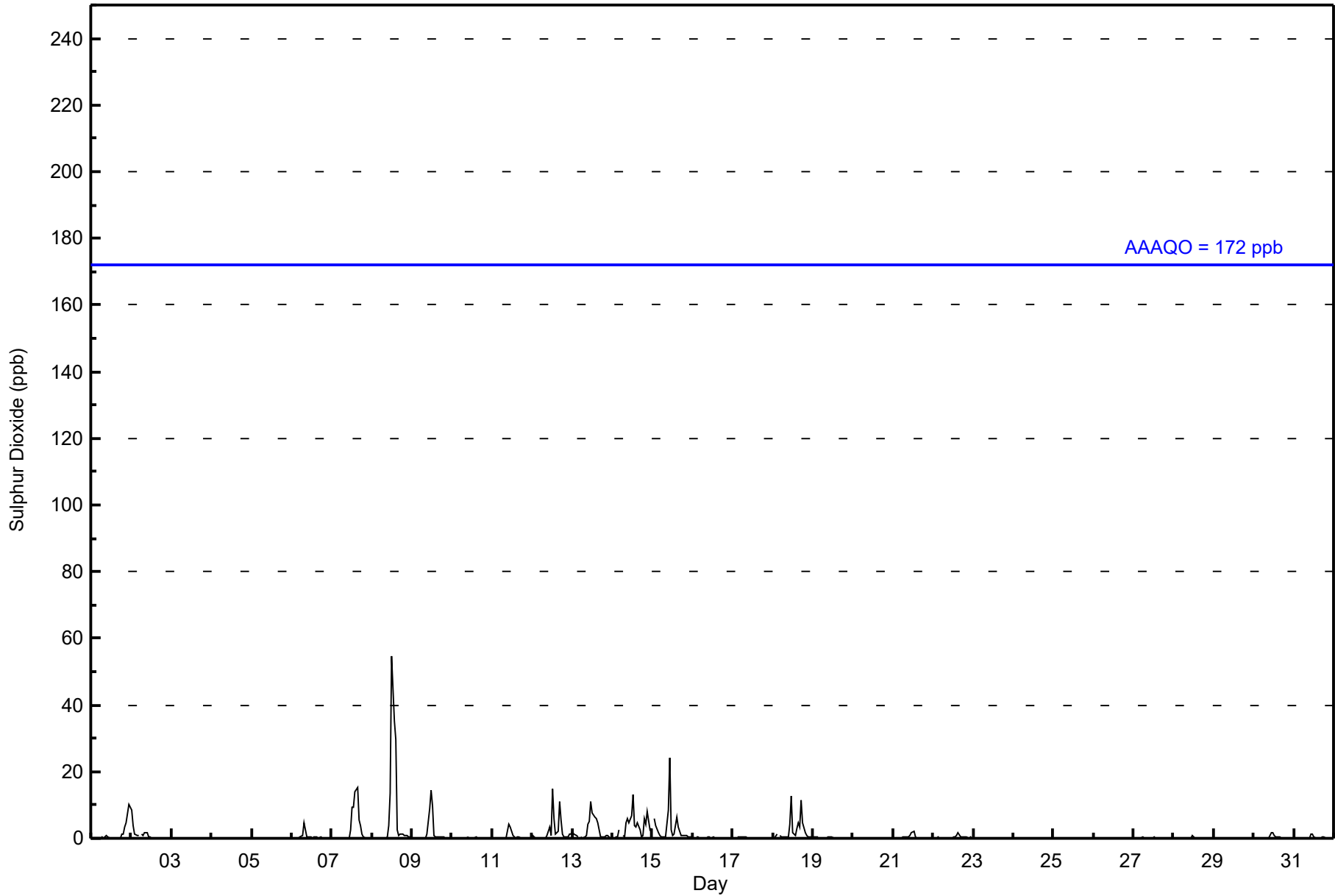
Sulphur Dioxide (SO₂) - ppb

Ells River - October 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 744														Daily Average		Daily Maximum					
Maximum Value: 54.5 ppb on Oct 8 13:00		Maximum Daily Average: 6.4 ppb on Oct 8		Hours of Data: 709														0.9		8.3							
Minimum Value: 0.0 ppb on Oct 1 01:00		Minimum Daily Average: 0.0 ppb on Oct 4		Hours of Missing Data: 35														0.0		0.0							
Maximum Diurnal Average: 3.9 ppb at hour 13		Minimum Diurnal Average: 0.1 ppb at hour 6		Hours of Calibration: 35														0.0		0.0							
Monthly Average: 0.97 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.3 P ₉₀ = 2.0 P ₉₉ = 14.1		Percent Operational Time: 100.0														0.0		0.0							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Oct	0.0	0.0	0.0	0.0	Z	0.1	0.5	0.2	0.4	0.7	0.4	0.2	0.1	0.0	0.0	0.0	0.1	0.0	1.4	1.3	3.5	4.5	10.0	9.4	1.4	10.0	
2-Oct	8.3	3.9	1.4	0.7	0.7	Z	1.1	1.0	1.7	1.5	0.4	0.3	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	8.3	
3-Oct	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1
4-Oct	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
5-Oct	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
6-Oct	0.0	0.0	0.0	Z	0.0	0.4	0.8	4.9	2.6	0.4	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.5	4.9	
7-Oct	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	2.6	9.2	9.4	14.2	15.3	5.5	3.6	1.3	0.5	0.2	0.1	0.0	0.0	2.7	15.3	
8-Oct	0.1	0.1	0.1	0.1	0.0	Z	0.1	0.0	0.0	0.2	3.8	13.6	54.5	35.4	29.7	2.7	0.7	1.2	1.2	0.8	0.7	0.7	0.3	0.3	6.4	54.5	
9-Oct	Z	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	1.3	9.0	14.6	9.9	0.9	0.4	0.5	0.3	0.3	0.2	0.2	0.2	0.1	0.0	0.0	1.7	14.6	
10-Oct	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.3	
11-Oct	0.1	0.1	Z	0.0	0.0	0.0	0.0	0.0	0.0	2.1	4.3	3.4	0.7	0.2	0.2	0.5	0.3	0.2	0.2	0.1	0.0	0.1	0.0	0.2	0.5	4.3	
12-Oct	0.7	0.3	0.1	Z	0.1	0.0	0.0	0.0	0.1	0.9	3.4	1.0	15.0	6.1	1.4	2.2	11.0	5.6	1.5	0.4	0.4	0.5	1.2	1.4	2.3	15.0	
13-Oct	2.0	1.3	1.1	0.4	Z	0.3	0.2	0.4	1.0	4.4	5.3	11.0	7.6	6.6	5.7	4.6	2.3	0.5	0.4	0.2	0.8	0.9	0.2	0.2	2.5	11.0	
14-Oct	0.2	0.2	0.2	0.5	2.6	Z	0.7	0.5	4.7	5.9	4.6	6.8	13.1	3.7	3.4	4.6	2.5	0.6	0.7	5.9	4.2	8.2	2.5	2.9	3.5	13.1	
15-Oct	Z	5.9	3.8	1.8	0.8	0.4	0.2	0.3	0.5	8.6	24.1	2.6	1.1	1.3	6.5	3.3	2.3	0.9	0.8	0.8	0.7	0.5	0.5	0.4	3.0	24.1	
16-Oct	0.4	Z	0.3	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.3	0.2	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.4	
17-Oct	0.1	0.1	Z	0.5	0.3	0.5	0.4	0.5	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.2	0.5	
18-Oct	0.0	0.0	1.3	Z	1.0	0.5	0.5	0.3	0.3	0.6	4.4	12.5	1.6	0.9	3.1	4.5	3.4	11.5	4.5	1.6	1.0	0.6	0.4	0.4	2.4	12.5	
19-Oct	0.3	0.2	0.2	0.3	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	
20-Oct	0.1	0.1	0.0	0.1	0.0	Z	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
21-Oct	Z	0.2	0.1	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.7	1.6	2.0	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	2.0
22-Oct	0.2	Z	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.9	1.6	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.3	1.6	
23-Oct	0.2	0.2	Z	0.2	0.2	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	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.2	
24-Oct	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	
25-Oct	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	
26-Oct	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	
27-Oct	Z	0.0	0.0	0.0	0.0	0.3	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	0.3	
28-Oct	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	
29-Oct	0.1	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	
30-Oct	0.0	0.0	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.1	1.7	1.7	0.9	0.4	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.3	1.7	
31-Oct	0.1	0.0	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	1.2	1.1	0.2	0.2	0.1	0.1	0.1	0.2	0.3	0.1	0.1	0.1	0.1	0.1	0.2	1.2	
																								Diurnal Average		Diurnal Maximum	
																								0.5		8.3	
																								0.5		5.9	
																								0.3		3.8	
																								0.2		1.8	
																								0.3		2.6	
																								0.1		0.5	
																								0.2		1.1	
																								0.3		4.9	
																								0.4		4.7	
																								1.0		8.6	
																								2.2		24.1	
																								2.5		14.6	
																								3.9		54.5	
																								2.2		35.4	
																								2.2		29.7	
																								1.3		15.3	
																								1.0		11.0	
																								0.8		11.5	
																								0.4		4.5	
																								0.4		5.9	
																								0.4		4.2	
																								0.6		8.2	
																								0.5		10.0	
																								0.5		9.4	

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
Ells River - October 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	695	98.03	98.03
11 - 20	10	1.41	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
Ells River - October 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	36	15	3	8	11	13	46	104	90	46	74	51	57	79	30	21	684
11 - 20	0	0	0	0	0	1	3	4	2	0	0	0	0	0	0	0	10
21 - 60	0	0	0	0	0	0	0	4	0	0	0	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	36	15	3	8	11	14	49	112	92	46	74	51	57	79	30	21	698

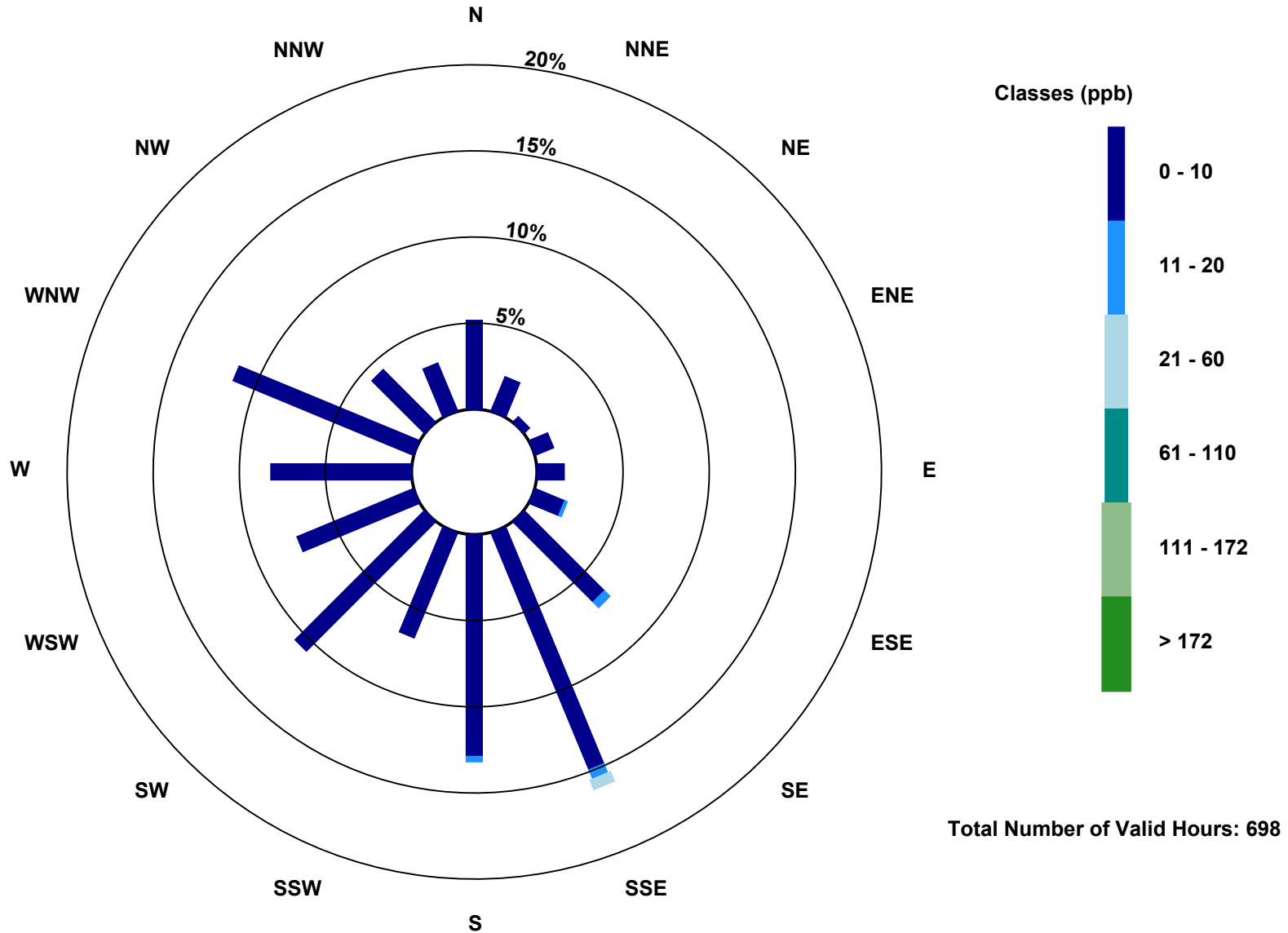
Total Number of Valid Hours: 698

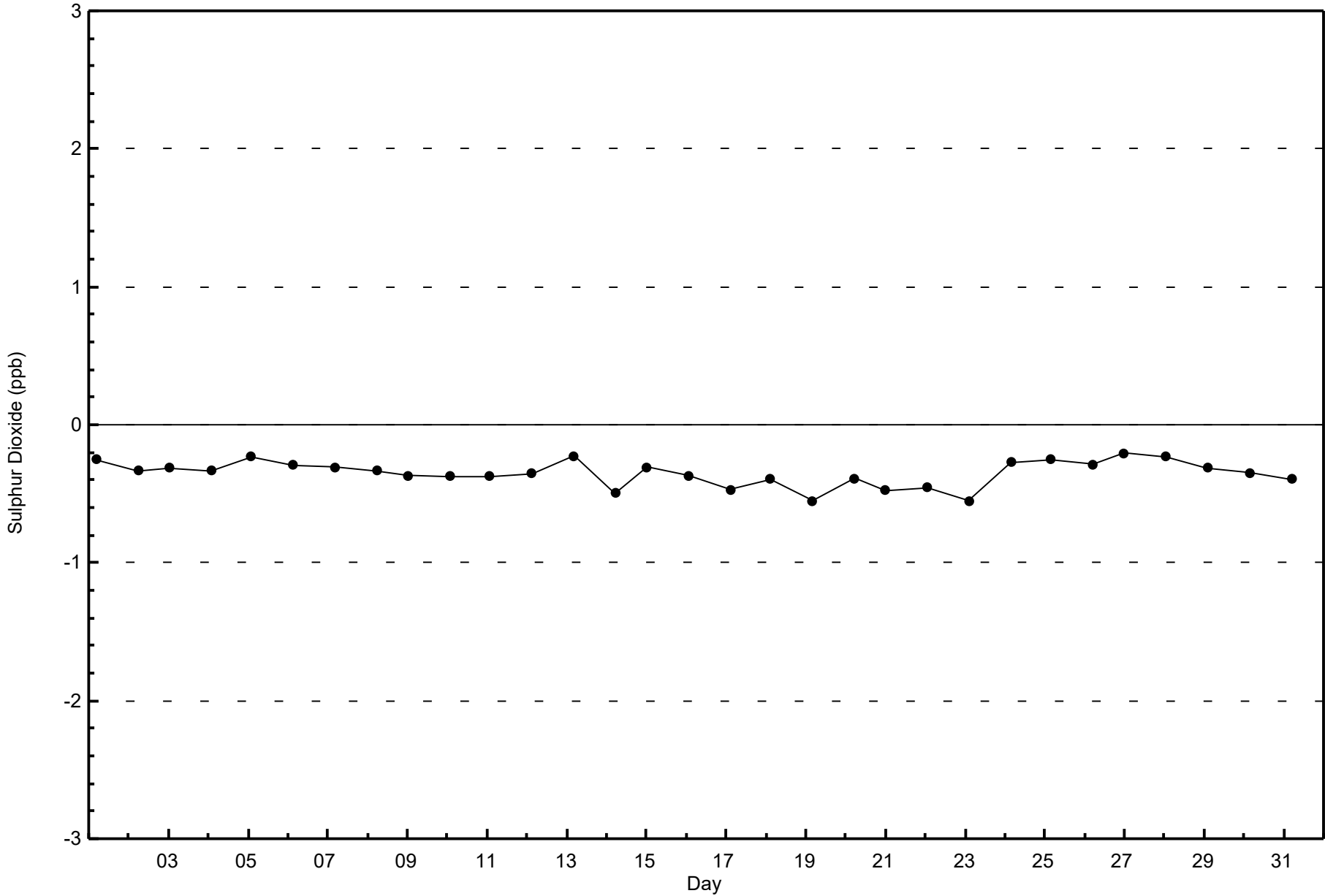
Total Number of Hours: 744

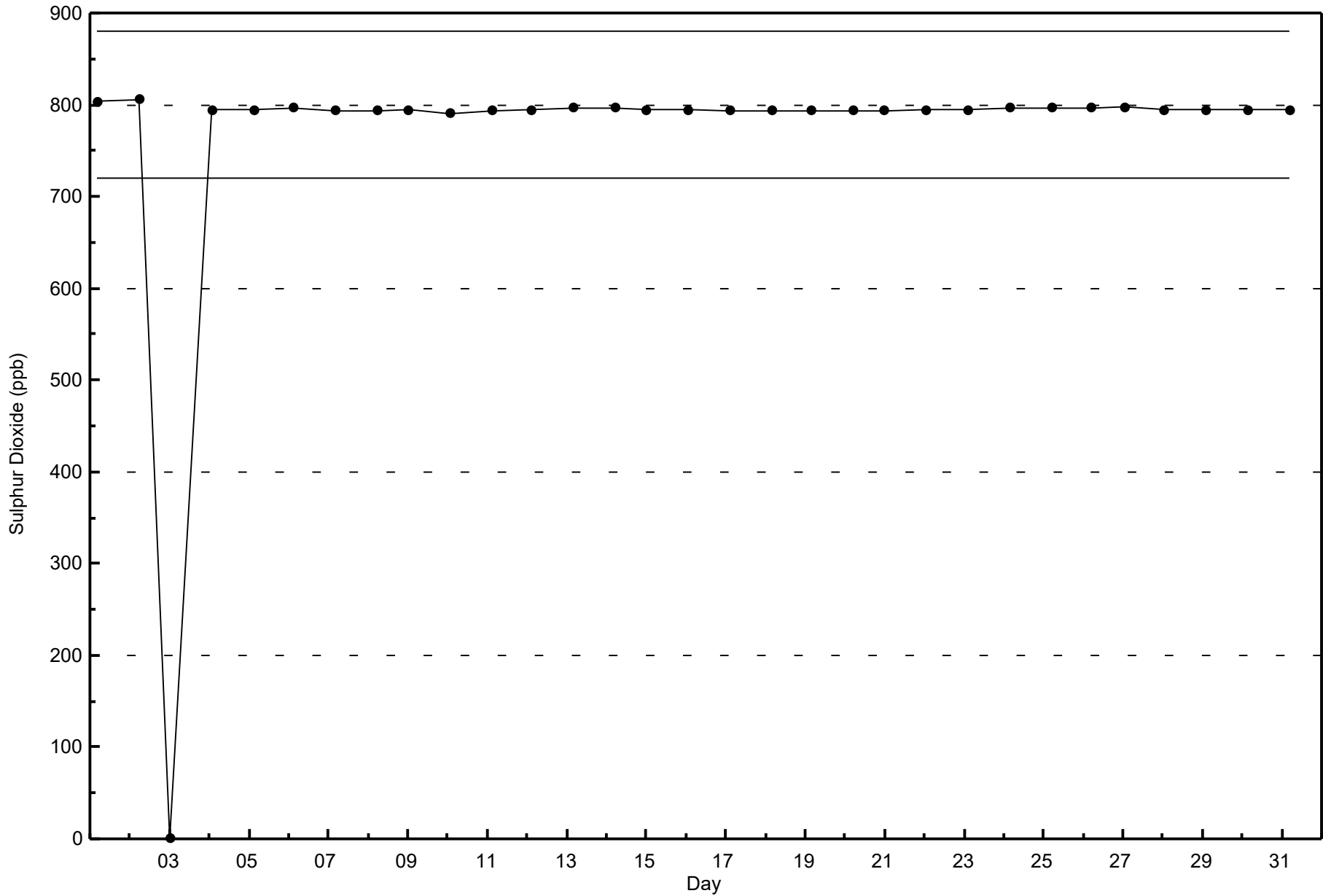


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Sulphur Dioxide (SO₂) - ppb
Ells River









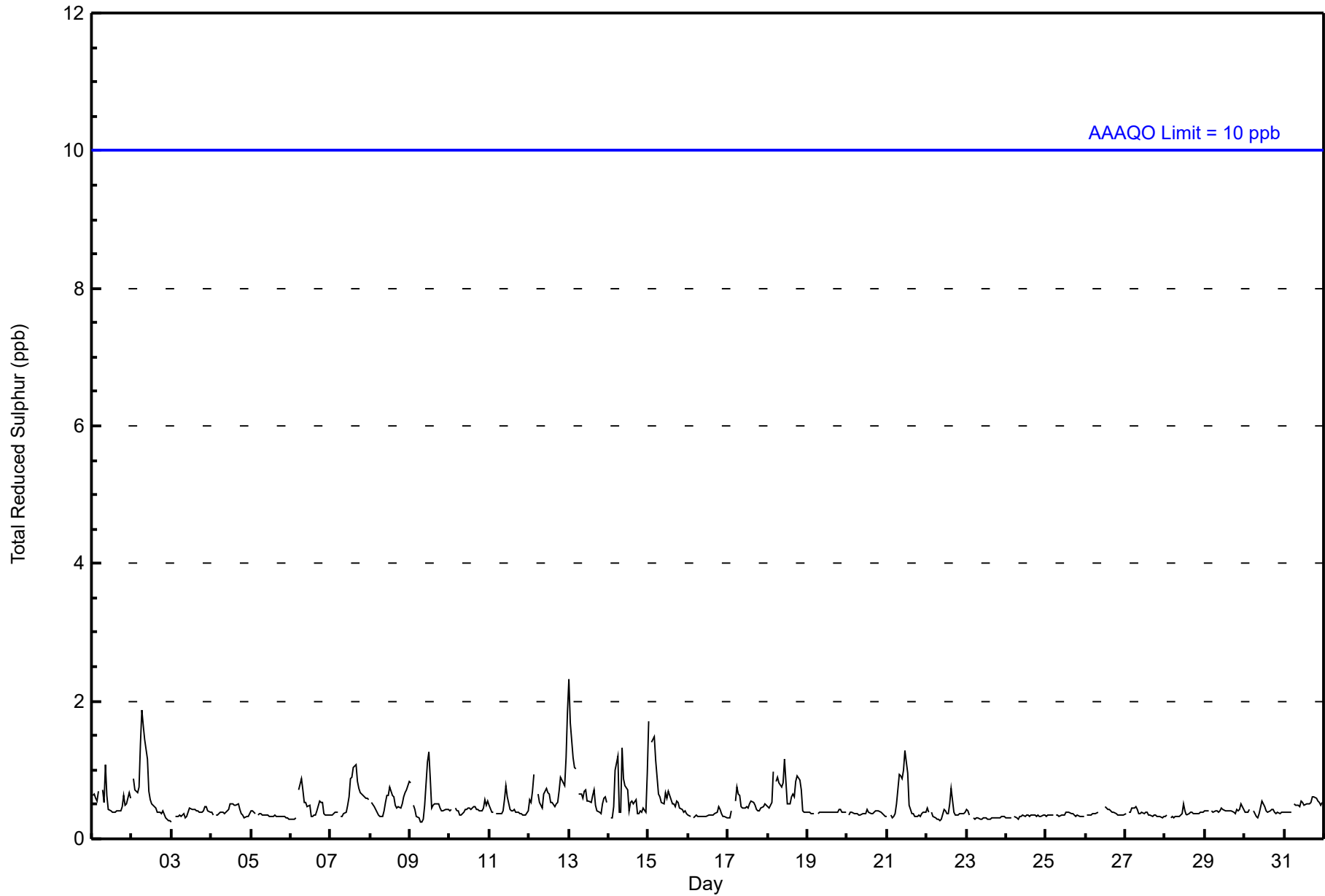
Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

Ells River - October 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 744																	Daily Average		Daily Maximum				
Maximum Value: 2.3 ppb on Oct 13 01:00		Maximum Daily Average: 0.8 ppb on Oct 13																	Hours of Data: 709		Hours of Missing Data: 35						
Minimum Value: 0.2 ppb on Oct 9 07:00		Minimum Daily Average: 0.3 ppb on Oct 23																	Hours of Calibration: 35		Percent Operational Time: 100.0						
Maximum Diurnal Average: 0.5 ppb at hour 11		Minimum Diurnal Average: 0.4 ppb at hour 22																									
Monthly Average: 0.47 ppb		Percentiles: P ₁ = 0.3 P ₁₀ = 0.3 Q ₁ = 0.4 Median = 0.4 Q ₃ = 0.5 P ₉₀ = 0.7 P ₉₉ = 1.4																									
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-Oct	0.6	0.6	0.6	0.6	0.7	Z	0.7	0.5	1.1	0.6	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.6	0.5	0.5	0.7	0.6	0.6	1.1	
2-Oct	Z	0.9	0.7	0.7	0.8	1.4	1.9	1.6	1.4	1.2	0.7	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.7	1.9	
3-Oct	0.2	Z	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	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.5	
4-Oct	0.4	0.4	Z	0.3	0.3	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	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.5	
5-Oct	0.4	0.4	0.4	Z	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	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	
6-Oct	0.3	0.3	0.3	0.3	Z	0.7	0.9	0.7	0.5	0.5	0.5	0.5	0.3	0.3	0.3	0.3	0.4	0.5	0.5	0.5	0.4	0.3	0.4	0.3	0.4	0.9	
7-Oct	0.3	0.4	0.4	0.4	0.4	Z	0.3	0.3	0.4	0.4	0.5	0.6	0.9	0.9	1.0	1.1	0.8	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.6	1.1	
8-Oct	Z	0.5	0.5	0.4	0.4	0.3	0.3	0.3	0.4	0.5	0.6	0.6	0.7	0.6	0.6	0.5	0.4	0.5	0.4	0.5	0.6	0.7	0.7	0.8	0.5	0.8	
9-Oct	0.8	Z	0.5	0.4	0.3	0.3	0.2	0.3	0.3	0.5	1.1	1.3	0.9	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5	1.3	
10-Oct	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.3	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	0.6	0.5	0.5	0.4	0.6	
11-Oct	0.5	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.6	0.8	0.6	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	0.8	
12-Oct	0.6	0.5	0.7	0.9	Z	0.7	0.5	0.5	0.4	0.6	0.7	0.7	0.6	0.5	0.5	0.5	0.5	0.5	0.7	0.9	0.8	0.8	1.2	1.8	0.7	1.8	
13-Oct	2.3	1.7	1.2	1.0	1.0	Z	0.6	0.6	0.6	0.7	0.7	0.6	0.6	0.5	0.6	0.7	0.5	0.4	0.4	0.4	0.5	0.6	0.6	0.5	0.8	2.3	
14-Oct	Z	0.3	0.3	0.5	1.0	1.2	0.4	0.4	1.3	0.9	0.8	0.7	0.4	0.5	0.5	0.6	0.4	0.4	0.4	0.4	0.4	0.5	0.4	1.0	0.6	1.3	
15-Oct	1.7	Z	1.4	1.5	1.1	0.9	0.7	0.6	0.5	0.5	0.7	0.6	0.7	0.6	0.5	0.5	0.5	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.7	1.7	
16-Oct	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	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.5	
17-Oct	0.3	0.3	0.4	Z	0.6	0.7	0.7	0.6	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.7	
18-Oct	0.5	0.4	0.5	1.0	Z	0.8	0.9	0.8	0.7	0.8	1.1	0.8	0.5	0.6	0.6	0.6	0.8	0.9	0.8	0.7	0.4	0.4	0.4	0.4	0.7	1.1	
19-Oct	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	
20-Oct	Z	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	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.4	
21-Oct	0.3	Z	0.3	0.3	0.3	0.4	0.5	0.9	0.9	0.9	1.0	1.3	1.0	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5	1.3	
22-Oct	0.5	0.4	Z	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.7	0.4	0.3	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.7	
23-Oct	0.4	0.4	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	
24-Oct	0.3	0.3	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	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	
25-Oct	0.3	0.3	0.3	0.3	0.3	Z	0.3	0.3	0.3	0.3	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	0.4	
26-Oct	Z	0.3	0.4	0.4	0.4	0.4	0.4	0.4	C	C	C	C	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.3	0.4	0.4	0.5	
27-Oct	0.4	Z	0.4	0.4	0.4	0.4	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	0.3	0.3	0.3	0.3	0.3	0.4	0.5	
28-Oct	0.3	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.3	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	0.5	
29-Oct	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	0.5	0.4	0.4	0.5	
30-Oct	0.4	0.4	0.4	0.4	Z	0.4	0.4	0.3	0.3	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	
31-Oct	0.4	0.4	0.4	0.4	0.4	Z	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.6	
																								Diurnal Average		Diurnal Maximum	
																								0.5		0.5	
																								2.3		1.8	
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

Total Reduced Sulphur (TRS) - ppb
Ells River - October 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

Total Reduced Sulphur (TRS) - ppb
Ells River - October 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	37	15	2	8	11	14	48	113	93	46	71	50	57	79	30	24	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	37	15	2	8	11	14	48	113	93	46	71	50	57	79	30	24	698

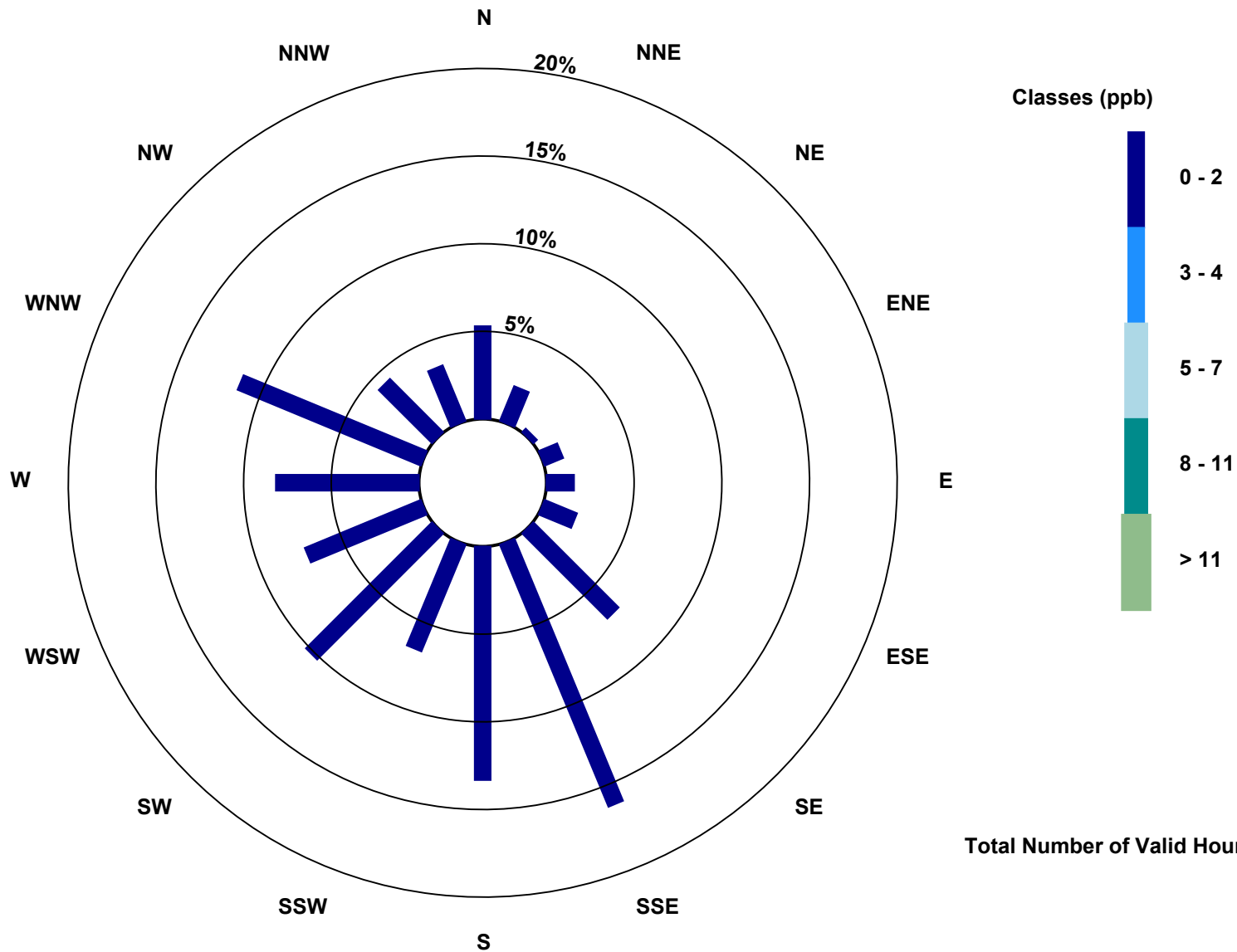
Total Number of Valid Hours: 698

Total Number of Hours: 744

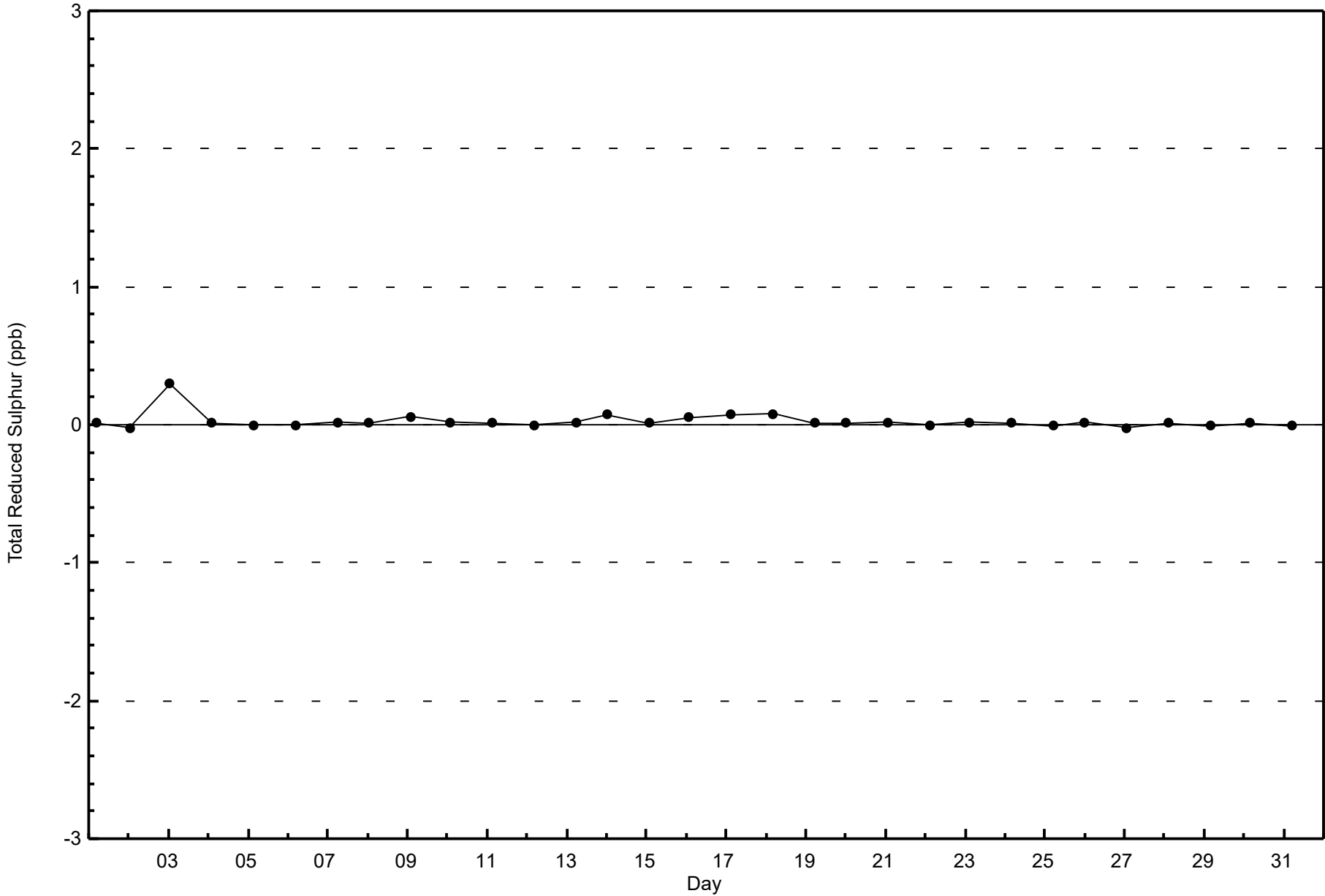


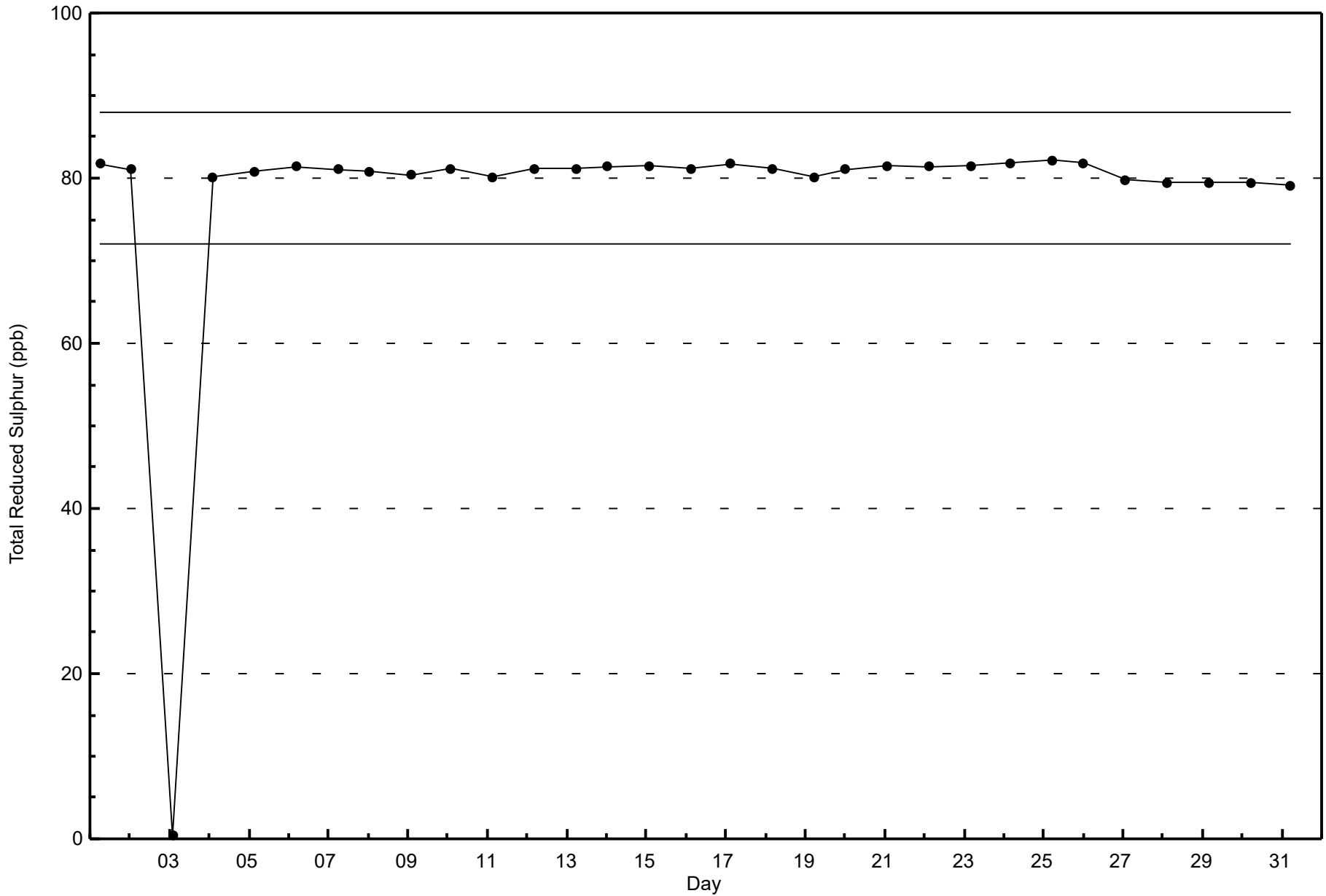
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Total Reduced Sulphur (TRS) - ppb
Ells River



Total Number of Valid Hours: 698





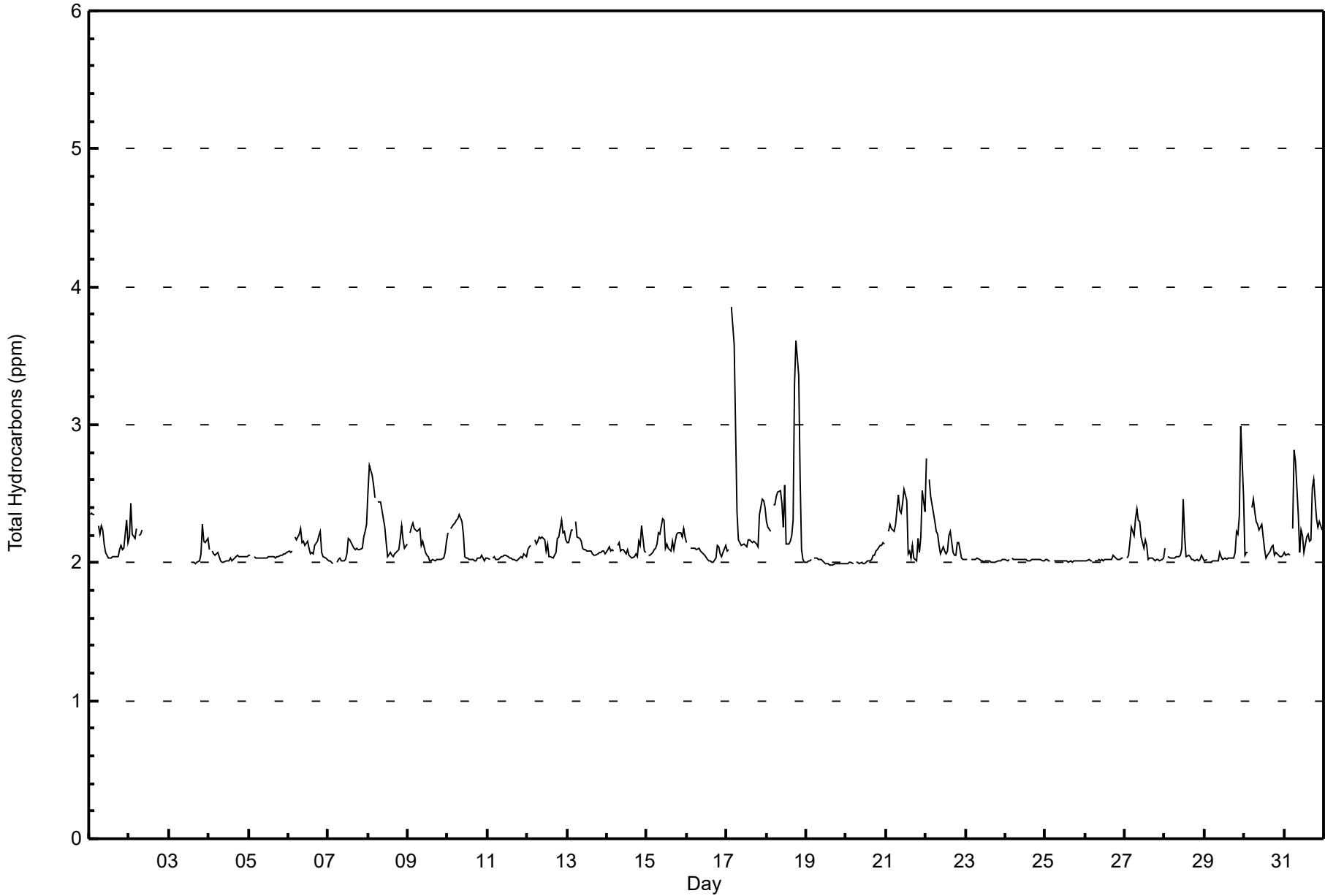


Maximum Value: 3.9 ppm on Oct 17 04:00		Maximum Daily Average: 2.4 ppm on Oct 18		Hours in Service: 744																							
Minimum Value: 2.0 ppm on Oct 19 16:00		Minimum Daily Average: 2.0 ppm on Oct 19		Hours of Data: 686																							
Maximum Diurnal Average: 2.2 ppm at hour 5		Minimum Diurnal Average: 2.1 ppm at hour 14		Hours of Missing Data: 58																							
Monthly Average: 2.13 ppm		Percentiles: P ₁ = 2.0 P ₁₀ = 2.0 Q ₁ = 2.0 Median = 2.1 Q ₃ = 2.2 P ₉₀ = 2.3 P ₉₉ = 2.8		Hours of Calibration: 34																							
				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-Oct	2.4	2.4	2.4	2.3	Z	2.3	2.2	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	2.1	2.1	2.3	2.1	2.2	2.4	
2-Oct	2.2	2.4	2.2	2.2	2.3	Z	2.2	2.2	2.2	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	2.4	
3-Oct	UO	UO	UO	UO	UO	UO	UO	UO	UO	C	C	C	C	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.3	2.2	2.1	2.2	--	2.3	
4-Oct	2.1	Z	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	
5-Oct	2.1	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	2.1	2.1	2.1	2.1	2.0	2.1	
6-Oct	2.1	2.1	2.1	Z	2.2	2.2	2.2	2.2	2.1	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.0	2.0	2.0	2.1	2.2	
7-Oct	2.0	2.0	2.0	2.0	Z	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	2.1	2.1	2.1	2.2	2.2	2.3	2.1	2.3	
8-Oct	2.5	2.7	2.6	2.6	2.5	Z	2.4	2.4	2.4	2.3	2.3	2.2	2.0	2.1	2.1	2.0	2.1	2.1	2.1	2.2	2.3	2.2	2.1	2.1	2.3	2.7	
9-Oct	Z	2.2	2.3	2.3	2.2	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	2.0	2.0	2.1	2.2	2.1	2.3	
10-Oct	2.2	Z	2.2	2.3	2.3	2.3	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	2.0	2.1	2.0	2.0	2.0	2.1	2.3	
11-Oct	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.1	
12-Oct	2.1	2.1	2.1	Z	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.2	2.2	2.3	2.2	2.2	2.2	2.1	2.3	
13-Oct	2.2	2.2	2.2	2.2	Z	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	2.1	2.1	2.1	2.1	2.3	
14-Oct	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	2.1	2.0	2.2	2.1	2.3	2.1	2.1	2.1	2.3
15-Oct	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.3	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.3	
16-Oct	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	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	
17-Oct	2.1	2.1	Z	3.9	3.6	3.0	2.4	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.2	2.1	2.1	2.1	2.4	2.5	2.4	2.4	2.4	3.9	
18-Oct	2.3	2.3	2.2	Z	2.4	2.4	2.5	2.5	2.5	2.4	2.3	2.6	2.1	2.1	2.2	2.2	2.3	3.3	3.6	3.4	2.6	2.1	2.0	2.0	2.4	3.6	
19-Oct	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	2.0	
20-Oct	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	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	
21-Oct	Z	2.2	2.3	2.3	2.2	2.2	2.3	2.5	2.4	2.4	2.4	2.5	2.5	2.1	2.1	2.0	2.1	2.0	2.0	2.2	2.1	2.2	2.5	2.4	2.3	2.5	
22-Oct	2.8	Z	2.6	2.5	2.4	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.0	2.1	2.1	2.0	2.0	2.0	2.2	2.8	
23-Oct	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
24-Oct	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	2.0	2.0	
25-Oct	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	2.0	
26-Oct	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	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	
27-Oct	Z	2.0	2.1	2.2	2.3	2.2	2.3	2.4	2.3	2.3	2.2	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	2.4	
28-Oct	2.1	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.5	2.2	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.5	
29-Oct	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.3	3.0	2.5	2.1	3.0	
30-Oct	2.1	2.1	2.1	Z	2.4	2.5	2.4	2.3	2.3	2.2	2.3	2.2	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.2	2.5	
31-Oct	2.1	2.1	2.1	2.1	Z	2.3	2.8	2.7	2.3	2.1	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.5	2.6	2.3	2.3	2.3	2.3	2.2	2.3	2.8	
																								Diurnal Average			
																								Diurnal Maximum			
2.1 2.1 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1																											
2.8 2.7 2.6 3.9 3.6 3.0 2.8 2.7 2.5 2.4 2.4 2.6 2.5 2.2 2.2 2.2 2.3 3.3 3.6 3.4 2.6 2.5 3.0 2.5																											
Z - zerospan				C - Calibration				UO - Unstable Operation																			



Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Ells River - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Ells River - October 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	308	44.90	44.90
2.1 - 3.0	373	54.37	99.27
3.1 - 10.0	5	0.73	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 686

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Total Hydrocarbons (THC) - ppm
Ells River - October 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	0	1	1	4	9	28	16	19	23	53	38	31	58	16	5	307
2.1 - 3.0	31	15	2	7	7	5	21	93	61	20	21	9	24	19	13	15	363
3.1 - 10.0	0	0	0	0	0	0	0	0	2	0	0	0	0	1	1	1	5
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	36	15	3	8	11	14	49	109	82	43	74	47	55	78	30	21	675

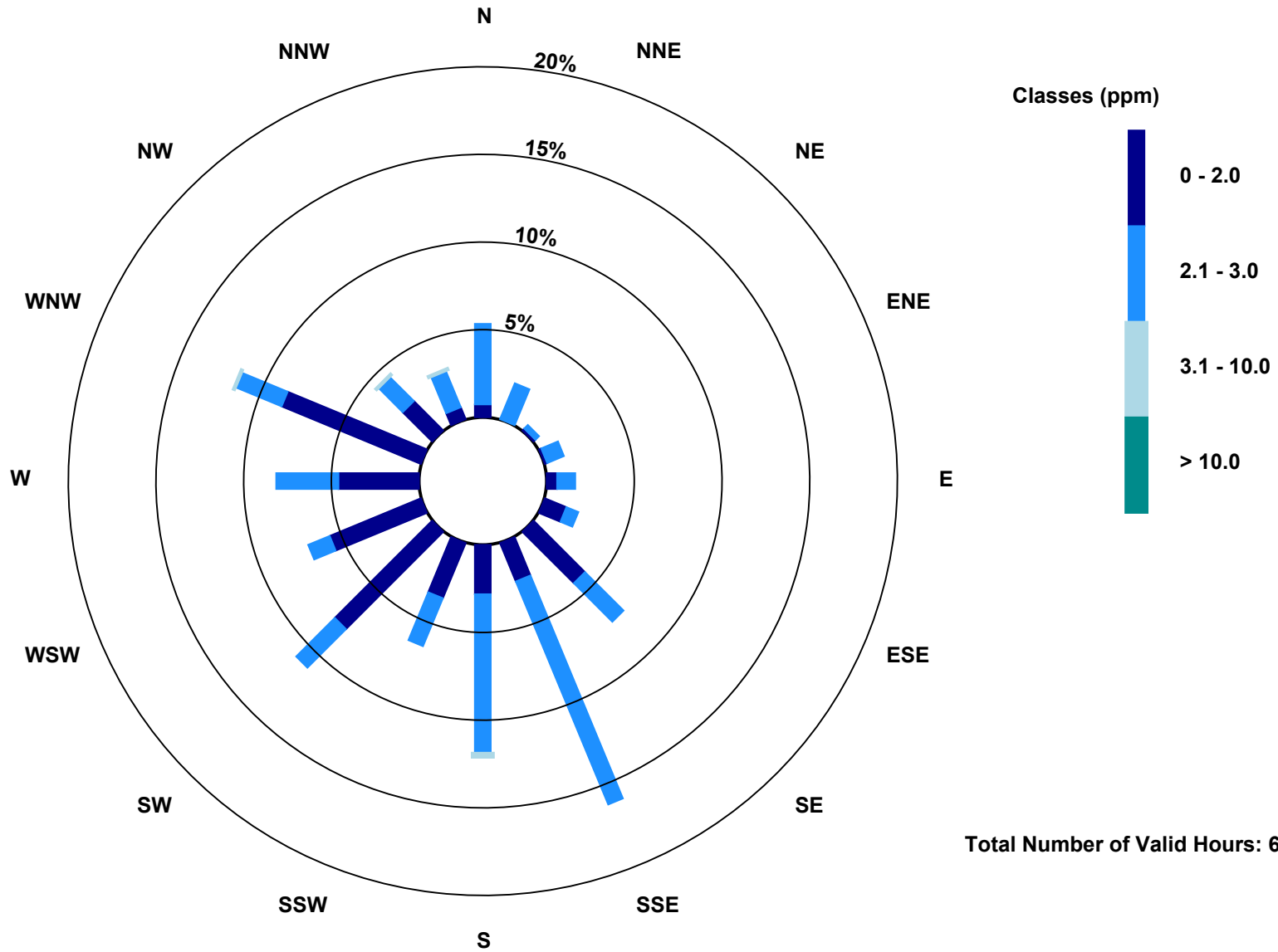
Total Number of Valid Hours: 675

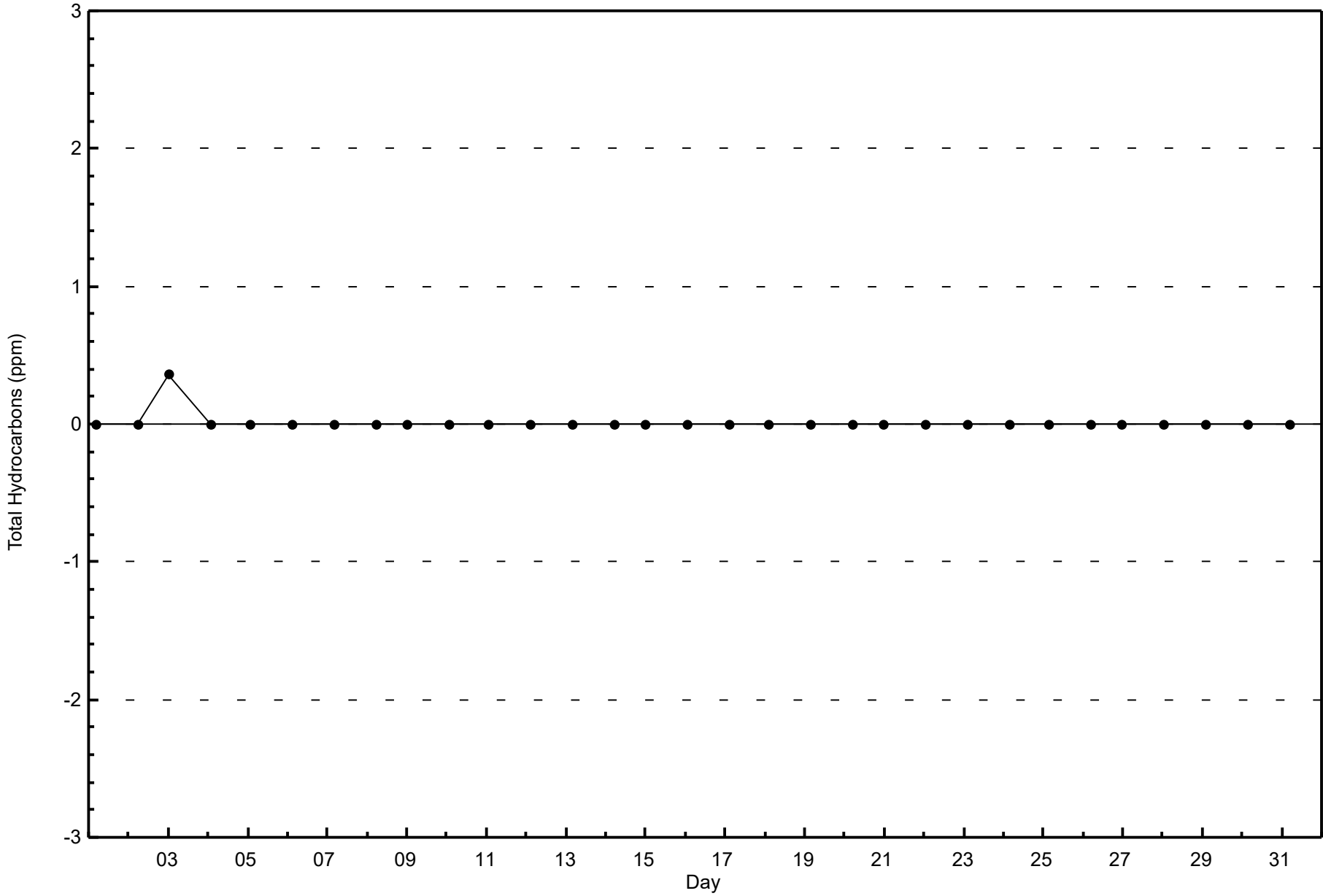
Total Number of Hours: 744

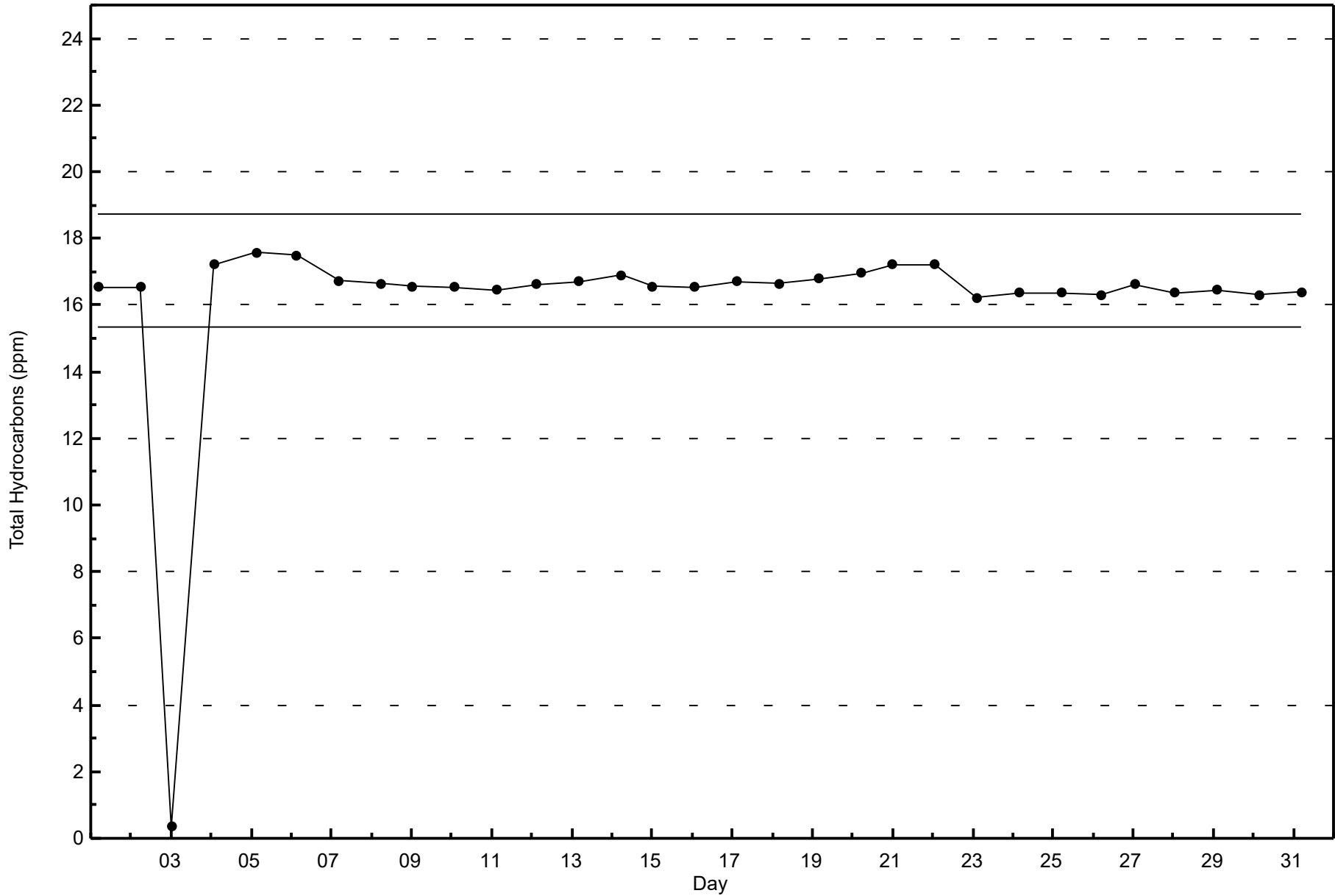


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Total Hydrocarbons (THC) - ppm
Ells River

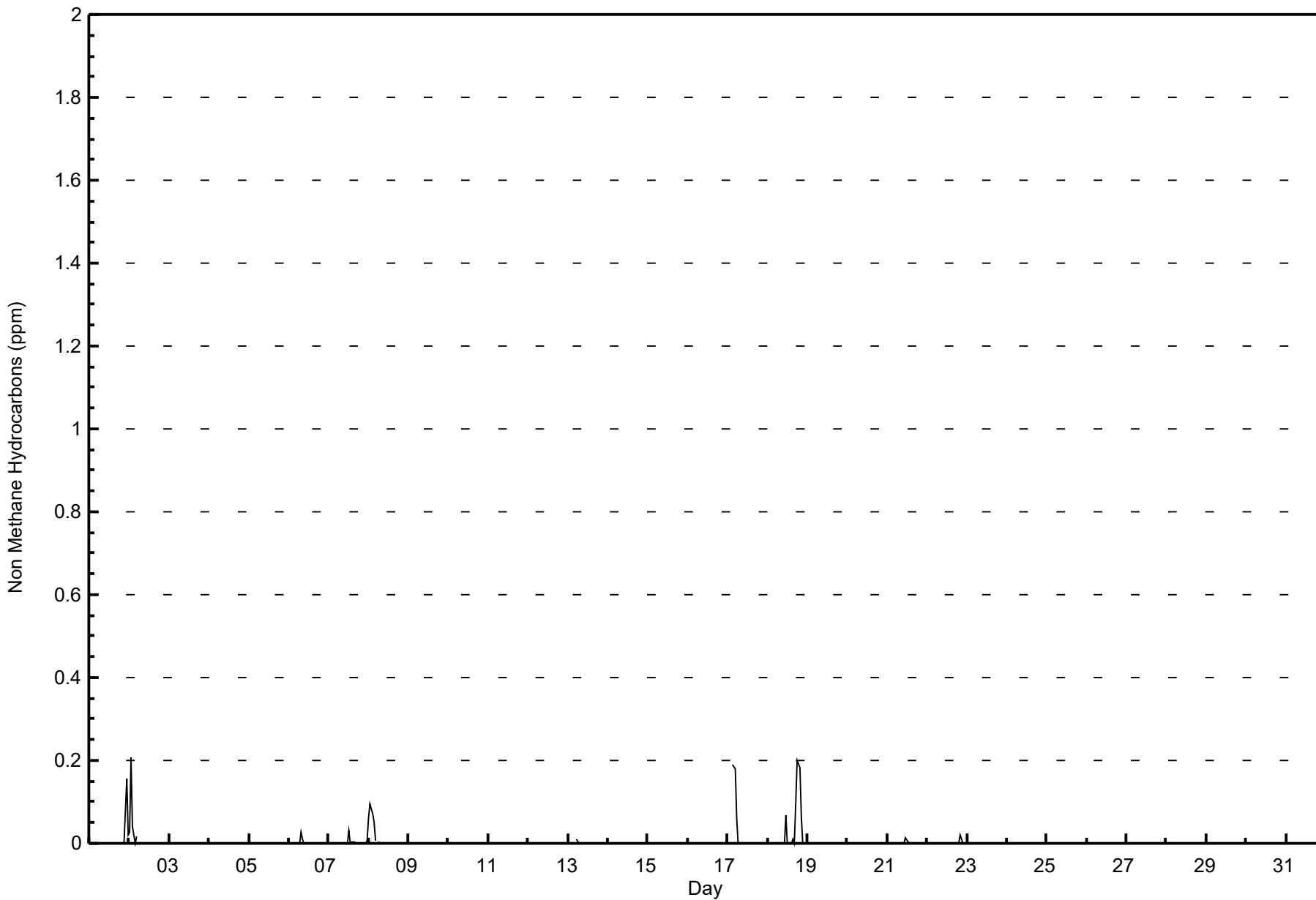








Maximum Value: 0.208 ppm on Oct 2 02:00																								Hours in Service: 744			
Minimum Value: 0.000 ppm on Oct 1 01:00																								Hours of Data: 686			
Maximum Diurnal Average: 0.012 ppm at hour 2																								Hours of Missing Data: 58			
Monthly Average: 0.003 ppm																								Hours of Calibration: 34			
Minimum Daily Average: 0.000 ppm on Oct 4																								Percent Operational Time: 96.8			
Minimum Diurnal Average: 0.000 ppm at hour 10																											
Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.0 P ₉₉ = 0.1																											
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Oct	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	0.155	0.019	0.008	0.155	
2-Oct	0.027	0.208	0.042	0.000	0.018	Z	0.000	0.000	0.000	0.000	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	0.208
3-Oct	UO	UO	UO	UO	UO	UO	UO	UO	UO	C	C	C	C	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	--	0.000
4-Oct	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
5-Oct	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
6-Oct	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.029	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.029	
7-Oct	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.031	0.000	0.004	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.031	
8-Oct	0.059	0.094	0.071	0.051	0.006	Z	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.012	0.094	
9-Oct	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
10-Oct	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
11-Oct	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
12-Oct	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
13-Oct	0.000	0.000	0.002	0.000	Z	0.009	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.009	
14-Oct	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
15-Oct	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
16-Oct	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
17-Oct	0.000	0.000	Z	0.191	0.178	0.062	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.019	0.191	
18-Oct	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.067	0.000	0.000	0.000	0.010	0.000	0.097	0.201	0.184	0.064	0.000	0.000	0.000	0.027	0.201	
19-Oct	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	
20-Oct	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	
21-Oct	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.013	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.013	
22-Oct	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	0.021	0.000	0.001	0.021	
23-Oct	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	
24-Oct	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	
25-Oct	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	
26-Oct	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	
27-Oct	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	
28-Oct	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	
29-Oct	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	
30-Oct	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	
31-Oct	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	
0.003 0.012 0.005 0.010 0.008 0.003 0.000 0.001 0.000 0.000 0.000 0.003 0.001 0.000 0.000 0.001 0.000 0.003 0.007 0.006 0.003 0.000 0.005 0.001																								Diurnal Average			
0.059 0.208 0.071 0.191 0.178 0.062 0.004 0.029 0.010 0.000 0.000 0.067 0.031 0.000 0.004 0.010 0.000 0.097 0.201 0.184 0.064 0.000 0.155 0.019																								Diurnal Maximum			
Z - zerospan C - Calibration UO - Unstable Operation																											





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm
Ells River - October 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	659	96.06	96.06
0.006 - 0.05	14	2.04	98.10
0.06 - 0.1	7	1.02	99.13
> 0.1	6	0.87	100.00

Total Number of Valid Hours: 686

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm
Ells River - October 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	34	15	3	8	11	14	48	100	78	42	74	47	49	77	28	20	648
0.006 - 0.05	1	0	0	0	0	0	1	7	1	0	0	0	3	0	1	0	14
0.06 - 0.1	1	0	0	0	0	0	0	0	2	1	0	0	3	0	0	0	7
> 0.1	0	0	0	0	0	0	0	2	1	0	0	0	0	1	1	1	6
Totals	36	15	3	8	11	14	49	109	82	43	74	47	55	78	30	21	675

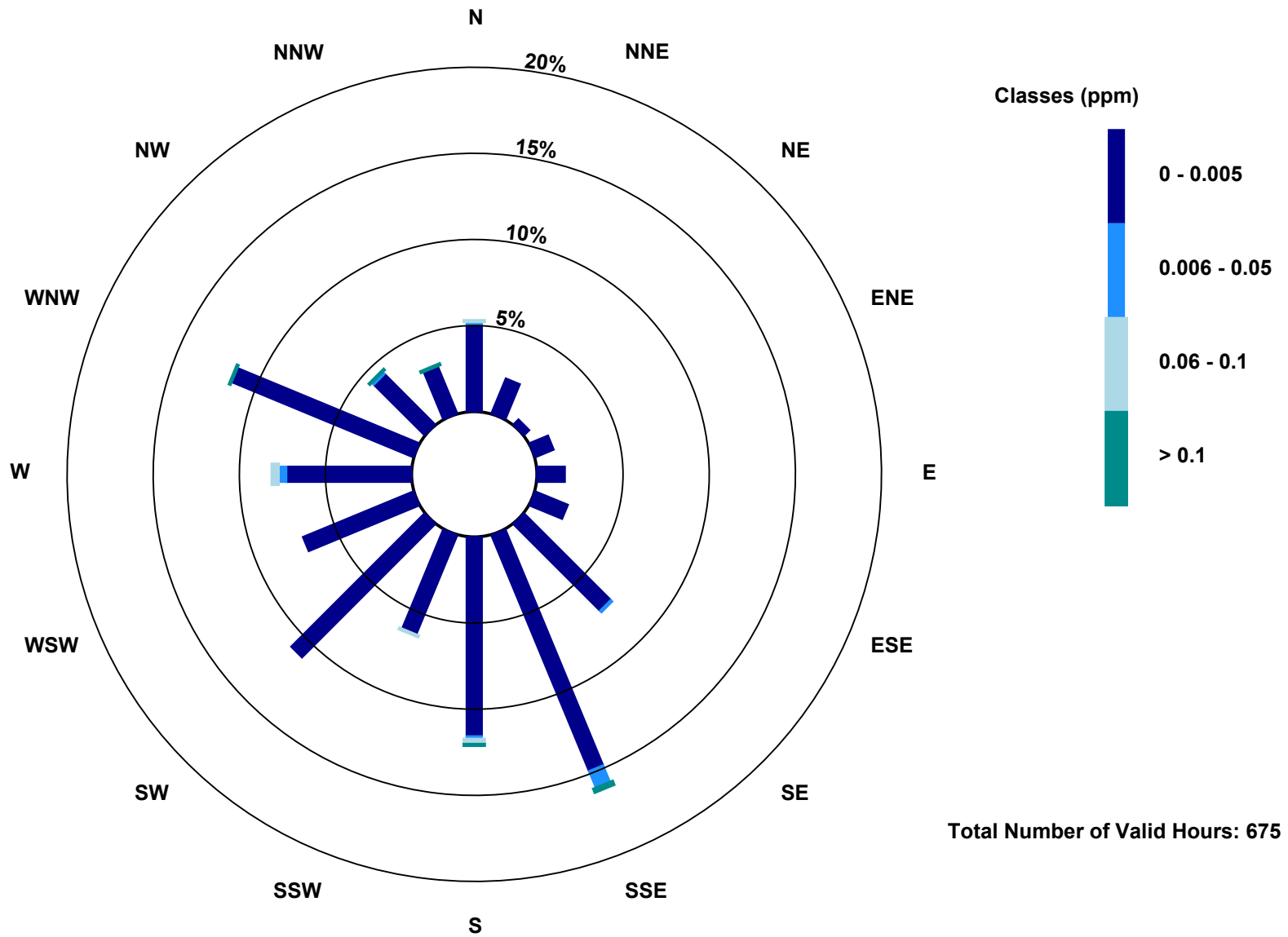
Total Number of Valid Hours: 675

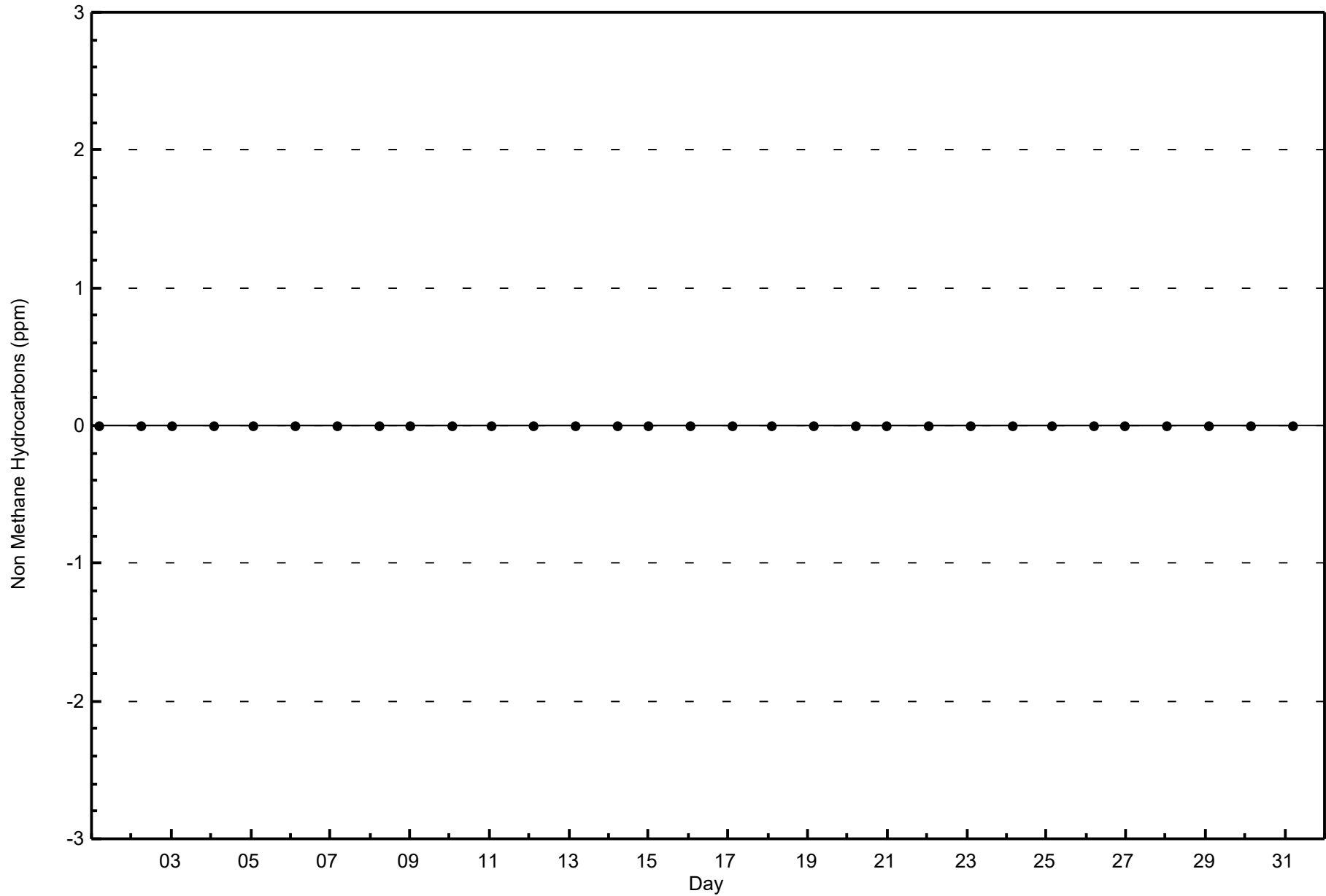
Total Number of Hours: 744

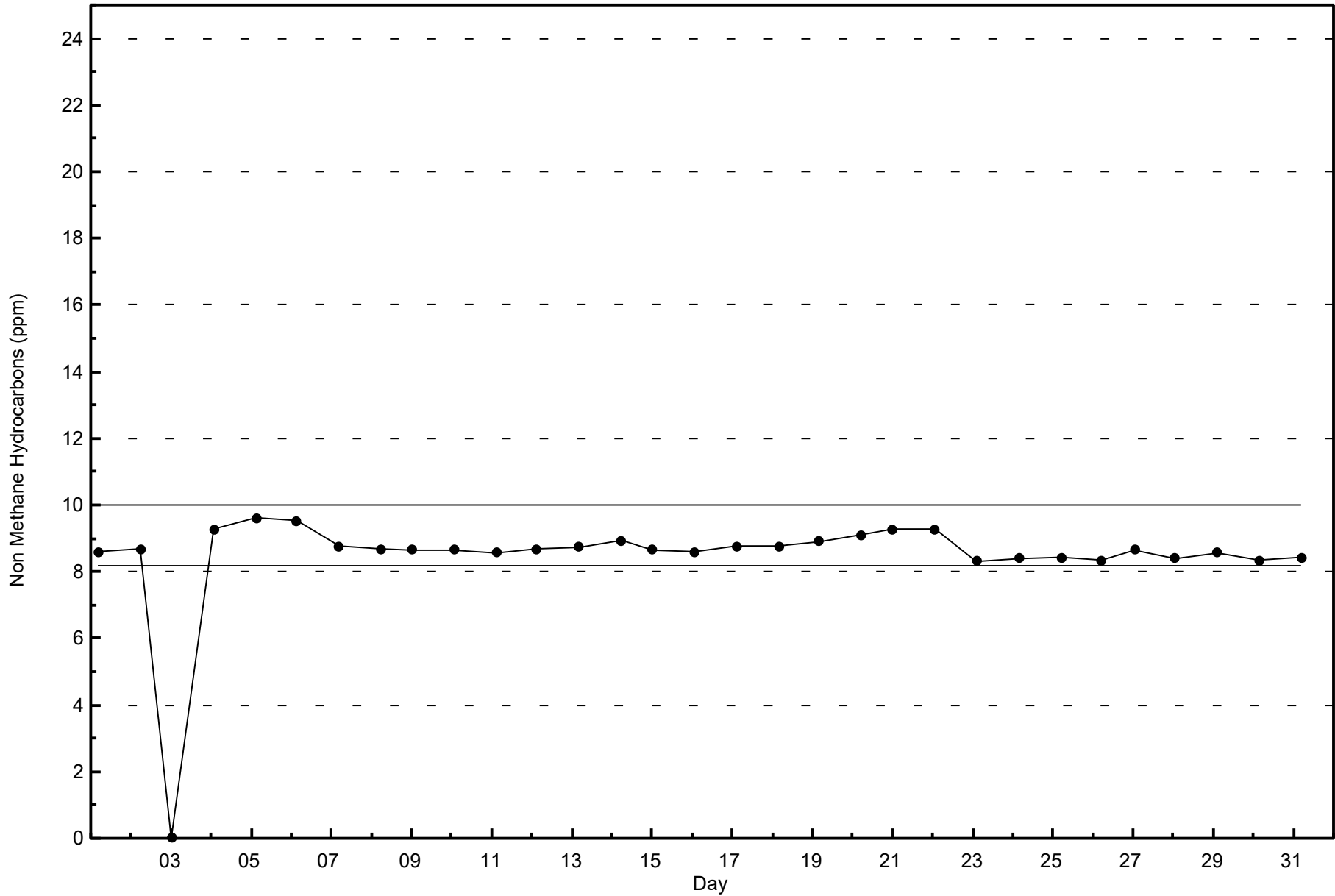


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Non Methane Hydrocarbons (NMHC) - ppm
Ells River









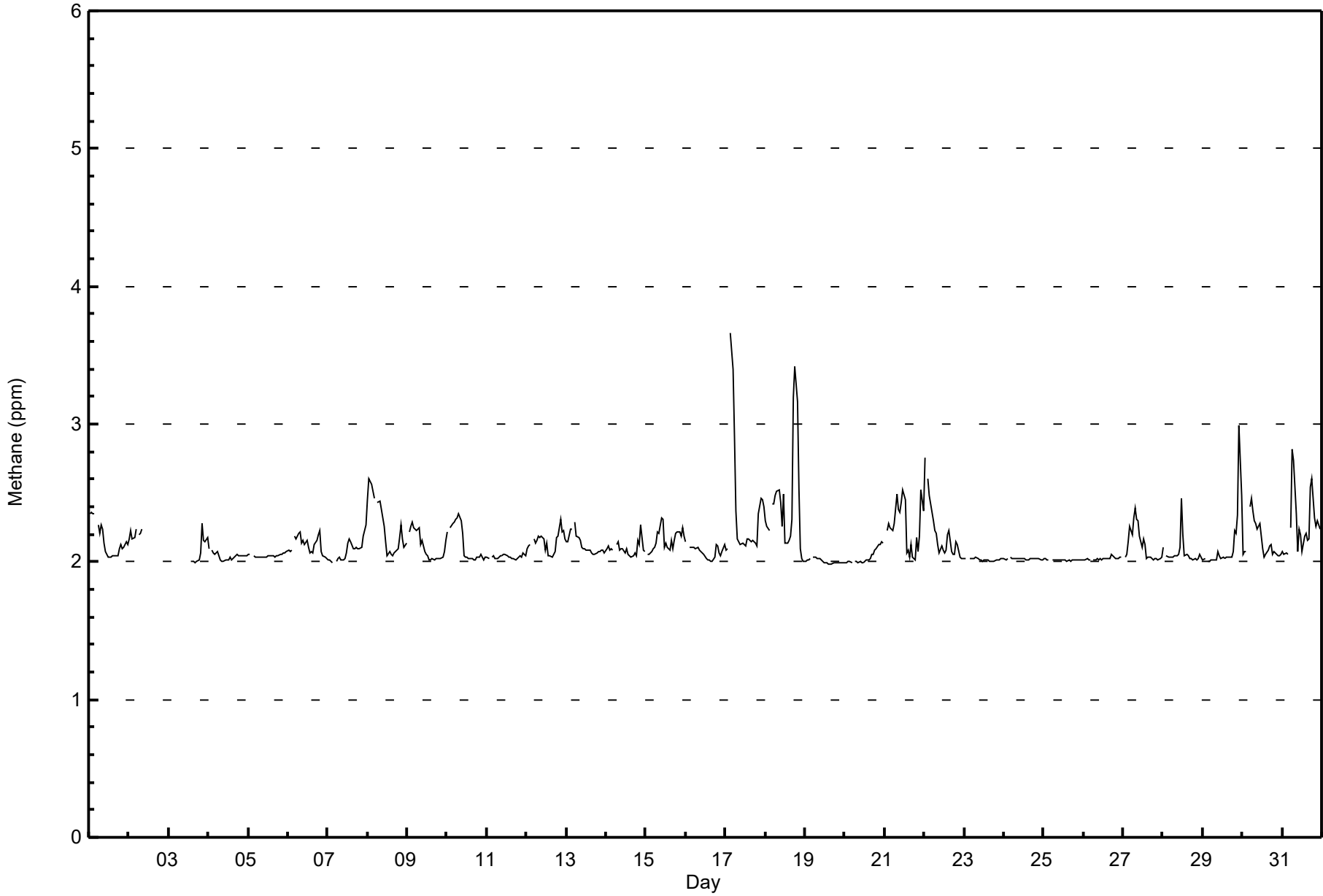
Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH₄) - ppm

Ells River - October 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		744																			
Maximum Value: 3.7 ppm on Oct 17 04:00		Maximum Daily Average: 2.4 ppm on Oct 18				Hours of Data:		686																			
Minimum Value: 2.0 ppm on Oct 19 16:00		Minimum Daily Average: 2.0 ppm on Oct 19				Hours of Missing Data:		58																			
Maximum Diurnal Average: 2.2 ppm at hour 5		Minimum Diurnal Average: 2.1 ppm at hour 14				Hours of Calibration:		34																			
Monthly Average: 2.13 ppm		Percentiles: P ₁ = 2.0 P ₁₀ = 2.0 Q ₁ = 2.0 Median = 2.1 Q ₃ = 2.2 P ₉₀ = 2.3 P ₉₉ = 2.8				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-Oct	2.4	2.4	2.4	2.3	Z	2.3	2.2	2.3	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	2.2	2.4	
2-Oct	2.2	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.2	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	2.2	
3-Oct	UO	UO	UO	UO	UO	UO	UO	UO	UO	C	C	C	C	2.0	2.0	2.0	2.0	2.0	2.1	2.3	2.2	2.1	2.2	--	2.3		
4-Oct	2.1	Z	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	
5-Oct	2.1	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	2.1	2.1	2.1	2.1	2.0	2.1	
6-Oct	2.1	2.1	2.1	Z	2.2	2.2	2.2	2.2	2.1	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.0	2.0	2.0	2.1	2.2	
7-Oct	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.1	2.3	
8-Oct	2.5	2.6	2.6	2.5	2.5	Z	2.4	2.4	2.4	2.3	2.3	2.2	2.0	2.1	2.1	2.0	2.1	2.1	2.1	2.2	2.3	2.2	2.1	2.1	2.3	2.6	
9-Oct	Z	2.2	2.3	2.3	2.2	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	2.0	2.0	2.1	2.2	2.1	2.3	
10-Oct	2.2	Z	2.2	2.3	2.3	2.3	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	2.0	2.1	2.0	2.0	2.0	2.1	2.3	
11-Oct	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1	
12-Oct	2.1	2.1	2.1	Z	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.2	2.2	2.3	2.2	2.2	2.2	2.1	2.3	
13-Oct	2.2	2.2	2.2	2.2	Z	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	2.1	2.1	2.1	2.1	2.3	
14-Oct	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	2.1	2.0	2.2	2.1	2.3	2.1	2.1	2.1	2.3	
15-Oct	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.3	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.3	
16-Oct	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	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	
17-Oct	2.1	2.1	Z	3.7	3.4	2.9	2.4	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.2	2.1	2.1	2.1	2.4	2.5	2.4	2.4	2.3	3.7	
18-Oct	2.3	2.3	2.2	Z	2.4	2.4	2.5	2.5	2.5	2.4	2.3	2.5	2.1	2.1	2.2	2.2	2.3	3.2	3.4	3.2	2.5	2.1	2.0	2.0	2.4	3.4	
19-Oct	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	2.0	
20-Oct	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	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	
21-Oct	Z	2.2	2.3	2.3	2.2	2.2	2.3	2.5	2.4	2.4	2.4	2.5	2.4	2.1	2.1	2.0	2.1	2.0	2.0	2.2	2.1	2.2	2.5	2.4	2.3	2.5	
22-Oct	2.8	Z	2.6	2.5	2.4	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.0	2.1	2.1	2.0	2.0	2.0	2.2	2.8	
23-Oct	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
24-Oct	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	2.0	2.0	
25-Oct	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	2.0	
26-Oct	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	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	
27-Oct	Z	2.0	2.1	2.2	2.3	2.2	2.3	2.4	2.3	2.3	2.2	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	2.1	2.4
28-Oct	2.1	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.5	2.2	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	2.5
29-Oct	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.3	3.0	2.5	2.1	3.0	
30-Oct	2.1	2.1	2.1	Z	2.4	2.5	2.4	2.3	2.3	2.2	2.3	2.2	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.2	2.5	
31-Oct	2.1	2.1	2.1	2.1	Z	2.3	2.8	2.7	2.3	2.1	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.5	2.6	2.3	2.3	2.3	2.3	2.2	2.3	2.8	
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerspan																											
C - Calibration																											
UO - Unstable Operation																											





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Ells River - October 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	308	44.90	44.90
2.1 - 3.0	373	54.37	99.27
3.1 - 10.0	5	0.73	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 686

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Methane (CH₄) - ppm
Ells River - October 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	0	1	1	4	9	28	16	19	23	53	38	31	58	16	5	307
2.1 - 3.0	31	15	2	7	7	5	21	93	61	20	21	9	24	19	13	15	363
3.1 - 10.0	0	0	0	0	0	0	0	0	2	0	0	0	0	1	1	1	5
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	36	15	3	8	11	14	49	109	82	43	74	47	55	78	30	21	675

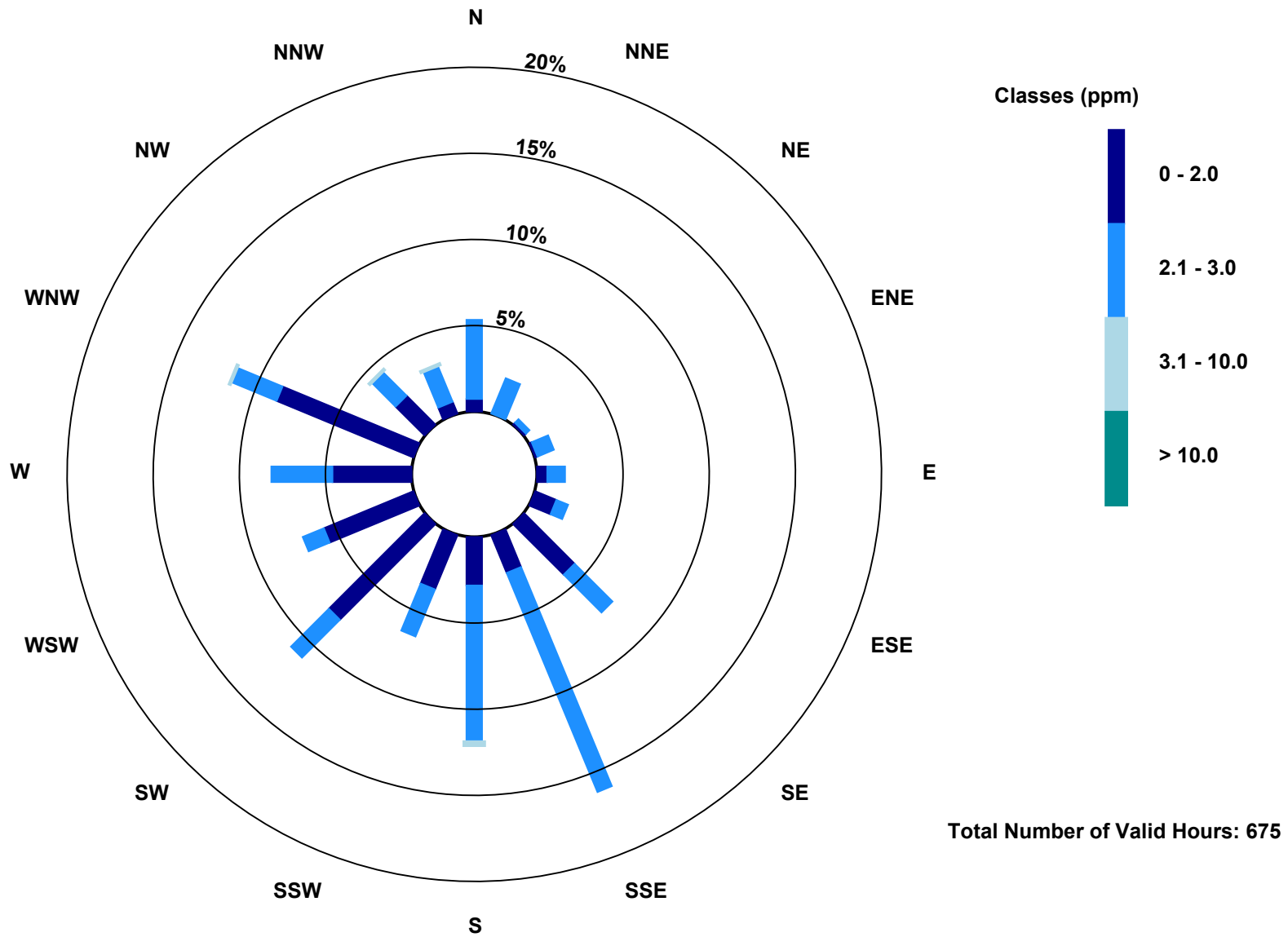
Total Number of Valid Hours: 675

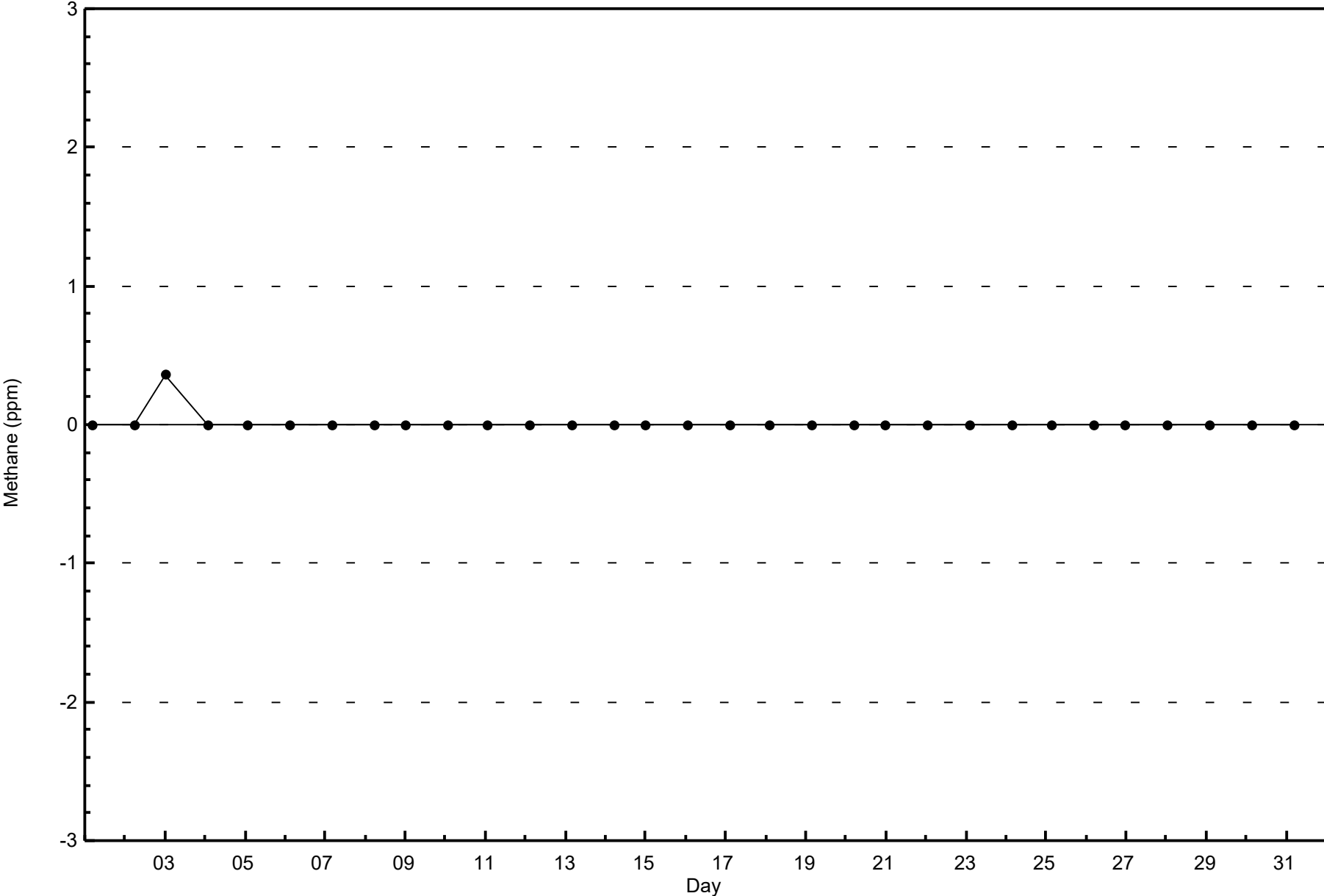
Total Number of Hours: 744

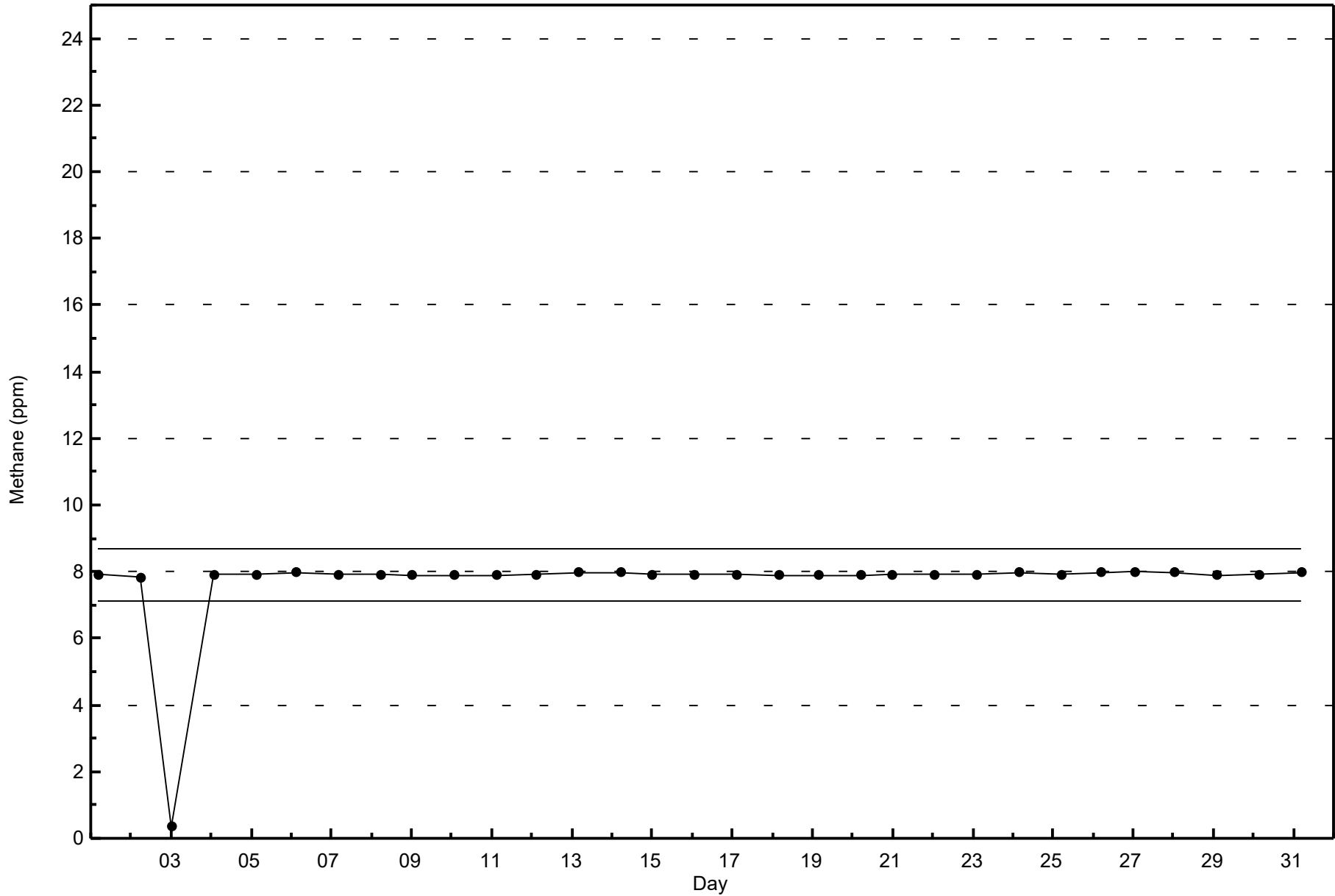


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Methane (CH₄) - ppm
Ells River









Wood Buffalo Environmental Association
Summary of Hour Averages

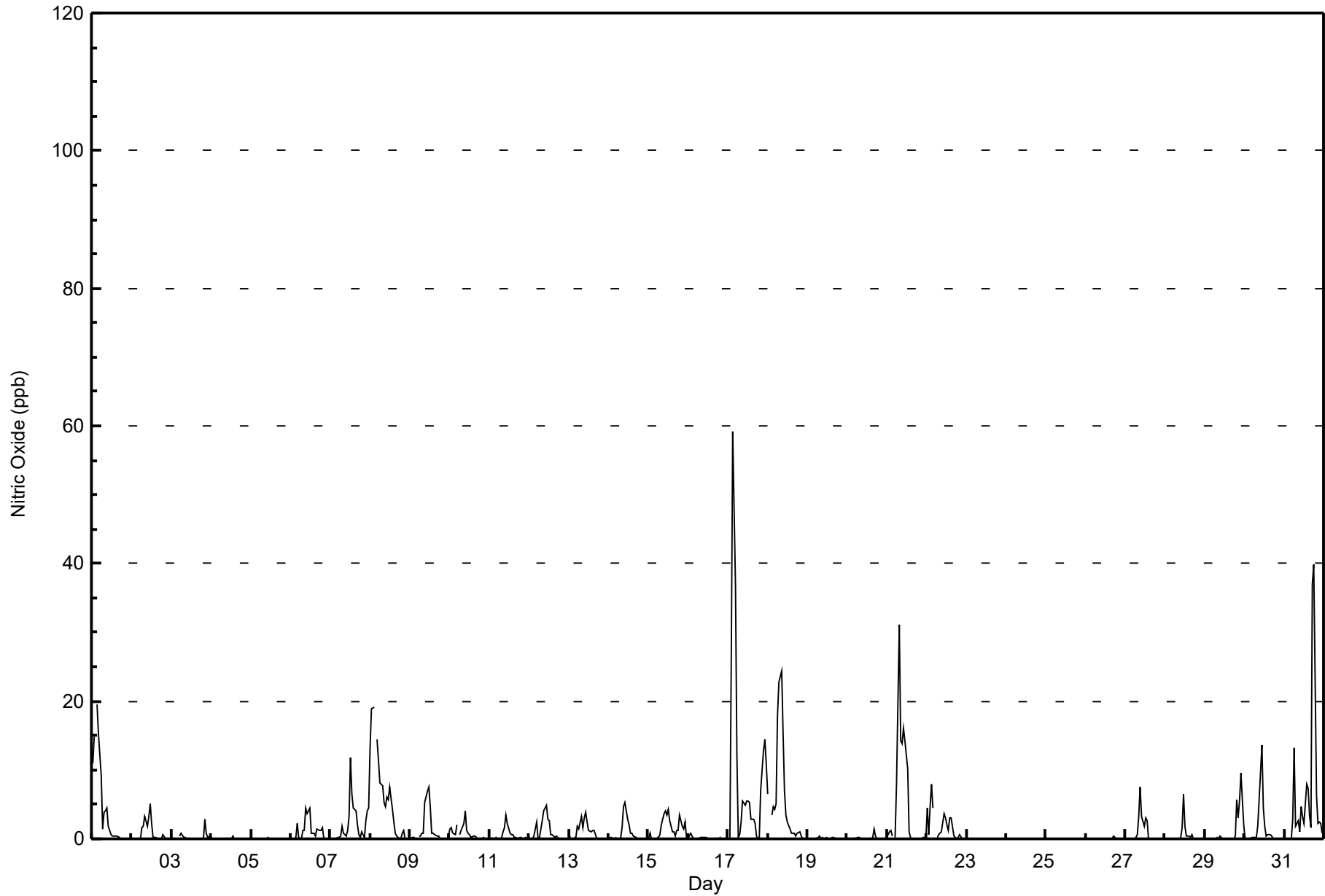
Nitric Oxide (NO) - ppb
Ells River - October 2023

Maximum Value: 59.3 ppb on Oct 17 04:00		Maximum Daily Average: 9.5 ppb on Oct 17		Hours in Service: 744																																												
Minimum Value: 0.0 ppb on Oct 1 18:00		Minimum Daily Average: 0.0 ppb on Oct 23		Hours of Data: 708																																												
Maximum Diurnal Average: 3.6 ppb at hour 4		Minimum Diurnal Average: 0.5 ppb at hour 17		Hours of Missing Data: 36																																												
Monthly Average: 1.74 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 1.2 P ₉₀ = 4.5 P ₉₉ = 22.5		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-Oct	11.1	14.9	Z	19.6	15.3	9.1	1.4	3.8	4.1	4.5	1.8	0.6	0.3	0.4	0.4	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.8	19.6																						
2-Oct	0.0	0.0	0.0	Z	0.0	0.0	1.6	1.9	3.2	1.8	3.2	5.1	2.2	0.3	0.2	0.0	0.0	0.0	0.1	0.6	0.1	0.0	0.0	0.1	0.9	5.1																						
3-Oct	0.2	0.0	0.0	0.0	Z	0.3	0.8	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	2.8	0.7	0.3	0.4	0.3	2.8																						
4-Oct	0.0	0.1	0.0	0.0	0.0	Z	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.3	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3																						
5-Oct	Z	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1																						
6-Oct	0.0	Z	0.0	0.3	2.1	0.3	0.1	1.3	1.3	4.5	3.7	4.5	0.9	0.7	0.7	0.5	1.5	1.2	1.2	1.7	0.1	0.0	0.0	0.0	1.2	4.5																						
7-Oct	0.0	0.0	Z	0.1	0.1	0.1	0.5	1.9	0.9	0.4	1.1	3.2	11.7	6.5	4.4	4.0	2.0	0.7	0.1	1.0	0.3	2.6	4.1	4.4	2.2	11.7																						
8-Oct	13.3	18.8	19.1	Z	14.4	11.4	8.1	7.7	5.3	4.8	6.2	5.8	7.6	4.4	2.4	0.7	0.4	0.2	0.0	0.8	1.2	0.0	0.0	0.1	5.8	19.1																						
9-Oct	0.1	0.2	0.1	0.2	Z	0.4	0.5	0.8	0.9	5.3	6.8	7.5	4.6	0.8	0.8	0.7	0.3	0.4	0.0	0.0	0.0	0.0	0.1	0.5	1.3	7.5																						
10-Oct	1.5	1.7	0.9	0.6	2.0	Z	0.6	1.2	2.2	4.0	1.2	0.7	0.6	0.3	0.4	0.5	0.2	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.8	4.0																						
11-Oct	Z	0.1	0.1	0.1	0.2	0.1	0.1	0.3	1.0	1.6	3.5	2.2	0.9	0.7	0.5	0.3	0.1	0.0	0.1	0.2	0.1	0.0	0.2	0.0	0.5	3.5																						
12-Oct	0.0	Z	0.1	0.3	2.5	0.1	0.2	1.3	2.6	4.1	4.8	2.9	2.7	0.7	0.5	0.2	0.3	0.1	0.1	0.1	0.1	0.0	0.0	0.0	1.0	4.8																						
13-Oct	0.0	0.5	Z	0.2	0.2	1.9	1.5	3.2	1.5	3.1	3.8	2.5	1.3	1.1	1.1	1.2	0.7	0.1	0.0	0.1	0.0	0.1	0.1	0.0	1.0	3.8																						
14-Oct	0.0	0.1	0.2	Z	0.2	0.1	0.0	0.3	1.7	4.7	5.2	2.9	1.9	0.7	0.8	0.5	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.9	5.2																						
15-Oct	0.1	0.9	0.0	0.1	Z	0.2	0.2	0.6	2.1	3.7	4.1	3.5	4.2	2.7	1.1	1.0	0.4	1.3	1.2	3.4	1.8	1.4	2.4	0.2	1.6	4.2																						
16-Oct	0.1	0.7	0.5	0.0	0.1	Z	0.0	0.2	0.3	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.0	0.0	0.0	0.0	0.1	0.7																						
17-Oct	Z	0.0	26.5	59.3	36.9	12.2	0.2	0.7	2.4	5.5	4.9	5.5	5.5	5.3	2.9	2.9	2.2	0.4	0.1	0.1	7.2	12.8	14.5	10.7	9.5	59.3																						
18-Oct	6.5	Z	3.4	4.8	4.3	5.0	18.0	22.7	24.4	15.3	6.9	3.5	2.4	1.4	0.8	0.9	0.8	0.4	0.8	1.1	0.4	0.0	0.0	0.0	5.4	24.4																						
19-Oct	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.3	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.3																						
20-Oct	0.1	0.1	0.1	Z	0.2	0.1	0.1	0.3	0.1	C	C	C	C	C	0.1	0.2	1.5	0.4	0.1	0.1	0.0	0.0	0.0	0.0	0.2	1.5																						
21-Oct	0.2	1.0	1.1	0.5	Z	0.1	7.9	31.1	14.3	13.8	16.0	14.3	10.2	1.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	4.9	31.1																						
22-Oct	4.4	0.6	4.8	7.9	4.5	Z	0.1	0.6	0.8	1.1	3.6	3.1	2.0	1.2	3.0	3.1	0.4	0.2	0.0	0.2	0.6	0.0	0.0	0.0	1.8	7.9																						
23-Oct	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																						
24-Oct	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																						
25-Oct	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																						
26-Oct	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	0.4	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.4																						
27-Oct	0.0	0.0	0.0	0.0	Z	0.1	0.1	0.6	3.3	7.5	3.2	1.9	3.0	2.7	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	7.5																						
28-Oct	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.2	1.6	6.5	1.8	0.4	0.4	0.2	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	6.5																						
29-Oct	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.4	0.3	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.4	5.7	3.2	5.6	9.5	2.0	1.2	9.5																						
30-Oct	0.0	Z	0.0	0.0	0.1	0.1	0.1	0.3	1.9	5.7	13.6	4.4	1.8	0.3	0.6	0.7	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	1.3	13.6																						
31-Oct	0.0	0.0	Z	0.1	0.0	2.9	13.2	1.9	2.6	1.0	4.6	3.3	2.2	8.0	7.4	3.5	1.7	37.1	39.8	6.4	2.2	2.5	2.2	0.7	6.2	39.8																						
																								1.4	1.5	2.3	3.6	3.2	1.7	1.8	2.7	2.5	3.1	3.4	2.8	2.3	1.3	0.9	0.7	0.5	1.4	1.4	0.7	0.7	0.8	1.1	0.6	Diurnal Average
																								13.3	18.8	26.5	59.3	36.9	12.2	18.0	31.1	24.4	15.3	16.0	14.3	11.7	8.0	7.4	4.0	2.2	37.1	39.8	6.4	7.2	12.8	14.5	10.7	Diurnal Maximum
Z - zerospan																								C - Calibration																								



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Ells River - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Ells River - October 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	700	98.87	98.87
21 - 40	7	0.99	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: 708

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Ells River - October 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	36	14	3	7	10	14	47	115	92	45	73	51	56	77	26	23	689
21 - 40	0	0	0	1	1	0	1	1	0	0	0	0	0	1	0	2	7
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	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	36	14	3	8	11	14	48	116	92	45	73	51	56	78	27	25	697

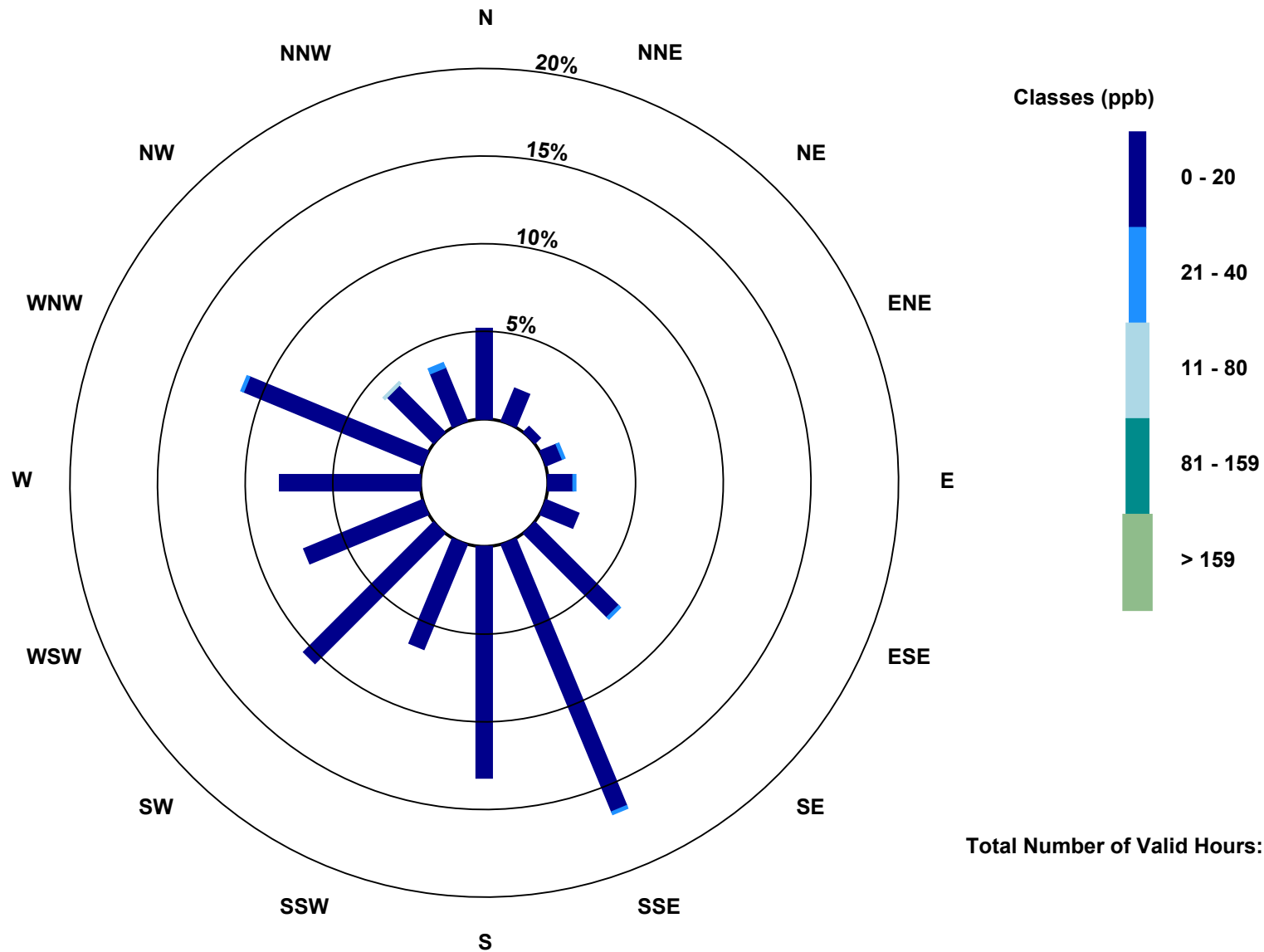
Total Number of Valid Hours: 697

Total Number of Hours: 744

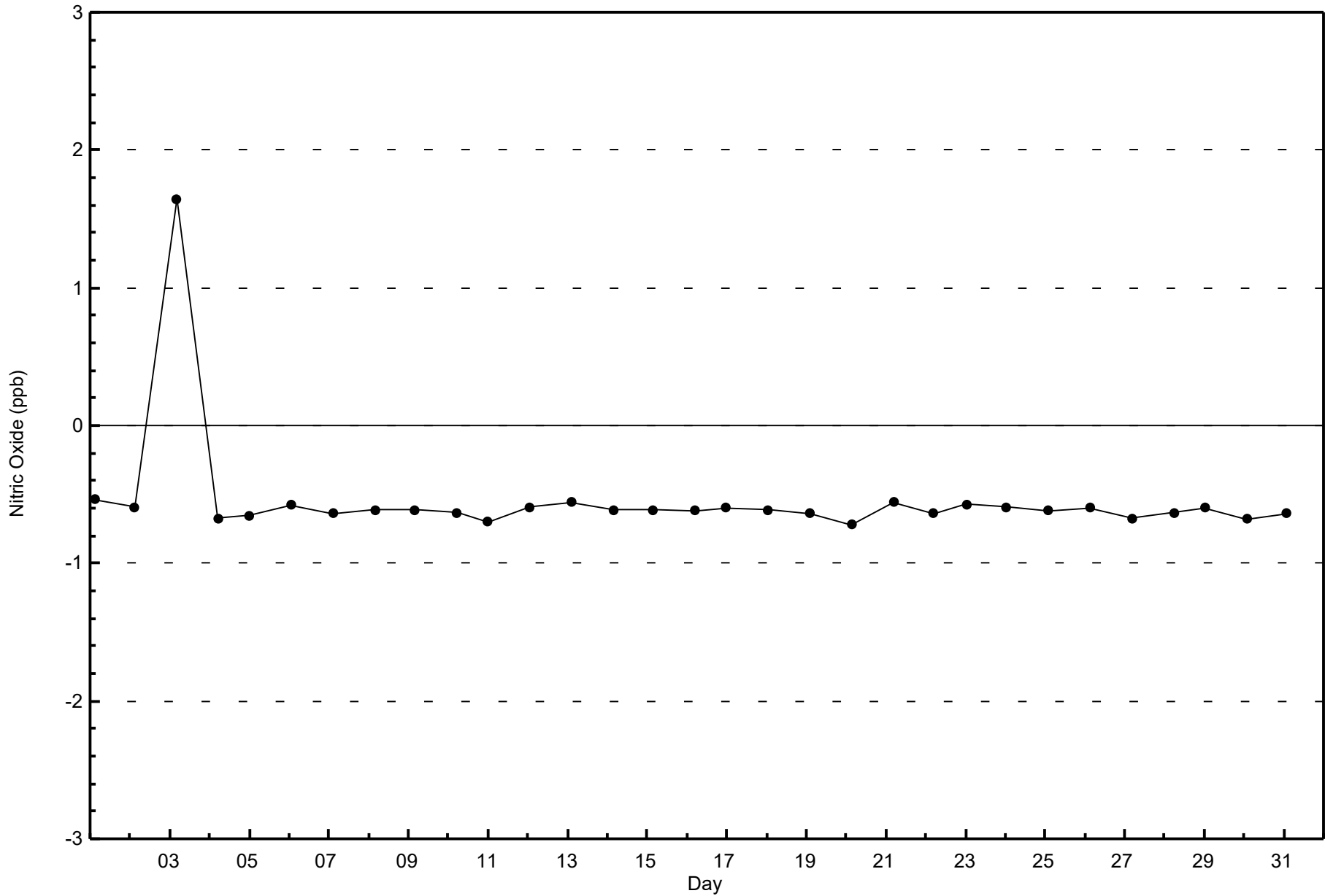


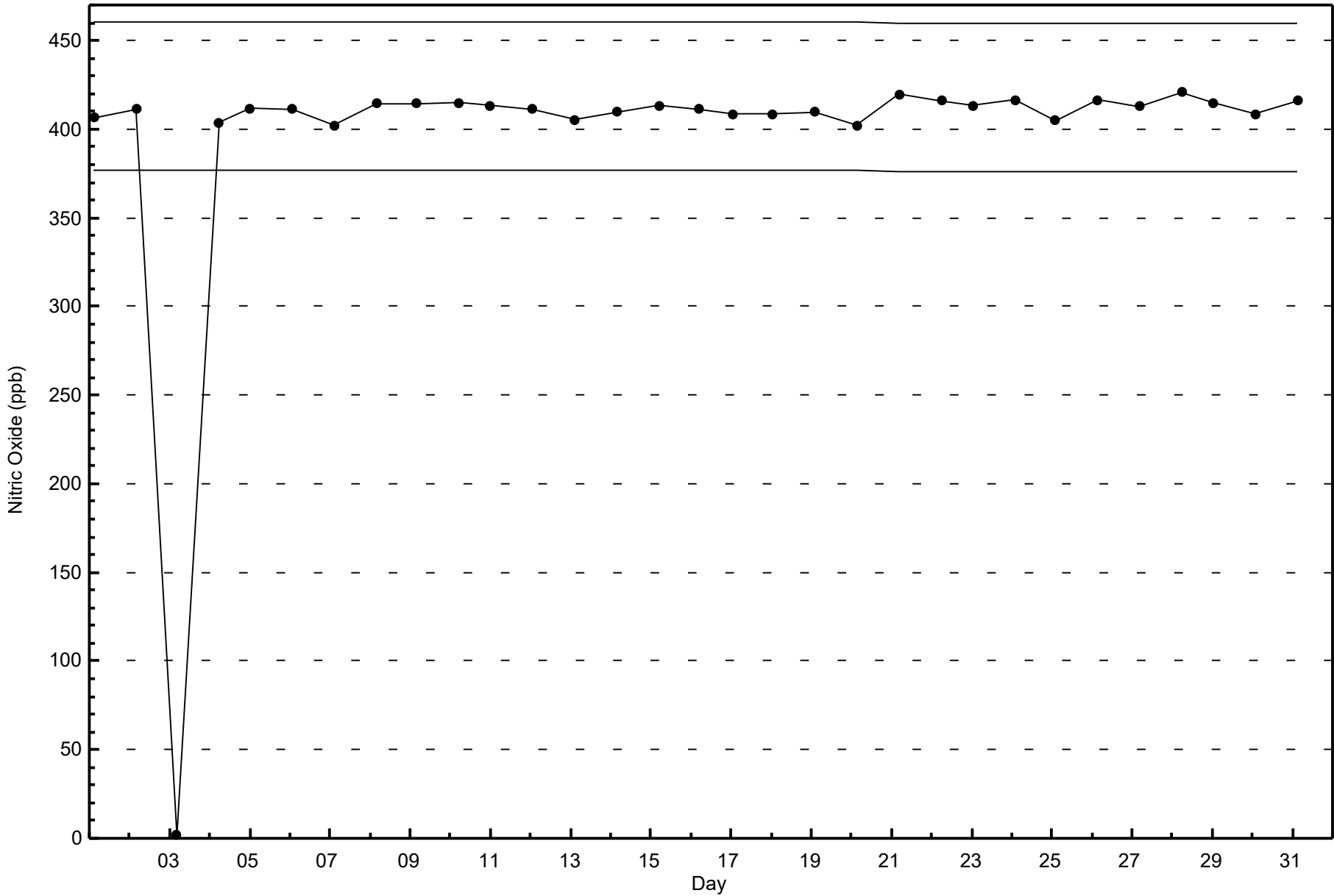
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitric Oxide (NO) - ppb
Ells River



Total Number of Valid Hours: 697







Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

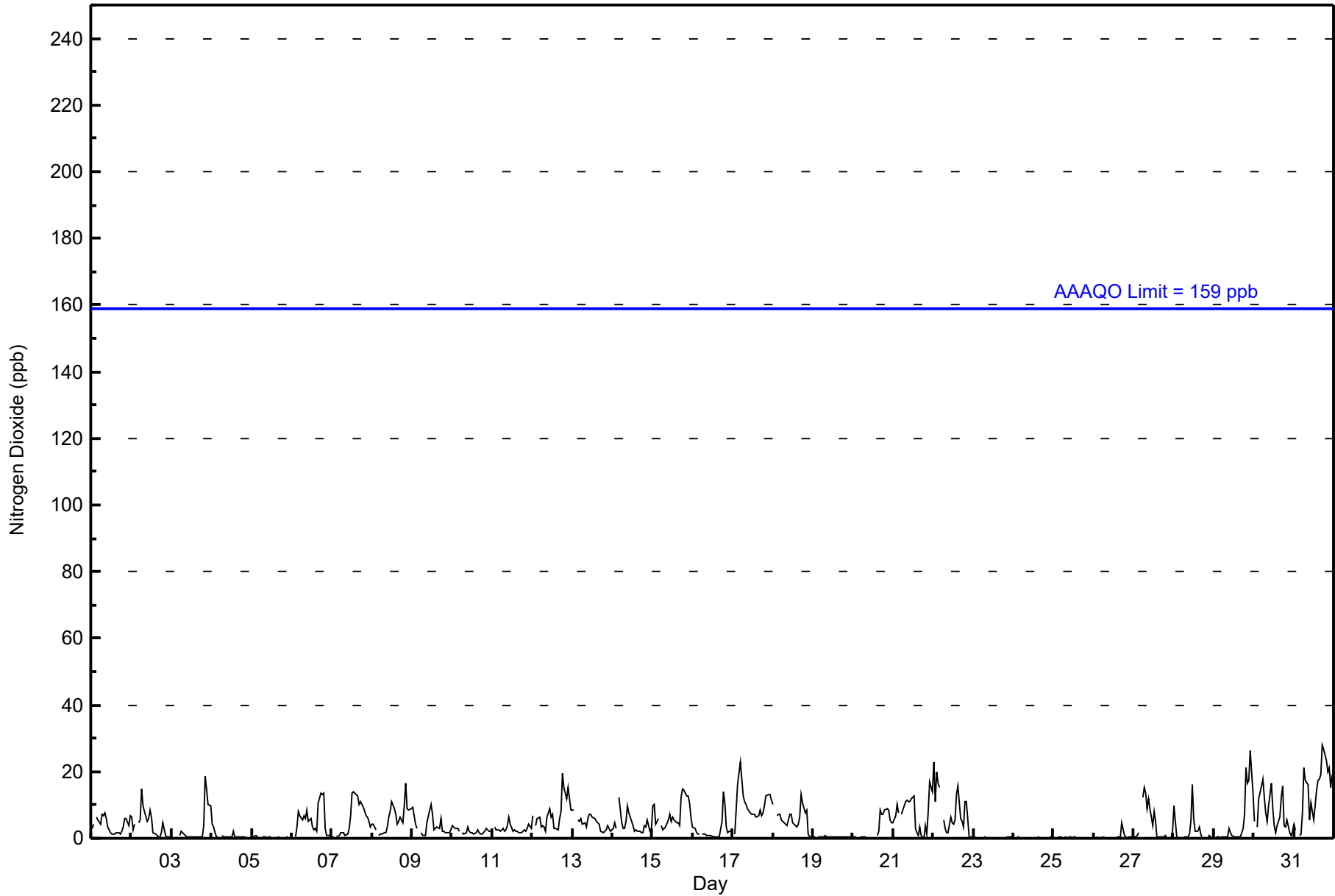
Ells River - October 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 744																	744					
Maximum Value: 27.8 ppb on Oct 31 18:00		Maximum Daily Average: 14.1 ppb on Oct 31																	Hours of Data: 708							
Minimum Value: 0.1 ppb on Oct 23 06:00		Minimum Daily Average: 0.2 ppb on Oct 23																	Hours of Missing Data: 36							
Maximum Diurnal Average: 6.1 ppb at hour 20		Minimum Diurnal Average: 3.2 ppb at hour 2																	Hours of Calibration: 36							
Monthly Average: 4.33 ppb		Percentiles: P ₁ = 0.1 P ₁₀ = 0.2 Q ₁ = 0.4 Median = 2.4 Q ₃ = 6.5 P ₉₀ = 11.8 P ₉₉ = 21.1																	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-Oct	2.9	4.2	Z	6.4	5.5	4.4	7.2	6.8	7.5	6.0	3.3	1.5	1.2	1.4	1.3	1.5	1.6	1.3	2.1	3.6	5.9	5.8	4.0	6.6	4.0	7.5
2-Oct	6.4	2.6	4.3	Z	4.8	5.4	14.7	9.6	8.0	5.1	6.1	8.3	6.2	1.7	1.2	0.7	0.6	0.5	1.7	4.7	0.9	0.5	0.6	0.5	4.1	14.7
3-Oct	0.3	0.2	0.2	0.3	Z	1.0	2.2	1.2	1.0	0.5	0.4	0.4	0.4	0.3	0.3	0.4	0.3	0.3	0.4	3.8	18.6	14.9	10.2	9.8	2.9	18.6
4-Oct	4.2	3.5	1.8	0.4	0.5	Z	0.8	0.6	0.5	0.5	0.5	0.5	0.4	2.1	0.6	0.4	0.5	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.9	4.2
5-Oct	Z	0.5	0.7	0.5	0.2	0.2	0.2	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.4	0.2	0.2	0.3	0.7
6-Oct	0.2	Z	0.5	3.5	8.2	6.7	5.6	6.8	5.8	8.3	5.0	6.1	3.4	2.4	2.8	2.1	10.8	13.5	13.2	13.6	3.1	1.0	0.9	0.7	5.4	13.6
7-Oct	0.5	0.5	Z	0.5	0.8	1.6	1.5	1.7	1.0	1.2	2.9	6.7	13.7	14.1	13.5	12.6	10.3	11.0	10.2	9.4	6.9	6.3	5.0	3.6	5.9	14.1
8-Oct	4.2	4.1	2.5	Z	1.0	1.3	1.1	1.6	1.5	3.3	6.5	7.9	11.2	8.9	7.2	4.2	5.1	6.3	4.7	9.7	16.7	8.8	8.5	8.8	5.9	16.7
9-Oct	9.4	6.8	4.3	2.9	Z	1.7	1.0	0.8	0.8	4.7	8.6	10.0	7.1	2.5	2.9	3.2	3.0	5.8	2.2	2.1	1.6	1.6	1.5	2.6	3.8	10.0
10-Oct	3.8	3.4	3.1	3.0	2.3	Z	1.8	1.4	1.8	3.6	2.2	1.8	1.7	1.2	1.9	2.4	1.8	1.2	1.2	2.0	3.1	2.6	2.3	2.2	2.3	3.8
11-Oct	Z	3.2	2.4	2.6	2.5	2.1	3.1	2.0	2.6	3.9	6.4	4.1	2.3	2.4	2.3	2.1	1.6	1.7	2.0	2.5	2.0	2.9	4.4	2.9	2.8	6.4
12-Oct	6.8	Z	3.9	5.9	6.5	3.5	3.7	3.6	2.0	6.2	8.8	6.5	7.0	3.0	2.9	2.4	6.1	8.2	19.7	15.4	11.9	15.1	12.0	8.6	7.4	19.7
13-Oct	8.4	8.3	Z	5.5	5.2	6.0	4.1	4.8	3.5	5.9	7.0	7.2	6.4	5.9	5.2	4.5	4.2	2.1	1.7	2.1	2.6	4.0	3.0	2.2	4.8	8.4
14-Oct	2.9	4.6	3.0	Z	12.2	4.8	3.1	3.0	5.2	9.7	7.5	4.9	4.0	2.1	2.4	2.3	2.0	1.5	1.7	3.9	3.2	5.7	2.2	2.5	4.1	12.2
15-Oct	9.6	10.2	4.2	6.0	Z	3.8	2.7	2.8	3.5	5.4	7.2	5.2	6.4	5.3	4.8	4.8	3.8	12.2	15.0	14.2	12.8	12.9	10.8	6.3	7.4	15.0
16-Oct	3.4	3.1	1.5	1.3	1.2	Z	1.2	1.1	0.9	0.8	0.7	0.8	0.5	0.5	0.6	0.5	0.5	5.2	14.1	10.5	3.4	1.5	2.1	2.1	2.5	14.1
17-Oct	Z	1.2	8.4	16.2	22.8	17.7	12.7	10.9	10.1	9.1	7.8	7.3	7.0	7.3	6.5	6.8	8.4	6.8	7.8	9.7	12.8	13.2	13.1	11.4	10.2	22.8
18-Oct	10.0	Z	6.6	7.4	7.2	5.6	5.2	4.5	3.8	5.6	7.3	7.2	4.6	4.0	3.3	4.1	6.2	13.0	10.4	7.8	8.6	1.1	0.6	0.6	5.9	13.0
19-Oct	0.5	0.5	Z	0.6	0.6	0.6	0.6	0.7	0.6	0.5	0.5	0.4	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.3	0.3	0.4	0.5	0.7
20-Oct	0.4	0.3	0.3	Z	0.3	0.3	0.3	0.4	0.3	C	C	C	C	C	0.9	2.0	8.5	7.2	7.1	8.6	9.1	8.3	5.3	4.5	3.6	9.1
21-Oct	4.6	6.9	10.3	7.5	Z	7.1	8.3	11.1	11.6	11.1	11.1	12.0	12.5	3.0	1.9	1.0	3.6	1.0	0.2	3.8	1.2	8.0	17.1	13.8	7.3	17.1
22-Oct	22.9	11.1	19.8	16.7	15.2	Z	5.3	3.1	1.7	1.7	6.3	4.5	4.4	5.5	13.2	15.6	6.1	5.2	3.2	11.2	10.9	0.5	0.4	0.3	8.0	22.9
23-Oct	Z	0.3	0.2	0.2	0.2	0.1	0.1	0.3	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.3
24-Oct	0.2	Z	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	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.3
25-Oct	0.2	0.2	Z	0.3	0.3	0.2	0.2	0.3	0.2	0.3	0.2	0.3	0.2	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
26-Oct	0.2	0.2	0.3	Z	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	4.7	0.8	0.3	0.2	0.3	0.3	0.3	0.5	4.7
27-Oct	0.4	0.4	0.8	1.7	Z	12.1	15.1	13.4	8.8	11.8	8.8	3.8	8.0	4.9	0.2	0.3	0.4	0.6	0.4	1.0	0.2	0.2	0.2	2.0	4.2	15.1
28-Oct	9.7	5.0	0.4	0.2	0.2	Z	0.4	0.3	0.5	1.2	4.9	15.9	6.0	2.0	2.2	3.4	1.1	0.2	0.2	0.2	0.2	0.9	0.4	0.2	2.4	15.9
29-Oct	Z	0.3	0.3	0.3	0.2	0.3	0.3	0.5	0.3	2.9	1.8	0.8	0.4	0.3	0.4	0.3	0.5	3.1	7.4	21.0	16.6	17.4	26.1	13.6	5.0	26.1
30-Oct	5.1	Z	3.6	11.8	15.8	18.0	12.3	7.6	5.1	9.6	16.5	8.8	4.0	1.5	3.7	6.4	12.3	15.7	4.0	3.6	5.6	1.7	0.9	2.1	7.6	18.0
31-Oct	4.2	2.5	Z	0.8	1.4	7.8	21.3	17.5	16.1	5.6	10.8	8.2	5.3	14.4	17.4	17.8	19.0	27.8	26.5	23.5	20.0	21.1	15.3	19.2	14.1	27.8
4.7 3.2 3.3 4.0 4.4 4.3 4.4 3.8 3.4 4.2 5.0 4.7 4.2 3.3 3.3 3.3 3.9 5.1 5.1 6.1 5.8 5.1 4.8 4.2																								Diurnal Average		
22.9 11.1 19.8 16.7 22.8 18.0 21.3 17.5 16.1 11.8 16.5 15.9 13.7 14.4 17.4 17.8 19.0 27.8 26.5 23.5 20.0 21.1 26.1 19.2																								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
Ells River - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Dioxide (NO₂) - ppb
Ells River - October 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	699	98.73	98.73
21 - 40	9	1.27	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Ells River - October 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	35	14	3	7	9	14	48	115	92	44	73	51	56	78	27	22	688
21 - 40	1	0	0	1	2	0	0	1	0	1	0	0	0	0	0	3	9
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	36	14	3	8	11	14	48	116	92	45	73	51	56	78	27	25	697

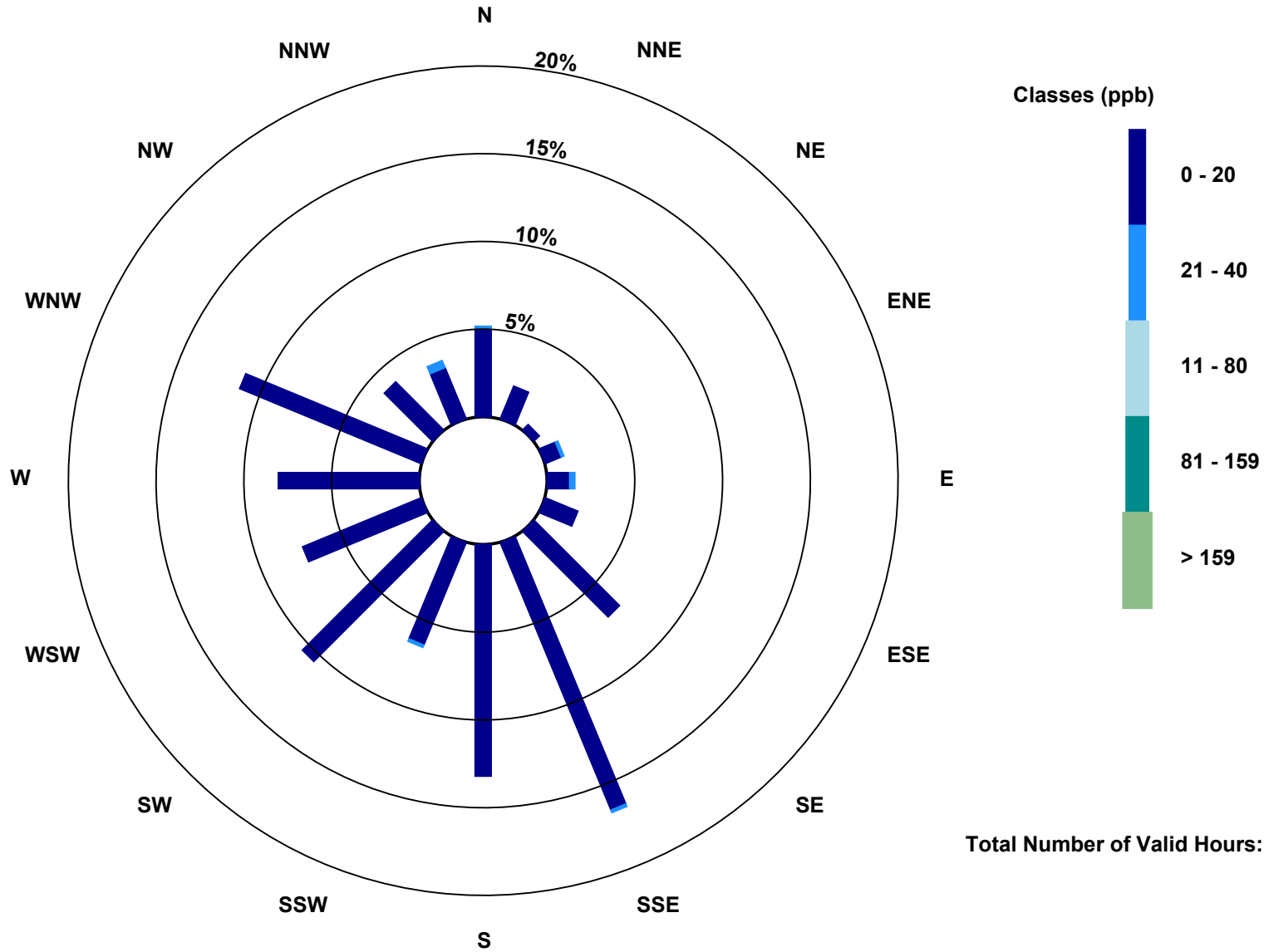
Total Number of Valid Hours: 697

Total Number of Hours: 744

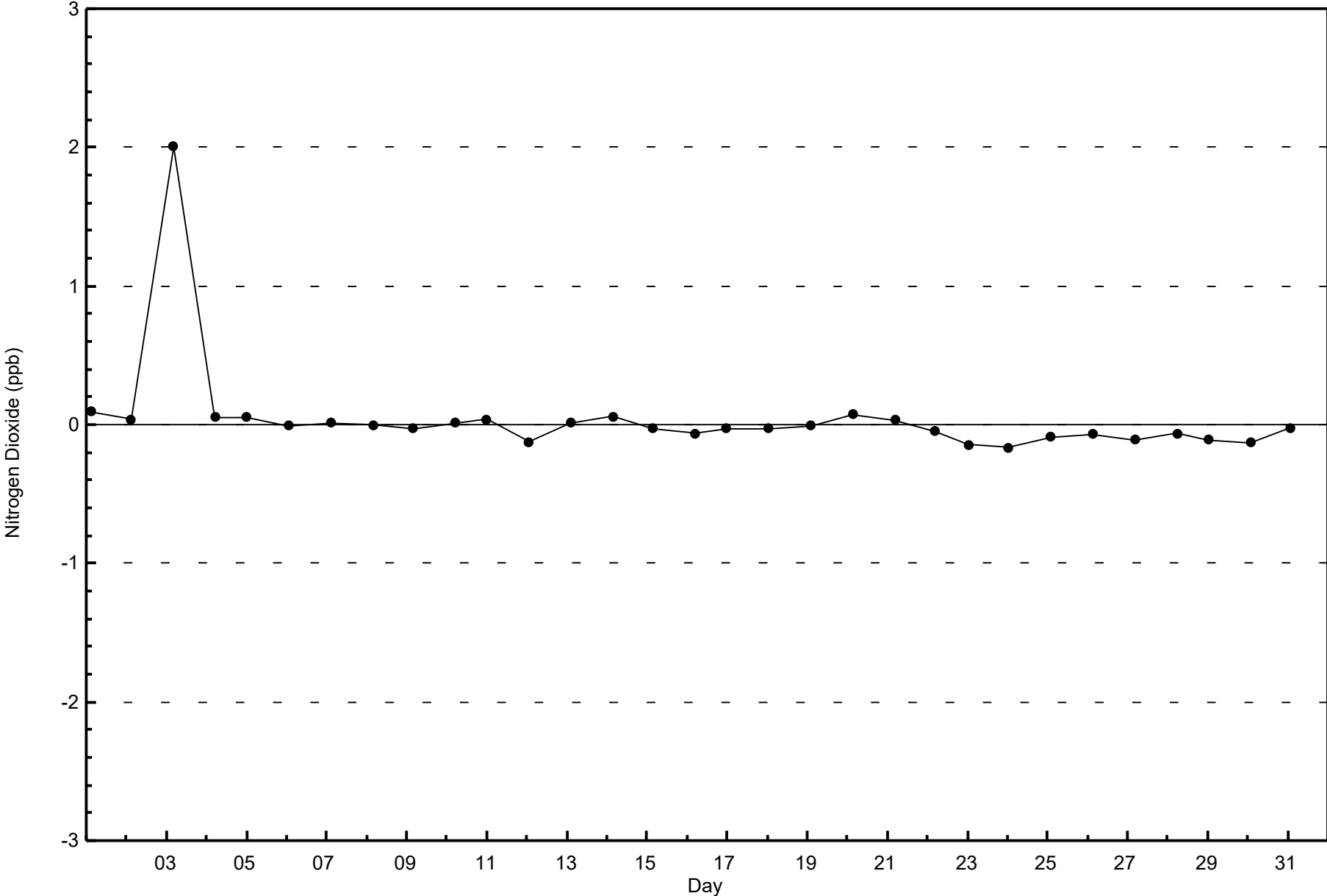


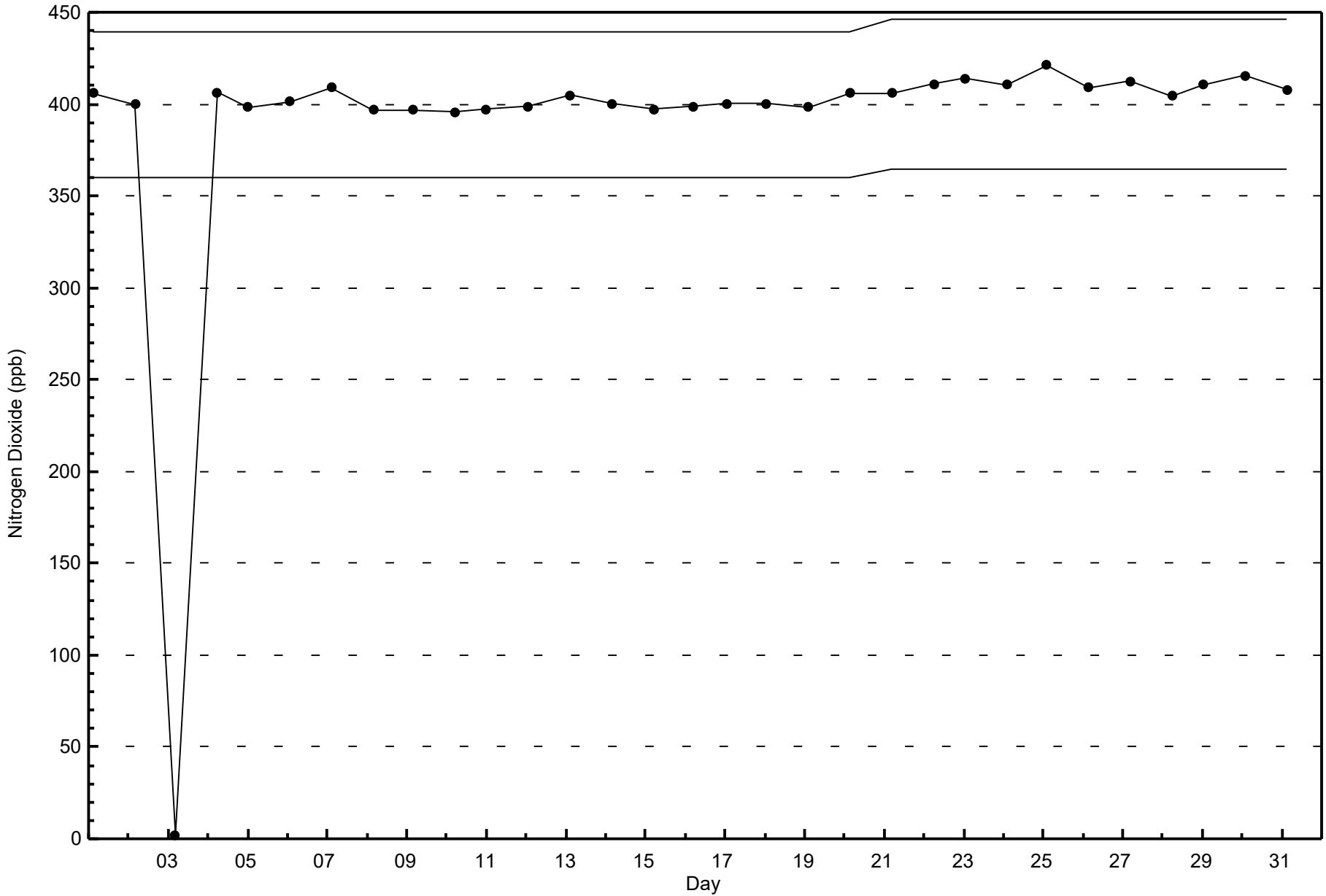
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitrogen Dioxide (NO₂) - ppb
Ells River



Total Number of Valid Hours: 697



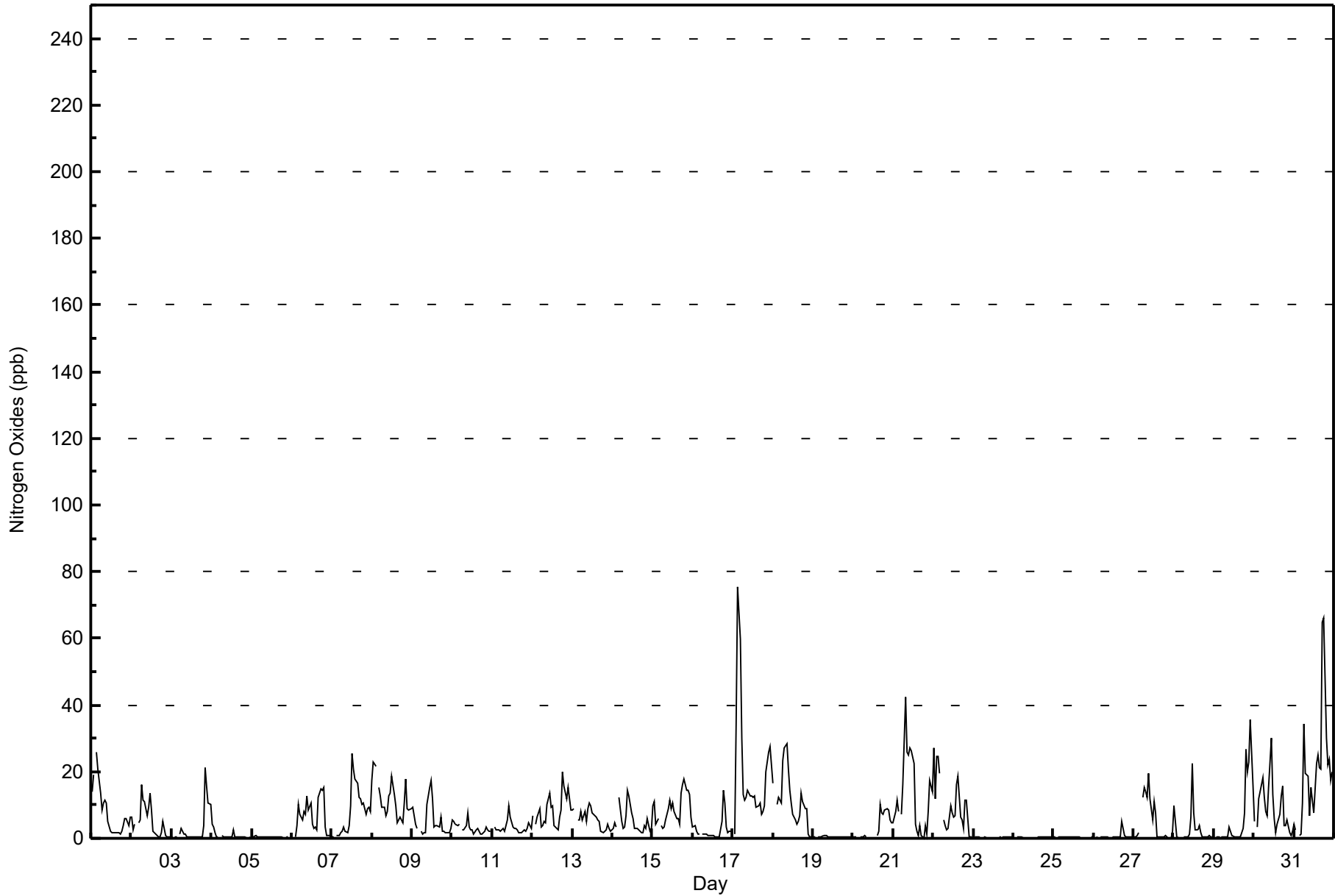




Wood Buffalo Environmental Association
Summary of Hour Averages

Nitrogen Oxides (NO_x) - ppb
Ells River - October 2023

Maximum Value: 75.5 ppb on Oct 17 04:00																				Maximum Daily Average: 20.3 ppb on Oct 31					Hours in Service: 744	
Minimum Value: 0.1 ppb on Oct 23 09:00																				Minimum Daily Average: 0.2 ppb on Oct 23					Hours of Data: 708	
Maximum Diurnal Average: 8.3 ppb at hour 11																				Minimum Diurnal Average: 4.0 ppb at hour 16					Hours of Missing Data: 36	
Monthly Average: 6.07 ppb																				Percentiles: P ₁ = 0.1 P ₁₀ = 0.2 Q ₁ = 0.5 Median = 3.0 Q ₃ = 9.0 P ₉₀ = 15.5 P ₉₉ = 34.2					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-Oct	14.0	19.1	Z	26.0	20.8	13.5	8.6	10.6	11.6	10.5	5.1	2.1	1.5	1.8	1.7	1.8	1.8	1.3	2.1	3.6	5.9	5.8	4.0	6.6	7.8	26.0
2-Oct	6.4	2.6	4.3	Z	4.8	5.4	16.3	11.5	11.2	6.9	9.3	13.4	8.4	2.0	1.4	0.7	0.6	0.5	1.8	5.3	1.0	0.5	0.6	0.6	5.0	16.3
3-Oct	0.5	0.2	0.2	0.3	Z	1.3	3.0	1.4	1.3	0.5	0.4	0.4	0.4	0.3	0.3	0.4	0.3	0.3	0.4	3.8	21.4	15.6	10.5	10.2	3.2	21.4
4-Oct	4.2	3.6	1.8	0.4	0.5	Z	0.9	0.6	0.5	0.6	0.5	0.5	0.5	2.4	0.6	0.4	0.5	0.5	0.3	0.3	0.3	0.2	0.2	0.2	0.9	4.2
5-Oct	Z	0.6	0.8	0.5	0.3	Z	0.2	0.2	0.3	0.3	0.2	0.4	0.3	0.3	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.4	0.2	0.3	0.8
6-Oct	0.2	Z	0.5	3.8	10.3	7.0	5.7	8.1	7.1	12.8	8.7	10.6	4.3	3.1	3.5	2.6	12.3	14.7	14.4	15.3	3.2	1.0	0.9	0.7	6.5	15.3
7-Oct	0.5	0.5	Z	0.6	0.9	1.7	2.0	3.6	1.9	1.6	4.0	9.9	25.4	20.6	17.9	16.6	12.3	11.7	10.3	10.4	7.2	8.9	9.1	8.0	8.1	25.4
8-Oct	17.5	22.9	21.6	Z	15.4	12.7	9.2	9.3	6.8	8.1	12.7	13.7	18.8	13.3	9.6	4.9	5.5	6.5	4.7	10.5	17.9	8.8	8.5	8.9	11.6	22.9
9-Oct	9.5	7.0	4.4	3.1	Z	2.1	1.5	1.6	1.7	10.0	15.4	17.5	11.7	3.3	3.7	3.9	3.3	6.2	2.2	2.1	1.6	1.6	1.6	3.1	5.1	17.5
10-Oct	5.3	5.1	4.0	3.6	4.3	Z	2.4	2.6	4.0	7.6	3.4	2.5	2.3	1.5	2.3	2.9	2.0	1.3	1.2	2.1	3.2	2.7	2.3	2.3	3.1	7.6
11-Oct	Z	3.3	2.5	2.7	2.7	2.2	3.2	2.3	3.6	5.5	9.9	6.3	3.2	3.1	2.8	2.4	1.7	1.7	2.1	2.7	2.1	2.9	4.6	2.9	3.3	9.9
12-Oct	6.8	Z	4.0	6.2	9.0	3.6	3.9	4.9	4.6	10.3	13.6	9.4	9.7	3.7	3.4	2.6	6.4	8.3	19.8	15.5	12.0	15.1	12.0	8.6	8.4	19.8
13-Oct	8.4	8.8	Z	5.7	5.4	7.9	5.6	8.0	5.0	9.0	10.8	9.7	7.7	7.0	6.3	5.7	4.9	2.2	1.7	2.2	2.6	4.1	3.1	2.2	5.8	10.8
14-Oct	2.9	4.7	3.2	Z	12.4	4.9	3.1	3.3	6.9	14.4	12.7	7.8	5.9	2.8	3.2	2.8	2.2	1.6	1.7	3.9	3.2	5.7	2.2	2.5	5.0	14.4
15-Oct	9.7	11.1	4.2	6.1	Z	4.0	2.9	3.4	5.6	9.1	11.3	8.7	10.6	8.0	5.9	5.8	4.2	13.5	16.2	17.6	14.6	14.3	13.2	6.5	9.0	17.6
16-Oct	3.5	3.8	2.0	1.3	1.3	Z	1.2	1.3	1.2	1.0	0.9	1.0	0.6	0.5	0.6	0.5	0.5	5.2	14.2	10.8	3.4	1.5	2.1	2.1	2.6	14.2
17-Oct	Z	1.2	34.9	75.5	59.7	29.9	12.9	11.6	12.5	14.6	12.7	12.8	12.5	12.6	9.4	9.7	10.6	7.2	7.9	9.8	20.0	26.0	27.6	22.1	19.7	75.5
18-Oct	16.5	Z	10.0	12.2	11.5	10.6	23.2	27.2	28.2	20.9	14.2	10.7	7.0	5.4	4.1	5.0	7.0	13.4	11.2	8.9	9.0	1.1	0.6	0.6	11.2	28.2
19-Oct	0.5	0.5	Z	0.6	0.6	0.6	0.7	1.0	0.7	0.6	0.6	0.6	0.4	0.5	0.4	0.5	0.5	0.3	0.3	0.5	0.4	0.3	0.3	0.4	0.5	1.0
20-Oct	0.5	0.4	0.4	Z	0.5	0.4	0.4	0.7	0.4	C	C	C	C	C	1.0	2.2	10.0	7.6	7.2	8.7	9.1	8.3	5.3	4.5	3.8	10.0
21-Oct	4.8	7.9	11.4	8.0	Z	7.2	16.2	42.2	25.9	24.9	27.1	26.3	22.7	4.0	2.1	1.0	3.6	1.0	0.2	3.8	1.2	8.0	17.3	14.0	12.2	42.2
22-Oct	27.3	11.7	24.6	24.6	19.7	Z	5.4	3.7	2.5	2.8	9.9	7.6	6.4	6.7	16.2	18.7	6.5	5.4	3.2	11.4	11.5	0.5	0.4	0.3	9.9	27.3
23-Oct	Z	0.3	0.2	0.2	0.2	0.1	0.1	0.3	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.3
24-Oct	0.2	Z	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	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.3
25-Oct	0.2	0.2	Z	0.3	0.3	0.2	0.2	0.3	0.2	0.3	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3
26-Oct	0.2	0.2	0.3	Z	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	5.1	0.8	0.3	0.3	0.3	0.3	0.3	0.5	5.1
27-Oct	0.4	0.4	0.8	1.7	Z	12.2	15.2	14.0	12.1	19.3	12.0	5.7	11.0	7.6	0.3	0.4	0.4	0.6	0.4	1.0	0.2	0.2	0.2	2.0	5.1	19.3
28-Oct	9.7	5.0	0.4	0.2	0.2	Z	0.4	0.3	0.5	1.4	6.5	22.4	7.8	2.4	2.6	3.6	1.7	0.2	0.2	0.2	0.2	0.9	0.4	0.2	2.9	22.4
29-Oct	Z	0.3	0.3	0.3	0.2	0.3	0.3	0.6	0.3	3.3	2.1	0.9	0.5	0.3	0.4	0.4	0.6	3.2	7.8	26.7	19.8	23.0	35.6	15.6	6.2	35.6
30-Oct	5.1	Z	3.6	11.8	15.9	18.1	12.4	7.9	7.0	15.3	30.1	13.2	5.8	1.8	4.3	7.1	12.7	15.8	4.0	3.6	5.6	1.7	0.9	2.1	9.0	30.1
31-Oct	4.2	2.5	Z	0.9	1.4	10.7	34.5	19.4	18.7	6.6	15.4	11.5	7.5	22.4	24.8	21.3	20.7	64.9	66.3	29.9	22.2	23.6	17.5	19.9	20.3	66.3
																								Diurnal Average		
																								Diurnal Maximum		
6.1 4.8 5.6 7.6 7.7 6.1 6.2 6.5 5.9 7.3 8.3 7.5 6.5 4.6 4.2 4.0 4.3 6.5 6.6 6.8 6.4 5.9 5.9 4.8																								Diurnal Average		
27.3 22.9 34.9 75.5 59.7 29.9 34.5 42.2 28.2 24.9 30.1 26.3 25.4 22.4 24.8 21.3 20.7 64.9 66.3 29.9 22.2 26.0 35.6 22.1																								Diurnal Maximum		
Z - zerospan C - Calibration																										





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Ells River - October 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	666	94.07	94.07
21 - 40	37	5.23	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: 708

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Ells River - October 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	13	3	6	7	12	45	110	89	43	73	50	53	76	24	20	655
21 - 40	5	1	0	1	3	2	3	5	3	2	0	1	3	2	2	4	37
11 - 80	0	0	0	1	1	0	0	1	0	0	0	0	0	0	1	1	5
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	36	14	3	8	11	14	48	116	92	45	73	51	56	78	27	25	697

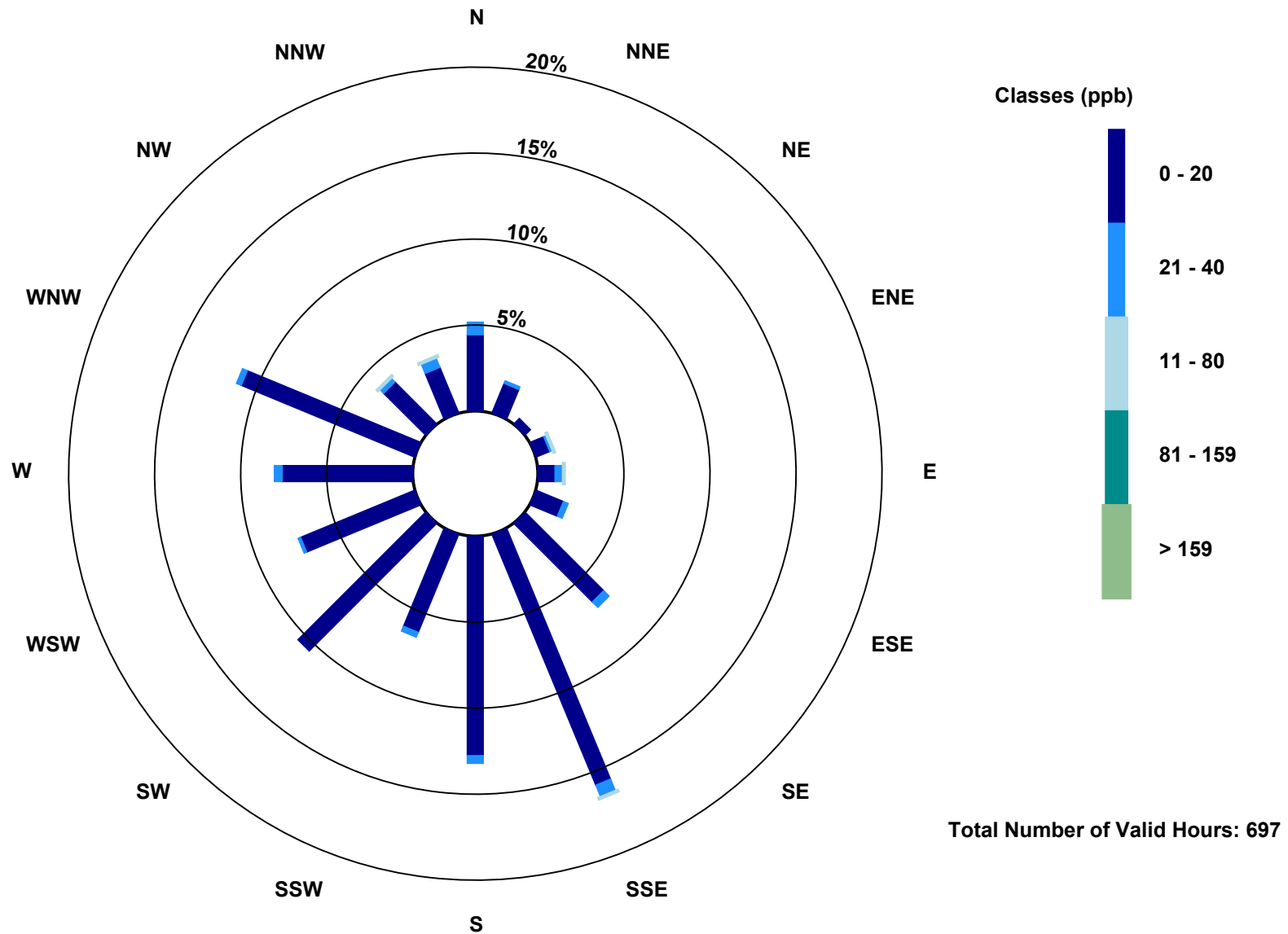
Total Number of Valid Hours: 697

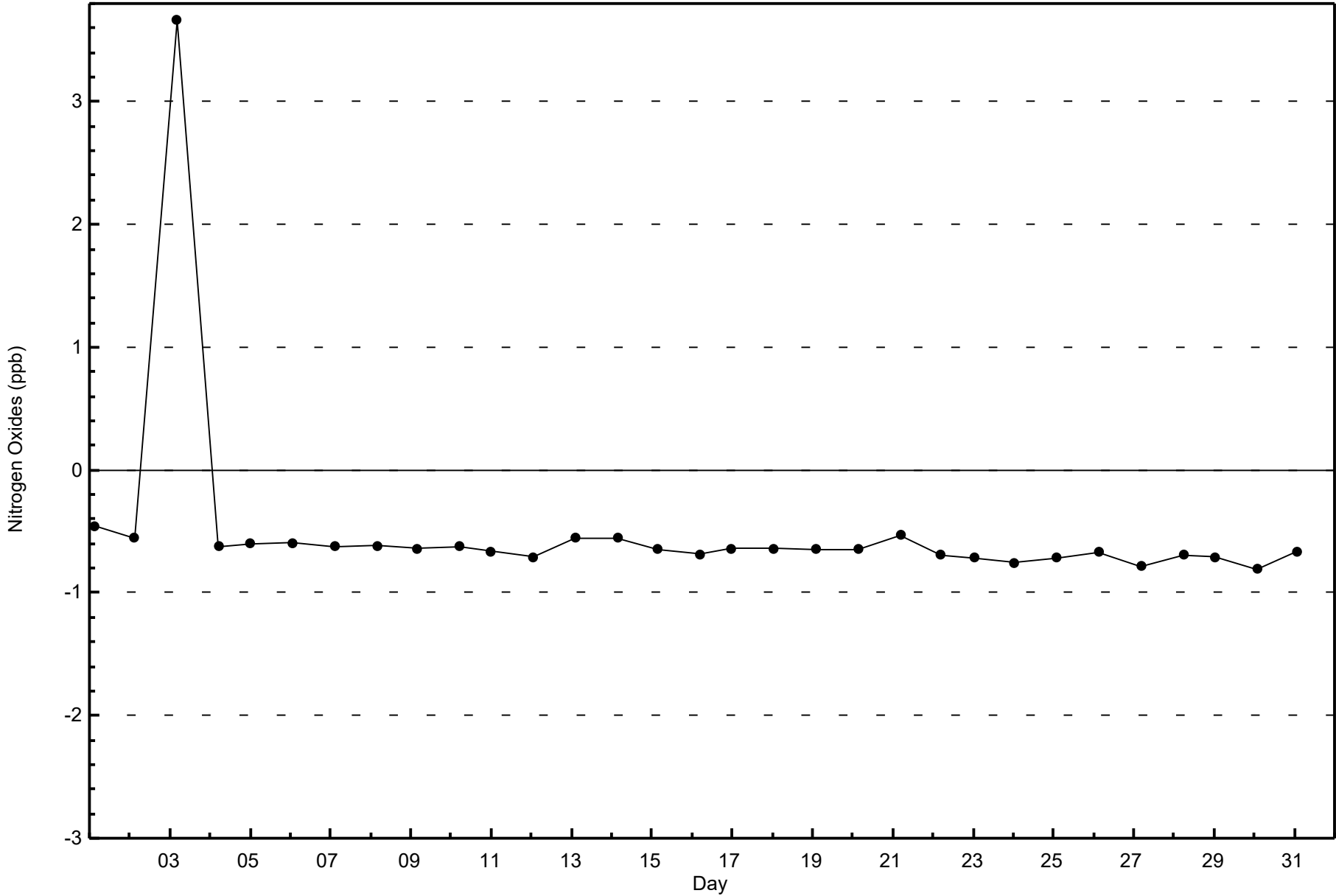
Total Number of Hours: 744

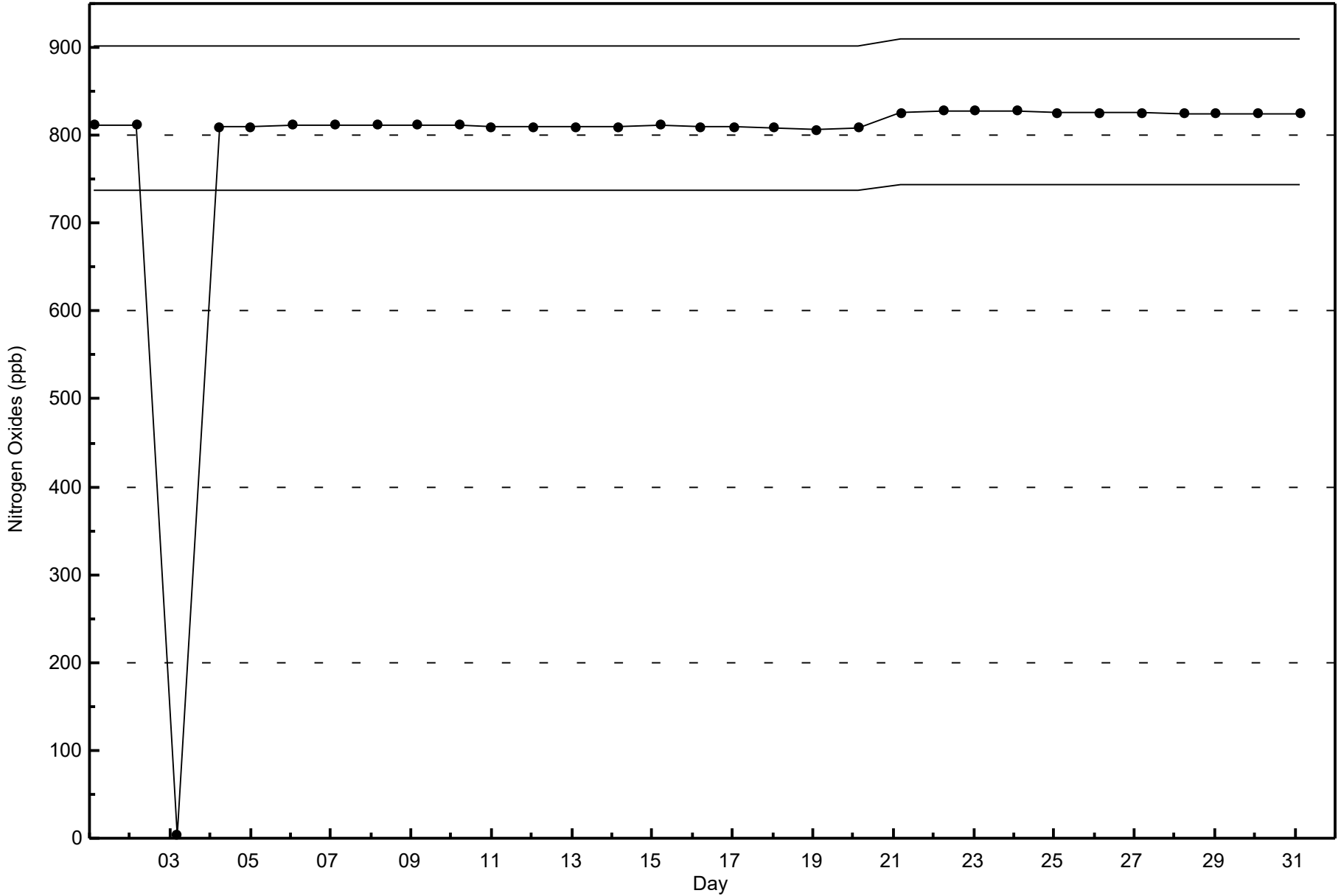


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitrogen Oxides (NO_x) - ppb
Ells River









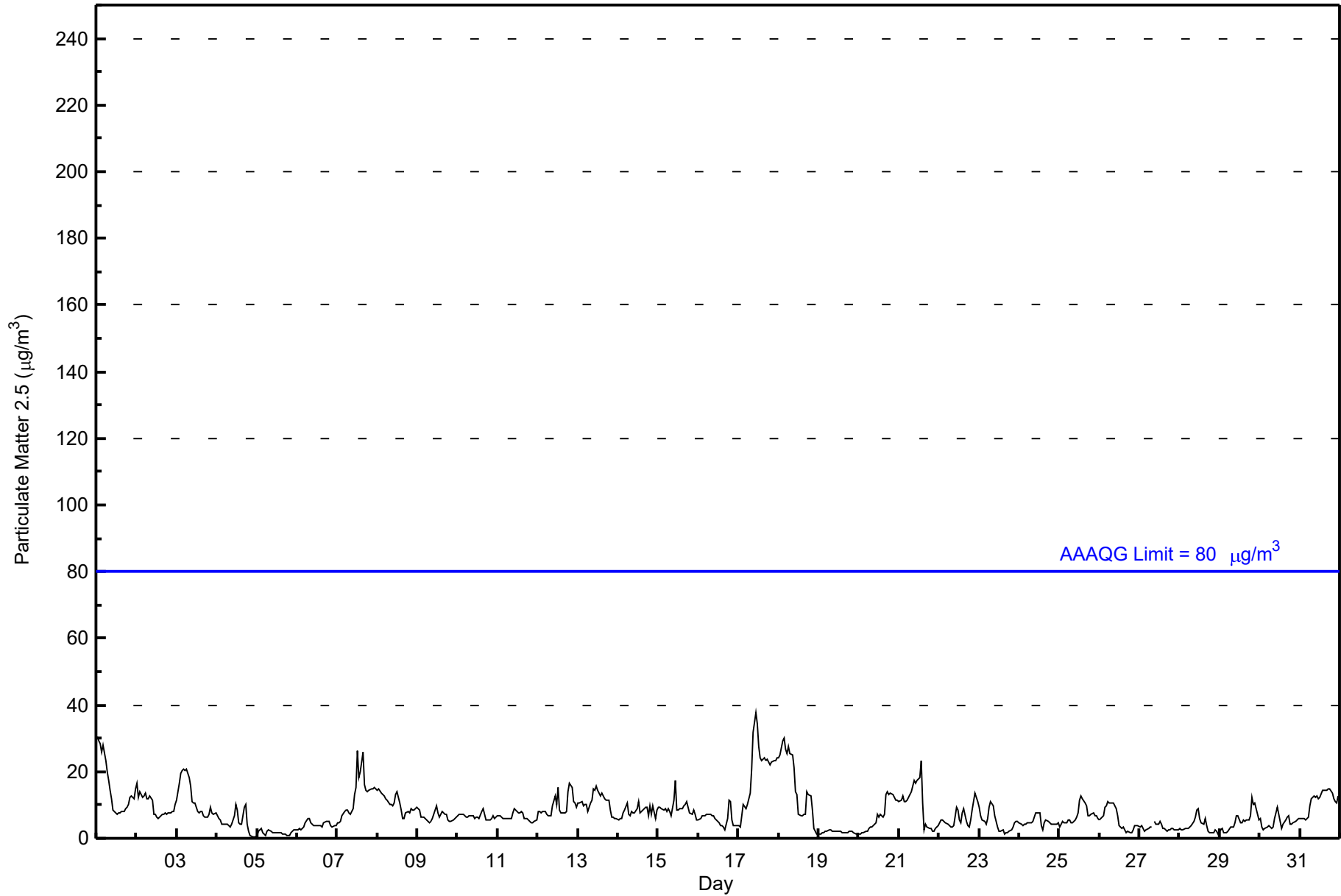
Wood Buffalo Environmental Association

Summary of Hour Averages

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

Ells River - October 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	744																										
Maximum Value: 37.5 µg/m ³ on Oct 17 11:00		Maximum Daily Average: 19.9 µg/m ³ on Oct 17																	Hours of Data:	743																												
Minimum Value: 0.3 µg/m ³ on Oct 4 23:00		Minimum Daily Average: 1.7 µg/m ³ on Oct 5																	Hours of Missing Data:	1																												
Maximum Diurnal Average: 9.6 µg/m ³ at hour 11		Minimum Diurnal Average: 6.8 µg/m ³ at hour 23																	Hours of Calibration:	1																												
Monthly Average: 7.89 µg/m ³		Percentiles: P ₁ = 1.1 P ₁₀ = 2.2 Q ₁ = 4.1 Median = 6.7 Q ₃ = 10.1 P ₉₀ = 14.4 P ₉₉ = 28.1																	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-Oct	30.6	29.1	28.3	26.0	27.8	23.4	19.8	17.2	14.5	11.7	8.5	7.7	7.3	7.4	7.6	7.8	8.2	8.9	9.3	10.1	12.3	12.9	12.0	14.8	15.1	30.6																						
2-Oct	16.4	12.5	13.9	12.2	12.6	13.7	11.8	12.1	12.7	11.6	7.1	7.2	6.4	6.1	6.7	7.2	7.2	7.4	7.2	7.7	7.4	7.9	8.1	10.1	9.7	16.4																						
3-Oct	11.3	16.7	19.5	20.5	21.0	20.4	20.9	18.3	15.6	11.2	10.6	10.7	8.2	7.8	8.2	8.1	6.8	6.6	6.3	7.4	9.4	7.7	7.1	7.5	12.0	21.0																						
4-Oct	6.6	5.9	5.4	4.2	4.2	4.4	4.1	3.6	3.2	4.1	6.6	10.3	8.3	4.8	4.1	4.2	9.4	10.3	4.1	2.0	0.8	0.3	0.3	0.4	4.7	10.3																						
5-Oct	0.8	2.0	2.8	1.9	1.2	0.9	1.9	2.4	2.1	1.8	1.5	1.5	1.7	1.8	1.6	1.3	1.3	1.2	1.0	1.0	1.6	2.0	2.6	2.6	1.7	2.8																						
6-Oct	2.7	2.8	2.7	2.8	3.4	4.7	5.8	6.0	4.7	4.1	3.9	4.0	3.8	3.7	3.6	3.6	4.5	5.0	4.9	5.1	3.8	3.6	3.6	4.0	4.0	6.0																						
7-Oct	4.8	4.6	4.9	6.6	8.2	8.4	8.5	7.5	7.2	8.8	13.0	15.2	26.3	18.2	19.7	25.8	16.0	14.5	13.8	14.3	14.9	14.8	15.3	14.8	12.8	26.3																						
8-Oct	14.4	14.9	13.7	13.1	12.6	12.0	11.3	10.3	10.2	9.6	10.5	13.3	14.1	10.4	8.6	5.9	6.1	7.5	7.9	7.8	9.0	8.6	8.6	9.5	10.4	14.9																						
9-Oct	8.9	8.4	6.6	6.3	6.2	5.4	5.2	4.7	5.0	5.8	8.6	9.9	7.6	6.2	7.3	8.2	7.0	7.2	5.5	5.0	5.1	5.7	6.0	6.1	6.6	9.9																						
10-Oct	6.6	7.0	7.1	7.0	6.9	6.5	6.3	6.8	6.8	6.7	5.9	6.2	6.2	5.7	8.0	8.9	7.0	5.6	5.5	5.6	6.1	6.9	6.0	6.5	6.6	8.9																						
11-Oct	6.8	6.7	6.5	6.0	5.7	5.8	5.9	5.8	6.1	7.6	9.0	8.5	7.6	7.6	8.0	7.8	6.1	5.7	5.3	5.0	4.5	4.9	5.3	5.5	6.4	9.0																						
12-Oct	8.1	8.0	7.8	8.2	8.0	7.2	7.0	6.9	6.8	9.6	12.8	10.1	15.4	8.4	7.5	7.5	7.4	8.2	13.9	16.5	15.1	11.1	10.5	9.5	9.6	16.5																						
13-Oct	10.4	10.7	10.8	9.9	10.2	10.2	8.0	10.6	11.4	14.9	14.3	15.6	14.5	12.8	13.7	12.8	11.8	11.2	11.3	8.6	6.3	6.3	5.9	5.8	10.7	15.6																						
14-Oct	5.4	5.9	6.1	7.5	8.7	10.5	7.1	6.6	8.1	7.6	7.6	8.8	11.0	7.8	8.1	8.4	9.3	9.4	6.8	9.7	7.1	9.9	6.0	8.3	8.0	11.0																						
15-Oct	9.4	9.5	9.0	8.6	8.9	8.1	8.7	8.0	6.9	11.3	17.5	8.3	8.4	8.9	9.1	9.8	10.2	10.9	9.5	7.6	7.1	8.4	7.1	5.5	9.0	17.5																						
16-Oct	5.4	5.8	6.6	6.9	7.0	7.1	7.2	7.2	6.9	6.7	5.9	5.4	4.5	3.7	3.9	3.5	2.4	5.7	11.5	10.9	5.4	3.7	3.9	4.0	5.9	11.5																						
17-Oct	3.7	3.6	6.8	10.3	8.9	10.1	11.8	13.5	20.6	31.9	37.5	34.5	27.5	23.9	23.3	24.0	23.3	23.7	22.8	21.8	23.0	23.3	23.3	24.3	19.9	37.5																						
18-Oct	24.1	25.0	29.1	30.3	26.7	25.5	27.6	25.4	25.0	21.0	14.2	13.0	7.2	6.9	6.7	7.3	7.2	13.8	13.1	12.6	8.5	3.2	1.9	1.5	15.7	30.3																						
19-Oct	1.4	1.4	1.6	1.8	2.0	2.1	2.4	2.5	2.2	2.1	2.2	2.1	2.0	2.0	1.9	1.9	1.7	1.9	2.3	2.2	2.0	1.8	1.1	1.2	1.9	2.5																						
20-Oct	1.4	1.4	1.5	1.5	2.0	2.2	3.0	3.2	3.6	4.4	4.7	7.0	6.6	7.3	6.4	7.1	13.1	13.8	13.1	13.4	13.0	12.4	11.4	11.4	6.9	13.8																						
21-Oct	10.9	11.6	12.5	11.1	11.2	11.6	12.2	14.0	15.5	17.5	16.4	17.2	18.2	23.2	10.5	2.4	4.3	3.4	3.2	3.0	2.3	2.2	2.9	3.7	10.0	23.2																						
22-Oct	4.5	5.4	5.5	5.1	4.6	4.3	3.8	3.4	3.2	3.9	9.4	8.6	5.4	4.9	7.8	9.0	5.1	3.9	3.6	5.4	8.6	13.6	12.4	10.9	6.3	13.6																						
23-Oct	9.2	6.7	5.5	5.1	4.4	6.1	9.2	11.1	9.7	6.8	5.1	3.3	2.1	2.1	2.3	1.2	1.7	1.8	2.2	2.8	3.5	4.7	5.1	5.0	4.9	11.1																						
24-Oct	4.9	4.3	4.0	4.2	4.3	4.6	4.6	4.8	5.1	6.3	7.6	7.5	7.4	3.8	2.6	4.6	5.7	5.3	4.5	4.1	4.0	4.0	4.1	4.6	4.9	7.6																						
25-Oct	3.4	4.3	5.1	4.5	4.6	5.3	5.5	4.7	4.7	5.4	6.3	7.7	11.5	12.8	12.0	10.4	9.8	6.7	6.6	7.4	7.5	7.0	6.8	5.8	6.9	12.8																						
26-Oct	5.7	6.0	6.6	9.3	9.7	10.8	10.8	10.5	10.5	9.9	8.8	6.7	3.9	3.2	3.4	2.5	1.6	2.2	1.6	1.6	2.5	3.6	3.7	3.7	5.8	10.8																						
27-Oct	3.6	3.6	3.0	2.0	2.4	2.8	3.3	3.2	C	5.2	4.1	4.2	5.1	4.4	3.0	2.8	2.0	2.5	2.7	2.8	2.8	2.5	2.4	2.5	3.2	5.2																						
28-Oct	2.8	2.6	2.4	2.9	3.1	3.0	3.2	3.8	4.9	6.3	8.5	8.8	6.1	4.6	4.1	5.8	4.0	2.2	1.6	1.7	1.7	2.6	2.1	1.2	3.8	8.8																						
29-Oct	1.9	2.9	1.8	1.6	1.5	1.9	3.3	3.4	3.2	4.8	6.7	6.9	4.8	4.7	5.7	5.2	5.3	5.5	6.9	12.2	10.1	10.4	8.9	5.5	5.2	12.2																						
30-Oct	5.7	3.4	2.5	2.8	3.4	3.8	3.5	3.0	3.4	5.8	9.5	7.1	5.0	2.8	4.0	5.5	6.2	6.9	4.4	4.2	4.6	4.9	5.4	5.7	4.7	9.5																						
31-Oct	6.1	5.8	5.8	5.7	6.1	6.5	9.8	12.0	12.6	12.5	12.5	12.0	12.5	14.6	14.5	14.4	14.3	14.6	14.9	13.4	11.9	11.1	10.7	12.6	11.1	14.9																						
																								7.7	7.7	7.9	7.9	8.0	8.0	8.2	8.1	8.4	8.9	9.6	9.3	8.9	7.8	7.5	7.6	7.3	7.5	7.3	7.5	7.2	7.2	6.8	6.9	Diurnal Average
																								30.6	29.1	29.1	30.3	27.8	25.5	27.6	25.4	25.0	31.9	37.5	34.5	27.5	23.9	23.3	25.8	23.3	23.7	22.8	21.8	23.0	23.3	23.3	24.3	Diurnal Maximum
C - Calibration																																																
Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 µg/m ³ 24-hr 29 µg/m ³																																																





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Ells River - October 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	286	38.49	38.49
6 - 15	400	53.84	92.33
16 - 25	41	5.52	97.85
26 - 80	16	2.15	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - μg/m³
Ells River - October 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	3	0	4	1	2	6	9	34	24	44	33	35	55	13	8	286
6 - 15	16	3	3	4	8	11	38	98	54	20	32	17	25	25	17	17	388
16 - 25	3	8	0	0	2	0	4	8	6	3	0	4	0	1	2	0	41
26 - 80	3	1	0	0	0	1	1	3	4	1	1	0	1	0	0	0	16
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	37	15	3	8	11	14	49	118	98	48	77	54	61	81	32	25	731

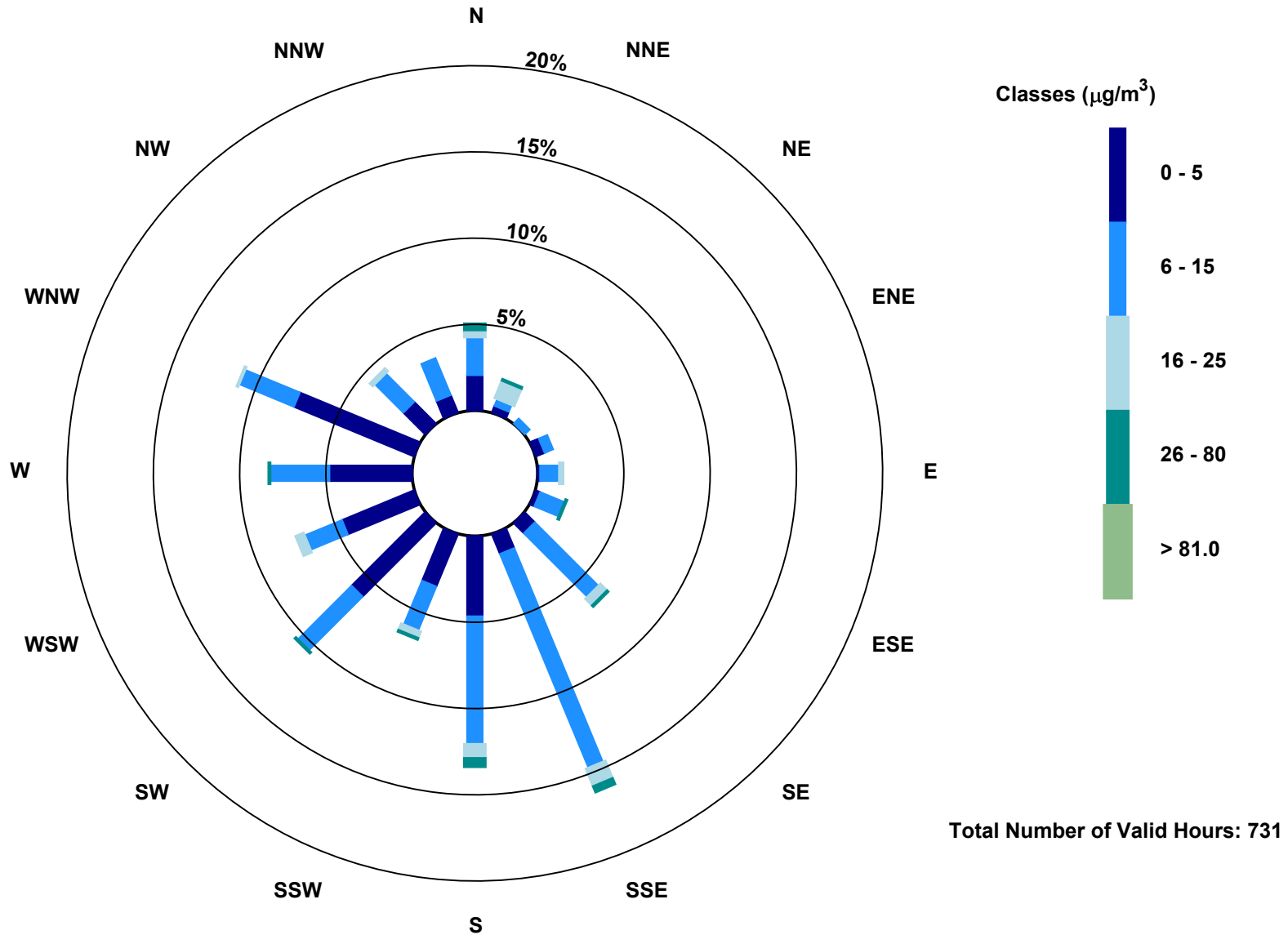
Total Number of Valid Hours: 731

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

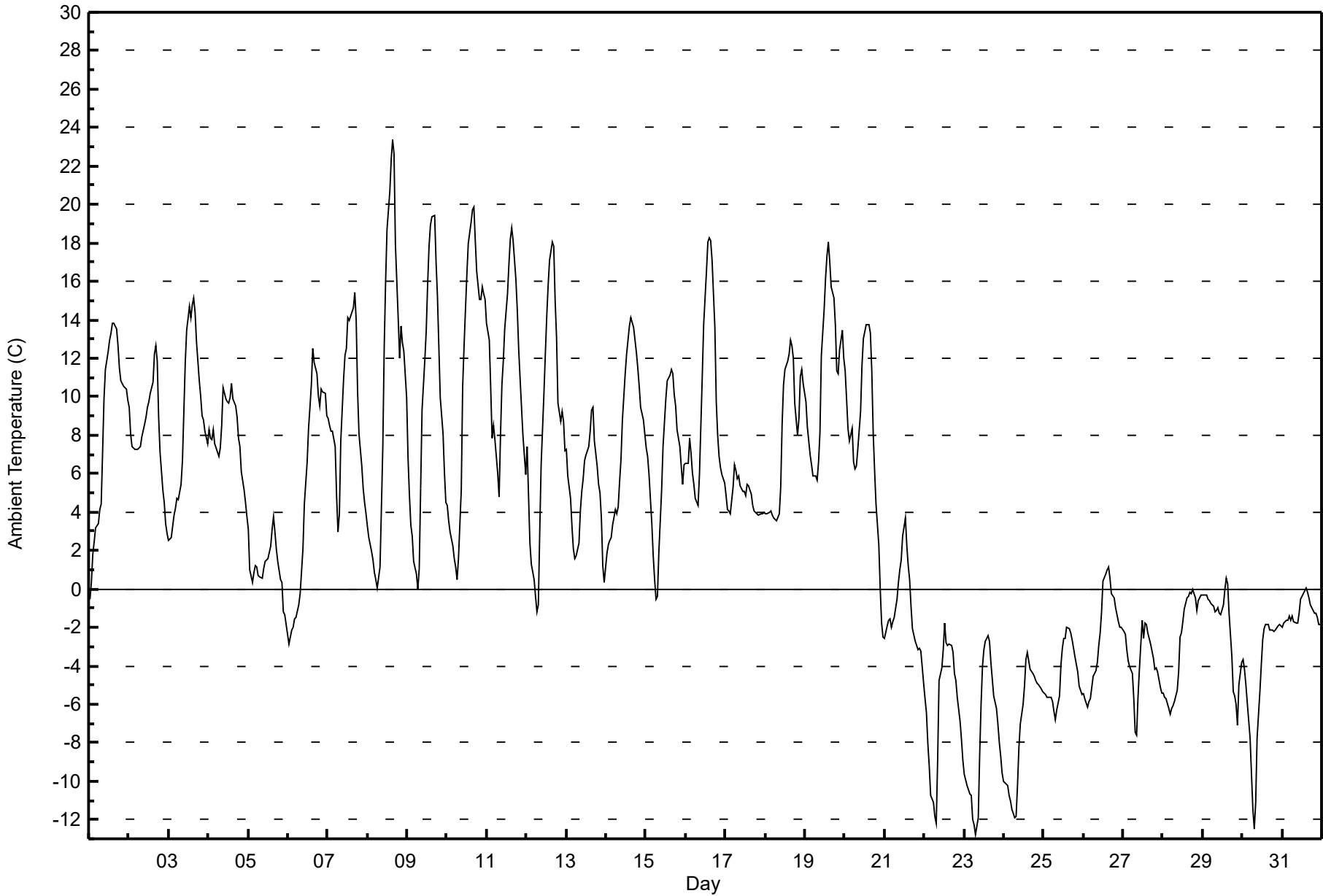
Particulate Matter 2.5 (PM_{2.5}) - μg/m³
Ells River



Total Number of Valid Hours: 731



Maximum Value: 23.4 C on Oct 8 16:00 Maximum Daily Average: 11.7 C on Oct 11																				Hours in Service: 744 Hours of Data: 744						
Minimum Value: -12.8 C on Oct 23 08:00 Minimum Daily Average: -7.6 C on Oct 23 Maximum Diurnal Average: 8.7 C at hour 16 Minimum Diurnal Average: -0.4 C at hour 7 Monthly Average: 3.80 C Percentiles: P ₁ = -11.9 P ₁₀ = -5.5 Q ₁ = -1.9 Median = 3.9 Q ₃ = 9.5 P ₉₀ = 13.6 P ₉₉ = 19.2																				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-Oct	-0.6	0.3	1.8	2.4	3.2	3.4	4.1	4.4	7.1	9.9	11.4	12.4	13.0	13.3	13.8	13.8	13.5	12.6	11.5	10.8	10.7	10.5	10.4	9.8	8.5	13.8
2-Oct	9.4	8.1	7.4	7.3	7.2	7.3	7.3	7.4	7.9	8.6	9.0	9.4	9.8	10.2	10.8	12.2	12.7	11.9	9.0	7.1	5.2	4.5	3.4	2.9	8.2	12.7
3-Oct	2.5	2.7	3.2	3.9	4.2	4.7	4.6	5.4	6.7	9.2	11.8	13.4	14.7	14.1	14.7	15.2	14.4	12.9	10.9	10.0	9.0	8.8	8.2	7.6	8.9	15.2
4-Oct	8.3	7.9	7.8	8.3	7.6	7.1	6.9	7.4	8.5	10.5	9.9	9.8	9.6	10.0	10.7	9.9	9.5	9.0	7.8	7.4	6.1	5.1	4.5	3.8	8.1	10.7
5-Oct	3.1	1.0	0.3	0.9	1.2	1.2	0.7	0.6	0.6	1.1	1.4	1.5	1.6	2.2	3.1	3.8	3.0	2.1	1.4	0.5	0.3	-1.2	-1.4	-1.9	1.1	3.8
6-Oct	-2.9	-2.5	-2.1	-2.0	-1.5	-1.5	-0.9	-0.3	0.9	2.1	4.4	6.6	8.3	9.5	10.6	12.5	11.8	11.2	10.0	9.5	10.4	10.3	10.1	9.0	5.2	12.5
7-Oct	8.9	8.5	8.2	8.2	7.4	4.9	3.0	3.9	7.7	10.9	12.1	12.5	14.1	14.0	14.2	14.6	15.4	14.0	10.2	8.1	6.4	5.2	4.5	3.9	9.2	15.4
8-Oct	3.2	2.7	1.9	1.5	0.8	0.5	0.0	1.1	4.2	7.4	12.6	16.0	18.7	20.7	22.4	23.4	22.6	17.9	14.0	12.0	13.7	12.8	12.3	9.9	10.5	23.4
9-Oct	6.8	4.8	3.3	2.7	1.4	0.8	0.0	1.1	5.2	9.3	11.9	13.5	15.9	17.8	18.9	19.4	19.4	17.0	15.2	12.6	10.0	8.1	6.0	4.5	9.4	19.4
10-Oct	4.3	3.5	3.0	2.2	1.5	1.1	0.5	1.6	5.2	10.5	12.6	14.5	16.4	18.0	19.0	19.7	19.9	18.1	16.5	15.1	15.0	15.7	15.4	15.1	11.0	19.9
11-Oct	13.8	13.0	10.5	7.9	8.5	7.8	6.0	4.8	8.0	10.6	11.9	13.6	15.4	16.9	18.2	18.7	18.1	16.1	14.4	12.4	10.9	9.5	8.0	5.9	11.7	18.7
12-Oct	7.4	4.9	2.3	1.3	0.5	-0.4	-1.2	-0.8	2.9	6.4	10.2	12.2	14.2	15.8	17.1	18.1	17.8	15.0	13.1	9.6	8.7	9.2	8.7	7.2	8.3	18.1
13-Oct	7.3	5.8	4.7	3.3	2.1	1.6	1.7	2.4	4.0	5.1	5.8	6.7	6.9	7.4	8.2	9.3	9.4	7.7	6.4	5.4	5.0	3.7	1.2	0.4	5.1	9.4
14-Oct	1.9	2.3	2.5	2.7	3.3	4.2	3.9	4.3	5.6	6.7	8.8	11.2	12.2	12.9	13.7	14.1	13.6	12.9	12.3	11.5	10.5	9.5	8.8	8.1	8.2	14.1
15-Oct	7.3	6.9	6.0	3.4	1.7	0.5	-0.6	-0.4	1.9	5.1	7.4	8.6	9.9	10.8	11.1	11.4	11.2	10.1	9.5	8.3	7.4	6.4	5.4	6.5	6.5	11.4
16-Oct	6.6	6.5	7.9	7.0	6.0	5.4	4.7	4.3	6.0	8.5	11.0	13.7	16.5	18.0	18.3	18.1	17.1	13.6	9.7	8.0	6.9	6.3	5.9	5.5	9.7	18.3
17-Oct	4.8	4.1	4.1	3.9	5.3	6.4	6.2	5.7	5.8	5.4	5.1	5.1	4.9	5.4	5.3	5.0	4.3	4.1	3.9	3.9	3.8	3.9	3.9	4.0	4.8	6.4
18-Oct	3.9	3.9	4.0	4.0	3.9	3.7	3.6	3.6	3.9	5.3	8.6	10.6	11.4	11.9	12.2	13.0	12.6	12.0	9.7	8.0	8.9	11.0	11.4	10.7	8.0	13.0
19-Oct	9.7	8.4	7.7	7.0	6.4	5.8	5.9	5.7	6.6	8.1	12.2	14.6	16.2	17.3	18.0	17.0	15.7	15.2	13.8	11.4	11.2	12.4	13.5	12.0	11.3	18.0
20-Oct	11.4	9.9	8.3	7.7	8.4	6.6	6.3	6.4	7.3	9.3	11.6	13.1	13.4	13.8	13.7	13.3	11.3	8.2	6.2	4.4	2.3	0.0	-1.8	-2.5	7.9	13.8
21-Oct	-2.6	-2.0	-1.6	-1.5	-2.0	-1.7	-1.5	-0.5	0.4	1.0	1.5	2.7	3.7	2.2	1.2	0.5	-0.9	-2.1	-2.7	-3.0	-3.2	-3.1	-3.2	-4.9	-1.0	3.7
22-Oct	-5.7	-6.4	-8.0	-9.2	-10.7	-11.1	-11.9	-12.2	-8.9	-4.8	-4.1	-3.1	-1.8	-2.8	-2.9	-2.9	-2.9	-3.3	-4.4	-4.8	-5.7	-6.9	-7.8	-8.9	-6.3	-1.8
23-Oct	-9.6	-10.0	-10.2	-10.7	-10.8	-12.0	-12.3	-12.8	-11.9	-8.7	-6.0	-4.0	-3.1	-2.7	-2.4	-2.7	-3.8	-4.7	-5.6	-6.3	-7.0	-8.0	-8.7	-9.6	-7.6	-2.4
24-Oct	-10.0	-10.1	-10.2	-10.7	-11.0	-11.5	-11.9	-11.8	-10.2	-8.3	-7.0	-6.0	-5.1	-3.7	-3.3	-3.7	-4.1	-4.4	-4.5	-4.8	-4.9	-5.0	-5.2	-5.3	-7.2	-3.3
25-Oct	-5.4	-5.5	-5.6	-5.6	-5.6	-5.9	-6.4	-6.8	-6.3	-5.6	-4.0	-3.1	-2.6	-2.6	-2.0	-2.1	-2.3	-2.7	-3.1	-3.5	-4.3	-5.0	-5.3	-5.5	-4.4	-2.0
26-Oct	-5.4	-5.7	-6.1	-5.9	-5.7	-5.1	-4.6	-4.2	-3.8	-3.0	-2.3	-1.2	0.4	0.8	1.0	1.1	0.5	-0.2	-0.5	-1.0	-1.4	-1.7	-2.0	-2.0	-2.4	1.1
27-Oct	-2.2	-2.3	-3.1	-3.8	-4.1	-4.4	-5.7	-7.5	-7.6	-5.6	-4.2	-1.7	-2.6	-1.8	-1.8	-2.3	-2.9	-3.2	-3.6	-4.2	-4.1	-4.3	-5.1	-5.4	-3.9	-1.7
28-Oct	-5.4	-5.6	-5.7	-6.2	-6.5	-6.2	-6.1	-5.9	-5.2	-4.4	-2.5	-2.3	-1.7	-1.0	-0.5	-0.4	-0.2	-0.3	0.0	-0.5	-1.1	-0.6	-0.5	-0.3	-2.9	0.0
29-Oct	-0.3	-0.3	-0.3	-0.5	-0.6	-0.8	-0.9	-1.2	-1.1	-1.0	-1.3	-1.3	-0.8	0.0	0.6	0.3	-1.2	-3.5	-5.3	-5.6	-6.0	-7.1	-5.0	-3.8	-2.0	0.6
30-Oct	-3.7	-4.2	-5.0	-6.0	-7.8	-9.6	-11.4	-12.5	-11.1	-7.8	-5.3	-3.9	-2.7	-2.1	-1.9	-1.9	-2.2	-2.2	-2.2	-2.2	-2.1	-1.9	-1.8	-1.9	-4.7	-1.8
31-Oct	-2.0	-1.8	-1.6	-1.6	-1.4	-1.6	-1.4	-1.7	-1.8	-1.8	-1.3	-0.6	-0.4	-0.1	0.1	-0.2	-0.5	-0.8	-1.0	-1.2	-1.2	-1.5	-1.9	-1.9	-1.2	0.1
																								Diurnal Average		
																								Diurnal Maximum		





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Ells River - October 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	267	35.89	35.89
0 - 10	312	41.94	77.82
10 - 20	161	21.64	99.46
> 20	4	0.54	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

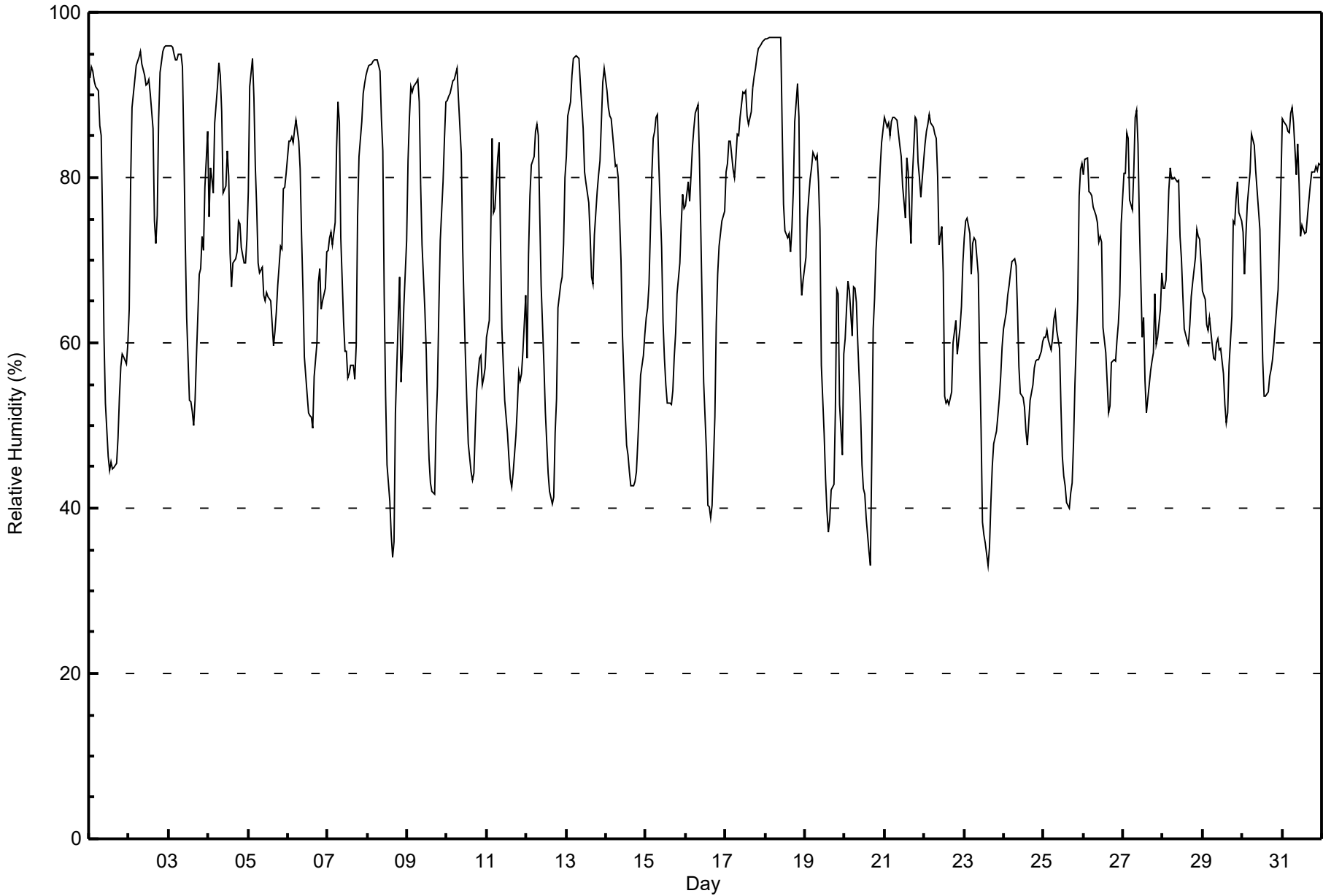
Relative Humidity (RH) - %
Ells River - October 2023

Maximum Value: 97.0 % on Oct 18 09:00		Maximum Daily Average: 88.4 % on Oct 2		Hours in Service: 744																						
Minimum Value: 33.0 % on Oct 20 16:00		Minimum Daily Average: 55.8 % on Oct 23		Hours of Data: 744																						
Maximum Diurnal Average: 83.5 % at hour 7		Minimum Diurnal Average: 52.9 % at hour 16		Hours of Missing Data: 0																						
Monthly Average: 70.41 %		Percentiles: P ₁ = 36.7 P ₁₀ = 49.0 Q ₁ = 58.3 Median = 72.0 Q ₃ = 83.8 P ₉₀ = 91.0 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-Oct	92.0	93.4	92.9	91.7	91.0	90.5	86.3	85.1	74.5	60.7	52.8	46.3	44.7	45.6	44.8	44.8	45.5	48.4	53.4	57.2	58.6	58.3	57.5	59.8	65.7	93.4
2-Oct	64.0	79.2	88.4	91.8	93.6	94.0	94.5	95.2	93.8	92.3	91.2	91.4	91.9	90.2	86.0	74.7	72.1	75.5	87.2	92.6	95.2	95.7	95.9	96.0	88.4	96.0
3-Oct	95.9	96.0	95.7	95.0	94.2	94.2	95.0	94.9	93.4	83.7	72.2	63.1	53.1	52.9	51.7	49.9	53.0	58.4	68.2	69.0	73.0	71.2	78.8	85.5	76.6	96.0
4-Oct	75.3	81.2	79.8	78.2	86.6	91.0	93.9	92.4	88.0	78.1	79.0	83.2	80.1	70.9	66.8	69.7	70.1	71.0	74.8	74.3	71.5	69.6	69.7	72.6	77.8	93.9
5-Oct	78.3	91.0	94.5	89.7	81.4	76.2	69.7	68.5	69.2	65.8	65.0	66.1	65.6	65.1	62.4	59.7	61.3	63.7	66.9	71.8	71.3	78.6	78.9	80.4	72.5	94.5
6-Oct	84.5	84.5	85.0	84.3	85.8	86.9	84.5	81.0	73.0	66.4	58.3	53.7	51.4	51.2	51.0	49.6	55.9	60.0	67.3	69.0	64.1	65.1	66.6	71.0	68.8	86.9
7-Oct	71.1	72.8	73.3	71.8	74.5	83.6	89.1	86.7	72.7	62.6	59.0	59.0	55.8	56.3	57.2	57.3	55.6	59.7	75.2	82.6	86.9	90.2	91.4	92.4	72.4	92.4
8-Oct	93.0	93.5	93.7	94.1	94.3	94.2	94.2	92.9	87.2	83.2	65.5	53.6	45.3	40.8	36.7	34.1	36.0	51.5	62.8	68.0	55.2	59.2	64.5	72.3	69.4	94.3
9-Oct	82.0	87.3	91.0	90.3	91.0	91.6	91.8	89.2	79.2	71.9	64.1	59.0	51.3	45.9	43.0	42.0	41.6	50.0	54.8	64.1	72.3	79.5	84.8	89.1	71.1	91.8
10-Oct	89.3	89.8	90.2	91.7	91.9	92.5	93.1	89.5	82.8	71.5	64.3	58.1	52.8	47.9	44.4	43.4	44.2	49.6	54.3	58.1	58.4	54.8	55.7	57.0	67.7	93.1
11-Oct	60.7	62.7	72.9	84.8	75.8	76.2	82.4	84.2	72.4	61.7	57.2	53.1	48.9	46.0	43.5	42.6	44.3	48.8	52.2	56.5	55.4	56.3	58.9	65.7	61.0	84.8
12-Oct	58.2	70.7	77.9	81.5	82.6	85.6	86.5	85.1	75.7	66.9	57.3	51.7	47.9	44.2	42.1	40.5	41.4	49.2	53.2	64.2	67.1	68.0	71.8	80.1	64.6	86.5
13-Oct	82.6	87.5	89.2	92.4	94.4	94.6	94.7	94.4	91.4	88.7	86.0	80.7	79.3	76.9	72.8	68.0	67.0	73.1	78.3	80.3	82.0	86.9	91.6	93.2	84.4	94.7
14-Oct	90.4	88.6	87.5	87.0	85.3	81.4	81.5	80.0	75.0	70.0	61.2	51.5	47.6	46.4	44.4	42.7	42.8	43.2	44.5	47.9	51.9	56.1	58.4	61.0	63.6	90.4
15-Oct	63.1	64.2	67.0	80.3	84.8	85.6	87.3	87.6	81.5	71.6	62.5	58.1	54.9	52.7	52.7	52.6	54.2	58.3	61.2	66.0	69.6	74.3	77.9	76.2	68.5	87.6
16-Oct	76.6	79.5	77.2	80.4	83.8	85.9	87.9	88.8	82.3	73.2	63.8	55.3	46.8	40.3	40.2	38.8	40.4	51.0	62.4	68.4	71.6	73.3	74.8	76.0	67.4	88.8
17-Oct	80.7	81.8	84.4	84.4	81.1	80.1	82.4	85.2	85.0	87.3	90.3	90.2	90.4	87.4	86.5	88.0	90.8	92.1	93.2	94.6	95.5	96.1	96.4	96.6	88.4	96.6
18-Oct	96.7	96.9	97.0	97.0	97.0	97.0	97.0	97.0	97.0	97.0	86.5	76.8	73.6	72.7	73.1	71.1	73.9	78.5	86.8	91.3	87.4	69.3	65.7	67.6	85.2	97.0
19-Oct	70.4	75.2	77.6	79.8	81.2	83.0	82.2	82.8	79.5	73.7	57.4	49.1	43.6	39.7	37.0	38.7	42.2	42.9	51.7	66.5	66.0	52.5	46.4	58.7	61.6	83.0
20-Oct	60.4	64.3	67.5	66.3	60.9	66.8	66.5	64.9	60.0	51.5	45.2	42.4	41.7	38.8	34.7	33.0	46.4	61.8	65.5	71.2	77.0	81.2	84.2	85.8	59.9	85.8
21-Oct	87.3	86.2	86.6	85.1	86.7	87.3	87.2	87.0	85.4	84.0	82.5	79.0	75.0	82.4	80.7	75.4	72.0	80.2	87.3	87.0	81.9	80.0	77.7	82.1	82.8	87.3
22-Oct	84.1	85.6	86.4	87.6	86.6	86.2	85.2	84.8	80.2	71.8	74.1	68.4	53.5	52.7	53.0	52.5	54.1	59.9	61.3	62.7	58.6	61.9	64.4	69.7	70.2	87.6
23-Oct	72.7	74.7	75.1	73.3	68.3	72.0	72.6	72.5	68.3	58.2	49.5	38.2	36.7	35.7	33.0	35.3	40.8	45.2	47.8	49.3	51.2	53.3	55.9	59.5	55.8	75.1
24-Oct	61.8	63.8	65.7	67.0	68.4	69.9	70.2	69.3	63.9	57.1	53.8	53.5	52.2	49.4	47.6	50.3	53.0	55.0	57.0	57.8	57.9	57.9	58.9	60.2	59.2	70.2
25-Oct	60.6	60.7	61.5	60.4	59.1	60.5	62.9	63.7	61.5	59.3	52.4	46.3	43.9	42.7	40.6	40.0	41.8	43.1	48.0	55.0	65.2	77.8	81.1	81.8	57.1	81.8
26-Oct	80.3	82.2	82.3	78.3	78.1	77.8	76.4	75.4	74.5	72.1	72.9	72.2	61.8	58.7	55.2	51.5	52.3	57.6	58.0	57.8	60.3	62.4	65.7	74.4	68.3	82.3
27-Oct	80.5	80.5	85.5	84.8	77.3	76.0	80.9	87.3	88.2	84.1	74.4	60.7	63.1	55.4	51.6	53.2	56.6	57.9	58.8	65.9	59.8	60.7	64.1	68.5	69.8	88.2
28-Oct	66.5	66.7	67.6	78.4	81.2	79.8	79.7	80.1	79.5	79.7	72.9	70.1	65.8	61.7	60.3	59.8	62.2	65.5	67.4	70.3	73.7	72.9	72.5	69.6	71.0	81.2
29-Oct	66.3	65.2	62.3	61.6	63.0	61.3	58.1	57.9	60.0	60.4	59.2	59.2	56.2	52.6	50.3	51.4	57.3	63.2	74.8	74.5	77.5	79.6	75.7	74.8	63.4	79.6
30-Oct	73.4	68.3	72.9	76.8	80.7	85.2	84.6	83.9	80.8	78.4	73.7	65.5	58.0	53.5	53.6	54.0	55.9	56.8	57.9	59.9	62.3	66.5	72.4	79.1	68.9	85.2
31-Oct	87.1	86.8	86.3	85.6	85.4	87.9	88.5	86.7	80.3	84.0	79.1	72.9	74.2	73.2	73.4	75.4	77.3	79.2	80.6	80.7	81.4	80.9	81.8	81.6	81.3	88.5
	77.0	79.4	81.1	82.3	82.1	83.1	83.5	83.0	78.6	73.1	67.2	62.2	58.3	55.8	53.9	52.9	54.9	59.7	64.9	68.8	69.7	70.6	72.3	75.4		Diurnal Average
	96.7	96.9	97.0	97.0	97.0	97.0	97.0	97.0	97.0	97.0	91.2	91.4	91.9	90.2	86.5	88.0	90.8	92.1	93.2	94.6	95.5	96.1	96.4	96.6		Diurnal Maximum



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Ells River - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Ells River - October 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	15	2.02	2.02
40 - 60	201	27.02	29.03
60 - 80	278	37.37	66.40
80 - 100	250	33.60	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



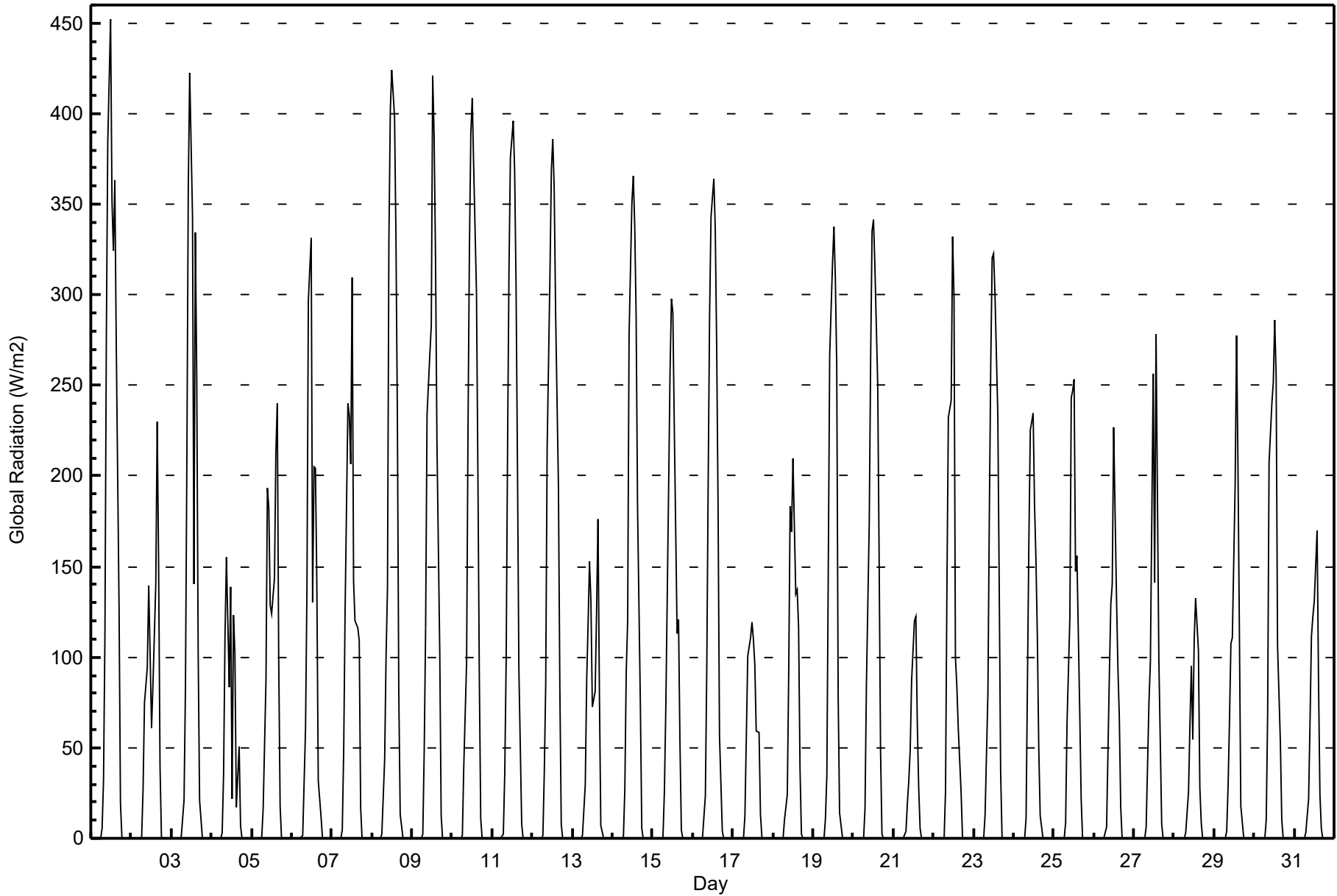
Wood Buffalo Environmental Association

Summary of Hour Averages

Global Radiation (GR) - W/m2

Ells River - October 2023

Maximum Value: 451.9 W/m2 on Oct 1 12:00																								Maximum Daily Average: 113.4 W/m2 on Oct 1																								Hours in Service: 744	
Minimum Value: 0.0 W/m2 on Oct 1 02:00																								Minimum Daily Average: 22.2 W/m2 on Oct 21																								Hours of Data: 744	
Maximum Diurnal Average: 252.4 W/m2 at hour 12																								Minimum Diurnal Average: 0.0 W/m2 at hour 24																								Hours of Missing Data: 0	
Monthly Average: 66.05 W/m2																								Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.2 Q ₃ = 102.5 P ₉₀ = 251.1 P ₉₉ = 393.1																								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-Oct	0.1	0.0	0.0	0.0	0.0	0.0	5.4	32.2	111.4	275.7	383.5	451.9	351.4	324.5	363.1	274.8	127.9	19.9	0.4	0.0	0.0	0.0	0.0	0.0	113.4	451.9																							
2-Oct	0.0	0.0	0.0	0.0	0.0	0.0	1.1	27.2	74.5	94.4	139.8	101.6	61.0	84.9	140.1	230.2	151.2	39.4	0.8	0.1	0.2	0.0	0.1	0.0	47.8	230.2																							
3-Oct	0.0	0.0	0.0	0.0	0.0	0.0	1.2	21.0	83.1	208.3	359.0	422.9	343.1	140.3	334.4	253.2	102.8	20.8	0.4	0.2	0.0	0.0	0.0	0.0	95.4	422.9																							
4-Oct	0.0	0.0	0.0	0.0	0.0	0.0	3.2	36.1	112.1	154.8	83.5	139.0	21.8	123.0	102.5	17.4	51.1	6.8	0.0	0.0	0.0	0.0	0.0	0.0	35.5	154.8																							
5-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.7	16.2	87.0	193.0	182.4	128.4	124.0	143.8	212.9	240.3	99.6	17.9	0.1	0.1	0.1	0.1	0.0	0.0	60.3	240.3																							
6-Oct	0.1	0.0	0.0	0.0	0.0	0.0	1.2	31.3	60.9	137.7	296.9	331.0	130.2	204.8	204.0	139.2	31.9	11.4	0.0	0.0	0.0	0.0	0.1	0.0	65.9	331.0																							
7-Oct	0.0	0.0	0.0	0.0	0.0	0.1	4.4	48.0	125.2	240.4	233.5	206.3	309.7	142.0	120.1	116.3	108.8	17.1	0.2	0.1	0.1	0.0	0.0	0.0	69.7	309.7																							
8-Oct	0.0	0.0	0.0	0.0	0.0	0.0	2.2	43.3	100.3	137.8	329.4	401.5	423.9	398.7	331.1	233.3	80.3	13.2	0.2	0.0	0.1	0.1	0.0	0.2	104.0	423.9																							
9-Oct	0.2	0.0	0.0	0.1	0.0	0.0	2.4	48.3	116.1	234.0	267.7	282.6	420.9	387.8	320.6	219.6	102.6	12.3	0.2	0.1	0.1	0.0	0.0	0.0	100.7	420.9																							
10-Oct	0.0	0.0	0.0	0.0	0.0	0.0	1.7	39.6	97.2	226.1	325.9	388.9	408.2	371.3	300.9	201.0	89.9	10.8	0.2	0.1	0.1	0.0	0.0	0.0	102.6	408.2																							
11-Oct	0.1	0.1	0.0	0.0	0.0	0.2	2.0	36.1	97.4	215.7	313.5	376.1	396.3	368.5	305.4	207.0	93.2	8.1	0.1	0.1	0.1	0.2	0.1	0.1	100.9	396.3																							
12-Oct	0.1	0.2	0.1	0.1	0.1	0.1	1.5	36.9	85.0	214.7	310.9	368.7	386.2	358.3	290.4	194.2	83.3	8.2	0.2	0.1	0.0	0.0	0.1	0.0	97.5	386.2																							
13-Oct	0.1	0.1	0.1	0.0	0.1	0.0	1.2	29.7	87.3	118.6	153.0	131.3	72.4	81.2	124.8	176.0	80.6	7.2	0.1	0.2	0.1	0.0	0.2	0.0	44.3	176.0																							
14-Oct	0.0	0.0	0.1	0.1	0.1	0.1	1.1	27.6	91.6	119.7	277.2	351.2	366.0	338.2	287.3	183.5	72.9	5.5	0.0	0.0	0.0	0.0	0.0	0.0	88.4	366.0																							
15-Oct	0.0	0.0	0.2	0.1	0.2	0.1	1.2	25.4	71.7	193.2	257.6	298.0	290.0	227.9	113.3	120.9	53.6	4.8	0.1	0.2	0.3	0.0	0.0	0.0	69.1	298.0																							
16-Oct	0.1	0.0	0.0	0.0	0.0	0.0	0.8	23.2	93.3	197.6	289.1	342.8	364.3	336.4	272.1	182.3	56.8	3.5	0.2	0.0	0.0	0.0	0.0	0.0	90.1	364.3																							
17-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.3	56.4	100.8	110.4	119.4	110.3	96.0	59.6	58.3	13.4	1.0	0.0	0.0	0.0	0.0	0.0	0.0	30.7	119.4																							
18-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.8	24.1	91.5	183.3	169.6	209.6	135.0	137.1	116.3	38.2	2.2	0.1	0.0	0.0	0.0	0.0	0.0	46.5	209.6																							
19-Oct	0.1	0.2	0.2	0.2	0.2	0.1	0.4	11.0	34.7	148.4	266.9	317.5	337.9	309.2	259.5	78.6	14.4	0.6	0.0	0.1	0.0	0.0	0.0	0.0	74.2	337.9																							
20-Oct	0.0	0.0	0.1	0.0	0.0	0.0	0.0	16.7	85.2	173.7	265.6	335.1	341.3	316.2	250.4	154.7	48.7	2.4	0.1	0.0	0.1	0.1	0.1	0.1	82.9	341.3																							
21-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.1	19.2	32.2	48.8	87.7	120.3	122.3	64.2	28.3	5.6	0.0	0.0	0.0	0.0	0.0	0.0	0.1	22.2	122.3																							
22-Oct	0.0	0.1	0.1	0.1	0.0	0.1	0.2	26.8	140.3	232.4	242.1	332.3	298.3	100.1	84.0	60.8	25.4	0.8	0.1	0.0	0.1	0.1	0.1	0.1	64.3	332.3																							
23-Oct	0.0	0.0	0.0	0.1	0.0	0.0	0.1	13.3	80.5	178.8	261.4	320.4	322.9	300.3	234.1	139.5	36.5	1.2	0.0	0.0	0.0	0.0	0.0	0.0	78.7	322.9																							
24-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.1	10.6	88.0	164.8	225.2	235.0	183.8	153.6	110.9	49.3	12.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	51.4	235.0																							
25-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.5	63.7	121.8	243.0	247.4	253.5	147.1	156.3	69.0	21.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0	55.5	253.5																							
26-Oct	0.0	0.0	0.1	0.0	0.0	0.0	0.0	6.2	49.4	92.4	129.6	140.5	226.7	133.2	94.6	67.1	16.8	0.2	0.0	0.0	0.0	0.0	0.0	0.0	39.9	226.7																							
27-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.5	40.7	75.3	97.3	256.5	141.1	278.7	187.2	98.5	8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	49.6	278.7																							
28-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.3	25.6	63.2	95.2	54.5	109.3	132.5	103.4	27.7	8.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	26.0	132.5																							
29-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.1	29.2	65.8	107.6	111.0	195.6	277.9	204.7	113.6	18.1	0.4	0.1	0.0	0.0	0.0	0.0	0.0	47.0	277.9																							
30-Oct	0.0	0.0	0.0	0.0	0.2	0.2	0.2	10.4	69.2	207.5	240.0	251.5	286.2	255.8	106.9	53.3	9.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	62.1	286.2																							
31-Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	21.5	64.4	111.6	122.6	131.1	169.7	87.7	23.8	5.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.9	169.7																							
																								0.0	0.0	0.0	0.0	0.0	1.0	21.6	74.9	154.0	220.3	252.4	249.6	224.5	192.4	133.2	53.8	7.0	0.1	0.0	0.0	0.0	0.0	0.0	Diurnal Average		
																								0.2	0.2	0.2	0.2	0.2	5.4	48.3	140.3	275.7	383.5	451.9	423.9	398.7	363.1	274.8	151.2	39.4	0.8	0.2	0.3	0.2	0.2	0.2	Diurnal Maximum		





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Speed (WS) - km/h
Ells River - October 2023

Maximum Speed: 36 km/h on Oct 21 17:00	Maximum Daily Speed Average: 18.9 km/h on Oct 14	Hours in Service: 744
Minimum Speed Value: 0 km/h on Oct 12 04:00	Minimum Daily Speed Average: 0.5 km/h on Oct 31	Hours of Data: 732
Maximum Diurnal Speed Average: 4.2 km/h at hour 12	Minimum Diurnal Speed Average: 0.9 km/h at hour 18	Hours of Missing Data: 12
Monthly Average Velocity: 3.1 km/h 214.4 deg	Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 5 Median = 8 Q ₃ = 12 P ₉₀ = 17 P ₉₉ = 29	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-Oct	S4	S3	SSW3	SSE5	S3	SE3	SSE6	SSE7	SSE9	SSE15	SSE21	SSE22	S21	S22	S23	SSE22	SSE21	SSE14	SSE11	SSE12	SSE13	SSE14	SSE15	SSE12	SSE12.4	S23
2-Oct	SSE10	SSE7	SSE11	SSE8	SSE9	SSE11	SSE11	S4	SSE7	SSE8	SSE10	S8	S5	S6	S6	SSW8	SSW8	S6	S6	W2	W2	WNW2	WSW2	WSW2	S5.9	SSE11
3-Oct	S3	SSW3	S7	S4	S6	SSE4	S6	WSW4	WSW2	SW4	SW4	WSW7	NW5	SSW6	S10	SSW11	S11	S8	SSE9	S10	S10	S8	N2	ENE1	SSW5.0	S11
4-Oct	S7	SSE7	S7	SW6	WNW6	WNW6	WNW8	W8	W7	WNW9	WNW13	WNW11	WNW16	NW16	NW18	WNW21	NW22	WNW23	WNW16	WNW17	WNW20	WNW15	WNW18	WNW18	WNW11.5	WNW23
5-Oct	NW17	WNW10	NW6	WNW12	WNW17	WNW20	WNW24	NW22	WNW18	WNW21	WNW21	WNW20	WNW18	WNW19	WNW22	WNW20	WNW17	W6	SW6	SSW8	SW6	SW5	WSW7	SW6	WNW13.3	WNW24
6-Oct	S6	S7	SSE8	SSW6	SSE6	S8	SSE8	SSE9	S8	SSE11	S13	S15	S12	S16	S12	S11	SSE7	SSW3	S6	S8	SW7	WSW7	WSW5	WSW7	S7.8	S16
7-Oct	SW10	WSW10	WSW9	WSW10	WNW4	S5	S2	S6	WSW3	WNW2	ESE4	SSE5	SE5	SE6	SE5	ESE5	E2	NNW2	WNW2	W2	WNW3	WSW2	WNW3	W4	SW2.3	SW10
8-Oct	W3	W3	W3	W3	W5	W4	W4	W2	WNW4	WNW6	SSE5	SSE12	SSE17	SSE18	SSE15	S9	SW5	NE2	SW1	SSE6	SSE10	SSE9	SSE11	SW2	S4.4	SSE18
9-Oct	S1	SW2	W3	SW1	W2	W1	W3	W2	W3	SSE5	SE10	SE7	SE11	SE10	SE13	SE12	SSE8	E5	E7	ENE3	NW1	UO	WNW4	W4	SSE3.0	SE13
10-Oct	W3	W3	W3	W3	W2	WNW3	W4	WNW2	WNW4	NW2	SE7	SE8	ESE8	SE12	SE13	SE13	ESE8	E10	E7	SE7	SE8	SE18	SSE21	SSE21	SE5.4	SSE21
11-Oct	SE10	SE9	NNW3	NE2	SE8	ESE5	E3	NNW3	ESE3	SE19	SE17	SE15	SE9	SE10	SE11	SE12	SE14	ESE10	SE13	SE10	SE10	SE8	SE6	SW2	SE8.1	SE19
12-Oct	S9	SW2	WNW2	S0	UO	UO	UO	UO	UO	N3	SSW3	SSE12	SSE11	SSE13	SE8	SSE7	SE6	SSE6	SSE7	S6	SSE7	SSE9	SSE10	SSE10	SSE6.2	SSE13
13-Oct	SSE9	S4	S7	NW1	UO	SSE7	S6	SSE7	SSE7	SE17	SE15	SSE17	SSE14	S10	SE12	SE14	ESE11	E8	E8	SE7	SSE9	SE2	SE5	SSE5	SE8.2	SSE17
14-Oct	SSE10	SE8	SSE9	SSE9	SSE13	SSE17	SSE16	SSE16	SE19	SSE18	SSE20	SSE26	SSE29	SE30	SE32	SE30	SE27	SSE22	SSE23	SSE18	SSE18	SSE15	SSE17	SSE16	SSE18.9	SE32
15-Oct	SSE16	SSE15	S8	SSW1	UO	UO	UO	W3	NW1	SSE9	SSE15	S12	S12	S12	SSE12	SSE12	S10	S8	S7	S8	S7	S7	SSE8	SSE9	S8.6	SSE16
16-Oct	S9	S11	SW12	SW12	SW10	SW12	SSW9	SSW7	SSW7	SSW9	S11	S14	SSW11	SW11	SSW11	S11	S7	SSE7	SSE4	S6	WNW2	WNW1	WSW1	WNW1	SSW7.5	S14
17-Oct	NW2	W2	NNW4	NW5	NNW7	N12	N13	N11	N16	N17	NNE17	N16	N17	NNE15	NNE14	NNE14	NNE13	NNE11	NNE9	N8	NW5	NW4	WSW2	E3	N9.1	N17
18-Oct	WSW3	SSW3	SSE4	SSE5	S4	SW3	W2	SE1	WNW2	SSE5	SSE9	S14	SSE15	SSE16	SSE16	SSE13	SSE9	S8	S3	WNW1	SSW6	SW9	SW10	SW9	S6.0	SSE16
19-Oct	SSW10	SSW9	SSW8	S7	S6	S10	SSW10	S11	SSW11	SSW10	SW12	SW12	SW13	SW14	SW15	SW14	SSW11	SSW12	WSW12	SSE8	SSW9	W12	SW14	SW14	SSW10.2	SW15
20-Oct	WSW12	SW10	WSW6	SW6	WSW11	SW11	SW12	SW13	SW14	WSW15	W16	NW26	NW24	NW21	NW20	NNW18	N12	NNE11	NE7	NNE6	N2	W2	UO	UO	WNW8.1	NW26
21-Oct	WSW1	S1	S4	S4	S6	S7	S9	SSE6	SSE4	S2	SSW4	N7	N16	NNE29	N30	N33	N36	N30	N23	N21	N15	N12	N12	NNW5	N9.2	N36
22-Oct	NNW7	NNW7	NW4	WNW2	SSW3	S6	SSW1	SW2	WSW3	ENE1	NNW2	N4	NNE2	NNE3	SSE3	SSE3	WSW2	S1	SSW5	NW10	NW10	WNW9	WNW8	WNW9	WNW2.5	NW10
23-Oct	W9	W9	W10	W8	WSW8	SW10	SW8	SW7	SW8	WSW12	W10	WNW19	WNW17	WNW19	WNW19	WNW19	WNW16	WNW12	W8	WSW8	SW9	SW10	WSW6	SW7	W10.2	WNW19
24-Oct	SW9	WSW8	SW10	SW10	SW9	SW8	SW8	SW10	WSW9	WSW13	WSW12	WSW13	SW13	W13	WNW14	W14	WNW14	W11	W12	W10	W10	W9	W11	WSW10.0	W14	
25-Oct	W11	WSW10	W9	W9	W8	SW7	SW8	SW7	SW8	WSW8	SW9	SSW10	SW9	SSW10	SW9	SSW10	SW9	SSW10	NW12	NW8	WSW5	SSW6	SSW9	SW9	WSW7.8	SW12
26-Oct	SW8	SW8	SW8	SW8	SSW6	SSW8	SW7	WSW10	SW9	WSW10	SW9	WSW7	NW14	WNW11	WNW9	WNW7	WNW8	WSW3	WNW11	W8	WSW4	SSW6	SSW7	WSW6	WSW6.7	NW14
27-Oct	WSW5	WSW4	N15	N13	N10	NNW7	NNW4	WNW3	SW3	SE3	SW2	ENE1	ENE1	NW10	WNW14	WNW14	WNW10	WNW6	W2	W3	SW7	SSW6	S7	SSE8	NW3.4	N15
28-Oct	S9	S6	SSW5	SW6	SW6	SW6	WSW6	WSW6	WSW3	WSW5	NW4	N12	NNW14	NW17	NNW11	NW7	WNW7	W7	W8	WSW6	SW6	WNW7	WNW9	WNW7	W5.1	NW17
29-Oct	WNW8	W9	WNW10	W6	W8	W9	WNW10	WSW5	WNW11	NW13	NNW15	NW13	NW12	NNW8	NNW5	N6	N3	ESE2	N3	E1	NNW3	NNW5	N8	N13	NW6.4	NNW15
30-Oct	NNE18	NNE18	N14	N11	NNW4	ESE2	SSW2	SSW1	SSW1	S6	SSE11	S13	S15	S16	S15	S13	S11	S11	S10	S9	S10	S10	S9	SSE8	S4.5	NNE18
31-Oct	S8	SSE8	S7	SW4	NNW5	WNW5	NNW8	NNW8	NNW7	N8	N8	NNW7	ENE6	ESE4	E4	ESE4	ENE5	ENE3	E2	SSE2	N1	SSW3	SSW6	SSW7	NNE0.5	N8

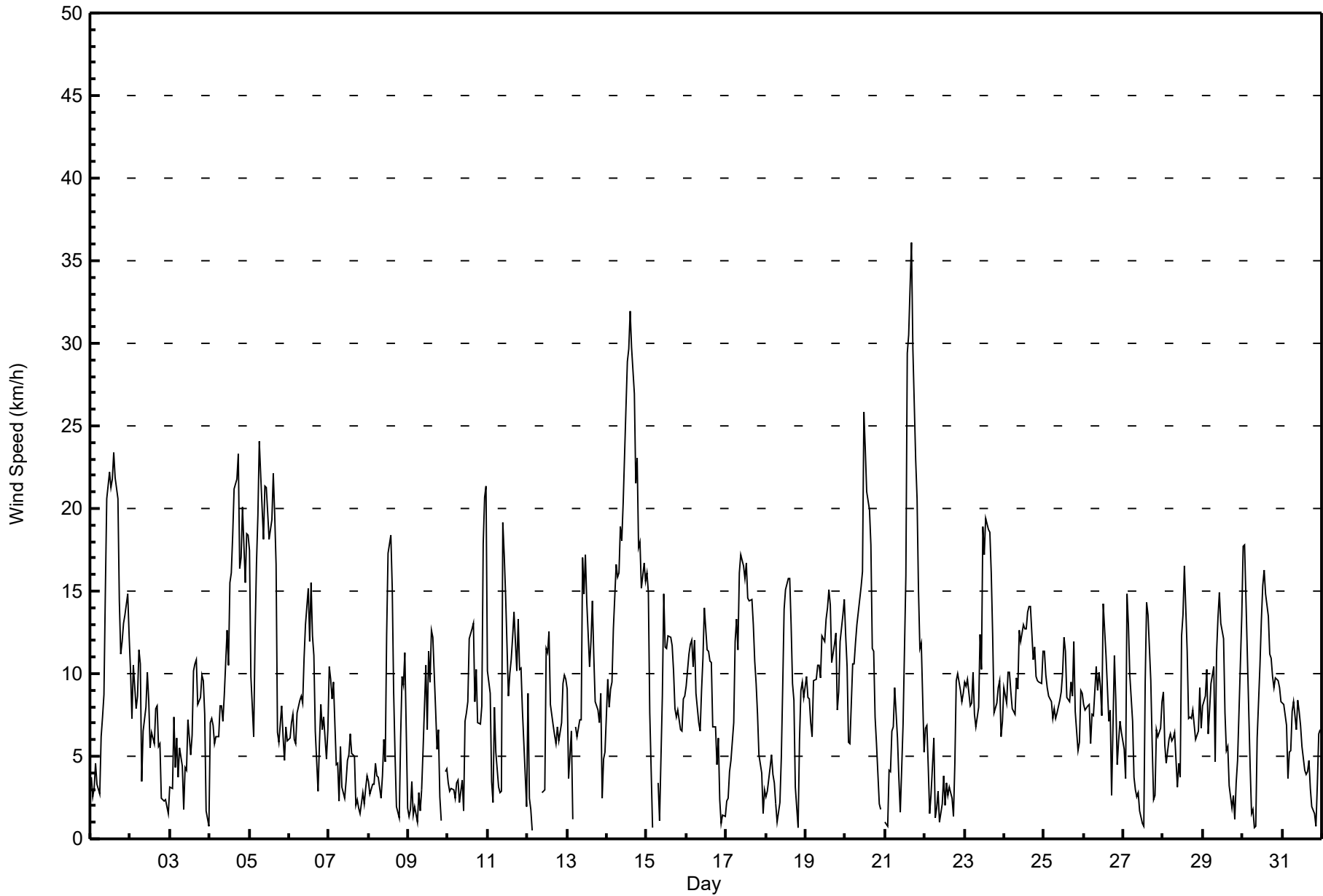
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NNE18	NNE18	N15	N13	WNW17	WNW20	WNW24	NW22	SE19	WNW21	WNW21	SSE26	SSE29	SE30	SE32	N33	N36	N30	SSE23	N21	WNW20	SE18	SSE21	SSE21			Diurnal Maximum

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
Ells River - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Ells River - October 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	198	27.05	27.05
6 - 11	339	46.31	73.36
12 - 19	154	21.04	94.40
20 - 28	32	4.37	98.77
29 - 38	9	1.23	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
Ells River - October 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	2	7	6	9	7	15	18	15	15	21	30	21	11	12	198
6 - 11	9	4	1	1	5	4	22	58	62	32	47	26	26	26	6	10	339
12 - 19	15	8	0	0	0	1	16	34	15	1	16	7	5	24	9	3	154
20 - 28	2	0	0	0	0	0	1	10	3	0	0	0	0	10	6	0	32
29 - 38	4	1	0	0	0	0	3	1	0	0	0	0	0	0	0	0	9
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	37	15	3	8	11	14	49	118	98	48	78	54	61	81	32	25	732

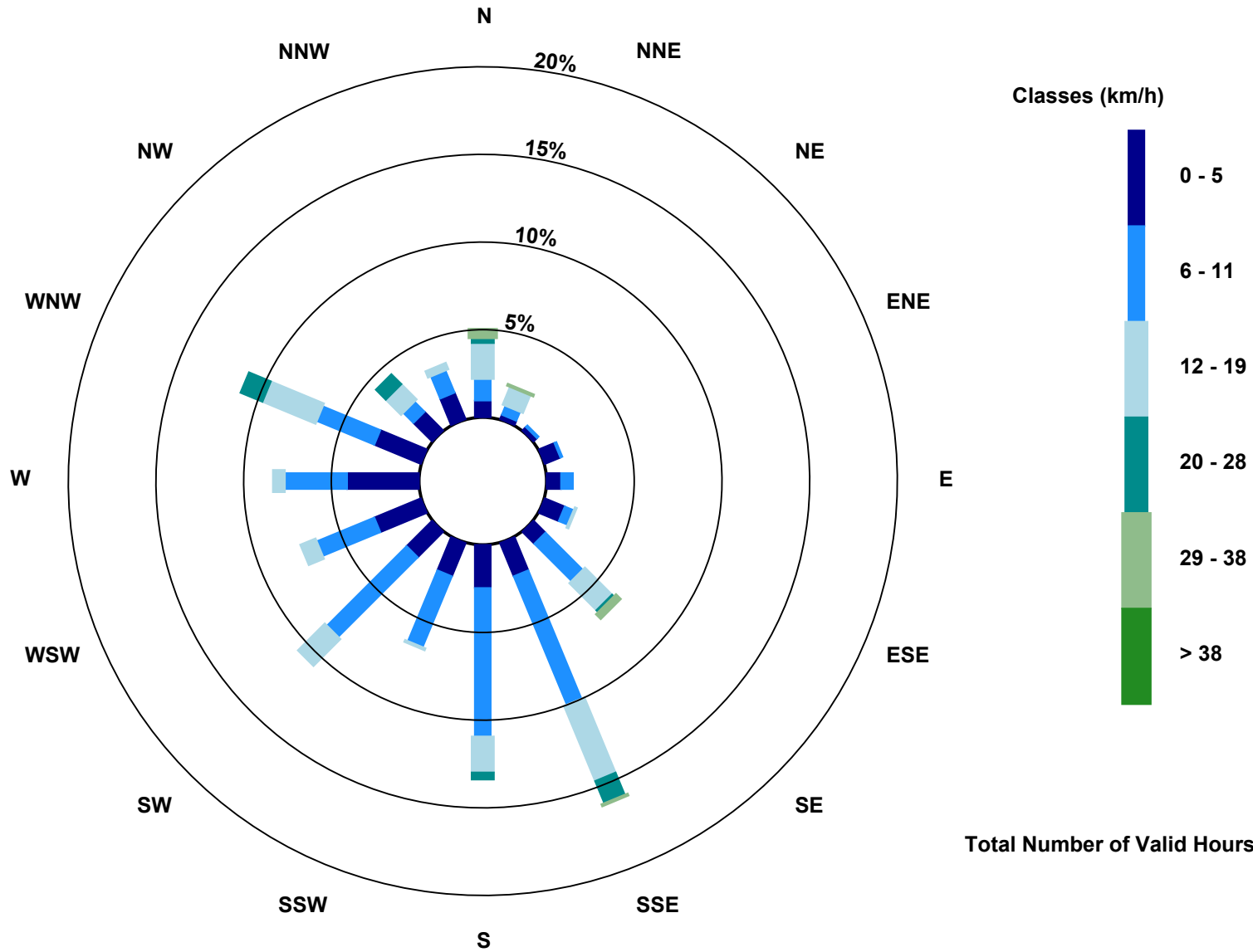
Total Number of Valid Hours: 732

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

Wind Speed (WS) - km/h
Ells River



Total Number of Valid Hours: 732



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Ells River - October 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 8 km/h on Oct 27 03:00 Minimum Value: 1 km/h on Oct 13 07:00 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: 732 Hours of Missing Data: 12 Hours of Calibration: 0 Percent Operational Time: 98.4								
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-Oct	1	2	2	2	1	2	1	1	1	4	5	5	5	6	6	6	5	3	2	2	2	2	3	2	6
2-Oct	3	1	1	2	2	2	2	1	2	2	2	2	1	1	2	2	2	1	1	2	2	1	2	1	3
3-Oct	1	2	2	2	2	1	2	2	2	2	3	3	3	3	3	3	2	1	1	1	1	1	1	1	3
4-Oct	3	1	1	2	3	1	1	1	2	2	3	4	4	4	5	6	5	5	4	5	5	5	4	4	6
5-Oct	4	3	2	4	4	5	7	6	4	5	5	4	4	4	5	5	4	2	2	1	1	2	1	1	7
6-Oct	1	2	1	1	2	1	2	1	2	2	3	3	3	3	3	3	2	2	1	2	2	2	2	2	3
7-Oct	2	2	2	2	3	2	1	2	1	1	1	2	2	1	1	1	2	1	1	1	1	1	1	1	3
8-Oct	1	1	1	1	1	1	1	1	1	2	4	3	4	4	3	2	2	2	1	4	2	1	2	3	4
9-Oct	2	2	2	1	1	1	1	2	2	6	2	2	3	3	3	2	2	1	2	2	1	UO	1	1	6
10-Oct	1	1	2	1	2	1	1	1	1	2	2	3	3	3	4	3	3	2	2	2	2	4	4	4	4
11-Oct	4	2	2	1	2	1	1	1	4	5	4	3	3	2	3	2	3	2	3	2	1	1	3	2	5
12-Oct	1	2	2	1	UO	UO	UO	UO	UO	1	4	4	3	4	2	2	1	1	1	1	1	2	1	1	4
13-Oct	2	2	2	1	UO	2	1	1	3	4	2	3	3	3	3	4	2	1	1	1	1	2	1	1	4
14-Oct	1	1	1	1	2	2	2	3	3	4	5	5	6	6	6	5	5	4	4	3	3	3	3	2	6
15-Oct	2	3	3	1	UO	UO	UO	2	1	6	3	3	2	3	2	2	2	1	1	1	1	2	2	3	6
16-Oct	2	2	3	3	2	3	3	2	2	2	2	3	3	3	3	2	2	1	2	2	1	1	1	2	3
17-Oct	1	1	2	1	1	3	2	1	3	3	3	2	3	2	2	2	2	2	2	2	1	1	2	1	3
18-Oct	2	1	2	2	1	1	1	1	2	3	3	4	3	3	3	2	2	2	1	2	2	2	3	2	4
19-Oct	2	2	2	2	1	2	2	2	2	2	4	3	4	4	5	5	3	3	7	3	2	4	4	4	7
20-Oct	4	3	2	2	3	3	3	3	4	4	6	5	5	5	5	4	3	2	3	1	1	1	UO	UO	6
21-Oct	2	1	2	3	2	1	1	1	2	2	2	2	7	5	5	6	6	5	5	4	3	2	2	2	7
22-Oct	1	1	1	1	2	2	2	1	1	1	2	1	2	2	2	1	1	1	1	2	2	2	2	2	2
23-Oct	2	2	2	2	2	2	2	2	2	4	3	5	4	5	5	4	4	3	3	2	2	2	2	2	5
24-Oct	2	2	2	3	2	2	2	2	3	4	3	4	4	4	3	4	3	3	3	2	2	3	2	3	4
25-Oct	3	2	2	2	2	2	2	2	2	2	2	3	3	3	3	2	3	2	3	2	2	1	2	2	3
26-Oct	2	2	1	2	2	1	2	2	2	2	2	4	3	3	3	3	3	2	5	3	2	2	1	2	5
27-Oct	2	1	8	4	2	3	2	1	1	2	2	2	2	3	3	3	2	2	1	2	1	1	1	1	8
28-Oct	2	1	1	2	2	2	2	1	2	2	2	3	4	3	3	3	2	2	2	1	1	2	3	3	4
29-Oct	2	2	3	2	2	2	3	1	3	3	3	2	2	3	2	2	3	1	1	2	1	1	2	2	3
30-Oct	4	3	2	3	3	2	2	1	1	2	3	3	4	4	3	3	2	2	2	1	1	2	2	2	4
31-Oct	2	1	1	1	3	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	3
Diurnal Maximum																									
UO - Unstable Operation																									



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Ells River - October 2023

Direction of Maximum Speed: 358 deg on Oct 21 17:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 148.4 deg on Oct 14	Hours of Data: 732
Direction of Minimum Speed: 178 deg on Oct 12 04:00	Hours of Missing Data: 12
Direction of Minimum Daily Speed Average: 0.5 deg on Oct 31	Percent Operational Time: 98.4
Monthly Average Direction: 214.4 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-Oct	175	188	198	157	181	145	163	158	152	164	162	164	173	172	169	168	162	158	152	156	152	151	161	152	162.7
2-Oct	161	166	150	167	159	155	155	173	158	165	167	175	180	178	189	203	195	176	173	262	271	286	253	251	173.1
3-Oct	174	196	179	185	173	152	178	238	246	230	228	244	318	195	176	199	190	179	164	180	179	189	357	69	191.4
4-Oct	191	148	176	227	296	293	287	275	269	287	285	290	300	319	311	300	305	301	293	293	294	297	298	299	292.7
5-Oct	313	300	307	296	297	298	296	305	300	301	303	299	288	297	299	296	294	261	221	199	225	227	239	226	292.0
6-Oct	187	178	166	198	154	173	165	154	176	167	170	174	176	174	177	184	164	200	169	178	233	238	246	254	180.5
7-Oct	233	241	245	254	291	176	185	178	250	289	107	168	137	140	136	110	83	346	297	278	288	256	300	278	220.1
8-Oct	278	273	279	281	281	277	269	262	284	288	160	166	162	157	167	180	224	46	223	154	148	152	154	221	181.7
9-Oct	169	227	280	217	272	259	274	262	277	152	142	142	145	146	138	142	151	93	79	66	306	UO	284	281	150.0
10-Oct	280	273	262	260	281	287	271	291	303	319	135	129	105	138	141	143	106	95	86	135	135	143	147	148	139.5
11-Oct	138	143	347	53	125	118	101	344	121	145	145	143	130	136	145	146	124	113	124	132	133	128	131	219	133.2
12-Oct	176	225	299	178	UO	UO	UO	UO	UO	351	194	153	166	158	146	158	140	153	162	177	150	167	166	158	162.1
13-Oct	160	173	174	314	UO	161	169	157	150	142	143	152	149	171	144	135	122	82	96	127	153	126	133	151	144.3
14-Oct	152	144	152	152	150	150	151	153	144	147	147	148	153	142	140	141	144	150	153	156	153	154	153	153	148.4
15-Oct	156	160	171	198	UO	UO	UO	271	316	166	167	178	182	169	162	160	177	180	182	169	191	190	167	163	171.0
16-Oct	173	187	221	225	226	220	212	202	198	195	184	189	208	234	201	190	179	155	159	186	295	291	244	287	202.2
17-Oct	321	281	328	316	332	359	2	0	9	11	17	6	11	31	18	21	20	20	15	359	316	325	243	96	7.0
18-Oct	241	195	165	165	170	228	265	138	292	156	151	172	164	163	164	147	151	177	188	301	210	225	227	226	178.3
19-Oct	208	194	206	184	186	188	193	191	194	197	226	227	227	220	228	224	212	209	245	163	195	262	225	222	212.8
20-Oct	238	232	246	220	253	235	233	232	233	250	279	309	314	319	322	330	9	29	39	24	359	261	UO	UO	289.3
21-Oct	237	182	182	180	178	183	174	162	157	190	202	3	11	12	3	5	358	5	7	359	1	353	356	344	4.1
22-Oct	328	343	318	299	213	177	208	236	244	68	332	2	30	17	154	168	244	185	210	319	307	288	290	286	294.2
23-Oct	277	277	280	277	249	232	236	220	230	251	261	290	292	294	288	293	293	292	272	242	235	234	238	236	269.7
24-Oct	233	245	236	229	228	227	217	247	250	251	247	231	280	292	277	283	277	277	271	271	277	271	268	267	256.9
25-Oct	270	257	268	266	261	232	233	229	235	239	230	212	223	238	231	220	224	287	310	306	254	192	213	222	244.1
26-Oct	233	231	216	235	205	211	233	239	233	241	233	244	306	300	290	297	303	257	295	275	245	197	198	249	252.3
27-Oct	245	251	355	3	356	338	344	291	215	141	217	66	59	316	301	303	303	303	277	270	221	204	175	165	303.8
28-Oct	180	191	206	232	229	233	239	247	254	258	322	354	333	325	328	308	284	280	271	253	236	284	296	295	281.1
29-Oct	290	275	299	269	264	280	294	241	295	323	330	325	312	335	345	10	3	119	9	95	336	334	349	5	315.1
30-Oct	18	20	2	354	333	116	204	212	213	177	167	178	174	183	171	169	171	176	184	181	178	186	178	164	168.9
31-Oct	176	167	173	222	327	297	332	335	347	8	356	343	73	109	100	106	59	76	95	158	5	209	200	210	14.1

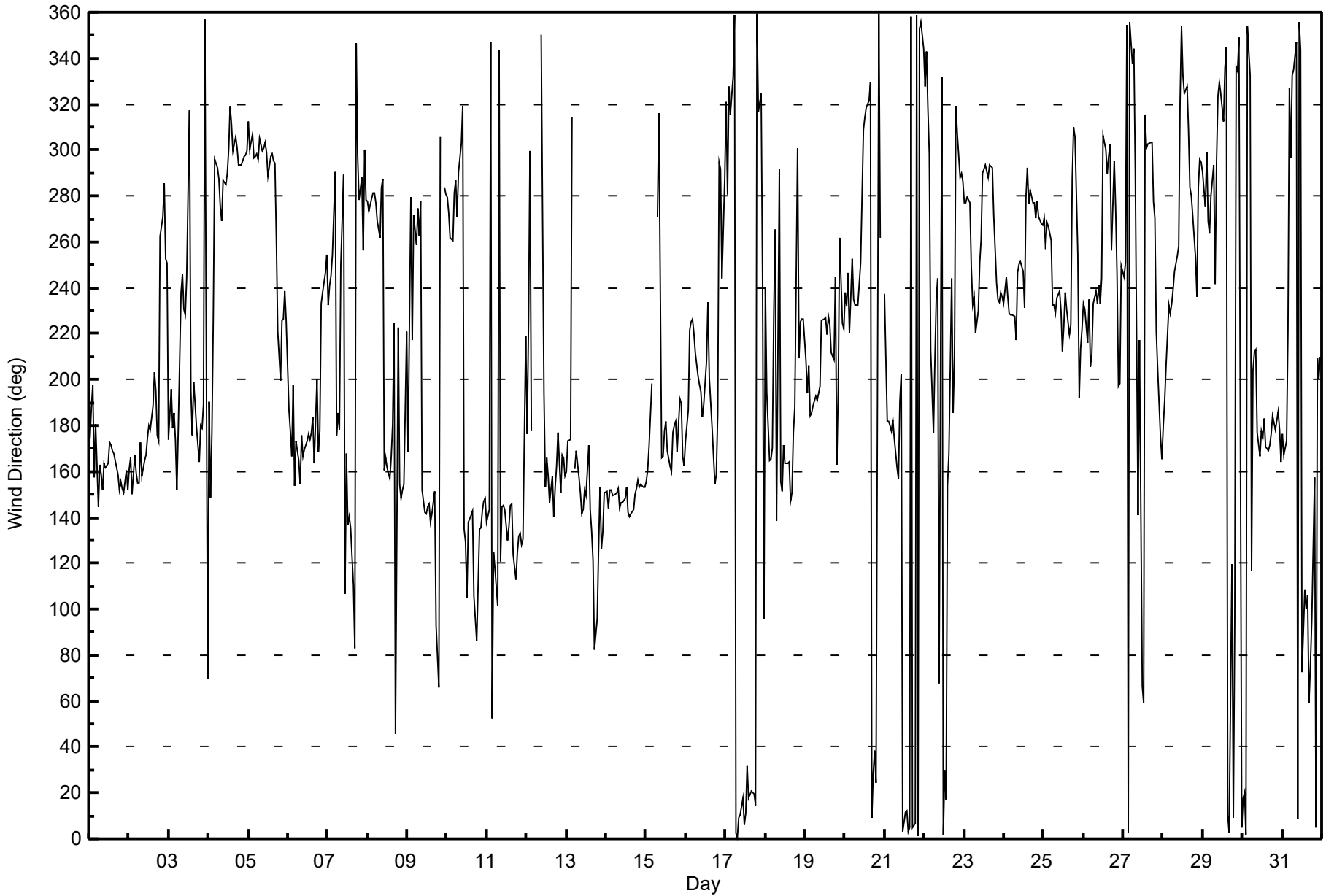
213.8 214.0 232.4 240.2 237.8 220.7 229.5 227.5 232.2 211.9 196.2 203.9 207.9 207.7 202.8 201.2 210.1 189.7 202.4 202.8 210.7 211.1 207.5 214.2
 Diurnal Average

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Ells River - October 2023





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Ells River - October 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 94 deg on Oct 22 10:00											Hours in Service: 744 Hours of Data: 732 Hours of Missing Data: 12 Hours of Calibration: 0 Percent Operational Time: 98.4														
Minimum Value: 4 deg on Oct 3 21:00																									
Percentiles: P ₁ = 6 P ₁₀ = 10 Q ₁ = 13 Median = 17 Q ₃ = 25 P ₉₀ = 48 P ₉₉ = 84																									
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-Oct	12	65	60	41	25	61	10	12	8	14	15	16	17	16	16	14	12	11	7	8	8	8	11	8	65
2-Oct	10	13	8	17	10	9	11	29	19	13	12	14	18	19	28	25	17	17	15	52	40	49	37	58	58
3-Oct	39	22	14	34	21	25	33	39	64	36	71	42	48	32	14	17	11	10	5	5	4	11	61	71	71
4-Oct	34	14	12	35	25	9	8	10	15	16	15	16	15	13	14	14	15	14	14	14	14	14	14	12	35
5-Oct	11	14	20	15	12	13	12	13	15	13	14	14	15	15	13	15	13	20	33	20	15	21	12	18	33
6-Oct	18	19	11	18	22	10	11	11	14	13	14	16	16	13	18	15	15	33	13	21	20	20	44	27	44
7-Oct	13	14	16	16	69	36	58	34	40	63	46	35	54	15	12	18	65	18	33	62	20	36	25	9	69
8-Oct	19	28	15	15	7	12	18	30	21	12	61	18	15	15	16	18	45	67	49	23	10	10	7	66	67
9-Oct	66	77	26	39	34	41	27	74	48	76	14	18	19	19	14	15	15	28	22	50	68	UO	16	10	77
10-Oct	18	16	10	28	21	13	11	42	26	73	22	26	26	20	17	12	20	9	19	15	11	9	8	9	73
11-Oct	12	12	38	53	16	18	47	20	71	11	13	12	21	17	18	12	15	10	11	8	6	8	63	65	71
12-Oct	6	63	32	79	UO	UO	UO	UO	UO	20	93	20	22	17	20	27	17	16	15	15	12	20	9	9	93
13-Oct	9	15	11	73	UO	9	8	9	15	10	9	10	12	18	16	12	15	13	11	12	6	60	12	9	73
14-Oct	6	6	6	7	6	6	7	8	7	9	11	10	13	11	9	8	9	10	10	11	9	9	9	8	13
15-Oct	9	11	10	90	UO	UO	UO	32	27	61	14	18	19	20	13	17	16	8	10	6	15	10	9	12	90
16-Oct	8	14	18	16	15	14	20	19	21	17	18	16	26	25	28	18	16	8	26	32	48	39	58	58	58
17-Oct	17	43	24	22	9	13	11	11	11	10	10	12	15	13	13	15	16	16	15	22	21	33	89	24	89
18-Oct	51	31	23	17	18	25	65	84	37	61	20	14	13	12	12	11	16	34	51	92	41	17	18	17	92
19-Oct	19	18	20	22	17	12	12	11	12	21	20	25	23	22	23	19	16	23	36	33	27	23	22	21	36
20-Oct	21	23	29	30	22	20	18	19	19	18	25	13	16	14	16	12	35	7	9	16	65	53	UO	UO	65
21-Oct	84	87	69	30	37	20	5	16	47	50	42	25	14	10	13	11	16	13	12	14	12	11	13	26	87
22-Oct	13	11	15	65	46	26	48	45	32	94	64	34	73	39	45	30	39	65	25	13	11	12	14	14	94
23-Oct	15	16	16	15	18	13	20	26	18	20	23	18	20	19	18	16	14	12	24	18	18	17	15	16	26
24-Oct	15	15	16	14	16	17	19	16	22	18	23	19	20	29	17	16	18	17	18	18	17	18	17	18	29
25-Oct	17	19	19	20	20	19	17	22	20	19	23	26	24	21	23	19	19	19	13	16	25	15	14	14	26
26-Oct	13	14	13	17	21	23	19	15	17	17	20	28	19	18	20	35	27	48	32	21	36	14	12	23	48
27-Oct	17	25	43	11	12	12	23	36	29	57	69	72	63	22	17	14	12	14	53	53	12	11	11	8	72
28-Oct	9	14	19	18	18	19	15	14	50	36	42	15	20	12	16	27	18	16	17	15	15	31	18	26	50
29-Oct	19	17	14	19	18	18	16	22	14	16	13	15	18	31	28	19	59	50	25	74	27	14	18	10	74
30-Oct	10	8	11	12	18	66	42	65	86	18	16	19	17	17	15	11	11	11	11	10	10	15	12	15	86
31-Oct	17	10	12	46	27	25	21	13	30	14	14	29	18	26	24	25	15	36	31	78	73	26	14	13	78
84 87 69 90 69 66 65 84 86 94 93 72 73 39 45 35 65 67 53 92 73 60 89 71																								Diurnal Maximum	
UO - Unstable Operation																									



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

**AMS501
LEISMER
OCTOBER 2023**

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

November 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LEISMER (AMS501)
OCTOBER 2023

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

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	707	35	37	99.73	30	0	17.2	0
H2S (ppb) Average	706	36	38	99.73	8	0	4	1
NO2 (ppb) Average	704	38	40	99.73	10.8	0	4.1	-
NO (ppb) Average	704	38	40	99.73	14.8	-	7.5	-
NOX (ppb) Average	704	38	40	99.73	20	-	11.6	-
Temperature 2 m (C) Average	742	0	2	99.73	21.8	-	13.7	-
Relative Humidity (%) Average	742	0	2	99.73	98.1	-	90.2	-
Wind Speed 10 m (km/h) Average	742	0	2	99.73	32	-	21	-
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 - LEISMER (AMS501)
OCTOBER 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	1.75	4.7	-	0	0	0.1	0.2	0.6	4.6	30
H2S (ppb) Average	706	0.26	0.9	-	0	0	0	0.1	0.1	0.2	8
NO2 (ppb) Average	704	1.4	1.4	-	0	0.3	0.5	1	1.6	3.2	10.8
NO (ppb) Average	704	0.82	2.1	-	0	0	0	0	0.3	2.6	14.8
NOX (ppb) Average	704	2.21	3.4	-	0	0.3	0.6	1.1	1.8	5.8	20
Temperature 2 m (C) Average	742	3.25	8.2	-	-16.5	-7.6	-4.2	5	9.4	12.9	21.8
Relative Humidity (%) Average	742	72.64	15.5	-	29.1	50	61.4	76.3	84.5	90.2	98.1
Wind Speed 10 m (km/h) Average	742	11.1	6	-	0	4	7	10	14	19	32
Wind Direction 10 m (deg) Average	742	225.9	0	-	0	-	-	-	-	-	0

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LEISMER (AMS501)
OCTOBER 2023

OPERATIONAL NOTES

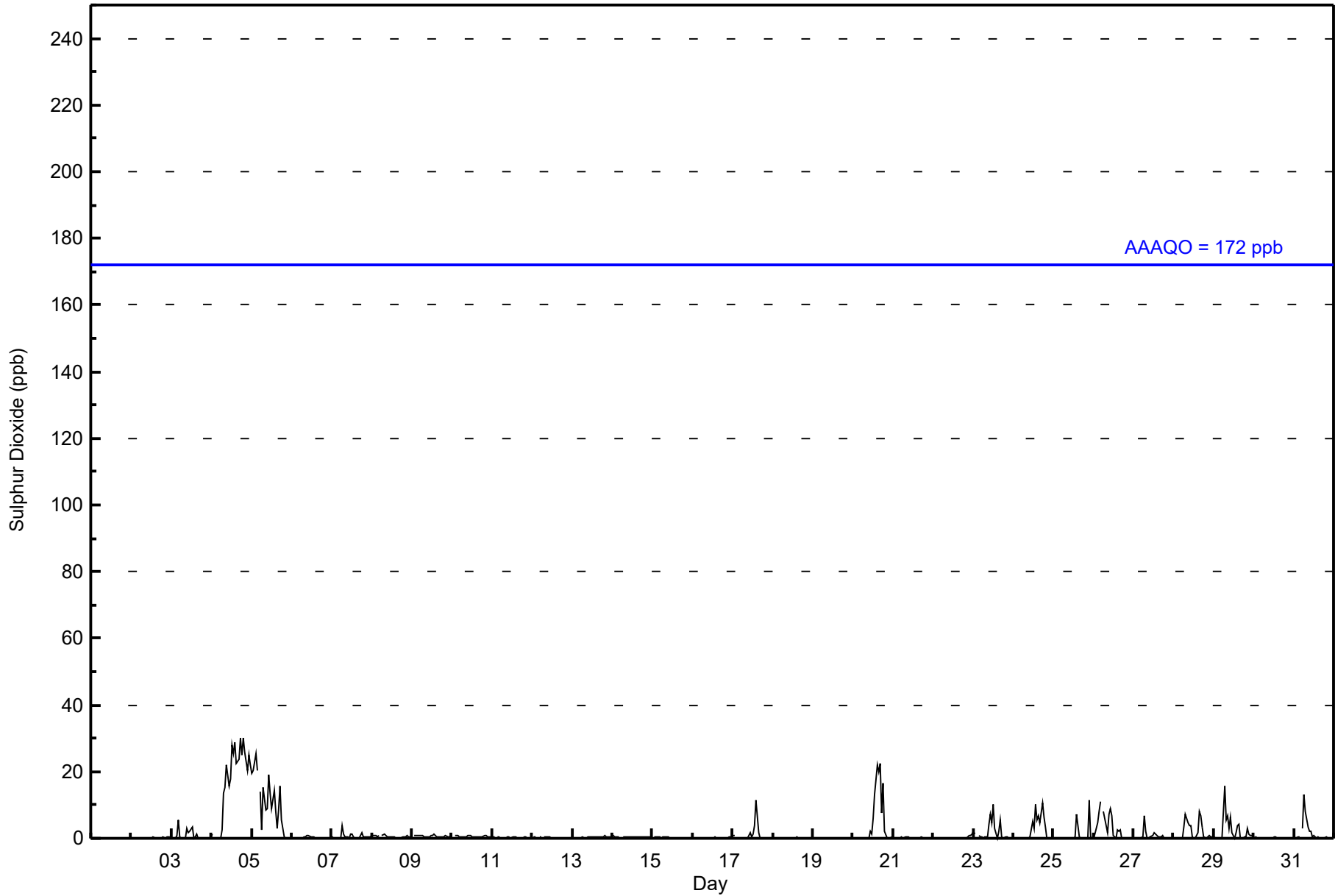
Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL PARAMETERS	12 Oct 2023 07:00	12 Oct 2023 07:00	1	Maintenance - station logger/modem reset
ALL PARAMETERS	19 Oct 2023 08:00	19 Oct 2023 08:00	1	Maintenance - station logger/modem reset



Wood Buffalo Environmental Association
Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb
Leismer - October 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		744																										
Maximum Value: 30.0 ppb on Oct 4 18:00		Maximum Daily Average: 17.2 ppb on Oct 4		Minimum Value: 0.0 ppb on Oct 1 03:00		Minimum Daily Average: 0.0 ppb on Oct 1		Hours of Data: 707																										
Maximum Diurnal Average: 3.1 ppb at hour 15		Minimum Diurnal Average: 0.8 ppb at hour 6		Hours of Missing Data: 37		Hours of Calibration: 35		Percent Operational Time: 99.7																										
Monthly Average: 1.75 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.2 Q ₃ = 0.6 P ₉₀ = 4.6 P ₉₉ = 25.1																																
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-Oct	0.0	0.1	0.0	0.0	Z	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Oct	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.3	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	
3-Oct	Z	0.2	0.1	1.0	5.5	0.3	0.1	0.1	0.0	2.9	1.8	2.2	3.4	0.2	0.4	1.3	0.2	0.1	0.2	0.0	0.0	0.0	0.2	0.1	0.9	0.9	0.9	0.9	0.9	0.9	0.9	5.5		
4-Oct	1.3	Z	0.2	0.1	0.1	0.0	2.6	13.4	15.2	21.9	15.5	17.6	28.1	25.3	28.9	22.6	23.8	30.0	24.9	29.9	25.8	20.2	25.1	22.2	17.2	17.2	17.2	17.2	17.2	17.2	17.2	30.0		
5-Oct	19.6	20.5	25.4	20.2	Z	14.0	2.6	15.3	8.6	8.9	19.3	13.4	9.0	14.3	8.3	2.9	8.4	15.7	5.7	0.4	0.1	0.1	0.0	0.0	10.1	10.1	10.1	10.1	10.1	10.1	10.1	25.4		
6-Oct	0.0	0.0	0.0	Z	0.0	0.0	0.2	0.6	0.6	0.8	0.7	0.6	0.4	0.3	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.8		
7-Oct	0.4	0.0	0.0	0.0	0.0	0.0	3.8	1.3	0.6	0.5	0.1	1.5	1.3	0.3	0.0	0.1	0.2	0.9	1.5	0.6	0.3	0.4	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	3.8		
8-Oct	0.9	0.9	0.8	0.6	0.6	Z	0.9	1.3	1.0	0.6	0.4	0.4	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.5	0.4	0.6	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1.3		
9-Oct	Z	0.7	0.9	0.8	0.8	0.8	0.7	0.5	0.6	0.6	0.6	0.8	0.9	1.1	0.9	0.4	0.5	0.4	0.5	0.4	0.6	0.5	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	1.1		
10-Oct	0.7	Z	0.8	0.6	0.4	0.3	0.3	0.2	0.2	0.7	0.7	0.7	0.6	0.3	0.2	0.3	0.4	0.3	0.5	0.6	0.7	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.8		
11-Oct	0.4	0.5	Z	0.4	0.3	0.1	0.1	0.1	0.1	0.3	0.2	0.1	0.2	0.3	0.3	0.2	0.1	0.0	0.1	0.3	0.4	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.5		
12-Oct	0.1	0.3	0.3	Z	0.5	0.4	M	0.4	0.4	0.4	0.3	0.2	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.5		
13-Oct	0.0	0.0	0.0	0.0	Z	0.2	0.3	0.1	0.1	0.2	0.3	0.2	0.5	0.4	0.4	0.5	0.4	0.6	0.7	0.5	0.6	0.5	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.7		
14-Oct	0.7	0.5	0.5	0.5	0.3	Z	0.4	0.4	0.4	0.5	0.5	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.7		
15-Oct	Z	0.4	0.4	0.3	0.3	0.2	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4		
16-Oct	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.6		
17-Oct	1.0	0.7	Z	0.2	0.1	0.0	0.0	0.0	0.0	0.0	1.8	0.5	1.5	3.8	11.4	1.6	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	11.4		
18-Oct	0.1	0.0	0.0	Z	0.1	0.0	0.0	0.1	0.1	C	C	C	C	0.2	0.3	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	0.1	0.3		
19-Oct	0.1	0.1	0.1	0.1	Z	0.1	0.0	M	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	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1		
20-Oct	0.1	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.2	2.0	1.2	5.8	13.2	22.1	20.0	22.6	7.8	16.5	2.2	0.1	0.1	0.2	0.2	5.0	5.0	5.0	5.0	5.0	5.0	5.0	22.6		
21-Oct	Z	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.4	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4		
22-Oct	0.1	Z	0.1	0.1	0.0	0.1	0.2	0.1	0.1	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	0.8	0.9	0.2	0.2	0.2	0.2	0.2	0.2	0.2	1.1		
23-Oct	2.3	1.3	Z	0.7	0.5	0.3	0.1	0.2	0.4	4.2	7.2	4.5	10.3	3.1	0.2	2.2	5.7	4.6	10.4	6.3	3.6	0.1	0.1	0.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	10.3		
24-Oct	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.6	5.1	2.8	10.0	5.5	6.7	4.6	10.4	6.3	3.6	0.1	0.1	0.1	0.2	2.4	2.4	2.4	2.4	2.4	2.4	2.4	10.4		
25-Oct	0.1	0.0	0.0	0.1	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	7.2	0.5	0.1	0.1	0.0	0.1	0.1	11.5	0.6	0.1	0.9	0.9	0.9	0.9	0.9	0.9	0.9	11.5		
26-Oct	0.0	1.2	4.7	7.9	11.0	Z	7.9	4.0	1.5	7.2	9.0	6.8	0.7	0.2	2.4	2.1	2.4	0.0	0.1	0.1	0.1	0.1	0.1	3.0	3.0	3.0	3.0	3.0	3.0	3.0	11.0			
27-Oct	Z	0.1	0.1	0.1	0.0	0.3	7.0	2.1	0.2	0.0	0.5	1.0	1.5	1.2	0.7	0.4	0.2	0.8	0.2	0.1	0.0	0.0	0.0	0.7	0.7	0.7	0.7	0.7	0.7	0.7	7.0			
28-Oct	0.1	Z	0.1	0.1	0.1	0.0	3.3	7.2	4.5	3.8	3.8	0.3	0.2	0.2	1.6	8.1	6.7	3.5	0.2	0.1	0.4	0.8	0.3	2.0	2.0	2.0	2.0	2.0	2.0	2.0	8.1			
29-Oct	0.5	0.2	Z	0.1	0.1	0.1	15.6	5.7	6.9	3.2	6.3	1.5	0.1	1.8	3.8	4.4	0.0	0.0	0.2	0.5	3.0	1.1	0.7	2.5	2.5	2.5	2.5	2.5	2.5	2.5	15.6			
30-Oct	0.2	0.2	0.2	Z	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.3	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4			
31-Oct	0.1	0.2	0.3	0.2	Z	2.8	13.1	8.1	3.2	2.0	1.9	0.6	1.0	0.2	0.4	0.0	0.0	0.1	0.1	0.3	0.2	0.0	0.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5	13.1			
1.1 1.1 1.3 1.3 0.9 0.8 2.0 2.1 1.5 2.0 2.5 2.0 2.3 2.5 3.1 2.4 2.5 2.3 1.9 1.3 1.1 1.2 1.0 1.0																								Diurnal Average										
19.6 20.5 25.4 20.2 11.0 14.0 15.6 15.3 15.2 21.9 19.3 17.6 28.1 25.3 28.9 22.6 23.8 30.0 24.9 29.9 25.8 20.2 25.1 22.2																								Diurnal Maximum										
Z - zerospan C - Calibration M - Maintenance																																		
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb																																		





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Leismer - October 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	670	94.77	94.77
11 - 20	22	3.11	97.88
21 - 60	15	2.12	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
Leismer - October 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	21	9	6	4	20	67	67	71	53	47	23	30	67	118	46	21	670
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	3	19	0	22
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	0	15
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	21	9	6	4	20	67	67	71	53	47	23	30	67	121	80	21	707

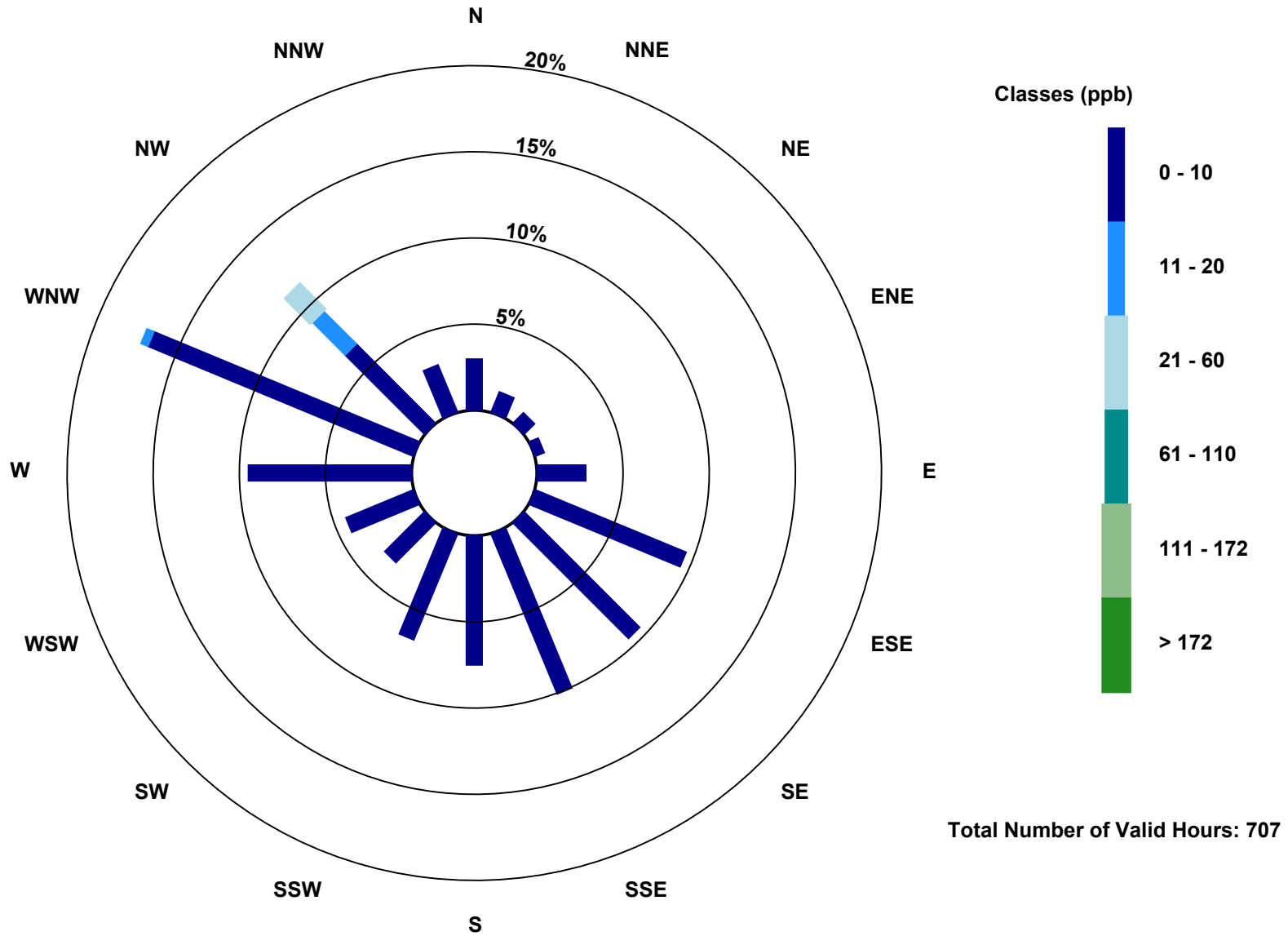
Total Number of Valid Hours: 707

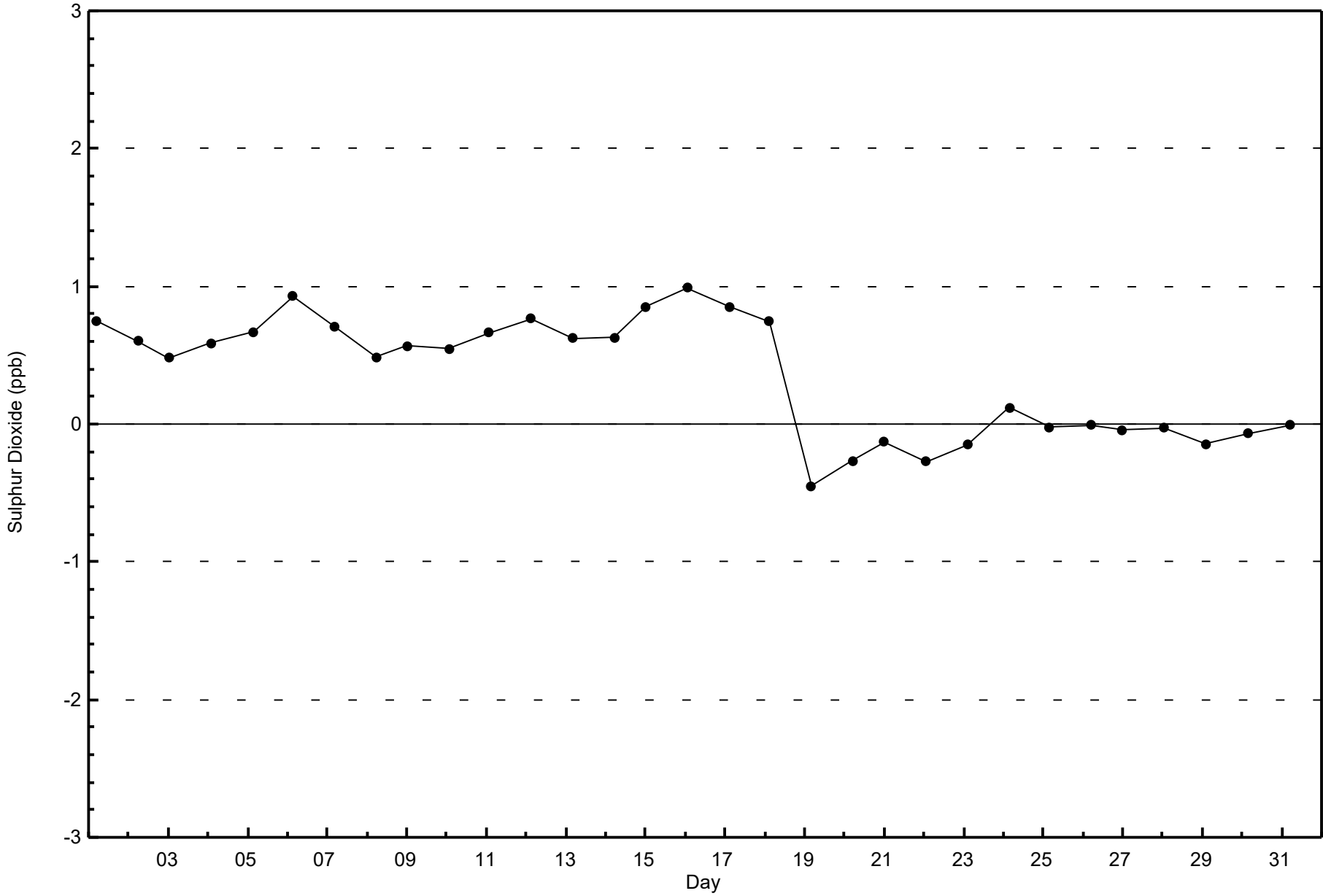
Total Number of Hours: 744

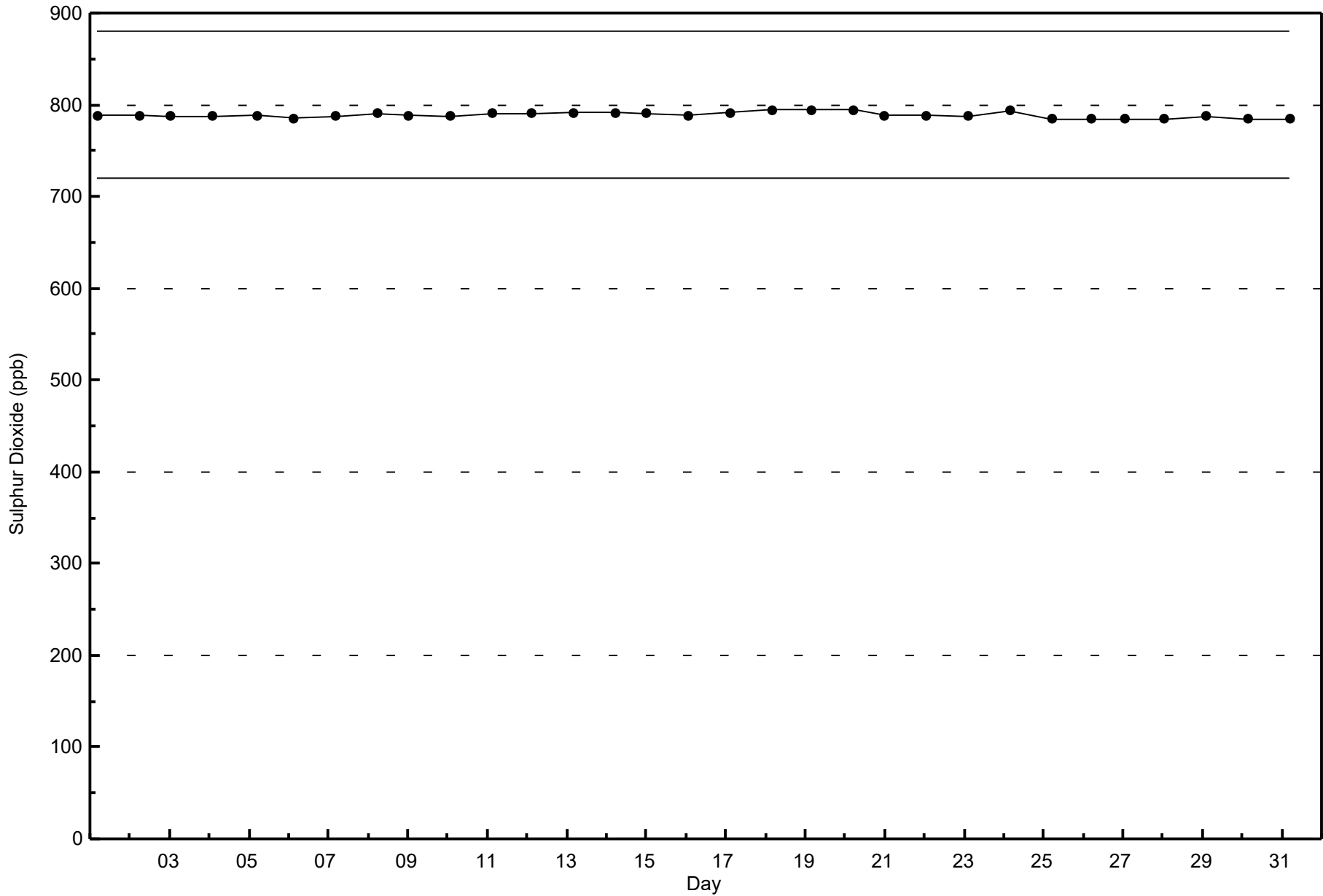


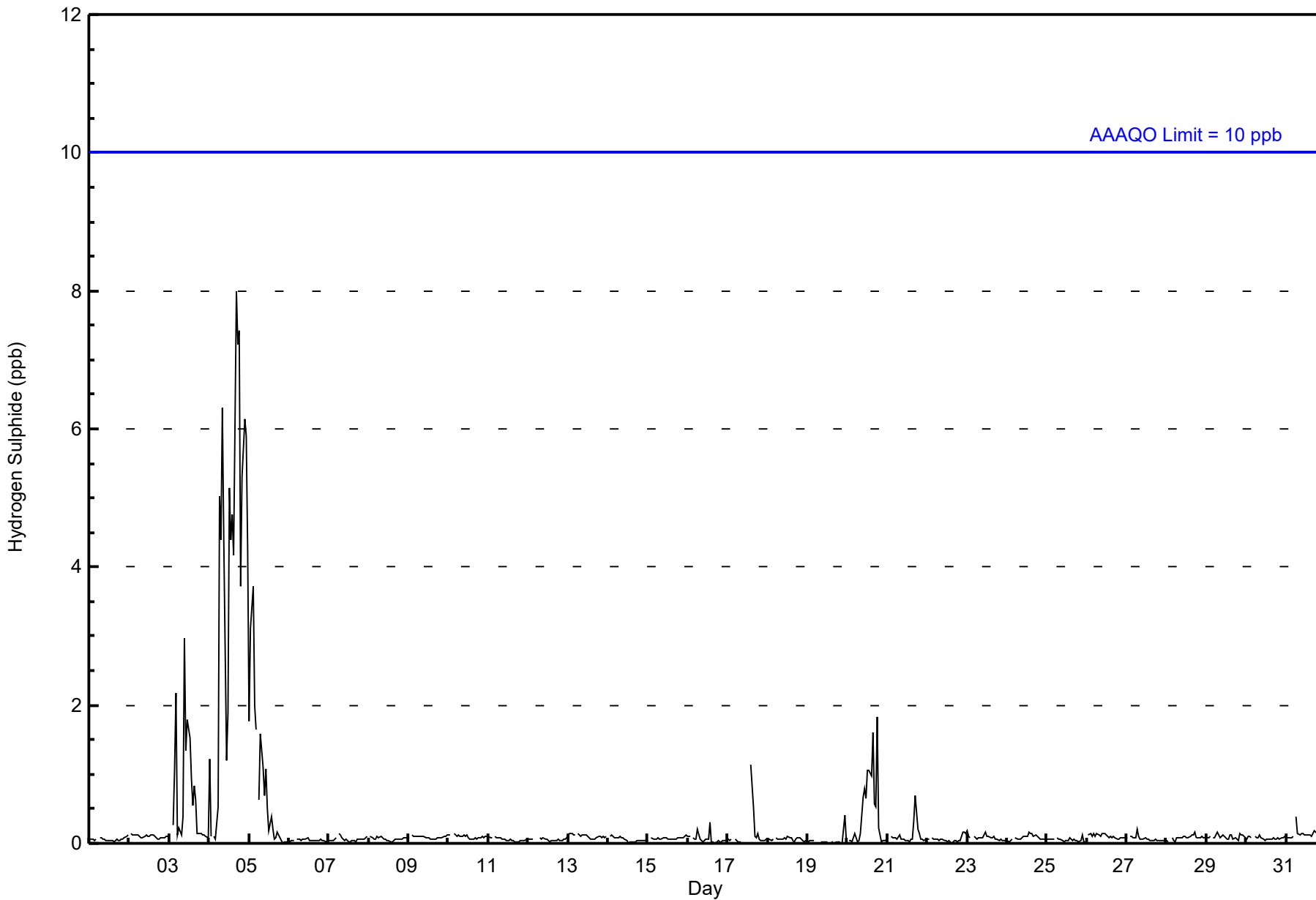
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Sulphur Dioxide (SO₂) - ppb
Leismer











Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Hydrogen Sulphide (H₂S) - ppb
Leismer - October 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	687	97.31	97.31
3 - 4	9	1.27	98.58
5 - 7	9	1.27	99.86
8 - 11	1	0.14	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
Leismer - October 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	21	9	6	4	21	65	68	69	55	50	22	31	66	117	62	21	687
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	1	8	0	9
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	1	8	0	9
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	21	9	6	4	21	65	68	69	55	50	22	31	66	119	79	21	706

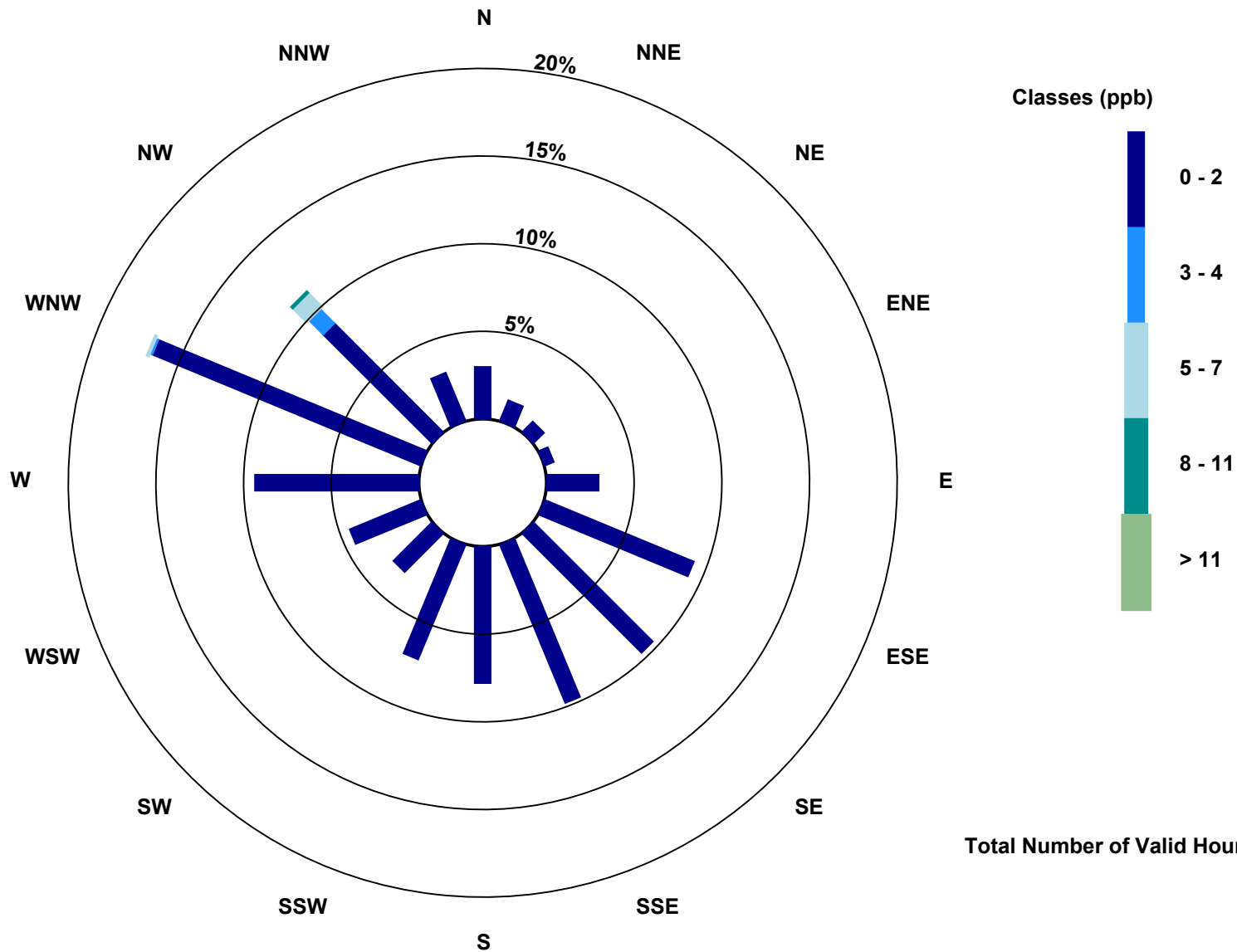
Total Number of Valid Hours: 706

Total Number of Hours: 744

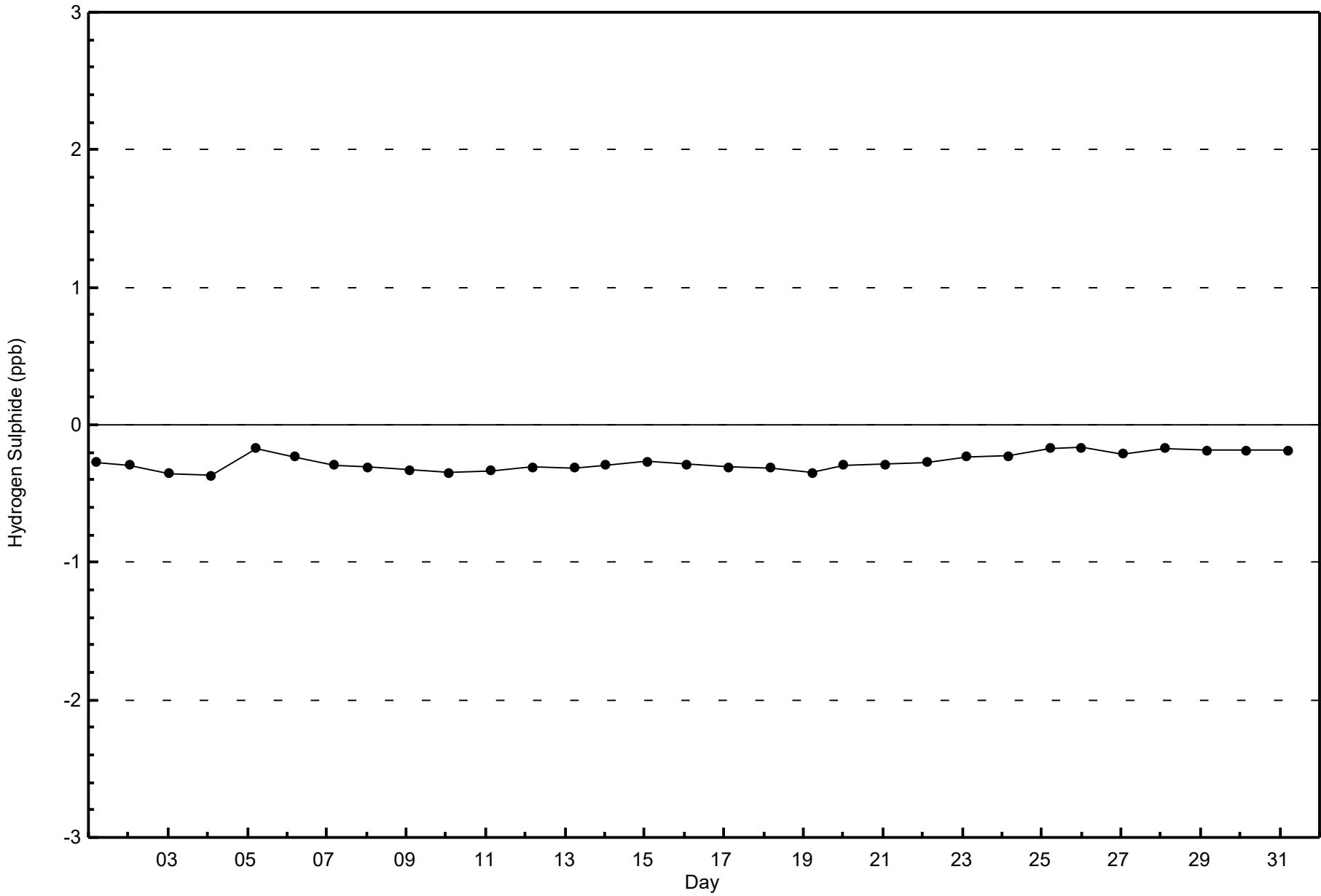


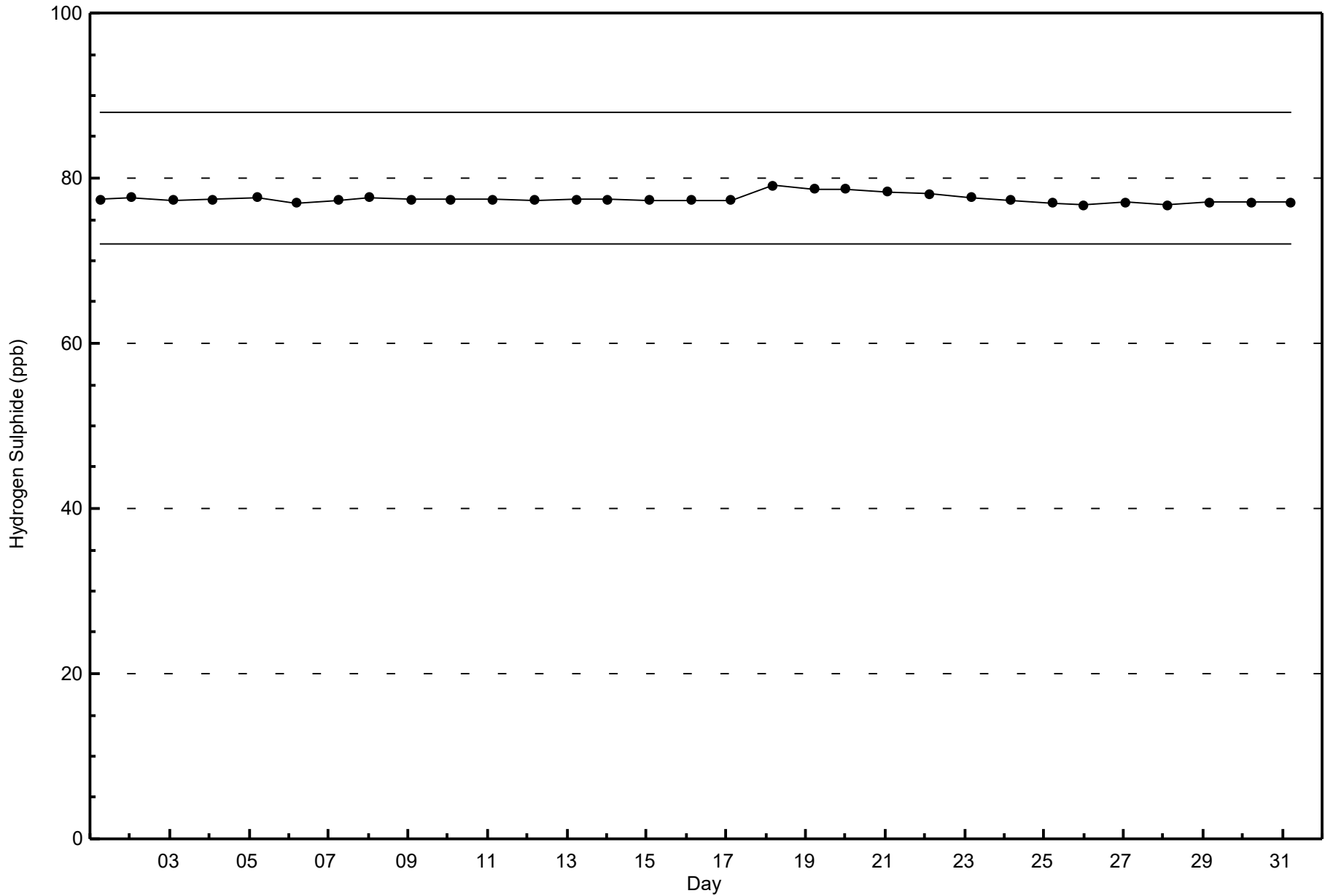
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Hydrogen Sulphide (H₂S) - ppb
Leismer



Total Number of Valid Hours: 706

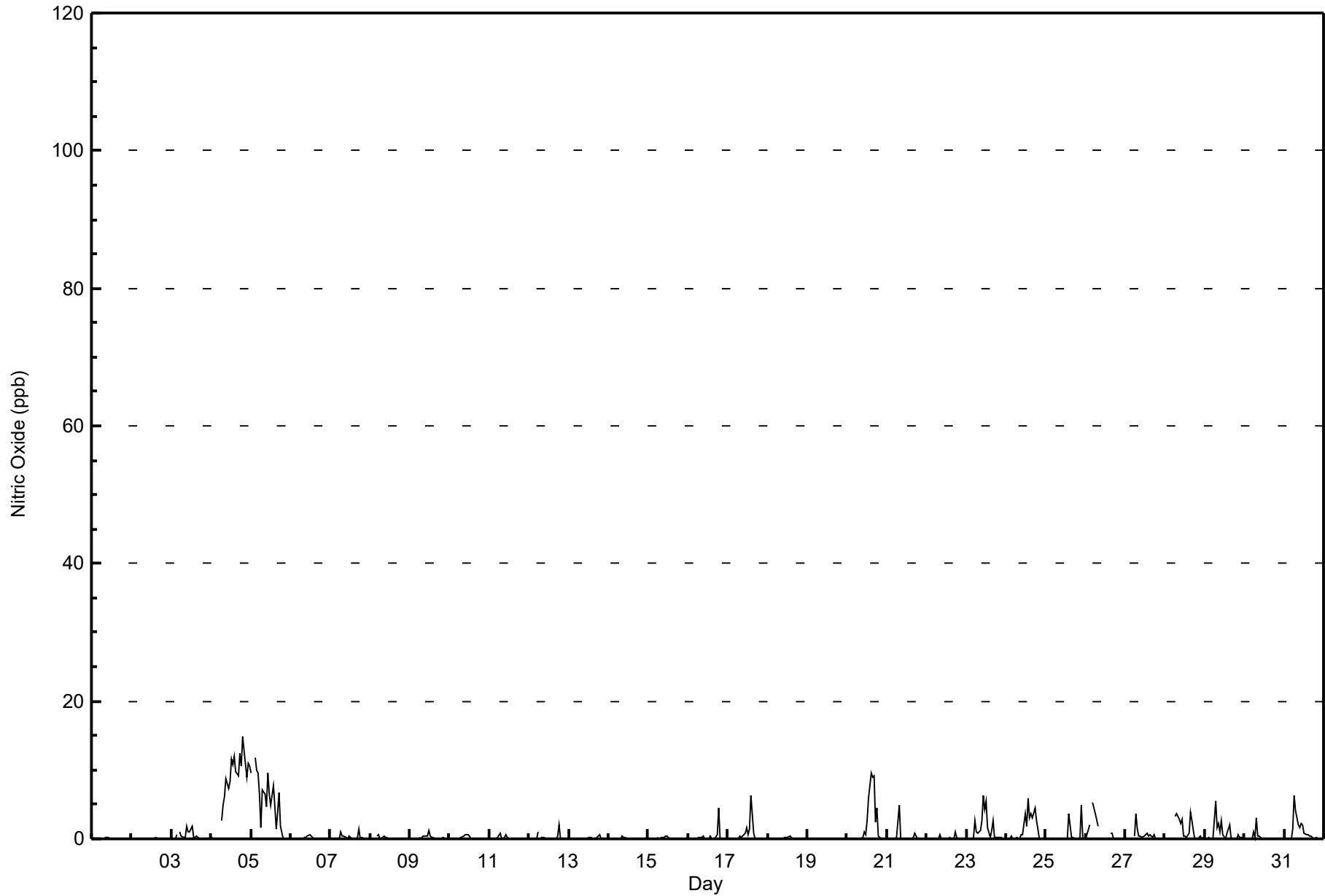






Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Leismer - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Leismer - October 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	704	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: 704

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Nitric Oxide (NO) - ppb
Leismer - October 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	9	5	4	22	63	69	71	58	48	23	30	66	115	77	22	704
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	22	9	5	4	22	63	69	71	58	48	23	30	66	115	77	22	704

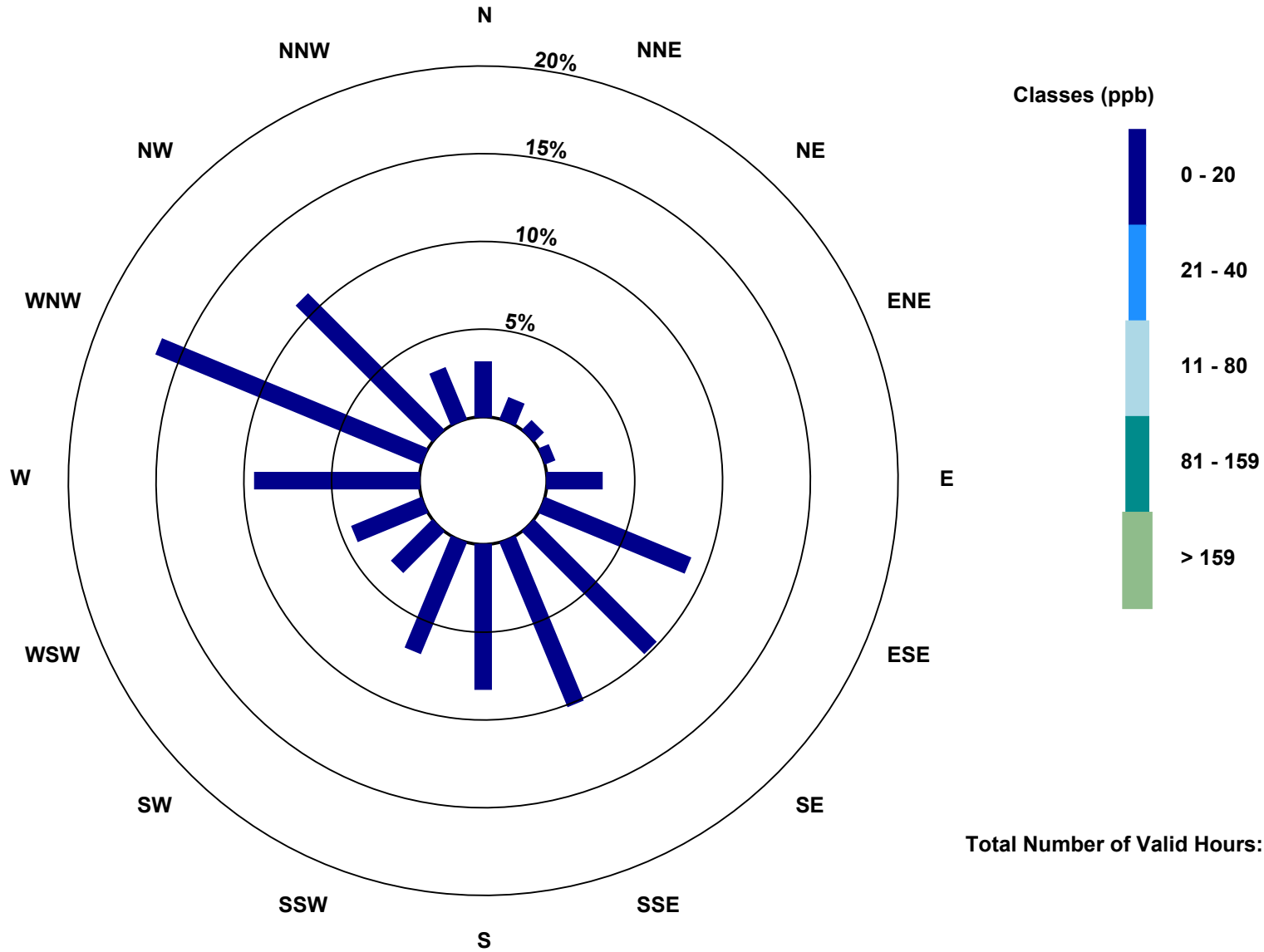
Total Number of Valid Hours: 704

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitric Oxide (NO) - ppb
Leismer

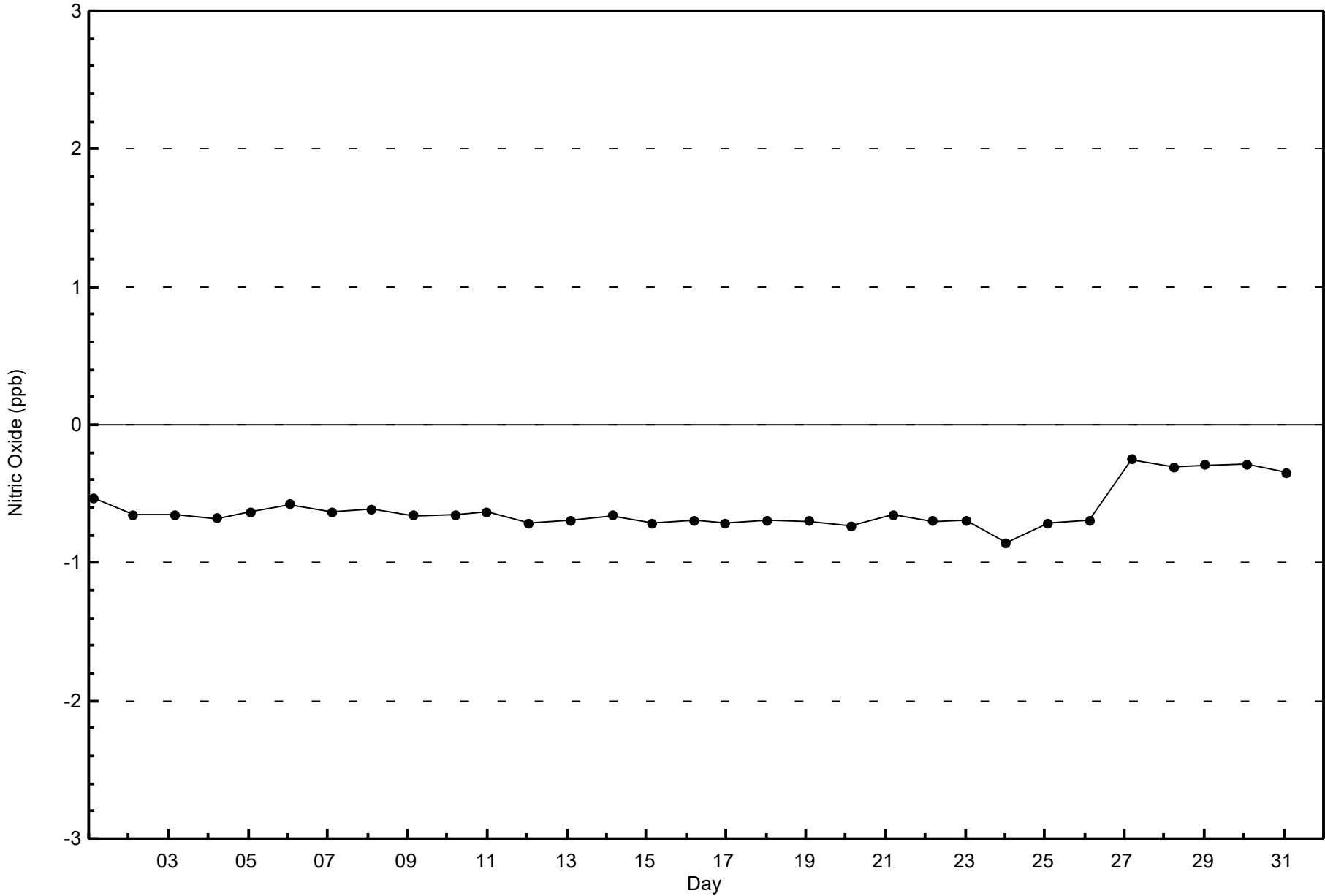


Total Number of Valid Hours: 704



Wood Buffalo Environmental Association
Zero Responses

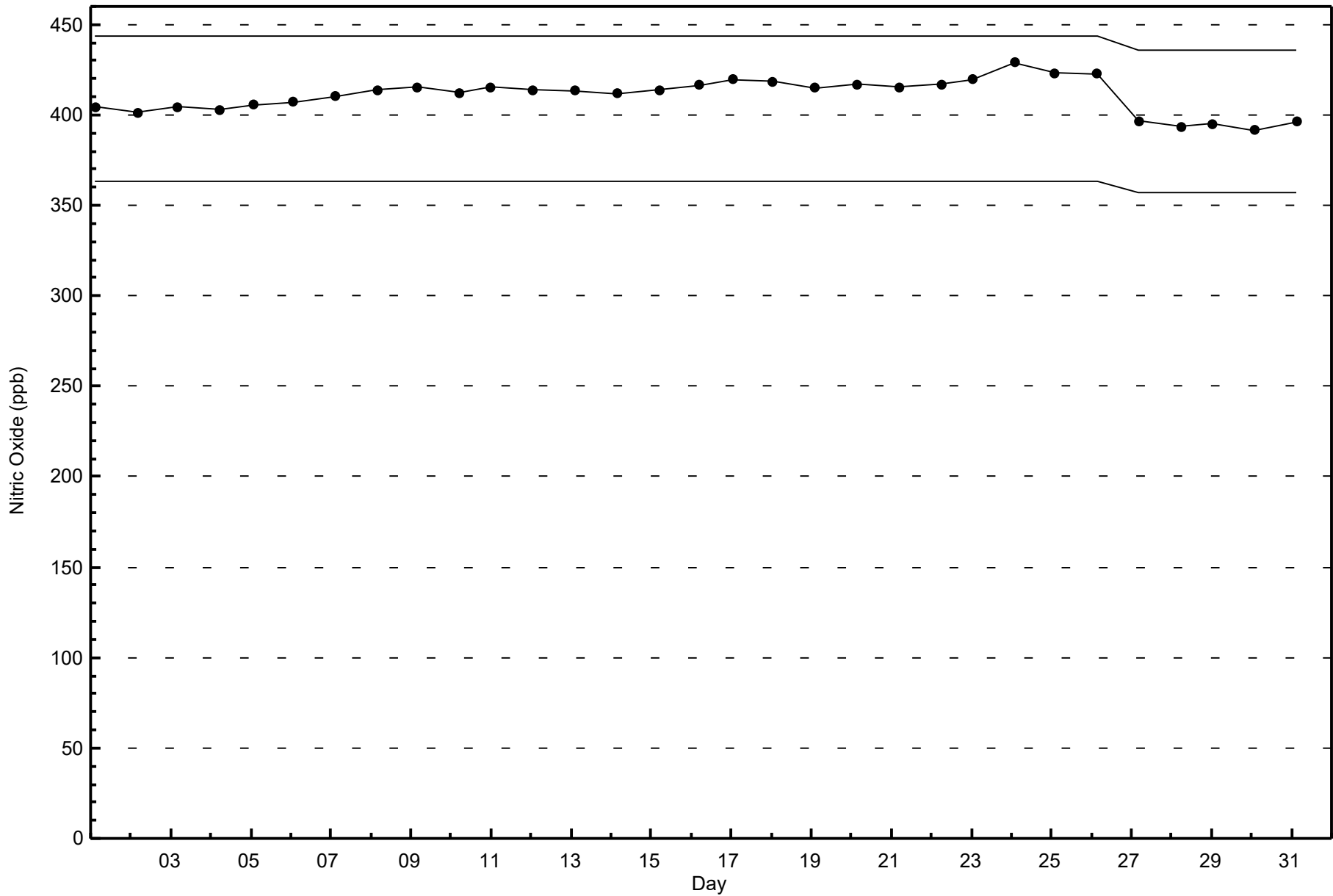
Nitric Oxide (NO) - ppb
Leismer - October 2023





Wood Buffalo Environmental Association
Span Responses

Nitric Oxide (NO) - ppb
Leismer - October 2023





Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

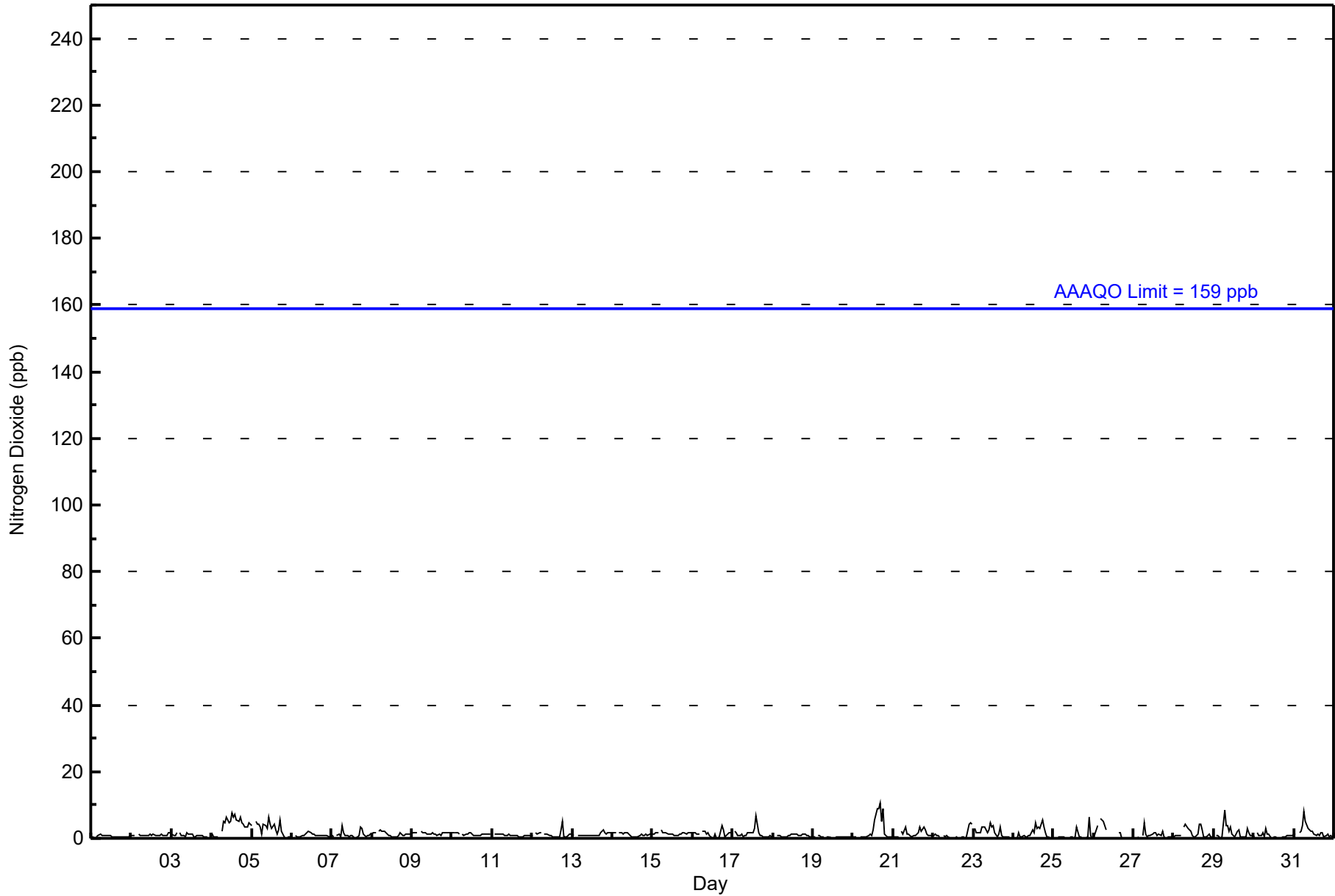
Leismer - October 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 744																	Daily Average		Daily Maximum																									
Maximum Value: 10.8 ppb on Oct 20 17:00		Maximum Daily Average: 4.1 ppb on Oct 4		Hours of Data: 704																	Hours of Missing Data: 40		Hours of Calibration: 38		Percent Operational Time: 99.7																							
Minimum Value: 0.0 ppb on Oct 22 14:00		Minimum Daily Average: 0.5 ppb on Oct 19		Hours of Missing Data: 40																	Hours of Calibration: 38		Percent Operational Time: 99.7																									
Maximum Diurnal Average: 2.1 ppb at hour 7		Minimum Diurnal Average: 0.9 ppb at hour 21		Hours of Calibration: 38																	Hours of Calibration: 38		Percent Operational Time: 99.7																									
Monthly Average: 1.40 ppb		Percentiles: P ₁ = 0.1 P ₁₀ = 0.3 Q ₁ = 0.5 Median = 1.0 Q ₃ = 1.6 P ₉₀ = 3.2 P ₉₉ = 7.0		Hours of Calibration: 38																	Hours of Calibration: 38		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-Oct	0.5	0.5	Z	0.6	0.8	1.2	0.8	0.8	1.0	0.9	0.8	0.7	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.6	0.6	0.7	0.7	1.2																						
2-Oct	0.8	0.8	0.8	Z	1.1	1.0	0.9	0.8	0.8	0.9	0.9	1.1	1.0	1.1	1.0	0.9	1.0	0.9	1.1	0.8	0.8	0.9	1.5	1.5	1.0	1.5																						
3-Oct	1.2	1.0	0.9	1.5	Z	1.7	1.0	0.8	0.5	1.7	1.1	1.3	1.3	0.4	0.5	0.9	0.7	0.7	0.7	0.5	0.3	0.4	0.1	0.2	0.8	1.7																						
4-Oct	1.3	0.4	0.5	0.5	0.6	Z	2.3	5.0	4.5	6.3	4.5	5.2	7.7	6.3	7.0	5.4	5.1	6.4	4.6	4.4	3.5	3.2	4.5	4.2	4.1	7.7																						
5-Oct	3.9	Z	4.9	4.1	4.1	3.2	1.2	4.4	3.7	3.1	6.3	4.3	3.1	4.4	2.7	1.2	2.7	5.4	2.3	0.4	0.1	0.1	0.3	0.4	2.9	6.3																						
6-Oct	0.2	Z	1.0	0.4	0.3	0.3	0.7	0.9	1.2	1.6	2.0	1.8	1.4	1.1	1.0	1.0	0.9	0.8	1.0	0.8	1.0	0.8	0.6	0.5	0.9	2.0																						
7-Oct	0.7	0.4	Z	0.7	1.1	0.6	3.8	1.9	0.9	0.8	0.5	1.0	0.9	0.4	0.2	0.4	0.9	3.2	2.9	1.2	0.6	0.8	1.0	1.1	1.1	3.8																						
8-Oct	1.4	1.9	1.8	Z	2.1	2.4	2.1	2.2	1.5	1.4	1.0	0.8	0.6	0.4	0.5	0.6	0.7	1.8	0.9	1.0	1.2	1.4	1.3	1.4	1.3	2.4																						
9-Oct	1.5	1.6	1.6	1.6	Z	2.1	1.7	1.5	1.5	1.2	1.2	1.3	1.5	1.4	1.4	1.0	1.1	1.0	1.5	1.5	1.6	1.6	1.6	1.6	1.5	2.1																						
10-Oct	1.7	1.5	1.7	1.5	1.1	Z	1.3	1.0	1.1	1.4	1.5	1.5	1.4	1.0	0.8	0.9	1.0	0.8	1.1	1.2	1.3	1.2	1.1	1.2	1.2	1.7																						
11-Oct	Z	1.4	1.1	1.1	1.2	1.1	1.2	0.7	0.7	1.0	1.1	1.0	0.8	0.8	0.7	0.7	0.6	0.5	0.5	0.8	1.0	0.8	0.8	0.9	0.9	1.4																						
12-Oct	1.0	Z	1.6	1.4	1.6	1.8	M	1.4	1.4	1.2	0.9	0.7	0.5	0.3	0.3	0.3	0.3	2.4	5.1	0.4	0.5	0.9	1.1	1.2	1.2	5.1																						
13-Oct	1.2	1.0	Z	1.0	0.8	0.9	0.9	0.7	0.7	0.7	0.9	0.8	0.7	0.8	0.8	0.9	0.8	1.9	2.6	1.7	1.4	1.6	1.6	1.7	1.1	2.6																						
14-Oct	1.9	1.6	1.8	Z	1.9	1.7	1.4	1.7	1.6	1.5	1.1	0.5	0.4	0.4	0.5	0.6	0.8	1.1	1.0	0.9	1.1	1.0	1.1	1.2	1.2	1.9																						
15-Oct	1.3	1.4	1.7	1.6	Z	2.5	1.8	1.6	1.5	1.3	1.2	1.1	1.1	1.0	1.0	1.0	1.1	1.3	1.8	1.5	1.4	1.6	1.7	1.7	1.4	2.5																						
16-Oct	1.7	1.6	1.4	1.4	1.4	Z	2.3	2.1	1.1	1.5	0.7	0.3	0.2	1.3	0.2	0.2	0.3	3.9	2.6	0.4	0.7	1.3	1.8	1.7	1.3	3.9																						
17-Oct	Z	2.3	1.6	1.0	0.8	1.2	0.5	0.8	0.8	1.7	1.9	1.8	1.7	3.1	6.9	1.9	0.9	0.7	0.6	0.6	0.6	0.6	0.7	0.5	1.4	6.9																						
18-Oct	0.5	Z	0.9	0.9	0.7	0.6	0.5	0.6	0.6	0.7	0.8	1.1	1.3	1.3	1.1	0.8	0.7	0.9	1.4	1.3	0.9	0.7	0.6	0.5	0.8	1.4																						
19-Oct	0.5	0.5	Z	0.8	0.7	0.6	0.6	M	0.6	0.4	0.4	0.2	0.2	0.2	0.3	0.4	0.6	0.5	0.4	0.3	0.4	0.5	0.5	0.5	0.5	0.8																						
20-Oct	0.5	0.4	0.4	Z	0.6	0.5	0.5	0.6	0.5	0.8	1.3	0.8	2.7	5.4	9.0	9.1	10.8	4.9	9.0	1.4	0.3	0.4	0.4	0.5	2.6	10.8																						
21-Oct	0.4	0.4	0.4	0.6	Z	2.3	1.2	3.3	1.2	1.2	0.8	0.6	0.7	0.8	1.2	1.5	3.4	2.1	3.5	2.4	1.4	1.0	0.8	0.9	1.4	3.5																						
22-Oct	1.0	1.1	1.0	0.8	0.6	Z	0.9	0.5	0.7	0.3	0.2	0.1	0.1	0.0	0.3	0.0	0.2	0.6	0.3	0.2	0.6	4.1	4.6	4.1	1.0	4.6																						
23-Oct	Z	2.8	1.7	1.7	1.5	3.4	3.3	3.4	1.5	2.5	4.6	3.2	4.0	1.5	0.3	1.3	3.3	0.8	0.4	0.6	0.5	0.3	0.2	0.1	1.9	4.6																						
24-Oct	0.1	Z	0.2	1.9	0.3	0.3	0.9	0.3	0.4	0.8	0.7	2.4	1.7	4.8	2.9	3.5	2.8	5.3	3.2	1.9	0.3	0.3	0.2	0.2	1.5	5.3																						
25-Oct	0.2	0.1	Z	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.2	0.4	3.6	0.6	0.4	0.2	0.2	0.2	0.4	6.5	1.0	0.2	0.7	6.5																						
26-Oct	0.2	1.4	3.7	Z	5.9	5.7	5.0	2.6	C	C	C	C	C	C	C	1.5	1.6	0.0	0.0	0.0	0.0	0.1	0.1	0.2	--	5.9																						
27-Oct	0.1	0.1	0.2	0.5	Z	0.8	4.7	1.3	0.5	0.8	0.8	1.1	1.6	1.7	1.0	1.3	1.0	2.1	0.5	0.2	0.1	0.3	0.5	0.5	0.9	4.7																						
28-Oct	0.5	0.7	0.9	0.7	0.8	Z	3.4	4.2	3.0	2.6	2.1	0.8	0.6	0.4	1.3	4.1	4.1	2.5	0.4	0.4	0.9	1.1	0.5	0.6	1.6	4.2																						
29-Oct	Z	0.8	0.9	0.4	0.2	0.3	8.5	4.0	3.7	2.2	3.4	1.3	0.4	1.2	2.2	2.7	0.4	0.4	0.5	0.6	3.1	1.8	1.0	0.9	1.8	8.5																						
30-Oct	0.4	Z	1.6	0.8	0.7	1.6	0.6	3.0	1.2	1.3	0.2	0.2	0.4	0.3	0.0	0.2	0.2	0.3	0.3	0.6	0.7	0.8	0.9	1.0	0.8	3.0																						
31-Oct	1.2	1.4	Z	1.8	2.1	4.0	8.1	4.9	3.0	2.5	2.3	2.2	1.4	1.0	1.2	0.9	1.8	1.9	0.6	1.0	1.2	0.5	1.0	0.4	2.0	8.1																						
1.0																								1.1	1.4	1.1	1.3	1.6	2.1	1.9	1.4	1.5	1.5	1.3	1.3	1.5	1.7	1.5	1.6	1.8	1.7	1.0	0.9	1.2	1.1	1.0	Diurnal Average	
3.9																								2.8	4.9	4.1	5.9	5.7	8.5	5.0	4.5	6.3	6.3	5.2	7.7	6.3	9.0	9.1	10.8	6.4	9.0	4.4	3.5	6.5	4.6	4.2	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
Leismer - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Dioxide (NO₂) - ppb
Leismer - October 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	704	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: 704

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Leismer - October 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	9	5	4	22	63	69	71	58	48	23	30	66	115	77	22	704
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	22	9	5	4	22	63	69	71	58	48	23	30	66	115	77	22	704

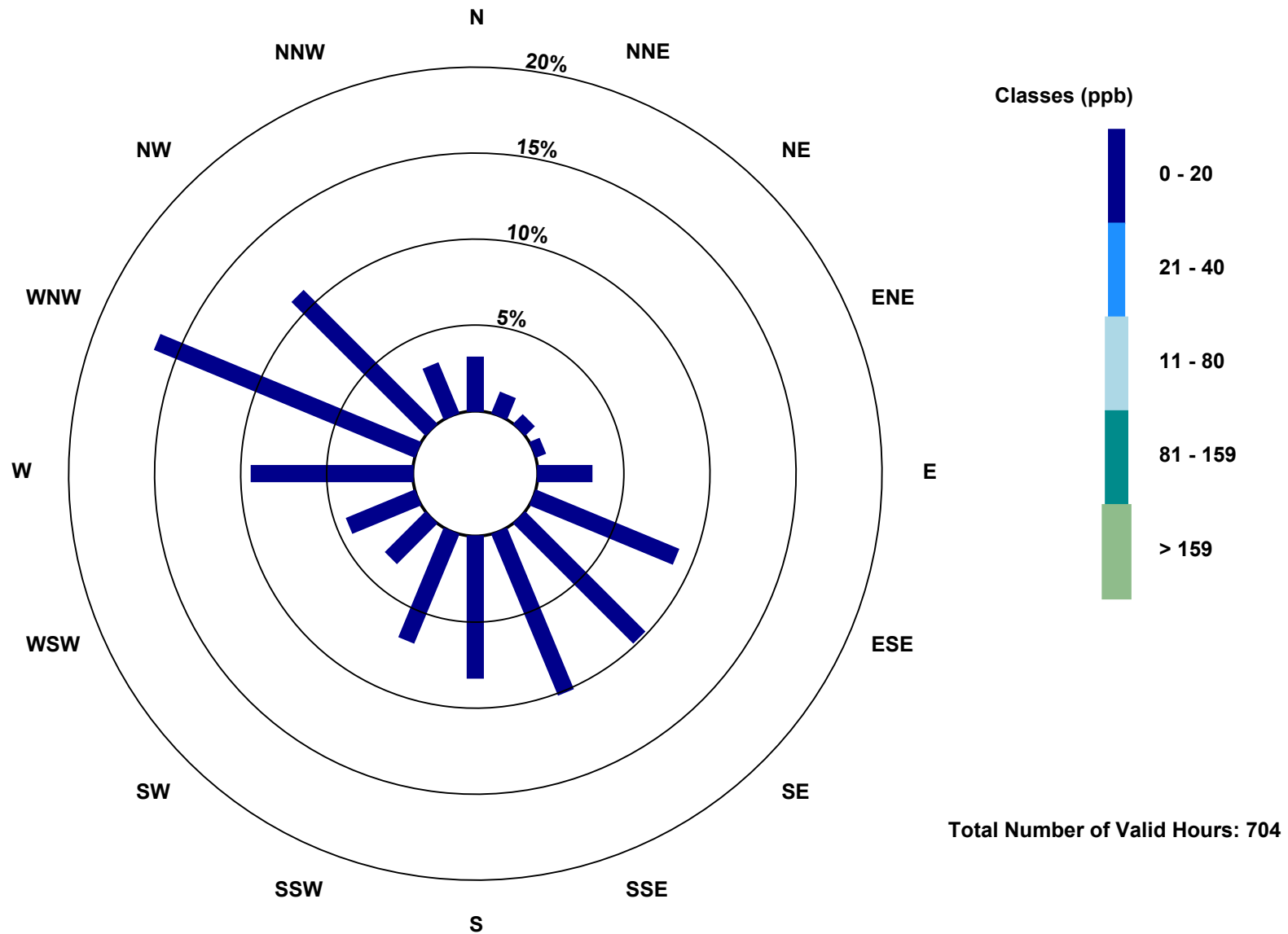
Total Number of Valid Hours: 704

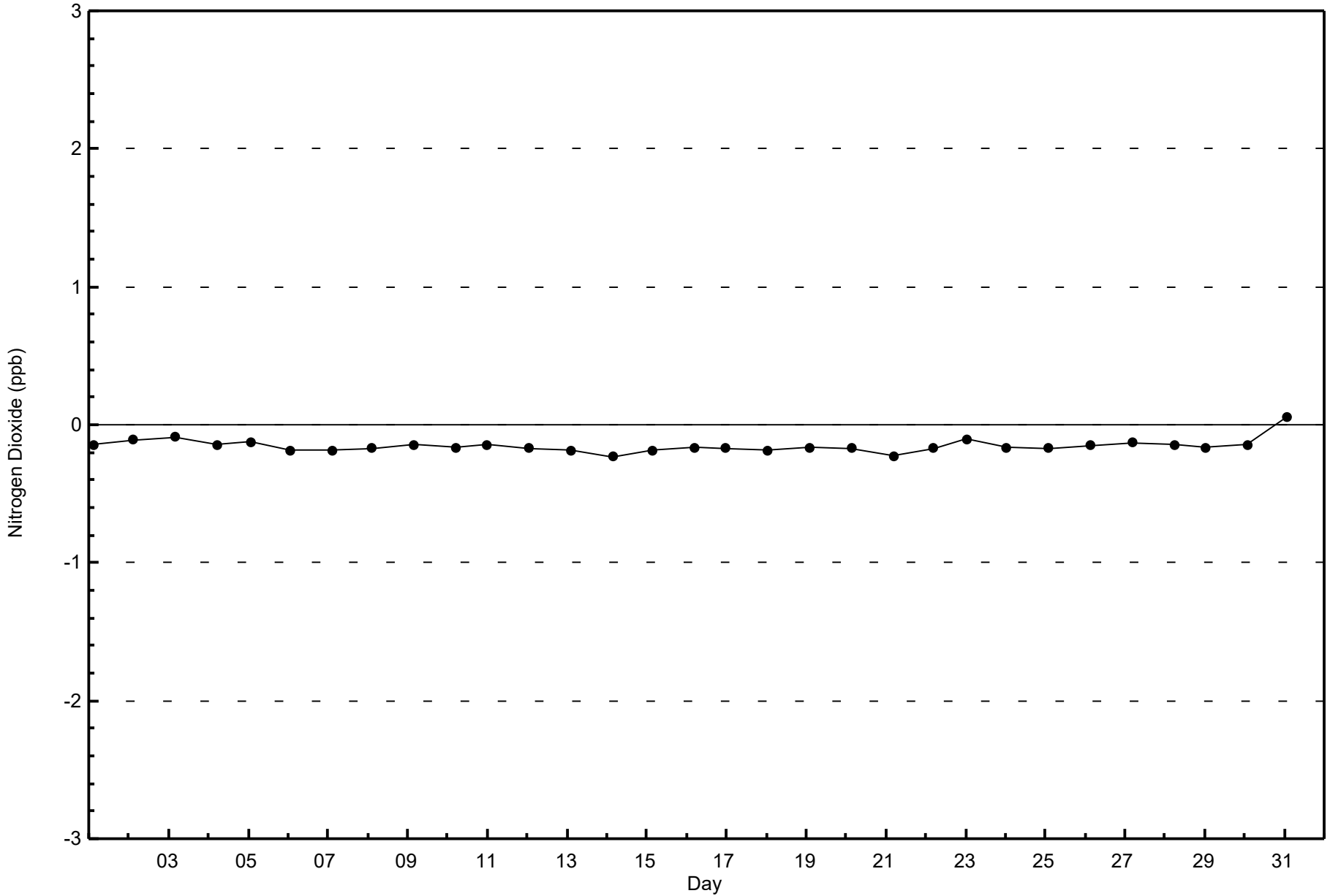
Total Number of Hours: 744

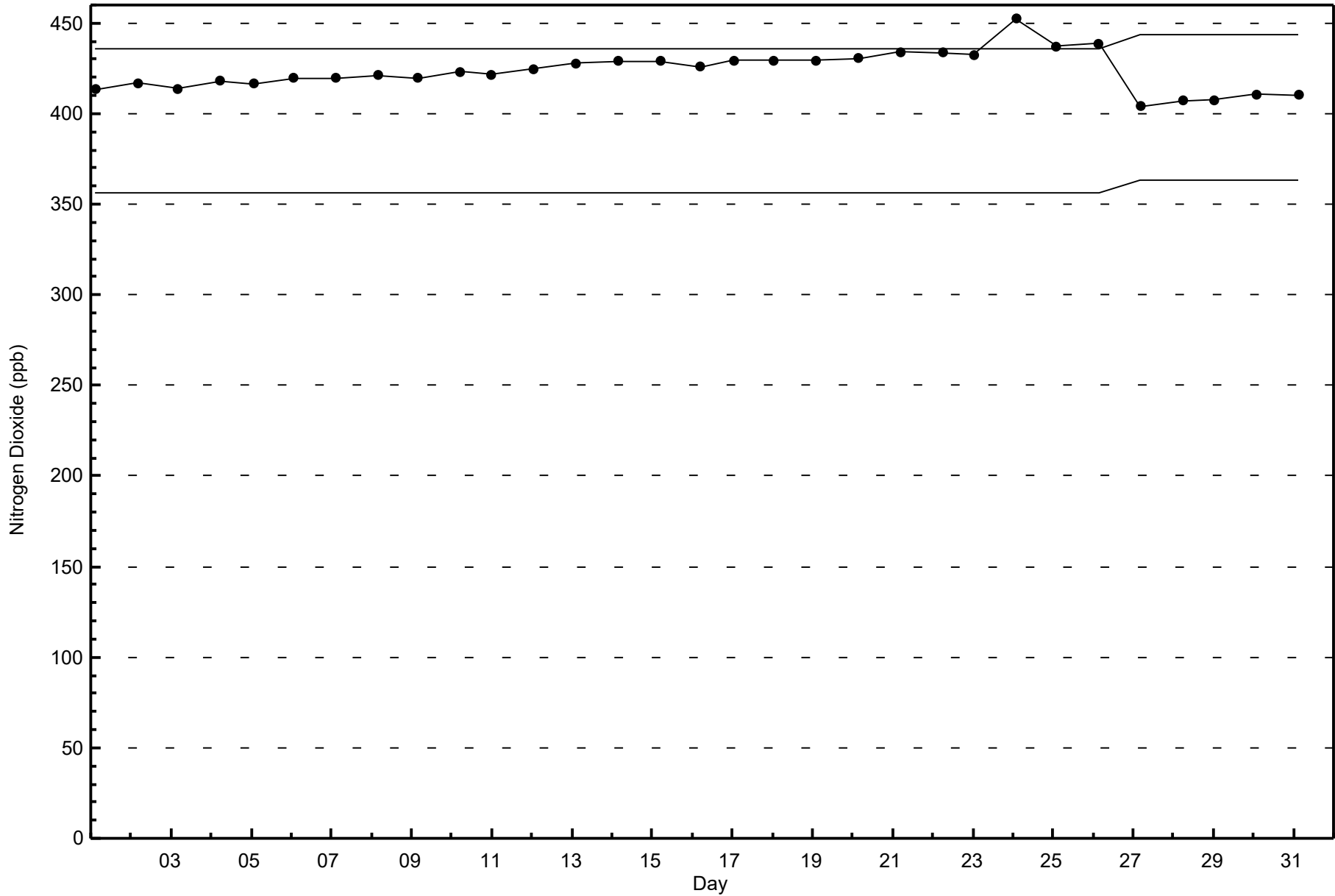


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitrogen Dioxide (NO₂) - ppb
Leismer









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_x) - ppb

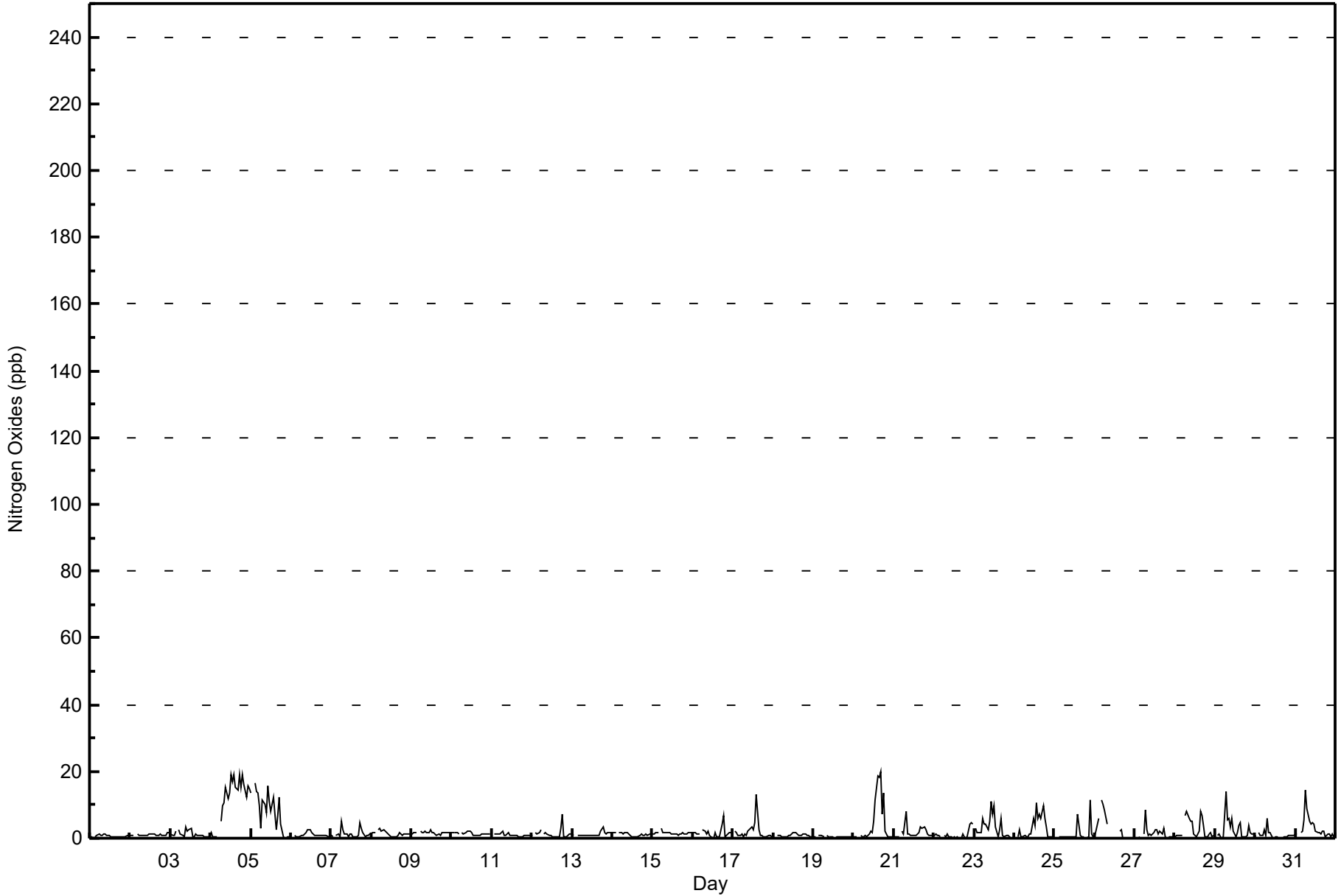
Leismer - October 2023

Maximum Value: 20.0 ppb on Oct 20 17:00																				Maximum Daily Average: 11.6 ppb on Oct 4					Hours in Service: 744								
Minimum Value: 0.0 ppb on Oct 22 16:00																				Minimum Daily Average: 0.5 ppb on Oct 19					Hours of Data: 704								
Maximum Diurnal Average: 3.1 ppb at hour 15																				Minimum Diurnal Average: 1.1 ppb at hour 2					Hours of Missing Data: 40								
Monthly Average: 2.21 ppb																				Percentiles: P ₁ = 0.1 P ₁₀ = 0.3 Q ₁ = 0.6 Median = 1.1 Q ₃ = 1.8 P ₉₀ = 5.8 P ₉₉ = 17.1					Hours of Calibration: 38								
																									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-Oct	0.5	0.5	Z	0.6	0.8	1.2	0.8	0.9	1.1	1.1	1.0	0.7	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.6	0.6	0.7	0.7	1.2							
2-Oct	0.8	0.8	0.8	Z	1.1	1.0	0.9	0.8	0.8	0.9	1.0	1.2	1.1	1.2	1.1	1.0	1.0	0.9	1.1	0.8	0.8	0.9	1.5	1.5	1.0	1.5							
3-Oct	1.2	1.0	0.9	2.1	Z	2.7	1.4	1.0	0.6	3.4	2.1	2.4	3.1	0.5	0.6	1.4	0.8	0.8	0.8	0.6	0.4	0.5	0.2	0.3	1.3	3.4							
4-Oct	1.6	0.5	0.5	0.6	Z	4.9	9.8	10.6	15.1	11.8	13.5	19.2	17.1	19.1	15.1	14.2	18.9	15.3	19.2	16.3	12.1	15.5	14.8	11.6	19.2								
5-Oct	13.5	Z	16.7	14.1	13.6	9.7	2.9	11.5	10.1	7.8	15.9	10.9	7.9	12.2	7.3	2.6	6.6	12.1	4.1	0.4	0.1	0.1	0.3	0.4	7.9	16.7							
6-Oct	0.2	Z	1.0	0.4	0.3	0.3	0.7	0.9	1.3	1.8	2.4	2.4	1.8	1.2	1.0	1.0	0.9	0.8	1.0	0.8	1.0	0.8	0.6	0.5	1.0	2.4							
7-Oct	0.8	0.4	Z	0.7	1.1	0.6	4.9	2.3	1.3	1.1	0.5	1.4	1.1	0.4	0.2	0.4	1.1	4.7	2.9	1.5	0.6	0.8	1.0	1.1	1.3	4.9							
8-Oct	1.4	1.9	1.8	Z	2.5	2.9	2.2	2.4	2.0	1.7	1.2	0.9	0.6	0.4	0.5	0.6	0.7	1.9	0.9	1.1	1.3	1.4	1.3	1.4	1.4	2.9							
9-Oct	1.5	1.6	1.6	1.6	Z	2.2	1.7	1.7	1.9	1.6	1.5	2.5	1.9	1.6	1.5	1.0	1.1	1.0	1.5	1.5	1.7	1.6	1.6	1.6	1.6	2.5							
10-Oct	1.7	1.5	1.7	1.5	1.2	Z	1.6	1.2	1.5	1.9	2.0	2.1	1.7	1.0	0.8	0.9	1.0	0.8	1.1	1.2	1.3	1.2	1.1	1.2	1.4	2.1							
11-Oct	Z	1.4	1.1	1.1	1.2	1.2	2.0	0.7	0.8	1.3	1.7	1.1	0.9	0.8	0.7	0.7	0.6	0.5	0.5	0.8	1.0	0.8	0.8	0.9	1.0	2.0							
12-Oct	1.0	Z	1.6	1.4	1.7	2.8	M	1.5	1.6	1.4	1.0	0.7	0.5	0.3	0.3	0.3	0.3	2.8	7.1	0.4	0.5	0.9	1.1	1.2	1.4	7.1							
13-Oct	1.2	1.0	Z	1.0	0.8	0.9	0.9	0.7	0.7	0.7	1.0	0.9	0.9	0.9	0.8	0.9	0.8	2.2	3.2	1.7	1.4	1.6	1.6	1.7	1.2	3.2							
14-Oct	1.9	1.6	1.8	Z	1.9	1.7	1.4	1.8	1.9	1.8	1.3	0.5	0.4	0.4	0.5	0.6	0.8	1.1	1.0	0.9	1.1	1.0	1.1	1.2	1.2	1.9							
15-Oct	1.3	1.4	1.7	1.6	Z	2.8	1.9	1.7	1.7	1.6	1.6	1.4	1.3	1.1	1.1	1.0	1.1	1.3	1.8	1.5	1.4	1.6	1.7	1.7	1.5	2.8							
16-Oct	1.7	1.6	1.4	1.4	1.4	Z	2.5	2.3	1.3	2.0	0.7	0.3	0.2	1.7	0.2	0.2	0.3	4.4	7.0	0.4	0.7	1.3	1.8	1.7	1.6	7.0							
17-Oct	Z	2.3	1.6	1.0	0.9	1.2	0.5	1.1	1.0	2.1	2.8	3.5	2.4	4.5	13.2	2.7	0.9	0.7	0.6	0.6	0.6	0.6	0.7	0.5	2.0	13.2							
18-Oct	0.5	Z	0.9	0.9	0.7	0.6	0.5	0.6	0.6	0.7	1.0	1.3	1.5	1.6	1.3	0.8	0.7	0.9	1.4	1.3	0.9	0.7	0.6	0.5	0.9	1.6							
19-Oct	0.5	0.5	Z	0.8	0.7	0.6	0.6	M	0.7	0.5	0.4	0.2	0.2	0.2	0.3	0.4	0.6	0.5	0.4	0.3	0.4	0.5	0.6	0.5	0.5	0.8							
20-Oct	0.5	0.4	0.4	Z	0.6	0.5	0.5	0.7	0.6	1.1	2.3	1.5	5.3	11.4	18.5	18.1	20.0	7.4	13.6	1.9	0.3	0.4	0.4	0.5	4.6	20.0							
21-Oct	0.4	0.4	0.4	0.6	Z	2.3	1.4	8.2	1.2	1.2	0.9	0.7	0.7	0.8	1.2	1.5	3.5	2.9	3.5	2.4	1.4	1.0	0.8	0.9	1.7	8.2							
22-Oct	1.0	1.1	1.0	0.8	0.6	Z	0.9	0.5	1.2	0.3	0.2	0.1	0.2	0.0	0.5	0.0	0.2	1.5	0.4	0.2	0.6	4.1	4.6	4.1	1.0	4.6							
23-Oct	Z	2.8	1.7	1.7	1.8	6.0	4.3	4.1	2.7	5.2	10.9	7.4	9.6	3.2	0.4	2.6	5.9	1.0	0.5	0.8	0.8	0.5	0.2	0.2	3.2	10.9							
24-Oct	0.1	Z	0.2	2.4	0.3	0.3	1.0	0.3	0.4	1.4	1.3	6.0	3.6	10.6	5.9	7.1	5.9	9.9	5.9	3.4	0.4	0.3	0.2	0.2	2.9	10.6							
25-Oct	0.2	0.1	Z	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.4	0.3	0.2	0.4	7.2	0.7	0.6	0.2	0.2	0.2	0.4	11.4	1.2	0.2	1.1	11.4							
26-Oct	0.2	2.0	5.8	Z	11.2	10.2	8.6	4.4	C	C	C	C	C	C	C	2.3	2.4	0.0	0.0	0.0	0.0	0.1	0.1	0.2	--	11.2							
27-Oct	0.1	0.1	0.2	0.6	Z	1.2	8.3	2.7	0.9	1.1	1.0	1.5	2.3	2.4	1.4	2.0	1.2	2.8	0.5	0.2	0.1	0.3	0.5	0.5	1.4	8.3							
28-Oct	0.5	0.7	0.9	0.7	0.8	Z	6.7	7.9	5.8	4.9	4.9	1.2	1.0	0.6	2.2	8.0	6.8	3.7	0.4	0.4	1.1	1.5	0.5	0.7	2.7	8.0							
29-Oct	Z	0.8	1.1	0.4	0.2	0.3	13.9	5.7	6.0	3.3	6.0	2.0	0.4	1.9	3.7	4.6	0.4	0.4	0.5	0.7	3.8	1.9	1.1	1.1	2.6	13.9							
30-Oct	0.4	Z	1.6	0.8	0.7	2.6	0.8	6.0	1.5	1.6	0.2	0.2	0.5	0.3	0.0	0.2	0.2	0.3	0.3	0.6	0.7	0.8	0.9	1.0	1.0	6.0							
31-Oct	1.2	1.4	Z	1.8	2.1	5.4	14.3	9.0	5.0	4.1	4.5	4.2	2.3	1.7	1.8	1.2	2.2	2.0	0.6	1.1	1.3	0.6	1.1	0.5	3.0	14.3							
																								Diurnal Average					Diurnal Maximum				
1.3 1.1 1.9 1.6 1.9 2.4 3.1 3.1 2.2 2.4 2.8 2.4 2.5 2.7 3.1 2.6 2.7 2.9 2.5 1.5 1.4 1.7 1.5 1.4																								13.5 2.8 16.7 14.1 13.6 10.2 14.3 11.5 10.6 15.1 15.9 13.5 19.2 17.1 19.1 18.1 20.0 18.9 15.3 19.2 16.3 12.1 15.5 14.8									
Z - zerospan			C - Calibration			M - Maintenance																											



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Leismer - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Oxides (NO_x) - ppb
Leismer - October 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	704	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: 704

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Leismer - October 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	9	5	4	22	63	69	71	58	48	23	30	66	115	77	22	704
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	22	9	5	4	22	63	69	71	58	48	23	30	66	115	77	22	704

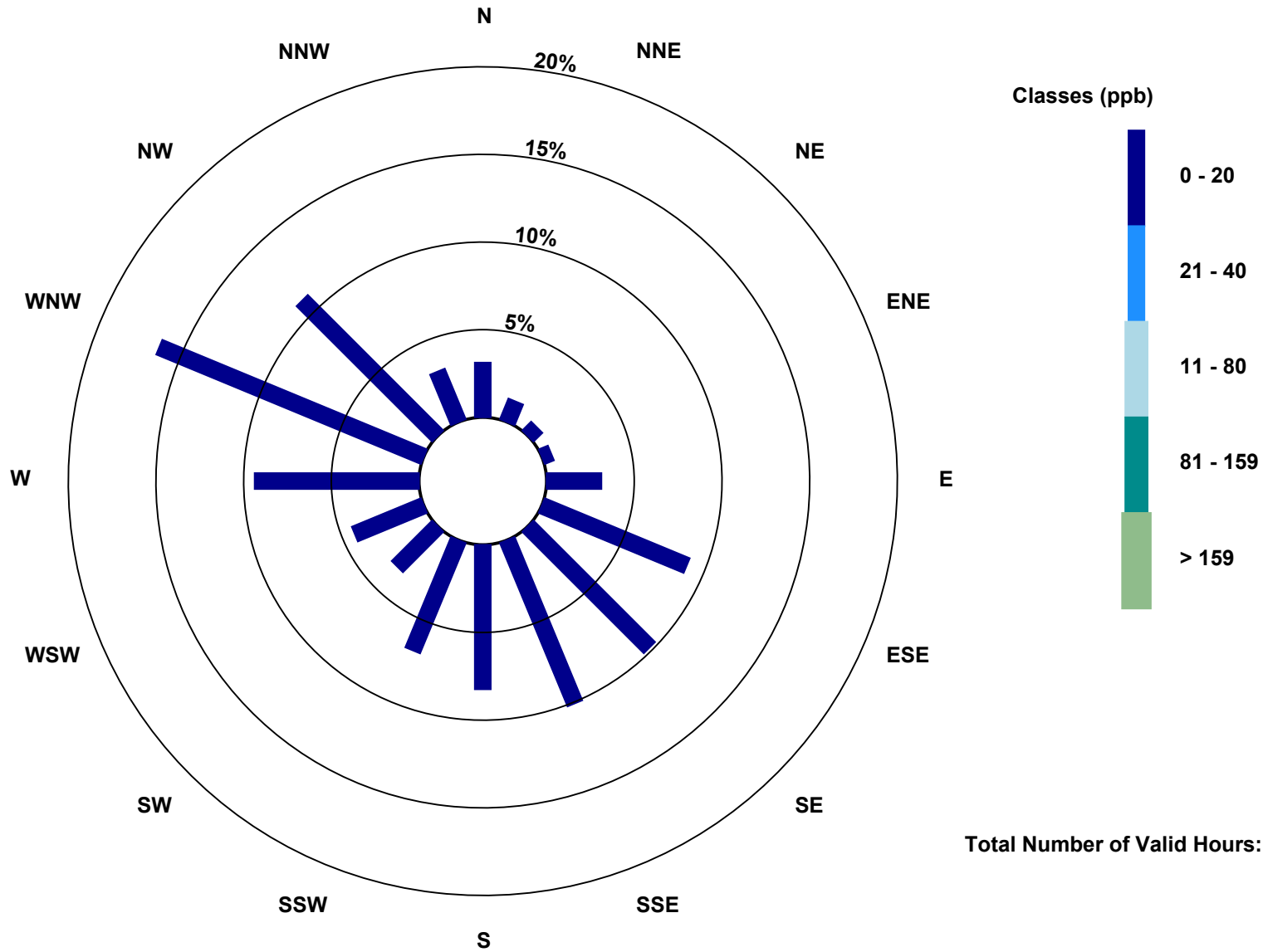
Total Number of Valid Hours: 704

Total Number of Hours: 744

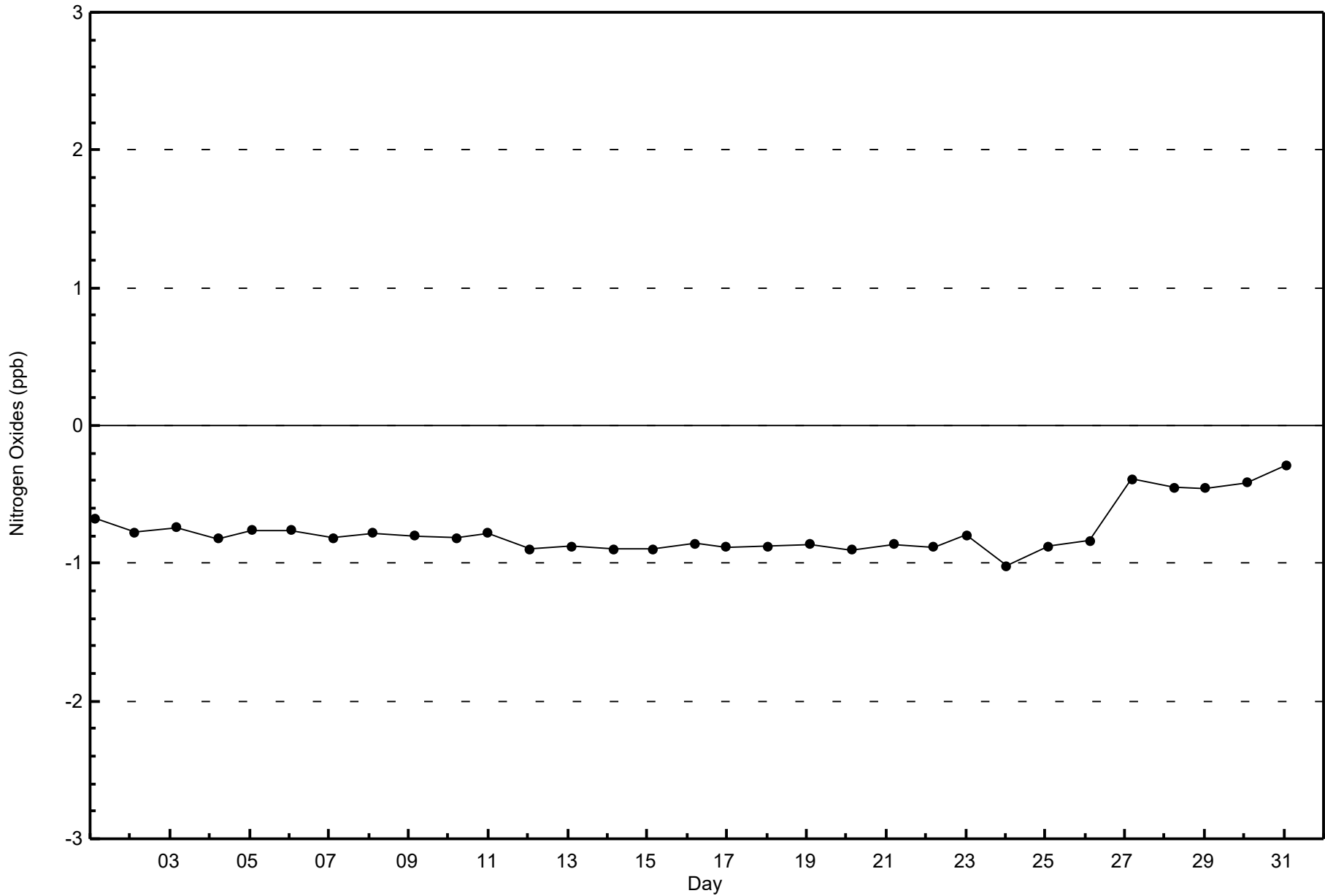


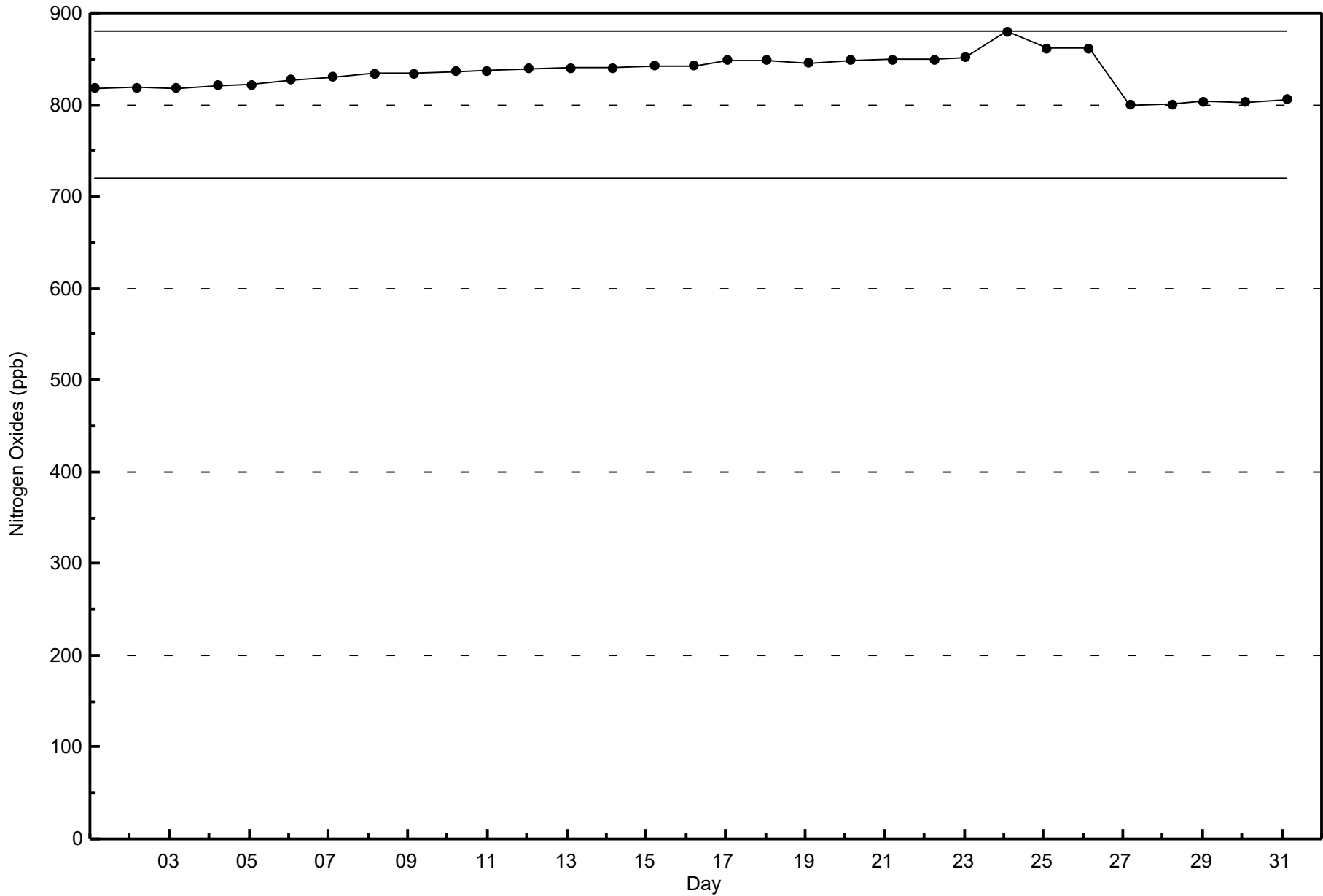
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitrogen Oxides (NO_x) - ppb
Leismer



Total Number of Valid Hours: 704







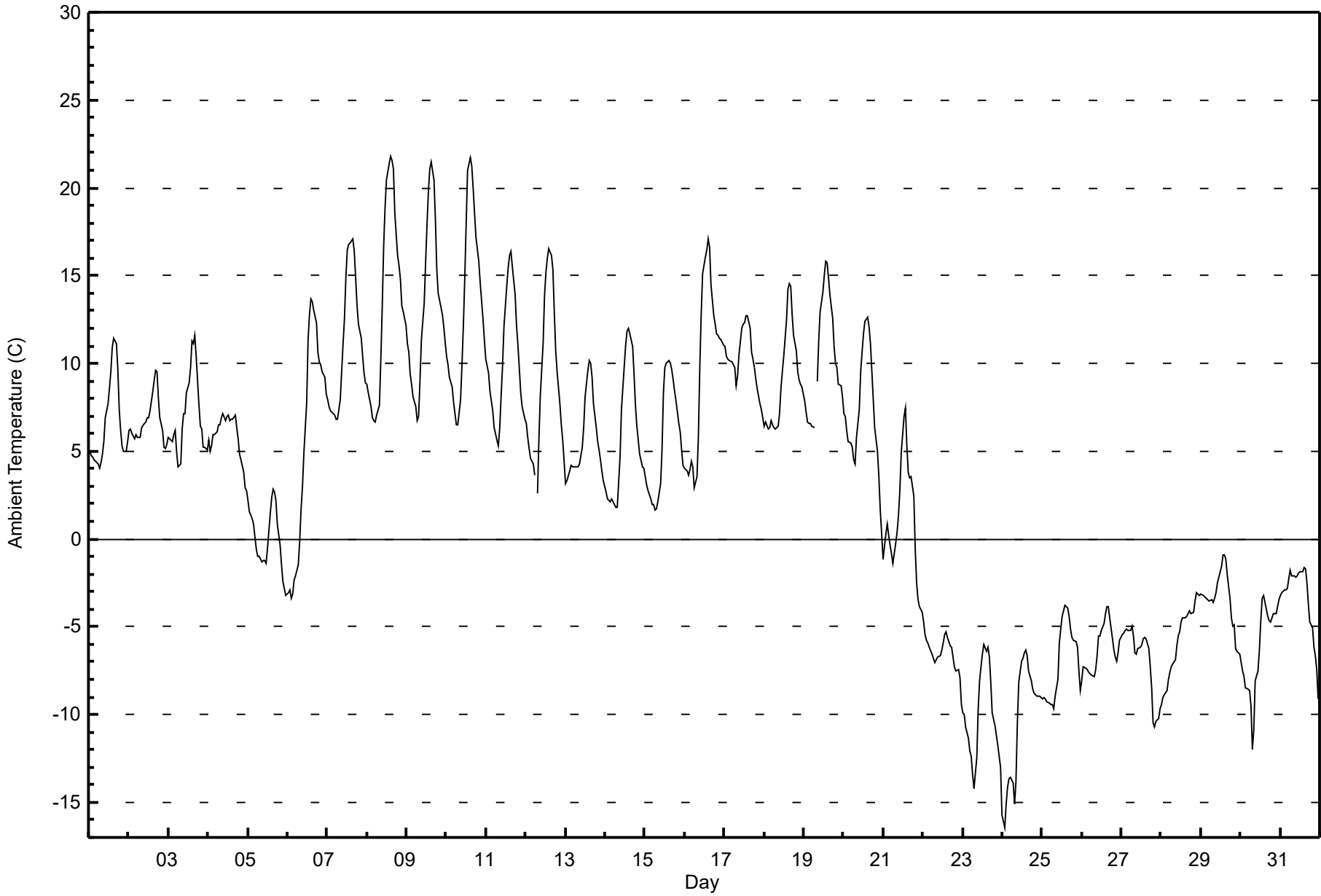
Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature (AT) - C

Leismer - October 2023

Maximum Value: 21.8 C on Oct 8 15:00		Maximum Daily Average: 13.7 C on Oct 8		Hours in Service: 744																							
Minimum Value: -16.5 C on Oct 24 02:00		Minimum Daily Average: -10.5 C on Oct 24		Hours of Data: 742																							
Maximum Diurnal Average: 7.6 C at hour 15		Minimum Diurnal Average: 0.1 C at hour 8		Hours of Missing Data: 2																							
Monthly Average: 3.25 C		Percentiles: P ₁ = -13.7 P ₁₀ = -7.6 Q ₁ = -4.2 Median = 5.0 Q ₃ = 9.4 P ₉₀ = 12.9 P ₉₉ = 21.0		Hours of Calibration: 0																							
				Percent Operational Time: 99.7																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Oct	5.0	4.8	4.7	4.5	4.4	4.3	4.0	4.4	4.9	5.6	6.9	7.7	8.6	9.5	10.8	11.4	11.1	9.7	7.4	6.2	5.3	5.0	5.0	5.5	6.5	11.4	
2-Oct	6.2	6.3	6.0	5.7	5.9	5.7	5.7	5.8	6.3	6.6	6.6	6.9	6.9	7.3	8.4	9.0	9.6	9.5	8.0	6.9	6.2	5.2	5.1	5.4	6.7	9.6	
3-Oct	5.8	5.6	5.6	5.9	6.2	5.0	4.1	4.3	6.2	7.1	7.1	8.3	8.9	9.8	11.3	11.1	11.6	10.4	7.6	6.4	6.3	5.2	5.2	5.1	7.1	11.6	
4-Oct	5.6	5.0	5.3	5.9	5.9	6.1	6.5	6.5	6.9	7.2	6.7	6.9	7.1	6.8	6.8	6.9	7.1	6.3	5.7	4.8	4.5	3.8	2.9	2.7	5.8	7.2	
5-Oct	2.2	1.6	1.2	0.8	0.1	-0.6	-1.0	-1.0	-1.3	-1.2	-1.2	-1.4	-0.5	1.5	2.4	2.8	2.7	2.2	0.9	-0.3	-1.5	-2.4	-2.8	-3.2	0.0	2.8	
6-Oct	-3.1	-2.9	-3.4	-3.2	-2.3	-2.1	-1.5	-0.1	1.7	3.0	4.9	7.8	11.4	12.8	13.7	13.5	13.0	12.3	10.6	10.1	9.9	9.5	9.2	8.2	5.5	13.7	
7-Oct	8.0	7.6	7.3	7.2	7.0	6.8	6.8	7.4	7.9	11.1	12.6	14.9	16.5	16.8	16.8	17.1	16.4	14.9	13.3	12.2	11.4	10.4	9.4	8.9	11.2	17.1	
8-Oct	8.8	8.4	7.5	6.9	6.7	6.7	7.0	7.6	10.2	13.2	16.6	18.8	20.4	21.4	21.8	21.6	21.1	18.5	16.1	15.5	14.8	13.3	12.9	12.2	13.7	21.8	
9-Oct	11.1	10.6	9.4	8.8	8.1	7.5	6.7	7.0	9.1	11.4	13.4	15.7	17.9	19.8	21.1	21.4	20.5	18.2	15.4	14.0	13.6	12.8	12.1	11.2	13.2	21.4	
10-Oct	10.4	9.9	9.2	8.7	7.8	7.1	6.5	6.5	7.9	9.9	12.2	14.9	17.9	21.0	21.7	21.2	20.0	18.5	17.2	15.8	14.7	13.6	12.6	11.3	13.2	21.7	
11-Oct	10.3	9.4	8.4	7.9	7.3	6.4	5.6	5.3	6.4	8.2	9.9	12.1	14.4	15.4	16.1	16.4	15.5	13.9	12.1	11.0	9.7	8.3	7.5	6.8	10.2	16.4	
12-Oct	6.6	5.8	5.2	4.6	4.3	3.7	M	2.6	5.7	8.1	11.1	13.8	15.2	16.0	16.5	16.2	15.3	12.9	10.7	9.6	7.7	6.5	5.6	4.4	9.0	16.5	
13-Oct	3.1	3.3	3.9	4.2	4.1	4.1	4.1	4.1	4.3	4.8	5.2	6.4	8.1	9.6	10.2	10.0	9.2	7.7	6.4	5.6	5.1	4.5	3.9	3.3	5.6	10.2	
14-Oct	2.6	2.3	2.2	2.1	2.3	2.0	1.8	1.8	3.2	4.7	7.4	9.8	11.0	11.8	12.0	11.7	10.9	9.4	7.6	6.4	5.6	4.8	4.1	4.1	5.9	12.0	
15-Oct	3.5	3.1	2.8	2.3	2.0	1.9	1.7	1.7	2.2	3.1	5.1	8.3	9.8	10.0	10.2	10.0	9.6	9.0	8.4	7.8	6.6	6.1	5.0	4.2	5.6	10.2	
16-Oct	4.0	3.8	3.6	3.9	4.4	4.1	2.9	3.6	5.9	9.8	12.8	15.1	16.1	16.5	17.1	16.6	14.5	12.7	12.2	11.7	11.6	11.5	11.3	11.0	9.9	17.1	
17-Oct	11.0	10.4	10.2	10.1	10.1	9.9	9.8	8.8	9.3	10.5	12.0	12.2	12.3	12.7	12.7	12.0	10.6	10.2	9.7	9.1	8.5	7.7	7.4	6.9	10.2	12.7	
18-Oct	6.4	6.7	6.2	6.3	6.7	6.5	6.3	6.3	6.4	7.1	8.6	9.6	10.4	12.5	14.2	14.6	14.4	12.8	11.6	10.7	9.5	9.0	8.8	8.7	9.2	14.6	
19-Oct	7.9	7.2	6.6	6.6	6.6	6.5	6.3	M	9.0	11.2	12.9	14.1	15.0	15.9	15.8	14.9	13.9	12.6	10.9	10.0	9.7	8.8	8.8	8.1	10.4	15.9	
20-Oct	7.1	7.0	6.2	5.5	5.4	5.2	4.5	4.3	5.8	7.4	9.5	10.7	11.6	12.4	12.7	12.1	11.1	9.5	7.9	6.3	5.0	3.5	1.7	0.3	7.2	12.7	
21-Oct	-1.2	0.3	0.9	0.2	-0.4	-0.8	-1.4	-0.3	0.3	1.4	2.7	4.9	6.9	7.4	5.3	3.8	3.5	3.5	2.4	-0.6	-2.5	-3.5	-3.9	-4.2	1.0	7.4	
22-Oct	-4.7	-5.5	-5.8	-5.9	-6.2	-6.6	-6.8	-7.1	-6.9	-6.8	-6.7	-6.3	-5.9	-5.5	-5.3	-5.6	-6.1	-6.2	-6.7	-7.2	-7.5	-7.5	-7.9	-9.4	-6.5	-4.7	
23-Oct	-9.9	-10.0	-10.7	-11.4	-12.0	-12.4	-13.4	-14.2	-12.5	-9.7	-8.1	-7.2	-6.5	-6.0	-6.4	-6.2	-6.7	-8.2	-9.9	-10.7	-11.1	-11.7	-12.4	-13.0	-10.0	-6.0	
24-Oct	-15.7	-16.5	-15.1	-14.1	-13.6	-13.6	-13.9	-15.1	-13.8	-10.4	-8.2	-6.9	-6.8	-6.5	-6.4	-6.6	-7.5	-8.1	-8.5	-8.8	-8.9	-9.0	-8.9	-9.0	-10.5	-6.4	
25-Oct	-9.1	-9.1	-9.1	-9.2	-9.3	-9.4	-9.4	-9.7	-9.0	-8.0	-6.0	-5.1	-4.4	-4.1	-3.8	-3.9	-4.4	-5.1	-5.6	-5.8	-5.9	-6.2	-7.5	-8.6	-7.0	-3.8	
26-Oct	-8.1	-7.3	-7.3	-7.5	-7.6	-7.7	-7.8	-7.8	-7.5	-6.6	-5.5	-5.5	-5.2	-4.8	-4.2	-3.8	-3.8	-4.5	-5.7	-6.3	-6.7	-7.0	-6.5	-5.8	-6.3	-3.8	
27-Oct	-5.5	-5.4	-5.2	-5.1	-5.2	-5.2	-5.0	-5.6	-6.5	-6.5	-6.3	-6.1	-6.0	-5.7	-5.6	-5.7	-6.3	-7.3	-8.5	-10.4	-10.7	-10.4	-10.3	-9.7	-6.8	-5.0	
28-Oct	-9.5	-9.1	-8.9	-8.6	-8.0	-7.6	-7.3	-7.2	-6.9	-6.1	-5.6	-5.3	-4.7	-4.5	-4.5	-4.4	-4.2	-4.1	-4.3	-4.2	-3.5	-3.1	-3.1	-3.2	-5.7	-3.1	
29-Oct	-3.2	-3.2	-3.3	-3.4	-3.5	-3.5	-3.4	-3.7	-3.4	-3.1	-2.5	-2.1	-1.5	-0.9	-0.9	-1.1	-2.0	-3.4	-4.5	-4.9	-4.9	-6.2	-6.4	-6.5	-3.4	-0.9	
30-Oct	-7.0	-7.5	-7.8	-8.5	-8.5	-8.6	-9.5	-12.0	-10.9	-8.1	-7.5	-6.3	-4.6	-3.4	-3.3	-4.0	-4.4	-4.6	-4.7	-4.5	-4.2	-4.3	-3.8	-3.5	-6.3	-3.3	
31-Oct	-3.2	-3.1	-2.9	-2.9	-2.8	-2.3	-1.8	-2.1	-2.1	-2.2	-2.1	-1.9	-1.8	-1.9	-1.6	-1.7	-2.5	-3.7	-4.7	-5.1	-6.1	-6.6	-7.5	-9.1	-3.4	-1.6	
		1.5	1.3	1.1	0.9	0.8	0.6	0.3	0.1	1.3	2.7	4.0	5.3	6.4	7.2	7.6	7.5	6.9	5.8	4.5	3.6	3.0	2.3	1.9	1.4	Diurnal Average	
		11.1	10.6	10.2	10.1	10.1	9.9	9.8	8.8	10.2	13.2	16.6	18.8	20.4	21.4	21.8	21.6	21.1	18.5	17.2	15.8	14.8	13.6	12.9	12.2	Diurnal Maximum	
M - Maintenance																											





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ambient Temperature (AT) - C
Leismer - October 2023

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	271	36.52	36.52
0 - 10	315	42.45	78.98
10 - 20	145	19.54	98.52
> 20	11	1.48	100.00

Total Number of Valid Hours: 742

Total Number of Hours: 744



Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

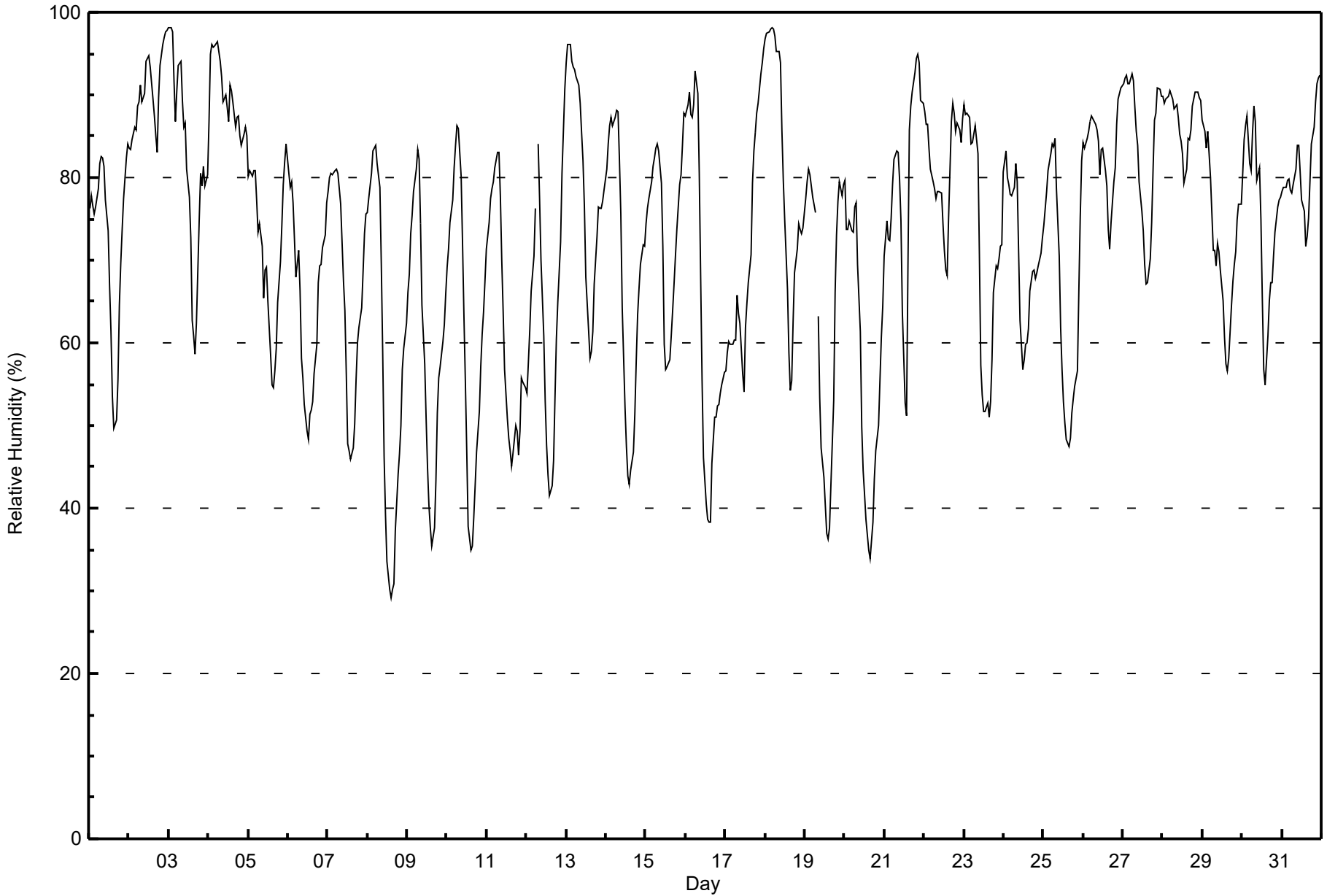
Leismer - October 2023

Maximum Value: 98.1 % on Oct 3 02:00 Maximum Daily Average: 90.2 % on Oct 2																						Hours in Service:	744																								
Minimum Value: 29.1 % on Oct 8 15:00 Minimum Daily Average: 57.0 % on Oct 8																						Hours of Data:	742																								
Maximum Diurnal Average: 83.4 % at hour 8 Minimum Diurnal Average: 56.2 % at hour 15																						Hours of Missing Data:	2																								
Monthly Average: 72.64 % Percentiles: P ₁ = 35.1 P ₁₀ = 50.0 Q ₁ = 61.4 Median = 76.3 Q ₃ = 84.5 P ₉₀ = 90.2 P ₉₉ = 97.6																						Hours of Calibration:	0																								
																						Percent Operational Time:	99.7																								
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																							
1-Oct	76.3	77.8	76.7	75.5	76.4	78.6	81.7	82.5	82.4	81.4	77.3	73.6	66.9	61.4	53.5	49.7	50.7	55.6	64.5	69.7	73.8	77.5	82.4	84.1	72.1	84.1																					
2-Oct	83.5	83.4	84.5	86.1	85.7	88.6	89.2	91.2	89.1	90.2	94.1	94.4	94.7	93.5	89.5	87.5	85.2	83.1	89.7	93.5	96.1	97.0	97.6	97.9	90.2	97.9																					
3-Oct	98.1	98.1	97.6	91.7	86.9	90.5	93.6	94.0	89.4	86.0	86.6	81.0	77.7	72.6	62.7	60.8	58.7	62.4	74.9	80.5	78.9	81.4	79.0	80.4	81.8	98.1																					
4-Oct	86.7	94.9	96.1	95.7	96.0	96.4	95.3	94.1	92.2	89.1	90.0	88.4	86.8	91.3	90.6	89.1	86.0	87.3	87.4	85.0	83.8	85.2	86.1	85.1	89.9	96.4																					
5-Oct	80.3	80.9	80.2	80.8	80.9	77.4	73.4	74.4	71.6	65.5	68.8	69.2	65.1	58.5	54.9	54.5	56.6	59.4	64.9	69.8	74.3	79.1	81.8	84.1	71.1	84.1																					
6-Oct	80.4	78.8	79.6	76.9	72.6	68.0	71.2	66.3	58.1	55.7	52.6	49.4	48.3	51.4	51.8	52.8	56.3	59.9	67.3	69.3	69.5	71.5	73.1	77.0	64.9	80.4																					
7-Oct	78.4	80.0	80.5	80.4	80.9	81.1	80.4	78.7	76.8	67.4	63.9	56.3	47.8	47.0	45.9	47.4	50.2	55.6	60.0	61.8	64.3	68.7	73.2	75.7	66.8	81.1																					
8-Oct	75.8	77.4	80.5	83.2	83.6	83.8	81.7	78.8	69.4	58.8	46.3	39.1	33.5	30.1	29.1	30.2	30.9	37.3	44.1	46.7	49.9	56.8	59.4	62.3	57.0	83.8																					
9-Oct	66.1	68.2	73.3	75.5	78.4	81.0	83.5	82.2	74.4	64.6	57.4	50.8	44.9	40.3	37.6	35.5	37.6	43.4	51.6	55.7	57.2	60.2	62.1	66.0	60.3	83.5																					
10-Oct	69.1	71.4	74.6	77.3	81.2	83.9	86.3	85.9	80.2	72.0	63.2	55.4	47.0	37.9	34.9	35.4	38.8	42.6	46.8	51.7	57.1	61.1	63.7	67.5	61.9	86.3																					
11-Oct	71.4	74.5	77.5	78.6	79.5	81.2	83.1	83.1	77.8	70.1	63.6	56.8	50.8	48.6	46.9	45.1	46.5	50.0	49.3	46.5	49.3	55.8	55.2	54.6	62.3	83.1																					
12-Oct	53.9	57.6	61.6	66.2	70.5	76.2	M	84.0	77.4	70.0	60.9	53.1	47.6	44.0	41.6	42.6	45.8	53.3	60.5	65.0	72.2	80.4	85.6	90.7	63.5	90.7																					
13-Oct	93.9	96.2	96.1	94.0	93.4	93.1	92.3	91.3	88.9	85.4	82.1	76.4	67.9	61.5	58.1	58.9	61.4	67.1	72.9	76.4	76.3	76.3	77.1	78.5	79.8	96.2																					
14-Oct	81.0	84.0	86.3	87.2	86.3	87.4	88.2	88.0	82.1	75.6	64.2	52.3	47.5	43.9	42.9	44.5	46.7	51.3	57.8	63.3	66.7	69.5	71.9	71.7	68.3	88.2																					
15-Oct	74.4	76.2	77.5	79.4	81.3	82.3	83.6	84.1	83.2	79.3	71.7	59.9	56.8	57.2	57.9	60.8	63.8	67.1	70.5	73.7	79.1	80.3	83.9	87.7	73.8	87.7																					
16-Oct	87.4	88.8	90.4	87.6	87.3	88.7	93.0	90.2	80.5	68.0	55.6	46.1	40.5	38.7	38.4	38.3	45.4	51.1	51.0	52.3	52.6	53.9	54.9	56.5	64.0	93.0																					
17-Oct	56.5	58.9	60.1	59.9	59.8	60.4	60.3	65.8	63.6	62.4	56.3	54.1	61.9	64.8	67.4	70.6	79.3	83.2	85.3	87.7	89.1	92.5	93.8	95.6	70.4	95.6																					
18-Oct	96.8	97.4	97.7	97.9	98.1	98.0	97.2	95.3	95.3	94.0	85.7	79.7	75.0	66.4	58.8	54.2	55.5	62.5	68.5	71.4	74.4	73.8	73.2	73.9	80.9	98.1																					
19-Oct	77.4	79.5	81.1	80.3	78.9	77.7	75.7	M	63.2	53.4	47.3	43.8	40.4	36.9	36.2	37.7	42.9	53.0	66.1	73.1	77.2	79.5	77.8	79.1	63.4	81.1																					
20-Oct	79.7	73.7	73.8	74.8	73.5	73.4	76.4	77.0	69.6	61.4	49.8	44.6	41.7	38.7	34.9	33.8	36.1	38.4	43.6	46.9	50.1	55.5	60.7	64.4	57.2	79.7																					
21-Oct	70.5	74.8	72.6	72.4	75.0	79.1	82.2	83.3	83.1	79.9	74.8	63.8	52.6	51.2	69.3	85.8	88.6	90.3	92.7	94.4	94.9	93.9	89.4	88.9	79.3	94.9																					
22-Oct	88.0	86.5	86.5	83.5	81.0	79.5	78.6	77.5	78.3	78.4	78.1	74.5	71.2	68.9	68.1	75.2	86.8	89.0	87.8	85.7	86.7	85.7	84.3	87.1	81.1	89.0																					
23-Oct	88.8	87.6	87.8	87.2	84.0	84.3	85.2	86.3	82.8	70.7	57.3	53.7	51.7	51.8	52.7	51.0	53.0	58.0	66.2	69.3	68.9	70.1	71.8	71.9	70.5	88.8																					
24-Oct	80.7	83.2	80.0	79.2	78.0	77.8	78.8	81.7	79.4	71.0	62.8	56.8	57.9	59.8	60.0	61.7	66.3	68.6	68.7	67.7	68.5	69.4	70.9	72.8	70.9	83.2																					
25-Oct	74.2	76.3	78.2	80.8	82.8	84.0	83.8	84.7	78.7	70.6	61.8	56.7	52.9	50.3	48.4	47.5	48.5	51.5	53.2	54.7	56.6	66.2	75.2	82.0	66.6	84.7																					
26-Oct	84.3	83.6	84.8	85.6	86.9	87.4	87.1	86.5	85.8	84.5	80.3	83.4	83.6	80.9	79.0	73.7	71.4	74.5	79.6	81.2	86.5	89.5	90.2	90.9	83.4	90.9																					
27-Oct	91.4	92.0	92.3	91.3	91.3	92.5	91.7	88.5	85.5	83.8	79.4	75.9	73.5	69.5	67.1	67.3	70.1	74.6	81.0	87.0	87.8	90.9	90.6	89.9	83.5	92.5																					
28-Oct	89.8	89.1	89.5	89.8	90.5	90.1	89.5	88.4	88.8	87.4	85.3	84.5	82.8	79.4	81.0	84.8	84.7	85.7	88.7	90.3	90.4	90.4	89.6	89.3	87.5	90.5																					
29-Oct	86.9	85.7	83.6	85.5	82.9	79.9	71.1	71.2	69.3	72.0	71.0	68.9	65.2	60.6	57.5	56.6	58.1	64.5	67.4	69.4	71.0	74.9	76.8	76.8	72.0	86.9																					
30-Oct	80.5	84.7	86.3	87.5	81.7	80.8	85.5	88.7	86.8	79.7	81.2	75.0	65.3	56.8	55.0	60.8	65.0	67.3	67.4	70.5	73.3	76.4	77.3	77.6	75.5	88.7																					
31-Oct	78.4	78.7	78.9	79.7	79.8	78.4	78.1	79.2	81.0	83.9	83.8	80.6	77.3	76.0	71.6	72.9	75.2	79.4	84.0	86.1	89.2	91.4	92.1	92.3	81.2	92.3																					
																						80.0	81.3	82.1	82.3	82.1	82.6	83.2	83.4	79.5	74.6	69.5	64.5	60.5	57.7	56.2	57.0	59.4	63.5	68.2	70.9	73.1	76.0	77.4	79.1	Diurnal Average	
																						98.1	98.1	97.7	97.9	98.1	98.0	97.2	95.3	95.3	94.0	94.1	94.4	94.7	93.5	90.6	89.1	88.6	90.3	92.7	94.4	96.1	97.0	97.6	97.9	Diurnal Maximum	
M - Maintenance																																															



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Leismer - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Leismer - October 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	25	3.37	3.37
40 - 60	146	19.68	23.05
60 - 80	284	38.27	61.32
80 - 100	287	38.68	100.00

Total Number of Valid Hours: 742

Total Number of Hours: 744



Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Leismer - October 2023

Maximum Speed: 32 km/h on Oct 4 19:00	Maximum Daily Speed Average: 20.8 km/h on Oct 5	Hours in Service: 744
Minimum Speed Value: 0 km/h on Oct 21 01:00	Minimum Daily Speed Average: 1.3 km/h on Oct 21	Hours of Data: 742
Maximum Diurnal Speed Average: 5.7 km/h at hour 13	Minimum Diurnal Speed Average: 1.1 km/h at hour 2	Hours of Missing Data: 2
Monthly Average Velocity: 2.8 km/h 265.8 deg	Percentiles: P ₁ = 2 P ₁₀ = 4 Q ₁ = 7 Median = 10 Q ₃ = 14 P ₉₀ = 19 P ₉₉ = 29	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-Oct	SE6	SE7	SE5	SE5	SE7	SE6	SE7	SE7	SE7	SSE9	SSE10	S10	S13	S11	S14	S13	S12	S8	SSE8	SSE10	SSE10	SSE10	SSE9	SSE8	SSE8.4	S14	
2-Oct	S10	S10	S9	S8	S9	S9	SSE13	S10	S9	SSW10	SSW12	SSW11	SSW10	SSW9	SSW9	SSW8	SSW7	SW4	SW2	SW2	WSW1	S2	SSE3	S2	SSW7.2	SSE13	
3-Oct	W3	W4	WNW7	WNW11	WNW14	WNW8	WNW9	WNW12	WNW13	WNW21	WNW14	WNW16	WNW15	WNW14	WNW12	WNW11	WNW6	SW3	SSW3	SSE3	S2	SSE4	S5	SSW4	WNW7.8	WNW21	
4-Oct	WNW5	S3	SW3	W5	W5	WNW9	WNW15	NW16	NW21	NW22	NW23	NW23	NW27	NW26	NW27	NW25	NW28	NW31	NW32	NW31	NW28	NW26	NW24	NW23	NW19.4	NW32	
5-Oct	NW31	NW32	NW29	NW29	NW28	NW28	NW25	NW26	NW27	NW31	NW29	NW28	NW27	NW26	NW27	NW23	NW18	NW18	NW11	WNW8	W3	SE2	S2	WSW3	NW20.8	NW32	
6-Oct	W3	WSW2	SSE4	S5	S5	S7	S8	SSW8	SSW11	SSW9	SSW9	SSW9	SW11	SW11	SW12	SSW12	SSW9	SSW7	SW2	WNW7	WNW8	W7	W9	W7	SW6.3	SW12	
7-Oct	WNW8	W6	W5	WNW6	WNW5	WNW7	WNW7	NW4	NW7	WNW7	WNW3	SE5	SSE3	SSE5	SE7	ESE9	ESE10	ESE8	ESE10	E11	ESE10	ESE9	ESE8	ESE9	SE1.6	ESE11	
8-Oct	ESE9	ESE9	ESE8	ESE9	E8	ESE10	ESE11	SE8	SE10	SSE15	SSE20	SSE19	SSE21	SSE24	S20	SSE18	S14	S7	SE9	SE9	SE11	SE10	SE9	SE10	SSE11.4	SSE24	
9-Oct	SE8	SE9	SE7	SE8	SE8	SE7	ESE7	ESE8	ESE8	SE10	SE12	SE13	SE14	SE15	SE14	SSE15	SE12	SE12	SSE9	SE9	SE9	SE10	ESE10	ESE10	SE10.0	SSE15	
10-Oct	E10	E10	E9	E11	E11	E11	E11	E10	ESE12	ESE13	SE14	SE16	SE17	SE21	SE22	SSE24	SSE19	SE13	SE11	ESE11	ESE12	ESE12	ESE12	ESE11	ESE12.6	SSE24	
11-Oct	ESE11	ESE13	ESE13	ESE12	E11	E8	ESE12	ESE14	ESE14	ESE15	ESE15	ESE13	ESE15	ESE17	ESE17	ESE17	SE16	SE12	SE10	SE11	ESE10	ESE10	SE9	SE9	ESE12.4	ESE17	
12-Oct	ESE10	ESE9	E8	E9	E9	E8	M	ESE5	SSE7	SSE10	SSE12	SSE16	S17	S16	S12	SSE12	SSE11	SSE6	SSE7	SSE6	SSE9	S6	S5	S6	SSE8.2	S17	
13-Oct	SSW7	SSW9	SSW10	SSW10	S9	S9	S8	SSE11	SSE13	SSE12	SSE16	SSE14	SSE14	SSE15	SSE15	SSE15	SSE13	ESE9	ESE10	SE8	SE9	SE10	SE10	SE10	SSE10.0	SSE16	
14-Oct	ESE11	SE12	ESE13	SE13	SE14	SE12	SE13	SE11	SE12	SE12	SSE18	SSE24	SSE23	SSE24	SSE23	SSE22	SSE17	SSE15	SSE12	SSE14	SE12	SSE12	SE10	SE11	SE14.6	SSE24	
15-Oct	SE10	SE9	ESE9	ESE8	ESE8	SE8	ESE7	SE7	SE6	SSE6	SSE10	S10	S9	S9	S8	SSW6	SSW5	SSW4	SSW4	SSW5	W3	WSW3	SW3	SW3	SSE5.6	S10	
16-Oct	WSW4	WSW4	SW4	W4	W5	W6	WSW3	W4	W5	WSW4	W4	W7	W11	WNW12	SW6	S7	S6	SSE6	ESE5	SE7	SE7	ESE6	ESE5	ESE8	SW2.4	WNW12	
17-Oct	E10	E11	E10	E9	E9	ESE5	E7	NNE5	NE3	SSE2	NW11	NW9	WNW14	WNW18	WNW19	WNW16	WNW13	W9	W5	W5	WSW3	S2	SSE5	SSE7	NW2.3	WNW19	
18-Oct	S5	SSW7	SSW8	S8	S8	S10	S8	S8	SSE9	S7	SSW11	SSW12	SSW10	SSW11	SSW11	WSW8	SW7	SW8	SW10	WSW6	SW4	WSW3	W6	WSW5	SSW7.1	SSW12	
19-Oct	W5	W4	WNW6	W5	WSW4	WSW4	WSW4	M	W10	W17	W22	W20	W18	W15	WSW12	W11	WSW4	WSW8	WSW7	WSW6	WSW9	W11	WNW20	W10	W9.9	W22	
20-Oct	W17	W16	W14	W17	WNW19	WNW14	WNW13	WNW15	WNW18	WNW23	WNW25	WNW28	WNW31	WNW28	NW28	NW26	NW21	NW14	NW13	NW10	NNW9	NNW7	N5	ENE1	WNW16.3	WNW31	
21-Oct	E0	ESE7	ESE7	ESE7	SE7	SE7	SSE5	SSE5	SSE7	SSE5	SSE6	S8	SSW11	SSW9	SW5	SW2	WNW4	WNW6	N12	N15	N22	N18	N16	N17	NE1.3	N22	
22-Oct	N16	N17	N13	N10	NNE8	NE7	NNE8	ENE7	E8	E9	ESE8	E9	ESE7	ENE7	ENE8	NE8	NE5	NE6	NNE9	NNE9	N8	N11	N9	NNW6	NNE7.1	N17	
23-Oct	NW7	NNW9	NNW9	NNW9	NNW9	NNW9	NNW7	NW3	WNW6	NW10	NW16	NW17	NW20	WNW21	WNW22	WNW19	WNW17	WNW12	W11	WNW14	W13	WNW13	W11	W10	WNW11.5	WNW22	
24-Oct	WSW5	WSW4	W9	WNW12	WNW13	WNW13	W13	WSW6	W9	WNW16	WNW18	WNW23	WNW22	NW19	WNW21	WNW19	NW21	NW19	NW17	WNW14	WNW13	WNW14	WNW14	W11	WNW13.8	WNW23	
25-Oct	W9	W9	W8	W7	W8	W7	WSW3	S2	W6	WSW7	WSW8	W12	W16	WNW19	NW19	WNW17	WNW12	W12	W10	W10	WNW14	WNW17	WNW12	W10	W10.5	NW19	
26-Oct	W9	WNW14	WNW15	NW18	NW18	NW16	NW16	WNW18	WNW15	WNW16	NW17	NW19	WNW16	WNW13	WNW13	NW14	WNW12	W8	W7	W3	W6	W7	W8	W9	WNW12.3	NW19	
27-Oct	W7	W8	W9	WNW12	W11	WNW10	NW13	N14	N14	N10	N14	N14	NNW14	N13	NNW14	NW13	NNW12	NW7	WNW4	SSW3	S3	SW1	SSW2	WSW2	NW7.3	N14	
28-Oct	WSW3	SW2	SSE2	S3	WSW4	WNW9	WNW12	NW15	NW15	NW15	NW19	NNW20	NNW19	NNW17	NW19	NW16	NW15	WNW15	WNW14	WNW15	WNW17	WNW16	WNW15	WNW15	NW11.8	NNW20	
29-Oct	WNW16	WNW16	WNW14	WNW15	WNW13	WNW15	NW17	NW14	NW19	WNW14	WNW15	WNW16	WNW16	WNW16	WNW17	WNW16	WNW11	WNW9	W12	WNW11	WNW10	WNW6	NNW9	NNW10	WNW13.1	NW19	
30-Oct	N10	NNE6	N6	NNE9	NNE5	NNE4	NE3	NNE1	S0	S4	S9	S9	S10	SSW11	S11	S10	SSW9	S9	SSW9	SSW9	SSW9	SSW9	SSW9	SW8	SW8	S3.7	S11
31-Oct	SSW6	SSW6	SW5	SW5	W6	WNW12	NW17	NW20	NW16	NW16	NW16	NNW18	NW19	NNW18	NNW17	NNW12	NNW8	WNW5	WNW3	WNW5	WNW4	WNW4	WNW4	SSW2	NW8.5	NW20	

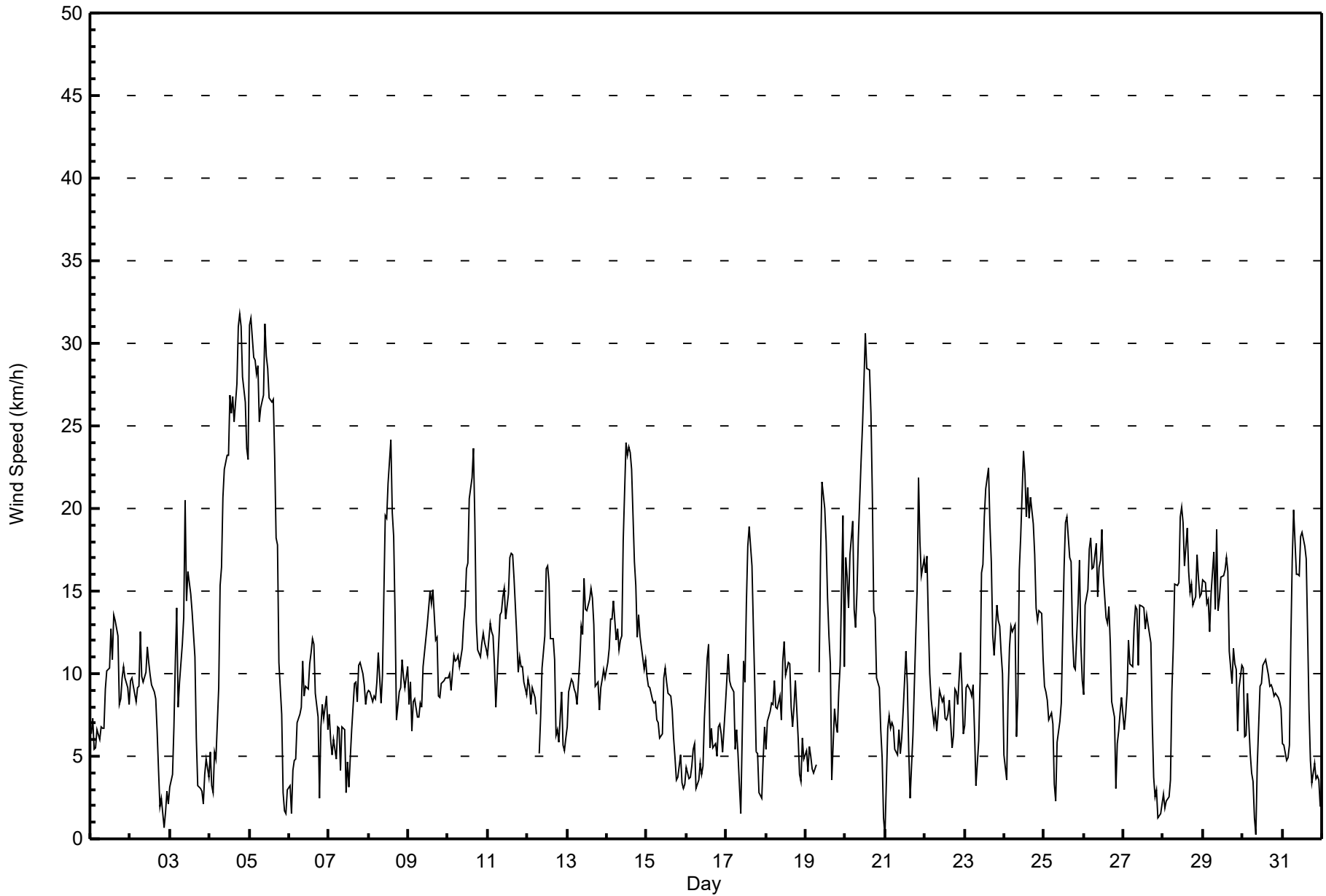
W1.5	WSW1.1	W1.2	WNW1.5	WNW1.7	W2.1	WNW2.3	WNW2.0	WNW2.6	W3.7	W4.3	W4.9	W5.7	WSW5.3	W5.4	WSW4.4	W3.9	WSW3.5	W2.5	W2.1	W1.8	W1.8	W2.0	WSW1.5	Diurnal Average
NW31	NW32	NW29	NW29	NW28	NW29	NW25	NW26	NW27	NW31	NW29	NW28	WNW31	WNW28	NW28	NW26	NW28	NW31	NW32	NW31	NW28	NW26	NW24	NW23	Diurnal Maximum

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Leismer - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Leismer - October 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	123	16.58	16.58
6 - 11	333	44.88	61.46
12 - 19	220	29.65	91.11
20 - 28	55	7.41	98.52
29 - 38	11	1.48	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
Leismer - October 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	4	3	1	1	4	4	12	15	10	15	22	18	11	2	0	123
6 - 11	7	6	3	3	23	45	45	26	35	37	8	9	40	26	8	12	333
12 - 19	13	0	0	0	0	20	20	24	8	3	1	1	11	76	34	9	220
20 - 28	1	0	0	0	0	0	2	9	1	0	0	0	2	11	28	1	55
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	1	10	0	11
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	22	10	6	4	24	69	71	71	59	50	24	32	71	125	82	22	742

Total Number of Valid Hours: 742

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Leismer - October 2023

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



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Leismer - October 2023

Direction of Maximum Speed: 306 deg on Oct 4 19:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 315.3 deg on Oct 5	Hours of Data: 742
Direction of Minimum Speed: 98 deg on Oct 21 01:00	Hours of Missing Data: 2
Direction of Minimum Daily Speed Average: 1.3 deg on Oct 21	Percent Operational Time: 99.7
Monthly Average Direction: 265.8 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-Oct	141	144	139	126	125	130	133	135	136	151	166	191	170	174	182	185	186	180	157	151	153	158	165	166	160.6
2-Oct	176	185	178	179	190	180	168	187	191	194	193	204	206	205	204	200	212	228	218	216	241	170	164	175	191.4
3-Oct	271	274	283	289	301	289	284	283	284	295	291	295	293	287	283	292	282	235	197	168	178	160	178	211	282.5
4-Oct	285	184	218	273	270	289	297	306	307	314	319	318	314	315	314	313	306	309	306	313	310	306	308	313	308.6
5-Oct	316	313	312	315	316	310	322	311	322	321	312	317	319	315	321	325	321	317	307	292	277	146	169	247	315.3
6-Oct	275	258	164	184	184	174	191	193	208	211	211	210	217	219	222	212	205	208	214	289	287	278	280	271	220.9
7-Oct	286	279	280	285	296	293	302	311	314	286	293	137	167	147	142	117	116	116	107	101	108	113	109	110	123.8
8-Oct	118	120	111	105	100	110	117	126	139	155	164	164	165	166	179	168	182	169	143	132	132	134	124	137	147.2
9-Oct	128	127	131	124	124	125	116	112	119	143	145	133	124	135	136	148	142	143	149	135	124	126	117	107	131.1
10-Oct	95	97	94	97	96	97	97	94	105	116	127	126	126	145	143	153	155	141	131	117	120	118	111	119	122.3
11-Oct	117	108	107	104	101	85	102	102	109	119	113	119	119	123	117	122	126	131	132	136	122	123	137	126	116.9
12-Oct	116	110	101	100	99	101	M	110	150	161	167	166	170	178	181	168	166	160	152	157	153	174	189	173	151.9
13-Oct	199	204	207	200	185	178	174	165	167	166	157	158	147	149	152	147	148	123	122	128	129	129	131	126	156.3
14-Oct	122	127	117	124	133	128	134	126	126	131	150	164	164	160	159	152	155	151	151	148	146	147	141	137	144.6
15-Oct	129	126	114	114	121	124	114	136	141	148	164	175	171	172	178	189	194	212	209	202	202	268	247	236	157.8
16-Oct	255	256	231	274	273	276	255	262	266	256	272	278	273	291	232	177	174	148	117	139	135	108	114	110	227.4
17-Oct	91	88	86	92	85	104	88	28	35	159	317	309	288	295	302	289	284	277	273	268	251	191	153	155	312.9
18-Oct	178	212	208	187	177	171	173	176	165	175	204	207	204	199	200	240	227	214	216	239	227	241	261	254	203.1
19-Oct	271	278	284	275	250	248	248	M	262	273	278	276	269	265	258	263	258	253	250	255	250	266	283	270	267.5
20-Oct	279	277	276	280	288	283	282	285	286	290	289	289	295	302	309	314	316	315	310	326	348	336	353	73	297.3
21-Oct	98	114	114	119	130	141	166	160	151	151	167	186	196	201	220	235	286	290	359	5	3	4	2	359	37.7
22-Oct	4	10	3	8	29	38	33	64	100	96	111	98	108	63	58	45	53	37	22	14	3	356	354	345	33.2
23-Oct	325	333	339	332	334	339	337	320	295	309	318	321	306	293	289	292	303	285	281	285	280	283	272	268	302.1
24-Oct	240	239	274	294	285	282	281	258	269	284	288	296	294	310	297	299	320	319	321	291	283	284	283	281	292.8
25-Oct	280	277	274	271	270	267	249	188	261	254	247	274	281	284	305	284	288	281	280	277	285	301	286	275	280.2
26-Oct	273	289	299	318	317	318	311	299	291	300	316	307	289	283	295	304	293	275	277	259	270	270	276	277	297.4
27-Oct	272	274	279	286	280	284	316	352	1	357	4	3	346	356	337	326	329	314	300	205	191	220	212	258	324.9
28-Oct	242	218	164	178	257	282	296	323	323	323	320	329	333	339	322	320	314	294	285	287	290	290	286	286	307.3
29-Oct	288	287	288	286	283	285	314	305	320	295	300	291	284	292	298	299	282	282	281	282	301	300	337	341	296.2
30-Oct	7	24	11	28	24	33	47	31	185	180	169	180	189	192	187	190	195	187	194	202	208	206	217	218	189.8
31-Oct	213	204	229	219	267	290	311	319	321	322	319	329	325	337	332	346	335	293	295	289	296	284	294	210	312.8

270.1 253.0 269.6 286.5 282.1 275.7 294.1 300.0 282.9 271.2 263.7 264.3 260.2 258.6 262.9 257.5 259.1 257.6 262.5 260.2 261.8 265.8 264.3 241.9
 Diurnal Average

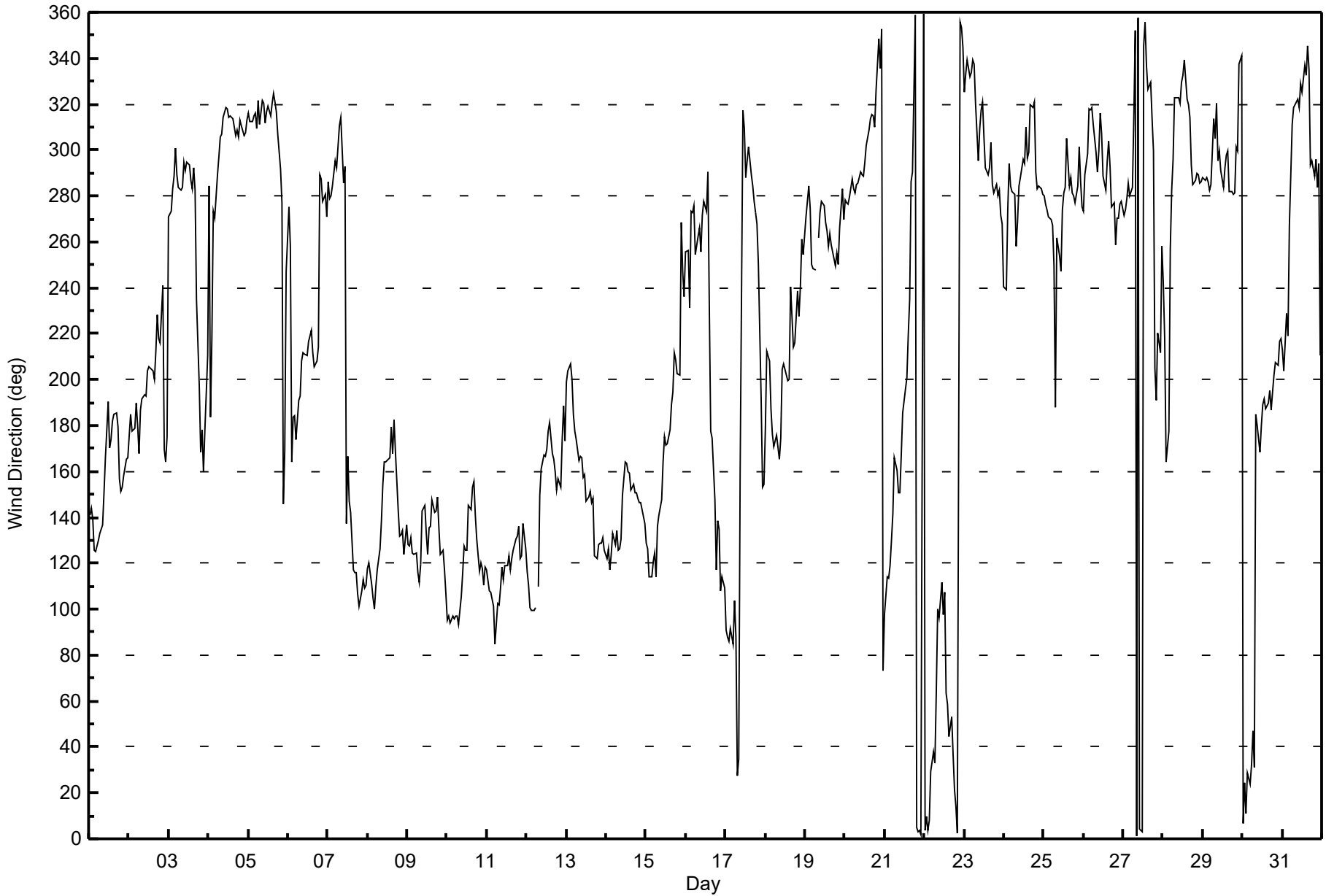
M - Maintenance

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Leismer - October 2023





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Leismer - October 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 91 deg on Oct 7 13:00											Hours in Service: 744 Hours of Data: 742 Hours of Missing Data: 2 Hours of Calibration: 0 Percent Operational Time: 99.7														
Minimum Value: 6 deg on Oct 23 05:00																									
Percentiles: P ₁ = 8 P ₁₀ = 11 Q ₁ = 13 Median = 16 Q ₃ = 21 P ₉₀ = 31 P ₉₉ = 67																									
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-Oct	14	13	16	13	14	14	14	14	16	18	20	26	20	23	24	20	21	15	11	7	8	9	11	12	26
2-Oct	15	17	16	16	17	17	14	18	17	17	19	21	21	22	22	20	24	28	29	45	57	25	22	43	57
3-Oct	28	17	13	26	19	31	12	11	14	11	13	14	18	17	18	20	22	32	16	28	27	17	16	35	35
4-Oct	45	13	46	26	23	25	15	16	14	13	11	11	12	12	12	12	12	12	13	12	12	13	14	13	46
5-Oct	11	12	12	11	12	15	12	14	13	13	14	12	12	16	13	15	13	13	15	11	76	53	65	27	76
6-Oct	22	44	13	15	16	12	13	17	19	22	22	28	28	29	30	22	18	17	28	17	10	12	13	19	44
7-Oct	26	24	16	11	19	8	21	45	34	23	59	43	91	38	24	22	15	11	11	12	13	14	16	13	91
8-Oct	15	13	13	14	16	14	14	14	15	12	15	16	16	16	19	15	17	21	9	13	14	12	13	12	21
9-Oct	15	14	12	13	13	13	11	10	17	16	16	20	19	19	20	16	13	11	13	11	13	13	14	14	20
10-Oct	15	14	15	14	14	14	13	15	18	17	19	19	19	16	15	14	12	15	15	14	16	15	13	15	19
11-Oct	14	11	12	14	14	20	15	14	16	17	16	19	21	20	19	19	18	16	16	14	15	15	14	16	21
12-Oct	12	11	14	13	14	14	M	15	19	14	17	17	21	22	26	18	16	11	7	11	9	12	11	23	26
13-Oct	17	18	19	19	19	17	17	15	16	17	13	17	24	20	19	19	13	16	15	14	15	15	15	15	24
14-Oct	14	15	15	15	14	15	15	16	16	17	15	15	18	15	14	14	11	10	10	11	10	11	10	11	18
15-Oct	14	14	12	12	12	14	15	12	12	18	19	23	24	21	21	21	15	20	17	16	14	42	26	29	42
16-Oct	28	28	27	36	17	18	41	42	25	32	46	40	31	19	52	32	15	8	12	10	16	12	21	12	52
17-Oct	16	15	17	18	20	28	22	21	73	85	55	29	13	14	15	15	10	14	29	16	35	27	21	11	85
18-Oct	30	23	17	21	16	15	16	15	15	19	20	20	21	25	22	34	28	22	24	33	30	39	34	41	41
19-Oct	34	30	16	33	37	41	35	M	31	20	18	19	26	28	31	25	35	35	37	33	33	27	15	23	41
20-Oct	13	15	15	13	10	12	11	10	11	11	12	13	12	15	13	14	11	13	13	20	14	14	8	67	67
21-Oct	87	11	14	11	11	14	15	18	13	16	16	20	19	28	25	40	26	43	74	18	19	19	18	18	87
22-Oct	19	20	19	18	26	19	22	32	27	33	30	28	36	33	36	25	26	18	18	16	15	15	14	11	36
23-Oct	10	7	6	6	6	6	10	23	21	25	14	15	17	14	11	15	18	13	9	10	12	12	13	21	25
24-Oct	35	47	19	16	9	11	11	21	28	12	12	14	12	17	14	17	11	11	11	16	13	11	11	12	47
25-Oct	12	13	13	14	17	20	68	52	29	32	34	26	17	14	17	14	10	11	11	13	13	14	14	10	68
26-Oct	15	13	14	12	11	13	16	17	13	16	13	16	14	15	21	20	19	11	14	38	21	14	15	14	38
27-Oct	20	15	13	13	13	13	12	24	16	17	19	20	18	19	18	11	11	28	51	42	23	55	50	45	55
28-Oct	35	50	16	22	27	14	19	9	9	10	11	12	13	16	11	11	17	13	11	9	9	12	10	10	50
29-Oct	10	10	11	10	11	11	13	19	11	18	19	17	14	19	14	16	9	11	13	14	11	16	14	19	19
30-Oct	21	18	15	17	32	21	27	59	77	29	20	26	24	24	23	17	17	16	16	16	18	17	24	24	77
31-Oct	21	18	30	21	24	16	14	10	11	12	11	12	15	14	17	14	20	28	35	26	21	20	27	61	61
											87 50 46 36 37 41 68 59 77 85 59 43 91 38 52 40 35 43 74 45 76 55 65 67														
Diurnal Maximum																									
M - Maintenance																									



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS505 SAWBONES BAY OCTOBER 2023

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

November 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - SAWBONES BAY (AMS505)
OCTOBER 2023

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

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	709	35	35	100	12.3	0	3.6	0
H2S (ppb) Average	708	36	36	100	1.6	0	0.3	0
NO2 (ppb) Average	708	36	36	100	14.5	0	5.9	-
NO (ppb) Average	708	36	36	100	9.7	-	2.6	-
NOX (ppb) Average	708	36	36	100	24.2	-	8.5	-
Temperature 2 m (C) Average	744	0	0	100	22.6	-	14.6	-
Relative Humidity (%) Average	707	0	37	95.03	99.8	-	91	-
Wind Speed 10 m (km/h) Average	744	0	0	100	28	-	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)
OCTOBER 2023

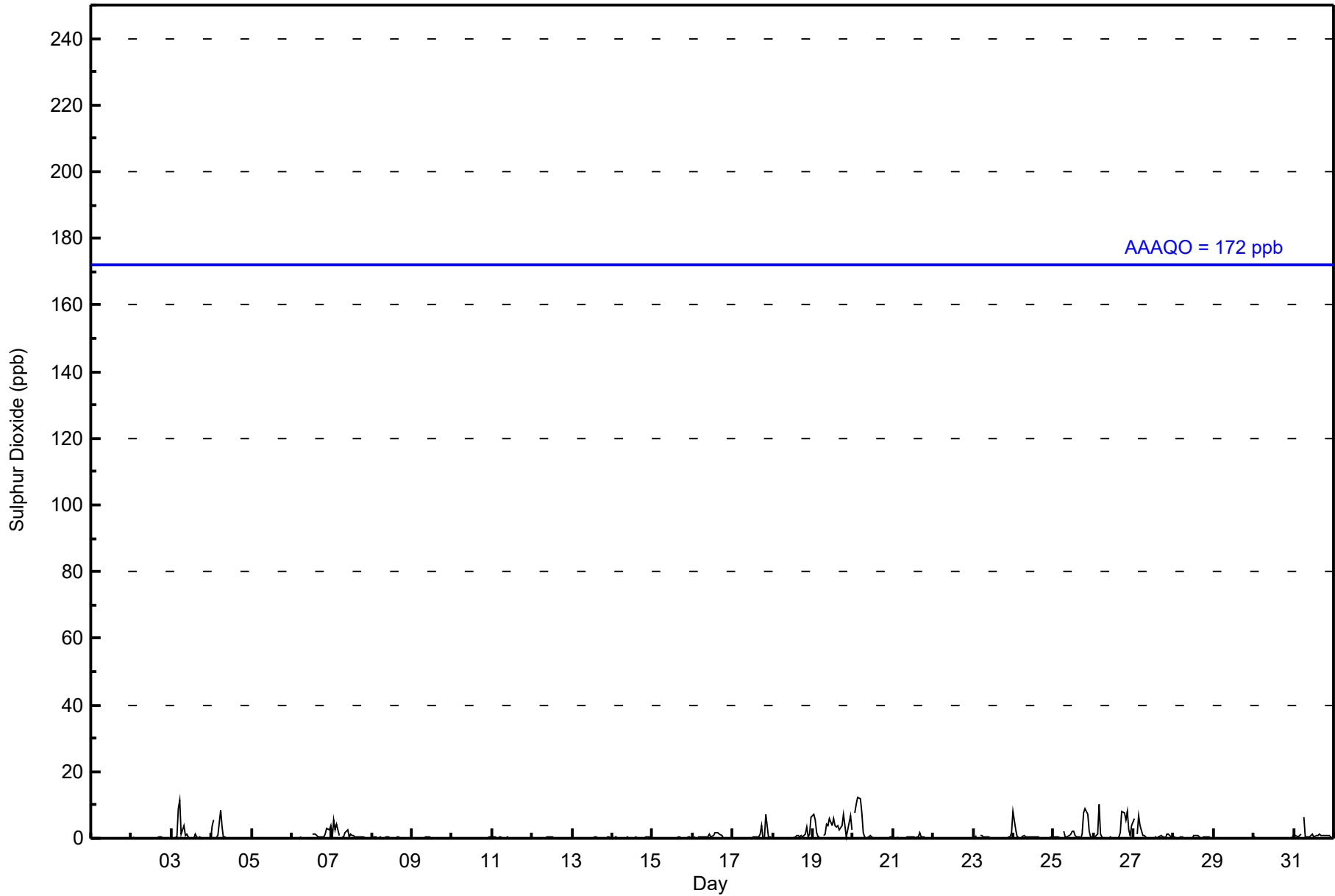
MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	709	0.7	1.7	-	0	0	0	0.2	0.4	1.4	12.3
H2S (ppb) Average	708	0.15	0.2	-	0	0	0.1	0.1	0.2	0.3	1.6
NO2 (ppb) Average	708	1.75	2.3	-	0	0	0.3	0.9	2.2	4.4	14.5
NO (ppb) Average	708	0.45	1.3	-	0	0	0	0	0.2	1.2	9.7
NOX (ppb) Average	708	2.2	3.5	-	0	0	0.3	1	2.5	5.4	24.2
Temperature 2 m (C) Average	744	3.81	8	-	-13	-7.2	-3.9	5.2	9.7	13.5	22.6
Relative Humidity (%) Average	707	71.63	15.9	-	31.9	48.5	61	73.1	84.6	92.7	99.8
Wind Speed 10 m (km/h) Average	744	11.8	5	-	0	6	8	12	15	18	28
Wind Direction 10 m (deg) Average	744	223.6	0	-	0	-	-	-	-	-	0

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - SAWBONES BAY (AMS505)
OCTOBER 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
Relative Humidity	02 Oct 2023 21:00	03 Oct 2023 07:00	11	Sensor operated out of range
Relative Humidity	04 Oct 2023 03:00	04 Oct 2023 10:00	8	Sensor operated out of range
Relative Humidity	13 Oct 2023 00:00	13 Oct 2023 03:00	4	Sensor operated out of range
Relative Humidity	16 Oct 2023 04:00	16 Oct 2023 07:00	4	Sensor operated out of range
Relative Humidity	18 Oct 2023 01:00	18 Oct 2023 08:00	8	Sensor operated out of range
Relative Humidity	21 Oct 2023 20:00	21 Oct 2023 21:00	2	Sensor operated out of range





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Sawbones Bay - October 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	706	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: 709

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Sawbones Bay - October 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	31	14	4	1	12	35	73	106	95	44	27	20	48	131	52	13	706
11 - 20	0	0	0	0	0	0	0	0	0	0	0	1	2	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	31	14	4	1	12	35	73	106	95	44	27	21	50	131	52	13	709

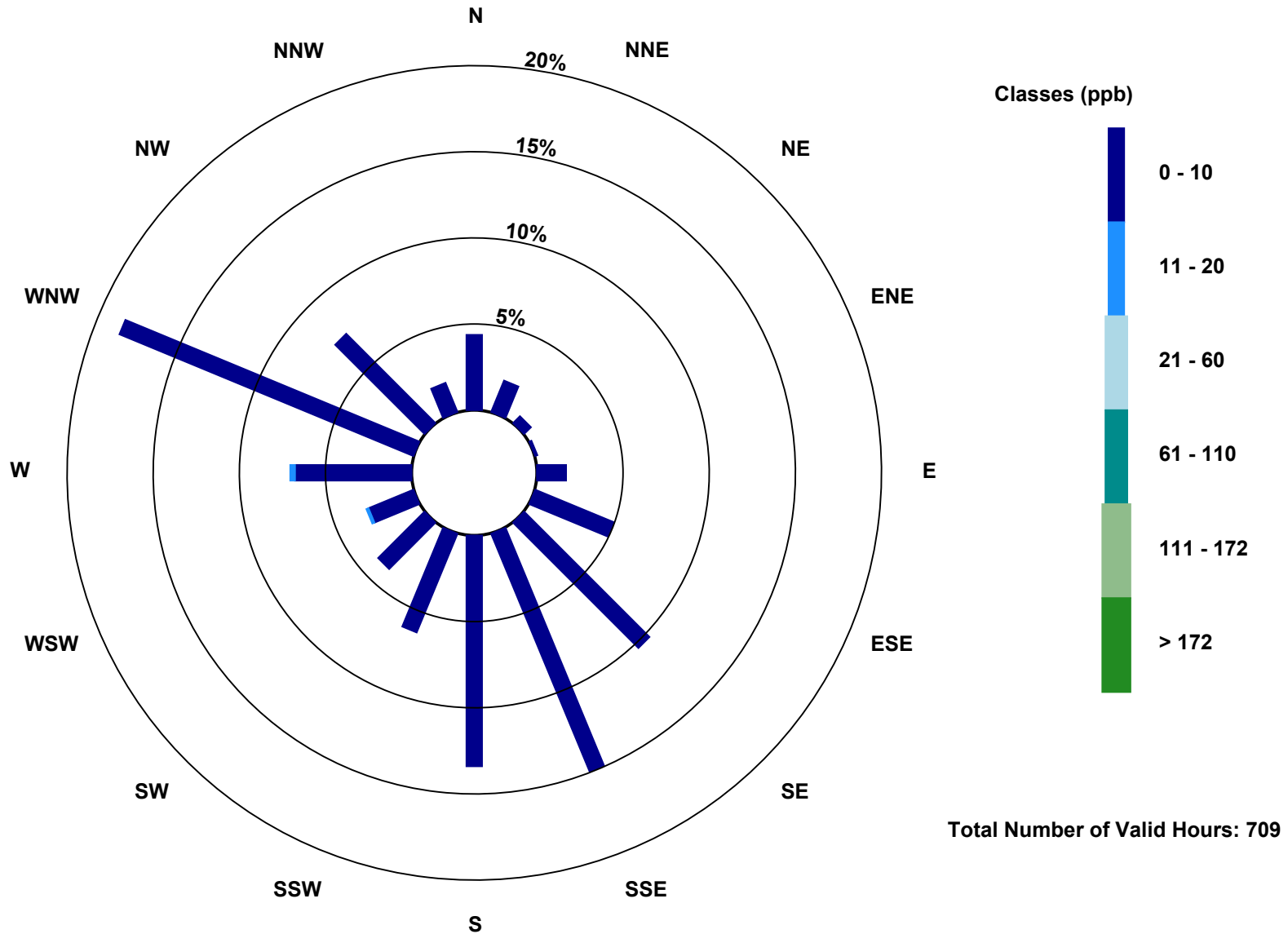
Total Number of Valid Hours: 709

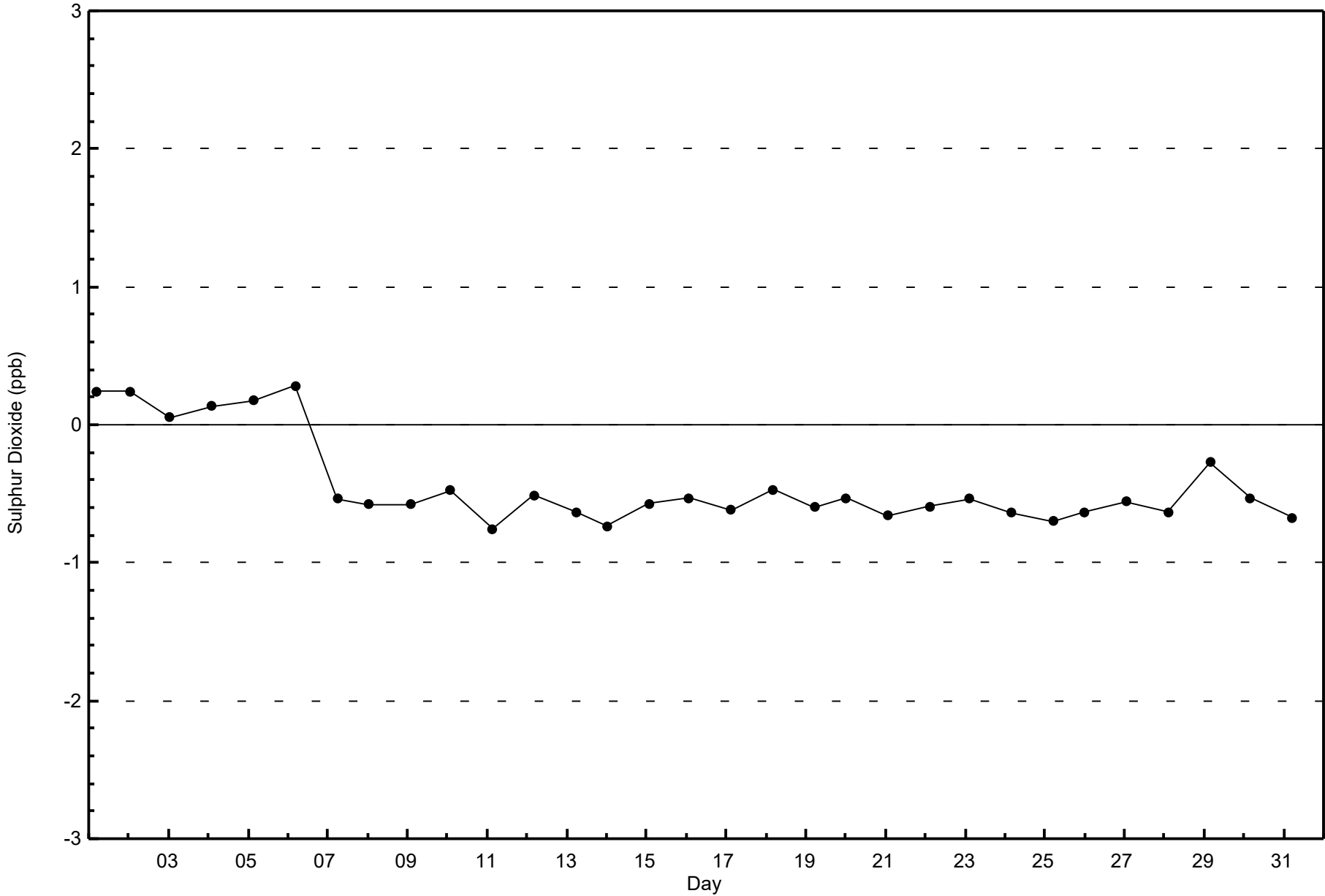
Total Number of Hours: 744

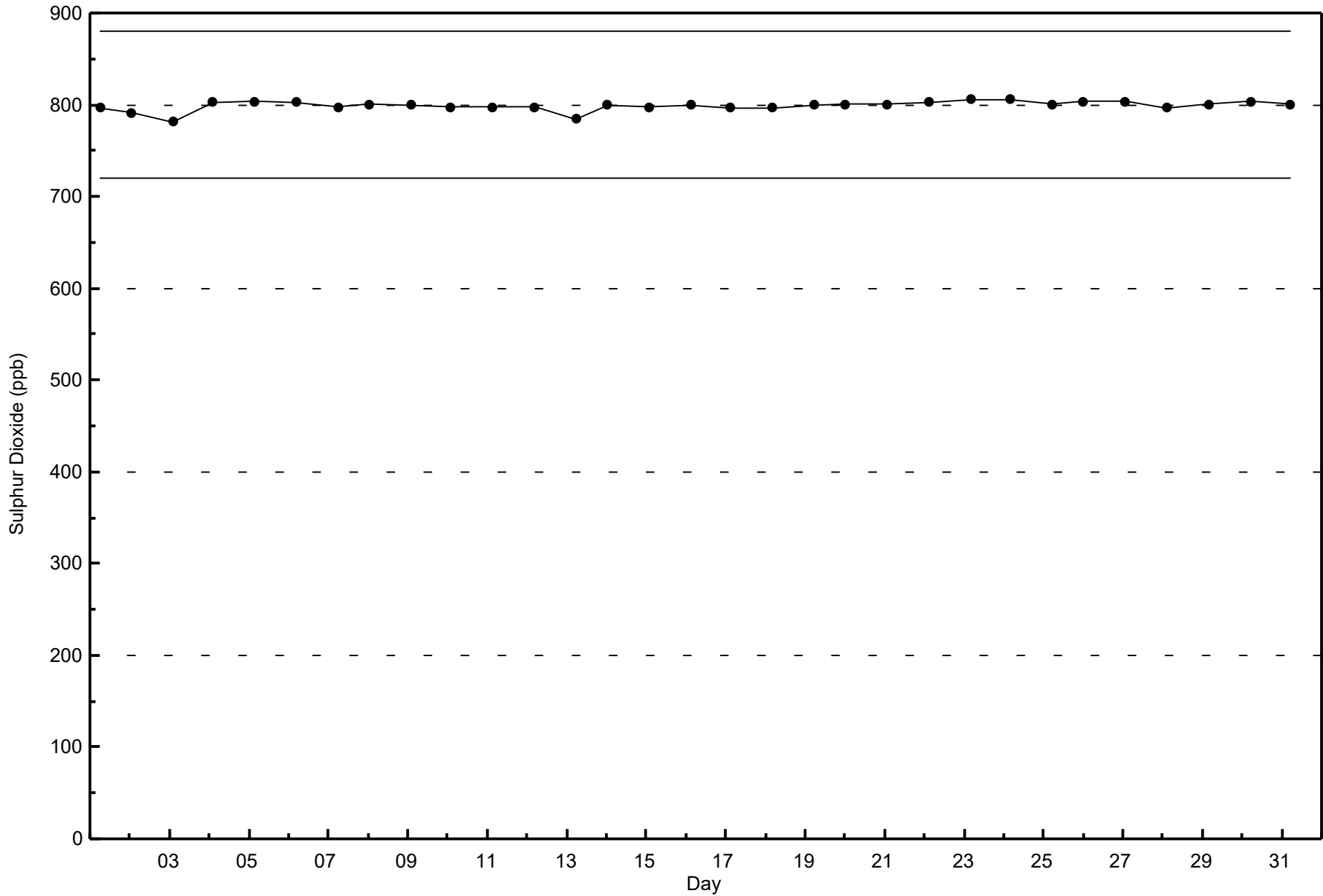


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Sulphur Dioxide (SO₂) - ppb
Sawbones Bay









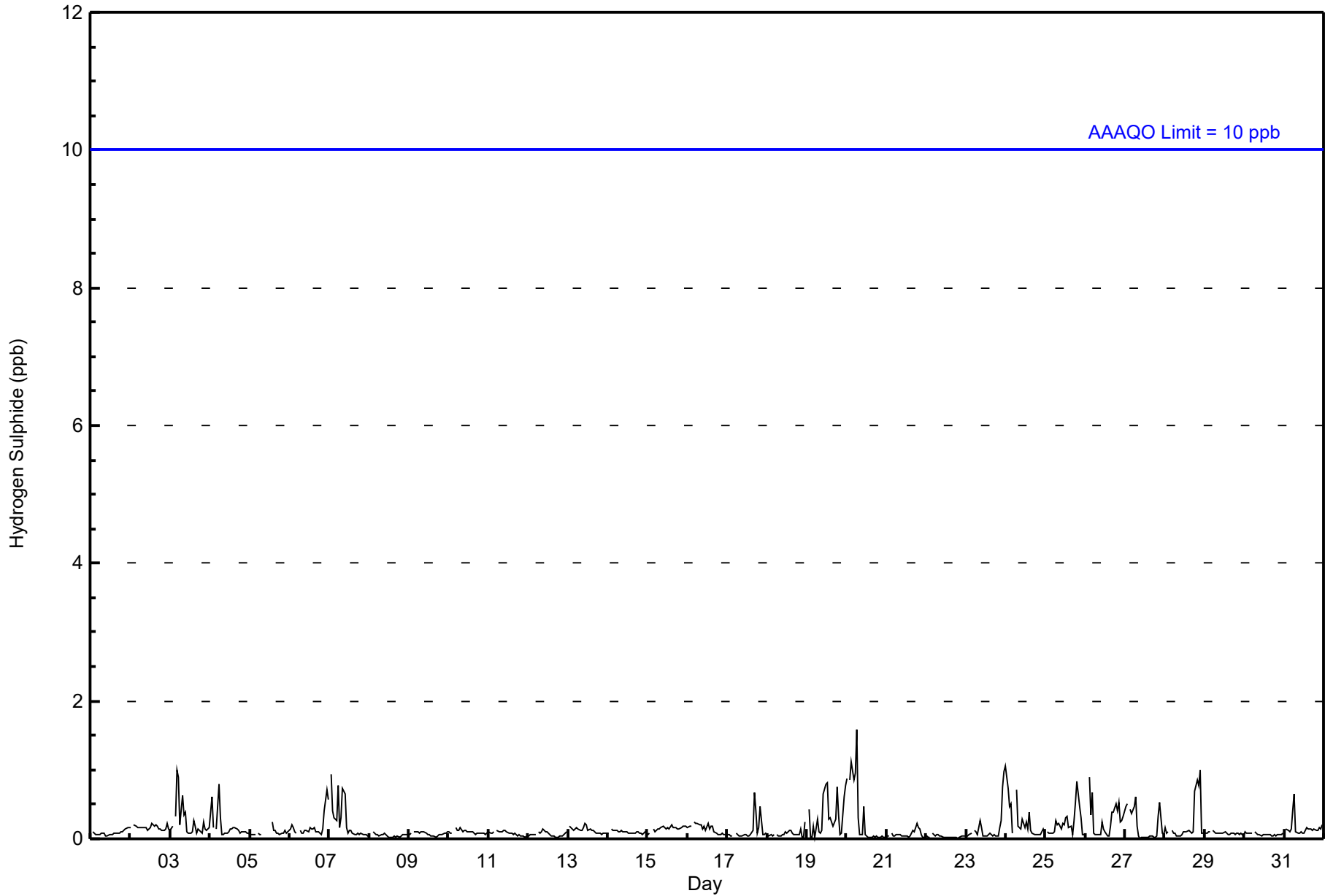
Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H2S) - ppb

Sawbones Bay - October 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 744																	Daily Average		Daily Maximum																									
Maximum Value: 1.6 ppb on Oct 20 07:00		Maximum Daily Average: 0.3 ppb on Oct 20		Hours of Data: 708																	Hours of Missing Data: 36		Hours of Calibration: 36																									
Minimum Value: 0.0 ppb on Oct 27 10:00		Minimum Daily Average: 0.0 ppb on Oct 22		Hours of Missing Data: 36																	Hours of Calibration: 36		Percent Operational Time: 100.0																									
Maximum Diurnal Average: 0.2 ppb at hour 6		Minimum Diurnal Average: 0.1 ppb at hour 16		Hours of Calibration: 36																	Hours of Calibration: 36		Percent Operational Time: 100.0																									
Monthly Average: 0.15 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 = 0.9		Hours of Calibration: 36																	Hours of Calibration: 36		Percent Operational Time: 100.0																									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Oct	Z	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	0.1	0.1	0.2	0.2	0.1	0.2																						
2-Oct	0.2	Z	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	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2																						
3-Oct	0.1	0.2	Z	0.3	1.0	0.9	0.2	0.6	0.3	0.4	0.1	0.1	0.1	0.1	0.3	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.3	1.0																						
4-Oct	0.4	0.6	0.2	Z	0.1	0.8	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.8																						
5-Oct	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	C	C	C	C	C	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																						
6-Oct	0.1	0.2	0.2	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	0.1	0.1	0.1	0.1	0.4	0.7	0.6	0.2	0.7																						
7-Oct	Z	0.9	0.4	0.3	0.3	0.8	0.2	0.3	0.7	0.6	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	0.0	0.2	0.9																						
8-Oct	0.0	Z	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.1																						
9-Oct	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	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1																						
10-Oct	0.1	0.1	0.1	Z	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2																						
11-Oct	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1																						
12-Oct	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1																						
13-Oct	Z	0.2	0.1	0.1	0.1	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	0.1	0.1	0.1	0.1	0.1	0.2																						
14-Oct	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	0.2																						
15-Oct	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.2																						
16-Oct	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2																						
17-Oct	0.1	0.1	0.0	0.0	Z	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.7	0.4	0.1	0.2	0.5	0.1	0.1	0.1	0.1	0.7																						
18-Oct	0.1	0.0	0.1	0.0	0.1	Z	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	0.2	0.1	0.2																						
19-Oct	Z	0.4	0.0	0.0	0.2	0.0	0.3	0.1	0.1	0.1	0.7	0.8	0.8	0.3	0.3	0.2	0.2	0.3	0.7	0.3	0.1	0.1	0.6	0.8	0.3	0.8																						
20-Oct	0.9	Z	0.8	1.1	0.8	0.9	1.6	0.3	0.1	0.1	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	0.3	1.6																						
21-Oct	0.0	0.0	Z	0.1	0.0	0.0	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	0.2	0.1	0.1	0.0	0.0	0.1	0.2																						
22-Oct	0.0	0.0	0.0	Z	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1																						
23-Oct	0.0	0.0	0.1	0.1	Z	0.1	0.1	0.1	0.3	0.2	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.2	0.3	0.8	1.0	0.2	1.0																						
24-Oct	1.1	0.7	0.5	0.5	0.1	Z	0.1	0.7	0.2	0.2	0.1	0.3	0.2	0.2	0.1	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	1.1																						
25-Oct	Z	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.2	0.1	0.2	0.2	0.3	0.3	0.2	0.2	0.1	0.3	0.5	0.8	0.5	0.3	0.1	0.1	0.2	0.8																						
26-Oct	0.0	Z	0.9	0.3	0.7	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.2	0.4	0.4	0.5	0.4	0.5	0.2	0.3	0.3	0.3	0.9																						
27-Oct	0.5	0.5	Z	0.4	0.4	0.5	0.6	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	0.3	0.5	0.1	0.1	0.2	0.6																						
28-Oct	0.2	0.1	0.1	Z	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	0.7	0.8	0.8	1.0	0.1	0.1	1.0																						
29-Oct	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1																						
30-Oct	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1																						
31-Oct	Z	0.1	0.1	0.1	0.1	0.4	0.6	0.1	0.1	0.1	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	0.2	0.2	0.6																						
																								0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	Diurnal Average
																								1.1	0.9	0.9	1.1	1.0	0.9	1.6	0.6	0.7	0.6	0.7	0.8	0.8	0.3	0.4	0.2	0.7	0.4	0.7	0.8	0.8	1.0	0.8	1.0	Diurnal Maximum
Z - zerospan C - Calibration																																																
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb																																																





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Hydrogen Sulphide (H₂S) - ppb
Sawbones Bay - October 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 - October 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	13	4	1	12	36	70	106	97	47	28	21	51	130	47	13	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	32	13	4	1	12	36	70	106	97	47	28	21	51	130	47	13	708

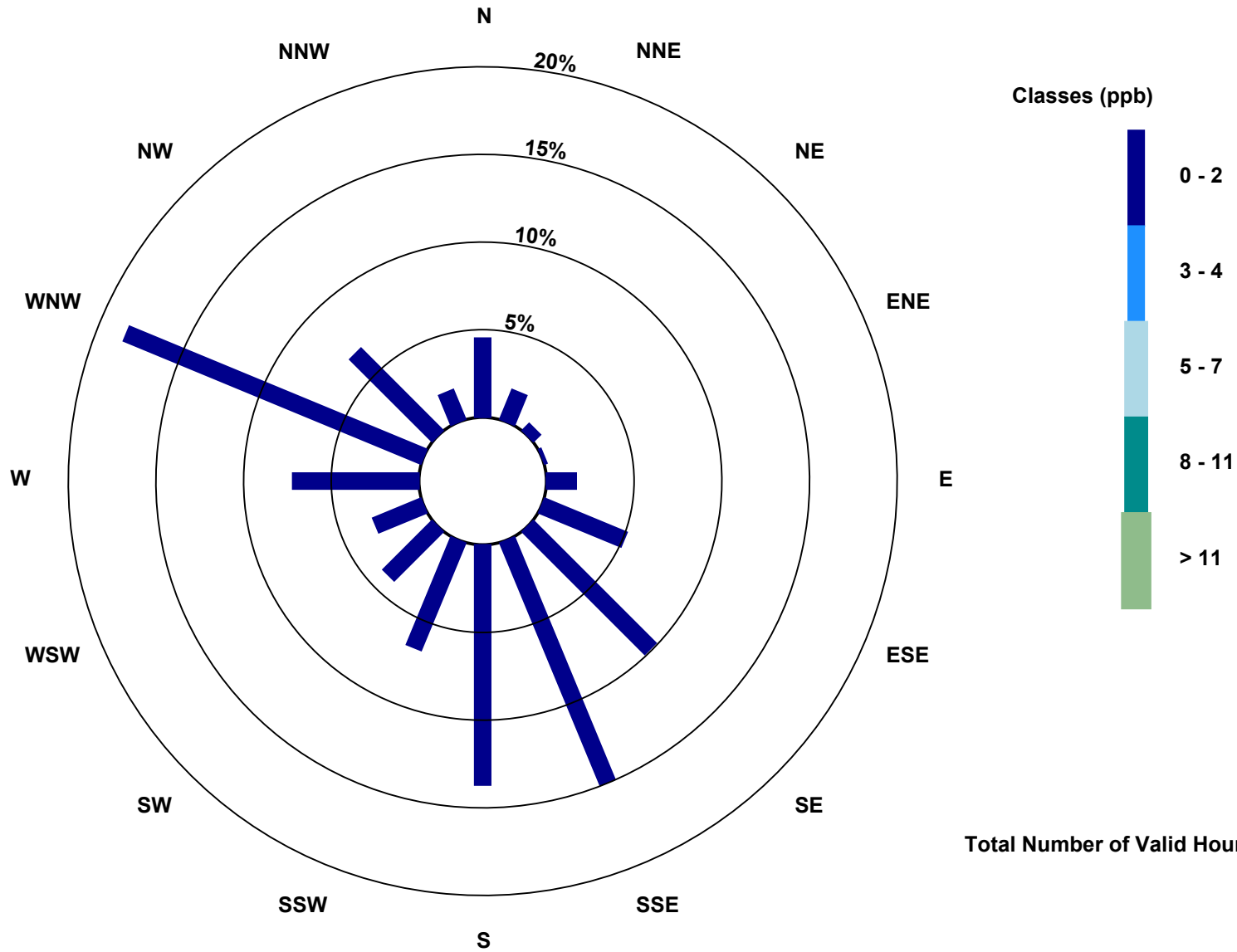
Total Number of Valid Hours: 708

Total Number of Hours: 744

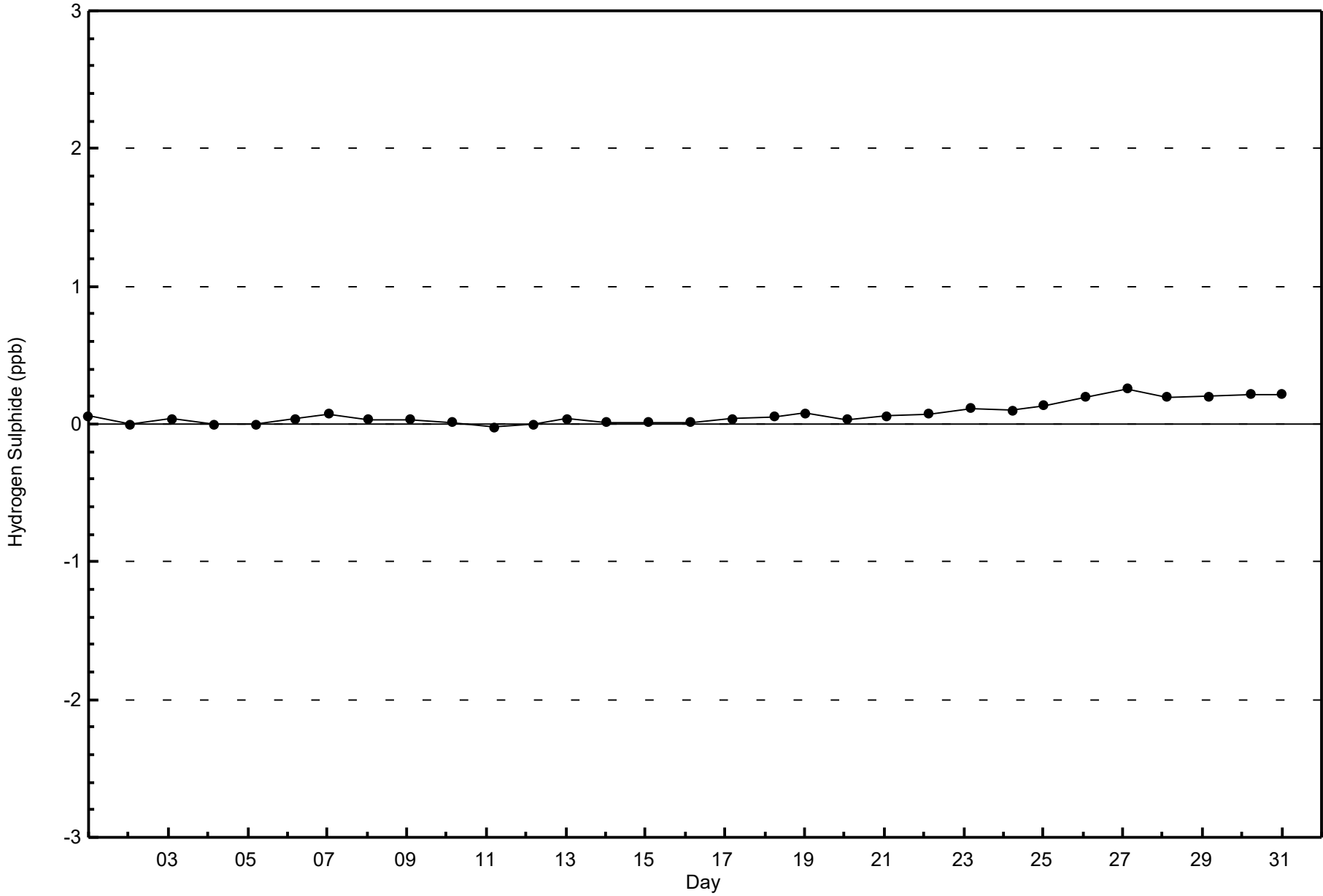


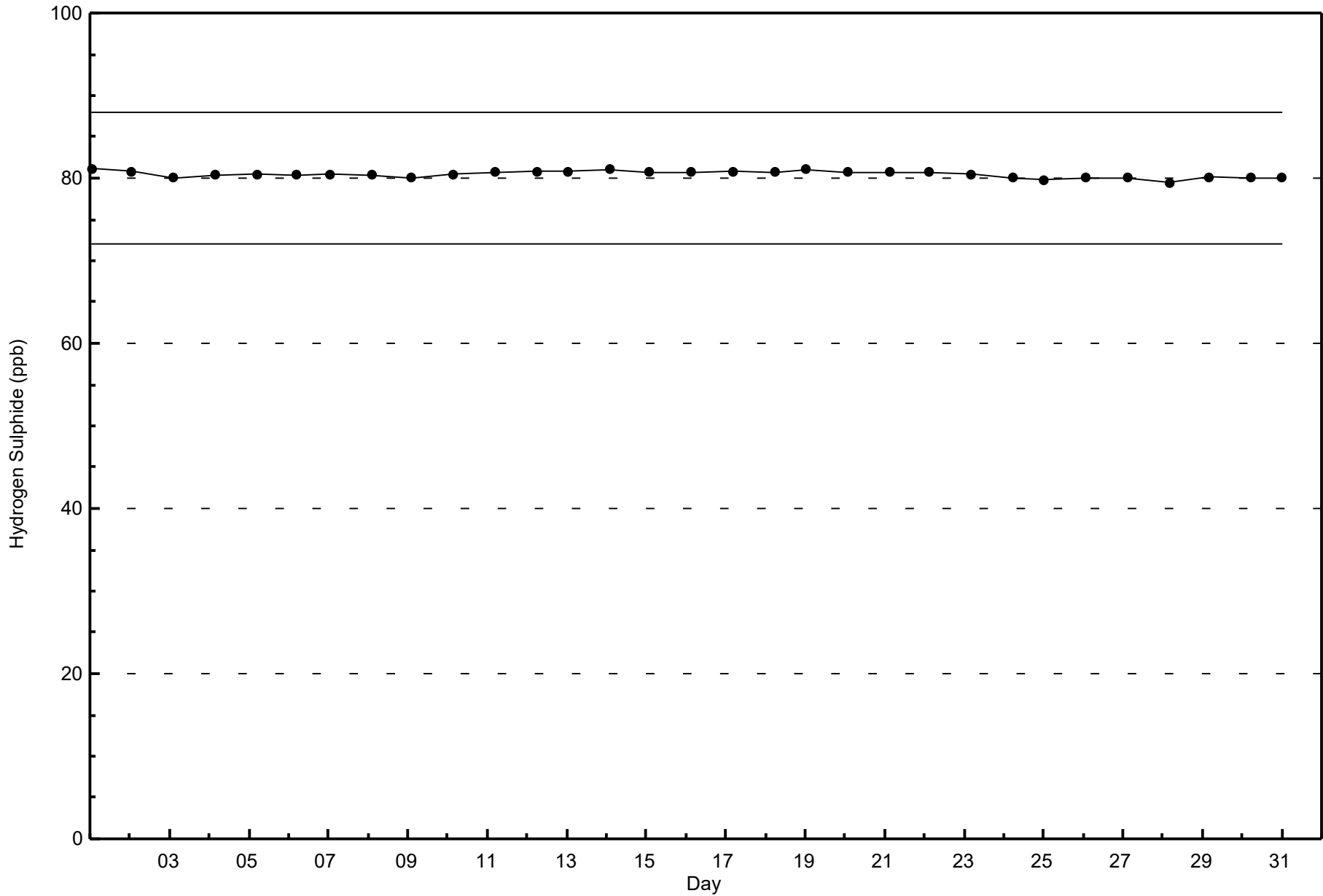
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Hydrogen Sulphide (H₂S) - ppb
Sawbones Bay



Total Number of Valid Hours: 708

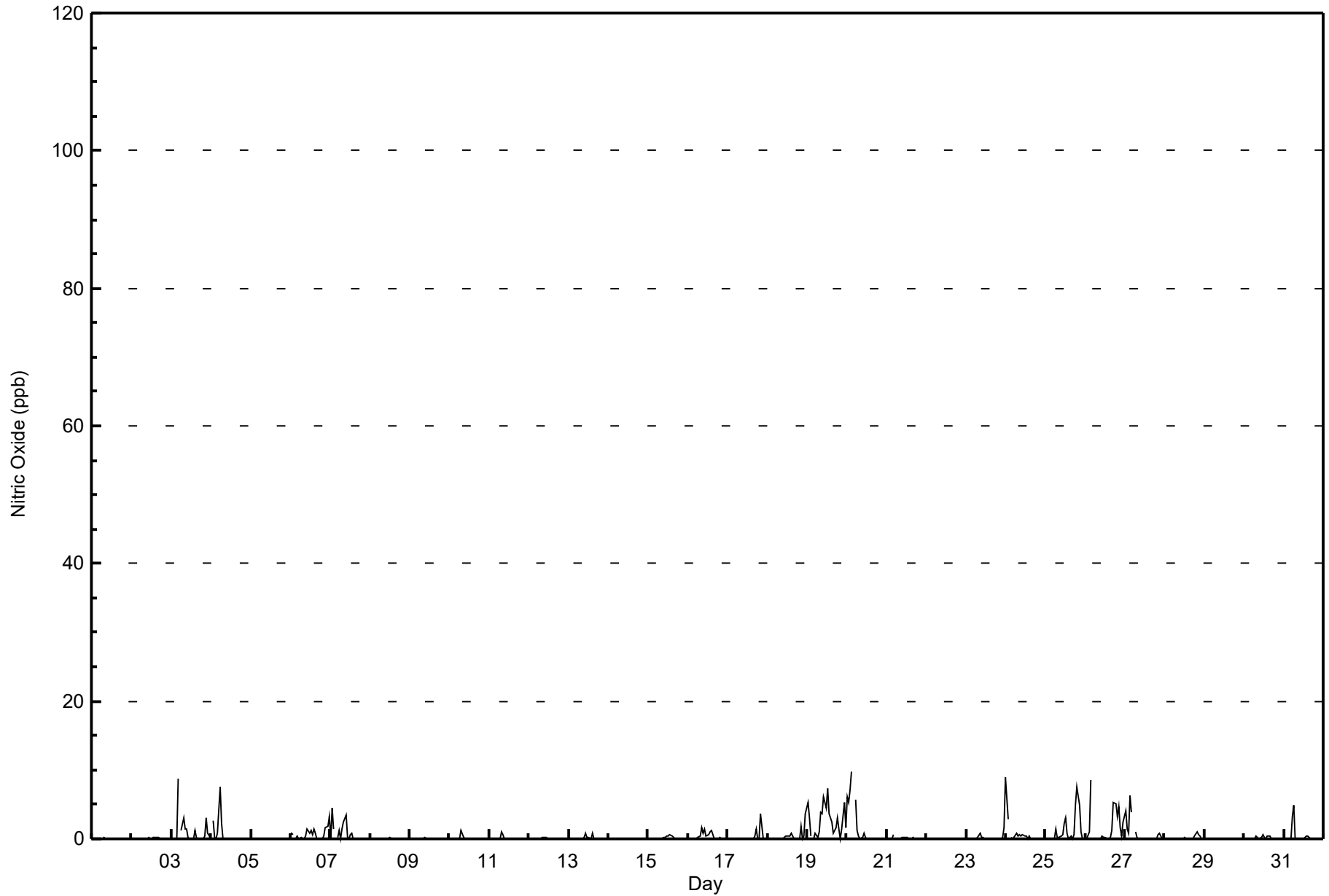






Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Sawbones Bay - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb
Sawbones Bay - October 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
Sawbones Bay - October 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	14	4	1	12	35	72	107	97	47	27	19	52	125	52	13	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	31	14	4	1	12	35	72	107	97	47	27	19	52	125	52	13	708

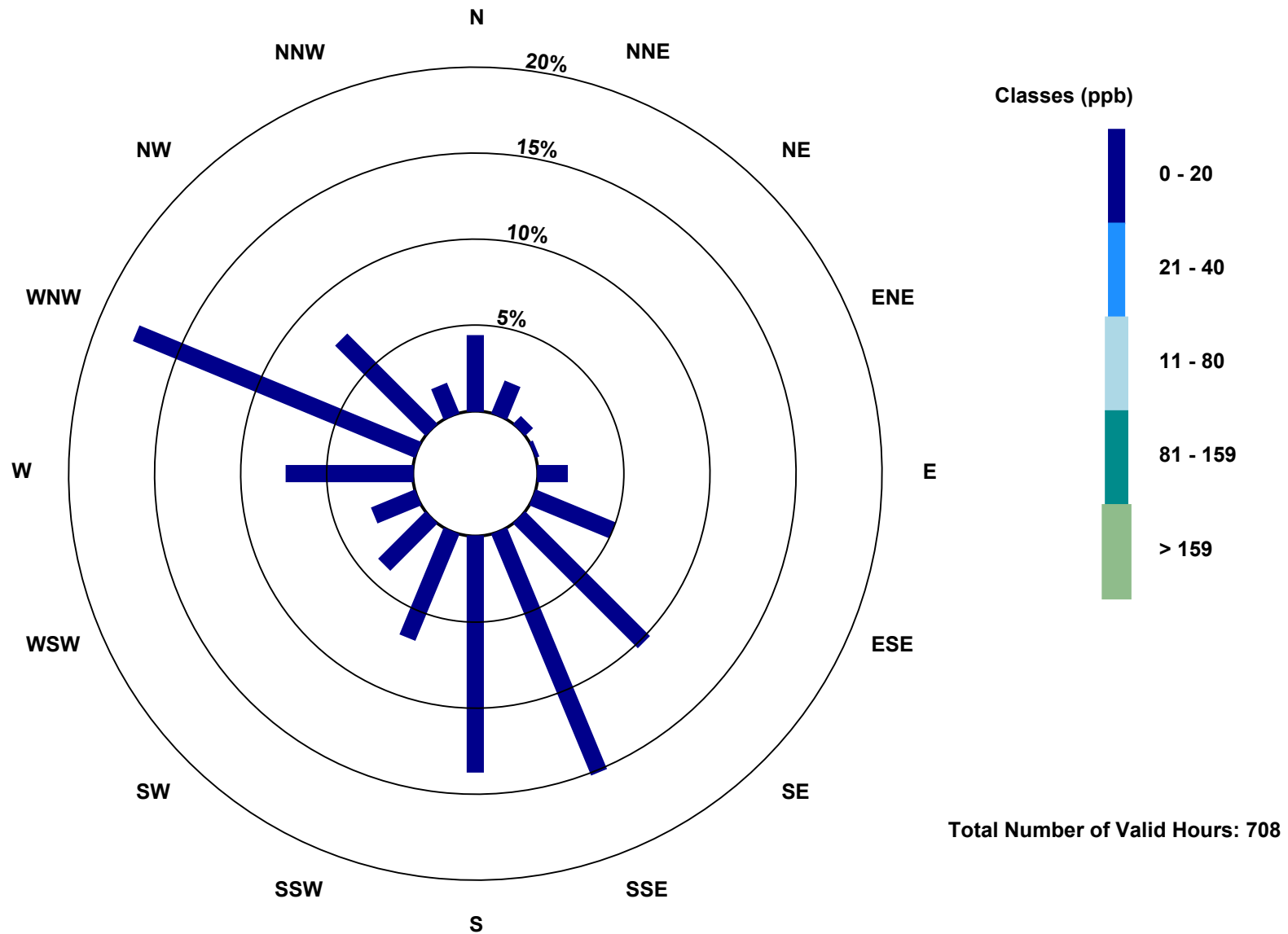
Total Number of Valid Hours: 708

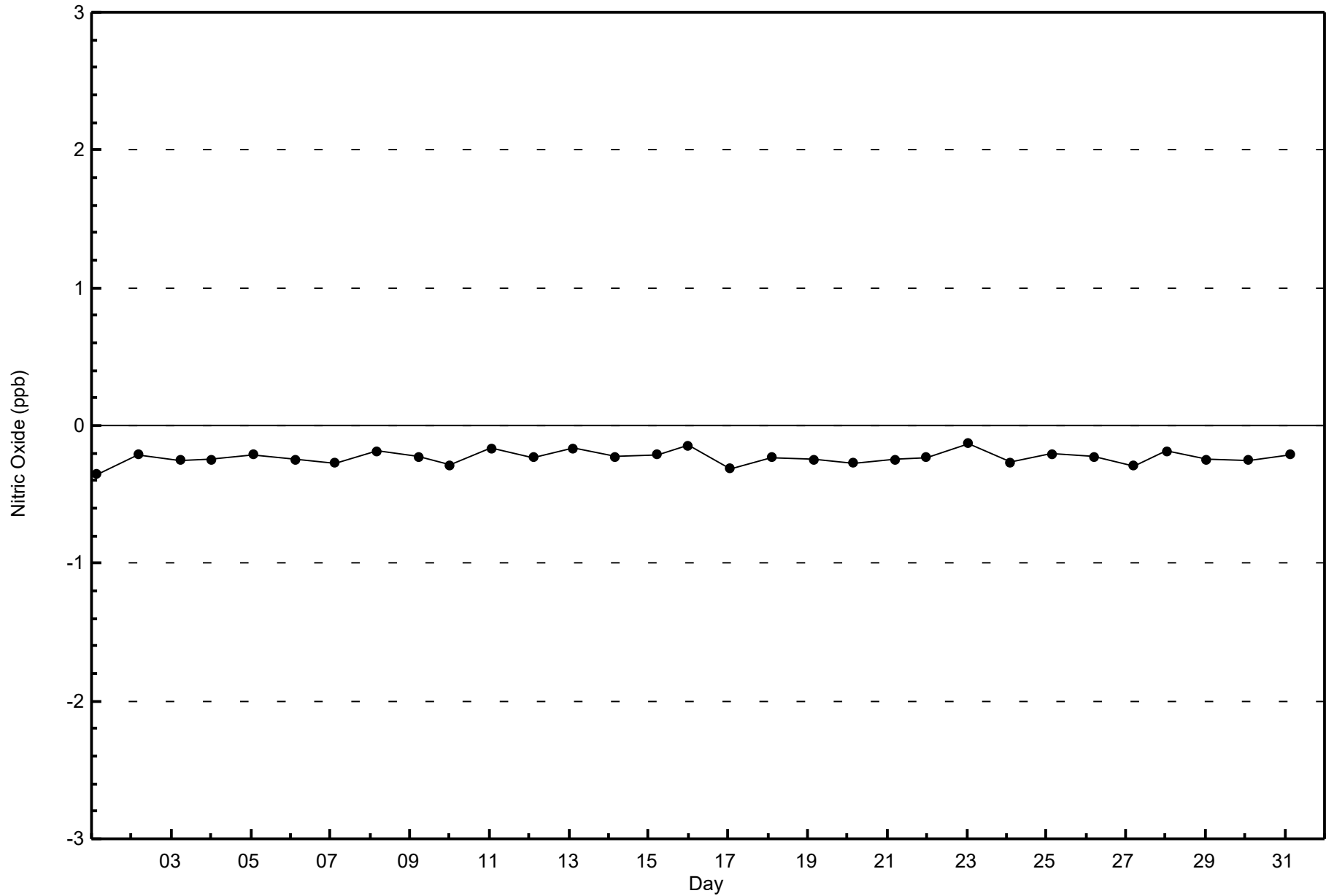
Total Number of Hours: 744

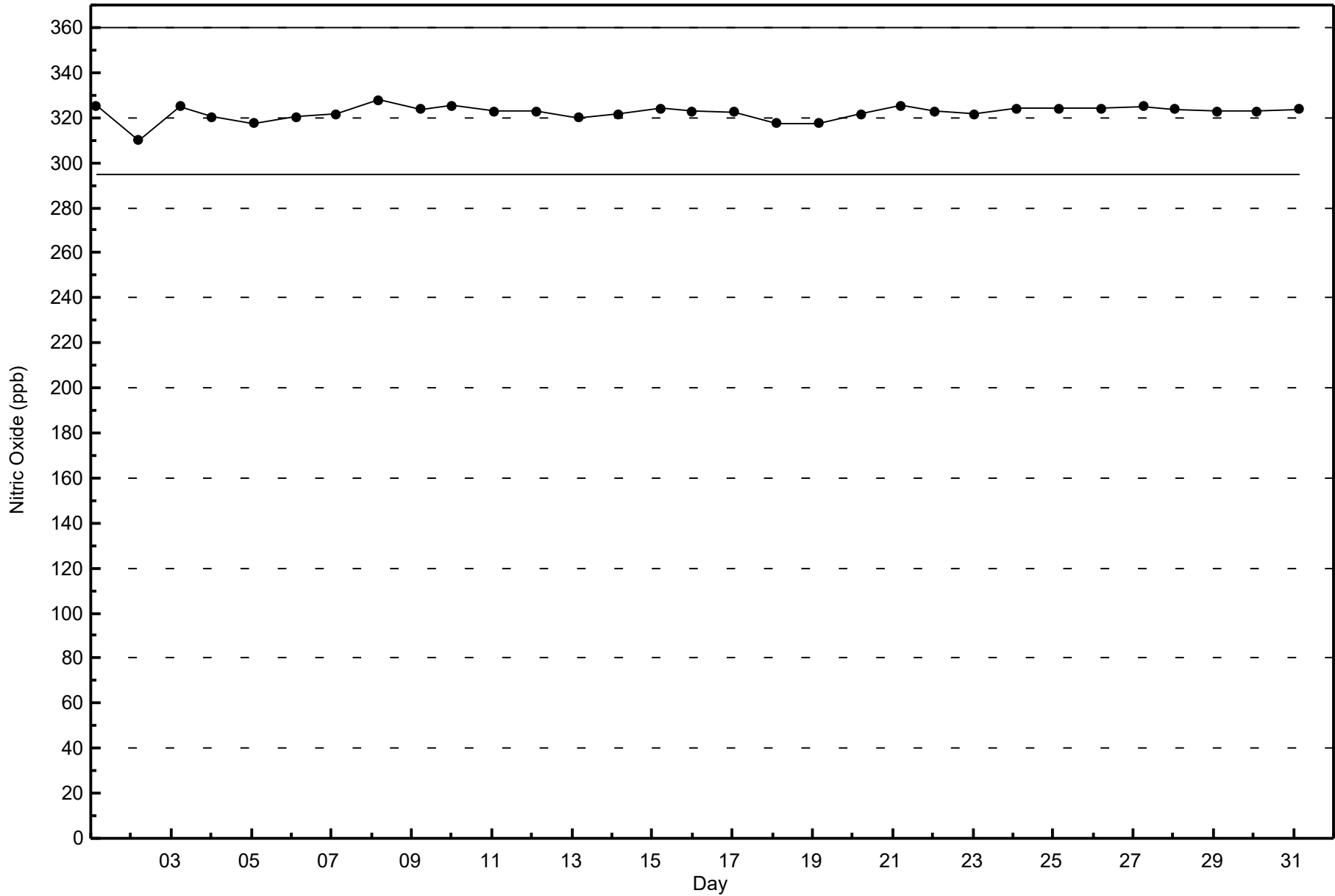


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitric Oxide (NO) - ppb
Sawbones Bay









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

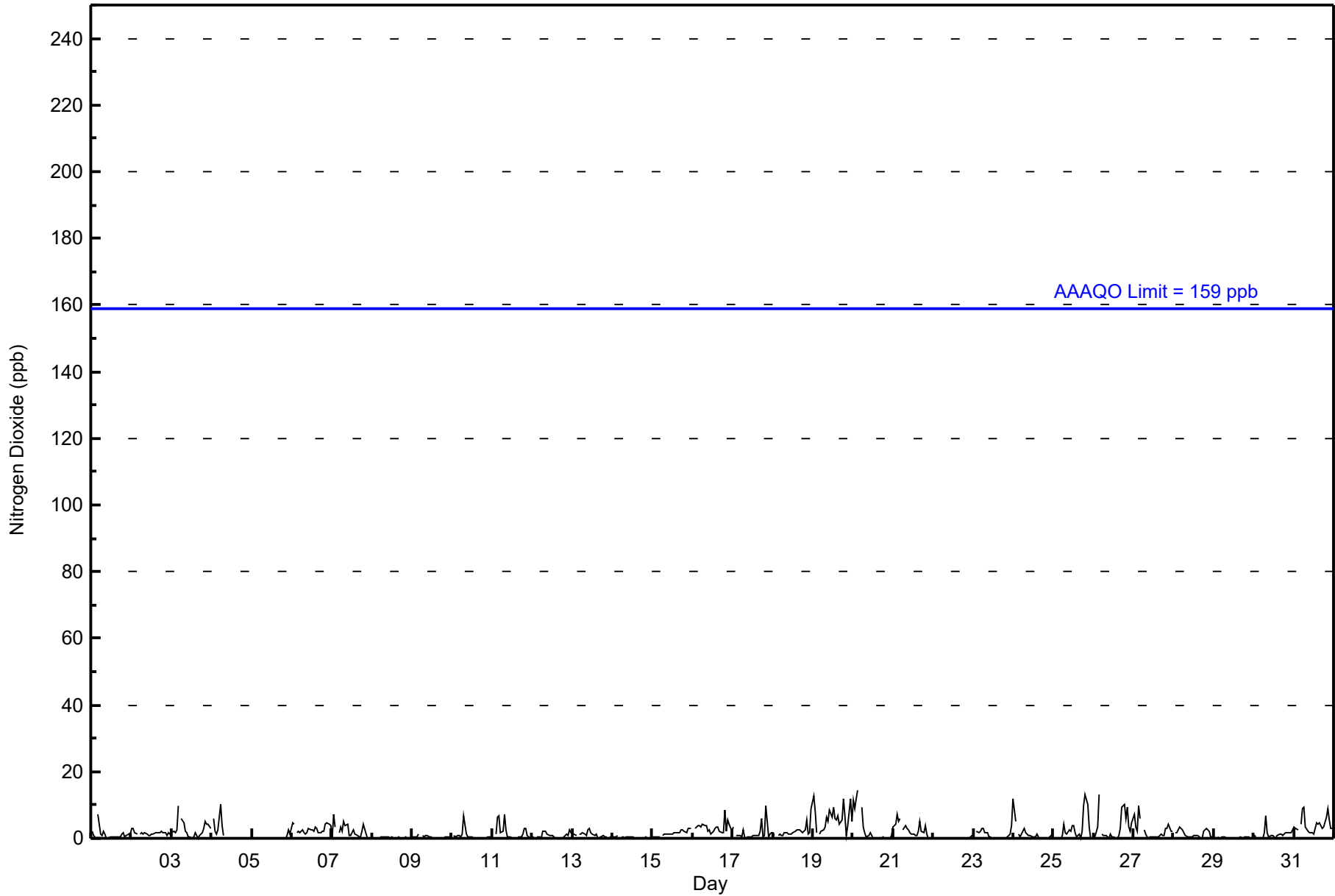
Sawbones Bay - October 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 744																	744																												
Maximum Value: 14.5 ppb on Oct 20 04:00		Maximum Daily Average: 5.9 ppb on Oct 19																	Hours of Data: 708																														
Minimum Value: 0.0 ppb on Oct 4 14:00		Minimum Daily Average: 0.1 ppb on Oct 22																	Hours of Missing Data: 36																														
Maximum Diurnal Average: 2.8 ppb at hour 4		Minimum Diurnal Average: 1.0 ppb at hour 12																	Hours of Calibration: 36																														
Monthly Average: 1.75 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.3 Median = 0.9 Q ₃ = 2.2 P ₉₀ = 4.4 P ₉₉ = 11.7																	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-Oct	2.2	0.8	0.4	Z	7.0	1.2	0.8	2.2	1.2	0.1	0.2	0.6	0.5	0.5	0.4	0.4	0.5	1.2	1.9	0.4	0.9	1.2	1.2	1.1	7.0																								
2-Oct	3.0	2.9	1.5	1.1	Z	1.3	1.5	1.2	1.5	1.2	0.9	0.9	1.2	1.4	1.5	1.7	1.8	1.7	2.0	1.6	1.9	0.9	1.5	1.3	1.5	3.0																							
3-Oct	1.7	2.0	1.9	2.4	9.6	Z	5.8	4.7	2.2	1.9	0.6	0.3	0.2	0.3	1.8	0.8	0.1	0.9	1.7	3.0	5.1	4.1	4.4	3.0	2.5	9.6																							
4-Oct	Z	6.1	2.2	1.2	2.7	10.3	4.0	0.7	C	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	10.3																							
5-Oct	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	1.0	2.4	1.3	0.2	2.4																							
6-Oct	4.6	4.3	Z	1.9	2.2	1.9	2.6	1.6	1.2	1.8	2.8	2.4	2.4	2.1	3.5	2.9	1.7	1.5	2.0	2.0	4.2	4.7	4.1	3.9	2.7	4.7																							
7-Oct	0.5	7.1	3.6	Z	1.6	3.2	2.3	4.9	3.8	4.3	0.9	0.7	1.8	2.4	1.2	1.0	0.3	0.4	2.2	4.3	1.3	0.0	0.0	0.1	2.1	7.1																							
8-Oct	0.0	0.0	0.0	0.0	Z	0.5	0.3	0.3	0.4	0.6	0.3	0.2	0.6	0.1	0.0	0.2	0.4	0.1	0.1	0.1	0.5	0.2	0.2	0.4	0.2	0.6																							
9-Oct	0.3	0.3	0.3	0.3	1.2	Z	0.7	0.6	0.7	0.8	0.6	0.3	0.2	0.2	0.1	0.1	0.0	0.1	0.2	0.2	0.5	0.6	0.5	0.4	0.4	1.2																							
10-Oct	Z	0.8	0.6	0.8	0.7	0.6	1.1	6.6	1.4	0.6	0.6	0.4	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.5	0.7	6.6																							
11-Oct	0.5	Z	1.3	6.2	6.8	1.7	2.3	7.4	2.5	0.6	0.4	0.3	0.1	0.1	0.0	0.0	0.3	0.6	1.3	3.1	3.1	0.9	0.5	0.1	1.7	7.4																							
12-Oct	0.5	0.1	Z	0.4	0.6	0.2	2.0	2.0	2.1	1.2	0.9	0.8	0.7	0.5	0.1	0.0	0.0	0.0	0.0	0.6	1.1	1.0	2.4	1.7	0.8	2.4																							
13-Oct	1.3	1.1	0.7	Z	1.2	1.1	1.9	1.1	0.9	2.7	3.0	1.5	1.1	0.8	1.2	0.2	0.2	0.3	0.7	0.5	0.3	0.1	0.2	0.3	1.0	3.0																							
14-Oct	0.4	0.3	0.3	1.0	Z	0.4	0.3	0.2	0.3	0.3	0.5	0.4	0.3	0.2	0.1	0.0	0.2	0.1	0.1	0.3	0.2	0.2	0.3	0.3	0.3	1.0																							
15-Oct	0.4	0.4	0.4	0.6	0.5	Z	0.8	1.4	1.1	1.1	1.1	1.2	1.3	1.7	1.8	1.8	1.7	2.5	2.5	2.1	1.9	3.1	3.1	3.1	1.5	3.1																							
16-Oct	Z	2.9	3.2	3.7	3.8	3.5	4.4	3.8	3.7	2.1	2.6	1.3	2.0	2.9	3.5	3.4	2.3	1.5	1.6	8.4	2.3	5.5	4.3	2.1	3.3	8.4																							
17-Oct	3.4	Z	0.7	0.9	0.7	0.5	2.4	0.3	0.2	0.3	0.4	0.3	0.9	0.7	0.8	0.8	2.2	5.9	0.5	0.7	9.7	0.6	1.1	1.6	1.5	9.7																							
18-Oct	1.6	0.8	Z	0.8	1.2	0.8	0.8	1.8	1.6	1.2	1.1	1.3	1.8	2.0	2.5	2.6	2.4	2.2	1.6	2.7	5.4	1.3	1.9	9.0	2.1	9.0																							
19-Oct	12.5	8.0	1.9	Z	1.2	2.3	2.5	3.3	6.2	5.0	8.3	6.5	9.5	5.8	5.7	6.7	4.4	5.3	11.7	6.6	1.0	3.9	12.0	4.9	5.9	12.5																							
20-Oct	11.4	9.0	12.0	14.5	Z	9.2	3.2	1.7	0.6	0.8	1.8	0.8	0.2	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.1	0.0	0.0	1.0	2.9	14.5																							
21-Oct	3.2	4.4	7.0	5.1	5.9	Z	2.5	3.7	2.8	2.6	1.9	1.4	1.3	1.0	0.8	2.2	4.9	2.2	1.6	3.7	1.4	0.0	0.0	0.0	2.6	7.0																							
22-Oct	Z	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	0.2	0.6	1.0	0.1	1.0																							
23-Oct	0.9	Z	2.0	1.9	2.2	2.8	2.8	1.9	1.8	0.6	0.3	0.0	0.0	0.0	0.2	0.1	0.2	0.1	0.0	0.6	0.9	1.3	3.9	1.1	3.9																								
24-Oct	11.9	5.1	Z	1.4	0.4	1.3	2.8	1.7	1.4	0.8	1.0	0.6	0.6	0.4	1.3	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.3	1.4	11.9																							
25-Oct	0.2	0.2	0.2	Z	0.1	0.7	4.1	1.5	1.2	2.5	2.3	3.9	4.0	1.7	0.4	1.1	0.1	2.0	9.9	13.2	10.2	3.3	0.2	0.2	2.7	13.2																							
26-Oct	0.1	0.6	3.6	13.1	Z	1.1	0.9	1.0	0.5	0.2	1.1	0.6	0.5	0.0	0.2	0.9	3.1	9.2	10.3	5.9	9.3	3.4	2.0	4.8	3.1	13.1																							
27-Oct	7.0	3.5	2.0	9.6	5.9	Z	2.7	1.2	0.6	0.0	0.3	0.3	0.5	0.4	0.3	0.6	1.1	0.8	0.8	2.8	2.9	4.1	2.2	2.3	2.3	9.6																							
28-Oct	Z	1.6	1.9	3.2	3.1	2.7	1.5	0.7	0.6	0.4	0.4	0.5	0.8	1.0	0.8	0.6	0.2	0.2	2.1	2.9	2.6	2.1	0.3	0.3	1.3	3.2																							
29-Oct	0.0	Z	0.3	0.2	0.1	0.3	0.5	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.2	0.3	0.0	0.4	0.5	0.3	0.3	0.2	0.2	0.2	0.5																							
30-Oct	0.8	0.3	Z	0.2	0.0	0.0	1.6	6.7	1.7	0.5	0.8	0.8	0.6	0.2	0.8	1.4	1.4	1.0	1.2	1.7	1.8	1.7	1.7	2.5	1.3	6.7																							
31-Oct	3.4	3.0	2.6	Z	4.3	8.9	9.4	3.2	2.1	1.5	1.5	1.5	1.2	4.8	4.4	4.8	4.0	3.0	3.5	6.5	8.9	5.3	3.0	2.8	4.1	9.4																							
																								2.8	2.5	1.9	2.8	2.4	2.2	2.2	1.5	1.2	1.2	1.0	1.2	1.0	1.1	1.1	1.1	1.4	1.9	2.4	2.5	1.6	1.7	1.8	Diurnal Average		
																								12.5	9.0	12.0	14.5	9.6	10.3	9.4	7.4	6.2	5.0	8.3	6.5	9.5	5.8	5.7	6.7	4.9	9.2	11.7	13.2	10.2	5.5	12.0	9.0	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
Sawbones Bay - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Dioxide (NO₂) - ppb
Sawbones Bay - October 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
Sawbones Bay - October 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	14	4	1	12	35	72	107	97	47	27	19	52	125	52	13	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	31	14	4	1	12	35	72	107	97	47	27	19	52	125	52	13	708

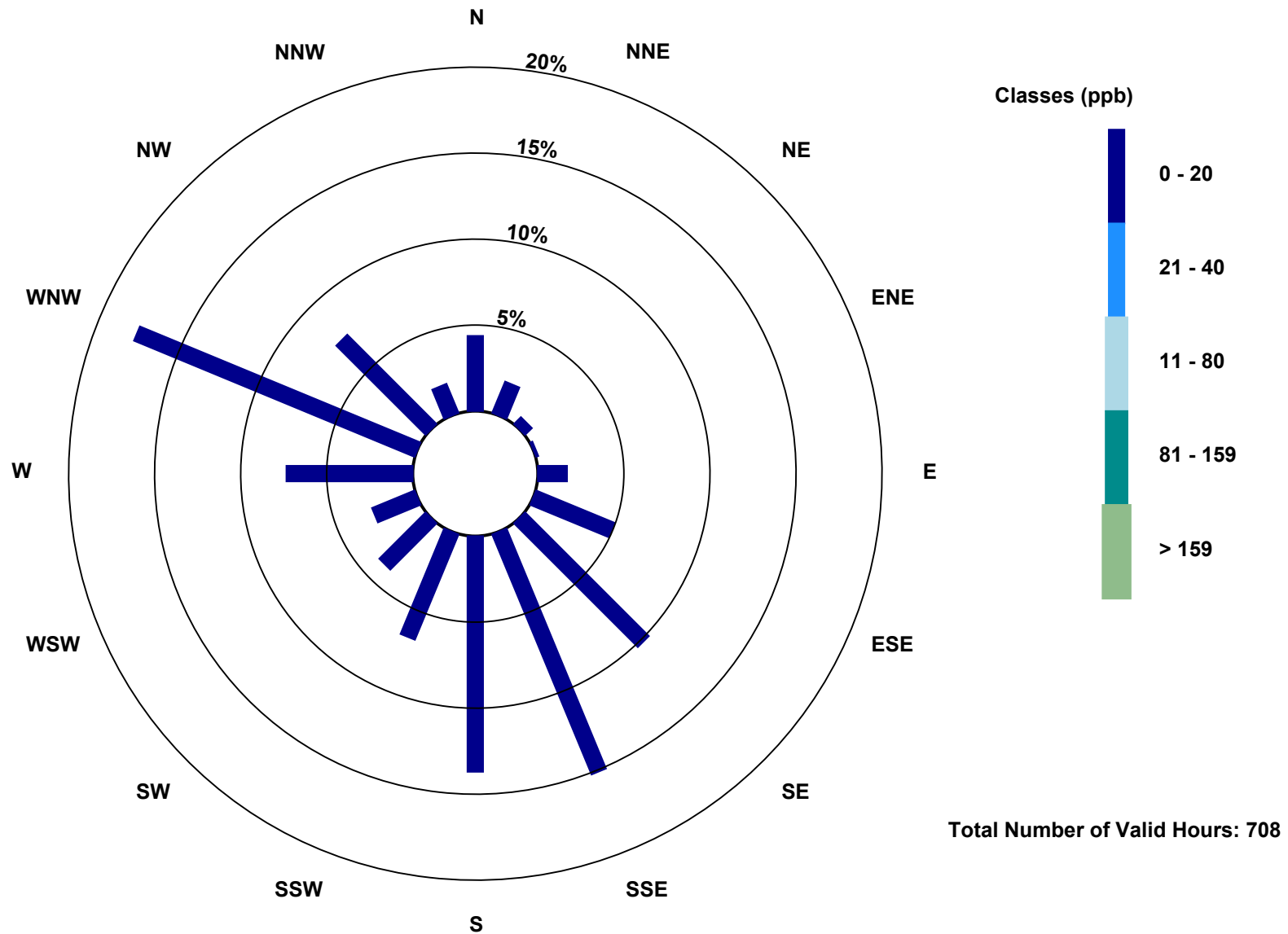
Total Number of Valid Hours: 708

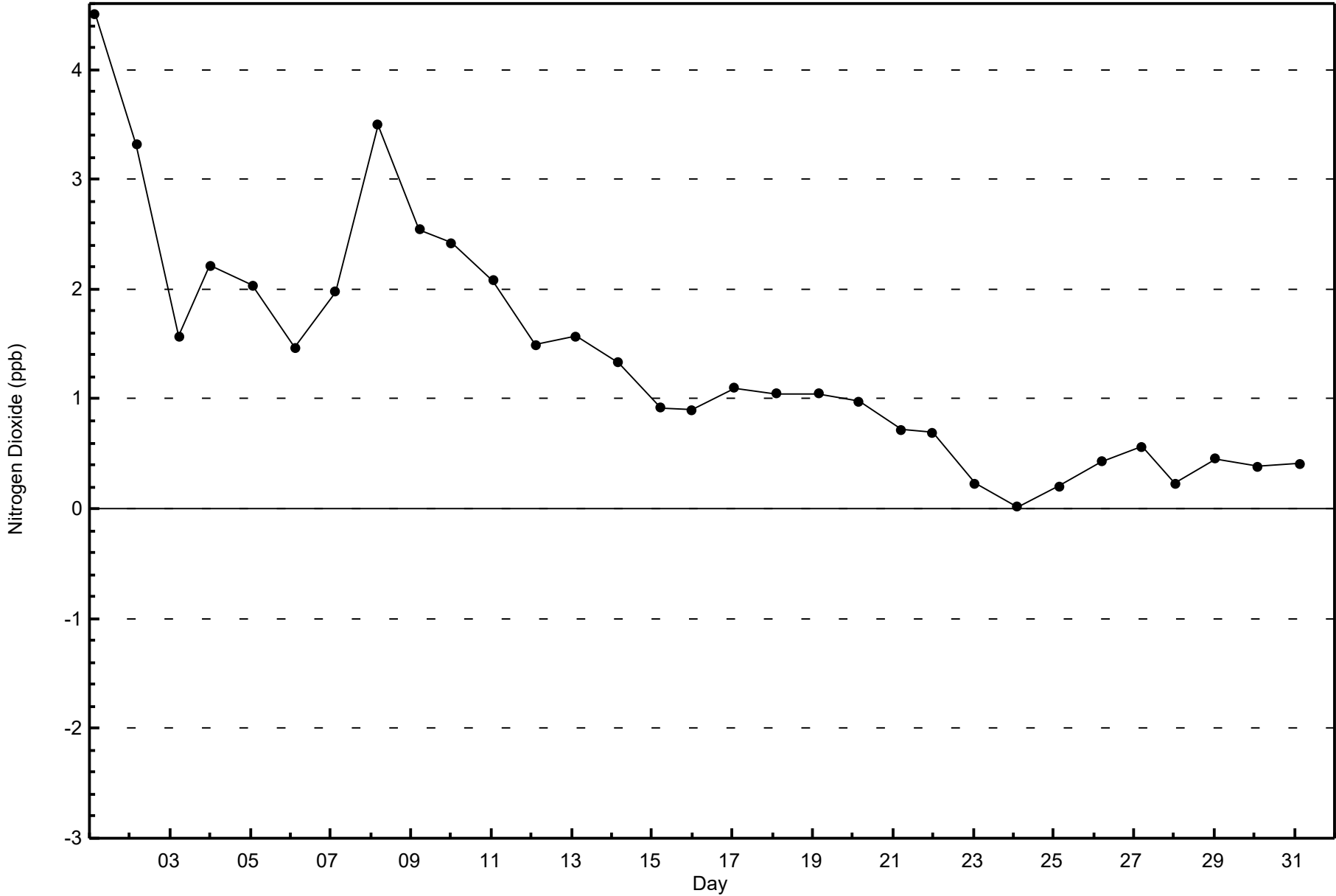
Total Number of Hours: 744

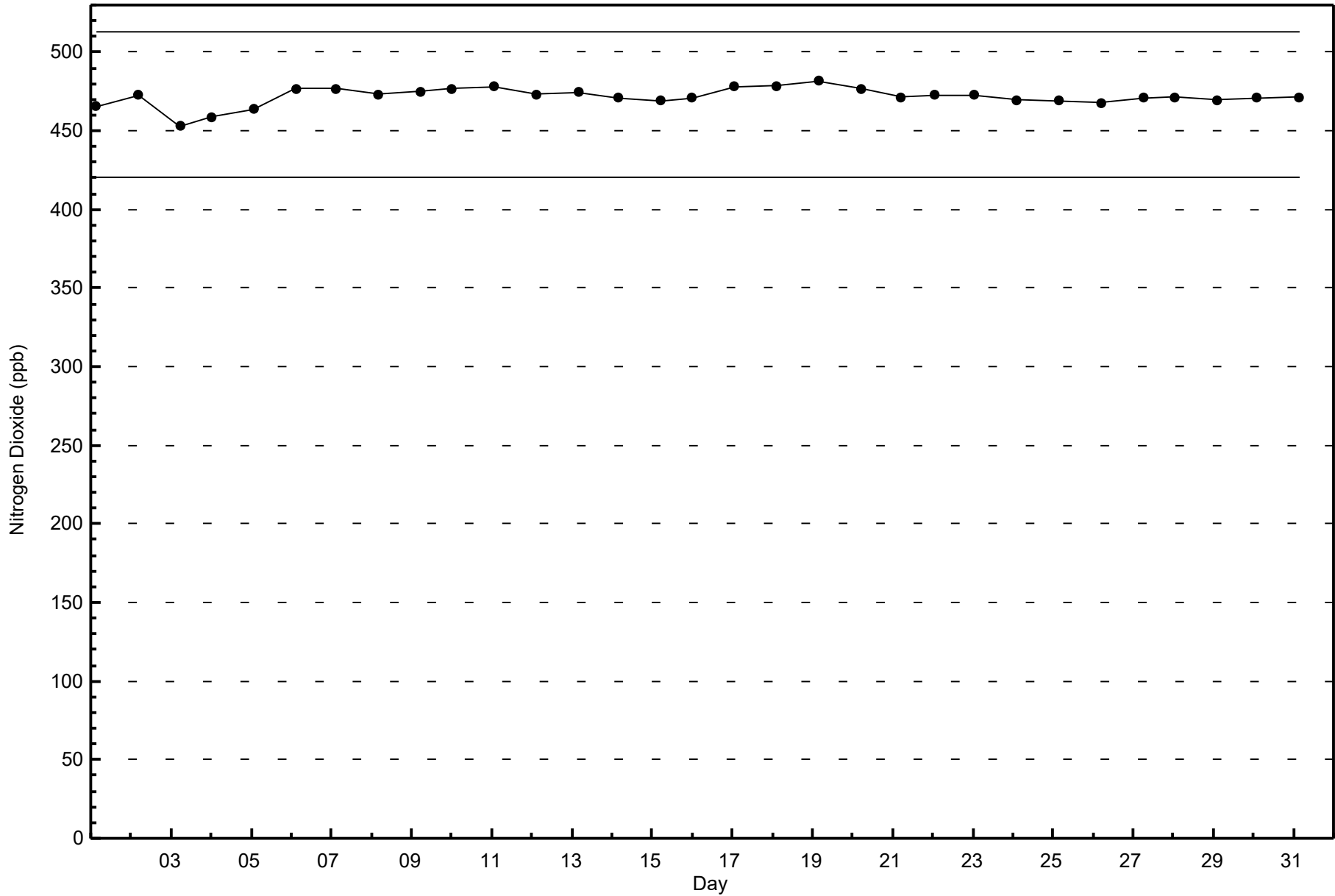


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitrogen Dioxide (NO₂) - ppb
Sawbones Bay









Wood Buffalo Environmental Association
Summary of Hour Averages

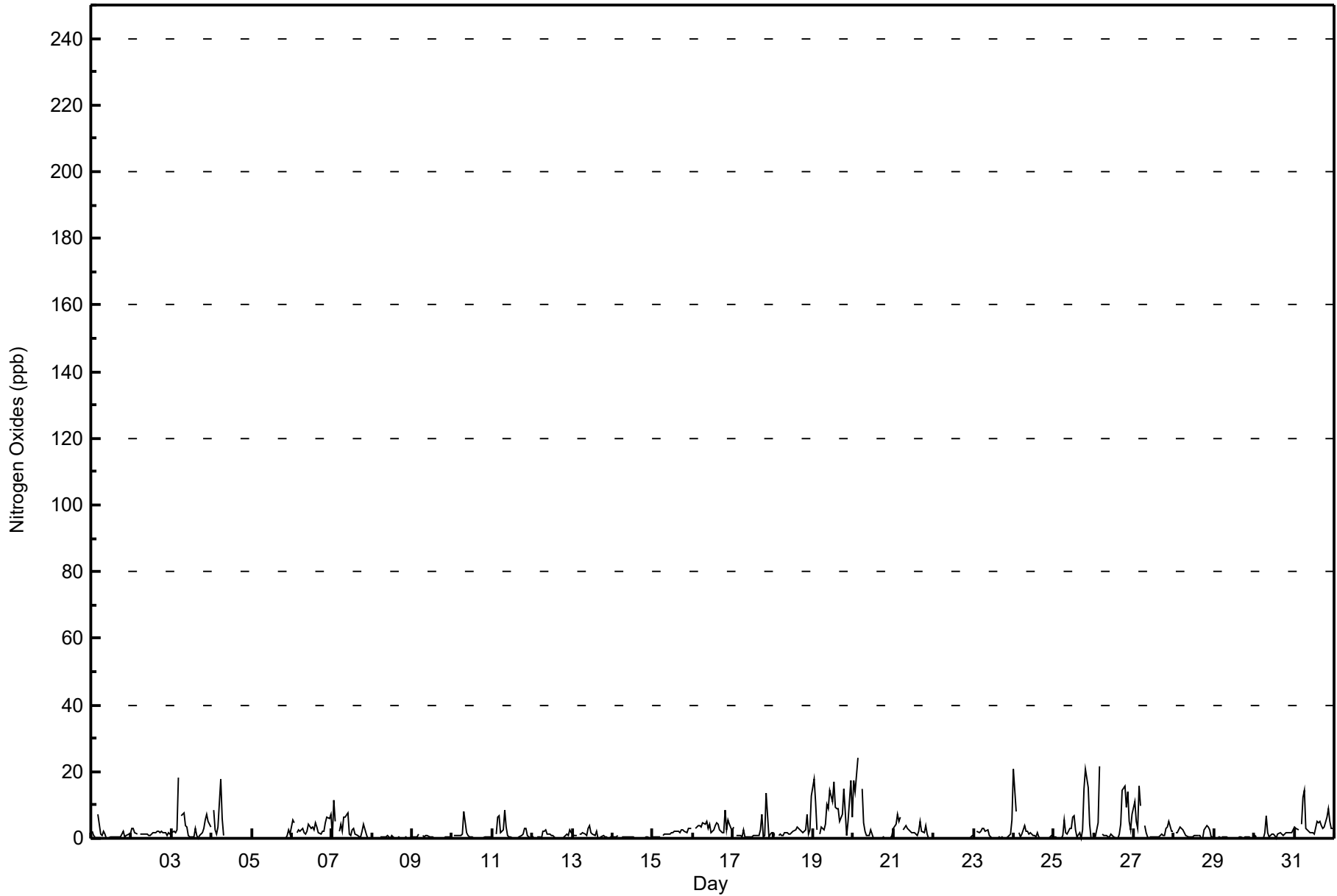
Nitrogen Oxides (NO_x) - ppb
Sawbones Bay - October 2023

Maximum Value: 24.2 ppb on Oct 20 04:00																				Maximum Daily Average: 8.5 ppb on Oct 19					Hours in Service: 744	
Minimum Value: 0.0 ppb on Oct 4 15:00																				Minimum Daily Average: 0.1 ppb on Oct 22					Hours of Data: 708	
Maximum Diurnal Average: 3.8 ppb at hour 4																				Minimum Diurnal Average: 1.2 ppb at hour 17					Hours of Missing Data: 36	
Monthly Average: 2.20 ppb																				Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.3 Median = 1.0 Q ₃ = 2.5 P ₉₀ = 5.4 P ₉₉ = 17.8					Hours of Calibration: 36	
																									Percent Operational Time: 100.0	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Oct	2.2	0.8	0.4	Z	7.0	1.2	0.8	2.3	1.3	0.1	0.2	0.6	0.5	0.5	0.5	0.4	0.4	0.5	1.2	1.9	0.4	0.9	1.2	1.2	1.1	7.0
2-Oct	3.0	2.9	1.5	1.1	Z	1.3	1.5	1.2	1.5	1.3	1.0	1.0	1.2	1.5	1.6	1.9	1.9	1.7	2.0	1.6	1.9	0.9	1.5	1.3	1.6	3.0
3-Oct	1.7	2.0	1.9	2.4	18.3	Z	7.0	7.7	3.6	3.4	0.8	0.3	0.2	0.3	3.0	1.0	0.1	0.9	1.7	3.0	5.6	7.2	5.1	3.3	3.5	18.3
4-Oct	Z	8.7	2.4	1.2	3.6	17.8	6.1	0.7	C	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	17.8
5-Oct	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	1.0	2.4	1.3	0.2	2.4
6-Oct	5.4	4.8	Z	1.9	2.5	2.0	2.8	1.6	1.3	2.2	4.1	3.2	3.6	2.7	4.9	3.6	1.7	1.5	2.0	2.0	4.5	6.3	5.9	7.1	3.4	7.1
7-Oct	0.5	11.6	5.0	Z	1.9	4.4	2.3	6.2	6.2	7.7	1.1	0.7	2.4	3.2	1.2	1.0	0.3	0.4	2.2	4.3	1.3	0.0	0.0	0.1	2.8	11.6
8-Oct	0.0	0.0	0.0	0.0	Z	0.5	0.3	0.3	0.4	0.6	0.3	0.2	0.7	0.1	0.0	0.2	0.4	0.1	0.1	0.1	0.5	0.2	0.2	0.4	0.2	0.7
9-Oct	0.3	0.3	0.3	0.3	1.2	Z	0.7	0.6	0.8	1.0	0.6	0.3	0.2	0.2	0.1	0.1	0.0	0.1	0.2	0.2	0.5	0.6	0.5	0.4	0.4	1.2
10-Oct	Z	0.8	0.6	0.8	0.7	0.6	1.1	7.9	1.6	0.7	0.6	0.4	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.5	0.8	7.9
11-Oct	0.5	Z	1.3	6.2	6.8	1.7	2.3	8.4	3.2	0.7	0.4	0.3	0.1	0.1	0.0	0.0	0.3	0.6	1.3	3.1	3.1	0.9	0.5	0.1	1.8	8.4
12-Oct	0.5	0.1	Z	0.4	0.6	0.2	2.0	2.0	2.4	1.4	1.1	0.8	0.7	0.5	0.1	0.0	0.0	0.0	0.0	0.6	1.1	1.0	2.4	1.7	0.9	2.4
13-Oct	1.3	1.1	0.7	Z	1.2	1.1	1.9	1.1	0.9	2.9	3.8	1.6	1.2	0.9	2.1	0.2	0.2	0.3	0.7	0.5	0.3	0.1	0.2	0.3	1.1	3.8
14-Oct	0.4	0.3	0.3	1.0	Z	0.4	0.3	0.2	0.3	0.3	0.6	0.5	0.3	0.2	0.1	0.0	0.2	0.1	0.1	0.3	0.2	0.2	0.3	0.3	0.3	1.0
15-Oct	0.4	0.4	0.4	0.6	0.5	Z	0.8	1.4	1.1	1.3	1.4	1.6	1.6	2.3	2.1	2.0	1.8	2.5	2.5	2.1	1.9	3.1	3.1	3.1	1.6	3.1
16-Oct	Z	2.9	3.2	3.7	3.8	3.5	4.5	4.2	5.3	2.9	4.0	1.7	2.6	3.9	4.8	4.1	2.4	1.5	1.6	8.5	2.3	5.5	4.3	2.1	3.6	8.5
17-Oct	3.4	Z	0.7	0.9	0.7	0.5	2.4	0.3	0.2	0.3	0.4	0.3	0.9	0.7	0.8	0.8	2.6	7.3	0.5	0.7	13.4	0.6	1.1	1.6	1.8	13.4
18-Oct	1.6	0.8	Z	0.8	1.3	0.8	0.8	1.8	1.6	1.2	1.3	1.6	2.2	2.5	3.3	2.9	2.5	2.2	1.6	2.7	7.3	1.3	2.3	12.6	2.5	12.6
19-Oct	17.8	11.0	2.3	Z	1.2	3.2	2.7	4.3	10.1	8.7	14.5	10.9	16.9	9.5	8.8	9.1	5.2	7.0	14.8	7.9	1.0	5.3	17.2	6.4	8.5	17.8
20-Oct	17.4	14.2	19.0	24.2	Z	14.8	4.5	2.2	0.7	0.9	2.7	1.1	0.2	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.1	0.0	0.0	1.0	4.5	24.2
21-Oct	3.2	4.4	7.1	5.1	6.4	Z	2.5	3.7	2.8	2.7	2.0	1.5	1.5	1.1	0.8	2.2	5.1	2.2	1.6	3.7	1.4	0.0	0.0	0.0	2.6	7.1
22-Oct	Z	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	0.2	0.6	1.0	0.1	1.0
23-Oct	0.9	Z	2.0	1.9	2.2	2.8	2.9	2.1	2.6	0.9	0.5	0.0	0.0	0.0	0.0	0.3	0.1	0.2	0.1	0.0	0.6	0.9	1.4	5.6	1.2	5.6
24-Oct	20.9	8.0	Z	1.7	0.4	1.4	3.6	2.1	2.0	1.2	1.7	1.0	0.9	0.5	1.7	0.5	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.3	2.1	20.9
25-Oct	0.2	0.2	0.2	Z	0.1	0.7	5.5	1.8	1.4	2.9	3.0	6.2	7.0	2.5	0.4	1.5	0.1	2.7	14.7	20.7	15.1	4.4	0.2	0.2	4.0	20.7
26-Oct	0.1	0.6	4.7	21.7	Z	1.1	0.9	1.0	0.5	0.2	1.5	0.8	0.6	0.0	0.2	1.1	4.4	14.4	15.5	9.2	14.0	5.0	2.4	7.2	4.7	21.7
27-Oct	11.1	5.0	2.8	15.9	9.8	Z	3.7	1.5	0.6	0.0	0.3	0.3	0.6	0.4	0.3	0.6	1.1	0.8	0.8	2.8	3.5	4.9	2.3	2.3	3.1	15.9
28-Oct	Z	1.6	1.9	3.2	3.1	2.7	1.5	0.7	0.6	0.4	0.4	0.5	1.0	1.0	0.8	0.6	0.2	0.2	2.5	3.9	3.3	2.5	0.3	0.3	1.4	3.9
29-Oct	0.0	Z	0.3	0.2	0.1	0.3	0.5	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.2	0.3	0.0	0.4	0.5	0.3	0.3	0.2	0.2	0.2	0.5
30-Oct	0.8	0.3	Z	0.2	0.0	0.0	1.6	7.0	1.8	0.6	1.1	1.3	0.8	0.2	1.2	1.8	1.4	1.0	1.2	1.7	1.8	1.7	1.7	2.5	1.4	7.0
31-Oct	3.4	3.0	2.6	Z	4.3	12.2	14.2	3.2	2.2	1.5	1.5	1.5	1.2	5.2	4.8	5.1	4.0	3.0	3.5	6.5	8.9	5.3	3.0	2.8	4.5	14.2
3.7 3.3 2.4 3.8 3.0 2.9 2.6 2.5 1.9 1.6 1.7 1.3 1.6 1.3 1.4 1.3 1.2 1.7 2.4 2.9 3.1 1.9 2.0 2.2																								Diurnal Average		
20.9 14.2 19.0 24.2 18.3 17.8 14.2 8.4 10.1 8.7 14.5 10.9 16.9 9.5 8.8 9.1 5.2 14.4 15.5 20.7 15.1 7.2 17.2 12.6																								Diurnal Maximum		
Z - zerospan C - Calibration																										



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Sawbones Bay - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Oxides (NO_x) - ppb
Sawbones Bay - October 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	704	99.44	99.44
21 - 40	4	0.56	100.00
11 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Sawbones Bay - October 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	14	4	1	12	35	72	107	97	47	27	19	48	125	52	13	704
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	4	0	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	31	14	4	1	12	35	72	107	97	47	27	19	52	125	52	13	708

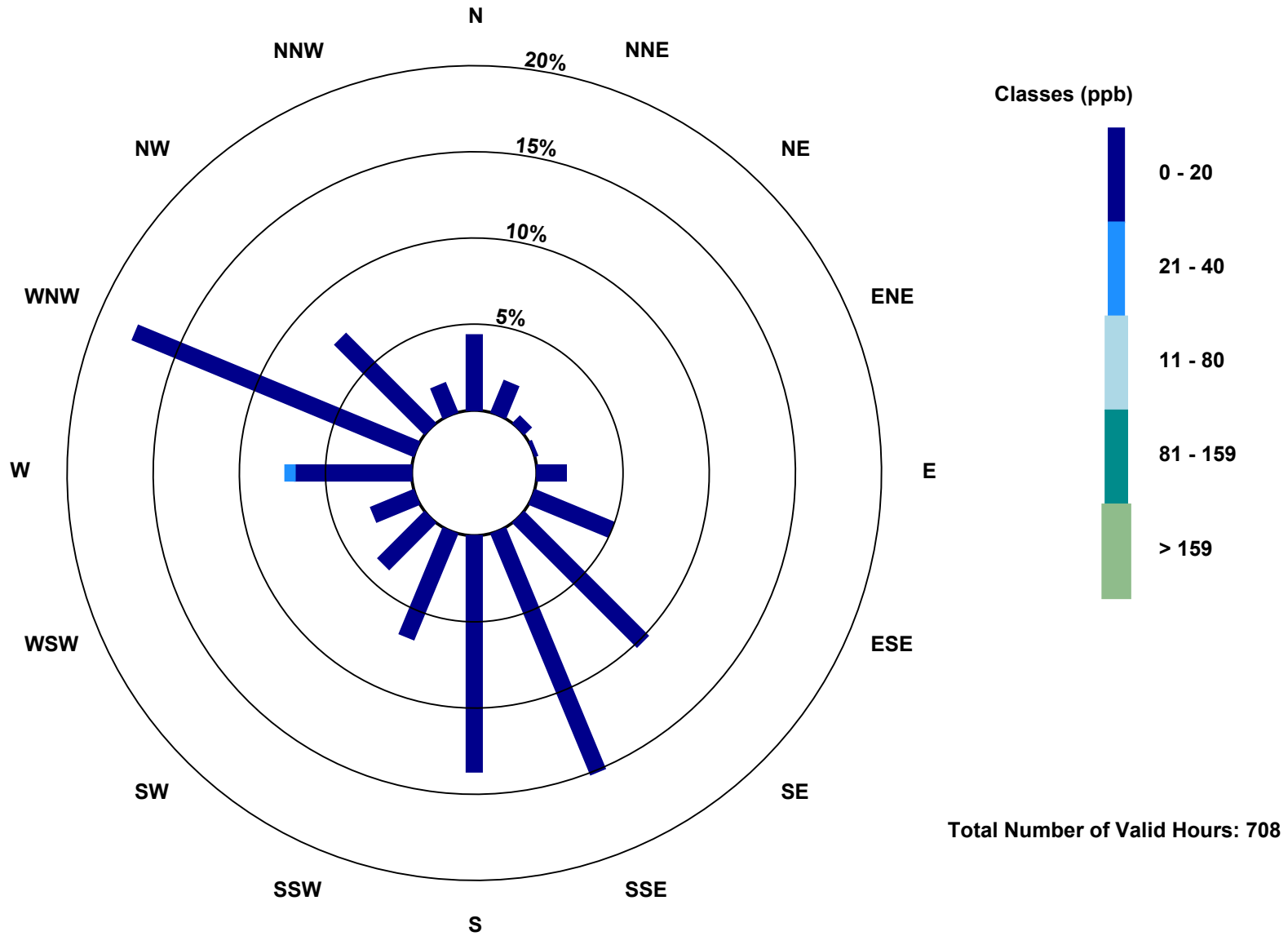
Total Number of Valid Hours: 708

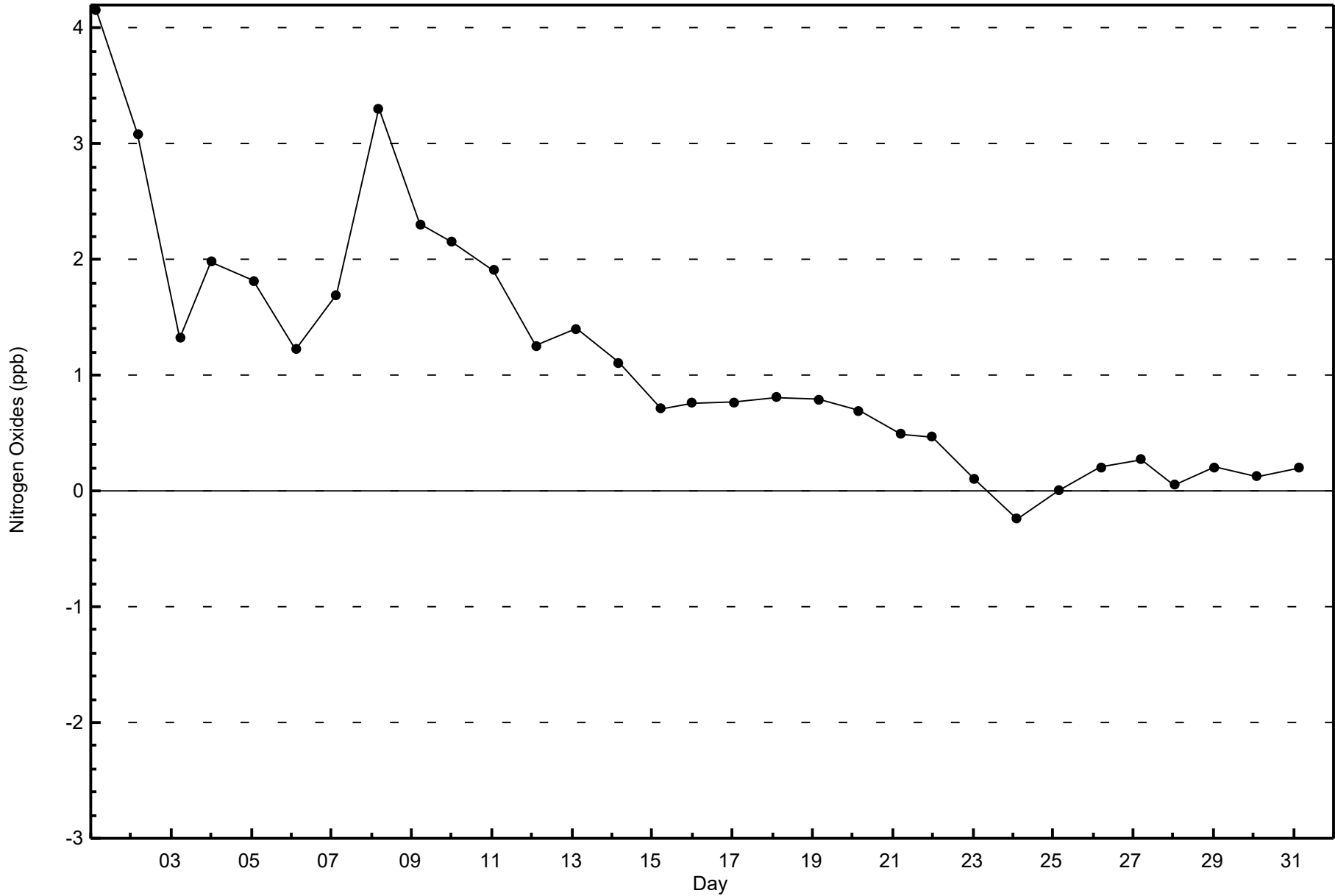
Total Number of Hours: 744

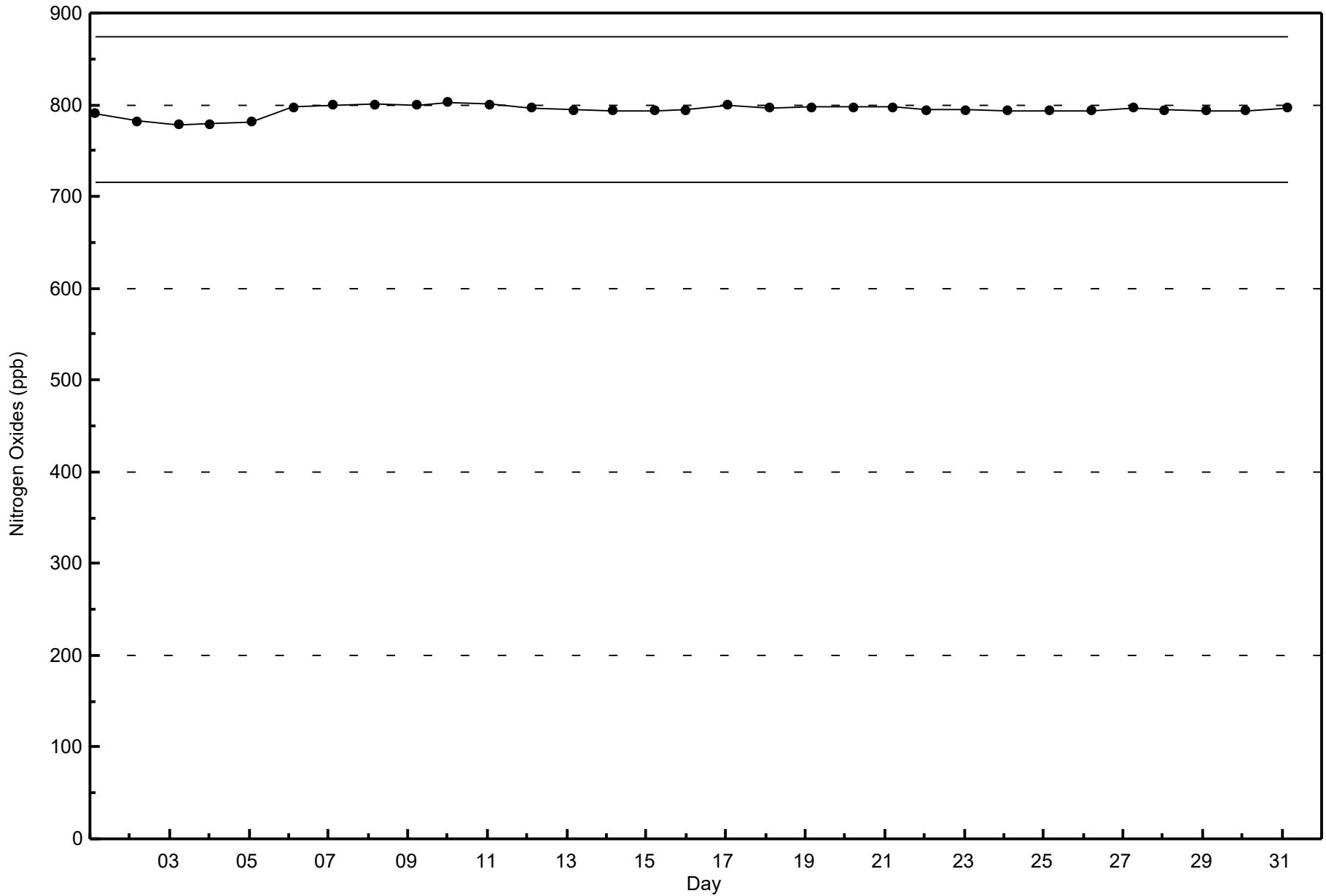


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitrogen Oxides (NO_x) - ppb
Sawbones Bay









Wood Buffalo Environmental Association
Summary of Hour Averages

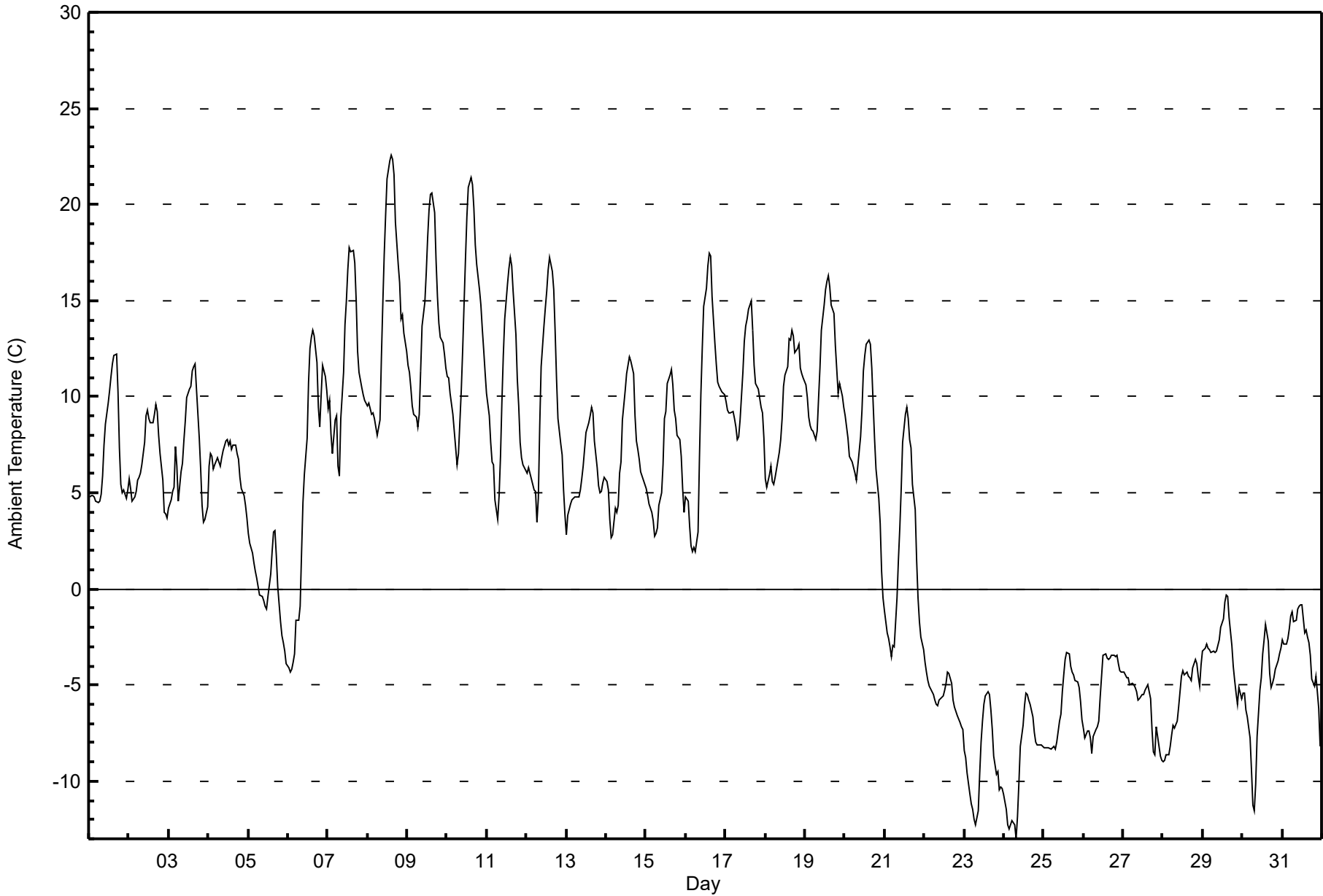
Ambient Temperature (AT) - C
Sawbones Bay - October 2023

Maximum Value: 22.6 C on Oct 8 15:00		Maximum Daily Average: 14.6 C on Oct 8		Hours in Service: 744																							
Minimum Value: -13.0 C on Oct 24 08:00		Minimum Daily Average: -9.0 C on Oct 24		Hours of Data: 744																							
Maximum Diurnal Average: 8.1 C at hour 15		Minimum Diurnal Average: 0.7 C at hour 7		Hours of Missing Data: 0																							
Monthly Average: 3.81 C		Percentiles: P ₁ = -11.9 P ₁₀ = -7.2 Q ₁ = -3.9 Median = 5.2 Q ₃ = 9.7 P ₉₀ = 13.5 P ₉₉ = 20.8		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-Oct	4.8	4.8	4.8	4.8	4.5	4.5	4.5	4.9	5.9	7.5	8.6	9.6	10.3	11.0	11.7	12.2	12.2	10.3	7.3	5.4	5.0	5.1	4.7	5.2	7.1	12.2	
2-Oct	5.7	5.2	4.6	4.8	5.1	5.6	5.8	6.1	6.4	7.6	9.0	9.3	8.9	8.6	8.7	9.1	9.6	9.2	8.0	7.0	5.6	4.0	3.9	3.7	6.7	9.6	
3-Oct	4.2	4.7	5.0	5.3	7.4	6.4	4.6	6.1	6.6	7.7	8.7	10.0	10.4	10.5	11.3	11.6	11.7	10.4	7.8	6.3	4.4	3.5	3.6	4.3	7.2	11.7	
4-Oct	6.4	7.0	6.9	6.2	6.5	6.8	6.6	6.4	6.8	7.2	7.7	7.7	7.5	7.7	7.2	7.5	7.4	7.1	6.7	5.8	5.2	4.8	4.3	3.7	6.6	7.7	
5-Oct	2.9	2.4	1.9	1.4	0.9	0.5	0.1	-0.3	-0.4	-0.6	-0.9	-1.0	-0.4	0.7	1.9	2.9	3.0	1.7	0.1	-1.7	-2.4	-2.8	-3.3	-3.9	0.1	3.0	
6-Oct	-4.1	-4.3	-4.2	-3.8	-3.4	-1.6	-1.6	-0.9	1.9	4.5	6.0	7.9	10.8	12.5	13.1	13.5	13.2	11.8	9.4	8.4	10.1	11.6	11.0	10.3	5.5	13.5	
7-Oct	9.4	9.8	8.1	7.0	8.8	9.0	6.4	5.9	8.9	11.3	13.8	15.0	16.6	17.7	17.5	17.6	17.0	15.0	12.4	11.3	10.4	10.1	9.8	9.7	11.6	17.7	
8-Oct	9.5	9.6	9.1	9.1	8.8	8.5	8.0	8.8	12.0	14.8	17.4	19.4	21.4	22.3	22.6	22.3	21.6	19.0	16.9	15.9	14.1	14.2	13.3	12.4	14.6	22.6	
9-Oct	11.6	11.3	10.5	9.6	9.1	8.9	8.4	9.1	11.4	13.7	14.9	16.5	18.2	19.8	20.5	20.6	19.5	17.1	15.2	13.8	13.1	12.8	12.2	11.5	13.7	20.6	
10-Oct	11.1	11.0	10.1	9.1	8.2	7.3	6.5	7.1	10.3	12.4	14.9	17.2	19.4	20.9	21.4	21.0	19.8	17.9	16.9	15.6	14.7	13.5	12.4	11.3	13.7	21.4	
11-Oct	10.2	9.0	7.6	6.6	6.5	4.6	3.6	4.9	6.9	9.7	12.1	14.0	15.9	16.7	17.3	16.8	15.5	13.2	10.9	9.5	7.6	6.8	6.5	6.2	9.9	17.3	
12-Oct	6.0	6.3	6.0	5.7	5.2	5.1	3.5	4.7	8.5	11.5	13.7	14.6	15.5	16.6	17.2	16.5	15.6	13.4	10.9	8.9	7.5	7.0	5.1	3.8	9.5	17.2	
13-Oct	2.8	3.8	4.4	4.6	4.7	4.8	4.8	4.8	5.2	5.7	6.4	7.3	8.1	8.6	9.0	9.5	9.1	7.7	6.3	5.4	5.0	5.1	5.5	5.8	6.0	9.5	
14-Oct	5.6	5.1	3.6	2.7	2.8	4.2	4.0	4.4	6.0	6.6	8.8	10.3	11.2	11.6	12.1	11.8	11.2	9.0	7.7	7.3	6.8	6.1	5.7	5.5	7.1	12.1	
15-Oct	5.2	4.8	4.4	4.0	3.6	2.7	2.9	3.2	4.4	5.0	6.5	8.9	9.2	10.7	11.1	11.4	10.6	9.3	8.9	8.0	7.7	6.9	5.2	4.0	6.6	11.4	
16-Oct	4.8	4.6	3.2	2.2	2.0	2.2	1.9	3.0	6.8	10.1	12.5	14.7	15.6	16.8	17.5	17.3	15.2	12.8	11.7	10.7	10.6	10.4	10.2	10.1	9.5	17.5	
17-Oct	9.7	9.3	9.2	9.1	9.3	8.9	8.4	7.8	7.9	8.8	11.2	12.8	13.7	14.1	14.6	15.0	13.5	11.7	10.7	10.5	10.4	9.4	9.1	7.9	10.5	15.0	
18-Oct	5.7	5.3	5.9	6.4	5.6	5.4	5.8	6.2	7.1	7.8	8.9	10.5	11.1	11.6	13.0	12.9	13.4	13.2	12.3	12.5	12.8	11.5	11.2	11.0	9.5	13.4	
19-Oct	10.6	9.9	9.0	8.5	8.3	8.2	7.8	8.2	9.9	11.5	13.5	14.8	15.6	16.0	16.3	15.7	14.8	14.3	12.7	11.4	10.2	10.7	10.0	9.5	11.6	16.3	
20-Oct	9.0	8.4	7.8	6.9	6.6	6.3	6.0	5.7	6.4	7.9	9.3	11.3	12.2	12.7	13.0	12.7	11.5	9.6	7.7	6.2	4.7	3.4	0.9	-0.4	7.7	13.0	
21-Oct	-1.1	-2.3	-2.6	-3.0	-3.5	-3.0	-3.0	-0.5	1.5	3.2	5.2	7.6	9.1	9.4	8.9	7.7	7.3	5.4	4.1	1.5	-0.4	-1.7	-2.5	-3.2	1.8	9.4	
22-Oct	-3.8	-4.4	-4.7	-5.1	-5.2	-5.5	-5.8	-6.0	-6.0	-5.8	-5.6	-5.6	-5.3	-4.9	-4.4	-4.4	-4.9	-5.8	-6.2	-6.3	-6.6	-7.0	-7.2	-7.3	-5.6	-3.8	
23-Oct	-8.4	-8.8	-9.6	-10.6	-11.2	-11.5	-12.0	-12.3	-11.5	-9.7	-8.0	-6.9	-6.0	-5.6	-5.4	-5.5	-6.3	-7.3	-8.7	-9.6	-9.5	-10.4	-10.3	-10.4	-9.0	-5.4	
24-Oct	-10.6	-11.5	-12.3	-12.5	-12.2	-12.0	-12.3	-13.0	-11.9	-10.1	-8.2	-7.1	-6.0	-5.4	-5.5	-5.8	-6.0	-6.7	-7.5	-8.0	-8.1	-8.1	-8.2	-8.2	-9.0	-5.4	
25-Oct	-8.3	-8.3	-8.3	-8.3	-8.3	-8.3	-8.2	-8.3	-8.0	-6.9	-6.5	-5.4	-4.4	-3.7	-3.3	-3.4	-4.0	-4.3	-4.4	-4.8	-4.8	-5.2	-5.8	-6.8	-6.2	-3.3	
26-Oct	-7.3	-7.7	-7.4	-7.4	-7.8	-8.5	-7.7	-7.3	-7.1	-6.9	-5.6	-4.5	-3.5	-3.4	-3.6	-3.7	-3.6	-3.4	-3.4	-3.5	-3.4	-3.9	-4.3	-4.4	-5.4	-3.4	
27-Oct	-4.3	-4.5	-4.6	-4.6	-5.0	-4.9	-5.0	-5.1	-5.3	-5.8	-5.7	-5.5	-5.5	-5.3	-5.1	-5.0	-5.7	-7.3	-8.5	-8.6	-7.2	-7.7	-8.7	-8.9	-6.0	-4.3	
28-Oct	-9.0	-8.9	-8.6	-8.7	-8.2	-7.6	-7.1	-7.2	-6.9	-6.1	-5.4	-4.6	-4.3	-4.5	-4.3	-4.6	-4.6	-4.8	-4.1	-3.7	-3.9	-4.6	-5.1	-4.0	-5.9	-3.7	
29-Oct	-3.3	-3.1	-2.9	-3.1	-3.2	-3.3	-3.2	-3.3	-3.3	-3.0	-2.6	-2.0	-1.6	-0.7	-0.3	-0.4	-1.5	-2.9	-4.0	-4.7	-5.4	-6.0	-5.1	-5.7	-3.1	-0.3	
30-Oct	-5.4	-5.5	-6.3	-6.7	-7.8	-9.4	-11.2	-11.5	-10.2	-7.7	-5.3	-4.6	-3.4	-2.6	-1.8	-2.8	-4.4	-5.2	-4.9	-4.6	-4.2	-3.7	-3.4	-3.1	-5.7	-1.8	
31-Oct	-2.7	-2.8	-2.9	-2.6	-2.1	-1.4	-1.2	-1.7	-1.6	-1.0	-0.9	-0.8	-0.8	-2.3	-2.1	-2.5	-2.8	-3.4	-4.7	-5.0	-4.5	-5.3	-6.2	-8.2	-2.9	-0.8	
		2.2	1.9	1.5	1.2	1.2	1.1	0.7	1.0	2.2	3.6	5.0	6.2	7.1	7.7	8.1	8.0	7.4	6.1	4.8	3.9	3.4	2.9	2.4	2.0	Diurnal Average	
		11.6	11.3	10.5	9.6	9.3	9.0	8.4	9.1	12.0	14.8	17.4	19.4	21.4	22.3	22.6	22.3	21.6	19.0	16.9	15.9	14.7	14.2	13.3	12.4	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Sawbones Bay - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Sawbones Bay - October 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	272	36.56	36.56
0 - 10	293	39.38	75.94
10 - 20	169	22.72	98.66
> 20	10	1.34	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association

Summary of Hour Averages

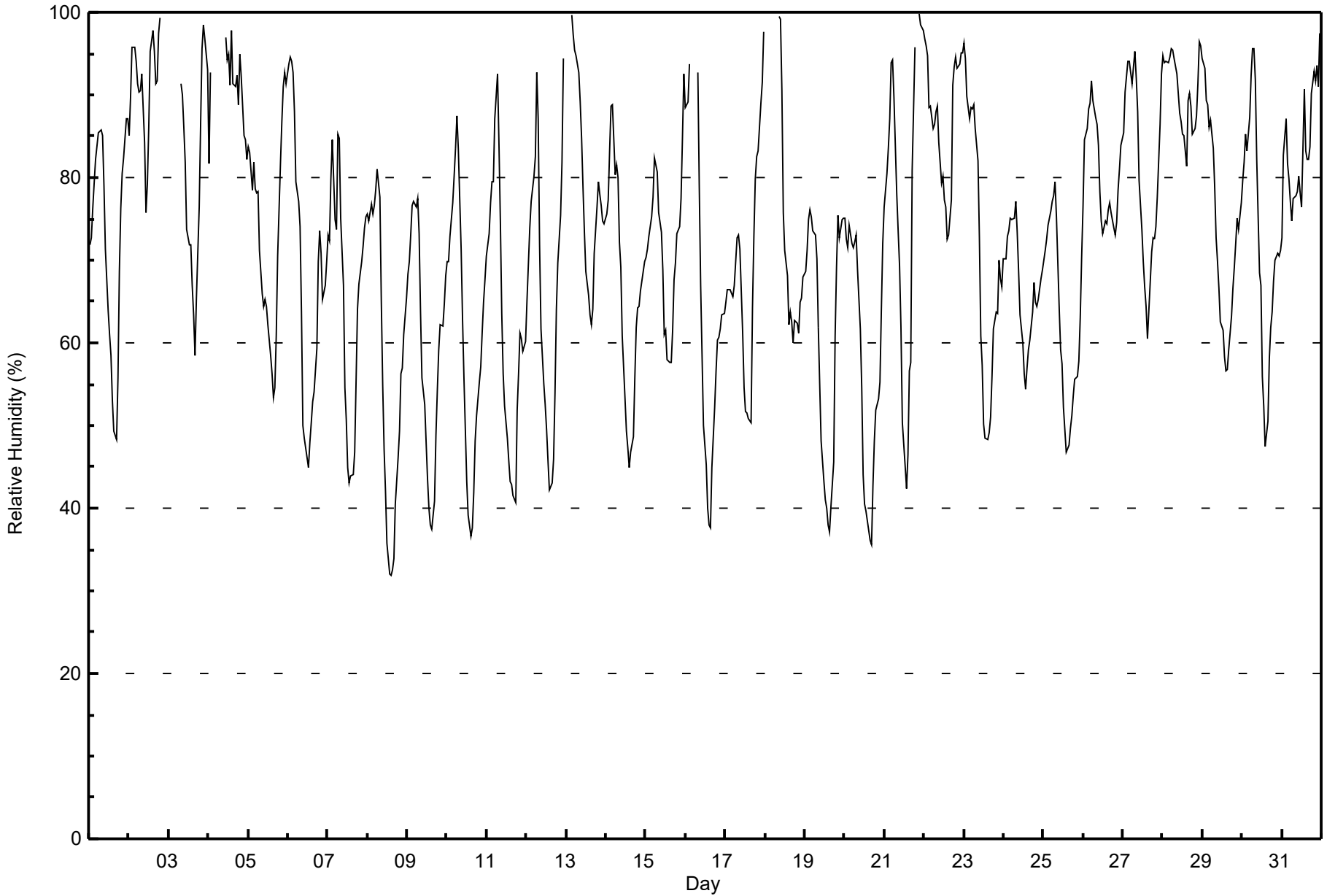
Relative Humidity (RH) - %
Sawbones Bay - October 2023

Maximum Value: 99.8 % on Oct 21 22:00																						Hours in Service: 744																											
Maximum Daily Average: 91.0 % on Oct 2																						Hours of Data: 707																											
Minimum Value: 31.9 % on Oct 8 15:00																						Hours of Missing Data: 37																											
Minimum Daily Average: 57.0 % on Oct 8																						Hours of Calibration: 0																											
Maximum Diurnal Average: 84.1 % at hour 7																						Percent Operational Time: 95.0																											
Minimum Diurnal Average: 55.8 % at hour 15																																																	
Monthly Average: 71.63 %																																																	
Percentiles: P ₁ = 36.7 P ₁₀ = 48.5 Q ₁ = 61.0 Median = 73.1 Q ₃ = 84.6 P ₉₀ = 92.7 P ₉₉ = 97.9																																																	
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-Oct	71.8	72.8	76.2	79.4	82.2	85.4	85.6	85.8	85.1	79.0	71.3	63.9	60.9	58.5	53.1	49.3	48.3	55.8	68.6	76.2	80.4	82.4	87.1	87.1	72.8	87.1																							
2-Oct	85.2	89.8	95.8	95.7	94.1	91.4	90.3	90.4	92.5	84.2	75.8	79.3	86.3	95.3	97.9	95.3	91.4	91.7	97.5	99.3	OR	OR	OR	OR	91.0	99.3																							
3-Oct	OR	OR	OR	OR	OR	OR	OR	OR	91.3	90.1	86.1	81.8	73.7	71.8	71.8	66.9	63.3	58.5	65.4	76.4	86.4	95.5	98.5	96.8	93.1	--	98.5																						
4-Oct	81.6	92.7	OR	OR	OR	OR	OR	OR	OR	OR	OR	96.9	94.2	94.9	91.2	97.8	91.3	91.1	92.4	88.9	95.0	92.2	85.0	84.6	82.3	--	97.8																						
5-Oct	83.8	83.1	78.5	81.9	78.6	78.2	78.2	71.2	65.9	64.3	65.3	64.5	62.1	58.4	56.2	53.4	54.5	60.9	70.5	81.7	86.8	90.9	92.7	91.4	73.1	92.7																							
6-Oct	93.8	94.6	94.1	92.7	87.9	79.5	77.2	74.1	63.7	50.1	48.5	46.1	44.9	48.0	50.3	52.9	54.0	59.3	69.9	73.5	70.8	65.3	67.0	69.9	67.8	94.6																							
7-Oct	73.1	72.3	79.8	84.7	74.9	73.8	85.2	84.8	75.1	67.0	54.6	50.6	44.9	43.1	44.0	44.1	46.8	55.5	64.0	67.2	69.8	71.7	74.0	75.3	65.7	85.2																							
8-Oct	75.5	74.8	76.8	75.7	76.5	78.5	81.1	77.6	65.0	54.9	47.2	42.1	35.7	32.1	31.9	32.6	33.9	40.5	46.1	49.3	56.3	56.9	61.1	65.4	57.0	81.1																							
9-Oct	68.3	69.8	73.1	76.5	77.1	76.4	77.5	73.3	63.8	55.8	52.5	47.9	43.6	40.0	37.9	37.5	40.9	48.8	54.3	59.2	62.3	62.1	64.7	68.1	59.6	77.5																							
10-Oct	69.8	69.9	72.9	77.0	80.2	83.6	87.5	83.4	71.3	62.9	55.7	49.6	43.2	39.2	36.7	37.6	41.9	48.2	51.2	55.2	57.2	61.2	64.9	67.7	61.2	87.5																							
11-Oct	70.6	73.2	76.9	79.5	79.5	87.1	92.6	84.1	74.7	63.5	56.2	52.3	48.4	45.8	43.2	43.0	41.5	40.7	51.9	56.3	61.2	60.5	58.9	60.1	62.6	92.6																							
12-Oct	65.1	69.4	73.9	77.1	80.1	82.6	92.8	87.1	71.9	61.8	55.0	52.5	49.4	45.8	42.1	43.0	45.9	53.9	64.0	69.7	75.5	81.8	94.4	OR	66.7	94.4																							
13-Oct	OR	OR	OR	99.7	97.3	95.5	94.8	92.8	89.2	84.7	78.8	73.3	68.7	65.7	63.3	62.3	64.1	70.9	76.5	79.4	77.9	76.6	74.8	74.3	79.1	99.7																							
14-Oct	75.7	77.2	83.3	88.6	88.7	80.4	81.5	80.1	72.2	69.1	60.9	53.3	49.2	47.3	44.9	46.7	48.7	55.8	61.8	64.3	64.4	66.3	68.6	69.8	66.6	88.7																							
15-Oct	70.3	71.3	73.0	75.2	77.6	82.5	81.4	80.7	75.7	73.4	68.8	61.0	61.6	58.0	57.7	57.7	61.5	67.7	69.7	73.3	74.1	77.4	84.7	92.5	71.9	92.5																							
16-Oct	88.4	89.1	93.7	OR	OR	OR	OR	92.7	79.0	67.0	58.5	50.0	45.2	40.0	38.0	37.7	45.0	52.2	56.5	60.4	60.7	61.8	63.5	63.6	62.1	93.7																							
17-Oct	64.9	66.4	66.4	66.5	65.6	67.0	69.8	72.8	73.1	71.4	61.1	54.5	51.7	51.5	50.9	50.4	64.2	72.9	79.7	82.5	83.3	89.0	91.5	97.5	69.4	97.5																							
18-Oct	OR	OR	OR	OR	OR	OR	OR	OR	99.5	99.1	90.4	75.8	71.2	68.2	62.1	63.7	62.5	59.9	62.6	62.4	61.2	64.9	65.4	67.9	--	99.5																							
19-Oct	68.6	71.2	74.9	76.2	75.2	73.6	73.1	70.1	61.9	54.9	48.1	43.2	41.0	40.1	38.0	37.0	40.2	45.5	60.8	69.1	75.4	72.7	75.0	75.1	60.9	76.2																							
20-Oct	75.1	72.6	71.5	74.3	72.0	71.6	72.3	73.0	68.9	61.6	54.6	44.0	40.6	39.6	37.3	36.1	35.6	42.8	48.2	51.9	53.1	55.3	63.8	72.0	57.8	75.1																							
21-Oct	76.5	80.5	83.5	87.1	93.9	94.2	89.6	78.0	73.5	69.3	61.8	50.3	45.1	42.4	46.4	56.6	57.6	80.8	95.7	OR	OR	99.8	98.4	97.9	75.4	99.8																							
22-Oct	96.8	95.9	94.7	88.4	88.6	85.9	86.4	87.9	88.6	84.2	79.3	80.1	77.3	76.4	72.6	73.1	77.3	91.2	93.4	94.5	93.3	93.8	95.2	95.1	87.1	96.8																							
23-Oct	96.2	94.4	89.8	87.2	88.4	88.2	88.8	85.9	82.0	72.8	60.9	57.3	50.3	48.5	48.3	49.1	51.0	55.9	61.6	63.7	63.5	70.0	67.8	66.9	70.3	96.2																							
24-Oct	70.2	70.2	72.8	73.5	75.1	74.9	75.1	77.1	73.4	68.7	63.4	60.0	56.3	54.5	57.0	59.2	60.3	63.8	67.2	64.9	64.3	65.3	67.8	68.8	66.8	77.1																							
25-Oct	70.0	71.2	72.5	74.3	75.9	77.2	77.8	79.5	75.3	64.0	59.1	57.4	52.2	49.4	46.8	47.7	49.6	51.2	53.5	55.7	55.9	57.8	63.1	70.4	62.8	79.5																							
26-Oct	76.7	84.5	85.9	88.4	89.0	91.6	89.3	87.2	86.4	83.9	78.4	74.8	73.2	74.7	74.4	76.1	76.9	75.8	73.9	73.1	74.6	78.5	81.0	83.9	80.5	91.6																							
27-Oct	85.5	90.4	92.2	94.1	94.0	91.4	93.3	95.2	92.0	88.0	79.6	73.7	69.8	66.8	64.5	60.6	67.5	71.0	72.7	72.5	74.0	77.6	86.5	92.6	81.1	95.2																							
28-Oct	94.7	93.9	94.0	93.9	94.7	95.5	95.4	94.4	92.5	90.2	87.8	86.7	85.3	85.1	81.3	89.3	90.2	88.7	85.3	85.9	87.5	91.3	96.4	95.9	90.7	96.4																							
29-Oct	94.4	93.2	89.4	88.8	86.2	86.9	83.5	78.8	72.8	69.9	66.6	62.5	61.5	58.3	56.7	56.7	59.2	63.3	66.7	69.2	72.0	75.1	73.7	76.9	73.4	94.4																							
30-Oct	79.7	81.9	85.3	83.1	87.2	92.4	95.6	95.6	91.9	82.2	68.6	66.9	56.0	52.4	47.4	50.5	58.1	61.8	63.8	67.4	70.1	70.9	70.6	71.1	72.9	95.6																							
31-Oct	72.7	82.7	87.1	81.7	79.9	77.1	74.7	77.4	77.9	78.3	80.2	78.2	76.5	90.6	83.2	82.2	82.2	83.8	90.2	92.8	91.7	93.6	90.9	97.5	83.5	97.5																							
																								78.4	80.3	81.8	83.0	83.0	83.0	84.1	82.8	78.2	72.1	66.7	61.9	58.7	57.4	55.8	56.0	58.1	63.5	69.1	71.7	72.6	75.1	77.5	79.0	Diurnal Average	
																								96.8	95.9	95.8	99.7	97.3	95.5	95.6	95.6	99.5	99.1	96.9	94.2	94.9	95.3	97.9	95.3	91.4	92.4	97.5	99.3	95.5	99.8	98.4	97.9	Diurnal Maximum	
OR - Out of Range																																																	



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Sawbones Bay - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Relative Humidity (RH) - %
Sawbones Bay - October 2023**

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	19	2.69	2.69
40 - 60	146	20.65	23.34
60 - 80	314	44.41	67.75
80 - 100	228	32.25	100.00

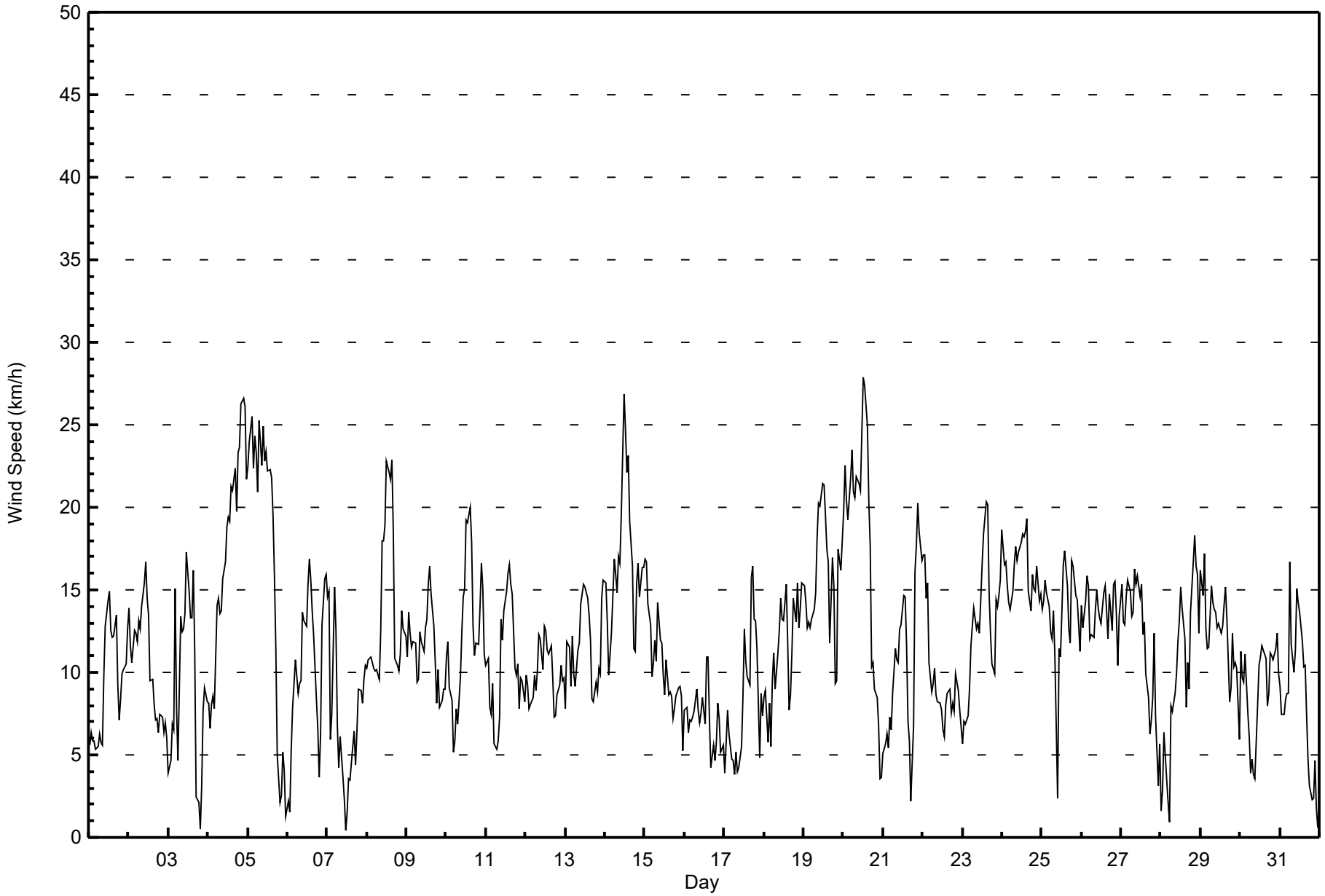
Total Number of Valid Hours: 707

Total Number of Hours: 744



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Sawbones Bay - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Wind Speed (WS) - km/h
Sawbones Bay - October 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	64	8.60	8.60
6 - 11	303	40.73	49.33
12 - 19	319	42.88	92.20
20 - 28	58	7.80	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 - October 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	3	0	1	5	6	7	9	13	7	1	2	1	0	1	3	64
6 - 11	14	11	4	0	8	26	41	46	61	27	10	8	4	22	16	5	303
12 - 19	13	0	0	0	0	5	26	48	27	15	16	9	41	94	20	5	319
20 - 28	1	0	0	0	0	0	1	9	0	0	1	3	7	20	16	0	58
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	14	4	1	13	37	75	112	101	49	28	22	53	136	53	13	744

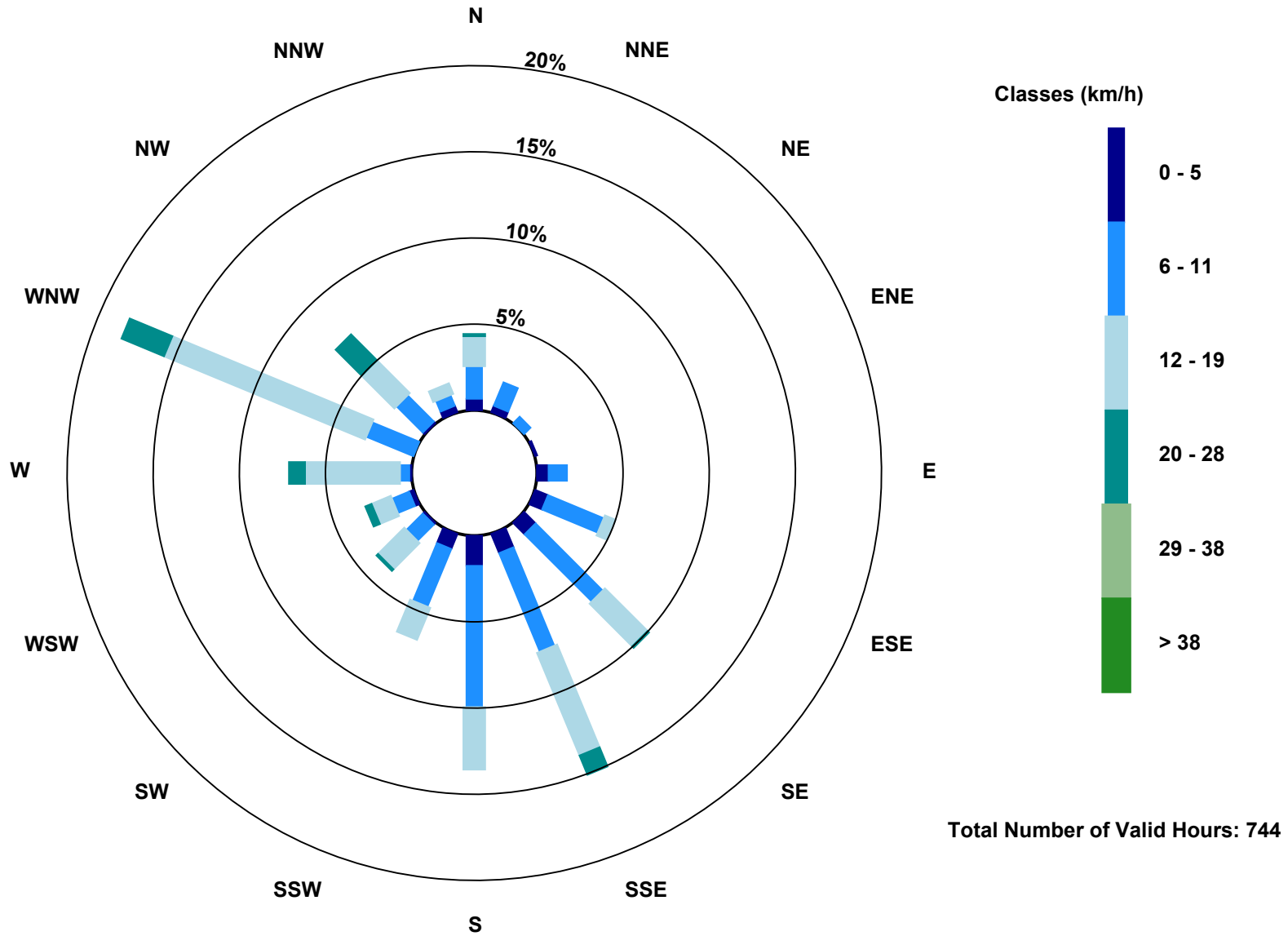
Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

Wind Speed (WS) - km/h
Sawbones Bay





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Sawbones Bay - October 2023

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



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Sawbones Bay - October 2023

Direction of Maximum Speed: 295 deg on Oct 20 13:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 285.0 deg on Oct 20	Hours of Data: 744
Direction of Minimum Speed: 142 deg on Oct 7 12:00	Hours of Missing Data: 0
Direction of Minimum Daily Speed Average: 2.3 deg on Oct 21	Percent Operational Time: 100.0
Monthly Average Direction: 234.5 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-Oct	127	116	112	107	112	110	110	106	129	162	169	172	178	175	184	184	185	171	157	172	174	168	165	169	160.4
2-Oct	165	167	174	171	170	174	166	175	171	177	184	189	191	203	199	206	195	191	187	193	188	173	183	177	180.6
3-Oct	169	174	182	203	256	243	210	282	283	283	291	294	305	295	277	288	299	280	174	171	170	167	166	168	264.2
4-Oct	241	243	213	198	233	256	278	288	295	295	300	302	304	304	300	303	300	300	300	301	296	297	302	306	292.3
5-Oct	308	306	307	302	308	311	315	303	321	322	322	323	317	312	308	324	315	318	10	31	141	172	171	136	313.0
6-Oct	174	170	167	168	184	181	169	167	177	202	208	198	212	210	219	217	199	188	186	175	227	277	273	281	208.6
7-Oct	288	265	228	238	284	271	195	166	254	255	357	142	153	175	147	118	123	98	97	110	126	137	145	152	200.0
8-Oct	150	140	143	146	147	144	147	140	154	157	155	159	160	159	157	160	161	150	152	132	138	149	154	156	152.4
9-Oct	155	152	145	151	156	152	151	151	156	160	142	140	135	140	142	146	142	141	136	128	156	138	136	137	145.5
10-Oct	143	146	129	126	109	107	111	105	140	136	142	137	148	141	143	140	137	119	114	115	134	144	141	131	134.4
11-Oct	116	116	108	106	106	101	105	98	99	117	132	122	137	126	136	132	119	112	101	110	111	121	136	131	119.3
12-Oct	133	146	124	137	136	151	164	170	170	170	164	153	155	156	144	132	134	136	133	152	151	155	166	171	151.1
13-Oct	185	189	186	188	194	188	181	170	168	166	180	172	170	162	151	142	130	121	116	119	135	134	146	152	161.8
14-Oct	152	146	129	125	139	154	151	150	154	154	161	160	159	148	162	150	152	155	150	156	156	152	156	156	152.6
15-Oct	159	158	158	160	156	161	168	165	164	169	173	167	155	191	188	196	188	193	190	180	180	184	180	200	171.6
16-Oct	212	208	192	183	181	181	188	171	192	206	215	216	260	222	227	226	168	149	128	132	117	114	123	131	186.9
17-Oct	98	83	93	95	94	100	98	13	339	305	325	347	295	306	310	297	274	276	292	288	252	197	198	150	293.3
18-Oct	168	186	176	185	181	151	169	171	156	165	165	195	193	197	195	180	187	203	201	215	228	215	222	237	192.3
19-Oct	250	238	224	218	217	219	219	220	228	229	254	266	253	237	236	231	224	241	257	235	203	227	246	273	237.3
20-Oct	262	262	262	259	261	262	262	287	287	288	284	286	295	299	309	315	322	302	292	295	306	314	7	130	285.0
21-Oct	166	157	162	133	154	160	174	174	173	170	171	179	188	198	199	202	221	198	339	358	3	355	359	355	180.9
22-Oct	354	354	353	6	3	8	11	16	20	29	45	37	33	39	37	20	26	31	14	357	350	353	352	356	10.5
23-Oct	308	301	317	310	290	290	288	289	290	287	291	301	307	292	289	289	296	293	298	292	284	287	278	267	291.5
24-Oct	261	274	286	286	289	287	281	289	287	288	285	288	289	290	282	288	302	318	315	305	291	291	292	292	289.3
25-Oct	294	291	290	294	291	290	277	294	290	244	275	238	260	276	290	286	295	276	263	260	266	279	298	295	281.1
26-Oct	290	289	282	261	282	291	292	294	295	291	285	294	292	300	295	284	273	261	267	268	262	280	279	265	282.0
27-Oct	264	270	281	262	273	285	285	287	349	3	359	349	340	348	333	321	344	316	302	292	266	272	197	196	305.7
28-Oct	202	201	181	155	176	167	308	305	306	303	310	333	322	324	326	327	301	296	284	277	279	280	290	295	297.4
29-Oct	288	288	286	290	290	293	289	290	310	306	324	317	301	317	298	293	295	307	297	292	295	293	292	338	298.2
30-Oct	13	9	360	12	10	15	347	326	15	102	166	186	182	182	196	196	187	181	183	187	194	191	195	194	186.7
31-Oct	191	174	171	191	202	239	269	295	302	307	324	324	339	2	351	358	354	9	61	133	163	174	220	350	300.8

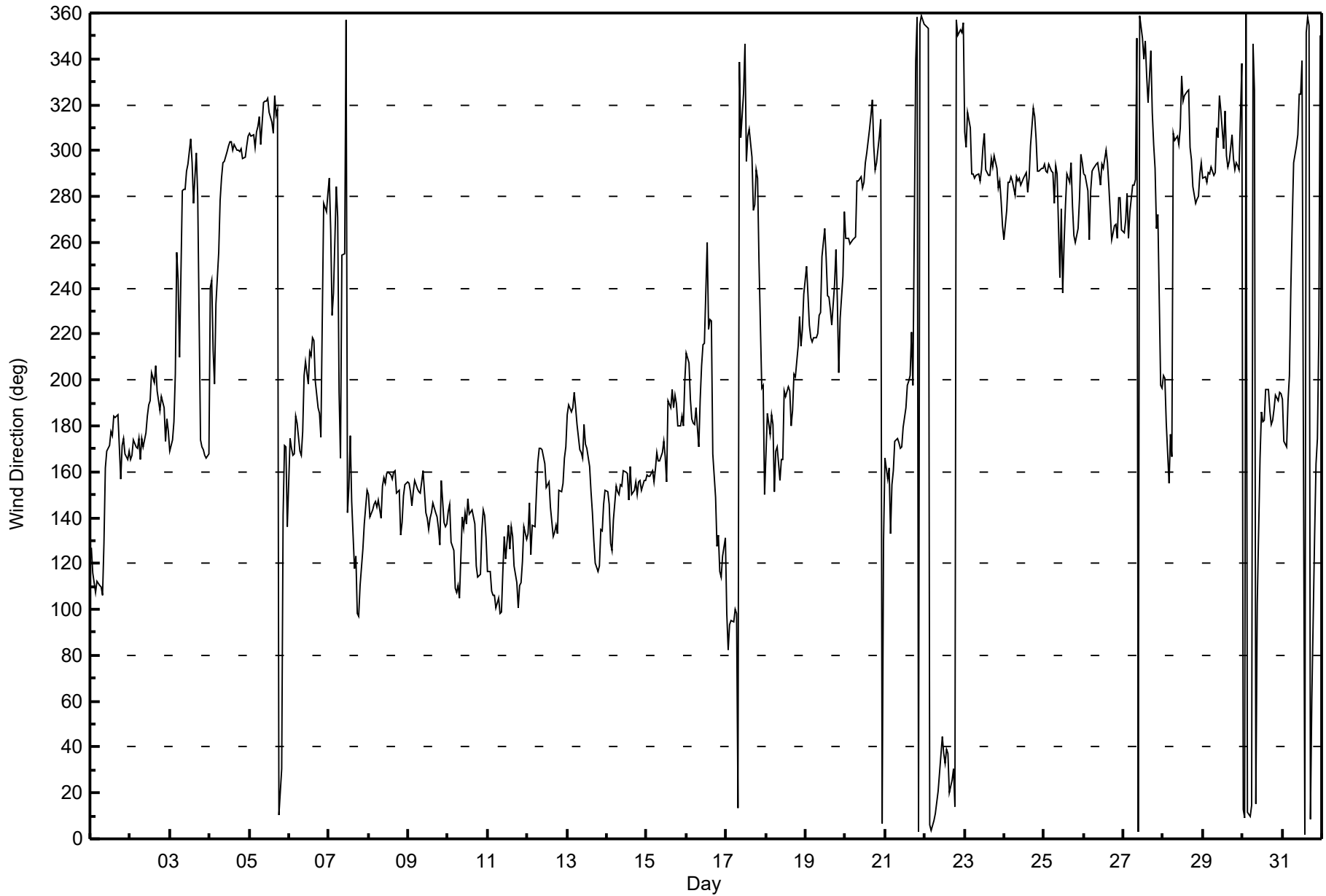
230.0 226.3 224.1 216.8 234.3 231.6 232.8 248.7 244.6 231.3 236.0 238.1 241.1 238.1 240.6 243.0 242.7 239.4 244.7 238.7 230.1 226.7 222.0 221.4
 Diurnal Average

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Sawbones Bay - October 2023





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Sawbones Bay - October 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0										Hours in Service: 744															
Maximum Value: 101 deg on Oct 7 12:00										Hours of Data: 744															
Minimum Value: 6 deg on Oct 27 20:00										Hours of Missing Data: 0															
Percentiles: P ₁ = 7 P ₁₀ = 11 Q ₁ = 13 Median = 15 Q ₃ = 18 P ₉₀ = 26 P ₉₉ = 79										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-Oct	18	10	8	10	15	13	8	11	18	19	18	18	20	20	21	25	18	14	10	10	11	13	12	13	25
2-Oct	13	12	13	13	14	15	14	16	14	17	18	17	18	18	19	17	15	13	13	12	11	11	13	17	19
3-Oct	33	25	18	24	14	39	33	17	12	17	15	14	16	15	24	13	16	65	78	98	61	7	8	7	98
4-Oct	40	58	25	18	19	13	16	10	12	12	13	13	13	12	14	13	12	14	12	12	12	13	14	58	
5-Oct	14	14	13	12	13	14	15	13	15	14	16	17	14	15	18	17	15	14	15	27	37	13	18	68	
6-Oct	40	62	43	11	17	15	11	12	18	18	18	18	20	18	17	17	16	14	11	70	39	18	16	16	70
7-Oct	9	17	43	34	14	13	30	51	37	47	70	101	88	73	42	26	19	19	21	17	14	14	14	12	101
8-Oct	12	13	14	12	13	13	12	15	16	15	16	15	15	17	16	15	14	13	12	18	19	15	14	13	19
9-Oct	13	12	13	12	11	12	15	14	15	18	21	22	22	20	20	18	17	15	16	14	16	17	16	13	22
10-Oct	12	13	16	14	16	11	12	14	21	21	20	20	17	21	20	19	18	15	13	15	19	16	18	17	21
11-Oct	15	12	14	18	14	27	30	26	24	19	23	20	23	21	22	20	18	18	21	13	13	12	15	14	30
12-Oct	15	12	13	14	13	11	11	6	11	15	21	18	21	26	28	19	17	14	14	12	27	12	9	8	28
13-Oct	14	15	17	15	14	17	18	17	16	16	15	16	18	23	22	21	17	11	10	11	15	15	14	23	
14-Oct	15	15	16	14	16	14	14	15	16	16	16	14	16	19	15	18	16	13	13	14	13	14	14	19	
15-Oct	13	12	12	11	13	12	13	11	13	15	17	21	21	23	21	17	13	12	13	10	13	13	12	23	23
16-Oct	13	19	16	12	14	11	14	8	21	28	23	21	47	26	26	30	24	12	21	17	13	9	26	19	47
17-Oct	31	31	23	21	34	25	38	15	28	25	30	21	15	18	19	26	15	16	9	11	26	33	17	24	38
18-Oct	11	15	15	16	16	13	14	13	13	12	15	19	16	15	18	18	20	14	13	16	17	13	15	19	20
19-Oct	16	17	17	14	15	15	15	15	15	16	20	18	19	20	21	20	22	25	23	27	18	16	20	16	27
20-Oct	12	10	11	12	11	10	12	11	10	11	14	12	14	14	15	14	14	11	8	9	12	14	27	44	44
21-Oct	9	7	6	13	12	12	9	10	11	15	13	15	16	17	15	14	50	82	29	15	16	17	17	17	82
22-Oct	17	16	16	17	15	16	15	15	15	21	29	29	27	35	31	15	14	19	17	14	14	13	13	14	35
23-Oct	9	10	8	9	6	7	7	7	10	9	13	16	18	14	13	12	13	13	8	9	11	12	13	11	18
24-Oct	11	16	12	13	10	13	14	12	9	11	13	14	16	17	17	11	14	13	14	15	10	10	13	11	17
25-Oct	11	10	10	10	10	12	16	13	20	70	19	26	29	23	17	19	11	17	11	13	14	17	11	11	70
26-Oct	10	11	12	13	13	11	11	11	13	11	16	15	18	14	14	17	17	11	17	15	12	18	15	16	18
27-Oct	13	15	16	12	15	11	11	12	23	16	18	19	16	19	20	16	22	14	6	6	14	55	43	23	55
28-Oct	80	61	21	49	79	94	17	12	13	13	15	16	15	14	15	14	13	11	15	14	11	14	9	12	94
29-Oct	8	9	9	10	9	10	9	11	15	15	16	21	20	18	16	11	10	9	7	9	9	7	14	33	33
30-Oct	14	13	15	14	12	10	26	16	26	38	19	19	19	21	19	15	13	12	14	14	14	13	15	14	38
31-Oct	14	14	14	15	17	23	16	10	13	14	15	14	20	17	16	16	15	18	12	42	51	24	86	75	86
										80 62 43 49 79 94 38 51 37 70 70 101 88 73 42 30 50 82 78 98 61 55 86 75															
Diurnal Maximum																									



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS507
KIRBY SOUTH
OCTOBER 2023

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

November 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - KIRBY SOUTH (AMS 507)
OCTOBER 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	6.5	0	2.4	0
H2S (ppb) Average	704	36	40	99.46	0.8	0	0.3	0
THC (ppm) Average	700	36	44	98.92	3.4	-	2.5	-
NO2 (ppb) Average	700	39	44	99.33	19.4	0	10.8	-
NO (ppb) Average	700	39	44	99.33	58.1	-	15.7	-
NOX (ppb) Average	700	39	44	99.33	71.9	-	26.5	-
Temperature 2 m (C) Average	743	0	1	99.87	21.5	-	14.7	-
Relative Humidity (%) Average	743	0	1	99.87	99.4	-	90.5	-
Wind Speed 10 m (km/h) Average	730	0	14	98.12	28	-	19	-
Wind Direction 10 m (deg) Average	730	0	14	98.12	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - KIRBY SOUTH(AMS507)
 OCTOBER 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	0.39	0.7	-	0	0	0.1	0.2	0.5	0.7	6.5
H2S (ppb) Average	704	0.11	0.1	-	0	0	0.1	0.1	0.1	0.2	0.8
THC (ppm) Average	700	2.32	0.2	-	1.9	2.2	2.2	2.3	2.4	2.5	3.4
NO2 (ppb) Average	700	1.61	2.2	-	0.1	0.4	0.7	1.1	1.7	2.4	19.4
NO (ppb) Average	700	0.68	3.7	-	0	0	0	0	0	0.3	58.1
NOX (ppb) Average	700	2.29	5.6	-	0.1	0.4	0.7	1.1	1.8	2.6	71.9
Temperature 2 m (C) Average	743	3.23	8	-	-13.4	-7.7	-4.7	4.9	9.4	12.9	21.5
Relative Humidity (%) Average	743	72.32	15.4	-	29.9	49.4	61.5	74.2	84.9	91	99.4
Wind Speed 10 m (km/h) Average	730	12.8	5	-	0	7	10	12	15	19	28
Wind Direction 10 m (deg) Average	730	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - KIRBY SOUTH (AMS507)
OCTOBER 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL PARAMETERS	12 Oct 2023 16:00	12 Oct 2023 16:00	1	DAS Failure - data not recorded
SO2	12 Oct 2023 13:00	12 Oct 2023 15:00	3	Maintenance - WBEA internal audit
THC	12 Oct 2023 14:00	12 Oct 2023 15:00	2	Maintenance - WBEA internal audit
H2S, NO2	12 Oct 2023 12:00	12 Oct 2023 14:00	3	Maintenance - WBEA internal audit
THC	19 Oct 2023 12:00	19 Oct 2023 16:00	5	Maintenance - sample pump replaced
NO2	19 Oct 2023 17:00	19 Oct 2023 17:00	1	Maintenance - troubleshooting station calibrator
Wind Speed, Wind Direction	04 Oct 2023 11:00	04 Oct 2023 11:00	1	Maintenance - station operator activities
Wind Speed, Wind Direction	22 Oct 2023 06:00	22 Oct 2023 17:00	12	Flat line in sensor output signal - Sensor frozen



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb

Kirby South - October 2023

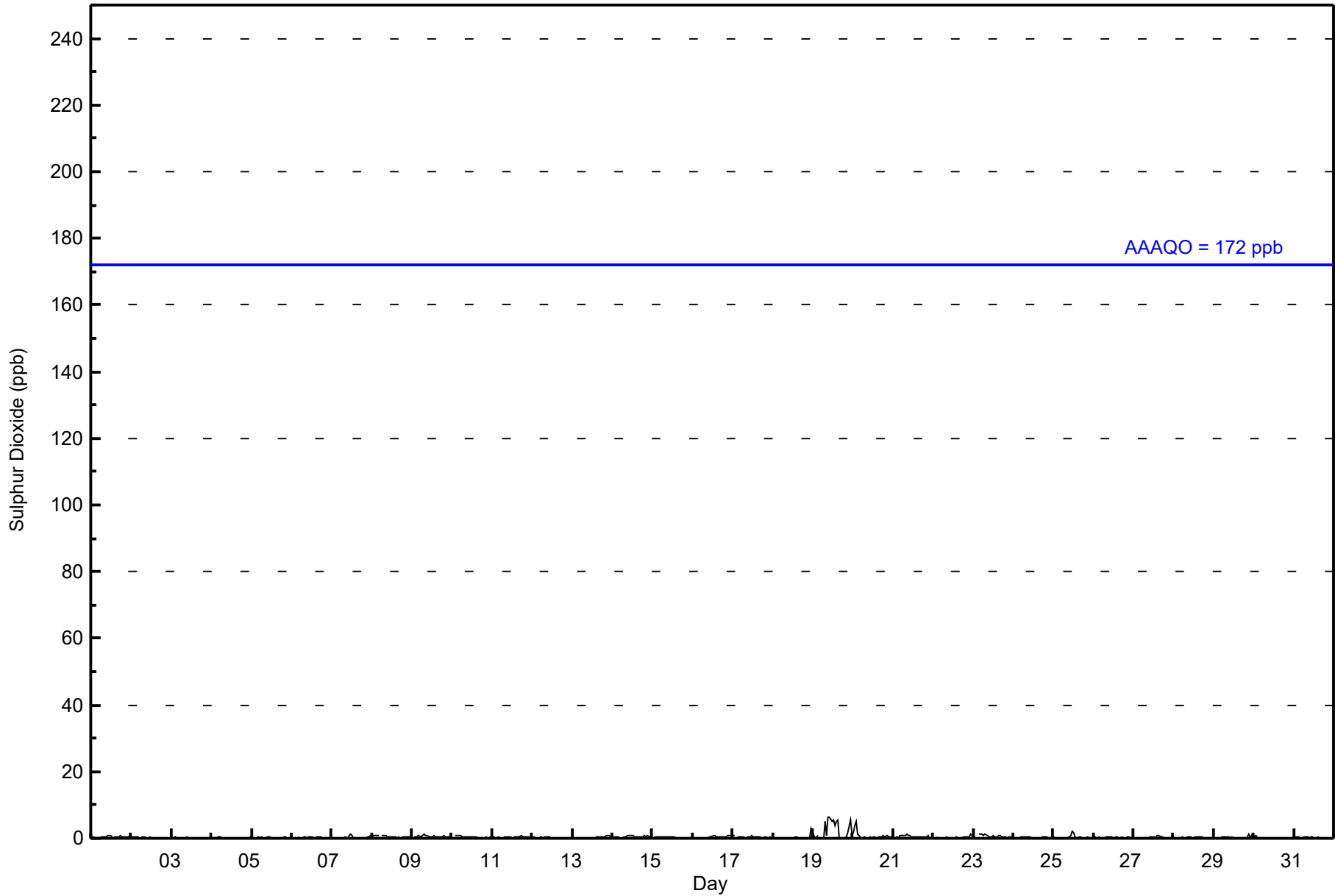
Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 744														Daily Average		Daily Maximum					
Maximum Value: 6.5 ppb on Oct 19 11:00		Maximum Daily Average: 2.4 ppb on Oct 19		Hours of Data: 704														Hours of Missing Data: 40		Hours of Calibration: 36							
Minimum Value: 0.0 ppb on Oct 2 13:00		Minimum Daily Average: 0.1 ppb on Oct 30		Hours of Calibration: 36														Percent Operational Time: 99.5									
Maximum Diurnal Average: 0.6 ppb at hour 11		Minimum Diurnal Average: 0.2 ppb at hour 19		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.2 Q ₃ = 0.5 P ₉₀ = 0.7 P ₉₉ = 5.0																							
Monthly Average: 0.39 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-Oct	0.3	0.3	0.1	0.2	Z	0.4	0.4	0.4	0.6	0.5	0.8	0.8	0.4	0.1	0.3	0.4	0.2	0.7	0.3	0.5	0.6	0.6	0.6	0.8	0.4	0.8	
2-Oct	0.6	0.5	0.4	0.4	0.3	Z	0.3	0.3	0.3	0.1	0.1	0.3	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.6	
3-Oct	Z	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.3	
4-Oct	0.1	Z	0.6	0.1	0.6	0.4	0.2	0.0	0.0	0.1	0.0	0.0	0.0	0.0	C	C	C	C	C	0.0	0.2	0.1	0.2	0.4	0.2	0.6	
5-Oct	0.2	0.1	Z	0.4	0.5	0.2	0.6	0.2	0.2	0.5	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.2	0.1	0.2	0.1	0.2	0.6	
6-Oct	0.0	0.0	0.0	Z	0.2	0.0	0.0	0.2	0.2	0.2	0.4	0.6	0.4	0.1	0.1	0.3	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.6	
7-Oct	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.3	0.2	1.0	1.2	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.9	0.2	1.2	
8-Oct	0.7	0.7	0.8	0.7	0.8	Z	0.9	0.9	0.7	0.6	0.4	0.4	0.4	0.4	0.2	0.1	0.2	0.2	0.2	0.3	0.4	0.5	0.3	0.4	0.5	0.9	
9-Oct	Z	0.4	0.6	0.6	0.7	0.6	0.9	1.1	0.9	0.7	0.5	0.6	0.5	0.7	0.6	0.6	0.5	0.4	0.4	0.8	0.6	0.5	0.6	0.7	0.6	1.1	
10-Oct	0.7	Z	0.7	0.7	0.8	0.7	0.5	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.1	0.1	0.1	0.0	0.1	0.3	0.0	0.0	0.3	0.4	0.8	
11-Oct	0.5	0.4	Z	0.6	0.4	0.2	0.0	0.3	0.3	0.6	0.4	0.3	0.2	0.4	0.5	0.4	0.5	0.7	0.3	0.2	0.3	0.5	0.3	0.0	0.4	0.7	
12-Oct	0.6	0.5	0.2	Z	0.2	0.3	0.1	0.4	0.6	0.5	0.3	0.2	M	M	M	DF	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.6	
13-Oct	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.2	0.2	0.4	0.4	0.6	0.6	0.5	0.4	0.7	0.9	0.7	0.6	0.3	0.9	
14-Oct	0.5	0.4	0.3	0.3	0.3	Z	0.4	0.6	0.6	0.7	0.6	0.7	0.7	0.5	0.5	0.4	0.6	0.6	0.6	0.7	0.4	0.7	0.6	0.5	0.5	0.7	
15-Oct	Z	0.4	0.4	0.2	0.5	0.5	0.5	0.4	0.5	0.5	0.4	0.3	0.3	0.3	0.2	0.1	0.0	0.0	0.1	0.2	0.1	0.0	0.1	0.0	0.3	0.5	
16-Oct	0.0	Z	0.0	0.0	0.2	0.0	0.1	0.1	0.2	0.2	0.4	0.3	0.7	0.7	0.2	0.3	0.3	0.4	0.4	0.5	0.6	0.7	1.0	0.9	0.4	1.0	
17-Oct	0.8	0.7	Z	0.3	0.3	0.3	0.3	0.2	0.1	0.3	0.6	0.6	0.5	0.4	0.5	0.3	0.2	0.1	0.1	0.3	0.4	0.2	0.2	0.1	0.3	0.8	
18-Oct	0.2	0.2	0.1	Z	0.2	0.2	0.2	0.2	0.1	0.0	0.0	0.1	0.1	0.3	0.4	0.2	0.1	0.1	0.0	0.0	0.1	0.0	0.0	2.9	0.2	2.9	
19-Oct	0.8	0.0	0.5	1.0	Z	0.1	0.2	5.0	0.8	6.4	6.5	5.2	5.5	3.9	5.0	5.5	0.2	0.1	0.1	0.1	0.3	1.6	5.4	1.4	2.4	6.5	
20-Oct	1.9	3.8	5.1	1.3	0.2	Z	0.3	0.2	0.1	0.2	0.3	0.1	0.3	0.4	0.1	0.3	0.4	0.4	1.0	0.4	0.9	0.5	0.4	0.4	0.8	5.1	
21-Oct	Z	0.5	0.3	0.1	0.7	0.8	0.7	1.0	1.2	1.0	0.8	0.6	0.6	0.4	0.6	0.6	0.5	0.4	0.3	0.4	0.6	0.7	0.2	0.1	0.6	1.2	
22-Oct	0.1	Z	0.6	0.2	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.1	0.0	0.2	0.2	0.2	0.2	0.1	0.3	0.3	0.4	0.5	1.4	0.7	0.3	1.4	
23-Oct	0.9	0.6	Z	1.3	1.3	1.2	1.0	1.3	0.8	0.4	0.4	0.5	0.9	0.6	0.4	0.7	0.6	0.3	0.2	0.5	0.2	0.3	0.3	0.3	0.6	1.3	
24-Oct	0.3	0.0	0.1	Z	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.0	0.3	0.2	0.6	0.2	0.1	0.0	0.1	0.2	0.6	
25-Oct	0.2	0.2	0.2	0.1	Z	0.0	0.0	0.0	0.1	0.3	0.9	2.0	1.6	0.3	0.1	0.3	0.3	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.3	2.0	
26-Oct	0.2	0.4	0.1	0.4	0.1	Z	0.1	0.4	0.4	0.5	0.5	0.3	0.1	0.2	0.4	0.1	0.0	0.4	0.2	0.2	0.4	0.3	0.2	0.4	0.3	0.5	
27-Oct	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.6	0.5	0.3	0.2	0.7	0.7	0.6	0.4	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.7	
28-Oct	0.0	Z	0.2	0.1	0.2	0.5	0.1	0.1	0.6	0.3	0.4	0.2	0.0	0.2	0.4	0.2	0.4	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.6	
29-Oct	0.0	0.0	Z	0.1	0.1	0.3	0.2	0.6	0.5	0.3	0.1	0.2	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.4	1.2	0.5	1.2	0.3	1.2	
30-Oct	0.4	0.9	0.3	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.1	0.9	
31-Oct	0.3	0.5	0.4	0.4	Z	0.2	0.3	0.2	0.4	0.1	0.2	0.3	0.1	0.1	0.3	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.2	0.5	
																								Diurnal Average		Diurnal Maximum	
																								0.4		1.9	
																								0.5		3.8	
																								0.5		5.1	
																								0.4		1.3	
																								0.4		1.3	
																								0.3		1.2	
																								0.3		1.0	
																								0.5		5.0	
																								0.4		1.2	
																								0.5		6.4	
																								0.6		6.5	
																								0.6		5.2	
																								0.5		5.5	
																								0.4		3.9	
																								0.4		5.0	
																								0.4		5.5	
																								0.2		0.6	
																								0.2		0.7	
																								0.2		1.0	
																								0.2		0.8	
																								0.3		0.9	
																								0.3		1.6	
																								0.3		5.4	
																								0.4		2.9	
																								0.3		5.4	
																								0.5		4.4	
																								0.4		2.9	
																								0.4		2.9	

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
Kirby South - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Kirby South - October 2023

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

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Kirby South - October 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	17	5	2	1	10	24	82	83	81	74	34	64	88	81	34	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	17	5	2	1	10	24	82	83	81	74	34	64	88	81	34	691

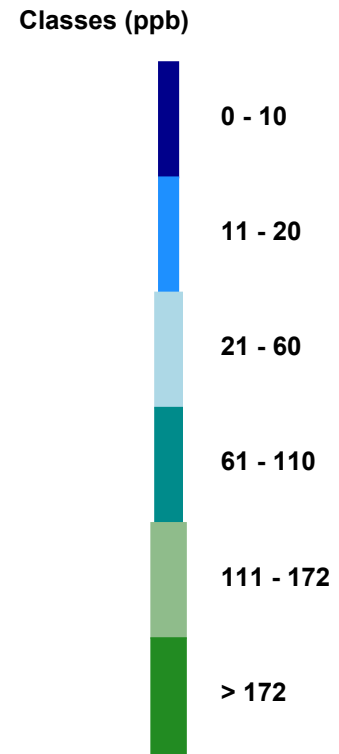
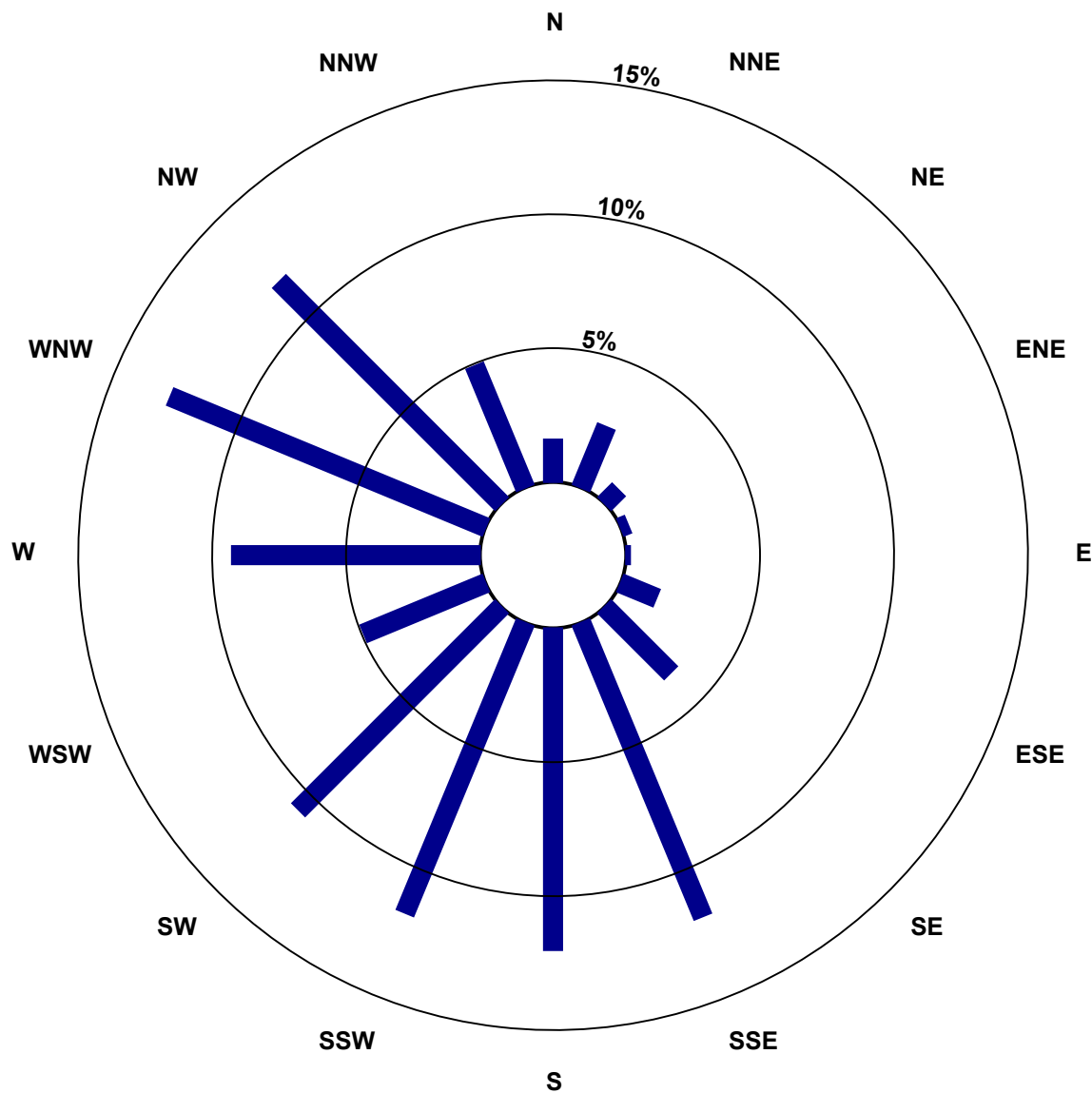
Total Number of Valid Hours: 691

Total Number of Hours: 744

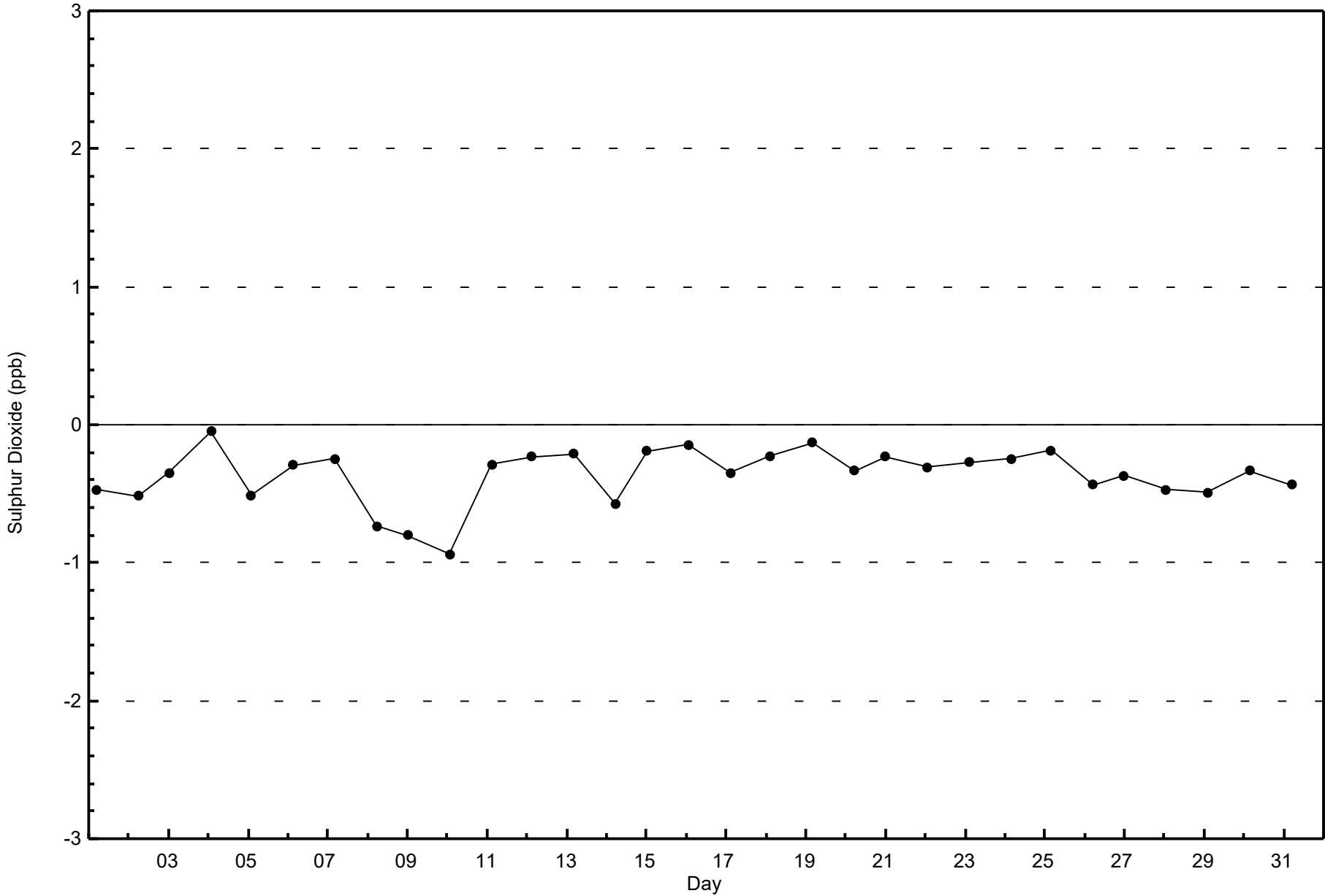


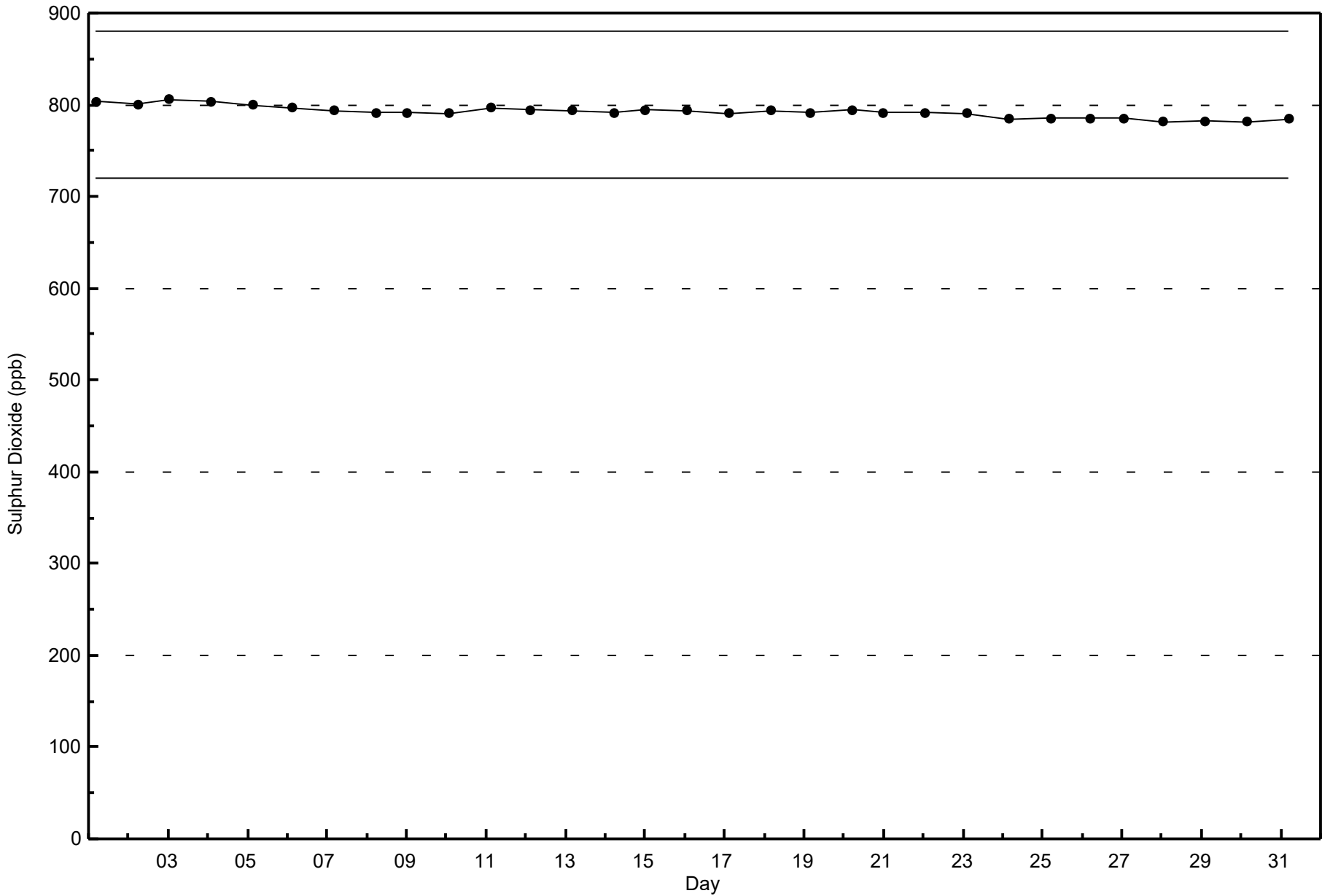
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Sulphur Dioxide (SO₂) - ppb
Kirby South



Total Number of Valid Hours: 691







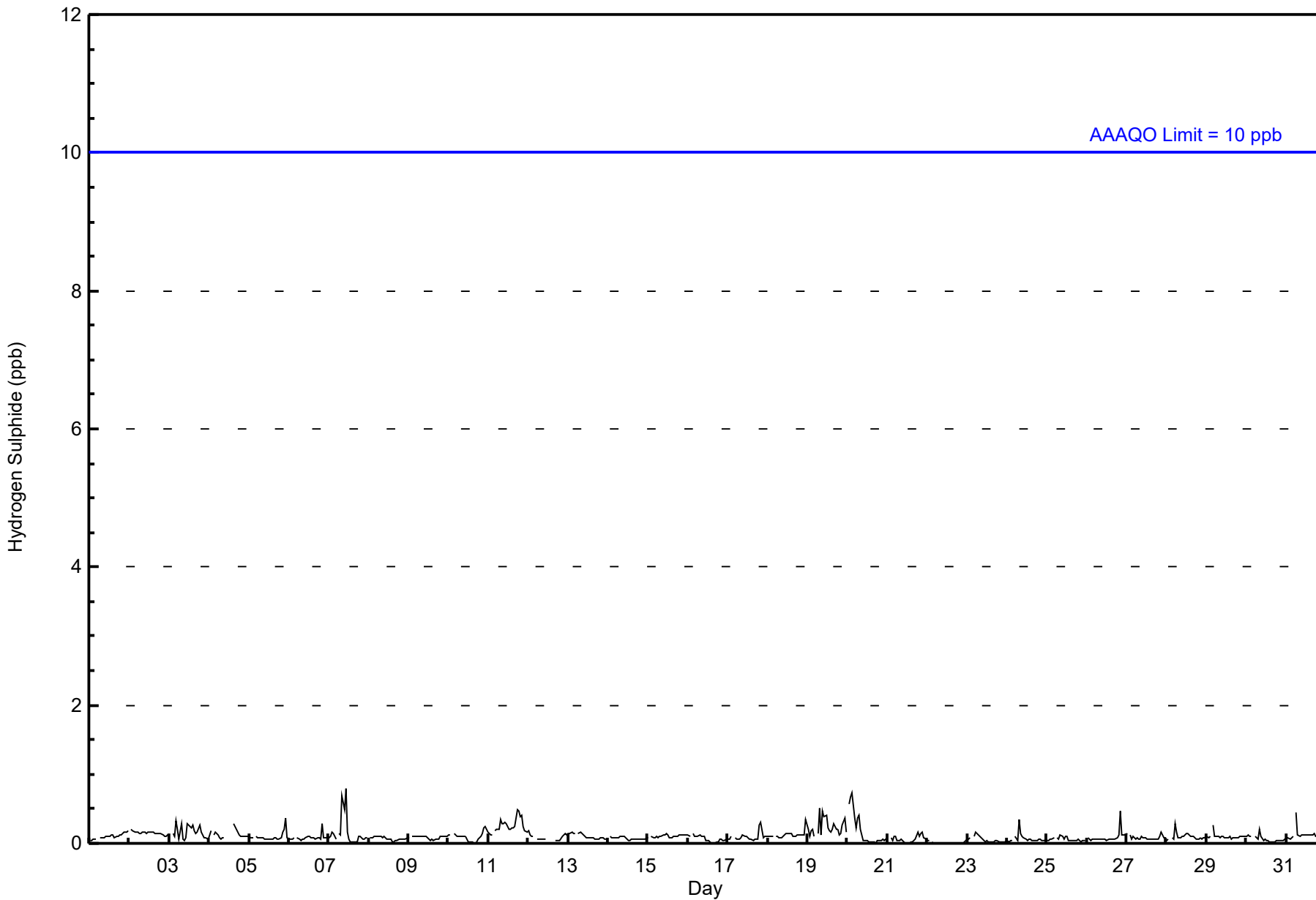
Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H₂S) - ppb

Kirby South - October 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		744																				
Maximum Value: 0.8 ppb on Oct 7 11:00		Maximum Daily Average: 0.3 ppb on Oct 11				Hours of Data:		704																				
Minimum Value: 0.0 ppb on Oct 22 06:00		Minimum Daily Average: 0.0 ppb on Oct 22				Hours of Missing Data:		40																				
Maximum Diurnal Average: 0.1 ppb at hour 8		Minimum Diurnal Average: 0.1 ppb at hour 15				Hours of Calibration:		36																				
Monthly Average: 0.11 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.1 Q ₃ = 0.1 P ₉₀ = 0.2 P ₉₉ = 0.5				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-Oct	0.0	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	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.2		
2-Oct	Z	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	
3-Oct	0.1	Z	0.1	0.1	0.3	0.2	0.1	0.3	0.1	0.0	0.1	0.3	0.3	0.2	0.3	0.2	0.1	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.3	
4-Oct	0.1	0.2	Z	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	C	C	C	C	C	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	
5-Oct	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.1	0.1	0.4	
6-Oct	0.1	0.1	0.1	0.1	Z	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	0.3	0.1	0.1	0.1	0.1	0.1	0.3	
7-Oct	0.1	0.1	0.2	0.1	0.1	Z	0.1	0.1	0.7	0.5	0.8	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.8
8-Oct	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	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
9-Oct	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	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
10-Oct	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	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.2	
11-Oct	0.2	0.1	0.1	Z	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.5	0.5	0.4	0.4	0.3	0.2	0.2	0.3	0.3	0.5	
12-Oct	0.2	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	M	M	M	0.0	DF	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	
13-Oct	0.1	0.2	0.2	0.1	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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	
14-Oct	Z	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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
15-Oct	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
16-Oct	0.1	0.1	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	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1
17-Oct	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.3
18-Oct	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	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.1	0.3
19-Oct	0.2	0.1	0.2	0.2	0.1	Z	0.1	0.5	0.1	0.5	0.4	0.4	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.1	0.1	0.3	0.4	0.2	0.2	0.2	0.5	
20-Oct	Z	0.6	0.7	0.7	0.4	0.2	0.4	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.7	
21-Oct	0.1	Z	0.1	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.2	
22-Oct	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
23-Oct	0.1	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	0.1	0.2
24-Oct	0.0	0.0	0.0	0.0	Z	0.1	0.0	0.4	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.4
25-Oct	0.0	0.0	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
26-Oct	Z	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.1	0.1	0.1	0.1	0.1	0.5
27-Oct	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	0.2	0.1	0.1	0.1	0.1	0.2
28-Oct	0.0	0.1	Z	0.1	0.1	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3
29-Oct	0.1	0.1	0.1	Z	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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3
30-Oct	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2
31-Oct	0.1	0.1	0.1	0.1	0.1	Z	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	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.4
																								Diurnal Average				
																								Diurnal Maximum				
Z - zerospan C - Calibration M - Maintenance DF - DAS Failure																												
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb																												





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Kirby South - October 2023**

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

Total Number of Hours: 744



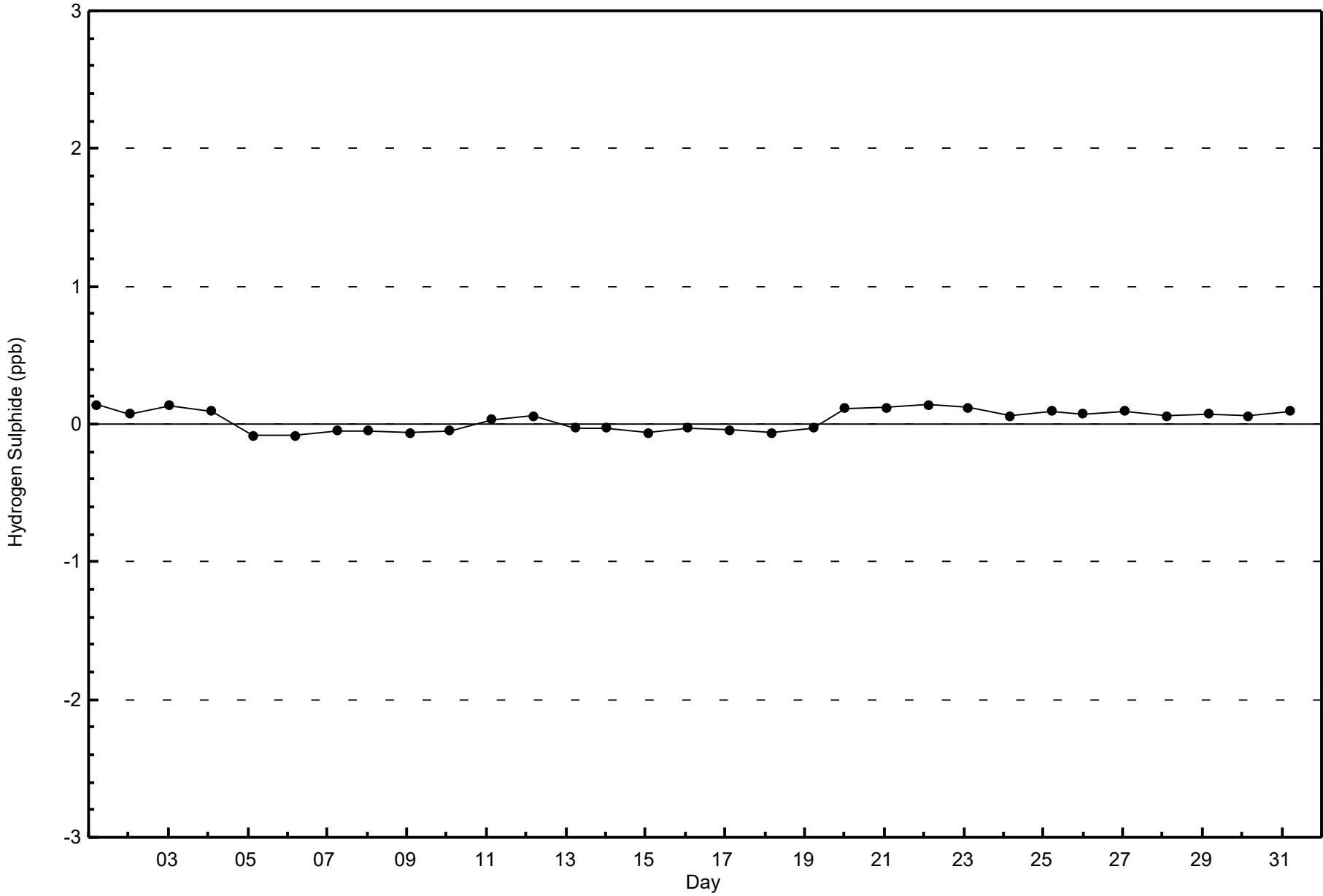
**Wood Buffalo Environmental Association
Frequency Distribution**

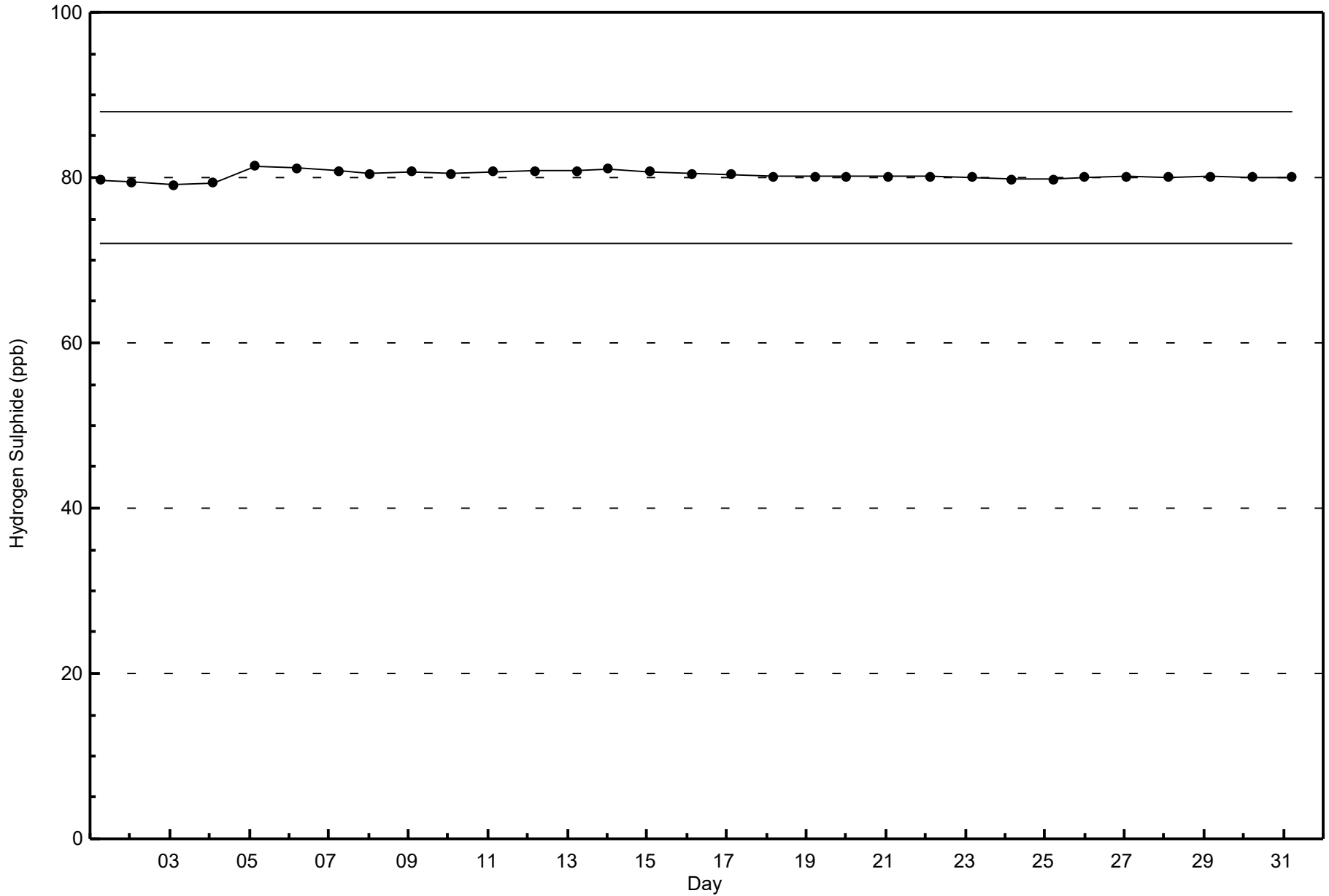
**Hydrogen Sulphide (H₂S) - ppb
Kirby South - October 2023**

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	17	6	2	1	10	24	82	83	79	78	32	61	89	83	33	692
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	17	6	2	1	10	24	82	83	79	78	32	61	89	83	33	692

Total Number of Valid Hours: 692

Total Number of Hours: 744

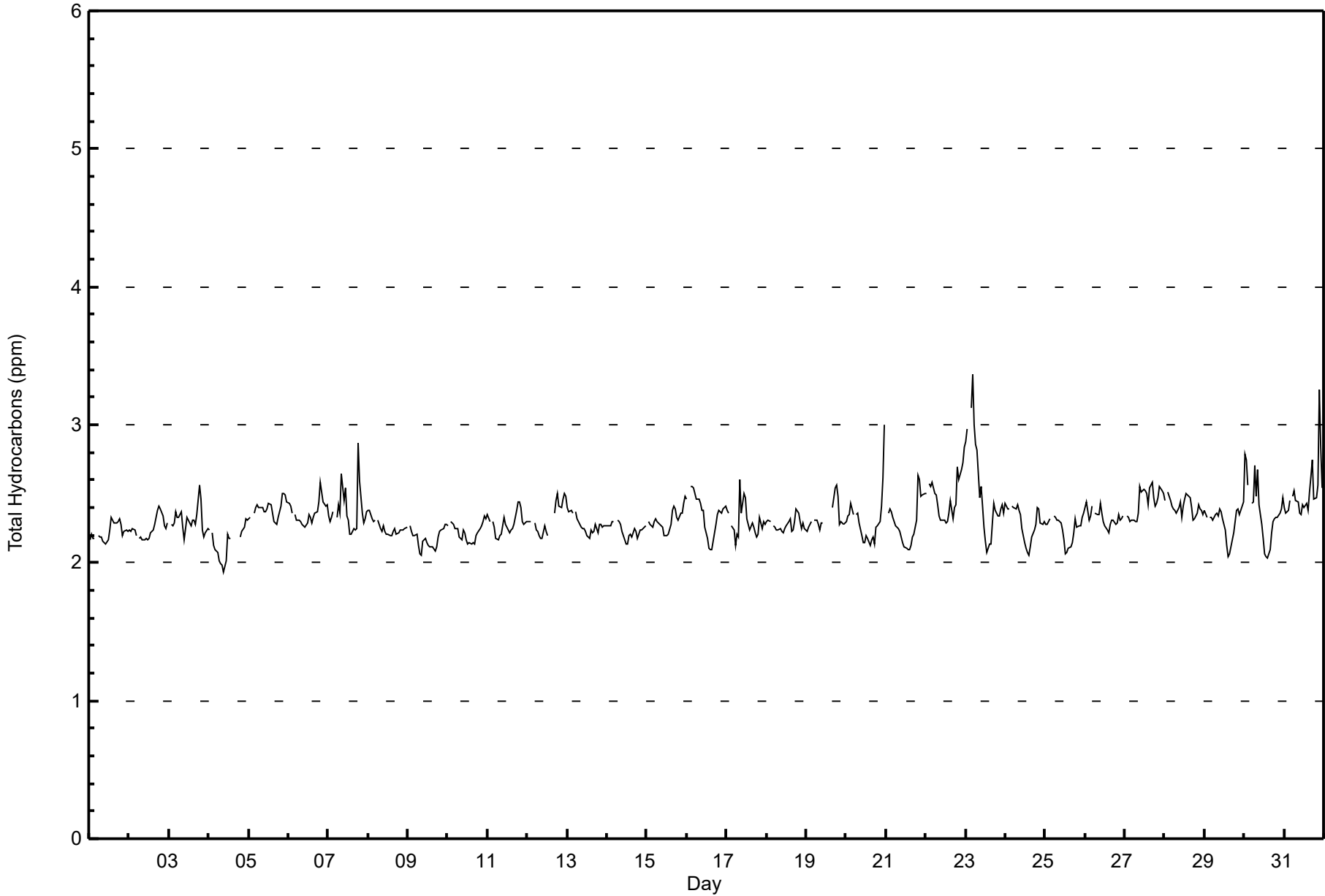






Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Kirby South - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Kirby South - October 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	8	1.14	1.14
2.1 - 3.0	689	98.43	99.57
3.1 - 10.0	3	0.43	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 700

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Total Hydrocarbons (THC) - ppm
Kirby South - October 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	1	1	0	0	3	2	0	7
2.1 - 3.0	10	17	5	2	1	10	24	82	84	80	73	33	59	85	79	33	677	
3.1 - 10.0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	3	
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Totals	11	17	5	2	1	10	24	82	84	81	74	34	59	88	81	34	687	

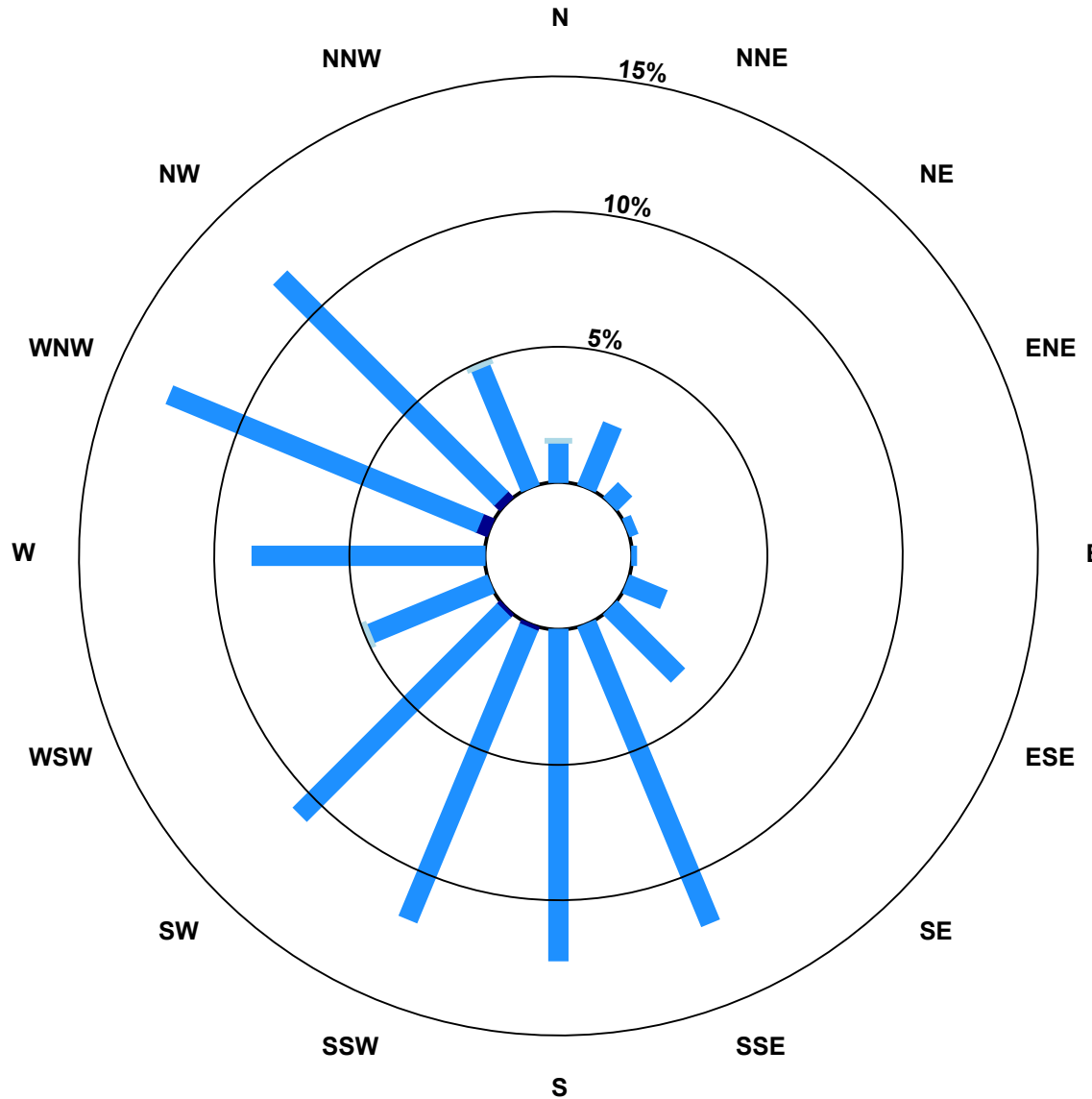
Total Number of Valid Hours: 687

Total Number of Hours: 744

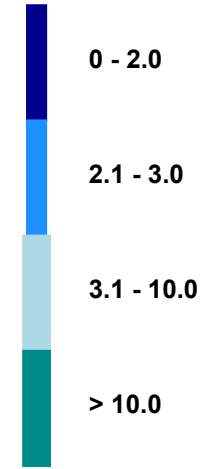


Wood Buffalo Environmental Association
Wind Rose Oct 2023

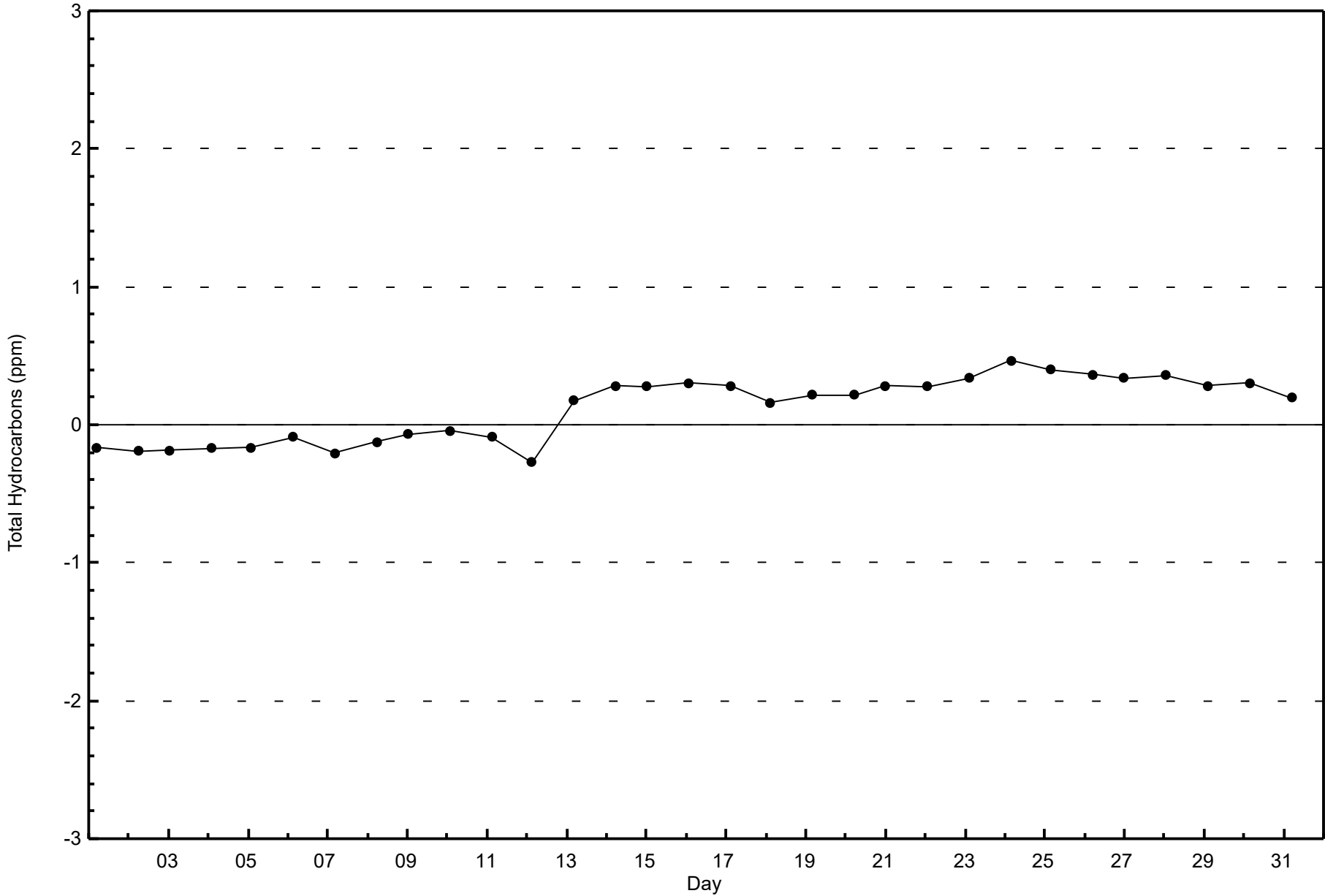
Total Hydrocarbons (THC) - ppm
Kirby South

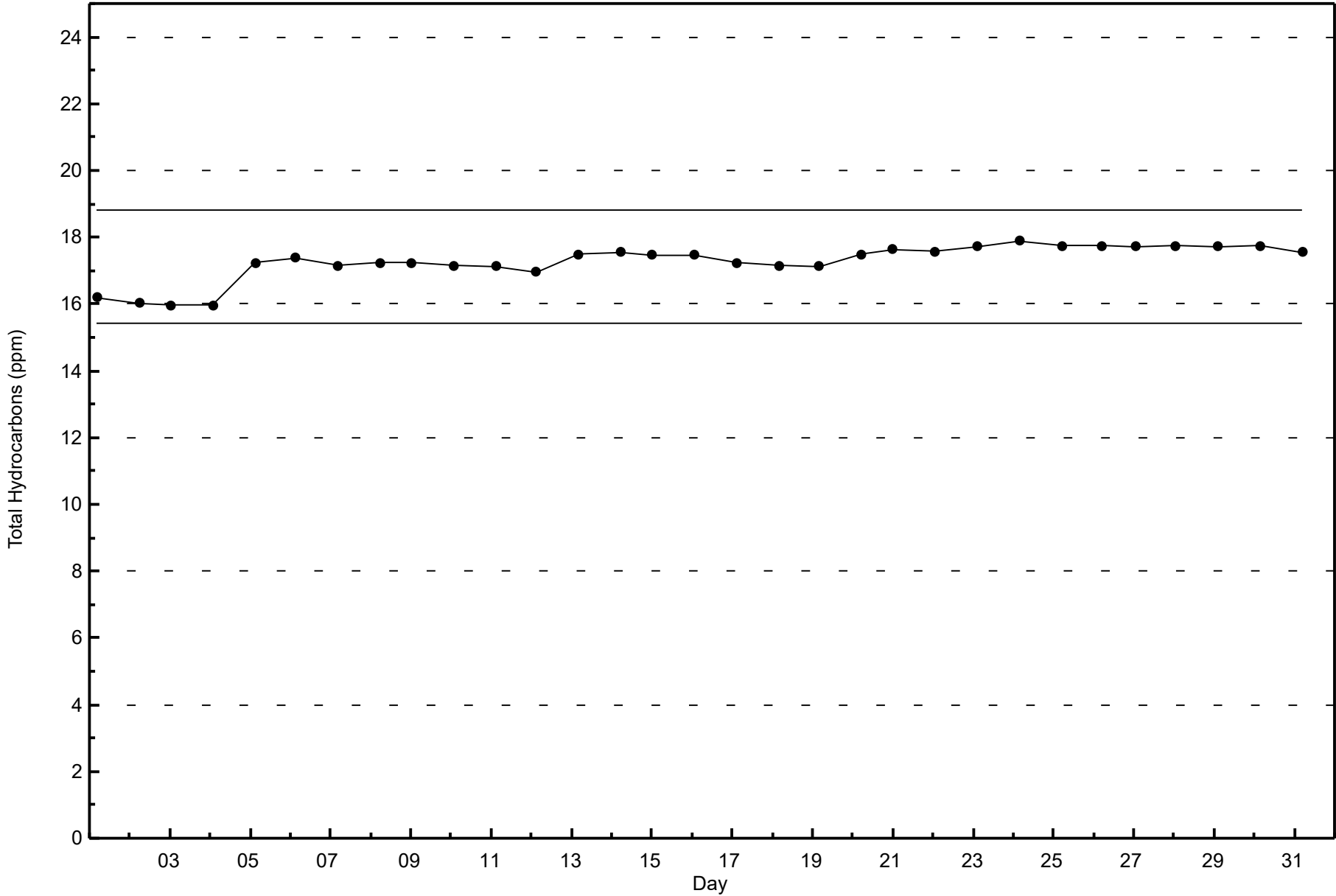


Classes (ppm)



Total Number of Valid Hours: 687

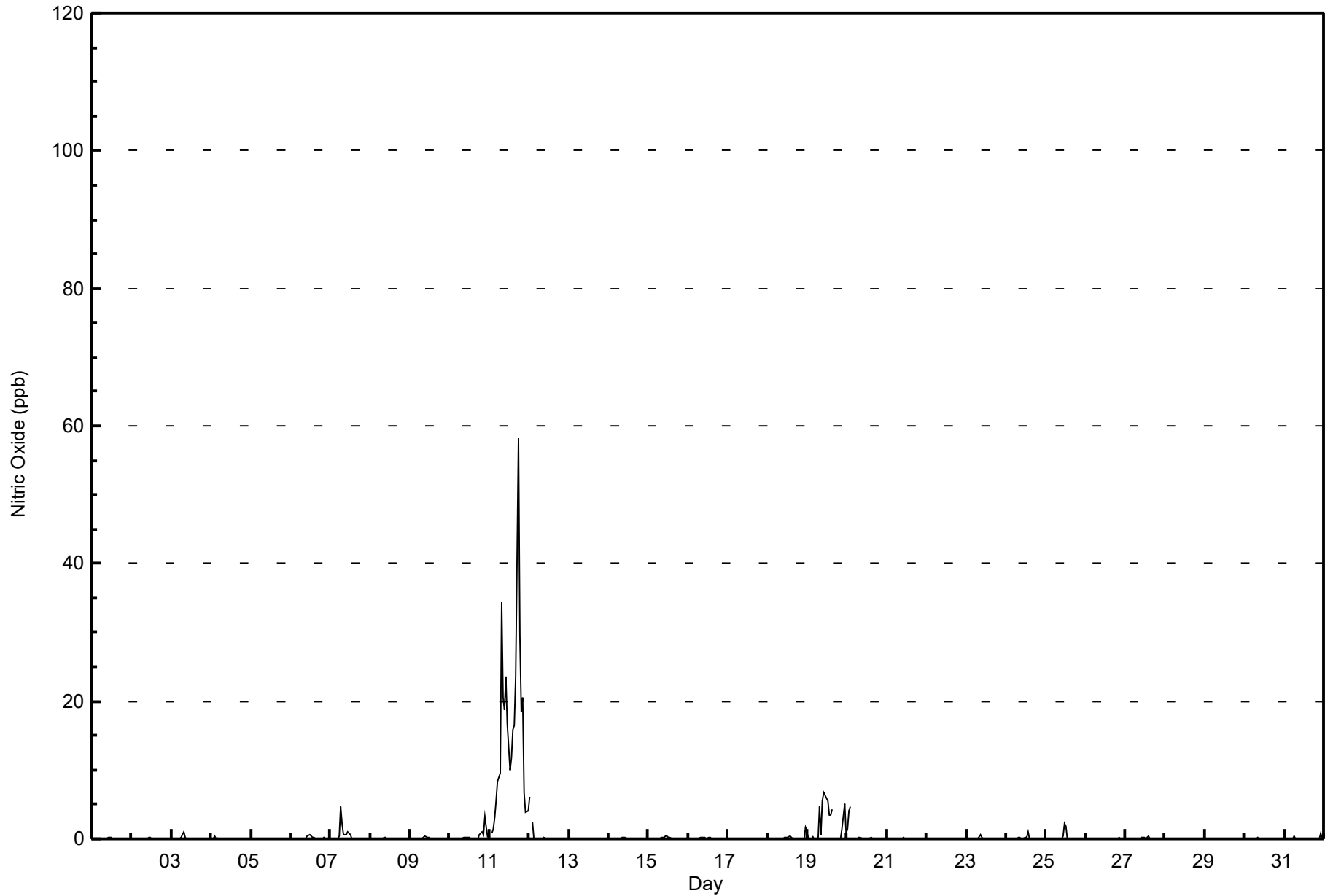






Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Kirby South - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Kirby South - October 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	694	99.14	99.14
21 - 40	5	0.71	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: 700

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Kirby South - October 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	11	17	7	2	1	7	22	81	83	80	77	34	60	87	80	34	683
21 - 40	0	0	0	0	0	2	3	0	0	0	0	0	0	0	0	0	5
11 - 80	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	11	17	7	2	1	10	25	81	83	80	77	34	60	87	80	34	689

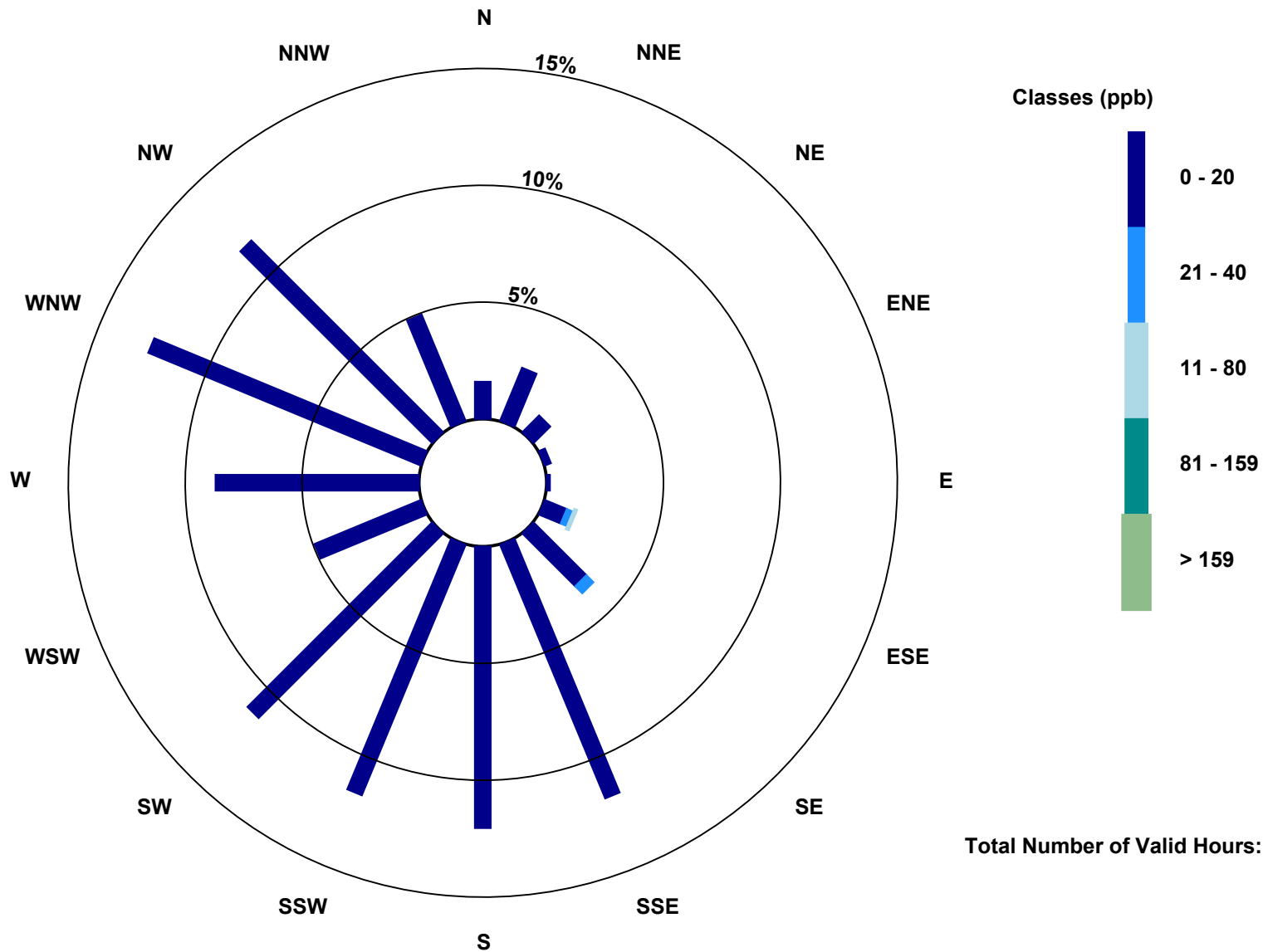
Total Number of Valid Hours: 689

Total Number of Hours: 744

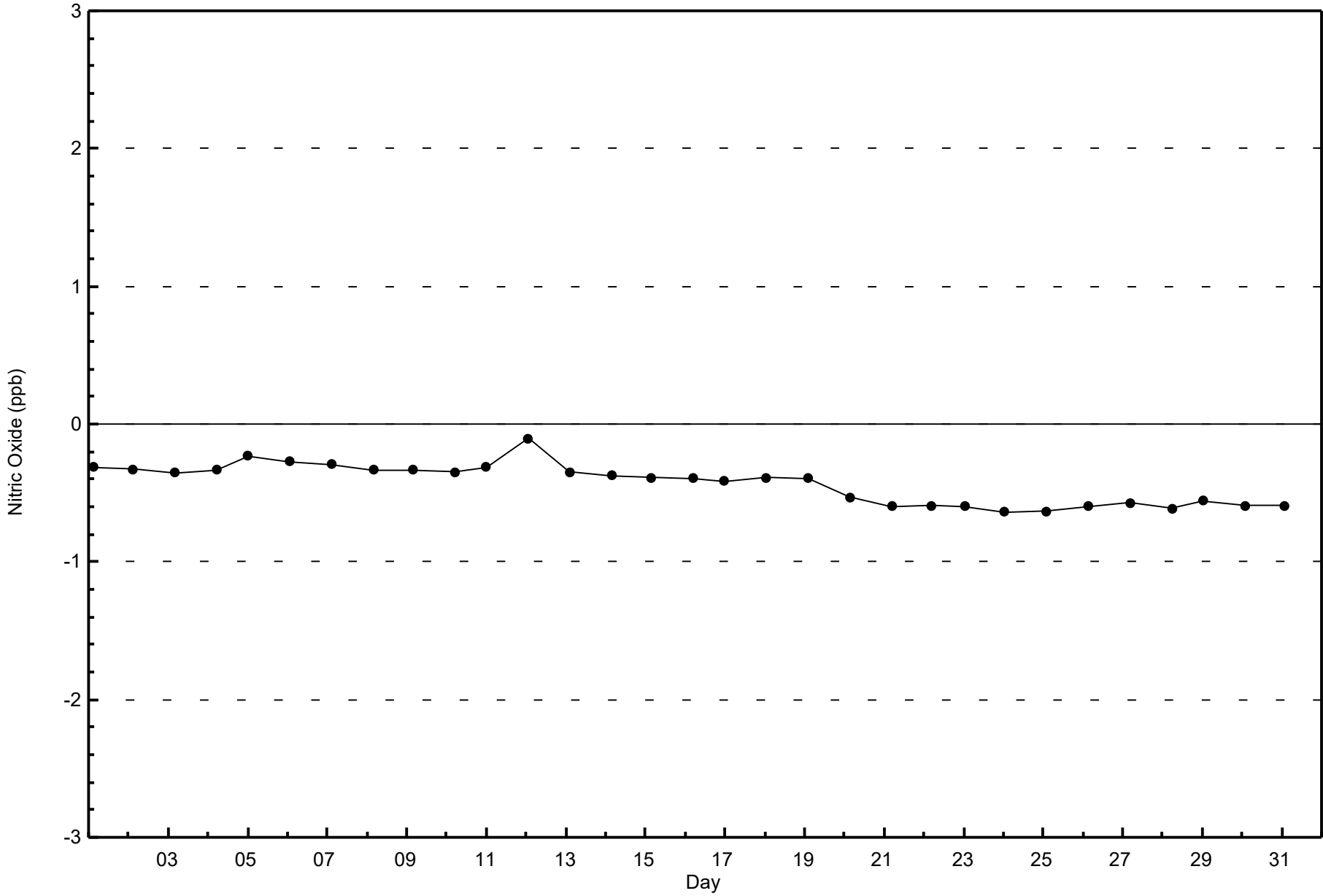


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitric Oxide (NO) - ppb
Kirby South



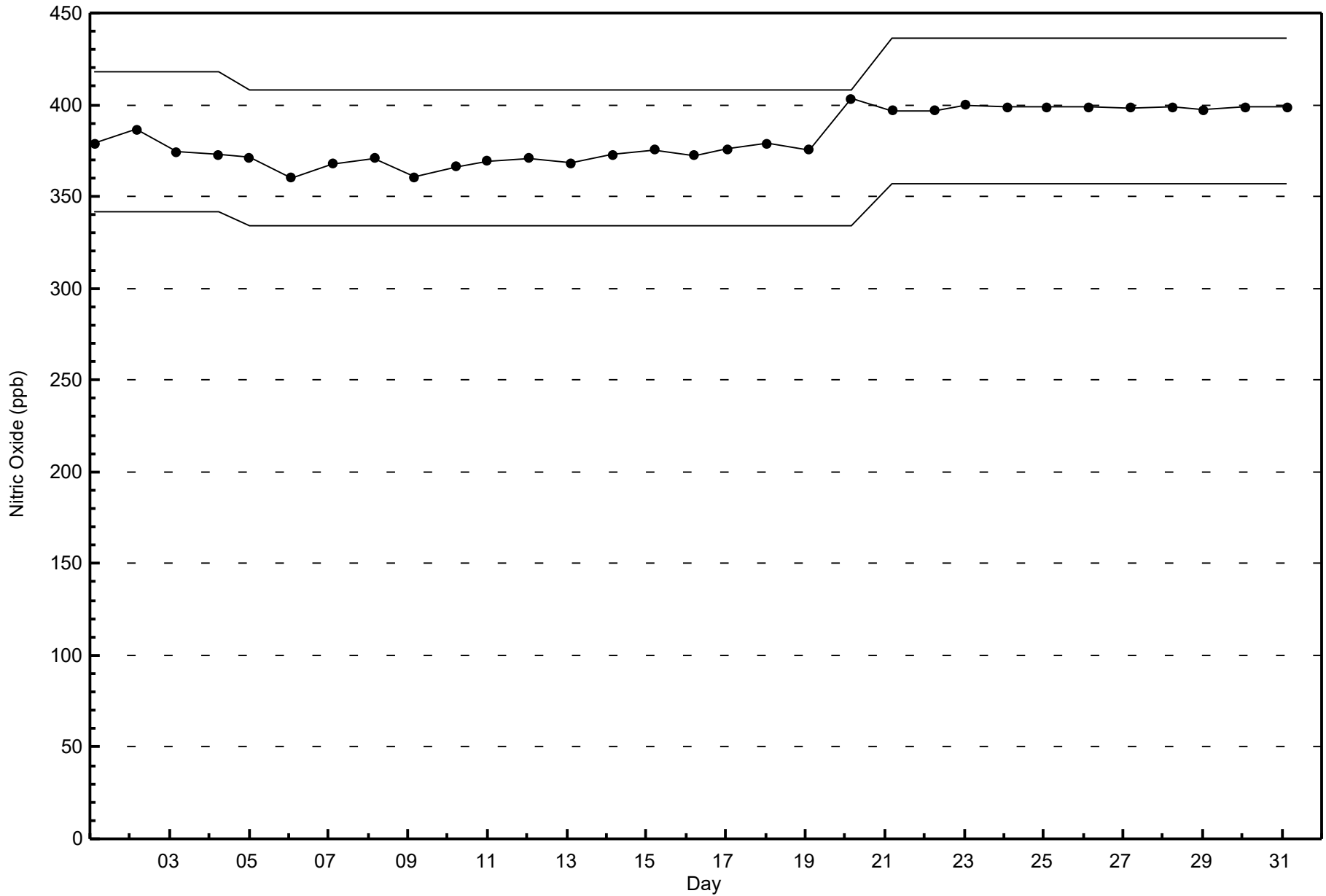
Total Number of Valid Hours: 689





Wood Buffalo Environmental Association
Span Responses

Nitric Oxide (NO) - ppb
Kirby South - October 2023





Wood Buffalo Environmental Association
Summary of Hour Averages

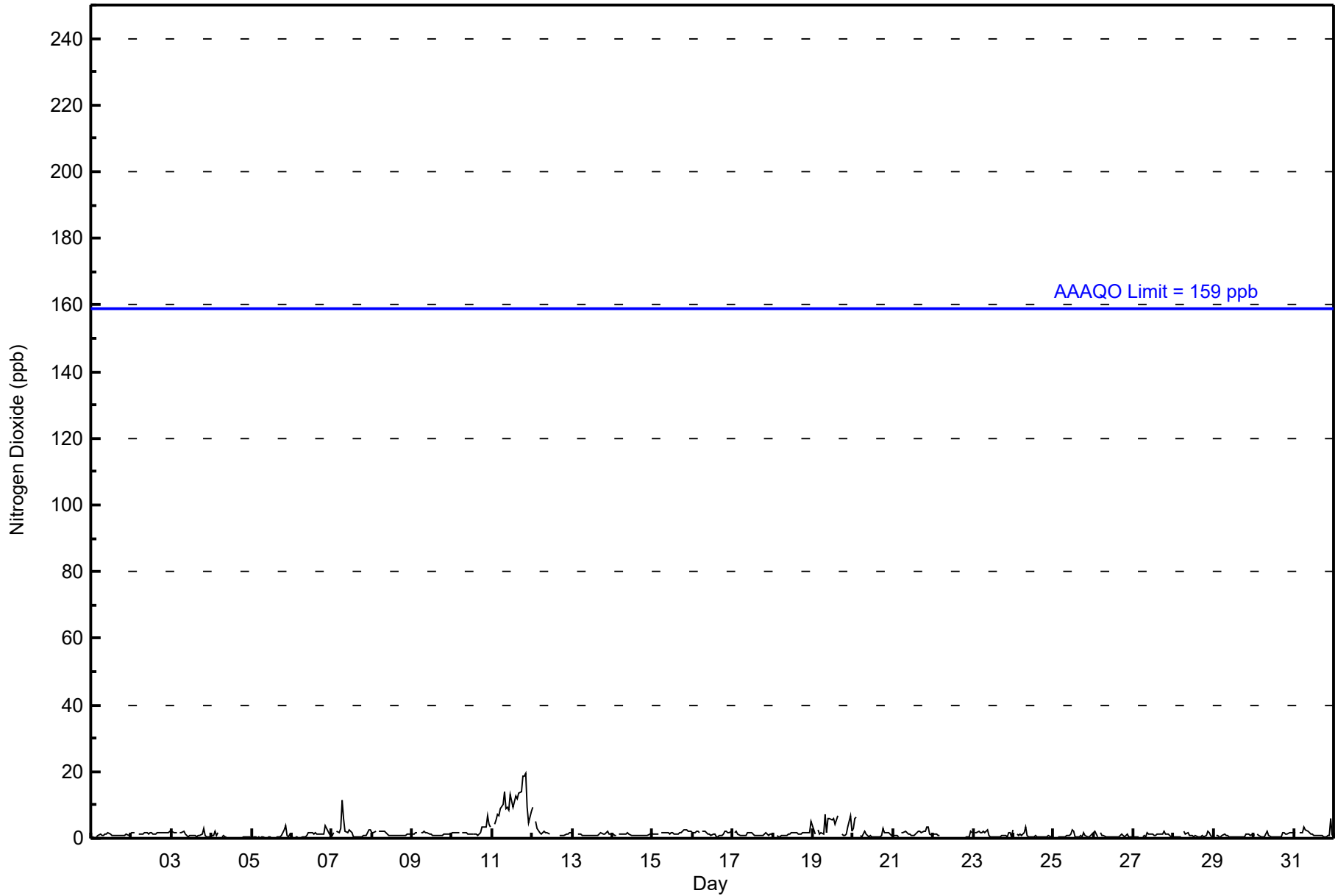
Nitrogen Dioxide (NO₂) - ppb
Kirby South - October 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	744				
Maximum Value: 19.4 ppb on Oct 11 21:00		Maximum Daily Average: 10.8 ppb on Oct 11																	Hours of Data:	700						
Minimum Value: 0.1 ppb on Oct 5 06:00		Minimum Daily Average: 0.5 ppb on Oct 22																	Hours of Missing Data:	44						
Maximum Diurnal Average: 2.1 ppb at hour 8		Minimum Diurnal Average: 1.3 ppb at hour 14																	Hours of Calibration:	39						
Monthly Average: 1.61 ppb		Percentiles: P ₁ = 0.1 P ₁₀ = 0.4 Q ₁ = 0.7 Median = 1.1 Q ₃ = 1.7 P ₉₀ = 2.4 P ₉₉ = 12.5																	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-Oct	0.5	0.5	Z	0.6	0.9	1.1	1.0	0.9	1.3	1.4	1.6	1.4	0.7	0.8	0.8	0.7	0.7	0.7	0.9	1.0	1.0	1.1	1.0	1.2	0.9	1.6
2-Oct	1.5	1.5	1.6	Z	1.2	1.2	1.2	1.3	1.6	1.5	1.4	1.5	1.5	1.4	1.4	1.7	1.9	1.8	1.9	1.9	1.9	1.9	1.9	2.2	1.6	2.2
3-Oct	2.2	1.8	1.8	1.5	Z	1.9	1.9	2.3	1.1	0.7	0.6	0.8	0.8	0.7	0.7	0.6	1.0	0.8	1.3	2.9	0.7	0.6	0.5	0.5	1.2	2.9
4-Oct	0.7	0.9	2.1	0.7	1.6	Z	0.5	0.7	0.6	0.4	C	C	C	C	C	C	C	C	0.2	0.3	0.4	0.3	0.4	0.5	--	2.1
5-Oct	Z	0.3	0.3	0.2	0.3	0.1	0.4	0.3	0.2	0.2	0.3	0.3	0.1	0.2	0.2	0.3	0.3	0.5	0.8	2.6	3.9	0.7	0.5	1.1	0.6	3.9
6-Oct	0.3	Z	0.3	0.3	0.2	0.2	0.4	0.4	0.6	0.8	1.8	1.7	1.6	1.4	1.5	1.4	1.2	1.2	1.2	1.3	3.9	3.1	1.4	1.3	1.2	3.9
7-Oct	0.8	1.7	Z	2.0	1.9	2.8	11.4	6.1	2.2	1.8	2.4	2.1	1.7	0.4	0.3	0.4	0.4	0.4	0.6	0.8	1.0	1.6	2.6	2.6	2.1	11.4
8-Oct	1.7	1.7	2.1	Z	2.1	2.1	2.2	2.1	1.7	1.3	1.0	0.9	1.0	0.9	0.8	0.8	1.0	0.7	0.9	0.9	1.0	1.2	1.1	1.3	1.3	2.2
9-Oct	1.3	1.3	1.5	1.5	Z	1.6	1.9	2.1	1.7	1.5	1.2	1.1	1.0	1.0	1.0	1.0	1.0	0.8	0.9	1.4	1.2	1.1	1.1	1.2	1.3	2.1
10-Oct	1.5	1.5	1.5	1.5	1.6	Z	1.7	1.6	1.5	1.4	1.4	1.2	1.1	1.1	1.2	1.0	1.2	1.7	3.4	3.2	3.6	6.8	4.3	3.6	2.1	6.8
11-Oct	Z	4.1	5.4	7.4	6.6	8.7	10.3	14.1	9.1	9.5	8.6	13.3	9.5	11.1	12.5	11.8	13.6	13.8	18.6	18.8	19.4	9.3	4.8	8.1	10.8	19.4
12-Oct	9.5	Z	5.0	3.0	1.8	1.4	1.8	2.1	1.6	1.5	1.2	M	M	M	0.7	DF	1.0	1.0	0.7	0.9	1.2	1.4	1.7	1.6	2.1	9.5
13-Oct	1.1	1.2	Z	1.3	1.2	1.1	0.9	0.9	0.9	0.8	0.9	0.9	0.9	0.9	1.0	0.8	1.2	1.5	1.1	1.2	1.6	2.1	1.3	1.3	1.1	2.1
14-Oct	1.2	1.0	1.0	Z	1.1	1.1	1.1	1.4	1.4	1.5	1.1	0.7	0.7	0.7	0.9	1.0	1.0	0.8	0.9	1.0	1.0	1.0	1.4	1.7	1.1	1.7
15-Oct	1.3	1.2	1.2	1.1	Z	1.5	1.7	1.9	1.7	1.5	1.4	1.7	1.5	1.2	1.2	1.4	1.5	1.7	2.2	2.4	2.4	2.2	2.1	2.0	1.7	2.4
16-Oct	1.9	1.9	2.0	2.1	1.8	Z	2.0	2.2	1.6	1.4	1.3	0.8	1.2	1.2	0.6	0.6	0.8	0.9	1.3	2.1	2.0	1.8	1.8	2.0	1.5	2.2
17-Oct	Z	1.7	2.0	1.2	0.9	0.9	0.7	0.9	1.0	1.7	1.7	1.7	1.2	0.7	0.8	1.0	0.9	0.7	0.7	1.3	1.7	1.0	1.2	1.2	1.2	2.0
18-Oct	1.0	Z	0.7	0.6	0.6	0.7	0.9	0.9	1.0	1.1	1.3	1.5	1.7	1.6	1.7	1.4	1.3	1.4	1.7	1.8	1.8	1.7	1.6	5.1	1.4	5.1
19-Oct	2.4	1.1	Z	2.5	1.1	1.6	1.2	7.2	1.8	6.1	5.9	5.7	5.9	4.2	5.5	6.7	M	1.4	1.0	1.0	1.2	3.4	6.9	2.1	3.5	7.2
20-Oct	3.0	5.9	6.4	Z	0.7	0.5	1.3	2.3	1.3	0.5	0.7	0.5	0.4	0.5	0.6	0.4	0.4	0.8	2.8	1.9	1.5	1.8	1.1	1.0	1.6	6.4
21-Oct	0.8	0.8	0.8	0.3	Z	1.9	1.5	2.2	1.8	1.3	1.1	0.9	1.0	1.1	1.6	2.0	2.3	1.9	2.0	2.1	3.6	3.3	1.2	0.9	1.6	3.6
22-Oct	1.2	1.1	1.3	0.9	0.7	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	0.6	2.2	1.6	0.5	2.2
23-Oct	Z	1.5	1.9	2.3	1.9	1.8	2.3	1.5	2.5	0.9	0.5	0.4	0.5	0.5	0.4	0.6	0.6	0.8	0.8	0.7	0.4	1.6	1.6	0.6	1.2	2.5
24-Oct	2.5	Z	1.2	0.8	1.3	0.9	1.8	3.4	1.0	0.6	0.6	0.6	0.5	0.8	0.4	0.5	0.6	0.5	0.5	0.6	0.4	0.7	0.5	0.2	0.9	3.4
25-Oct	0.2	0.2	Z	0.3	0.4	0.6	0.5	0.5	0.7	0.9	1.4	2.6	2.1	0.5	0.4	0.4	0.8	0.5	1.5	0.8	0.5	0.5	1.0	1.4	0.8	2.6
26-Oct	1.8	2.1	0.4	Z	1.8	0.9	0.7	0.6	0.5	0.6	0.5	0.6	0.6	0.6	0.5	0.5	0.7	1.1	0.6	0.8	1.1	0.4	0.6	0.4	0.8	2.1
27-Oct	0.4	0.4	0.3	0.4	Z	0.5	0.7	0.6	1.7	1.3	1.2	1.2	0.9	0.9	1.3	1.1	1.3	1.3	2.0	1.4	1.4	1.3	0.3	0.3	1.0	2.0
28-Oct	0.4	0.5	0.5	0.6	0.6	Z	2.0	1.2	1.5	0.9	1.0	0.9	0.6	0.7	0.5	0.5	0.6	1.0	0.4	1.0	2.1	1.7	1.0	0.5	0.9	2.1
29-Oct	Z	0.8	1.0	0.4	0.4	0.7	1.3	0.8	0.8	0.5	0.4	0.5	0.5	0.6	0.6	0.6	0.6	0.5	0.5	0.4	1.1	1.1	1.4	0.7	0.7	1.4
30-Oct	0.9	Z	1.3	1.0	0.6	0.3	0.5	1.1	2.1	0.7	0.3	0.3	0.3	0.4	0.3	0.4	0.6	1.6	1.6	1.2	1.2	1.5	1.7	1.6	0.9	2.1
31-Oct	1.6	1.7	Z	1.9	1.9	1.9	3.6	2.7	2.3	1.6	1.4	1.3	1.0	1.0	0.9	0.9	0.8	0.7	0.5	0.6	0.9	0.7	5.9	0.9	1.6	5.9
																								Diurnal Average		
																								Diurnal Maximum		
1.6 1.5 1.7 1.4 1.4 1.5 1.9 2.1 1.6 1.5 1.5 1.6 1.4 1.3 1.3 1.4 1.4 1.4 1.7 1.9 2.1 1.9 1.8 1.7																										
9.5 5.9 6.4 7.4 6.6 8.7 11.4 14.1 9.1 9.5 8.6 13.3 9.5 11.1 12.5 11.8 13.6 13.8 18.6 18.8 19.4 9.3 6.9 8.1																										
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
Kirby South - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Kirby South - October 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	700	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: 700

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Kirby South - October 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	11	17	7	2	1	10	25	81	83	80	77	34	60	87	80	34	689
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	11	17	7	2	1	10	25	81	83	80	77	34	60	87	80	34	689

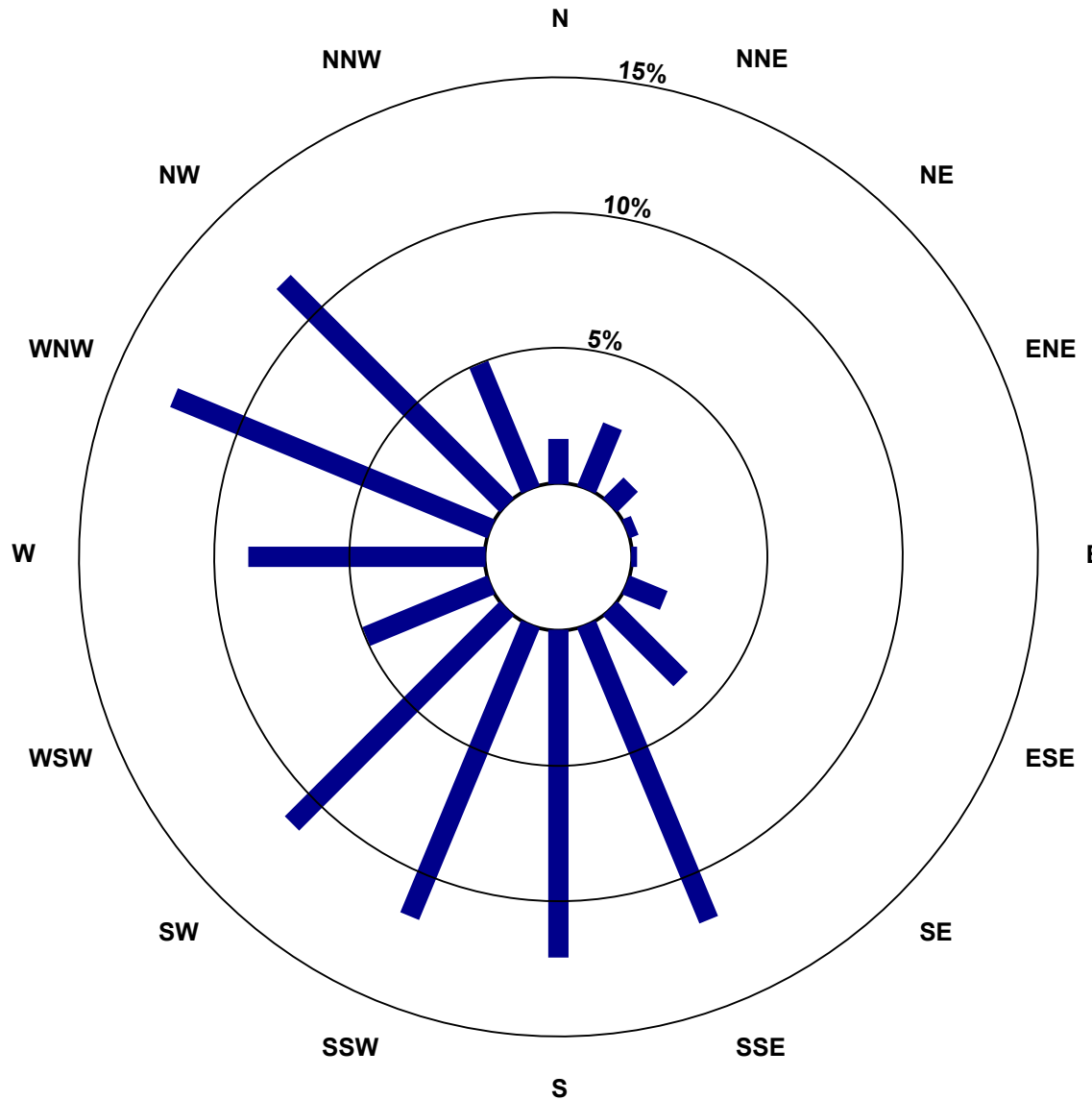
Total Number of Valid Hours: 689

Total Number of Hours: 744

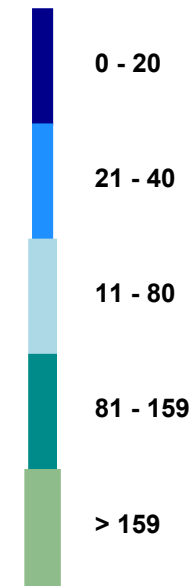


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitrogen Dioxide (NO₂) - ppb
Kirby South



Classes (ppb)

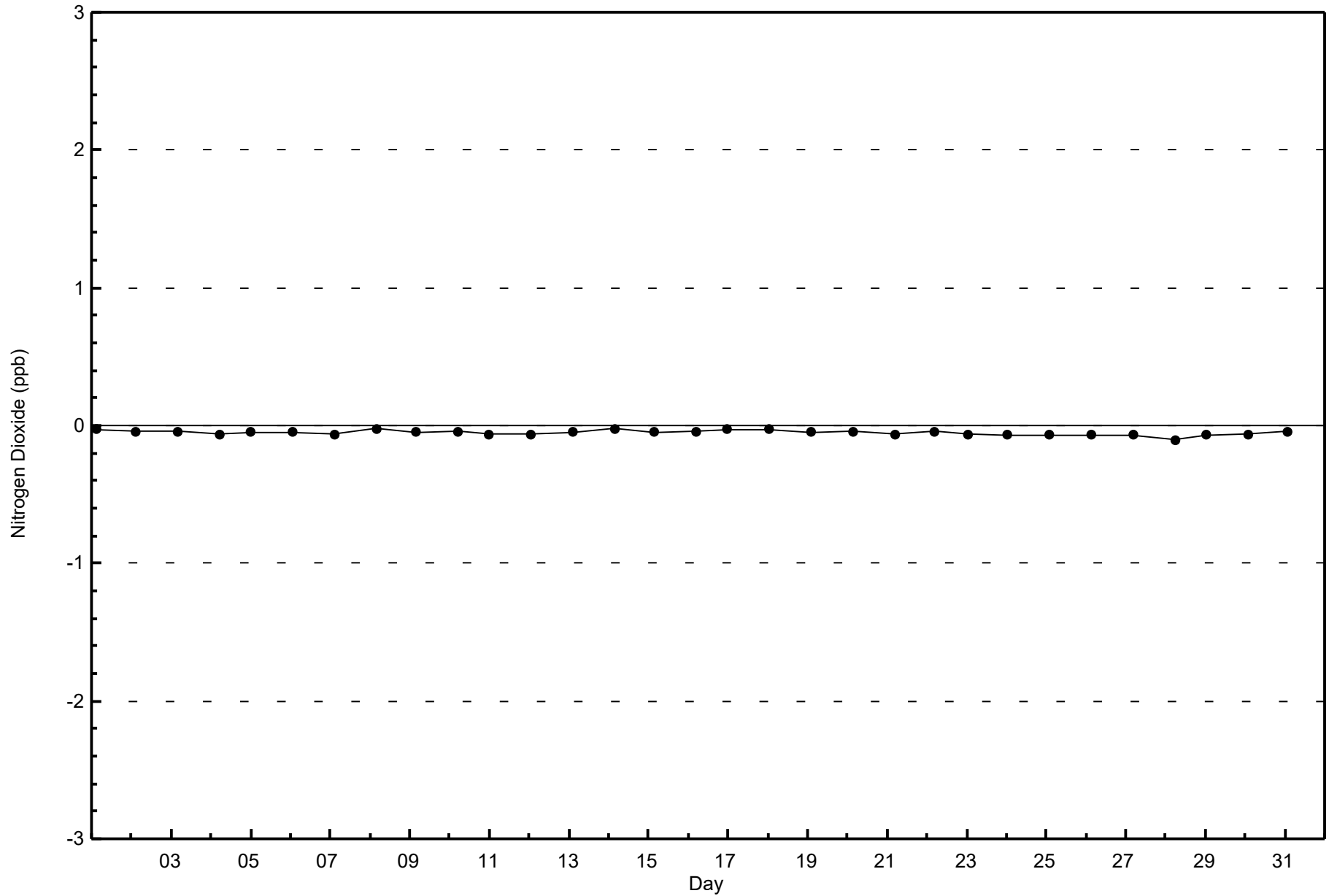


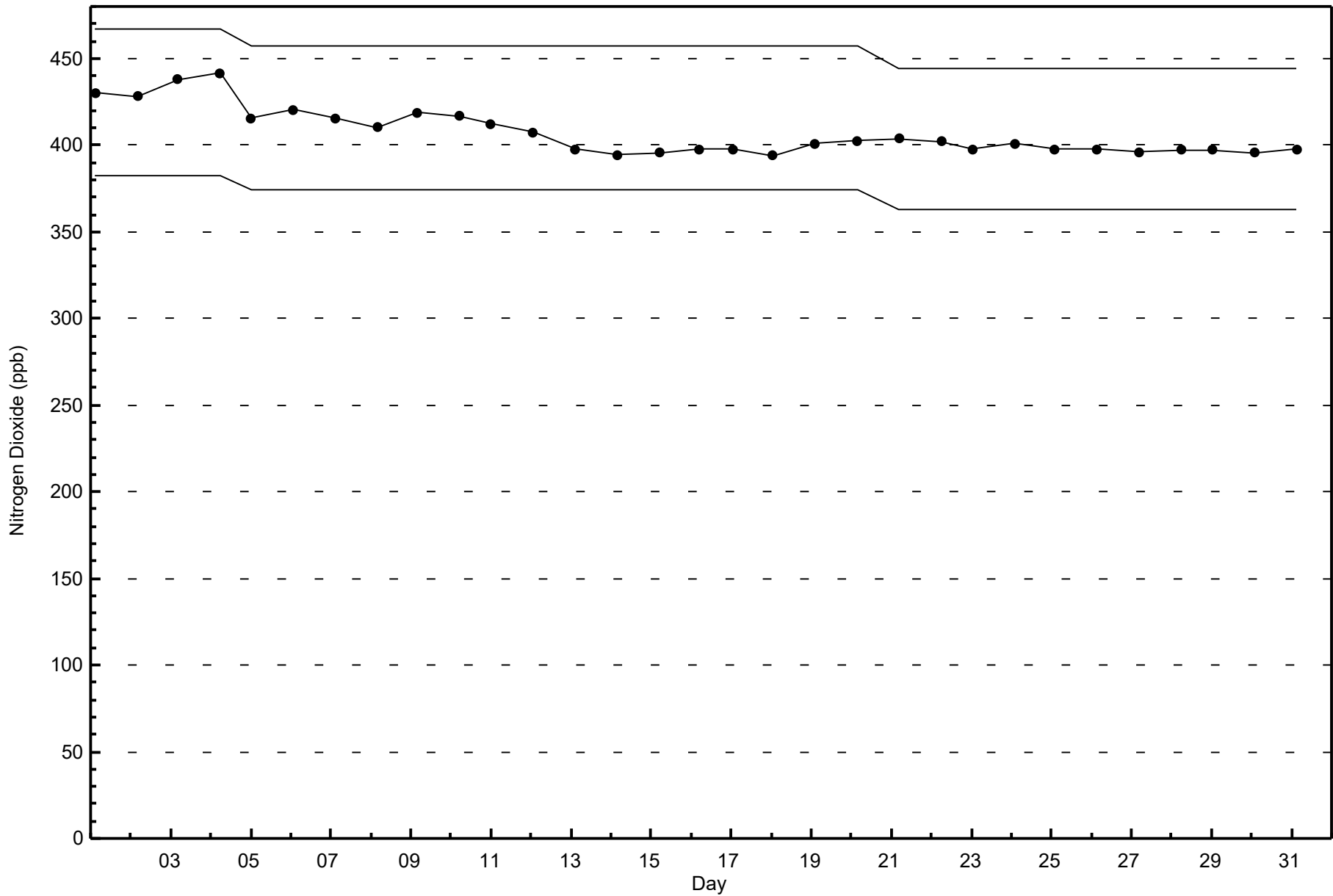
Total Number of Valid Hours: 689



Wood Buffalo Environmental Association
Zero Responses

Nitrogen Dioxide (NO₂) - ppb
Kirby South - October 2023







Wood Buffalo Environmental Association
Summary of Hour Averages

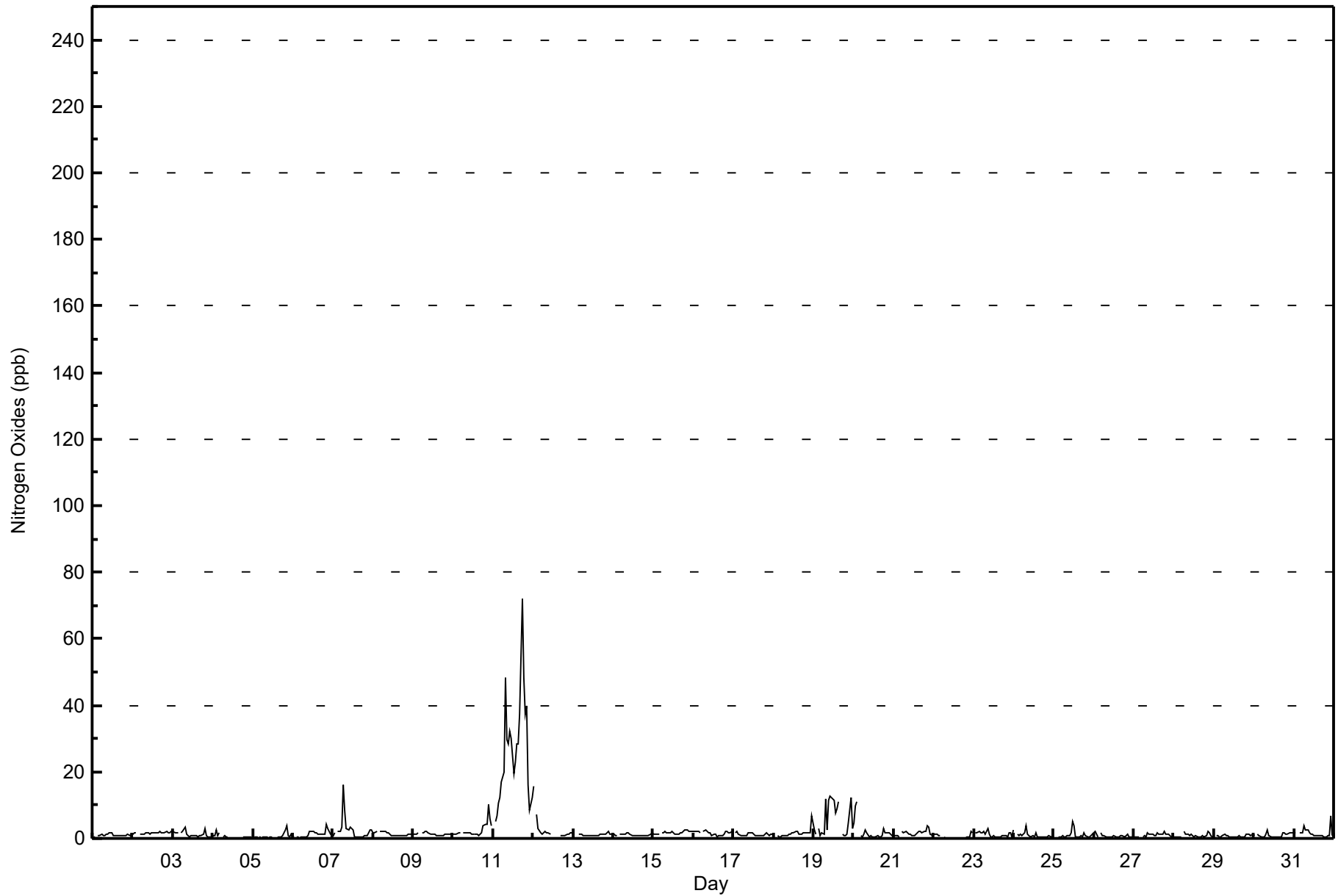
Nitrogen Oxides (NO_x) - ppb
Kirby South - October 2023

Maximum Value: 71.9 ppb on Oct 11 18:00																				Maximum Daily Average: 26.5 ppb on Oct 11					Hours in Service: 744		
Minimum Value: 0.1 ppb on Oct 22 13:00																				Minimum Daily Average: 0.5 ppb on Oct 22					Hours of Data: 700		
Maximum Diurnal Average: 3.5 ppb at hour 8																				Minimum Diurnal Average: 1.5 ppb at hour 4					Hours of Missing Data: 44		
Monthly Average: 2.29 ppb																				Percentiles: P ₁ = 0.1 P ₁₀ = 0.4 Q ₁ = 0.7 Median = 1.1 Q ₃ = 1.8 P ₉₀ = 2.6 P ₉₉ = 29.9					Hours of Calibration: 39		
																									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-Oct	0.5	0.5	Z	0.6	0.9	1.1	1.0	0.9	1.3	1.5	1.8	1.6	0.7	0.8	0.8	0.7	0.7	0.7	0.9	1.0	1.0	1.1	1.0	1.2	1.0	1.8	
2-Oct	1.5	1.5	1.6	Z	1.2	1.2	1.2	1.3	1.6	1.6	1.5	1.6	1.6	1.5	1.5	1.8	1.9	1.8	1.9	1.9	1.9	1.9	1.9	2.2	1.6	2.2	
3-Oct	2.2	1.8	1.8	1.5	Z	1.9	2.1	3.3	1.2	0.7	0.6	0.8	0.8	0.7	0.7	0.6	1.0	0.8	1.3	2.9	0.7	0.6	0.5	0.5	1.2	3.3	
4-Oct	0.7	0.9	2.5	0.7	1.8	Z	0.5	0.7	0.6	0.4	C	C	C	C	C	C	C	C	0.2	0.3	0.4	0.3	0.4	0.5	--	2.5	
5-Oct	Z	0.3	0.3	0.2	0.3	0.1	0.4	0.3	0.2	0.2	0.3	0.3	0.1	0.2	0.2	0.3	0.3	0.5	0.8	2.6	3.9	0.7	0.5	1.2	0.6	3.9	
6-Oct	0.3	Z	0.3	0.3	0.2	0.2	0.4	0.4	0.6	0.9	2.3	2.2	2.0	1.6	1.7	1.4	1.2	1.2	1.2	1.3	4.1	3.1	1.4	1.3	1.3	4.1	
7-Oct	0.8	1.7	Z	2.0	1.9	3.2	16.0	8.4	2.8	2.5	3.4	3.0	2.4	0.4	0.3	0.4	0.4	0.4	0.6	0.8	1.0	1.6	2.6	2.6	2.6	16.0	
8-Oct	1.7	1.7	2.1	Z	2.1	2.1	2.2	2.1	1.9	1.5	1.1	0.9	1.0	0.9	0.8	0.8	1.0	0.7	0.9	0.9	1.0	1.2	1.1	1.3	1.3	2.2	
9-Oct	1.3	1.3	1.5	1.5	Z	1.6	1.9	2.2	2.0	1.8	1.4	1.3	1.1	1.1	1.0	1.0	1.0	0.8	0.9	1.4	1.2	1.1	1.1	1.2	1.3	2.2	
10-Oct	1.5	1.5	1.5	1.5	1.6	Z	1.7	1.6	1.7	1.7	1.6	1.3	1.2	1.1	1.2	1.0	1.2	1.7	4.0	4.3	4.2	10.0	5.8	3.8	2.5	10.0	
11-Oct	Z	4.9	6.8	10.5	12.2	17.1	19.8	48.4	29.7	28.2	32.1	29.9	19.4	22.9	28.4	28.3	37.2	71.9	48.1	37.2	39.9	16.0	8.7	12.1	26.5	71.9	
12-Oct	15.7	Z	7.4	3.0	1.8	1.4	1.8	2.1	1.7	1.7	1.2	M	M	M	0.7	DF	1.0	1.0	0.7	0.9	1.2	1.4	1.7	1.6	2.5	15.7	
13-Oct	1.1	1.2	Z	1.3	1.2	1.1	0.9	0.9	0.9	0.8	0.9	0.9	0.9	0.9	1.0	0.8	1.2	1.5	1.1	1.2	1.6	2.1	1.3	1.3	1.1	2.1	
14-Oct	1.2	1.0	1.0	Z	1.1	1.1	1.1	1.4	1.6	1.7	1.4	0.7	0.8	0.8	1.0	1.0	1.0	0.8	0.9	1.0	1.0	1.0	1.4	1.7	1.1	1.7	
15-Oct	1.3	1.2	1.2	1.1	Z	1.5	1.7	1.9	1.8	1.8	1.8	2.1	1.8	1.3	1.3	1.4	1.5	1.7	2.2	2.4	2.4	2.2	2.1	2.0	1.7	2.4	
16-Oct	1.9	1.9	2.0	2.1	1.8	Z	2.0	2.4	1.9	1.7	1.5	0.8	1.4	1.4	0.6	0.6	0.8	0.9	1.3	2.1	2.0	1.8	1.8	2.0	1.6	2.4	
17-Oct	Z	1.7	2.0	1.2	0.9	0.9	0.7	0.9	1.0	1.7	1.8	1.8	1.2	0.7	0.8	1.0	0.9	0.7	0.7	1.3	1.8	1.0	1.2	1.2	1.2	2.0	
18-Oct	1.0	Z	0.7	0.6	0.6	0.7	0.9	0.9	1.0	1.1	1.4	1.7	1.9	2.0	2.0	1.4	1.3	1.4	1.7	1.8	1.8	1.7	1.6	6.8	1.6	6.8	
19-Oct	2.6	1.1	Z	2.9	1.1	1.6	1.2	11.8	2.4	11.5	12.6	11.7	11.4	7.7	8.9	11.0	M	1.4	1.0	1.0	1.2	4.8	12.1	3.0	5.6	12.6	
20-Oct	4.5	9.9	11.1	Z	0.7	0.5	1.3	2.6	1.5	0.5	0.7	0.5	0.4	0.6	0.8	0.4	0.4	0.8	2.8	1.9	1.5	1.8	1.1	1.0	2.1	11.1	
21-Oct	0.8	0.8	0.8	0.3	Z	1.9	1.5	2.2	1.8	1.4	1.3	1.0	1.0	1.2	1.7	2.0	2.3	1.9	2.0	2.1	3.6	3.3	1.2	0.9	1.6	3.6	
22-Oct	1.2	1.1	1.3	0.9	0.7	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	0.2	0.4	0.6	2.2	1.6	0.5	2.2
23-Oct	Z	1.5	1.9	2.3	1.9	1.8	2.3	1.5	3.1	1.1	0.5	0.4	0.6	0.5	0.4	0.6	0.6	0.8	0.8	0.7	0.4	1.6	1.6	0.6	1.2	3.1	
24-Oct	2.5	Z	1.2	0.8	1.3	0.9	1.8	3.7	1.2	0.7	0.6	0.8	0.6	1.8	0.4	0.5	0.6	0.5	0.5	0.6	0.4	0.7	0.5	0.2	1.0	3.7	
25-Oct	0.2	0.2	Z	0.3	0.4	0.6	0.5	0.5	0.7	1.0	1.9	4.9	3.9	0.5	0.4	0.4	0.8	0.5	1.5	0.8	0.5	1.0	1.4	1.0	1.0	4.9	
26-Oct	1.8	2.1	0.4	Z	1.8	0.9	0.7	0.6	0.5	0.6	0.5	0.6	0.6	0.6	0.5	0.5	0.7	1.1	0.6	0.9	1.4	0.4	0.6	0.4	0.8	2.1	
27-Oct	0.4	0.4	0.3	0.4	Z	0.5	0.7	0.6	1.7	1.4	1.3	1.3	0.9	1.0	1.6	1.1	1.3	1.3	2.0	1.4	1.4	1.3	0.3	0.3	1.0	2.0	
28-Oct	0.4	0.5	0.5	0.6	0.6	Z	2.1	1.2	1.5	0.9	1.1	0.9	0.6	0.7	0.5	0.5	0.6	1.0	0.4	1.0	2.1	1.7	1.0	0.5	0.9	2.1	
29-Oct	Z	0.8	1.0	0.4	0.4	0.7	1.3	0.8	0.8	0.5	0.4	0.5	0.5	0.6	0.6	0.6	0.6	0.5	0.5	0.4	1.1	1.1	1.4	0.7	1.4	0.7	1.4
30-Oct	0.9	Z	1.3	1.0	0.6	0.3	0.5	1.1	2.4	0.7	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.6	1.6	1.6	1.2	1.2	1.5	1.7	1.6	1.0	2.4
31-Oct	1.6	1.7	Z	1.9	1.9	1.9	4.0	2.7	2.4	1.7	1.5	1.3	1.0	1.0	0.9	0.9	0.8	0.7	0.5	0.6	0.9	0.7	6.7	0.9	1.7	6.7	
1.9 1.7 2.1 1.5 1.6 1.8 2.4 3.5 2.4 2.4 2.6 2.6 2.1 1.9 2.0 2.1 2.2 3.4 2.7 2.5 2.8 2.2 2.2 1.9																								Diurnal Average			
15.7 9.9 11.1 10.5 12.2 17.1 19.8 48.4 29.7 28.2 32.1 29.9 19.4 22.9 28.4 28.3 37.2 71.9 48.1 37.2 39.9 16.0 12.1 12.1																								Diurnal Maximum			
Z - zerospan C - Calibration M - Maintenance DF - DAS Failure																											



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Kirby South - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Kirby South - October 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	687	98.14	98.14
21 - 40	10	1.43	99.57
41 - 80	3	0.43	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 700

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Kirby South - October 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	11	17	7	2	1	6	16	81	83	80	77	34	60	87	80	34	676
21 - 40	0	0	0	0	0	2	8	0	0	0	0	0	0	0	0	0	10
11 - 80	0	0	0	0	0	2	1	0	0	0	0	0	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	11	17	7	2	1	10	25	81	83	80	77	34	60	87	80	34	689

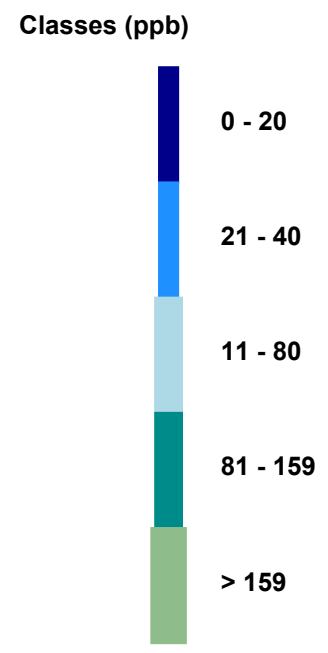
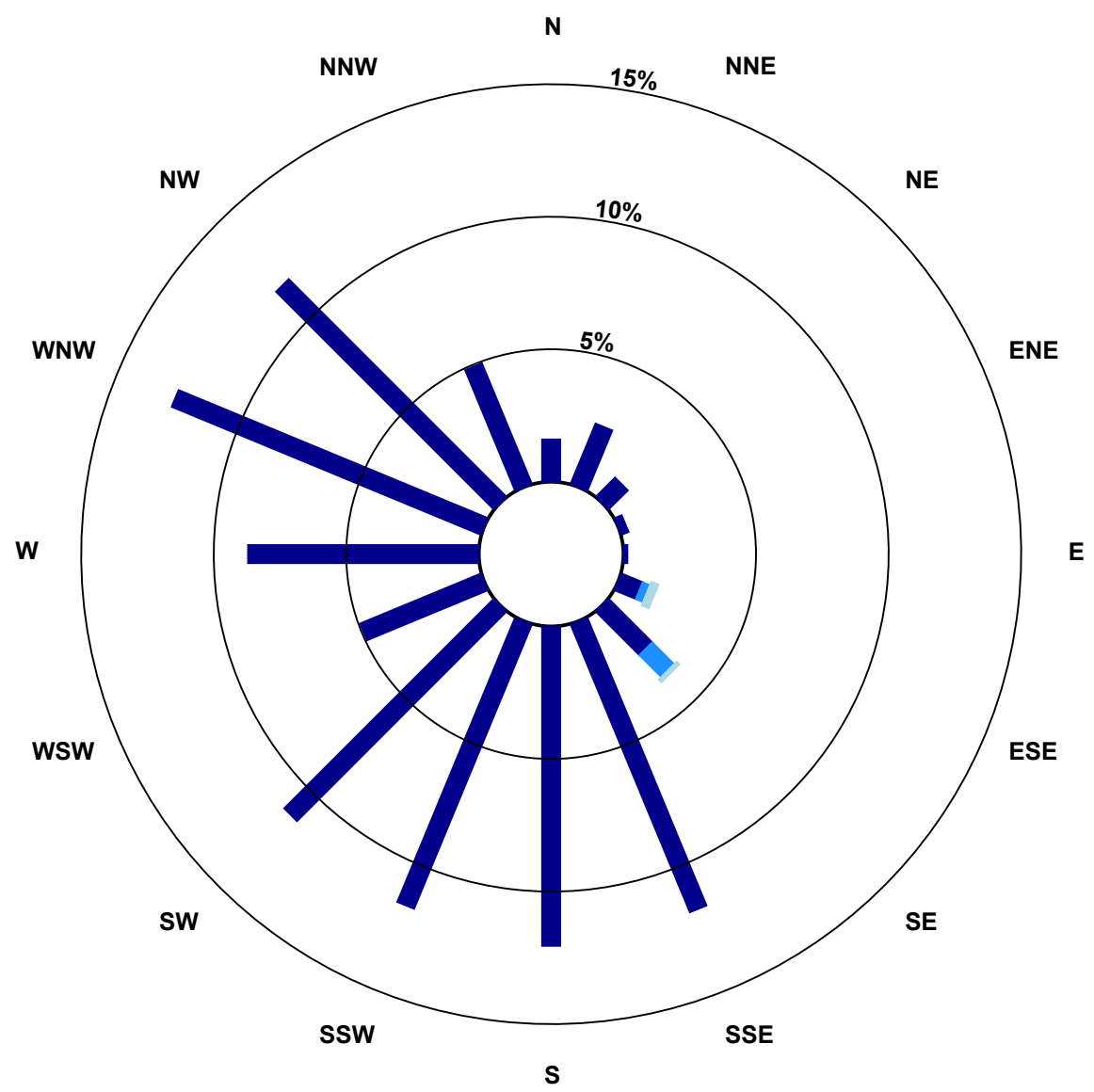
Total Number of Valid Hours: 689

Total Number of Hours: 744

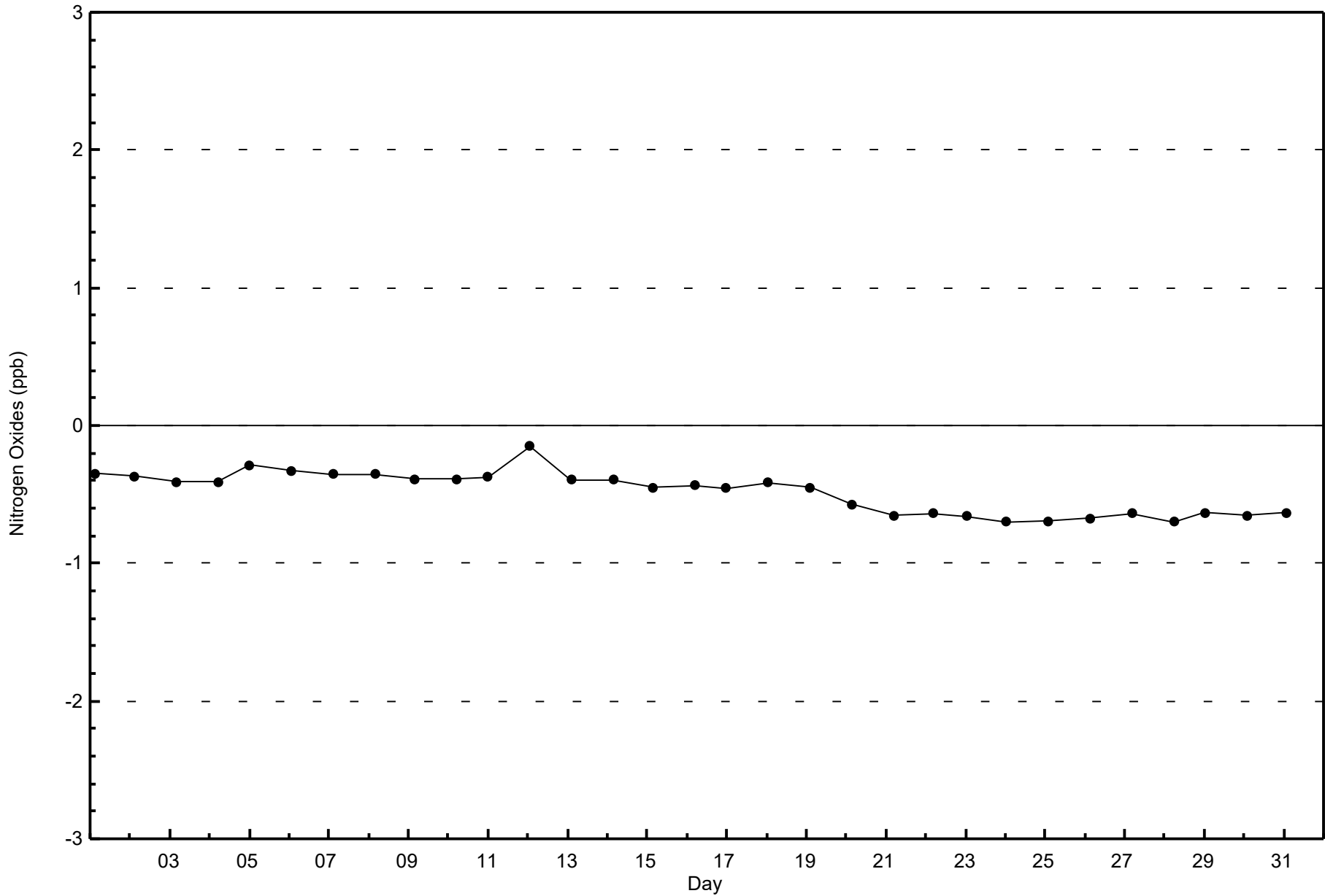


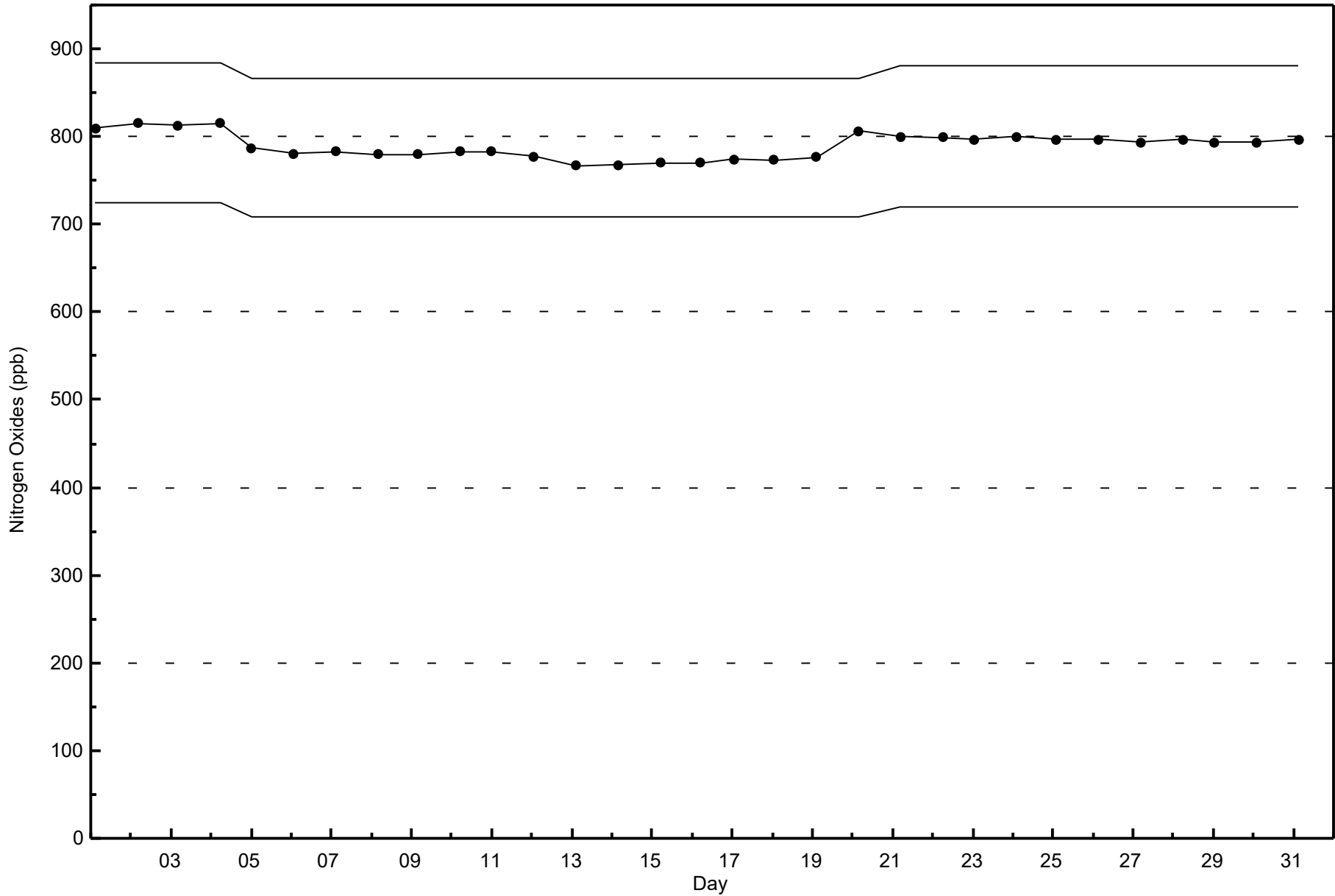
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitrogen Oxides (NO_x) - ppb
Kirby South



Total Number of Valid Hours: 689







Wood Buffalo Environmental Association
Summary of Hour Averages

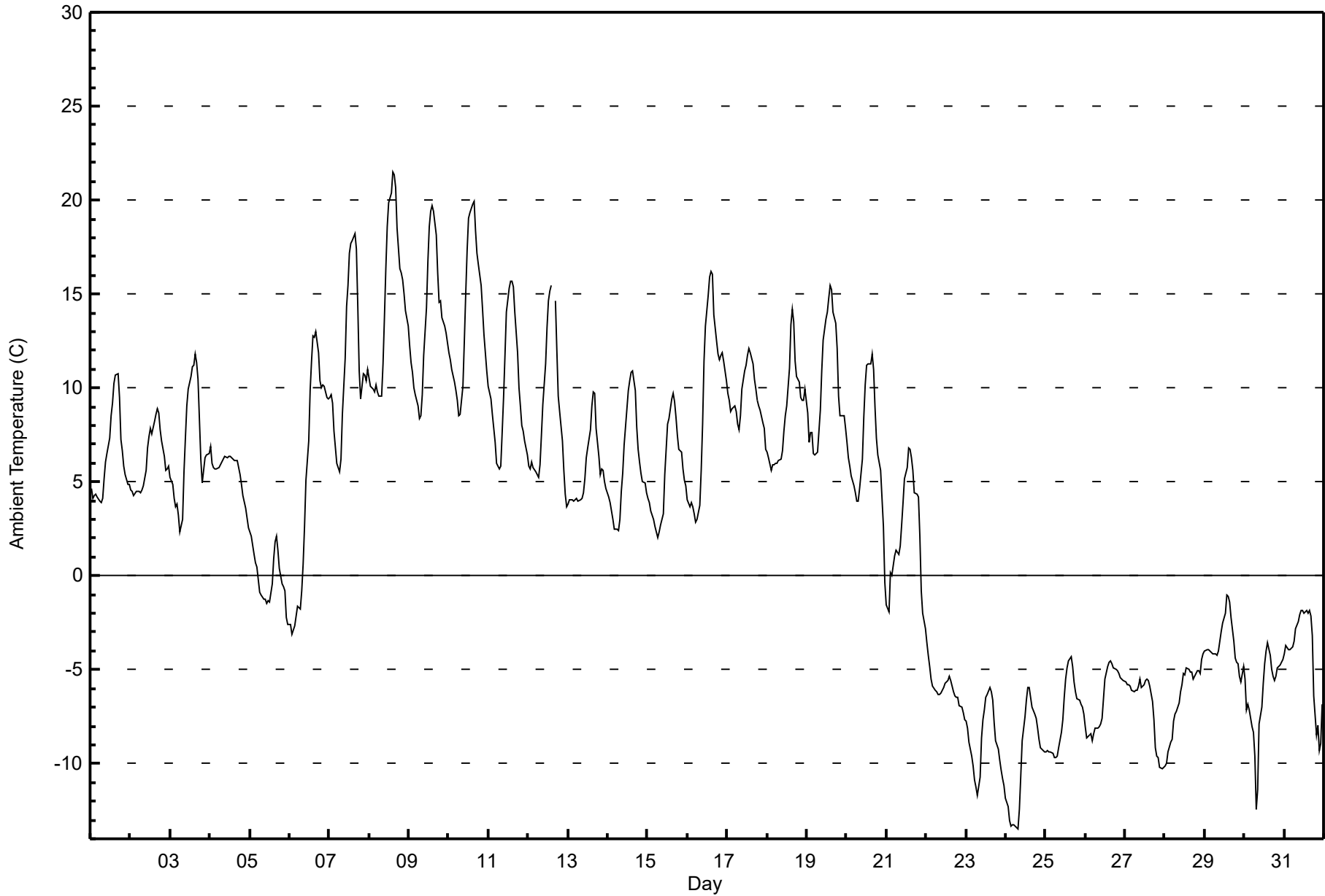
Ambient Temperature (AT) - C
Kirby South - October 2023

Maximum Value: 21.5 C on Oct 8 15:00		Maximum Daily Average: 14.7 C on Oct 8		Hours in Service: 744																						
Minimum Value: -13.4 C on Oct 24 08:00		Minimum Daily Average: -9.8 C on Oct 24		Hours of Data: 743																						
Maximum Diurnal Average: 7.1 C at hour 15		Minimum Diurnal Average: 0.5 C at hour 7		Hours of Missing Data: 1																						
Monthly Average: 3.23 C		Percentiles: P ₁ = -12.4 P ₁₀ = -7.7 Q ₁ = -4.7 Median = 4.9 Q ₃ = 9.4 P ₉₀ = 12.9 P ₉₉ = 19.6		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-Oct	4.6	4.1	4.2	4.3	4.2	3.9	3.9	4.1	5.2	6.1	6.5	7.3	8.6	9.2	10.3	10.7	10.8	9.5	7.3	6.7	5.9	5.4	4.9	4.8	6.4	10.8
2-Oct	4.6	4.5	4.3	4.5	4.5	4.5	4.4	4.5	4.8	5.6	6.8	7.4	7.8	7.6	8.3	8.6	8.9	8.6	7.8	7.2	6.3	5.6	5.7	5.9	6.2	8.9
3-Oct	5.2	4.8	4.1	3.7	3.8	3.2	2.3	3.0	5.6	7.3	9.1	9.9	10.6	11.1	11.2	11.8	11.4	10.5	6.2	4.9	5.6	6.3	6.4	6.5	6.9	11.8
4-Oct	6.8	6.0	5.7	5.7	5.7	5.7	5.9	6.1	6.2	6.4	6.3	6.3	6.4	6.3	6.2	6.2	6.1	5.8	5.4	4.9	4.2	3.6	3.0	2.6	5.6	6.8
5-Oct	2.3	2.1	1.1	0.7	0.5	-0.2	-0.9	-1.0	-1.3	-1.3	-1.5	-1.3	-1.4	-0.4	0.9	1.8	2.1	1.4	0.4	-0.4	-0.6	-0.8	-2.2	-2.6	-0.1	2.3
6-Oct	-2.6	-3.1	-2.9	-2.7	-2.1	-1.6	-1.7	-0.8	0.6	2.6	5.1	7.2	9.9	11.4	12.8	12.7	13.0	11.9	10.4	10.0	10.2	10.1	9.5	9.4	5.4	13.0
7-Oct	9.5	9.6	9.2	7.7	6.0	5.8	5.6	6.2	8.6	11.5	14.4	15.4	17.2	17.7	17.8	18.2	17.4	14.4	10.9	9.4	10.7	10.7	10.4	10.9	11.5	18.2
8-Oct	10.6	10.1	9.9	9.8	10.1	9.8	9.6	9.6	11.3	13.7	16.3	18.6	19.8	20.4	21.5	21.4	20.7	18.5	16.3	16.1	15.7	15.0	14.1	13.3	14.7	21.5
9-Oct	12.3	11.4	10.8	10.0	9.6	9.0	8.4	8.5	9.7	11.7	14.2	16.7	18.6	19.4	19.7	19.4	18.1	16.1	14.6	14.7	13.8	13.3	12.9	12.4	13.6	19.7
10-Oct	11.9	11.5	11.0	10.3	9.8	9.3	8.5	8.6	10.1	12.4	15.0	17.3	19.0	19.3	19.8	19.9	18.3	17.2	16.6	15.5	14.2	12.9	11.9	10.9	13.8	19.9
11-Oct	10.1	9.4	8.6	7.9	7.1	6.0	5.7	5.8	7.7	9.5	11.7	14.0	15.3	15.7	15.7	15.4	14.0	11.9	10.0	9.0	8.0	7.7	7.2	6.4	10.0	15.7
12-Oct	5.8	5.7	6.1	5.8	5.6	5.4	5.2	5.9	7.4	9.1	11.3	13.2	14.6	15.2	15.5	DF	14.6	12.0	9.6	8.7	7.2	5.6	4.3	3.6	8.6	15.5
13-Oct	3.8	4.0	4.1	4.0	4.1	4.1	4.0	4.0	4.1	4.5	5.2	6.3	6.8	7.8	9.0	9.8	9.7	7.8	6.3	5.4	5.7	5.6	5.0	4.7	5.7	9.8
14-Oct	4.2	3.9	3.5	3.0	2.5	2.5	2.4	3.0	4.5	5.5	7.0	8.9	9.8	10.4	10.8	10.9	9.9	7.9	6.7	6.0	5.4	5.0	4.9	4.4	6.0	10.9
15-Oct	4.1	3.9	3.5	3.0	2.6	2.3	2.1	2.4	2.7	3.3	5.4	6.8	8.1	8.4	9.4	9.7	9.3	8.5	7.5	6.8	6.6	5.7	5.1	4.8	5.5	9.7
16-Oct	4.1	3.7	3.9	3.7	3.3	2.9	3.0	3.7	5.6	8.1	11.4	13.3	15.0	15.9	16.2	16.0	13.9	12.5	11.8	11.5	11.7	11.9	11.5	10.4	9.4	16.2
17-Oct	9.7	9.4	8.8	8.9	9.1	8.7	8.0	7.8	8.5	9.9	10.9	11.2	11.8	12.1	11.9	11.2	10.4	10.0	9.4	9.1	8.8	8.2	7.8	6.7	9.5	12.1
18-Oct	6.6	6.3	5.6	5.9	5.9	6.0	6.0	6.1	6.2	6.6	7.7	8.6	9.0	11.1	13.4	14.2	13.5	11.4	10.6	10.3	9.5	9.3	9.4	10.0	8.7	14.2
19-Oct	8.7	7.1	7.6	7.6	6.5	6.4	6.5	7.7	8.8	10.9	12.6	13.7	14.0	14.8	15.5	15.3	14.1	13.5	12.1	9.6	8.5	8.5	8.5	7.8	10.3	15.5
20-Oct	7.1	6.3	5.9	5.3	4.8	4.4	4.0	4.0	4.7	6.2	8.4	10.2	11.2	11.3	11.2	11.8	11.0	9.0	7.3	6.4	5.6	4.1	2.6	-0.4	6.8	11.8
21-Oct	-1.5	-1.9	0.2	0.0	0.6	1.1	1.4	1.1	1.6	2.7	3.9	5.2	5.7	6.8	6.8	6.3	5.6	4.4	4.4	4.2	2.1	-0.8	-2.0	-2.8	2.3	6.8
22-Oct	-3.6	-4.3	-4.8	-5.5	-5.8	-6.1	-6.2	-6.3	-6.4	-6.2	-6.0	-5.7	-5.7	-5.5	-5.4	-5.6	-6.2	-6.4	-6.5	-6.5	-6.9	-7.0	-7.3	-7.7	-6.0	-3.6
23-Oct	-7.8	-8.1	-8.9	-9.6	-10.1	-10.8	-11.2	-11.7	-10.7	-8.7	-7.6	-7.2	-6.5	-6.3	-6.0	-6.2	-6.6	-7.8	-8.8	-9.3	-9.8	-10.3	-10.8	-11.2	-8.8	-6.0
24-Oct	-11.9	-12.3	-13.1	-13.3	-13.3	-13.3	-13.4	-13.4	-12.4	-10.7	-8.8	-7.5	-6.6	-5.9	-5.9	-6.5	-7.0	-7.3	-7.6	-8.1	-8.7	-9.1	-9.3	-9.4	-9.8	-5.9
25-Oct	-9.4	-9.3	-9.4	-9.4	-9.5	-9.7	-9.7	-9.6	-9.2	-8.3	-7.7	-6.4	-5.5	-4.9	-4.5	-4.3	-4.8	-5.6	-6.2	-6.6	-6.6	-6.9	-7.0	-7.4	-7.4	-4.3
26-Oct	-8.0	-8.6	-8.5	-8.4	-8.8	-8.4	-8.1	-8.1	-8.1	-7.9	-7.6	-6.6	-5.5	-4.8	-4.6	-4.5	-4.7	-4.9	-5.0	-5.1	-5.2	-5.4	-5.5	-5.5	-6.6	-4.5
27-Oct	-5.6	-5.8	-5.8	-5.9	-6.1	-6.2	-6.1	-6.1	-5.9	-5.5	-6.0	-5.8	-5.6	-5.5	-5.6	-5.9	-6.7	-7.7	-9.1	-9.6	-9.7	-10.2	-10.3	-10.2	-6.9	-5.5
28-Oct	-10.1	-10.0	-9.4	-8.9	-8.7	-7.8	-7.4	-7.2	-6.8	-6.2	-5.8	-5.2	-5.2	-4.9	-5.0	-5.1	-5.2	-5.5	-5.4	-5.0	-5.0	-5.2	-4.5	-4.2	-6.4	-4.2
29-Oct	-4.0	-3.9	-3.9	-4.0	-4.1	-4.2	-4.2	-4.2	-4.0	-3.5	-3.0	-2.5	-2.0	-1.0	-1.1	-1.4	-2.2	-3.5	-4.4	-4.6	-4.7	-5.4	-5.6	-4.8	-3.6	-1.0
30-Oct	-5.5	-7.1	-6.8	-7.1	-8.0	-8.4	-9.6	-12.4	-11.4	-7.9	-7.0	-5.7	-4.7	-4.0	-3.6	-4.2	-4.9	-5.4	-5.6	-5.4	-4.9	-4.7	-4.6	-4.4	-6.4	-3.6
31-Oct	-4.2	-3.7	-3.9	-3.9	-3.8	-3.8	-3.5	-2.8	-2.4	-2.1	-1.8	-1.9	-2.0	-1.9	-2.0	-1.9	-2.2	-3.2	-6.4	-8.4	-8.0	-9.3	-9.0	-6.9	-4.1	-1.8
1.9 1.5 1.3 1.1 0.8 0.7 0.5 0.6 1.5 2.8 4.1 5.2 6.1 6.7 7.1 6.9 6.5 5.3 4.1 3.5 3.1 2.6 2.2 1.9																								Diurnal Average		
12.3 11.5 11.0 10.3 10.1 9.8 9.6 9.6 11.3 13.7 16.3 18.6 19.8 20.4 21.5 21.4 20.7 18.5 16.6 16.1 15.7 15.0 14.1 13.3																								Diurnal Maximum		
DF - DAS Failure																										



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Kirby South - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Kirby South - October 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	268	36.07	36.07
0 - 10	322	43.34	79.41
10 - 20	149	20.05	99.46
> 20	4	0.54	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

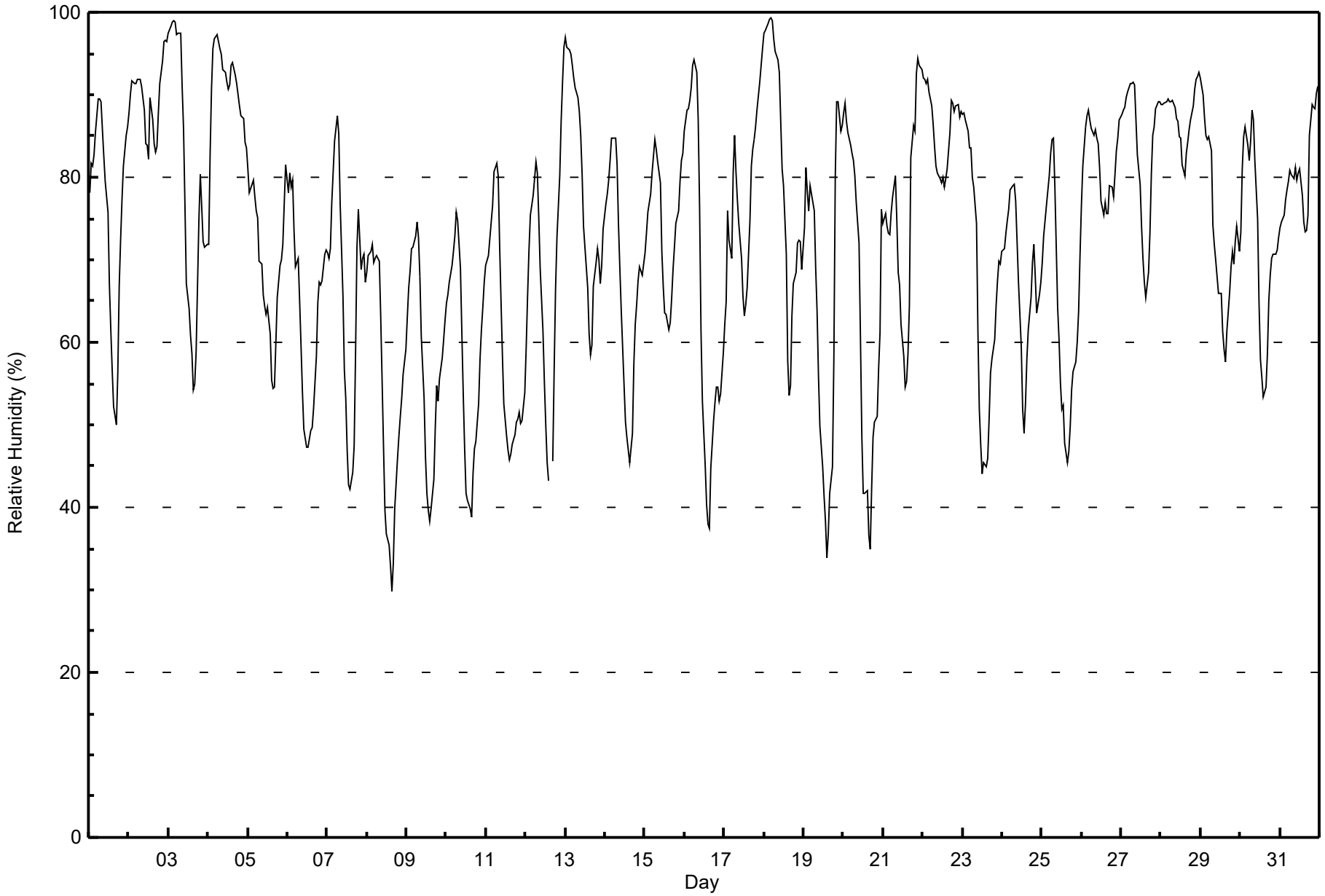
Relative Humidity (RH) - %
Kirby South - October 2023

Maximum Value: 99.4 % on Oct 18 05:00																						Hours in Service: 744				
Maximum Daily Average: 90.5 % on Oct 4																						Hours of Data: 743				
Minimum Value: 29.9 % on Oct 8 16:00																						Hours of Missing Data: 1				
Minimum Daily Average: 53.7 % on Oct 8																						Hours of Calibration: 0				
Maximum Diurnal Average: 84.2 % at hour 7																						Percent Operational Time: 99.9				
Minimum Diurnal Average: 56.2 % at hour 15																										
Monthly Average: 72.32 %																										
Percentiles: P ₁ = 36.8 P ₁₀ = 49.4 Q ₁ = 61.5 Median = 74.2 Q ₃ = 84.9 P ₉₀ = 91.0 P ₉₉ = 98.1																										
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Oct	78.2	81.6	81.3	82.7	85.4	89.5	89.6	89.1	85.8	82.5	79.5	75.7	66.9	61.6	56.6	52.2	50.0	56.2	66.7	72.4	77.3	81.3	85.1	86.2	75.6	89.6
2-Oct	87.7	90.0	91.7	91.3	91.3	91.8	91.9	91.8	91.0	88.1	84.1	83.9	82.1	89.6	87.0	84.1	83.1	83.8	87.9	91.3	94.2	96.5	96.6	96.4	89.5	96.6
3-Oct	97.4	98.3	98.8	99.1	98.9	97.2	97.5	97.5	91.0	85.9	76.7	67.2	64.1	60.9	58.7	54.2	54.9	58.8	75.0	80.3	76.4	72.1	71.5	71.9	79.3	99.1
4-Oct	71.8	82.7	90.6	95.5	96.8	97.3	96.4	95.5	94.9	93.1	92.6	91.6	90.7	91.3	93.5	93.9	92.3	91.4	90.1	88.7	87.5	87.0	84.2	83.6	90.5	97.3
5-Oct	81.0	78.2	79.2	79.6	77.7	76.0	75.1	69.9	69.5	65.8	64.4	64.3	61.1	55.5	54.4	54.5	59.8	65.4	69.3	70.0	71.9	76.7	81.5	69.3	81.5	
6-Oct	78.2	80.6	78.9	79.6	73.6	69.1	70.2	65.0	59.6	54.1	49.4	47.4	47.2	48.4	49.4	49.7	52.0	58.2	64.8	67.3	66.9	67.5	70.6	71.2	63.3	80.6
7-Oct	70.8	70.1	71.4	76.9	84.4	85.9	87.4	85.3	76.8	65.5	56.6	53.2	46.9	42.8	42.3	44.3	47.5	58.7	71.5	76.2	68.8	70.1	70.7	67.3	66.3	87.4
8-Oct	68.5	70.6	71.0	71.8	69.7	70.1	70.6	69.9	63.0	55.2	47.3	39.7	36.8	35.5	32.8	29.9	33.2	39.9	45.9	48.7	50.9	53.3	56.1	59.1	53.7	71.8
9-Oct	63.1	66.6	68.6	71.4	71.6	72.9	74.5	72.8	68.0	60.7	53.1	46.1	41.8	39.6	38.3	39.9	43.4	49.7	54.8	52.8	55.6	58.1	60.4	62.7	57.8	74.5
10-Oct	64.7	65.7	67.3	69.3	71.0	73.0	75.8	74.7	68.9	61.3	53.7	47.2	41.7	40.8	39.8	38.8	44.0	47.1	47.9	52.6	58.0	61.5	64.3	67.4	58.2	75.8
11-Oct	69.3	70.5	72.5	74.6	76.6	80.7	81.8	80.2	71.8	65.1	58.6	52.5	48.7	46.9	45.7	46.4	47.7	48.8	50.3	50.6	51.5	50.2	50.5	53.9	60.2	81.8
12-Oct	59.4	65.6	71.2	75.3	77.8	79.8	81.8	80.5	75.1	68.9	61.4	55.3	50.0	45.4	43.2	DF	45.6	56.6	66.5	72.7	80.3	86.8	91.5	95.7	69.0	95.7
13-Oct	96.9	95.8	95.4	94.9	93.5	92.1	90.9	89.7	88.0	85.0	80.4	74.0	71.4	66.7	61.0	58.5	59.7	66.8	69.7	71.4	69.9	67.1	69.3	73.8	78.4	96.9
14-Oct	76.8	78.0	79.7	82.1	84.8	84.8	81.6	74.2	68.9	63.7	54.8	50.3	48.5	47.0	45.4	49.0	57.5	62.3	64.5	67.4	69.2	68.1	69.5	67.2	84.8	84.8
15-Oct	70.8	73.2	75.8	77.9	80.5	82.6	84.6	83.5	81.9	79.3	71.0	66.8	63.6	63.5	61.6	62.4	65.2	68.8	71.6	74.4	76.0	79.5	82.0	82.8	74.1	84.6
16-Oct	85.7	88.2	88.3	89.3	90.9	93.5	94.3	92.7	87.0	76.3	61.3	52.9	45.1	40.4	38.0	37.4	44.7	50.4	52.7	54.6	54.5	52.9	53.7	58.7	66.0	94.3
17-Oct	62.1	65.0	75.9	72.3	70.2	80.5	85.1	80.7	77.2	74.5	70.1	65.6	63.2	64.5	66.7	74.7	81.3	83.5	84.5	86.1	88.1	91.6	93.5	95.6	77.2	95.6
18-Oct	97.5	97.9	98.7	99.2	99.4	99.0	96.8	95.2	94.2	92.8	86.8	81.0	79.0	70.6	57.7	53.6	54.7	63.1	67.1	68.5	72.1	72.4	72.3	68.8	80.8	99.4
19-Oct	73.8	81.2	78.4	75.9	78.9	77.9	75.9	69.0	63.7	56.0	49.8	44.8	41.4	38.3	33.9	36.8	41.7	44.9	57.9	80.0	89.2	89.1	85.7	86.3	64.6	89.2
20-Oct	87.8	88.9	86.7	85.4	83.9	83.0	82.1	80.3	77.0	72.0	60.8	48.7	41.6	41.8	42.1	36.7	35.0	42.3	48.5	50.4	51.1	56.9	61.1	76.2	63.3	88.9
21-Oct	74.4	75.6	74.0	73.3	73.1	75.7	77.6	80.1	74.8	68.4	66.9	62.2	58.3	54.5	55.3	58.6	64.5	82.4	86.3	85.6	92.5	94.4	93.6	93.0	74.8	94.4
22-Oct	92.1	91.9	91.4	91.8	90.3	88.7	86.4	83.7	81.4	80.5	79.8	79.3	79.9	78.9	79.8	81.1	85.4	89.3	88.9	88.0	88.6	88.8	87.3	87.9	85.9	92.1
23-Oct	87.6	87.8	87.0	85.6	83.6	83.6	80.0	78.8	74.3	61.3	51.9	47.6	44.1	45.4	44.9	46.0	50.7	56.3	57.9	60.4	64.4	67.5	69.9	69.5	66.1	87.8
24-Oct	71.0	71.3	73.2	74.7	76.1	78.5	78.9	79.2	77.2	72.2	67.3	59.5	51.8	48.9	52.5	57.9	61.5	65.4	69.7	71.9	68.0	63.5	65.7	67.2	67.6	79.2
25-Oct	69.7	72.9	74.8	76.7	80.1	82.8	84.6	84.8	79.1	64.2	60.4	55.1	51.8	52.4	47.9	45.4	46.7	49.9	54.3	56.4	57.6	60.1	63.7	70.5	64.2	84.8
26-Oct	76.6	81.4	86.1	87.5	88.2	86.9	85.9	85.1	85.8	84.7	84.0	81.2	77.2	75.5	76.9	75.6	75.6	79.1	78.8	77.7	80.3	83.2	84.7	86.9	81.9	88.2
27-Oct	87.6	88.2	88.4	89.7	90.3	91.4	91.3	91.5	91.3	87.0	82.8	79.2	74.0	70.1	67.3	65.4	68.4	73.3	80.4	85.1	86.1	88.3	89.1	89.2	83.1	91.5
28-Oct	88.8	88.8	89.0	89.1	89.4	89.2	89.1	89.3	88.4	87.2	86.8	84.9	84.8	81.5	80.2	82.9	84.3	85.8	87.0	88.6	90.7	91.9	92.2	92.7	87.6	92.7
29-Oct	92.0	90.0	87.2	85.1	84.7	85.0	83.2	74.3	71.9	70.1	68.0	65.9	65.9	61.4	59.2	57.6	61.3	66.2	69.2	71.1	69.5	72.1	74.2	71.1	73.2	92.0
30-Oct	73.5	81.1	84.9	86.1	84.0	82.1	84.4	88.2	87.0	82.0	74.9	64.7	57.9	55.7	53.5	54.7	58.7	65.1	68.1	70.2	70.7	70.7	71.2	72.7	72.6	88.2
31-Oct	74.0	74.5	75.4	77.3	78.4	79.5	80.8	80.4	79.8	81.2	79.6	80.5	81.0	77.8	74.6	73.3	73.5	75.5	85.0	88.9	88.5	88.4	90.2	91.0	80.4	91.0
78.3 80.4 81.7 82.6 83.1 83.9 84.2 82.6 79.0 73.9 68.5 63.6 60.1 58.1 56.2 56.4 58.4 63.7 68.6 71.5 73.0 74.3 75.7 77.4																						Diurnal Average				
97.5 98.3 98.8 99.2 99.4 99.0 97.5 97.5 94.9 93.1 92.6 91.6 90.7 91.3 93.5 93.9 92.3 91.4 90.1 91.3 94.2 96.5 96.6 96.4																						Diurnal Maximum				
DF - DAS Failure																										



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Kirby South - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Relative Humidity (RH) - %
Kirby South - October 2023**

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	19	2.56	2.56
40 - 60	151	20.32	22.88
60 - 80	298	40.11	62.99
80 - 100	275	37.01	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

Kirby South - October 2023

Maximum Speed: 28 km/h on Oct 5 10:00	Maximum Daily Speed Average: 18.6 km/h on Oct 8	Hours in Service: 744
Minimum Speed Value: 0 km/h on Oct 30 09:00	Minimum Daily Speed Average: 3.4 km/h on Oct 17	Hours of Data: 730
Maximum Diurnal Speed Average: 7.2 km/h at hour 14	Minimum Diurnal Speed Average: 3.9 km/h at hour 18	Hours of Missing Data: 14
Monthly Average Velocity: 5.7 km/h 235.5 deg	Percentiles: P ₁ = 3 P ₁₀ = 7 Q ₁ = 10 Median = 12 Q ₃ = 15 P ₉₀ = 19 P ₉₉ = 25	Percent Operational Time: 98.1

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Oct	ESE6	ESE6	SE6	SE6	SE6	SSE6	SSE6	SSE8	S10	S13	S13	SSW11	SW12	SW11	SSW13	SSW13	SSW14	SSW10	S10	S14	SSW15	SSW14	SSW14	S14	S9.6	SSW15
2-Oct	SSW15	SSW14	SSW13	SSW15	SSW15	S17	SSW17	SSW16	SSW17	SSW18	SSW17	SSW17	SSW17	SSW14	SW16	SW13	SW11	SW10	SW8	SW7	SW7	SSW7	SW8	SW8	SSW13.1	SSW18
3-Oct	SW8	SW10	SW9	SW10	WSW8	WSW8	SW9	WSW11	WNW14	WNW14	WNW16	WNW18	WNW19	WNW18	WNW15	NW14	WNW12	WNW7	W2	WSW3	SSW8	SSW8	SSW9	SW9	W8.6	WNW19
4-Oct	WSW10	WSW8	W11	W11	W9	W10	WNW14	WNW17	NW16	NW20	M	NW20	NW21	NW21	NW21	NW22	NW22	NW23	NW23	NW25	NW24	NW24	NW21	NW20	NW17.1	NW25
5-Oct	NW21	NW26	NW28	NW24	NW21	NNW25	NW23	NW24	NW25	NW28	NW25	NW24	NNW23	NNW21	NNW20	NNW18	NNW15	NW11	NW9	WNW7	WNW8	W6	SW4	WSW5	NW17.6	NW28
6-Oct	SW8	SW9	SW9	SW9	SSW10	SSW12	SSW13	SSW13	SSW14	SW16	SW16	SW17	SW18	SW17	SW18	SW19	SW13	SW12	SW9	SW10	W11	W12	W13	W13	SW11.9	SW19
7-Oct	W13	W12	W12	WSW8	SW10	WSW12	WSW10	WSW10	WSW9	W9	NW3	W5	W3	SSW7	S4	SSW7	SSW7	S6	SSE6	SSE7	SSE8	SSE11	SSE12	S18	SW6.0	S18
8-Oct	S17	S16	S18	S16	S17	S17	S19	S18	S21	S22	S24	S24	SSE22	S22	S19	SSW22	S16	S10	SSE12	SSE18	S21	S20	S18	S21	S18.6	S24
9-Oct	S19	S17	S18	SSE16	S17	S17	S18	S18	S16	S13	SSE14	S14	SSE14	S16	S15	SSE13	SSE15	SSE11	S12	S16	S13	SSE15	SSE15	SSE16	S15.3	S19
10-Oct	SSE15	SSE15	SSE16	SSE16	SSE18	SSE18	SSE16	SSE14	SSE18	SSE17	SSE17	SSE19	SSE21	SSE24	SSE24	SSE21	SSE14	SSE11	SSE13	SSE13	SSE14	SE12	SSE14	SSE14	SSE16.4	SSE24
11-Oct	SSE15	SE15	SE15	SE15	SE13	SE13	SE14	SE13	SE14	SE14	SE14	SE16	SE17	SE17	SE17	ESE17	ESE15	ESE11	ESE10	SE11	SE12	SE13	SSE11	SSE10	SE13.7	SE17
12-Oct	SE10	SSE10	SSE10	SSE13	SSE14	S14	S15	S15	S15	S12	S12	S15	S14	S15	S14	DF	S10	S9	S10	S12	SSW11	SSW11	SSW12	SSW14	S12.1	S15
13-Oct	SSW15	SSW14	SSW13	SSW13	SSW10	SSW9	S9	S12	S12	S15	S15	S14	SSE16	S15	S15	S13	SSE12	SSE9	SSE10	SSE11	SSE17	S19	S17	SSE17	S13.0	S19
14-Oct	SSE16	SSE15	SSE15	SSE12	SSE14	SSE14	SSE15	S15	S19	S20	S23	S24	SSE25	S23	SSE22	SSE21	SSE19	SSE12	SSE13	SSE15	SSE13	S14	S17	SSE15	SSE17.0	SSE25
15-Oct	SSE13	SSE14	SSE14	SSE12	SSE9	SSE11	S13	S14	S10	S10	SSW13	SSW11	SSW10	SSW11	SSW10	SW8	SSW9	SW8	SW9	SW11	SW13	SW13	SW12	SW11	SSW10.1	SSE14
16-Oct	SW11	SW11	WSW10	WSW10	SW10	SW9	SW10	SW11	SW11	SW8	SW6	SW11	WSW11	SW10	SW11	SSW8	S6	S7	S7	S9	SSE11	SSE11	SE10	SE9	SSW8.0	SW11
17-Oct	ESE8	ESE9	ESE9	SE8	SE8	SE10	E6	ESE5	ENE2	W2	N4	NW7	WNW12	WNW16	WNW18	WNW14	WNW11	WNW13	WNW12	W11	W9	SW12	SW10	S7	W3.4	WNW18
18-Oct	SSW9	SSW12	SSW12	SSW13	SSW14	SSW17	SSW18	SSW16	SSW14	SSW14	SSW18	SSW16	SW15	SW18	SW15	SW14	SW12	SW10	SW11	SW12	SW12	SW13	WSW14	WSW14	SW13.2	SSW18
19-Oct	WSW11	WSW10	WSW12	WSW12	WSW12	WSW15	WSW15	W17	WSW19	W21	W27	W24	W26	W25	W22	W20	W6	WNW7	WNW7	WSW8	WSW14	WSW16	W21	W22	W15.8	W27
20-Oct	W18	W15	W17	W19	W18	W18	W16	W16	W16	WNW17	NW18	NW20	WNW23	NW25	NW23	NW20	NW18	NW10	WNW8	NW9	NW7	NW6	NW6	NNW4	WNW14.4	NW25
21-Oct	NE4	ESE4	SSE6	SSE8	S10	S12	S14	SSW15	SSW14	SSW15	SSW17	SSW15	SSW14	SSW15	SSW13	SSW10	SSW8	SSW7	W5	N8	NNE14	NNE13	NNE11	NNE13	S5.3	SSW17
22-Oct	NNE15	NNE16	NNE17	NNE17	NNE12	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	ENE8	NE9	NNE9	NE10	NNE10	NNE11	NNE7	---	NNE17
23-Oct	N8	NNE7	N6	N6	N6	NNW6	NNW6	NNW7	WNW5	NNW8	NNW11	NNW11	NW14	NW16	NW15	NW15	NNW11	NNW9	NW9	NW10	NW9	WNW9	NW10	NW11	NNW8.8	NW16
24-Oct	WNW9	WNW10	WNW9	WNW9	WNW10	WNW10	WNW10	W11	W13	WNW14	WNW15	NW18	WNW19	NW19	WNW18	NW17	NW13	NW12	NNW13	NNW13	NW13	WNW11	WNW12	WNW12.7	WNW19	
25-Oct	WNW12	WNW13	WNW12	WNW10	WNW8	W9	WNW8	WNW8	W7	WSW4	W11	W12	WNW16	WNW15	WNW15	WNW11	WNW9	WNW8	W11	W11	W11	WNW11	WNW11	WNW10.7	WNW16	
26-Oct	WNW10	WNW9	WNW11	WNW10	WNW9	NW11	NW11	NW14	NW14	NW14	NW13	NW11	WNW12	WNW13	WNW13	NW12	NW10	WNW7	W8	W11	W15	W12	W12	W12	WNW11.0	W15
27-Oct	W12	W13	W13	W13	W12	WNW11	W11	WNW11	WNW9	N13	NNE14	NNE12	N12	N13	N15	N10	NNW5	NW7	WNW7	WNW9	W9	WSW8	WSW9	WSW8	NW7.5	N15
28-Oct	SW8	SW7	SW8	SW9	SW9	W13	W12	WNW10	NW11	NNW12	NW13	NNW15	NNW15	NNW14	NNW15	NNW11	NW12	NW11	NW12	WNW10	WNW12	WNW13	WNW14	WNW12	WNW9.5	NNW15
29-Oct	WNW11	WNW12	WNW11	W10	W10	WNW10	WNW12	NW11	NW13	NNW13	NNW13	NW15	NW11	NW14	WNW15	WNW14	WNW12	WNW10	WNW11	NW11	NW9	NW9	NW9	NW12	WNW11.3	WNW15
30-Oct	N9	NNE10	NE11	NE12	NE13	NE9	NNE5	NW2	SW0	SE4	SW7	SSW9	SSW13	SW12	SSW13	SSW12	SSW12	SSW13	SSW14	SSW15	SSW16	SW17	SW16	SW15	SSW4.8	SW17
31-Oct	SW11	SW11	SW12	SW9	SW12	WSW11	W13	WNW12	NW13	NW15	NW15	NNW14	NNW14	NNW13	NNW14	NNW12	N10	N5	NNW3	NW3	NW3	WSW3	W5	WNW9	WNW6.9	NW15

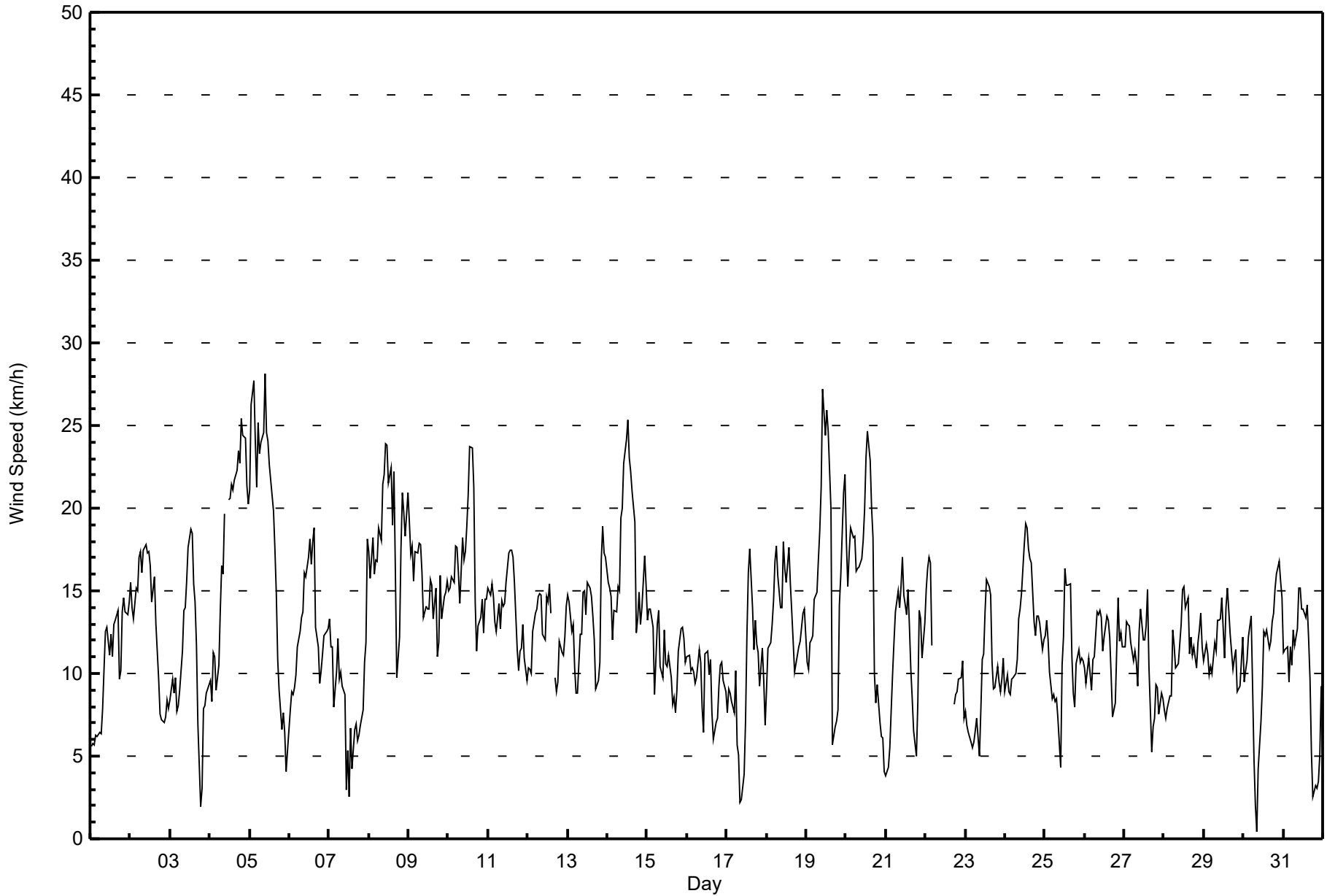
SW5.2	SW5.2	SW5.5	SW5.4	SW5.6	SW6.4	SW6.6	SW6.9	SW6.8	WSW6.0	WSW6.2	WSW6.8	WSW7.2	WSW7.2	WSW7.2	WSW6.2	WSW4.7	WSW3.9	WSW3.9	WSW4.7	SW5.1	SW5.7	SW6.0	SW5.8	Diurnal Average	
NW21	NW26	NW28	NW24	NW21	NNW25	NW23	NW24	NW25	NW28	W27	W24	W26	NW25	SSE24	SSW22	NW22	NW23	NW23	NW25	NW24	NW24	NW21	W22	Diurnal Maximum	

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Kirby South - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Kirby South - October 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	29	3.97	3.97
6 - 11	272	37.26	41.23
12 - 19	365	50.00	91.23
20 - 28	64	8.77	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 730

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Kirby South - October 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	1	1	1	0	2	1	0	1	0	2	4	5	2	4	4	29
6 - 11	7	7	4	1	1	7	9	24	15	25	48	21	22	46	25	10	272
12 - 19	4	10	2	0	0	2	16	55	60	57	30	11	30	42	30	16	365
20 - 28	0	0	0	0	0	0	0	8	12	1	0	0	9	1	29	4	64
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	18	7	2	1	11	26	87	88	83	80	36	66	91	88	34	730

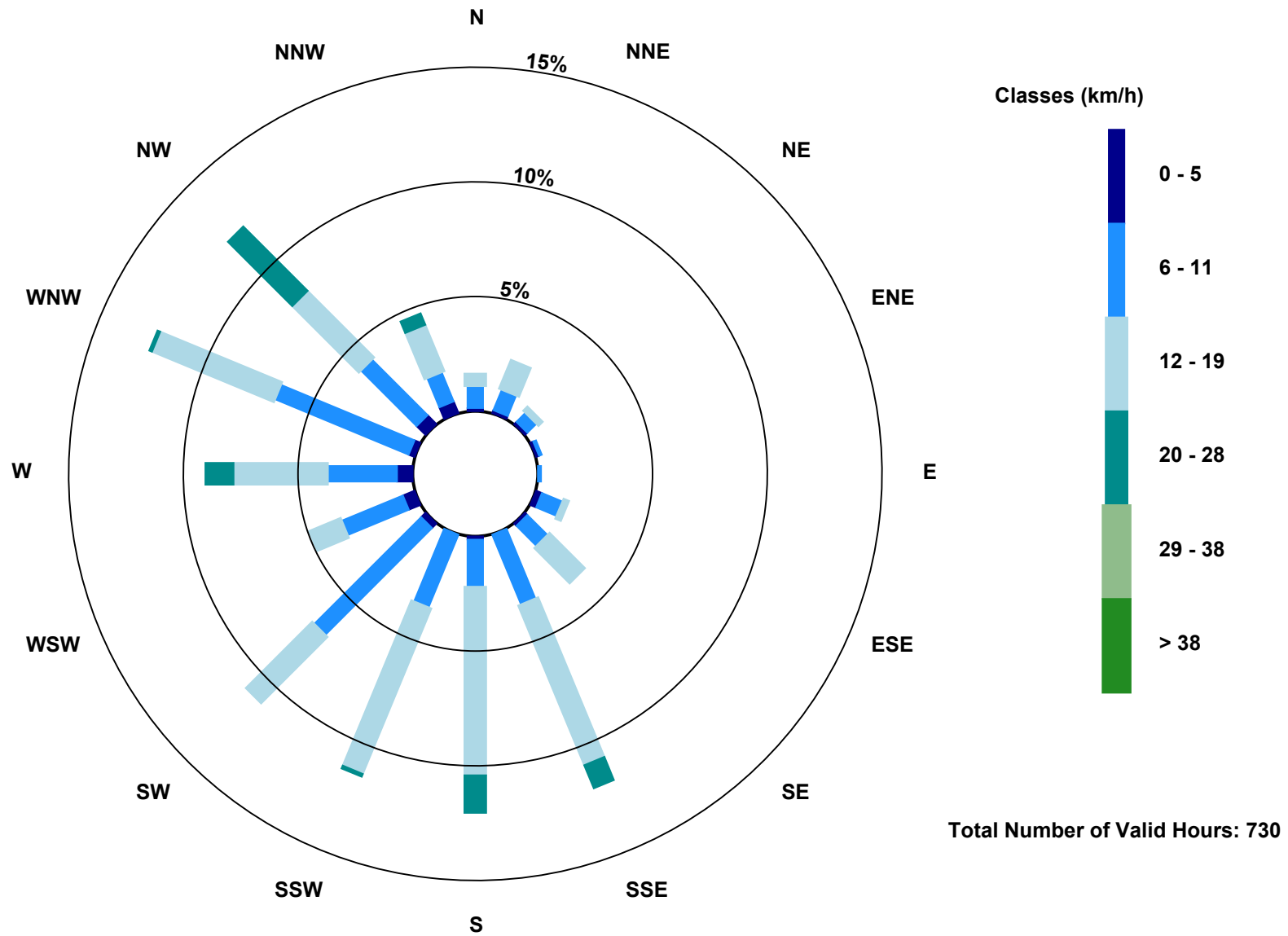
Total Number of Valid Hours: 730

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Oct 2023

Wind Speed (WS) - km/h
Kirby South





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Kirby South - October 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Oct 5 02:00 Minimum Value: 1 km/h on Oct 17 08:00 Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 2 Median = 3 Q ₃ = 4 P ₉₀ = 5 P ₉₉ = 6																	Hours in Service: 744 Hours of Data: 730 Hours of Missing Data: 14 Hours of Calibration: 0 Percent Operational Time: 98.1									
Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Oct	1	1	1	1	1	1	1	2	3	3	3	3	4	3	4	4	4	3	2	3	3	3	3	3	4	4
2-Oct	4	3	3	3	3	4	4	4	4	4	5	4	4	4	4	3	3	3	1	1	1	1	1	1	2	5
3-Oct	2	2	2	2	2	2	2	2	3	3	4	4	4	5	4	4	3	2	2	1	1	1	1	2	5	
4-Oct	2	2	3	2	3	2	3	4	3	4	M	4	5	5	5	5	5	5	5	6	6	7	6	5	7	
5-Oct	5	7	6	6	6	6	6	6	7	7	6	6	6	5	6	5	5	3	2	1	1	2	1	2	7	
6-Oct	2	1	1	2	2	3	3	3	3	4	4	4	4	4	5	4	4	2	1	2	3	2	2	2	5	
7-Oct	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	2	2	4	4	
8-Oct	4	3	4	3	4	4	4	4	5	5	6	6	6	6	6	6	5	2	3	4	5	5	4	5	6	
9-Oct	5	4	4	4	4	4	4	4	4	4	4	3	3	4	4	3	4	3	3	4	3	3	3	3	5	
10-Oct	3	3	3	4	4	4	4	4	4	4	4	5	5	6	6	7	4	3	3	3	4	3	3	3	7	
11-Oct	4	4	3	3	3	3	3	3	4	4	4	4	5	4	5	5	4	3	2	3	3	3	3	2	5	
12-Oct	2	2	3	3	3	3	3	3	3	3	3	4	4	4	4	DF	2	2	2	2	2	2	3	3	4	
13-Oct	4	4	3	3	3	3	3	3	3	4	4	4	4	4	4	4	3	2	2	3	4	5	4	4	5	
14-Oct	4	4	3	3	3	3	3	4	5	5	5	6	6	6	6	5	5	3	3	4	3	4	4	4	6	
15-Oct	3	3	3	3	2	3	3	4	4	3	3	3	3	3	2	2	2	2	2	2	3	2	2	1	4	
16-Oct	2	2	1	1	2	1	2	3	2	2	2	2	2	3	3	3	2	1	1	2	2	2	2	2	3	
17-Oct	1	2	2	2	2	3	1	1	1	2	2	3	3	3	4	3	2	2	3	3	3	2	2	1	4	
18-Oct	2	3	3	3	3	4	4	4	3	4	4	4	4	4	4	3	3	2	2	2	2	2	3	3	4	
19-Oct	2	2	2	3	2	4	3	3	4	5	6	5	5	5	5	5	3	3	2	3	4	3	5	4	6	
20-Oct	4	3	4	3	3	3	3	3	3	3	4	5	6	6	6	5	5	3	1	2	1	1	1	1	6	
21-Oct	1	1	2	2	2	2	3	3	3	3	4	4	3	3	3	3	2	2	2	2	7	6	5	4	7	
22-Oct	5	5	5	5	7	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	2	2	2	2	2	3	2	7	
23-Oct	2	2	2	1	1	1	1	1	1	2	3	3	3	4	4	4	3	2	2	2	2	2	2	4	4	
24-Oct	2	2	2	2	2	2	2	2	3	3	3	4	4	4	4	4	4	3	3	3	4	3	2	2	4	
25-Oct	2	2	2	2	2	2	1	2	2	2	3	4	4	4	4	3	3	1	1	2	2	2	3	2	4	
26-Oct	3	2	2	2	2	3	3	4	3	3	3	2	3	3	3	3	2	2	1	3	2	2	2	2	4	
27-Oct	2	3	2	3	2	2	2	2	2	4	4	3	3	4	4	3	1	1	1	1	1	2	1	1	4	
28-Oct	2	2	2	2	2	3	2	2	3	3	3	4	4	4	4	3	3	2	3	2	2	3	3	2	4	
29-Oct	2	2	2	2	2	2	3	4	5	4	3	3	3	3	3	3	2	1	2	3	2	2	3	2	5	
30-Oct	2	2	2	3	3	3	2	1	2	2	2	3	3	3	3	3	3	3	3	4	4	4	3	3	4	
31-Oct	3	2	2	2	2	2	3	2	2	3	4	4	3	4	4	4	3	2	1	1	1	1	2	2	4	
Diurnal Maximum																										
M - Maintenance DF - DAS Failure UO - Unstable Operation																										



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Kirby South - October 2023

Direction of Maximum Speed: 321 deg on Oct 5 10:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 176.5 deg on Oct 8	Hours of Data: 730
Direction of Minimum Speed: 216 deg on Oct 30 09:00	Direction of Minimum Daily Speed Average: 3.4 deg on Oct 17
Direction of Minimum Daily Speed Average: 3.4 deg on Oct 17	Hours of Missing Data: 14
Monthly Average Direction: 235.5 deg	Percent Operational Time: 98.1

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Oct	123	119	140	135	145	153	155	165	173	187	183	195	214	217	204	199	205	197	187	190	193	195	192	190	185.6
2-Oct	196	199	202	200	195	190	196	197	193	199	202	203	211	212	218	220	219	229	216	219	214	204	218	219	205.1
3-Oct	221	232	231	234	254	241	233	250	284	290	297	301	296	298	302	313	303	300	269	251	198	205	199	216	269.7
4-Oct	238	247	273	278	260	276	288	298	308	313	M	319	312	314	313	316	315	306	310	316	318	317	322	316	306.4
5-Oct	314	316	316	316	324	332	324	322	322	321	323	326	331	335	337	336	329	317	313	294	284	281	222	245	321.0
6-Oct	233	218	215	214	210	200	200	202	212	220	230	221	230	228	231	222	225	215	220	228	263	277	280	278	227.5
7-Oct	280	280	278	257	228	237	242	241	253	268	316	279	271	210	188	213	206	182	155	155	151	162	167	172	223.5
8-Oct	176	177	182	181	177	173	174	180	181	173	175	172	168	176	187	194	191	172	160	167	170	172	175	177	176.5
9-Oct	172	169	176	168	174	181	175	177	177	176	167	173	165	173	171	163	161	161	172	173	170	165	166	165	170.7
10-Oct	163	164	165	165	168	166	167	162	165	165	165	165	167	163	162	165	159	160	153	151	153	142	147	153	161.4
11-Oct	154	146	144	138	137	134	138	134	135	135	134	131	142	132	129	116	115	120	120	126	129	145	153	150	134.7
12-Oct	146	165	159	165	167	171	171	184	187	188	186	176	173	177	169	DF	173	178	172	185	196	200	207	205	178.7
13-Oct	201	203	199	200	198	196	189	181	181	178	189	181	167	171	172	172	157	150	159	164	167	169	171	166	178.0
14-Oct	161	163	159	156	161	161	165	178	180	176	176	177	168	171	168	166	160	156	162	163	167	171	178	168	168.1
15-Oct	167	167	165	165	156	159	178	182	184	184	196	206	198	202	213	218	213	214	214	224	230	233	234	236	196.2
16-Oct	234	236	244	238	229	230	231	232	229	227	235	236	242	219	218	212	190	177	172	171	166	156	144	130	212.2
17-Oct	114	122	123	135	130	142	90	103	78	278	349	306	303	298	295	297	287	285	284	275	260	233	226	187	264.8
18-Oct	203	208	210	202	208	203	200	206	197	199	192	213	217	223	232	232	231	219	223	228	232	236	243	258	216.5
19-Oct	250	241	251	252	238	246	245	260	251	261	272	272	274	275	275	273	265	286	285	258	255	253	269	276	263.4
20-Oct	272	263	266	271	275	278	277	277	280	292	306	305	297	317	309	324	326	316	300	308	312	319	320	346	295.0
21-Oct	47	113	152	163	169	178	189	198	201	197	197	201	207	206	212	210	213	198	281	355	28	31	29	31	190.9
22-Oct	25	29	30	32	33	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	57	51	29	36	28	26	23	-
23-Oct	8	12	4	349	357	339	334	330	286	338	342	331	323	312	322	323	328	327	321	316	308	297	304	307	326.3
24-Oct	293	289	285	285	288	282	283	273	278	291	294	304	301	306	302	304	307	312	315	327	327	304	287	289	298.5
25-Oct	285	283	283	283	284	280	283	283	273	242	259	267	284	293	293	294	294	290	289	277	280	281	298	301	284.1
26-Oct	300	292	284	291	296	313	314	312	315	325	318	307	299	298	297	313	312	289	278	276	271	276	275	275	297.6
27-Oct	274	276	276	278	279	283	278	284	302	10	25	20	2	3	350	7	341	326	297	284	281	240	237	238	307.8
28-Oct	234	231	230	226	234	263	279	293	319	327	317	331	338	342	341	330	325	308	308	296	293	297	293	290	301.4
29-Oct	297	291	290	281	277	285	301	319	318	327	327	323	317	306	297	297	294	284	282	308	311	307	307	319	303.5
30-Oct	354	30	40	42	52	54	28	319	216	136	217	212	211	218	209	207	210	205	204	210	211	220	220	227	210.2
31-Oct	218	216	217	228	231	244	275	299	318	315	319	334	329	334	329	348	9	10	328	321	319	258	260	283	297.1

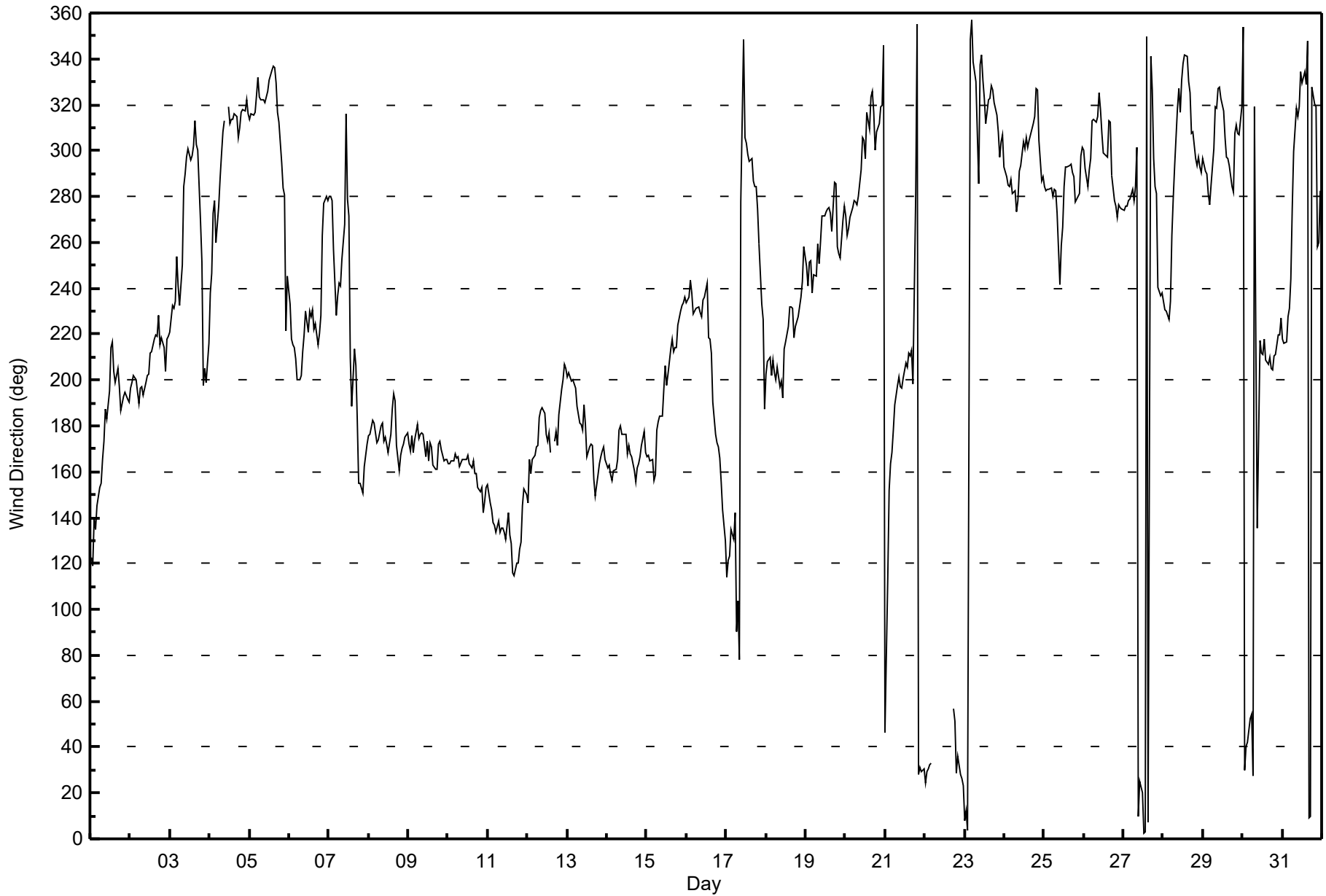
224.2 222.0 224.3 221.0 215.2 219.0 224.2 231.7 233.2 240.6 238.1 248.4 250.7 251.9 254.0 257.2 248.9 245.0 238.3 236.9 232.6 228.5 229.8 231.5
 Diurnal Average

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Kirby South - October 2023





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Kirby South - October 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 87 deg on Oct 30 09:00 Minimum Value: 5 deg on Oct 7 19:00 Percentiles: P ₁ = 8 P ₁₀ = 11 Q ₁ = 13 Median = 15 Q ₃ = 17 P ₉₀ = 20 P ₉₉ = 49														Hours in Service: 744 Hours of Data: 730 Hours of Missing Data: 14 Hours of Calibration: 0 Percent Operational Time: 98.1											
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Oct	12	12	15	13	15	12	12	12	14	18	18	20	25	22	26	21	19	14	11	13	13	13	14	14	26
2-Oct	14	14	14	14	15	14	15	15	15	16	17	16	16	16	16	16	17	16	11	10	13	8	9	15	17
3-Oct	18	14	12	11	18	14	12	19	12	14	16	18	17	17	25	23	15	14	36	33	7	9	10	18	36
4-Oct	14	18	16	10	19	16	12	14	13	13	M	14	14	14	14	15	14	13	13	15	15	14	14	15	19
5-Oct	14	14	13	15	16	15	15	15	17	15	16	17	17	21	20	19	16	15	13	13	13	14	24	18	24
6-Oct	12	11	10	12	13	15	13	14	17	15	15	17	16	17	18	15	16	12	10	12	17	9	10	11	18
7-Oct	10	11	10	24	8	8	8	10	13	12	52	41	73	38	46	35	15	11	5	7	12	11	11	14	73
8-Oct	14	14	14	14	14	13	14	15	15	14	16	16	18	17	21	17	15	14	12	14	14	14	14	14	21
9-Oct	14	14	15	15	16	15	14	15	17	18	18	20	21	20	19	21	15	12	13	14	14	13	14	14	21
10-Oct	13	14	15	15	15	14	14	15	15	16	16	17	18	18	17	16	14	14	15	17	18	17	15	15	18
11-Oct	15	15	15	15	15	14	14	15	18	19	19	20	20	21	20	18	16	15	14	13	14	15	15	15	21
12-Oct	13	14	17	14	14	14	13	14	15	17	18	20	23	20	22	DF	17	12	9	15	12	13	14	16	23
13-Oct	14	14	16	18	18	18	17	17	18	18	18	24	18	21	19	20	17	12	13	13	15	14	14	15	24
14-Oct	14	14	14	14	14	14	14	15	15	16	16	17	18	19	15	17	16	15	14	15	16	16	14	15	19
15-Oct	15	14	15	15	21	18	17	17	19	18	17	20	20	19	22	18	14	14	13	14	12	10	8	10	22
16-Oct	9	9	9	10	9	9	9	11	11	14	26	18	23	32	23	24	14	9	8	9	13	14	17	12	32
17-Oct	13	15	17	21	20	25	18	11	67	68	51	28	15	15	14	13	10	10	10	11	15	11	14	12	68
18-Oct	13	14	15	15	15	14	15	15	15	17	16	17	16	16	19	16	15	13	12	13	11	11	13	13	19
19-Oct	16	12	12	13	12	13	12	13	12	15	13	12	13	13	13	12	44	23	29	52	16	15	13	11	52
20-Oct	13	14	12	9	9	10	11	11	13	13	14	15	15	17	15	16	14	15	12	14	16	13	18	20	20
21-Oct	18	21	31	12	9	14	14	13	14	15	15	16	15	15	16	14	14	14	43	22	22	15	16	15	43
22-Oct	18	15	15	15	14	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	16	16	15	15	16	14	16	18
23-Oct	19	17	21	18	18	15	15	16	22	24	24	20	21	16	20	16	19	15	14	12	15	14	15	14	24
24-Oct	14	14	11	11	12	11	12	10	12	14	18	16	17	21	21	15	15	15	18	16	16	16	12	11	21
25-Oct	10	10	10	10	12	11	8	10	17	39	27	26	18	19	16	14	13	9	11	9	9	8	14	13	39
26-Oct	14	13	10	12	13	15	15	15	15	17	15	16	16	15	15	17	15	13	10	11	9	10	10	11	17
27-Oct	11	10	11	10	12	10	11	11	15	26	18	19	21	20	23	19	23	14	7	6	7	17	11	10	26
28-Oct	12	14	14	13	15	13	10	14	15	16	14	16	17	18	18	17	16	13	13	14	12	13	12	13	18
29-Oct	13	13	12	11	10	11	14	16	15	17	18	16	17	20	16	13	11	10	9	18	18	12	14	12	20
30-Oct	24	12	12	12	12	16	22	56	87	37	37	25	21	19	20	16	15	14	15	15	15	14	14	13	87
31-Oct	14	13	13	15	14	13	14	14	13	13	16	18	19	17	17	20	20	20	21	9	29	5	11	10	29
Diurnal Maximum																									
M - Maintenance DF - DAS Failure UO - Unstable Operation																									



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

**AMS511
BLACKGOLD
OCTOBER 2023**

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

November 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BLACKGOLD (AMS511)
OCTOBER 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	37	39	99.73	15.8	0	8	0
H2S (ppb) Average	707	36	37	99.87	1.1	0	0.3	0
THC (ppm) Average	705	37	39	99.73	2.8	-	2.4	-
NO2 (ppb) Average	693	40	51	98.52	13.3	0	4.2	-
NO (ppb) Average	693	40	51	98.52	24.3	-	3.3	-
NOX (ppb) Average	693	40	51	98.52	37.6	-	6.1	-
Temperature 2 m (C) Average	744	0	0	100	22.2	-	14.4	-
Relative Humidity (%) Average	744	0	0	100	99.7	-	88.6	-
Wind Speed 10 m (km/h) Average	703	0	41	94.49	25	-	14	-
Wind Direction 10 m (deg) Average	703	0	41	94.49	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BLACKGOLD (AMS511)
 OCTOBER 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	0.84	1.9	-	0	0	0.1	0.2	0.7	2.1	15.8
H2S (ppb) Average	707	0.12	0.1	-	0	0	0.1	0.1	0.1	0.2	1.1
THC (ppm) Average	705	2.24	0.1	-	2.1	2.1	2.2	2.2	2.3	2.4	2.8
NO2 (ppb) Average	693	1.39	1.7	-	0	0	0.3	0.9	1.9	3.3	13.3
NO (ppb) Average	693	0.57	1.9	-	0	0	0	0.1	0.4	1.2	24.3
NOX (ppb) Average	693	1.96	3.2	-	0	0.1	0.4	1	2.3	4.4	37.6
Temperature 2 m (C) Average	744	3.77	8	-	-13.8	-6.9	-3.7	5.5	9.5	13.4	22.2
Relative Humidity (%) Average	744	70.09	15.1	-	30.1	47.9	59.4	72.6	82	87.9	99.7
Wind Speed 10 m (km/h) Average	703	9.1	4	-	0	4	6	9	12	15	25
Wind Direction 10 m (deg) Average	703	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BLACKGOLD (AMS511)
OCTOBER 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
H2S, SO2, THC	18 Oct 2023 13:00	18 Oct 2023 13:00	1	Maintenance -verify daily QA check
NO2	18 Oct 2023 06:00	18 Oct 2023 11:00	6	Unstable Operation - flatline in analyzer output signal
NO2	18 Oct 2023 12:00	18 Oct 2023 13:00	2	Maintenance - analyzer rebooted and QA check
NO2	20 Oct 2023 08:00	20 Oct 2023 10:00	3	Maintenance - replaced calibration gas cylinder
SO2, THC	21 Oct 2023 09:00	21 Oct 2023 09:00	1	Maintenance - reinitiated daily QA check
Wind Speed, Wind Direction	21 Oct 2023 22:00	23 Oct 2023 13:00	40	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	23 Oct 2023 14:00	23 Oct 2023 14:00	1	Maintenance - de-ice wind sensor

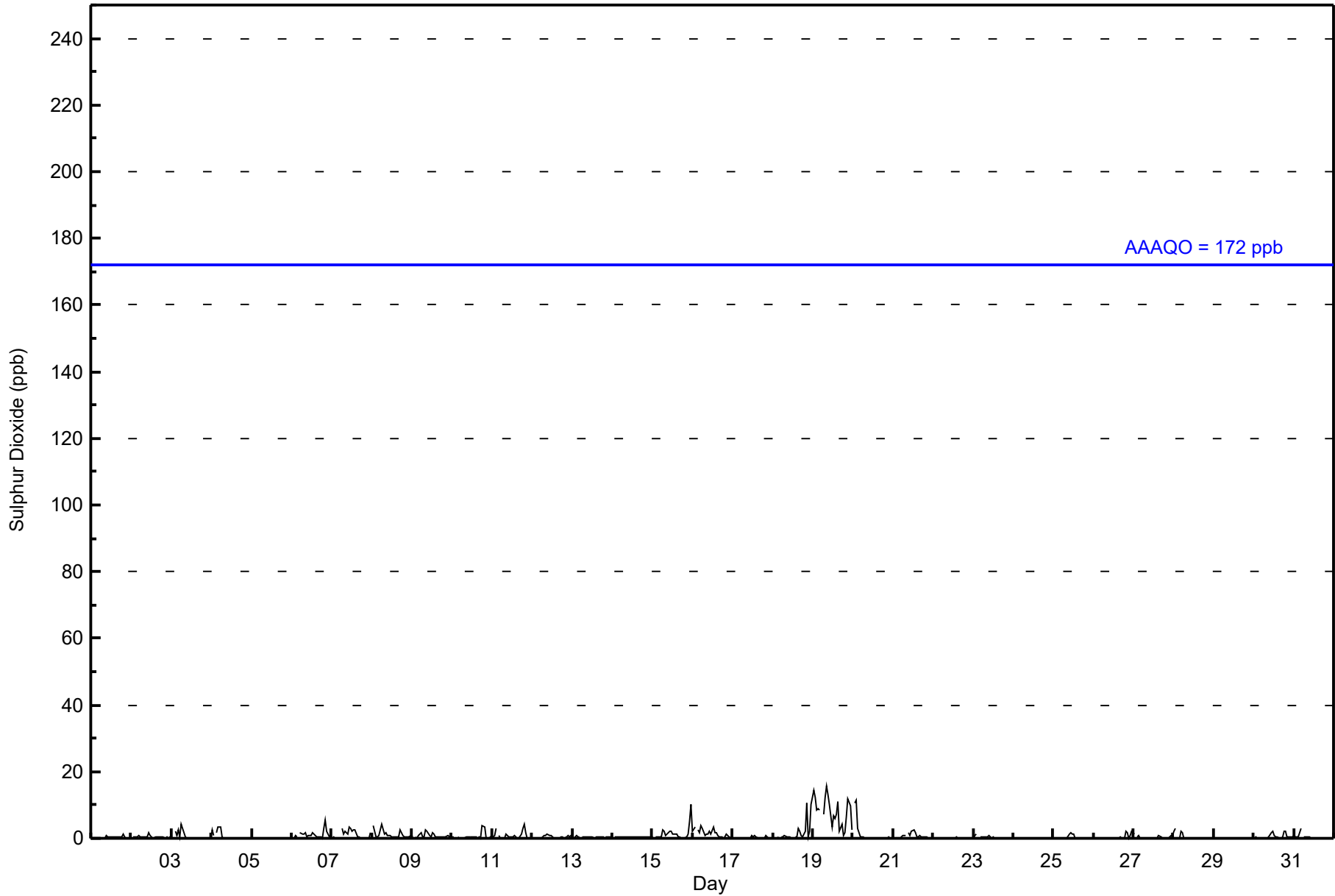


Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 744																	744					
Maximum Value: 15.8 ppb on Oct 19 09:00		Maximum Daily Average: 8.0 ppb on Oct 19																	Hours of Data: 705							
Minimum Value: 0.0 ppb on Oct 1 02:00		Minimum Daily Average: 0.0 ppb on Oct 29																	Hours of Missing Data: 39							
Maximum Diurnal Average: 1.5 ppb at hour 2		Minimum Diurnal Average: 0.3 ppb at hour 17																	Hours of Calibration: 37							
Monthly Average: 0.84 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.2 Q ₃ = 0.7 P ₉₀ = 2.1 P ₉₉ = 11.1																	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-Oct	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	1.0	0.3	0.2	0.4	0.5	0.5	0.5	0.4	0.3	0.4	1.3	0.2	0.1	0.1	0.0	0.3	1.3
2-Oct	Z	0.5	0.6	0.5	0.7	0.6	0.3	0.4	0.2	0.6	1.9	0.9	0.5	0.2	0.3	0.3	0.4	0.3	0.2	0.2	0.2	0.3	0.2	0.5	0.5	1.9
3-Oct	0.5	Z	2.2	0.6	2.6	0.3	4.1	1.8	0.3	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.2	0.6	4.1
4-Oct	2.6	0.8	Z	1.7	3.3	3.4	0.4	0.1	0.2	0.1	0.2	0.0	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.6	3.4
5-Oct	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	C	C	C	C	C	C	0.0	0.0	0.0	0.1	0.1	0.1	--	0.1
6-Oct	0.1	0.1	0.7	0.3	Z	1.5	1.2	1.1	1.7	0.6	0.8	0.7	1.7	1.4	0.7	0.6	0.4	0.4	0.2	3.1	5.6	2.0	0.3	0.2	1.1	5.6
7-Oct	0.0	0.3	0.0	0.0	0.0	Z	3.0	1.5	1.9	1.3	3.3	3.0	2.2	2.5	2.6	0.6	0.3	0.1	0.0	0.0	0.0	0.0	0.0	1.8	1.1	3.3
8-Oct	Z	4.0	0.3	0.3	0.7	2.7	4.1	1.2	1.8	1.0	0.8	1.0	0.4	0.6	0.6	0.6	0.2	2.4	0.7	0.5	0.5	0.4	0.4	1.0	1.1	4.1
9-Oct	0.4	Z	0.4	0.2	0.8	1.8	0.5	0.6	2.5	1.9	0.7	0.3	1.8	1.1	0.5	0.4	0.4	0.6	0.5	0.4	0.4	0.9	0.4	0.4	0.8	2.5
10-Oct	0.5	0.5	Z	0.4	0.1	0.0	0.1	0.1	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.2	0.3	0.1	4.0	3.4	0.2	0.1	0.2	0.3	0.6	4.0
11-Oct	0.1	0.8	2.8	Z	0.7	0.1	0.1	0.0	1.3	0.9	0.4	0.4	0.5	0.9	0.4	0.0	0.1	1.2	2.8	4.1	1.8	0.0	0.0	0.0	0.9	4.1
12-Oct	0.0	0.0	0.0	0.0	Z	0.1	0.5	0.7	0.8	1.3	0.9	0.8	0.4	0.1	0.1	0.0	0.2	0.2	0.4	0.2	0.6	0.8	0.4	0.9	0.4	1.3
13-Oct	0.3	0.0	0.7	0.6	0.5	Z	0.4	0.2	0.4	0.2	0.2	0.4	0.2	0.1	0.4	0.4	0.4	0.2	0.3	0.1	0.3	0.3	0.3	0.3	0.3	0.7
14-Oct	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.5	0.6	0.6	0.3	0.2	0.2	0.2	0.3	0.4	0.4	0.5	0.4	0.4	0.3	0.6
15-Oct	0.3	Z	0.5	0.5	0.4	0.4	2.4	2.3	0.9	1.7	1.9	2.3	1.3	1.4	1.1	0.5	0.3	0.2	0.2	0.2	0.6	1.1	5.2	10.1	1.6	10.1
16-Oct	2.1	3.6	Z	2.3	1.5	3.6	2.8	1.0	1.1	1.3	2.1	1.2	3.3	1.7	1.8	0.7	0.3	0.2	0.2	0.3	1.3	0.7	0.4	0.1	1.5	3.6
17-Oct	0.1	0.2	0.1	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.0	0.4	0.7	0.4	0.1	0.0	0.0	0.0	0.1	0.7	0.2	0.0	0.1	0.2	1.0
18-Oct	0.0	0.1	0.1	0.2	Z	0.3	0.3	0.7	0.3	0.3	0.4	0.2	M	0.4	0.4	2.9	2.2	1.0	0.3	2.2	10.4	0.4	2.1	10.2	1.6	10.4
19-Oct	14.5	12.5	8.5	8.8	8.5	Z	7.4	12.5	15.8	13.2	10.0	3.2	6.7	5.9	7.3	11.1	2.3	4.0	0.8	1.5	6.5	11.7	9.7	2.7	8.0	15.8
20-Oct	Z	10.4	11.3	2.9	0.3	0.2	0.2	0.1	0.2	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.2	0.3	0.1	0.1	1.2	11.3
21-Oct	0.1	Z	0.1	0.1	0.1	0.5	0.9	0.7	M	1.8	0.9	1.9	2.4	1.8	0.6	0.5	0.7	0.6	0.2	0.3	0.3	0.2	0.2	0.1	0.7	2.4
22-Oct	0.0	0.2	Z	0.0	0.1	0.0	0.1	0.1	0.2	0.0	0.0	0.1	0.1	0.2	0.3	0.1	0.1	0.0	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.3
23-Oct	0.1	0.8	1.3	Z	0.5	0.3	0.3	0.4	0.5	0.8	0.2	0.1	0.3	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	1.3
24-Oct	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.2
25-Oct	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	1.1	1.9	1.1	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.9
26-Oct	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.3	0.0	0.1	2.2	1.5	0.1	1.0	2.1	0.3	2.2
27-Oct	1.5	Z	0.4	0.8	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.0	0.0	0.2	0.8	0.4	0.2	0.1	0.0	0.0	0.1	0.7	0.8	0.3	1.5
28-Oct	2.1	3.0	Z	0.0	2.2	1.7	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	3.0
29-Oct	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.2	0.0	0.2
30-Oct	0.2	0.4	0.2	0.1	Z	0.1	0.2	0.1	0.1	0.3	1.9	2.3	1.0	0.4	0.4	0.2	0.1	0.4	2.1	2.2	0.2	0.2	0.2	0.5	0.6	2.3
31-Oct	0.7	0.4	0.5	1.6	3.0	Z	0.5	0.4	0.3	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	0.0	0.0	0.3	3.0
1.0 1.5 1.2 0.9 1.0 0.7 1.0 0.9 1.1 1.0 1.0 0.8 0.9 0.7 0.7 0.7 0.3 0.4 0.5 0.8 1.0 0.7 0.7 1.1																								Diurnal Average		
14.5 12.5 11.3 8.8 8.5 3.6 7.4 12.5 15.8 13.2 10.0 3.2 6.7 5.9 7.3 11.1 2.3 4.0 4.0 4.1 10.4 11.7 9.7 10.2																								Diurnal Maximum		
Z - zerospan C - Calibration M - Maintenance																										
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb																										



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Blackgold - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Blackgold - October 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	697	98.87	98.87
11 - 20	8	1.13	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
Blackgold - October 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	9	4	5	6	7	12	42	93	68	72	57	40	59	121	45	18	658
11 - 20	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	8
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	9	4	5	6	7	12	42	93	68	72	57	48	59	121	45	18	666

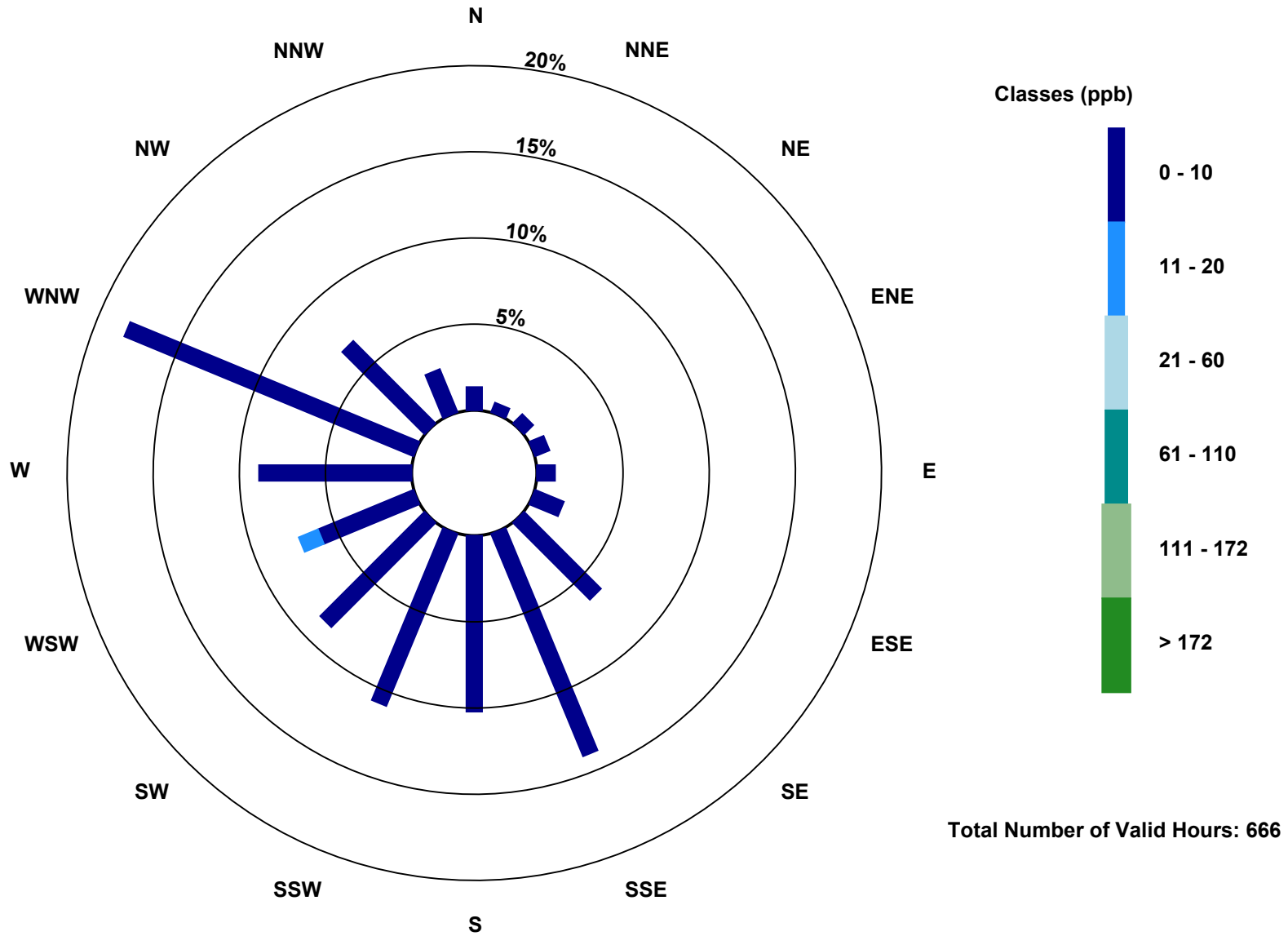
Total Number of Valid Hours: 666

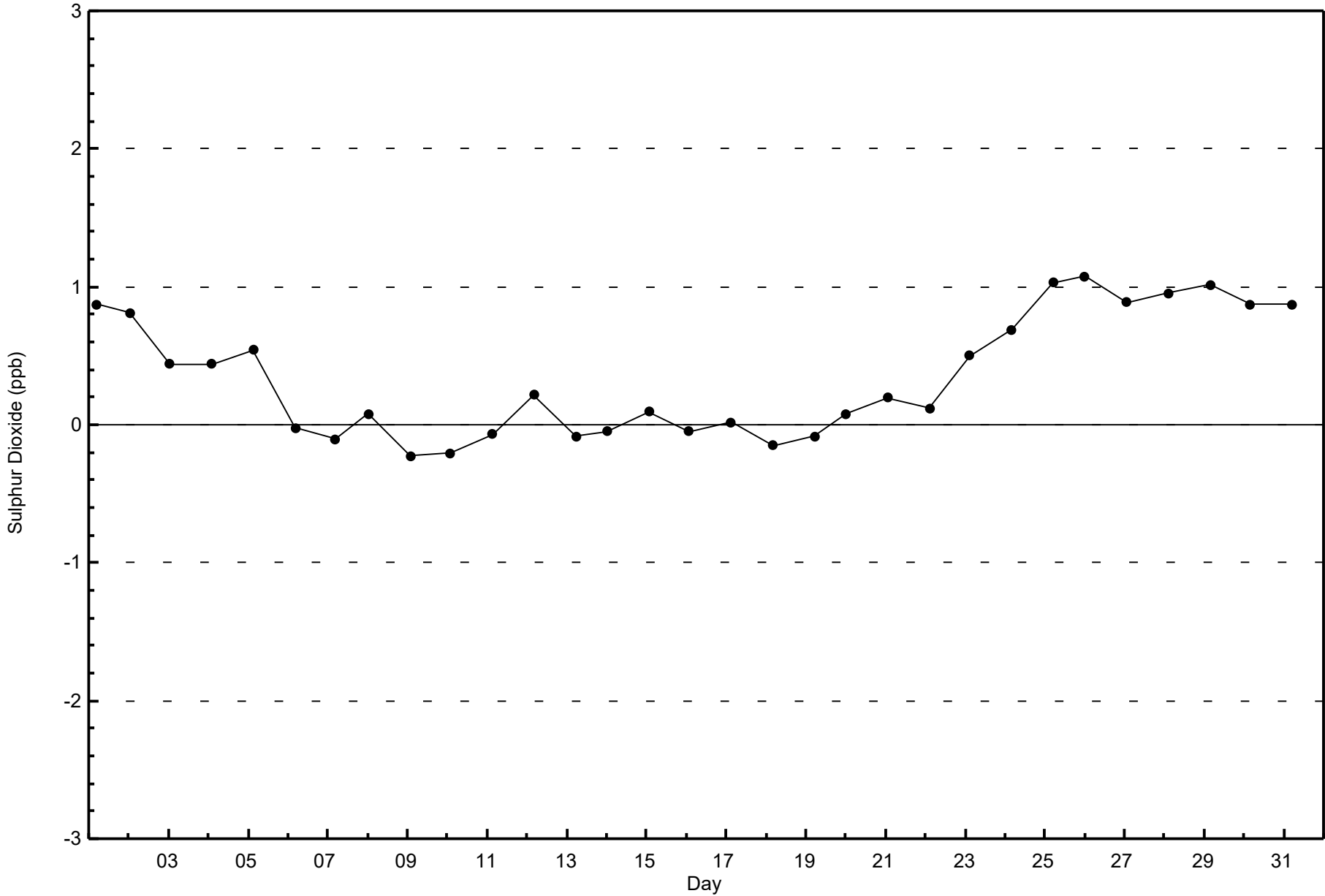
Total Number of Hours: 744

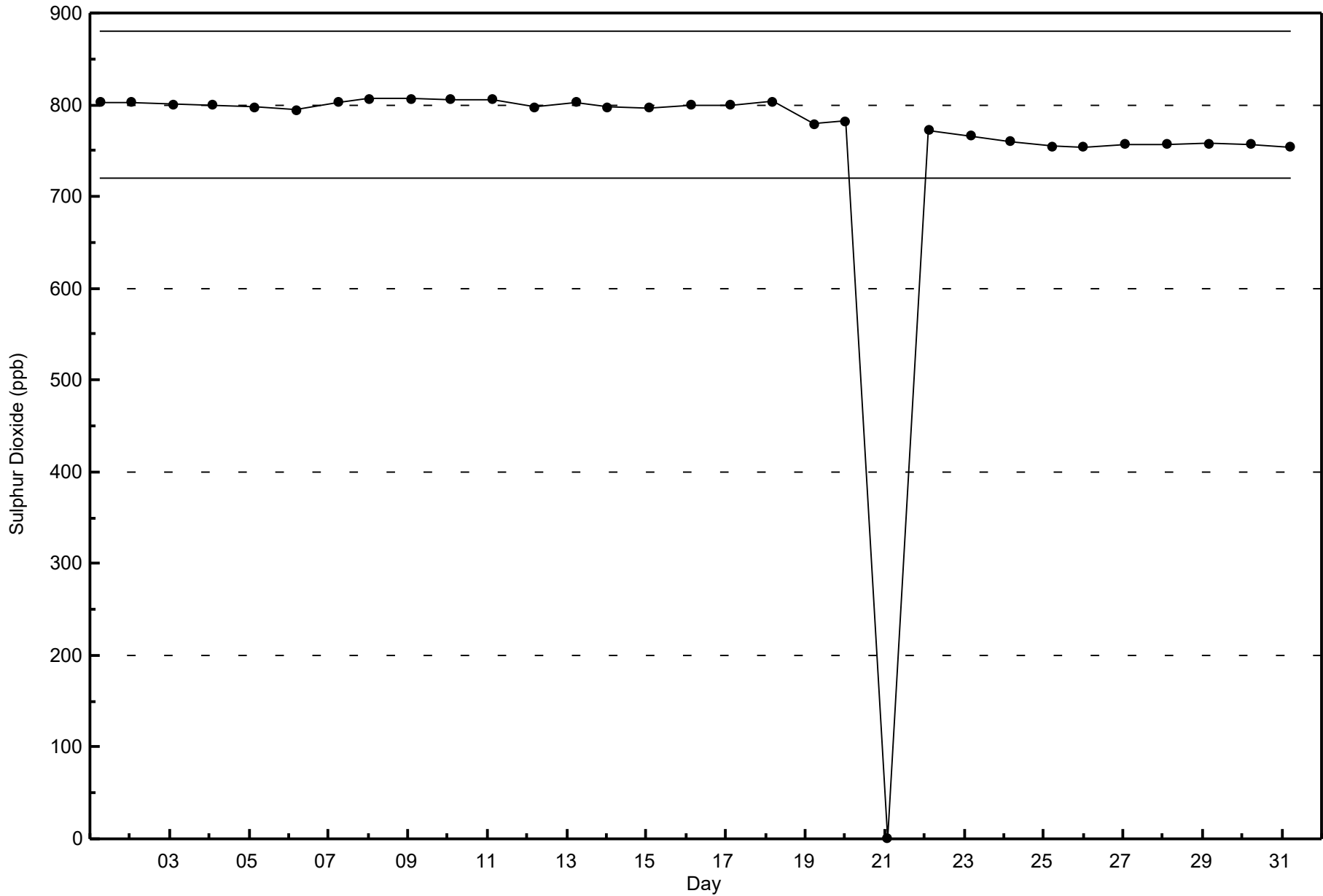


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Sulphur Dioxide (SO₂) - ppb
Blackgold

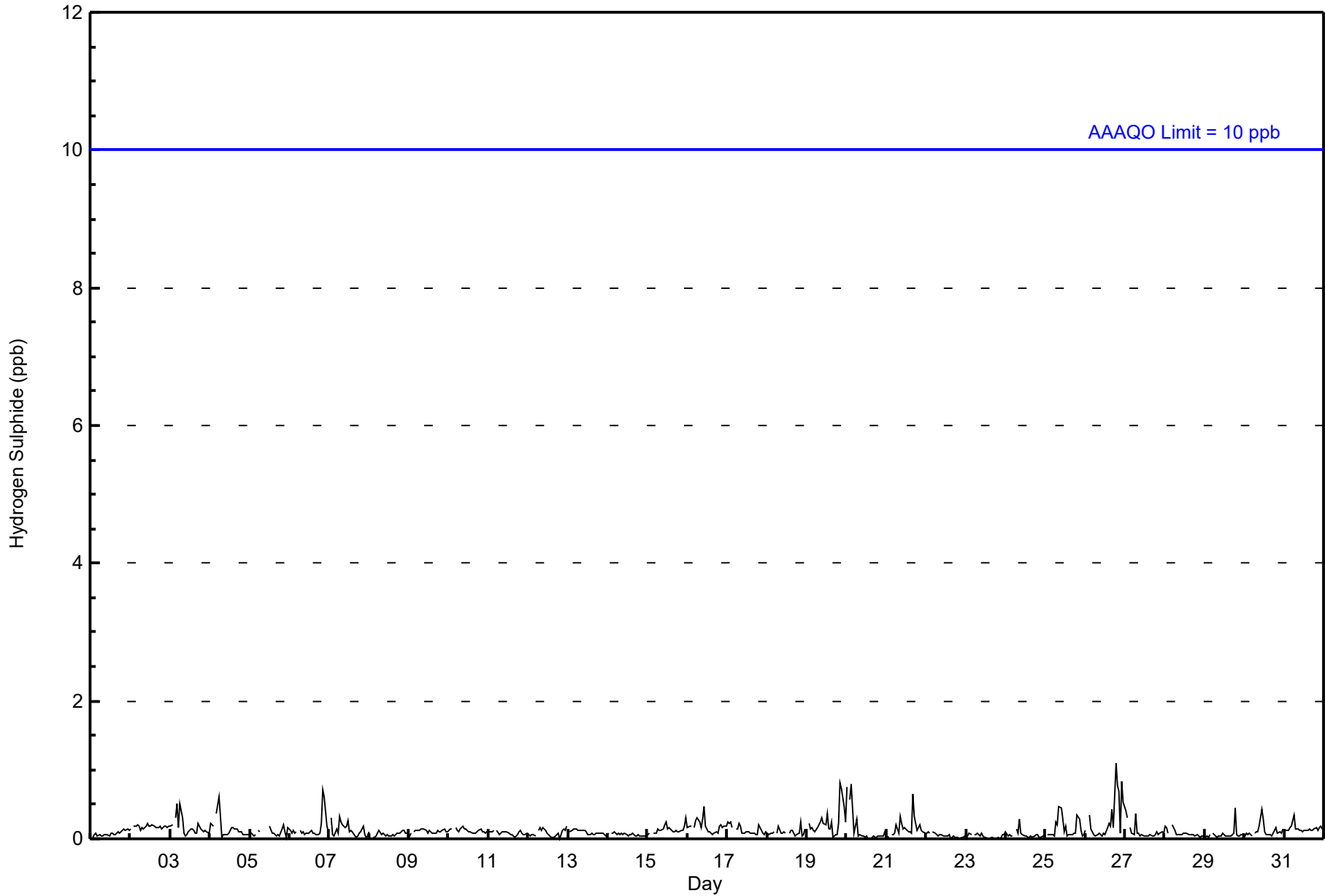








Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	744																										
Maximum Value: 1.1 ppb on Oct 26 19:00		Maximum Daily Average: 0.3 ppb on Oct 26																			Hours of Data:	707																										
Minimum Value: 0.0 ppb on Oct 23 14:00		Minimum Daily Average: 0.0 ppb on Oct 23																			Hours of Missing Data:	37																										
Maximum Diurnal Average: 0.2 ppb at hour 21		Minimum Diurnal Average: 0.1 ppb at hour 16																			Hours of Calibration:	36																										
Monthly Average: 0.12 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.1 Q ₃ = 0.1 P ₉₀ = 0.2 P ₉₉ = 0.7																			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-Oct	Z	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.2																						
2-Oct	0.1	Z	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2																						
3-Oct	0.2	0.2	Z	0.3	0.5	0.2	0.5	0.3	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	0.1	0.1	0.1	0.2																						
4-Oct	0.2	0.2	0.2	Z	0.4	0.6	0.3	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2																						
5-Oct	0.1	0.1	0.0	0.1	Z	0.1	0.1	C	C	C	C	C	0.2	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.2	0.1	0.0	0.2	0.1																							
6-Oct	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	0.1	0.1	0.1	0.1	0.2	0.7	0.6	0.2	0.1	0.1																							
7-Oct	Z	0.3	0.1	0.0	0.2	0.1	0.3	0.2	0.2	0.2	0.2	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.0	0.0	0.1																							
8-Oct	0.1	Z	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1																							
9-Oct	0.0	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1																							
10-Oct	0.1	0.1	0.1	Z	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1																							
11-Oct	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	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1																							
12-Oct	0.1	0.0	0.1	0.1	0.0	Z	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.1																							
13-Oct	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	0.0	0.1																							
14-Oct	0.1	Z	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	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1																							
15-Oct	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.1																							
16-Oct	0.2	0.2	0.2	Z	0.2	0.3	0.3	0.3	0.2	0.3	0.5	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2																							
17-Oct	0.3	0.2	0.2	0.2	Z	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1																							
18-Oct	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.2	0.1	0.1	0.1	0.1	M	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.0	0.1	0.2	0.1																							
19-Oct	Z	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.2	0.4	0.2	0.1	0.2	0.0	0.1	0.1	0.2	0.8	0.7	0.5	0.2	0.2																							
20-Oct	0.8	Z	0.6	0.8	0.1	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	0.0	0.0	0.0	0.0	0.0	0.1	0.1																							
21-Oct	0.0	0.0	Z	0.1	0.1	0.1	0.2	0.1	0.3	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.6	0.3	0.1	0.2	0.2	0.1	0.1	0.1	0.2																							
22-Oct	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																							
23-Oct	0.0	0.0	0.1	0.1	Z	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	0.0	0.0	0.1	0.1	0.0																							
24-Oct	0.1	0.0	0.1	0.0	0.0	Z	0.1	0.1	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1																							
25-Oct	Z	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.5	0.5	0.3	0.1	0.2	0.0	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.1	0.0	0.1	0.2																							
26-Oct	0.1	Z	0.3	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.2	0.2	0.4	0.2	1.1	0.8	0.7	0.1	0.8	0.5	0.3																							
27-Oct	0.4	0.3	Z	0.2	0.1	0.1	0.4	0.1	0.1	0.0	0.1	0.0	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																							
28-Oct	0.2	0.2	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	0.0	0.1	0.0	0.0	0.0	0.1																							
29-Oct	0.0	0.0	0.0	0.1	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.1	0.0	0.0	0.1	0.1	0.1																							
30-Oct	0.0	0.1	0.1	0.1	0.0	Z	0.1	0.1	0.1	0.2	0.4	0.3	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1																							
31-Oct	Z	0.1	0.1	0.2	0.2	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.1	0.2																							
																								0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	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	Diurnal Average
																								0.8	0.3	0.6	0.8	0.5	0.6	0.5	0.3	0.5	0.5	0.5	0.3	0.4	0.2	0.2	0.2	0.6	0.3	1.1	0.8	0.8	0.7	0.8	0.5	Diurnal Maximum
Z - zerospan C - Calibration M - Maintenance																																																
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb																																																





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Blackgold - October 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	707	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Blackgold - October 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	8	5	5	5	7	13	42	93	69	71	58	49	57	122	46	18	668
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	8	5	5	5	7	13	42	93	69	71	58	49	57	122	46	18	668

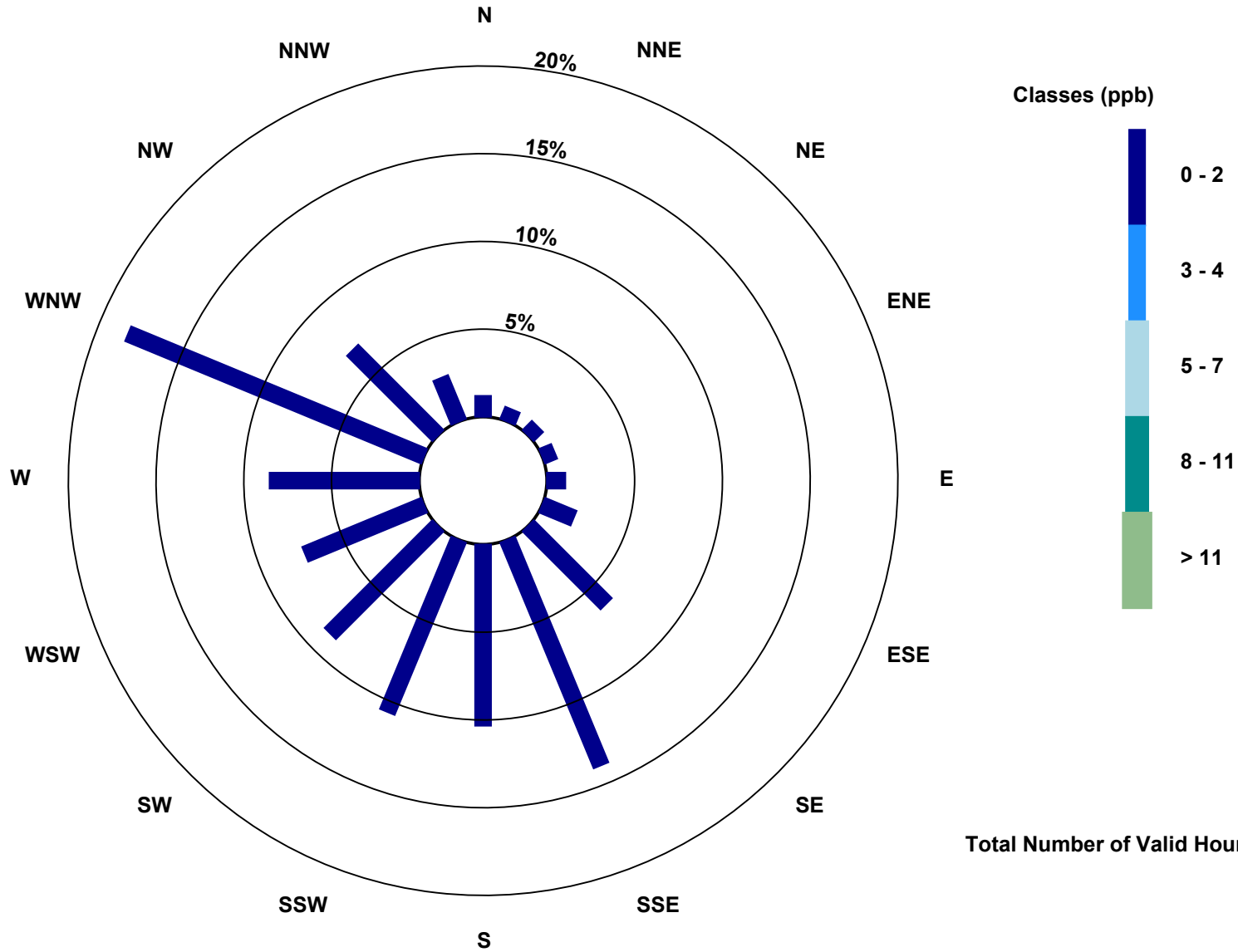
Total Number of Valid Hours: 668

Total Number of Hours: 744

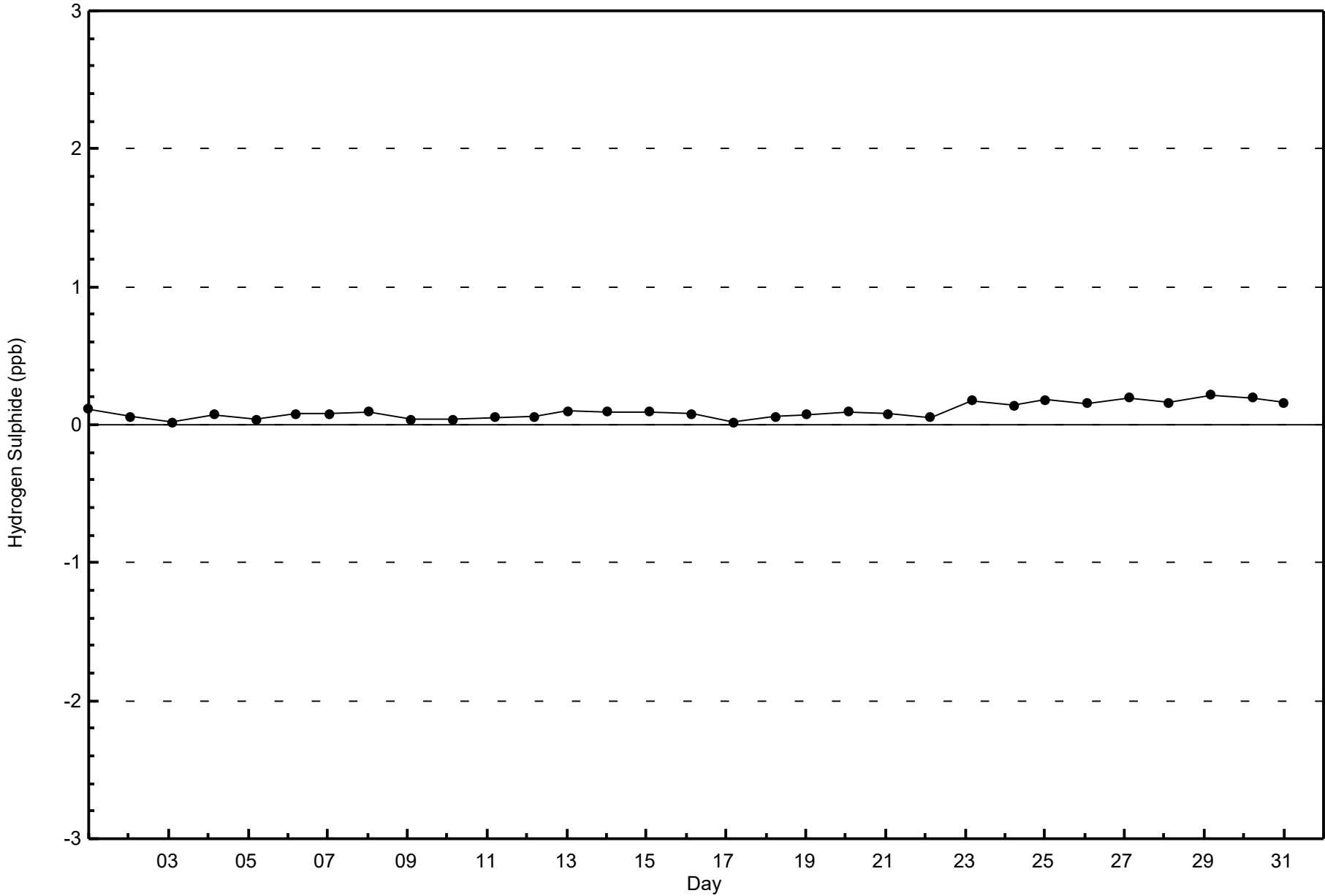


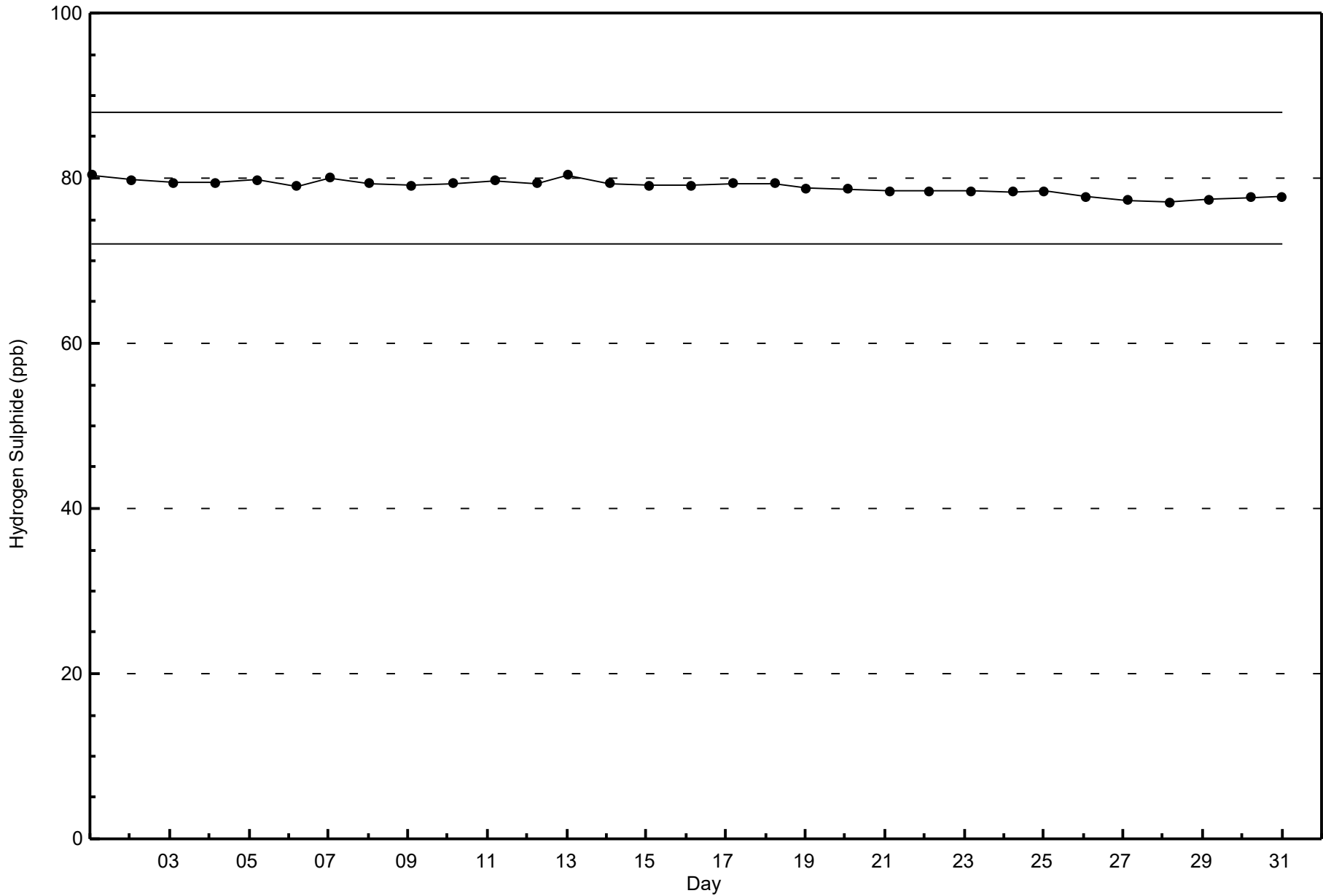
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Hydrogen Sulphide (H₂S) - ppb
Blackgold



Total Number of Valid Hours: 668







Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbon (THC) - ppm

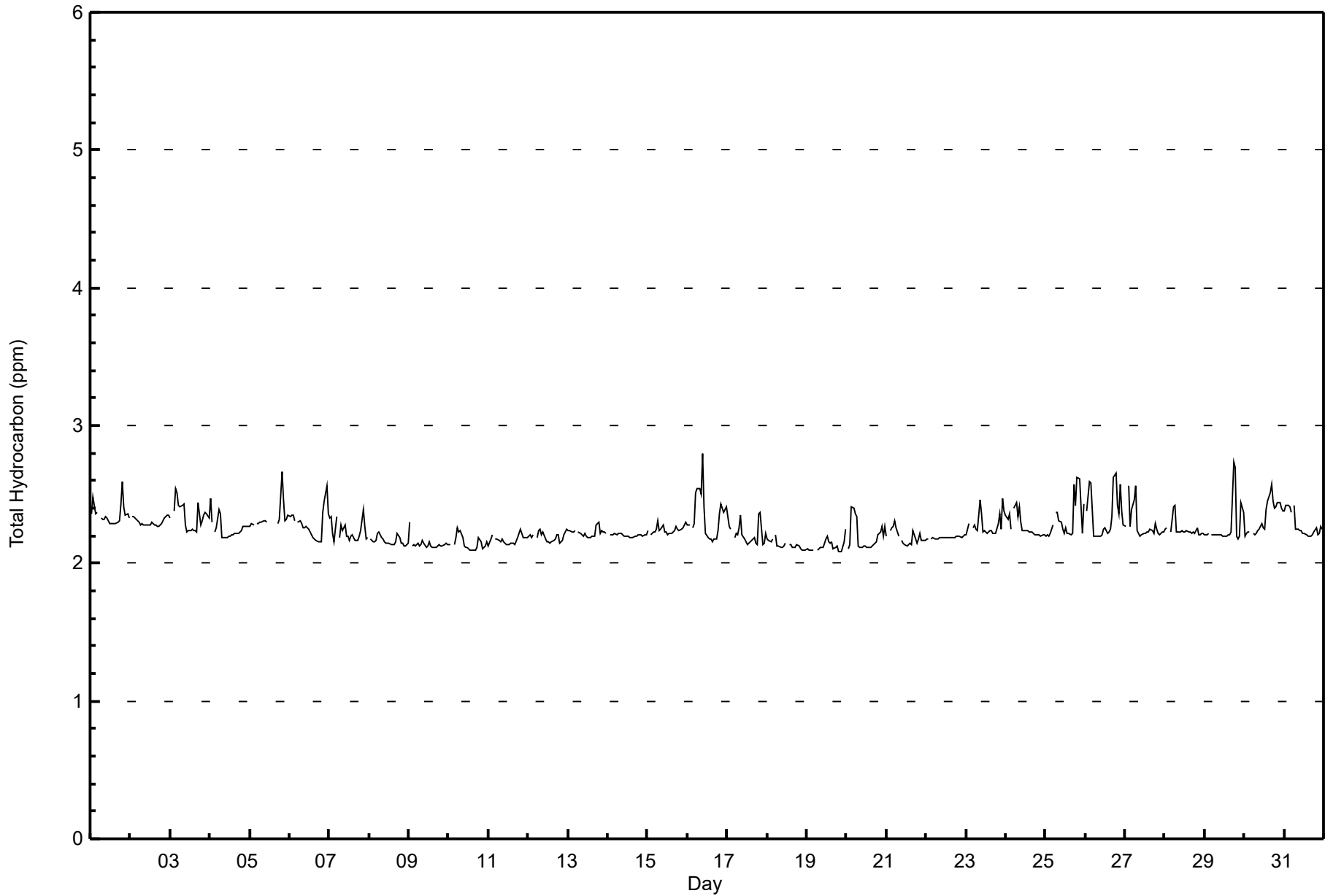
Blackgold - October 2023

Maximum Value: 2.8 ppm on Oct 16 10:00		Maximum Daily Average: 2.4 ppm on Oct 1		Hours in Service: 744																									
Minimum Value: 2.1 ppm on Oct 19 22:00		Minimum Daily Average: 2.1 ppm on Oct 19		Hours of Data: 705																									
Maximum Diurnal Average: 2.3 ppm at hour 6		Minimum Diurnal Average: 2.2 ppm at hour 14		Hours of Missing Data: 39																									
Monthly Average: 2.24 ppm		Percentiles: P ₁ = 2.1 P ₁₀ = 2.1 Q ₁ = 2.2 Median = 2.2 Q ₃ = 2.3 P ₉₀ = 2.4 P ₉₉ = 2.6		Hours of Calibration: 37																									
				Percent Operational Time: 99.7																									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24					
1-Oct	2.4	2.5	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	2.3	2.3	2.4	2.6	2.4	2.3	2.4	2.3	2.4	2.6			
2-Oct	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.4	2.6		
3-Oct	2.3	Z	2.4	2.5	2.5	2.4	2.4	2.4	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4	2.3	2.3	2.4	2.4	2.4	2.3	2.3	2.4	2.6		
4-Oct	2.5	2.3	Z	2.2	2.3	2.4	2.4	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.4	2.6		
5-Oct	2.3	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	C	C	C	C	C	C	C	2.3	2.3	2.7	2.5	2.3	2.3	2.4	--	2.7			
6-Oct	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	2.2	2.2	2.2	2.2	2.2	2.2	2.4	2.5	2.6	2.4	2.3	2.6			
7-Oct	2.3	2.3	2.2	2.2	2.3	Z	2.2	2.3	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4	2.3	2.2	2.2	2.2	2.4	2.6		
8-Oct	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.4	2.6	
9-Oct	2.3	Z	2.1	2.1	2.1	2.2	2.1	2.1	2.2	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4	2.6	
10-Oct	2.1	2.1	Z	2.1	2.2	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	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.4	2.6	
11-Oct	2.1	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4	2.6	
12-Oct	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.4	2.6	
13-Oct	2.2	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.4	2.6	
14-Oct	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4	2.6	
15-Oct	2.2	Z	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.3	2.3	2.3	2.2	2.4	2.6	
16-Oct	2.3	2.3	Z	2.3	2.3	2.5	2.5	2.5	2.5	2.8	2.4	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.8	2.6	
17-Oct	2.3	2.3	2.2	Z	2.2	2.2	2.2	2.3	2.4	2.2	2.2	2.2	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.4	2.4	2.1	2.1	2.2	2.2	2.2	2.4	2.6	
18-Oct	2.2	2.2	2.2	2.2	Z	2.2	2.1	2.1	2.1	2.1	2.1	2.1	M	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4	2.6	
19-Oct	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4	2.6	
20-Oct	Z	2.1	2.1	2.4	2.4	2.4	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.2	2.3	2.2	2.4	2.6	2.6	
21-Oct	2.2	Z	2.2	2.3	2.3	2.3	2.3	2.2	M	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4	2.6	
22-Oct	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4	2.6	
23-Oct	2.2	2.2	2.3	Z	2.3	2.3	2.2	2.2	2.5	2.4	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.2	2.5	2.4	2.3	2.5	2.4	2.6	
24-Oct	2.3	2.3	2.4	2.2	Z	2.4	2.4	2.3	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4	2.6	
25-Oct	2.2	2.2	2.2	2.2	2.3	Z	2.4	2.4	2.3	2.3	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.6	2.4	2.6	2.6	2.4	2.2	2.4	2.3	2.6	2.6	
26-Oct	Z	2.4	2.6	2.6	2.4	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.3	2.6	2.7	2.4	2.4	2.6	2.4	2.3	2.3	2.3	2.3	2.4	2.6	
27-Oct	2.3	Z	2.6	2.3	2.4	2.5	2.6	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4	2.6	
28-Oct	2.2	2.3	Z	2.2	2.3	2.4	2.4	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.4	2.6	
29-Oct	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.7	2.7	2.2	2.2	2.2	2.4	2.4	2.3	2.7	2.6	2.6	
30-Oct	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.4	2.5	2.5	2.6	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.6	2.6
31-Oct	2.4	2.4	2.4	2.4	2.4	Z	2.4	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.3	2.2	2.2	2.2	2.4	2.6	
																								Diurnal Average					
																								Diurnal Maximum					
Z - zerospan C - Calibration M - Maintenance																													



Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbon (THC) - ppm
Blackgold - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbon (THC) - ppm
Blackgold - October 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	0	0.00	0.00
2.1 - 3.0	705	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: 705

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Hydrocarbon (THC) - ppm
Blackgold - October 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	9	4	5	6	7	12	42	93	68	72	57	48	59	121	45	18	666
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	9	4	5	6	7	12	42	93	68	72	57	48	59	121	45	18	666

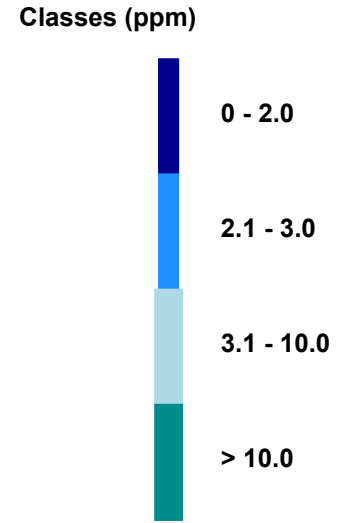
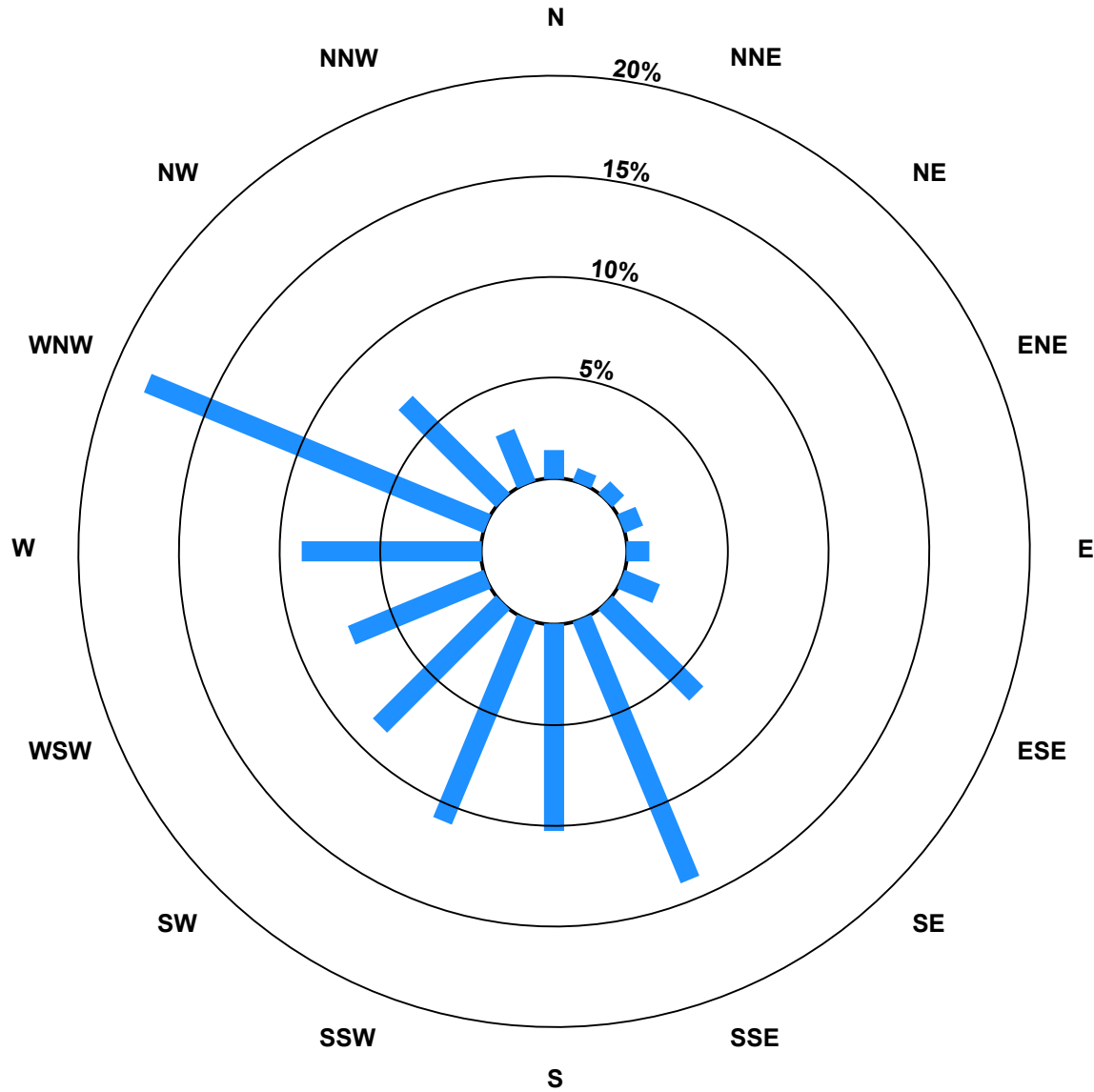
Total Number of Valid Hours: 666

Total Number of Hours: 744

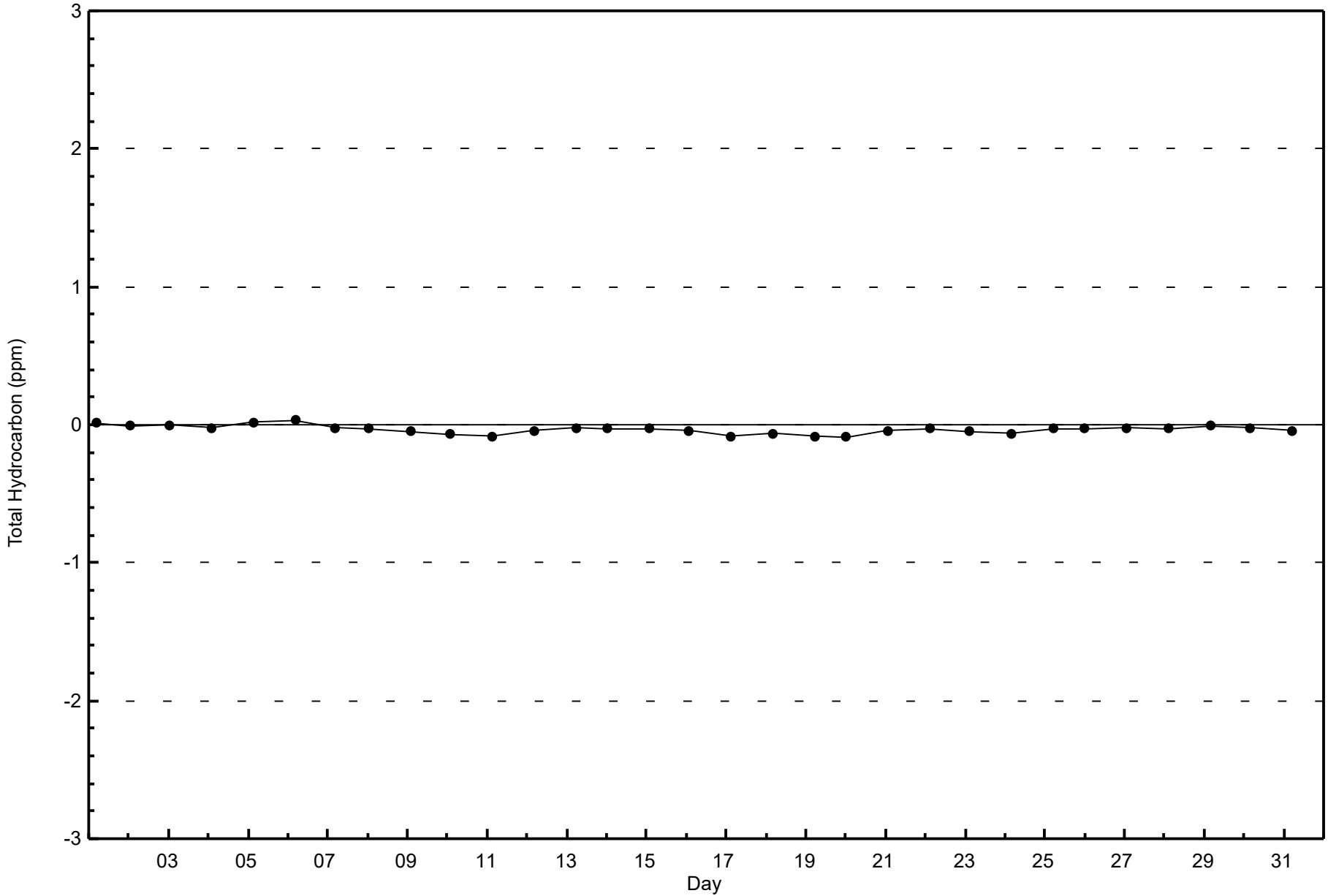


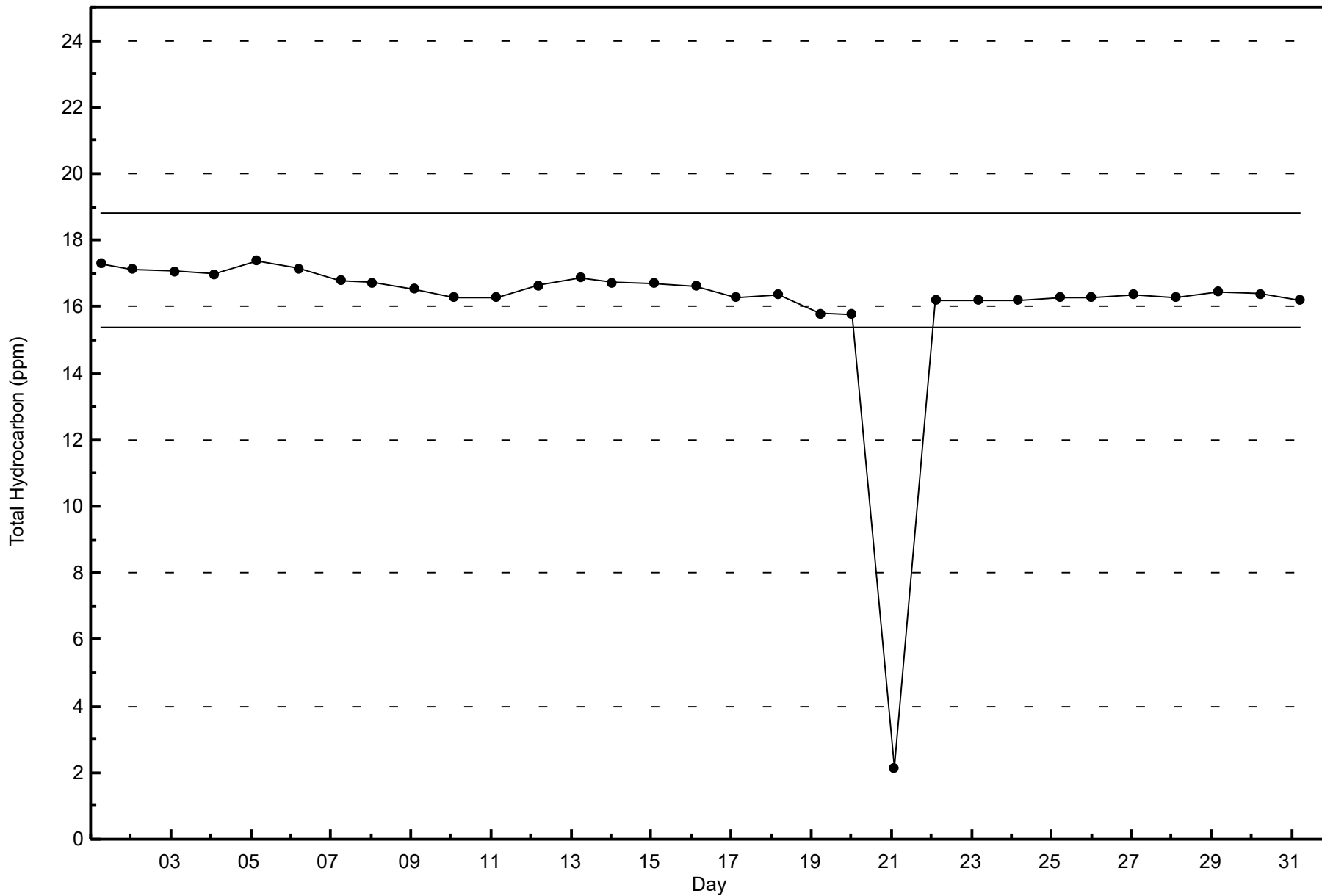
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Total Hydrocarbon (THC) - ppm
Blackgold



Total Number of Valid Hours: 666

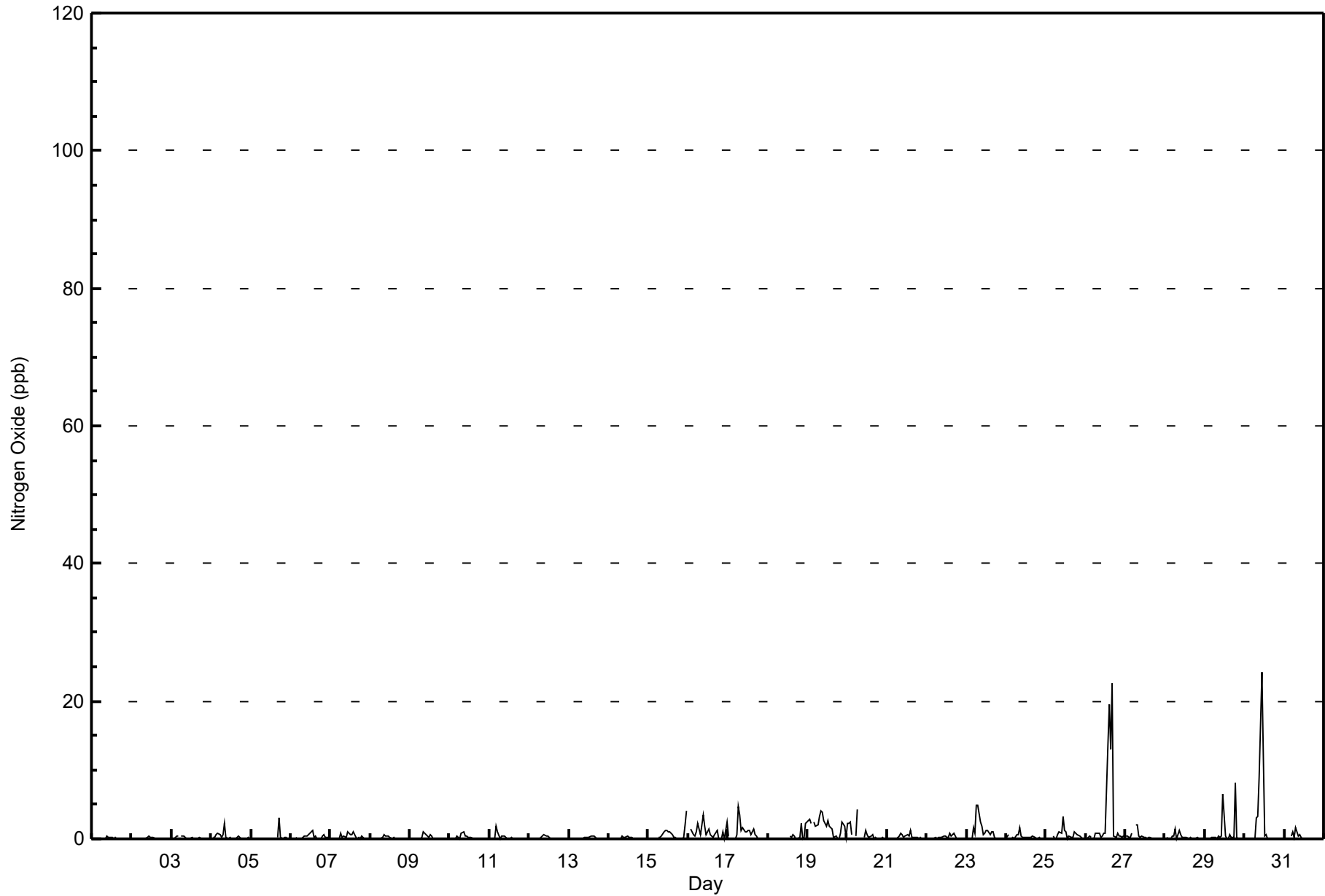






Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxide (NO) - ppb
Blackgold - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Oxide (NO) - ppb
Blackgold - October 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	691	99.71	99.71
21 - 40	2	0.29	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: 693

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxide (NO) - ppb
Blackgold - October 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	6	5	7	13	42	91	64	69	59	51	56	115	43	18	652
21 - 40	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	2
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	8	5	6	5	7	13	42	91	65	69	59	51	56	116	43	18	654

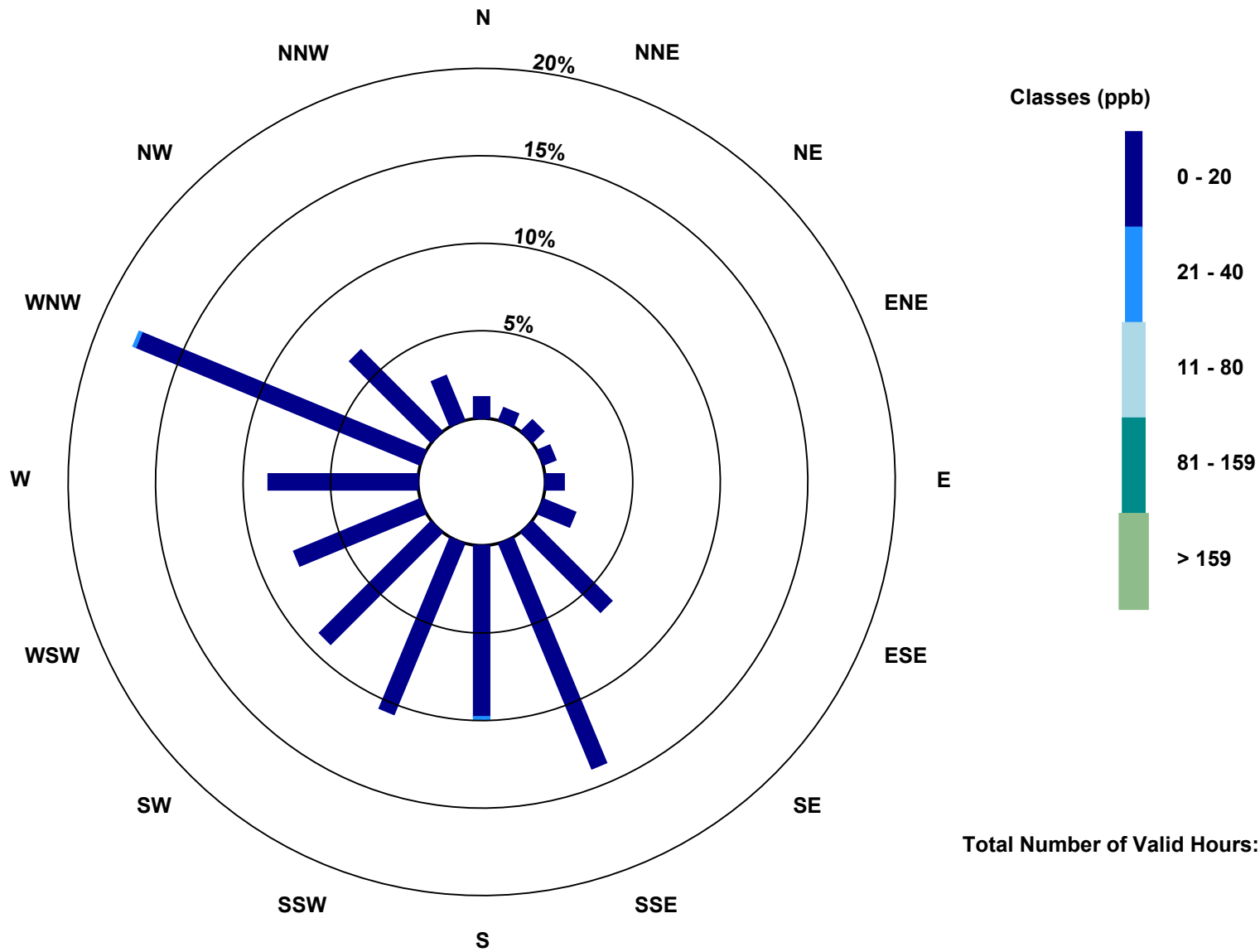
Total Number of Valid Hours: 654

Total Number of Hours: 744

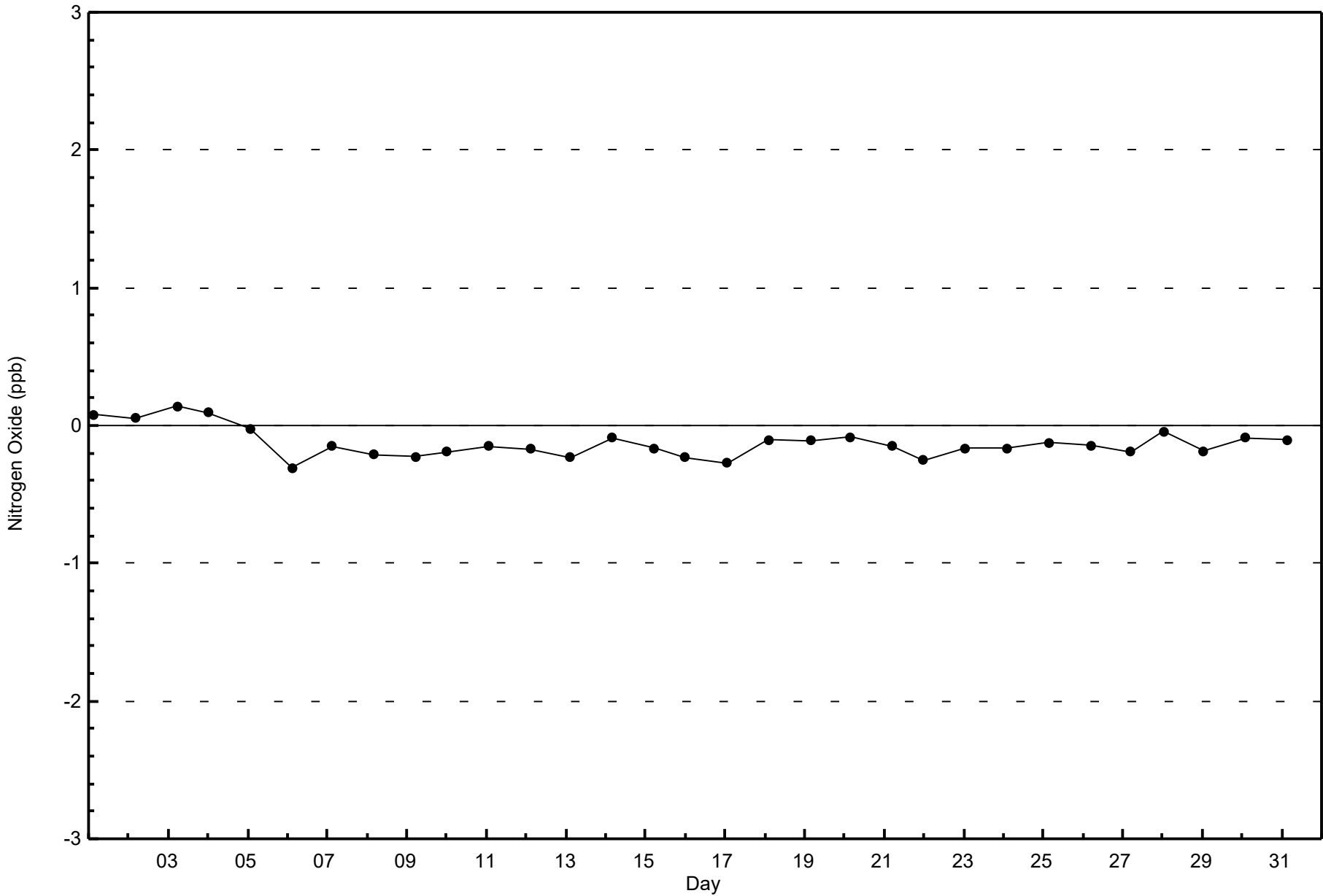


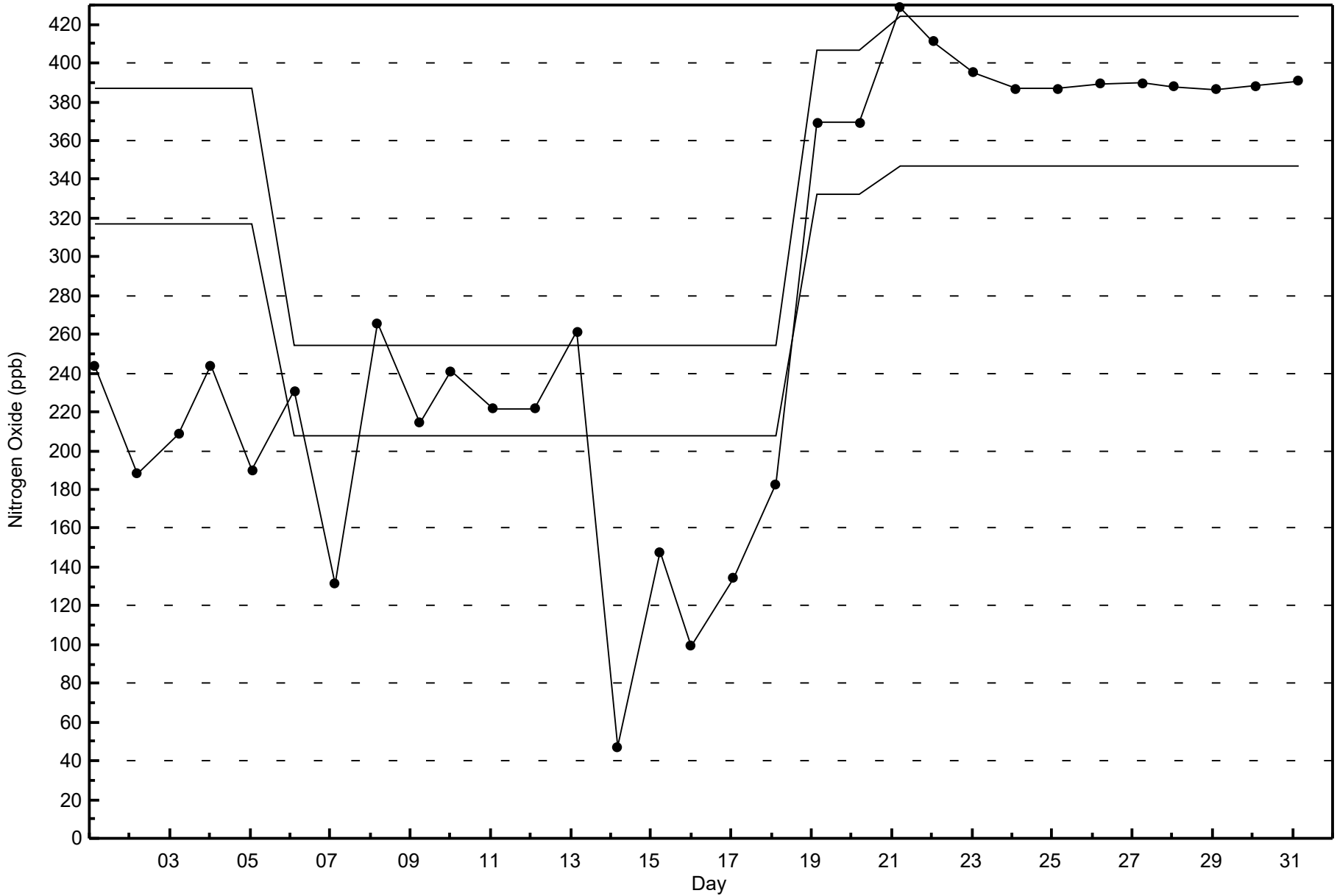
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitrogen Oxide (NO) - ppb
Blackgold



Total Number of Valid Hours: 654







Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

Blackgold - October 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 13.3 ppb on Oct 30 11:00	Maximum Daily Average: 4.2 ppb on Oct 19		Hours of Data:	693
Minimum Value: 0.0 ppb on Oct 1 01:00	Minimum Daily Average: 0.2 ppb on Oct 1		Hours of Missing Data:	51
Maximum Diurnal Average: 2.4 ppb at hour 7	Minimum Diurnal Average: 0.9 ppb at hour 14		Hours of Calibration:	40
Monthly Average: 1.39 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.3 Median = 0.9 Q ₃ = 1.9 P ₉₀ = 3.3 P ₉₉ = 7.0		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-Oct	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.1	0.2	0.8	0.2	0.2	1.3
2-Oct	0.9	1.8	2.1	1.9	Z	1.9	1.4	1.6	1.4	1.4	1.6	1.0	1.1	0.7	0.7	0.7	0.9	0.8	0.6	0.6	0.6	0.8	0.6	0.8	1.1	2.1
3-Oct	1.1	1.1	1.8	2.3	2.1	Z	2.0	1.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	1.9	0.0	0.0	0.0	0.2	0.0	0.0	0.6	2.3
4-Oct	Z	0.6	0.6	1.0	2.0	1.9	0.8	0.1	0.9	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	0.3	2.0
5-Oct	0.0	Z	0.0	0.0	0.0	0.0	0.0	C	C	C	C	C	C	C	C	C	0.0	0.6	0.5	0.7	0.7	0.0	0.0	0.0	--	0.7
6-Oct	0.1	0.0	Z	0.2	0.1	1.5	1.1	0.7	1.2	0.7	1.2	1.0	1.1	1.2	0.7	0.7	0.4	0.3	1.6	2.8	1.7	1.4	0.1	0.9	2.8	
7-Oct	0.0	0.0	0.0	Z	0.2	1.0	2.2	0.8	0.7	0.0	2.0	1.7	0.9	1.6	3.0	0.7	0.1	3.4	0.7	1.3	0.6	0.0	0.0	2.0	1.0	3.4
8-Oct	6.9	4.9	0.2	0.3	Z	3.9	5.5	1.1	1.6	0.7	0.4	0.6	0.0	0.1	0.2	0.3	0.1	2.5	1.2	0.5	0.5	0.4	0.3	1.2	1.5	6.9
9-Oct	0.2	0.3	0.3	0.1	1.1	Z	1.5	1.0	2.4	1.3	0.4	0.2	1.1	0.7	0.3	0.2	0.4	0.8	0.6	0.3	0.4	1.5	0.5	0.4	0.7	2.4
10-Oct	Z	1.1	0.9	0.9	2.5	2.7	0.4	1.2	1.8	0.6	0.6	0.5	0.4	0.4	0.2	0.1	0.0	0.0	3.1	2.9	0.0	0.0	0.0	0.2	0.9	3.1
11-Oct	0.0	Z	2.9	2.7	4.4	5.9	0.8	1.7	0.9	0.5	0.2	0.1	0.1	0.5	0.1	0.0	0.0	0.8	2.2	3.2	1.5	0.0	0.0	0.0	1.2	5.9
12-Oct	0.0	0.0	Z	2.1	1.6	0.7	2.4	2.2	1.5	1.6	0.9	0.6	0.3	0.0	0.0	0.0	0.1	0.4	0.4	0.1	1.0	3.1	1.4	2.8	1.0	3.1
13-Oct	0.9	0.9	1.1	Z	1.4	1.2	1.4	0.7	0.9	0.7	1.3	0.6	0.4	0.6	1.0	0.9	1.1	0.9	0.7	0.3	0.6	0.9	0.7	0.6	0.9	1.4
14-Oct	0.8	0.7	0.8	0.7	Z	1.0	1.1	1.2	1.0	0.9	0.6	0.6	0.5	0.5	0.4	0.3	0.3	0.3	0.6	0.6	0.7	0.7	0.8	0.8	0.7	1.2
15-Oct	1.0	1.1	1.1	1.1	1.1	Z	4.8	4.0	2.0	2.2	1.9	2.6	2.0	2.5	1.5	1.1	1.3	1.1	1.1	1.1	1.7	2.2	4.2	6.7	2.1	6.7
16-Oct	Z	3.4	2.8	2.5	1.9	3.6	5.4	2.6	2.5	4.3	2.6	1.2	2.4	1.3	1.1	0.5	2.9	7.4	2.3	1.0	1.7	5.1	3.2	3.1	2.8	7.4
17-Oct	3.6	Z	1.2	0.7	0.7	1.4	6.6	5.6	5.3	5.1	2.4	2.6	2.1	1.8	1.3	2.4	1.7	1.3	0.3	2.9	1.3	0.1	0.0	0.0	2.2	6.6
18-Oct	0.0	0.1	Z	0.8	0.3	UO	UO	UO	UO	UO	UO	M	M	1.1	1.3	2.0	2.0	0.8	0.7	1.8	7.0	0.2	1.3	6.2	--	7.0
19-Oct	8.7	7.4	4.9	Z	5.0	3.7	4.5	6.0	6.6	5.5	3.9	2.6	3.4	3.3	3.3	5.6	1.9	2.3	0.2	0.7	3.6	6.8	5.5	2.0	4.2	8.7
20-Oct	6.1	5.3	5.8	2.0	Z	1.7	4.6	M	M	M	0.4	1.1	0.7	0.3	0.6	0.7	0.3	1.1	1.4	0.2	0.3	3.3	0.4	0.5	1.8	6.1
21-Oct	0.7	0.8	0.6	0.5	0.6	Z	2.7	2.3	7.0	4.6	1.2	2.4	1.9	1.7	2.2	2.1	2.8	3.2	2.7	2.3	3.3	1.2	0.5	0.4	2.1	7.0
22-Oct	Z	0.9	0.0	0.0	0.0	0.0	0.0	0.3	0.6	0.6	0.7	1.2	0.8	0.6	2.2	1.2	2.2	1.0	0.1	0.1	0.0	0.2	0.7	1.0	0.6	2.2
23-Oct	0.7	Z	3.3	2.4	3.9	3.1	6.1	6.2	4.2	2.4	0.8	0.9	1.4	1.1	0.6	1.0	1.7	1.3	0.5	0.5	0.5	1.2	1.3	0.2	2.0	6.2
24-Oct	0.2	0.8	Z	0.3	1.0	1.3	2.2	1.3	2.7	1.0	0.4	0.3	0.3	0.5	0.4	0.4	1.0	0.3	0.4	0.5	0.9	0.7	0.2	0.1	0.7	2.7
25-Oct	0.0	0.0	0.0	Z	1.6	1.0	1.2	1.6	1.5	1.7	3.1	1.4	1.6	0.2	0.5	0.4	0.7	5.2	4.3	5.1	2.8	2.0	0.1	0.3	1.6	5.2
26-Oct	0.2	0.6	1.6	2.0	Z	0.5	1.1	1.0	1.1	0.3	0.4	1.2	1.4	4.3	9.1	6.0	6.7	2.2	1.5	2.6	2.0	2.0	1.5	2.0	2.2	9.1
27-Oct	1.7	1.9	1.3	1.5	2.0	Z	1.9	2.4	1.2	0.8	1.5	1.0	0.5	0.4	1.2	1.3	0.8	0.5	1.3	1.3	0.5	0.5	0.6	0.8	1.2	2.4
28-Oct	Z	2.1	0.6	0.3	2.3	2.6	3.6	1.1	1.8	1.5	0.9	0.7	0.6	0.4	0.4	0.6	0.4	0.2	0.2	1.5	0.2	0.0	0.1	0.0	1.0	3.6
29-Oct	0.0	Z	0.0	0.0	0.4	0.3	0.2	0.1	0.8	0.1	0.3	3.3	0.5	0.1	0.1	0.8	0.9	1.8	11.8	1.6	0.4	1.1	2.0	0.5	1.2	11.8
30-Oct	0.3	0.7	Z	0.3	0.1	0.6	1.3	7.4	6.0	6.7	13.3	6.3	0.8	1.1	0.3	0.0	0.0	0.2	2.6	3.1	0.9	0.8	0.9	1.3	2.4	13.3
31-Oct	2.0	2.1	2.2	Z	4.1	5.9	4.0	3.4	2.6	1.9	1.2	0.6	0.6	0.3	0.1	0.2	0.2	1.0	2.1	1.1	0.1	1.0	2.0	2.0	1.8	5.9

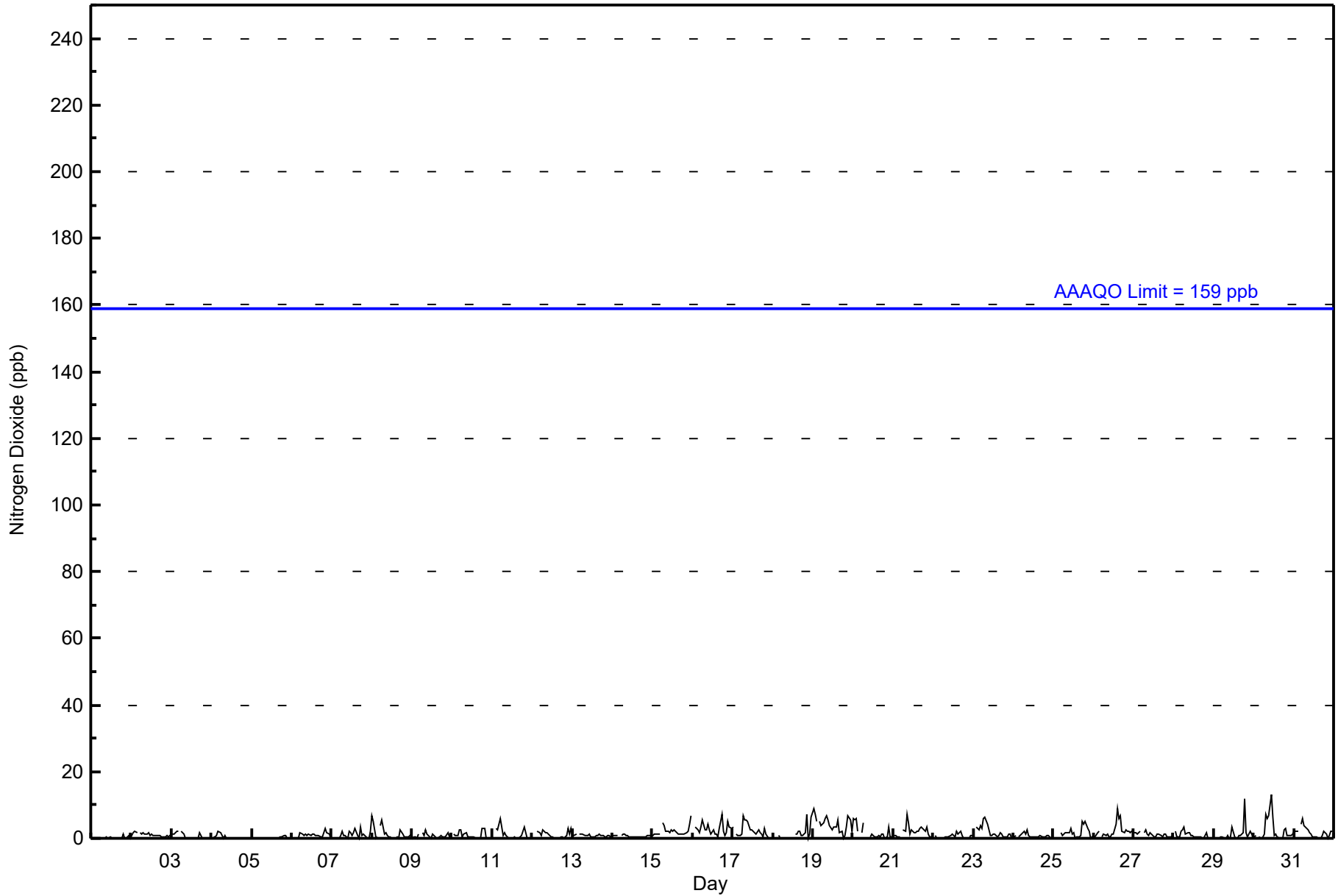
1.4	1.5	1.4	1.1	1.6	1.9	2.4	2.1	2.2	1.7	1.5	1.3	0.9	0.9	1.1	1.0	1.0	1.4	1.4	1.3	1.2	1.2	1.0	1.2	Diurnal Average	
8.7	7.4	5.8	2.7	5.0	5.9	6.6	7.4	7.0	6.7	13.3	6.3	3.4	4.3	9.1	6.0	6.7	7.4	11.8	5.1	7.0	6.8	5.5	6.7	Diurnal Maximum	

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



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Blackgold - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Blackgold - October 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	693	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: 693

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Blackgold - October 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	6	5	7	13	42	91	65	69	59	51	56	116	43	18	654
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	8	5	6	5	7	13	42	91	65	69	59	51	56	116	43	18	654

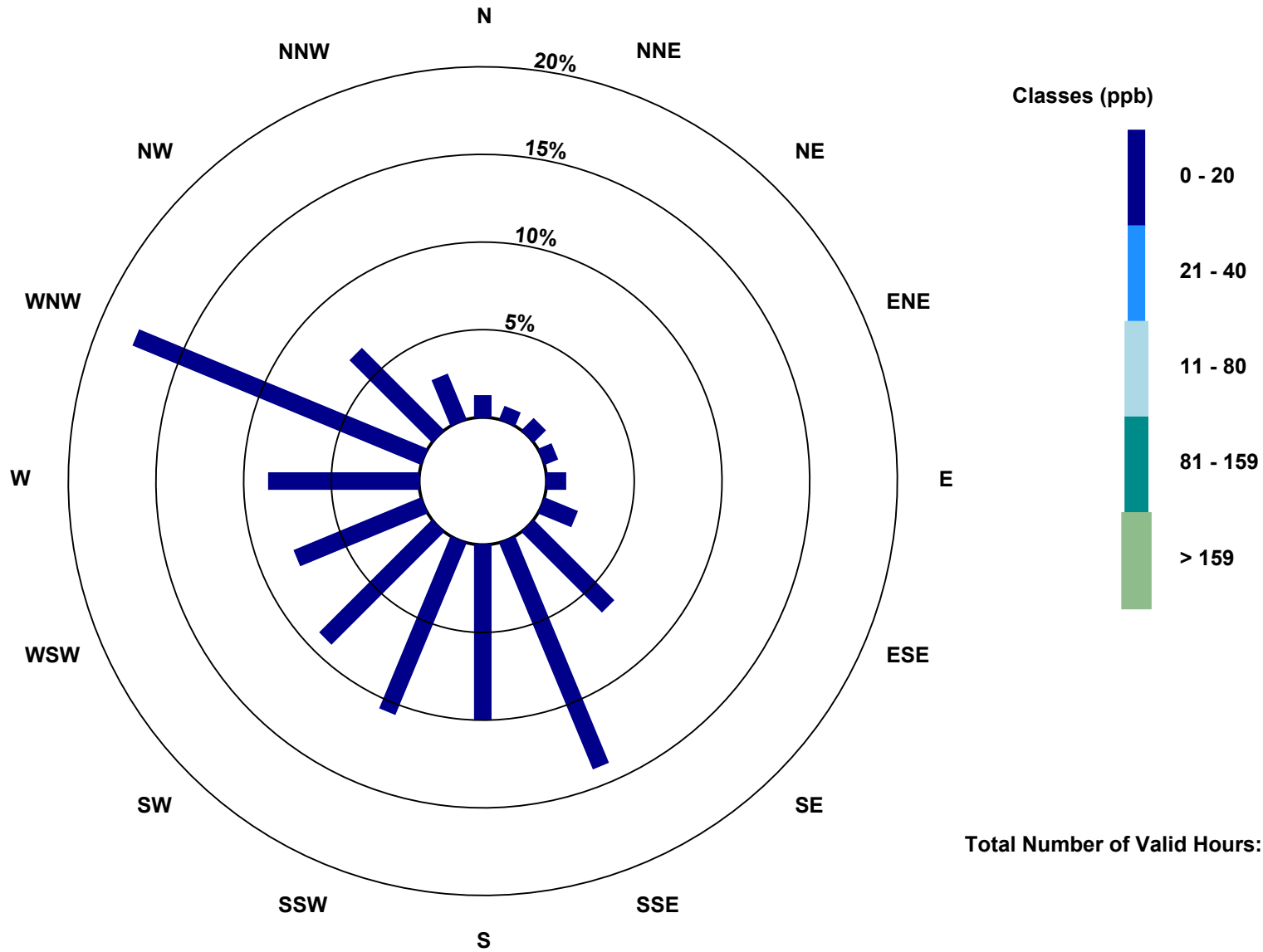
Total Number of Valid Hours: 654

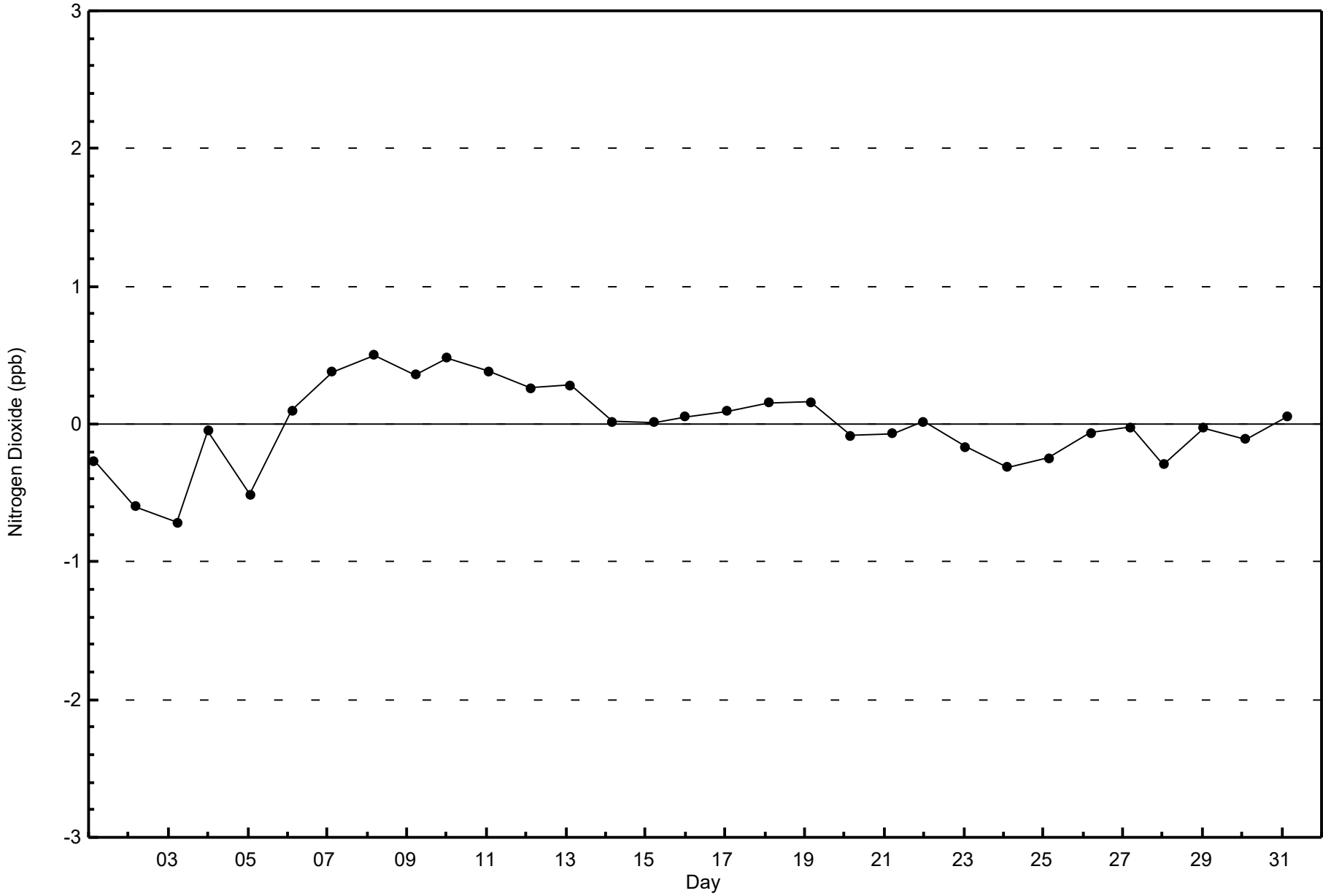
Total Number of Hours: 744

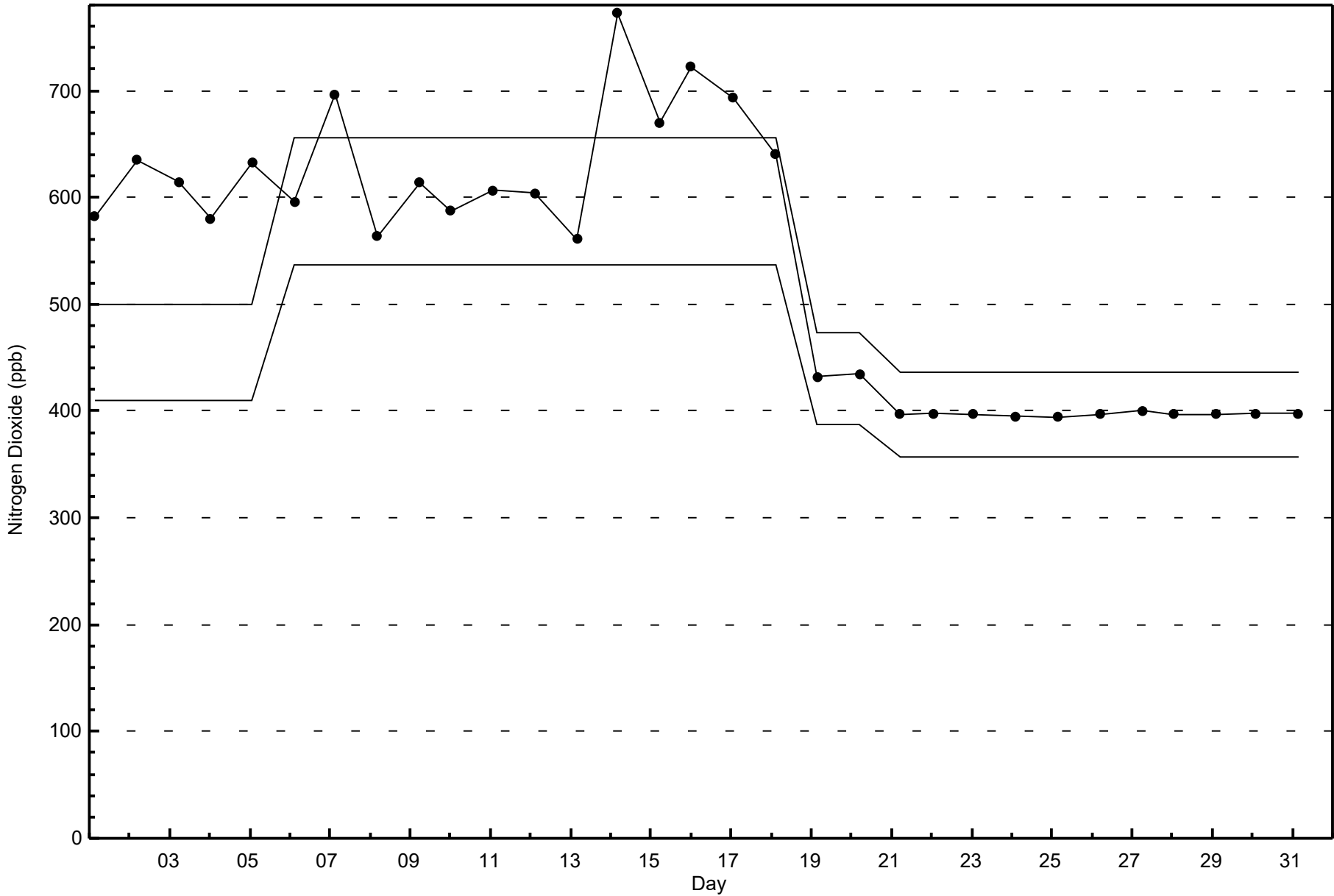


Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitrogen Dioxide (NO₂) - ppb
Blackgold









Wood Buffalo Environmental Association
Summary of Hour Averages

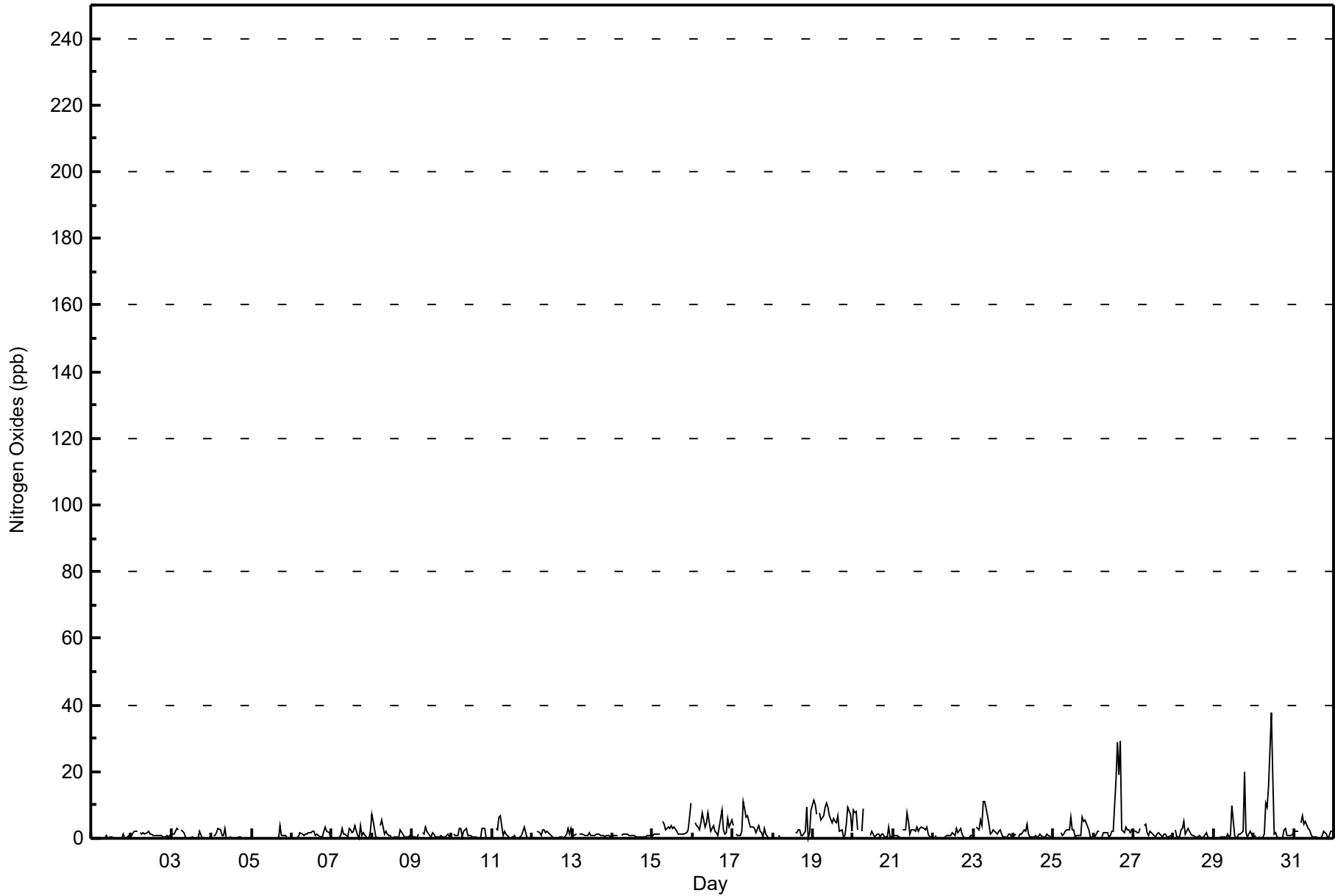
Nitrogen Oxides (NO_x) - ppb
Blackgold - October 2023

Maximum Value: 37.6 ppb on Oct 30 11:00																				Maximum Daily Average: 6.1 ppb on Oct 19					Hours in Service: 744																								
Minimum Value: 0.0 ppb on Oct 1 01:00																				Minimum Daily Average: 0.2 ppb on Oct 1					Hours of Data: 693																								
Maximum Diurnal Average: 3.2 ppb at hour 7																				Minimum Diurnal Average: 1.2 ppb at hour 23					Hours of Missing Data: 51																								
Monthly Average: 1.96 ppb																				Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.4 Median = 1.0 Q ₃ = 2.3 P ₉₀ = 4.4 P ₉₉ = 15.8					Hours of Calibration: 40																								
																				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-Oct	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.9	0.2	0.5	0.2	0.1	0.1	0.1	0.0	0.0	0.0	1.3	0.1	0.2	0.8	0.2	0.2	1.3																							
2-Oct	0.9	1.8	2.1	1.9	Z	1.9	1.4	1.6	1.5	1.7	2.1	1.2	1.2	0.8	0.8	0.8	1.0	0.8	0.6	0.6	0.6	0.8	0.6	0.8	1.2	2.1																							
3-Oct	1.1	1.1	2.0	2.8	2.6	Z	2.4	1.5	0.3	0.0	0.0	0.0	0.3	0.0	0.1	0.0	0.2	2.1	0.0	0.0	0.0	0.2	0.0	0.0	0.7	2.8																							
4-Oct	Z	0.8	0.8	1.6	2.9	2.5	1.0	0.8	3.1	0.1	0.1	0.3	0.1	0.1	0.0	0.0	0.5	0.2	0.1	0.0	0.0	0.0	0.1	0.0	0.7	3.1																							
5-Oct	0.0	Z	0.0	0.0	0.0	0.0	0.0	C	C	C	C	C	C	C	C	C	0.1	3.7	0.7	0.8	0.9	0.2	0.1	0.1	--	3.7																							
6-Oct	0.2	0.1	Z	0.3	0.2	1.5	1.2	0.9	1.5	1.1	1.6	1.7	2.0	2.3	0.9	1.1	0.7	0.4	0.3	2.0	3.5	2.0	1.5	0.1	1.2	3.5																							
7-Oct	0.0	0.0	0.0	Z	0.2	1.0	3.0	1.1	1.2	0.3	3.0	2.4	1.6	2.3	4.0	0.9	0.1	3.7	0.7	1.6	0.6	0.0	0.0	2.0	1.3	4.0																							
8-Oct	7.0	4.9	0.2	0.3	Z	3.9	5.6	1.3	2.2	1.2	0.7	0.9	0.2	0.2	0.3	0.4	0.1	2.5	1.2	0.5	0.5	0.4	0.3	1.2	1.6	7.0																							
9-Oct	0.2	0.3	0.3	0.1	1.1	Z	1.5	1.1	3.3	2.2	0.8	0.4	1.8	1.2	0.4	0.3	0.4	0.8	0.6	0.3	0.4	1.5	0.5	0.4	0.9	3.3																							
10-Oct	Z	1.1	0.9	0.9	3.0	3.0	0.5	1.9	2.8	1.0	1.0	0.8	0.6	0.5	0.3	0.1	0.0	0.0	3.1	2.9	0.0	0.0	0.0	0.2	1.1	3.1																							
11-Oct	0.0	Z	2.9	2.7	6.1	6.8	0.8	2.0	1.2	0.9	0.4	0.2	0.2	0.7	0.1	0.0	0.0	0.8	2.2	3.2	1.5	0.0	0.0	0.0	1.4	6.8																							
12-Oct	0.0	0.0	Z	2.2	1.6	0.7	2.4	2.4	1.9	2.3	1.4	1.0	0.5	0.1	0.1	0.1	0.2	0.4	0.4	0.1	1.1	3.1	1.4	2.8	1.1	3.1																							
13-Oct	1.0	1.0	1.1	Z	1.4	1.2	1.4	0.8	0.9	0.8	1.5	0.9	0.7	1.0	1.4	1.2	1.2	0.9	0.7	0.3	0.6	0.9	0.7	0.6	1.0	1.5																							
14-Oct	0.8	0.7	0.8	0.7	Z	1.0	1.1	1.2	1.4	1.2	0.9	1.0	0.9	0.7	0.6	0.4	0.3	0.3	0.3	0.6	0.6	0.7	0.7	0.8	0.8	1.4																							
15-Oct	1.0	1.1	1.1	1.1	1.1	Z	4.9	4.2	2.4	3.3	3.1	3.9	2.9	3.5	2.1	1.3	1.4	1.1	1.1	1.1	1.8	2.4	6.3	10.8	2.7	10.8																							
16-Oct	Z	4.8	3.8	3.2	2.3	4.7	7.6	3.3	4.5	7.7	4.5	1.9	3.8	2.0	1.6	0.6	3.4	8.7	2.4	1.1	1.7	6.1	3.2	5.6	3.9	8.7																							
17-Oct	4.0	Z	1.3	0.8	0.7	2.0	11.2	9.0	6.5	6.8	3.4	3.6	3.4	2.9	1.9	3.8	2.2	1.6	0.3	3.0	1.3	0.1	0.0	0.0	3.0	11.2																							
18-Oct	0.0	0.1	Z	0.8	0.3	UO	UO	UO	UO	UO	UO	M	M	1.5	1.6	2.7	2.4	0.8	0.7	2.0	9.2	0.2	1.6	8.4	--	9.2																							
19-Oct	11.4	10.3	7.1	Z	7.5	5.5	6.6	9.2	10.8	9.4	6.6	4.5	6.0	5.1	4.8	7.0	2.1	2.7	0.2	0.7	4.4	9.3	7.4	2.2	6.1	11.4																							
20-Oct	8.3	7.5	8.3	2.6	Z	2.2	8.9	M	M	M	0.7	2.3	1.3	0.4	1.1	1.2	0.4	1.2	1.4	0.2	0.3	3.4	0.4	0.5	2.6	8.9																							
21-Oct	0.7	0.8	0.6	0.5	0.6	Z	2.7	2.6	7.8	5.2	1.4	2.7	2.5	2.1	3.3	2.3	2.9	3.3	2.8	2.4	3.4	1.2	0.6	0.4	2.3	7.8																							
22-Oct	Z	0.9	0.0	0.1	0.1	0.1	0.0	0.5	0.9	0.9	1.0	1.7	1.1	0.8	2.9	1.6	3.0	1.3	0.2	0.2	0.0	0.2	0.7	1.0	0.8	3.0																							
23-Oct	0.7	Z	3.4	2.4	5.6	3.8	11.0	11.0	6.7	4.2	1.5	1.8	2.6	2.3	1.1	1.9	2.7	1.4	0.5	0.5	0.5	1.2	1.3	0.2	3.0	11.0																							
24-Oct	0.2	1.4	Z	0.3	1.2	1.4	2.7	1.9	4.4	1.5	0.5	0.5	0.6	0.5	0.6	1.4	0.4	0.4	0.5	1.2	0.8	0.2	0.1	0.1	1.0	4.4																							
25-Oct	0.0	0.0	0.0	Z	1.9	1.0	1.2	2.1	2.6	2.4	6.4	2.6	2.6	0.2	1.0	0.7	1.0	6.2	5.1	5.6	3.2	2.1	0.1	0.3	2.1	6.4																							
26-Oct	0.2	0.6	1.9	2.2	Z	0.6	1.9	1.8	1.9	0.5	0.8	2.1	2.3	17.9	28.6	19.0	29.2	2.5	1.8	3.4	2.5	2.4	1.8	2.4	5.6	29.2																							
27-Oct	2.0	2.3	1.6	1.7	2.8	Z	3.8	4.3	1.7	0.9	2.0	1.2	0.7	0.5	1.4	1.5	0.8	0.5	1.3	1.3	0.5	0.5	0.6	0.8	1.5	4.3																							
28-Oct	Z	2.4	0.6	0.3	2.6	3.1	5.1	1.1	3.0	2.2	1.2	0.8	0.8	0.6	0.5	0.7	0.5	0.2	0.2	1.8	0.3	0.0	0.2	0.0	1.2	5.1																							
29-Oct	0.0	Z	0.0	0.0	0.6	0.4	0.3	0.1	1.3	0.2	0.7	9.9	0.8	0.1	0.2	1.3	1.2	1.9	19.9	1.8	0.4	1.1	2.0	0.5	2.0	19.9																							
30-Oct	0.3	0.7	Z	0.3	0.1	0.6	1.3	10.5	9.2	15.6	37.6	18.2	1.2	1.8	0.3	0.0	0.0	0.2	2.6	3.1	0.9	0.8	0.9	1.3	4.7	37.6																							
31-Oct	2.0	2.1	2.2	Z	4.6	7.0	4.3	4.9	2.9	2.5	1.3	0.6	0.6	0.3	0.1	0.2	0.2	1.0	2.1	1.1	0.1	1.0	2.1	2.0	2.0	7.0																							
																								1.6	1.8	1.7	1.2	2.0	2.2	3.2	3.0	3.1	2.8	3.0	2.4	1.5	1.8	2.1	1.7	1.9	1.7	1.7	1.4	1.4	1.4	1.2	1.5	Diurnal Average	
																								11.4	10.3	8.3	3.2	7.5	7.0	11.2	11.0	10.8	15.6	37.6	18.2	6.0	17.9	28.6	19.0	29.2	8.7	19.9	5.6	9.2	9.3	7.4	10.8	Diurnal Maximum	
Z - zerospan				C - Calibration				M - Maintenance				UO - Unstable Operation																																					



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Blackgold - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Blackgold - October 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	690	99.57	99.57
21 - 40	3	0.43	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 693

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Blackgold - October 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	6	5	7	13	42	91	64	69	59	51	56	115	42	18	651
21 - 40	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	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	8	5	6	5	7	13	42	91	65	69	59	51	56	116	43	18	654

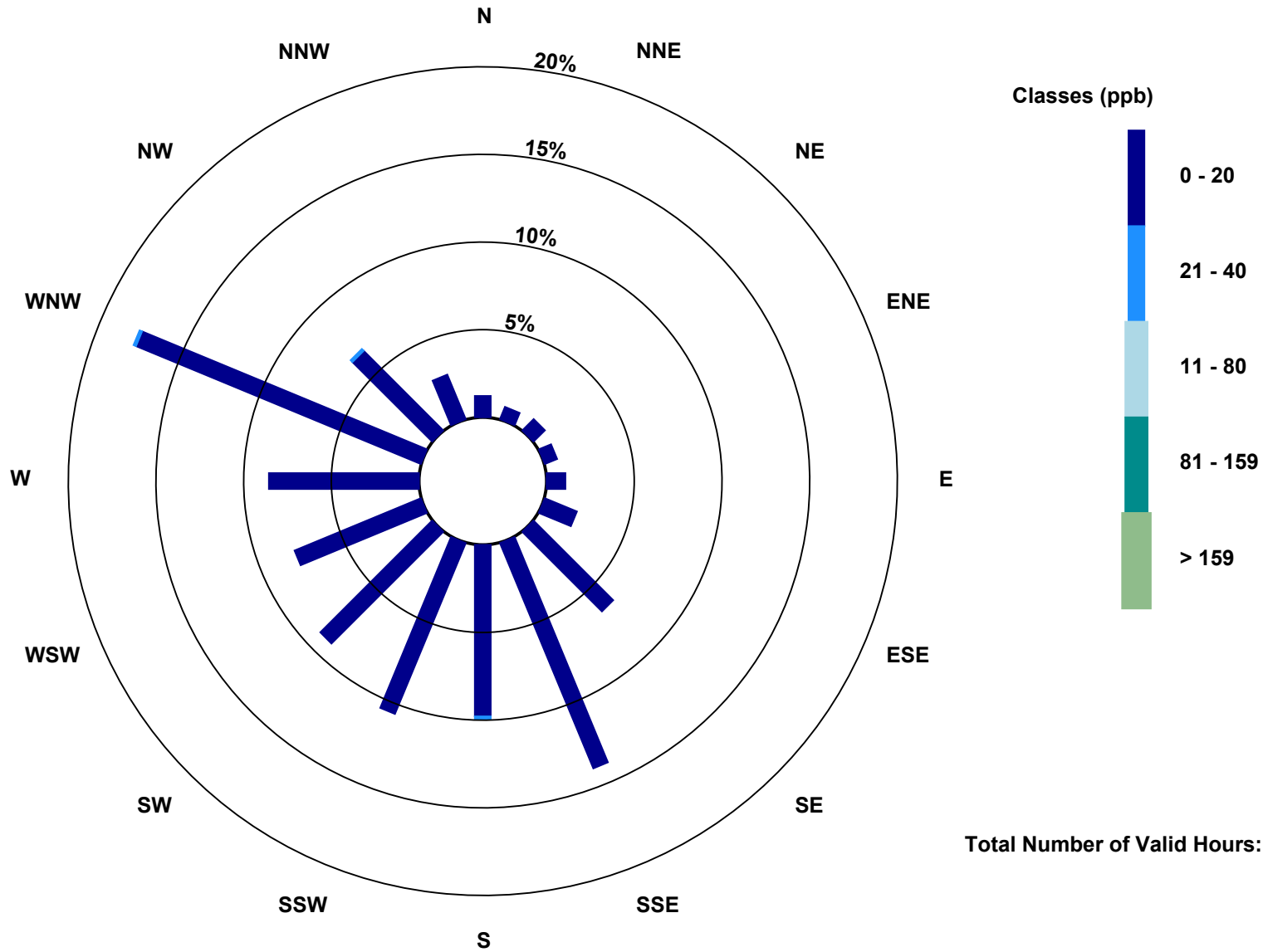
Total Number of Valid Hours: 654

Total Number of Hours: 744

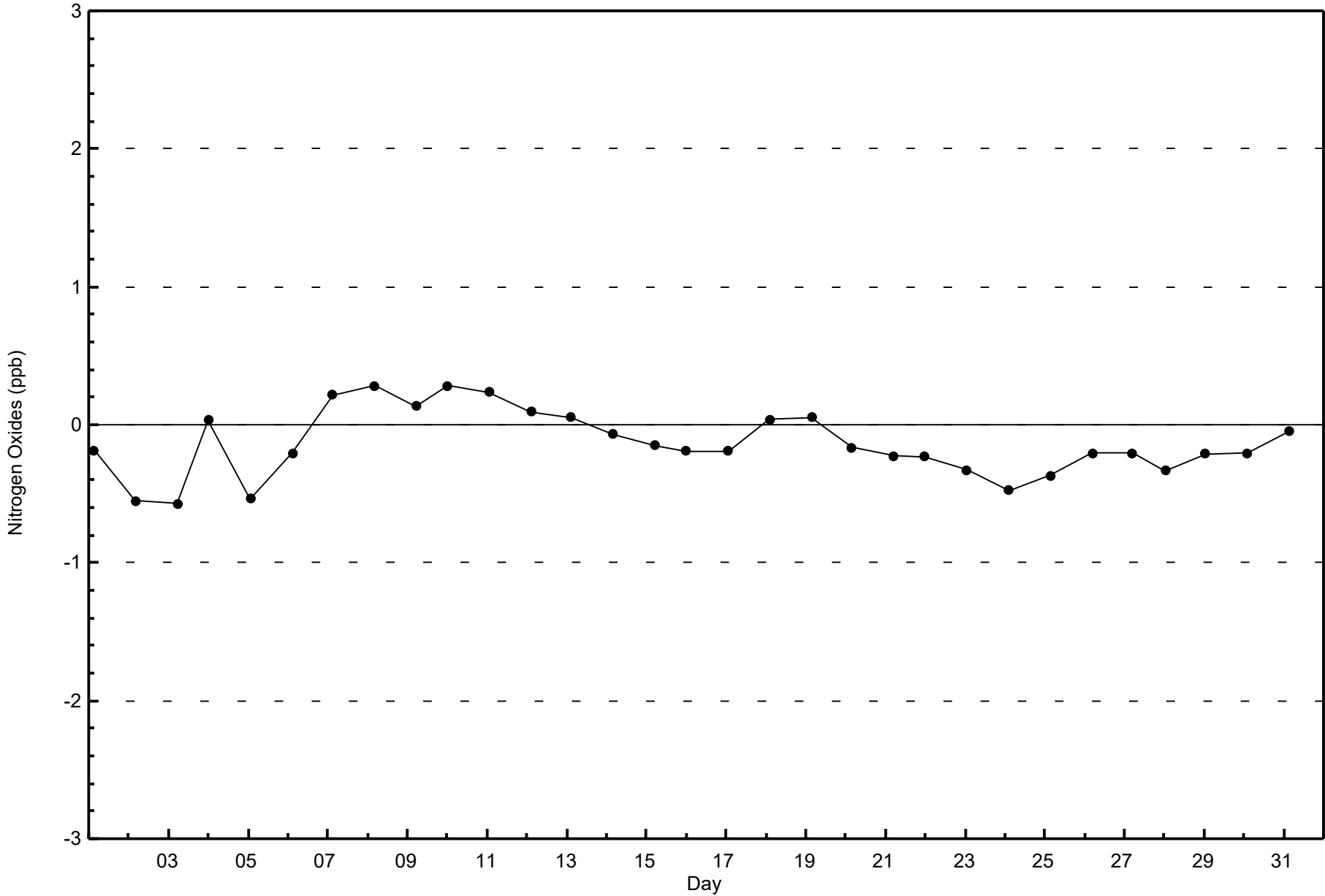


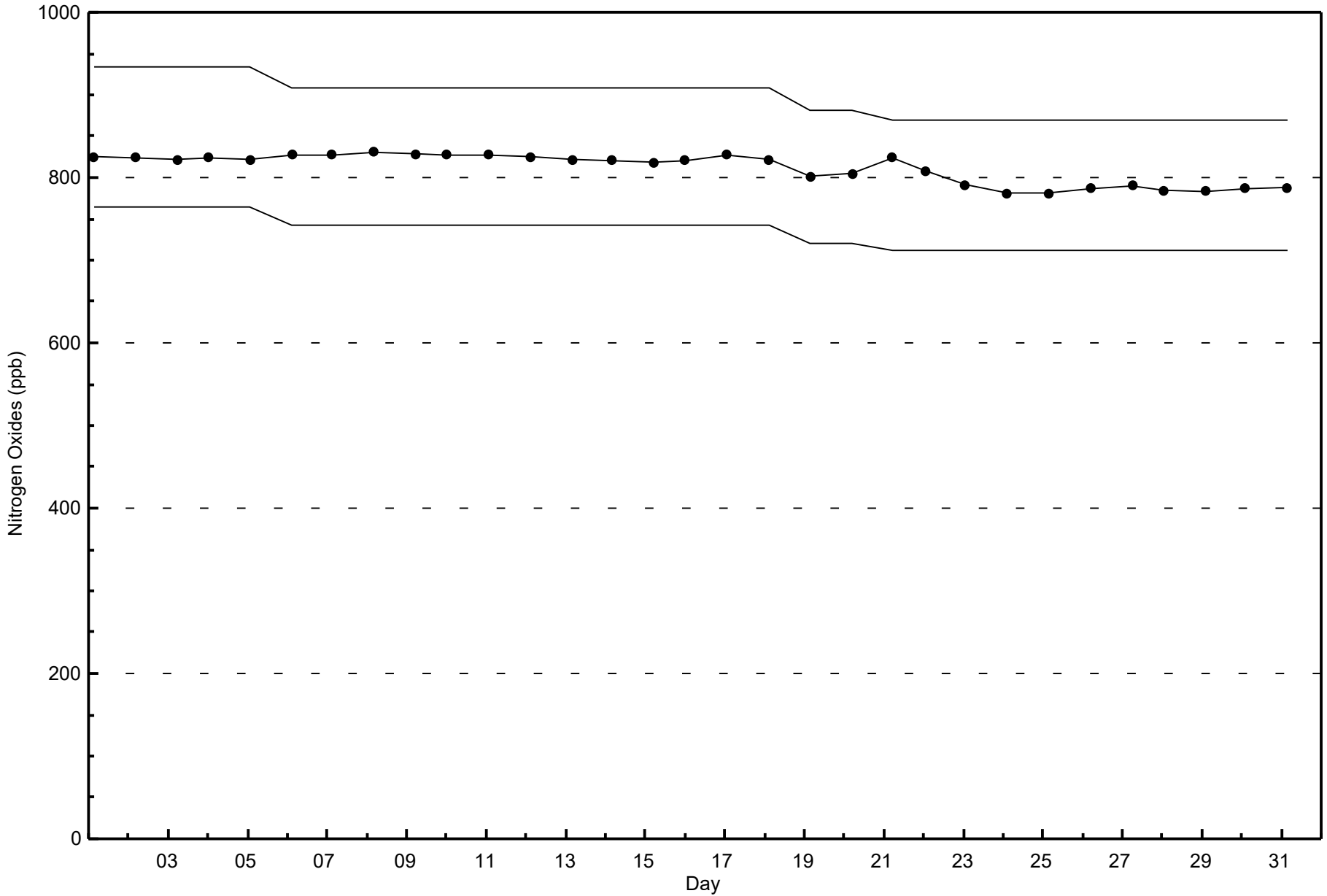
Wood Buffalo Environmental Association
Wind Rose Oct 2023

Nitrogen Oxides (NO_x) - ppb
Blackgold



Total Number of Valid Hours: 654







Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature (AT) - C

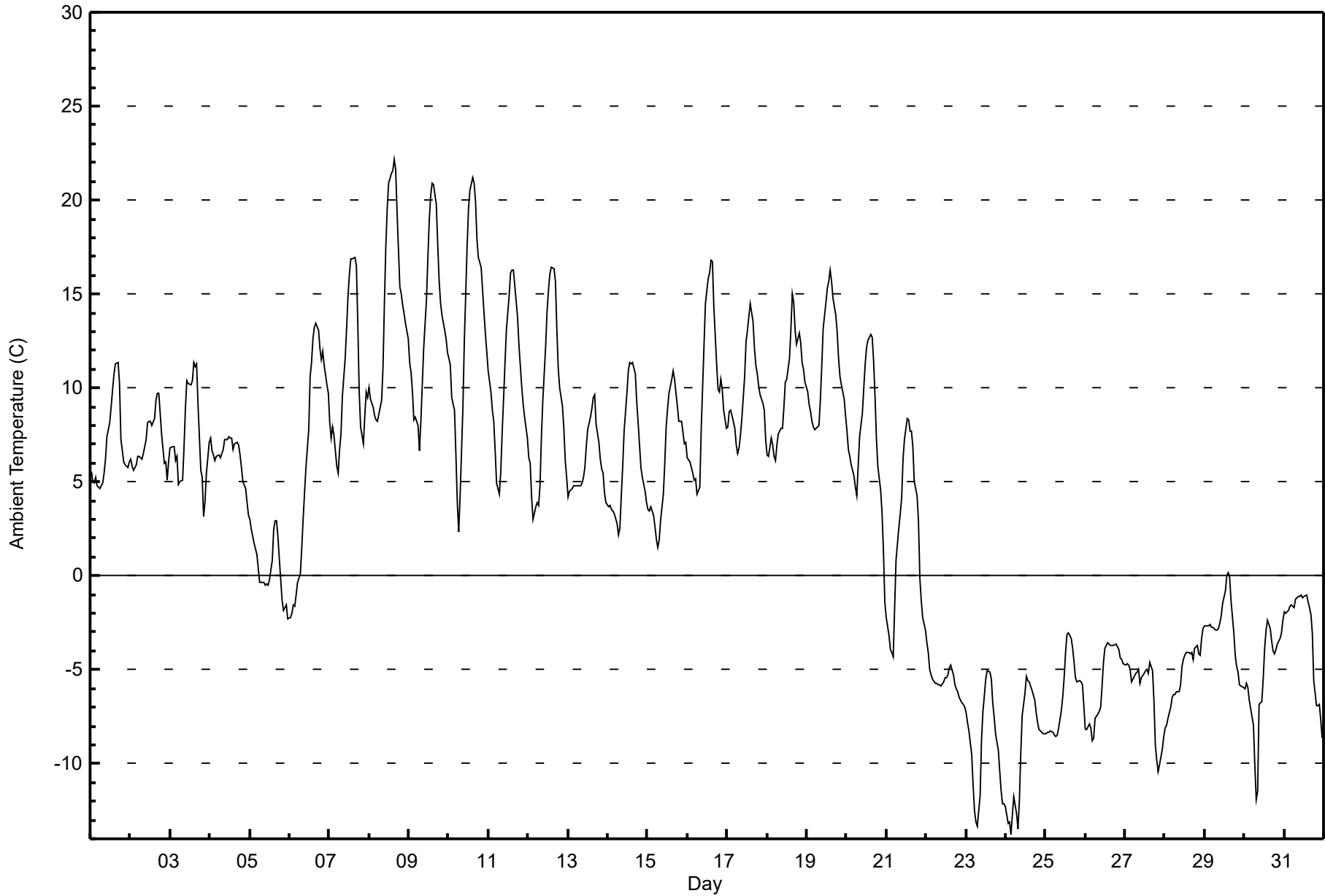
Blackgold - October 2023

Maximum Value: 22.2 C on Oct 8 16:00		Maximum Daily Average: 14.4 C on Oct 8		Hours in Service: 744																							
Minimum Value: -13.8 C on Oct 24 04:00		Minimum Daily Average: -9.2 C on Oct 24		Hours of Data: 744																							
Maximum Diurnal Average: 7.9 C at hour 16		Minimum Diurnal Average: 0.6 C at hour 7		Hours of Missing Data: 0																							
Monthly Average: 3.77 C		Percentiles: P ₁ = -12.6 P ₁₀ = -6.9 Q ₁ = -3.7 Median = 5.5 Q ₃ = 9.5 P ₉₀ = 13.4 P ₉₉ = 20.9		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-Oct	5.5	5.0	4.9	5.3	4.8	4.6	4.8	5.0	5.4	6.2	7.4	8.2	8.9	9.8	10.7	11.3	11.3	10.2	7.3	6.7	6.1	5.9	5.8	6.1	7.0	11.3	
2-Oct	6.2	5.8	5.6	5.9	6.4	6.3	6.3	6.2	6.5	7.2	8.2	8.2	8.0	8.3	9.3	9.7	9.7	8.7	7.5	6.0	6.0	5.1	6.1	7.1	9.7	11.3	
3-Oct	6.8	6.9	6.9	6.2	6.4	4.8	5.0	5.1	6.8	8.9	10.4	10.2	10.4	11.4	11.1	11.3	9.1	5.6	5.3	3.2	4.0	5.5	7.1	7.4	11.4	11.4	
4-Oct	7.3	6.6	6.4	6.2	6.3	6.4	6.3	6.5	6.8	7.2	7.3	7.4	7.4	7.3	6.8	7.0	7.1	7.0	6.5	5.8	5.0	4.7	3.9	3.2	6.3	7.4	
5-Oct	3.0	2.5	1.7	1.5	1.1	0.4	-0.3	-0.4	-0.4	-0.5	-0.5	-0.5	-0.2	0.9	2.5	3.0	2.9	2.1	0.9	-1.3	-1.8	-1.7	-1.5	-2.3	0.5	3.0	
6-Oct	-2.2	-2.0	-1.5	-1.6	-1.0	-0.3	0.1	1.4	3.0	4.4	5.8	7.8	10.6	11.3	12.6	13.2	13.4	13.1	12.1	11.5	11.9	11.2	10.2	9.7	6.4	13.4	
7-Oct	8.1	7.3	7.9	7.4	5.8	5.5	6.8	7.6	9.6	11.5	13.1	14.8	16.0	16.9	16.9	16.9	16.5	13.4	9.8	7.9	7.1	8.5	9.8	9.5	10.6	16.9	
8-Oct	10.0	9.5	9.0	8.5	8.3	8.2	8.6	9.3	11.2	14.6	17.5	19.6	20.9	21.5	21.6	22.2	21.6	19.4	15.4	15.0	14.4	14.0	13.4	12.6	14.4	22.2	
9-Oct	11.3	10.9	9.8	8.3	8.4	8.0	6.6	8.2	10.2	12.1	14.7	16.9	18.9	20.3	20.9	20.9	19.8	17.7	15.8	14.6	13.9	13.1	12.7	11.9	13.6	20.9	
10-Oct	11.6	11.2	9.5	8.8	6.4	3.9	2.3	4.2	8.9	12.4	15.0	17.5	19.6	20.5	21.2	20.9	19.9	17.9	17.0	16.4	15.2	14.0	12.9	12.0	13.3	21.2	
11-Oct	10.9	9.8	8.8	8.2	6.6	4.9	4.3	5.5	7.6	9.4	11.3	13.0	14.9	16.1	16.3	16.3	15.4	13.8	12.3	11.1	10.0	9.1	8.4	7.4	10.5	16.3	
12-Oct	6.3	6.0	4.2	3.0	3.7	3.9	3.7	4.8	7.4	9.4	12.2	14.0	15.1	16.0	16.4	16.3	15.7	13.2	11.1	10.0	9.0	7.9	6.1	5.3	9.2	16.4	
13-Oct	4.2	4.5	4.7	4.8	4.8	4.8	4.8	4.8	5.0	5.2	5.7	6.9	7.8	8.4	8.9	9.5	9.7	8.1	7.1	6.2	5.7	5.5	4.5	3.9	6.1	9.7	
14-Oct	3.6	3.7	3.6	3.5	3.3	2.8	2.5	2.5	4.2	5.8	7.7	9.7	10.9	11.4	11.3	11.4	10.7	9.3	8.1	7.0	5.8	5.2	4.5	3.9	6.3	11.4	
15-Oct	3.5	3.5	3.6	3.3	2.6	1.9	1.5	1.9	2.9	4.3	6.0	7.9	8.9	9.7	10.4	10.9	10.4	9.7	9.1	8.2	8.2	7.6	7.1	7.1	6.3	10.9	
16-Oct	6.3	6.0	5.7	5.5	5.1	5.2	4.3	4.8	7.8	10.0	12.3	14.5	15.8	16.2	16.8	16.7	14.4	11.3	10.0	9.8	10.5	10.0	8.8	7.9	9.8	16.8	
17-Oct	7.9	8.7	8.8	8.5	7.9	7.0	6.5	6.8	7.5	8.4	10.6	12.5	13.1	13.8	14.5	13.5	12.1	11.2	10.8	10.1	9.6	9.2	8.8	7.3	9.8	14.5	
18-Oct	6.4	6.3	7.3	6.9	6.4	6.1	6.9	7.6	7.9	7.9	9.0	10.3	10.5	11.6	13.1	15.0	14.6	13.1	12.3	12.9	12.4	11.4	11.0	10.3	9.9	15.0	
19-Oct	9.8	9.1	8.8	8.3	7.9	7.8	7.9	8.0	9.4	11.2	13.2	14.6	15.3	15.7	16.3	15.7	14.8	13.9	13.0	11.6	10.6	10.2	9.4	8.5	11.3	16.3	
20-Oct	7.7	6.7	6.4	5.9	5.3	4.7	4.3	5.9	7.4	8.6	10.0	11.3	12.2	12.6	12.8	12.7	11.4	9.6	7.3	5.8	4.6	3.3	1.3	-1.4	7.4	12.8	
21-Oct	-2.2	-3.2	-3.9	-4.1	-4.3	-1.7	0.8	2.6	3.3	4.1	6.2	7.2	8.4	8.3	7.7	7.7	6.9	5.0	4.3	2.9	-0.1	-1.3	-2.3	-2.9	2.1	8.4	
22-Oct	-3.6	-4.1	-5.0	-5.3	-5.5	-5.7	-5.7	-5.8	-5.8	-5.8	-5.7	-5.5	-5.5	-5.2	-4.9	-4.8	-5.3	-5.8	-6.0	-6.1	-6.5	-6.8	-6.8	-7.0	-5.6	-3.6	
23-Oct	-7.3	-7.8	-8.3	-9.5	-11.2	-12.5	-13.1	-13.3	-11.7	-8.7	-7.2	-6.4	-5.5	-5.0	-5.1	-5.5	-6.7	-7.5	-8.4	-9.3	-10.4	-11.5	-12.1	-12.1	-9.0	-5.0	
24-Oct	-12.3	-13.1	-13.1	-13.8	-12.7	-11.7	-12.7	-13.5	-12.0	-9.4	-7.5	-6.3	-5.4	-5.6	-5.6	-5.9	-6.1	-6.6	-7.3	-7.8	-8.1	-8.3	-8.4	-8.4	-9.2	-5.4	
25-Oct	-8.4	-8.3	-8.3	-8.3	-8.3	-8.5	-8.5	-8.5	-8.1	-7.2	-6.4	-5.3	-4.0	-3.1	-3.1	-3.3	-3.9	-4.6	-5.4	-5.7	-5.6	-5.7	-5.8	-6.9	-6.3	-3.1	
26-Oct	-8.2	-8.2	-7.9	-8.1	-8.8	-8.6	-7.6	-7.3	-7.2	-7.0	-5.9	-4.6	-3.9	-3.5	-3.6	-3.7	-3.7	-3.7	-3.6	-3.8	-4.0	-4.4	-4.5	-4.7	-5.7	-3.5	
27-Oct	-4.7	-4.6	-4.8	-5.0	-5.6	-5.3	-5.2	-5.1	-5.0	-5.7	-5.5	-5.2	-5.0	-5.0	-5.2	-4.6	-5.0	-6.6	-9.0	-9.8	-10.4	-10.0	-9.2	-8.5	-6.3	-4.6	
28-Oct	-8.1	-8.0	-7.6	-7.0	-6.5	-6.3	-6.4	-6.2	-6.2	-5.8	-4.8	-4.5	-4.2	-4.1	-4.1	-4.2	-4.1	-4.5	-3.9	-3.7	-4.2	-4.3	-3.3	-2.8	-5.2	-2.8	
29-Oct	-2.7	-2.7	-2.7	-2.6	-2.7	-2.8	-2.9	-2.9	-2.8	-2.5	-2.1	-1.5	-0.8	0.0	0.2	0.0	-1.3	-3.0	-4.2	-4.8	-5.2	-5.8	-5.9	-6.0	-2.8	0.2	
30-Oct	-6.0	-5.7	-5.9	-6.6	-7.5	-7.9	-10.2	-11.9	-11.5	-6.8	-6.7	-5.4	-3.9	-2.9	-2.4	-2.8	-3.5	-4.0	-4.2	-3.9	-3.6	-3.4	-3.1	-2.4	-5.5	-2.4	
31-Oct	-1.9	-2.0	-1.8	-1.6	-1.6	-1.6	-1.7	-1.2	-1.1	-1.1	-1.0	-1.2	-1.1	-1.0	-1.4	-1.7	-2.1	-3.1	-5.6	-7.0	-6.9	-6.8	-7.6	-8.6	-2.9	-1.0	
		2.2	1.9	1.7	1.4	1.0	0.8	0.6	1.0	2.2	3.5	4.8	6.0	6.9	7.5	7.8	7.9	7.4	6.1	4.7	4.0	3.3	2.9	2.5	2.1	Diurnal Average	
		11.6	11.2	9.8	8.8	8.4	8.2	8.6	9.3	11.2	14.6	17.5	19.6	20.9	21.5	21.6	22.2	21.6	19.4	17.0	16.4	15.2	14.0	13.4	12.6	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Blackgold - October 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ambient Temperature (AT) - C
Blackgold - October 2023

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	267	35.89	35.89
0 - 10	314	42.20	78.09
10 - 20	152	20.43	98.52
> 20	11	1.48	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

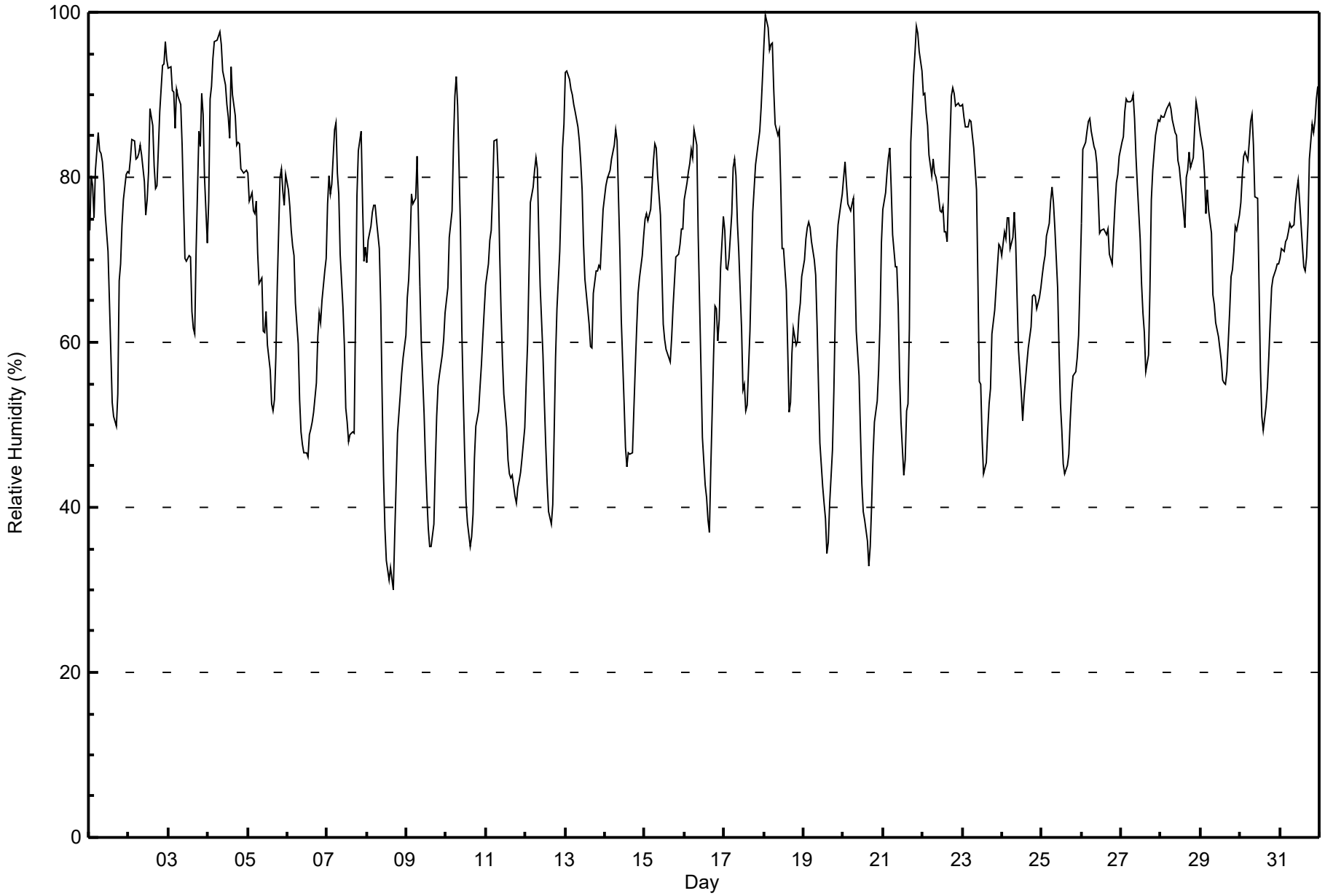
Relative Humidity (RH) - %
Blackgold - October 2023

Maximum Value: 99.7 % on Oct 18 02:00																						Maximum Daily Average: 88.6 % on Oct 4																						Hours in Service: 744			
Minimum Value: 30.1 % on Oct 8 17:00																						Minimum Daily Average: 54.8 % on Oct 8																						Hours of Data: 744			
Maximum Diurnal Average: 82.2 % at hour 6																						Minimum Diurnal Average: 53.7 % at hour 16																						Hours of Missing Data: 0			
Monthly Average: 70.09 %																						Percentiles: P ₁ = 35.2 P ₁₀ = 47.9 Q ₁ = 59.4 Median = 72.6 Q ₃ = 82.0 P ₉₀ = 87.9 P ₉₉ = 96.4																						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-Oct	73.5	80.2	79.1	75.2	80.8	85.3	83.2	82.9	81.9	79.6	75.6	70.9	65.0	59.0	52.7	50.9	49.9	53.7	67.4	69.6	74.2	77.4	80.4	80.7	72.0	85.3																					
2-Oct	80.5	82.3	84.6	84.4	82.2	82.3	83.0	83.8	82.7	79.5	75.4	77.4	80.7	88.3	86.3	81.4	78.7	78.9	83.5	88.0	93.6	93.7	96.4	94.3	84.2	96.4																					
3-Oct	93.2	93.4	90.5	90.3	85.9	90.7	89.8	88.9	84.0	77.0	70.2	69.8	70.5	70.3	63.7	61.7	61.1	71.2	85.7	83.8	90.2	87.6	80.0	72.1	80.1	93.4																					
4-Oct	77.1	89.5	91.1	94.5	96.5	96.5	97.1	97.6	96.0	93.0	91.1	88.8	87.3	84.8	93.4	90.0	87.4	83.8	84.3	84.2	81.1	80.5	80.7	80.9	88.6	97.6																					
5-Oct	80.6	77.2	78.1	76.0	75.6	77.1	70.8	67.1	67.8	61.3	61.1	63.6	59.6	56.6	52.5	51.7	53.1	58.2	66.7	80.0	81.0	78.3	76.6	80.3	68.8	81.0																					
6-Oct	78.4	76.5	73.5	71.7	70.4	64.7	59.9	53.0	49.2	47.7	46.6	46.1	48.9	49.5	50.3	51.4	55.1	60.7	63.6	62.3	65.1	68.6	70.2	59.6	78.4																						
7-Oct	76.8	80.1	77.9	79.1	85.7	86.5	80.6	78.0	70.6	64.2	59.7	52.1	50.3	47.9	48.9	49.1	49.0	63.4	77.8	83.3	85.5	77.0	69.9	71.5	69.4	86.5																					
8-Oct	69.7	72.3	74.1	75.7	76.6	76.6	74.7	71.3	64.7	53.6	43.9	37.5	33.6	31.2	32.7	31.3	30.1	36.6	49.0	51.3	53.7	56.2	58.2	60.9	54.8	76.6																					
9-Oct	65.4	67.6	72.0	78.0	76.8	77.5	82.5	74.6	66.7	59.9	51.4	45.6	41.2	37.5	35.2	35.2	38.0	45.0	51.0	54.8	56.0	58.5	60.4	63.6	58.1	82.5																					
10-Oct	65.2	66.7	72.7	75.9	83.9	89.8	92.3	88.7	73.8	61.3	53.5	46.6	40.6	38.1	35.3	36.5	39.1	45.9	49.8	51.8	54.6	57.3	60.7	63.9	60.1	92.3																					
11-Oct	66.9	69.6	72.4	73.6	78.3	84.4	84.6	80.4	71.2	63.9	58.2	53.7	49.6	45.8	44.0	43.6	43.9	41.4	40.5	42.4	43.2	44.2	46.0	49.6	58.0	84.6																					
12-Oct	55.1	59.9	68.5	77.0	78.8	80.9	82.4	81.0	73.2	66.7	58.5	52.7	47.5	42.9	39.5	38.0	40.3	49.0	58.2	64.1	71.1	77.1	83.5	86.5	63.9	86.5																					
13-Oct	92.7	92.8	91.8	90.7	90.1	88.8	87.9	86.1	84.4	81.8	78.5	71.9	67.6	64.0	62.2	59.4	59.4	65.9	68.6	68.6	69.4	69.1	72.5	76.1	76.7	92.8																					
14-Oct	79.1	79.8	80.4	80.9	82.3	83.9	85.7	84.3	77.6	71.0	62.8	52.8	47.3	44.9	46.6	46.5	46.6	51.8	56.9	61.7	66.0	67.7	70.4	72.9	66.7	85.7																					
15-Oct	74.9	75.6	74.8	76.1	79.0	82.1	84.0	83.5	80.2	75.5	68.8	62.3	60.3	59.1	58.2	57.6	60.5	64.2	67.2	70.3	70.7	71.9	73.7	73.7	71.0	84.0																					
16-Oct	77.3	79.2	80.7	81.8	83.3	82.4	85.8	83.9	72.9	64.7	56.7	48.4	42.8	41.3	38.4	37.0	44.7	58.5	64.4	64.1	60.2	62.6	68.9	75.2	64.8	85.8																					
17-Oct	73.5	68.9	68.8	70.2	75.6	81.2	82.2	80.2	74.6	71.0	61.7	54.3	54.9	51.7	52.4	61.4	68.5	75.8	78.6	81.5	82.9	85.5	88.4	92.2	72.3	92.2																					
18-Oct	96.2	99.7	98.1	95.4	96.1	96.3	90.7	86.4	85.2	85.8	79.1	71.3	71.3	66.3	59.2	51.5	52.7	58.7	61.6	59.7	60.2	63.2	64.8	68.0	75.7	99.7																					
19-Oct	70.0	72.6	73.8	74.5	73.9	72.2	70.0	68.1	62.0	54.8	47.9	42.6	40.5	38.7	34.5	35.8	40.6	47.0	54.1	63.3	71.0	74.2	76.8	78.0	59.9	78.0																					
20-Oct	80.0	81.9	79.2	76.8	75.8	76.8	77.4	69.3	61.4	56.0	49.2	42.9	39.4	38.5	36.0	32.8	35.2	40.4	46.3	50.3	52.9	56.6	62.4	72.1	57.9	81.9																					
21-Oct	76.2	78.2	80.6	82.3	83.5	78.6	73.1	69.2	69.1	64.4	55.9	50.4	44.0	45.8	51.8	52.6	61.7	84.2	92.4	95.1	98.4	97.4	95.2	92.8	73.9	98.4																					
22-Oct	90.1	90.1	87.8	86.3	82.7	80.1	82.2	80.6	80.0	78.9	75.8	75.7	76.5	73.4	73.4	72.1	84.3	89.8	90.9	90.1	88.6	89.1	88.7	88.6	83.2	90.9																					
23-Oct	88.9	87.3	86.2	86.1	87.0	86.7	85.2	83.6	78.5	67.4	55.2	54.9	48.3	44.0	45.4	49.2	52.6	54.5	61.0	63.8	66.6	69.3	71.9	71.5	68.5	88.9																					
24-Oct	70.5	73.4	72.6	75.1	75.2	71.3	72.6	75.8	72.3	65.4	59.1	53.8	50.5	53.3	55.5	57.5	59.4	61.9	65.6	65.8	65.5	64.1	65.5	66.7	65.3	75.8																					
25-Oct	68.2	69.6	70.5	72.9	74.5	77.1	78.8	76.9	74.0	66.6	59.1	52.5	49.4	45.3	44.1	45.0	46.5	50.6	53.8	55.9	56.4	58.1	60.9	67.5	61.4	78.8																					
26-Oct	74.5	83.4	84.2	85.6	86.9	87.2	85.6	83.7	83.3	81.7	77.8	73.2	73.6	73.8	73.3	73.1	73.7	70.7	69.4	73.2	76.6	79.4	80.3	82.6	78.6	87.2																					
27-Oct	84.2	84.8	87.9	89.5	89.2	89.2	89.3	89.9	87.1	82.6	78.9	72.5	67.1	63.6	61.1	56.4	58.4	66.4	77.3	80.8	83.1	85.2	86.9	86.7	79.1	89.9																					
28-Oct	87.5	87.3	87.2	88.3	88.7	88.9	88.3	86.9	85.4	85.2	82.0	81.1	79.3	77.9	73.9	80.0	80.8	83.0	81.2	82.3	86.1	89.1	88.2	86.6	84.4	89.1																					
29-Oct	85.3	83.3	80.5	75.7	78.5	75.9	73.2	65.8	64.5	62.4	61.6	60.7	57.9	55.5	55.1	54.8	56.4	63.7	67.9	68.9	71.0	74.1	73.6	75.4	68.4	85.3																					
30-Oct	77.0	80.1	82.5	83.1	82.0	84.3	86.7	87.6	83.9	77.6	77.4	66.9	56.8	51.0	49.4	52.3	54.6	58.4	62.8	66.5	67.9	68.8	69.5	69.5	70.7	87.6																					
31-Oct	70.2	71.4	71.1	72.3	72.5	73.4	74.5	73.9	74.3	76.8	78.5	79.6	77.0	71.7	69.2	68.7	70.4	74.4	82.2	86.4	85.5	86.9	89.5	91.1	76.7	91.1																					
																						77.4	79.2	79.8	80.5	81.6	82.2	81.7	79.4	75.2	70.2	64.9	60.4	57.3	55.2	54.0	53.7	55.8	61.4	67.0	69.8	71.8	73.1	74.5	76.2	Diurnal Average	
																						96.2	99.7	98.1	95.4	96.5	96.5	97.1	97.6	96.0	93.0	91.1	88.8	87.3	88.3	93.4	90.0	87.4	89.8	92.4	95.1	98.4	97.4	96.4	94.3	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Blackgold - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Relative Humidity (RH) - %
Blackgold - October 2023**

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	27	3.63	3.63
40 - 60	166	22.31	25.94
60 - 80	320	43.01	68.95
80 - 100	231	31.05	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Speed (WS) - km/h
Blackgold - October 2023

Maximum Speed: 25 km/h on Oct 10 15:00	Maximum Daily Speed Average: 13.0 km/h on Oct 14	Hours in Service: 744
Minimum Speed Value: 0 km/h on Oct 7 18:00	Minimum Daily Speed Average: 1.7 km/h on Oct 7	Hours of Data: 703
Maximum Diurnal Speed Average: 4.9 km/h at hour 12	Minimum Diurnal Speed Average: 3.2 km/h at hour 19	Hours of Missing Data: 41
Monthly Average Velocity: 4.0 km/h 226.9 deg	Percentiles: P ₁ = 2 P ₁₀ = 4 Q ₁ = 6 Median = 9 Q ₃ = 12 P ₉₀ = 15 P ₉₉ = 21	Percent Operational Time: 94.5

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-Oct	S6	SSE3	SSE4	SSE4	SSE3	SE4	SSE4	SSE6	SSE8	SSE10	S12	S13	SSW12	S13	S13	S13	S14	S9	S6	S9	S9	SSE9	SSE9	S12	S8.4	S14	
2-Oct	S13	S11	S10	S12	S13	S14	S13	S13	S13	S15	SSW17	SSW17	SSW16	SSW11	SSW12	SSW10	SSW8	SSW7	SSW6	SSW5	SSW5	SSW6	SW5	SSW5	SSW10.4	SSW17	
3-Oct	SW5	SW5	SW5	W5	W6	W6	WSW6	W5	W7	WNW10	WNW12	NW13	WNW12	NW11	NW10	NW7	WNW5	W3	WSW3	SW6	SW3	SW6	SSW6	SSW7	W5.5	NW13	
4-Oct	W7	SW4	SW7	SW8	WSW7	WSW6	W7	WNW10	WNW10	WNW12	WNW13	WNW15	WNW15	WNW16	WNW16	WNW16	WNW16	WNW17	WNW16	WNW17	WNW16	WNW20	NW17	WNW12.2	WNW20		
5-Oct	WNW18	WNW19	NW18	NW18	NW19	WNW17	NW20	NW16	NW18	NW18	NW17	NW16	NW16	NW16	NW14	NW12	WNW9	WNW4	WSW2	WSW4	SW4	SW6	SW5	NW12.9	NW22		
6-Oct	SW6	SW5	SSW6	SSW8	SSW8	S12	SSW12	SSW12	SSW15	SSW14	SW12	SSW11	SW13	SW13	SW13	SW12	SSW12	SSW10	SW7	SW7	W7	W7	W9	W8	SW9.3	SSW15	
7-Oct	W7	W5	WNW9	W6	W4	WSW5	SW7	WSW5	W4	WSW2	S2	WNW3	E3	E3	ENE6	E7	ESE6	E0	NNE1	SE1	SSE2	SSE6	SSE10	S11	SSW1.7	S11	
8-Oct	S12	SSE9	SSE8	SSE9	SSE9	S11	S13	S11	SSE12	SSE15	SSE18	S21	SSE21	SSE23	SSE21	S17	S15	S7	SE4	SSE7	SE8	SSE7	S9	SSE8	SSE12.2	SSE23	
9-Oct	SSE7	SSE6	SSE5	SE3	SSE5	SSE3	SE2	SSE5	S11	SSE11	SSE12	SE11	ESE11	SE13	SE16	SSE14	SSE13	SSE10	SSE6	SSE8	SSE8	SSE8	SSE7	SSE9	SSE8.4	SSE16	
10-Oct	SSE9	SSE7	ESE3	ESE4	NNW2	N2	NNE2	NE4	ESE5	SE11	SE13	SE15	SE19	SE20	SSE25	SE20	SSE12	SE7	SE10	SE12	SE14	SE14	SE14	SE13	SE9.9	SSE25	
11-Oct	SE9	ESE9	ESE9	ESE8	ENE5	E5	E4	E6	ESE9	ESE11	ESE12	ESE12	ESE15	SE18	SE19	SE17	ESE16	SE11	SE10	SE10	SE9	SE9	SSE10	SE9	SE10.1	SE19	
12-Oct	SSE7	SSE8	SE5	SE4	SSE4	SSE5	S5	S8	SSE8	S10	SSE10	SSE12	SSE14	SSE15	SSE12	S11	S9	S6	S7	S10	S9	S9	SSW6	SSW8	S8.2	SSE15	
13-Oct	SSW12	SSW12	SSW9	SSW8	SSW8	S8	S9	S10	SSE11	S13	S12	S13	SSE14	SSE15	SE14	SSE13	SE10	SE7	SE8	SSE7	SE8	SSE9	SSE8	SSE8	SSE9.7	SSE15	
14-Oct	SE8	SE9	SE10	SE12	SSE13	SE10	SSE8	SSE8	SSE12	SSE14	SSE17	SSE22	SSE22	SSE22	SSE20	SSE19	SSE19	SSE14	SSE12	SSE10	SSE10	SSE10	SSE8	SE9	SSE13.0	SSE22	
15-Oct	SE8	SSE9	SSE11	SSE10	SSE8	SSE7	SSE7	SSE7	S13	S11	S11	S8	S9	S7	SW8	SSW7	S7	SSW6	SSW7	SSW6	SW7	SW7	SW7	WSW7	S7.3	S13	
16-Oct	SW6	SW7	SW7	SW6	SW6	WSW5	WSW4	SW5	SW5	W5	W7	W8	WSW8	WSW9	SW7	SSW6	WSW2	WSW1	SSW2	SSW4	S5	ENE3	ENE3	NE3	SW4.1	WSW9	
17-Oct	NE4	ENE6	ENE5	NNE4	N2	NE3	NNW1	NW4	WNW5	NW5	WNW5	WNW8	WNW10	WNW10	WNW11	WNW11	WNW10	WNW8	WNW7	W5	WSW4	SW6	SSW5	SSE5	WNW3.8	WNW11	
18-Oct	S6	SSW7	SSW7	S10	S7	S8	S9	S6	S9	S11	S12	SSW14	SSW12	SSW11	SSW10	SW10	SW9	SW9	SSW11	SW13	SW10	SW9	SW11	SW10	SSW9.1	SSW14	
19-Oct	WSW8	WSW9	SW10	WSW11	SW11	SW12	WSW13	WSW12	WSW13	WSW14	WSW15	W15	WSW12	WSW13	WSW12	WSW9	SW8	W10	W6	SSW6	SW8	SW12	WSW11	W9	WSW10.6	WSW15	
20-Oct	WSW9	WSW8	WSW9	W9	W11	W10	W9	WNW13	WNW13	WNW16	WNW16	WNW19	WNW19	WNW20	NW19	NW16	NW12	WNW9	WNW6	WNW6	WNW5	WNW6	WNW5	W2	WNW10.5	WNW20	
21-Oct	WSW2	WSW2	WSW2	SSW3	S3	SSW7	S11	S10	SSW8	S13	S15	SSW12	SSW15	SSW14	SSW7	SSW7	SW5	SSW2	NNW5	N7	NNE10	UO	UO	UO	SSW5.3	S15	
22-Oct	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	---	
23-Oct	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	NW13	NW12	WNW9	WNW7	WNW7	WNW6	WNW7	WNW5	W6	W8	---	NW13
24-Oct	WNW9	W8	WNW8	WNW7	W6	W6	W7	WNW7	W9	WNW9	WNW12	WNW14	WNW13	NW13	WNW13	WNW13	WNW11	WNW13	NW14	NW12	WNW9	WNW8	WNW7	WNW8	WNW9.6	WNW14	
25-Oct	WNW8	WNW7	WNW8	WNW8	WNW7	WNW7	W7	W8	SW4	WSW6	WSW9	SW9	W11	NW13	WNW14	WNW11	WNW9	W7	WNW7	W7	W8	W7	WNW10	W6	WNW7.8	WNW14	
26-Oct	WNW6	W7	W7	W7	WNW8	WNW9	WNW8	WNW9	WNW10	WNW9	WNW9	W8	WNW9	WNW11	NW11	WNW8	WNW8	W7	W7	W6	W7	W8	W6	WSW6	WNW7.6	NW11	
27-Oct	WSW6	W6	W7	WSW5	WNW7	W6	W7	WNW6	NNW10	N12	N9	N10	NNW9	NNW10	NNW9	NW7	NNW9	NW5	WSW3	WSW3	SW3	SW5	SW5	SW6	NW4.8	N12	
28-Oct	SW5	SW5	SW6	SSW6	WSW5	W6	WNW7	NW8	NW10	NW10	NW11	NNW11	NNW14	NNW11	NNW11	NW10	NW10	WNW9	WNW9	WNW8	WNW9	WNW9	WNW8	WNW9	WNW7.5	NNW14	
29-Oct	WNW9	WNW9	WNW9	WNW9	WNW8	WNW8	WNW10	NW11	NW10	NW13	NW9	NW9	NW11	NW12	WNW10	WNW10	WNW8	WNW5	W5	WNW7	WNW6	WNW6	W6	NW6	WNW8.4	NW13	
30-Oct	NNW7	N6	N6	NNE7	NE5	NE4	N2	WNW3	S1	SSE3	S7	SSW8	SW9	SSW11	SSW11	SSW9	SSW8	SSW10	SSW12	SSW10	SSW9	SSW10	SSW12	SW10	SSW4.3	SSW12	
31-Oct	SW9	SSW8	SSW6	SW9	SW9	WSW7	WNW8	WNW8	WNW9	NW11	NW10	NNW11	NW10	NW12	NNW12	NNW10	NNW8	NNW3	W2	W2	WSW2	WSW6	WSW5	WSW4	WNW5.3	NNW12	

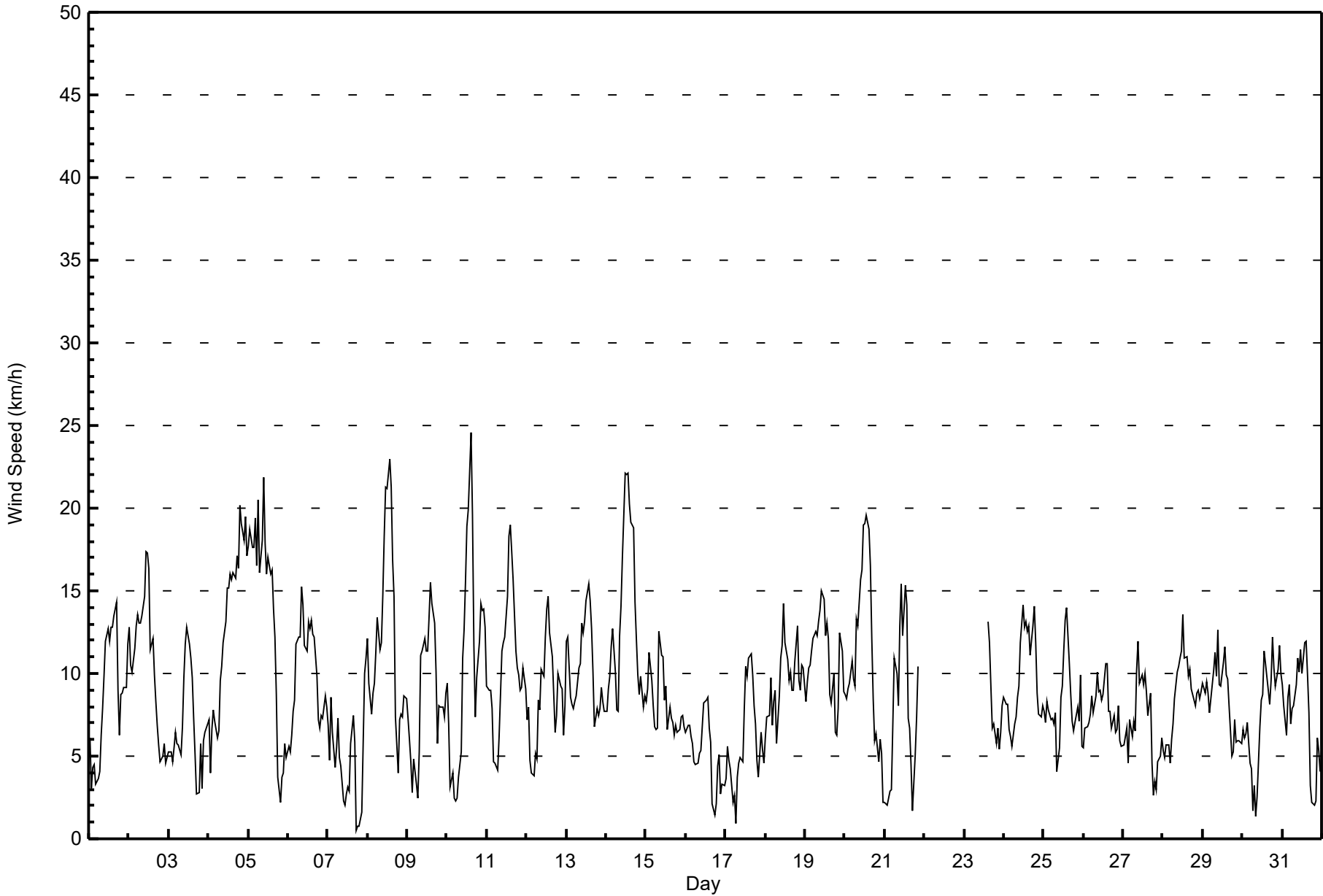
SW4.2 SW3.8 SW3.6 SW3.6 SW3.7 SW3.8 SW4.2	SSW3.8 SW4.0 SW3.9 SW4.8 SW4.9 SW4.8 SW4.3 SW4.2 SW3.9 SW3.4 SW3.2 SW3.7 SW3.5 SW4.5 SW4.5 SW4.2	Diurnal Average		
WNW18	WNW19 NW18 NW18 NW19	WNW17 NW20 NW16 NW18 NW22 SSE18 SSE22 SSE22 SSE23 SSE25 SE20 SSE19	WNW17	Diurnal Maximum

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
Blackgold - October 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Blackgold - October 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	126	17.92	17.92
6 - 11	398	56.61	74.54
12 - 19	163	23.19	97.72
20 - 28	16	2.28	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 703

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Blackgold - October 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	3	3	6	4	5	3	6	15	5	8	17	23	11	10	3	4	126
6 - 11	5	2	0	2	2	7	21	51	40	47	38	20	49	82	20	12	398
12 - 19	1	0	0	0	0	4	14	23	26	20	7	9	1	29	27	2	163
20 - 28	0	0	0	0	0	0	2	8	1	0	0	0	0	3	2	0	16
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	9	5	6	6	7	14	43	97	72	75	62	52	61	124	52	18	703

Total Number of Valid Hours: 703

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Blackgold - October 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Oct 5 07:00 Minimum Value: 0 km/h on Oct 21 02:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 2 Q ₃ = 3 P ₉₀ = 4 P ₉₉ = 6																	Hours in Service: 744 Hours of Data: 703 Hours of Missing Data: 41 Hours of Calibration: 0 Percent Operational Time: 94.5								
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-Oct	1	1	1	2	1	1	1	1	2	3	3	3	3	3	3	4	4	3	1	1	1	2	2	3	4
2-Oct	3	3	3	3	3	3	3	3	4	4	5	4	4	3	3	3	2	2	1	1	1	1	1	1	5
3-Oct	1	2	2	2	2	2	2	2	2	3	3	4	3	3	3	2	2	1	1	2	1	1	1	4	
4-Oct	3	2	2	2	2	2	2	2	3	4	4	5	4	5	5	5	5	6	5	7	6	6	6	7	
5-Oct	5	6	5	6	6	5	7	6	6	7	6	6	6	5	5	5	4	3	2	1	2	1	1	7	
6-Oct	1	2	2	2	2	3	3	3	4	4	3	3	4	4	4	4	3	3	2	2	3	2	2	4	
7-Oct	2	2	2	2	1	2	2	2	2	1	1	1	2	2	2	2	2	1	1	1	1	2	2	3	
8-Oct	3	3	2	2	2	3	3	2	3	4	6	5	5	6	6	4	4	2	1	2	2	1	2	6	
9-Oct	2	2	2	2	2	2	1	2	4	3	3	3	3	3	4	4	4	2	2	2	2	2	1	4	
10-Oct	2	2	1	1	1	1	1	1	3	3	3	3	5	5	6	6	6	2	3	3	4	3	3	6	
11-Oct	2	2	2	2	1	1	1	1	3	3	3	3	5	4	4	4	5	4	2	2	2	2	3	5	
12-Oct	2	3	1	2	2	2	2	3	2	2	3	3	4	4	4	3	2	1	1	2	2	2	1	4	
13-Oct	4	3	3	2	2	2	2	3	3	3	3	4	4	4	4	3	2	1	2	1	2	2	2	4	
14-Oct	2	2	2	3	3	2	2	2	3	4	5	6	6	5	5	5	4	2	2	2	2	2	2	6	
15-Oct	2	2	3	3	2	2	2	2	3	3	3	2	3	2	2	2	1	1	1	2	2	2	3	3	
16-Oct	2	2	2	2	2	2	2	1	2	2	2	2	3	3	3	2	1	1	1	1	1	1	1	3	
17-Oct	1	1	1	1	1	1	1	2	2	1	2	2	3	3	3	3	3	2	2	2	2	2	2	3	
18-Oct	1	2	2	3	2	3	2	2	3	4	4	4	3	3	3	3	3	2	3	4	3	3	4	4	
19-Oct	3	4	4	3	4	4	4	5	5	5	6	5	5	5	5	3	3	5	4	2	4	5	4	6	
20-Oct	3	3	4	3	3	3	3	3	3	5	5	5	6	5	6	5	4	2	2	2	1	1	1	6	
21-Oct	1	0	0	1	1	2	2	3	2	4	4	4	4	4	3	2	2	2	2	6	4	UO	UO	6	
22-Oct	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	
23-Oct	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	4	4	2	2	2	1	1	1	4	
24-Oct	2	2	2	1	2	2	2	2	2	3	3	4	4	4	4	4	3	4	4	4	3	2	2	4	
25-Oct	2	2	2	2	2	2	2	2	2	2	3	3	3	3	4	4	3	3	2	2	2	2	3	4	
26-Oct	1	2	2	2	2	2	2	2	3	3	2	2	3	3	3	2	2	2	2	3	2	2	2	3	
27-Oct	2	2	2	2	2	2	2	2	4	4	3	3	3	3	4	3	4	3	1	1	1	1	1	4	
28-Oct	2	2	2	2	2	2	2	2	3	3	4	3	4	3	4	3	3	2	2	2	2	2	2	4	
29-Oct	2	2	3	2	2	2	3	3	3	5	3	3	3	4	3	3	3	2	1	2	1	2	2	5	
30-Oct	2	2	2	3	3	2	1	1	1	1	2	2	3	3	3	2	2	2	3	3	3	3	3	3	
31-Oct	3	2	2	3	3	3	2	2	2	4	3	4	3	4	4	3	3	2	1	1	2	1	2	4	
																	Diurnal Maximum								
																	5 6 5 6 6 5 7 6 6 7 6 6 6 6 6 6 6 6 5 7 6 6 6 5								
M - Maintenance																	UO - Unstable Operation								



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Blackgold - October 2023

Direction of Maximum Speed: 148 deg on Oct 10 15:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 152.8 deg on Oct 14	Hours of Data: 703
Direction of Minimum Speed: 88 deg on Oct 7 18:00	Hours of Missing Data: 41
Direction of Minimum Daily Speed Average: 1.7 deg on Oct 7	Percent Operational Time: 94.5
Monthly Average Direction: 226.9 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-Oct	172	163	149	162	149	146	160	155	156	162	175	170	201	182	187	181	181	183	175	174	174	168	166	172	173.4
2-Oct	178	180	177	179	182	185	188	188	181	186	197	192	199	200	202	213	212	208	205	208	212	209	217	210	193.0
3-Oct	218	224	230	275	270	281	246	259	274	284	301	307	299	309	312	324	299	279	240	233	228	219	212	213	273.9
4-Oct	261	234	224	228	240	258	280	293	296	301	299	301	299	300	300	301	301	301	300	303	305	302	303	305	294.2
5-Oct	302	301	305	306	308	302	309	311	308	316	317	318	317	318	314	314	306	300	282	256	242	219	231	234	305.8
6-Oct	225	215	212	200	193	191	196	195	198	210	216	210	216	219	218	215	205	212	214	227	259	266	278	276	215.6
7-Oct	275	277	282	280	267	245	236	243	280	258	175	295	97	94	68	92	116	88	22	138	167	166	160	170	213.6
8-Oct	173	155	163	165	161	170	172	172	149	152	160	170	159	166	167	170	186	170	140	151	146	150	172	168	164.3
9-Oct	166	163	158	141	160	164	127	156	169	165	151	143	123	145	146	151	151	152	164	156	156	155	167	157	153.0
10-Oct	149	157	118	116	339	8	27	35	115	135	145	138	143	139	148	145	152	128	128	143	146	140	139	134	138.7
11-Oct	137	119	121	118	70	84	89	88	121	120	107	106	118	136	135	130	121	127	128	130	134	144	147	143	123.9
12-Oct	153	167	139	144	157	159	176	174	167	169	164	152	159	166	162	177	182	170	180	181	185	191	194	198	170.0
13-Oct	198	195	192	197	193	185	175	174	168	170	180	171	152	149	144	148	137	130	140	148	145	149	148	148	164.0
14-Oct	145	139	135	140	149	144	148	154	148	154	160	162	165	165	154	151	149	149	152	152	154	161	152	145	152.8
15-Oct	146	153	158	152	161	167	164	158	180	173	178	187	181	191	214	205	191	200	195	201	215	220	235	246	183.5
16-Oct	228	235	233	227	227	239	242	225	231	269	267	276	240	249	215	210	241	239	206	194	184	64	57	52	234.4
17-Oct	49	60	62	31	4	39	339	312	302	322	298	294	294	294	297	283	285	290	292	267	251	218	205	167	295.0
18-Oct	191	210	202	189	188	170	181	180	187	179	190	206	201	201	213	226	219	215	211	225	236	221	231	236	205.7
19-Oct	243	237	235	237	235	235	239	237	238	241	254	265	258	256	254	246	218	273	264	207	232	236	255	267	245.2
20-Oct	240	238	251	267	277	272	275	293	295	299	296	289	303	303	309	313	314	294	287	284	288	287	291	264	289.8
21-Oct	255	251	239	203	177	193	181	177	199	184	185	198	199	200	209	197	233	205	338	3	15	UO	UO	UO	198.5
22-Oct	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
23-Oct	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
24-Oct	285	280	287	282	278	265	276	288	281	285	292	296	298	307	296	291	292	297	308	306	291	289	287	291	291.8
25-Oct	289	294	288	286	283	288	276	274	236	251	239	233	274	305	296	297	296	280	285	281	279	281	296	278	281.3
26-Oct	291	281	275	281	285	291	295	295	299	301	293	277	290	297	306	289	282	275	276	261	269	276	261	252	285.2
27-Oct	254	260	266	254	282	280	281	295	346	10	358	355	348	335	344	317	339	318	251	253	231	226	221	227	308.9
28-Oct	232	236	221	212	246	267	289	306	308	307	309	333	329	337	334	308	304	295	295	285	292	292	292	294	298.6
29-Oct	293	292	290	293	290	294	293	306	304	325	325	315	313	305	292	292	290	282	280	293	291	290	280	305	299.1
30-Oct	347	8	11	22	42	49	358	301	181	147	185	202	215	198	209	201	207	196	199	202	204	198	205	215	205.6
31-Oct	216	203	213	225	231	249	283	295	301	306	314	327	326	321	336	342	344	347	271	259	243	237	245	254	287.6

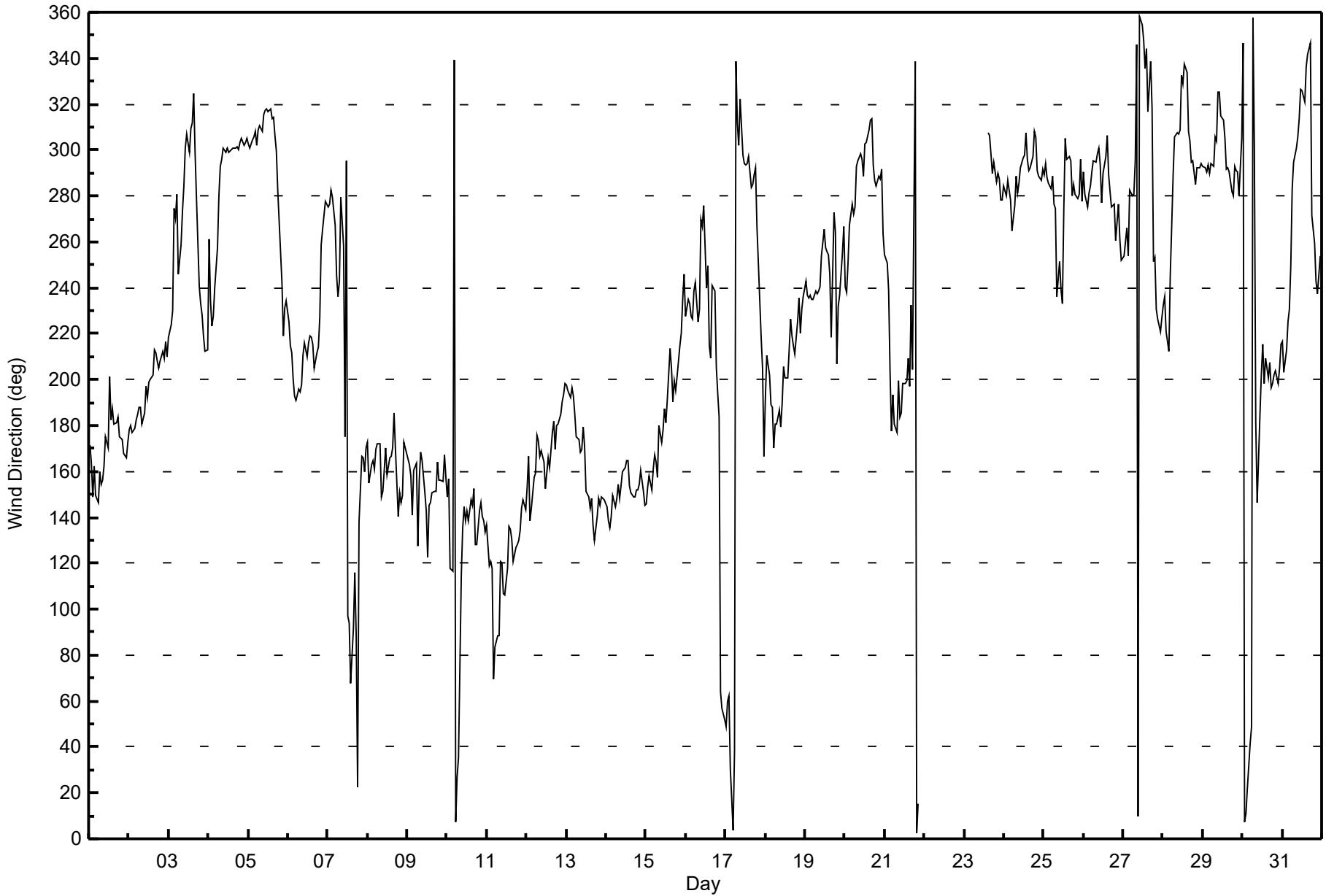
219.4 217.9 223.3 221.9 231.2 227.9 234.0 239.5 228.8 226.2 224.2 228.3 227.2 227.3 232.3 228.9 228.8 235.9 233.3 224.3 225.4 218.8 223.6 219.8
 Diurnal Average

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
Blackgold - October 2023





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Blackgold - October 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 83 deg on Oct 7 13:00 Minimum Value: 8 deg on Oct 13 18:00 Percentiles: P ₁ = 11 P ₁₀ = 14 Q ₁ = 16 Median = 20 Q ₃ = 26 P ₉₀ = 34 P ₉₉ = 72																			Hours in Service: 744 Hours of Data: 703 Hours of Missing Data: 41 Hours of Calibration: 0 Percent Operational Time: 94.5						
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-Oct	13	19	13	20	23	18	17	14	14	17	18	19	22	22	21	20	18	14	10	9	12	14	16	15	23
2-Oct	14	15	14	16	15	15	17	17	16	17	17	16	15	16	16	21	19	18	14	14	13	19	22	22	22
3-Oct	24	38	38	35	32	31	31	46	28	26	24	26	23	23	28	25	26	29	18	14	20	15	13	15	46
4-Oct	40	41	30	28	32	31	33	15	18	20	18	19	18	20	19	18	19	19	19	21	20	21	18	20	41
5-Oct	19	19	21	22	20	19	23	22	22	25	25	25	25	24	24	25	20	19	25	41	31	17	12	18	41
6-Oct	19	22	17	14	15	14	15	17	17	20	23	22	26	24	23	22	18	19	22	34	31	31	19	18	34
7-Oct	20	33	16	14	18	14	21	28	48	69	62	38	83	79	34	29	29	79	53	82	77	14	14	15	83
8-Oct	13	19	18	17	15	16	14	14	18	17	16	18	16	18	18	19	17	14	15	15	13	13	13	13	19
9-Oct	14	18	53	72	30	52	57	25	22	21	18	21	25	23	19	15	17	14	16	16	16	14	13	14	72
10-Oct	13	21	55	22	39	33	18	17	37	17	23	17	17	15	16	18	21	11	13	13	13	13	11	12	55
11-Oct	16	14	12	14	23	20	17	11	19	20	23	19	22	17	15	14	15	14	11	12	12	15	13	11	23
12-Oct	17	16	21	29	27	22	19	15	16	17	20	22	22	25	22	24	15	12	10	10	12	13	15	14	29
13-Oct	16	16	16	18	18	19	19	17	20	18	20	24	23	22	19	21	14	8	13	11	12	13	10	14	24
14-Oct	13	13	12	13	12	11	13	15	12	14	18	18	19	18	17	15	14	13	12	12	11	13	12	11	19
15-Oct	12	13	14	15	21	19	16	20	14	18	17	26	25	38	24	20	13	14	12	18	21	26	35	37	38
16-Oct	27	32	27	26	29	38	36	31	38	34	32	29	45	37	34	24	30	51	34	10	11	59	30	15	59
17-Oct	18	15	14	20	41	35	58	49	39	28	25	24	20	24	20	22	18	16	15	32	49	24	30	23	58
18-Oct	12	22	20	13	16	17	15	21	20	17	23	19	20	22	21	27	22	19	19	26	30	24	27	28	30
19-Oct	33	31	31	27	27	26	29	30	28	28	32	33	31	36	32	38	22	40	43	22	28	31	32	32	43
20-Oct	29	28	32	30	23	26	26	17	19	19	20	18	21	22	22	22	20	16	17	17	24	14	14	56	56
21-Oct	19	23	15	23	13	11	11	14	22	16	16	19	18	20	21	18	46	71	20	38	26	UO	UO	UO	71
22-Oct	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
23-Oct	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	23
24-Oct	18	18	17	15	18	25	20	17	21	24	21	21	25	21	20	21	21	18	19	20	19	18	19	16	25
25-Oct	18	20	20	19	20	17	23	28	41	40	31	37	29	24	24	21	18	23	18	24	24	25	16	25	41
26-Oct	20	22	24	24	17	12	18	17	19	21	26	25	25	20	24	22	23	28	23	35	33	24	37	40	40
27-Oct	38	38	30	42	21	23	24	21	33	25	27	29	28	25	31	27	27	36	23	18	23	14	19	27	42
28-Oct	26	33	24	24	38	33	20	19	19	19	21	23	23	23	23	23	20	14	16	18	16	16	14	15	38
29-Oct	14	14	17	14	18	16	17	20	19	26	27	27	27	27	24	21	15	21	22	13	17	18	21	39	39
30-Oct	29	25	24	27	26	26	72	22	76	59	33	27	32	22	22	16	18	17	18	20	19	17	17	22	76
31-Oct	22	20	28	26	26	35	21	15	16	20	23	23	24	23	23	24	26	40	25	26	34	11	14	14	40
40 41 55 72 41 52 72 49 76 69 62 38 83 79 34 38 46 79 53 82 77 59 37 56																									
Diurnal Maximum																									
M - Maintenance UO - Unstable Operation																									



Appendix 1 - Summary of Ambient Air Quality Objectives (AAQOs) and Ambient Air Quality Guidelines (AAQGs) in October 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	30Oct23, 08:00	420578	1-hr	80	80.5	exc
Fort Chip	PM2.5	30Oct23, 09:00	420578	1-hr	152	152.4	exc
Fort Chip	PM2.5	30Oct23, 10:00	420578	1-hr	187	187.2	exc
Fort Chip	PM2.5	30Oct23, 11:00	420578	1-hr	180	180.1	exc
Fort Chip	PM2.5	30Oct23, 12:00	420578	1-hr	104	104.1	exc
Fort Chip	PM2.5	30Oct23, 13:00	420578	1-hr	89	88.7	exc
Lower Camp	H2S	30Oct23, 18:00	420309	1-hr	19	19.5	exc
Lower Camp	H2S	30Oct23, 19:00	420311	1-hr	18	18.3	exc
Lower Camp	H2S	30Oct23, 21:00	420311	1-hr	17	17.3	exc
Fort Chip	PM2.5	30Oct23, 24:00	420578	24-hr	72	71.7	exc
Fort Chip	PM2.5	40Oct23, 09:00	420578	1-hr	98	97.9	exc
Fort Chip	PM2.5	40Oct23, 10:00	420578	1-hr	100	99.8	exc
Fort Chip	PM2.5	40Oct23, 11:00	420578	1-hr	99	99.2	exc
Fort Chip	PM2.5	40Oct23, 12:00	420578	1-hr	143	142.8	exc
Fort Chip	PM2.5	40Oct23, 13:00	420578	1-hr	190	189.7	exc
Fort Chip	PM2.5	40Oct23, 24:00	420578	24-hr	56	56	exc
Leismer	H2S	40Oct23, 24:00	420364	24-hr	4	4	exc
Conklin	PM2.5	70Oct23, 20:00	420579	1-hr	164	164.2	exc
Conklin	PM2.5	70Oct23, 21:00	420579	1-hr	195	194.8	exc
Conklin	PM2.5	70Oct23, 24:00	420579	24-hr	31	31.3	exc
Conklin	PM2.5	80Oct23, 19:00	420579	1-hr	146	145.5	exc
Fort Hills	PM2.5	15Oct23, 20:00	420797	1-hr	85	85	exc
Fort Chip	PM2.5	16Oct23, 09:00	421150	1-hr	85	84.8	exc
Conklin	PM2.5	16Oct23, 18:00	421151	1-hr	125	124.6	exc
Fort Hills	PM2.5	16Oct23, 20:00	420850	1-hr	88	88	exc
Fort Chip	PM2.5	16Oct23, 24:00	421150	24-hr	40	39.9	exc
Fort Hills	PM2.5	17Oct23, 01:00	420897	1-hr	124	124.1	exc
Mannix	H2S	17Oct23, 05:00	420846	1-hr	10	9.9	nae
Conklin	PM2.5	29Oct23, 21:00	421428	1-hr	83	82.6	exc
Conklin	PM2.5	29Oct23, 22:00	421428	1-hr	116	116	exc
Conklin	PM2.5	30Oct23, 03:00	421440	1-hr	90	89.9	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 29, 2023
2:46:38 PM
Request # 4617410

Submitted by: EN6138
Submission Date: Nov 29, 2023 2:46:12 PM

File Type

Ambient Data

File Name

AMB-WBEA-202310-V00.xml

Total Number of Files: 1

*** End of Report ***

**ELECTRONIC TRANSFER SYSTEM
AIRDATA
SUBMISSION REPORT**

November 29, 2023
2:48:20 PM
Request # 4617414

Submitted by: EN6138
Submission Date: Nov 29, 2023 2:48:11 PM

File Type
Airshed Monitoring Report

File Name
WBEA-202310.pdf

Total Number of Files: 1

*** End of Report ***

**ELECTRONIC TRANSFER SYSTEM
AIRDATA
SUBMISSION REPORT**

November 29, 2023
2:49:01 PM
Request # 4617419

Submitted by: EN6138
Submission Date: Nov 29, 2023 2:48:51 PM

File Type

Calibration Report

File Name

CAL-WBEA-202310.pdf

Total Number of Files: 1

*** End of Report ***



End of Report