



**WOOD BUFFALO
ENVIRONMENTAL ASSOCIATION**

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Wood Buffalo Environmental Association

SEPTEMBER 2023 MONTHLY REPORT

CONTINUOUS MONITORING

October 30, 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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October 30, 2023

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

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

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

The continuous ambient air quality monitoring network stations are:

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

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



Industry Operators

Athabasca Oil Corporation
Canadian Natural

EPEA Approval No.

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

Cenovus Energy Inc.

48522-01-00

ChemTrade Logistics

404827-00-00

CNOOC International

137467-01-00; 236394-00-00

Connacher Oil and Gas Ltd.

240008-00-00

ConocoPhillips

48263-01-00

Fort Hills Energy Corporation

151469-01-00

Hammerstone Corporation

189942-00-00

Harvest Operations Corp.

246984-01-00

H.J. Baker Sulphur Canada ULC

426549-00-00

Husky Oil Operations Ltd.

206355-01-00

Imperial Oil Ltd.

00046586-00-00

Inter Pipeline Ltd.

73203-02-00

Keyera Energy Ltd.

187-03-00

MEG Energy Corp.

00216466-01-00

Parsons Creek Aggregates

231302-00

PetroChina Canada Ltd.

254465-00-00

Suncor Energy Inc.

094-02-00; 80105-01-00

Sunshine Oilsands Ltd.

305529-00-00

Surmont Energy

318401-00-00

Syncrude Canada Ltd.

026-02-00

Titan Tire Reclamation Corporation

364232-00-00

Government and Non-Government Organizations

Alberta Energy Regulator

Health Canada

Alberta Environment and Protected Areas

Keyano College

Alberta Health

Parks Canada

Alberta Health Services

Regional Municipality of Wood Buffalo

Environment and Climate Change Canada

Indigenous Communities

Athabasca Chipewyan First Nation

Fort McKay First Nation

Chard Métis Nation

Fort McMurray 468 First Nation

Chipewyan Prairie Dene First Nation

Fort McKay Métis

Christina River Dene Nation Council

Lakeland Métis

Conklin Resource Development Advisory
Council

McMurray Métis

Mikisew Cree First Nation

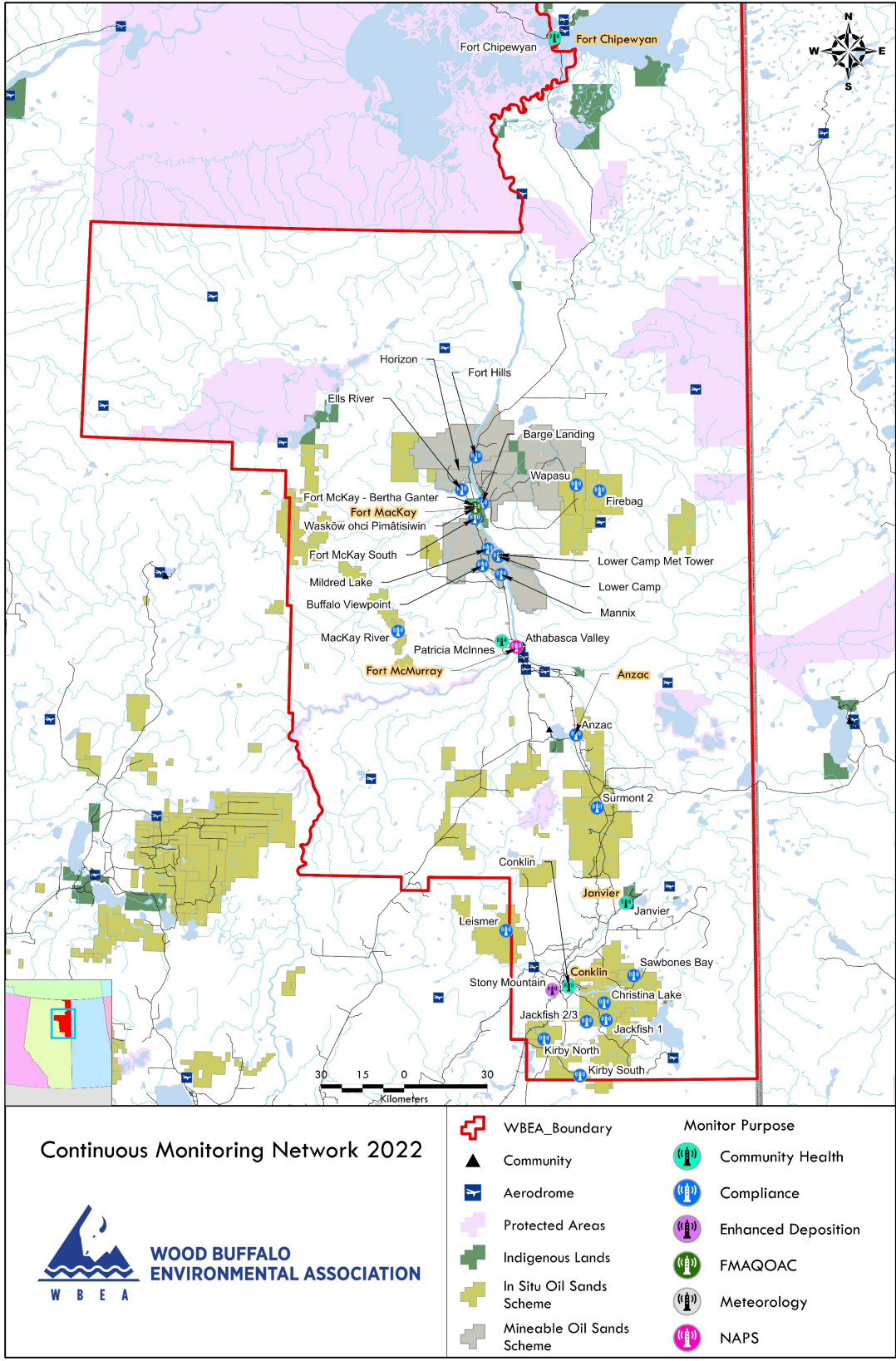


Figure 1: Map of WBEA Continuous Monitoring Network

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

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

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

There were one ground-level concentrations in excess of the 1-hour SO₂ objective reported to AEPA; following data validation and processing, the exceedance was confirmed.

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

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

There were two hundred fifty-three 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.

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

There were two ground-level concentrations in excess of the 30-day dustfall guideline 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 September 2023, there were three instances that resulted in monitoring instruments operating less than 90% of the time.

1. The wind speed and wind direction sensor at Stony Mountain air monitoring station (AMS) operated less than 90% of September 2023, which is a contravention of Clause DQ 4-C, of Chapter 6 of the Air Monitoring Directive (2016, as amended). This incident was reported to Alberta Environment and Protected Areas (AEPA) on October 5, 2023 (reference number 420368).

During the monthly data validation process, the WBEA identified a repeated wind direction pattern that did not compare well with nearby stations. An on-site investigation determined the wind direction vane was unbalanced and the sensor was replaced on September 28. As a result, 491 hours of data were invalid from September 8 to 28, 2023.

2. The ammonia (NH₃) sensor at the Patricia McInnes air monitoring station (AMS) operated less than 90% of September 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 420983).

The AMD specifies the range at which the daily spans and monthly calibration are conducted on the NH₃ analyzer. The NH₃ analyzer requires additional time to stabilize to ambient conditions following daily spans and routine monthly multipoint calibrations at the range required by the AMD. This additional stabilization time is necessary and expected for this type of analyzer after exposure to high concentrations of NH₃ gas. As a result, it may take multiple hours before the response returns to normal. In the month of September, the additional stabilization time after the spans resulted in a total of 78 hours of invalid data.

3. The O₃ analyzer at Anzac air monitoring station (AMS) operated less than 90% of September 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 5, 2023 (reference number 420369).

During a site visit on September 5, the WBEA discovered that the O₃ sample inlet line had been left disconnected from the manifold, inadvertently, since the previous O₃ calibration, preventing the analyzer from sampling ambient air. The line was reconnected to the manifold upon discovery. A review of the baseline data during the monthly data validation process confirmed that the line had been disconnected since the September 1 calibration, resulting in 129 hours of invalid data for September 2023.

3.2 Intermittent Monitoring

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

Cleaning of the sample manifold on September 14 interrupted the normal operations of the SO₂, NO₂, O₃, TRS, H₂S, THC/NMHC/CH₄, CO₂, and NH₃ analyzers for 2 hours.

A flatline in the output of the TRS analyzer on September 21 and 22 resulted in 22 hours of invalid data. Subsequent maintenance to reboot the analyzer on September 22 resulted in a further 1 hour of downtime.

A flatline in the output signal of the NH₃ analyzer on September 21 and 22 resulted in 17 hours of invalid data. Subsequent maintenance to reboot the NH₃ analyzer on September 22 resulted in a further 1 hour of downtime.

The NH₃ analyzer required additional time to stabilize to levels below ambient concentrations following the automated daily spans and routine monthly multipoint calibrations. Additional time is required for stabilization after exposure to high concentrations of NH₃ gas, and this is an inherent behavior in the NH₃

analyzer operations due to the properties of the NH₃ gas. Data for 1 to 2 hours following the daily spans have been reported as invalid for a total of 38 hours this month.

Maintenance to verify performance of relative humidity sensor on September 15 interrupted the normal operations of the 10m relative humidity sensor resulting in 2 hours of downtime.

Maintenance activities on other sensors required bringing down the meteorological on September 18 tower interrupted the normal operation of the wind sensor and resulting in 1 hour of downtime.

A flatline in the output signal of the wind sensors on September 18 resulted in 1 hour of invalid data.

The surface leaf wetness sensor operated out of range on September 7 resulting in 2 hours of invalid data.

Station 2, Mildred Lake

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

A flatline in the output signal of the wind sensor on September 9 and 30 resulted in 4 hours of invalid data.

Station 3, Lower Camp – Meteorology

A flatline in the output signal of the wind sensor, wind direction and vertical wind speed at 100-meter on September 6 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 September 9 resulted in 2 hours of invalid data.

Station 4, Buffalo Viewpoint

Analyzer failure due to inconsistent response of the O₃ analyzer on September 13 resulted in 19 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 September. Therefore, the calibrator zeros from the August, September, and October multi-point calibrations were used to validate the analyzer baseline response.

Station 5, Mannix

Maintenance to replace the support gas cylinder on September 8 interrupted the normal operation of the THC/NMHC/CH₄ analyzer resulting in 3 hours of downtime.

Cleaning of the sample manifold on September 8 interrupted the normal operation of the H₂S analyzer for 2 hours.

The relative humidity sensor at the 75-meters elevation operated out of range on September 6 and 28 resulting in 7 hours of invalid data.

The relative humidity sensor at the 90-meters elevation operated out of range on September 6 and 28 resulting in 7 hours of invalid data.

A flatline in the output signal of the wind sensor, wind direction and vertical wind speed at 45-meter on September 6 resulted in 1 hour 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 76 hours this month.

Maintenance to verify the daily QA check on September 6 interrupted the normal operation of the O₃ analyzer resulting in 1 hour of downtime.

Unstable operations due to flatline signal of the SO₂ analyzer on September 7 and 8 resulted in 15 hours of invalid data. Subsequent maintenance to reboot the analyzer on September 8 resulted in additional 1 hour of downtime.

Cleaning of the sample manifold on September 20 interrupted the normal operations of the NH₃, O₃, SO₂ THC/NMHC/CH₄, and TRS analyzers for 1 hour.

Station 7, Athabasca Valley

A flatline in the output signal of the SO₂ analyzer on September 8 and 9 resulted in 18 hours of invalid data. Subsequent maintenance to reboot the analyzer on September 9 resulted in a further 1 hour of downtime.

Failure to record data for the SO₂ analyzer on September 25 resulted in 1 hour of invalid data.

Multiple flatlines in the output signal of the THC/NMHC/CH₄ analyzer throughout the month resulted in 60 hours of invalid data. Maintenances to reboot the analyzer resulted in a further 5 hours of downtime.

A flatline in the output signal of the barometric pressure sensor on September 1 resulted in 10 hours of invalid data. Subsequent maintenance to replace the sensor on September 1 resulted in a further 2 hours of downtime.

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

Station 8, Fort Chipewyan

Maintenance to verify the daily QA check on September 1 and 5 interrupted the normal operations of the CO₂, NO₂, and SO₂ analyzers resulting in a total of 7 hours of downtime.

Unstable operations due to flatline signal of the CO and CO₂ analyzers on September 4 and 6 resulted in a total of 12 hours of invalid data.

Station power failures throughout the month interrupted the normal operations of all air quality analyzers for a total of 11 hours.

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

Station 9, Barge Landing

Cleaning of the sample manifold on September 7 interrupted the normal operations of NO₂, SO₂, and THC/NMHC/CH₄ analyzers for 2 hours.

Maintenance to replace the PM2.5 analyzer on September 29 resulted in 2 hours of downtime.

The daily span checks for the TRS analyzer were outside the 10% AMD criteria on September 1 due to high atmospheric humidity.

Station 11, Lower Camp

The relative humidity sensor operated out of range throughout the month resulting in 17 hours of invalid data.

Station 13, Fort McKay South

Maintenance to replace the PM2.5 analyzer on September 29 resulted in 1 hour of downtime.

Flatline in the output signal of the wind sensors from September 9 to September 30 resulted in 3 hours of invalid data.

Station 14, Anzac

Maintenance to verify the daily QA check on September 20 interrupted the normal operations of all gaseous analyzers resulting in 5 hours of downtime.

Maintenance to replace the support gas cylinder for THC/NMHC/CH₄ analyzer on September 25 resulted in 2 hours of downtime.

Unstable operations due to sample line being disconnected from September 1 to 5 affected the normal operation of the O₃ analyzer resulting in 98 hours of invalid data.

Maintenance to verify the daily QA check on September 20 interrupted the normal operations of the O₃ analyzer for 1 hour.

Maintenance to verify the daily QA check on September 20 interrupted the normal operations of the NO₂ analyzer for 1 hour.

The relative humidity sensor operated out of range from September 6 to September 7 resulted in 4 hours of invalid data.

Station 17, Wapasu

Cleaning of the sample manifold on September 22 interrupted the normal operations of H₂S, O₃, SO₂ and THC analyzers for 1 hour.

The daily span check for the O₃ analyzer was outside the 10% AMD criteria on September 13 due to the lamp voltage.

A flatline in the output signal of the wind sensor on September 4 resulted in 1 hour of invalid data.

Station 18, Stony Mountain

Unstable operations of the THC/NMHC/CH₄ due to shifting of the chromatogram windows on September 8 resulted in 10 hours of invalid data. Subsequent maintenance to replace the THC/NMHC/CH₄ analyzer on September 8 resulted in an additional 2 hours of downtime.

Station power failure on September 11 and 12 interrupted the normal operations of all air quality analyzers for 11 hours.

Unstable operations due to flatline signal of the CO₂ and O₃ analyzers on September 12 resulted in 11 hours of invalid data.

Unstable operations due to flatline signal of the CO analyzer on September 12 resulted in 10 hours of invalid data. Subsequent maintenance to reboot the CO analyzer on September 12 resulted in an additional 1 hour of downtime.

Unstable operations of the THC/NMHC/CH₄ analyzer due to flameout of the FID (flame ionization detector) on September 12 resulted in 10 hours of invalid data. Subsequent maintenance to re-ignite the FID flame on September 12 resulted in additional 1 hour of downtime.

Unstable operations of the THC/NMHC/CH₄ analyzer due to depletion of the support gases on September 20 and 21 resulted in 34 hours of invalid data. Subsequent maintenance to replace the support gas of THC/NMHC/CH₄ analyzer on September 21 resulted in additional 2 hours of downtime.

Maintenance to replace the CO₂ analyzer on September 29 due to noisy baseline signal resulted in 5 hours of downtime.

Unstable operations due to inconsistent response of the wind sensor throughout the month resulted in 489 hours of invalid data. Subsequent maintenance to replace the wind direction sensor on September 28 resulted in an additional 2 hours of downtime.

Failure to record data for the precipitation collector on September 11 resulted in 10 hours of invalid data.

The relative humidity sensor operated out of range on September 29 resulting in 7 hours of invalid data.

Station 19, Firebag

Cleaning of the sample manifold on September 29 interrupted the normal operations of H₂S, SO₂ and THC analyzers for 1 hour.

The relative humidity sensor operated out of range throughout the month resulting in 34 hours of invalid data.

Station 20, MacKay River

No operational issues to report.

Station 21, Conklin

Cleaning of the sample manifold on September 26 interrupted the normal operations of NO₂, O₃, and TRS analyzers for 1 hour.

Failure to record data for the PM_{2.5} analyzer on September 26 resulted in 1 hour of invalid data.

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

Station 22, Janvier

Note: The as-found span of the O₃ analyzer on was outside of AMD compliance due to maintenance which was completed to the station calibrator on August 31. An internal WBEA audit of this instrument was completed on September 6 which showed the response of this analyzer to be well within AMD compliance.

Maintenance to verify the daily QA check on September 1 interrupted the normal operations of the TRS analyzer for 3 hours.

Maintenance to verify the daily QA check on September 1 and 2 interrupted the normal operations of the NO₂ analyzer for 2 hours.

An internal audit on September 5 and 6 interrupted the normal operations of all air quality analyzers for 1 to 4 hours.

The TRS span target failed to meet the 10% AMD criteria on September 24 and 25 resulting in 48 hours of invalid data.

A flatline in the output signal of the wind sensor on September 10, 27 and 30 resulted in 5 hours of invalid data.

The daily span check of all gaseous analyzers was outside the 10% AMD criteria on September 1 due to an interruption in the station calibrator configuration.

Station 23, Fort Hills

Cleaning of the sample manifold on September 7 interrupted the normal operations of the NO₂ and TRS for 1 hour.

Failure to record data for all parameters on September 11 resulted in 1 hour of invalid data.

Maintenance to replace the support gas cylinder on September 27 interrupted the normal operations of the THC/NMHC/CH₄ analyzer resulting in 2 hours of downtime.

Unstable operations due to a flatline in the output signal of the THC/NMHC/CH₄ analyzer on September 27 resulted in 1 hour of invalid data.

Station 25, Waskōw ohci Pimâtisiwin

Cleaning of the sample manifold on September 28 interrupted the normal operations of the H₂S and SO₂ for 1 hour.

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

Station 26, Christina Lake

Maintenance to replace the station calibrator on September 21 resulted in 1 hour of downtime.

Station 27, Jackfish 2/3

A flatline in the output signal of the temperature sensor on September 29 resulted in 2 hours of invalid data.

Station 29, Surmont 2

Cleaning of the sample manifold on September 6 interrupted the normal operations of the H₂S, SO₂ and THC analyzers for 1 hour.

Station power failure on September 8 interrupted the normal operations of H₂S, SO₂, NO₂ and PM_{2.5} analyzers for 7 hours.

Station power failure on September 8 interrupted the normal operations of THC analyzers for 8 hours.

The relative humidity sensor operated out of range on throughout the month resulting in 2 hours of invalid data.

Intermittent flatlines in the output signal of the wind sensor throughout the month resulted in 16 hours of invalid data.

Station 30, Ells River

The daily span checks for the TRS analyzer were outside the 10% AMD criteria on September 1 due to high atmospheric humidity.

A flatline in the output signal of the wind sensor on September 10 and 30 resulted in 2 hours of invalid data.

Station 505, Sawbones Bay

The relative humidity sensor operated out of range on throughout the month resulting in 30 hours of invalid data.

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

Station 507, Kirby South

Cleaning of the sample manifold on September 15 interrupted the normal operations of the H₂S, SO₂, and THC analyzers for 2 hours.

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

Yours sincerely,

Wood Buffalo Environmental Association

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

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

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

Karina Fenwick, Data Technician
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E: kfenwick@wbea.org

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



Dianne McIsaac
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WOOD BUFFALO ENVIRONMENTAL ASSOCIATION
MONTHLY AIR MONITORING SUMMARY

September 2023

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APPROVAL NUMBERS	REPORT DATE						
	MONTH	YEAR					
289664-00-00	9	2023					
241311-00-00	CONTINUOUS AMBIENT MONITORING						
20809-02-00							
149968-01-00							
237382-00-00				ONE-HOUR AVERAGE		24-HOUR AVERAGE	
48522-01-00	PARAMETER	STN. NO.	% TIME OPERATIONAL	MAXIMUM CONCENTRATION	NO. READINGS > REGULATION	MAXIMUM CONCENTRATION	NO. READINGS > REGULATION
240008-00-00	SO2(ppb)	1	100	13	0	5.3	0
48263-01-00	SO2(ppb)	2	100	32.8	0	8.6	0
224816-00-00	SO2(ppb)	4	100	31.6	0	6.5	0
151469-01-00	SO2(ppb)	5	100	15.4	0	5.1	0
189942-00-00	SO2(ppb)	6	98	7.6	0	1.2	0
206355-00-00	SO2(ppb)	7	97	3.1	0	0.8	0
46586-00-00	SO2(ppb)	8	99	7.0	0	2.7	0
73203-02-00	SO2(ppb)	9	100	17.8	0	3.2	0
216466-01-00	SO2(ppb)	11	100	218.4	1	18.2	0
137467-01-00	SO2(ppb)	13	100	25.2	0	5.7	0
236394-00-00	SO2(ppb)	14	100	8.1	0	1.3	0
254465-00-00	SO2(ppb)	17	100	24.8	0	3.9	0
094-03-00	SO2(ppb)	18	98	3.7	0	0.7	0
80105-01-00	SO2(ppb)	19	100	31.6	0	6.8	0
305529-00-00	SO2(ppb)	20	100	11.0	0	1.2	0
318401-00-00	SO2(ppb)	21	100	1.8	0	0.5	0
026-03-00	SO2(ppb)	22	100	2.6	0	0.5	0
364232-00-00	SO2(ppb)	23	100	35.4	0	6.0	0
228044-00-00	SO2(ppb)	25	100	11.3	0	4.7	0
247548-00-00	SO2(ppb)	26	100	21.4	0	6.3	0
231302-00-00	SO2(ppb)	27	100	5.7	0	1.5	0
153125-01-00	SO2(ppb)	29	99	6.6	0	1.4	0
	SO2(ppb)	30	100	35.1	0	5.4	0
	SO2(ppb)	505	100	13.0	0	5.2	0
	SO2(ppb)	507	100	18.3	0	2.2	0
	H2S(ppb)	1	100	6.3	0	0.8	0
	H2S(ppb)	2	100	9.0	0	1.0	0
	H2S(ppb)	4	100	2.3	0	0.6	0
	H2S(ppb)	5	100	10.3	1	1.5	0
	H2S(ppb)	11	100	24.6	1	1.9	0
	H2S(ppb)	17	100	1.3	0	0.6	0
	H2S(ppb)	19	100	2.4	0	0.6	0
	H2S(ppb)	20	100	2.1	0	0.6	0
	H2S(ppb)	25	100	5.3	0	0.9	0
	H2S(ppb)	26	100	1.4	0	0.8	0
	H2S(ppb)	27	100	1.0	0	0.6	0
	H2S(ppb)	29	98	1.1	0	0.5	0
	H2S(ppb)	505	100	1.6	0	0.9	0
	H2S(ppb)	507	100	1.7	0	0.7	0
	TRS(ppb)	1	97	6.6	0	1.2	0
	TRS(ppb)	6	100	2.2	0	1.0	0
	TRS(ppb)	7	100	1.9	0	0.8	0
	TRS(ppb)	8	100	4.5	0	1.2	0
	TRS(ppb)	9	100	5.2	0	1.2	0
	TRS(ppb)	13	100	7.3	0	1.3	0
	TRS(ppb)	14	100	1.6	0	0.8	0
	TRS(ppb)	18	98	1.3	0	0.8	0
	TRS(ppb)	21	100	1.6	0	1.0	0
	TRS(ppb)	22	93	1.2	0	0.4	0
	TRS(ppb)	23	100	2.7	0	0.6	0
	TRS(ppb)	30	100	4.1	0	1.1	0
	THC(ppm)	1	100	2.9	-	2.4	-
	THC(ppm)	2	100	3.8	-	2.5	-
	THC(ppm)	4	100	4.3	-	2.5	-
	THC(ppm)	5	100	3.4	-	2.5	-
	THC(ppm)	6	100	2.5	-	2.2	-
	THC(ppm)	7	91	2.5	-	2.3	-
	THC(ppm)	9	100	2.8	-	2.4	-
	THC(ppm)	11	100	3.7	-	2.3	-
	THC(ppm)	13	100	3.3	-	2.4	-
	THC(ppm)	14	100	3.3	-	2.3	-
	THC(ppm)	17	100	3.7	-	2.7	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION
MONTHLY AIR MONITORING SUMMARY

September 2023

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REPORT DATE							
MONTH	YEAR						
9	2023	CONTINUOUS AMBIENT MONITORING					
APPROVAL NUMBERS	PARAMETER	STN. NO.	% TIME OPERATIONAL	ONE-HOUR AVERAGE		24-HOUR AVERAGE	
				MAXIMUM CONCENTRATION	NO. READINGS > REGULATION	MAXIMUM CONCENTRATION	NO. READINGS > REGULATION
289664-00-00	THC(ppm)	18	90	2.2	-	2.1	-
241311-00-00	THC(ppm)	19	100	3.8	-	2.6	-
20809-02-00	THC(ppm)	20	100	3.1	-	2.6	-
149968-01-00	THC(ppm)	21	100	3.2	-	2.4	-
237382-00-00	THC(ppm)	22	100	2.4	-	2.2	-
48522-01-00	THC(ppm)	23	99	5.6	-	2.8	-
240008-00-00	THC(ppm)	29	99	2.8	-	2.6	-
48263-01-00	THC(ppm)	30	100	3.3	-	2.4	-
224816-00-00	THC(ppm)	507	100	6.0	-	2.6	-
151469-01-00	O3(ppb)	1	100	45.1	0	32.1	-
189942-00-00	O3(ppb)	4	97	51.9	0	41.2	-
206355-00-00	O3(ppb)	6	100	49.9	0	40.7	-
46586-00-00	O3(ppb)	7	100	48.7	0	38.5	-
73203-02-00	O3(ppb)	8	100	55.6	0	41.6	-
216466-01-00	O3(ppb)	13	100	46.4	0	34.7	-
137467-01-00	O3(ppb)	14	86	50.7	0	37.6	-
236394-00-00	O3(ppb)	17	100	56.4	0	43.8	-
254465-00-00	O3(ppb)	18	97	49.8	0	37.6	-
094-03-00	O3(ppb)	21	100	51.0	0	39.1	-
80105-01-00	O3(ppb)	22	100	54.0	0	39.2	-
305529-00-00	NO2(ppb)	1	100	30.4	0	10.5	-
318401-00-00	NO2(ppb)	4	100	26.0	0	8.5	-
026-03-00	NO2(ppb)	6	100	22.7	0	4.7	-
364232-00-00	NO2(ppb)	7	100	28.9	0	7.5	-
228044-00-00	NO2(ppb)	8	99	14.1	0	6.3	-
247548-00-00	NO2(ppb)	9	100	31.3	0	12.4	-
231302-00-00	NO2(ppb)	13	100	26.2	0	11.1	-
153125-01-00	NO2(ppb)	14	100	9.4	0	4.2	-
	NO2(ppb)	17	100	13.7	0	7.9	-
	NO2(ppb)	18	98	5.1	0	3.4	-
	NO2(ppb)	19	100	17.1	0	6.7	-
	NO2(ppb)	20	100	13.5	0	4.4	-
	NO2(ppb)	21	100	13.2	0	3.5	-
	NO2(ppb)	22	99	5.5	0	2.9	-
	NO2(ppb)	23	100	36.5	0	14.9	-
	NO2(ppb)	26	100	21.3	0	14.0	-
	NO2(ppb)	27	100	6.9	0	2.9	-
	NO2(ppb)	29	99	7.6	0	4.0	-
	NO2(ppb)	30	100	33.5	0	8.3	-
	NO2(ppb)	505	100	16.3	0	10.8	-
	NO2(ppb)	507	100	16.9	0	5.8	-
	CO(ppm)	1	100	2.1	0	1.4	-
	CO(ppm)	7	100	2.1	0	1.4	-
	CO(ppm)	8	98	4.5	0	1.2	-
	CO(ppm)	18	97	2.4	0	1.3	-
	CO2(ppm)	1	100	534.7	-	452.2	-
	CO2(ppm)	8	99	507.7	-	450.3	-
	CO2(ppm)	18	96	449.9	-	429.0	-
	NH3(ppb)	1	92	43.4	0	24.3	-
	NH3(ppb)	6	89	64.4	0	30.9	-
	PM2.5(ug/m3)	1	100	435.5	163	288.4	19
	PM2.5(ug/m3)	4	100	505.9	159	349.8	19
	PM2.5(ug/m3)	6	100	441.2	140	321.2	15
	PM2.5(ug/m3)	7	100	512.7	122	321.0	14
	PM2.5(ug/m3)	8	100	687.4	282	288.7	20
	PM2.5(ug/m3)	9	100	432.7	163	293.2	20
	PM2.5(ug/m3)	13	100	466.4	172	313.3	20
	PM2.5(ug/m3)	14	100	482.8	111	326.3	13
	PM2.5(ug/m3)	17	100	554.6	163	284.9	16
	PM2.5(ug/m3)	18	98	524.0	101	308.2	13
	PM2.5(ug/m3)	21	100	519.4	98	316.0	14
	PM2.5(ug/m3)	22	100	408.1	93	262.9	12
	PM2.5(ug/m3)	23	100	585.7	217	296.7	23
	PM2.5(ug/m3)	29	99	444.0	112	303.3	14

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION
MONTHLY AIR MONITORING SUMMARY

September 2023

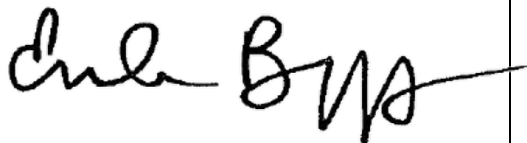
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REPORT DATE	
MONTH	YEAR
9	2023

CONTINUOUS AMBIENT MONITORING

APPROVAL NUMBERS	PARAMETER	STN. NO.	% TIME OPERATIONAL	ONE-HOUR AVERAGE		24-HOUR AVERAGE	
				MAXIMUM CONCENTRATION	NO. READINGS > REGULATION	MAXIMUM CONCENTRATION	NO. READINGS > REGULATION
289664-00-00	PM2.5(ug/m3)	30	100	421.1	170	278.1	21
241311-00-00	WS(km/h)	1	100	-	-	-	-
20809-02-00	WS(km/h)	2	99	-	-	-	-
149968-01-00	WS(km/h)	4	100	-	-	-	-
237382-00-00	WS(km/h)	5	100	-	-	-	-
48522-01-00	WS(km/h)	6	100	-	-	-	-
240008-00-00	WS(km/h)	7	100	-	-	-	-
48263-01-00	WS(km/h)	8	100	-	-	-	-
224816-00-00	WS(km/h)	9	100	-	-	-	-
151469-01-00	WS(km/h)	11	100	-	-	-	-
189942-00-00	WS(km/h)	13	100	-	-	-	-
206355-00-00	WS(km/h)	14	100	-	-	-	-
46586-00-00	WS(km/h)	17	100	-	-	-	-
73203-02-00	WS(km/h)	18	32	-	-	-	-
216466-01-00	WS(km/h)	19	100	-	-	-	-
137467-01-00	WS(km/h)	20	100	-	-	-	-
236394-00-00	WS(km/h)	21	100	-	-	-	-
254465-00-00	WS(km/h)	22	99	-	-	-	-
094-03-00	WS(km/h)	23	100	-	-	-	-
80105-01-00	WS(km/h)	25	99	-	-	-	-
318401-00-00	WS(km/h)	26	100	-	-	-	-
026-03-00	WS(km/h)	27	100	-	-	-	-
364232-00-00	WS(km/h)	29	98	-	-	-	-
228044-00-00	WS(km/h)	30	100	-	-	-	-
247548-00-00	WS(km/h)	505	100	-	-	-	-
231302-00-00	WS(km/h)	507	100	-	-	-	-
153125-01-00							



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 SEPTEMBER 2023

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

October 30, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT McKAY - BERTHA GANTER (AMS01)
 SEPTEMBER 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	684	34	36	99.72	13.1	0	5.3	0
H2S(ppb) Average	681	37	39	99.72	6.3	0	0.8	0
TRS(ppb) Average	659	36	61	96.53	6.6	0	1.2	0
THC(ppm) Average	684	34	36	99.72	2.9	-	2.4	-
NMHC(ppm) Average	684	34	36	99.72	0.429	-	0.205	-
CH4(ppm) Average	684	34	36	99.72	2.7	-	2.2	-
O3 (ppb) Average	684	34	36	99.72	45.1	0	32.1	-
NO2 (ppb) Average	683	35	37	99.72	30.4	0	10.5	-
NO (ppb) Average	683	35	37	99.72	53.9	-	7.7	-
NOX (ppb) Average	683	35	37	99.72	64.8	-	15	-
NH3 (ppb) Average	618	44	102	91.94	43.4	0	24.3	-
PM2.5 (ug/m3) Average	718	2	2	100	435.5	163	288.4	19
CO(ppm) Average	685	35	35	100	2.1	0	1.4	0
CO2(ppm) Average	684	34	36	99.72	534.7	0	452.2	0
Temperature 2 m (C) Average	720	0	0	100	27.1	-	21	-
Temperature 10 m (C) Average	718	0	2	99.72	26.5	-	20.8	-
Relative Humidity (%) Average	720	0	0	100	98.4	-	91.1	-
Wind Speed 10 m (km/h) Average	718	0	2	99.72	23	-	14	-
Wind Direction 10 m (deg) Average	718	0	2	99.72	-	-	-	-
Precipitation (mm) Total	720	0	0	100	1.6	-	5.4	-
Leaf Wetness (% of range) Average	718	0	2	99.72	91.6	-	28	-
Global Solar Radiation (W/m2) Average	720	0	0	100	672.8	-	209	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BERTHA GANTER FORT MCKAY (AMS01)
 SEPTEMBER 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	684	1.09	2.2	-	0	0	0.1	0.2	0.7	3.6	13.1
H2S (ppb) Average	681	0.41	0.5	-	0	0.1	0.1	0.3	0.5	0.8	6.3
TRS (ppb) Average	659	0.71	0.5	-	0.2	0.4	0.4	0.5	0.8	1.2	6.6
THC (ppm) Average	684	2.15	0.2	-	1.9	2	2	2.1	2.3	2.5	2.9
NMHC(ppm) Average	684	0.06	0.086	-	0	0	0	0	0.1	0.2	0.429
CH4(ppm) Average	684	2.09	0.1	-	1.9	2	2	2.1	2.2	2.3	
O3 (ppb) Average	684	17.64	11.9	-	0.1	2.3	7.3	16.1	26.6	34.5	45.1
NO2 (ppb) Average	683	5.22	5	-	0	0.3	1.5	3.8	7.8	11.7	30.4
NO (ppb) Average	683	1.89	5.1	-	0	0	0	0.1	1.4	4.8	53.9
NOX (ppb) Average	683	7.11	8.3	-	0	0.3	1.6	4.4	10.1	16.5	64.8
NH3 (ppb) Average	618	3.7	8.3	-	0	0	0	0	0	18.2	43.4
PM2.5 (ug/m3) Average	718	62.86	78.2	-	3.1	11.1	16.4	30.3	73.2	173.4	435.5
CO(ppm) Average	685	0.58	0.3	-	0.3	0.3	0.4	0.4	0.6	1.1	2.1
CO2(ppm) Average	684	433.14	19.6	-	404.2	412.6	419.4	428.7	443.3	456	534.7
Temperature 2 m (C) Average	720	13.64	5.8	-	1.2	6.2	8.9	13.3	18.1	21.5	27.1
Temperature 10 m (C) Average	718	13.83	5.4	-	2.4	6.8	9.2	13.5	18	21.1	26.5
Relative Humidity (%) Average	720	67.15	20.1	-	23.5	38.1	51.3	68.5	84	94	98.4
Wind Speed 10 m (km/h) Average	718	7.1	4	-	0	2	4	6	10	13	23
Wind Direction 10 m (deg) Average	718	-	-	-	-	-	-	-	-	-	-
Precipitation (mm) Total	720	-	-	7.6	-	-	-	-	-	-	-
Leaf Wetness (% of range) Average	718	7.83	16.3	-	0.3	0.8	1.2	1.7	2.7	24.7	91.6
Global Solar Radiation (W/m2) Average	720	132.01	185.9	-	0	0	0	14.6	228.3	470.4	672.8

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BERTHA GANTER FORT McKAY (AMS01)
 SEPTEMBER 2023

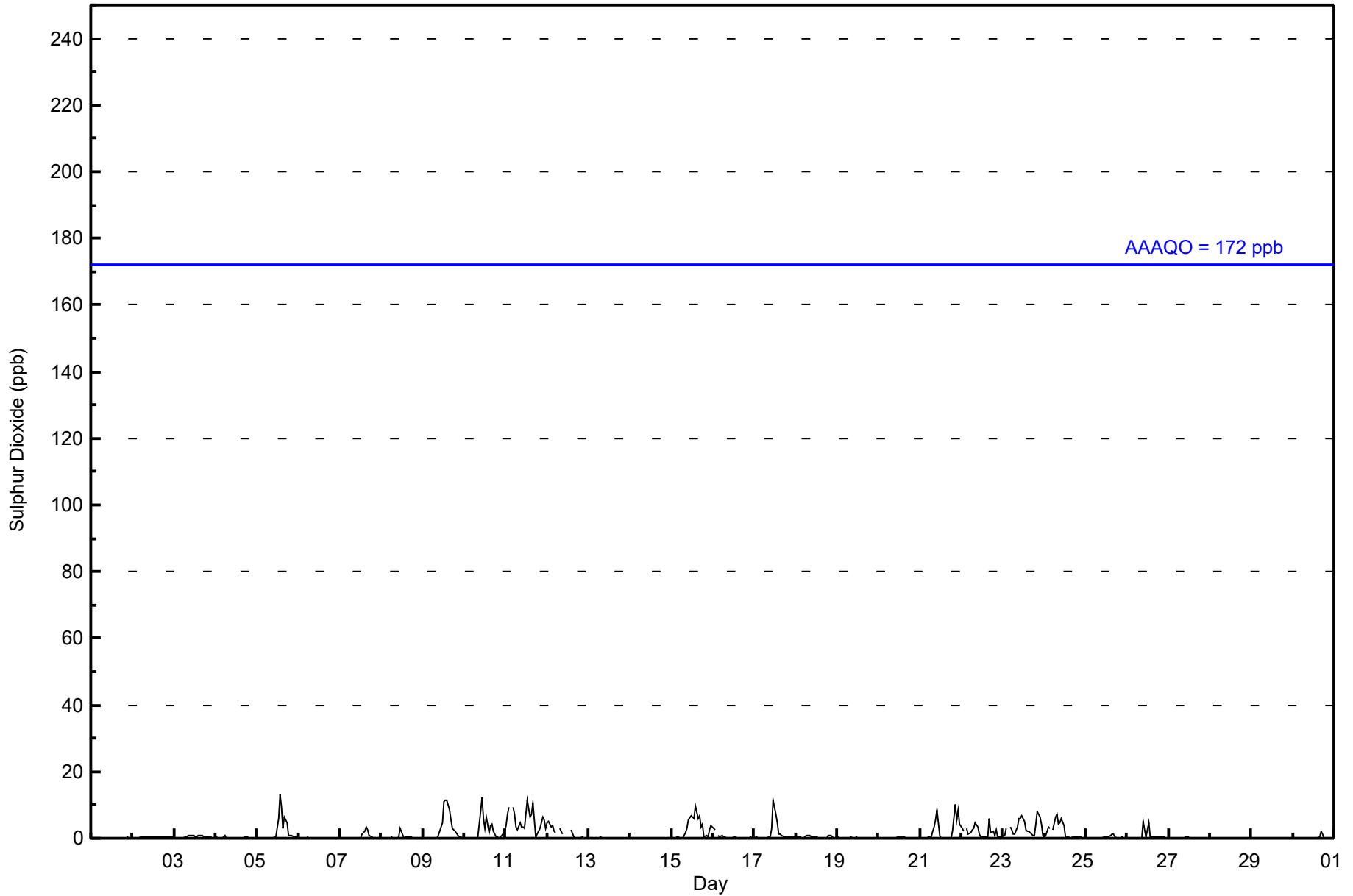
OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL GASEOUS ANALYZERS (except CO)	14 Sep 2023 12:00	14 Sep 2023 13:00	2	Maintenance - sample manifold cleaned
TRS	21 Sep 2023 12:00	22 Sep 2023 09:00	22	Unstable Operation - flatline in analyzer output signal
TRS	22 Sep 2023 10:00	22 Sep 2023 10:00	1	Maintenance - analyzer rebooted
NH3	21 Sep 2023 17:00	22 Sep 2023 09:00	17	Unstable Operation - flatline in analyzer output signal
NH3	22 Sep 2023 10:00	22 Sep 2023 10:00	1	Maintenance - analyzer rebooted
NH3	01 Sep 2023 04:00	30 Sep 2023 04:00	38	Stabilization after daily QA check
Temperature 10 m	15 Sep 2023 11:00	15 Sep 2023 12:00	2	Maintenance - station operator activities
Wind Speed, Wind Direction	15 Sep 2023 12:00	15 Sep 2023 12:00	1	Maintenance - station operator activities
Wind Speed, Wind Direction	18 Sep 2023 00:00	18 Sep 2023 00:00	1	Flat line in sensor output signal
Surface Leaf Wetness	07 Sep 2023 02:00	07 Sep 2023 03:00	2	Sensor operated out of range



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	676	98.83	98.83
11 - 20	8	1.17	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: 684

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

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

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	34	15	8	1	3	8	6	93	175	86	52	39	33	56	35	30	674
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	34	15	8	1	3	8	6	98	178	86	52	39	33	56	35	30	682

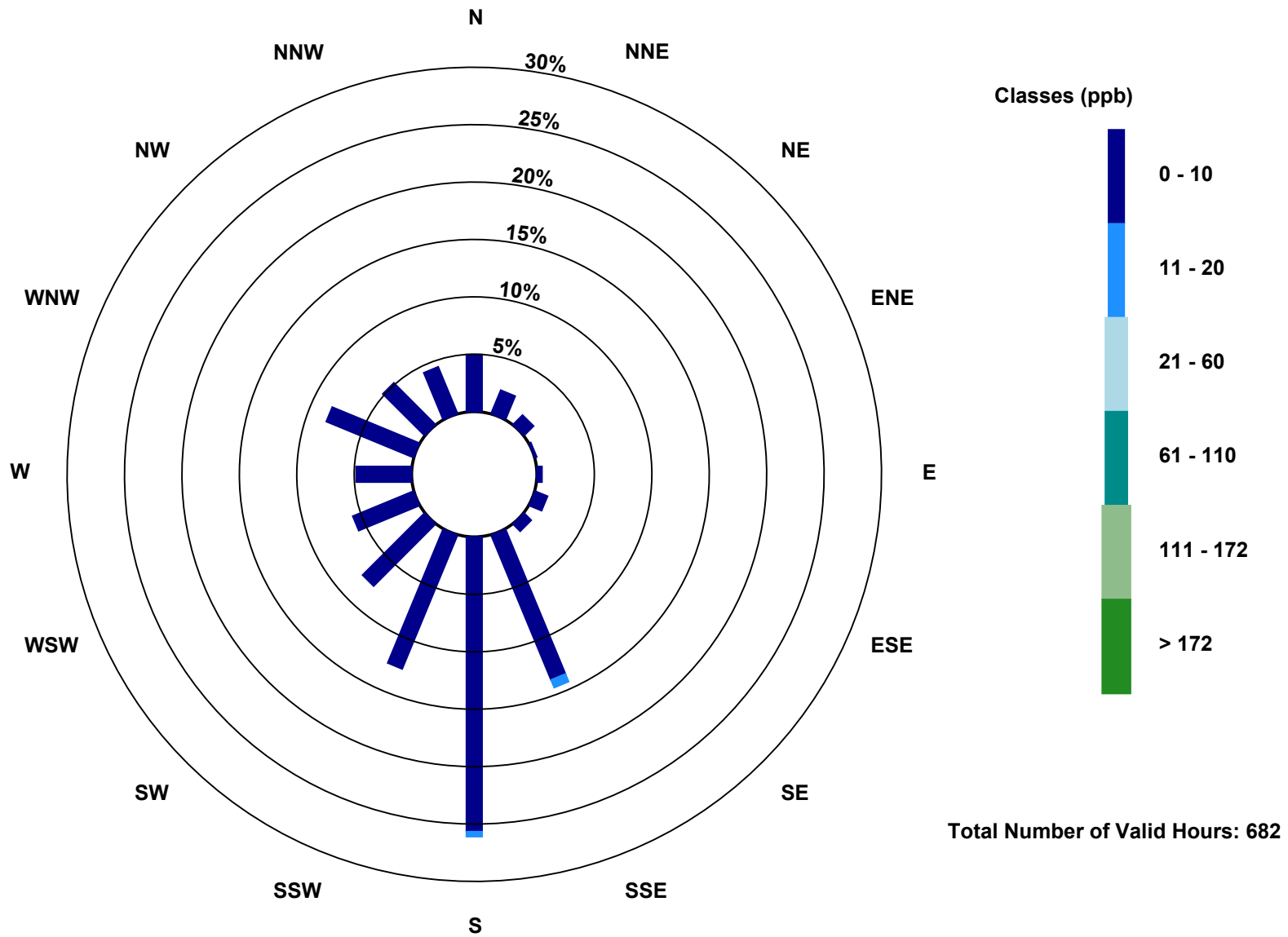
Total Number of Valid Hours: 682

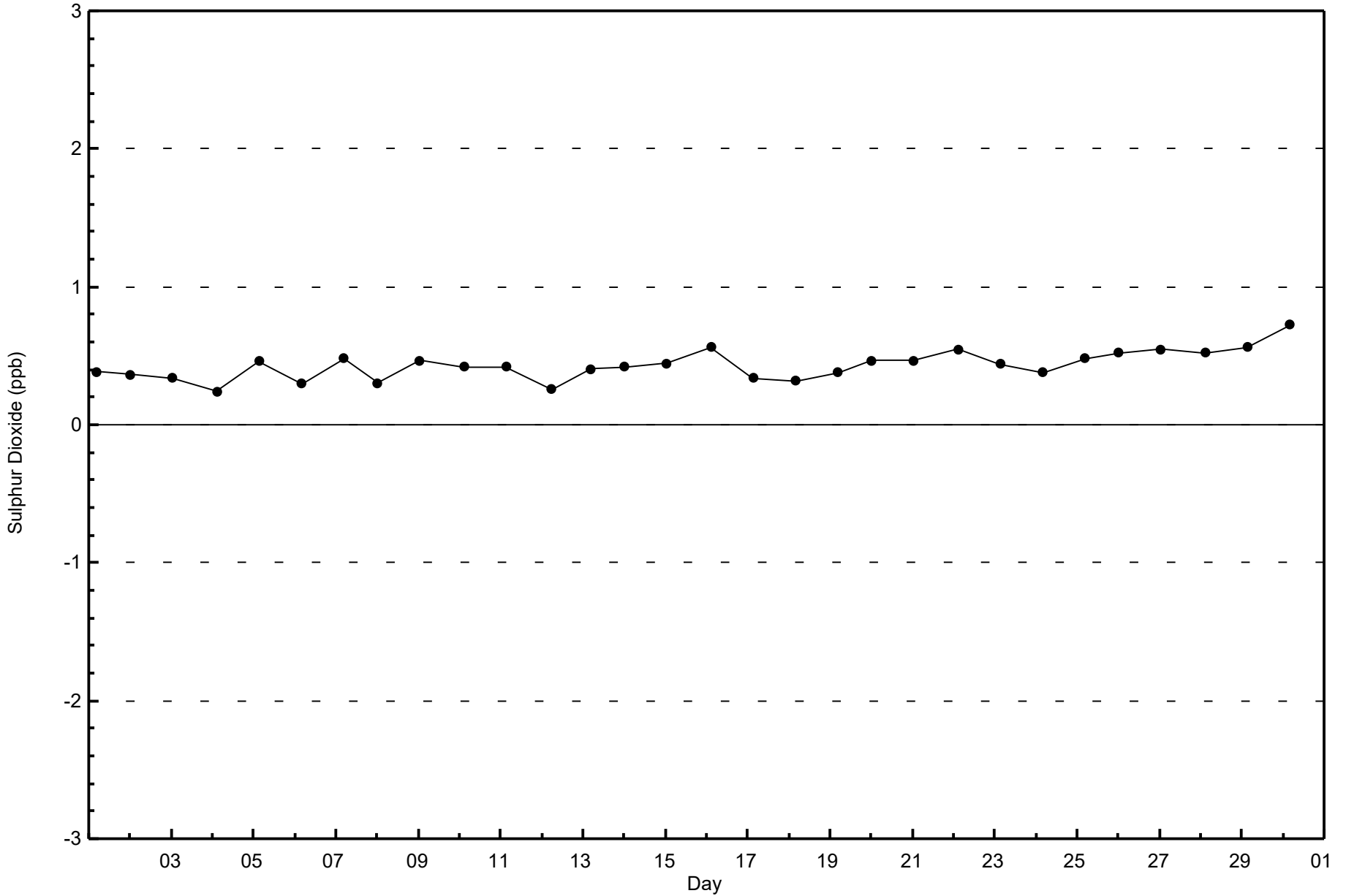
Total Number of Hours: 720

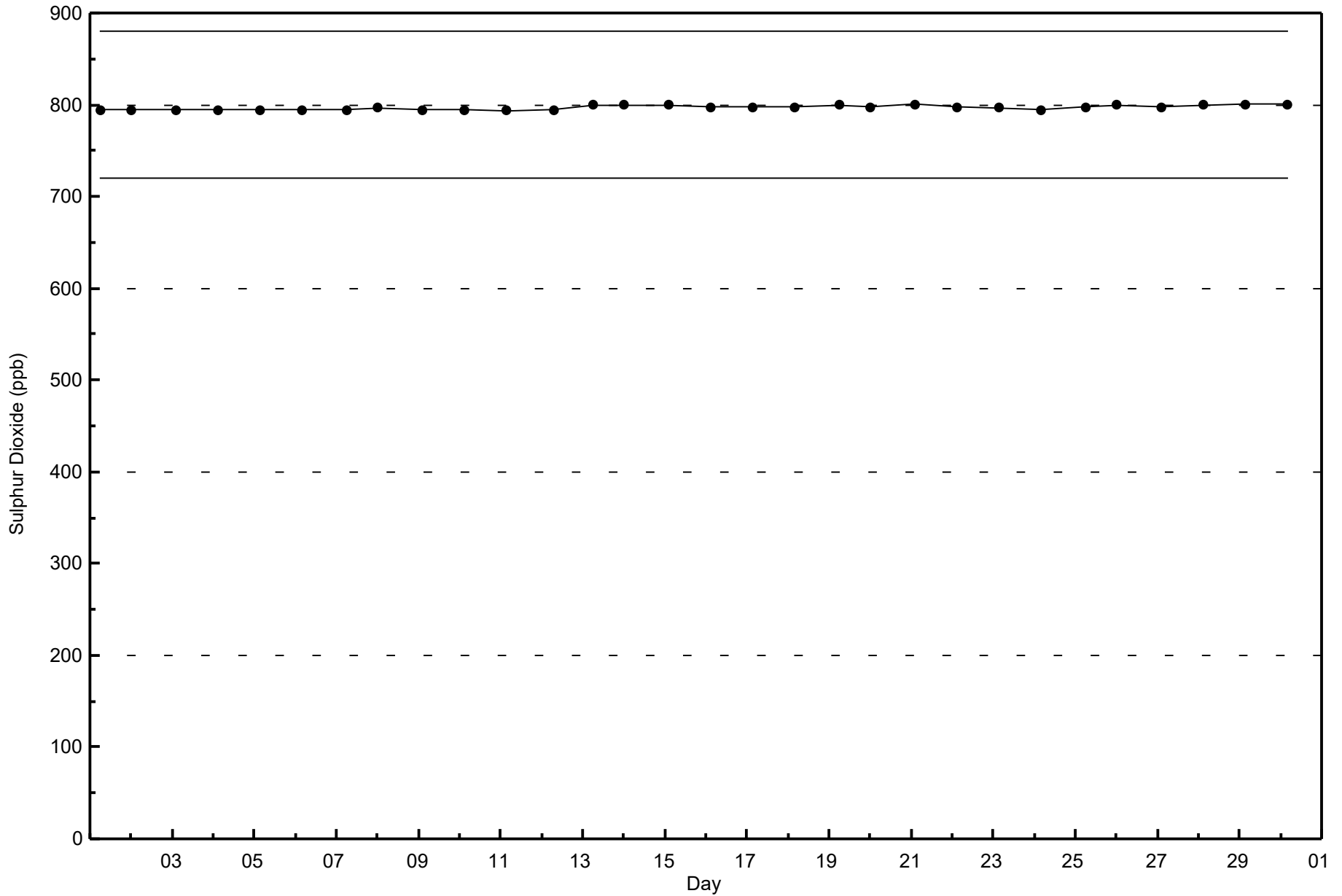


Wood Buffalo Environmental Association
Wind Rose Sep 2023

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









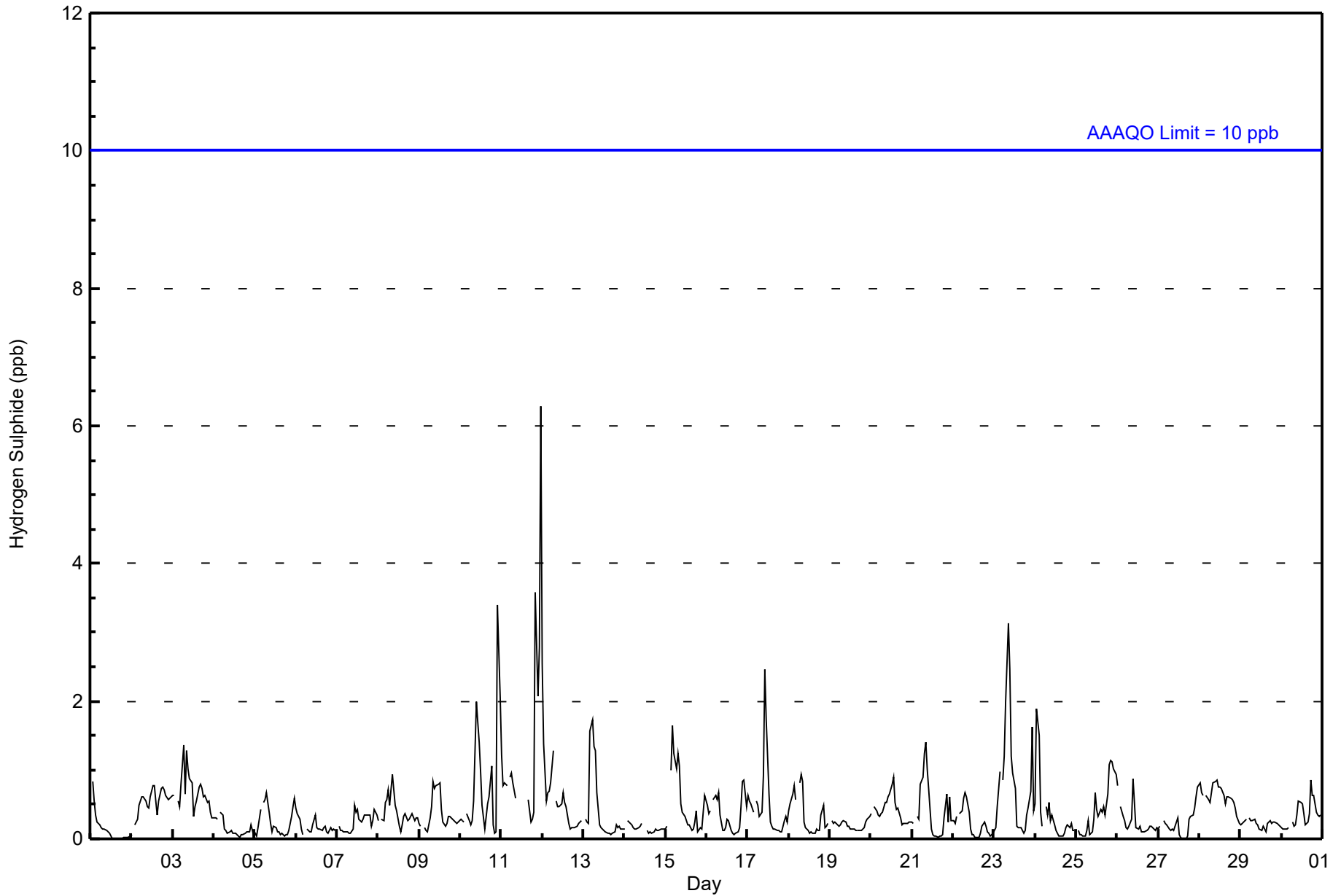
Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H₂S) - ppb

Fort McKay - Bertha Ganter - September 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	720					
Maximum Value: 6.3 ppb on Sep 12 00:00		Maximum Daily Average: 0.8 ppb on Sep 23																	Hours of Data:	681							
Minimum Value: 0.0 ppb on Sep 1 15:00		Minimum Daily Average: 0.1 ppb on Sep 1																	Hours of Missing Data:	39							
Maximum Diurnal Average: 0.6 ppb at hour 9		Minimum Diurnal Average: 0.2 ppb at hour 16																	Hours of Calibration:	37							
Monthly Average: 0.41 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.1 Median = 0.3 Q ₃ = 0.5 P ₉₀ = 0.8 P ₉₉ = 2.5																	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-Sep	Z	0.8	0.5	0.4	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.8	
2-Sep	0.1	Z	0.2	0.3	0.5	0.6	0.6	0.6	0.5	0.5	0.4	0.6	0.8	0.8	0.5	0.3	0.6	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.5	0.8	
3-Sep	0.6	0.6	Z	0.6	0.5	0.8	1.4	0.6	1.3	1.0	0.9	0.8	0.3	0.5	0.5	0.8	0.8	0.7	0.6	0.6	0.5	0.5	0.4	0.3	0.7	1.4	
4-Sep	0.3	0.3	0.3	Z	0.4	0.4	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	0.2	0.0	0.1	0.4	
5-Sep	0.1	0.0	0.2	0.4	Z	0.5	0.6	0.7	0.4	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.3	0.5	0.6	0.2	0.7	
6-Sep	0.4	0.4	0.3	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.2	0.3	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.1	0.2	0.1	0.2	0.4	
7-Sep	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.4	0.4	0.3	0.2	0.3	0.3	0.3	0.4	0.4	0.2	0.3	0.4	0.4	0.3	0.5	
8-Sep	0.3	Z	0.3	0.3	0.5	0.6	0.7	0.5	0.9	0.7	0.5	0.4	0.2	0.1	0.2	0.3	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.4	0.9	
9-Sep	0.2	0.2	Z	0.2	0.1	0.1	0.3	0.5	0.8	0.7	0.8	0.8	0.8	0.4	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.4	0.8	
10-Sep	0.3	0.3	0.3	Z	0.4	0.3	0.2	0.3	0.6	2.0	1.7	1.4	1.0	0.5	0.1	0.3	0.5	0.6	1.1	0.2	0.1	0.1	3.4	2.1	0.8	3.4	
11-Sep	1.2	0.8	0.8	0.8	Z	0.9	1.0	0.8	0.6	C	C	C	C	C	C	C	0.6	0.3	0.3	0.4	3.6	2.1	2.8	6.3	--	6.3	
12-Sep	2.5	1.4	0.5	0.7	0.7	0.8	1.3	Z	0.6	0.5	0.5	0.5	0.7	0.5	0.5	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.6	2.5	
13-Sep	Z	0.3	0.2	0.2	1.6	1.7	1.3	1.3	0.7	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.4	1.7	
14-Sep	0.2	Z	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	M	M	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	
15-Sep	0.1	0.2	Z	1.0	1.7	1.2	1.0	1.2	1.0	0.5	0.4	0.3	0.3	0.2	0.2	0.1	0.1	0.2	0.4	0.1	0.2	0.1	0.4	0.6	0.5	1.7	
16-Sep	0.5	0.4	0.4	Z	0.6	0.6	0.6	0.7	0.4	0.1	0.1	0.2	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.2	0.5	0.8	0.9	0.5	0.4	0.9	
17-Sep	0.6	0.6	0.5	0.4	Z	0.5	0.5	0.3	0.4	0.9	2.5	1.7	0.6	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.2	0.5	2.5	
18-Sep	0.4	0.5	0.7	0.8	0.6	Z	0.8	0.9	0.8	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.3	0.5	0.2	0.2	0.2	0.4	0.9	
19-Sep	Z	0.3	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	0.1	0.2	0.2	0.3	0.3	0.2	0.3	
20-Sep	0.4	Z	0.5	0.4	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.8	0.9	0.5	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.4	0.9	
21-Sep	0.2	0.2	Z	0.3	0.3	0.8	0.9	1.2	1.4	1.0	0.7	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.6	0.2	0.6	0.3	0.4	1.4	
22-Sep	0.3	0.2	0.3	Z	0.4	0.4	0.6	0.7	0.6	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.1	0.1	0.0	0.1	0.2	0.7	
23-Sep	0.1	0.2	0.5	1.0	Z	0.9	1.2	2.0	3.1	2.5	1.2	1.0	0.7	0.2	0.2	0.2	0.2	0.1	0.1	0.4	0.4	0.7	1.6	0.4	0.8	3.1	
24-Sep	0.5	1.9	1.5	0.4	0.2	Z	0.5	0.3	0.5	0.3	0.4	0.2	0.1	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.3	1.9	
25-Sep	Z	0.1	0.1	0.1	0.0	0.0	0.1	0.3	0.1	0.1	0.3	0.7	0.4	0.3	0.4	0.4	0.5	0.4	0.7	1.1	1.1	1.1	1.0	0.9	0.4	1.1	
26-Sep	0.8	Z	0.5	0.3	0.3	0.2	0.1	0.2	0.3	0.9	0.5	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.3	0.9	
27-Sep	0.1	0.2	Z	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.4	0.4	0.6	0.7	0.2	0.7	
28-Sep	0.8	0.7	0.6	Z	0.6	0.6	0.5	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.6	0.5	0.6	0.6	0.6	0.6	0.5	0.4	0.3	0.2	0.6	0.8
29-Sep	0.2	0.2	0.2	0.3	Z	0.3	0.3	0.3	0.3	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.2	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.3
30-Sep	0.2	0.1	0.1	0.1	0.2	Z	0.2	0.2	0.2	0.3	0.6	0.5	0.5	0.4	0.2	0.2	0.4	0.8	0.6	0.6	0.4	0.3	0.3	0.3	0.3	0.8	
																								Diurnal Average			
																								Diurnal Maximum			
																								0.5 0.4 0.4 0.4 0.4 0.5 0.5 0.5 0.6 0.5 0.5 0.5 0.4 0.3 0.2 0.2 0.2 0.2 0.3 0.3 0.4 0.4 0.6 0.6			
																								2.5 1.9 1.5 1.0 1.7 1.7 1.4 2.0 3.1 2.5 2.5 1.7 1.0 0.9 0.6 0.8 0.8 0.8 1.1 1.1 3.6 2.1 3.4 6.3			
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
Fort McKay - Bertha Ganter - September 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	675	99.12	99.12
3 - 4	5	0.73	99.85
5 - 7	1	0.15	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 681

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

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

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	34	15	8	1	3	8	6	97	169	88	50	39	34	56	34	31	673
3 - 4	0	0	0	0	0	0	0	1	4	0	0	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	34	15	8	1	3	8	6	98	174	88	50	39	34	56	34	31	679

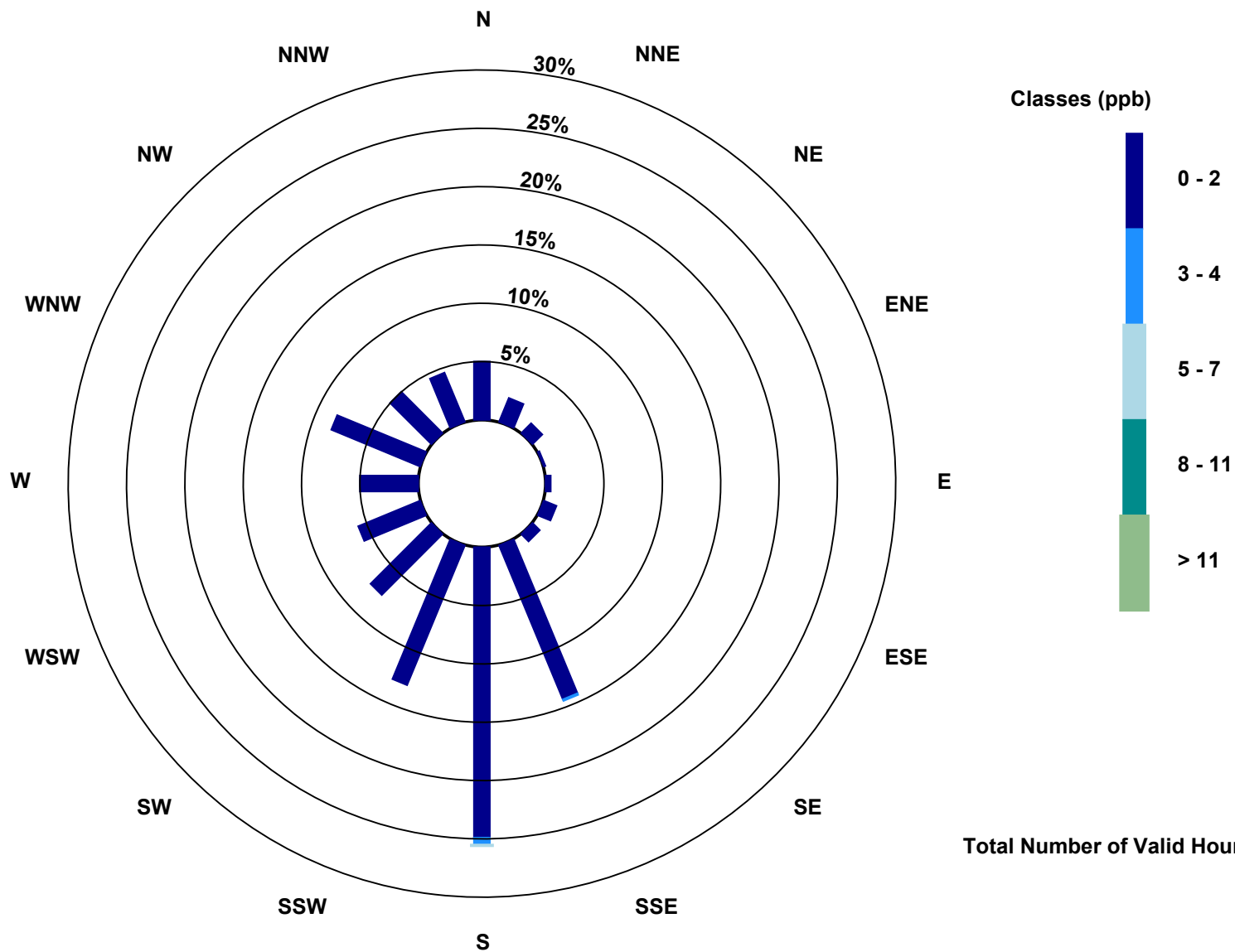
Total Number of Valid Hours: 679

Total Number of Hours: 720

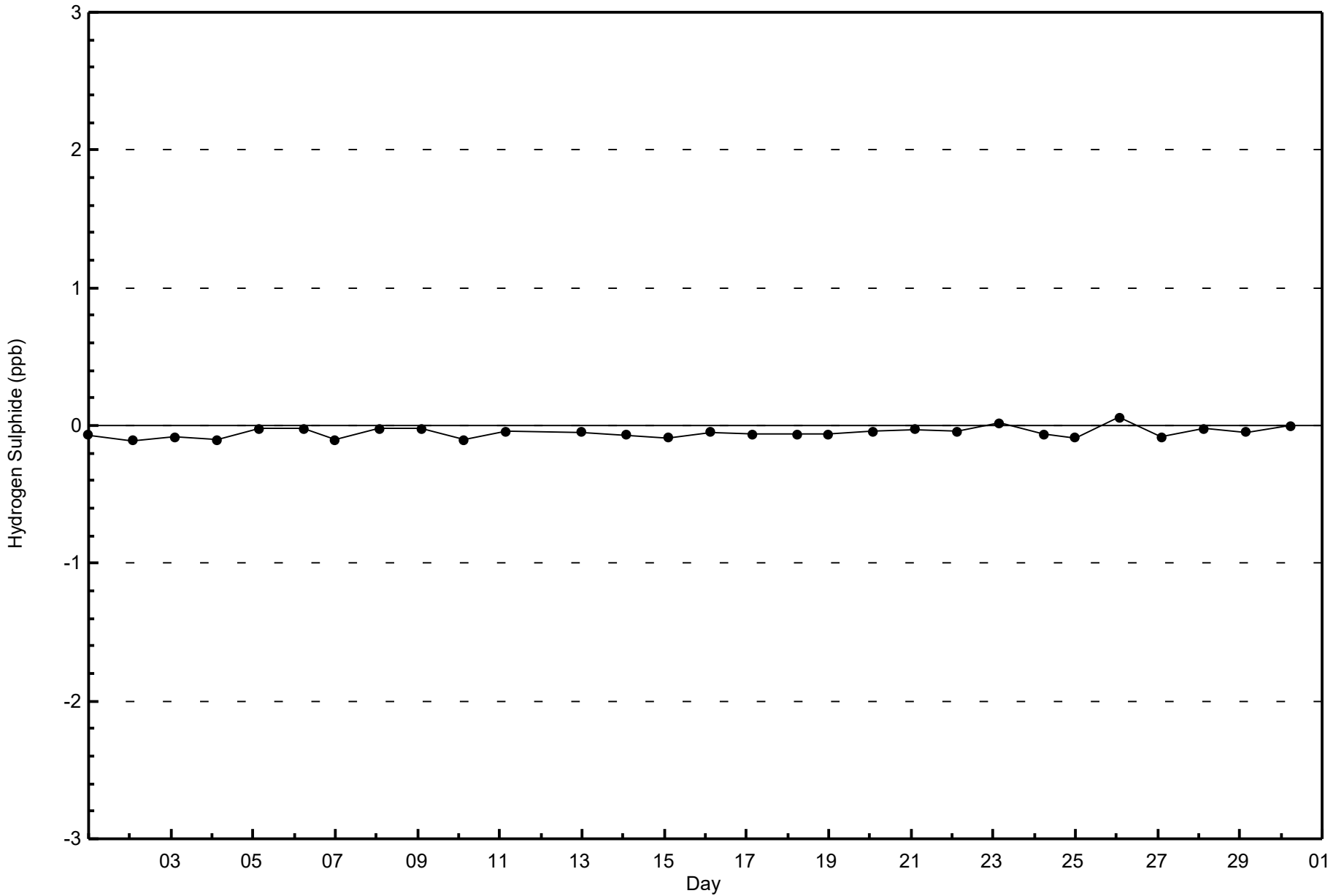


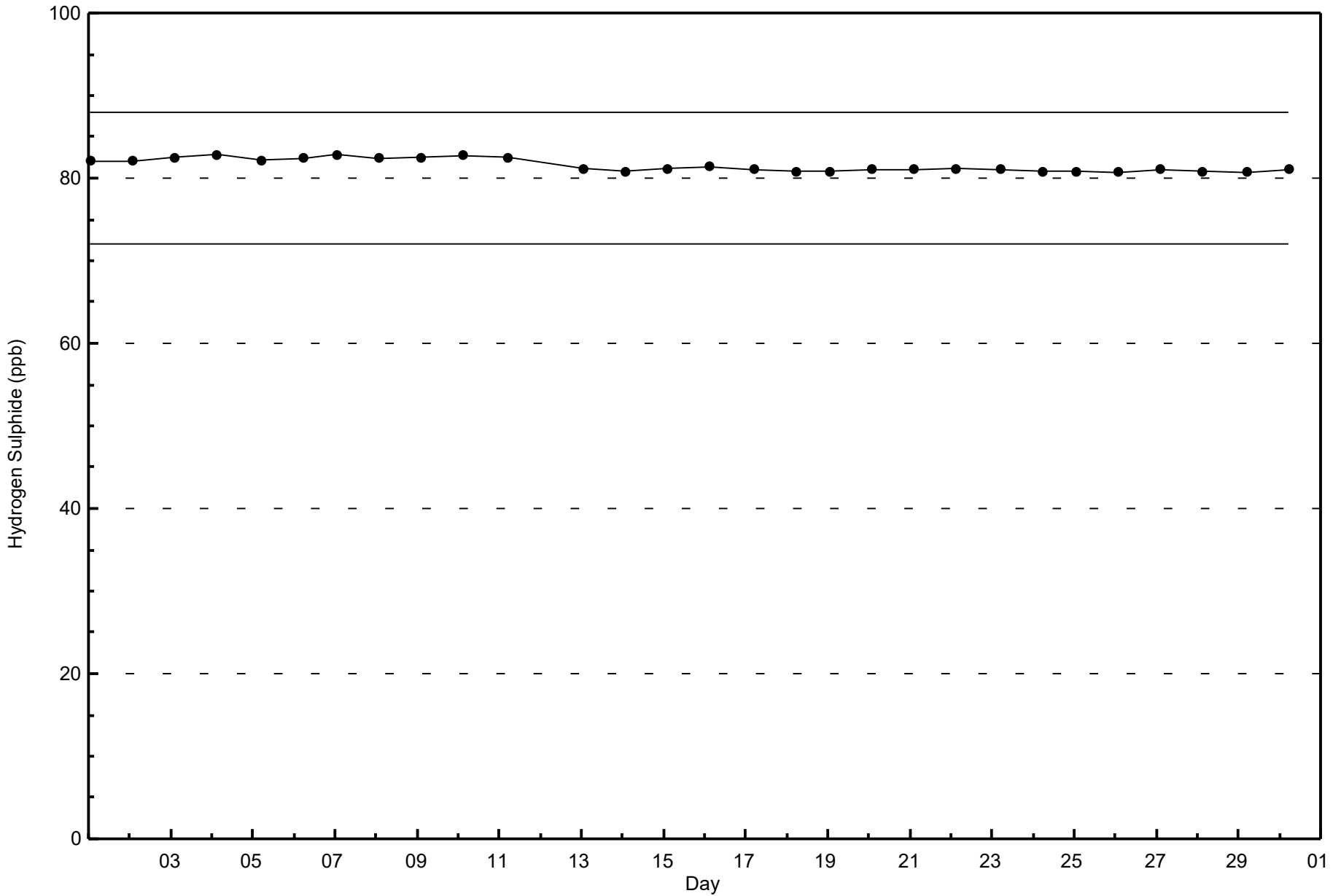
Wood Buffalo Environmental Association
Wind Rose Sep 2023

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



Total Number of Valid Hours: 679







Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 6.6 ppb on Sep 12 00:00	Maximum Daily Average: 1.2 ppb on Sep 23		Hours of Data:	659
Minimum Value: 0.2 ppb on Sep 6 05:00	Minimum Daily Average: 0.4 ppb on Sep 6		Hours of Missing Data:	61
Maximum Diurnal Average: 0.9 ppb at hour 24	Minimum Diurnal Average: 0.5 ppb at hour 16		Hours of Calibration:	36
Monthly Average: 0.71 ppb	Percentiles: P ₁ = 0.3 P ₁₀ = 0.4 Q ₁ = 0.4 Median = 0.5 Q ₃ = 0.8 P ₉₀ = 1.2 P ₉₉ = 2.7		Percent Operational Time:	96.5

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24				
1-Sep	Z	1.2	1.0	0.8	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	1.2		
2-Sep	0.4	Z	0.4	0.6	0.9	1.0	1.0	1.0	1.0	1.0	0.8	0.8	1.0	1.2	1.2	1.0	0.7	0.9	1.2	1.2	1.1	1.0	0.9	0.9	1.0	0.9	1.2	
3-Sep	1.0	1.0	Z	0.8	0.8	1.1	1.5	0.9	1.6	1.3	1.2	1.1	0.5	0.7	0.9	1.1	1.1	1.0	0.9	1.0	0.9	0.9	0.7	0.6	1.0	1.6		
4-Sep	0.6	0.6	0.6	Z	0.6	0.6	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.3	0.4	0.6		
5-Sep	0.3	0.3	0.4	0.6	Z	0.7	0.8	0.9	0.6	0.4	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.6	0.7	0.8	0.5	0.9	
6-Sep	0.7	0.6	0.5	0.3	0.2	Z	0.3	0.3	0.3	0.3	0.4	0.5	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.7	0.7	
7-Sep	Z	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.3	0.4	0.7	0.6	0.7	0.6	0.6	0.6	0.7	0.7	0.7	0.6	0.5	0.6	0.7	0.6	0.5	0.7	0.7	
8-Sep	0.5	Z	0.5	0.4	0.7	0.7	0.7	0.7	1.1	0.9	0.7	0.6	0.4	0.4	0.5	0.6	0.6	0.5	0.6	0.6	0.6	0.5	0.5	0.5	0.6	1.1	1.1	
9-Sep	0.4	0.4	Z	0.3	0.3	0.3	0.5	0.5	1.0	1.0	1.1	1.1	1.0	0.6	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.6	1.1	1.1	
10-Sep	0.5	0.5	0.4	Z	0.5	0.4	0.3	0.4	0.8	2.4	2.1	1.7	1.2	0.8	0.4	0.6	0.8	0.9	1.3	0.5	0.4	0.4	3.5	2.3	1.0	3.5	3.5	
11-Sep	1.5	1.1	1.2	1.2	Z	1.3	1.4	1.1	0.9	C	C	C	C	C	C	C	0.5	0.4	0.5	0.7	3.9	2.5	3.2	6.6	--	6.6	6.6	
12-Sep	3.1	2.0	0.9	1.1	1.1	1.2	1.9	Z	0.8	0.7	0.8	0.8	1.0	0.8	0.8	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	1.0	3.1	3.1	
13-Sep	Z	0.5	0.5	0.5	1.8	1.9	1.5	1.4	0.9	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.7	1.9	1.9	
14-Sep	0.5	Z	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.5	0.5	M	M	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5
15-Sep	0.4	0.4	Z	0.9	1.6	1.3	1.1	1.6	1.4	0.7	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.5	0.6	0.4	0.5	0.4	0.8	1.1	0.7	1.6	1.6	
16-Sep	0.9	0.7	0.8	Z	0.8	0.9	0.8	0.9	0.6	0.4	0.4	0.4	0.6	0.6	0.4	0.4	0.4	0.4	0.4	0.5	0.8	1.1	1.2	0.8	0.7	1.2	1.2	
17-Sep	0.9	0.9	0.8	0.6	Z	0.7	0.7	0.5	0.6	1.1	2.7	2.2	1.0	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.6	0.6	0.5	0.8	2.7	2.7	
18-Sep	0.6	0.8	0.9	0.9	0.8	Z	1.0	1.3	1.1	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.7	0.8	0.4	0.4	0.4	0.6	1.3	1.3	
19-Sep	Z	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.6	0.6	0.6	0.4	0.6	0.6	0.6
20-Sep	0.7	Z	0.8	0.7	0.6	0.6	0.7	0.7	0.8	0.9	0.9	1.1	1.2	1.3	0.9	0.8	0.8	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.8	1.3	1.3	1.3
21-Sep	0.6	0.6	Z	0.6	0.6	1.3	1.5	1.9	2.1	1.5	1.2	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	2.1	2.1	
22-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.4	--	0.5	0.5	
23-Sep	0.4	0.5	0.9	1.5	Z	1.2	1.6	2.3	3.3	2.7	1.5	1.3	1.0	0.5	0.5	0.5	0.5	0.4	0.5	0.8	0.9	1.1	1.9	0.7	1.2	3.3	3.3	
24-Sep	0.8	2.1	1.8	0.7	0.5	Z	0.8	0.7	1.0	0.6	0.6	0.5	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.6	2.1	2.1	
25-Sep	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.5	1.0	0.7	0.6	0.7	0.8	0.9	0.8	1.2	1.7	1.8	1.7	1.6	1.5	0.8	1.8	1.8	
26-Sep	1.2	Z	0.8	0.7	0.6	0.5	0.5	0.5	0.5	1.5	0.9	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.6	1.5	1.5	
27-Sep	0.4	0.4	Z	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.6	0.4	0.3	0.3	0.3	0.3	0.4	0.7	0.8	0.8	0.9	1.1	1.2	0.5	1.2	1.2	
28-Sep	1.3	1.1	1.1	Z	1.0	1.0	0.9	1.1	1.3	1.3	1.3	1.2	1.2	1.1	1.0	0.9	1.0	1.0	1.0	1.0	0.9	0.7	0.6	0.5	1.0	1.3	1.3	
29-Sep	0.5	0.5	0.5	0.6	Z	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.4	0.5	0.6	0.5	0.6	0.6	0.5	0.5	0.5	0.5	0.6	0.6
30-Sep	0.5	0.4	0.4	0.4	0.4	Z	0.4	0.5	0.5	0.6	0.7	0.7	0.7	0.6	0.5	0.5	0.7	1.2	0.9	0.9	0.7	0.6	0.6	0.6	0.6	0.6	1.2	1.2

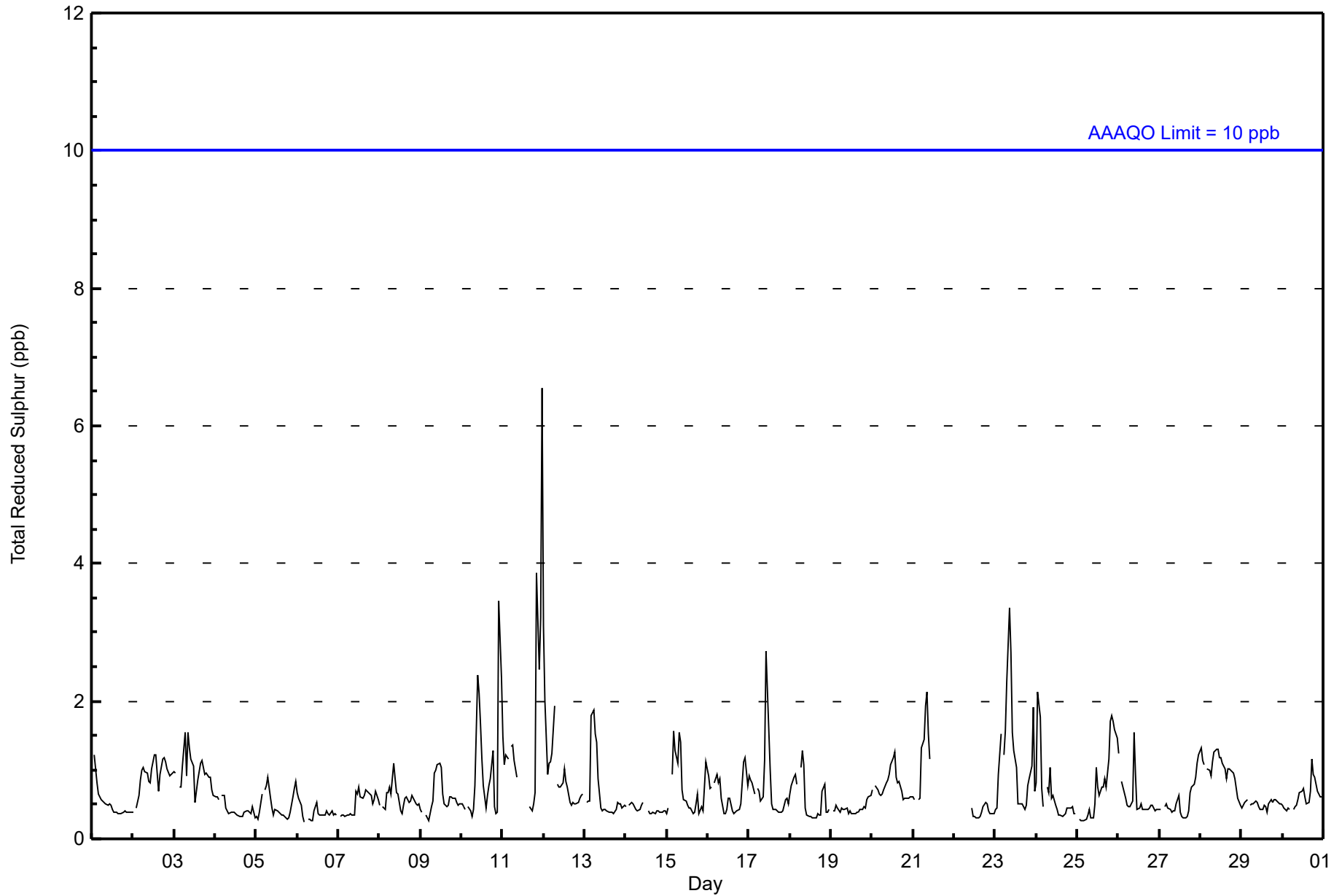
0.8	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.7	0.6	0.5	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.9	0.9	Diurnal Average	
3.1	2.1	1.8	1.5	1.8	1.9	1.9	2.3	3.3	2.7	2.7	2.2	1.2	1.3	1.0	1.1	1.1	1.2	1.3	1.7	3.9	2.5	3.5	6.6	Diurnal Maximum		

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



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	651	98.79	98.79
3 - 4	7	1.06	99.85
5 - 7	1	0.15	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 659

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

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

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	34	15	8	1	3	8	6	95	153	82	50	39	34	56	34	31	649
3 - 4	0	0	0	0	0	0	0	2	5	0	0	0	0	0	0	0	7
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	34	15	8	1	3	8	6	97	159	82	50	39	34	56	34	31	657

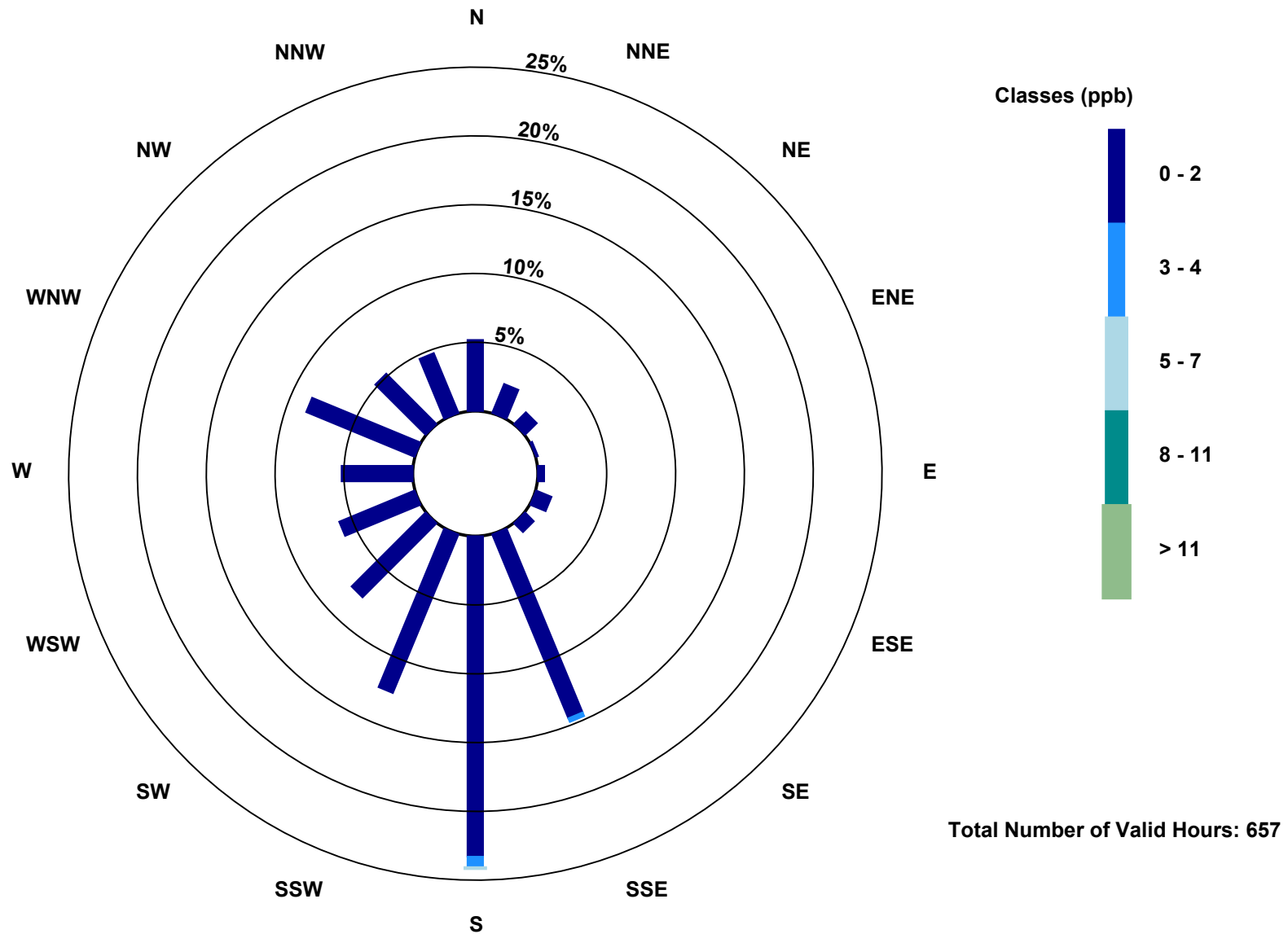
Total Number of Valid Hours: 657

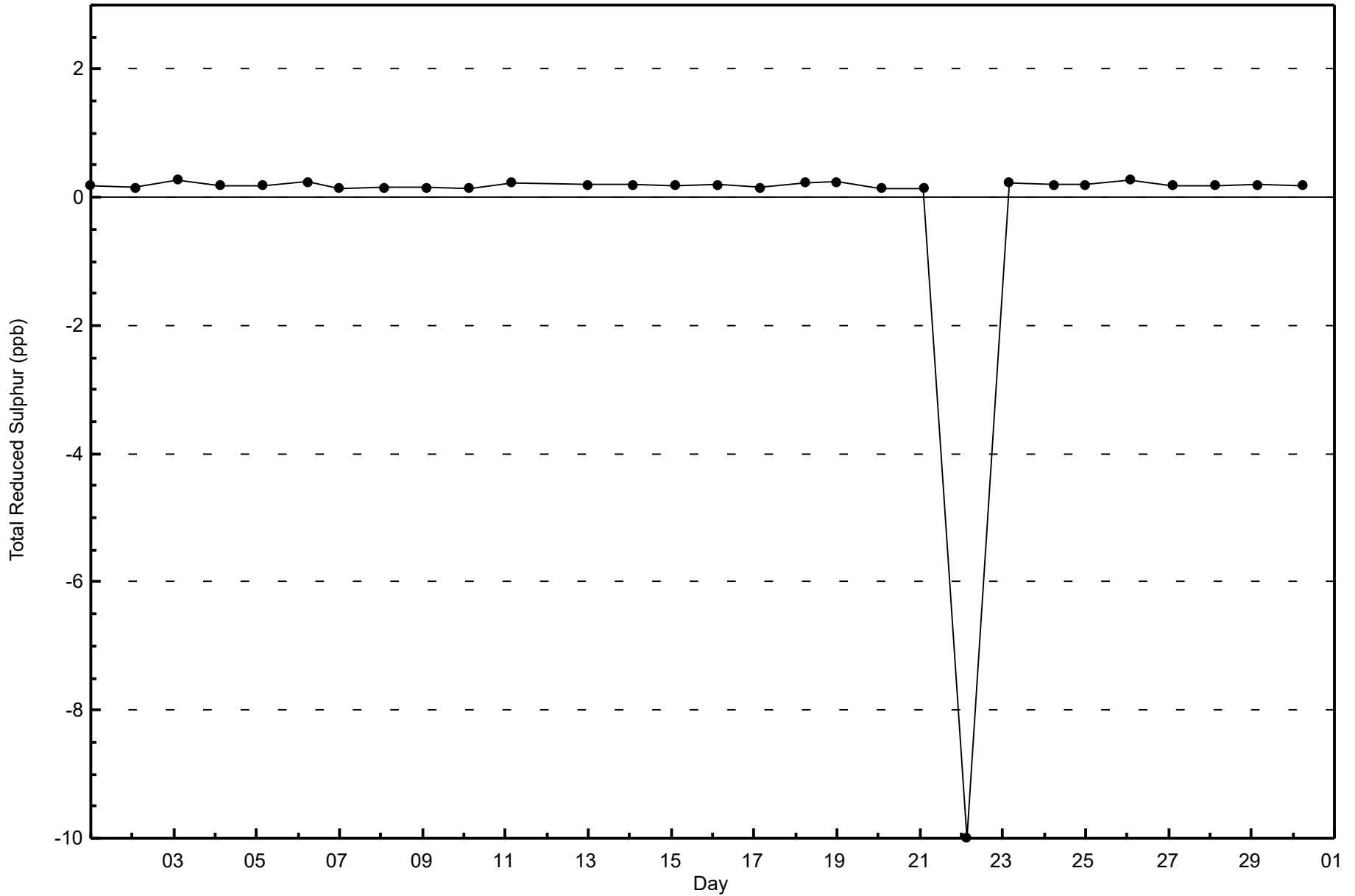
Total Number of Hours: 720

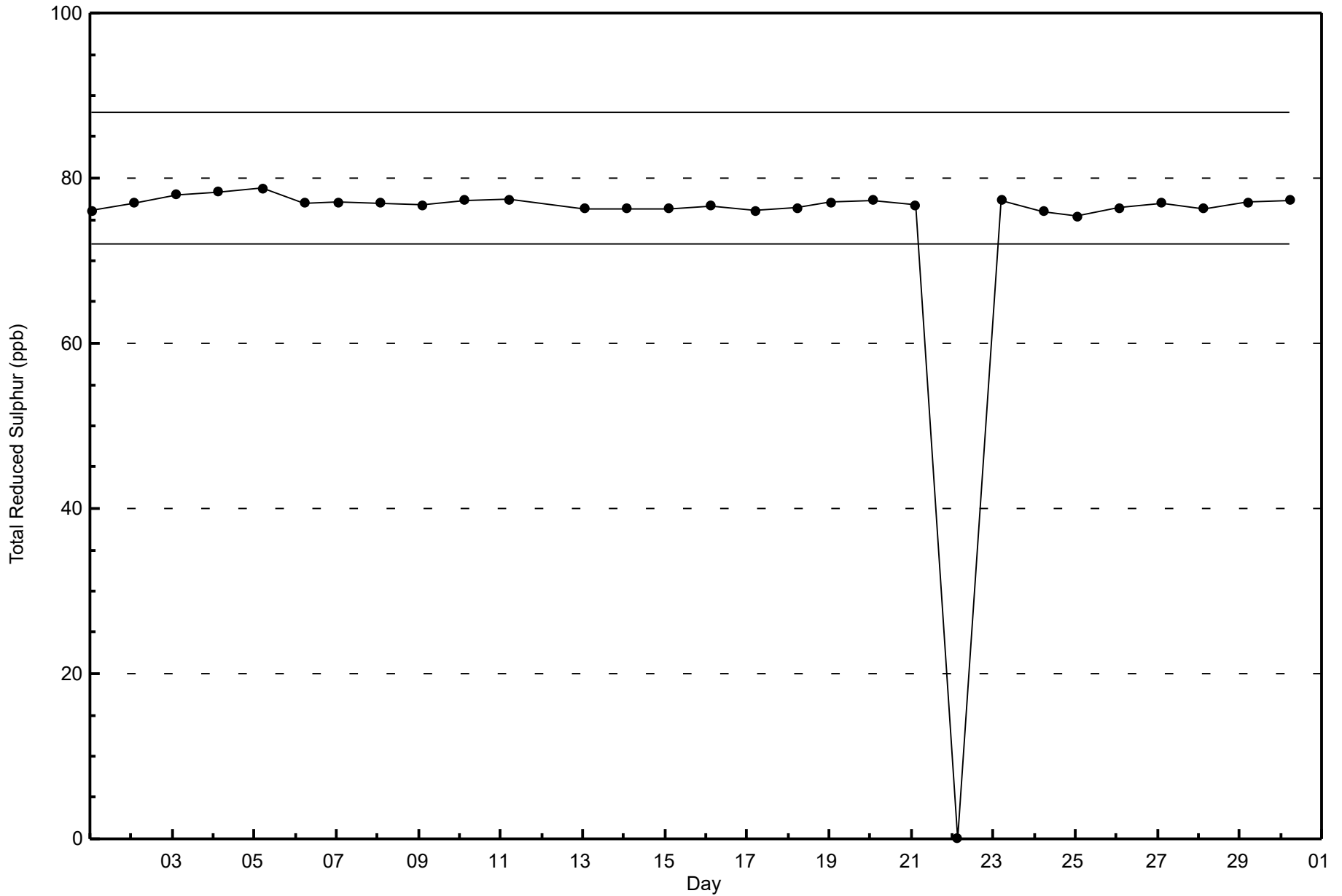


Wood Buffalo Environmental Association
Wind Rose Sep 2023

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







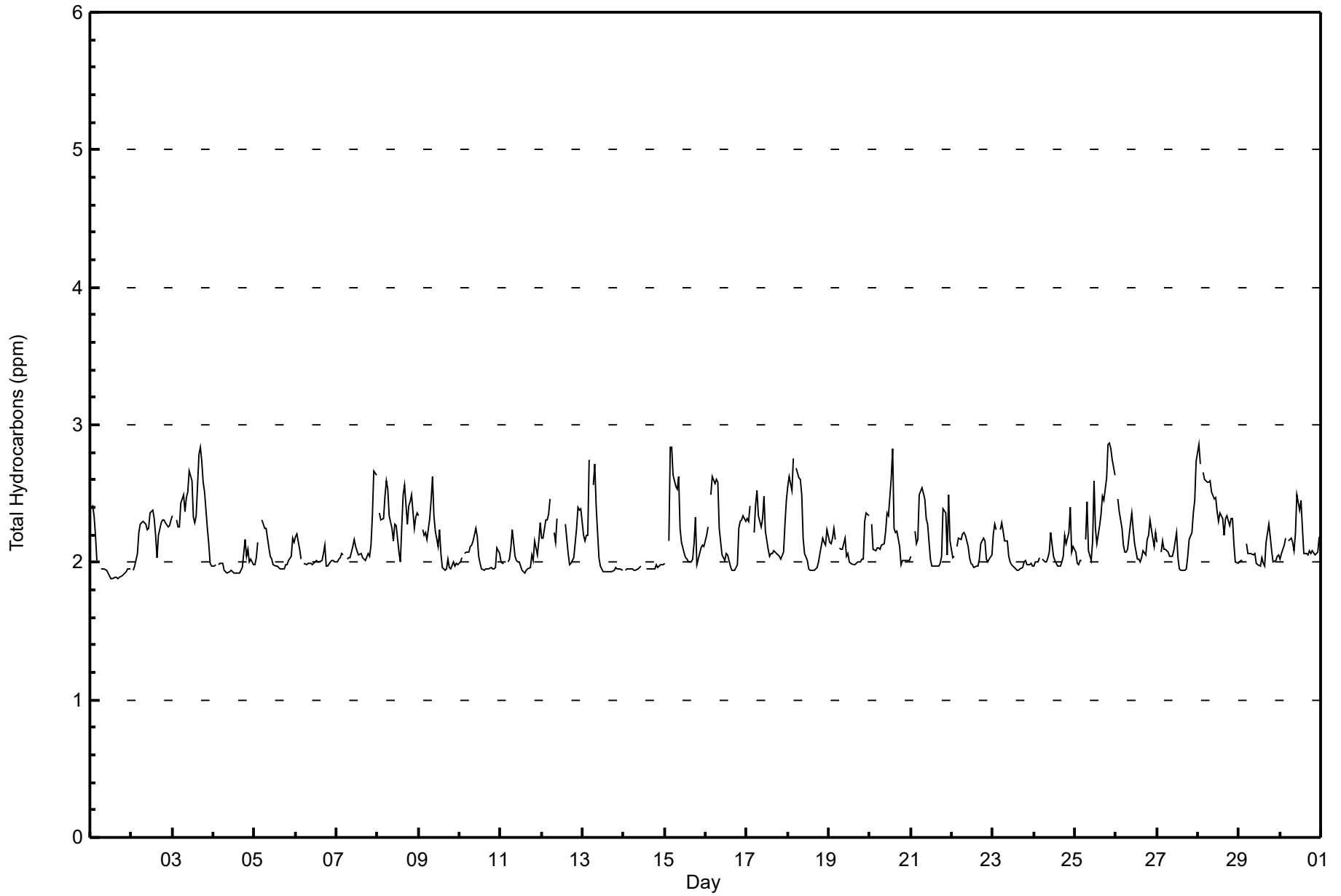


Maximum Value: 2.9 ppm on Sep 25 21:00																				Maximum Daily Average: 2.4 ppm on Sep 3					Hours in Service: 720																							
Minimum Value: 1.9 ppm on Sep 1 14:00																				Minimum Daily Average: 2.0 ppm on Sep 14					Hours of Data: 684																							
Maximum Diurnal Average: 2.3 ppm at hour 6																				Minimum Diurnal Average: 2.0 ppm at hour 15					Hours of Missing Data: 36																							
Monthly Average: 2.15 ppm																				Percentiles: P ₁ = 1.9 P ₁₀ = 2.0 Q ₁ = 2.0 Median = 2.1 Q ₃ = 2.3 P ₉₀ = 2.5 P ₉₉ = 2.8					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-Sep	2.4	2.4	2.3	2.2	2.0	Z	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.4																							
2-Sep	Z	1.9	2.0	2.1	2.2	2.3	2.3	2.3	2.3	2.2	2.3	2.4	2.4	2.3	2.2	2.0	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.4																						
3-Sep	2.3	Z	2.3	2.3	2.3	2.4	2.5	2.4	2.5	2.5	2.7	2.6	2.3	2.3	2.3	2.8	2.8	2.7	2.6	2.5	2.3	2.1	2.0	2.0	2.4	2.8																						
4-Sep	2.0	2.0	Z	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.2	2.0	2.1	2.0	2.0	2.0	2.0	2.2																						
5-Sep	2.0	2.0	2.1	Z	2.3	2.3	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.1	2.1	2.3																						
6-Sep	2.2	2.2	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	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2																						
7-Sep	2.0	2.0	2.0	2.1	2.1	Z	2.0	2.0	2.0	2.1	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.0	2.1	2.3	2.7	2.6	2.1	2.7																						
8-Sep	Z	2.4	2.3	2.3	2.5	2.6	2.5	2.3	2.3	2.2	2.3	2.3	2.1	2.0	2.3	2.5	2.6	2.3	2.4	2.4	2.5	2.3	2.3	2.4	2.3	2.6																						
9-Sep	2.3	Z	2.2	2.2	2.2	2.2	2.3	2.5	2.6	2.3	2.2	2.1	2.2	2.1	2.0	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.6																						
10-Sep	2.0	2.0	Z	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.0	2.0	2.0	1.9	1.9	2.0	2.0	2.0	2.0	1.9	2.0	2.1	2.1	2.0	2.2																						
11-Sep	2.0	2.0	2.0	Z	2.0	2.0	2.1	2.2	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.1	2.0	2.2	2.1	2.2	2.3	2.0	2.3																						
12-Sep	2.2	2.2	2.3	2.3	2.4	2.5	Z	2.2	2.1	2.3	C	C	C	C	2.3	2.1	2.0	2.0	2.0	2.0	2.2	2.4	2.4	2.4	2.2	2.5																						
13-Sep	2.2	2.2	2.2	2.2	2.8	Z	2.6	2.7	2.4	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	2.0	1.9	1.9	1.9	2.1	2.8																						
14-Sep	Z	1.9	1.9	2.0	2.0	1.9	1.9	1.9	2.0	2.0	2.0	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																						
15-Sep	2.0	Z	2.2	2.8	2.8	2.6	2.5	2.5	2.6	2.3	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.3	2.0	2.1	2.1	2.1	2.2	2.8																						
16-Sep	2.2	2.3	Z	2.5	2.6	2.6	2.6	2.6	2.2	2.1	2.0	2.0	2.1	2.1	2.0	1.9	1.9	1.9	2.0	2.3	2.3	2.3	2.3	2.3	2.2	2.6																						
17-Sep	2.3	2.3	2.4	Z	2.2	2.4	2.5	2.3	2.3	2.3	2.5	2.2	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.3	2.4	2.2	2.5																						
18-Sep	2.6	2.6	2.5	2.8	Z	2.7	2.6	2.6	2.5	2.2	2.1	2.0	2.0	1.9	1.9	1.9	2.0	2.0	2.0	2.1	2.2	2.1	2.1	2.2	2.2	2.8																						
19-Sep	2.1	2.1	2.2	2.2	2.2	Z	2.1	2.1	2.1	2.2	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3	2.4	2.3	2.1	2.4																						
20-Sep	Z	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.4	2.3	2.6	2.8	2.2	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.8																						
21-Sep	2.0	Z	2.2	2.1	2.2	2.5	2.5	2.5	2.5	2.3	2.3	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4	2.4	2.1	2.5	2.2	2.2	2.5																						
22-Sep	2.0	2.0	Z	2.1	2.2	2.2	2.2	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.0	2.0	2.0	2.1	2.1	2.2																						
23-Sep	2.2	2.3	2.2	Z	2.2	2.3	2.2	2.2	2.2	2.0	2.0	2.0	2.0	2.0	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.3																						
24-Sep	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.1	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.1	2.2	2.4	2.1	2.1	2.1	2.4																						
25-Sep	2.1	2.0	2.0	2.0	2.0	Z	2.2	2.4	2.1	2.0	2.2	2.6	2.2	2.1	2.3	2.3	2.5	2.5	2.6	2.9	2.9	2.8	2.7	2.6	2.3	2.9																						
26-Sep	Z	2.5	2.4	2.2	2.1	2.1	2.1	2.1	2.3	2.4	2.2	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.2	2.3	2.2	2.1	2.2	2.2	2.5																						
27-Sep	2.1	Z	2.1	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.2	2.0	1.9	1.9	1.9	1.9	2.0	2.0	2.2	2.2	2.4	2.4	2.7	2.1	2.7																						
28-Sep	2.9	2.7	Z	2.7	2.6	2.6	2.6	2.6	2.5	2.5	2.5	2.4	2.3	2.4	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.1	2.0	2.0	2.4	2.9																					
29-Sep	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	2.0	2.1	2.3	2.2	2.1	2.0	2.0	2.0	2.1	2.1	2.3																						
30-Sep	2.0	2.1	2.1	2.2	Z	2.2	2.2	2.1	2.1	2.2	2.5	2.4	2.5	2.2	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3																						
																								2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	Diurnal Average
																								2.9	2.7	2.5	2.8	2.8	2.7	2.6	2.7	2.6	2.5	2.7	2.6	2.6	2.8	2.3	2.8	2.8	2.7	2.6	2.9	2.9	2.8	2.7	2.7	Diurnal Maximum
Z - zerospan C - Calibration M - Maintenance																																																



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	295	43.13	43.13
2.1 - 3.0	389	56.87	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Fort McKay - Bertha Ganter - September 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	2	0	0	1	8	2	48	65	29	34	25	15	23	19	14	295
2.1 - 3.0	24	13	8	1	2	0	4	50	113	57	18	14	18	33	16	16	387
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	34	15	8	1	3	8	6	98	178	86	52	39	33	56	35	30	682

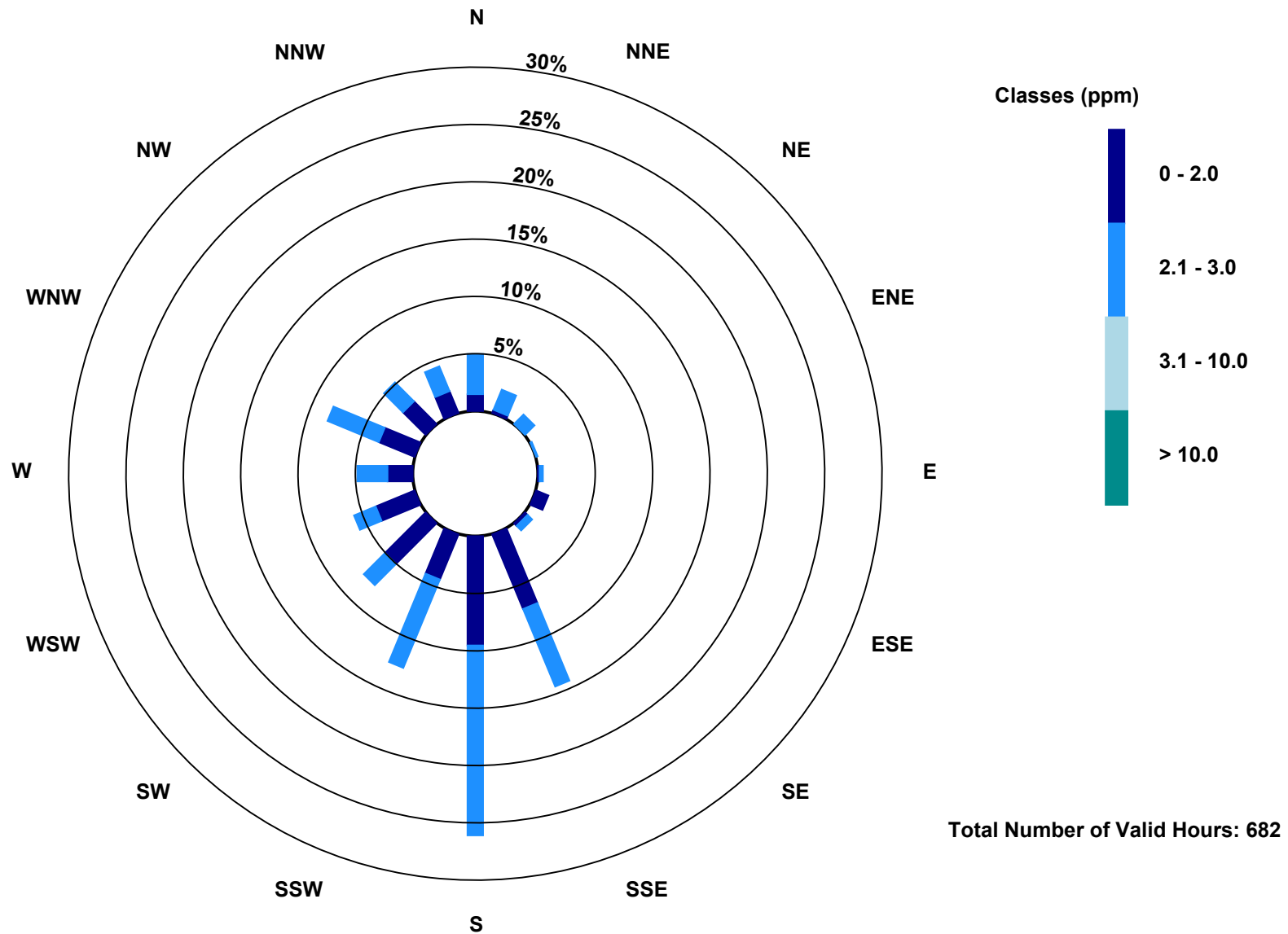
Total Number of Valid Hours: 682

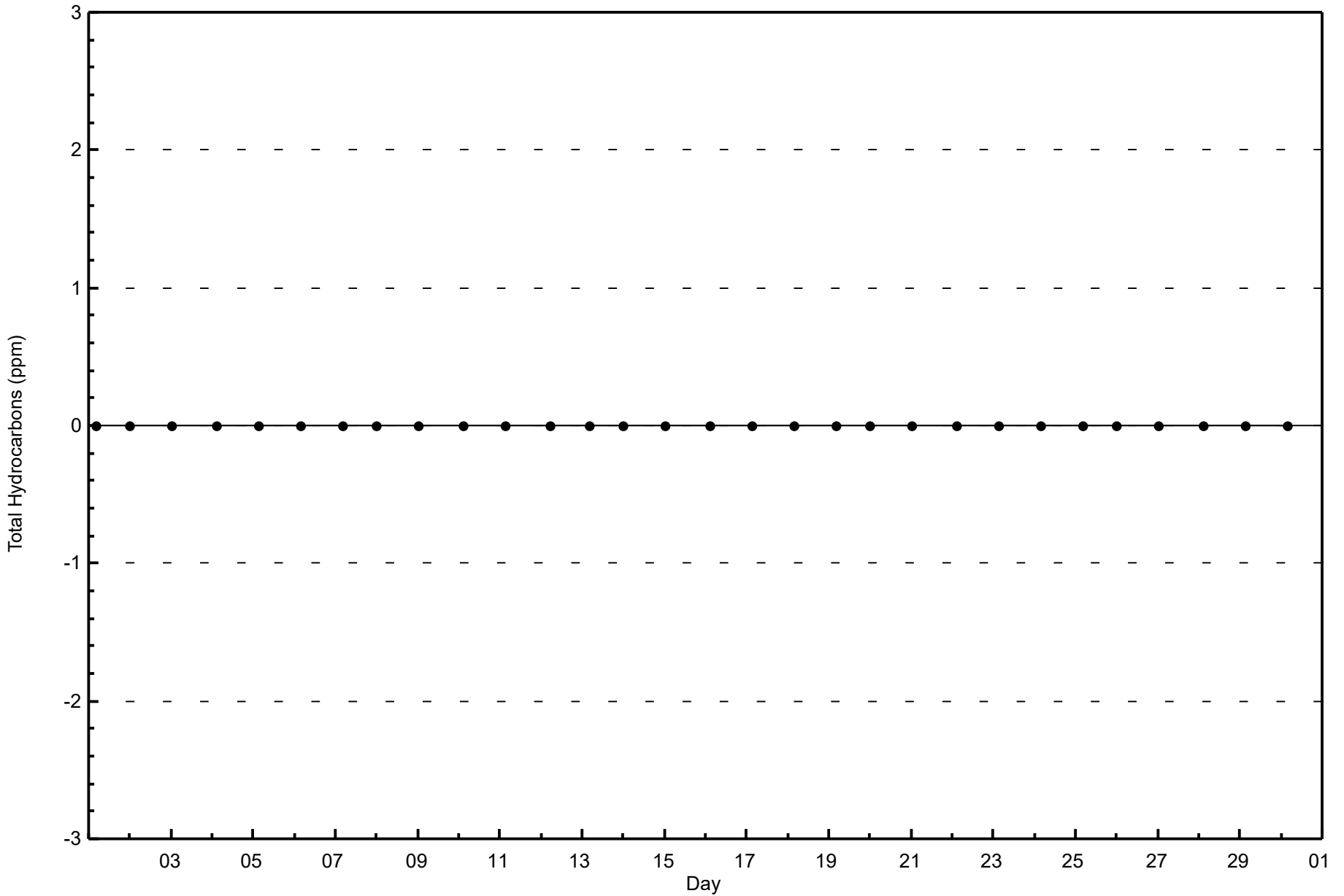
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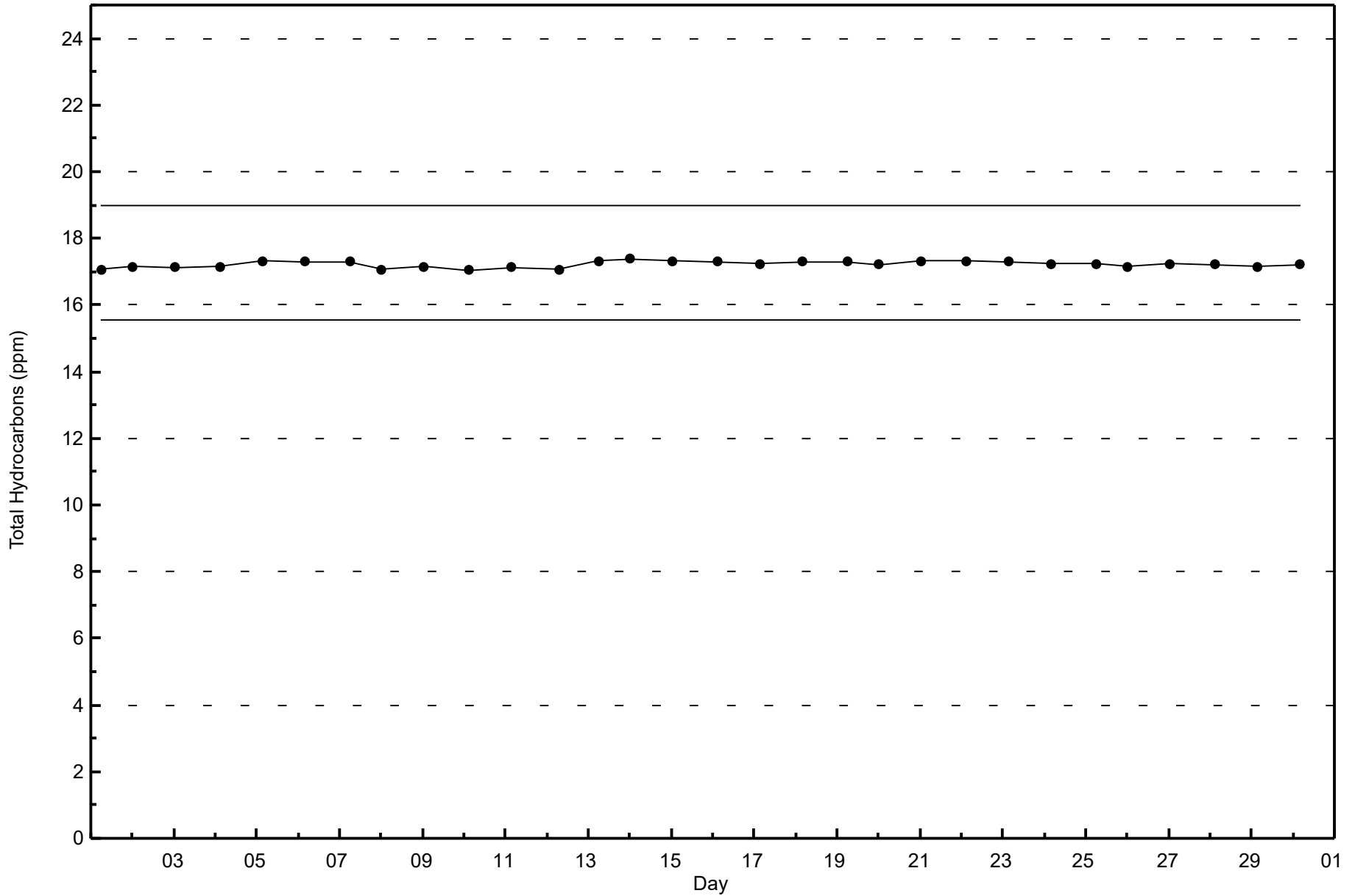


Wood Buffalo Environmental Association
Wind Rose Sep 2023

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



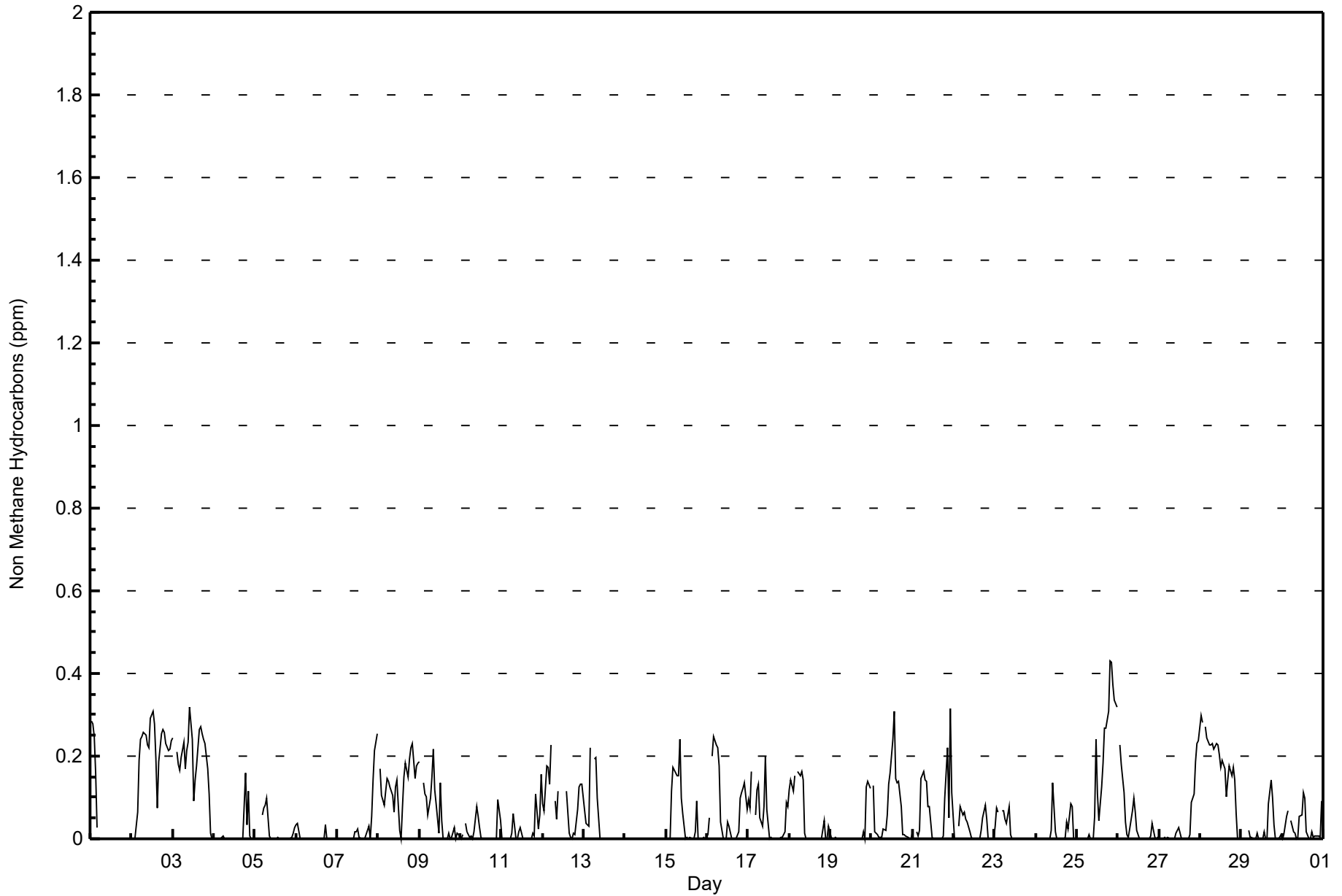






Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	332	48.54	48.54
0.006 - 0.05	113	16.52	65.06
0.06 - 0.1	123	17.98	83.04
> 0.1	116	16.96	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Fort McKay - Bertha Ganter - September 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	2	1	0	2	7	2	51	82	37	37	29	17	26	18	11	331
0.006 - 0.05	3	2	0	0	0	1	1	22	34	19	6	5	6	4	4	6	113
0.06 - 0.1	6	5	3	0	1	0	2	18	36	23	8	1	2	7	4	6	122
> 0.1	16	6	4	1	0	0	1	7	26	7	1	4	8	19	9	7	116
Totals	34	15	8	1	3	8	6	98	178	86	52	39	33	56	35	30	682

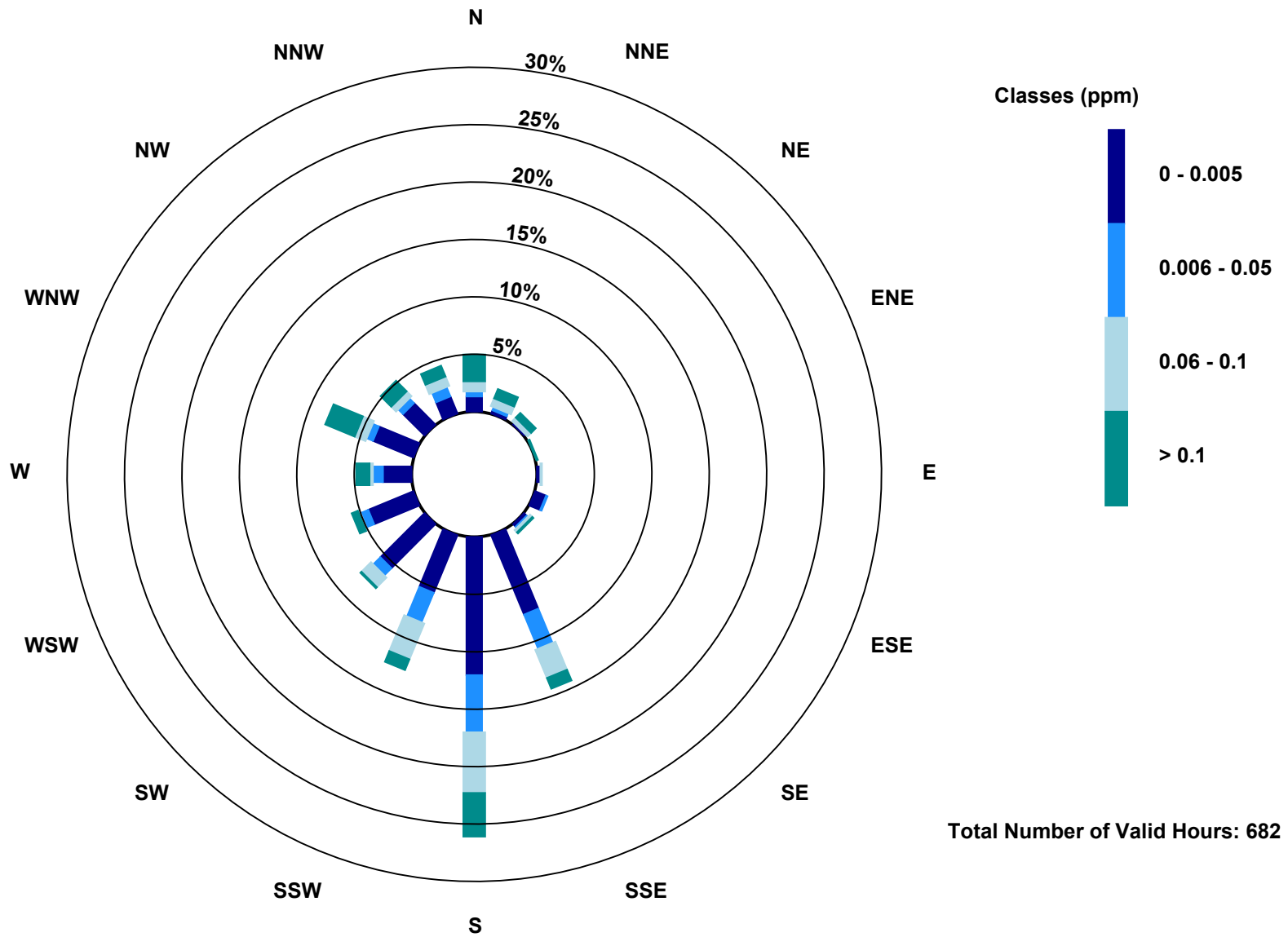
Total Number of Valid Hours: 682

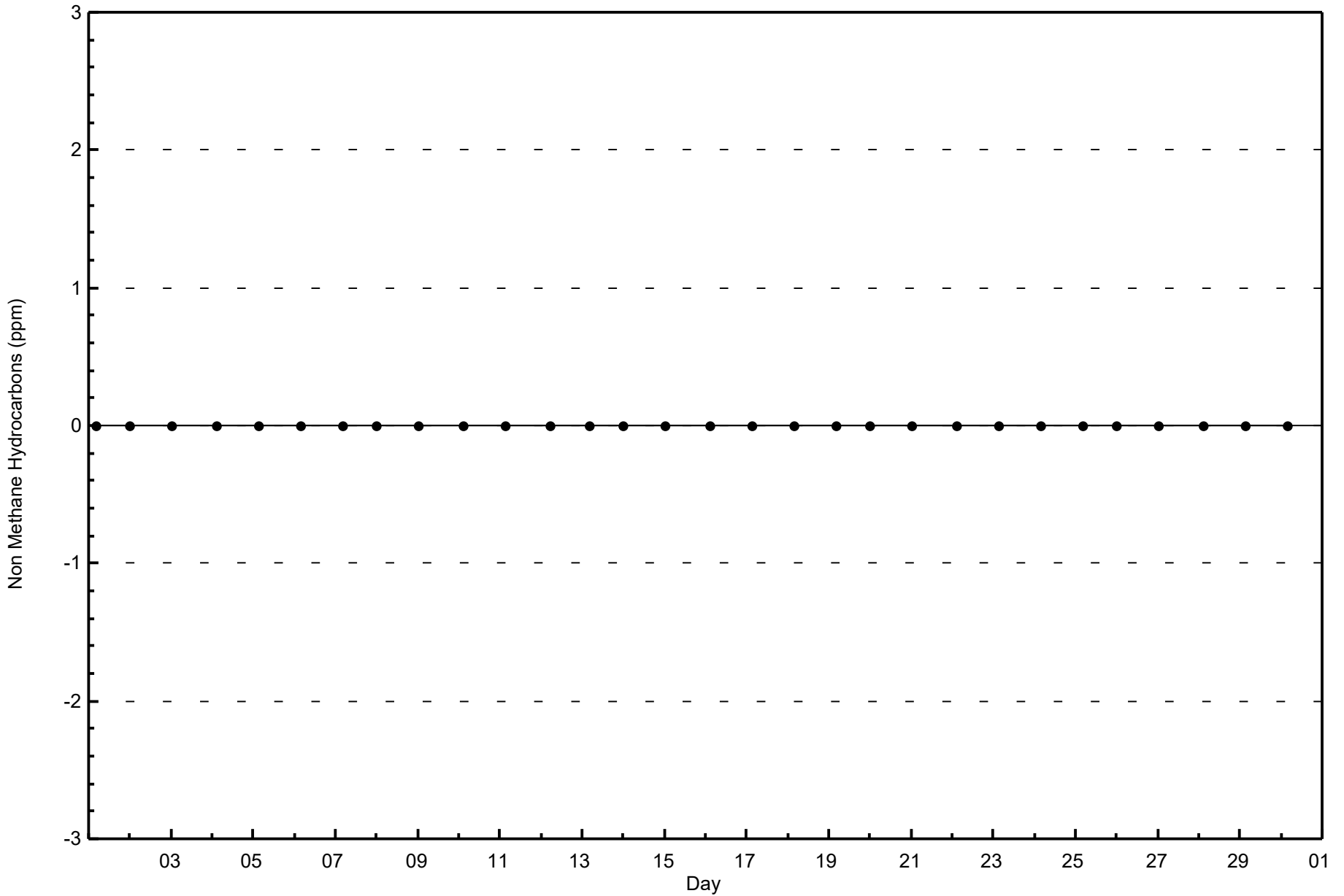
Total Number of Hours: 720

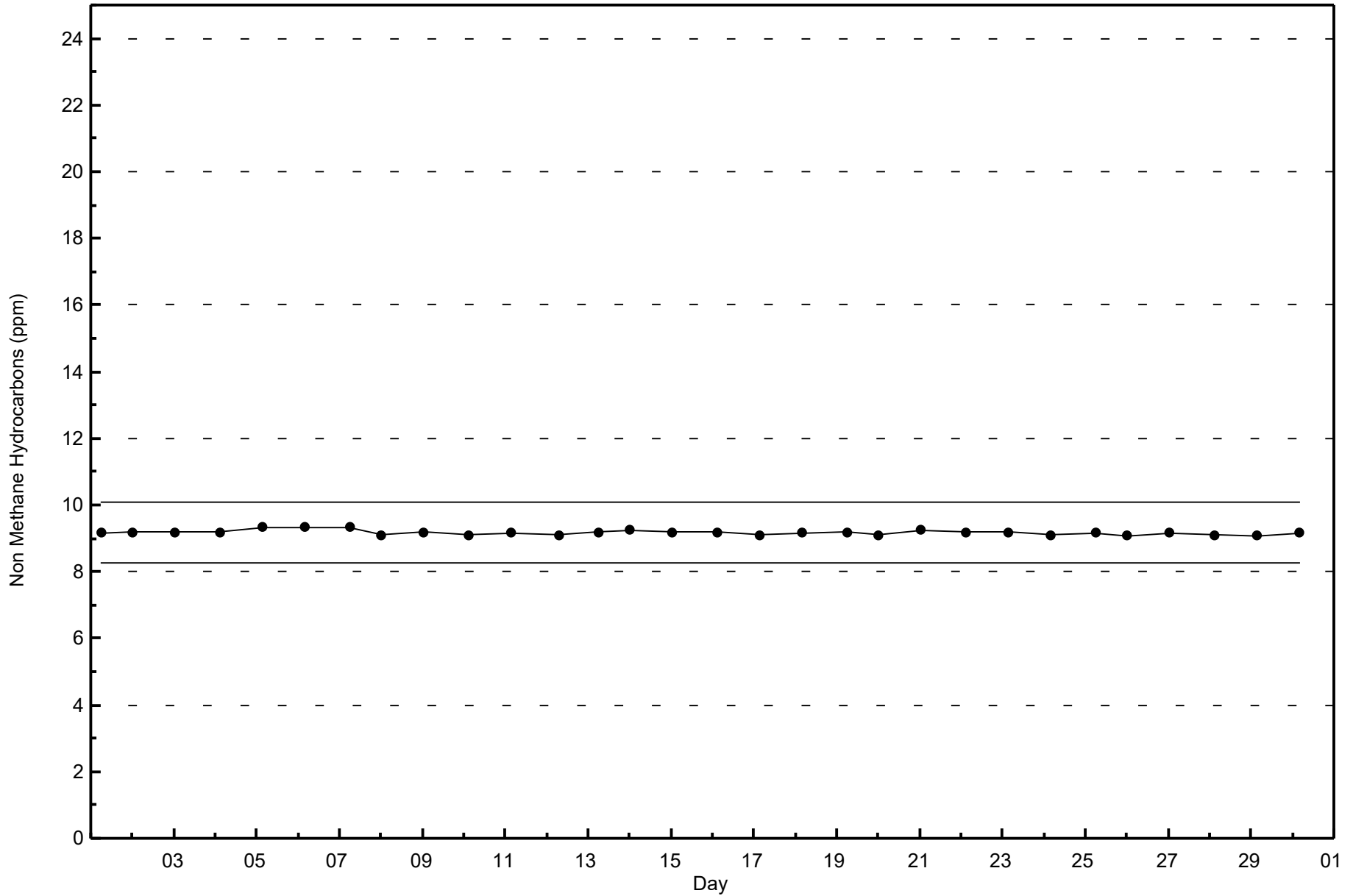


Wood Buffalo Environmental Association
Wind Rose Sep 2023

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





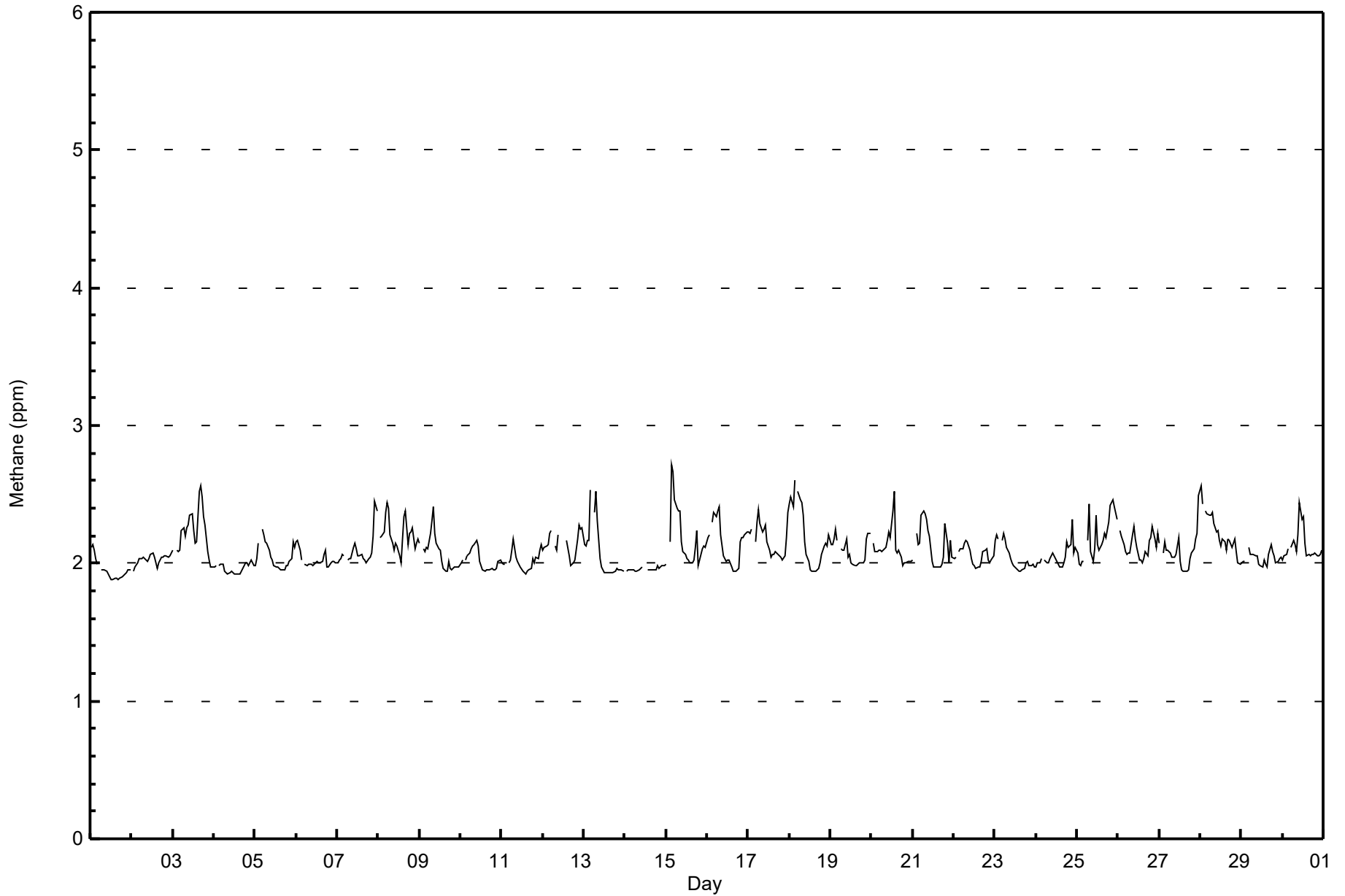




Summary of Hour Averages

Fort McKay - Bertha Ganter - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0										Hours in Service: 720																	
Maximum Value: 2.7 ppm on Sep 15 04:00										Maximum Daily Average: 2.2 ppm on Sep 28										Hours of Data: 684							
Minimum Value: 1.9 ppm on Sep 1 14:00										Minimum Daily Average: 2.0 ppm on Sep 1										Hours of Missing Data: 36							
Maximum Diurnal Average: 2.2 ppm at hour 6										Minimum Diurnal Average: 2.0 ppm at hour 15										Hours of Calibration: 34							
Monthly Average: 2.09 ppm										Percentiles: P ₁ = 1.9 P ₁₀ = 2.0 Q ₁ = 2.0 Median = 2.1 Q ₃ = 2.2 P ₉₀ = 2.3 P ₉₉ = 2.5										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-Sep	2.1	2.1	2.1	2.0	2.0	Z	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.1	
2-Sep	Z	1.9	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	2.1	2.1	2.0	2.1	2.1	2.0	2.1	2.1
3-Sep	2.1	Z	2.1	2.1	2.1	2.2	2.3	2.2	2.3	2.3	2.3	2.4	2.2	2.2	2.2	2.5	2.6	2.5	2.3	2.3	2.1	2.0	2.0	2.0	2.0	2.2	2.6
4-Sep	2.0	2.0	Z	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
5-Sep	2.0	2.0	2.1	Z	2.3	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.1	2.0	2.0	2.3
6-Sep	2.2	2.2	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	2.2
7-Sep	2.0	2.0	2.0	2.1	2.1	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	2.1	2.2	2.4	2.4	2.1	2.1	2.4
8-Sep	Z	2.2	2.2	2.2	2.4	2.4	2.4	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.2	2.3	2.4	2.1	2.2	2.2	2.3	2.1	2.1	2.2	2.2	2.2	2.4
9-Sep	2.1	Z	2.1	2.1	2.1	2.1	2.2	2.3	2.4	2.2	2.1	2.1	2.1	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	2.4
10-Sep	2.0	2.0	Z	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.0	2.0	2.0	1.9	1.9	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.2
11-Sep	2.0	2.0	2.0	Z	2.0	2.0	2.1	2.2	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.2
12-Sep	2.1	2.1	2.1	2.1	2.2	2.2	Z	2.1	2.1	2.2	C	C	C	C	2.2	2.1	2.0	2.0	2.0	2.0	2.2	2.3	2.2	2.3	2.1	2.3	2.3
13-Sep	2.1	2.1	2.2	2.2	2.5	Z	2.4	2.5	2.3	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	2.0	1.9	1.9	2.1	2.5	
14-Sep	Z	1.9	1.9	2.0	2.0	1.9	1.9	1.9	2.0	2.0	2.0	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
15-Sep	2.0	Z	2.2	2.7	2.7	2.5	2.4	2.4	2.4	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.0	2.1	2.1	2.1	2.1	2.2	2.7
16-Sep	2.2	2.2	Z	2.3	2.4	2.3	2.4	2.4	2.2	2.1	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	2.0	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.4
17-Sep	2.2	2.2	2.3	Z	2.2	2.3	2.4	2.3	2.2	2.2	2.3	2.2	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.2	2.4	2.2	2.2	2.4
18-Sep	2.4	2.5	2.4	2.6	Z	2.5	2.5	2.4	2.4	2.2	2.1	2.0	2.0	1.9	1.9	1.9	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.6
19-Sep	2.1	2.1	2.2	2.2	2.2	Z	2.1	2.1	2.1	2.2	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.2	2.2	2.1	2.1	2.2
20-Sep	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.4	2.5	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.5
21-Sep	2.0	Z	2.2	2.1	2.1	2.4	2.4	2.4	2.3	2.2	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3	2.1	2.0	2.2	2.0	2.1	2.1	2.4
22-Sep	2.0	2.0	Z	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.2
23-Sep	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2
24-Sep	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.1	2.1	2.3	2.1	2.1	2.1	2.1	2.3
25-Sep	2.1	2.0	2.0	2.0	2.0	Z	2.2	2.4	2.1	2.0	2.1	2.4	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.4	2.4	2.5	2.4	2.3	2.2	2.2	2.5
26-Sep	Z	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.2	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.2	2.3	2.2	2.1	2.2	2.1	2.1	2.3
27-Sep	2.1	Z	2.1	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.2	2.0	1.9	1.9	1.9	1.9	2.0	2.0	2.1	2.1	2.2	2.2	2.5	2.1	2.1	2.5
28-Sep	2.6	2.4	Z	2.4	2.4	2.4	2.4	2.4	2.3	2.2	2.2	2.2	2.1	2.2	2.2	2.1	2.2	2.2	2.1	2.1	2.2	2.1	2.0	2.0	2.2	2.2	2.6
29-Sep	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	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
30-Sep	2.0	2.1	2.1	2.1	Z	2.1	2.2	2.1	2.1	2.2	2.4	2.3	2.3	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	2.4
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerospan C - Calibration M - Maintenance																											





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	328	47.95	47.95
2.1 - 3.0	356	52.05	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Methane (CH₄) - ppm
Fort McKay - Bertha Ganter - September 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	11	2	0	1	1	8	2	52	71	30	35	27	19	33	21	15	328
2.1 - 3.0	23	13	8	0	2	0	4	46	107	56	17	12	14	23	14	15	354
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	34	15	8	1	3	8	6	98	178	86	52	39	33	56	35	30	682

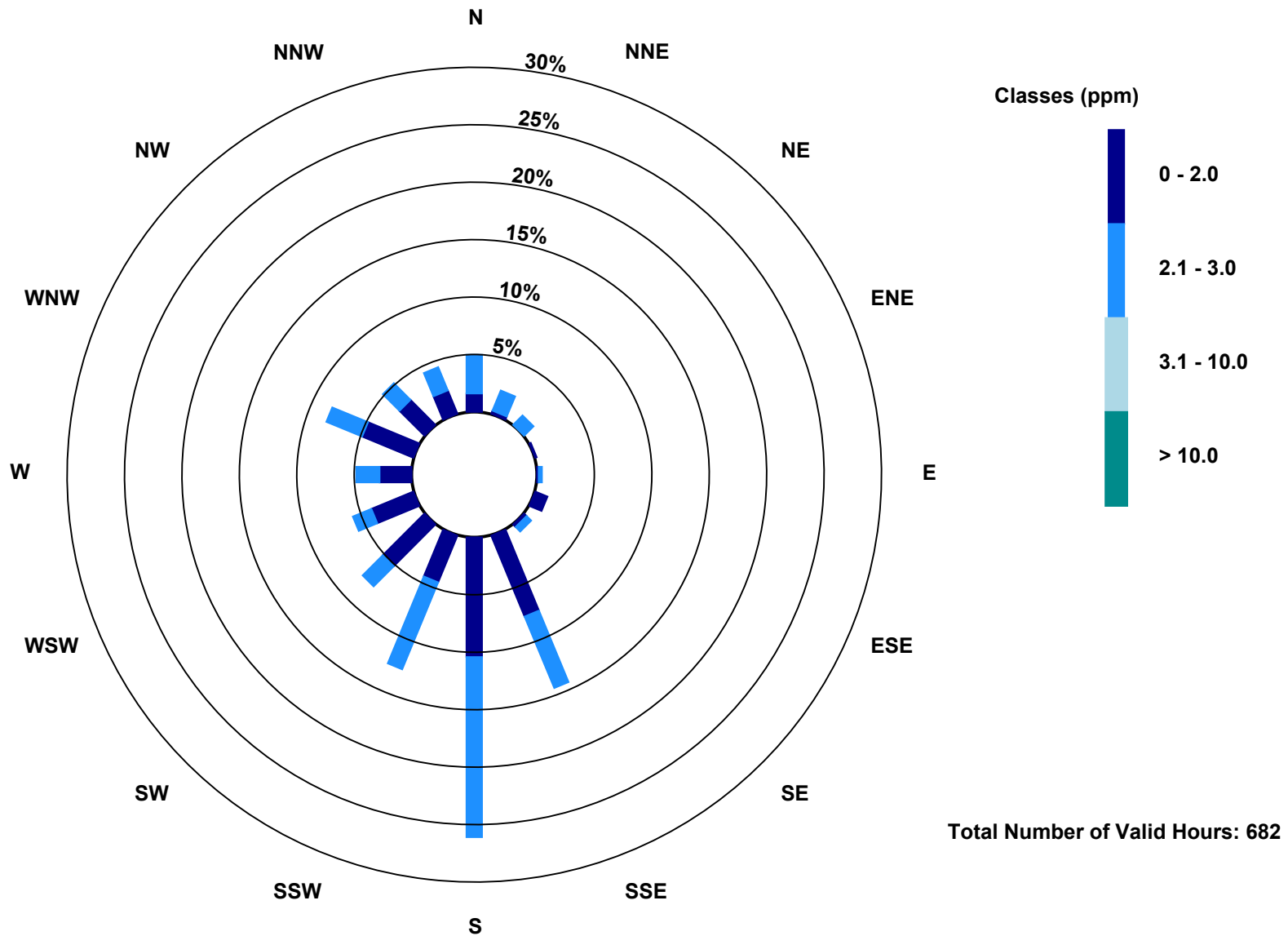
Total Number of Valid Hours: 682

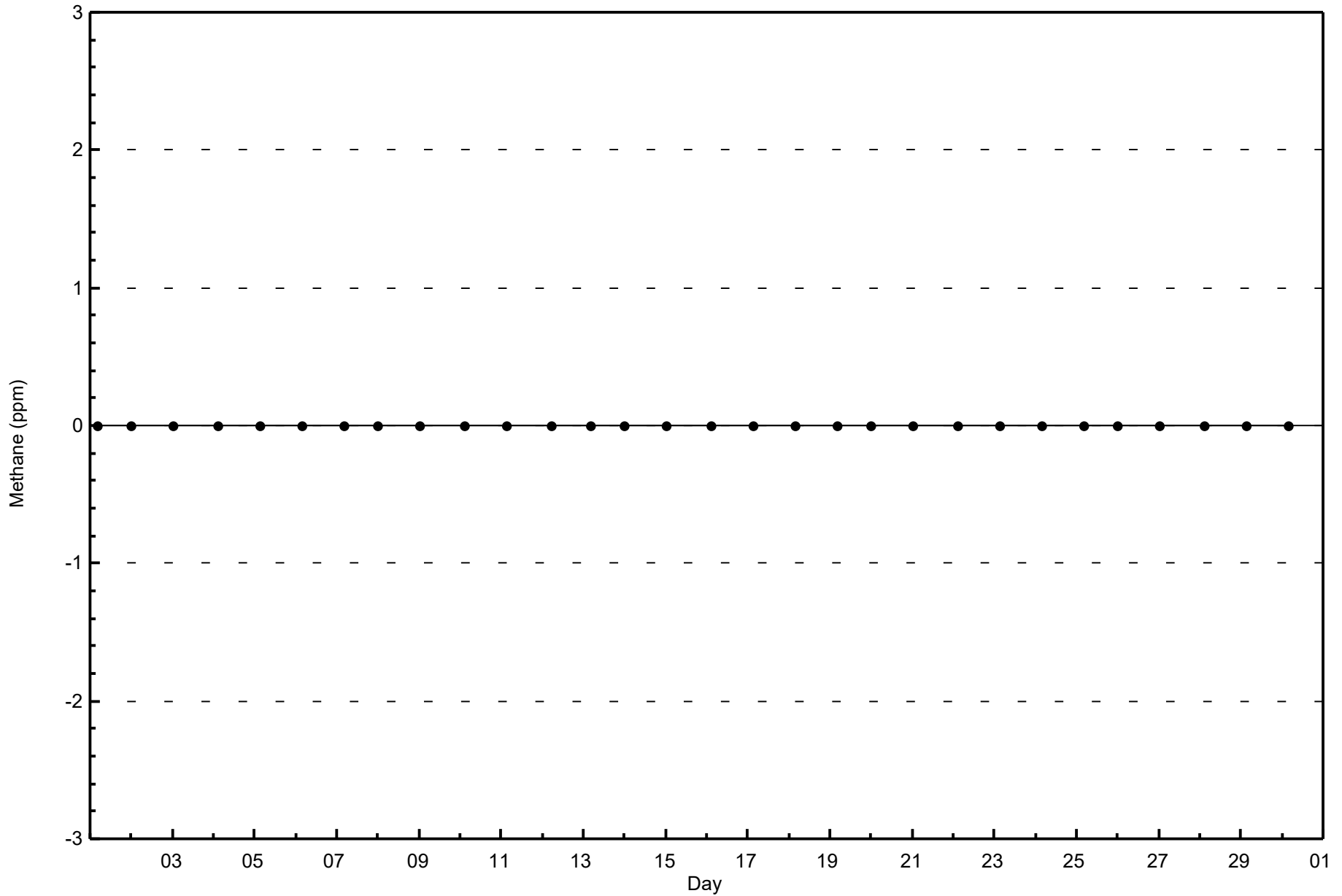
Total Number of Hours: 720

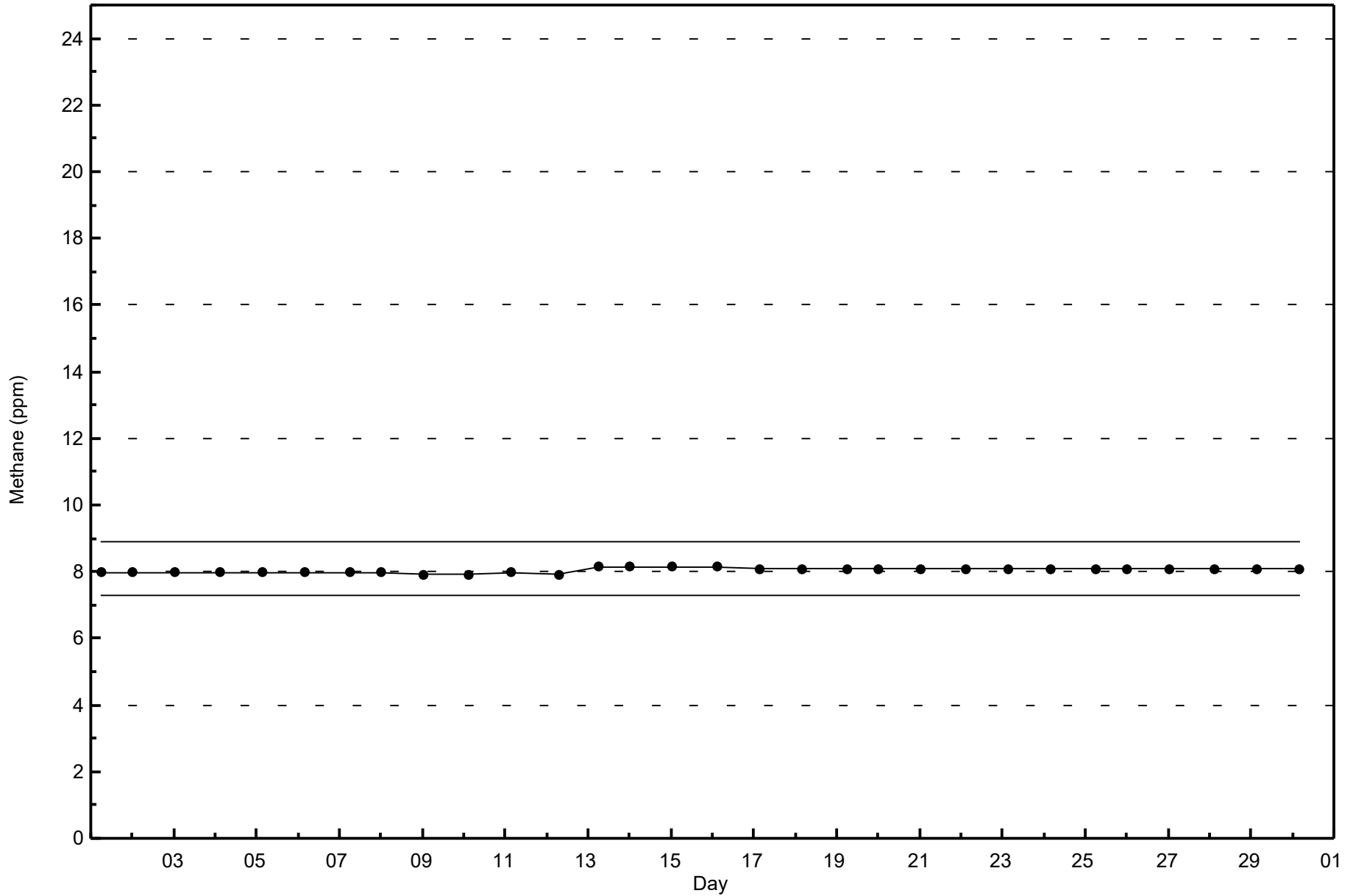


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Methane (CH₄) - ppm
Fort McKay - Bertha Ganter





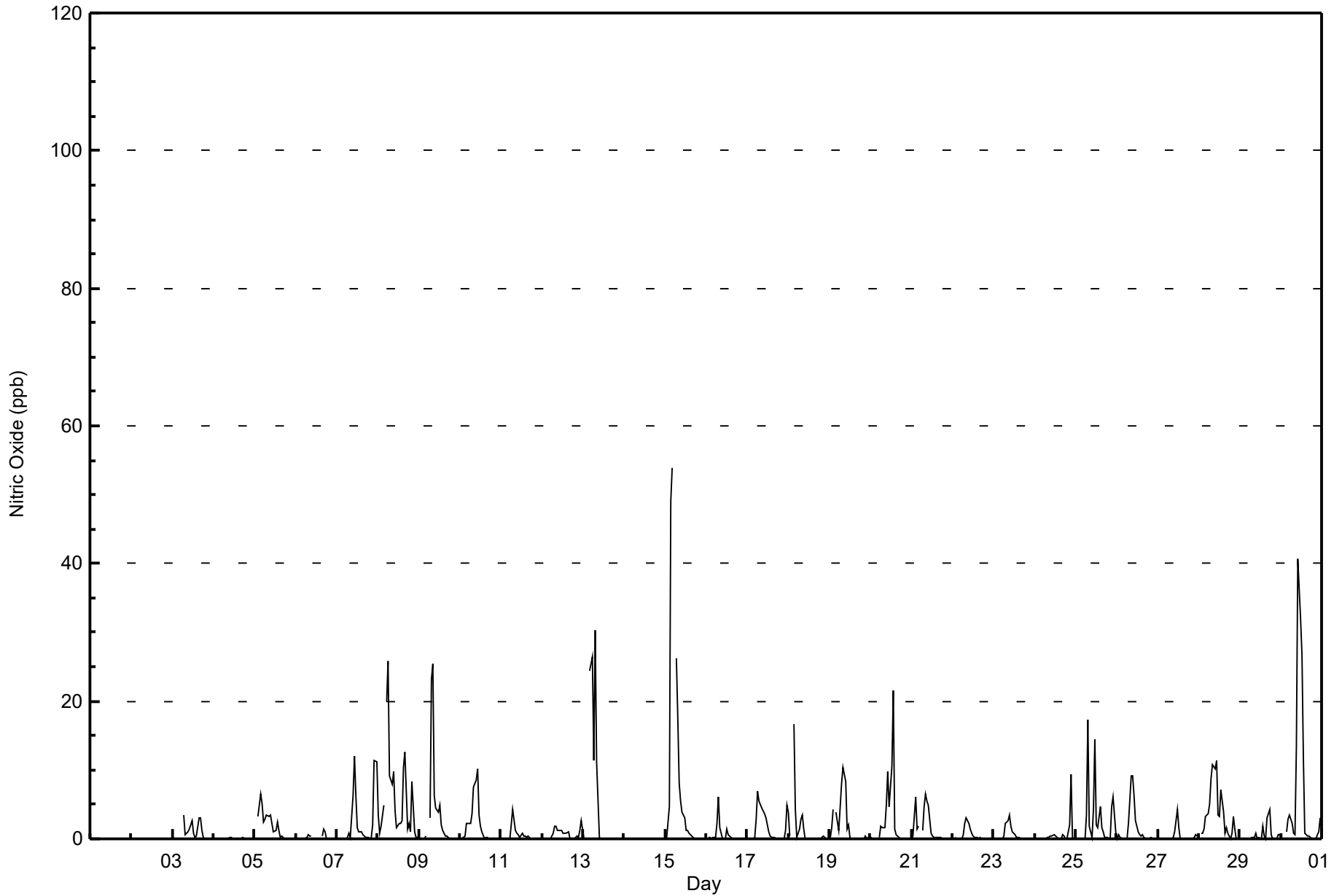




Summary of Hour Averages

Fort McKay - Bertha Ganter - September 2023

Table with 24 columns for hourly data and 2 rows for diurnal averages. Includes summary statistics like Maximum Value: 53.9 ppb on Sep 15 05:00 and Minimum Value: 0.0 ppb on Sep 1 01:00. Legend: Z - zerospan, C - Calibration, M - Maintenance.





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	670	98.10	98.10
21 - 40	10	1.46	99.56
41 - 80	3	0.44	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 683

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

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

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	34	15	6	1	2	9	6	96	172	80	52	40	36	57	32	30	668
21 - 40	0	0	1	0	0	0	0	4	4	1	0	0	0	0	0	0	10
11 - 80	0	0	0	0	0	0	0	0	2	1	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	34	15	7	1	2	9	6	100	178	82	52	40	36	57	32	30	681

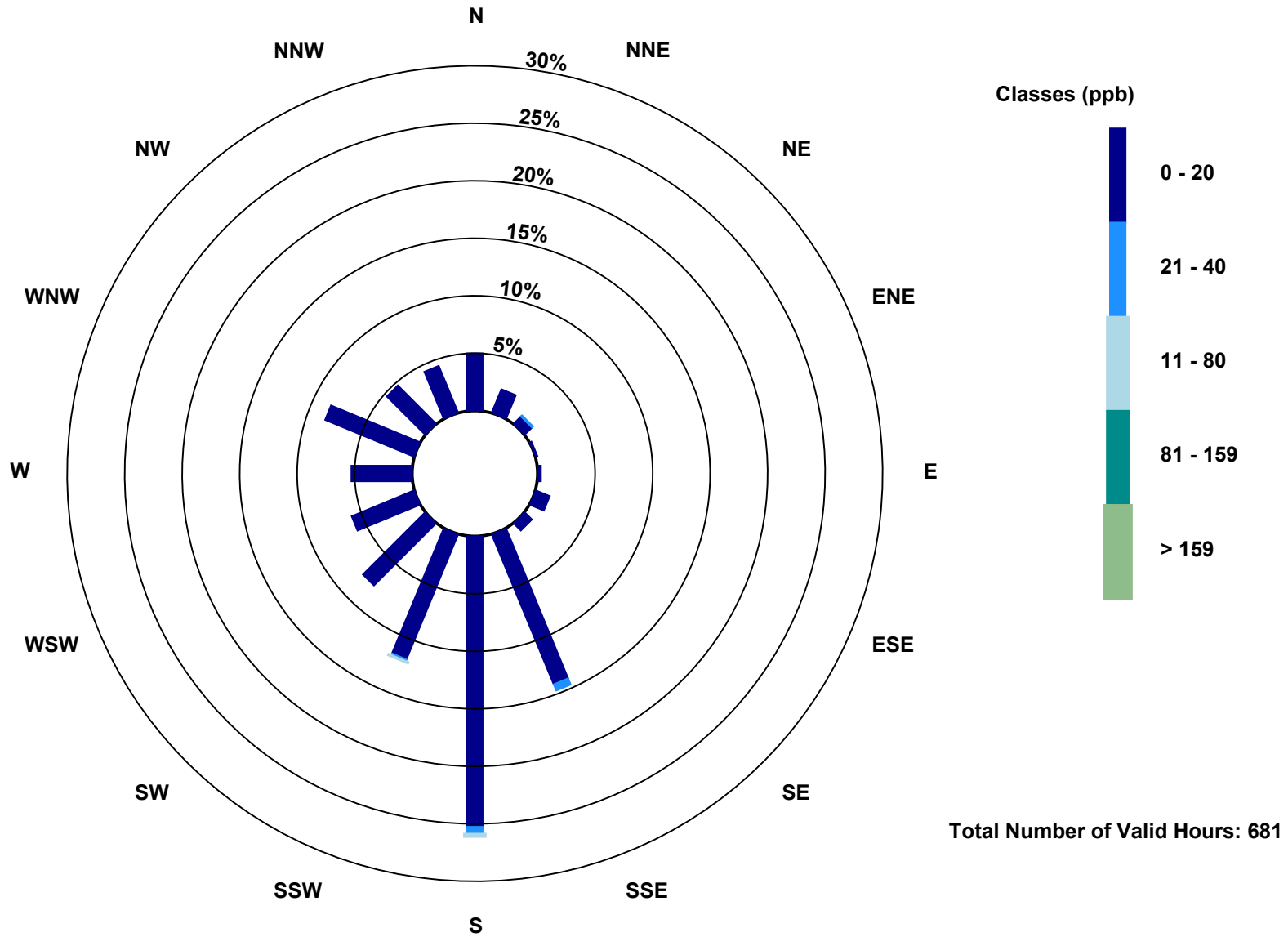
Total Number of Valid Hours: 681

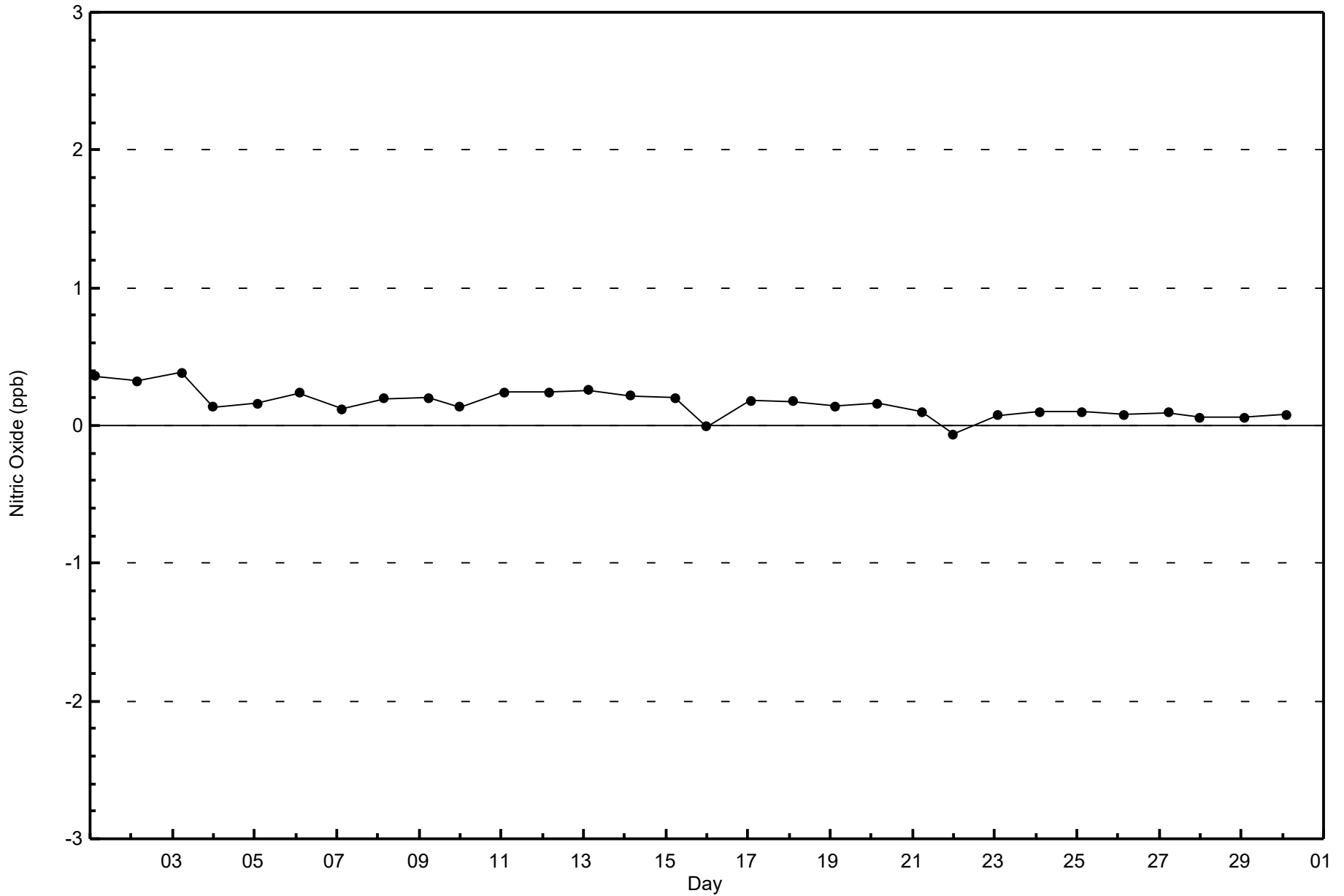
Total Number of Hours: 720

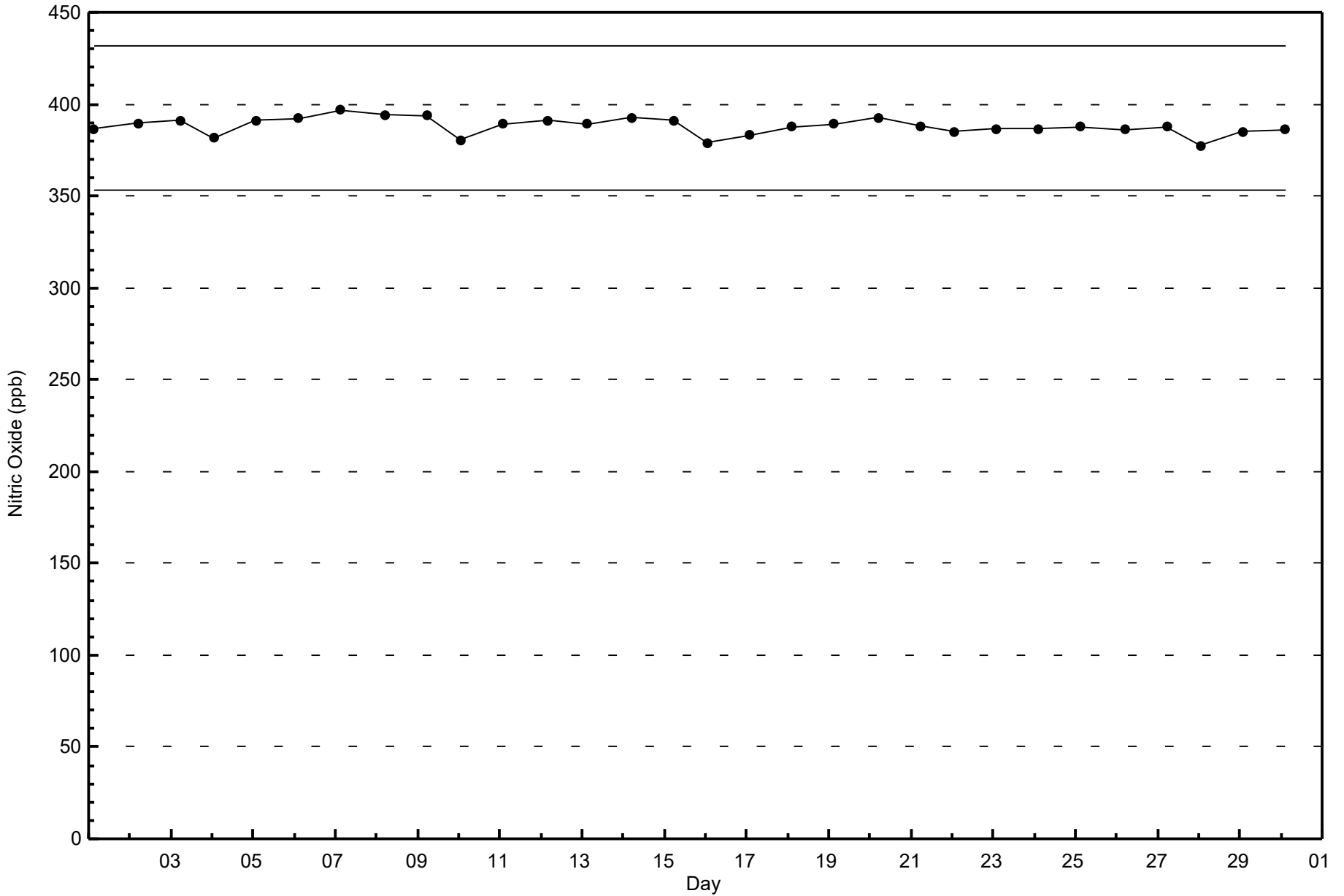


Wood Buffalo Environmental Association
Wind Rose Sep 2023

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









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

Fort McKay - Bertha Ganter - September 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 30.4 ppb on Sep 20 14:00	Maximum Daily Average: 10.5 ppb on Sep 25		Hours of Data:	683
Minimum Value: 0.0 ppb on Sep 1 05:00	Minimum Daily Average: 0.3 ppb on Sep 14		Hours of Missing Data:	37
Maximum Diurnal Average: 7.0 ppb at hour 24	Minimum Diurnal Average: 3.0 ppb at hour 15		Hours of Calibration:	35
Monthly Average: 5.22 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.3 Q ₁ = 1.5 Median = 3.8 Q ₃ = 7.8 P ₉₀ = 11.7 P ₉₉ = 21.5		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-Sep	0.6	0.5	0.5	Z	0.0	0.0	0.1	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.7	0.7	0.7	0.5	0.5	0.4	0.3	0.7	
2-Sep	0.3	0.4	0.5	2.1	Z	4.6	4.7	4.9	5.1	4.2	3.9	4.2	4.1	3.5	2.6	1.6	2.5	3.1	3.1	2.9	2.4	2.3	2.4	2.6	3.0	5.1
3-Sep	2.7	2.6	2.1	1.8	1.7	Z	11.3	7.2	6.5	6.1	7.9	8.3	3.8	2.4	6.0	21.8	24.2	17.1	11.4	8.0	3.3	1.0	0.3	0.0	6.8	24.2
4-Sep	Z	0.1	0.0	0.0	0.0	3.3	1.0	0.0	0.5	1.1	1.4	0.5	0.0	0.0	0.0	0.8	2.0	2.7	3.3	4.5	2.5	2.1	0.4	1.1	4.5	
5-Sep	0.4	Z	9.8	11.1	10.3	8.9	7.0	5.0	4.1	4.2	3.6	2.2	2.4	4.4	3.5	1.6	2.8	2.0	2.7	2.3	3.0	3.6	4.0	5.2	4.5	11.1
6-Sep	7.8	8.2	Z	1.9	1.1	1.4	3.1	4.2	3.0	2.1	C	C	C	C	C	0.5	3.2	3.2	0.7	0.9	0.9	0.6	0.4	0.5	2.4	8.2
7-Sep	0.5	0.3	0.4	Z	0.5	0.5	0.6	0.9	0.5	2.7	7.6	7.1	3.6	3.5	4.5	3.9	3.8	2.4	2.7	1.1	5.2	8.8	13.3	9.2	3.6	13.3
8-Sep	7.2	4.0	4.3	5.7	Z	4.4	5.1	6.4	5.9	7.2	4.4	3.3	4.2	3.3	8.7	17.0	21.1	12.1	17.7	21.4	21.2	8.7	8.6	8.0	9.1	21.4
9-Sep	5.1	2.5	1.8	1.3	1.2	Z	1.7	4.9	5.9	5.5	5.7	6.4	10.0	6.4	5.5	4.2	5.3	4.1	3.7	4.1	3.6	2.4	3.0	2.2	4.2	10.0
10-Sep	Z	1.8	1.6	2.8	2.7	2.5	1.5	2.2	5.2	8.6	11.2	7.0	5.9	4.0	1.3	2.3	2.5	2.2	3.8	2.1	0.8	1.8	6.9	10.8	4.0	11.2
11-Sep	7.7	Z	7.3	7.5	7.8	6.5	7.8	6.3	4.1	3.0	2.5	2.0	3.6	3.0	2.6	2.5	3.5	1.6	2.3	2.3	5.0	7.1	10.5	21.0	5.5	21.0
12-Sep	15.4	12.7	6.8	8.2	Z	9.3	13.1	11.0	6.8	5.1	5.3	5.9	5.4	4.9	4.4	5.5	1.9	1.3	1.3	1.4	9.6	14.1	12.9	12.5	7.6	15.4
13-Sep	3.4	2.1	4.2	Z	16.0	14.9	12.7	13.3	8.9	1.0	0.3	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.1	0.0	3.4	16.0
14-Sep	0.0	0.1	0.0	0.1	Z	0.1	0.0	0.0	0.1	0.3	0.4	M	M	0.2	0.0	0.0	0.0	0.0	0.1	1.7	0.0	0.2	1.0	1.0	0.3	1.7
15-Sep	0.8	1.9	10.6	13.1	10.9	Z	8.3	8.0	8.2	6.3	5.5	4.6	3.2	3.7	3.8	2.2	2.4	1.9	2.6	2.1	2.5	2.8	4.2	4.0	4.9	13.1
16-Sep	Z	5.1	8.9	6.8	7.9	9.9	13.9	16.0	7.6	1.0	0.8	1.0	5.4	4.9	1.9	0.7	0.6	0.9	2.4	15.6	21.9	23.4	21.0	16.4	8.4	23.4
17-Sep	18.8	Z	11.7	11.1	7.9	12.0	11.1	8.0	6.4	7.3	9.3	9.5	5.2	3.0	3.4	3.6	4.1	1.3	1.7	1.6	1.3	5.7	12.5	24.1	7.9	24.1
18-Sep	20.2	13.8	Z	20.8	15.4	11.2	13.4	11.6	9.7	3.7	0.9	0.5	0.4	0.3	0.3	0.7	0.5	0.3	3.3	4.9	7.5	8.5	5.2	9.4	7.1	20.8
19-Sep	12.4	14.4	15.2	Z	14.4	11.6	12.0	9.2	8.9	7.4	2.4	3.3	0.7	0.2	0.1	0.1	0.9	1.5	2.4	4.1	3.4	10.3	10.2	8.6	6.7	15.2
20-Sep	9.6	6.1	1.7	1.6	Z	1.7	2.6	2.4	2.0	3.9	8.8	11.2	21.4	30.4	7.6	6.4	7.8	5.0	1.6	2.7	2.2	2.1	2.3	1.9	6.2	30.4
21-Sep	2.3	2.8	7.8	5.8	5.8	Z	9.4	8.8	7.0	6.1	6.1	1.9	1.4	1.1	1.1	1.3	2.0	4.0	5.9	1.6	4.0	4.7	5.4	5.6	4.4	9.4
22-Sep	Z	3.5	3.8	4.9	8.9	9.3	10.2	9.4	8.0	5.6	3.9	2.9	1.8	1.1	1.2	1.0	2.2	2.0	3.1	4.6	4.8	3.0	2.3	2.4	4.3	10.2
23-Sep	2.5	Z	5.3	10.1	8.6	9.9	10.8	12.7	9.8	10.7	6.7	3.7	2.8	1.3	1.5	1.2	1.1	1.1	1.6	3.6	6.9	8.3	8.5	3.5	5.7	12.7
24-Sep	2.9	5.1	Z	2.3	1.3	1.8	4.1	3.9	3.1	3.2	2.6	3.1	3.0	1.2	0.7	0.6	5.4	11.1	4.9	3.7	12.0	20.0	6.3	7.6	4.8	20.0
25-Sep	10.0	0.6	0.2	Z	4.0	5.1	10.8	13.1	4.2	0.7	6.6	16.5	7.0	6.3	10.0	10.5	15.2	10.8	15.1	18.0	19.5	22.2	20.8	14.9	10.5	22.2
26-Sep	8.9	14.5	11.7	6.2	Z	2.7	4.5	7.8	10.3	13.2	9.4	6.2	4.6	4.4	5.4	11.6	8.1	4.6	13.5	15.3	15.5	7.7	3.5	6.5	8.5	15.5
27-Sep	4.9	4.5	0.9	5.0	1.9	Z	1.5	1.4	0.9	1.0	3.6	10.2	4.2	0.3	0.1	0.1	0.1	0.4	2.2	4.8	10.6	18.0	19.0	17.0	4.9	19.0
28-Sep	Z	12.7	11.0	10.9	9.7	8.2	6.5	8.2	8.4	8.6	9.0	7.1	4.3	6.1	5.1	3.4	6.8	5.7	5.4	8.6	9.4	5.3	0.3	0.0	7.0	12.7
29-Sep	0.0	Z	0.7	0.3	3.1	1.1	1.0	1.1	0.8	2.4	0.2	0.7	0.2	3.9	1.8	0.1	9.3	13.5	10.2	7.3	1.7	2.3	6.9	7.3	3.3	13.5
30-Sep	2.9	3.1	Z	4.0	5.3	6.1	4.3	2.4	1.8	5.7	8.3	9.6	9.7	8.0	2.7	1.6	2.3	3.4	4.0	5.1	5.3	6.0	6.5	6.1	5.0	9.7

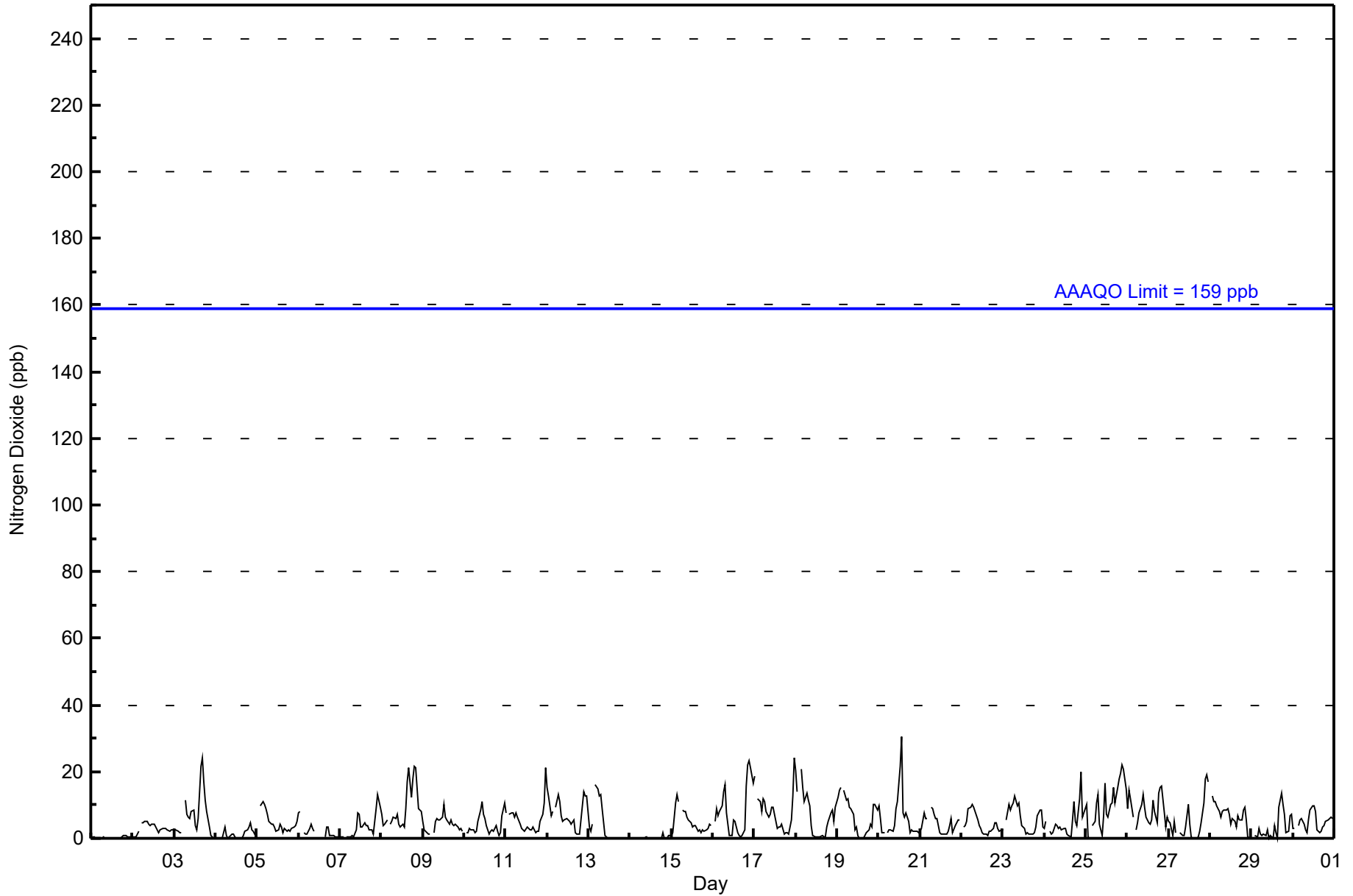
5.9	4.9	5.0	5.8	6.1	5.9	6.5	6.4	5.1	4.6	4.8	5.0	4.2	3.9	3.0	3.5	4.7	4.0	4.4	5.2	6.3	6.8	6.7	7.0	Diurnal Average	
20.2	14.5	15.2	20.8	16.0	14.9	13.9	16.0	10.3	13.2	11.2	16.5	21.4	30.4	10.0	21.8	24.2	17.1	17.7	21.4	21.9	23.4	21.0	24.1	Diurnal Maximum	

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
Fort McKay - Bertha Ganter - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	668	97.80	97.80
21 - 40	15	2.20	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: 683

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Fort McKay - Bertha Ganter - September 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	14	6	1	2	9	5	100	175	80	52	40	36	56	31	28	667
21 - 40	2	1	1	0	0	0	1	0	3	2	0	0	0	1	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	34	15	7	1	2	9	6	100	178	82	52	40	36	57	32	30	681

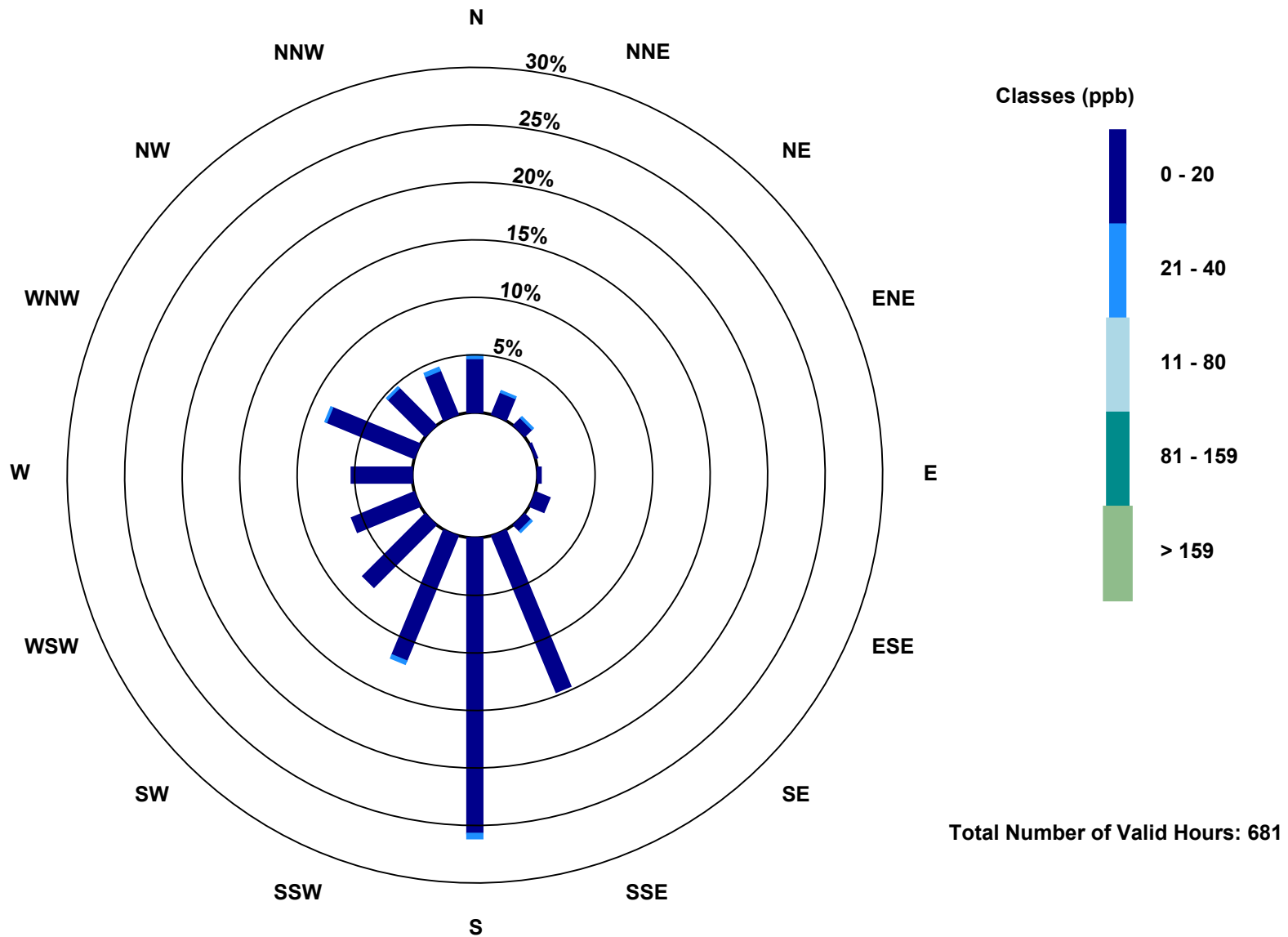
Total Number of Valid Hours: 681

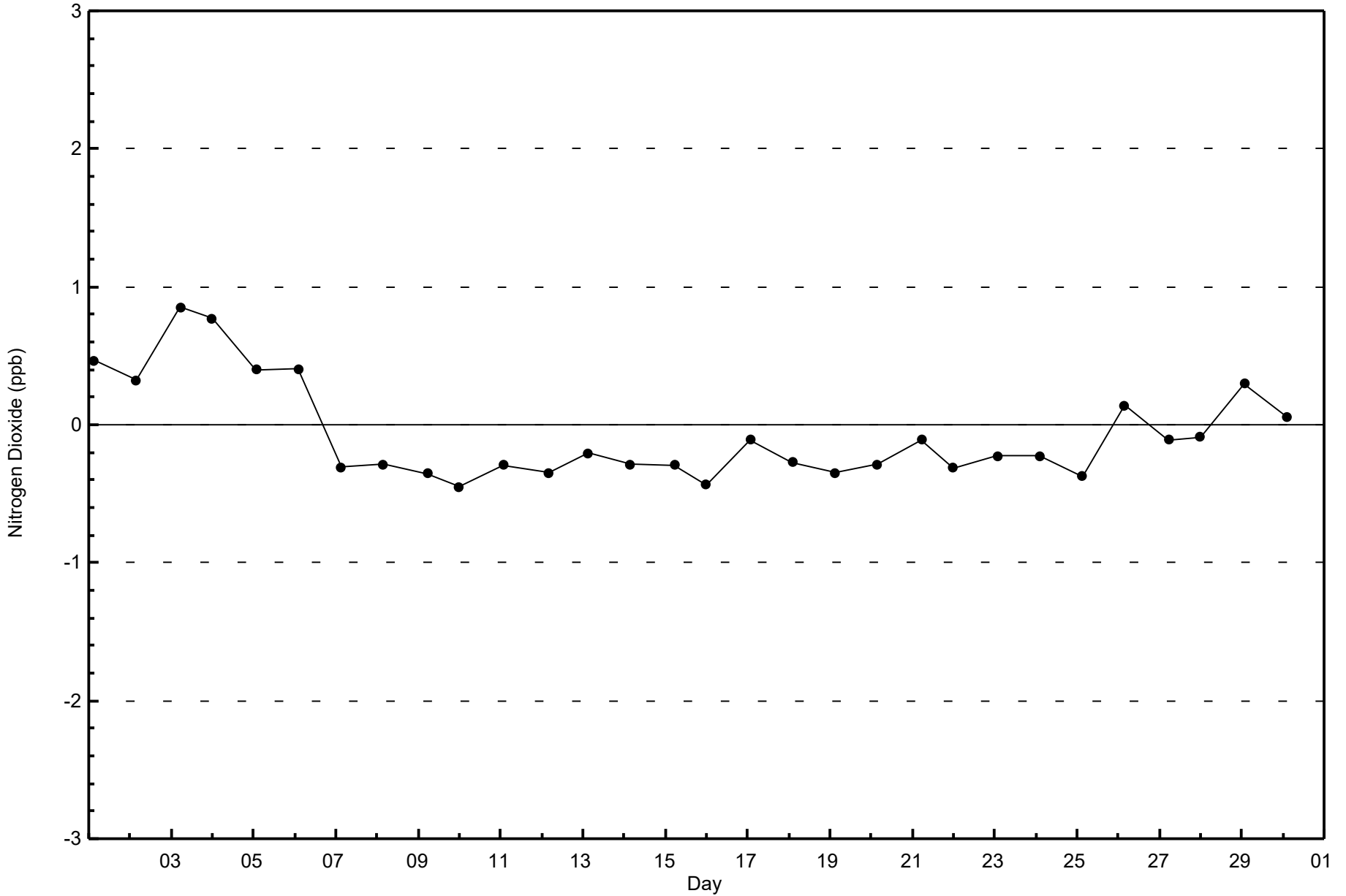
Total Number of Hours: 720

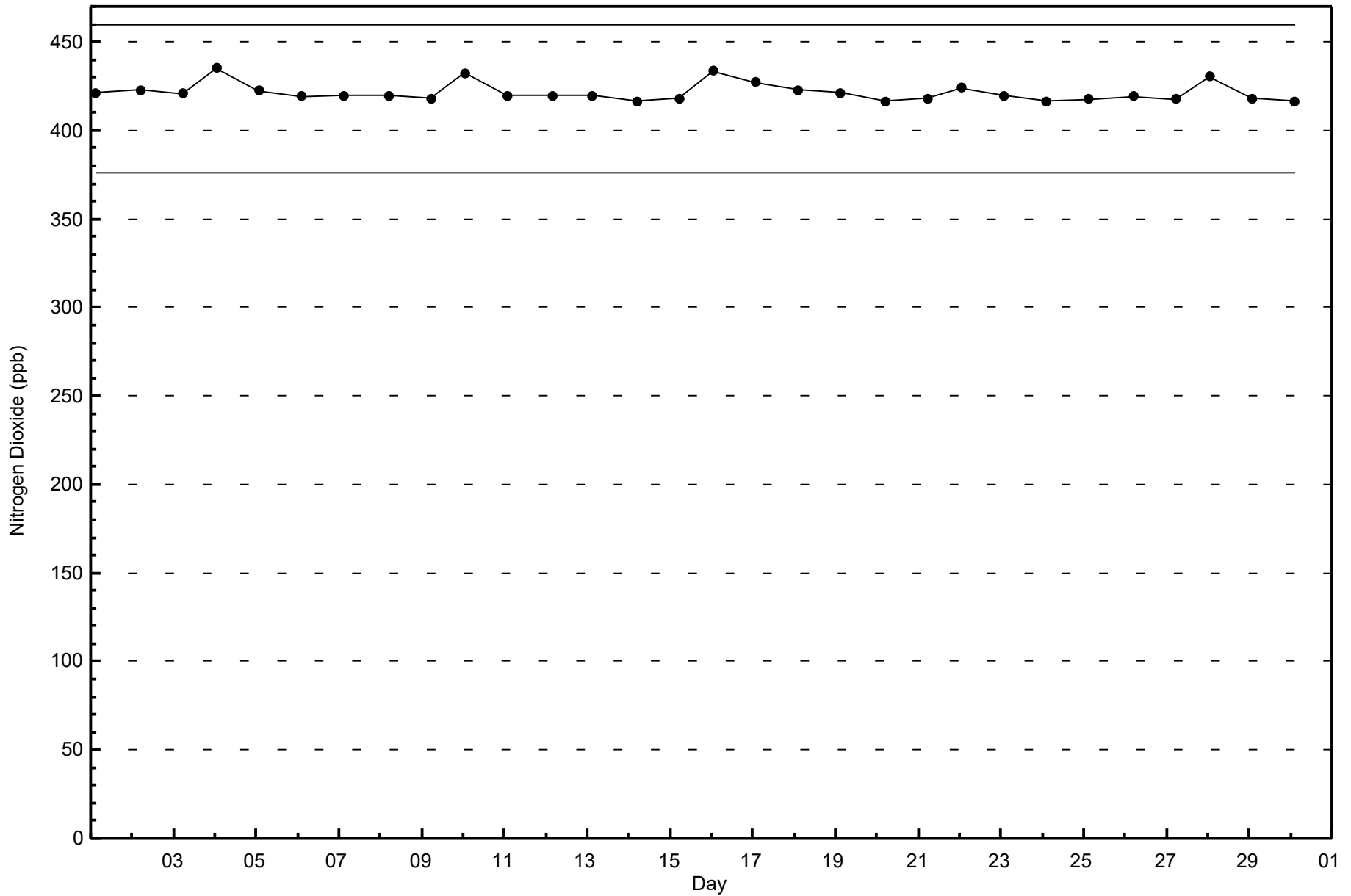


Wood Buffalo Environmental Association
Wind Rose Sep 2023

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









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_x) - ppb

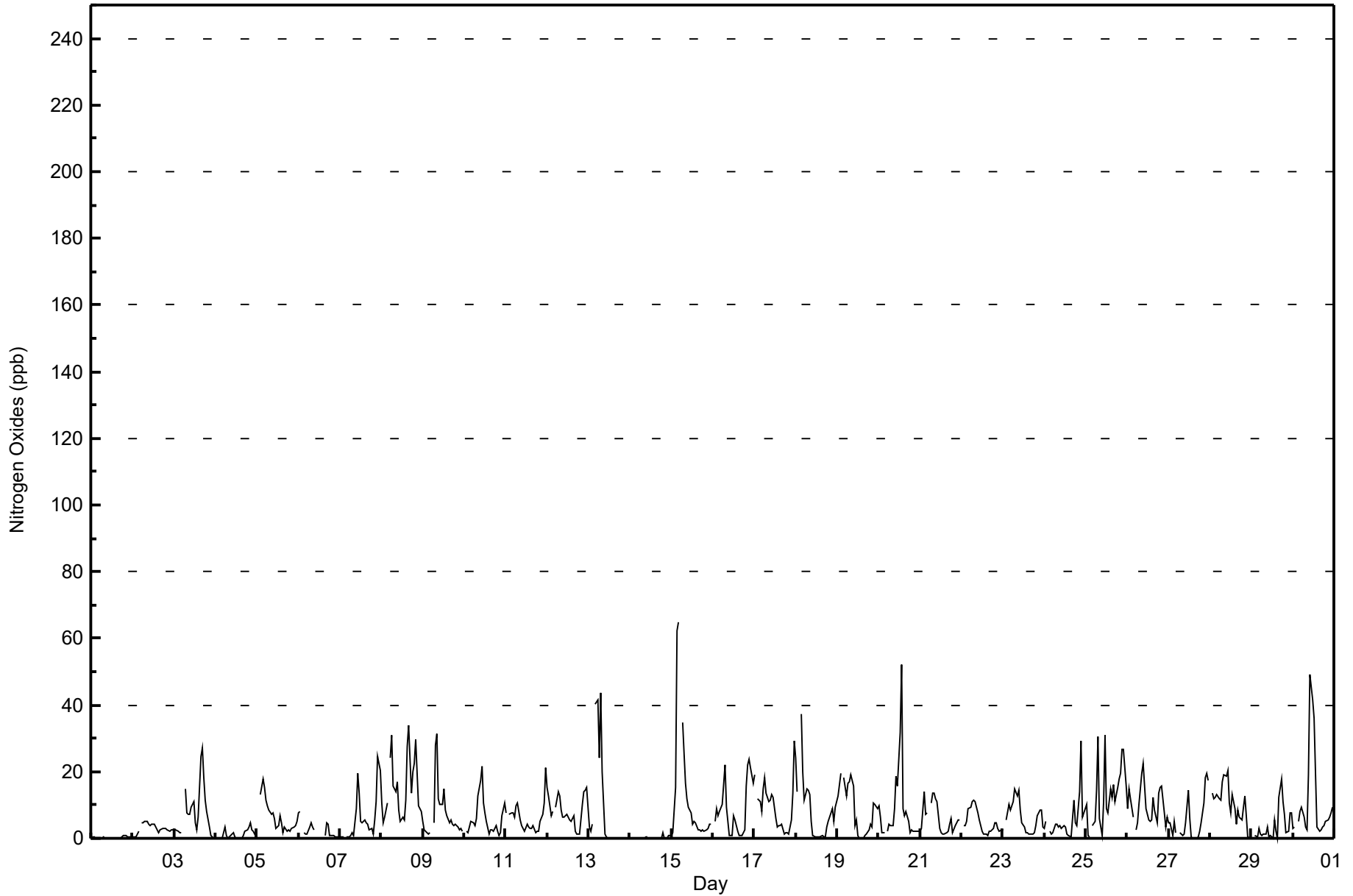
Fort McKay - Bertha Ganter - September 2023

Maximum Value: 64.8 ppb on Sep 15 05:00																				Maximum Daily Average: 15.0 ppb on Sep 8					Hours in Service: 720																								
Minimum Value: 0.0 ppb on Sep 1 06:00																				Minimum Daily Average: 0.3 ppb on Sep 14					Hours of Data: 683																								
Maximum Diurnal Average: 11.6 ppb at hour 8																				Minimum Diurnal Average: 3.7 ppb at hour 15					Hours of Missing Data: 37																								
Monthly Average: 7.11 ppb																				Percentiles: P ₁ = 0.0 P ₁₀ = 0.3 Q ₁ = 1.6 Median = 4.4 Q ₃ = 10.1 P ₉₀ = 16.5 P ₉₉ = 40.6					Hours of Calibration: 35																								
																									Percent Operational Time: 99.7																								
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Sep	0.6	0.5	0.5	Z	0.0	0.0	0.1	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.7	0.7	0.7	0.5	0.5	0.4	0.3	0.7																								
2-Sep	0.3	0.4	0.5	2.1	Z	4.6	4.7	4.9	5.1	4.2	3.9	4.2	4.1	3.5	2.6	1.6	2.5	3.1	3.1	2.9	2.4	2.3	2.4	2.6	3.0	5.1																							
3-Sep	2.7	2.6	2.1	1.8	1.7	Z	14.8	7.7	7.2	7.1	9.3	10.8	4.6	2.5	6.4	24.8	27.2	18.3	11.6	8.0	3.3	1.0	0.3	0.0	7.6	27.2																							
4-Sep	Z	0.1	0.0	0.0	0.0	3.3	1.0	0.0	0.6	1.3	1.6	0.5	0.0	0.0	0.0	0.0	0.9	2.2	2.7	3.3	4.5	2.5	2.1	0.4	1.2	4.5																							
5-Sep	0.4	Z	13.1	17.7	15.4	11.4	9.8	8.5	7.3	7.6	5.8	3.2	3.7	6.9	4.7	1.7	3.3	2.0	2.7	2.3	3.0	3.6	4.0	5.2	6.2	17.7																							
6-Sep	7.8	8.2	Z	1.9	1.1	1.4	3.2	4.7	3.4	2.5	C	C	C	C	C	1.0	4.7	4.3	0.8	0.9	0.9	0.6	0.4	0.5	2.7	8.2																							
7-Sep	0.5	0.3	0.4	Z	0.6	0.5	0.7	1.7	0.7	9.0	19.6	13.4	5.1	4.5	5.4	4.6	4.3	2.5	2.8	1.1	5.4	10.9	24.7	20.3	6.1	24.7																							
8-Sep	10.7	4.8	6.2	10.5	Z	24.3	31.0	15.5	13.9	17.0	8.4	5.0	6.5	5.5	11.3	27.5	33.8	13.6	19.9	22.5	29.5	9.8	8.8	8.2	15.0	33.8																							
9-Sep	5.2	2.5	1.8	1.3	1.7	Z	4.7	28.1	31.2	11.8	10.2	10.3	14.9	8.3	6.8	4.6	5.6	4.3	3.8	4.1	3.6	2.4	3.0	2.2	7.5	31.2																							
10-Sep	Z	1.9	1.8	3.2	4.9	4.7	3.7	5.8	12.6	17.2	21.4	10.4	7.8	5.0	1.4	2.5	2.7	2.2	3.8	2.1	0.8	1.8	6.9	10.8	5.9	21.4																							
11-Sep	7.7	Z	7.3	7.5	7.8	6.5	9.8	10.6	5.4	3.9	3.0	2.3	4.3	3.5	3.0	2.8	3.8	1.6	2.3	2.3	5.0	7.1	10.5	21.0	6.0	21.0																							
12-Sep	15.4	12.7	6.8	8.2	Z	9.3	14.0	12.7	8.6	6.3	6.5	7.2	6.3	5.7	5.2	6.6	1.9	1.3	1.3	1.4	10.0	14.2	14.2	15.1	8.3	15.4																							
13-Sep	3.4	2.1	4.2	Z	40.4	41.4	24.1	43.6	20.1	1.2	0.3	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.1	0.0	7.9	43.6																							
14-Sep	0.0	0.1	0.0	0.1	Z	0.1	0.0	0.0	0.1	0.3	0.4	M	M	0.2	0.0	0.0	0.0	0.0	0.1	1.7	0.0	0.2	1.0	1.0	0.3	1.7																							
15-Sep	0.8	1.9	15.3	62.1	64.8	Z	34.6	25.6	16.4	11.7	9.4	7.6	4.4	5.0	4.7	2.5	2.6	2.0	2.6	2.2	2.6	2.9	4.3	4.1	12.6	64.8																							
16-Sep	Z	5.2	9.0	6.9	8.0	10.0	16.2	22.1	9.3	1.0	0.8	1.0	6.8	5.4	2.1	0.8	0.6	0.9	2.4	15.6	22.0	23.5	21.1	16.4	9.0	23.5																							
17-Sep	18.9	Z	11.7	11.2	8.1	14.8	18.1	13.5	10.9	11.3	13.1	12.5	6.1	3.4	3.6	3.8	4.3	1.3	1.7	1.6	1.3	5.7	13.6	29.1	9.6	29.1																							
18-Sep	24.0	14.2	Z	37.5	19.8	11.3	14.8	14.4	13.1	5.2	0.9	0.5	0.4	0.3	0.3	0.7	0.5	0.3	3.3	4.9	7.8	8.8	5.2	9.4	8.6	37.5																							
19-Sep	12.7	16.0	19.5	Z	18.3	12.9	16.5	17.1	19.2	15.8	3.9	5.4	0.8	0.2	0.1	0.1	1.0	1.5	2.4	4.1	3.4	10.7	10.2	9.1	8.7	19.5																							
20-Sep	9.8	6.1	1.7	1.6	Z	1.9	4.4	4.0	3.7	8.9	18.6	15.9	32.0	51.9	8.9	6.9	8.2	5.0	1.6	2.7	2.2	2.1	2.3	1.9	8.8	51.9																							
21-Sep	2.3	3.1	13.9	7.2	7.5	Z	10.6	13.5	13.6	11.7	11.1	2.8	1.8	1.3	1.3	1.5	2.2	4.2	6.0	1.6	4.0	4.7	5.5	5.7	6.0	13.9																							
22-Sep	Z	3.6	3.9	5.0	9.0	9.4	10.8	11.6	11.1	7.8	5.3	3.6	2.1	1.2	1.3	1.0	2.3	2.0	3.1	4.6	4.8	3.0	2.3	2.4	4.8	11.6																							
23-Sep	2.5	Z	5.3	10.1	8.6	9.9	11.2	14.9	12.5	14.2	8.6	4.6	3.3	1.5	1.6	1.3	1.1	1.1	1.6	3.6	6.9	8.3	8.5	3.5	6.3	14.9																							
24-Sep	2.9	5.1	Z	2.3	1.3	1.8	4.1	4.0	3.3	3.6	2.9	3.6	3.5	1.3	0.7	0.6	6.0	11.6	4.9	3.7	14.0	29.3	6.4	7.6	5.4	29.3																							
25-Sep	10.0	0.6	0.2	Z	4.0	5.1	14.2	30.5	6.0	0.8	10.9	31.0	9.0	7.8	14.8	12.1	16.3	11.0	15.2	18.0	19.6	26.9	26.8	15.8	13.3	31.0																							
26-Sep	8.9	15.0	11.9	6.2	Z	2.7	4.5	10.1	19.4	22.4	15.7	8.9	5.6	4.9	5.7	12.2	8.3	4.6	13.5	15.3	15.8	7.7	3.5	6.5	10.0	22.4																							
27-Sep	4.9	4.5	0.9	5.0	1.9	Z	1.5	1.5	1.0	1.2	4.6	14.4	5.8	0.3	0.1	0.1	0.1	0.4	2.2	4.8	10.6	18.2	19.5	17.4	5.3	19.5																							
28-Sep	Z	13.5	11.8	12.3	12.9	11.8	11.6	17.0	19.1	18.7	20.4	10.5	7.6	13.2	9.0	4.1	8.4	6.4	5.4	9.4	12.6	6.7	0.3	0.0	10.5	20.4																							
29-Sep	0.0	Z	0.7	0.3	3.1	1.1	1.0	1.4	1.1	3.3	0.3	0.9	0.2	5.7	2.2	0.1	12.3	17.8	10.9	7.3	1.7	2.3	7.6	7.8	3.9	17.8																							
30-Sep	2.9	3.2	Z	5.0	8.1	9.5	6.5	3.3	2.5	19.2	48.9	41.5	36.2	19.5	3.5	2.1	2.7	3.5	4.0	5.1	5.4	6.5	7.5	9.2	11.1	48.9																							
																								6.2	5.1	5.8	9.1	10.4	8.4	10.1	11.6	9.3	8.2	9.2	8.3	6.5	5.8	3.7	4.3	5.6	4.3	4.5	5.3	6.8	7.5	7.4	7.8	Diurnal Average	
																								24.0	16.0	19.5	62.1	64.8	41.4	34.6	43.6	31.2	22.4	48.9	41.5	36.2	51.9	14.8	27.5	33.8	18.3	19.9	22.5	29.5	29.3	26.8	29.1	Diurnal Maximum	
Z - zerospan																								C - Calibration			M - Maintenance																						



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	644	94.29	94.29
21 - 40	32	4.69	98.98
41 - 80	7	1.02	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 683

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Fort McKay - Bertha Ganter - September 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	13	5	1	2	9	5	95	164	76	52	40	36	54	31	28	643
21 - 40	2	2	1	0	0	0	1	5	9	5	0	0	0	3	1	2	31
11 - 80	0	0	1	0	0	0	0	0	5	1	0	0	0	0	0	0	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	34	15	7	1	2	9	6	100	178	82	52	40	36	57	32	30	681

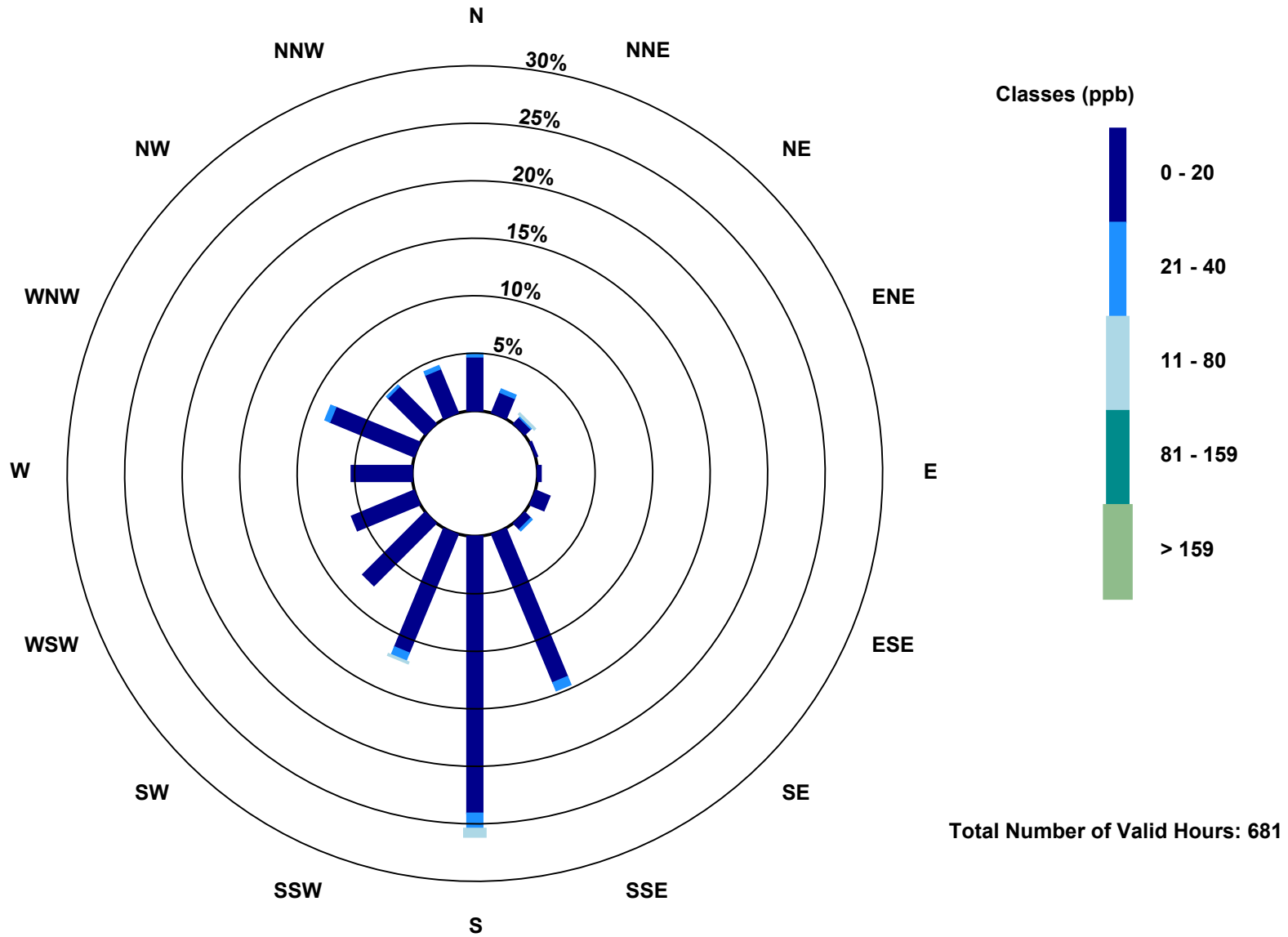
Total Number of Valid Hours: 681

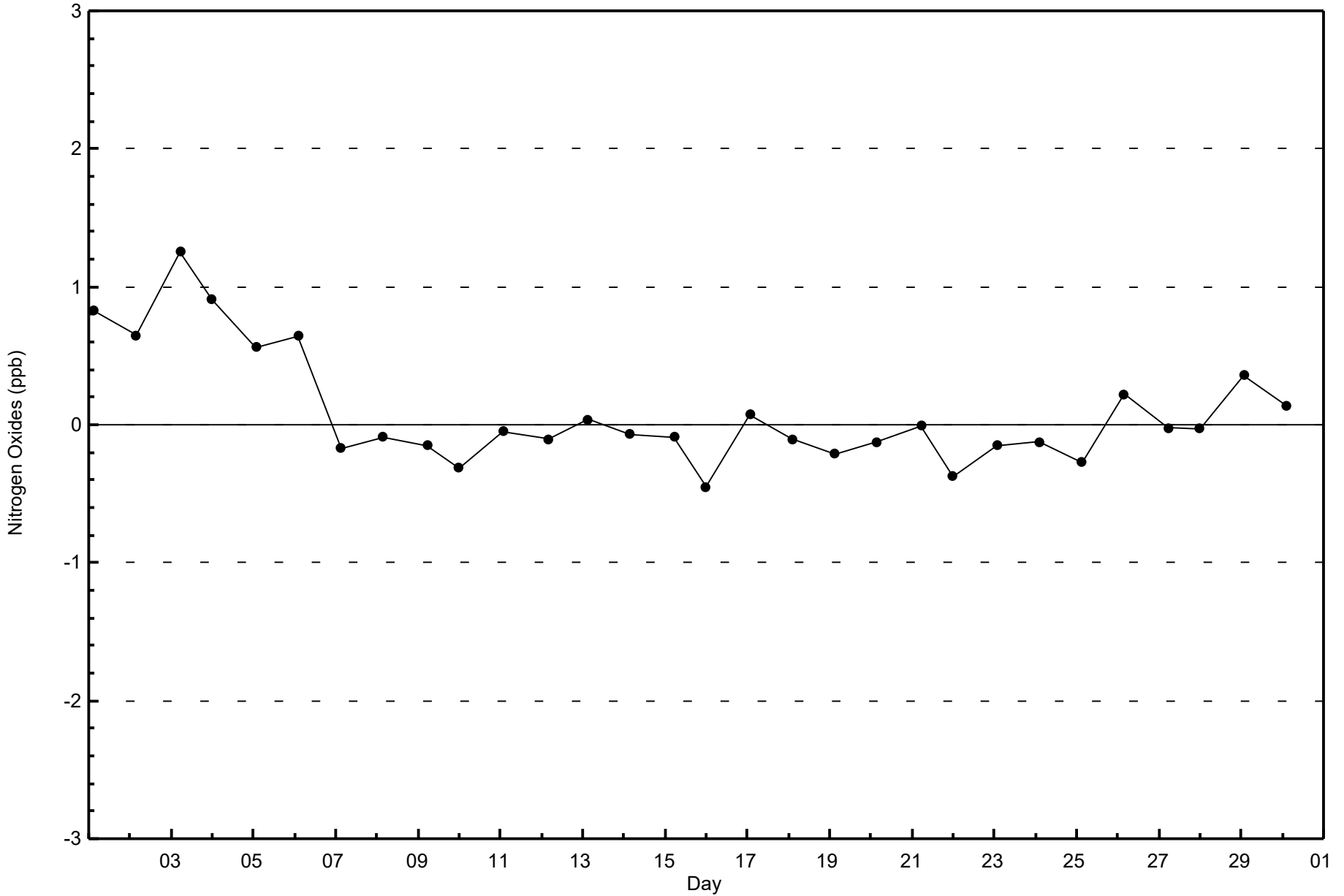
Total Number of Hours: 720

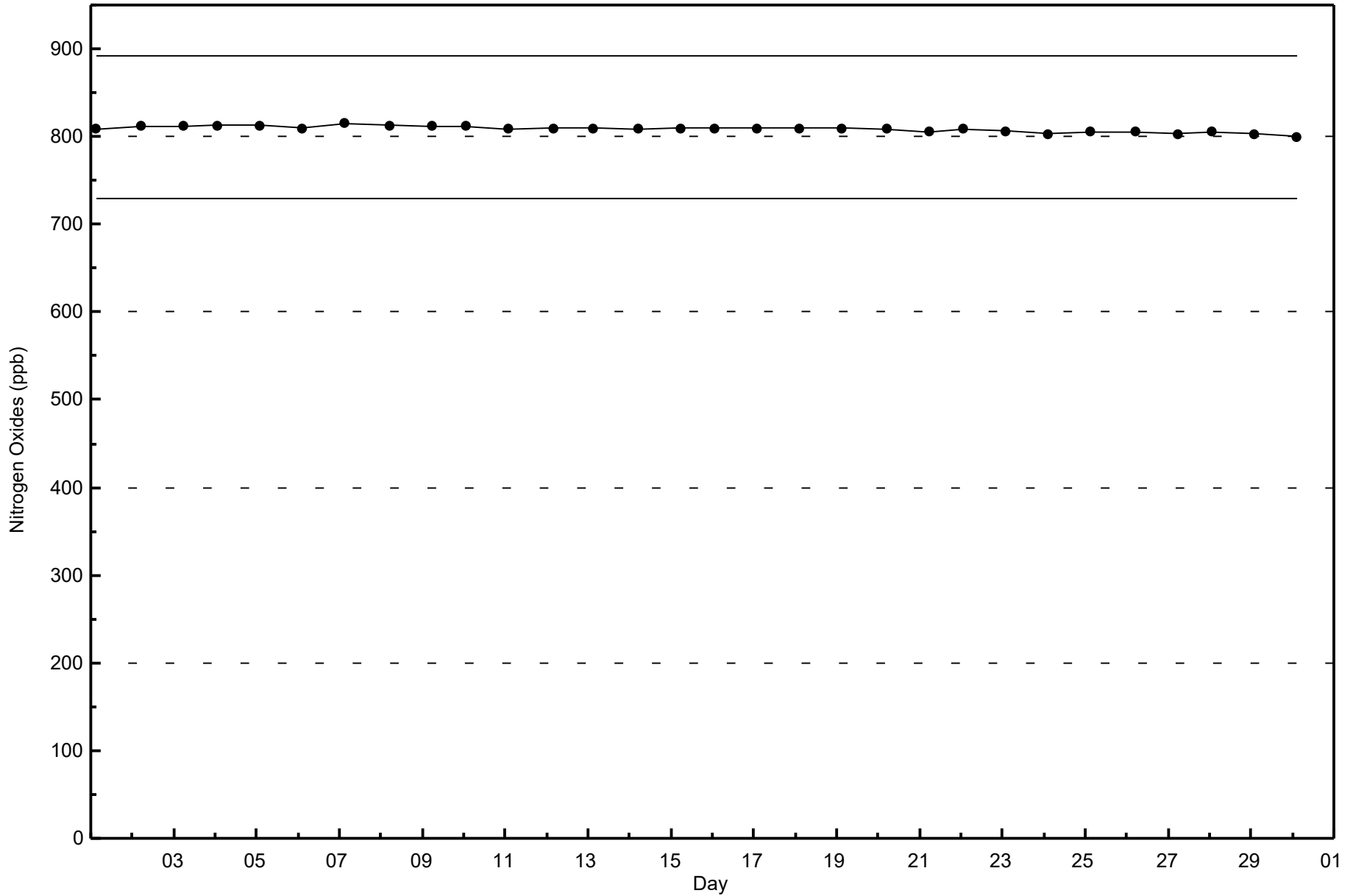


Wood Buffalo Environmental Association
Wind Rose Sep 2023

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





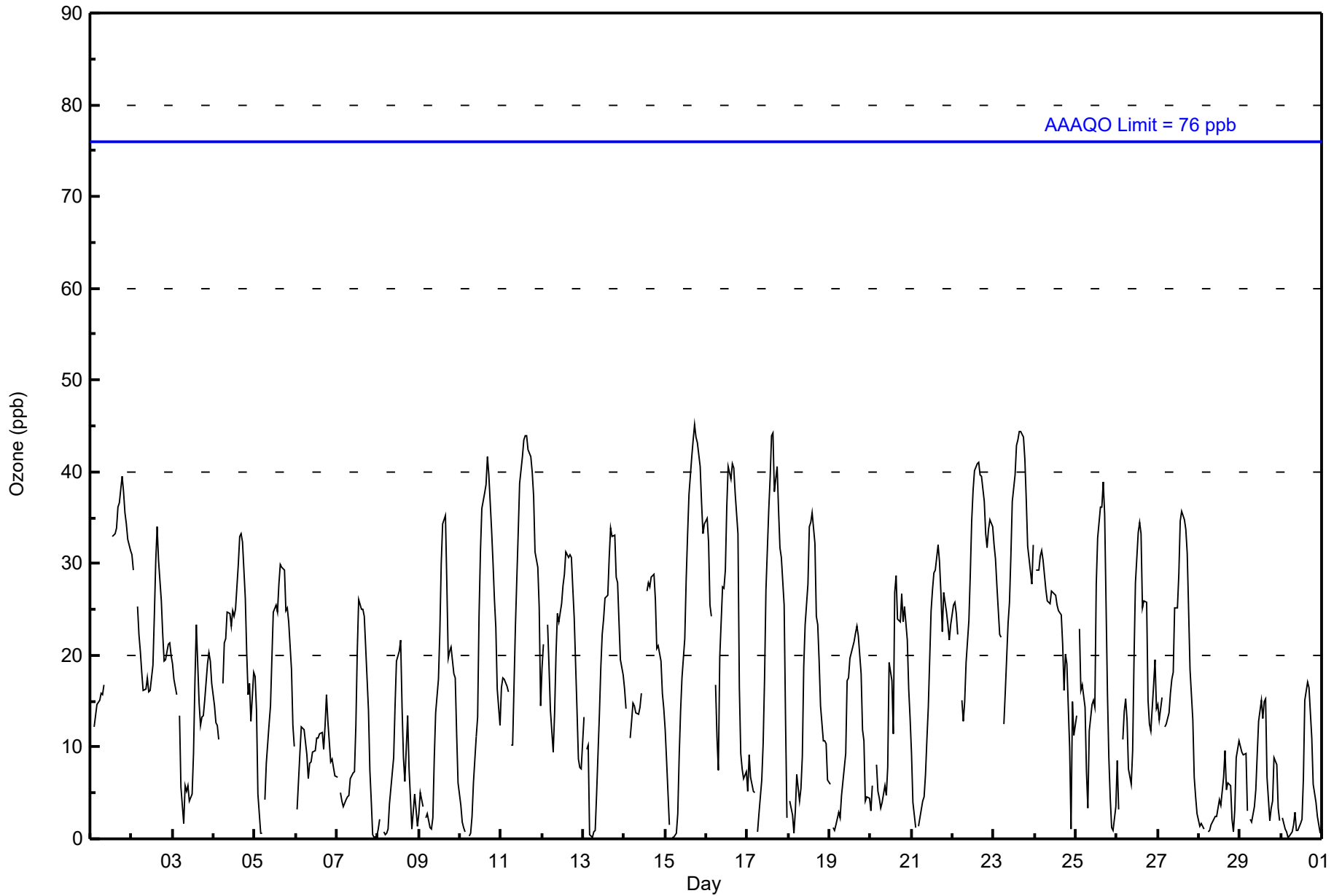




Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 45.1 ppb on Sep 15 18:00	Maximum Daily Average: 32.1 ppb on Sep 23		Hours of Data:	684
Minimum Value: 0.1 ppb on Sep 15 05:00	Minimum Daily Average: 3.7 ppb on Sep 28		Hours of Missing Data:	36
Maximum Diurnal Average: 29.6 ppb at hour 16	Minimum Diurnal Average: 7.6 ppb at hour 7		Hours of Calibration:	34
Monthly Average: 17.64 ppb	Percentiles: P ₁ = 0.4 P ₁₀ = 2.3 Q ₁ = 7.3 Median = 16.1 Q ₃ = 26.6 P ₉₀ = 34.5 P ₉₉ = 43.8		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-Sep	12.8	Z	12.1	13.4	14.6	15.1	15.9	15.7	16.8	C	C	C	C	32.9	33.2	33.9	36.1	36.5	39.4	37.9	35.6	34.3	32.7	31.5	26.3	39.4																							
2-Sep	31.0	29.2	Z	25.3	22.2	20.5	18.2	16.2	16.3	17.5	16.0	16.1	19.0	24.2	30.2	34.1	30.3	26.0	22.3	19.4	19.6	21.2	21.3	20.0	22.4	34.1																							
3-Sep	19.0	17.4	15.7	Z	13.5	5.6	1.7	5.7	5.2	5.8	4.1	5.0	9.3	17.1	23.3	14.8	12.4	13.3	13.4	15.1	19.0	20.2	19.3	17.0	12.7	23.3																							
4-Sep	14.5	12.7	12.4	10.8	Z	16.9	21.3	21.8	24.8	24.6	23.1	24.9	24.3	25.0	29.9	32.9	33.3	32.3	26.3	20.2	15.7	16.9	12.8	18.2	21.5	33.3																							
5-Sep	17.7	14.0	4.8	0.6	0.7	Z	4.3	8.2	12.4	14.6	19.7	24.7	25.4	24.7	27.8	29.9	29.5	29.4	24.9	25.2	23.7	18.5	12.4	10.1	17.5	29.9																							
6-Sep	Z	3.3	9.3	12.2	12.0	11.9	9.2	6.6	8.2	8.3	9.5	9.6	11.0	10.9	11.5	11.6	9.7	12.4	15.7	12.9	8.4	8.7	7.8	6.9	9.9	15.7																							
7-Sep	6.8	Z	5.0	4.0	3.5	4.3	4.5	4.8	6.6	7.2	7.3	12.4	20.5	26.1	25.1	24.9	24.3	20.9	14.0	7.4	4.2	0.5	0.2	0.4	10.2	26.1																							
8-Sep	1.0	2.2	Z	0.8	0.4	0.6	1.1	3.9	7.1	8.9	14.5	19.3	20.5	21.6	14.3	8.8	6.3	13.5	7.6	4.5	1.1	4.9	3.2	1.4	7.3	21.6																							
9-Sep	2.7	5.0	3.5	Z	2.4	2.8	1.2	1.1	2.2	8.8	13.8	17.4	22.6	30.0	34.3	35.3	27.7	19.7	20.5	20.8	18.0	17.5	11.5	6.2	14.1	35.3																							
10-Sep	3.7	1.9	1.2	0.8	Z	0.4	0.7	2.4	6.1	11.2	13.3	24.3	31.3	36.0	37.7	38.5	41.7	39.7	33.6	30.1	26.1	23.0	16.4	12.3	18.8	41.7																							
11-Sep	16.5	17.6	17.4	16.7	16.0	Z	10.2	10.3	23.2	28.4	33.4	38.8	41.7	43.5	43.9	43.9	42.4	41.6	39.9	37.4	31.3	29.6	25.1	14.4	28.8	43.9																							
12-Sep	18.6	21.2	Z	23.3	18.8	14.0	9.5	13.7	20.2	24.5	23.6	25.6	27.6	28.9	31.3	30.6	31.0	30.7	27.2	24.1	14.1	8.6	7.7	7.6	21.0	31.3																							
13-Sep	13.2	Z	9.7	10.2	0.4	0.1	0.7	0.9	4.8	13.6	18.7	22.3	24.0	26.3	26.6	30.7	33.8	32.9	33.1	28.5	27.9	23.6	19.5	17.9	18.2	33.8																							
14-Sep	16.3	14.2	Z	10.9	12.8	14.8	14.5	13.8	13.6	14.4	15.9	Z	M	27.0	27.9	27.5	28.6	28.8	26.0	20.8	21.1	19.4	15.9	14.1	19.0	28.8																							
15-Sep	11.9	8.5	1.5	Z	0.1	0.2	0.5	2.7	9.0	13.9	17.6	21.8	28.3	33.1	37.5	41.7	43.5	45.1	43.8	43.1	40.6	36.6	33.3	34.4	23.9	45.1																							
16-Sep	34.9	32.3	25.5	24.3	Z	16.7	11.1	7.5	19.8	27.4	27.3	29.3	36.1	40.6	39.3	40.9	40.4	37.7	33.3	16.5	9.2	7.7	6.6	7.3	24.9	40.9																							
17-Sep	5.2	9.2	6.7	5.1	5.0	Z	0.7	2.8	6.4	10.3	17.4	27.1	35.9	39.3	44.0	44.3	37.9	40.6	35.8	31.7	30.6	25.4	13.0	2.2	20.7	44.3																							
18-Sep	Z	4.2	2.6	0.6	3.0	7.0	4.1	5.5	9.1	18.7	23.3	27.8	34.0	34.5	35.6	32.2	24.2	23.4	19.4	14.6	10.6	10.7	10.4	6.4	15.7	35.6																							
19-Sep	5.9	Z	1.3	0.9	1.5	2.9	2.3	4.7	6.2	9.4	17.3	17.5	19.7	20.3	21.4	22.4	23.1	22.1	18.1	11.9	10.6	4.0	4.6	4.4	11.0	23.1																							
20-Sep	3.1	5.8	Z	8.1	5.2	4.4	3.3	4.0	5.9	4.7	7.8	19.3	17.2	11.5	26.8	28.7	23.9	23.7	26.6	23.7	25.4	21.6	16.4	13.2	14.4	28.7																							
21-Sep	9.4	3.9	1.3	Z	1.3	2.3	4.1	4.5	7.1	10.8	14.4	24.9	27.1	29.0	29.2	32.0	30.1	26.8	22.5	26.9	24.7	23.3	21.7	23.3	17.4	32.0																							
22-Sep	25.5	25.8	24.6	22.2	Z	15.0	12.8	15.0	19.2	23.8	28.8	34.7	38.0	40.2	40.8	41.0	39.7	39.4	36.8	33.2	31.8	33.7	34.8	34.1	30.0	41.0																							
23-Sep	32.1	30.5	27.5	22.3	22.0	Z	12.5	16.1	23.4	25.8	30.9	36.7	39.7	42.8	43.5	44.4	44.4	43.7	41.3	36.8	31.9	29.2	27.7	32.0	32.1	44.4																							
24-Sep	Z	29.3	29.4	30.8	31.5	30.3	27.2	26.0	25.8	25.6	26.9	26.6	26.5	25.5	24.8	24.5	21.1	16.2	20.1	19.1	9.9	1.0	14.9	11.3	22.8	31.5																							
25-Sep	13.4	Z	22.9	16.2	16.8	14.3	7.3	3.4	11.7	14.7	15.1	14.3	27.8	32.9	36.1	36.2	38.8	35.4	15.8	8.9	4.4	1.3	0.9	3.5	17.1	38.8																							
26-Sep	8.5	3.1	Z	10.8	13.9	15.3	13.0	7.6	5.9	9.6	19.7	27.9	33.5	34.5	33.3	25.2	25.9	25.8	15.1	12.5	11.8	16.8	19.6	14.1	17.5	34.5																							
27-Sep	14.7	12.9	15.3	Z	12.2	12.5	13.8	15.8	17.4	18.1	25.2	25.2	28.8	34.6	35.7	34.8	33.7	31.2	24.8	18.4	12.9	6.7	4.5	2.7	19.6	35.7																							
28-Sep	1.4	1.6	1.4	1.0	Z	0.8	1.0	1.5	1.9	2.4	2.5	3.4	4.3	3.7	6.7	9.5	5.3	6.1	5.8	2.2	0.7	3.2	8.8	10.7	3.7	10.7																							
29-Sep	10.1	9.4	9.2	9.2	3.0	Z	2.2	1.8	3.4	5.4	9.2	12.8	15.1	13.1	14.9	15.3	6.7	2.1	3.3	4.1	8.9	8.1	3.4	2.0	7.5	15.3																							
30-Sep	Z	2.3	1.0	0.7	0.1	0.3	0.7	1.6	2.9	0.9	0.9	1.6	2.1	6.5	15.0	17.2	16.5	13.7	10.9	5.9	4.0	2.5	1.5	0.7	4.8	17.2																							
																								13.5	12.7	10.9	11.3	9.3	9.2	7.6	8.2	11.4	14.1	17.1	21.1	24.7	27.2	29.4	29.6	28.1	27.0	23.9	20.5	17.8	16.0	14.3	12.7	Diurnal Average	
																								34.9	32.3	29.4	30.8	31.5	30.3	27.2	26.0	25.8	28.4	33.4	38.8	41.7	43.5	44.0	44.4	44.4	45.1	43.8	43.1	40.6	36.6	34.8	34.4	Diurnal Maximum	

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	417	60.96	60.96
21 - 50	267	39.04	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: 720



Wood Buffalo Environmental Association
Frequency Distribution

Ozone (O₃) - ppb
Fort McKay - Bertha Ganter - September 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	9	4	0	2	9	4	47	98	61	22	18	25	42	22	21	416
21 - 50	2	6	4	1	1	0	2	53	84	24	23	22	9	13	13	9	266
51 - 82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	34	15	8	1	3	9	6	100	182	85	45	40	34	55	35	30	682

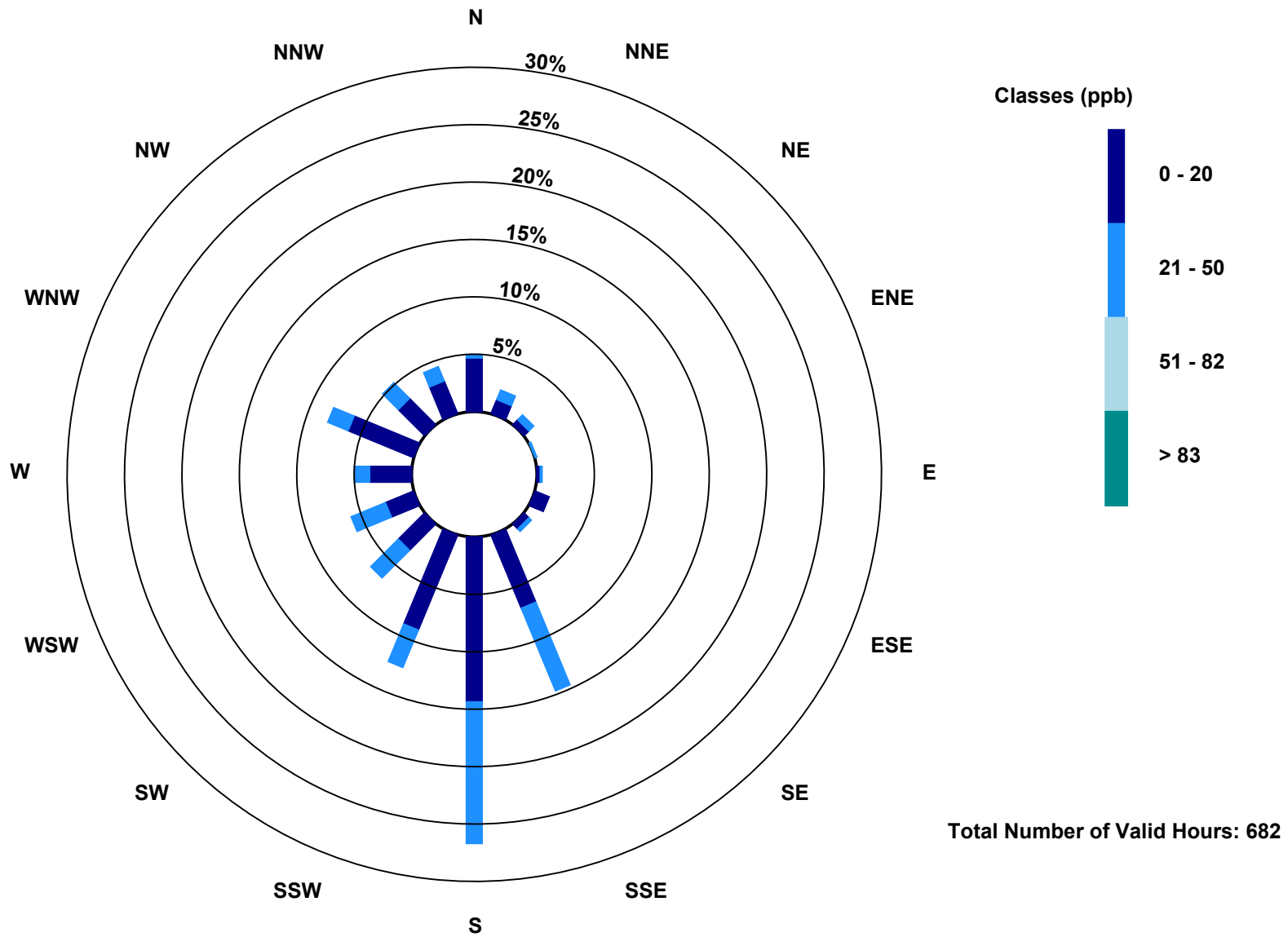
Total Number of Valid Hours: 682

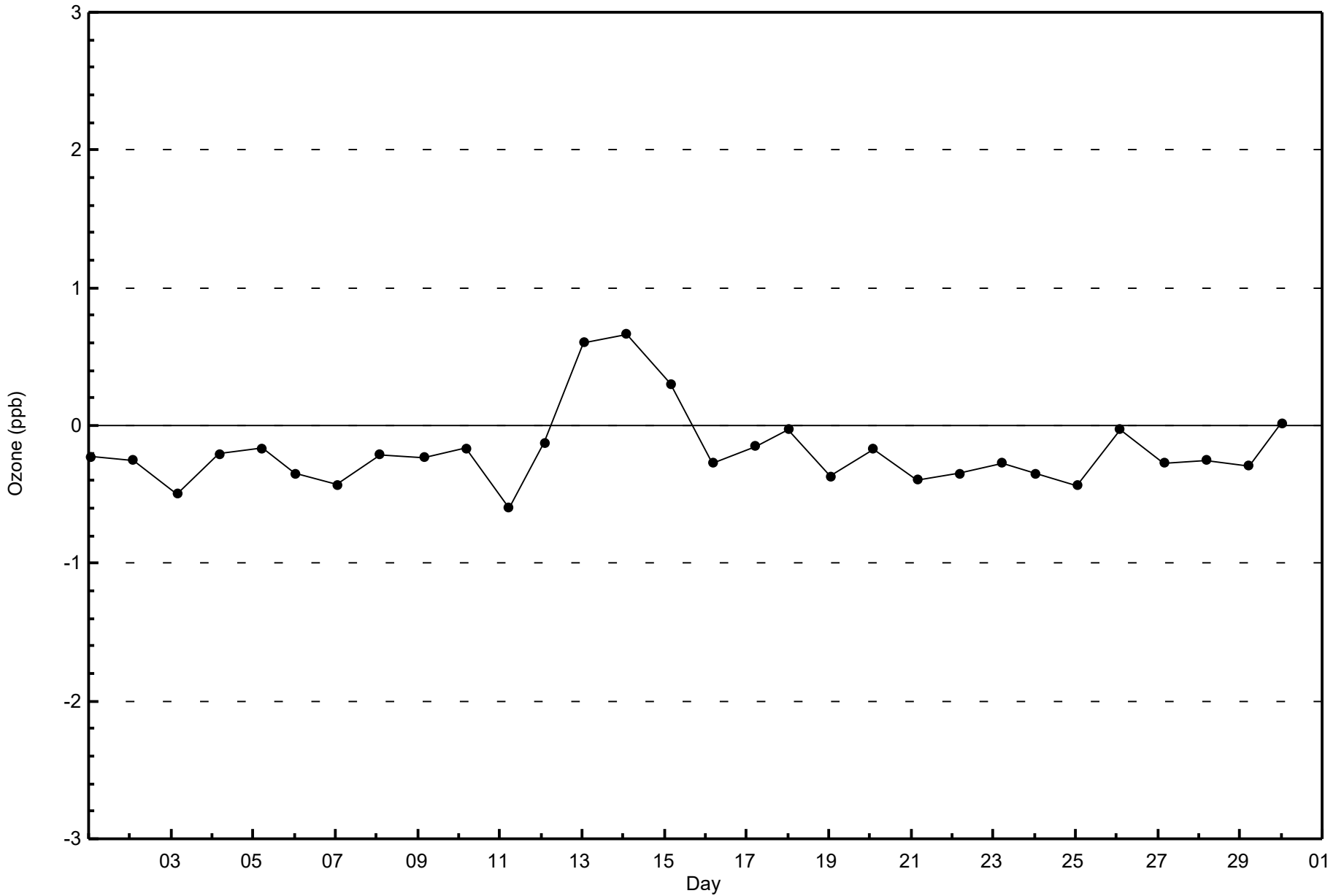
Total Number of Hours: 720

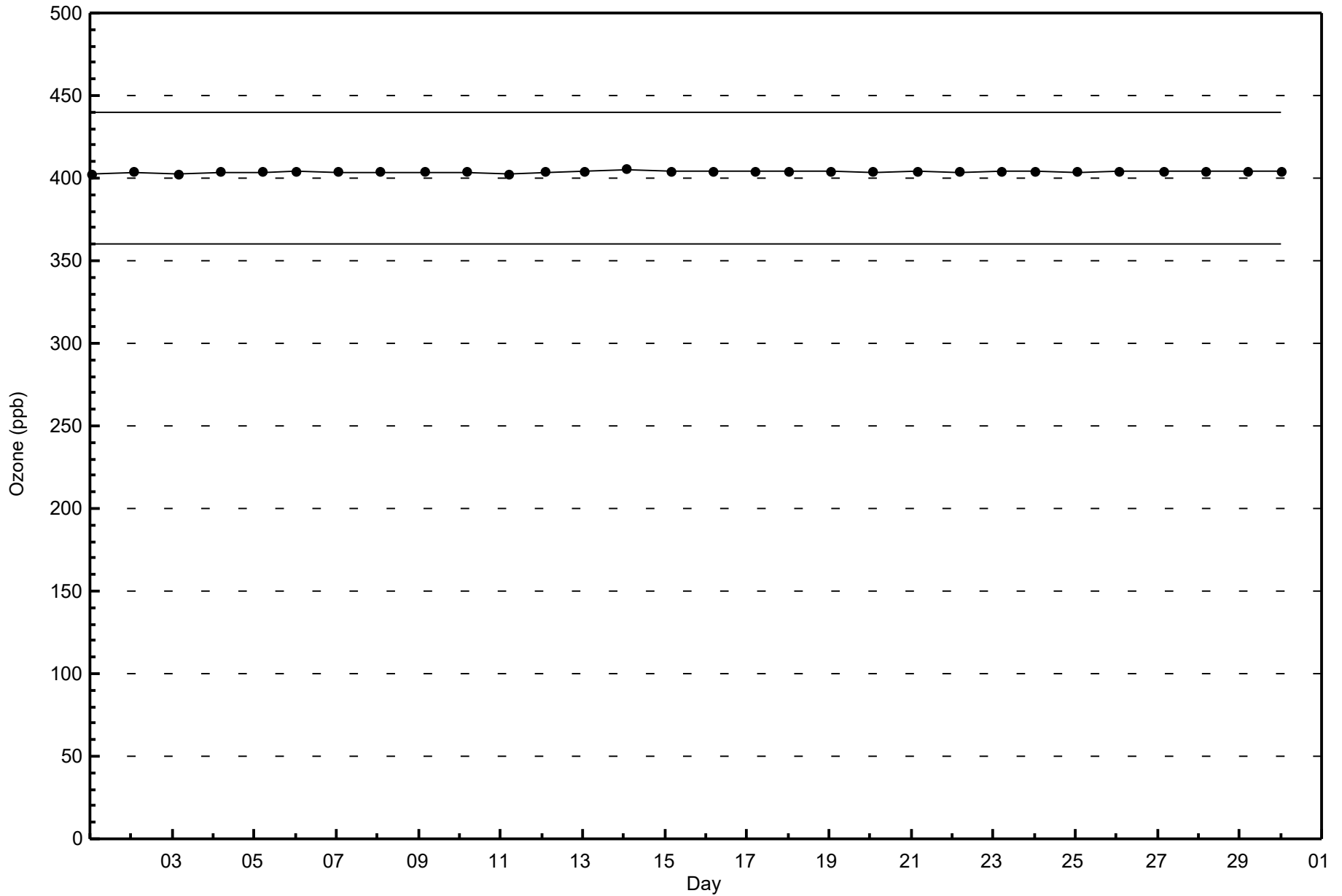


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Ozone (O₃) - ppb
Fort McKay - Bertha Ganter









Wood Buffalo Environmental Association

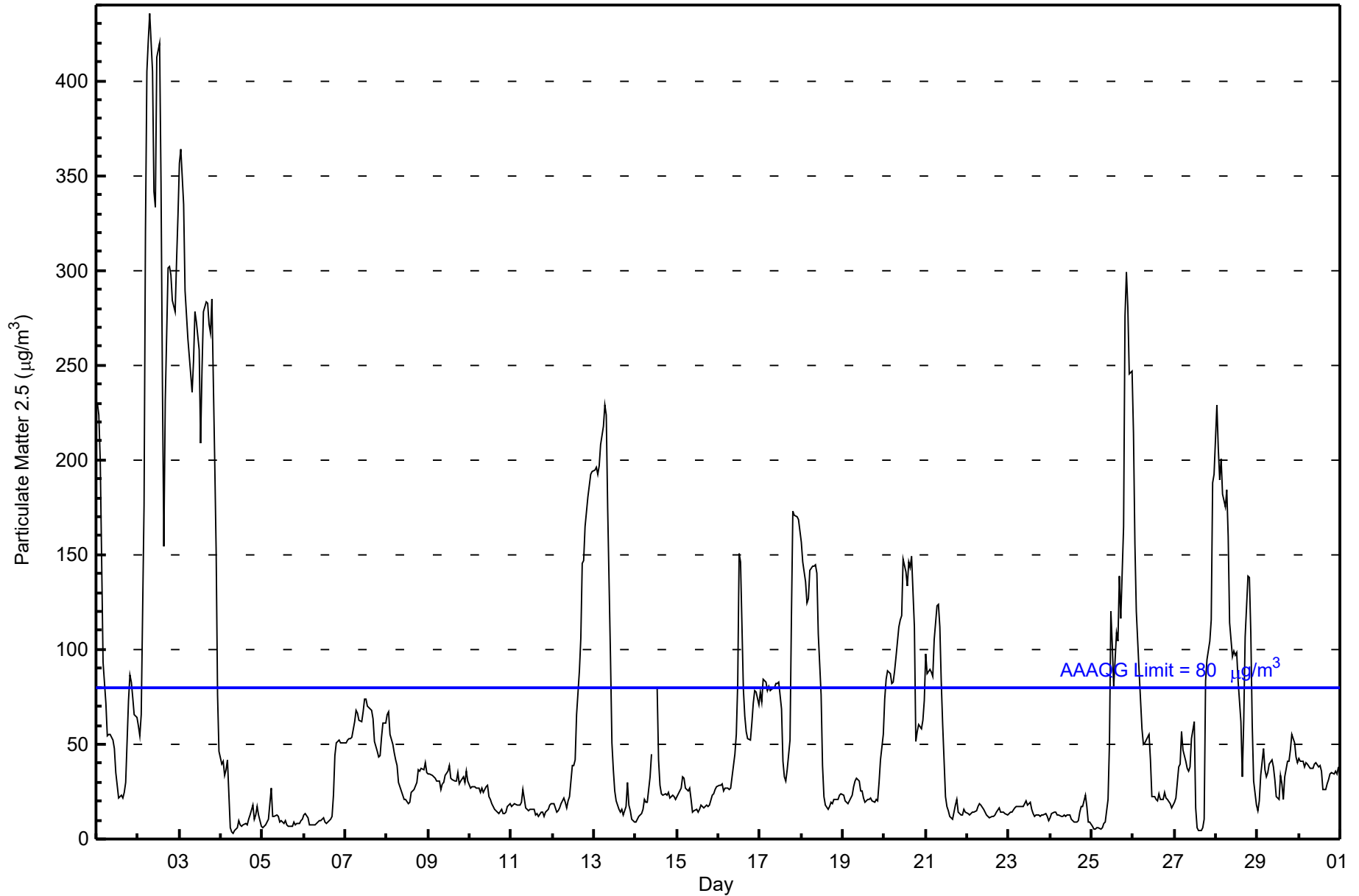
Summary of Hour Averages

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

Summary statistics table including: Number of Exceedences (AAAQO): 1-hr: 163, 24-hr: 19; Maximum Value: 435.5 µg/m³ on Sep 2 08:00; Minimum Value: 3.1 µg/m³ on Sep 4 08:00; Maximum Daily Average: 288.4 µg/m³ on Sep 2; Minimum Daily Average: 10.1 µg/m³ on Sep 5; Maximum Diurnal Average: 72.2 µg/m³ at hour 1; Minimum Diurnal Average: 43.7 µg/m³ at hour 16; Monthly Average: 62.86 µg/m³; Percentiles: P1 = 5.6, P10 = 11.1, Q1 = 16.4, Median = 30.3, Q3 = 73.2, P90 = 173.4, P99 = 354.4; Hours in Service: 720; Hours of Data: 718; Hours of Missing Data: 2; Hours of Calibration: 2; Percent Operational Time: 100.0

Main data table with columns: Day, Hourly Period Ending At (MST) [1-24], Daily Average, Daily Maximum. Rows include 1-Sep to 30-Sep. Values are in µg/m³. Many cells are highlighted in red to indicate exceedences. Two cells on 13-Sep are highlighted in green and labeled 'C' for calibration.

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	7	0.97	0.97
6 - 15	156	21.73	22.70
16 - 25	154	21.45	44.15
26 - 80	239	33.29	77.44
> 81.0	162	22.56	100.00

Total Number of Valid Hours: 718

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - μg/m³
Fort McKay - Bertha Ganter - September 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	0	0	0	0	0	0	0	0	1	0	0	3	0	0	2	1	7
6 - 15	1	1	1	0	1	7	1	33	65	14	4	6	4	5	6	6	155
16 - 25	4	3	0	1	0	0	0	27	56	20	15	7	7	8	3	3	154
26 - 80	14	4	0	0	1	2	2	36	42	36	24	12	13	29	14	10	239
> 81.0	15	7	7	0	1	0	3	6	25	21	9	13	13	17	12	12	161
Totals	34	15	8	1	3	9	6	102	189	91	52	41	37	59	37	32	716

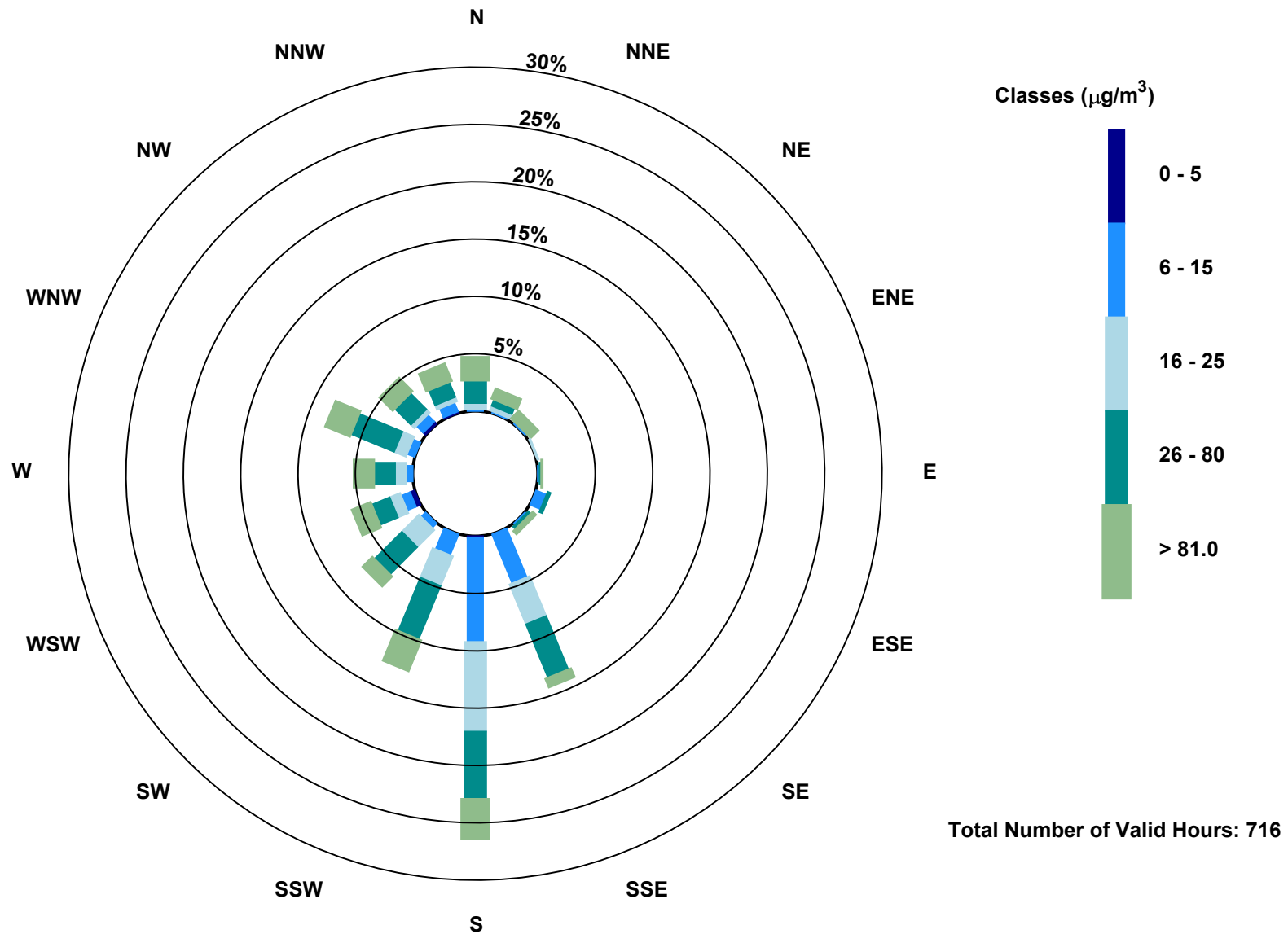
Total Number of Valid Hours: 716

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 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

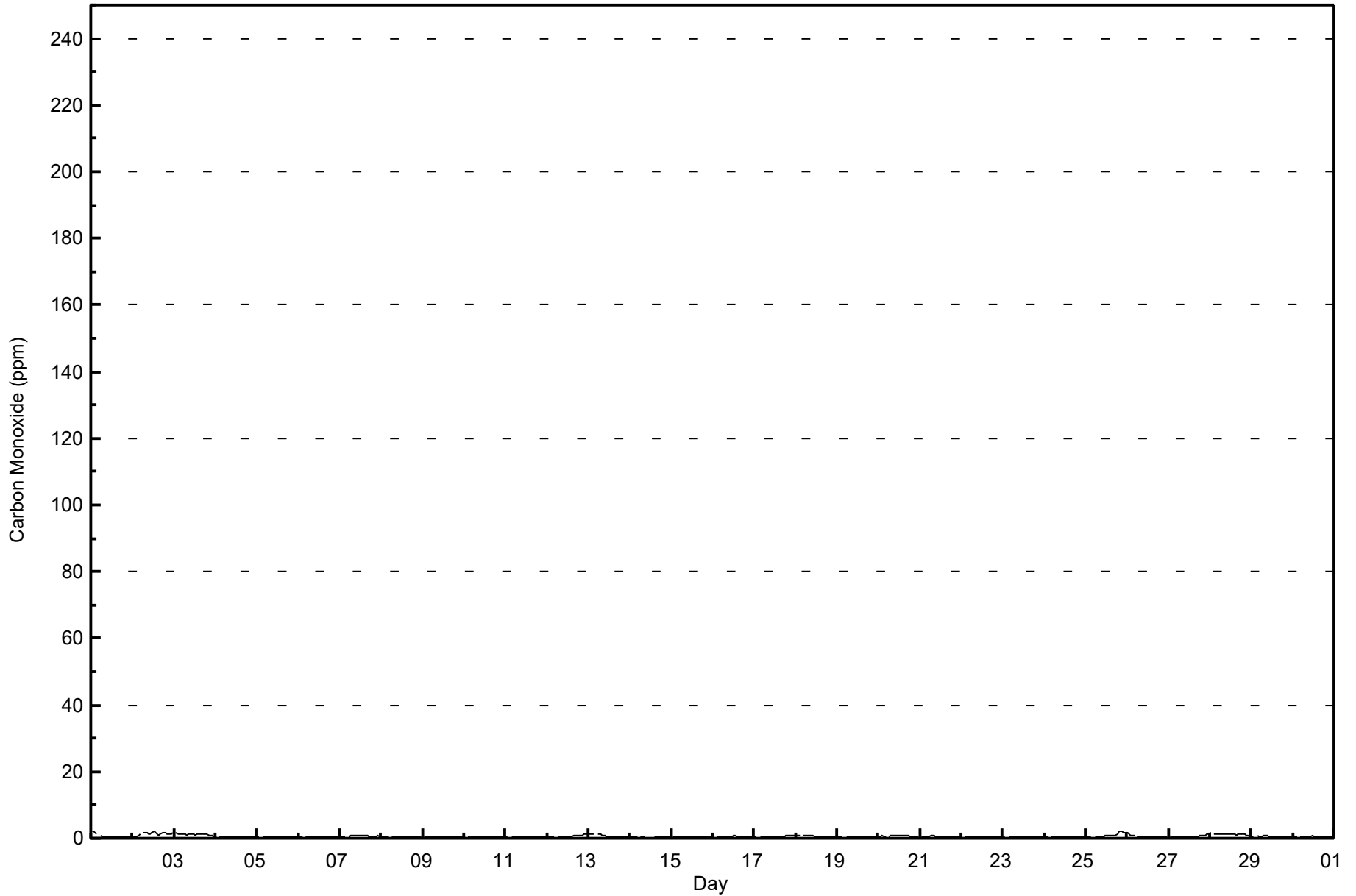
Fort McKay - Bertha Ganter - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0		Hours in Service: 720																									
Maximum Value: 2.1 ppm on Sep 25 21:00		Maximum Daily Average: 1.4 ppm on Sep 2																									
Minimum Value: 0.3 ppm on Sep 4 09:00		Hours of Data: 685																									
Maximum Diurnal Average: 0.6 ppm at hour 3		Hours of Missing Data: 35																									
Minimum Daily Average: 0.3 ppm on Sep 5		Hours of Calibration: 35																									
Monthly Average: 0.58 ppm		Percent Operational Time: 100.0																									
		Minimum Diurnal Average: 0.5 ppm at hour 16																									
		Percentiles: P ₁ = 0.3 P ₁₀ = 0.3 Q ₁ = 0.4 Median = 0.4 Q ₃ = 0.6 P ₉₀ = 1.1 P ₉₉ = 1.9																									
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-Sep	2.0	2.0	1.8	1.4	Z	0.8	0.6	0.6	0.6	0.6	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.7	2.0	
2-Sep	0.5	0.5	0.5	0.9	1.3	Z	1.6	1.6	1.6	1.4	1.5	1.9	2.1	1.9	1.4	0.9	1.4	1.6	1.6	1.6	1.4	1.4	1.4	1.5	1.4	2.1	
3-Sep	Z	1.6	1.5	1.3	1.2	1.2	1.1	1.0	1.1	1.2	1.2	1.2	1.0	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.0	1.0	0.7	0.6	1.1	1.6	
4-Sep	0.6	Z	0.5	0.6	0.6	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.6
5-Sep	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
6-Sep	0.3	0.4	0.3	Z	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.4	0.6	
7-Sep	0.6	0.6	0.6	0.6	Z	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.7
8-Sep	0.6	0.6	0.6	0.5	0.5	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.6	0.6
9-Sep	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.5	0.5	0.6	0.5	0.4	0.6	0.6
10-Sep	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	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
11-Sep	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	0.3	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
12-Sep	0.4	0.4	0.4	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.7	0.8	0.9	0.9	1.0	1.1	1.1	1.1	1.1	0.6	1.1	
13-Sep	1.1	1.1	1.1	1.1	Z	1.2	1.2	1.2	1.0	0.7	0.5	0.5	0.4	0.4	0.3	0.3	0.3	0.4	0.6	0.5	0.5	0.4	0.4	0.4	0.7	1.2	
14-Sep	0.5	0.5	0.5	0.5	0.5	Z	0.4	0.4	0.5	C	C	C	C	C	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5
15-Sep	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4
16-Sep	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.6	0.8	0.8	0.5	0.5	0.4	0.4	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.8	0.8
17-Sep	0.5	0.5	Z	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.7	0.8	0.8	0.8	0.8	0.8	0.6	0.8	
18-Sep	0.8	0.8	0.7	Z	0.7	0.8	0.8	0.8	0.8	0.8	0.7	0.6	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.6	0.8	
19-Sep	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	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.5	
20-Sep	0.6	0.6	0.6	0.6	0.6	Z	0.6	0.7	0.8	0.8	0.8	0.8	0.9	0.9	0.8	0.9	0.9	0.7	0.5	0.5	0.5	0.5	0.5	0.6	0.7	0.9	
21-Sep	Z	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.6	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.7	
22-Sep	0.3	Z	0.3	0.3	0.3	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	0.4	
23-Sep	0.3	0.3	Z	0.3	0.3	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	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
24-Sep	0.4	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
25-Sep	0.3	0.3	0.3	0.3	Z	0.3	0.3	0.3	0.3	0.4	0.6	1.0	0.9	0.8	0.9	0.9	1.0	0.9	1.4	2.0	2.1	2.0	1.8	1.8	0.9	2.1	
26-Sep	1.6	1.2	1.0	0.8	0.7	Z	0.5	0.6	0.6	0.6	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.6	1.6		
27-Sep	Z	0.4	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.4	0.3	0.3	0.3	0.3	0.3	0.8	0.8	0.9	0.9	1.3	1.3	0.6	1.3	
28-Sep	1.5	Z	1.3	1.4	1.2	1.3	1.2	1.3	1.4	1.4	1.4	1.3	1.3	1.2	1.1	1.0	1.1	1.3	1.3	1.3	1.1	0.8	0.6	0.5	1.2	1.5	
29-Sep	0.5	0.5	Z	0.7	0.6	0.6	0.6	0.6	0.7	0.7	0.6	0.5	0.5	0.5	0.5	0.4	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	
30-Sep	0.6	0.6	0.6	Z	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	
																								Diurnal Average			
																								Diurnal Maximum			
0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.5 0.5 0.5 0.5 0.5 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6																											
2.0 2.0 1.8 1.4 1.3 1.3 1.6 1.6 1.6 1.4 1.5 1.9 2.1 1.9 1.4 1.2 1.4 1.6 1.6 2.0 2.1 2.0 1.8 1.8																											
Z - zerospan C - Calibration																											
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 13 ppm																											



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.3	122	17.81	17.81
0.4 - 0.5	323	47.15	64.96
0.6 - 0.7	111	16.20	81.17
0.8 - 1.4	106	15.47	96.64
1.5 - 10	20	2.92	99.56
> 10	0	0.00	99.56

Total Number of Valid Hours: 685

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Carbon Monoxide (CO) - ppm
Fort McKay - Bertha Ganter - September 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	1	0	1	1	1	3	1	20	51	17	2	6	4	1	6	6	121
0.4 - 0.5	10	4	0	0	0	5	2	66	91	34	35	13	17	24	14	8	323
0.6 - 0.7	6	2	0	0	1	0	1	14	20	18	11	12	4	14	3	5	111
0.8 - 1.4	16	9	7	0	1	0	2	2	15	16	3	6	5	7	10	6	105
1.5 - 10	1	0	0	0	0	0	0	0	0	0	1	2	3	7	1	5	20
> 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	34	15	8	1	3	8	6	102	177	85	52	39	33	53	34	30	680

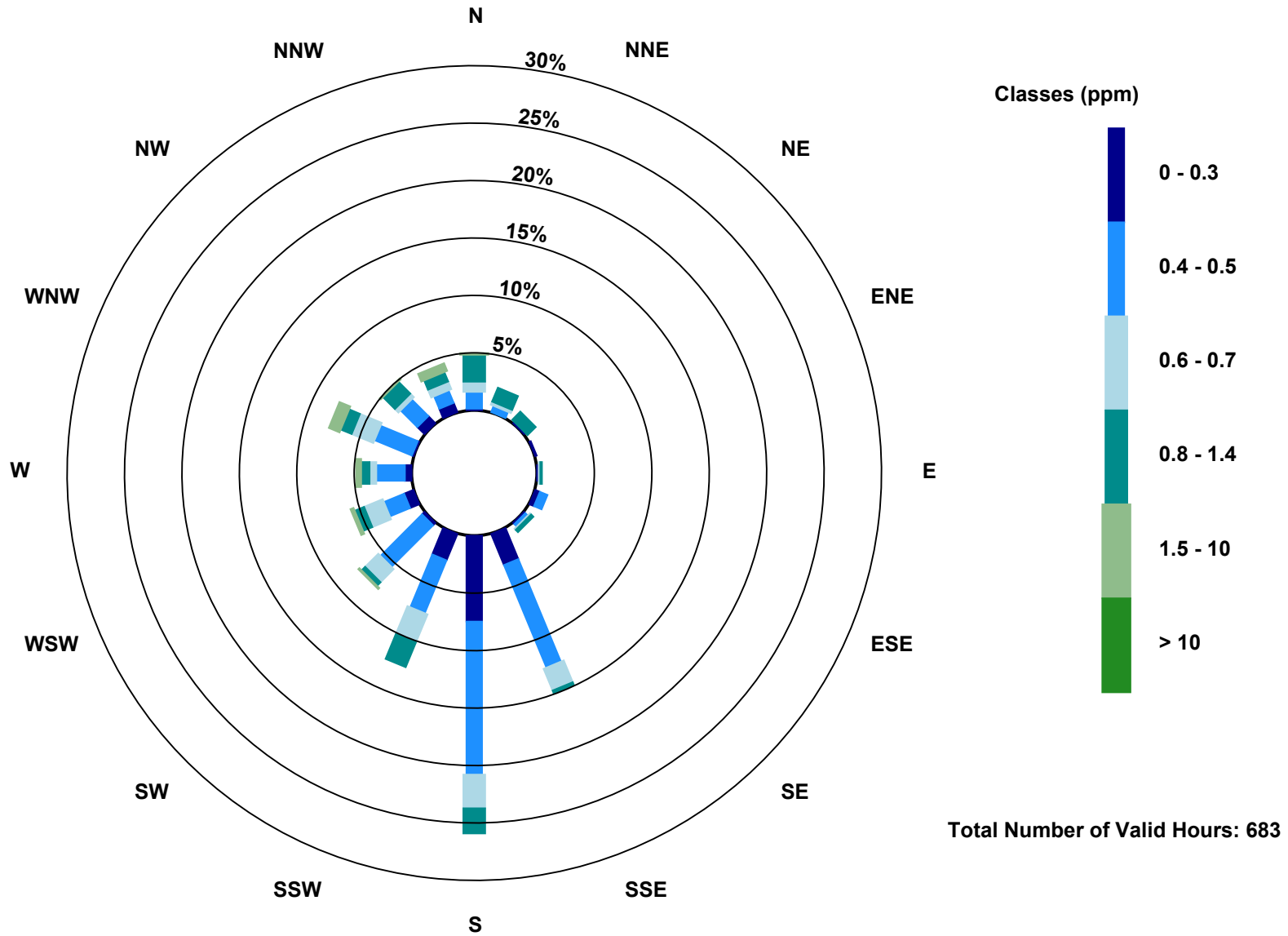
Total Number of Valid Hours: 683

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

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





Wood Buffalo Environmental Association

Summary of Hour Averages

Carbon Dioxide (CO₂) - ppm

Fort McKay - Bertha Ganter - September 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720	
Maximum Value:	534.7 ppm on Sep 10 07:00	Maximum Daily Average:	452.2 ppm on Sep 9	Hours of Data:	684
Minimum Value:	404.2 ppm on Sep 5 16:00	Minimum Daily Average:	415.7 ppm on Sep 4	Hours of Missing Data:	36
Maximum Diurnal Average:	456.4 ppm at hour 7	Minimum Diurnal Average:	415.6 ppm at hour 16	Hours of Calibration:	34
Monthly Average:	433.14 ppm	Percentiles:	P ₁ = 406.4 P ₁₀ = 412.6 Q ₁ = 419.4 Median = 428.7 Q ₃ = 443.3 P ₉₀ = 456.0 P ₉₉ = 502.2	Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Sep	463.2	464.1	467.3	461.1	Z	449.1	441.1	435.2	428.5	421.2	416.3	412.3	411.6	411.5	413.2	414.4	414.7	414.0	414.8	418.6	422.6	424.2	427.1	429.6	429.4	467.3
2-Sep	429.2	433.7	439.4	440.5	441.4	Z	437.9	434.8	429.2	423.5	421.3	422.9	421.1	418.7	415.1	411.5	415.0	417.8	421.2	426.3	427.8	428.3	429.1	432.1	426.9	441.4
3-Sep	Z	436.5	436.7	437.6	441.2	445.8	449.7	444.9	448.2	450.0	450.7	445.3	438.0	431.6	426.7	430.0	428.9	430.1	435.3	436.6	425.4	424.6	419.6	422.1	436.3	450.7
4-Sep	426.0	Z	426.0	428.9	431.7	418.5	412.6	411.3	409.2	408.1	408.5	407.4	406.7	406.3	405.8	405.7	406.2	406.5	409.1	416.5	427.0	424.4	432.0	426.1	415.7	432.0
5-Sep	430.1	437.1	Z	446.1	447.1	443.5	436.1	429.8	418.9	413.7	C	C	C	C	407.5	404.2	405.6	405.3	408.2	410.9	414.3	422.0	442.1	444.7	424.6	447.1
6-Sep	445.7	447.7	437.5	Z	430.8	429.0	428.2	430.0	426.8	425.1	422.9	422.9	422.2	421.9	420.2	418.2	417.4	415.2	414.7	419.9	432.4	435.6	436.0	436.2	427.7	447.7
7-Sep	438.9	439.8	441.9	447.5	Z	444.8	440.3	435.5	429.5	425.9	424.2	416.8	412.2	411.2	410.4	408.9	408.8	409.7	414.6	426.6	427.5	444.2	443.2	455.5	428.6	455.5
8-Sep	454.8	467.0	466.7	463.1	476.8	Z	485.8	459.2	436.6	428.8	427.4	425.0	415.0	410.3	414.0	415.2	415.3	418.7	426.6	427.7	435.4	446.2	451.9	461.1	440.4	485.8
9-Sep	Z	468.0	486.4	480.2	496.4	494.5	523.0	508.2	500.4	467.6	452.4	438.6	438.5	422.3	413.8	409.1	410.8	419.4	414.1	414.0	424.1	424.1	438.8	456.2	452.2	523.0
10-Sep	471.9	Z	499.3	501.0	517.5	521.6	534.7	513.3	471.6	444.1	435.0	420.2	413.2	410.3	407.9	408.0	408.1	409.0	409.8	411.6	411.4	412.8	417.6	420.8	446.6	534.7
11-Sep	422.6	423.7	Z	424.4	426.6	429.5	443.0	448.9	423.6	419.6	416.7	414.1	413.6	412.5	412.3	411.5	412.2	410.2	412.5	419.1	421.5	423.3	425.4	427.2	421.5	448.9
12-Sep	429.9	432.1	437.5	438.8	453.1	Z	461.4	454.1	446.6	438.1	437.6	433.7	431.9	432.7	425.1	419.2	417.0	421.3	426.0	431.2	436.1	437.6	441.4	441.1	435.8	461.4
13-Sep	444.2	447.3	449.0	450.4	Z	459.5	457.9	454.6	445.5	432.6	422.8	417.6	414.1	413.0	412.2	412.1	412.6	412.4	414.1	417.4	417.3	421.0	423.3	422.1	429.3	459.5
14-Sep	422.7	423.6	424.9	427.3	425.7	Z	421.6	420.6	418.9	417.3	415.6	M	M	410.0	409.5	409.4	409.1	409.8	412.9	422.2	420.6	426.4	432.1	434.9	419.8	434.9
15-Sep	Z	449.3	449.1	456.0	464.6	467.1	468.8	466.3	454.1	447.5	436.4	426.5	418.1	413.5	411.0	408.6	409.0	410.3	413.6	414.3	414.6	417.0	420.2	420.9	432.9	468.8
16-Sep	421.9	Z	435.5	439.4	446.1	444.4	449.1	452.4	438.5	429.4	427.0	423.3	419.4	416.9	415.7	413.6	414.2	414.5	415.3	424.4	426.3	428.4	433.2	446.1	429.3	452.4
17-Sep	447.1	451.3	Z	460.3	466.1	473.5	475.1	475.9	462.9	453.8	444.9	431.6	422.0	418.8	421.2	421.1	420.1	420.0	425.0	428.7	428.0	429.9	443.0	443.1	441.9	475.9
18-Sep	451.9	456.4	454.4	Z	457.1	454.9	460.0	459.3	453.3	436.6	431.1	424.7	417.3	414.7	414.6	415.8	417.6	415.8	417.8	422.3	425.4	431.2	438.9	437.4	435.1	460.0
19-Sep	432.4	436.1	439.4	438.4	Z	433.2	433.3	431.3	425.1	420.8	416.8	416.4	414.4	413.4	412.8	412.4	412.6	412.9	415.4	427.3	432.2	439.0	440.0	448.1	426.2	448.1
20-Sep	449.1	448.4	447.2	455.3	469.1	Z	471.5	467.2	453.5	453.2	444.2	431.8	430.6	430.0	424.0	419.8	419.4	417.9	416.0	421.5	420.6	424.6	430.0	430.4	438.0	471.5
21-Sep	Z	451.5	450.1	453.3	464.2	462.0	455.7	454.5	452.5	448.3	442.6	415.3	410.2	410.3	410.9	410.5	411.5	412.3	413.1	414.3	419.6	423.9	426.8	428.2	432.2	464.2
22-Sep	424.2	Z	424.7	426.8	426.7	432.0	436.4	434.3	429.3	424.5	418.8	414.5	413.4	411.9	411.8	412.2	413.1	414.3	416.2	420.3	424.7	420.7	420.7	422.1	421.5	436.4
23-Sep	425.5	428.3	Z	432.3	434.2	441.8	448.6	439.4	430.0	426.7	423.8	421.5	420.5	417.9	416.0	415.3	415.3	416.1	418.3	420.8	423.2	423.1	422.6	421.1	425.3	448.6
24-Sep	421.5	422.6	424.6	Z	425.1	425.7	428.8	428.8	427.7	427.7	426.6	426.3	425.1	423.3	423.0	422.5	422.0	423.9	426.4	429.5	432.2	442.1	438.7	449.0	428.0	449.0
25-Sep	439.1	436.0	436.0	438.7	Z	442.6	445.4	448.4	438.9	437.4	440.0	448.5	433.9	427.7	429.0	430.7	433.1	429.1	434.0	443.7	449.7	451.3	451.0	450.0	439.6	451.3
26-Sep	445.9	448.7	446.4	444.9	441.0	Z	443.5	452.8	451.4	442.1	435.3	427.7	424.1	422.9	422.7	425.3	427.2	430.9	437.2	437.3	437.1	440.7	442.6	449.5	438.1	452.8
27-Sep	Z	454.9	457.9	470.6	466.5	466.0	463.2	455.8	447.9	444.0	438.1	436.5	421.5	418.9	417.2	416.9	416.8	419.7	430.7	437.6	438.6	440.2	445.8	455.4	441.8	470.6
28-Sep	462.0	Z	487.4	486.7	493.7	494.3	512.6	472.2	447.6	438.7	437.8	436.8	435.9	436.4	432.4	427.0	431.4	433.4	433.0	435.2	434.1	429.5	426.6	424.5	450.0	512.6
29-Sep	426.6	428.6	Z	430.0	441.5	450.4	453.5	455.6	449.5	435.4	426.0	420.4	417.5	418.7	417.8	417.0	423.3	427.3	426.9	428.6	426.1	428.2	430.8	435.2	431.1	455.6
30-Sep	441.6	451.5	453.5	Z	464.6	460.3	472.9	474.7	460.4	453.7	453.3	445.3	444.0	434.6	424.7	423.5	425.3	426.8	427.9	434.2	440.3	443.3	445.6	455.0	446.0	474.7

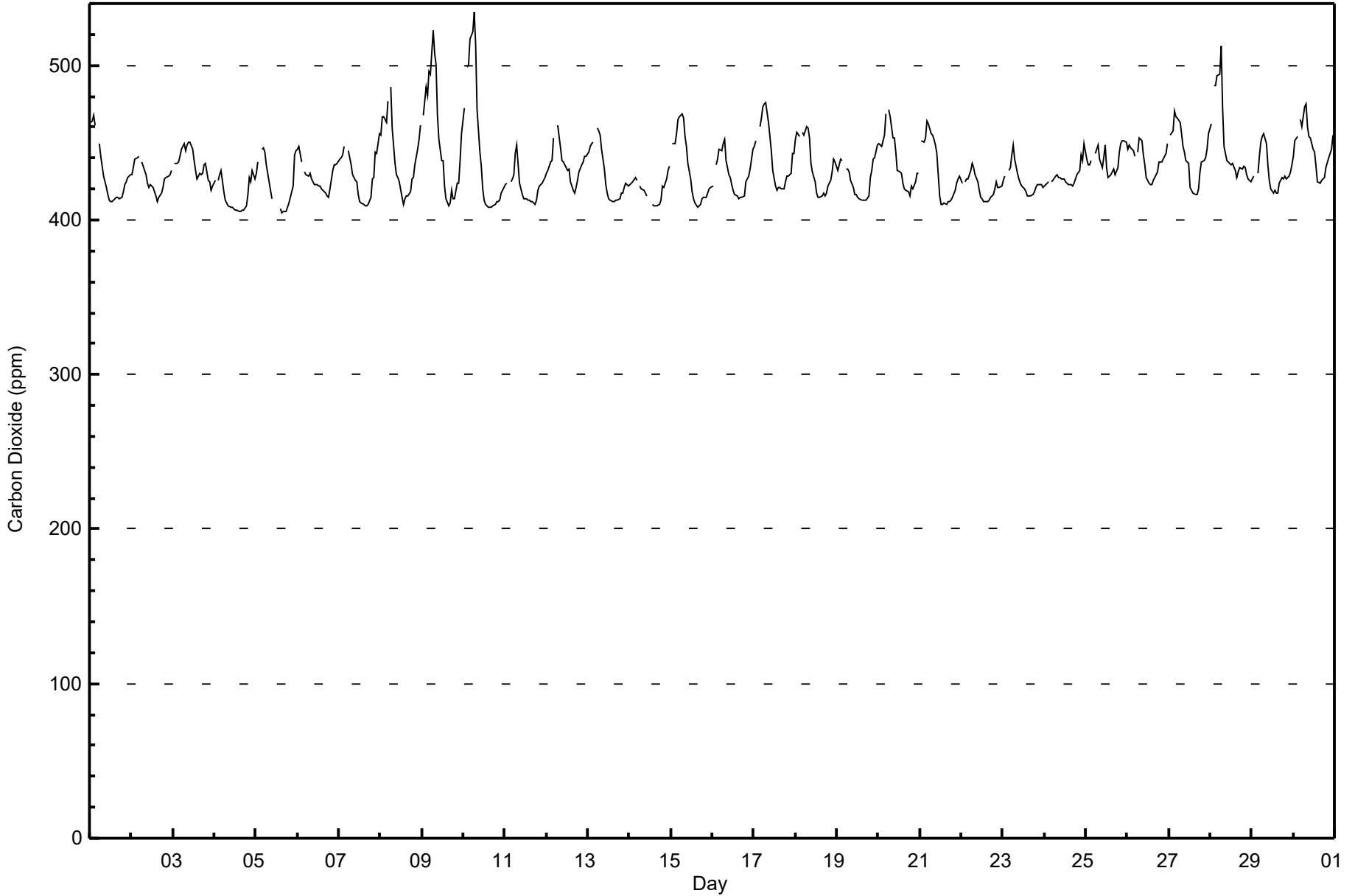
438.7	443.4	448.8	449.2	454.0	453.5	456.4	451.6	441.9	434.4	430.8	425.9	421.6	418.7	416.6	415.6	416.5	417.5	420.0	424.6	427.2	430.3	433.9	437.5	Diurnal Average	
471.9	468.0	499.3	501.0	517.5	521.6	534.7	513.3	500.4	467.6	453.3	448.5	444.0	436.4	432.4	430.7	433.1	433.4	437.2	443.7	449.7	451.3	451.9	461.1	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
400 - 420	188	27.49	27.49
420 - 440	302	44.15	71.64
440 - 460	138	20.18	91.81
460 - 480	38	5.56	97.37
480 - 500	10	1.46	98.83
> 500	8	1.17	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Carbon Dioxide (CO₂) - ppm
Fort McKay - Bertha Ganter - September 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	9	3	1	1	1	2	1	40	46	17	20	12	6	6	14	9	188
420 - 440	22	10	6	0	0	6	3	38	78	32	22	22	14	26	11	11	301
440 - 460	1	2	1	0	2	0	2	16	41	27	4	5	4	18	4	10	137
460 - 480	1	0	0	0	0	0	0	4	10	5	5	1	3	3	6	0	38
480 - 500	0	0	0	0	0	0	0	1	1	2	1	0	2	2	1	0	10
> 500	1	0	0	0	0	0	0	2	0	1	0	0	4	0	0	0	8
Totals	34	15	8	1	3	8	6	101	176	84	52	40	33	55	36	30	682

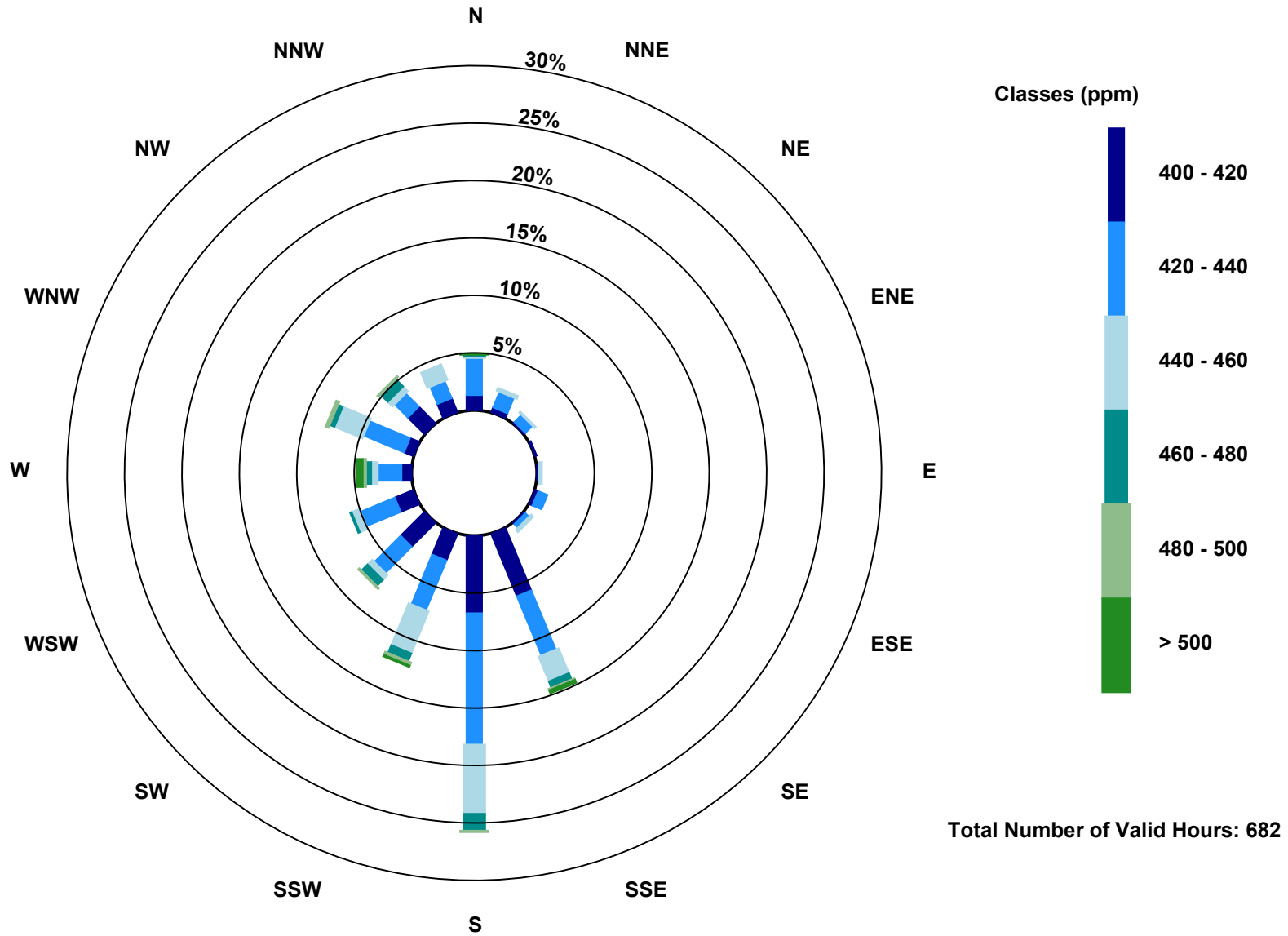
Total Number of Valid Hours: 682

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

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





Wood Buffalo Environmental Association

Summary of Hour Averages

Ammonia (NH₃) - ppb

Fort McKay - Bertha Ganter - September 2023

Number of Exceedences (AAAQO): 1-hr: 0	Maximum Value: 43.4 ppb on Sep 2 18:00	Maximum Daily Average: 24.3 ppb on Sep 2	Hours in Service: 720
Minimum Value: 0.0 ppb on Sep 1 06:00	Maximum Diurnal Average: 5.4 ppb at hour 14	Minimum Daily Average: 0.0 ppb on Sep 5	Hours of Data: 618
Monthly Average: 3.70 ppb	Minimum Diurnal Average: 0.7 ppb at hour 7	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 18.2 P ₉₉ = 33.7	Hours of Missing Data: 102
			Hours of Calibration: 44
			Percent Operational Time: 91.9

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-Sep	19.2	19.3	Z	RE	11.3	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	2.3	19.3
2-Sep	0.0	0.0	0.0	Z	RE	17.4	17.6	18.1	18.7	18.4	17.7	20.7	26.4	38.7	35.8	29.0	32.6	43.4	43.4	38.0	33.0	29.1	28.1	27.9	24.3	43.4
3-Sep	27.0	26.0	23.2	19.5	Z	RE	RE	15.2	14.7	14.7	13.9	12.9	11.3	13.6	16.8	19.4	21.5	20.9	19.7	19.7	20.1	20.8	20.5	16.7	18.5	27.0
4-Sep	14.9	13.8	12.0	11.1	10.8	Z	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	14.9
5-Sep	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
6-Sep	0.0	Z	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7-Sep	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	C	C	C	C	C	C	C	RE	RE	0.0	0.0	0.0	0.0	0.0	--	0.0
8-Sep	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	C	C	C	C	C	C	C	C	RE	RE	0.0	0.0	0.0	0.0	--	0.0
9-Sep	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
10-Sep	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
11-Sep	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
12-Sep	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
13-Sep	0.0	0.0	Z	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14-Sep	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
15-Sep	0.0	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	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
16-Sep	0.0	0.0	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	18.5	12.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	18.5
17-Sep	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
18-Sep	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
19-Sep	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
20-Sep	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	21.7	27.4	25.4	24.6	22.6	20.9	17.5	11.7	10.8	10.9	10.2	0.0	0.0	9.3	27.4
21-Sep	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	--	0.0
22-Sep	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
23-Sep	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
24-Sep	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
25-Sep	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.1	18.4	17.6	18.9	19.9	22.4	21.4	24.3	33.8	35.6	33.0	29.3	27.8	14.3	35.6
26-Sep	24.8	19.8	15.8	Z	RE	10.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	24.8
27-Sep	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	10.1	10.5	11.5	16.5	17.1	3.0	17.1
28-Sep	19.5	18.1	15.7	15.9	14.5	Z	RE	15.4	17.7	20.1	23.0	24.5	25.4	24.4	23.7	21.7	22.1	22.2	22.4	21.8	19.6	16.3	14.9	12.7	19.6	25.4
29-Sep	Z	RE	12.8	13.0	11.5	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	1.7	13.0
30-Sep	0.0	Z	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.1	11.8	12.3	12.0	12.4	12.7	12.7	11.0	0.0	0.0	0.0	0.0	0.0	4.5	12.7

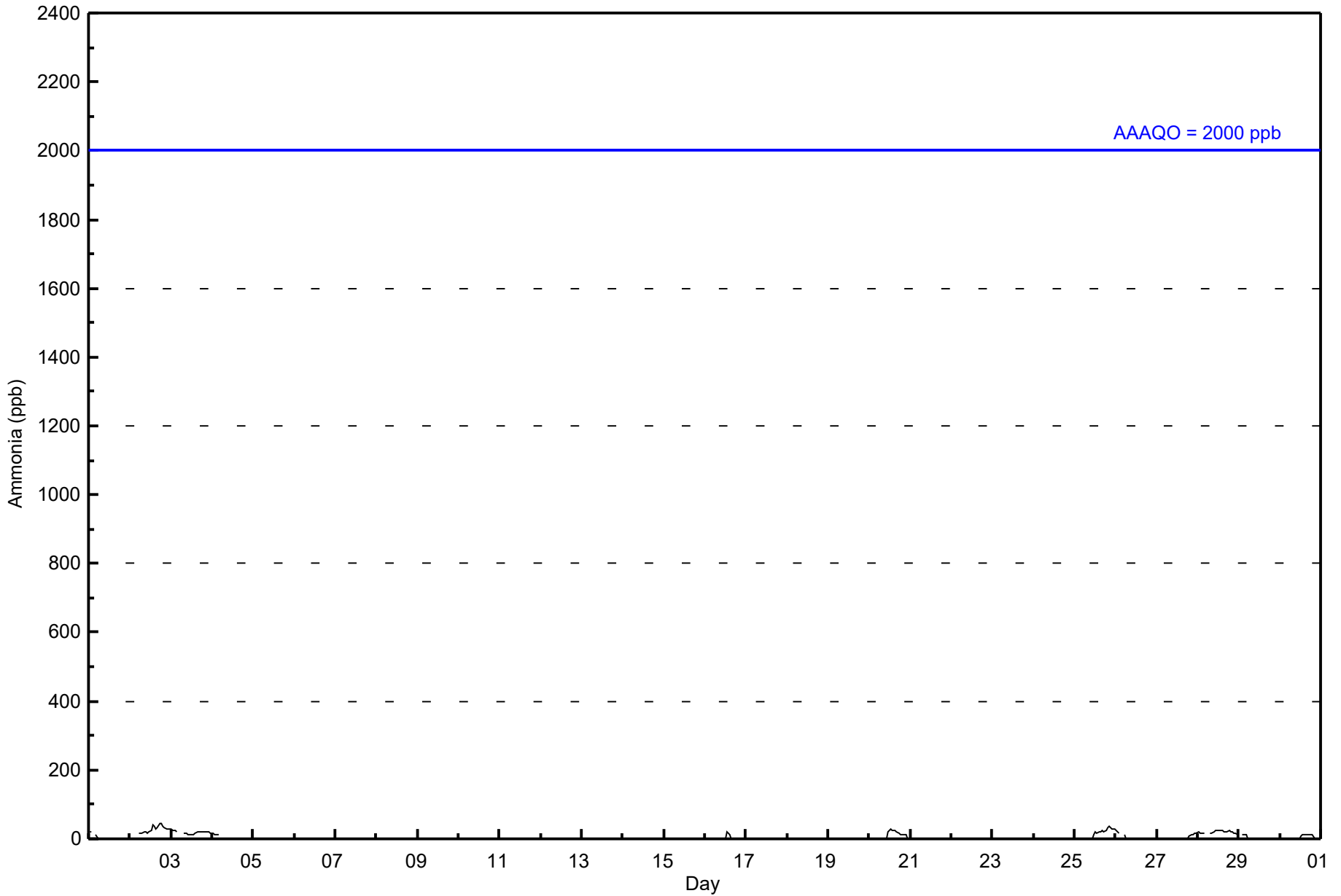
4.4	4.8	4.0	3.7	2.8	1.4	0.7	1.7	1.8	2.0	1.9	3.4	4.4	5.4	5.2	4.5	4.9	5.1	4.8	5.0	4.5	4.2	3.8	3.5	Diurnal Average	
27.0	26.0	23.2	19.5	14.5	17.4	17.6	18.1	18.7	20.1	23.0	24.5	27.4	38.7	35.8	29.0	32.6	43.4	43.4	38.0	35.6	33.0	29.3	27.9	Diurnal Maximum	

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 - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 5	502	81.23	81.23
6 - 10	3	0.49	81.72
11 - 15	35	5.66	87.38
16 - 20	34	5.50	92.88
21 - 25	24	3.88	96.76
> 26	20	3.24	100.00

Total Number of Valid Hours: 618

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Ammonia (NH₃) - ppb
Fort McKay - Bertha Ganter - September 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	12	3	0	1	2	8	5	84	144	68	47	34	22	39	22	9	500
6 - 10	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1	3
11 - 15	2	0	1	0	0	0	0	7	7	1	0	2	3	3	1	8	35
16 - 20	4	4	2	0	0	0	0	0	1	2	0	0	3	6	9	3	34
21 - 25	10	4	4	0	0	0	1	0	0	1	1	1	0	0	1	1	24
> 26	1	1	0	0	0	0	0	0	0	0	0	2	4	6	2	4	20
Totals	29	12	7	1	2	8	6	92	152	72	48	39	32	55	35	26	616

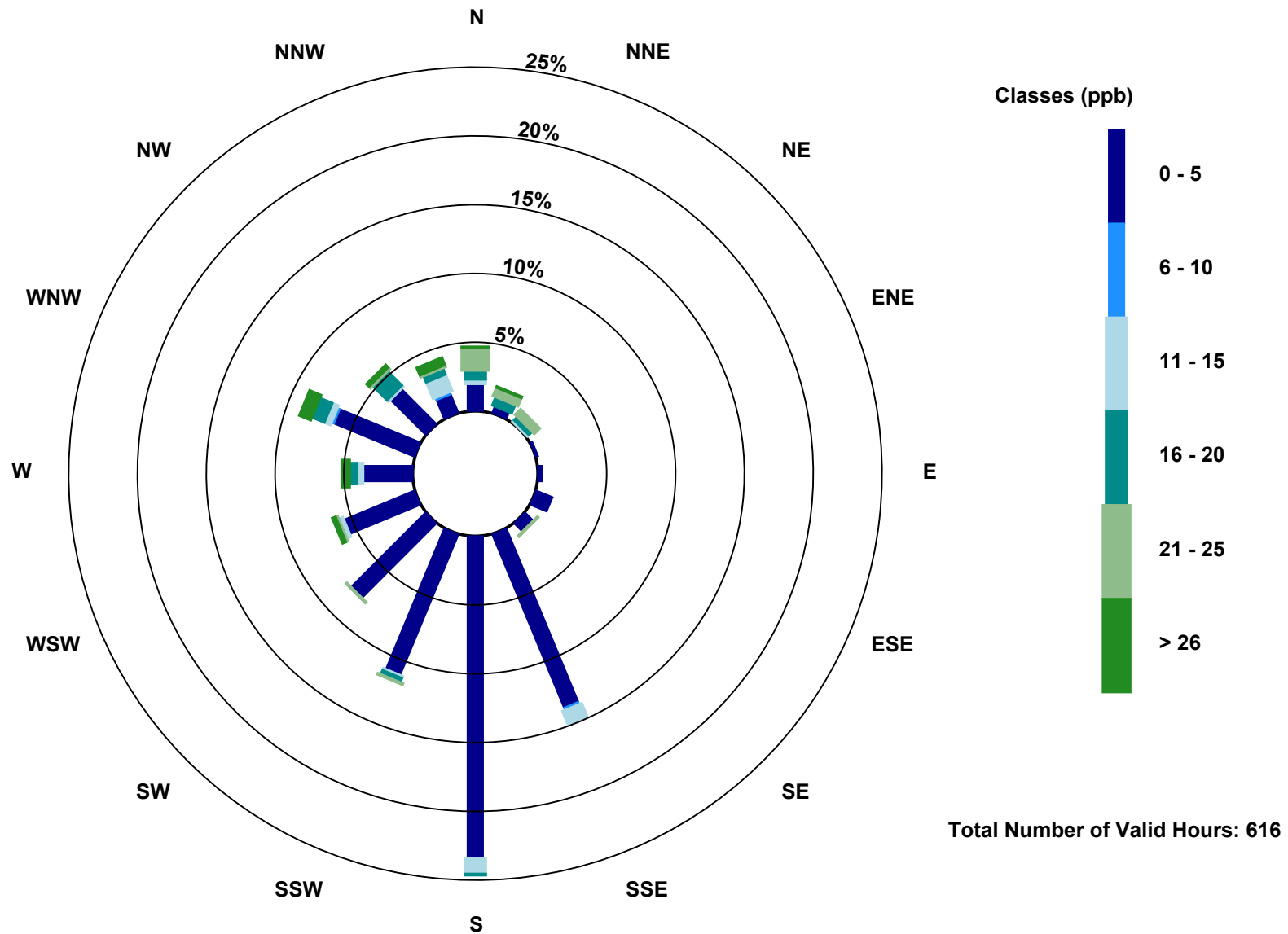
Total Number of Valid Hours: 616

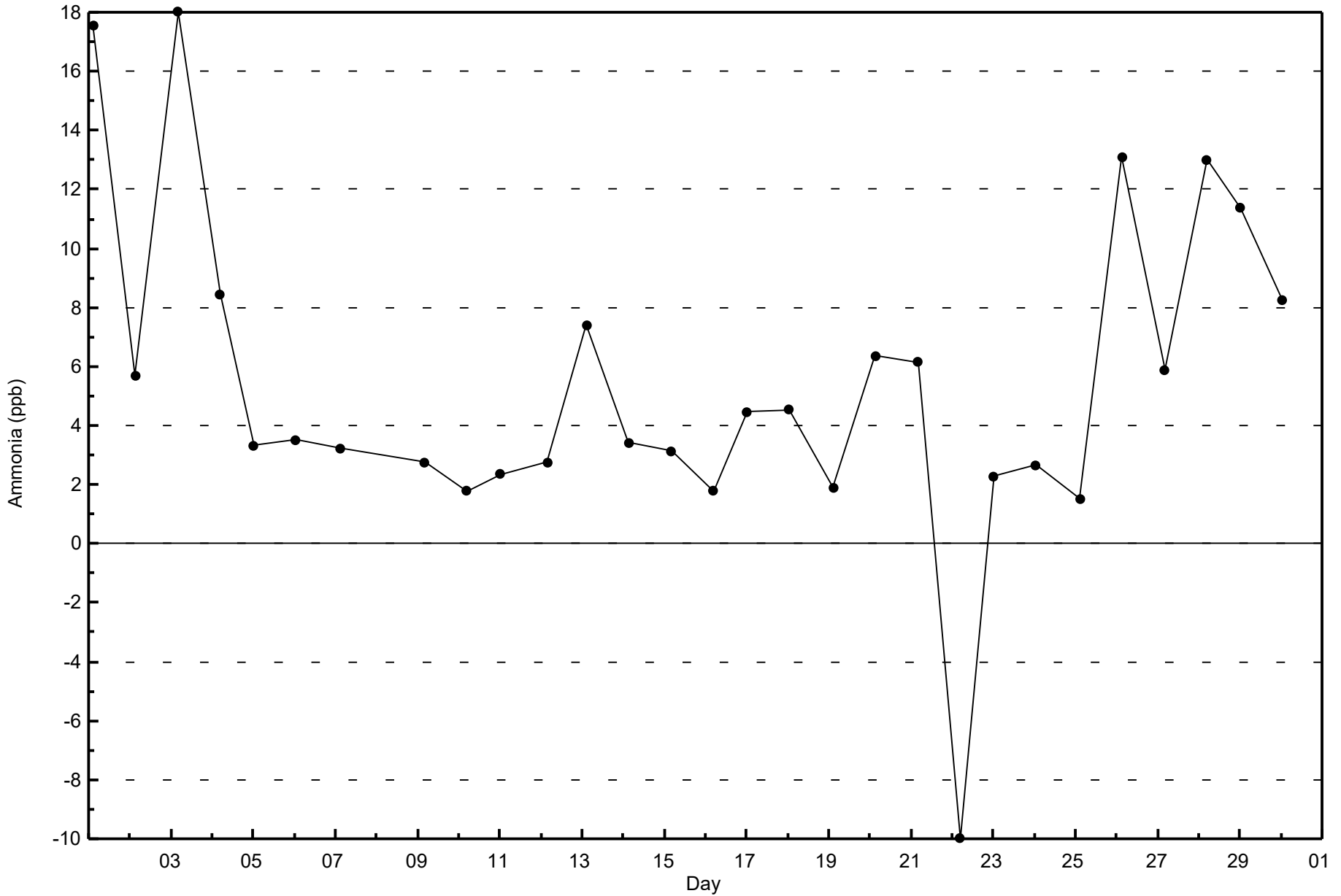
Total Number of Hours: 720

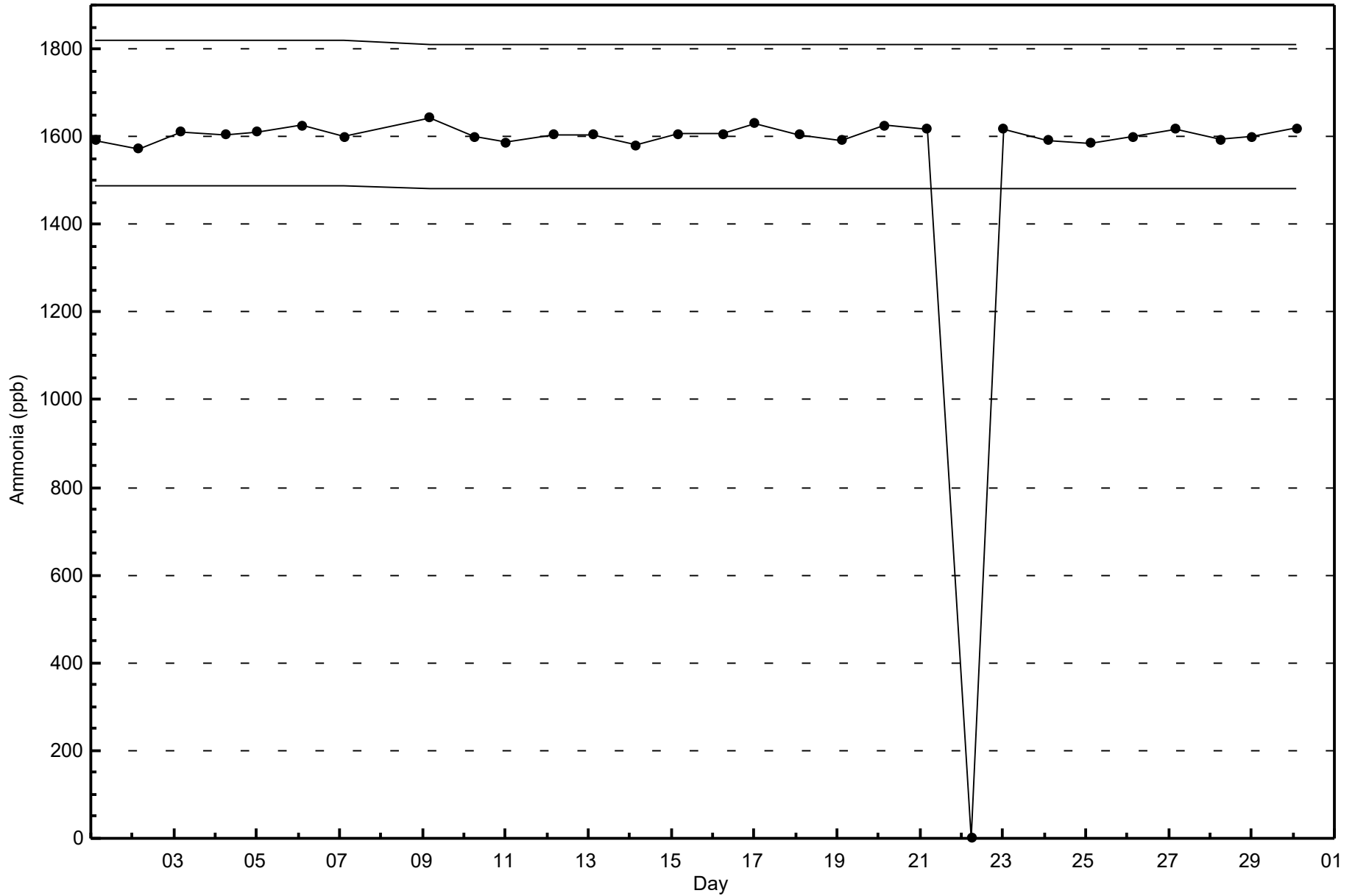


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Ammonia (NH₃) - ppb
Fort McKay - Bertha Ganter









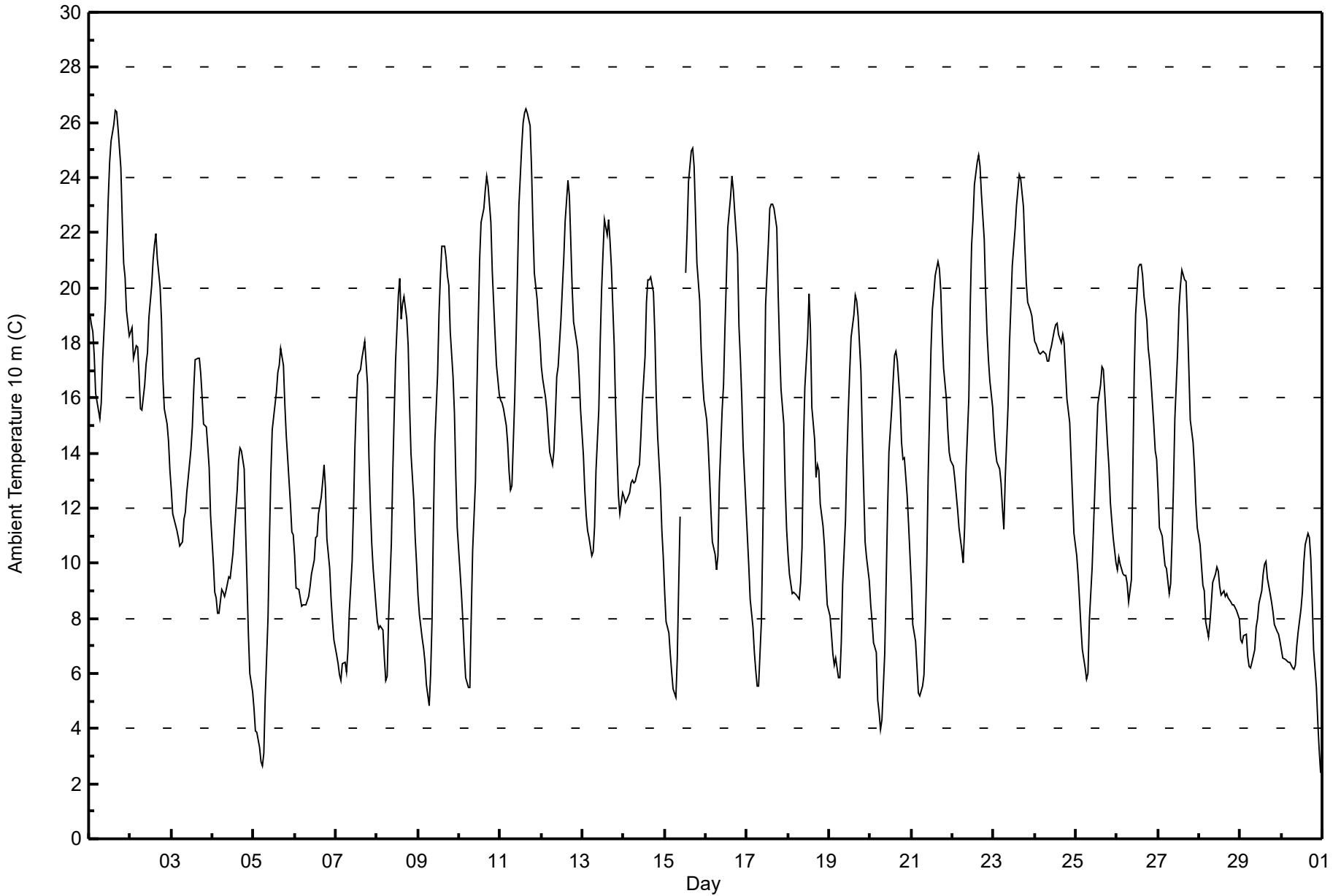
Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature 10 m (AT 10m) - C

Fort McKay - Bertha Ganter - September 2023

Maximum Value: 26.5 C on Sep 11 16:00		Maximum Daily Average: 20.8 C on Sep 1		Hours in Service: 720																						
Minimum Value: 2.4 C on Oct 1 00:00		Minimum Daily Average: 7.2 C on Sep 30		Hours of Data: 718																						
Maximum Diurnal Average: 19.5 C at hour 16		Minimum Diurnal Average: 8.7 C at hour 7		Hours of Missing Data: 2																						
Monthly Average: 13.83 C		Percentiles: P ₁ = 3.9 P ₁₀ = 6.8 Q ₁ = 9.2 Median = 13.5 Q ₃ = 18.0 P ₉₀ = 21.1 P ₉₉ = 25.9		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-Sep	19.0	18.7	18.4	17.6	16.2	15.5	15.2	15.8	17.4	19.5	21.5	23.2	24.6	25.3	25.9	26.4	26.4	25.8	24.4	22.5	20.9	20.4	19.2	18.3	20.8	26.4
2-Sep	18.4	18.5	17.5	17.9	17.9	16.9	15.6	15.6	16.5	17.3	17.7	18.9	20.1	21.0	21.5	22.0	21.0	20.0	18.8	16.7	15.6	15.0	14.4	13.4	17.8	22.0
3-Sep	12.6	11.8	11.4	11.2	10.9	10.6	10.8	11.6	11.9	12.6	13.1	14.2	15.0	16.3	17.4	17.4	17.4	16.9	16.0	15.1	14.9	14.2	13.5	11.8	13.7	17.4
4-Sep	10.0	8.9	8.7	8.2	8.2	9.1	8.9	8.8	9.0	9.5	9.5	9.9	10.4	11.2	12.6	13.7	14.2	14.1	13.4	11.2	9.3	7.4	6.0	5.4	9.9	14.2
5-Sep	4.7	3.9	3.8	3.3	2.8	2.7	3.1	5.2	8.0	10.8	13.2	14.8	15.8	16.2	16.9	17.2	17.8	17.2	15.8	14.6	13.8	12.2	11.1	11.0	10.7	17.8
6-Sep	10.3	9.1	9.0	8.7	8.4	8.5	8.5	8.6	8.8	9.2	9.6	10.1	10.9	11.0	11.8	12.4	13.0	13.6	12.7	10.9	9.8	8.7	7.9	7.2	9.9	13.6
7-Sep	6.7	6.4	6.0	5.7	6.4	6.4	6.1	6.8	8.2	10.1	12.0	14.3	15.8	16.8	17.0	17.4	17.8	18.0	16.5	13.8	12.1	10.8	9.8	8.5	11.2	18.0
8-Sep	7.9	7.6	7.7	7.6	6.6	5.8	5.9	7.9	10.7	13.3	15.3	17.4	19.7	20.3	18.9	19.4	19.7	18.8	17.9	15.7	14.0	12.3	11.0	9.9	13.0	20.3
9-Sep	8.8	8.1	7.3	6.9	6.4	5.6	4.8	6.0	7.9	11.4	14.4	16.9	19.0	20.5	21.5	21.5	21.1	20.4	20.1	18.4	16.8	15.5	13.1	11.3	13.5	21.5
10-Sep	9.7	8.9	7.9	6.8	5.8	5.5	5.5	8.1	10.5	13.0	16.2	18.8	21.1	22.4	22.9	23.5	24.1	23.7	22.4	20.6	19.4	18.2	17.2	16.1	15.3	24.1
11-Sep	15.9	15.8	15.6	15.0	14.3	13.3	12.7	12.8	16.0	18.1	20.6	23.0	25.1	26.0	26.3	26.5	26.4	25.9	24.4	22.2	20.5	19.6	18.7	18.1	19.7	26.5
12-Sep	17.1	16.7	16.0	15.5	14.7	14.0	13.6	14.1	15.4	16.8	17.1	18.9	20.0	21.1	22.4	23.9	23.4	21.7	20.0	18.7	18.1	17.7	16.8	15.6	17.9	23.9
13-Sep	13.9	12.6	11.7	11.2	10.9	10.3	10.4	11.4	13.4	15.6	18.0	19.9	21.3	22.5	21.9	22.5	21.7	20.7	17.9	15.6	13.9	12.4	11.8	12.5	15.6	22.5
14-Sep	12.4	12.2	12.3	12.6	12.9	13.0	12.9	13.0	13.4	13.6	14.6	15.8	17.5	19.5	20.3	20.3	20.4	19.8	18.3	16.0	14.6	12.7	11.2	10.2	15.0	20.4
15-Sep	9.0	7.9	7.5	6.7	6.0	5.4	5.1	6.5	9.2	11.7	M	M	20.5	22.0	23.8	25.0	25.1	24.4	22.7	20.9	19.5	17.8	16.7	15.9	15.0	25.1
16-Sep	15.2	14.3	13.2	11.9	10.8	10.3	9.8	10.3	12.9	15.6	16.5	18.5	20.3	22.1	23.3	24.1	23.5	22.7	21.2	18.6	17.4	16.0	14.2	12.0	16.4	24.1
17-Sep	11.0	9.9	8.7	7.7	6.8	6.1	5.5	5.6	7.9	11.0	14.9	19.4	21.6	22.9	23.0	23.0	22.9	22.2	19.7	17.8	16.3	15.1	12.8	11.2	14.3	23.0
18-Sep	10.3	9.6	8.9	8.9	8.9	8.9	8.7	9.3	10.6	14.3	16.4	18.2	19.8	18.5	15.7	14.5	13.1	13.6	13.4	12.2	11.4	10.6	9.4	8.5	12.2	19.8
19-Sep	8.1	7.4	6.7	6.3	6.6	5.8	5.8	7.1	9.3	11.5	13.8	15.5	16.9	18.2	19.0	19.7	19.5	19.0	17.0	14.7	12.7	10.8	10.2	9.3	12.1	19.7
20-Sep	8.5	7.9	7.1	6.8	5.0	4.6	4.0	4.3	6.7	9.2	11.9	14.0	15.6	16.6	17.5	17.7	17.4	15.9	14.4	13.8	13.8	12.5	11.5	10.3	11.1	17.7
21-Sep	9.2	7.8	7.2	6.2	5.3	5.2	5.5	6.0	7.7	10.0	13.1	17.7	19.2	19.8	20.4	21.0	20.7	19.9	18.3	17.1	15.9	14.9	14.0	13.7	13.2	21.0
22-Sep	13.5	13.1	12.5	11.9	11.3	10.5	10.0	11.3	13.4	16.0	19.3	21.5	22.5	23.7	24.6	24.8	24.4	23.4	21.8	19.8	18.4	17.4	16.6	15.7	17.4	24.8
23-Sep	14.7	14.1	13.7	13.4	12.9	12.0	11.3	13.1	15.7	18.0	19.3	20.8	22.1	23.0	23.5	24.1	23.9	23.0	21.4	20.2	19.5	19.1	18.9	18.5	18.2	24.1
24-Sep	18.0	18.0	17.6	17.6	17.7	17.7	17.6	17.3	17.3	17.7	17.9	18.5	18.6	18.7	18.3	18.0	18.3	18.0	17.0	15.9	15.1	13.7	12.4	11.1	17.0	18.7
25-Sep	10.3	9.6	8.7	7.7	6.9	6.2	5.8	6.0	7.9	9.9	11.3	12.8	14.3	15.7	16.5	17.1	17.0	16.2	14.3	13.5	12.2	11.5	10.9	10.0	11.3	17.1
26-Sep	9.8	10.2	10.0	9.6	9.6	9.6	9.2	8.6	9.4	13.3	16.9	19.0	20.7	20.8	20.8	20.4	19.7	18.8	17.8	17.3	16.6	15.0	14.1	13.8	14.6	20.8
27-Sep	12.6	11.3	11.0	10.4	9.9	9.8	8.9	9.2	10.8	12.8	15.3	17.7	19.3	20.1	20.6	20.3	20.2	18.8	17.0	15.2	14.4	13.5	12.1	11.3	14.3	20.6
28-Sep	10.7	9.9	9.2	9.0	7.9	7.3	7.8	8.6	9.3	9.6	9.9	9.7	9.1	8.9	9.0	8.8	8.9	8.8	8.6	8.5	8.5	8.4	8.3	8.0	8.9	10.7
29-Sep	7.2	7.1	7.4	7.4	6.6	6.3	6.2	6.4	6.9	7.7	8.0	8.6	9.0	9.6	10.0	10.1	9.4	8.9	8.6	8.3	7.8	7.5	7.4	7.2	7.9	10.1
30-Sep	6.9	6.6	6.5	6.4	6.4	6.4	6.2	6.2	6.3	7.0	7.5	8.4	8.9	10.0	10.7	11.1	10.9	10.1	8.6	6.9	5.5	4.2	3.2	2.4	7.2	11.1
																								Diurnal Average		
																								Diurnal Maximum		
M - Maintenance																										





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	218	30.36	30.36
10 - 20	393	54.74	85.10
> 20	107	14.90	100.00

Total Number of Valid Hours: 718

Total Number of Hours: 720



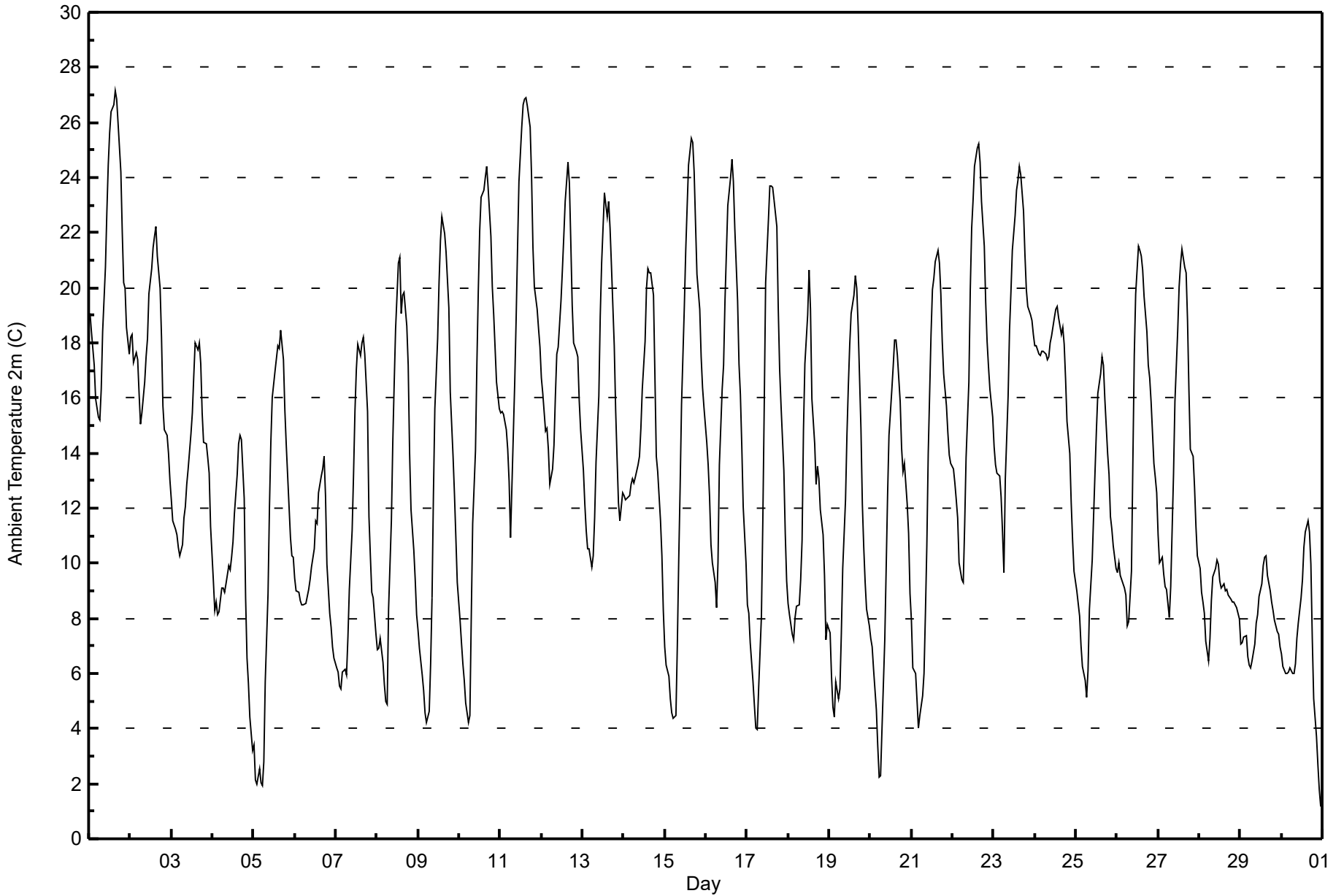
Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature 2m (AT 2m) - C

Fort McKay - Bertha Ganter - September 2023

Maximum Value: 27.1 C on Sep 1 16:00		Maximum Daily Average: 21.0 C on Sep 1		Hours in Service: 720																						
Minimum Value: 1.2 C on Oct 1 00:00		Minimum Daily Average: 6.9 C on Sep 30		Hours of Data: 720																						
Maximum Diurnal Average: 19.9 C at hour 16		Minimum Diurnal Average: 8.1 C at hour 7		Hours of Missing Data: 0																						
Monthly Average: 13.64 C		Percentiles: P ₁ = 2.3 P ₁₀ = 6.2 Q ₁ = 8.9 Median = 13.3 Q ₃ = 18.1 P ₉₀ = 21.5 P ₉₉ = 26.3		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-Sep	19.1	18.4	17.8	17.2	16.0	15.3	15.2	16.3	18.4	20.7	22.7	24.5	25.6	26.4	26.6	27.1	26.8	26.0	24.2	22.0	20.2	20.0	18.6	17.6	21.0	27.1
2-Sep	18.2	18.3	17.3	17.6	17.4	16.2	15.1	15.5	16.6	17.5	18.1	19.8	20.7	21.4	21.9	22.2	21.2	20.0	18.2	15.7	14.8	14.6	14.0	13.0	17.7	22.2
3-Sep	12.3	11.6	11.2	11.0	10.6	10.3	10.7	11.7	12.0	12.8	13.4	14.7	15.5	16.8	18.0	17.8	18.0	17.2	15.5	14.4	14.3	13.8	13.3	11.4	13.7	18.0
4-Sep	9.3	8.3	8.6	8.1	8.2	9.1	9.1	9.0	9.2	9.9	9.8	10.2	10.8	11.8	13.2	14.3	14.7	14.5	12.3	8.7	6.6	5.7	4.4	3.2	9.5	14.7
5-Sep	3.4	2.1	2.0	2.5	2.0	1.9	2.8	5.7	8.9	12.0	14.4	16.0	17.0	17.4	17.9	17.8	18.5	17.4	15.5	14.3	13.2	10.9	10.3	10.2	10.6	18.5
6-Sep	9.5	9.0	8.9	8.6	8.5	8.5	8.6	8.8	9.0	9.4	9.9	10.5	11.5	11.4	12.6	13.1	13.4	13.9	12.5	10.0	8.2	7.7	7.0	6.5	9.9	13.9
7-Sep	6.2	6.1	5.5	5.5	6.1	6.1	5.9	7.3	9.1	11.2	13.2	15.5	17.0	18.0	17.6	18.0	18.2	17.6	15.5	11.7	10.3	8.9	8.8	7.4	11.1	18.2
8-Sep	6.9	6.9	7.3	6.4	5.6	5.0	4.9	8.3	11.5	14.4	16.5	18.5	20.9	21.1	19.1	19.7	19.8	18.6	17.2	14.0	11.9	10.4	9.4	8.1	12.6	21.1
9-Sep	7.6	6.9	6.0	5.4	4.6	4.2	4.6	6.4	8.8	12.5	15.6	18.2	20.2	21.7	22.6	22.0	21.3	20.3	19.2	16.2	13.9	12.5	10.9	9.3	13.0	22.6
10-Sep	7.9	7.1	6.4	5.7	4.9	4.2	4.5	8.1	11.4	14.1	17.3	19.9	22.1	23.3	23.5	24.0	24.4	23.6	21.8	20.0	19.0	17.8	16.6	15.6	15.1	24.4
11-Sep	15.5	15.5	15.4	14.8	14.2	13.0	10.9	12.8	16.6	18.9	21.4	23.9	25.8	26.7	26.8	26.9	26.6	25.8	24.1	21.5	20.1	19.2	18.5	17.8	19.7	26.9
12-Sep	16.7	16.2	14.8	14.9	14.1	12.9	13.4	14.3	16.0	17.6	17.9	19.5	20.6	21.9	23.1	24.6	23.8	21.7	19.4	18.0	17.7	17.5	15.9	14.9	17.8	24.6
13-Sep	13.4	12.2	11.2	10.5	10.5	9.9	10.3	11.7	13.7	16.1	19.0	20.9	22.2	23.4	22.6	23.1	22.2	20.8	17.9	15.5	13.8	12.2	11.5	12.6	15.7	23.4
14-Sep	12.4	12.3	12.4	12.5	12.8	13.1	12.9	13.1	13.6	13.9	14.9	16.3	18.1	20.0	20.7	20.5	20.5	19.7	16.8	13.9	13.3	11.5	10.2	8.3	14.7	20.7
15-Sep	7.0	6.3	5.9	5.1	4.6	4.4	4.5	7.0	10.1	12.8	15.8	19.3	21.4	22.9	24.5	25.4	25.3	24.2	22.3	20.5	19.2	17.5	16.4	15.7	14.9	25.4
16-Sep	14.4	13.6	12.4	10.7	10.0	9.3	8.4	10.0	13.6	16.3	17.2	19.5	21.2	23.0	24.0	24.6	23.9	22.1	19.5	17.3	16.1	14.2	12.0	10.0	16.0	24.6
17-Sep	8.5	8.2	7.1	5.7	4.8	4.0	4.0	5.4	8.1	11.5	15.7	20.2	22.5	23.7	23.7	23.7	23.2	22.2	19.3	17.0	15.7	13.4	11.1	9.3	13.7	23.7
18-Sep	8.5	8.1	7.4	7.2	8.0	8.4	8.5	9.4	10.8	14.8	17.2	19.0	20.7	19.2	16.0	14.4	12.9	13.5	13.1	11.9	11.0	9.6	7.2	7.8	11.9	20.7
19-Sep	7.5	5.9	4.8	4.4	5.7	5.1	5.4	7.4	9.8	12.3	14.6	16.4	17.9	19.1	19.7	20.4	20.0	18.6	14.9	12.1	10.6	9.3	8.3	7.7	11.6	20.4
20-Sep	7.3	7.0	6.1	4.7	3.4	2.2	2.3	3.9	7.2	9.8	12.5	14.6	16.3	17.1	18.1	18.1	17.6	15.9	14.2	13.3	13.6	12.2	11.1	8.9	10.7	18.1
21-Sep	7.9	6.2	6.0	5.0	4.0	4.5	5.2	6.0	8.2	10.6	14.0	18.3	19.9	20.3	20.9	21.3	20.9	19.8	18.1	16.9	15.7	14.7	13.9	13.6	13.0	21.3
22-Sep	13.4	12.9	12.3	11.6	10.0	9.4	9.3	11.4	13.8	16.6	19.9	22.2	23.2	24.4	25.1	25.2	24.6	23.1	21.5	19.5	18.1	17.1	16.3	15.3	17.3	25.2
23-Sep	14.2	13.6	13.3	13.2	12.4	11.1	9.6	13.1	16.0	18.5	19.8	21.4	22.6	23.5	23.9	24.4	24.1	22.8	21.2	19.9	19.3	19.0	18.8	18.3	18.1	24.4
24-Sep	17.9	17.9	17.6	17.6	17.7	17.7	17.6	17.4	17.5	18.0	18.3	18.9	19.2	19.3	18.9	18.3	18.6	17.9	16.7	15.1	14.0	12.2	10.8	9.7	16.9	19.3
25-Sep	9.0	8.5	8.1	7.0	6.3	5.8	5.1	6.1	8.3	10.1	11.8	13.3	14.9	16.2	16.9	17.5	17.2	16.0	14.0	13.2	11.7	11.3	10.6	9.8	11.2	17.5
26-Sep	9.6	10.0	9.5	9.2	9.1	8.9	7.7	7.9	9.7	13.7	17.5	19.8	21.5	21.3	21.2	20.6	19.7	18.4	17.2	16.7	15.8	13.7	13.1	12.6	14.4	21.5
27-Sep	11.0	10.0	10.2	9.6	9.2	9.1	8.0	9.2	11.2	13.2	15.9	18.5	20.0	20.8	21.4	20.8	20.6	18.8	16.3	14.1	13.9	12.8	11.4	10.3	14.0	21.4
28-Sep	9.8	8.9	8.6	8.2	7.2	6.5	7.3	8.7	9.5	9.8	10.1	9.9	9.3	9.1	9.3	9.0	9.0	8.9	8.7	8.6	8.6	8.5	8.4	8.0	8.7	10.1
29-Sep	7.1	7.1	7.3	7.4	6.6	6.3	6.2	6.5	7.1	7.8	8.2	8.8	9.2	9.9	10.2	10.3	9.6	9.0	8.6	8.3	7.9	7.5	7.4	7.0	8.0	10.3
30-Sep	6.7	6.3	6.0	6.0	6.1	6.2	6.0	6.0	6.4	7.3	7.8	8.7	9.4	10.6	11.1	11.5	11.1	10.0	7.3	5.1	3.7	2.7	1.8	1.2	6.9	11.5
																								Diurnal Average		
																								Diurnal Maximum		





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	238	33.06	33.06
10 - 20	370	51.39	84.44
> 20	112	15.56	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

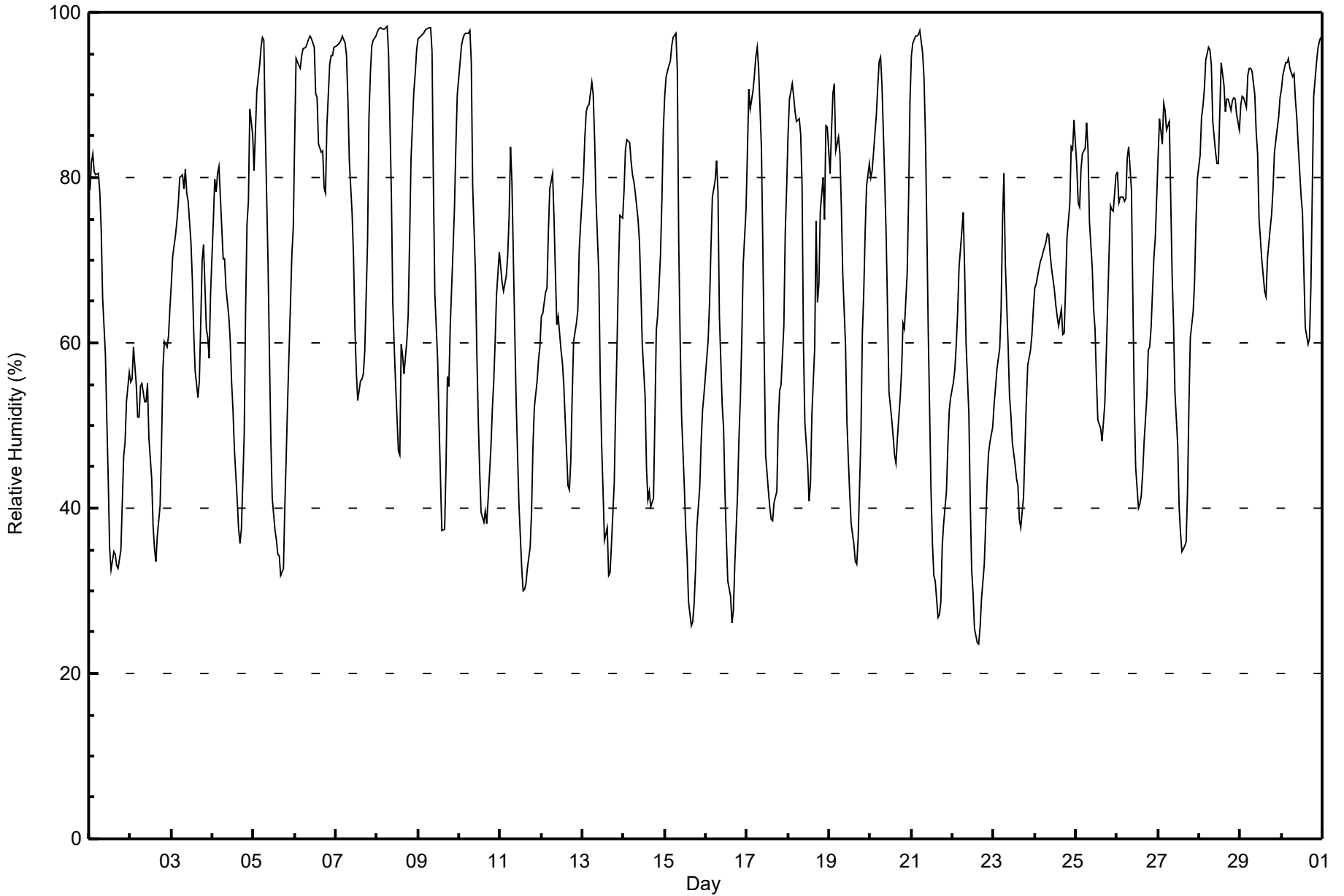
Fort McKay - Bertha Ganter - September 2023

Maximum Value: 98.4 % on Sep 8 07:00																						Maximum Daily Average: 91.1 % on Sep 6																						Hours in Service: 720					
Minimum Value: 23.5 % on Sep 22 16:00																						Minimum Daily Average: 46.8 % on Sep 22																						Hours of Data: 720					
Maximum Diurnal Average: 86.6 % at hour 7																						Minimum Diurnal Average: 44.6 % at hour 16																						Hours of Missing Data: 0					
Monthly Average: 67.15 %																						Percentiles: P ₁ = 26.9 P ₁₀ = 38.1 Q ₁ = 51.3 Median = 68.5 Q ₃ = 84.0 P ₉₀ = 94.0 P ₉₉ = 98.0																						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-Sep	78.4	81.8	82.9	80.6	80.4	80.6	78.1	73.5	65.5	58.4	50.6	43.4	35.1	32.5	34.7	34.5	33.1	32.8	34.8	40.6	46.2	47.9	52.9	56.5	55.7	82.9																							
2-Sep	55.2	55.6	59.4	54.9	51.1	51.0	54.7	55.1	52.9	52.8	55.0	48.5	43.6	37.8	35.1	33.6	36.7	40.3	47.7	56.8	60.1	59.5	60.8	64.2	50.9	64.2																							
3-Sep	67.1	70.5	73.0	74.8	77.0	80.0	80.3	78.6	81.0	78.1	77.1	72.2	67.6	61.2	56.6	53.4	55.4	62.5	70.0	71.8	61.8	60.7	58.2	65.9	68.9	81.0																							
4-Sep	74.9	79.8	78.3	80.5	81.4	73.9	70.1	70.2	66.6	63.1	60.3	55.2	51.9	47.1	41.0	37.5	35.7	37.4	48.9	64.0	74.3	77.0	88.3	85.3	64.3	88.3																							
5-Sep	80.8	85.7	90.4	93.5	95.8	96.9	96.5	86.1	69.6	58.7	48.3	41.1	37.2	36.2	34.5	34.2	31.9	32.6	40.3	46.4	53.0	64.8	70.7	73.9	62.5	96.9																							
6-Sep	84.5	94.5	93.6	93.2	94.8	95.6	95.8	96.2	96.7	97.2	96.8	95.8	90.2	89.7	84.1	83.1	83.2	78.9	78.1	86.3	93.7	94.7	94.7	95.7	91.1	97.2																							
7-Sep	96.0	96.1	96.2	96.6	97.2	96.3	94.8	89.3	82.0	75.6	70.4	61.6	56.5	53.0	55.5	55.6	56.3	59.0	72.2	87.3	92.6	96.0	96.6	97.1	80.4	97.2																							
8-Sep	97.7	98.0	98.1	97.9	98.0	98.1	98.4	94.9	78.0	64.8	59.7	55.0	47.0	46.4	59.8	58.4	56.4	60.2	63.4	72.4	82.2	90.4	92.6	95.4	77.6	98.4																							
9-Sep	96.8	97.0	97.3	97.5	97.7	98.0	98.2	98.2	95.2	79.0	66.0	58.0	50.6	43.8	37.2	37.5	45.2	55.9	54.8	62.0	71.4	76.2	83.8	90.0	74.5	98.2																							
10-Sep	93.9	95.9	96.9	97.2	97.4	97.5	97.8	94.0	79.0	68.3	58.5	50.6	44.4	39.6	38.2	39.6	38.1	41.0	47.3	51.8	55.3	60.0	65.8	71.0	67.5	97.8																							
11-Sep	69.1	67.3	66.3	68.2	70.7	75.2	83.7	79.4	61.6	53.1	46.5	40.5	32.8	29.9	30.2	30.9	32.7	35.3	39.5	47.5	52.2	55.3	58.0	59.7	53.6	83.7																							
12-Sep	63.3	63.5	66.0	66.6	73.5	78.7	80.6	75.2	68.6	62.2	63.3	59.2	57.6	54.8	50.6	42.6	42.3	45.8	53.6	60.1	62.3	64.0	71.3	74.5	62.5	80.6																							
13-Sep	80.0	84.8	88.0	88.7	88.8	91.5	90.0	84.5	77.4	68.3	55.8	47.6	42.2	36.2	37.7	31.9	32.1	35.6	43.0	52.2	59.9	68.7	75.5	75.1	64.0	91.5																							
14-Sep	78.5	83.4	84.6	84.3	82.0	80.3	79.6	78.1	75.0	72.2	66.4	59.8	53.5	44.9	41.0	42.0	40.2	41.2	50.8	61.5	63.4	70.6	77.3	85.7	66.5	85.7																							
15-Sep	89.8	92.1	93.6	94.1	95.9	97.0	97.5	93.0	72.2	60.5	51.3	42.5	37.4	34.1	28.7	25.8	26.2	28.5	32.5	37.8	42.5	47.9	51.8	53.7	59.4	97.5																							
16-Sep	58.1	60.4	64.9	71.5	77.7	79.7	82.0	78.3	63.4	52.6	49.6	41.8	36.3	31.2	29.3	26.0	27.6	33.1	41.8	48.7	53.4	60.5	69.5	76.2	54.7	82.0																							
17-Sep	83.1	90.7	88.3	90.6	92.5	94.5	95.8	93.3	83.6	71.7	58.6	46.4	42.1	40.0	38.6	38.4	40.7	42.1	50.2	54.3	55.0	62.1	73.4	78.8	66.9	95.8																							
18-Sep	85.2	89.5	91.3	89.9	87.9	86.8	87.2	85.3	79.1	59.7	50.4	45.3	40.8	43.1	51.3	59.4	74.8	65.0	67.1	76.0	80.0	74.9	86.3	86.2	72.6	91.3																							
19-Sep	80.6	85.6	90.2	91.4	83.2	84.9	82.9	76.6	68.5	59.7	50.5	45.9	41.6	38.1	35.6	33.6	33.3	36.2	48.8	61.0	66.2	73.4	78.9	81.7	63.7	91.4																							
20-Sep	80.1	80.9	83.1	87.6	91.0	94.2	94.6	91.2	79.6	72.8	63.9	54.1	50.7	48.6	46.4	45.4	48.5	53.4	56.7	62.4	61.7	68.6	77.4	89.4	70.1	94.6																							
21-Sep	94.7	96.2	97.1	97.0	97.3	97.7	95.0	92.0	85.0	74.1	61.6	42.0	35.7	31.9	31.1	26.8	27.1	28.7	35.5	38.1	42.1	47.4	51.9	53.3	61.6	97.7																							
22-Sep	55.3	56.8	59.9	63.8	69.2	73.6	75.8	68.7	60.0	51.3	40.5	32.5	29.7	25.5	23.8	23.5	25.7	29.0	33.2	38.1	43.0	46.6	47.9	49.9	46.8	75.8																							
23-Sep	52.6	54.5	56.9	59.3	64.0	74.6	80.5	69.6	59.6	53.6	51.2	47.9	45.2	43.6	42.7	38.6	37.6	41.4	47.0	52.9	57.4	59.2	61.0	64.0	54.8	80.5																							
24-Sep	66.6	67.1	69.0	69.8	70.3	71.1	72.2	73.2	73.0	70.7	68.9	66.4	64.5	63.2	62.0	64.0	60.9	61.2	66.6	72.8	76.8	83.8	83.4	87.0	70.2	87.0																							
25-Sep	81.3	76.9	76.5	81.0	82.9	83.5	86.6	83.3	74.7	69.2	64.0	61.6	55.5	50.7	49.6	48.1	50.3	52.8	64.3	70.7	76.5	76.1	75.9	80.4	69.7	86.6																							
26-Sep	80.6	76.9	77.5	77.7	77.1	77.4	82.4	83.7	78.4	65.3	52.9	44.9	40.1	40.5	41.5	44.3	48.0	53.6	59.2	59.5	61.9	70.4	72.7	77.7	64.3	83.7																							
27-Sep	82.5	87.2	84.0	89.0	88.2	85.7	86.8	77.6	68.3	62.4	54.1	47.6	40.1	37.0	34.7	35.4	35.9	42.1	52.5	60.7	63.7	67.2	74.4	79.9	64.0	89.0																							
28-Sep	82.7	87.3	88.7	90.7	94.2	95.7	95.5	93.5	86.7	83.1	81.6	81.7	87.8	94.0	91.2	88.0	89.6	89.5	88.2	89.4	89.6	89.4	87.7	85.7	88.8	95.7																							
29-Sep	88.8	89.8	89.7	88.5	92.3	93.3	93.2	92.9	90.1	85.5	82.9	75.0	70.0	68.2	66.3	65.6	70.1	73.8	75.6	78.6	83.0	86.0	87.3	89.7	82.3	93.3																							
30-Sep	90.7	92.4	93.8	93.9	94.4	93.3	92.1	92.5	89.3	87.1	83.8	77.8	75.8	68.7	61.9	59.8	60.4	66.6	78.3	89.8	93.9	95.5	96.5	97.0	84.4	97.0																							
																								79.0	81.3	82.5	83.7	84.8	85.9	86.6	83.3	75.3	67.7	61.4	54.7	50.1	47.0	45.7	44.6	45.9	48.5	54.7	61.7	65.8	69.8	74.1	77.3	Diurnal Average	
																								97.7	98.0	98.1	97.9	98.0	98.1	98.4	98.2	96.7	97.2	96.8	95.8	90.2	94.0	91.2	88.0	89.6	89.5	88.2	89.8	93.9	96.0	96.6	97.1	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

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



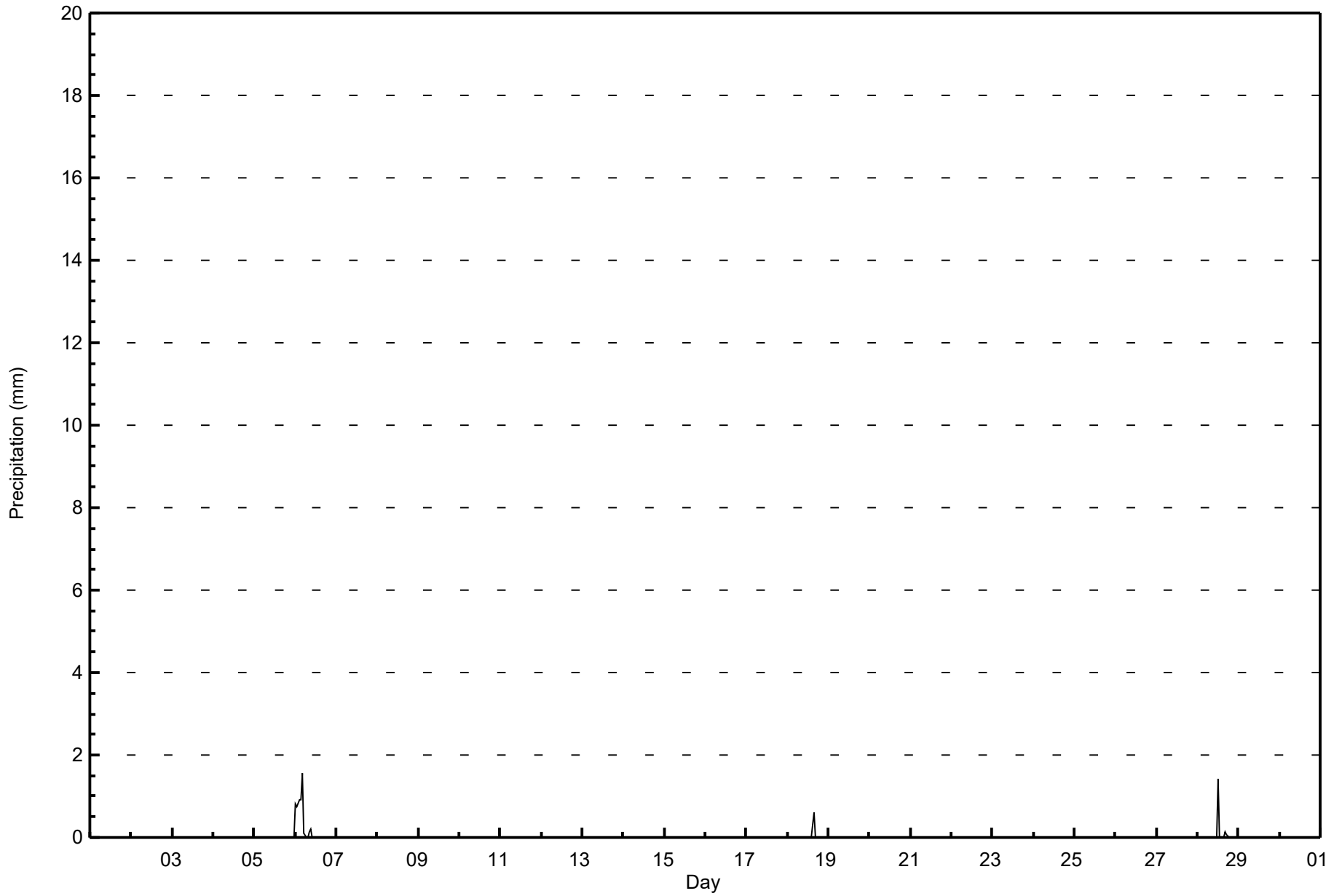


Maximum Value: 1.6 mm on Sep 6 05:00		Maximum Daily Total: 5.4 mm on Sep 6		Hours in Service: 720																																															
Minimum Value: 0.0 mm on Sep 1 01:00		Minimum Daily Total: 0.0 mm on Sep 1		Hours of Data: 720																																															
Maximum Diurnal Total: 1.6 mm at hour 5		Minimum Diurnal Total: 0.0 mm at hour 7		Hours of Missing Data: 0																																															
Monthly Total: 7.60 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 = 0.2		Hours of Calibration: 0																																															
				Percent Operational Time: 100.0																																															
Day	Hourly Period Ending At (MST)																								Daily Total	Daily Maximum																									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																											
1-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.8	0.8	0.9	0.9	1.6	0.1	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.4	1.6																					
7-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.6																					
19-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	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	1.6	1.4	0.0																					
29-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																					
																								0.8	0.8	0.9	0.9	1.6	0.1	0.0	0.0	0.1	0.2	0.0	0.0	1.4	0.0	0.6	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Diurnal Average	
																								0.8	0.8	0.9	0.9	1.6	0.1	0.0	0.0	0.1	0.2	0.0	0.0	1.4	0.0	0.6	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

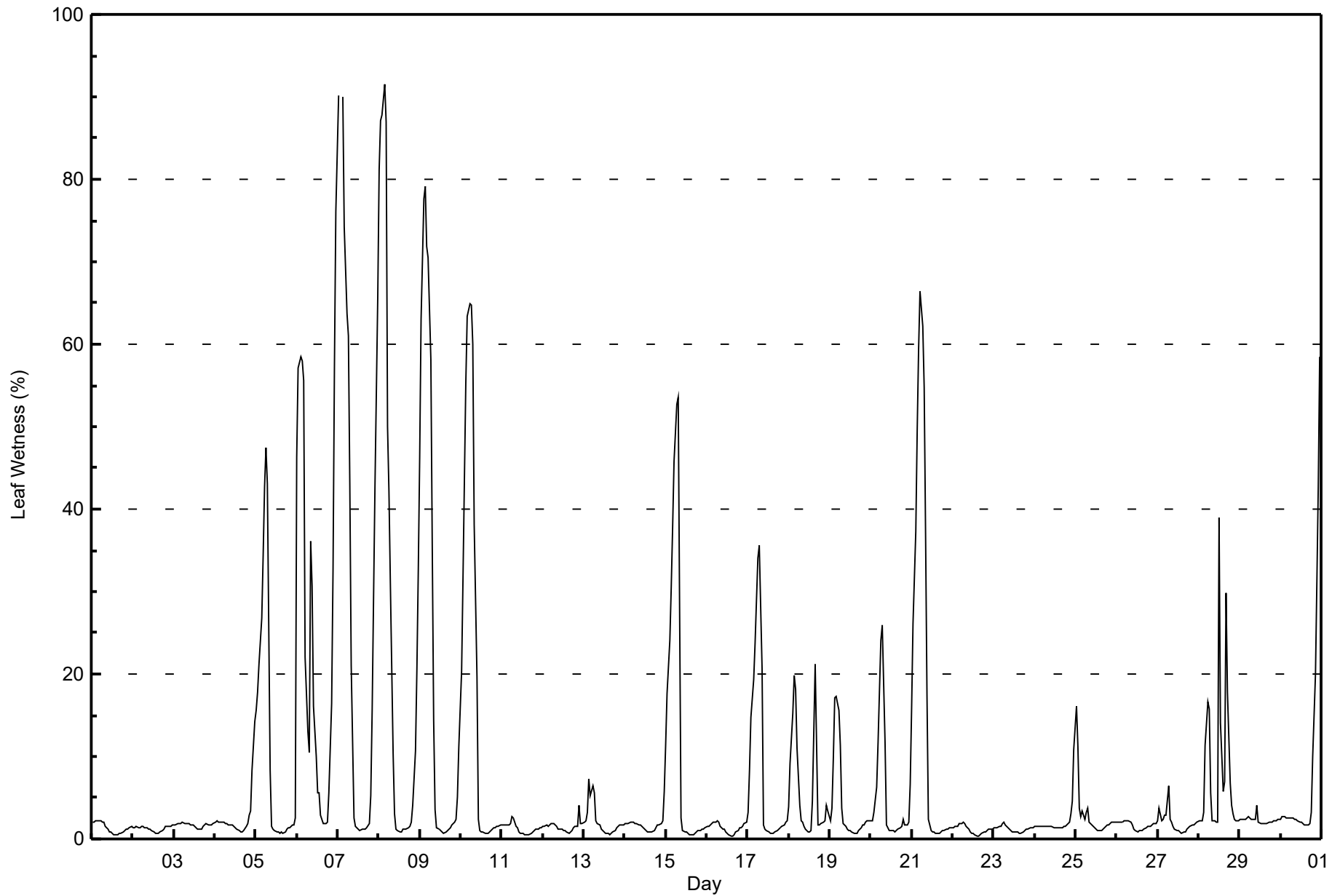
Concentration Ranges (mm)	Number of Hours	%	Cumulative %
0 - 0.3	713	99.03	99.03
0.4 - 0.5	0	0.00	99.03
0.6 - 0.7	1	0.14	99.17
0.8 - 1.4	5	0.69	99.86
1.5 - 10	1	0.14	100.00
> 10	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Maximum Value: 91.6 % on Sep 8 04:00																				Maximum Daily Average: 28.0 % on Sep 7					Hours in Service: 720	
Minimum Value: 0.3 % on Sep 22 15:00																				Minimum Daily Average: 1.1 % on Sep 22					Hours of Data: 718	
Maximum Diurnal Average: 20.1 % at hour 5																				Minimum Diurnal Average: 1.2 % at hour 15					Hours of Missing Data: 2	
Monthly Average: 7.83 %																				Percentiles: P ₁ = 0.5 P ₁₀ = 0.8 Q ₁ = 1.2 Median = 1.7 Q ₃ = 2.7 P ₉₀ = 24.7 P ₉₉ = 78.8					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-Sep	2.0	2.1	2.2	2.2	2.2	2.2	2.1	2.0	1.5	1.2	0.9	0.8	0.6	0.6	0.6	0.5	0.6	0.7	0.8	1.0	1.2	1.2	1.4	1.5	1.3	2.2
2-Sep	1.4	1.4	1.4	1.4	1.4	1.5	1.5	1.4	1.3	1.2	1.1	0.9	0.9	0.7	0.7	0.7	0.8	0.9	1.2	1.5	1.5	1.5	1.6	1.6	1.2	1.6
3-Sep	1.7	1.8	1.8	1.8	1.9	2.0	1.9	1.9	1.9	1.8	1.8	1.6	1.5	1.3	1.2	1.2	1.3	1.4	1.7	1.8	1.8	1.7	1.7	1.8	1.7	2.0
4-Sep	2.1	2.2	2.1	2.1	2.1	2.0	1.9	1.8	1.8	1.6	1.6	1.5	1.4	1.2	1.0	0.9	0.8	1.0	1.5	1.9	2.9	3.4	8.4	14.2	2.6	14.2
5-Sep	15.6	17.7	21.2	26.8	34.5	42.7	47.5	43.0	8.3	1.5	1.2	1.0	0.9	0.8	0.7	0.9	0.7	0.9	1.2	1.3	1.4	1.7	1.8	2.6	11.5	47.5
6-Sep	46.3	57.1	58.4	57.9	55.6	22.1	13.0	10.5	36.0	30.6	16.1	9.9	5.5	5.6	2.8	1.8	1.8	1.9	2.1	5.5	16.5	32.8	57.3	76.2	26.0	76.2
7-Sep	90.2	OR	OR	90.0	74.2	63.7	61.0	43.1	21.1	2.6	1.5	1.3	1.1	1.1	1.3	1.2	1.2	1.4	1.8	5.3	15.5	29.3	42.8	65.8	28.0	90.2
8-Sep	81.1	87.2	87.8	91.6	87.0	50.1	42.2	31.1	10.3	3.0	1.2	1.1	0.8	0.9	1.3	1.2	1.2	1.4	1.6	2.0	4.1	10.7	20.5	32.5	27.2	91.6
9-Sep	46.3	63.1	77.6	79.1	71.9	70.6	58.1	35.5	14.4	3.5	1.4	1.1	0.9	0.8	0.6	0.8	1.0	1.2	1.3	1.7	2.0	2.3	5.0	11.1	23.0	79.1
10-Sep	20.4	31.7	43.5	55.2	63.3	65.0	64.8	60.0	38.1	19.6	2.5	1.0	0.9	0.8	0.7	0.7	0.7	0.9	1.1	1.3	1.3	1.4	1.6	1.7	19.9	65.0
11-Sep	1.7	1.7	1.7	1.7	1.8	1.9	2.7	2.6	1.5	1.3	0.9	0.8	0.6	0.5	0.5	0.5	0.5	0.7	0.8	1.1	1.2	1.2	1.3	1.3	1.3	2.7
12-Sep	1.5	1.5	1.7	1.6	1.7	1.9	1.9	1.7	1.5	1.2	1.2	1.1	1.1	1.0	0.9	0.7	0.9	1.1	1.3	1.4	1.5	4.1	1.9	1.9	1.5	4.1
13-Sep	2.1	2.2	3.2	7.3	5.3	6.4	5.5	2.2	1.9	1.6	1.2	1.0	0.8	0.7	0.7	0.6	0.7	0.9	1.1	1.3	1.4	1.6	1.8	1.7	2.2	7.3
14-Sep	1.8	1.9	1.9	2.0	2.0	2.0	1.9	1.9	1.8	1.7	1.5	1.3	1.1	0.9	0.9	0.9	0.9	1.1	1.4	1.7	1.7	1.9	2.2	5.8	1.7	5.8
15-Sep	11.3	17.6	24.1	30.5	37.8	45.7	52.7	53.5	27.6	2.6	1.1	0.8	0.8	0.7	0.5	0.4	0.5	0.7	0.8	1.0	1.0	1.2	1.3	1.3	13.1	53.5
16-Sep	1.5	1.6	1.7	1.9	2.0	2.1	2.2	2.0	1.5	1.2	1.1	0.8	0.7	0.6	0.4	0.4	0.5	0.8	1.1	1.3	1.4	1.6	1.8	2.0	1.3	2.2
17-Sep	3.2	8.3	14.8	19.3	23.8	28.9	34.1	35.5	20.7	1.7	1.2	0.9	0.8	0.7	0.7	0.7	0.8	1.0	1.2	1.4	1.5	1.7	2.0	2.2	8.6	35.5
18-Sep	3.8	9.1	15.2	19.8	18.1	11.1	4.1	2.3	2.0	1.5	1.1	0.9	0.8	1.0	4.6	21.1	11.6	1.7	1.7	1.8	2.0	2.1	4.2	3.3	6.0	21.1
19-Sep	2.2	3.8	9.8	17.0	17.2	15.6	11.3	3.7	1.9	1.5	1.2	1.0	0.9	0.8	0.7	0.6	0.7	1.0	1.4	1.7	1.8	2.0	2.1	2.2	4.3	17.2
20-Sep	2.2	2.2	3.2	6.2	11.7	18.0	24.1	26.0	11.6	1.7	1.4	1.1	1.0	1.0	0.9	0.9	1.1	1.3	1.5	2.3	1.8	1.7	2.0	6.7	5.5	26.0
21-Sep	15.7	26.1	37.3	49.5	59.3	66.4	62.2	54.8	36.9	17.5	2.4	1.1	0.9	0.9	0.7	0.7	0.7	0.9	1.0	1.1	1.2	1.2	1.3	1.4	18.4	66.4
22-Sep	1.4	1.4	1.5	1.6	1.8	1.9	2.0	1.8	1.5	1.2	0.8	0.7	0.6	0.5	0.3	0.3	0.4	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.1	2.0
23-Sep	1.3	1.4	1.4	1.4	1.5	1.8	2.0	1.8	1.4	1.2	1.0	0.9	0.8	0.8	0.7	0.7	0.9	1.1	1.2	1.3	1.3	1.3	1.4	1.4	1.2	2.0
24-Sep	1.5	1.5	1.5	1.5	1.5	1.5	1.6	1.6	1.6	1.5	1.4	1.3	1.4	1.3	1.3	1.4	1.4	1.5	1.6	1.8	2.0	3.0	4.5	10.9	2.1	10.9
25-Sep	16.1	11.2	3.7	2.6	3.3	2.4	3.3	3.7	2.0	1.8	1.4	1.3	1.2	1.1	1.1	1.1	1.2	1.4	1.6	1.8	1.9	2.0	2.0	2.1	3.0	16.1
26-Sep	2.1	2.0	2.1	2.1	2.1	2.1	2.3	2.2	2.0	1.7	1.2	1.0	0.9	1.0	1.0	1.1	1.2	1.3	1.5	1.5	1.6	1.9	1.9	1.9	1.7	2.3
27-Sep	2.3	3.7	2.3	2.4	2.8	2.8	6.5	2.4	2.0	1.6	1.1	1.0	1.0	0.9	0.7	0.9	0.8	1.1	1.4	1.6	1.6	1.8	1.9	2.1	1.9	6.5
28-Sep	2.2	2.2	2.3	3.3	11.4	16.6	15.8	5.6	2.2	2.1	2.1	2.1	38.9	14.0	5.7	7.0	29.8	17.7	6.7	4.0	3.0	2.4	2.3	2.3	8.4	38.9
29-Sep	2.4	2.4	2.4	2.4	2.5	2.7	2.5	2.4	2.3	2.5	4.0	2.1	1.9	1.8	1.8	1.8	1.9	2.0	2.0	2.1	2.1	2.2	2.4	2.3	2.3	4.0
30-Sep	2.4	2.6	2.7	2.5	2.5	2.5	2.5	2.5	2.4	2.3	2.2	2.1	2.0	1.8	1.7	1.6	1.7	1.9	3.3	9.9	19.9	31.2	42.8	58.5	8.6	58.5
																								Diurnal Average		
																								Diurnal Maximum		
12.9 12.7 14.8 19.5 20.1 18.5 17.8 14.7 8.7 3.9 2.0 1.5 2.4 1.5 1.2 1.8 2.3 1.7 1.6 2.1 3.3 5.1 7.5 10.7 90.2 87.2 87.8 91.6 87.0 70.6 64.8 60.0 38.1 30.6 16.1 9.9 38.9 14.0 5.7 21.1 29.8 17.7 6.7 9.9 19.9 32.8 57.3 76.2																										
OR - Out of Range																										





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

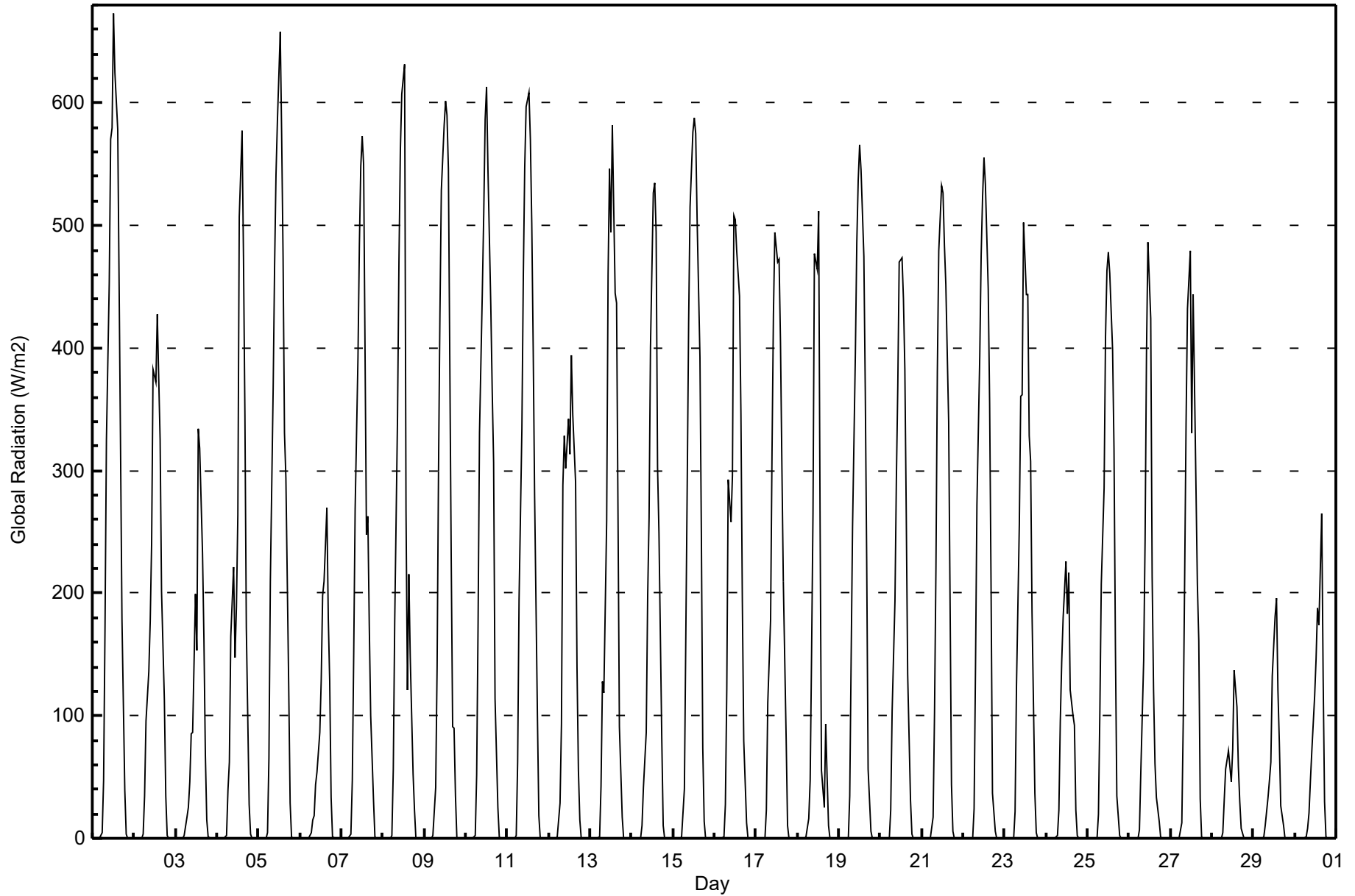
Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 0.3	2	0.28	0.28
0.4 - 0.5	13	1.81	2.09
0.6 - 0.7	40	5.57	7.66
0.8 - 1.4	217	30.22	37.88
1.5 - 10	309	43.04	80.92
> 10	122	16.99	97.91

Total Number of Valid Hours: 718

Total Number of Hours: 720



Maximum Value: 672.8 W/m2 on Sep 1 13:00 Maximum Daily Average: 209.0 W/m2 on Sep 1																							Hours in Service:	720		
Minimum Value: 0.0 W/m2 on Sep 1 01:00 Minimum Daily Average: 28.4 W/m2 on Sep 28																							Hours of Data:	720		
Maximum Diurnal Average: 435.7 W/m2 at hour 13 Minimum Diurnal Average: 0.0 W/m2 at hour 2																							Hours of Missing Data:	0		
Monthly Average: 132.01 W/m2 Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 14.6 Q ₃ = 228.3 P ₉₀ = 470.4 P ₉₉ = 601.3																							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-Sep	0.0	0.0	0.0	0.0	0.0	4.5	46.7	172.0	325.1	452.9	570.8	579.8	672.8	625.2	578.3	450.1	317.1	178.1	39.6	3.8	0.0	0.0	0.0	0.0	209.0	672.8
2-Sep	0.0	0.0	0.0	0.0	0.0	3.0	34.7	95.3	136.3	177.2	242.3	383.0	372.2	427.2	375.6	325.0	202.1	113.4	34.5	2.4	0.0	0.0	0.0	0.0	121.8	427.2
3-Sep	0.0	0.0	0.0	0.0	0.0	1.8	16.9	25.9	46.1	85.6	86.0	198.9	153.4	334.2	318.2	232.4	163.0	68.7	15.2	0.7	0.0	0.0	0.0	0.0	72.8	334.2
4-Sep	0.0	0.0	0.0	0.0	0.0	2.1	38.8	62.3	164.5	220.9	147.8	189.3	264.2	507.0	577.0	472.4	345.8	171.8	28.0	3.0	0.0	0.0	0.0	0.0	133.1	577.0
5-Sep	0.0	0.0	0.0	0.0	0.0	5.2	66.0	209.5	367.2	466.5	541.4	585.8	658.5	574.4	474.6	330.7	294.4	123.5	28.3	1.0	0.0	0.0	0.0	0.0	197.0	658.5
6-Sep	0.0	0.0	0.0	0.0	0.0	0.4	4.1	14.9	18.9	43.3	53.9	86.4	129.6	198.3	210.3	269.1	179.8	127.6	33.0	1.6	0.0	0.0	0.0	0.0	57.1	269.1
7-Sep	0.0	0.0	0.0	0.0	0.0	2.9	47.2	151.3	268.7	391.5	484.2	548.6	572.8	549.3	248.0	263.0	174.0	99.8	30.6	1.0	0.0	0.0	0.0	0.0	159.7	572.8
8-Sep	0.0	0.0	0.0	0.0	0.0	2.3	56.5	176.2	345.0	470.6	561.7	607.3	632.1	267.0	120.5	215.1	147.0	52.7	23.6	0.6	0.0	0.0	0.0	0.0	153.3	632.1
9-Sep	0.0	0.0	0.0	0.0	0.0	2.2	41.5	139.4	299.7	427.5	528.7	582.0	602.2	590.6	545.9	226.5	91.4	90.4	34.6	0.4	0.0	0.0	0.0	0.0	175.1	602.2
10-Sep	0.0	0.0	0.0	0.0	0.0	1.8	51.5	175.4	330.5	446.4	509.2	586.7	613.5	545.5	434.1	364.8	306.1	114.3	24.9	1.1	0.0	0.0	0.0	0.0	187.7	613.5
11-Sep	0.0	0.0	0.0	0.0	0.0	2.2	62.0	195.1	333.8	457.3	547.8	597.4	608.1	570.3	501.3	399.9	279.9	99.0	19.0	0.5	0.0	0.0	0.0	0.0	194.7	608.1
12-Sep	0.0	0.0	0.0	0.0	0.0	1.7	28.4	93.5	288.2	328.5	301.7	342.4	313.3	394.0	345.2	289.9	139.0	55.2	14.9	0.0	0.0	0.0	0.0	0.0	122.3	394.0
13-Sep	0.0	0.0	0.0	0.0	0.0	0.9	42.3	127.7	118.8	258.9	459.6	546.0	494.6	582.3	444.4	436.7	267.0	90.8	16.9	0.0	0.0	0.0	0.0	0.0	162.0	582.3
14-Sep	0.0	0.0	0.0	0.0	0.0	1.0	9.9	41.3	86.7	197.2	261.5	401.7	526.4	534.8	494.1	303.6	249.5	80.2	10.9	0.0	0.0	0.0	0.0	0.0	133.2	534.8
15-Sep	0.0	0.0	0.0	0.0	0.0	1.0	39.9	164.2	288.9	420.3	515.7	576.2	587.3	575.0	504.4	393.0	248.5	73.6	13.6	0.2	0.0	0.0	0.0	0.0	183.4	587.3
16-Sep	0.0	0.0	0.0	0.0	0.0	0.9	28.1	122.3	293.2	258.5	296.2	508.1	504.8	479.0	442.8	346.4	193.5	79.3	13.1	0.2	0.1	0.0	0.0	0.0	148.6	508.1
17-Sep	0.0	0.0	0.0	0.0	0.0	0.2	23.0	110.1	179.2	314.6	428.1	494.6	470.7	472.9	404.3	302.7	209.8	81.7	10.8	0.0	0.0	0.0	0.0	0.0	145.9	494.6
18-Sep	0.0	0.0	0.0	0.0	0.0	0.6	16.4	47.1	150.9	265.3	477.3	464.7	511.4	262.3	55.7	25.2	93.8	49.4	10.6	0.0	0.0	0.0	0.0	0.0	101.3	511.4
19-Sep	0.0	0.0	0.0	0.0	0.0	0.4	34.2	147.7	254.7	396.6	486.2	537.0	566.3	545.0	475.2	364.0	227.0	56.4	6.0	0.0	0.0	0.0	0.0	0.0	170.7	566.3
20-Sep	0.0	0.0	0.0	0.0	0.0	0.0	23.5	103.3	193.6	292.6	369.3	470.4	474.0	440.2	383.2	264.4	133.4	31.2	3.4	0.0	0.0	0.0	0.0	0.0	132.6	474.0
21-Sep	0.0	0.0	0.0	0.0	0.0	0.0	17.4	102.2	220.1	381.2	478.9	532.3	526.6	483.6	451.9	340.0	193.3	43.4	5.5	0.0	0.0	0.0	0.0	0.0	157.3	532.3
22-Sep	0.0	0.0	0.0	0.0	0.0	0.2	23.7	139.1	271.8	392.6	476.5	523.5	555.2	533.4	448.8	354.8	206.5	37.4	5.6	0.0	0.0	0.0	0.0	0.0	165.4	555.2
23-Sep	0.0	0.0	0.0	0.0	0.0	0.2	22.4	124.7	255.6	360.4	361.5	502.1	443.8	443.7	328.3	307.6	184.6	37.2	4.6	0.0	0.0	0.0	0.0	0.0	140.7	502.1
24-Sep	0.0	0.0	0.0	0.0	0.0	0.0	2.4	23.2	95.1	143.8	179.9	226.3	183.1	217.1	120.5	100.3	92.3	23.5	2.4	0.0	0.0	0.0	0.0	0.0	58.7	226.3
25-Sep	0.0	0.0	0.0	0.0	0.0	0.1	19.1	103.7	208.0	285.9	409.2	463.7	478.1	461.1	398.7	318.4	156.5	35.1	2.0	0.0	0.0	0.0	0.0	0.0	139.1	478.1
26-Sep	0.0	0.0	0.0	0.0	0.0	0.0	7.1	55.4	144.9	243.7	395.9	486.7	424.3	213.4	120.5	61.0	33.6	14.3	0.9	0.0	0.0	0.0	0.0	0.0	91.7	486.7
27-Sep	0.0	0.0	0.0	0.0	0.0	0.0	12.1	96.2	211.7	338.6	431.9	479.5	331.0	443.9	367.7	207.8	161.2	31.7	0.8	0.0	0.0	0.0	0.0	0.0	129.8	479.5
28-Sep	0.0	0.0	0.0	0.0	0.0	0.0	4.8	31.1	56.7	71.4	58.4	46.0	72.9	136.9	107.0	58.4	30.1	8.4	0.1	0.0	0.0	0.0	0.0	0.0	28.4	136.9
29-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.7	9.8	33.0	47.6	62.3	132.8	180.4	196.4	120.5	78.1	26.4	10.9	0.0	0.0	0.0	0.0	0.0	0.0	37.4	196.4
30-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.8	8.3	20.8	47.1	71.3	116.5	146.6	187.7	173.6	264.7	130.8	29.7	0.8	0.0	0.0	0.0	0.0	0.0	49.9	264.7
																							Diurnal Average			
																							Diurnal Maximum			





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (W/m2)	Number of Hours	%	Cumulative %
0 - 20	370	51.39	51.39
21 - 100	89	12.36	63.75
101 - 300	113	15.69	79.44
301 - 600	140	19.44	98.89
601 - 900	8	1.11	100.00
> 900	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Maximum Speed: 23 km/h on Sep 23 13:00	Maximum Daily Speed Average: 13.4 km/h on Sep 11	Hours in Service: 720
Minimum Speed Value: 0 km/h on Sep 30 02:00	Minimum Daily Speed Average: 1.1 km/h on Sep 6	Hours of Data: 718
Maximum Diurnal Speed Average: 5.8 km/h at hour 12	Minimum Diurnal Speed Average: 2.1 km/h at hour 23	Hours of Missing Data: 2
Monthly Average Velocity: 3.5 km/h 200.9 deg	Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 4 Median = 6 Q ₃ = 10 P ₉₀ = 13 P ₉₉ = 20	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-Sep	WNW5	NW2	W2	W3	W3	WNW6	W8	W6	WSW6	SSW7	SW9	SW11	SW12	SW12	SW14	SW13	SW15	SW14	SW11	SW7	SW5	WSW5	WNW4	WNW5	WSW7.1	SW15
2-Sep	WNW7	W5	W6	WNW8	WNW8	WNW8	WNW8	WNW10	WNW9	WNW8	S4	SW7	WNW8	WNW10	NW13	NW13	WNW13	WNW10	W4	WSW4	W5	W5	WNW6	W6	WNW7.2	WNW13
3-Sep	WNW6	WSW4	WSW5	SSW3	S5	SSW5	S6	S6	SSE6	S5	S3	S6	WSW4	NW5	NE5	N6	SE3	SSW3	W1	NW8	NW11	NW10	NW11	NW9	W2.4	NW11
4-Sep	WNW5	W5	W6	WSW3	WNW5	NNW13	NNW15	NW10	NW18	NW16	NNW13	NW14	NW13	NW12	NNW11	NNW9	N6	E4	ENE2	SSE1	SW3	S2	S1	SSW5	NW6.3	NW18
5-Sep	S5	S4	S5	S4	S6	S5	S6	S9	S10	S9	SSW11	S13	S11	SSE14	SSE10	SSE9	SSE8	S8	S6	S6	SSE4	SE2	SSE2	S2	S6.8	SSE14
6-Sep	NNW2	NNE3	NE2	ESE3	ESE3	ESE3	ESE4	ESE4	ESE4	ESE3	SSE4	S1	NW2	NW7	SSE0	SSE7	SSE8	SSW6	SW3	SSW4	SW2	WNW3	WNW4	W2	SSE1.1	SSE8
7-Sep	S2	WNW3	SW1	E1	S1	SSW3	SSW3	SW4	SW4	S6	SSE8	SSW7	SSE7	SSE10	SSE8	SSE7	SSE7	SW1	WSW1	NW3	WNW5	WNW3	WNW4	WSW3	SSW2.8	SSE10
8-Sep	SSW3	S3	SSW4	SW3	S3	SSW3	SSW4	S6	S10	S9	S11	SSE11	SSE8	NNE3	N8	NNE6	N5	N6	N6	NW3	WNW3	WNW3	WNW4	WNW4	SSW1.5	S11
9-Sep	WNW3	NW3	W2	SW1	SW4	SSW2	SSW4	S5	SSE7	SSE9	SSE9	SSE8	SSE10	SSE9	SSE9	SSE8	SSE3	ESE2	ESE2	SE2	SSE1	SSE2	SW0	WNW3	SSE3.4	SSE10
10-Sep	NW4	WNW3	WNW3	W2	W2	W3	W3	SSE1	SSE5	SSE10	S9	S10	S13	SSE14	SSE12	SSE13	SSE14	SSE9	SSE7	SSE8	SSE11	SSE9	SSE8	SSE8	S6.3	SSE14
11-Sep	S10	S12	S14	S14	S11	S7	SSE2	SSE5	SSE15	SSE17	SSE17	SSE18	S21	S22	S22	S20	S19	S13	S11	S7	S10	S11	S13	S11	S13.4	S22
12-Sep	S9	SSW7	SSW6	S6	S4	S5	S6	S8	SSE11	SSE12	SSE11	SSE10	SSE11	SSE11	SSE9	S6	SW5	WSW4	WSW4	WSW4	SW5	SSW4	SSW5	SSW5	S6.2	SSE12
13-Sep	SSW5	SSW5	S5	SSW6	S7	S7	SSW5	S7	SSW7	SSW7	SW11	SW11	WSW10	WSW14	W10	WSW13	WSW12	W10	W10	WSW10	W8	SSW6	SW4	WSW6	SW7.1	WSW14
14-Sep	W6	WNW6	WNW7	WNW6	WNW6	WNW7	WNW6	WNW6	NW12	WNW10	WNW11	NW12	NW10	NW15	NNW19	NNW15	NW15	NW12	NW6	WNW5	WNW7	WNW2	SW1	S3	NW8.1	NNW19
15-Sep	SSW4	S4	SSW5	SSW4	S5	S4	SSE4	SSE6	SSE8	SSE10	SSE10	M	SSE15	SSE17	S16	S16	S12	S11	S12	S12	S10	S12	S10	S10	S9.5	SSE17
16-Sep	SSW5	S7	S7	S5	S6	SSW5	SSW4	S4	SSW6	SSW5	SW5	SSE7	SSE10	SSW8	SSW7	WSW7	SW6	S4	S4	SSW6	SSW4	S4	SSW4	SW1	SSW5.1	SSE10
17-Sep	SSW2	SSW4	WSW2	W2	SW3	SW2	WNW2	NW2	NW3	SE3	SSE4	SSE10	S10	S11	SSW10	S8	S9	SW6	SW5	WSW5	SW3	SSW5	SSW3	UO	SSW3.9	S11
18-Sep	S4	SSW5	SSW4	S5	S6	S5	S6	S6	S8	SW8	WSW9	WSW8	WSW9	W11	WSW10	SSW5	SW5	SW6	S7	S9	S6	WSW1	S3	S7	SSW5.4	W11
19-Sep	S6	SW3	S4	S5	SSW6	SSW7	SSW6	S5	SSW7	S9	SSW10	SSW11	SSW10	SW7	SW7	SSW6	S8	S5	S4	SW2	W2	NNW4	NW3	W2	SSW5.1	SSW11
20-Sep	WNW5	WNW5	WNW3	W4	WSW2	W3	SW1	S1	SSW2	SE2	E2	NE3	NNE5	NE6	NE5	NE5	N5	NNW12	NNW5	S2	NNW1	WNW3	S1	SSW3	NNW1.5	NNW12
21-Sep	SSW3	WSW3	SSW2	SW4	SSW3	S5	S6	S8	S10	SSE13	SSE11	SSW17	SSW18	S21	SSW16	SSW16	SSW16	SSW14	S13	S11	S12	S13	S10	S12	S10.5	S21
22-Sep	S12	S11	S9	S8	S5	S6	S7	SSE7	S10	S12	S13	S16	S18	SSW16	S14	S15	S17	S12	S13	S11	S12	S13	S9	S8	S11.3	S18
23-Sep	SSW7	S7	S10	S12	SSE8	SSE6	SSE4	SSE9	S11	S16	SSE18	SSE19	SSE23	SSE23	SSE20	SSE22	SSE18	SSE14	S11	S11	S13	S13	SSE14	SSE15	SSE13.4	SSE23
24-Sep	SSE16	SSE19	S14	S14	S14	S14	S13	S12	S13	S13	S11	SSE12	SW8	WSW6	WSW5	SSW5	S5	S6	S5	SSW4	SSW4	WNW2	WSW1	S2	S8.5	SSE19
25-Sep	SW2	W3	WSW3	SSW4	SSW4	S6	SSW4	S4	SSE3	N2	NNE6	NE5	NE5	NNE5	NNE9	NNE9	NNE8	NNE8	N9	N9	NNW6	NNW7	NNW5	NNW6	N2.7	N9
26-Sep	NNW6	NNW4	NNW6	NNW6	NNW6	NNW4	WNW2	SSW2	S4	S7	S8	SSW10	SSW10	SSW8	SSW6	SW4	SW4	SW2	SSE4	WSW4	W3	WSW2	WNW4	S4	SW2.3	SSW10
27-Sep	S2	SSW3	NW2	S3	SSW2	S1	W2	SW2	SSW3	SSE5	SE6	SSE8	SW7	WSW9	WSW9	WSW7	W7	WNW6	NW6	NNW5	NNW5	NNW5	NW3	NW3	WSW2.3	WSW9
28-Sep	NW4	W1	W1	NW2	S2	W1	N2	N5	NNE7	N11	N11	N12	N10	N12	N12	NNE10	NNE8	N9	N10	N7	N10	N10	N11	NNW11	N7.0	N12
29-Sep	NNW7	NW7	NNW7	NNW6	WNW5	WNW3	WNW2	WNW3	NW5	N7	N8	N11	NNE11	N10	N9	N8	N10	NNE7	NNW7	N7	N7	NNW5	N4	WSW3	NNW6.0	NNE11
30-Sep	WSW1	S0	SSW3	SSW2	SSW2	S2	S1	SSW2	WSW2	S3	S5	S6	SSE7	SSE8	SSE9	SSE11	SSE10	S7	SSE3	SSE2	S3	SSW2	S2	S1	S3.7	SSE11

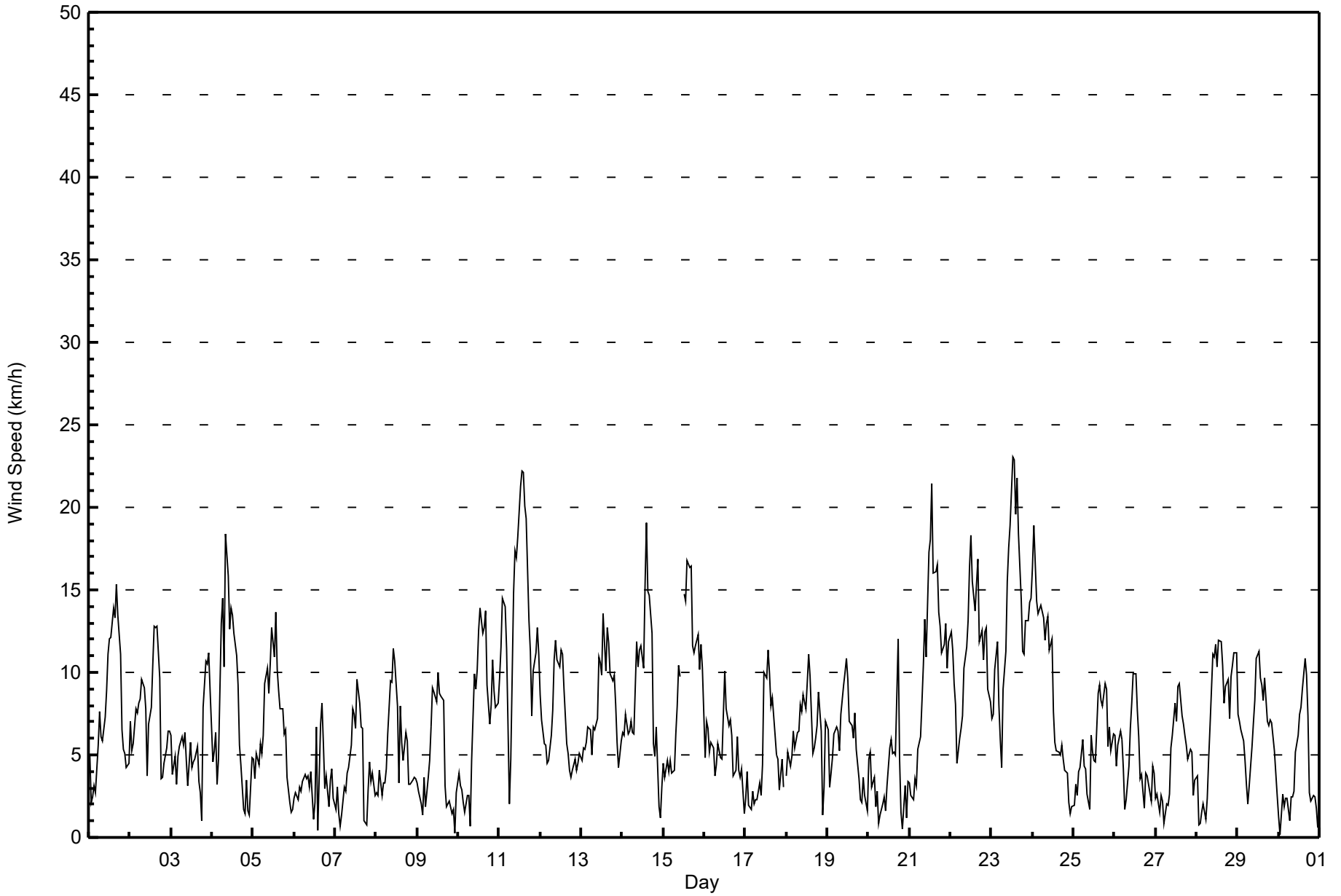
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SSE16	SSE19	S14	S14	S14	S14	NNW15	S12	NW18	SSE17	SSE18	SSE19	SSE23	SSE23	S22	SSE22	S19	SSE14	S13	S12	S13	S13	SSE14	SSE15	Diurnal Maximum

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
Fort McKay - Bertha Ganter - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	314	43.73	43.73
6 - 11	292	40.67	84.40
12 - 19	103	14.35	98.75
20 - 28	9	1.25	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 718

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Fort McKay - Bertha Ganter - September 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	4	7	1	3	9	5	21	61	55	31	25	25	34	16	11	314
6 - 11	25	11	1	0	0	0	1	54	81	29	15	13	12	25	10	15	292
12 - 19	3	0	0	0	0	0	0	23	42	7	6	3	0	1	12	6	103
20 - 28	0	0	0	0	0	0	0	4	5	0	0	0	0	0	0	0	9
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	34	15	8	1	3	9	6	102	189	91	52	41	37	60	38	32	718

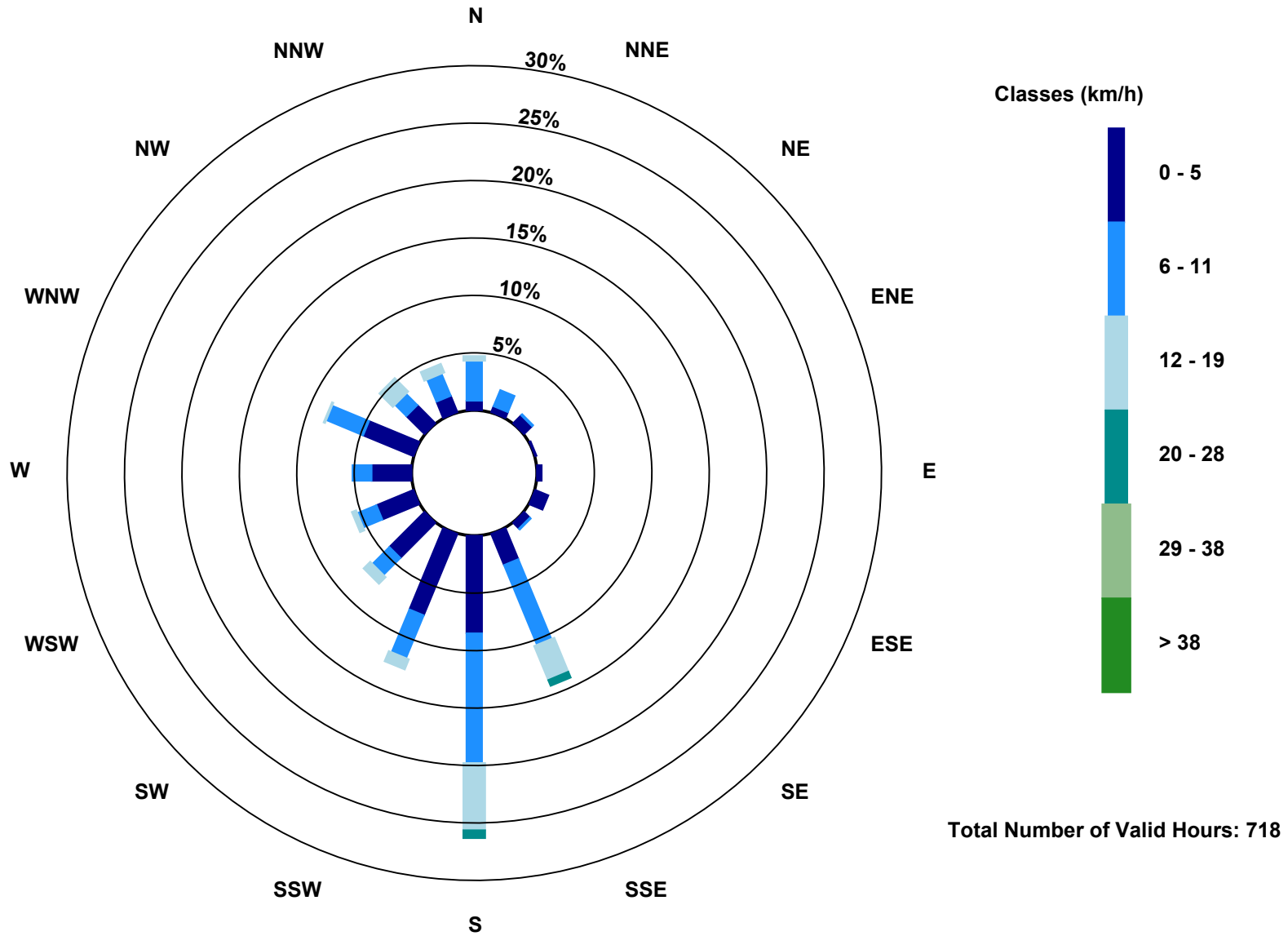
Total Number of Valid Hours: 718

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 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 - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 7 km/h on Sep 21 12:00	Hours of Data: 718
Minimum Value: 0 km/h on Sep 19 19:00	Hours of Missing Data: 2
Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 3 P ₉₀ = 4 P ₉₉ = 6	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-Sep	2	1	1	2	2	2	3	3	3	3	4	4	5	5	6	6	6	6	5	3	2	2	1	2	6
2-Sep	3	2	2	2	2	2	3	3	3	3	3	2	4	4	4	4	4	5	1	2	2	2	2	2	5
3-Sep	2	2	2	2	1	1	1	2	3	2	3	3	3	2	2	2	1	2	1	4	2	3	4	2	4
4-Sep	2	2	2	2	3	3	4	3	5	5	4	4	4	4	4	4	2	1	1	2	1	1	1	1	5
5-Sep	1	2	1	2	1	1	2	3	2	3	3	4	3	3	3	3	3	2	1	1	1	1	1	2	4
6-Sep	1	1	1	2	1	2	1	1	1	1	2	1	2	2	2	1	2	2	2	1	1	2	1	1	2
7-Sep	1	2	1	1	1	2	1	2	2	2	2	2	3	3	2	2	2	2	1	2	1	1	1	1	3
8-Sep	1	1	1	1	1	2	1	1	2	3	3	3	3	2	2	1	1	1	1	1	1	1	1	1	3
9-Sep	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
10-Sep	1	1	1	1	1	2	1	1	2	2	2	2	3	3	3	3	3	3	2	2	2	2	2	2	3
11-Sep	2	3	3	3	3	2	2	5	3	3	3	4	6	6	6	6	5	4	3	1	2	2	2	2	6
12-Sep	2	2	1	1	1	2	1	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1	1	1	2
13-Sep	1	1	1	1	1	1	2	1	2	3	4	4	4	6	5	6	5	5	5	4	4	2	2	3	6
14-Sep	3	3	2	2	2	2	2	3	4	3	4	4	3	6	4	4	4	3	1	1	2	1	1	1	6
15-Sep	1	1	1	1	1	1	1	2	2	2	2	M	3	3	4	4	4	3	2	2	2	2	3	3	4
16-Sep	1	3	2	1	2	2	2	2	2	2	2	2	3	4	3	3	3	1	1	2	1	1	1	2	4
17-Sep	2	1	2	2	1	1	2	2	1	1	2	3	2	4	4	3	3	3	1	2	2	1	2	UO	4
18-Sep	2	1	1	1	1	2	1	2	2	3	4	3	5	6	6	2	4	2	1	2	1	2	2	1	6
19-Sep	2	1	1	2	2	1	1	2	2	2	3	4	4	3	3	3	2	1	0	2	2	2	3	2	4
20-Sep	1	1	1	1	2	1	1	1	1	1	1	2	2	2	2	2	1	6	4	2	2	2	1	1	6
21-Sep	1	1	1	1	1	2	2	2	2	3	2	7	6	7	6	6	5	4	3	3	2	3	2	2	7
22-Sep	2	2	1	2	1	1	1	2	2	3	4	5	5	5	4	5	4	3	3	2	2	3	2	2	5
23-Sep	1	2	2	2	2	1	2	2	3	4	4	4	5	5	5	5	4	4	3	2	3	3	4	3	5
24-Sep	4	4	4	4	3	3	3	3	3	3	3	3	3	3	3	2	1	1	1	1	2	1	1	2	4
25-Sep	1	1	1	1	1	2	2	2	2	1	3	2	2	2	2	2	2	2	2	2	1	1	1	2	3
26-Sep	2	2	2	2	2	2	1	1	2	2	3	3	4	2	2	2	1	3	4	2	1	1	2	1	4
27-Sep	1	1	1	1	1	1	1	1	2	1	1	2	3	4	4	3	3	3	1	2	1	1	1	2	4
28-Sep	1	2	1	1	1	1	1	1	2	2	2	3	3	2	3	3	2	2	2	2	2	2	2	2	3
29-Sep	1	1	1	1	1	1	1	1	1	2	2	2	3	3	2	2	2	1	1	2	2	1	1	1	3
30-Sep	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	2	2	3	1	1	1	1	1	1	3

4	4	4	4	3	3	4	5	5	5	4	7	6	7	6	6	6	6	6	5	4	4	3	4	3	
Diurnal Maximum																									

M - Maintenance UO - Unstable Operation



Wood Buffalo Environmental Association
Summary of Hour Averages

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

Direction of Maximum Speed: 159 deg on Sep 23 13:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 172.3 deg on Sep 11	Hours of Data: 718
Direction of Minimum Speed: 186 deg on Sep 30 02:00	Hours of Missing Data: 2
Direction of Minimum Daily Speed Average: 1.1 deg on Sep 6	Percent Operational Time: 99.7
Monthly Average Direction: 200.9 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-Sep	303	304	270	278	269	283	278	271	237	212	225	226	231	232	227	231	221	235	231	233	228	249	284	290	240.8
2-Sep	290	277	278	294	297	300	299	296	292	294	186	226	290	299	304	304	294	294	273	256	276	281	284	280	288.8
3-Sep	282	246	245	192	184	193	183	186	161	179	174	180	251	316	36	357	144	209	261	305	312	315	317	305	261.1
4-Sep	292	275	268	237	286	332	330	324	325	324	331	323	323	326	337	330	9	90	77	160	222	186	169	197	320.4
5-Sep	184	188	190	184	183	185	176	174	180	181	202	178	180	154	158	167	166	174	175	185	160	144	164	187	175.9
6-Sep	332	20	53	110	116	102	115	118	113	116	165	191	313	323	158	150	160	197	227	207	221	286	287	263	161.6
7-Sep	179	286	230	89	174	209	207	217	216	173	165	203	165	166	168	148	150	221	251	305	295	285	287	238	192.8
8-Sep	199	178	200	218	191	205	195	177	176	185	170	163	156	15	8	15	6	358	355	316	297	284	283	296	196.7
9-Sep	299	309	261	228	232	208	192	169	153	160	159	151	149	153	152	152	156	123	119	136	167	160	231	295	163.9
10-Sep	306	300	292	279	266	261	259	166	150	166	178	175	173	163	164	153	162	163	158	160	166	162	168	162	170.1
11-Sep	171	176	175	173	174	177	163	152	163	163	165	165	171	177	173	176	173	184	177	171	180	175	177	174	172.3
12-Sep	180	197	202	187	177	173	185	177	165	162	157	160	162	161	160	185	230	254	250	251	229	200	193	194	181.0
13-Sep	203	199	190	193	182	183	199	177	197	210	227	234	239	237	261	252	242	262	269	256	260	211	224	255	230.0
14-Sep	265	288	292	295	297	300	294	299	306	300	303	311	310	316	332	330	318	320	307	283	294	303	220	191	306.9
15-Sep	211	184	195	196	183	176	168	163	168	158	154	M	160	161	168	176	179	180	176	174	171	176	173	177	172.3
16-Sep	203	183	185	182	172	192	201	191	207	195	227	155	167	200	195	241	234	189	191	201	195	172	200	235	194.1
17-Sep	213	197	242	268	236	232	285	323	323	138	163	167	172	186	194	183	186	230	222	257	236	203	198	UO	200.3
18-Sep	180	194	193	190	178	185	180	177	186	216	252	254	255	260	258	204	216	217	172	177	185	252	177	174	208.5
19-Sep	189	235	189	188	197	200	199	187	202	190	196	195	206	217	221	193	182	185	181	226	278	335	313	277	201.7
20-Sep	289	289	298	265	255	273	225	183	213	130	89	53	32	35	56	34	7	332	328	184	348	294	188	203	335.9
21-Sep	199	254	208	222	208	178	178	179	171	164	163	195	195	188	203	200	195	197	183	180	178	177	180	176	187.1
22-Sep	174	174	180	183	190	179	177	164	172	171	179	187	183	194	187	188	179	180	180	175	172	170	179	184	179.7
23-Sep	192	191	171	173	168	155	151	168	171	172	164	160	159	165	162	162	166	168	176	172	172	170	166	159	166.9
24-Sep	163	165	172	179	174	174	171	175	175	176	177	166	223	242	243	194	185	185	181	192	199	288	258	187	179.8
25-Sep	226	274	245	195	194	184	199	178	166	349	31	43	39	18	15	19	28	20	6	6	343	345	345	345	7.2
26-Sep	341	338	330	342	328	331	297	198	172	174	178	196	199	195	200	215	217	229	149	240	276	248	299	183	226.9
27-Sep	191	205	305	177	194	191	264	222	194	148	143	161	223	249	251	248	277	302	325	344	343	331	310	315	250.9
28-Sep	310	269	273	324	174	281	4	6	20	9	8	2	354	355	5	16	16	356	355	350	352	350	354	346	358.1
29-Sep	341	326	339	327	293	287	301	297	304	355	354	356	12	8	359	4	11	12	346	358	6	345	351	251	348.6
30-Sep	254	186	193	209	213	187	182	201	246	179	178	177	164	155	158	165	168	174	164	167	180	193	186	169	174.7

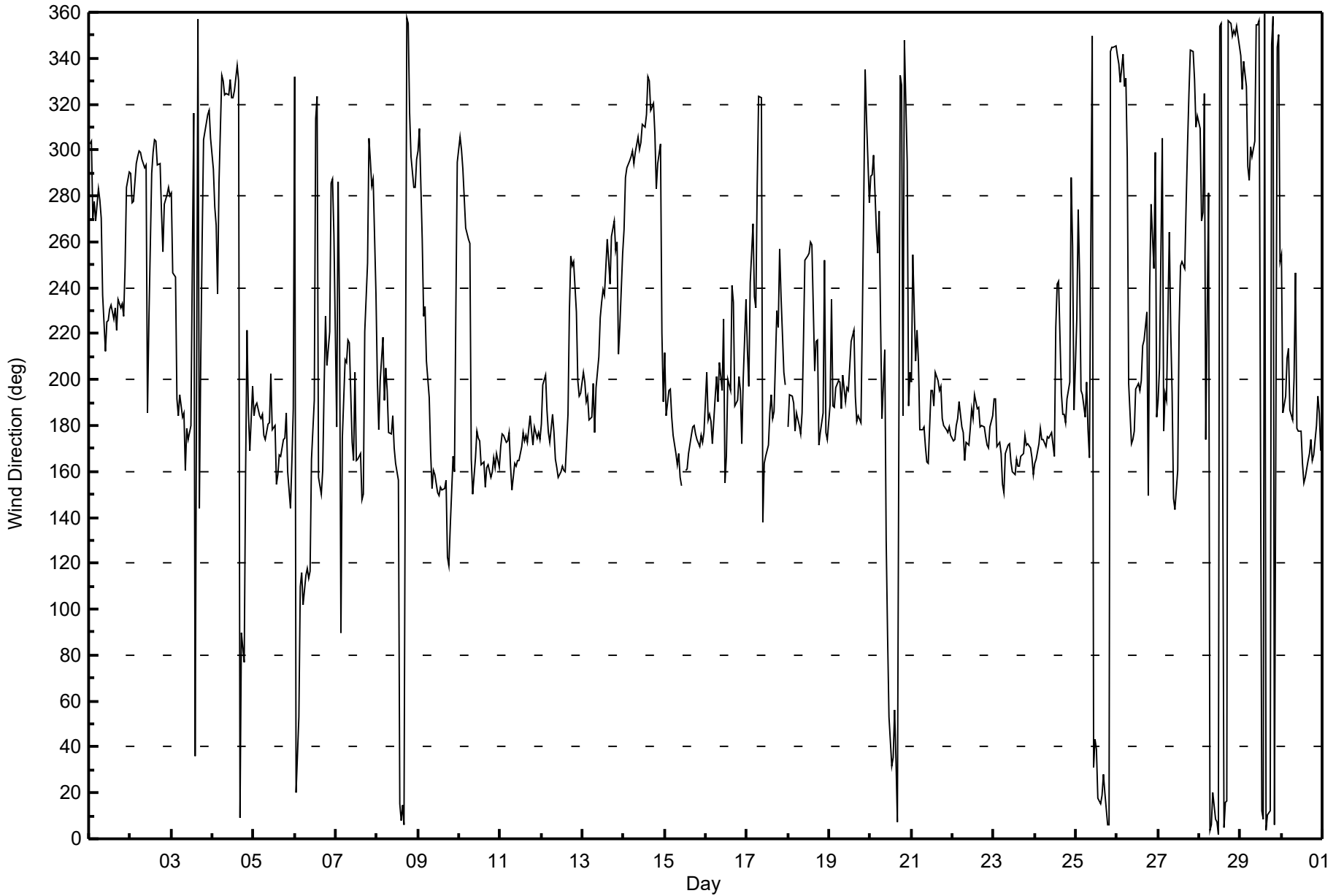
220.3 216.1 212.4 204.6 201.5 208.1 209.9 192.6 191.6 181.1 182.8 187.2 191.4 201.5 201.8 195.2 194.8 216.4 206.3 212.3 218.0 218.5 219.2 210.5

Diurnal Average

M - Maintenance

UO - Unstable Operation

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





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg

Fort McKay - Bertha Ganter - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 99 deg on Sep 20 21:00	Hours of Data: 718
Minimum Value: 8 deg on Sep 30 21:00	Hours of Missing Data: 2
Percentiles: P ₁ = 10 P ₁₀ = 13 Q ₁ = 15 Median = 23 Q ₃ = 42 P ₉₀ = 58 P ₉₉ = 86	Hours of Calibration: 0
	Percent Operational Time: 99.7

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Sep	25	32	41	45	83	42	40	52	46	40	46	42	47	46	42	48	38	44	39	43	40	59	42	50	83
2-Sep	37	38	40	24	22	17	18	21	29	26	74	42	49	30	28	23	26	25	33	50	52	44	36	36	74
3-Sep	40	63	53	61	22	19	13	37	34	62	92	32	59	54	47	24	33	41	32	13	9	15	17	15	92
4-Sep	31	40	45	58	45	13	14	17	17	23	17	18	27	26	34	39	40	29	38	71	21	53	74	11	74
5-Sep	12	21	21	20	18	25	17	17	20	29	31	27	33	16	21	25	29	17	17	29	35	68	80	80	
6-Sep	64	33	38	29	26	40	19	27	20	31	31	86	78	17	91	20	13	45	44	17	40	35	28	65	91
7-Sep	60	74	79	77	77	58	68	51	58	45	36	39	37	42	17	17	16	70	85	28	11	23	13	44	85
8-Sep	31	30	24	58	43	32	15	16	17	23	22	22	32	69	11	16	17	12	12	16	14	29	18	21	69
9-Sep	20	18	52	63	19	63	17	14	14	13	18	19	16	21	18	11	22	44	38	18	61	33	77	20	77
10-Sep	8	9	10	18	22	30	12	66	23	16	25	19	18	17	16	16	15	15	14	14	14	12	13	11	66
11-Sep	12	13	13	13	14	15	69	61	13	13	14	15	17	18	16	17	15	17	14	10	13	13	13	12	69
12-Sep	13	17	14	14	26	20	15	15	14	13	14	13	12	14	13	46	42	47	46	42	40	39	14	21	47
13-Sep	23	16	13	14	16	13	21	15	33	34	40	49	47	44	52	51	48	52	45	48	47	26	49	50	52
14-Sep	48	33	26	22	21	24	24	26	19	22	24	26	32	25	18	19	19	14	17	17	18	75	81	38	81
15-Sep	19	33	18	23	12	12	16	18	21	16	16	M	15	14	17	18	17	16	13	13	11	12	12	14	33
16-Sep	26	41	16	14	26	16	29	22	32	34	43	29	29	40	45	51	42	21	16	25	23	12	15	80	80
17-Sep	58	13	58	39	36	47	61	42	35	63	33	21	19	30	32	38	23	44	29	47	56	23	36	UO	63
18-Sep	53	15	13	17	15	23	17	15	18	38	54	51	53	47	54	40	50	43	13	14	15	92	60	16	92
19-Sep	15	46	29	27	18	14	17	16	24	28	30	29	42	51	45	48	18	15	16	47	69	45	57	77	77
20-Sep	14	14	19	13	56	27	69	53	59	48	67	56	48	35	42	28	20	14	86	97	99	40	57	28	99
21-Sep	25	30	45	22	19	21	17	16	16	14	16	27	25	20	29	24	22	22	14	14	12	13	12	12	45
22-Sep	11	10	11	15	11	9	12	14	15	19	22	21	20	23	24	23	17	14	14	12	12	11	16	14	24
23-Sep	15	15	11	11	14	14	22	14	15	16	14	14	15	14	15	15	14	13	15	13	14	15	14	14	22
24-Sep	15	14	16	18	14	14	14	14	15	16	16	17	39	58	52	27	22	13	17	13	27	55	62	66	66
25-Sep	55	53	60	24	24	14	28	29	67	80	35	49	44	41	23	19	19	13	13	16	23	14	17	19	80
26-Sep	21	24	35	32	18	31	53	37	21	22	41	31	32	30	24	46	40	84	68	57	48	58	43	32	84
27-Sep	59	60	65	47	37	78	67	67	80	17	24	33	47	46	46	53	42	43	20	16	14	15	57	51	80
28-Sep	30	81	77	81	60	87	54	13	19	17	20	17	28	16	16	15	17	16	15	14	14	13	13	10	87
29-Sep	10	12	10	18	17	32	40	25	21	20	16	17	17	21	18	18	15	14	12	15	12	15	25	26	40
30-Sep	42	98	32	45	40	26	91	70	59	27	14	15	16	16	13	14	13	13	9	12	8	27	52	82	98

64	98	79	81	83	87	91	70	80	80	80	92	86	78	69	91	53	50	84	86	97	99	92	81	82	
Diurnal Maximum																									

M - Maintenance UO - Unstable Operation



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS02 MILDRED LAKE SEPTEMBER 2023

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

October 30, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MILDRED LAKE (AMS02)
 SEPTEMBER 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	682	36	38	99.72	32.8	0	8.6	0
H2S (ppb) Average	680	40	40	100	9	0	1	0
THC (ppm) Average	682	36	38	99.72	3.8	-	2.5	-
NMHC(ppm) Average	682	36	38	99.72	0.666	-	0.253	-
CH4(ppm) Average	682	36	38	99.72	3.5	-	2.4	-
Temperature (C) Average	720	0	0	100	26.5	-	21	-
Relative Humidity (%) Average	720	0	0	100	99.2	-	90.6	-
Wind Speed 10 m (km/h) Average	716	0	4	99.44	25	-	17	-
Wind Direction 10 m (deg) Average	716	0	4	99.44	-	-	-	-

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

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

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	682	1.6	4	-	0	0	0.1	0.3	0.8	4	32.8
H2S (ppb) Average	680	0.47	0.6	-	0	0.1	0.2	0.3	0.5	1	9
THC (ppm) Average	682	2.24	0.3	-	2	2	2.1	2.2	2.3	2.6	3.8
NMHC(ppm) Average	682	0.068	0.085	-	0	0	0	0	0.1	0.2	0.666
CH4(ppm) Average	682	2.17	0.2	-	2	2	2	2.1	2.2	2.4	3.5
Temperature 2 m (C) Average	720	14.15	5.3	-	3.2	7.4	9.5	13.8	18.1	21.3	26.5
Relative Humidity (%) Average	720	64.85	18.8	-	24.2	39.2	50.6	65.4	79.2	90.7	99.2
Wind Speed 10 m (km/h) Average	716	9.1	5	-	0	4	6	8	12	16	25
Wind Direction 10 m (deg) Average	716	-	-	-	-	-	-	-	-	-	-

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

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2, THC/NMHC/CH4	20 Sep 2023 16:00	20 Sep 2023 17:00	2	Maintenance - sample manifold cleaned
Wind Speed, Wind Direction	09 Sep 2023 02:00	09 Sep 2023 03:00	2	Flat line in sensor output signal
Wind Speed, Wind Direction	09 Sep 2023 05:00	09 Sep 2023 05:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	30 Sep 2023 02:00	30 Sep 2023 02:00	1	Flat line in sensor output signal



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb

Mildred Lake - September 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 32.8 ppb on Sep 18 13:00	Maximum Daily Average: 8.6 ppb on Sep 2		Hours of Data:	682
Minimum Value: 0.0 ppb on Sep 4 11:00	Minimum Daily Average: 0.1 ppb on Sep 29		Hours of Missing Data:	38
Maximum Diurnal Average: 3.0 ppb at hour 13	Minimum Diurnal Average: 0.7 ppb at hour 7		Hours of Calibration:	36
Monthly Average: 1.60 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.3 Q ₃ = 0.8 P ₉₀ = 4.0 P ₉₉ = 19.9		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-Sep	0.3	Z	0.2	0.1	1.3	1.4	2.3	1.8	6.0	9.7	3.6	2.7	0.2	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.1	0.2	5.0	1.6	9.7
2-Sep	17.9	1.2	Z	1.2	0.4	0.5	0.5	0.4	0.4	0.6	24.7	16.5	23.1	27.6	16.3	15.4	15.2	0.7	1.9	1.4	3.8	8.3	9.8	10.2	8.6	27.6
3-Sep	4.0	6.0	0.9	Z	0.5	0.3	0.3	1.2	0.6	1.3	0.8	1.2	5.3	0.8	0.5	0.6	0.7	0.6	0.6	2.0	0.3	0.2	0.1	0.1	1.3	6.0
4-Sep	0.0	0.1	1.8	0.8	Z	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.0	0.1	0.2	1.8
5-Sep	0.1	0.0	0.0	0.0	0.1	Z	0.0	0.1	0.1	0.1	0.8	1.6	0.1	0.0	0.4	0.3	0.1	0.3	0.4	0.4	0.2	0.2	0.1	0.1	0.3	1.6
6-Sep	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.5	1.0	0.3	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.8	0.8	0.3	0.3	0.1	0.1	0.1	0.2	1.0
7-Sep	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.2	0.9	0.5	0.5	1.0	3.6	2.4	0.2	0.1	0.1	0.1	0.2	0.0	0.5	3.6
8-Sep	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.2	0.1	0.2	0.2	0.1	0.7	7.3	0.5	0.4	0.4	0.5	0.4	0.2	0.0	0.3	0.2	0.1	0.5	7.3
9-Sep	0.3	0.4	0.4	Z	0.4	0.6	0.4	0.2	0.5	0.2	0.3	0.6	0.9	0.8	0.4	1.4	9.5	5.8	2.8	0.8	1.4	0.3	8.9	16.6	2.3	16.6
10-Sep	5.2	12.5	2.3	0.6	Z	0.5	0.9	0.5	4.5	1.5	2.3	8.7	4.5	0.6	0.7	0.8	0.7	1.2	1.2	1.1	1.1	0.7	0.4	0.6	2.3	12.5
11-Sep	0.7	0.6	0.5	0.7	0.4	Z	0.3	0.4	0.5	0.5	0.6	0.6	0.4	0.3	0.3	0.3	0.2	0.2	0.2	5.4	6.4	4.3	6.1	1.8	1.4	6.4
12-Sep	Z	1.7	5.2	13.4	1.0	0.6	1.3	0.3	0.3	0.2	3.4	0.7	0.4	0.2	0.1	0.1	0.0	0.2	0.2	0.1	0.1	0.1	0.2	0.2	1.3	13.4
13-Sep	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.4	0.1	0.5	2.0	9.9	11.7	24.6	11.6	13.8	9.8	12.2	0.6	0.4	15.2	24.6
14-Sep	1.9	0.5	Z	0.4	0.3	0.2	0.1	0.2	0.2	0.1	0.1	0.2	0.3	0.3	0.3	0.2	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.1	0.3	1.9
15-Sep	0.1	0.0	0.0	Z	0.6	2.4	0.9	3.9	0.5	0.9	0.8	0.6	0.5	0.3	0.1	0.3	0.2	0.3	0.4	0.4	0.4	0.3	0.4	0.3	0.6	3.9
16-Sep	15.2	19.1	1.4	0.6	Z	0.3	0.2	0.3	0.5	4.0	6.4	1.4	3.8	0.3	2.3	9.2	0.6	0.2	0.1	0.2	0.0	0.1	0.0	0.0	2.9	19.1
17-Sep	0.7	0.5	0.1	0.0	0.0	Z	0.3	0.6	4.5	30.1	9.2	1.6	1.0	0.8	1.0	0.8	0.7	0.4	0.3	0.4	0.3	0.3	0.2	0.2	2.3	30.1
18-Sep	Z	0.1	0.1	0.2	0.1	0.2	0.2	0.4	0.2	5.5	17.8	12.5	32.8	27.2	11.8	0.6	0.3	0.3	0.1	0.1	0.1	0.2	0.2	0.8	4.9	32.8
19-Sep	0.4	Z	0.3	0.2	0.2	0.2	0.2	0.4	0.2	0.2	0.2	0.3	0.4	0.2	0.2	0.0	0.7	0.1	0.1	0.1	0.9	0.5	0.2	0.2	0.3	0.9
20-Sep	0.1	0.3	Z	0.2	0.2	0.2	0.5	0.5	0.7	0.6	0.2	0.2	0.2	0.3	0.2	M	M	0.0	0.0	0.0	0.0	1.3	0.3	0.2	0.3	1.3
21-Sep	0.2	0.1	0.2	Z	0.2	0.1	0.3	0.4	3.4	6.1	1.2	0.2	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.2	0.2	0.6	6.1
22-Sep	0.2	0.2	0.6	2.1	Z	10.4	5.7	4.4	1.0	0.5	0.2	0.2	0.0	0.0	0.3	0.0	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.3	1.2	10.4
23-Sep	0.5	0.5	1.8	1.4	2.1	Z	2.4	1.9	4.2	2.1	1.1	0.9	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.5	0.6	0.5	2.4	2.0	1.1	4.2
24-Sep	Z	1.1	0.2	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.3	0.4	0.1	0.1	0.2	0.2	0.1	0.2	0.7	0.7	0.3	0.3	1.1
25-Sep	0.4	Z	0.3	0.2	0.3	0.2	0.7	0.4	1.9	1.4	C	C	C	C	C	C	4.3	1.8	1.2	0.8	0.7	0.7	0.5	0.3	--	4.3
26-Sep	0.5	0.6	Z	18.0	18.6	9.4	1.4	1.2	17.7	5.5	0.7	0.6	0.6	0.5	0.5	0.4	0.4	1.4	0.6	7.6	5.2	1.1	0.5	0.4	4.1	18.6
27-Sep	0.2	0.1	0.2	Z	0.0	0.0	0.2	0.1	1.0	1.2	2.1	3.5	8.3	4.0	14.2	2.0	3.1	0.4	1.1	0.5	0.4	0.3	0.2	0.2	1.9	14.2
28-Sep	0.2	0.3	0.4	0.5	Z	0.3	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.5
29-Sep	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.0	0.2	0.1	0.1	0.2	0.1	0.2
30-Sep	Z	0.3	0.6	0.4	0.3	0.2	0.2	0.2	0.1	0.0	0.0	0.2	0.1	0.0	0.1	4.0	1.0	0.0	0.0	0.0	0.2	2.6	2.7	1.1	0.6	4.0

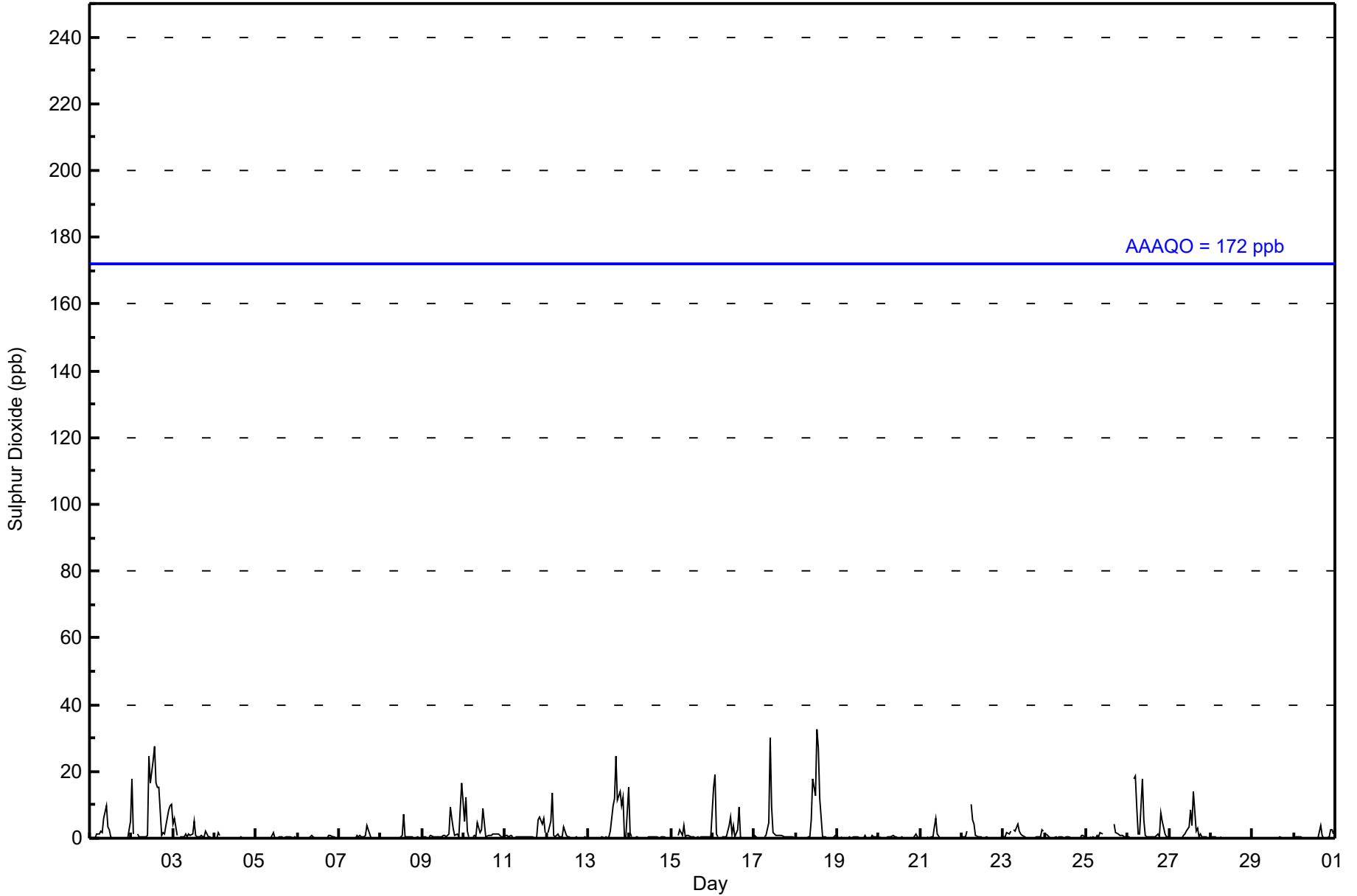
2.0	1.9	0.7	1.6	1.1	1.1	0.7	0.7	1.7	2.5	2.7	1.9	3.0	2.6	2.1	1.8	2.3	1.0	0.9	1.1	1.2	0.8	1.2	1.9	Diurnal Average	
17.9	19.1	5.2	18.0	18.6	10.4	5.7	4.4	17.7	30.1	24.7	16.5	32.8	27.6	16.3	15.4	24.6	11.6	13.8	9.8	12.2	8.3	9.8	16.6	Diurnal Maximum	

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
Mildred Lake - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	653	95.75	95.75
11 - 20	22	3.23	98.97
21 - 60	7	1.03	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 682

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Mildred Lake - September 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	4	6	15	12	74	121	93	63	70	31	24	33	22	26	649
11 - 20	0	0	0	0	0	2	6	0	0	0	0	6	7	1	0	0	22
21 - 60	0	0	0	0	0	1	0	0	0	0	0	2	4	0	0	0	7
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	45	10	4	6	15	15	80	121	93	63	70	39	35	34	22	26	678

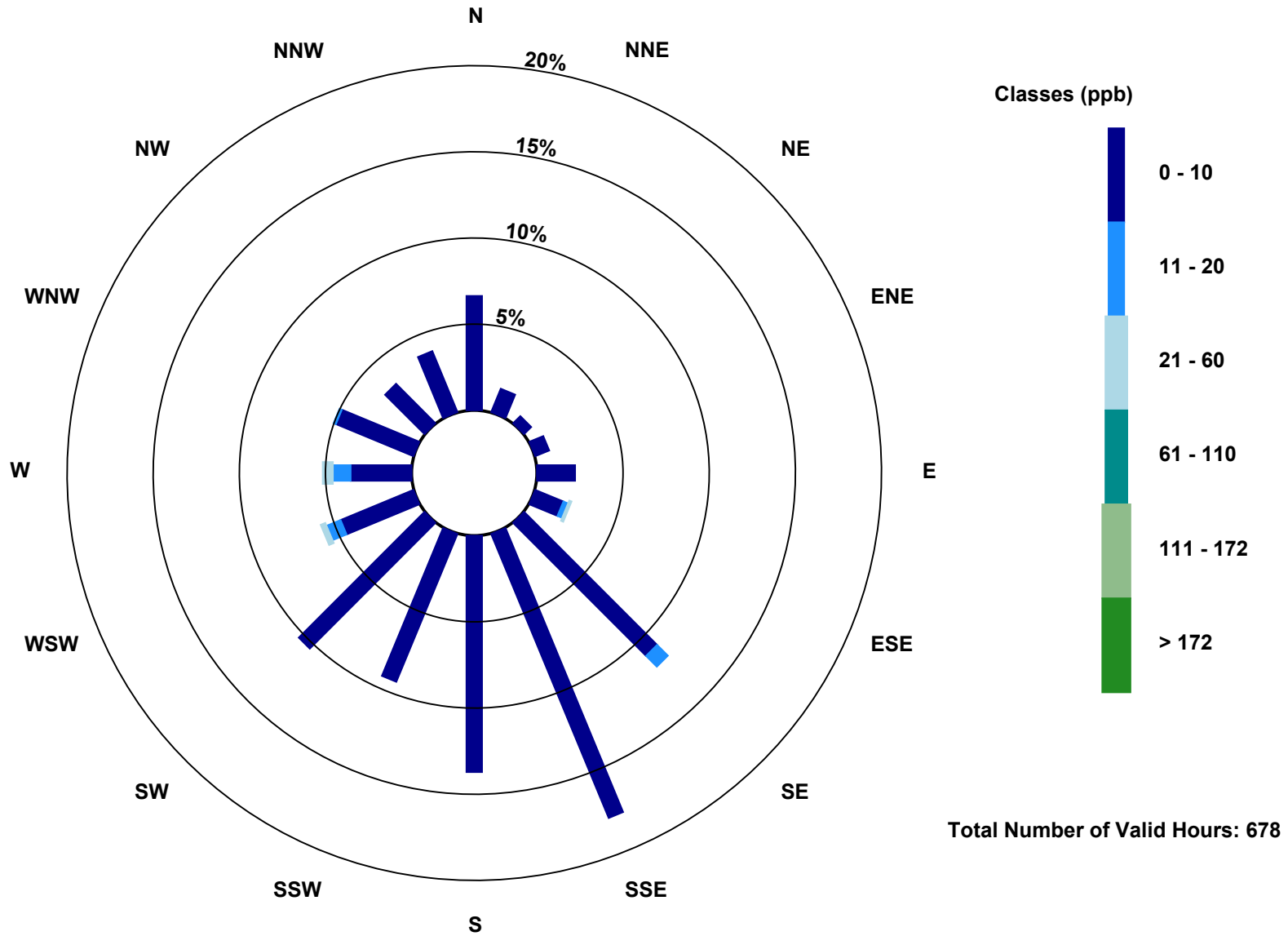
Total Number of Valid Hours: 678

Total Number of Hours: 720

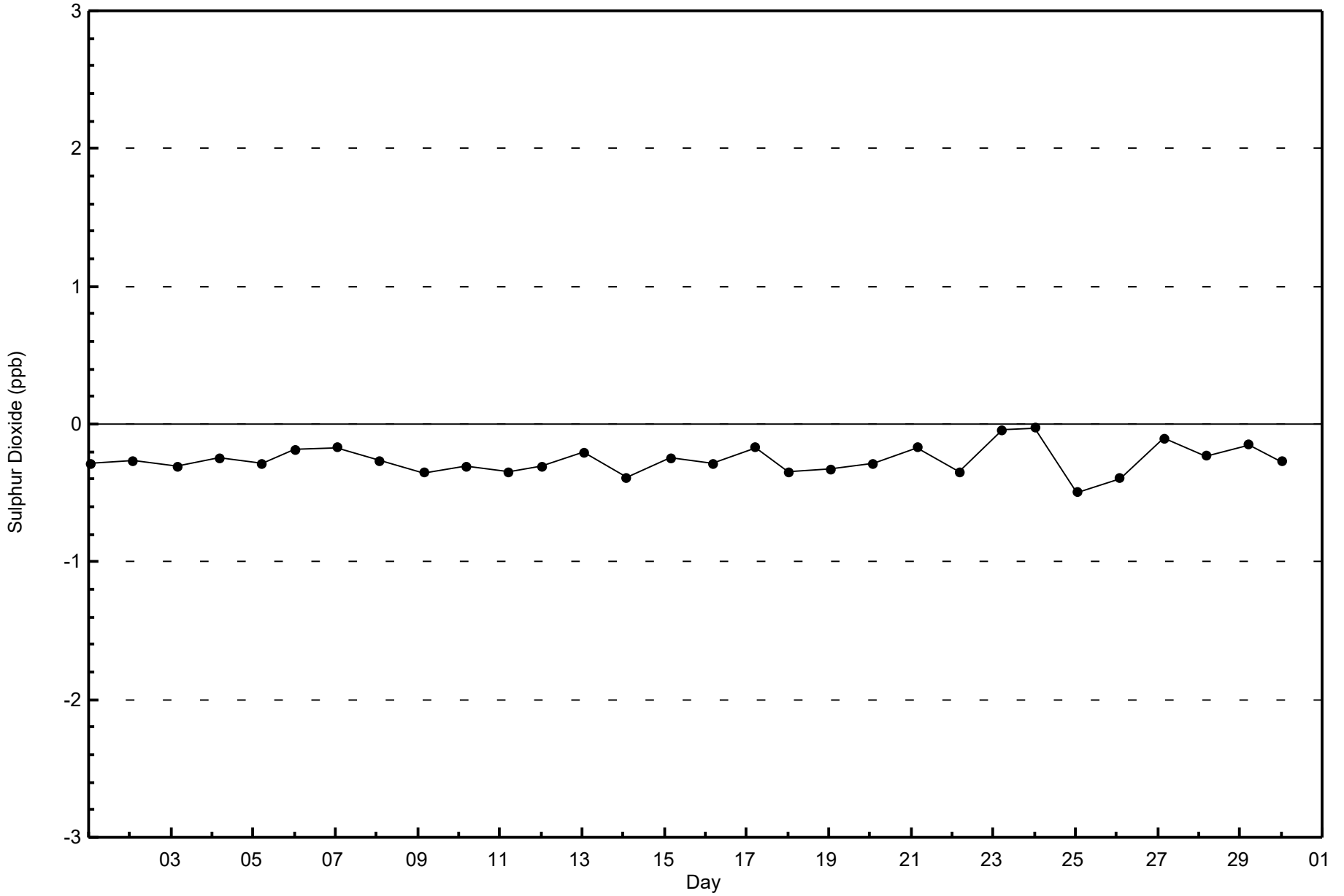


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Sulphur Dioxide (SO₂) - ppb
Mildred Lake



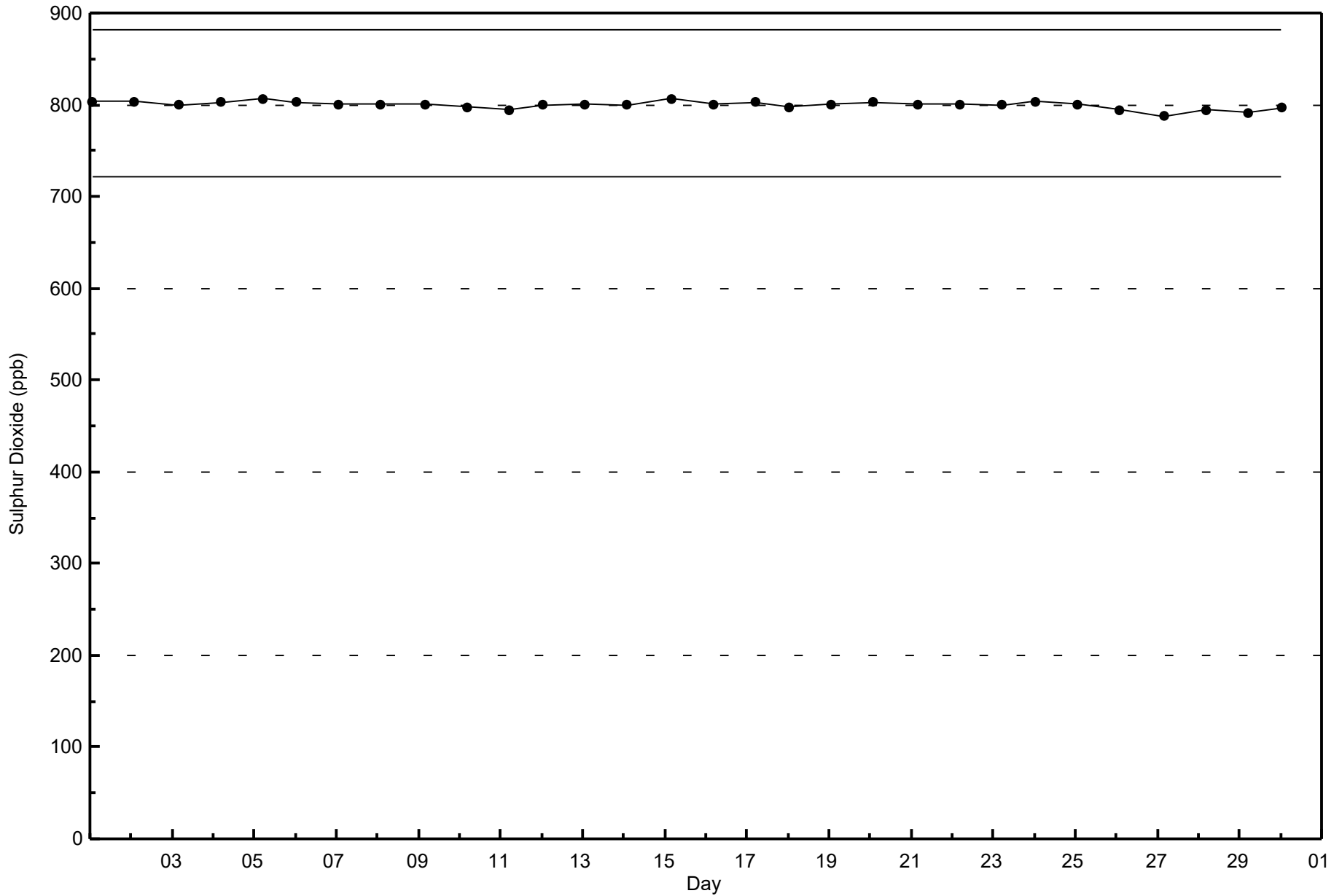
Total Number of Valid Hours: 678





Wood Buffalo Environmental Association
Span Responses

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





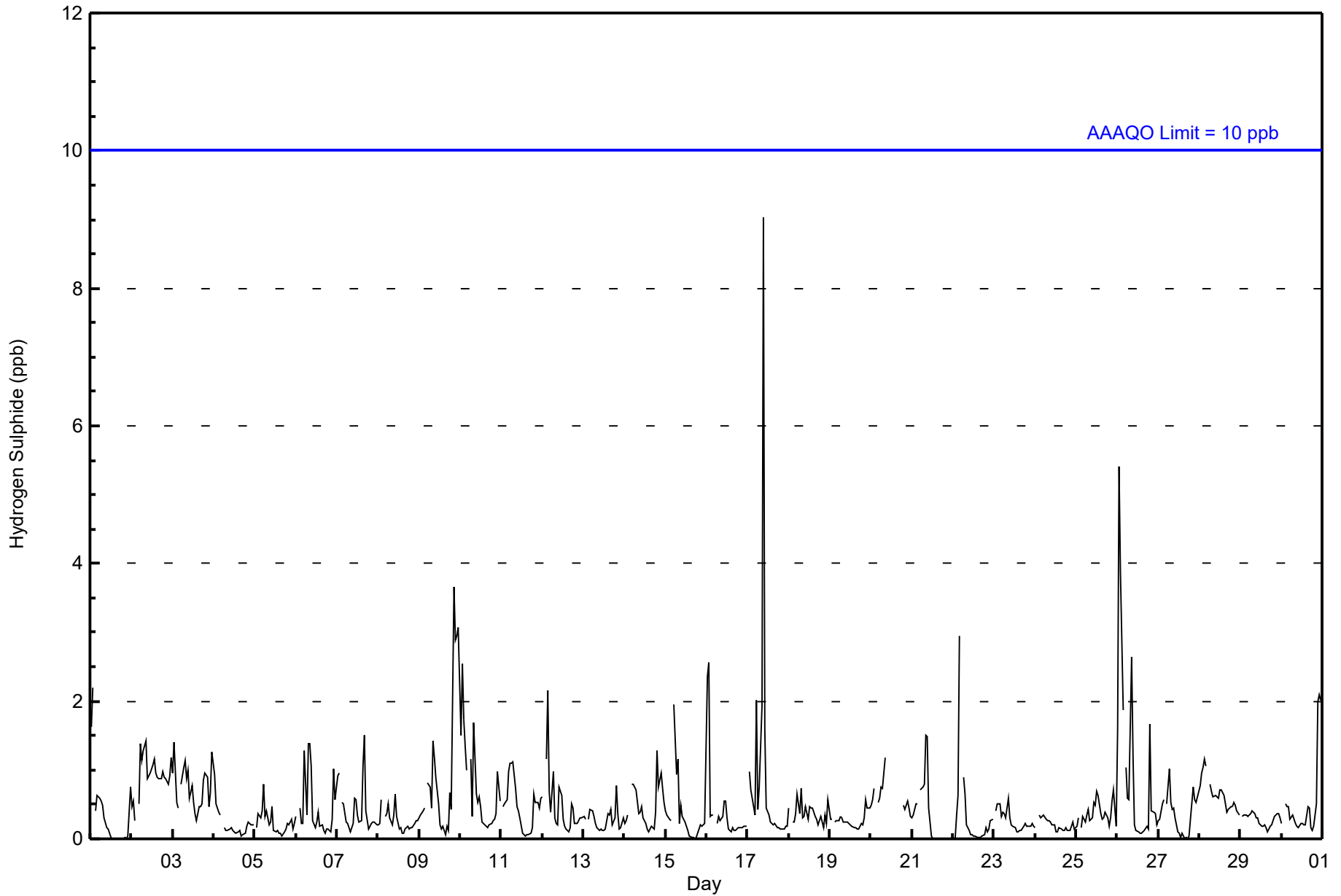
Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H₂S) - ppb

Mildred Lake - September 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		720																		
Maximum Value: 9.0 ppb on Sep 17 10:00		Maximum Daily Average: 1.0 ppb on Sep 26		Hours of Data:		680																				
Minimum Value: 0.0 ppb on Sep 1 14:00		Minimum Daily Average: 0.2 ppb on Sep 24		Hours of Missing Data:		40																				
Maximum Diurnal Average: 0.9 ppb at hour 2		Minimum Diurnal Average: 0.2 ppb at hour 18		Hours of Calibration:		40																				
Monthly Average: 0.47 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.2 Median = 0.3 Q ₃ = 0.5 P ₉₀ = 1.0 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-Sep	1.6	2.2	Z	0.4	0.6	0.6	0.5	0.5	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7	0.3	2.2	
2-Sep	0.5	0.6	0.3	Z	0.5	1.4	1.1	1.3	1.4	0.9	0.9	1.0	1.1	1.2	0.9	0.9	0.9	0.9	1.0	0.9	0.9	0.8	0.9	1.2	0.9	1.4
3-Sep	1.0	1.4	0.5	0.5	Z	0.8	1.0	1.1	0.9	1.0	0.6	0.8	0.5	0.4	0.3	0.5	0.5	0.5	0.9	1.0	0.9	0.5	0.7	1.3	0.7	1.4
4-Sep	0.9	0.5	0.5	0.4	0.4	Z	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.9
5-Sep	Z	0.2	0.4	0.3	0.4	0.8	0.3	0.4	0.2	0.3	0.5	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.2	0.3	0.1	0.2	0.8
6-Sep	0.3	Z	0.5	0.2	0.2	1.3	0.3	1.4	1.4	1.1	0.3	0.2	0.3	0.4	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.3	1.0	0.6	0.5	1.4
7-Sep	0.9	1.0	Z	0.5	0.5	0.2	0.2	0.2	0.1	0.2	0.6	0.6	0.3	0.3	0.3	1.1	1.5	0.4	0.1	0.2	0.2	0.3	0.3	0.2	0.4	1.5
8-Sep	0.2	0.2	0.6	Z	0.3	0.4	0.5	0.3	0.2	0.3	0.7	0.3	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.7
9-Sep	0.3	0.3	0.4	0.4	Z	0.8	0.8	0.5	1.4	1.2	0.9	0.5	0.2	0.1	0.2	0.1	0.2	0.1	0.7	0.4	3.7	2.9	3.0	3.1	1.0	3.7
10-Sep	1.5	2.5	1.7	1.3	1.0	Z	1.2	0.3	1.7	0.7	0.5	0.6	0.5	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	1.0	0.6	0.7	2.5
11-Sep	Z	0.5	0.5	0.6	1.0	1.1	1.1	1.1	0.7	0.5	0.4	0.3	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.6	0.5	0.5	0.4	0.6	0.5	1.1
12-Sep	0.6	Z	1.2	2.2	0.7	0.4	1.0	0.3	0.2	0.2	0.8	0.6	0.3	0.2	0.1	0.1	0.2	0.5	0.4	0.2	0.2	0.3	0.3	0.3	0.5	2.2
13-Sep	0.3	0.3	Z	0.3	0.4	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.4	0.3	0.4	0.2	0.3	0.8	0.4	0.1	0.2	0.3	0.3	0.8
14-Sep	0.2	0.3	0.3	Z	0.8	0.8	0.7	0.7	0.4	0.4	0.5	0.3	0.2	0.1	0.1	0.1	0.2	0.1	0.4	1.3	0.8	1.0	0.7	0.5	0.5	1.3
15-Sep	0.4	0.3	0.3	0.3	Z	2.0	0.9	1.2	0.2	0.5	0.3	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.3	2.0
16-Sep	2.4	2.6	0.3	0.4	0.3	Z	0.2	0.3	0.3	0.3	0.5	0.6	0.3	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.4	2.6
17-Sep	Z	1.0	0.7	0.5	0.4	2.0	0.4	0.7	1.9	9.0	1.6	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.9	9.0
18-Sep	0.5	Z	0.2	0.3	0.4	0.6	0.4	0.7	0.3	0.3	0.5	0.3	0.5	0.4	0.4	0.3	0.3	0.2	0.3	0.3	0.2	0.3	0.2	0.6	0.4	0.7
19-Sep	0.3	0.3	Z	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	0.1	0.1	0.2	0.2	0.3	0.6	0.4	0.5	0.3	0.6
20-Sep	0.5	0.6	0.7	Z	0.5	0.6	0.7	0.7	1.2	C	C	C	C	C	C	C	C	C	C	0.5	0.4	0.5	0.4	0.3	--	1.2
21-Sep	0.3	0.3	0.5	0.5	Z	0.7	0.8	0.8	1.5	1.5	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	0.3	1.5
22-Sep	0.0	0.0	0.3	0.6	3.0	Z	0.9	0.6	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.3	0.3	0.3	3.0
23-Sep	Z	0.4	0.5	0.5	0.3	0.4	0.4	0.3	0.6	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.6
24-Sep	0.2	Z	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.3	0.1	0.2	0.4
25-Sep	0.2	0.3	Z	0.2	0.3	0.2	0.3	0.4	0.3	0.3	0.5	0.5	0.7	0.6	0.4	0.3	0.3	0.4	0.3	0.2	0.3	0.5	0.7	0.2	0.4	0.7
26-Sep	1.6	5.4	3.9	1.9	Z	1.0	0.6	0.6	2.6	1.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	1.7	0.4	0.4	0.4	0.2	1.0	5.4
27-Sep	0.3	0.3	0.5	0.6	Z	0.5	1.0	0.5	0.4	0.4	0.3	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.3	0.7	0.6	0.5	0.6	0.3	1.0
28-Sep	0.8	1.0	1.0	1.2	1.1	Z	0.8	0.7	0.6	0.6	0.6	0.6	0.7	0.7	0.6	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.7	1.2
29-Sep	Z	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.3	0.3	0.4
30-Sep	0.2	Z	0.5	0.5	0.5	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.5	0.5	0.2	0.1	0.2	0.5	2.0	2.1	2.0	0.5	2.1
																								Diurnal Average		
																								Diurnal Maximum		
																								0.6 0.9 0.7 0.6 0.6 0.7 0.6 0.6 0.7 0.8 0.5 0.3 0.3 0.2 0.2 0.2 0.2 0.2 0.2 0.4 0.4 0.5 0.5 0.5		
																								2.4 5.4 3.9 2.2 3.0 2.0 1.2 1.4 2.6 9.0 1.6 1.0 1.1 1.2 0.9 1.1 1.5 0.9 1.0 1.7 3.7 2.9 3.0 3.1		
Z - zerospan C - Calibration																										
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb																										





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	669	98.38	98.38
3 - 4	9	1.32	99.71
5 - 7	1	0.15	99.85
8 - 11	1	0.15	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 680

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

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

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	38	14	4	7	15	12	75	122	95	62	70	38	34	34	22	25	667
3 - 4	0	0	0	0	0	3	6	0	0	0	0	0	0	0	0	0	9
5 - 7	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
8 - 11	0	0	0	0	0	1	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	38	14	4	7	16	16	81	122	95	62	70	38	34	34	22	25	678

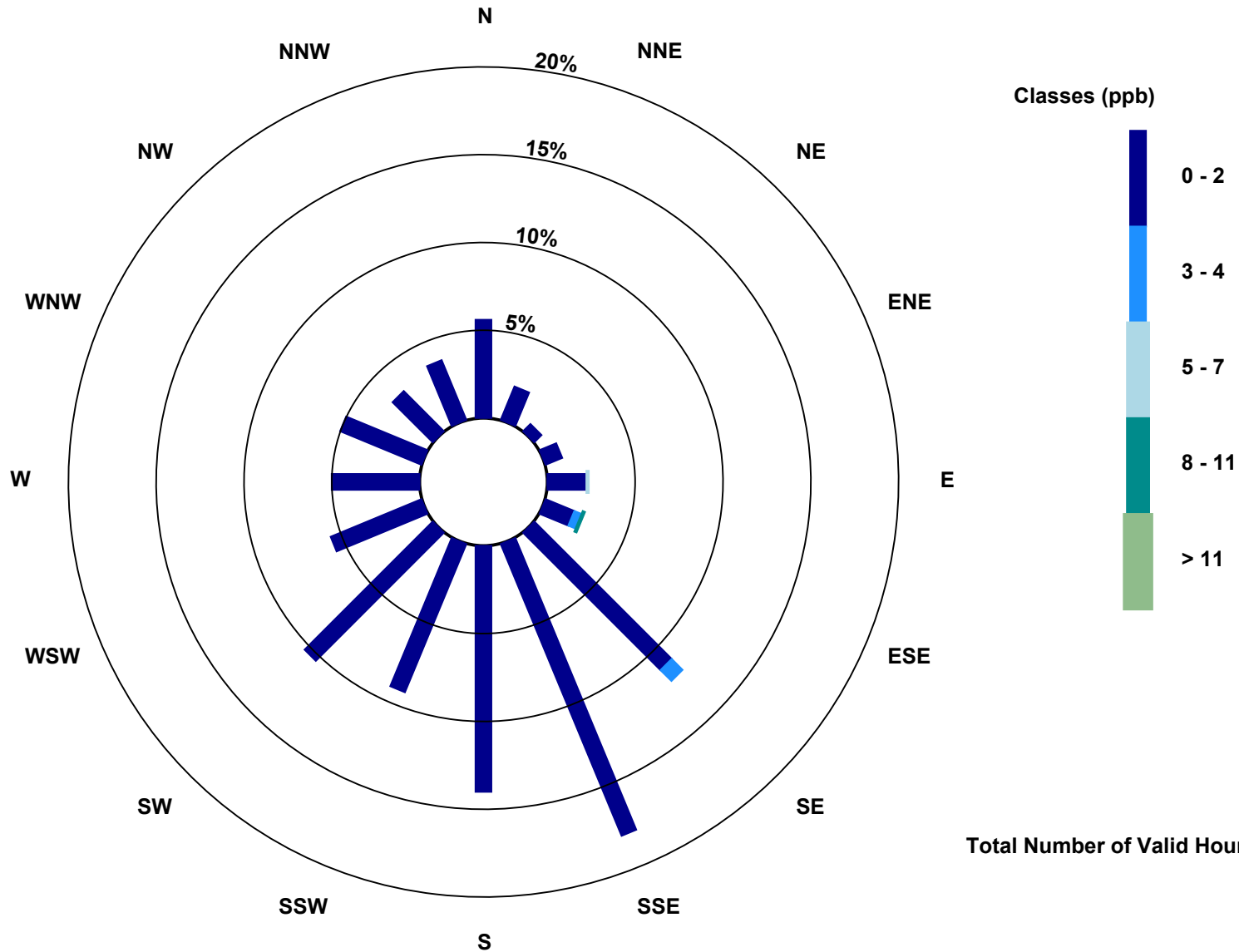
Total Number of Valid Hours: 678

Total Number of Hours: 720

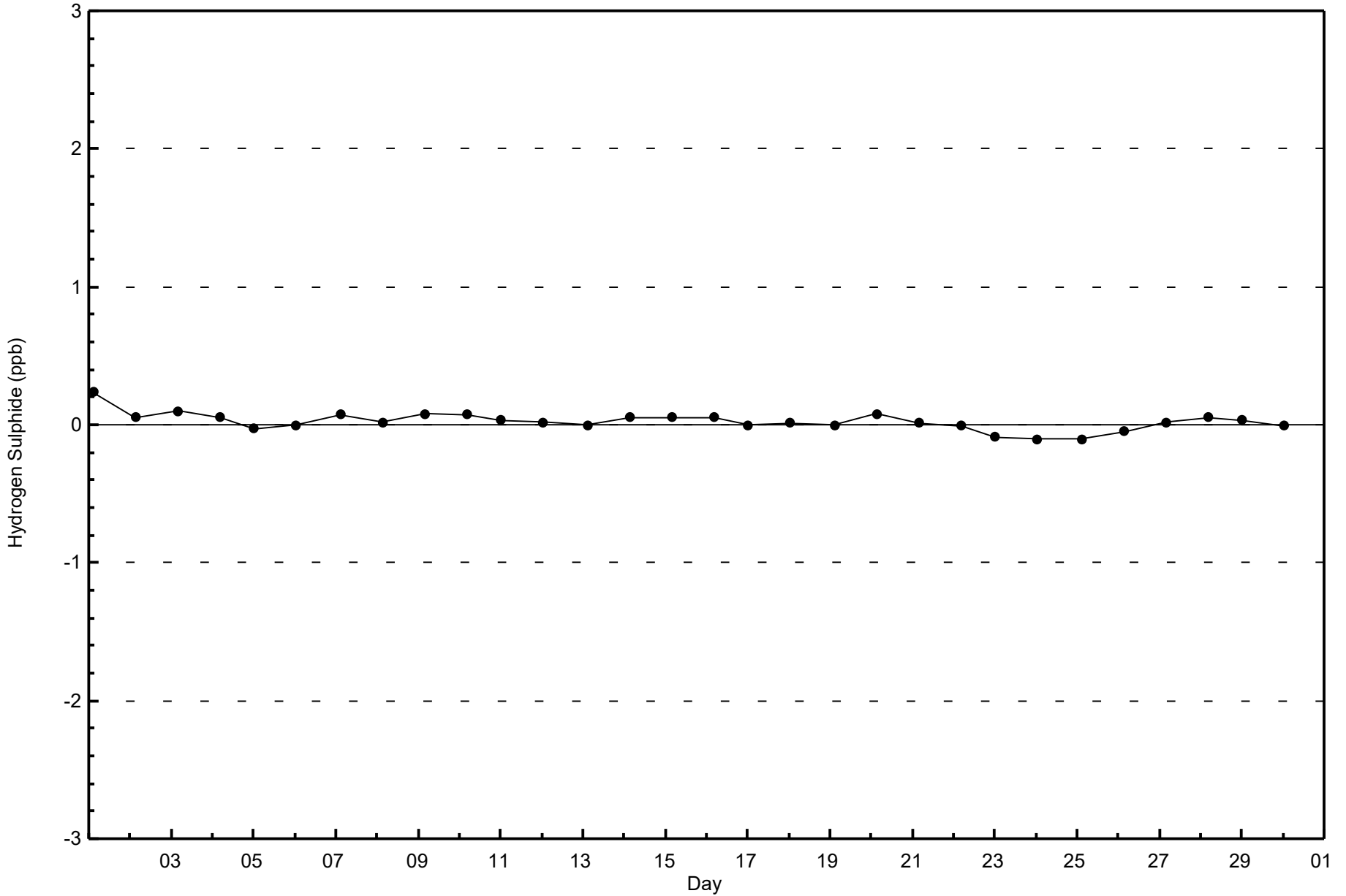


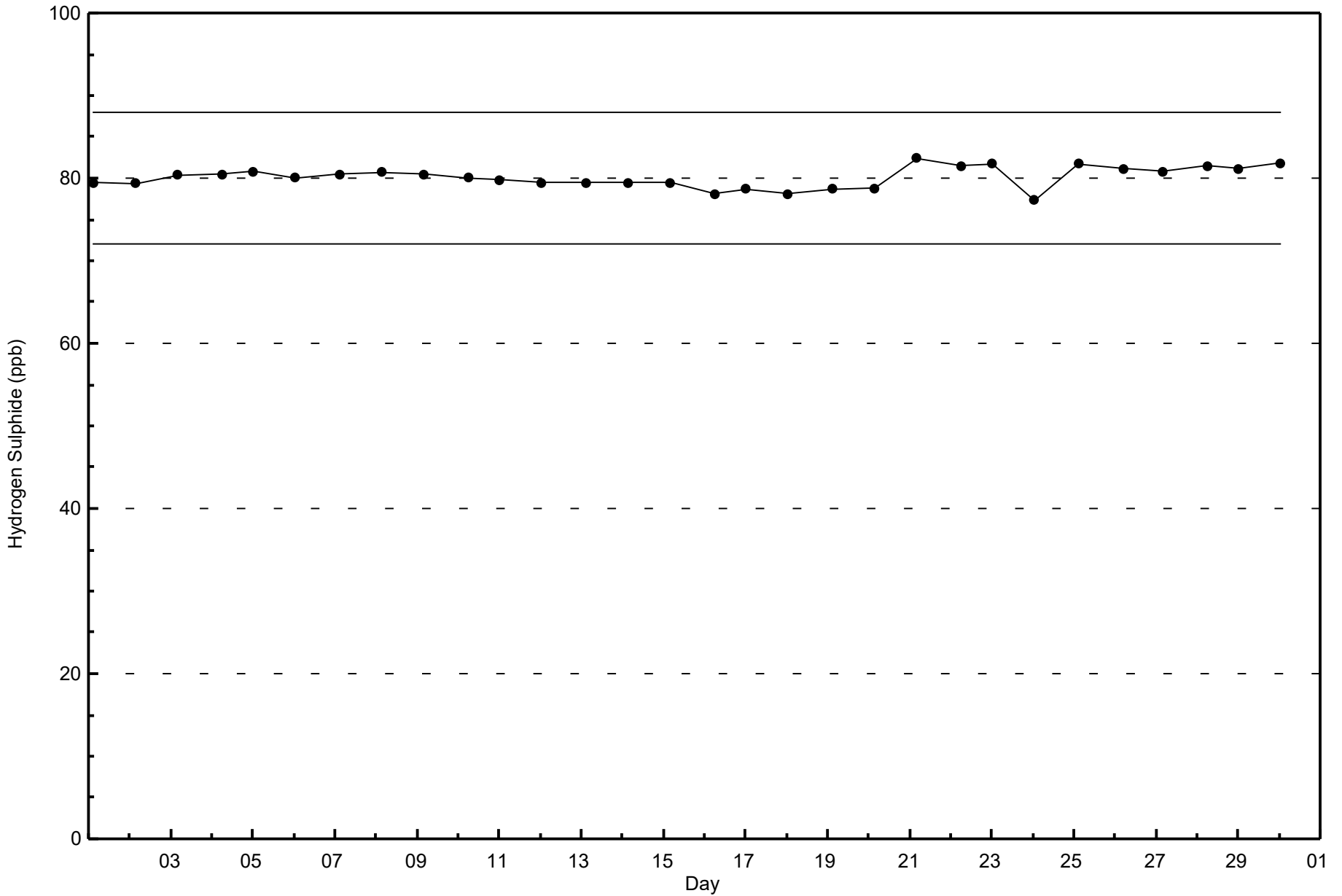
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Hydrogen Sulphide (H₂S) - ppb
Mildred Lake



Total Number of Valid Hours: 678







Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Mildred Lake - September 2023

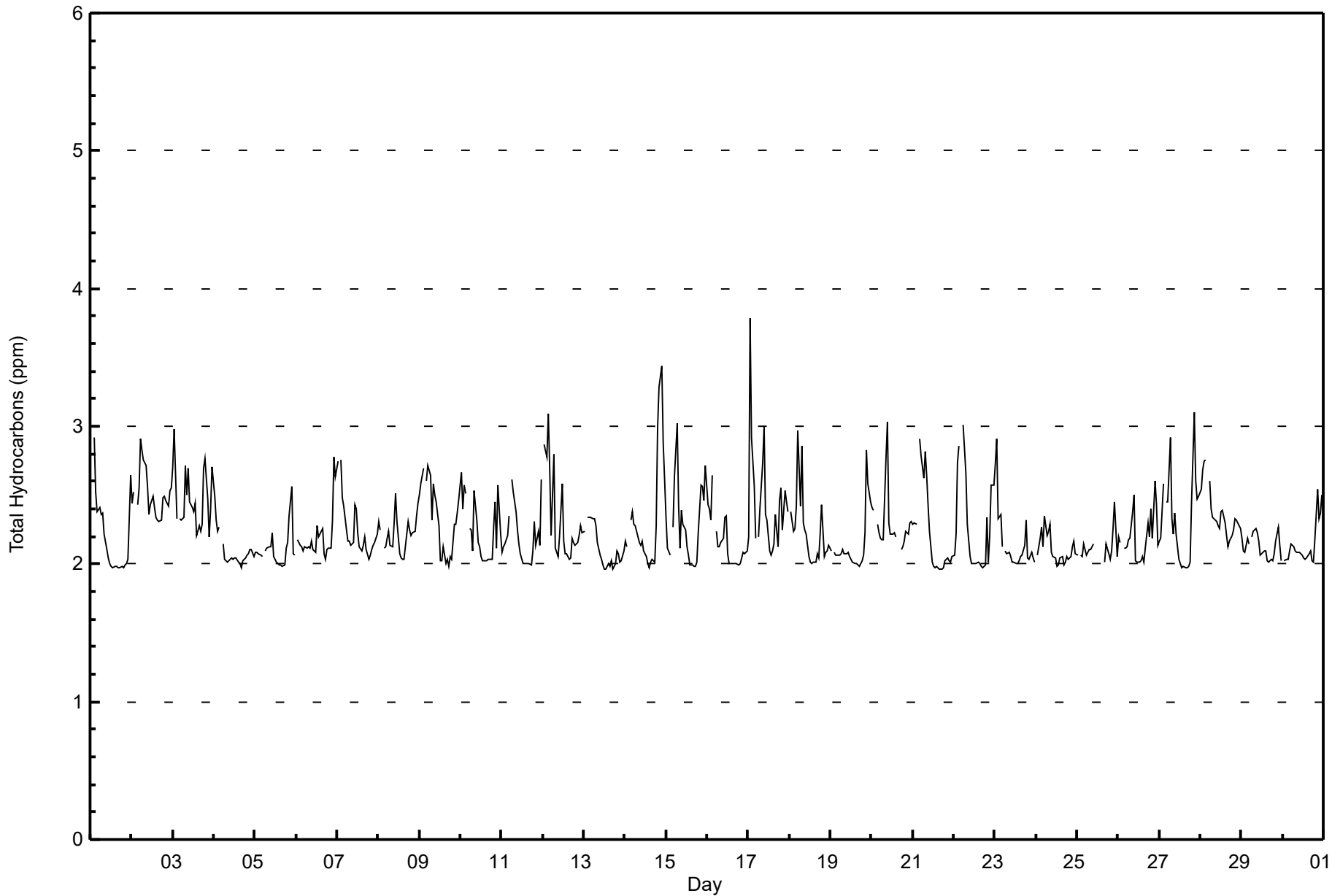
Maximum Value: 3.8 ppm on Sep 17 02:00		Maximum Daily Average: 2.5 ppm on Sep 2		Hours in Service:	720																						
Minimum Value: 2.0 ppm on Sep 13 13:00		Minimum Daily Average: 2.1 ppm on Sep 4		Hours of Data:	682																						
Maximum Diurnal Average: 2.4 ppm at hour 2		Minimum Diurnal Average: 2.1 ppm at hour 16		Hours of Missing Data:	38																						
Monthly Average: 2.24 ppm		Percentiles: P ₁ = 2.0 P ₁₀ = 2.0 Q ₁ = 2.1 Median = 2.2 Q ₃ = 2.3 P ₉₀ = 2.6 P ₉₉ = 3.0		Hours of Calibration:	36																						
				Percent Operational Time:	99.7																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Sep	3.0	Z	2.9	2.5	2.4	2.4	2.4	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.6	2.2	3.0	
2-Sep	2.4	2.5	Z	2.4	2.6	2.9	2.8	2.8	2.7	2.6	2.4	2.4	2.5	2.4	2.3	2.3	2.3	2.3	2.5	2.5	2.5	2.4	2.5	2.6	2.5	2.9	
3-Sep	2.7	3.0	2.3	Z	2.3	2.3	2.3	2.7	2.5	2.7	2.5	2.4	2.4	2.4	2.2	2.3	2.2	2.3	2.7	2.8	2.5	2.2	2.4	2.7	2.5	3.0	
4-Sep	2.5	2.3	2.2	Z	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	2.1	2.1	2.1	2.1	2.1	2.1	2.5	
5-Sep	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.3	2.6	2.1	2.1	2.1	2.6	
6-Sep	Z	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.3	2.2	2.2	2.3	2.1	2.0	2.1	2.1	2.1	2.3	2.8	2.6	2.2	2.8	
7-Sep	2.7	Z	2.8	2.5	2.4	2.2	2.2	2.2	2.1	2.2	2.4	2.4	2.2	2.1	2.1	2.1	2.2	2.1	2.0	2.1	2.1	2.1	2.2	2.2	2.2	2.8	
8-Sep	2.3	2.2	Z	2.1	2.1	2.2	2.2	2.1	2.1	2.3	2.5	2.3	2.1	2.0	2.0	2.0	2.1	2.3	2.2	2.2	2.2	2.2	2.4	2.4	2.2	2.5	
9-Sep	2.5	2.6	2.7	Z	2.6	2.7	2.6	2.3	2.6	2.5	2.4	2.3	2.0	2.0	2.1	2.0	2.0	2.0	2.1	2.0	2.3	2.3	2.4	2.5	2.3	2.7	
10-Sep	2.7	2.4	2.6	2.5	Z	2.3	2.2	2.1	2.5	2.3	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.3	2.4	2.1	2.6	2.2	2.2	2.7	
11-Sep	2.1	2.1	2.1	2.2	2.4	Z	2.6	2.5	2.4	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.3	2.1	2.2	2.1	2.6	2.2	2.6	
12-Sep	Z	2.9	2.8	3.1	2.7	2.2	2.8	2.1	2.1	2.1	2.2	2.6	2.2	2.1	2.1	2.0	2.0	2.2	2.2	2.1	2.2	2.2	2.3	2.2	2.3	3.1	
13-Sep	2.2	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.1	2.1	2.3	
14-Sep	2.2	2.1	Z	2.3	2.4	2.3	2.3	2.2	2.2	2.1	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.3	3.0	3.3	3.4	2.9	2.6	2.3	3.4	
15-Sep	2.3	2.1	2.1	Z	2.3	2.6	3.0	2.4	2.1	2.4	2.3	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.2	2.6	2.6	2.5	2.7	2.3	3.0	
16-Sep	2.4	2.4	2.3	2.6	Z	2.2	2.1	2.1	2.2	2.2	2.3	2.3	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	2.6	
17-Sep	2.2	3.8	2.9	2.6	2.2	Z	2.2	2.4	2.7	3.0	2.4	2.3	2.1	2.1	2.1	2.1	2.4	2.1	2.5	2.6	2.2	2.5	2.4	2.4	2.4	3.8	
18-Sep	Z	2.4	2.2	2.3	2.4	3.0	2.4	2.9	2.3	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.2	2.4	2.1	2.1	2.1	2.1	2.2	3.0	
19-Sep	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	2.1	2.2	2.8	2.6	2.5	2.1	2.8	
20-Sep	2.4	2.4	Z	2.3	2.2	2.2	2.2	2.2	2.8	3.0	2.3	2.2	2.2	2.2	2.2	M	M	2.1	2.1	2.2	2.2	2.2	2.3	2.3	2.3	3.0	
21-Sep	2.3	2.3	2.3	Z	2.9	2.8	2.6	2.8	2.6	2.4	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.9	
22-Sep	2.1	2.2	2.7	2.9	Z	3.0	2.8	2.7	2.3	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3	2.0	2.2	2.6	2.6	2.3	3.0	
23-Sep	2.7	2.9	2.3	2.4	2.1	Z	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.3	2.0	2.0	2.1	2.0	2.0	2.2	2.9	
24-Sep	Z	2.1	2.2	2.3	2.1	2.3	2.2	2.2	2.3	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.1	2.1	2.3	
25-Sep	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	C	C	C	C	C	C	2.0	2.1	2.1	2.0	2.1	2.3	2.4	2.1	--	2.4	
26-Sep	2.2	2.2	Z	2.1	2.1	2.1	2.2	2.2	2.4	2.5	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.3	2.2	2.4	2.2	2.6	2.4	2.1	2.2	2.6	
27-Sep	2.2	2.2	2.6	Z	2.4	2.5	2.9	2.3	2.2	2.4	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4	3.1	2.6	2.5	2.5	2.3	3.1	
28-Sep	2.5	2.7	2.7	2.8	Z	2.6	2.4	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.3	2.2	2.1	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.4	2.8	
29-Sep	2.2	2.1	2.1	2.2	2.1	Z	2.2	2.2	2.3	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.2	2.3	2.1	2.0	2.3	
30-Sep	Z	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.2	2.5	2.3	2.4	2.5	2.1	2.5	
																								Diurnal Average			
																								Diurnal Maximum			
2.4		2.4	2.4	2.4	2.3	2.4	2.4	2.3	2.3	2.3	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.3	2.3	2.3	2.3
3.0		3.8	2.9	3.1	2.9	3.0	3.0	2.9	2.8	3.0	2.5	2.6	2.5	2.4	2.3	2.3	2.4	2.3	2.7	3.0	3.3	3.4	2.9	2.7	2.7	2.7	

Z - zerspan C - Calibration M - Maintenance



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	167	24.49	24.49
2.1 - 3.0	510	74.78	99.27
3.1 - 10.0	5	0.73	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 682

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Total Hydrocarbons (THC) - ppm
Mildred Lake - September 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	4	2	0	3	3	16	20	32	19	29	12	4	4	13	3	166
2.1 - 3.0	43	6	2	6	12	12	63	100	61	44	41	27	30	28	9	23	507
3.1 - 10.0	0	0	0	0	0	0	1	1	0	0	0	0	1	2	0	0	5
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	45	10	4	6	15	15	80	121	93	63	70	39	35	34	22	26	678

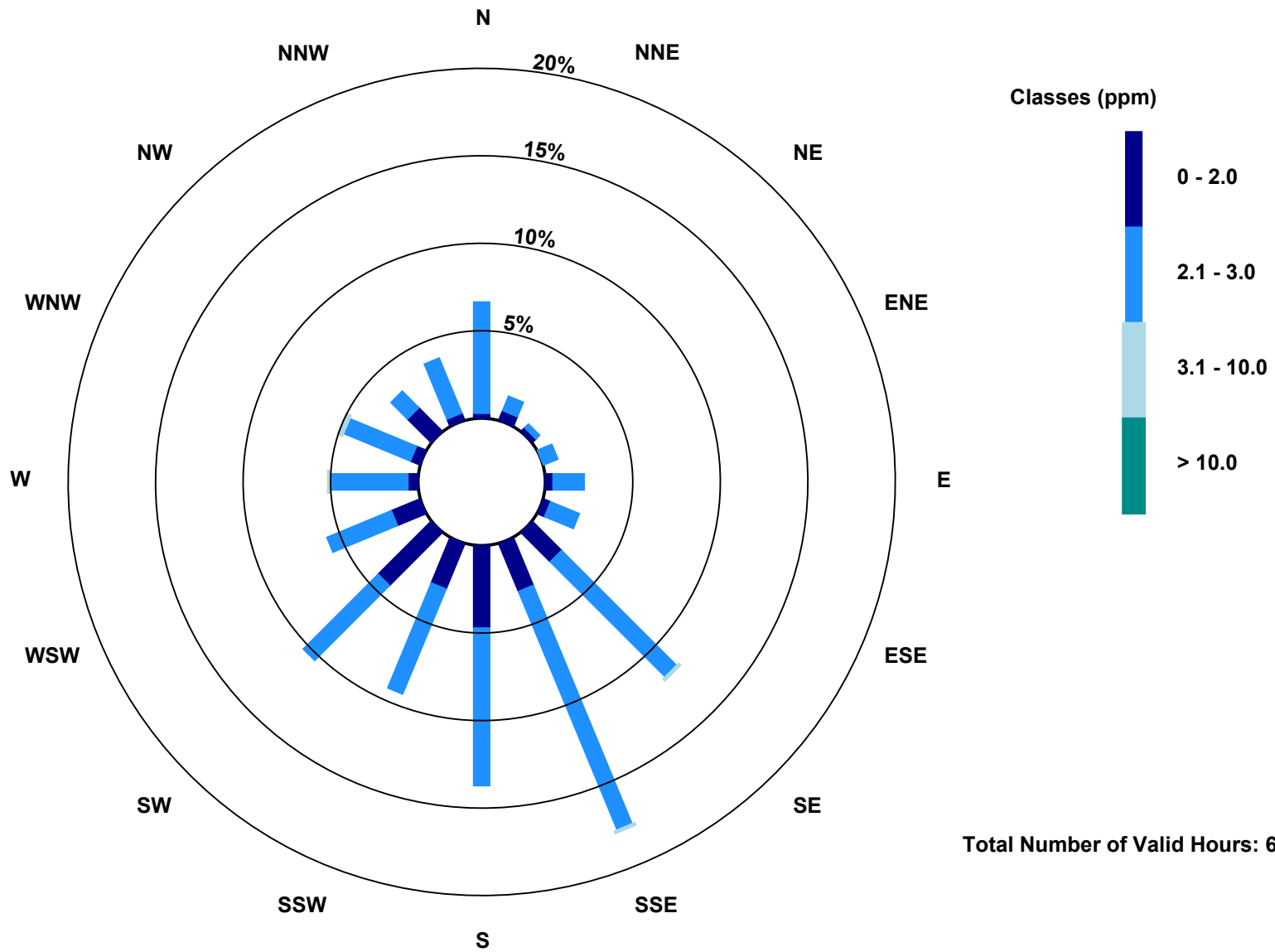
Total Number of Valid Hours: 678

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

Total Hydrocarbons (THC) - ppm
Mildred Lake



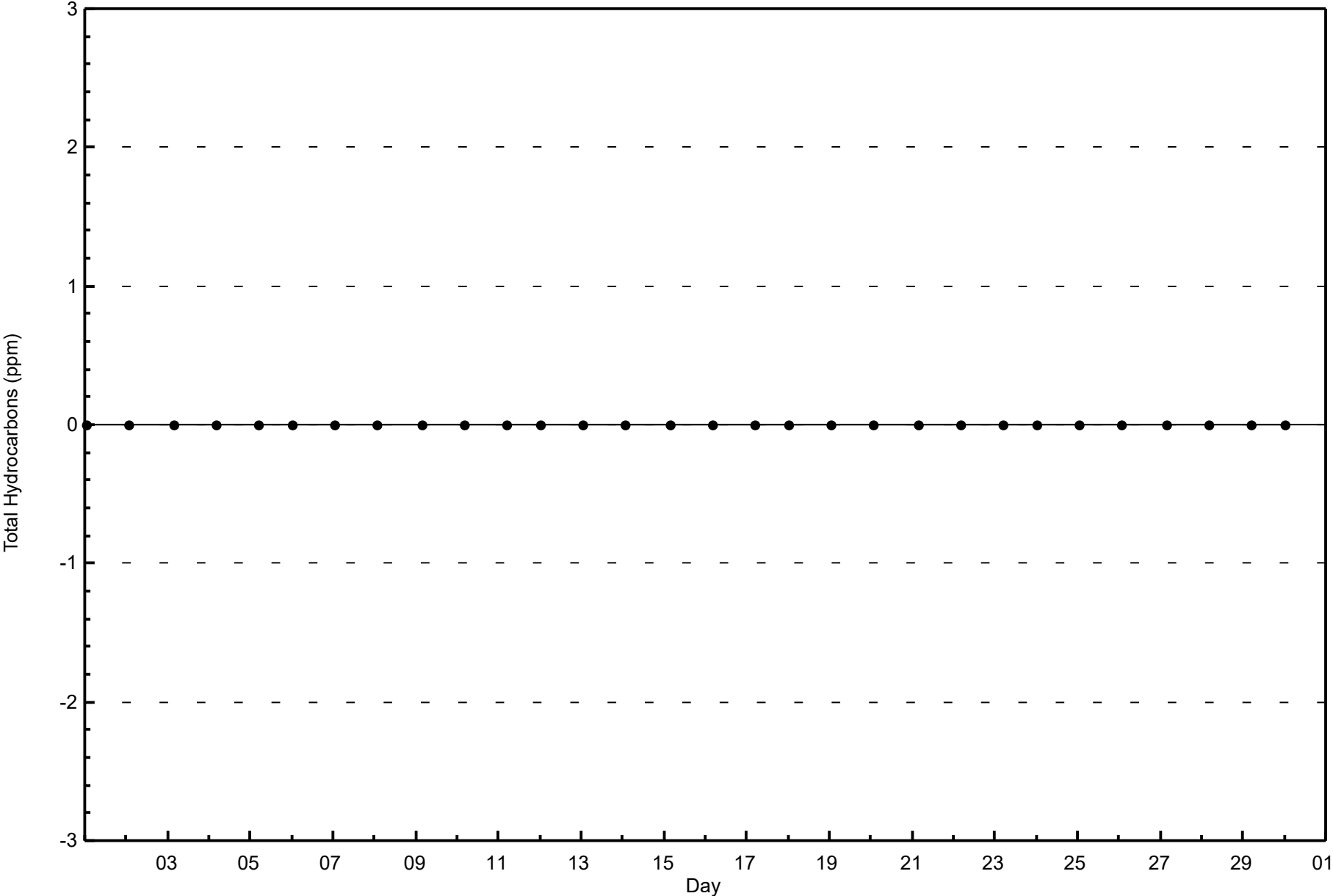


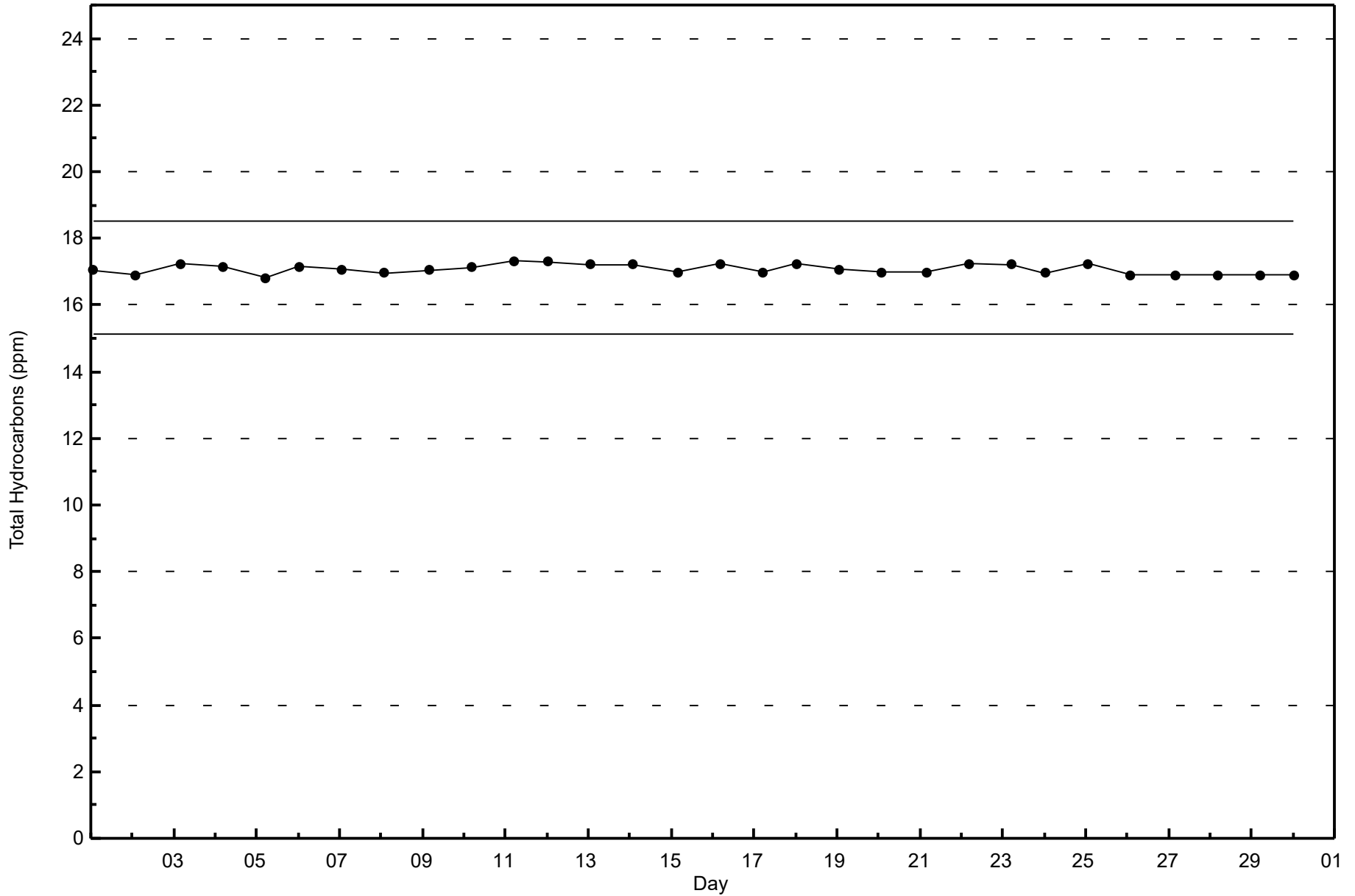
Wood Buffalo Environmental Association

Zero Responses

Total Hydrocarbons (THC) - ppm

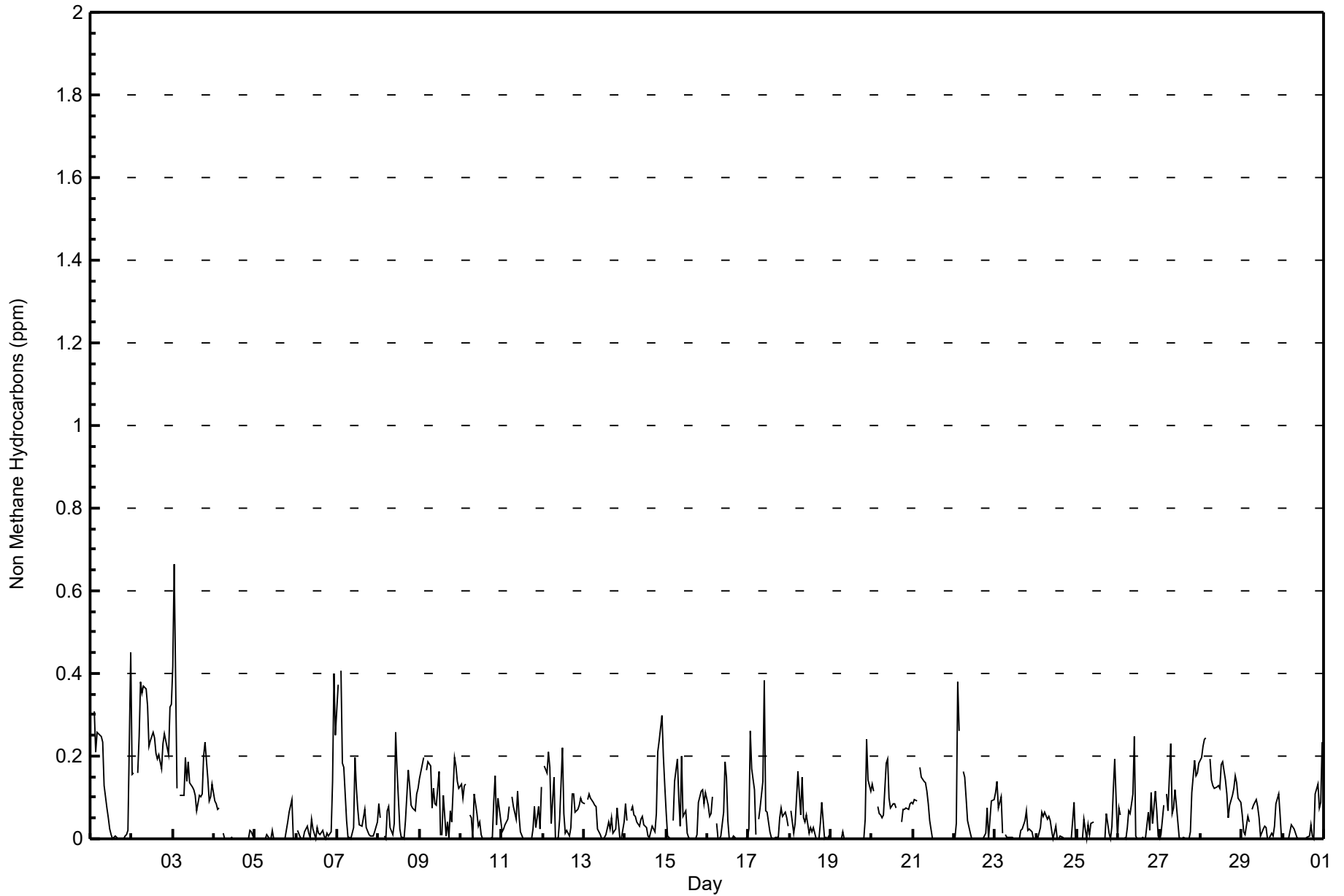
Mildred Lake - September 2023







Maximum Value: 0.666 ppm on Sep 3 02:00		Maximum Daily Average: 0.253 ppm on Sep 2		Hours in Service: 720																																													
Minimum Value: 0.000 ppm on Sep 1 19:00		Minimum Daily Average: 0.011 ppm on Sep 5		Hours of Data: 682																																													
Maximum Diurnal Average: 0.113 ppm at hour 1		Minimum Diurnal Average: 0.020 ppm at hour 16		Hours of Missing Data: 38																																													
Monthly Average: 0.068 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		Hours of Calibration: 36																																													
				Percent Operational Time: 99.7																																													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Sep	0.427	Z	0.310	0.211	0.259	0.252	0.249	0.235	0.131	0.076	0.051	0.023	0.010	0.001	0.008	0.003	0.001	0.001	0.000	0.001	0.007	0.012	0.020	0.452	0.119	0.452																							
2-Sep	0.155	0.161	Z	0.161	0.247	0.379	0.352	0.371	0.362	0.321	0.224	0.237	0.256	0.243	0.206	0.194	0.204	0.169	0.231	0.256	0.239	0.204	0.318	0.327	0.253	0.379																							
3-Sep	0.416	0.666	0.121	Z	0.106	0.105	0.105	0.196	0.138	0.186	0.134	0.124	0.119	0.105	0.069	0.103	0.101	0.109	0.200	0.233	0.147	0.092	0.102	0.132	0.166	0.666																							
4-Sep	0.090	0.084	0.072	0.076	Z	0.014	0.000	0.000	0.000	0.001	0.002	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.020	0.017	0.000	0.016	0.090																							
5-Sep	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.011	0.001	0.001	0.019	0.001	0.000	0.000	0.000	0.001	0.000	0.001	0.021	0.040	0.064	0.095	0.000	0.000	0.011	0.095																							
6-Sep	Z	0.020	0.003	0.000	0.000	0.015	0.029	0.012	0.004	0.048	0.022	0.000	0.027	0.015	0.009	0.020	0.005	0.001	0.014	0.007	0.018	0.139	0.399	0.250	0.046	0.399																							
7-Sep	0.373	Z	0.408	0.184	0.172	0.044	0.004	0.004	0.001	0.029	0.198	0.123	0.072	0.036	0.030	0.052	0.072	0.027	0.010	0.006	0.007	0.007	0.018	0.041	0.083	0.408																							
8-Sep	0.085	0.052	Z	0.007	0.000	0.068	0.076	0.026	0.010	0.037	0.258	0.165	0.023	0.003	0.002	0.001	0.043	0.166	0.128	0.081	0.075	0.067	0.108	0.124	0.070	0.258																							
9-Sep	0.145	0.162	0.195	Z	0.167	0.187	0.177	0.076	0.123	0.086	0.081	0.161	0.009	0.009	0.106	0.006	0.040	0.003	0.068	0.042	0.196	0.175	0.139	0.123	0.108	0.196																							
10-Sep	0.131	0.098	0.127	0.133	Z	0.056	0.050	0.001	0.108	0.061	0.030	0.042	0.012	0.001	0.001	0.000	0.000	0.001	0.003	0.092	0.154	0.035	0.098	0.044	0.056	0.154																							
11-Sep	0.016	0.025	0.033	0.047	0.077	Z	0.103	0.080	0.046	0.115	0.059	0.017	0.000	0.000	0.000	0.000	0.000	0.000	0.024	0.078	0.029	0.076	0.022	0.127	0.042	0.127																							
12-Sep	Z	0.175	0.160	0.210	0.173	0.037	0.150	0.000	0.000	0.003	0.047	0.221	0.061	0.014	0.021	0.006	0.027	0.108	0.108	0.065	0.073	0.082	0.099	0.089	0.084	0.221																							
13-Sep	0.084	Z	0.096	0.107	0.097	0.087	0.082	0.076	0.023	0.009	0.000	0.000	0.002	0.009	0.040	0.025	0.051	0.013	0.022	0.076	0.037	0.000	0.000	0.041	0.043	0.107																							
14-Sep	0.083	0.043	Z	0.067	0.079	0.058	0.054	0.042	0.030	0.046	0.056	0.034	0.027	0.006	0.005	0.015	0.029	0.018	0.062	0.212	0.238	0.298	0.199	0.130	0.080	0.298																							
15-Sep	0.064	0.008	0.000	Z	0.044	0.139	0.193	0.100	0.032	0.199	0.055	0.068	0.015	0.002	0.000	0.000	0.000	0.000	0.011	0.089	0.116	0.120	0.086	0.112	0.063	0.199																							
16-Sep	0.080	0.055	0.062	0.102	Z	0.038	0.000	0.001	0.007	0.064	0.187	0.149	0.045	0.001	0.001	0.005	0.002	0.002	0.002	0.001	0.000	0.000	0.000	0.002	0.035	0.187																							
17-Sep	0.024	0.261	0.171	0.118	0.012	Z	0.048	0.075	0.140	0.385	0.069	0.065	0.017	0.005	0.000	0.000	0.004	0.004	0.049	0.074	0.055	0.066	0.050	0.032	0.075	0.385																							
18-Sep	Z	0.067	0.013	0.038	0.098	0.163	0.058	0.150	0.051	0.040	0.057	0.015	0.027	0.018	0.027	0.000	0.000	0.000	0.038	0.088	0.000	0.005	0.000	0.008	0.042	0.163																							
19-Sep	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.016	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.049	0.241	0.141	0.117	0.025	0.241																							
20-Sep	0.131	0.117	Z	0.078	0.061	0.056	0.052	0.057	0.184	0.192	0.098	0.076	0.086	0.084	0.073	M	M	0.042	0.073	0.070	0.076	0.072	0.085	0.088	0.088	0.192																							
21-Sep	0.085	0.095	0.090	Z	0.173	0.148	0.140	0.136	0.114	0.084	0.044	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.048	0.173																							
22-Sep	0.000	0.038	0.380	0.260	Z	0.162	0.148	0.099	0.043	0.013	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.014	0.076	0.000	0.049	0.092	0.096	0.064	0.380																								
23-Sep	0.112	0.140	0.076	0.103	0.012	Z	0.012	0.002	0.005	0.004	0.002	0.001	0.001	0.001	0.001	0.020	0.024	0.043	0.068	0.020	0.022	0.017	0.001	0.000	0.030	0.140																							
24-Sep	Z	0.001	0.027	0.063	0.053	0.064	0.048	0.054	0.043	0.019	0.001	0.030	0.001	0.000	0.008	0.002	0.000	0.000	0.000	0.000	0.000	0.043	0.087	0.000	0.024	0.087																							
25-Sep	0.000	Z	0.000	0.000	0.048	0.000	0.034	0.011	0.039	0.042	C	C	C	C	C	C	0.001	0.061	0.012	0.001	0.031	0.118	0.195	0.001	--	0.195																							
26-Sep	0.074	0.059	Z	0.002	0.001	0.028	0.067	0.060	0.107	0.247	0.005	0.001	0.000	0.000	0.003	0.000	0.000	0.065	0.021	0.111	0.036	0.115	0.067	0.005	0.047	0.247																							
27-Sep	0.001	0.009	0.082	Z	0.109	0.068	0.229	0.063	0.074	0.118	0.081	0.004	0.000	0.001	0.002	0.000	0.000	0.000	0.018	0.113	0.191	0.151	0.159	0.183	0.072	0.229																							
28-Sep	0.195	0.223	0.242	0.245	Z	0.194	0.144	0.128	0.123	0.126	0.128	0.123	0.180	0.187	0.143	0.108	0.050	0.080	0.105	0.122	0.153	0.137	0.097	0.089	0.144	0.245																							
29-Sep	0.059	0.016	0.009	0.054	0.042	Z	0.072	0.081	0.096	0.079	0.051	0.006	0.023	0.031	0.026	0.000	0.000	0.015	0.007	0.029	0.085	0.108	0.056	0.002	0.041	0.108																							
30-Sep	Z	0.000	0.000	0.000	0.016	0.033	0.023	0.014	0.002	0.000	0.001	0.001	0.001	0.000	0.004	0.008	0.033	0.005	0.000	0.108	0.133	0.074	0.090	0.235	0.034	0.235																							
																								0.113	0.103	0.107	0.091	0.082	0.096	0.090	0.073	0.068	0.088	0.068	0.058	0.035	0.027	0.027	0.020	0.024	0.031	0.044	0.070	0.074	0.087	0.092	0.095	Diurnal Average	
																								0.427	0.666	0.408	0.260	0.259	0.379	0.352	0.371	0.362	0.385	0.258	0.237	0.256	0.243	0.206	0.194	0.204	0.169	0.231	0.256	0.239	0.298	0.399	0.452	Diurnal Maximum	
Z - zerospan		C - Calibration				M - Maintenance																																											





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm
Mildred Lake - September 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	208	30.50	30.50
0.006 - 0.05	177	25.95	56.45
0.06 - 0.1	200	29.33	85.78
> 0.1	97	14.22	100.00

Total Number of Valid Hours: 682

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

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

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	1	3	2	1	5	5	15	31	49	35	39	3	2	2	11	3	207
0.006 - 0.05	9	3	0	4	5	4	27	37	18	15	16	14	7	6	5	7	177
0.06 - 0.1	28	3	2	1	5	3	27	40	22	11	13	10	7	12	5	11	200
> 0.1	7	1	0	0	0	3	11	13	4	2	2	12	19	14	1	5	94
Totals	45	10	4	6	15	15	80	121	93	63	70	39	35	34	22	26	678

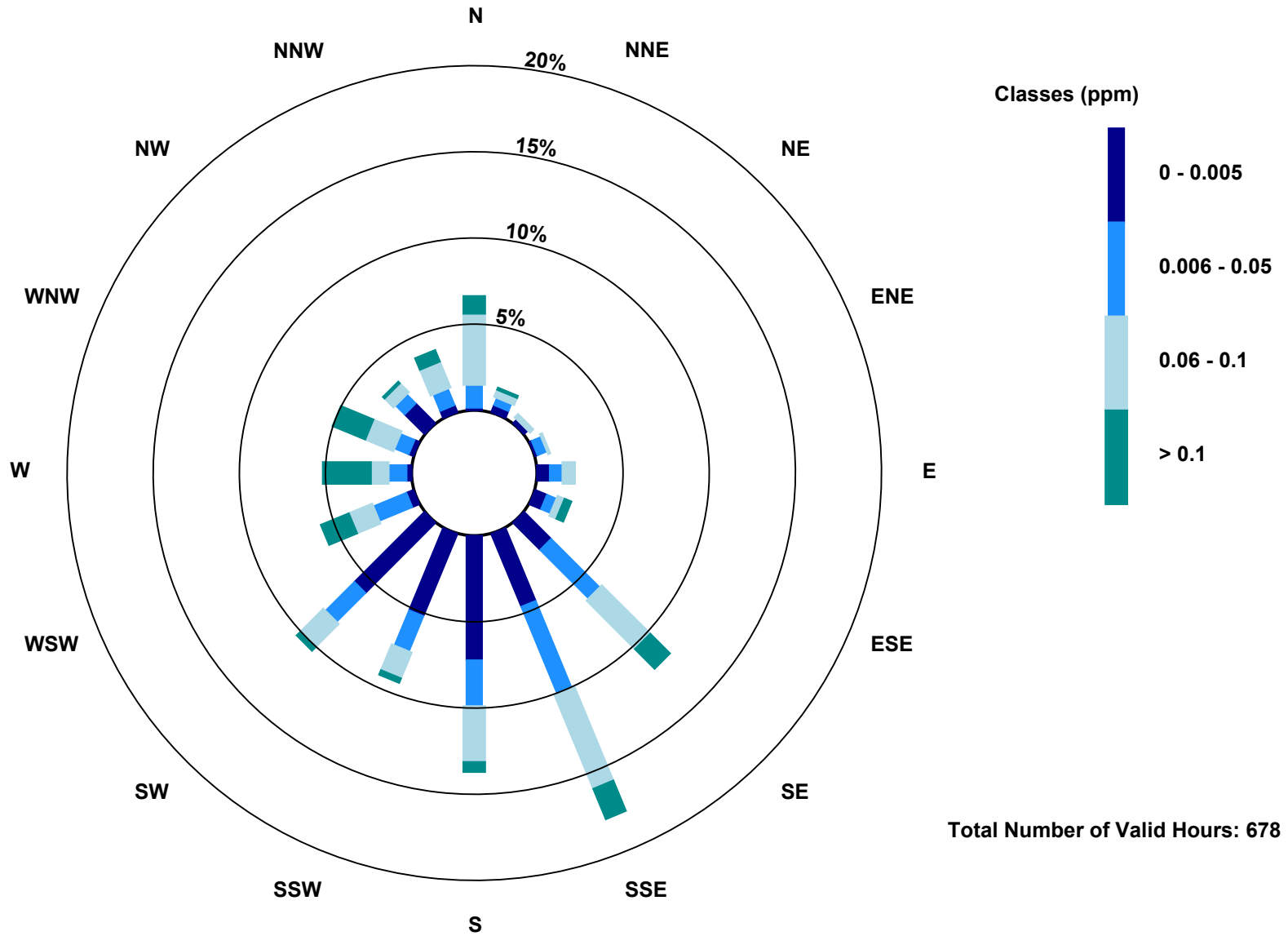
Total Number of Valid Hours: 678

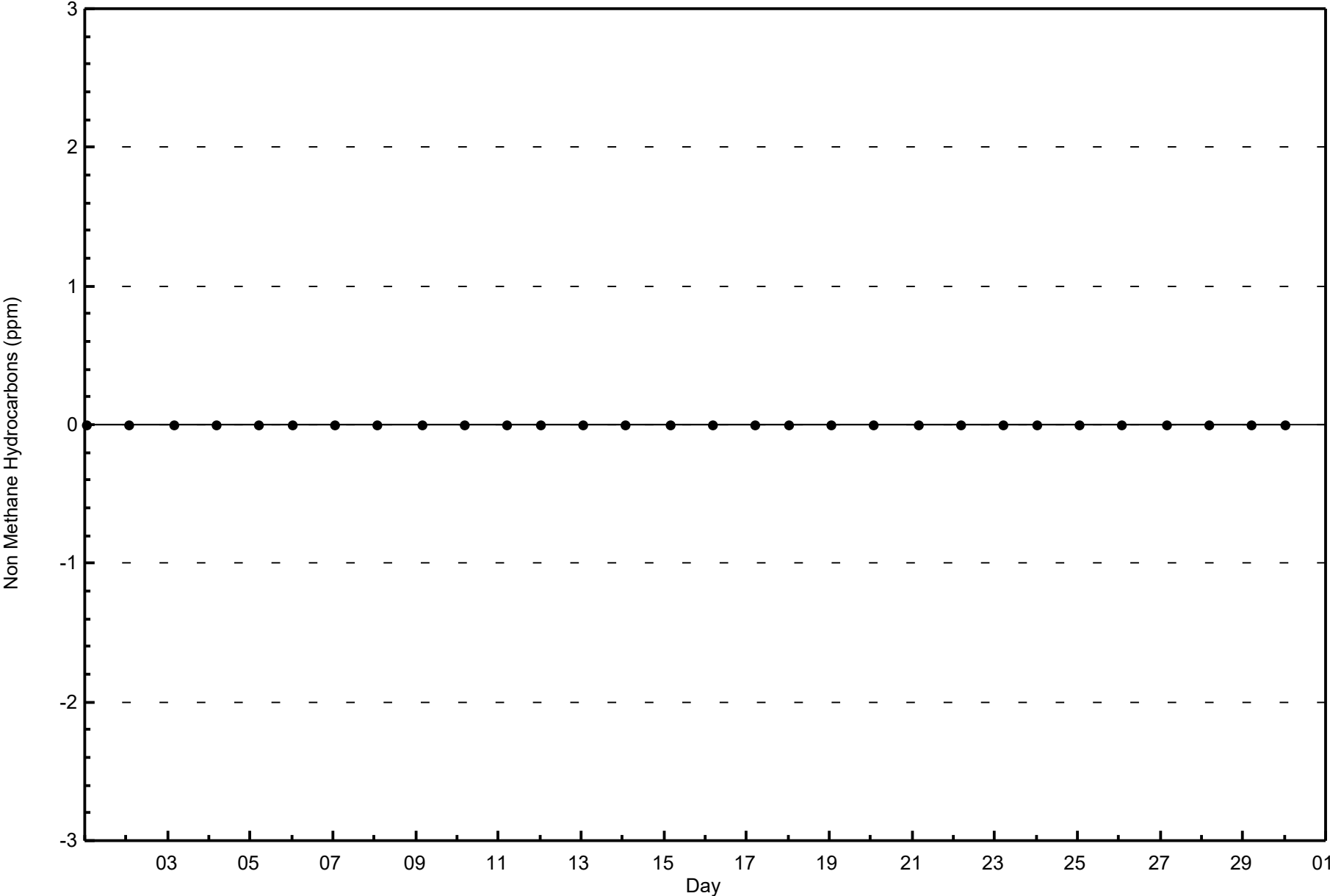
Total Number of Hours: 720

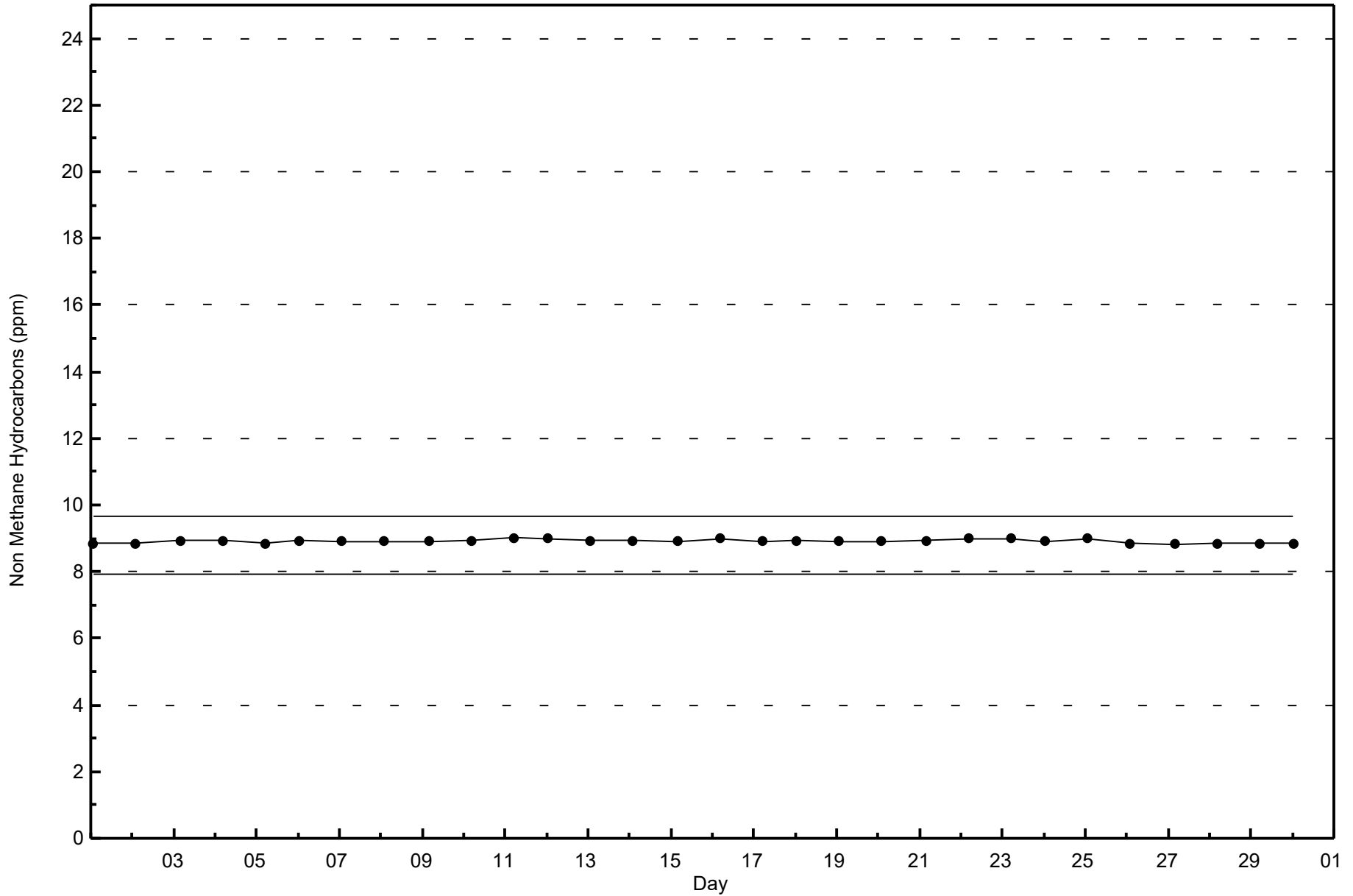


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Non Methane Hydrocarbons (NMHC) - ppm
Mildred Lake









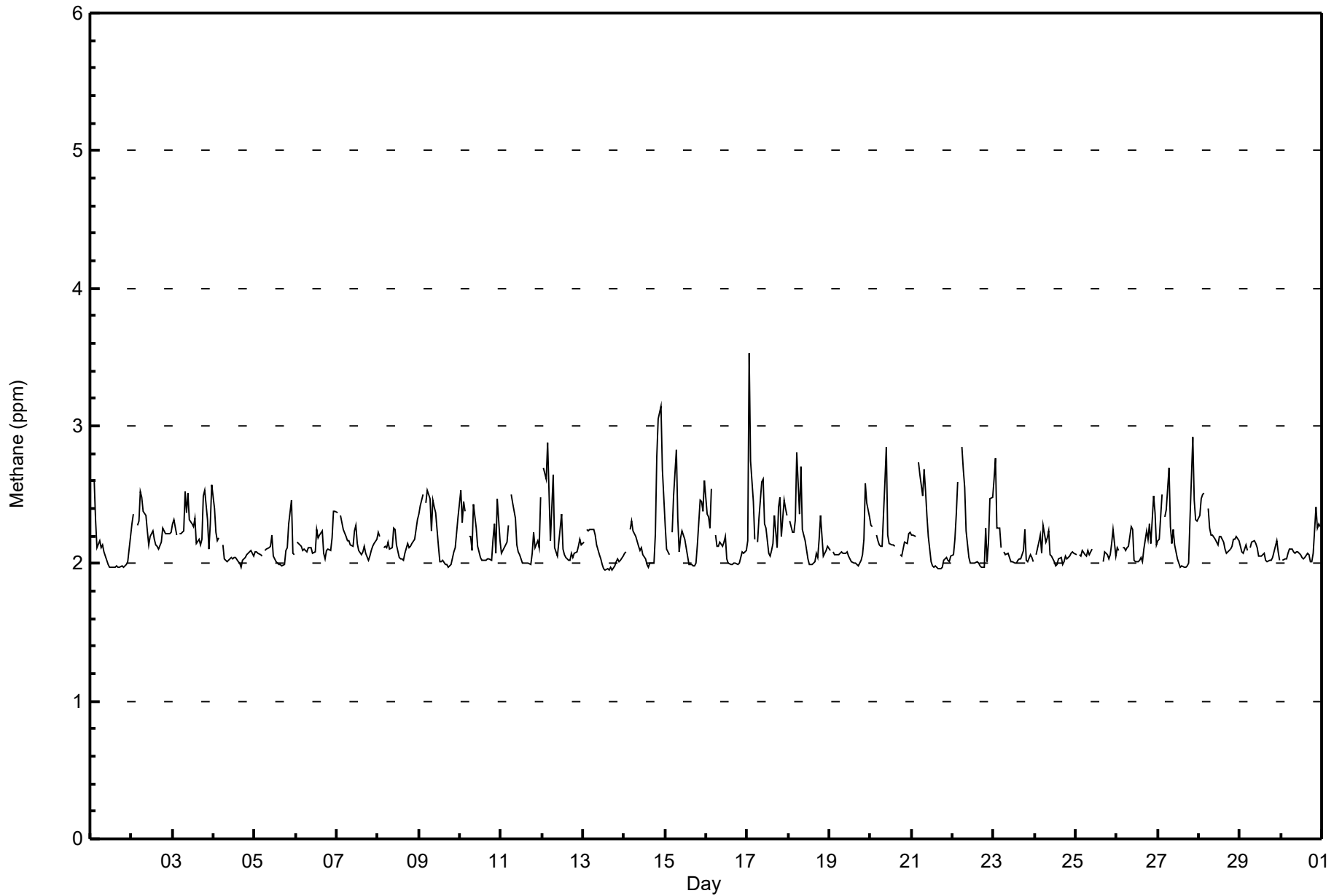
Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH₄) - ppm

Mildred Lake - September 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:														720						
Maximum Value: 3.5 ppm on Sep 17 02:00		Maximum Daily Average: 2.4 ppm on Sep 17		Hours of Data:														682								
Minimum Value: 2.0 ppm on Sep 13 18:00		Minimum Daily Average: 2.1 ppm on Sep 13		Hours of Missing Data:														38								
Maximum Diurnal Average: 2.3 ppm at hour 2		Minimum Diurnal Average: 2.0 ppm at hour 16		Hours of Calibration:														36								
Monthly Average: 2.17 ppm		Percentiles: P ₁ = 2.0 P ₁₀ = 2.0 Q ₁ = 2.0 Median = 2.1 Q ₃ = 2.2 P ₉₀ = 2.4 P ₉₉ = 2.8		Percent Operational Time:														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-Sep	2.6	Z	2.6	2.3	2.1	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.1	2.6	
2-Sep	2.3	2.4	Z	2.3	2.3	2.5	2.5	2.4	2.4	2.2	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.5
3-Sep	2.3	2.3	2.2	Z	2.2	2.2	2.2	2.5	2.4	2.5	2.3	2.3	2.3	2.1	2.2	2.1	2.2	2.5	2.5	2.3	2.1	2.3	2.6	2.3	2.6	
4-Sep	2.4	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	2.1	2.1	2.1	2.1	2.1	2.1	2.4	
5-Sep	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.3	2.5	2.1	2.1	2.5	
6-Sep	Z	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.2	2.2	2.2	2.1	2.0	2.1	2.1	2.1	2.2	2.4	2.4	2.4	
7-Sep	2.4	Z	2.4	2.3	2.3	2.2	2.2	2.2	2.1	2.1	2.2	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.2	2.4	
8-Sep	2.2	2.2	Z	2.1	2.1	2.1	2.2	2.1	2.1	2.3	2.2	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.3	
9-Sep	2.4	2.4	2.5	Z	2.4	2.5	2.5	2.2	2.5	2.4	2.4	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.3	2.5	
10-Sep	2.5	2.3	2.4	2.4	Z	2.2	2.2	2.1	2.4	2.3	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.3	2.1	2.5	2.2	2.5	
11-Sep	2.1	2.1	2.1	2.2	2.3	Z	2.5	2.4	2.3	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.1	2.2	2.1	2.5	2.5	
12-Sep	Z	2.7	2.6	2.9	2.5	2.2	2.6	2.1	2.1	2.1	2.2	2.4	2.1	2.1	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.2	2.1	2.9	
13-Sep	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	
14-Sep	2.1	2.1	Z	2.2	2.3	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.8	3.0	3.1	2.7	2.5	3.1	
15-Sep	2.3	2.1	2.1	Z	2.2	2.5	2.8	2.3	2.1	2.2	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.5	2.4	2.4	2.6	2.8	
16-Sep	2.4	2.3	2.3	2.5	Z	2.2	2.1	2.1	2.2	2.1	2.2	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.5	
17-Sep	2.2	3.5	2.7	2.4	2.2	Z	2.2	2.3	2.6	2.6	2.3	2.3	2.1	2.1	2.1	2.1	2.4	2.1	2.4	2.5	2.2	2.5	2.4	2.3	3.5	
18-Sep	Z	2.3	2.2	2.2	2.3	2.8	2.4	2.7	2.3	2.2	2.2	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.2	2.3	2.1	2.1	2.1	2.1	2.8	
19-Sep	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	2.1	2.2	2.6	2.4	2.3	2.6	
20-Sep	2.3	2.3	Z	2.2	2.2	2.1	2.1	2.1	2.6	2.8	2.2	2.1	2.1	2.1	2.1	M	M	2.1	2.1	2.1	2.2	2.1	2.2	2.2	2.8	
21-Sep	2.2	2.2	2.2	Z	2.7	2.6	2.5	2.7	2.5	2.3	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.7	
22-Sep	2.1	2.2	2.4	2.6	Z	2.9	2.7	2.6	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3	2.0	2.2	2.5	2.5	2.9	
23-Sep	2.6	2.8	2.3	2.3	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	2.2	2.0	2.0	2.1	2.0	2.0	2.8	
24-Sep	Z	2.1	2.2	2.2	2.1	2.3	2.2	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.3	
25-Sep	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	C	C	C	C	C	C	2.0	2.1	2.1	2.0	2.1	2.1	2.3	2.1	2.3	
26-Sep	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.3	2.3	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.3	2.1	2.5	2.4	2.1	2.5	
27-Sep	2.2	2.2	2.5	Z	2.3	2.4	2.7	2.3	2.1	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3	2.9	2.5	2.3	2.3	2.9	
28-Sep	2.3	2.5	2.5	2.5	Z	2.4	2.3	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.5	
29-Sep	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.1	2.0	2.2	
30-Sep	Z	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.1	2.4	2.3	2.3	2.3	2.4	
																								Diurnal Average		
																								Diurnal Maximum		
																								2.17		
																								3.5		
																								2.0		
																								2.17		
																								2.0		
																								2.1		
																								2.1		
																								2.2		
																								2.2		
																								2.4		
																								2.8		
																								99.7		
																								Z - zerspan		
																								C - Calibration		
																								M - Maintenance		





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Mildred Lake - September 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	185	27.13	27.13
2.1 - 3.0	495	72.58	99.71
3.1 - 10.0	2	0.29	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 682

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Methane (CH₄) - ppm
Mildred Lake - September 2023

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	3	4	2	0	4	3	17	24	34	20	32	15	5	4	14	3	184
2.1 - 3.0	42	6	2	6	11	12	63	96	59	43	38	24	29	30	8	23	492
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	45	10	4	6	15	15	80	121	93	63	70	39	35	34	22	26	678

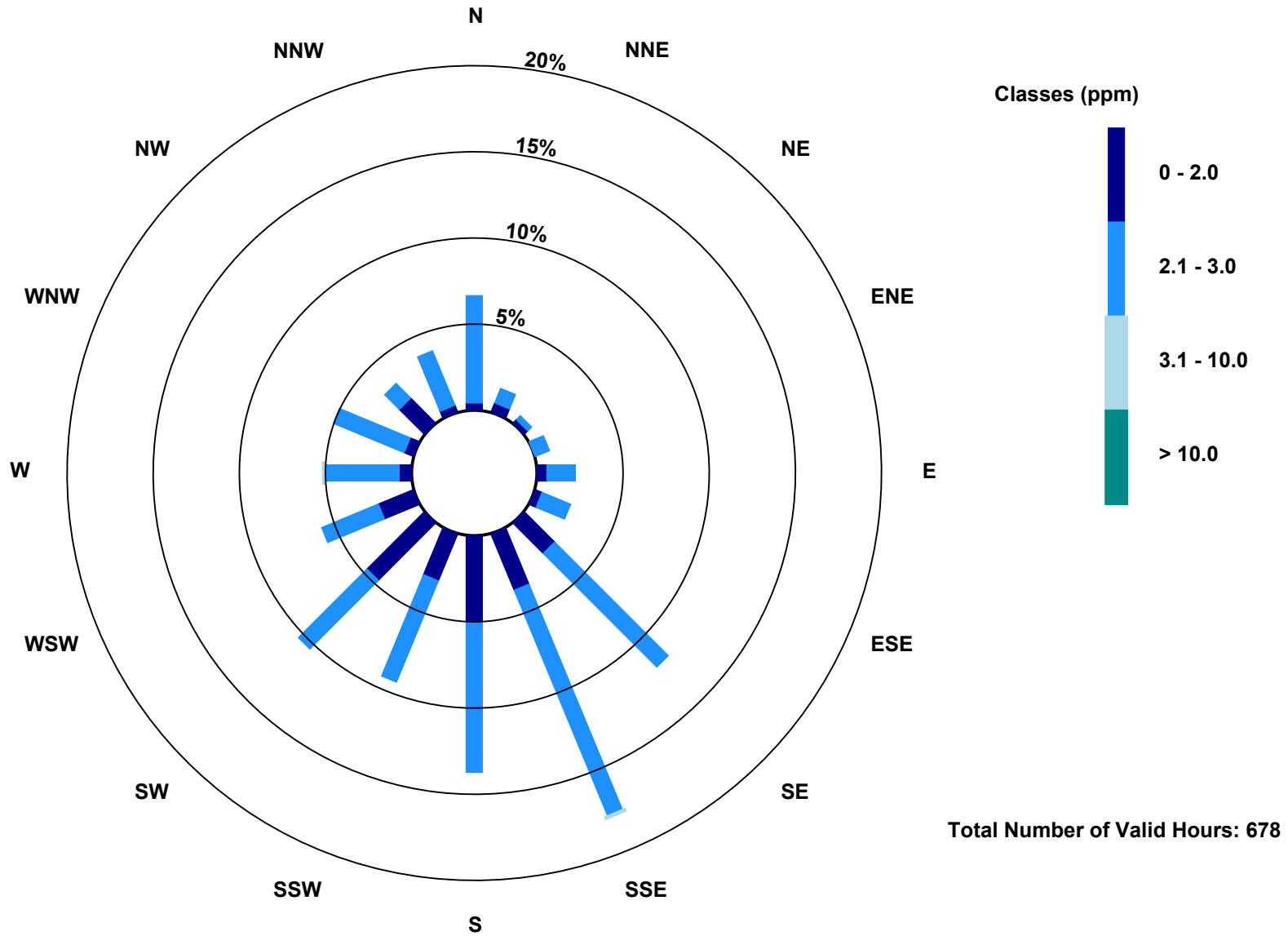
Total Number of Valid Hours: 678

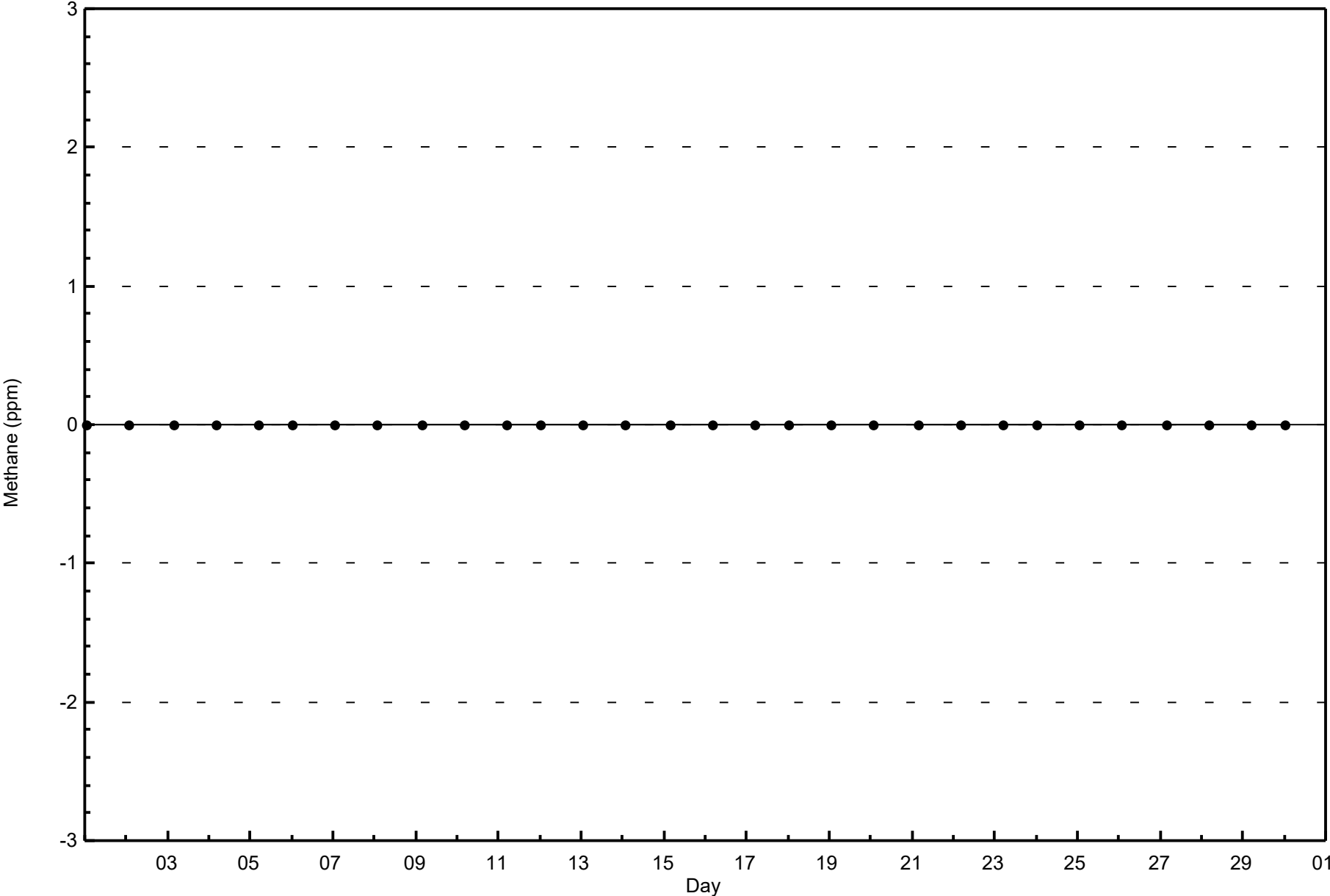
Total Number of Hours: 720

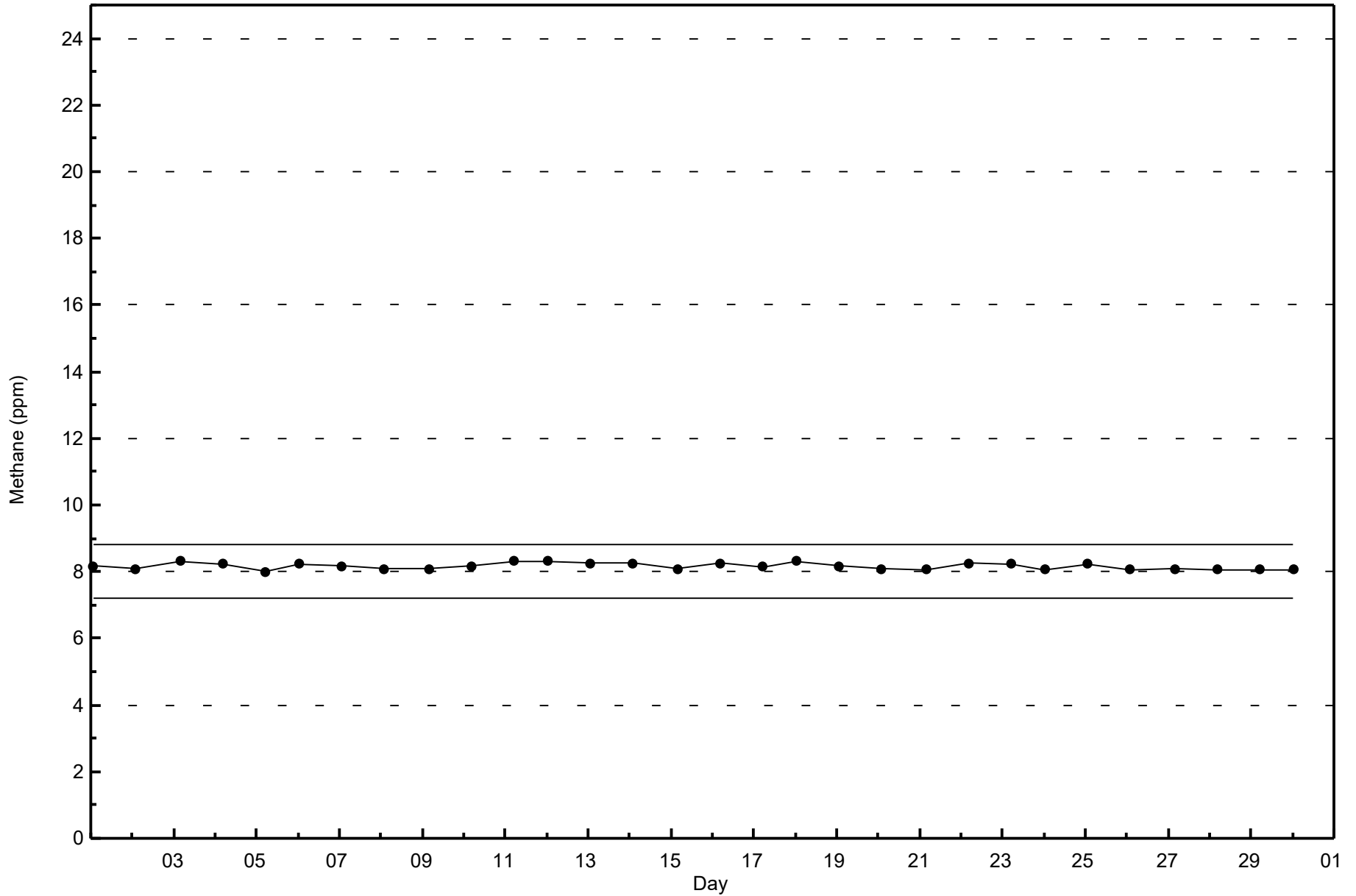


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Methane (CH₄) - ppm
Mildred Lake









Wood Buffalo Environmental Association
Summary of Hour Averages

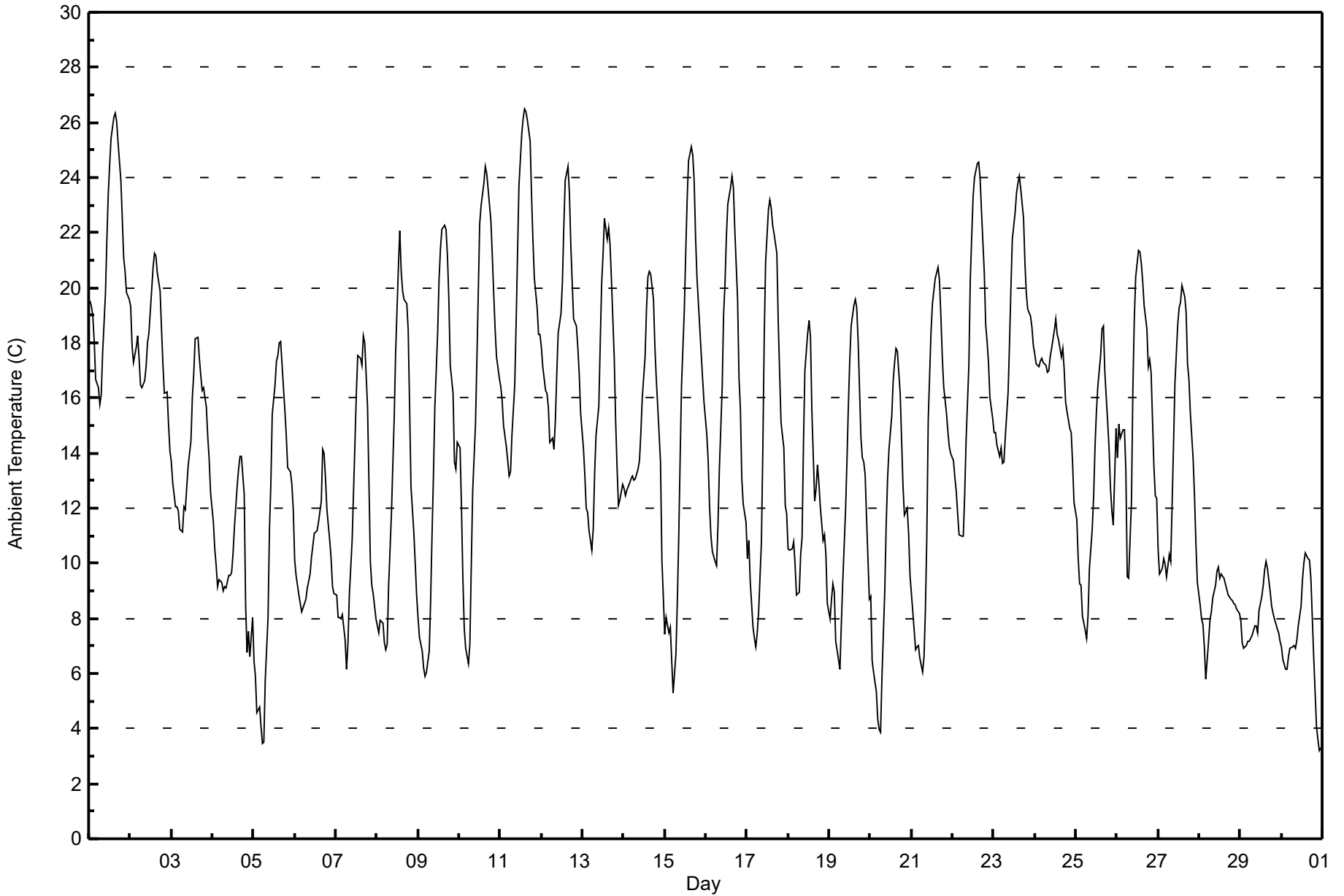
Ambient Temperature (AT) - C
Mildred Lake - September 2023

Maximum Value: 26.5 C on Sep 11 15:00 Maximum Daily Average: 21.0 C on Sep 1																						Hours in Service: 720 Hours of Data: 720																											
Minimum Value: 3.2 C on Sep 30 23:00 Minimum Daily Average: 7.2 C on Sep 30 Maximum Diurnal Average: 19.4 C at hour 16 Minimum Diurnal Average: 9.5 C at hour 7 Monthly Average: 14.15 C Percentiles: P ₁ = 4.1 P ₁₀ = 7.4 Q ₁ = 9.5 Median = 13.8 Q ₃ = 18.1 P ₉₀ = 21.3 P ₉₉ = 25.6																						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-Sep	19.5	19.3	19.0	18.0	16.7	16.4	15.8	16.1	17.7	19.8	21.7	23.4	24.5	25.4	26.2	26.3	26.0	25.3	23.9	22.5	21.1	20.6	19.8	19.6	21.0	26.3																							
2-Sep	19.3	17.9	17.3	17.8	18.2	17.4	16.5	16.4	16.6	17.2	18.0	18.3	19.9	20.7	21.2	21.1	20.5	19.9	18.5	17.2	16.1	16.2	15.0	14.1	18.0	21.2																							
3-Sep	13.7	12.9	12.0	12.1	11.9	11.2	11.2	12.1	11.9	12.8	13.5	14.4	16.0	16.9	18.2	18.2	17.5	16.8	16.3	16.4	15.7	14.6	13.8	12.5	14.3	18.2																							
4-Sep	11.5	10.5	9.9	9.1	9.4	9.3	9.0	9.1	9.1	9.5	9.5	9.7	10.3	11.3	12.8	13.4	13.9	13.9	12.5	8.5	6.8	7.5	6.6	8.0	10.1	13.9																							
5-Sep	6.4	5.9	4.6	4.8	4.1	3.5	3.5	3.5	5.7	8.1	11.2	12.9	15.4	16.5	17.4	17.5	18.0	16.4	15.6	14.6	13.5	13.3	12.8	11.9	11.3	18.0																							
6-Sep	10.1	9.6	8.8	8.5	8.2	8.4	8.7	9.1	9.3	9.6	10.2	11.1	11.1	11.2	11.5	12.3	14.1	14.0	13.0	12.0	10.8	10.2	9.2	8.9	10.4	14.1																							
7-Sep	8.8	8.0	8.0	8.0	8.2	7.2	6.2	7.1	8.8	10.8	12.6	14.3	16.2	17.6	17.5	17.2	18.3	18.0	15.6	12.9	10.0	9.2	8.9	8.0	11.6	18.3																							
8-Sep	7.7	7.5	7.9	7.8	7.1	6.9	7.0	9.2	11.8	13.5	15.3	17.6	20.7	22.1	20.6	19.9	19.6	19.4	18.5	15.7	12.7	11.1	10.0	8.8	13.3	22.1																							
9-Sep	8.0	7.3	6.8	6.2	5.9	6.0	6.8	8.7	11.0	13.2	15.6	18.4	20.3	21.4	22.1	22.3	22.1	21.1	19.6	17.2	16.2	13.7	13.4	14.4	14.1	22.3																							
10-Sep	14.2	12.0	9.4	7.6	6.9	6.3	7.1	9.9	12.6	15.1	17.4	19.8	22.3	23.0	23.8	24.4	24.1	23.6	22.4	21.2	19.8	18.5	17.5	16.7	16.5	24.4																							
11-Sep	16.4	15.9	15.0	14.2	13.7	13.1	13.3	14.7	16.5	18.7	21.3	23.7	25.6	26.1	26.5	26.4	26.1	25.3	23.4	21.7	20.3	19.2	18.3	18.3	19.7	26.5																							
12-Sep	17.8	17.1	16.3	16.2	15.6	14.4	14.6	14.2	15.2	16.9	18.4	19.1	20.2	22.2	23.9	24.4	23.4	21.5	20.2	18.9	18.6	17.9	16.9	15.4	18.3	24.4																							
13-Sep	14.2	13.2	12.0	11.8	11.2	10.5	11.2	13.3	14.6	15.7	18.0	20.2	21.2	22.5	21.8	22.2	21.5	20.3	17.5	15.1	13.5	12.1	12.3	12.9	15.8	22.5																							
14-Sep	12.7	12.4	12.7	12.9	13.1	13.2	13.0	13.1	13.4	13.7	14.7	16.0	17.5	19.2	20.4	20.6	20.5	19.6	17.8	16.7	15.7	13.7	10.1	8.8	15.1	20.6																							
15-Sep	7.4	8.0	7.5	7.7	6.4	5.3	6.7	8.6	10.9	13.8	16.5	19.2	21.3	23.2	24.6	25.1	24.8	23.9	21.8	20.4	18.6	17.7	16.7	15.9	15.5	25.1																							
16-Sep	14.7	13.7	12.1	11.0	10.4	10.1	9.9	11.4	13.4	16.4	19.0	20.1	21.9	23.0	23.6	24.0	23.6	22.1	19.6	16.8	15.6	13.1	12.2	11.5	16.2	24.0																							
17-Sep	10.2	10.8	9.4	7.7	7.3	6.9	7.5	8.2	10.8	14.1	18.2	20.9	22.8	23.2	22.9	22.3	22.0	21.3	18.8	16.9	15.1	14.2	12.1	11.8	14.8	23.2																							
18-Sep	10.5	10.5	10.5	10.8	9.9	8.9	8.9	10.3	10.9	14.3	17.0	18.4	18.8	18.2	15.5	12.3	12.7	13.6	12.9	12.1	10.8	11.0	10.3	8.5	12.4	18.8																							
19-Sep	8.0	8.7	9.2	8.9	7.2	6.5	6.2	7.8	9.3	11.9	13.7	15.6	17.3	18.6	19.4	19.6	19.3	18.1	14.6	13.8	13.7	13.2	11.7	8.7	12.5	19.6																							
20-Sep	8.8	6.5	6.0	5.3	4.3	3.9	3.9	5.9	9.0	11.4	13.1	14.1	15.3	16.6	17.3	17.8	17.7	16.2	14.5	12.8	11.7	12.0	11.1	9.5	11.0	17.8																							
21-Sep	8.9	8.2	6.8	6.9	7.0	6.6	6.1	6.6	8.3	11.0	15.2	18.4	19.4	19.9	20.3	20.8	20.3	19.0	17.5	16.4	15.5	14.8	14.2	14.0	13.4	20.8																							
22-Sep	13.7	13.1	12.6	11.8	11.0	11.0	11.0	12.4	14.4	17.2	20.3	21.8	23.3	24.0	24.5	24.6	24.0	22.8	20.5	18.7	18.0	17.3	16.0	15.2	17.5	24.6																							
23-Sep	14.7	14.7	14.3	13.9	14.2	13.6	13.7	14.6	16.2	18.0	20.0	21.8	22.7	23.4	23.8	24.1	23.6	22.5	20.9	19.8	19.2	19.0	18.6	17.9	18.5	24.1																							
24-Sep	17.6	17.3	17.1	17.3	17.4	17.3	17.2	16.9	17.0	17.5	17.8	18.4	18.8	18.3	18.1	17.5	17.8	17.0	15.9	15.5	14.9	14.7	13.6	12.2	16.8	18.8																							
25-Sep	11.6	10.2	9.3	9.2	8.1	7.6	7.3	8.1	9.8	11.2	12.4	14.3	15.5	16.4	17.6	18.5	18.6	16.9	15.2	14.2	12.8	11.9	11.4	14.9	12.6	18.6																							
26-Sep	13.8	15.0	14.5	14.9	14.8	13.4	9.5	9.5	12.3	16.3	18.8	20.4	21.3	21.3	20.9	20.3	19.4	18.5	17.1	17.4	17.0	13.5	12.5	12.3	16.0	21.3																							
27-Sep	10.5	9.6	9.8	10.2	9.9	9.5	10.3	10.0	12.1	14.3	16.5	18.7	19.3	19.5	20.1	19.7	19.1	17.2	16.7	15.5	13.8	12.4	10.7	9.3	13.9	20.1																							
28-Sep	8.5	8.0	7.8	7.0	5.8	7.2	7.9	8.2	8.8	9.2	9.7	9.9	9.5	9.6	9.5	9.2	9.1	8.8	8.7	8.6	8.5	8.5	8.4	8.2	8.5	9.9																							
29-Sep	7.9	7.1	6.9	7.0	7.2	7.2	7.3	7.4	7.7	7.7	7.5	8.3	8.8	9.2	9.8	10.1	9.8	8.9	8.5	8.2	8.0	7.6	7.5	7.2	8.0	10.1																							
30-Sep	7.0	6.5	6.2	6.2	6.6	6.9	7.0	7.0	6.9	7.2	7.7	8.5	9.4	10.0	10.3	10.2	10.1	9.5	8.0	6.6	4.1	3.6	3.2	3.3	7.2	10.3																							
																								11.8	11.3	10.7	10.4	9.9	9.5	9.5	10.4	11.8	13.6	15.4	17.0	18.3	19.1	19.4	19.4	19.3	18.4	16.9	15.5	14.3	13.4	12.5	12.0	Diurnal Average	
																								19.5	19.3	19.0	18.0	18.2	17.4	17.2	16.9	17.7	19.8	21.7	23.7	25.6	26.1	26.5	26.4	26.1	25.3	23.9	22.5	21.1	20.6	19.8	19.6	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	200	27.78	27.78
10 - 20	411	57.08	84.86
> 20	109	15.14	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720

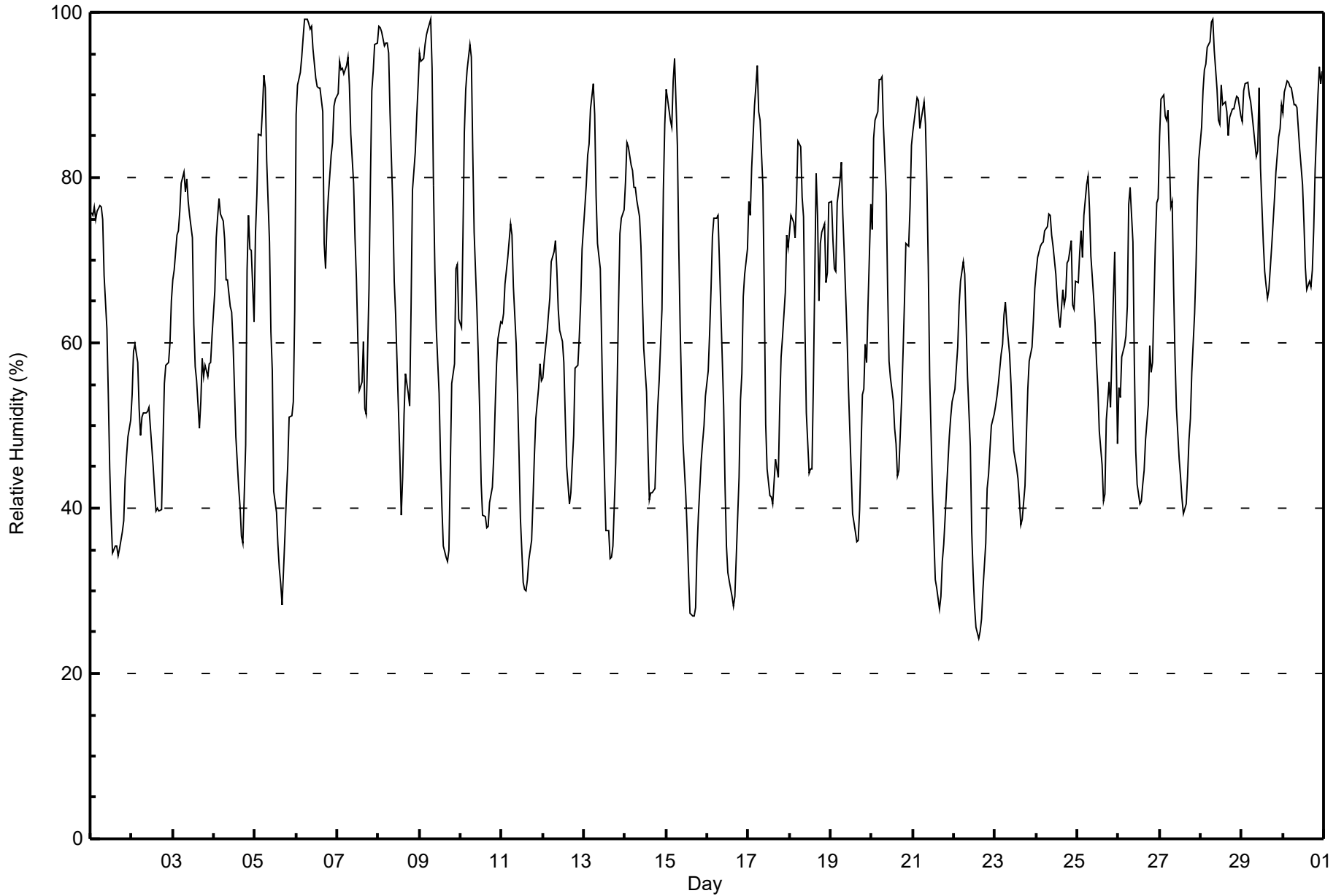


Wood Buffalo Environmental Association

Summary of Hour Averages

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

Table with columns: Day, Hourly Period Ending At (MST) [1-24], Daily Average, Daily Maximum. Includes summary statistics: Maximum Value: 99.2% on Sep 28 08:00, Minimum Value: 24.2% on Sep 22 15:00, etc.





Maximum Speed: 25 km/h on Sep 21 14:00	Maximum Daily Speed Average: 17.3 km/h on Sep 23	Hours in Service: 720
Minimum Speed Value: 0 km/h on Sep 9 01:00	Minimum Daily Speed Average: 0.6 km/h on Sep 25	Hours of Data: 716
Maximum Diurnal Speed Average: 6.5 km/h at hour 13	Minimum Diurnal Speed Average: 3.0 km/h at hour 1	Hours of Missing Data: 4
Monthly Average Velocity: 4.3 km/h 189.0 deg	Percentiles: $P_1 = 1$ $P_{10} = 4$ $Q_1 = 6$ Median = 8 $Q_3 = 12$ $P_{90} = 16$ $P_{99} = 23$	Percent Operational Time: 99.4

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-Sep	WNW7	NW6	W7	W9	WSW7	W9WSW10	SW8	SW9	SW10	SW12	SW17	SW17	SW18	SW18	SW19	SW20	SW19	SW17	SW14	SW12WSW13WSW11	WSW9				SW11.7	SW20
2-Sep	WNW8	SSW6	SW8	W11WNW11WNW10	WNW7	WNW9WNW13	W12	W10	W9	W12	W12	W13WSW13	W18	W12	WSW8	W8	WSW8	W11WSW10	W7					W9.7	W18	
3-Sep	W10	SW7	SSW8	SSW6	SSW8	S9	S7	SSE5	SSE8	SSE11	S9	S6	WSW7	W5	SSW9	NNW8	N6	WNW3	WNW5WNW10	NW14	NW11WNW12WNW11			WSW3.8	NW14	
4-Sep	WNW11WNW11	W13	W12	W12	NW15	NW15	NW19	NW17	NW16	NW13	NW14	NW13WNW10	WNW9	NW8	NNW7	NE1	SSE2	SSW3	SSW5	SSW5	SW8			WNW9.2	NW19	
5-Sep	SW7	SSW4	SSE6	S8	SSE7	SSE9	S8	SSE9	SSE9	SSE7	SE9	S10	S11	SSE10	SSE11	SSE11	S12	S8	SSE12	SSE10	SSE6	SSE8	SSE8	SSW4	SSE8.2	S12
6-Sep	ENE4	ENE5	ENE7	E8	E7	E7	ESE6	ESE7	ESE6	SE6	S10	SSW6	N4	ENE4	ENE5	E4	SSW9	SW10	WSW7	WSW7	SW4	W5	SSW4	WSW5	SE2.2	S10
7-Sep	WSW6	SW5	WSW5	WSW5	WSW5	SW6	SW7	SW6	SW7	SSE6	SSE8	SSE8	SSE8	SSE8	SE7	ENE7	SE1	SSE5	S5	SSE2	SE3	S1	SSW4	SSW2	S3.8	SSE8
8-Sep	S2	ESE1	S5	S8	S8	S8	S8	S8	S8	SSE9	SSE11	SSE10	SSW8	W5	NNW7	NNE7	N6	NNE7	NNE7	N5	N4	N5	N4	WNW1	SSE1.7	SSE11
9-Sep	SE0	UO	UO	NNE1	UO	S3	S5	S5	SSE9	SSE10	SSE9	SSE8	SSE9	SE8	SSE7	SE6	ESE5	ESE6	E4	E7	ESE6	ESE5	SE6	SE10	SE5.5	SSE10
10-Sep	SSE9	SE5	WSW2	SSW3	SSE1	SE2	SE2	S6	SSE7	SE12	SSE11	SSE10	SE12	SSE13	SE13	SE14	SE15	SE15	SE15	SE17	SE18	SE17	SSE15	SE14	SSE10.2	SE18
11-Sep	SE17	SE18	SE15	SE13	SE15	SE13	SSE15	SE16	SSE18	SSE18	SSE18	SSE22	S25	S25	S24	SSE23	S19	S17	SSE12	SE11	SE11	SE10	SE12	SSE14	SSE16.3	S25
12-Sep	SE12	SE11	SE9	SE11	SSE9	SSE6	SSE10	SSE10	SSE10	SSE8	SE7	SE10	SSE9	S8	S9	SSW9	SW9	WSW8	WSW8	SW8	WSW9	SW7	SSW8	SW6	S7.0	SE12
13-Sep	SW6	SSW5	SSW5	SSW6	S7	S7	SSW7	SSW8	SW11	SW12	SW14	SW13	SW17	SW19WSW18WSW19WSW16WSW20	W20WSW16WSW15	SW14	SW11	W13						SW11.8	WSW20	
14-Sep	W14	W12WNW11WNW11WNW10WNW12WNW11WNW12WNW13WNW13WNW13	NW15	NW13	NW15	NW17WNW16WNW14	NW11	NW8	WNW9	WNW9	W4	SE1	SSW3	WNW10.6	NW17										WNW10.6	NW17
15-Sep	SSE4	S5	S6	S7	SSE6	SSE4	SSE7	SSE10	SSE10	SE10	SE12	SE14	SE15	SSE15	SSE16	S16	SSE17	S16	SSE13	SSE14	SSE12	SE14	SE14	SSE14	SSE11.0	SSE17
16-Sep	SE10	SE8	S6	S7	S6	SSW6	S7	S8	SSW5	SW6	W4	WNW6	SW7	SSW10	SW11	SW9	SW7	S6	S8	S7	SSW6	SW2	S6	S5	SSW5.7	SW11
17-Sep	SSE7	SSE9	S5	S3	S4	SSE4	S6	E0	SSE2	ESE6	SSE13	SSE8	S12	SSW11	SW12	SSW9	SSW8	SW11	SSW9	SW6	SW5	SW6	S4	S4	S5.9	SSE13
18-Sep	SE3	S5	S5	S7	S7	S8	SSE7	SSE9	S9	SSW8WSW10	W14WSW16	W15WSW15	SSW8	SW12	SW11	SSE7	S10	S8	SW10	SSW6	SSE5				SSW7.1	WSW16
19-Sep	SSE7	S8	SW8	SSW9	S7	S7	S7	SSE8	S10	SSW10	SW9	SSW10	SSW11	SSW11	SSW10	SSW9	S9	S8	NW2	SSW3	SW4	WNW6	NNW7	NW4	SSW6.1	SSW11
20-Sep	WNW5	NW3	NNE3	N4	N2	NNW2	N2	ENE1	N1	NNW3	N5	N7	NNW8	N8	N8	NNE7	N6	NNW5	NNW7	NNW3	E4	SSE4	S2	S4	N3.2	N8
21-Sep	S5	SSW6	S5	SSE8	SSE9	SSE9	SSE8	SSE10	SE10	SE11	SSE9	SSW20	SSW23	SSW25	SSW23	SSW20	SSW20	S16	S14	S15	SSE14	S16	SSE15	S12	S12.8	SSW25
22-Sep	SSE12	SE12	SE10	SE7	SE8	SE9	SE9	SE11	SSE13	SSE13	S17	S19	S18	S19	S19	S18	S18	SSE17	SSE12	SSE10	SSE12	SSE14	SSE13	SE14	SSE12.9	S19
23-Sep	SE14	SE13	SE12	SE12	SE14	SE13	SE13	SE14	SE16	SE19	SE20	SE22	SE24	SSE24	SE24	SSE23	SSE21	SSE17	SSE16	SE15	SE16	SE19	SE17	SE18	SE17.3	SE24
24-Sep	SE21	SE19	SSE20	SSE16	SSE17	SE16	SSE13	SSE13	SSE13	SSE11	SE10	SW9	SW11	WSW7	SW4	SSW4	S8	S3	S7	SW5	W7	WSW6	SW6		S9.1	SE21
25-Sep	SW8	SW6	SW8	SW8	SW6	SSW7	SW6	SSW7	SW7	W3	NNW4	ESE4	E3	ENE6	NNE6	NNE7	NNE9	NNE9	NNE8	NE6	NNE7	N7	N5	E12	N0.6	E12
26-Sep	E6	E9	ESE7	ESE11	ESE9	E4	N5	N1	SE5	SSE8	S10	S10	S11	SSW7	S6	S6	WSW6	SW3	SE3	ESE7	WSW4	WSW2	S4	SSE3	SSE3.9	S11
27-Sep	SSW2	SSW3	W3	SW4	WSW3	WNW6	SW5	S4	S5	S6	SSW6	WSW9	SW9	W10	SW9	SW10	WSW8	WSW6	W2	WNW3	NNW5	NNW4	NW6	WSW4.2	SW10	
28-Sep	NW5	N3	W0	NNW2	NNW2	N5	NE5	NE6	NNE5	N8	N9	N10	N10	N10	N10	N14	N13	N10	N8	N7	N7	N8	N10	NNW10	N7.1	N14
29-Sep	N12	N10	N8	NNW9	NNW7	NNW6	NNW6	NNW5	NNW8	NNW9	NNW10	N10	N12	N12	NNW10	NNW12	N10	NNE8	N6	N5	N8	N8	N6	NNE2	NNW8.0	N12
30-Sep	SE2	UO	E2	E3	S4	SSW4	SSW3	S4	SSW4	S6	S7	S6	S6	SSE5	ESE6	E8	SE7	S7	SSE7	SSE6	ESE4	SE5	ESE4	SE4	SSE4.2	E8

S3.0	S3.9	S3.7	S3.6	S4.1	S3.6	S3.6	S4.2	S4.7	S4.9	S5.4	S5.7	SSW6.5	SSW6.2	SSW6.0	SSW4.8	SSW5.1	SSW4.9	SSW3.6	S3.8	SSW3.2	SSW3.2	S3.4	S3.6			Diurnal Average
SE21	SE19	SSE20	SSE16	SSE16	SSE17	SSE16	NW19	SSE18	SE19	SE20	SE22	SSE25	SSW25	S24	SSE23	SSE21	WSW20	W20	SE17	SE18	SE19	SE17	SE18			Diurnal Maximum

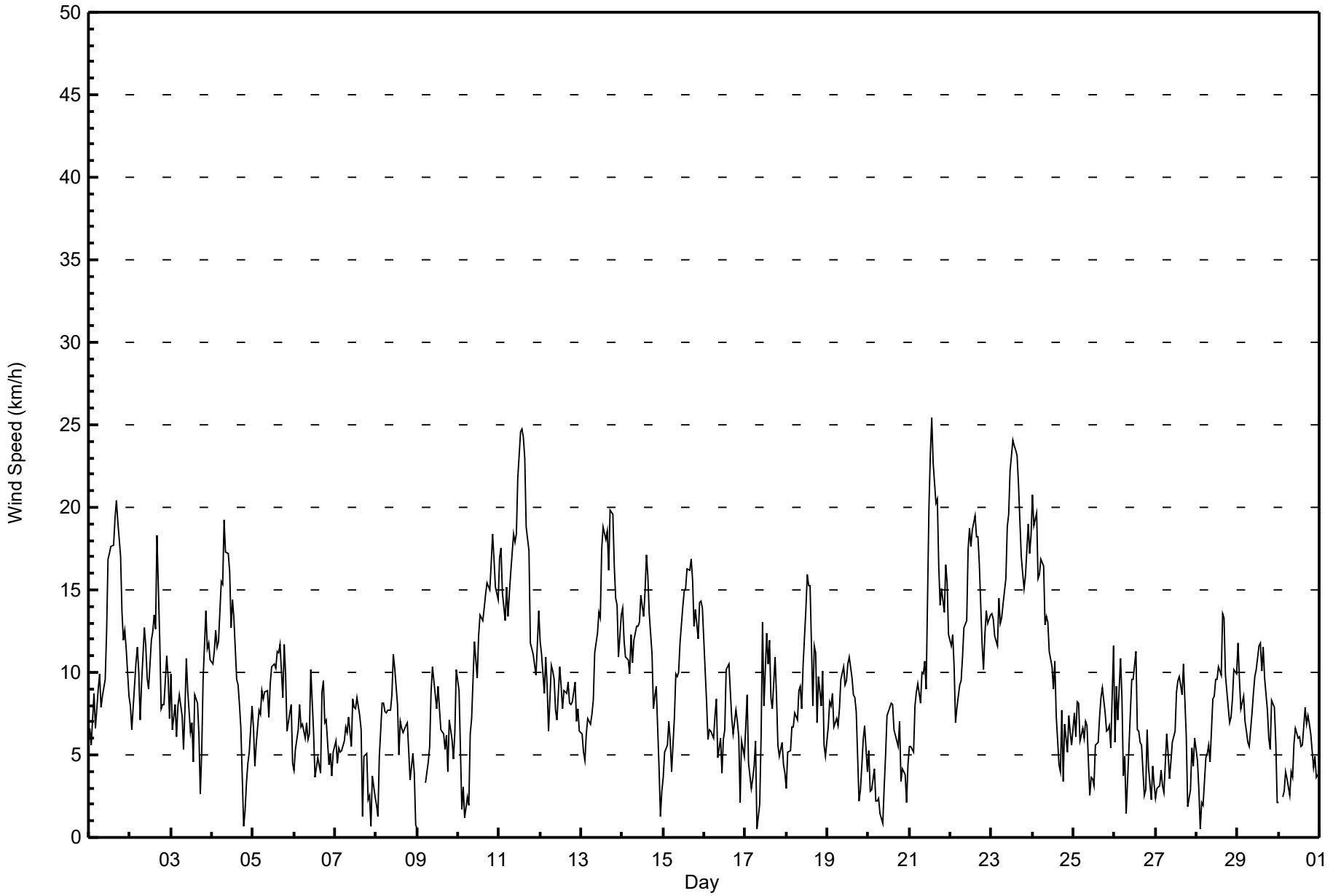
UO - Unstable Operation
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Sep 1 17:00 Minimum Value: 1 km/h on Sep 8 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: 720 Hours of Data: 716 Hours of Missing Data: 4 Hours of Calibration: 0 Percent Operational Time: 99.4								
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Sep	2	2	2	3	2	4	3	3	3	3	4	5	5	6	6	6	7	6	6	4	4	4	3	3	7
2-Sep	3	2	2	4	4	3	2	3	4	4	4	4	4	5	4	5	5	5	3	3	3	4	3	3	5
3-Sep	3	2	2	2	2	2	2	2	3	4	3	2	4	3	3	3	2	1	2	4	3	3	3	4	
4-Sep	3	4	5	4	4	4	3	4	4	4	4	3	4	4	4	3	3	3	2	1	1	1	2	3	5
5-Sep	2	2	2	2	2	2	2	2	2	2	2	4	3	3	3	3	3	3	3	2	2	2	2	3	4
6-Sep	2	2	1	2	1	1	1	2	2	2	2	3	1	1	1	2	3	3	3	3	2	2	2	2	3
7-Sep	2	1	2	2	2	1	2	2	3	2	2	2	2	2	2	1	2	2	1	2	1	1	1	1	3
8-Sep	2	1	3	2	1	1	1	1	2	2	2	2	3	3	2	2	1	2	2	1	2	1	1	1	3
9-Sep	1	UO	UO	1	UO	1	1	1	2	2	2	2	2	2	2	2	2	1	1	1	1	2	1	3	3
10-Sep	2	1	1	1	2	1	1	2	2	3	2	3	5	4	3	3	4	3	3	3	4	3	3	3	5
11-Sep	3	3	3	3	3	3	3	3	4	4	5	5	6	6	6	6	5	5	3	2	2	2	2	2	6
12-Sep	2	2	2	1	2	1	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	2	2	3
13-Sep	2	2	2	2	2	1	2	3	4	4	4	4	6	6	7	6	5	7	7	6	5	4	4	5	7
14-Sep	4	4	3	3	3	4	3	3	4	4	4	4	4	6	5	4	5	3	2	2	2	2	1	2	6
15-Sep	1	1	1	1	2	2	2	3	3	2	3	3	3	3	4	4	4	4	3	3	3	2	3	2	4
16-Sep	3	2	2	2	1	2	2	2	2	2	2	2	3	3	3	4	2	1	2	1	1	2	2	2	4
17-Sep	2	2	1	2	2	2	2	2	1	2	4	2	4	4	4	3	2	4	2	2	2	2	2	1	4
18-Sep	1	1	2	2	2	2	1	2	2	3	4	5	5	6	6	2	4	3	1	2	2	4	2	2	6
19-Sep	2	3	3	3	2	1	2	2	2	3	3	3	3	3	3	2	2	2	1	2	2	1	2	1	3
20-Sep	1	1	1	1	2	1	1	1	1	1	1	2	3	3	2	2	2	1	2	2	1	2	1	1	3
21-Sep	1	1	2	1	2	2	2	2	2	3	4	6	7	7	7	6	5	5	2	3	3	3	3	3	7
22-Sep	2	2	2	2	2	1	2	2	3	3	5	5	5	5	4	5	4	4	3	2	2	3	2	2	5
23-Sep	3	2	3	3	3	3	3	3	4	4	4	5	6	6	5	5	5	4	3	3	3	4	4	4	6
24-Sep	5	4	4	3	3	3	3	3	3	3	3	2	3	4	2	2	2	2	2	2	2	2	3	2	5
25-Sep	3	2	2	2	2	2	2	3	3	2	2	2	2	2	2	2	2	2	2	2	2	1	2	4	4
26-Sep	3	3	2	3	3	3	2	1	2	3	3	4	3	2	2	2	2	2	2	4	2	1	2	2	4
27-Sep	1	1	2	2	2	2	2	1	1	1	2	2	4	4	3	3	4	3	2	1	2	3	1	1	4
28-Sep	1	1	2	1	1	1	1	2	1	3	2	3	2	2	3	3	3	3	2	2	1	2	2	2	3
29-Sep	3	2	2	2	1	1	1	1	1	2	3	2	3	3	2	2	2	2	1	1	2	2	1	2	3
30-Sep	2	UO	1	1	1	1	1	1	2	2	1	2	1	2	1	2	2	1	1	1	1	1	1	2	2
Diurnal Maximum																								5	
UO - Unstable Operation																									





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	160	22.35	22.35
6 - 11	365	50.98	73.32
12 - 19	168	23.46	96.79
20 - 28	23	3.21	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 716

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

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

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	16	4	2	5	8	6	13	15	24	20	11	8	9	5	4	10	160
6 - 11	25	11	2	3	7	11	27	65	56	37	44	21	12	21	5	18	365
12 - 19	5	0	0	0	1	0	42	38	15	2	18	9	14	9	14	1	168
20 - 28	0	0	0	0	0	0	5	7	2	6	1	1	1	0	0	0	23
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	46	15	4	8	16	17	87	125	97	65	74	39	36	35	23	29	716

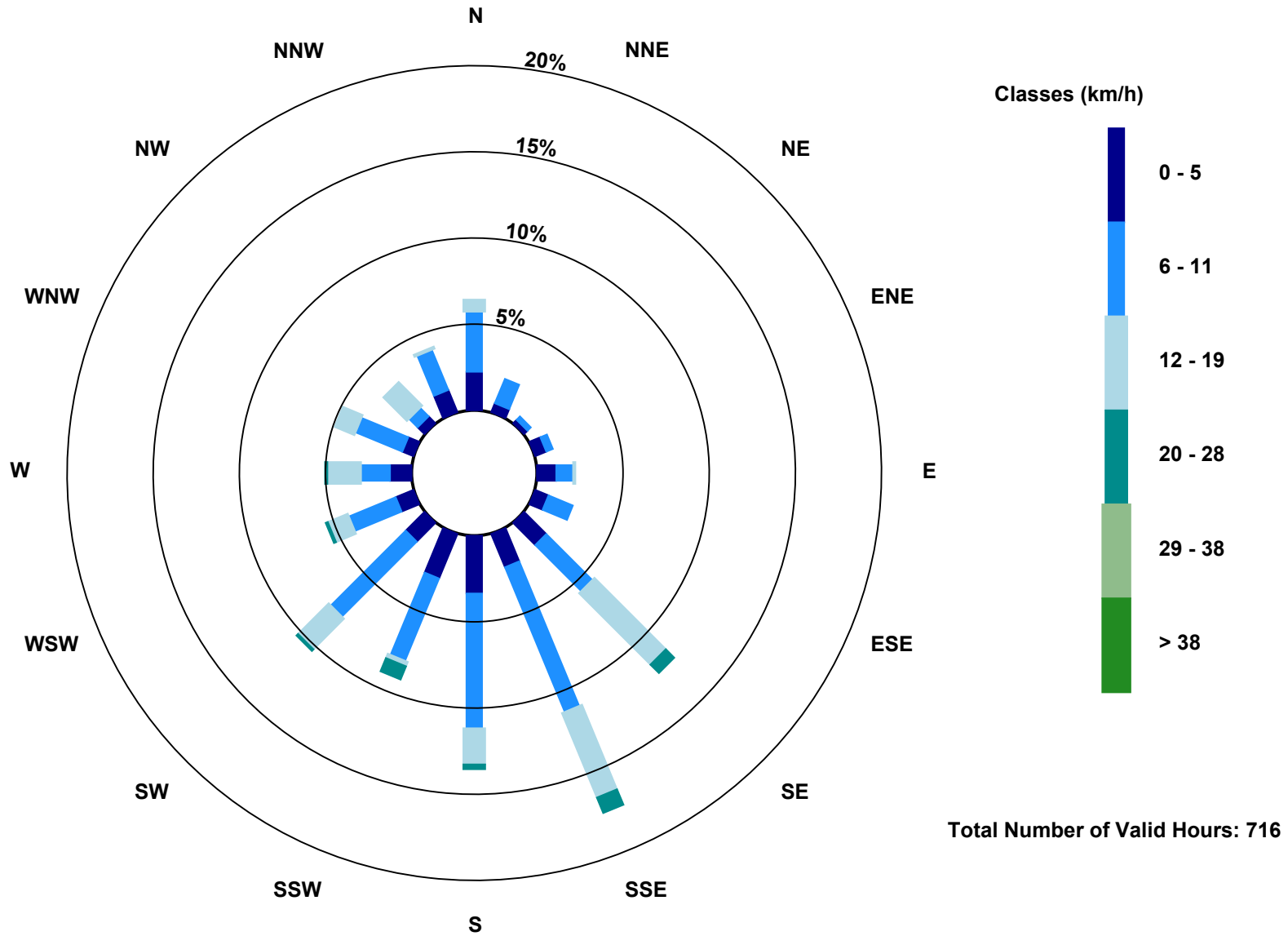
Total Number of Valid Hours: 716

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

Wind Speed (WS) - km/h
Mildred Lake





Wood Buffalo Environmental Association
Summary of Hour Averages

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

Direction of Maximum Speed: 193 deg on Sep 21 14:00		Hours in Service:	720
Direction of Maximum Daily Speed Average: 144.4 deg on Sep 23		Hours of Data:	716
Direction of Minimum Speed: 129 deg on Sep 9 01:00		Hours of Missing Data:	4
Direction of Minimum Daily Speed Average: 0.6 deg on Sep 25		Percent Operational Time:	99.4
Monthly Average Direction: 189.0 deg			

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Sep	295	311	268	267	248	261	250	233	236	220	220	226	228	226	221	221	222	229	229	233	229	237	240	246	234.7
2-Sep	290	208	220	276	282	296	297	300	283	279	262	276	271	265	267	254	270	280	251	266	252	275	255	265	270.1
3-Sep	271	227	205	205	209	185	173	158	168	151	169	172	249	274	193	330	355	292	290	289	320	317	302	302	245.7
4-Sep	295	283	276	279	281	307	319	322	325	316	315	326	310	312	296	293	319	330	46	161	206	206	213	228	301.8
5-Sep	226	199	156	173	164	165	170	168	152	161	132	182	171	160	161	168	172	182	161	166	157	163	167	208	168.0
6-Sep	70	61	74	83	89	100	102	108	109	127	176	196	350	59	76	80	209	227	250	239	231	259	201	250	142.6
7-Sep	248	223	247	238	239	223	228	232	229	162	154	152	154	153	136	76	139	160	175	154	142	176	194	197	186.5
8-Sep	186	110	176	186	180	182	180	182	183	164	150	149	192	266	338	14	11	20	15	7	3	355	355	297	166.1
9-Sep	129	UO	UO	24	UO	191	180	184	164	163	147	154	153	145	147	129	117	102	99	93	105	109	139	145	141.1
10-Sep	156	141	240	204	159	129	135	182	157	146	149	147	144	152	141	144	145	138	138	139	141	145	148	141	146.3
11-Sep	141	142	138	138	140	143	147	146	148	150	152	154	169	170	172	168	172	178	157	141	141	144	142	149	154.0
12-Sep	143	146	145	146	152	160	154	166	165	154	132	144	151	173	185	194	231	249	251	231	239	227	213	218	177.4
13-Sep	233	213	208	201	187	173	198	207	220	223	226	216	234	235	238	242	251	245	260	247	241	227	235	267	233.0
14-Sep	275	279	285	297	293	294	294	295	291	303	298	304	314	313	308	302	299	310	308	293	297	275	139	192	297.0
15-Sep	165	189	184	181	151	158	164	153	162	142	137	142	144	154	166	169	167	171	162	159	155	146	143	147	157.0
16-Sep	136	145	188	170	174	195	186	188	203	229	270	303	218	212	221	228	220	176	178	189	194	235	171	169	195.0
17-Sep	153	156	183	187	181	148	179	90	151	121	150	150	180	202	221	198	203	221	206	227	222	219	173	184	185.5
18-Sep	142	181	186	191	170	179	165	167	174	207	253	273	248	261	245	195	220	219	160	171	191	228	199	156	210.4
19-Sep	164	183	214	204	175	171	171	158	178	211	216	212	201	205	202	202	189	177	315	208	226	288	328	311	200.2
20-Sep	302	313	15	357	359	338	5	73	360	344	10	351	336	352	357	14	5	346	347	328	83	156	182	183	353.8
21-Sep	169	195	178	158	157	157	152	149	139	134	157	193	193	193	200	203	196	190	175	169	167	172	168	171	177.9
22-Sep	152	146	144	135	138	142	144	142	148	153	183	191	191	181	181	177	171	167	163	159	168	160	152	145	163.8
23-Sep	145	144	141	145	142	137	140	138	136	143	142	145	145	152	146	149	151	154	150	142	144	144	138	139	144.4
24-Sep	142	140	149	158	159	149	146	149	152	165	165	167	217	227	240	215	203	177	177	177	227	260	251	232	169.0
25-Sep	230	219	227	236	218	195	229	213	218	260	344	122	93	60	32	24	26	15	26	46	15	3	11	98	8.1
26-Sep	81	98	109	120	113	90	356	9	131	167	181	174	185	194	185	191	237	224	127	115	258	244	181	164	153.7
27-Sep	192	207	272	234	216	238	283	215	188	183	186	209	245	236	267	233	235	245	252	272	303	340	334	326	244.2
28-Sep	316	351	262	336	346	10	35	50	18	358	6	2	353	357	9	2	9	10	5	1	358	350	350	347	1.3
29-Sep	351	351	349	347	341	327	330	328	328	342	347	349	352	350	335	334	351	12	3	6	1	357	8	19	347.9
30-Sep	140	UO	85	94	172	196	199	186	193	180	179	181	174	165	119	89	134	169	161	154	122	125	114	143	152.8

182.1	171.3	183.9	186.2	177.8	179.7	180.4	176.5	178.2	175.6	178.7	187.7	200.5	203.8	204.2	198.9	206.0	203.6	192.9	183.5	192.7	200.6	182.9	180.4
Diurnal Average																							

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

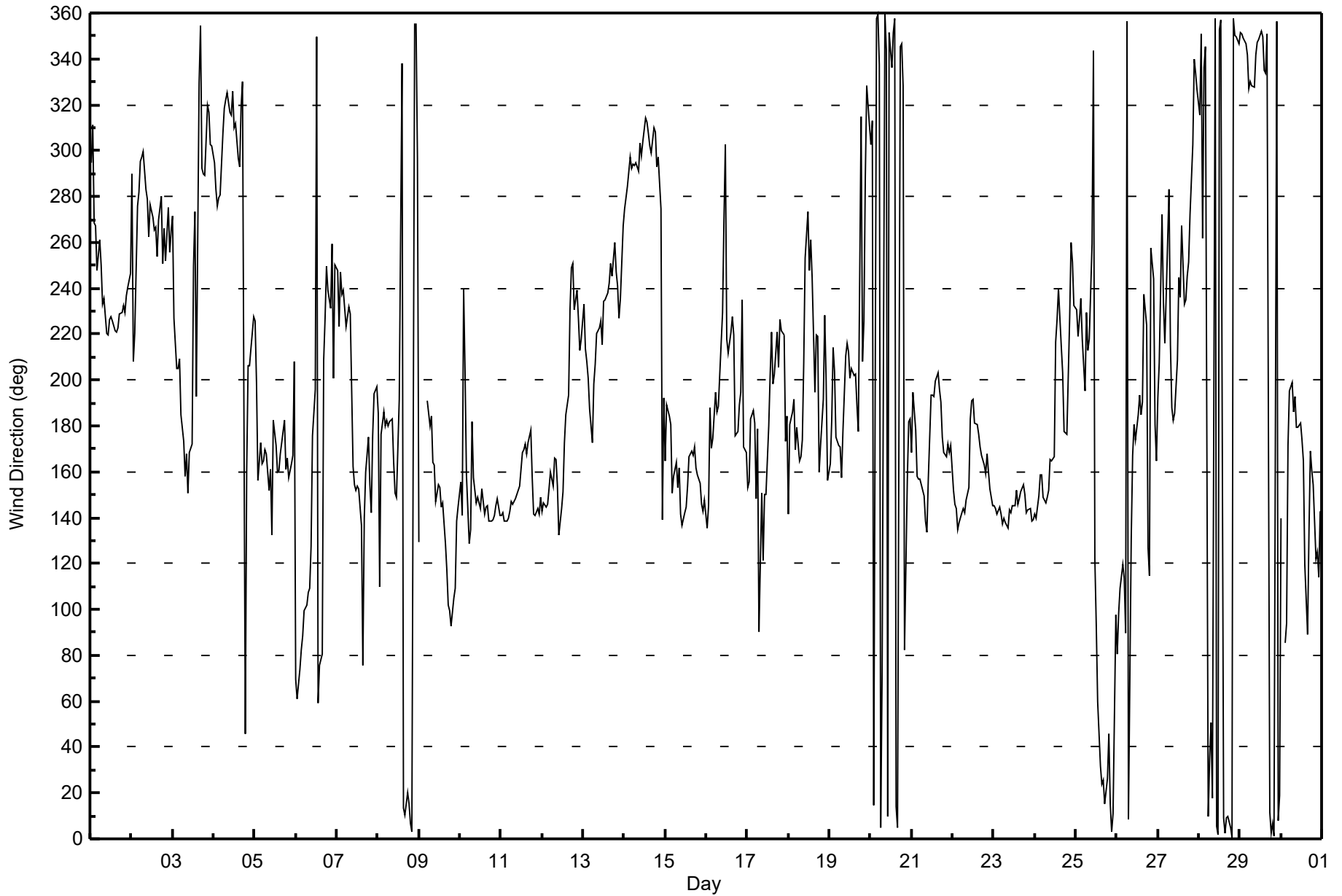
Wind Direction (WD) - deg
Mildred Lake - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 98 deg on Sep 7 17:00	Hours of Data: 716
Minimum Value: 8 deg on Sep 28 00:00	Hours of Missing Data: 4
Percentiles: P ₁ = 9 P ₁₀ = 13 Q ₁ = 15 Median = 21 Q ₃ = 28 P ₉₀ = 38 P ₉₉ = 77	Hours of Calibration: 0
	Percent Operational Time: 99.4

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Sep	22	21	20	23	27	30	26	25	24	28	28	24	27	26	26	24	24	23	24	24	23	23	25	29	30
2-Sep	37	38	23	23	21	21	24	25	23	24	35	37	28	26	24	27	22	21	28	31	27	24	29	29	38
3-Sep	24	31	22	26	22	14	15	24	26	28	20	31	50	56	29	42	26	52	21	23	12	11	17	16	56
4-Sep	21	22	26	22	23	20	12	13	13	18	17	16	19	23	38	31	35	35	74	69	33	15	22	24	74
5-Sep	18	41	17	14	15	19	16	19	17	31	25	30	28	25	28	25	21	18	17	14	13	18	15	55	55
6-Sep	22	16	8	9	11	13	15	18	20	29	15	51	51	35	20	49	33	26	28	30	39	40	37	28	51
7-Sep	26	22	33	28	25	17	18	21	28	33	24	19	23	25	29	20	98	25	14	70	35	68	32	29	98
8-Sep	61	68	28	12	12	10	10	13	16	25	14	14	35	55	26	18	18	16	16	12	19	8	17	68	68
9-Sep	79	UO	UO	21	UO	24	12	16	19	18	18	24	20	22	39	32	41	13	24	13	11	12	14	12	79
10-Sep	14	18	27	22	74	27	47	17	20	17	21	24	21	17	19	16	16	15	15	14	13	12	12	13	74
11-Sep	13	13	15	16	15	15	13	12	13	14	15	17	16	17	17	17	17	15	17	14	12	14	10	11	17
12-Sep	12	12	13	10	14	19	17	15	15	16	23	16	15	28	22	26	26	29	28	32	28	28	23	32	32
13-Sep	21	25	36	23	15	16	26	30	26	25	26	27	27	25	25	25	25	27	27	26	28	23	26	26	36
14-Sep	22	22	22	18	20	18	20	19	21	19	20	22	20	21	19	21	22	16	15	15	16	42	78	57	78
15-Sep	33	20	16	12	17	16	21	16	20	19	18	15	14	18	19	17	14	13	14	15	14	11	13	11	33
16-Sep	16	21	23	17	19	21	13	15	33	26	60	28	55	27	31	33	26	15	20	11	20	70	15	15	70
17-Sep	9	10	29	29	31	38	18	78	52	27	14	29	26	25	25	20	18	23	21	24	31	23	38	35	78
18-Sep	51	21	31	21	23	14	17	15	18	31	30	25	27	25	30	23	23	23	26	18	22	26	50	40	51
19-Sep	19	23	28	20	20	14	18	16	18	26	29	29	27	24	27	23	20	14	86	56	37	29	12	30	86
20-Sep	15	23	21	16	16	34	29	47	91	31	37	27	25	31	31	36	22	10	13	39	36	54	70	9	91
21-Sep	14	11	12	14	11	11	12	10	15	17	42	22	20	18	21	21	18	17	13	12	13	13	14	17	42
22-Sep	14	10	11	14	16	9	10	12	15	15	18	18	19	17	17	16	15	14	14	13	14	15	12	11	19
23-Sep	11	11	13	12	13	15	13	14	16	14	15	15	15	16	13	14	14	14	12	14	13	13	16	15	16
24-Sep	14	15	13	16	15	12	12	13	14	18	17	24	29	26	27	29	39	16	41	18	36	27	27	25	41
25-Sep	23	20	21	21	20	26	30	26	35	65	69	67	73	39	45	28	18	17	19	23	17	25	45	17	73
26-Sep	50	21	17	21	25	68	25	56	25	24	27	30	23	32	24	35	40	84	72	68	42	49	38	36	84
27-Sep	27	26	40	39	34	46	25	25	32	30	30	34	33	30	29	37	37	29	29	61	47	41	36	8	61
28-Sep	19	27	84	44	51	22	20	23	31	19	20	20	16	18	22	18	19	18	19	17	15	15	15	14	84
29-Sep	14	12	12	11	15	11	10	11	10	19	15	17	17	18	20	15	23	19	17	18	17	13	18	68	68
30-Sep	38	UO	21	24	24	22	18	14	29	17	14	18	20	29	25	12	28	13	12	9	12	11	14	20	38

79	68	84	44	74	68	47	78	91	65	69	67	73	56	45	49	98	84	86	70	47	70	78	68	
Diurnal Maximum																								

UO - Unstable Operation





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS03 LOWER CAMP METEOROLOGY SEPTEMBER 2023

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

October 30, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP MET TOWER (AMS03)
SEPTEMBER 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	720	0	0	100	26.7	-	21.3	-
Temperature 45 m (C) Average	720	0	0	100	26.5	-	21.2	-
Temperature 100 m (C) Average	720	0	0	100	25.9	-	20.8	-
Temperature 163 m (C) Average	720	0	0	100	25.2	-	20.5	-
Relative Humidity 20 m (%) Average	720	0	0	100	100	-	90.5	-
Relative Humidity 45 m (%) Average	720	0	0	100	100	-	90.2	-
Relative Humidity 100 m (%) Average	720	0	0	100	96.4	-	87.5	-
Relative Humidity 163 m (%) Average	720	0	0	100	99.4	-	90.9	-
Wind Speed 20 m (km/h) Average	720	0	0	100	33	-	22.0	-
Wind Speed 45 m (km/h) Average	718	0	2	99.72	38	-	27.0	-
Wind Speed 100 m (km/h) Average	719	0	1	99.86	43	-	33.0	-
Wind Speed 163 m (km/h) Average	720	0	0	100	46	-	37.0	-
Wind Direction 20 m (deg) Average	720	0	0	100	-	-	-	-
Wind Direction 45 m (deg) Average	718	0	2	99.72	-	-	-	-
Wind Direction 100 m (deg) Average	719	0	1	99.86	-	-	-	-
Wind Direction 163 m (deg) Average	720	0	0	100	-	-	-	-
Vertical Wind Speed 20 m (km/h) Average	720	0	0	100	0.5	-	0.0	-
Vertical Wind Speed 45 m (km/h) Average	718	0	2	99.72	1.3	-	0.5	-
Vertical Wind Speed 100 m (km/h) Average	719	0	1	99.86	2.1	-	0.5	-
Vertical Wind Speed 163 m (km/h) Average	720	0	0	100	4.7	-	1.2	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP MET TOWER (AMS03)
 SEPTEMBER 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	720	14.57	5.1	-	3.8	8	10	14.1	18.5	21.6	26.7
Temperature 45 m (C) Average	720	14.69	5	-	4.5	8.2	10.1	14.4	18.5	21.5	26.5
Temperature 100 m (C) Average	720	14.76	4.8	-	4.8	8.3	10.5	14.9	18.2	21.1	25.9
Temperature 163 m (C) Average	720	14.72	4.6	-	5.9	8.2	11	15	18	20.8	25.2
Relative Humidity 20 m (%) Average	720	65.03	19.6	-	23.5	37.7	49.4	65.8	82.2	90.4	100
Relative Humidity 45 m (%) Average	720	63.53	19	-	23.7	37.8	48.1	63	79.3	88.8	100
Relative Humidity 100 m (%) Average	720	58.75	17.2	-	23.2	36.6	44.9	58.1	71.7	83.4	96.4
Relative Humidity 163 m (%) Average	720	59.11	16.6	-	25.6	38.1	45.7	58.2	71.1	82.3	99.4
Wind Speed 20 m (km/h) Average	720	9.9	7	-	0	2	5	8	13	21	33
Wind Speed 45 m (km/h) Average	718	13.4	8	-	0	4	7	12	18	26	38
Wind Speed 100 m (km/h) Average	719	16.8	10	-	1	6	9	15	23	32	43
Wind Speed 163 m (km/h) Average	720	19.9	11	-	1	8	12	17	27	37	46
Wind Direction 20 m (deg) Average	720	-	-	-	-	-	-	-	-	-	-
Wind Direction 45 m (deg) Average	718	-	-	-	-	-	-	-	-	-	-
Wind Direction 100 m (deg) Average	719	-	-	-	-	-	-	-	-	-	-
Wind Direction 163 m (deg) Average	720	-	-	-	-	-	-	-	-	-	-
Vertical Wind Speed 20 m (km/h) Average	720	-0.39	0.4	-	-1.9	-1	-0.6	-0.3	0	0	0.5
Vertical Wind Speed 45 m (km/h) Average	718	0.15	0.4	-	-1.1	-0.3	-0.1	0.1	0.4	0.6	1.3
Vertical Wind Speed 100 m (km/h) Average	719	0.06	0.5	-	-1.4	-0.6	-0.2	0	0.3	0.7	2.1
Vertical Wind Speed 163 m (km/h) Average	720	0.43	0.7	-	-2.1	-0.3	0.1	0.3	0.7	1.2	4.7

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

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
Wind Speed, Wind Direction, Vertical Wind Speed 45 m	09 Sep 2023 07:00	09 Sep 2023 08:00	2	Flat line in sensor output signal
Wind Speed, Wind Direction, Vertical Wind Speed 100 m	06 Sep 2023 06:00	06 Sep 2023 06:00	1	Flat line in sensor output signal



Wood Buffalo Environmental Association
Summary of Hour Averages

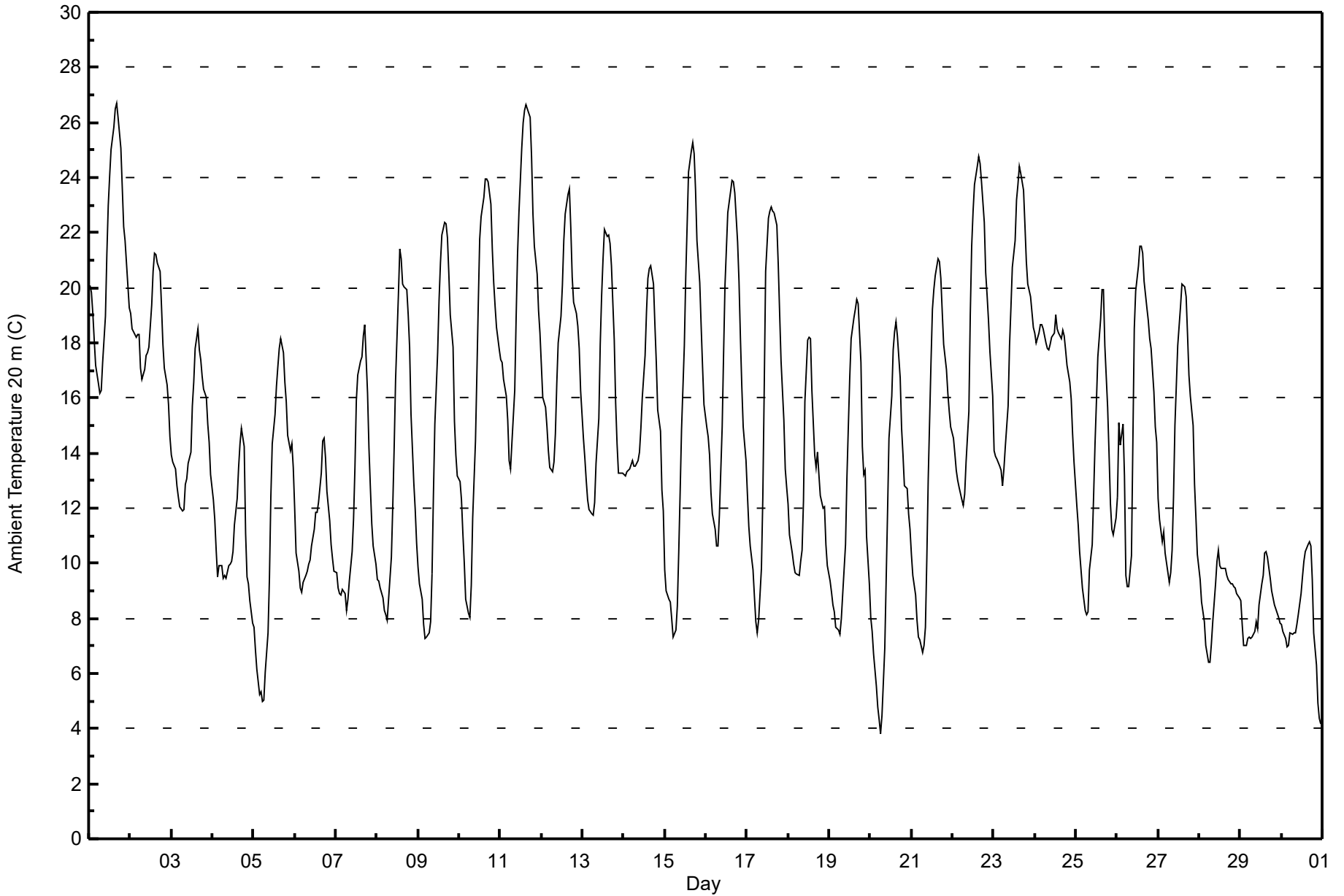
Ambient Temperature 20 m (AT20m) - C
Lower Camp Met Tower - September 2023

Maximum Value: 26.7 C on Sep 1 17:00 Maximum Daily Average: 21.3 C on Sep 1																						Hours in Service: 720 Hours of Data: 720																											
Minimum Value: 3.8 C on Sep 20 07:00 Minimum Daily Average: 7.9 C on Sep 30 Maximum Diurnal Average: 19.7 C at hour 16 Minimum Diurnal Average: 9.9 C at hour 7 Monthly Average: 14.57 C Percentiles: P ₁ = 5.0 P ₁₀ = 8.0 Q ₁ = 10.0 Median = 14.1 Q ₃ = 18.5 P ₉₀ = 21.6 P ₉₉ = 26.0																						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-Sep	20.1	19.8	19.1	18.1	17.2	16.5	16.2	16.3	17.3	19.0	21.2	23.0	24.1	25.0	25.8	26.5	26.7	26.2	25.1	23.6	22.2	21.7	20.9	19.3	21.3	26.7																							
2-Sep	19.1	18.5	18.4	18.2	18.3	18.3	17.1	16.7	17.1	17.5	17.7	17.8	19.4	20.6	21.3	21.2	20.9	20.6	19.3	18.0	17.1	16.5	15.8	14.6	18.3	21.3																							
3-Sep	14.0	13.7	13.4	12.8	12.4	12.1	11.9	11.9	12.9	13.1	13.6	14.0	15.7	16.6	17.8	18.5	17.7	17.4	16.8	16.3	16.0	15.1	14.4	13.2	14.6	18.5																							
4-Sep	12.3	11.6	10.5	9.5	9.9	9.9	9.5	9.6	9.4	9.9	10.0	10.1	10.4	11.4	12.4	13.5	14.3	14.9	14.2	11.1	9.5	9.3	8.7	7.9	10.8	14.9																							
5-Sep	7.7	6.9	6.2	5.2	5.3	5.0	5.0	6.0	7.5	9.4	12.4	14.3	15.4	16.4	17.1	17.8	18.2	17.6	16.6	15.8	14.6	14.1	14.3	13.5	11.8	18.2																							
6-Sep	12.0	10.4	9.7	9.1	9.0	9.3	9.6	9.7	10.0	10.1	10.6	11.2	11.9	11.8	12.2	13.3	14.4	14.5	13.8	12.6	11.5	10.7	10.2	9.7	11.1	14.5																							
7-Sep	9.7	9.1	8.9	8.9	9.1	8.9	8.3	8.7	9.4	10.4	11.6	13.5	15.9	16.9	17.4	17.5	18.3	18.6	16.2	14.2	12.8	11.4	10.6	10.0	12.3	18.6																							
8-Sep	9.4	9.3	9.1	8.8	8.3	8.1	7.9	8.7	10.2	12.1	14.2	16.7	19.7	21.4	21.1	20.1	20.0	19.9	19.0	17.9	15.4	12.9	11.9	10.7	13.9	21.4																							
9-Sep	9.9	9.3	8.7	7.8	7.3	7.3	7.5	7.9	9.6	12.5	15.0	17.6	19.5	20.9	21.9	22.4	22.3	21.8	20.5	19.0	17.9	15.2	13.9	13.2	14.5	22.4																							
10-Sep	13.0	12.3	11.1	10.0	8.7	8.2	8.0	9.2	11.7	14.4	16.9	19.4	21.8	22.6	23.3	24.0	24.0	23.8	23.0	21.4	20.2	19.3	18.5	17.8	16.8	24.0																							
11-Sep	17.4	17.3	16.7	16.1	15.2	13.8	13.4	14.4	16.3	18.9	21.2	22.7	25.1	26.0	26.4	26.7	26.5	26.2	24.7	22.7	21.5	20.5	19.2	18.4	20.3	26.7																							
12-Sep	17.2	16.0	15.7	14.9	14.1	13.5	13.3	13.7	14.7	16.5	18.0	19.0	20.1	21.7	22.7	23.4	23.6	22.2	20.4	19.5	19.1	18.6	17.8	16.3	18.0	23.6																							
13-Sep	14.6	13.8	13.0	12.3	12.0	11.8	11.8	12.2	13.6	15.3	17.9	19.7	21.0	22.1	21.9	21.9	21.6	20.8	18.1	15.8	14.3	13.2	13.3	13.3	16.1	22.1																							
14-Sep	13.2	13.2	13.3	13.4	13.6	13.7	13.5	13.5	13.7	14.1	14.9	16.0	17.5	19.1	20.3	20.7	20.8	20.1	18.7	17.3	15.6	14.8	12.7	11.9	15.7	20.8																							
15-Sep	9.7	9.0	8.7	8.6	8.0	7.3	7.6	8.4	10.4	12.6	14.8	17.9	20.4	22.3	24.2	25.0	25.3	24.8	23.6	21.7	20.2	18.6	17.1	15.8	15.9	25.3																							
16-Sep	14.9	14.6	13.9	12.6	11.8	11.2	10.6	10.6	11.8	14.9	17.6	20.1	21.4	22.7	23.5	23.9	23.9	23.5	21.7	20.2	18.2	16.4	14.9	13.7	17.0	23.9																							
17-Sep	12.5	11.4	10.6	9.7	8.8	7.9	7.4	7.9	9.8	12.4	16.4	20.6	22.5	22.8	22.9	22.8	22.7	22.3	20.9	19.1	17.4	15.2	13.4	12.8	15.4	22.9																							
18-Sep	12.1	11.1	10.4	10.0	9.7	9.6	9.5	10.1	10.5	12.3	15.9	18.1	18.2	18.1	16.3	13.9	13.5	14.0	13.2	12.5	12.0	12.0	10.7	9.9	12.6	18.2																							
19-Sep	9.4	9.0	8.5	8.2	7.7	7.6	7.4	8.0	8.9	10.7	13.1	14.9	16.8	18.2	18.9	19.2	19.6	19.4	17.3	14.2	13.2	13.4	11.0	9.3	12.7	19.6																							
20-Sep	8.1	7.5	6.7	5.6	4.8	4.3	3.8	4.5	6.9	9.4	11.9	14.5	16.1	17.7	18.4	18.8	18.3	16.7	14.9	13.9	12.8	12.7	11.8	11.2	11.3	18.8																							
21-Sep	10.3	9.6	8.8	7.9	7.3	7.2	6.8	7.0	7.7	10.2	13.1	17.3	19.2	19.9	20.4	21.0	20.9	20.4	19.1	17.9	17.0	16.2	15.5	15.0	14.0	21.0																							
22-Sep	14.5	14.0	13.4	13.0	12.8	12.3	12.1	12.5	13.7	15.5	19.0	21.5	22.8	23.7	24.4	24.7	24.5	23.9	22.4	20.5	19.7	18.8	17.7	16.0	18.1	24.7																							
23-Sep	14.1	13.9	13.8	13.5	13.4	12.8	13.4	14.2	15.7	17.9	19.3	20.8	21.7	23.2	23.7	24.4	24.2	23.6	22.3	21.0	20.1	19.7	19.1	18.6	18.5	24.4																							
24-Sep	18.3	18.0	18.3	18.7	18.6	18.5	18.0	17.8	17.8	18.0	18.2	18.4	19.0	18.5	18.4	18.1	18.5	18.3	17.7	17.2	16.6	16.0	14.7	13.7	17.7	19.0																							
25-Sep	12.1	11.4	10.4	9.8	9.1	8.3	8.1	8.2	9.8	10.7	12.5	14.4	15.9	17.5	18.9	20.0	19.9	17.9	15.7	14.0	12.2	11.2	11.1	11.6	12.9	20.0																							
26-Sep	12.4	15.1	14.3	15.0	13.2	9.6	9.2	9.1	10.3	14.4	18.5	19.9	20.8	21.5	21.5	21.2	20.3	19.3	18.8	18.2	17.8	16.2	14.9	14.4	16.1	21.5																							
27-Sep	12.4	11.6	10.8	11.1	10.4	10.0	9.3	9.7	10.5	12.4	15.0	17.9	18.6	19.3	20.1	20.0	19.7	18.3	16.8	16.1	15.0	12.9	11.6	10.3	14.2	20.1																							
28-Sep	9.4	8.6	8.2	7.9	7.0	6.4	6.4	7.1	7.9	9.3	10.1	10.5	9.9	9.8	9.8	9.8	9.5	9.4	9.3	9.2	9.2	9.1	8.9	8.7	8.8	10.5																							
29-Sep	8.7	7.8	7.0	7.0	7.3	7.3	7.3	7.3	7.5	7.9	7.6	8.5	9.2	9.5	10.4	10.4	10.2	9.5	9.0	8.7	8.5	8.2	8.0	7.8	8.4	10.4																							
30-Sep	7.8	7.5	7.3	7.0	7.0	7.5	7.4	7.5	7.5	7.8	8.1	8.9	9.5	10.1	10.4	10.7	10.8	10.6	9.4	7.5	6.3	5.0	4.3	4.2	7.9	10.8																							
																								12.5	12.0	11.5	11.0	10.6	10.1	9.9	10.3	11.3	13.0	14.9	16.6	18.0	18.9	19.5	19.7	19.7	19.2	17.9	16.6	15.5	14.5	13.6	12.8	Diurnal Average	
																								20.1	19.8	19.1	18.7	18.6	18.5	18.0	17.8	17.8	19.0	21.2	23.0	25.1	26.0	26.4	26.7	26.7	26.2	25.1	23.6	22.2	21.7	20.9	19.3	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	183	25.42	25.42
10 - 20	414	57.50	82.92
> 20	123	17.08	100.00

Total Number of Valid Hours: 720

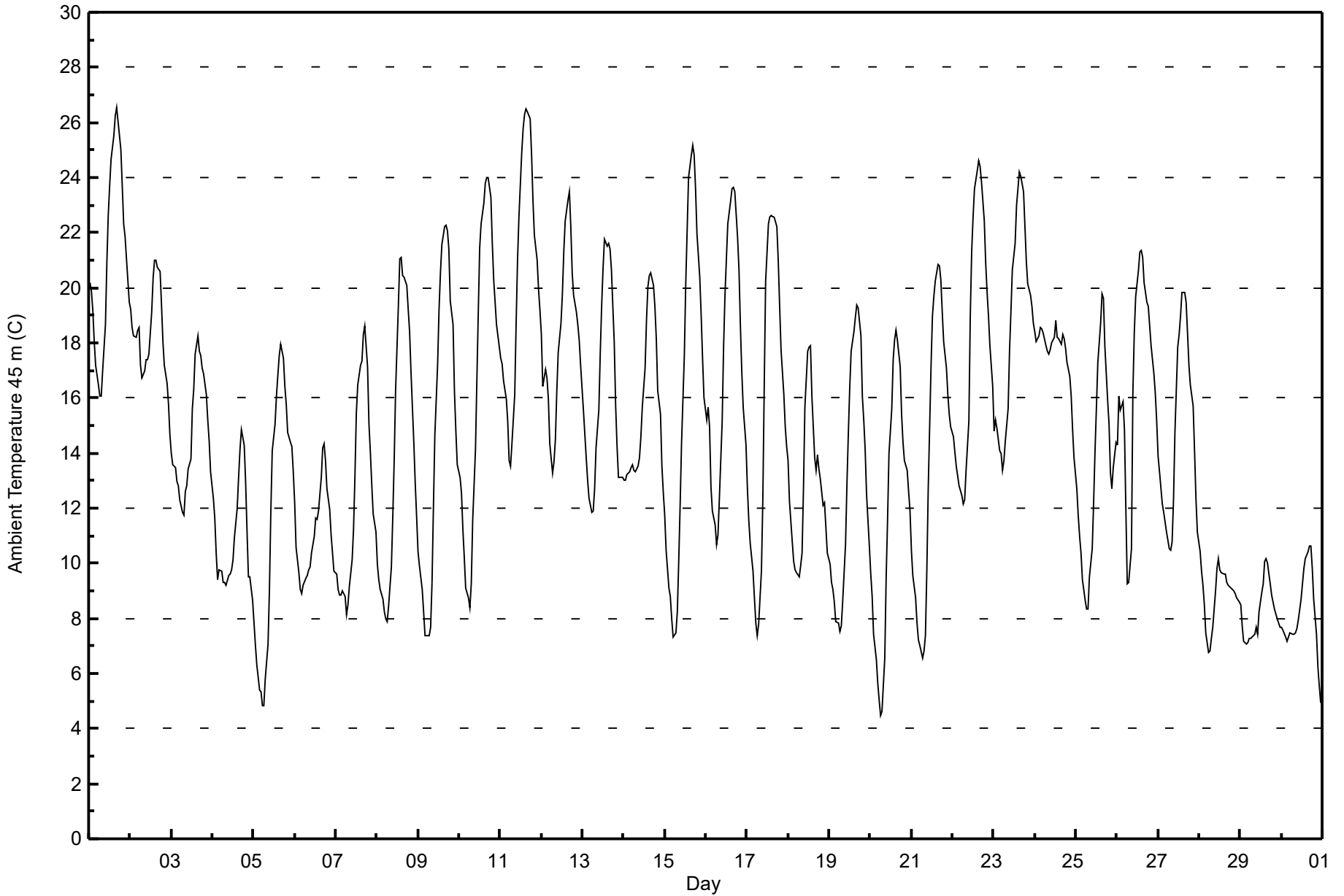
Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

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

Maximum Value: 26.5 C on Sep 1 17:00 Maximum Daily Average: 21.2 C on Sep 1																						Hours in Service: 720 Hours of Data: 720				
Minimum Value: 4.5 C on Sep 20 07:00 Minimum Daily Average: 8.1 C on Sep 30 Maximum Diurnal Average: 19.6 C at hour 17 Minimum Diurnal Average: 10.0 C at hour 7 Monthly Average: 14.69 C Percentiles: P ₁ = 5.4 P ₁₀ = 8.2 Q ₁ = 10.1 Median = 14.4 Q ₃ = 18.5 P ₉₀ = 21.5 P ₉₉ = 25.7																						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-Sep	20.2	19.9	19.2	18.0	17.2	16.5	16.1	16.1	17.0	18.7	20.9	22.6	23.7	24.7	25.5	26.2	26.5	26.0	25.0	23.7	22.3	21.8	21.1	19.5	21.2	26.5
2-Sep	19.2	18.6	18.3	18.2	18.5	18.5	17.2	16.7	17.0	17.4	17.4	17.6	19.1	20.3	21.0	21.0	20.8	20.6	19.4	18.1	17.2	16.5	15.7	14.6	18.3	21.0
3-Sep	14.0	13.6	13.5	13.0	12.8	12.3	11.8	11.8	12.6	12.8	13.4	13.8	15.6	16.3	17.6	18.3	17.7	17.5	17.1	16.9	16.1	15.2	14.4	13.3	14.6	18.3
4-Sep	12.4	11.6	10.4	9.4	9.8	9.7	9.3	9.3	9.2	9.5	9.6	9.7	10.1	10.9	12.0	13.1	14.1	14.8	14.3	13.0	11.2	9.5	9.5	8.7	10.9	14.8
5-Sep	7.8	7.0	6.3	5.4	5.4	4.8	4.9	5.8	7.1	9.0	11.9	14.1	15.0	16.0	16.9	17.6	18.0	17.5	16.4	15.8	14.7	14.4	14.3	13.3	11.6	18.0
6-Sep	12.2	10.6	9.7	9.1	8.9	9.2	9.5	9.6	9.8	9.9	10.4	11.0	11.6	11.6	11.9	13.1	14.2	14.3	13.7	12.7	12.0	11.1	10.4	9.7	11.1	14.3
7-Sep	9.6	9.0	8.9	8.8	9.0	8.8	8.1	8.5	9.2	10.1	11.2	13.1	15.5	16.5	17.2	17.3	18.3	18.6	17.1	15.1	14.0	12.9	11.8	11.1	12.5	18.6
8-Sep	10.0	9.4	9.1	8.7	8.3	8.0	7.9	8.4	9.8	11.7	13.7	16.3	19.4	21.0	21.1	20.5	20.4	20.1	19.2	18.4	16.9	14.4	12.9	11.7	14.1	21.1
9-Sep	10.4	9.9	9.1	8.2	7.4	7.3	7.4	7.7	9.3	12.1	14.6	17.2	19.2	20.6	21.6	22.2	22.2	22.0	21.4	19.5	18.7	16.2	14.8	13.6	14.7	22.2
10-Sep	13.1	12.6	11.3	10.2	9.1	8.7	8.4	9.2	11.5	14.1	16.7	19.1	21.5	22.3	23.1	23.8	24.0	24.0	23.3	21.6	20.3	19.5	18.6	17.8	16.8	24.0
11-Sep	17.4	17.2	16.7	16.0	15.2	13.7	13.5	14.3	16.1	18.7	21.0	22.6	24.9	25.8	26.3	26.5	26.4	26.1	24.9	23.2	21.9	21.0	19.9	19.2	20.4	26.5
12-Sep	18.3	16.4	17.1	16.7	15.9	14.3	13.3	13.7	14.5	16.2	17.6	18.7	19.8	21.3	22.4	23.2	23.5	22.2	20.5	19.7	19.1	18.7	18.1	17.2	18.3	23.5
13-Sep	15.6	14.7	13.8	13.0	12.3	11.9	11.9	12.7	14.2	15.5	17.6	19.3	20.7	21.7	21.5	21.6	21.4	20.6	18.0	15.7	14.2	13.1	13.1	13.1	16.1	21.7
14-Sep	13.0	13.0	13.2	13.3	13.5	13.6	13.4	13.3	13.5	13.8	14.6	15.7	17.1	18.8	20.0	20.4	20.5	20.1	19.3	18.1	16.3	15.4	13.5	12.6	15.7	20.5
15-Sep	11.7	10.5	9.1	8.8	8.0	7.3	7.5	8.2	10.1	12.1	14.3	17.5	20.1	22.1	24.0	24.8	25.2	24.8	23.6	22.0	20.4	19.0	17.4	16.0	16.0	25.2
16-Sep	15.2	15.7	15.0	12.8	11.9	11.4	10.7	11.0	12.3	15.1	17.9	19.8	21.0	22.3	23.1	23.6	23.6	23.5	21.8	20.6	18.6	17.0	15.7	14.3	17.2	23.6
17-Sep	12.7	11.5	10.7	9.7	8.7	7.8	7.4	7.8	9.7	12.3	16.4	20.2	22.3	22.6	22.6	22.6	22.6	22.2	21.0	19.3	17.7	16.1	15.0	14.2	15.6	22.6
18-Sep	13.7	12.3	10.8	10.0	9.7	9.7	9.5	9.9	10.4	12.7	15.7	17.7	17.8	17.9	16.1	13.9	13.4	13.9	13.4	13.1	12.1	12.2	11.3	10.4	12.8	17.9
19-Sep	10.0	9.3	9.1	8.6	7.9	7.8	7.5	7.7	8.6	10.7	12.9	14.7	16.4	17.7	18.4	18.9	19.4	19.3	18.3	16.0	15.2	14.1	12.5	10.6	13.0	19.4
20-Sep	9.6	8.8	7.4	6.5	5.7	5.0	4.5	4.6	6.5	9.5	11.6	14.0	15.6	17.4	18.1	18.5	18.1	17.1	15.4	14.4	13.7	13.4	12.6	11.9	11.7	18.5
21-Sep	10.5	9.5	8.7	7.8	7.2	7.0	6.6	6.8	7.4	9.7	12.7	17.2	19.0	19.7	20.2	20.8	20.8	20.3	19.1	18.0	17.1	16.1	15.4	15.0	13.9	20.8
22-Sep	14.6	14.0	13.5	13.2	12.8	12.5	12.2	12.3	13.4	15.1	19.0	21.3	22.6	23.6	24.3	24.6	24.4	23.8	22.4	20.9	19.8	18.9	17.9	16.4	18.1	24.6
23-Sep	14.8	15.2	14.9	14.1	14.0	13.4	13.7	14.5	15.6	17.7	19.1	20.6	21.6	23.0	23.6	24.2	24.1	23.5	22.2	20.9	20.1	19.7	19.3	18.7	18.7	24.2
24-Sep	18.4	18.0	18.3	18.6	18.5	18.4	17.9	17.7	17.6	17.8	18.0	18.2	18.8	18.2	18.2	18.0	18.3	18.2	17.8	17.3	16.8	16.1	14.9	13.8	17.6	18.8
25-Sep	12.7	11.8	11.0	10.4	9.4	8.6	8.3	8.3	9.5	10.5	12.2	14.1	15.7	17.3	18.7	19.8	19.6	17.9	15.9	15.1	13.3	12.7	13.5	14.4	13.4	19.8
26-Sep	14.3	16.0	15.6	15.9	14.8	12.0	9.3	9.3	10.5	16.2	18.3	19.7	20.6	21.3	21.4	21.1	20.2	19.5	19.3	18.6	17.9	16.9	16.1	15.2	16.7	21.4
27-Sep	13.9	13.3	12.2	11.8	11.5	11.2	10.5	10.5	10.8	12.3	14.8	17.8	18.3	19.0	19.8	19.8	19.5	18.3	17.2	16.5	15.7	14.1	12.4	11.1	14.7	19.8
28-Sep	10.4	9.7	9.2	8.5	7.5	6.8	6.8	7.3	7.7	9.0	9.8	10.2	9.8	9.7	9.6	9.6	9.3	9.2	9.1	9.1	9.0	8.9	8.8	8.6	8.9	10.4
29-Sep	8.5	7.7	7.2	7.1	7.1	7.3	7.3	7.3	7.4	7.7	7.4	8.2	9.0	9.3	10.1	10.2	10.0	9.3	8.8	8.6	8.3	8.0	7.8	7.7	8.2	10.2
30-Sep	7.7	7.6	7.3	7.2	7.3	7.5	7.4	7.4	7.5	7.6	7.9	8.7	9.3	9.8	10.1	10.4	10.6	10.6	9.8	8.7	7.4	6.2	5.5	4.9	8.1	10.6
13.1 12.5 11.9 11.3 10.8 10.4 10.0 10.3 11.2 12.9 14.6 16.4 17.7 18.6 19.2 19.5 19.6 19.2 18.2 17.0 15.9 15.0 14.1 13.3																								Diurnal Average		
20.2 19.9 19.2 18.6 18.5 18.5 17.9 17.7 17.6 18.7 21.0 22.6 24.9 25.8 26.3 26.5 26.5 26.1 25.0 23.7 22.3 21.8 21.1 19.5																								Diurnal Maximum		





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	176	24.44	24.44
10 - 20	424	58.89	83.33
> 20	120	16.67	100.00

Total Number of Valid Hours: 720

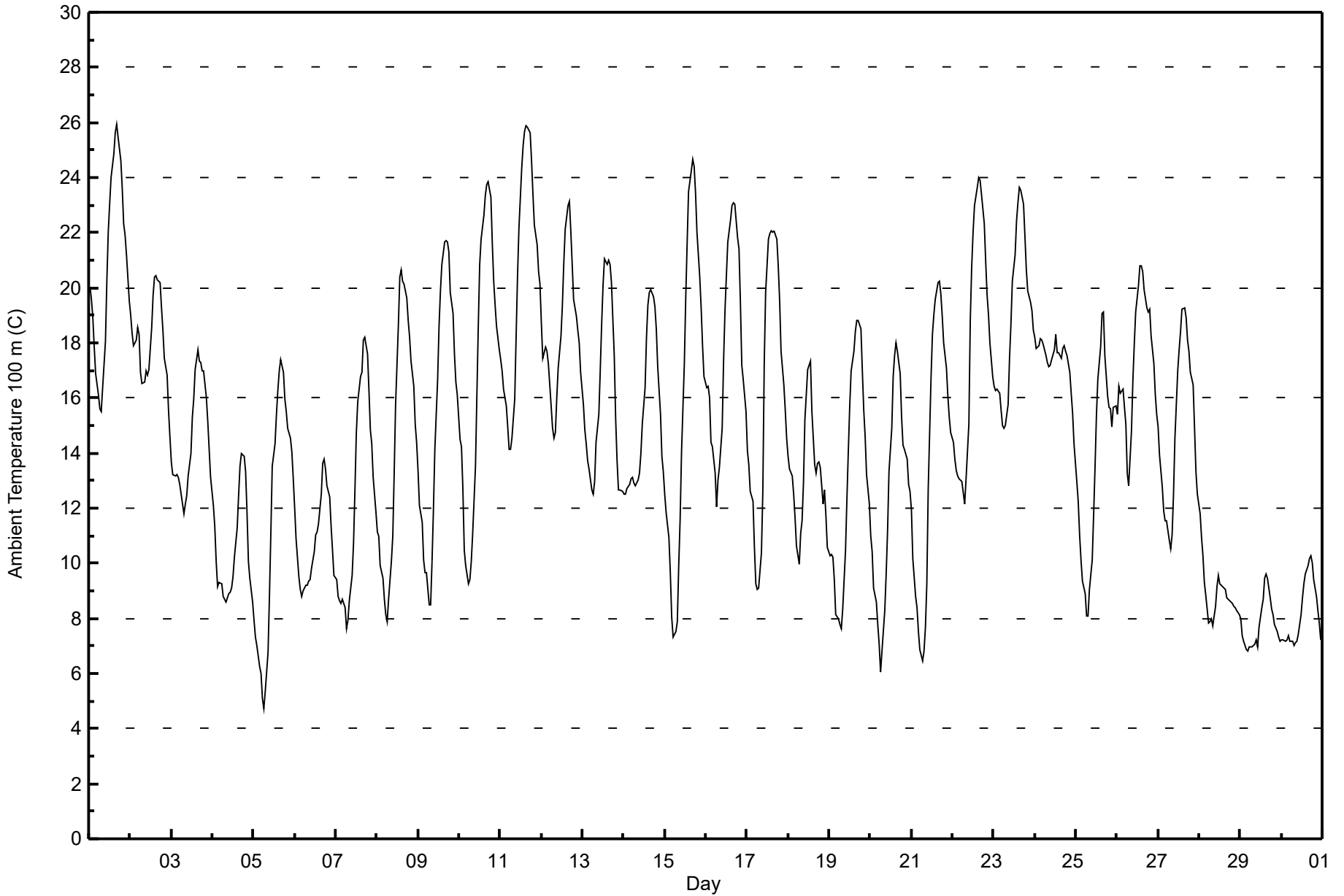
Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

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

Maximum Value: 25.9 C on Sep 1 17:00		Maximum Daily Average: 20.8 C on Sep 1		Hours in Service: 720																																												
Minimum Value: 4.8 C on Sep 5 07:00		Minimum Daily Average: 7.8 C on Sep 29		Hours of Data: 720																																												
Maximum Diurnal Average: 19.1 C at hour 17		Minimum Diurnal Average: 10.4 C at hour 7		Hours of Missing Data: 0																																												
Monthly Average: 14.76 C		Percentiles: P ₁ = 6.8 P ₁₀ = 8.3 Q ₁ = 10.5 Median = 14.9 Q ₃ = 18.2 P ₉₀ = 21.1 P ₉₉ = 25.1		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-Sep	20.1	19.6	18.9	17.8	16.9	16.1	15.6	15.5	16.4	18.1	20.3	22.0	23.1	24.0	24.9	25.6	25.9	25.5	24.6	23.6	22.3	21.9	21.2	19.5	20.8	25.9																						
2-Sep	19.0	18.4	17.9	18.1	18.6	18.3	16.9	16.5	16.6	17.0	16.8	17.0	18.5	19.7	20.4	20.4	20.3	20.2	19.3	18.5	17.4	16.9	15.6	14.6	18.0	20.4																						
3-Sep	13.7	13.2	13.2	13.2	13.1	12.9	12.1	11.8	12.2	12.5	13.1	14.0	15.3	16.0	17.1	17.8	17.4	17.3	17.0	17.0	16.0	15.2	14.1	13.1	14.5	17.8																						
4-Sep	12.1	11.4	10.0	9.1	9.3	9.2	8.8	8.7	8.6	8.9	8.9	9.1	9.5	10.2	11.3	12.4	13.5	14.0	13.9	13.3	11.9	10.0	9.5	8.6	10.5	14.0																						
5-Sep	7.9	7.3	7.0	6.3	6.0	5.1	4.8	5.3	6.8	8.8	11.1	13.5	14.3	15.4	16.3	17.0	17.4	16.9	16.0	15.5	14.9	14.5	14.0	13.1	11.5	17.4																						
6-Sep	12.0	10.9	9.5	9.0	8.8	9.0	9.2	9.2	9.4	9.4	9.8	10.4	11.0	11.1	11.4	12.5	13.7	13.8	13.4	12.8	12.4	11.3	10.5	9.6	10.8	13.8																						
7-Sep	9.4	8.8	8.7	8.5	8.7	8.4	7.6	7.9	8.6	9.6	10.7	12.7	14.7	15.9	16.8	16.9	18.1	18.2	17.6	16.3	14.8	14.3	13.1	11.8	12.4	18.2																						
8-Sep	11.1	11.0	9.9	9.5	8.7	8.1	7.9	8.7	10.1	11.0	13.3	15.8	18.6	20.4	20.7	20.2	20.1	19.6	18.8	18.2	17.3	16.4	15.1	14.4	14.4	20.7																						
9-Sep	13.4	12.1	11.5	10.1	9.7	9.7	8.5	8.5	10.1	11.9	14.1	16.7	18.6	19.9	20.9	21.6	21.7	21.7	21.3	19.8	19.1	17.6	16.6	16.1	15.5	21.7																						
10-Sep	14.5	14.2	12.7	10.5	9.9	9.3	9.4	10.1	11.1	13.5	16.1	18.6	20.8	21.8	22.6	23.3	23.8	23.8	23.3	21.6	20.3	19.4	18.6	17.8	17.0	23.8																						
11-Sep	17.4	17.0	16.3	15.7	14.9	14.1	14.1	14.5	16.0	18.2	20.4	22.2	24.3	25.2	25.7	25.9	25.8	25.6	24.6	23.4	22.3	21.6	20.6	20.2	20.3	25.9																						
12-Sep	18.7	17.5	17.8	17.7	17.2	16.5	14.9	14.5	14.8	16.0	17.1	18.2	19.4	20.9	22.1	23.0	23.2	22.1	20.9	19.6	19.0	18.5	18.0	16.9	18.5	23.2																						
13-Sep	15.8	14.8	14.3	13.7	13.4	12.6	12.5	13.0	14.4	15.4	17.0	18.6	20.1	21.1	20.8	21.0	20.8	20.2	17.5	15.3	13.7	12.7	12.6	12.6	16.0	21.1																						
14-Sep	12.5	12.5	12.7	12.9	13.0	13.1	12.9	12.8	13.0	13.2	14.0	15.0	16.4	18.2	19.4	19.8	20.0	19.7	19.3	18.5	17.1	15.4	13.9	13.3	15.4	20.0																						
15-Sep	12.5	11.8	10.9	9.6	8.0	7.3	7.5	7.9	9.9	11.6	14.1	17.2	19.6	21.6	23.5	24.3	24.7	24.4	23.4	22.0	20.4	19.3	17.9	16.8	16.1	24.7																						
16-Sep	16.4	16.4	16.0	14.4	14.2	13.3	12.1	13.0	13.5	14.9	17.3	19.2	20.4	21.7	22.5	23.0	23.1	23.0	21.8	21.4	19.5	17.2	16.7	15.5	17.8	23.1																						
17-Sep	14.1	13.6	12.6	12.2	10.6	9.3	9.0	9.1	10.4	12.6	17.3	19.8	21.8	22.0	22.1	22.0	22.1	21.8	20.8	19.5	17.7	16.5	15.6	14.5	16.1	22.1																						
18-Sep	13.9	13.4	13.2	12.5	11.6	10.6	10.0	11.1	11.5	12.9	15.2	17.0	17.2	17.4	15.5	13.6	13.3	13.6	13.7	13.5	12.1	12.6	11.7	10.6	13.2	17.4																						
19-Sep	10.3	10.3	10.2	9.4	8.1	8.0	7.8	7.6	8.3	10.5	12.3	14.1	15.7	17.0	17.7	18.4	18.8	18.8	18.5	17.0	15.6	14.6	13.2	12.2	13.1	18.8																						
20-Sep	11.0	10.4	9.1	8.6	7.8	7.1	6.0	6.8	8.3	9.6	11.2	13.3	14.9	16.8	17.6	18.0	17.7	16.9	15.3	14.3	14.1	13.8	12.9	12.6	12.3	18.0																						
21-Sep	12.0	10.2	8.8	8.4	7.5	6.9	6.5	6.8	7.7	9.2	12.7	16.7	18.3	19.0	19.6	20.2	20.2	19.8	19.0	18.0	17.1	16.1	15.3	14.7	13.8	20.2																						
22-Sep	14.4	13.8	13.4	13.2	13.1	13.0	12.6	12.2	13.1	15.1	18.8	20.8	22.0	23.0	23.7	24.0	23.9	23.4	22.3	20.9	19.7	19.0	18.0	16.8	17.9	24.0																						
23-Sep	16.4	16.3	16.3	16.2	15.5	15.0	14.9	15.0	15.7	17.4	18.7	20.2	21.2	22.4	23.1	23.6	23.6	23.0	21.9	20.6	19.9	19.5	19.2	18.5	18.9	23.6																						
24-Sep	18.2	17.8	17.9	18.2	18.1	18.0	17.5	17.3	17.1	17.2	17.4	17.7	18.3	17.7	17.6	17.5	17.8	17.9	17.7	17.5	16.9	16.2	15.5	14.3	17.4	18.3																						
25-Sep	12.9	12.3	11.0	10.1	9.4	8.9	8.1	8.1	9.0	10.1	11.8	13.5	15.4	16.7	17.9	19.0	19.1	17.6	16.1	15.7	15.6	14.9	15.7	15.7	13.5	19.1																						
26-Sep	15.4	16.4	16.2	16.3	15.7	15.1	13.2	12.8	14.8	16.6	17.9	19.1	20.1	20.8	20.8	20.6	19.9	19.3	19.1	19.2	18.3	17.2	16.1	15.4	17.4	20.8																						
27-Sep	15.0	13.9	12.8	11.9	11.6	11.6	10.9	10.5	11.0	12.5	14.6	17.0	17.7	18.4	19.2	19.3	18.9	18.1	17.7	16.9	16.5	14.9	13.3	12.5	14.9	19.3																						
28-Sep	11.8	10.9	10.3	9.3	8.9	7.8	7.9	8.0	7.7	8.4	9.1	9.6	9.3	9.2	9.1	9.0	8.8	8.7	8.6	8.5	8.5	8.4	8.3	8.1	8.9	11.8																						
29-Sep	8.0	7.4	7.2	6.9	6.8	6.9	7.0	7.0	7.1	7.2	7.0	7.7	8.4	8.7	9.5	9.6	9.5	8.7	8.3	8.1	7.8	7.5	7.3	7.1	7.8	9.6																						
30-Sep	7.2	7.2	7.2	7.2	7.4	7.2	7.2	7.0	7.1	7.2	7.4	8.2	8.8	9.3	9.6	9.9	10.2	10.3	10.0	9.4	8.8	8.3	7.8	7.2	8.2	10.3																						
																								13.6	13.0	12.5	11.9	11.4	10.9	10.4	10.6	11.3	12.5	14.2	15.8	17.1	18.0	18.6	19.0	19.1	18.8	18.1	17.2	16.2	15.4	14.6	13.8	Diurnal Average
																								20.1	19.6	18.9	18.2	18.6	18.3	17.5	17.3	17.1	18.2	20.4	22.2	24.3	25.2	25.7	25.9	25.9	25.6	24.6	23.6	22.3	21.9	21.2	20.2	Diurnal Maximum





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	158	21.94	21.94
10 - 20	453	62.92	84.86
> 20	109	15.14	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

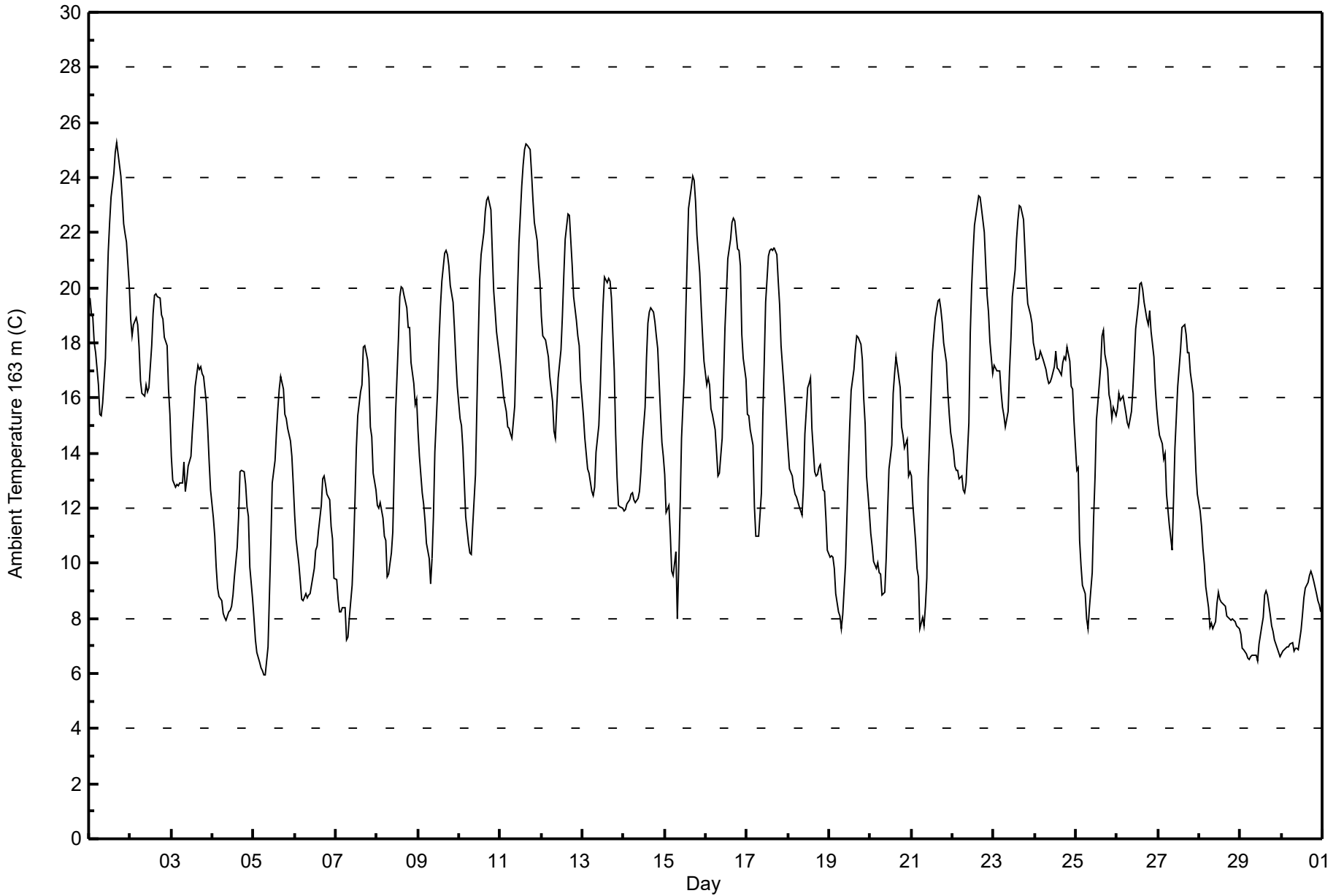
Ambient Temperature 163 m (AT163m) - C
Lower Camp Met Tower - September 2023

Maximum Value: 25.2 C on Sep 1 17:00 Maximum Daily Average: 20.5 C on Sep 1																						Hours in Service: 720 Hours of Data: 720				
Minimum Value: 5.9 C on Sep 5 08:00 Minimum Daily Average: 7.3 C on Sep 29 Maximum Diurnal Average: 18.6 C at hour 17 Minimum Diurnal Average: 10.9 C at hour 8 Monthly Average: 14.72 C Percentiles: P ₁ = 6.5 P ₁₀ = 8.2 Q ₁ = 11.0 Median = 15.0 Q ₃ = 18.0 P ₉₀ = 20.8 P ₉₉ = 24.4																						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-Sep	19.6	19.1	18.9	18.0	17.6	16.5	15.4	15.4	15.8	17.4	19.6	21.3	22.4	23.3	24.2	24.9	25.2	24.9	24.1	23.2	22.3	22.0	21.6	20.1	20.5	25.2
2-Sep	18.9	18.2	18.7	18.9	18.7	17.9	16.6	16.2	16.1	16.5	16.2	16.4	17.9	19.1	19.7	19.8	19.7	19.6	19.0	18.9	18.2	17.9	16.3	15.4	17.9	19.8
3-Sep	13.9	13.0	12.8	12.9	12.8	12.9	12.9	13.7	12.6	13.0	13.5	13.9	14.8	15.6	16.4	17.2	17.0	17.1	16.9	16.8	15.8	14.8	13.7	12.7	14.4	17.2
4-Sep	11.6	11.0	9.8	9.1	8.8	8.6	8.2	8.0	7.9	8.2	8.3	8.4	8.8	9.5	10.6	11.7	13.3	13.4	13.3	12.9	12.1	11.7	9.9	8.7	10.2	13.4
5-Sep	8.0	7.2	6.8	6.4	6.2	6.1	6.0	5.9	6.9	8.8	10.7	12.9	13.7	14.8	15.6	16.3	16.8	16.3	15.4	15.3	14.9	14.5	13.9	12.9	11.3	16.8
6-Sep	11.7	10.9	9.9	9.3	8.7	8.6	8.9	8.8	8.9	8.9	9.2	9.8	10.5	10.6	11.2	12.1	13.1	13.2	12.9	12.5	12.3	11.3	10.9	9.5	10.6	13.2
7-Sep	9.4	8.7	8.3	8.3	8.4	8.4	7.2	7.3	8.0	9.2	10.5	12.3	14.2	15.4	16.2	16.5	17.9	17.9	17.4	16.7	14.9	14.6	13.3	12.7	12.2	17.9
8-Sep	12.1	12.0	12.2	11.6	11.0	10.8	9.5	9.6	10.4	11.1	13.3	15.5	18.1	19.7	20.1	20.0	19.8	19.3	18.6	18.6	17.3	16.5	15.8	16.0	14.9	20.1
9-Sep	14.8	13.9	12.5	12.2	11.6	10.8	10.2	9.3	10.2	11.7	14.0	16.3	18.1	19.3	20.3	21.2	21.3	21.2	20.8	20.1	19.5	18.5	17.4	16.4	15.9	21.3
10-Sep	15.3	15.0	14.2	13.0	11.7	10.7	10.4	10.3	11.3	13.2	15.7	18.1	20.3	21.2	22.0	22.8	23.2	23.3	22.8	21.3	19.9	19.1	18.4	17.5	17.1	23.3
11-Sep	17.1	16.6	16.0	15.5	14.9	14.9	14.7	14.5	15.7	17.7	19.8	21.6	23.7	24.5	25.0	25.2	25.2	25.0	24.2	23.2	22.4	21.7	20.8	20.2	20.0	25.2
12-Sep	19.0	18.2	18.1	17.8	17.5	16.8	15.9	14.8	14.5	15.7	16.7	17.8	19.0	20.5	21.8	22.7	22.6	21.7	20.8	19.7	18.8	18.2	17.9	16.6	18.5	22.7
13-Sep	15.4	14.5	14.0	13.4	13.3	12.6	12.5	12.8	14.1	15.0	16.3	18.0	19.4	20.4	20.2	20.3	20.2	19.6	17.0	14.7	13.1	12.1	12.0	12.0	15.5	20.4
14-Sep	11.9	11.9	12.2	12.3	12.5	12.5	12.3	12.2	12.4	12.6	13.3	14.3	15.6	17.4	18.7	19.1	19.3	19.1	18.8	18.2	17.8	15.5	14.4	13.9	14.9	19.3
15-Sep	13.2	11.8	12.1	11.0	9.7	9.6	10.4	8.0	9.9	12.1	14.5	16.9	19.0	21.0	22.9	23.6	24.1	23.9	23.1	21.9	20.6	19.3	18.3	17.4	16.4	24.1
16-Sep	16.5	16.7	16.5	15.6	15.4	14.8	14.1	13.2	13.3	14.6	16.7	18.6	19.8	21.0	21.8	22.4	22.5	22.4	21.4	21.3	20.8	18.3	17.5	16.7	18.0	22.5
17-Sep	15.4	15.4	14.9	14.3	12.0	11.0	11.0	12.6	15.3	17.3	19.5	21.2	21.3	21.4	21.4	21.4	21.2	20.3	19.3	17.9	16.5	15.7	14.9	16.8	21.4	
18-Sep	14.1	13.4	13.2	12.8	12.5	12.4	12.1	11.9	11.8	12.8	14.7	16.4	16.5	16.7	14.9	13.3	13.2	13.2	13.5	13.6	12.6	12.6	11.6	10.5	13.3	16.7
19-Sep	10.2	10.3	10.2	9.8	8.9	8.2	8.1	7.6	8.1	10.0	11.7	13.5	15.0	16.3	17.0	17.8	18.2	18.2	17.9	17.4	16.0	15.1	13.2	11.8	12.9	18.2
20-Sep	11.1	10.6	10.1	9.8	10.0	9.7	9.6	8.9	8.9	10.2	11.9	13.4	14.3	16.2	16.9	17.5	17.2	16.3	15.0	14.7	14.2	14.5	13.2	13.3	12.8	17.5
21-Sep	13.2	12.1	10.8	9.8	9.5	7.6	8.1	7.8	8.4	9.5	13.1	16.2	17.6	18.3	18.9	19.5	19.6	19.2	18.7	18.0	17.3	16.2	15.4	14.7	14.1	19.6
22-Sep	14.1	13.5	13.4	13.4	13.1	13.2	12.7	12.5	12.9	15.1	18.4	20.1	21.3	22.3	23.0	23.4	23.3	22.9	22.0	20.8	19.7	19.1	18.0	16.9	17.7	23.4
23-Sep	17.2	17.1	17.0	17.0	16.2	15.7	15.3	14.9	15.5	17.0	18.1	19.7	20.7	21.8	22.5	23.0	22.9	22.5	21.3	20.2	19.4	19.0	18.7	18.0	18.8	23.0
24-Sep	17.7	17.4	17.4	17.7	17.6	17.4	17.0	16.7	16.5	16.6	16.7	17.2	17.7	17.1	17.0	16.8	17.3	17.5	17.4	17.8	17.3	16.4	16.3	15.2	17.1	17.8
25-Sep	13.4	13.5	10.8	9.9	9.2	8.9	8.0	7.6	8.4	9.6	11.7	13.1	15.2	15.8	17.1	18.3	18.5	17.6	17.0	16.1	15.9	15.3	15.6	15.4	13.4	18.5
26-Sep	15.6	16.2	15.9	16.1	15.8	15.5	15.1	15.0	15.5	16.3	17.4	18.5	19.4	20.2	20.2	19.9	19.5	18.9	18.7	19.1	18.4	17.5	16.4	15.6	17.4	20.2
27-Sep	15.1	14.7	14.3	13.8	14.0	12.5	11.4	10.9	10.5	12.2	14.2	16.4	17.1	17.7	18.6	18.7	18.3	17.6	17.6	16.9	16.2	14.7	13.3	12.5	15.0	18.7
28-Sep	11.9	11.3	10.6	10.0	9.2	8.4	7.7	7.8	7.6	7.9	8.5	8.9	8.7	8.6	8.5	8.4	8.1	8.0	8.0	8.0	7.9	7.9	7.7	7.6	8.6	11.9
29-Sep	7.4	6.9	6.9	6.7	6.5	6.5	6.6	6.6	6.7	6.7	6.5	7.1	7.7	8.1	8.8	9.0	8.8	8.1	7.7	7.5	7.2	6.9	6.8	6.6	7.3	9.0
30-Sep	6.7	6.8	6.9	7.0	7.0	7.1	7.1	6.8	6.9	6.9	6.9	7.6	8.2	8.7	9.1	9.3	9.6	9.7	9.6	9.3	8.9	8.7	8.5	8.2	8.0	9.7
13.7 13.3 12.8 12.4 12.0 11.6 11.2 10.9 11.3 12.4 13.8 15.3 16.5 17.4 18.0 18.4 18.6 18.3 17.7 17.1 16.3 15.5 14.8 14.0																								Diurnal Average		
19.6 19.1 18.9 18.9 18.7 17.9 17.0 16.7 16.5 17.7 19.8 21.6 23.7 24.5 25.0 25.2 25.2 25.0 24.2 23.2 22.4 22.0 21.6 20.2																								Diurnal Maximum		



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	148	20.56	20.56
10 - 20	479	66.53	87.08
> 20	93	12.92	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720

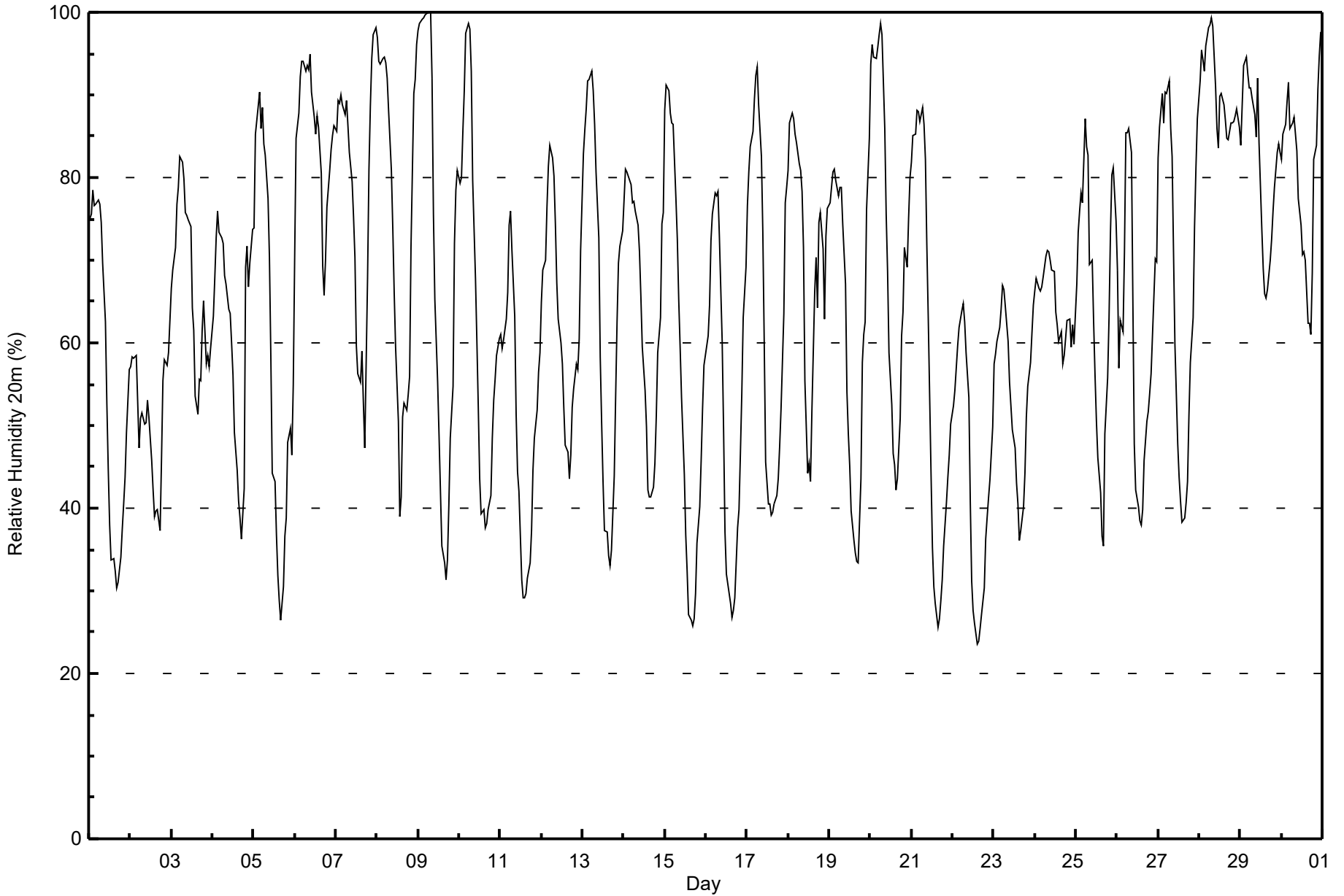


Maximum Value: 100.0 % on Sep 9 07:00																						Maximum Daily Average: 90.5 % on Sep 28																						Hours in Service: 720					
Minimum Value: 23.5 % on Sep 22 15:00																						Minimum Daily Average: 43.9 % on Sep 22																						Hours of Data: 720					
Maximum Diurnal Average: 83.7 % at hour 6																						Minimum Diurnal Average: 43.6 % at hour 17																						Hours of Missing Data: 0					
Monthly Average: 65.03 %																						Percentiles: P ₁ = 26.5 P ₁₀ = 37.7 Q ₁ = 49.4 Median = 65.8 Q ₃ = 82.2 P ₉₀ = 90.4 P ₉₉ = 98.6																						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-Sep	75.1	75.6	78.5	76.6	76.8	77.3	76.9	74.6	69.7	62.6	52.7	44.8	38.0	33.7	33.9	32.4	30.4	31.1	34.1	37.4	40.6	43.7	49.1	56.8	54.3	78.5																							
2-Sep	57.1	58.3	58.1	58.4	52.9	47.3	50.8	51.6	50.1	50.3	53.0	51.0	45.7	42.1	38.9	39.7	39.9	37.3	45.9	55.4	57.9	57.3	58.9	62.7	50.9	62.7																							
3-Sep	66.7	68.8	71.6	76.8	78.8	82.6	81.8	79.9	75.7	75.4	74.8	64.3	61.5	53.6	51.3	55.6	55.4	61.6	65.1	57.4	58.5	57.1	59.4	67.0	82.6																								
4-Sep	63.3	67.8	72.8	75.9	73.4	72.7	72.0	68.1	67.1	64.0	63.6	60.1	56.1	49.1	44.6	40.8	38.8	36.2	42.4	69.1	71.7	66.8	69.7	73.8	61.6	75.9																							
5-Sep	73.8	85.3	86.9	90.4	85.9	88.4	84.0	82.6	77.5	70.4	58.4	44.3	43.3	36.7	31.9	28.8	26.5	30.5	36.6	38.8	47.9	49.7	46.5	54.9	58.3	90.4																							
6-Sep	70.3	84.8	87.9	92.2	94.0	94.0	93.0	93.6	93.0	94.9	90.4	87.2	85.2	87.5	86.1	80.5	69.2	65.7	69.9	76.5	80.8	83.4	85.2	86.4	84.6	94.9																							
7-Sep	85.6	89.4	89.0	90.0	88.7	87.6	89.3	86.2	83.0	79.5	75.2	70.3	59.6	56.2	55.3	59.0	52.9	47.3	67.8	81.1	88.7	94.5	97.3	98.2	78.0	98.2																							
8-Sep	97.0	94.0	93.8	94.5	94.6	93.8	92.0	88.2	80.8	73.8	66.2	59.4	50.5	39.0	41.4	51.0	52.7	51.9	53.8	55.9	71.7	90.3	91.9	96.1	73.9	97.0																							
9-Sep	97.8	98.6	99.2	99.3	99.6	99.9	100.0	100.0	92.1	75.5	65.3	55.3	48.8	42.0	35.4	33.4	31.4	33.7	40.4	48.6	54.8	72.0	78.5	80.8	70.1	100.0																							
10-Sep	79.3	80.0	85.5	90.5	97.5	98.6	97.9	92.8	79.6	67.8	60.2	52.3	43.5	39.4	39.8	37.7	38.1	39.9	41.6	48.5	53.0	55.7	58.4	60.5	64.1	98.6																							
11-Sep	61.1	59.3	60.4	62.9	66.1	74.2	75.9	71.2	63.1	51.3	44.4	42.1	31.4	29.2	29.2	29.6	31.6	33.4	37.3	44.6	48.5	51.9	56.5	58.8	50.6	75.9																							
12-Sep	65.0	68.7	70.1	76.4	81.3	83.8	82.3	80.2	74.5	67.3	62.9	60.0	57.4	52.2	47.7	46.8	43.5	46.4	52.3	54.4	57.5	56.8	60.4	71.3	63.3	83.8																							
13-Sep	82.8	85.7	88.3	91.6	91.9	92.8	90.6	86.5	80.6	72.7	58.4	50.3	43.2	37.2	37.1	34.3	33.0	34.9	43.8	53.6	62.5	69.7	71.6	73.6	65.3	92.8																							
14-Sep	77.4	81.0	80.6	79.6	79.1	77.0	77.1	75.9	74.2	71.0	65.6	59.5	54.3	49.9	42.3	41.3	41.3	42.5	45.4	51.2	58.9	63.1	74.4	75.8	64.1	81.0																							
15-Sep	88.2	91.3	90.5	87.9	86.7	86.5	77.5	72.5	65.2	59.6	53.5	44.1	36.7	32.3	27.1	26.4	25.8	26.6	29.7	35.7	40.1	45.8	52.0	57.2	55.8	91.3																							
16-Sep	59.6	60.9	64.5	72.4	75.7	78.2	77.8	78.3	72.9	60.2	49.4	37.2	32.0	30.8	28.4	26.8	27.6	29.2	37.6	39.8	46.7	53.8	63.1	69.1	53.0	78.3																							
17-Sep	76.6	80.7	83.8	85.5	89.5	92.3	93.3	88.8	82.6	73.4	59.9	45.7	40.4	40.6	39.1	39.5	40.4	41.5	43.5	47.4	52.1	63.5	77.0	78.8	64.8	93.3																							
18-Sep	80.8	86.6	87.8	87.1	85.2	84.3	81.6	80.8	78.4	71.6	55.4	44.2	45.4	43.3	51.7	66.1	70.3	64.2	74.6	75.8	71.3	62.8	72.9	76.3	70.8	87.8																							
19-Sep	76.9	78.8	80.7	81.0	79.7	77.8	78.9	78.8	74.4	67.1	54.1	49.0	45.0	39.7	36.1	34.6	33.6	33.4	43.5	57.7	61.1	62.5	76.0	84.7	61.9	84.7																							
20-Sep	93.7	96.2	94.5	94.3	95.8	97.2	98.6	97.3	86.0	75.7	68.6	58.7	52.5	46.6	45.2	42.1	43.5	50.9	60.8	63.8	71.6	69.1	75.0	79.9	73.2	98.6																							
21-Sep	81.8	85.2	85.3	88.1	88.0	86.8	88.5	86.4	82.2	71.9	63.1	44.2	35.3	30.6	28.4	25.6	26.6	28.8	31.4	35.5	40.8	43.6	46.4	50.2	57.3	88.5																							
22-Sep	52.3	54.3	57.0	59.6	61.9	63.9	64.7	62.5	58.9	53.4	40.9	31.2	27.6	26.0	23.5	23.9	25.4	27.2	30.3	36.3	38.8	41.2	43.3	49.8	43.9	64.7																							
23-Sep	57.5	58.7	60.2	61.9	64.1	66.9	66.4	64.3	60.2	55.3	52.3	49.4	47.3	43.0	40.4	36.0	37.3	40.2	44.3	51.0	54.8	57.6	61.2	64.6	54.0	66.9																							
24-Sep	66.3	67.8	66.7	66.3	66.7	67.9	70.6	71.2	71.0	70.0	68.8	68.7	63.8	62.2	60.2	61.4	57.5	58.5	60.5	62.8	62.8	59.5	62.3	59.9	64.7	71.2																							
25-Sep	67.1	73.4	76.0	78.1	77.0	87.1	83.8	82.7	69.5	70.1	62.6	56.1	50.5	46.1	41.9	36.5	35.4	49.0	55.7	63.1	73.2	80.3	81.2	74.8	65.5	87.1																							
26-Sep	68.8	56.9	62.6	61.4	71.0	85.5	85.4	85.9	83.1	65.0	47.8	42.3	40.1	38.4	38.0	39.8	45.8	50.5	51.6	53.9	56.3	65.5	70.1	69.9	59.8	85.9																							
27-Sep	82.4	86.1	90.2	86.7	90.4	90.2	91.7	85.9	82.6	71.0	59.8	47.7	43.8	40.8	38.3	38.8	40.7	43.2	51.2	57.7	63.0	74.0	81.2	87.2	67.7	91.7																							
28-Sep	91.6	95.3	94.2	92.9	95.9	98.2	98.4	99.3	98.3	91.1	86.0	83.5	89.9	90.2	88.9	86.9	84.7	84.6	86.6	86.6	86.8	87.5	88.4	86.0	90.5	99.3																							
29-Sep	84.0	88.8	93.6	94.5	92.5	90.9	90.8	89.7	87.6	84.9	92.1	84.3	73.7	69.0	65.9	65.4	66.5	70.1	72.6	75.9	78.7	83.0	84.1	83.1	81.7	94.5																							
30-Sep	82.2	85.3	86.4	89.1	91.5	85.9	86.6	87.2	85.3	83.2	77.5	74.2	70.6	71.1	70.0	62.3	62.4	61.0	68.5	82.2	83.8	90.7	94.7	97.7	80.4	97.7																							
																								75.4	78.1	79.9	81.4	82.4	83.7	83.3	81.4	76.6	70.0	62.8	55.7	50.5	46.9	44.7	44.0	43.6	44.8	50.5	56.8	61.1	65.1	69.5	72.6	Diurnal Average	
																								97.8	98.6	99.2	99.3	99.6	99.9	100.0	100.0	98.3	94.9	92.1	87.2	89.9	90.2	88.9	86.9	84.7	84.6	86.6	86.6	88.7	94.5	97.3	98.2	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	94	13.06	13.06
40 - 60	198	27.50	40.56
60 - 80	226	31.39	71.94
80 - 100	200	27.78	99.72

Total Number of Valid Hours: 720

Total Number of Hours: 720

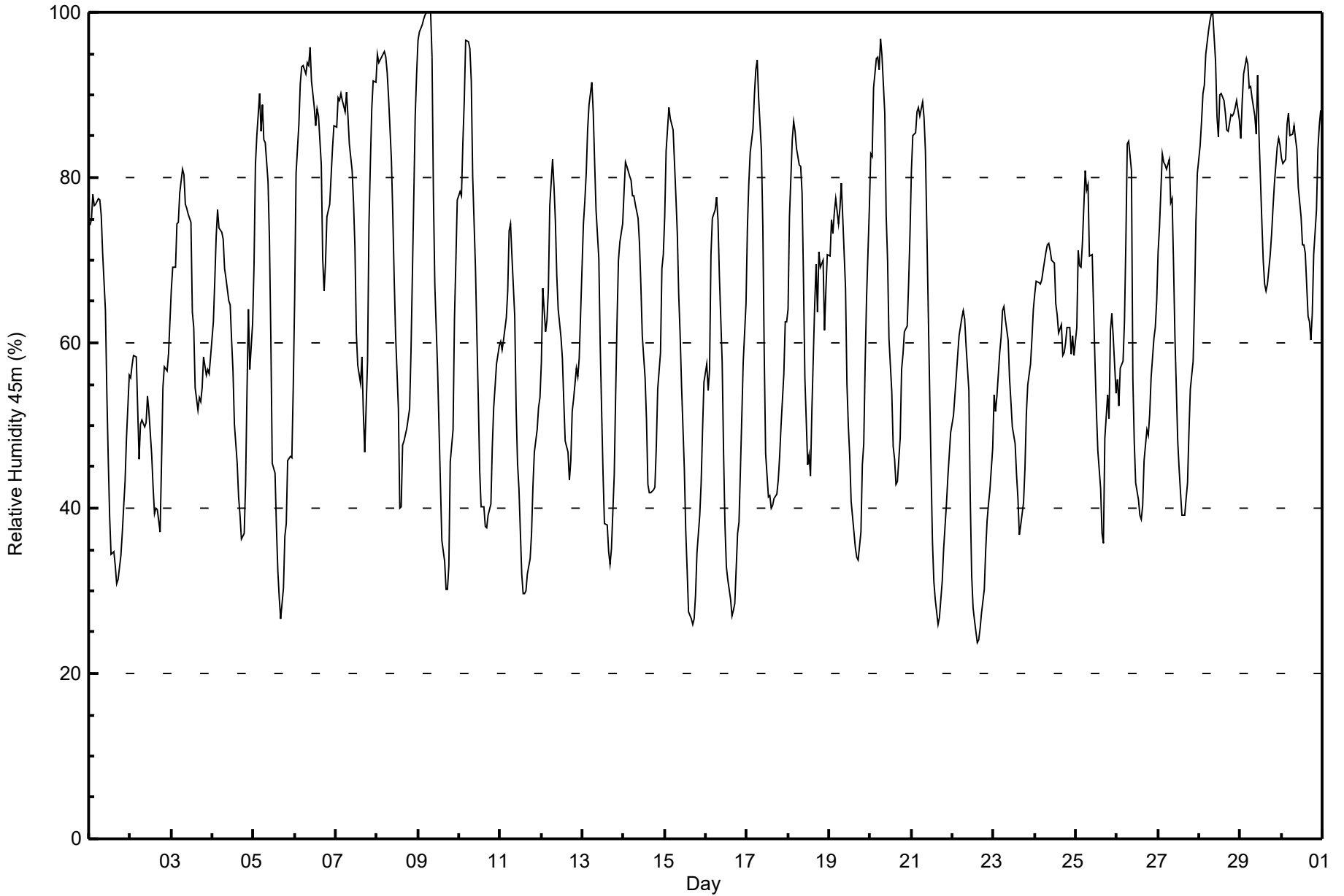


Maximum Value: 100.0 % on Sep 9 06:00																						Maximum Daily Average: 90.2 % on Sep 28																						Hours in Service: 720			
Minimum Value: 23.7 % on Sep 22 15:00																						Minimum Daily Average: 43.5 % on Sep 22																						Hours of Data: 720			
Maximum Diurnal Average: 82.4 % at hour 7																						Minimum Diurnal Average: 43.5 % at hour 17																						Hours of Missing Data: 0			
Monthly Average: 63.53 %																						Percentiles: P ₁ = 26.5 P ₁₀ = 37.8 Q ₁ = 48.1 Median = 63.0 Q ₃ = 79.3 P ₉₀ = 88.8 P ₉₉ = 98.8																						Hours of Calibration: 0			
																																												Percent Operational Time: 100.0			
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																							
1-Sep	74.3	74.9	78.0	76.6	76.7	77.4	77.3	75.4	70.9	63.9	53.9	45.9	39.0	34.4	34.7	33.0	30.8	31.3	34.2	37.0	40.1	43.2	48.5	56.1	54.5	78.0																					
2-Sep	55.8	57.2	58.6	58.3	52.0	46.0	50.2	50.6	49.8	50.3	53.6	51.7	46.4	42.5	39.3	40.0	39.9	37.1	45.3	54.6	57.1	56.6	58.6	62.5	50.6	62.5																					
3-Sep	66.5	69.2	69.2	74.5	74.5	78.1	81.0	80.3	76.8	76.2	75.6	74.5	63.7	61.8	54.5	51.8	53.4	52.9	54.6	58.3	56.1	56.7	56.2	58.3	65.6	81.0																					
4-Sep	62.6	67.5	73.0	76.1	73.8	73.3	72.5	69.0	67.9	65.0	64.6	60.4	56.6	50.1	45.5	41.4	39.2	36.2	36.9	43.0	54.3	64.1	56.8	62.4	58.8	76.1																					
5-Sep	69.2	81.6	85.0	90.2	85.5	88.8	84.7	84.2	79.5	72.5	60.7	45.4	44.3	37.6	32.3	29.1	26.5	30.3	36.6	38.1	45.7	46.3	46.0	54.7	58.1	90.2																					
6-Sep	65.4	80.5	86.5	91.4	93.4	93.6	92.5	93.8	93.6	95.7	91.8	88.6	86.3	88.3	87.5	81.6	70.2	66.2	69.6	75.2	76.7	80.2	83.6	86.2	84.1	95.7																					
7-Sep	86.2	89.6	89.3	90.2	89.4	87.9	90.4	87.5	84.1	80.8	76.9	71.5	61.1	57.3	55.1	58.4	51.5	46.7	57.8	74.2	81.7	88.2	91.7	91.6	76.6	91.7																					
8-Sep	95.0	93.9	94.2	94.9	95.2	94.7	92.7	89.6	82.2	75.5	67.8	61.0	52.0	40.0	40.2	47.7	48.1	49.7	50.8	52.0	59.0	77.8	87.5	92.5	72.3	95.2																					
9-Sep	96.6	97.7	98.4	99.1	99.6	100.0	100.0	100.0	94.6	77.9	67.0	56.6	49.6	42.8	36.1	33.5	30.2	30.2	33.1	45.7	49.5	62.8	69.8	77.3	68.7	100.0																					
10-Sep	78.4	77.8	84.3	89.3	96.6	96.4	95.6	91.6	80.2	68.9	60.8	53.3	44.5	40.1	40.2	37.8	37.6	39.1	40.5	47.5	52.3	54.8	57.4	59.6	63.5	96.6																					
11-Sep	60.1	59.2	60.4	63.0	66.2	73.6	74.4	70.4	63.2	52.0	45.4	42.4	32.0	29.7	29.6	30.1	32.1	33.8	36.9	42.7	46.7	49.5	52.1	53.5	50.0	74.4																					
12-Sep	57.6	66.6	61.4	62.7	66.4	76.7	82.2	79.0	74.7	68.2	64.0	60.7	58.2	52.9	48.1	46.7	43.4	45.8	51.7	53.2	57.0	56.0	58.2	63.5	60.6	82.2																					
13-Sep	74.4	77.1	80.5	85.7	88.9	91.6	88.0	81.8	76.1	70.2	59.7	51.7	44.3	38.2	37.9	34.8	33.2	35.1	44.1	53.8	62.8	70.0	72.2	74.3	63.6	91.6																					
14-Sep	78.2	81.9	81.3	80.2	79.6	77.7	77.8	76.7	75.1	72.1	66.9	60.9	55.7	50.7	42.9	41.9	41.8	42.2	42.5	47.5	54.4	58.9	69.0	70.8	63.6	81.9																					
15-Sep	75.3	83.3	88.6	87.2	86.4	85.8	77.6	73.2	65.8	61.1	54.9	44.7	37.3	32.6	27.4	26.6	25.9	26.5	29.5	34.7	39.1	43.1	49.5	55.3	54.6	88.6																					
16-Sep	57.4	54.3	56.8	70.7	75.1	76.1	77.6	74.8	68.2	57.7	46.6	37.9	32.8	31.4	29.0	27.0	27.6	28.5	36.9	38.3	44.5	51.0	57.6	64.8	50.9	77.6																					
17-Sep	73.8	79.4	83.0	85.9	90.0	93.1	94.2	89.7	83.2	74.1	58.7	46.7	41.4	41.5	40.1	40.4	41.1	41.7	43.3	46.3	49.9	56.3	62.5	62.5	63.3	94.2																					
18-Sep	64.1	75.3	84.5	86.8	85.5	83.6	81.5	81.4	78.1	67.9	55.8	45.3	46.5	43.9	51.9	64.6	69.6	63.6	71.1	69.2	70.0	61.6	66.5	70.6	68.3	86.8																					
19-Sep	70.5	74.9	73.2	75.7	77.4	74.4	76.2	79.3	75.2	66.7	55.1	50.1	46.3	40.9	37.1	35.2	34.1	33.7	37.1	45.3	47.7	57.4	65.5	76.3	58.6	79.3																					
20-Sep	82.9	82.6	90.9	94.3	94.6	93.1	96.8	94.7	87.8	75.3	70.0	60.5	54.1	47.5	46.0	42.8	43.2	48.5	56.7	58.7	61.4	62.0	67.1	73.1	70.2	96.8																					
21-Sep	80.9	85.2	85.5	88.0	88.4	87.4	89.1	87.3	83.2	73.9	64.1	45.0	36.2	31.1	28.9	25.9	26.8	28.9	31.2	35.1	40.5	43.7	46.4	49.2	57.6	89.1																					
22-Sep	51.2	53.5	55.9	58.5	60.8	63.0	64.0	62.8	59.6	54.3	41.0	31.9	28.0	26.4	23.7	24.1	25.5	27.2	30.2	34.8	38.5	40.5	42.2	47.4	43.5	64.0																					
23-Sep	53.8	51.7	53.5	58.9	60.7	63.9	64.4	62.8	60.3	55.8	52.8	49.8	47.7	44.0	41.1	36.8	37.9	40.7	44.8	51.4	54.9	57.5	60.5	64.0	52.9	64.4																					
24-Sep	65.9	67.5	67.3	67.1	67.6	68.8	71.0	71.8	72.0	71.2	70.0	69.6	64.8	63.4	61.1	62.3	58.4	58.9	59.9	61.9	61.8	58.7	60.8	58.5	65.0	72.0																					
25-Sep	61.8	71.1	69.3	69.1	72.1	80.9	78.5	79.2	70.5	70.6	64.0	57.5	51.7	46.9	42.4	36.9	35.8	48.5	53.7	50.8	61.5	63.5	60.7	53.9	60.5	80.9																					
26-Sep	55.7	52.3	56.9	57.7	62.6	72.2	84.1	84.4	80.9	55.5	48.1	43.1	41.0	39.2	38.7	40.4	45.8	49.4	48.8	51.4	55.7	60.6	61.8	65.0	56.3	84.4																					
27-Sep	71.1	74.0	82.8	81.9	81.4	80.9	82.2	76.9	77.5	69.7	60.8	48.1	44.8	41.8	39.1	39.2	41.2	43.0	49.2	54.3	57.8	64.8	74.8	80.5	63.2	82.8																					
28-Sep	83.9	86.8	90.2	91.2	95.0	97.8	98.9	99.8	99.8	94.1	87.4	85.0	90.0	90.2	89.4	87.8	85.8	85.5	87.7	87.5	87.8	88.5	89.3	86.9	90.2	99.8																					
29-Sep	84.7	89.1	92.5	94.5	93.7	90.8	91.0	89.7	87.5	85.3	92.3	85.1	74.8	70.1	67.2	66.3	67.1	70.7	73.2	76.4	79.3	83.8	84.8	84.0	82.2	94.5																					
30-Sep	82.4	81.7	82.3	86.5	87.9	85.1	85.3	86.2	84.7	83.4	78.7	75.2	71.8	71.9	70.9	63.1	62.6	60.3	63.5	70.7	76.1	83.3	86.3	88.2	77.8	88.2																					
																						71.2	74.6	77.1	79.5	80.6	81.7	82.4	80.8	76.8	70.2	63.6	56.7	51.4	47.6	45.3	44.2	43.5	44.4	48.4	53.0	57.3	61.4	64.8	68.1	Diurnal Average	
																						96.6	97.7	98.4	99.1	99.6	100.0	100.0	100.0	99.8	95.7	92.3	88.6	90.0	90.2	89.4	87.8	85.8	85.5	87.7	87.5	87.8	88.5	91.7	92.5	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	90	12.50	12.50
40 - 60	225	31.25	43.75
60 - 80	229	31.81	75.56
80 - 100	173	24.03	99.58

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

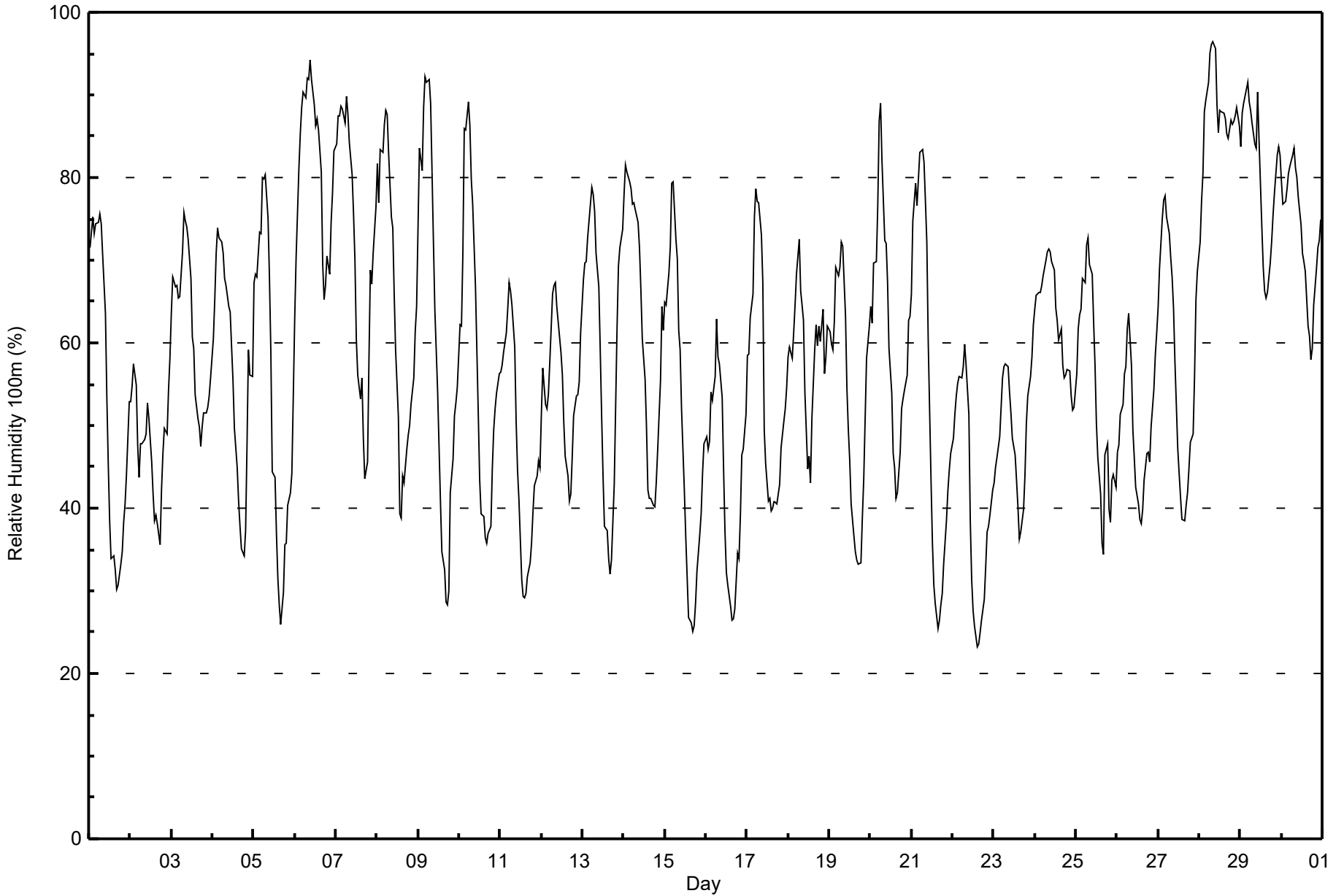
Relative Humidity 100m (RH100m) - %
Lower Camp Met Tower - September 2023

Maximum Value: 96.4 % on Sep 28 09:00																						Hours in Service: 720																									
Maximum Daily Average: 87.5 % on Sep 28																						Hours of Data: 720																									
Minimum Value: 23.2 % on Sep 22 15:00																						Hours of Missing Data: 0																									
Minimum Daily Average: 41.1 % on Sep 22																						Hours of Calibration: 0																									
Maximum Diurnal Average: 75.4 % at hour 7																						Percent Operational Time: 100.0																									
Minimum Diurnal Average: 42.0 % at hour 17																																															
Monthly Average: 58.75 %																																															
Percentiles: P ₁ = 25.9 P ₁₀ = 36.6 Q ₁ = 44.9 Median = 58.1 Q ₃ = 71.7 P ₉₀ = 83.4 P ₉₉ = 91.9																																															
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-Sep	71.5	73.3	75.2	73.2	74.5	74.5	75.6	74.3	70.6	63.5	53.4	45.5	38.5	33.9	34.3	32.6	30.2	30.8	33.2	34.8	38.2	40.6	44.1	53.0	52.9	75.6																					
2-Sep	53.0	54.7	57.4	55.0	47.6	43.8	47.9	47.7	48.2	49.0	52.7	50.8	45.6	41.7	38.4	39.1	38.1	35.5	42.2	46.7	49.7	49.0	54.2	58.1	47.8	58.1																					
3-Sep	63.6	67.9	66.9	67.0	65.5	65.7	70.9	75.8	74.8	74.1	72.6	67.8	60.7	59.3	53.7	50.8	49.9	47.5	49.9	51.5	51.5	52.2	53.5	55.7	61.2	75.8																					
4-Sep	60.5	65.2	70.8	74.0	72.6	72.2	70.9	67.8	66.9	64.3	63.8	59.5	55.4	49.6	45.0	40.9	37.8	35.1	34.3	37.4	47.7	59.2	56.2	56.0	56.8	74.0																					
5-Sep	67.2	68.3	68.0	73.3	73.2	79.9	79.8	80.4	75.1	68.0	58.9	44.4	43.7	36.9	31.5	28.4	25.9	29.8	35.6	35.8	40.3	41.9	44.2	53.4	53.5	80.4																					
6-Sep	62.7	70.2	80.9	85.3	88.4	90.4	89.7	92.0	91.9	94.2	91.8	88.9	86.2	87.0	85.7	80.7	69.5	65.3	66.9	70.6	68.4	74.6	78.1	83.3	80.9	94.2																					
7-Sep	84.1	87.5	87.4	88.6	88.3	86.7	89.9	87.7	84.3	80.3	75.6	69.9	60.3	56.2	53.1	55.8	48.5	43.6	45.6	57.9	68.8	67.1	70.9	76.4	71.4	89.9																					
8-Sep	81.6	77.0	83.4	83.0	86.4	88.1	87.6	83.1	75.3	73.9	66.0	59.1	51.1	39.3	38.7	43.8	43.1	47.1	48.8	49.9	52.5	55.7	61.4	64.3	64.2	88.1																					
9-Sep	73.9	83.5	80.8	88.4	92.2	91.6	91.9	89.0	80.6	72.1	64.0	54.0	47.4	40.9	34.7	32.6	28.7	28.3	30.0	41.9	46.0	51.2	52.7	54.7	60.5	92.2																					
10-Sep	62.2	62.0	70.8	85.9	85.8	89.2	86.3	79.8	76.9	66.8	59.0	51.4	43.3	39.3	39.0	36.5	35.7	36.9	37.8	44.8	49.4	52.0	53.8	56.2	58.4	89.2																					
11-Sep	56.5	57.2	58.8	61.2	64.0	67.2	66.3	64.7	59.5	50.5	44.6	41.0	31.3	29.3	29.2	29.7	31.7	33.3	35.8	39.5	42.7	44.0	45.8	44.9	47.0	67.2																					
12-Sep	51.3	56.9	52.5	52.1	53.8	57.7	66.0	66.9	67.2	64.4	62.5	58.9	56.0	50.3	46.2	44.0	40.9	41.7	46.0	51.1	53.6	53.7	55.3	61.2	54.6	67.2																					
13-Sep	67.6	69.7	69.9	72.7	74.8	78.8	78.0	75.9	70.8	66.8	59.2	51.3	43.9	37.8	37.3	33.9	32.0	33.7	43.0	52.4	61.9	69.3	71.6	73.7	59.4	78.8																					
14-Sep	77.9	81.5	80.7	79.5	78.6	76.9	77.0	76.1	74.5	71.6	66.4	60.5	55.6	49.8	42.2	41.1	41.2	40.3	40.1	43.2	47.2	55.5	64.3	61.6	61.8	81.5																					
15-Sep	65.0	64.6	68.4	71.7	79.3	79.5	72.6	70.2	61.4	59.1	52.0	42.3	36.6	31.8	26.7	26.1	25.1	25.7	28.5	32.4	36.8	39.3	44.2	47.8	49.5	79.5																					
16-Sep	48.6	47.1	48.1	54.1	53.1	55.9	63.0	58.3	57.5	53.4	44.8	37.0	32.1	30.7	28.2	26.4	26.6	27.7	34.6	33.9	39.2	46.5	47.1	51.4	43.6	63.0																					
17-Sep	58.4	58.7	63.1	65.9	75.3	78.6	77.1	76.9	73.0	67.3	49.5	45.4	40.9	41.2	39.7	40.1	40.8	40.6	41.7	42.8	47.2	50.4	52.0	54.6	55.0	78.6																					
18-Sep	58.4	59.4	58.1	61.2	64.6	68.3	72.6	66.2	64.5	62.8	54.1	44.8	46.3	43.1	50.9	59.2	62.2	59.6	62.0	60.2	64.1	56.3	58.4	62.0	59.1	72.6																					
19-Sep	61.3	59.9	59.2	62.6	69.2	68.2	69.2	72.3	71.7	63.3	54.4	49.5	45.8	40.5	36.7	34.8	33.7	33.2	33.4	38.8	43.6	50.8	58.1	62.0	53.0	72.3																					
20-Sep	64.4	62.3	69.7	69.9	76.6	86.9	89.0	82.1	72.3	72.1	67.3	59.3	53.9	46.5	44.9	41.3	41.9	46.7	52.1	53.2	54.2	56.2	62.7	63.3	62.0	89.0																					
21-Sep	65.9	74.7	79.3	76.6	79.9	83.0	83.5	81.8	77.1	72.2	60.2	43.3	35.7	30.7	28.5	25.4	26.4	28.3	29.7	33.3	38.5	42.0	44.6	46.7	53.6	83.5																					
22-Sep	48.5	51.4	53.6	55.1	55.9	55.8	57.2	59.9	57.3	51.3	38.4	31.3	27.6	25.8	23.2	23.6	24.9	26.5	28.9	32.9	37.1	37.8	39.2	42.3	41.1	59.9																					
23-Sep	43.1	44.9	46.1	48.7	52.3	55.8	57.1	57.5	57.2	54.1	51.5	48.5	46.5	43.5	40.2	36.3	37.2	39.8	44.0	50.2	53.6	55.9	58.4	62.3	49.4	62.3																					
24-Sep	64.1	65.8	66.2	66.1	66.9	68.1	70.0	71.0	71.4	71.0	69.9	68.9	64.2	62.7	60.3	61.7	57.3	55.8	56.2	56.8	56.5	53.6	51.9	52.1	62.9	71.4																					
25-Sep	56.3	61.7	63.4	64.0	67.9	67.3	71.9	72.7	69.5	68.3	62.6	57.3	50.1	46.2	41.6	35.7	34.5	46.4	47.8	39.9	38.4	43.3	44.1	42.6	53.9	72.7																					
26-Sep	46.9	47.6	51.3	52.6	56.3	57.2	61.7	63.6	57.3	49.5	46.1	42.6	40.5	38.6	38.2	39.8	43.4	46.7	46.8	45.5	49.9	54.4	58.5	61.2	49.8	63.6																					
27-Sep	64.2	69.0	75.1	77.2	77.9	75.3	73.2	70.4	68.0	64.2	57.8	47.3	44.3	41.3	38.7	38.4	40.3	41.8	44.8	47.9	49.0	55.9	65.3	68.6	58.2	77.9																					
28-Sep	72.2	77.1	80.5	88.0	89.3	91.6	95.1	96.2	96.4	95.7	88.9	85.4	88.1	88.1	87.8	87.1	85.2	84.8	86.9	86.5	86.8	87.4	88.5	86.3	87.5	96.4																					
29-Sep	83.7	87.7	89.0	90.8	91.6	89.2	88.1	86.6	84.0	83.6	90.4	84.6	74.0	69.2	66.3	65.4	66.0	69.6	72.2	75.4	78.1	82.6	83.7	82.7	80.6	91.6																					
30-Sep	79.5	76.7	77.1	78.7	80.5	81.4	82.6	83.5	81.2	80.1	77.6	74.2	70.8	69.8	68.7	62.1	60.8	57.9	59.3	64.6	69.0	71.6	72.4	74.8	73.1	83.5																					
																						63.8	66.1	68.4	70.7	72.7	74.2	75.4	74.3	71.2	67.6	61.9	55.5	50.6	46.7	44.3	43.1	42.0	42.7	45.3	48.4	52.0	55.0	57.8	60.4	Diurnal Average	
																						84.1	87.7	89.0	90.8	92.2	91.6	95.1	96.2	96.4	95.7	91.8	88.9	88.1	88.1	87.8	87.1	85.2	84.8	86.9	86.5	86.8	87.4	88.5	86.3	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	111	15.42	15.42
40 - 60	276	38.33	53.75
60 - 80	237	32.92	86.67
80 - 100	96	13.33	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720

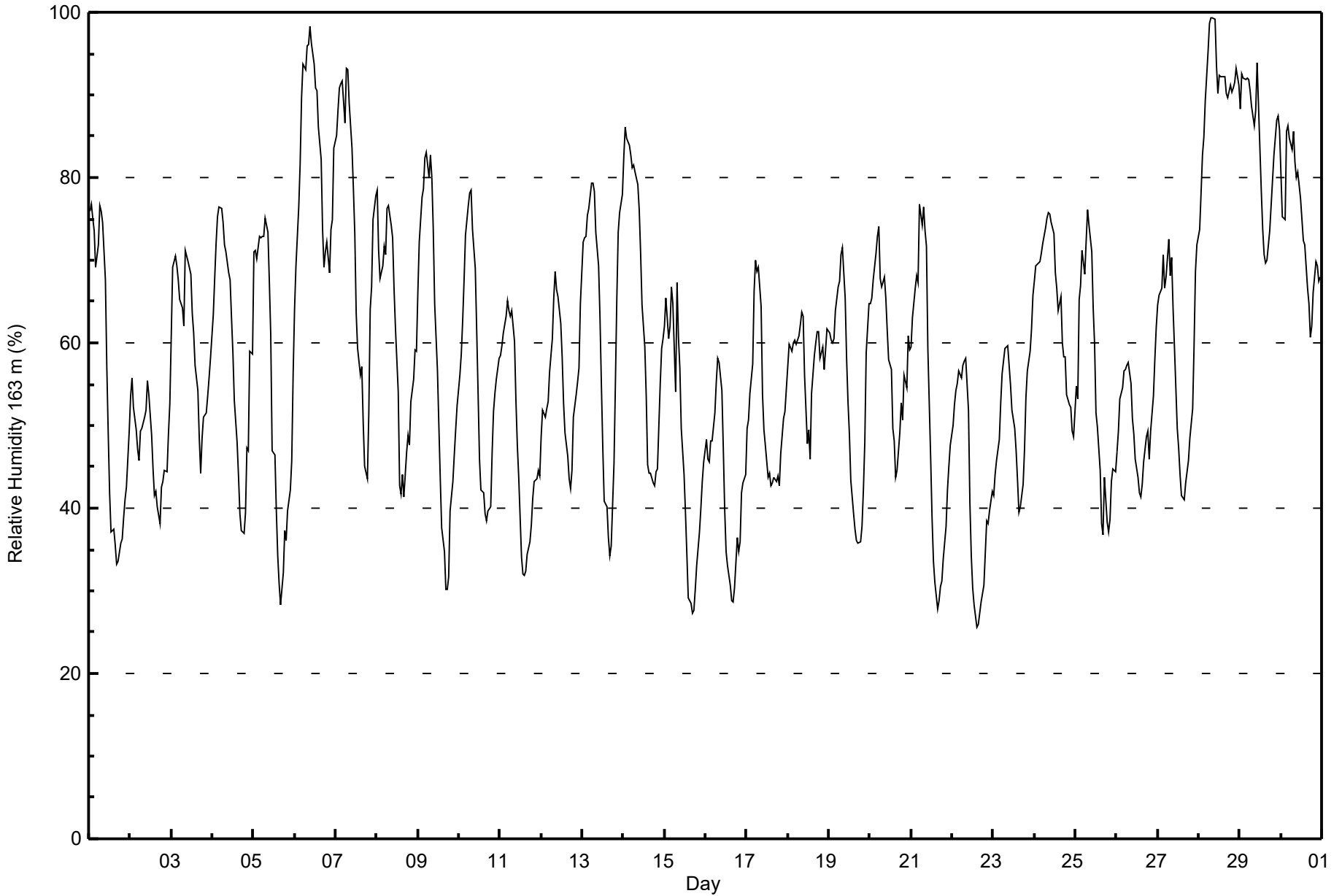


Maximum Value: 99.4 % on Sep 28 09:00																						Hours in Service: 720																									
Maximum Daily Average: 90.9 % on Sep 28																						Hours of Data: 720																									
Minimum Value: 25.6 % on Sep 22 15:00																						Hours of Missing Data: 0																									
Minimum Daily Average: 42.2 % on Sep 22																						Hours of Calibration: 0																									
Maximum Diurnal Average: 72.9 % at hour 8																						Percent Operational Time: 100.0																									
Minimum Diurnal Average: 44.2 % at hour 17																																															
Monthly Average: 59.11 %																																															
Percentiles: P ₁ = 28.4 P ₁₀ = 38.1 Q ₁ = 45.7 Median = 58.2 Q ₃ = 71.1 P ₉₀ = 82.3 P ₉₉ = 95.8																																															
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-Sep	76.0	76.9	75.1	73.5	69.2	71.8	76.5	75.9	74.5	67.6	57.1	49.2	41.8	37.1	37.5	35.6	33.2	33.6	35.7	36.4	38.9	41.0	42.6	49.4	54.4	76.9																					
2-Sep	53.5	55.7	52.2	49.4	47.2	45.8	49.3	49.7	51.0	51.9	55.4	53.7	48.9	44.8	41.5	42.1	40.2	38.2	42.5	43.3	44.6	44.3	48.9	52.7	47.8	55.7																					
3-Sep	60.8	69.1	70.6	69.2	67.6	65.2	64.2	62.0	71.3	70.4	69.8	68.3	63.5	61.1	57.2	54.3	48.5	44.2	48.4	51.1	51.5	53.5	55.7	58.2	60.7	71.3																					
4-Sep	63.4	67.8	72.0	75.2	76.4	76.3	74.5	71.8	71.1	68.4	67.6	63.1	58.9	53.0	48.0	43.9	39.3	37.3	37.0	39.5	47.3	47.0	59.0	58.6	59.0	76.4																					
5-Sep	71.0	71.2	70.1	72.8	72.6	72.8	72.9	75.1	73.4	67.4	61.1	47.0	46.4	39.6	34.2	30.9	28.3	32.1	37.3	36.1	39.7	42.3	45.7	56.2	54.0	75.1																					
6-Sep	64.0	69.3	76.4	81.7	89.7	93.7	93.1	95.9	96.1	98.3	96.3	93.7	90.8	90.5	86.0	82.3	73.7	69.2	71.0	72.2	68.5	73.7	75.0	83.6	82.7	98.3																					
7-Sep	85.1	88.2	90.9	91.3	91.7	86.6	93.2	93.0	89.1	83.6	78.6	73.2	63.5	59.3	56.1	57.2	50.3	45.1	43.5	51.5	64.0	66.8	74.9	77.8	73.1	93.2																					
8-Sep	78.5	71.1	67.8	69.4	71.7	70.7	76.3	76.6	74.2	72.7	66.6	61.8	54.1	42.6	41.7	44.0	41.3	46.8	48.8	47.6	52.8	55.7	59.1	58.9	60.5	78.5																					
9-Sep	66.1	72.2	77.6	78.6	82.3	83.0	79.9	82.7	80.0	73.7	64.7	56.6	50.0	43.6	37.6	34.8	30.1	30.2	31.6	39.7	43.1	46.4	49.5	52.4	57.8	83.0																					
10-Sep	56.2	58.7	62.6	67.7	73.0	76.7	78.2	78.5	73.7	69.0	61.5	53.9	46.0	42.3	41.8	39.3	38.5	39.6	40.1	46.7	51.6	53.9	55.5	58.1	56.8	78.5																					
11-Sep	58.6	59.7	61.1	63.2	65.1	63.8	63.3	63.9	60.2	53.0	47.7	43.7	34.1	32.1	31.9	32.5	34.5	35.9	38.0	41.1	43.2	43.5	44.6	43.9	48.3	65.1																					
12-Sep	48.7	51.9	51.1	52.0	52.9	56.5	60.5	65.5	68.7	66.5	65.6	62.4	58.3	52.8	49.2	46.3	43.5	42.3	44.6	51.0	53.8	55.3	56.9	64.7	55.0	68.7																					
13-Sep	72.1	72.6	72.9	75.4	76.3	79.3	79.3	78.4	73.4	69.3	63.1	54.8	47.3	40.9	40.1	36.5	34.2	35.5	45.4	55.1	65.3	73.3	75.7	78.0	62.3	79.3																					
14-Sep	82.5	86.1	84.8	83.9	82.7	81.3	81.5	80.7	79.1	76.2	70.8	64.7	59.6	53.6	45.3	44.2	44.2	43.0	42.8	44.4	44.7	55.1	59.3	60.5	64.6	86.1																					
15-Sep	62.0	65.4	60.6	62.0	66.8	64.8	54.0	67.3	60.7	56.9	49.7	44.1	39.4	34.4	29.1	28.5	27.3	27.6	30.2	33.1	37.1	40.0	43.2	45.6	47.1	67.3																					
16-Sep	48.3	45.9	45.5	48.1	48.1	51.5	55.2	58.1	57.7	54.2	47.4	39.9	34.7	33.1	30.7	28.9	28.7	30.3	36.4	34.7	36.0	41.8	43.1	44.1	42.6	58.1																					
17-Sep	49.7	50.7	53.8	57.5	66.3	70.0	68.6	69.2	64.5	53.7	49.4	47.7	43.8	44.2	42.7	43.0	43.8	43.3	43.9	42.8	46.6	50.9	51.6	54.4	52.2	70.0																					
18-Sep	57.1	59.9	59.0	60.0	60.4	59.8	60.8	62.3	63.8	63.3	56.2	47.8	49.4	45.9	53.9	58.4	59.9	61.3	61.3	58.2	59.5	56.9	59.2	61.7	58.2	63.8																					
19-Sep	61.2	60.4	60.1	60.5	63.9	66.9	67.5	70.7	71.5	65.4	58.1	52.9	49.0	43.4	39.4	37.4	36.2	35.8	35.9	37.7	42.2	47.9	58.7	64.8	53.6	71.5																					
20-Sep	64.7	65.4	67.7	70.8	72.8	74.0	67.9	66.7	67.9	65.5	61.6	58.0	56.8	49.7	48.1	43.8	44.7	49.2	52.6	50.6	56.2	54.6	60.9	59.2	59.6	74.0																					
21-Sep	59.5	63.1	66.7	68.2	67.2	76.7	74.2	76.4	73.6	71.6	59.4	46.0	38.8	33.5	31.1	27.8	28.8	30.5	31.1	33.8	37.9	42.3	45.1	47.6	51.3	76.7																					
22-Sep	50.0	52.6	54.2	55.0	56.6	55.8	57.3	57.8	58.1	51.8	40.7	34.2	30.3	28.4	25.6	25.9	27.2	28.7	30.8	34.5	38.5	38.1	39.7	42.0	42.2	58.1																					
23-Sep	41.5	44.1	45.8	48.3	52.8	56.3	57.7	59.4	59.7	57.3	54.9	51.8	49.7	46.9	43.4	39.4	40.2	42.8	47.1	53.3	56.6	59.1	61.8	65.8	51.5	65.8																					
24-Sep	67.4	69.3	69.7	69.9	70.8	72.1	73.8	75.0	75.8	75.5	74.6	73.2	68.5	66.6	63.9	65.5	59.9	58.4	58.3	53.8	52.6	52.3	49.4	48.7	65.2	75.8																					
25-Sep	54.8	53.3	65.2	66.9	71.1	68.4	72.3	76.1	74.2	71.0	64.2	59.8	51.5	49.9	44.5	38.1	36.7	43.7	38.4	37.1	38.6	43.2	44.7	44.5	54.5	76.1																					
26-Sep	46.8	49.4	53.2	54.6	56.7	56.8	57.3	57.6	55.0	50.9	48.9	45.9	43.8	41.9	41.3	42.9	45.6	48.7	49.3	45.9	49.4	53.6	58.0	61.8	50.6	61.8																					
27-Sep	64.5	65.8	66.7	70.7	66.7	68.0	72.6	68.2	70.4	64.3	59.4	49.6	47.2	44.1	41.6	41.0	43.0	44.4	45.8	48.5	52.0	59.6	68.7	71.8	58.1	72.6																					
28-Sep	73.6	78.2	82.6	84.8	89.4	95.3	98.7	99.3	99.4	99.2	93.5	90.3	92.4	92.2	92.1	92.2	90.1	89.7	91.2	90.4	90.9	91.5	93.3	91.1	90.9	99.4																					
29-Sep	88.3	92.5	92.1	91.8	92.0	91.9	90.5	88.7	86.2	88.2	93.9	88.6	78.3	73.7	70.6	69.7	70.1	73.6	76.6	79.6	82.6	87.0	87.4	85.7	84.2	93.9																					
30-Sep	80.5	75.2	75.0	85.6	86.3	84.8	83.4	85.5	81.9	80.0	80.7	77.4	74.8	72.4	71.8	66.6	64.8	60.6	62.1	66.1	69.8	69.3	67.4	68.0	74.6	86.3																					
																						63.5	65.4	66.8	68.6	70.2	71.2	71.8	72.9	71.9	68.6	63.9	58.4	53.7	49.8	47.3	45.8	44.2	44.7	46.6	48.5	51.9	54.7	57.8	60.3	Diurnal Average	
																						88.3	92.5	92.1	91.8	92.0	95.3	98.7	99.3	99.4	99.2	96.3	93.7	92.4	92.2	92.1	92.2	90.1	89.7	91.2	90.4	90.9	91.5	93.3	91.1	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	92	12.78	12.78
40 - 60	300	41.67	54.44
60 - 80	246	34.17	88.61
80 - 100	82	11.39	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Maximum Speed: 33 km/h on Sep 21 14:00	Maximum Daily Speed Average: 21.5 km/h on Sep 11	Hours in Service: 720
Minimum Speed Value: 0 km/h on Sep 7 23:00	Minimum Daily Speed Average: 1.2 km/h on Sep 25	Hours of Data: 720
Maximum Diurnal Speed Average: 8.4 km/h at hour 13	Minimum Diurnal Speed Average: 3.5 km/h at hour 24	Hours of Missing Data: 0
Monthly Average Velocity: 5.1 km/h 174.4 deg	Percentiles: P ₁ = 0 P ₁₀ = 2 Q ₁ = 5 Median = 8 Q ₃ = 13 P ₉₀ = 21 P ₉₉ = 31	Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Sep	NW3	W2	W6	W7	WSW10	WSW11	WSW9	WSW12	WSW13	WSW18	WSW17	WSW22	WSW25	WSW26	SW28	SW31	SW32	SW28	SW23	WSW17	WSW14	WSW11	W9	W4	WSW15.4	SW32
2-Sep	WSW5	SSE2	SSW9	W9	W8	NW5	WNW3	WNW5	NW7	NW7	WSW11	WSW14	WSW16	WSW14	WSW16	WSW21	WSW18	WNW14	WSW11	WSW12	WSW13	WSW16	WSW17	W13	WSW10.4	WSW21
3-Sep	WSW5	S7	S7	SE6	SE8	SE9	SE8	SE9	SE7	SE11	SE10	SE11	SW5	SSE5	SSW13	W6	NNW5	WNW2	N2	W4	NNW8	NNW7	NW8	NW9	SSE2.6	SSW13
4-Sep	WNW12	W13	W14	W12	WNW13	NW15	NW12	NW14	NW15	NW13	NW13	NNW10	NW10	NW11	NW7	NW6	NNE3	NNW2	SSE0	ESE3	SE2	SSE2	SSE6	SE7	NW6.8	NW15
5-Sep	SSE9	SE9	SE8	ESE8	SE11	SE9	SSE12	SSE11	SE9	SE10	SE10	SSE15	SSE11	SSE13	SSE15	SSE15	S14	S18	SSE21	SSE14	SE8	SE7	SSE11	S7	SSE10.9	SSE21
6-Sep	E1	NE2	ENE2	E4	ESE3	ESE6	ESE5	ESE5	ESE4	SE6	S12	SSW9	SW6	N4	NE3	SE2	SSW9	SW13	SW10	SW5	WSW2	WSW2	SW2	WNW1	S2.6	SW13
7-Sep	WNW2	SSW3	WSW2	SE2	SSW3	WSW9	SSW3	SSW5	SSW7	SSE7	SE9	SE9	SE7	SE8	SE6	ESE2	ESE2	SSE3	SE10	ESE3	SE1	SE1	N0	SE2	SSE3.3	SE10
8-Sep	ESE5	ESE6	SE6	SE7	SE8	SE9	ESE6	SE8	SE9	SE9	SE10	SE9	SSE3	WSW10	NNW4	N6	N6	NNW4	NW4	NNW3	WNW1	NW1	NW3	S0	SE2.6	WSW10
9-Sep	NNW1	NNW2	WNW2	NW1	WNW0	SE2	SE3	SE4	SE5	SE7	ESE7	SE7	SE7	SE6	SE5	E3	ESE3	SE6	SE3	SSE3	ESE6	E1	ENE1	NNE1	SE3.1	SE7
10-Sep	ESE3	ESE6	E3	E2	NE1	SE2	NE0	ESE3	SE3	SSE6	SE8	SSE8	SE10	SSE16	SE14	SE15	SE16	SE17	SE13	SE13	SE16	SE20	SSE22	SE22	SE9.7	SE22
11-Sep	SE23	SSE28	SSE26	SSE24	SSE20	SE15	SE14	SE16	SSE18	SSE23	SSE27	SSE24	SSE31	SSE31	SSE29	S31	SSE29	S23	SSE17	SE16	SE17	SE17	SE15	SE13	SSE21.5	SSE31
12-Sep	ESE7	E3	SE9	SE15	SE16	SE11	SE8	SE11	SE8	SE8	SE7	SE7	SE6	ESE6	SE8	ESE5	WSW7	WSW10	WSW10	SW4	WSW7	S5	ESE1	SE4	SE5.4	SE16
13-Sep	SE5	SE6	SE7	SE6	SE7	SE7	SE10	SE12	SE11	S7	WSW17	WSW14	WSW22	WSW25	WSW22	WSW24	WSW25	WSW22	W23	WSW22	WSW18	WSW19	WSW17	WSW17	SW11.1	WSW25
14-Sep	W15	WNW11	WNW13	WNW10	WNW10	WNW11	WNW10	NW10	WNW11	NW13	WNW13	WNW14	NW12	NNW7	NW10	NW12	NW12	NW8	NW8	NW7	N5	WSW2	S5	SSW2	WNW8.9	W15
15-Sep	SE4	SE5	ESE5	SE8	SE9	SE8	SE13	SE10	SE10	SE10	SE11	SE15	SE19	SSE20	SSE22	SSE19	SSE20	SSE20	SSE20	SSE21	SSE23	SSE20	SE19	SE10	SSE13.9	SSE23
16-Sep	SE8	SE12	SE14	ESE4	SE7	SE8	ESE6	SE12	SE12	SE5	SE5	SW6	WSW7	W8	WSW10	WSW12	WSW9	SSW6	S17	S16	SSE3	ESE5	SE8	SE9	SSE5.8	S17
17-Sep	SE8	SE8	SE6	SE6	ESE7	SE7	SE1	ESE1	N2	SE5	ESE5	S19	SSW15	SW15	SSW11	SSW13	SW13	SW9	SW8	SW5	SSE5	SE7	SE9	S5.7	S19	
18-Sep	SE9	SE9	SE10	ESE10	ESE8	SE7	SE7	SE9	SE9	SE11	WSW15	WSW18	WSW27	W18	WSW19	SSW11	SSW14	SSW11	SE8	SE6	SE3	SW7	SE8	SE7	S6.1	WSW27
19-Sep	SE10	SE10	ESE8	SE12	SE12	SE13	SE11	SE11	SE10	SSE12	SSW12	SSW15	SW10	W9	WSW9	SW10	SW7	SSW9	SSW5	NNW2	SE1	SW2	SE5	E0	S6.0	SSW15
20-Sep	NW0	NW1	ESE2	N1	ESE1	E1	NE1	ESE1	ESE1	N2	WNW2	NNW5	NW6	NNW7	NNW7	N5	N6	NNW4	NNW5	WNW1	SE4	SE6	N3	SE6	N1.6	NNW7
21-Sep	SE8	SE6	SE6	SE9	SE9	SSE11	SSE13	SSE15	SE15	SE11	SE13	SSW25	SSW31	SSW33	SSW31	SSW29	SSW31	SSW23	SSE17	SSE19	SSE22	SSE23	SSE22	SE16	S16.4	SSW33
22-Sep	SE13	SE13	SE12	SE13	SE12	SE13	SE13	SE14	SE13	SE12	SSE19	S24	S25	S23	S27	S25	SSE21	SSE22	SSE18	SSE17	SSE17	SSE24	SSE21	SE11	SSE16.5	S27
23-Sep	SE8	SE11	SE13	SE15	SE18	SE16	SE16	SE13	SE14	SE18	SE18	SE24	SE27	SSE30	SSE27	SSE30	SSE26	SSE22	SSE23	SSE21	SSE20	SSE23	SE18	SE19	SSE19.5	SSE30
24-Sep	SE24	SE21	SSE27	SSE25	SSE25	SSE26	SSE23	SSE22	SSE23	SSE19	SSE15	SSE13	S12	WSW14	WSW13	SW9	SSW8	S10	S9	S8	SW8	WSW11	WSW10	SW5	S13.2	SSE27
25-Sep	SSW3	SW6	SE7	SE7	SSE5	SE7	SE9	SE7	S7	SE6	E3	S3	SE1	NNW4	N4	N5	NNE5	N7	NW5	N9	N12	N11	NNW9	N9	NE1.2	N12
26-Sep	N5	ESE3	ESE3	SE8	NNE4	NNW8	NNW3	NNW2	ESE0	SE9	SSE10	S18	SSW16	S14	S14	SSW10	WSW5	S4	SE3	SE8	W7	WSW4	SE6	SSW1	S3.9	S18
27-Sep	SE1	SSE1	NNW3	WSW2	SE7	SE5	SE3	SE7	SE7	SE5	SW4	WSW18	WSW12	WSW15	WSW15	WSW18	WSW14	WSW8	W5	W2	NW3	NW3	NNW3	SW4.2	WSW18	
28-Sep	SSW0	SE1	SE3	ESE3	ENE1	SSE0	E2	ESE3	SSE2	NNW2	N9	N9	NNW8	N8	N8	N11	N11	N10	N8	N8	N8	NNW9	NNW6	NNW6	N4.7	N11
29-Sep	N8	NNW5	N3	N3	WSW1	WNW2	NW1	NW3	NW3	NNW6	NNW7	NNW6	N9	N11	N7	N8	N8	N8	N5	NNW5	N5	N6	N5	NNE2	N5.1	N11
30-Sep	SE1	ENE1	E1	ESE1	SE3	SSE3	SSE3	SE4	SE4	SSE5	S6	S6	S7	SE5	ESE5	ESE6	SE8	SSE9	SSE7	ESE3	ESE3	SE1	NE1	ENE1	SE3.5	SSE9

SSE3.6	SE4.5	SSE5.0	SE5.4	SSE5.4	SSE4.8	SE5.2	SE5.7	SE5.5	SSE5.6	S5.8	S7.1	SSW8.4	SSW7.2	SSW7.9	SSW7.4	SSW7.4	SSW7.0	S6.2	S4.7	S3.8	S4.3	SSE4.3	SSE3.5	Diurnal Average	
SE24	SSE28	SSE27	SSE25	SSE25	SSE26	SSE23	SSE22	SSE23	SSE23	SSE23	SSE27	SSW25	SSW31	SSW33	SSW31	SW31	SW32	SW28	SW23	WSW22	SSE23	SSE24	SSE22	SE22	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

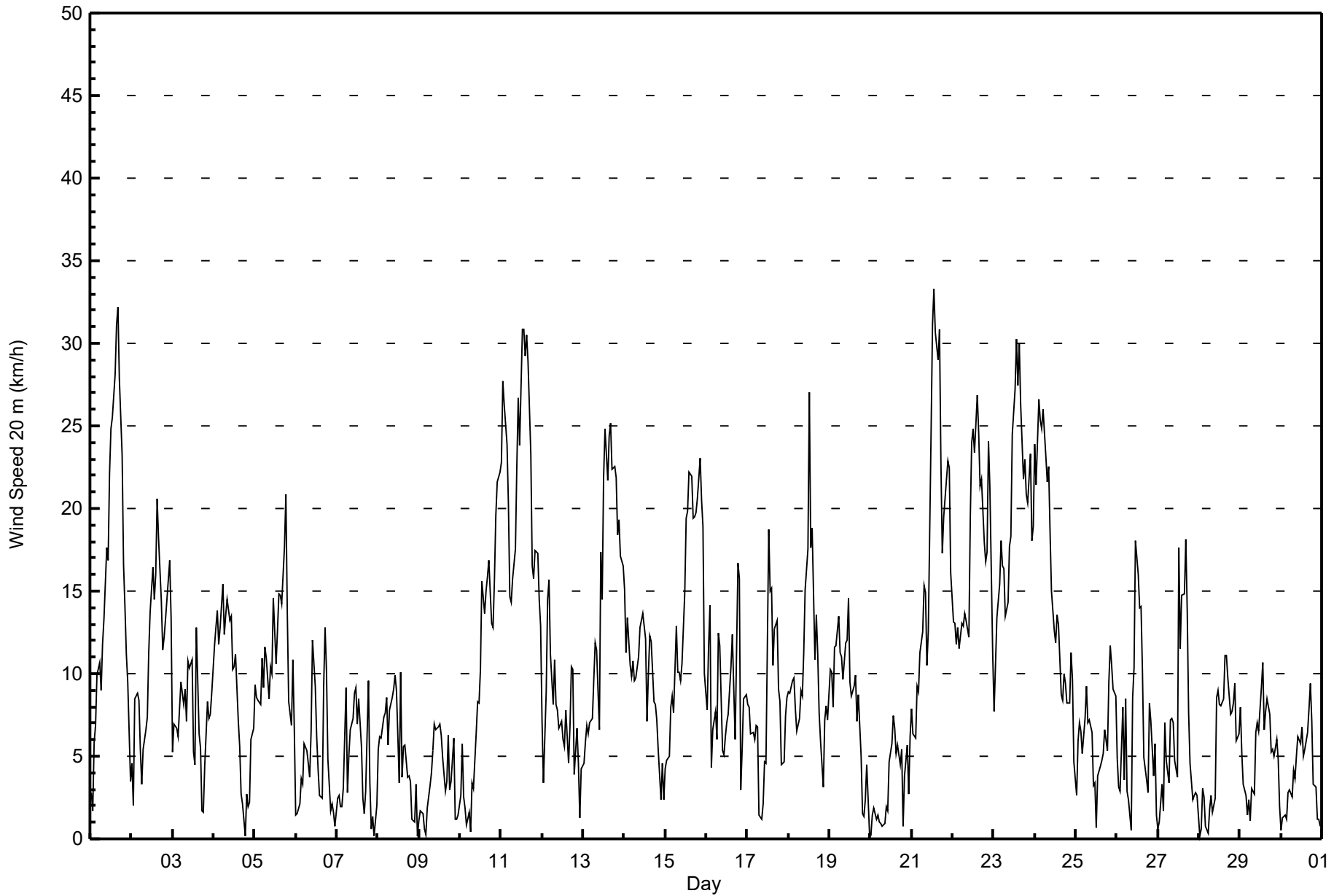
Lower Camp Met Tower - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 9 km/h on Sep 21 12:00 Minimum Value: 0 km/h on Sep 9 05:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 3 Q ₃ = 4 P ₉₀ = 5 P ₉₉ = 7																		Hours in Service: 720 Hours of Data: 720 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-Sep	2	2	3	6	5	5	5	5	4	4	5	5	7	7	7	7	7	7	7	4	3	4	3	3	7
2-Sep	3	2	4	4	4	3	2	3	3	3	5	4	5	5	5	6	6	6	3	3	3	4	5	5	6
3-Sep	4	2	3	2	2	3	3	3	3	5	4	3	4	4	3	3	2	1	1	5	4	4	3	4	5
4-Sep	4	4	5	5	5	6	5	5	6	5	5	4	4	5	4	4	2	1	1	1	1	1	1	2	6
5-Sep	2	2	3	3	3	4	4	4	3	3	3	5	4	4	4	5	4	4	4	3	2	3	2	4	5
6-Sep	2	1	1	2	2	3	2	2	2	3	2	2	2	2	1	2	6	4	2	4	2	2	2	2	6
7-Sep	2	3	2	2	2	5	3	2	2	3	3	3	3	3	3	2	2	2	3	2	1	1	1	1	5
8-Sep	2	2	2	3	3	3	2	2	3	3	3	3	3	3	3	2	2	1	1	2	1	1	2	1	3
9-Sep	1	1	1	1	0	1	1	1	1	2	2	2	2	3	2	1	1	2	1	2	3	1	1	1	3
10-Sep	2	2	1	1	1	1	1	2	1	2	2	2	5	5	4	5	5	5	4	4	4	5	4	5	5
11-Sep	5	4	4	4	3	3	3	3	4	5	5	6	7	6	7	6	6	6	4	4	3	3	3	2	7
12-Sep	2	1	4	3	3	3	3	3	3	3	3	2	3	2	3	2	4	3	2	3	4	2	1	3	4
13-Sep	2	2	2	2	2	3	3	3	2	4	5	6	6	8	8	9	7	7	8	8	6	5	5	5	9
14-Sep	6	5	5	4	3	4	4	4	4	5	6	5	5	4	5	5	5	4	2	2	2	2	1	2	6
15-Sep	1	1	1	2	2	3	2	3	3	3	4	5	4	4	5	5	4	4	3	3	4	3	4	4	5
16-Sep	2	3	5	2	3	3	2	3	3	3	2	2	3	4	3	4	3	3	3	2	4	2	2	2	5
17-Sep	2	2	3	3	2	3	2	1	1	1	4	2	6	4	5	3	2	4	2	2	2	2	2	2	6
18-Sep	2	2	3	3	2	2	2	3	3	3	6	6	6	7	7	3	3	2	2	3	2	3	3	3	7
19-Sep	3	3	3	3	3	3	3	4	3	3	3	3	5	4	4	3	3	1	3	1	2	2	1	1	5
20-Sep	1	1	1	1	1	1	1	1	1	1	2	2	3	3	3	2	2	1	2	1	3	3	2	3	3
21-Sep	1	2	2	3	3	3	3	3	4	4	5	9	6	6	6	5	6	6	3	2	3	3	3	4	9
22-Sep	3	3	3	3	3	2	2	3	4	4	5	4	4	5	5	4	4	4	3	3	4	4	4	3	5
23-Sep	2	2	2	3	3	2	3	3	4	6	5	6	7	6	6	6	5	5	5	5	4	5	5	5	7
24-Sep	6	6	5	5	5	5	4	5	4	4	3	3	4	4	3	2	2	1	3	3	4	3	3	2	6
25-Sep	1	4	3	2	2	2	3	2	2	3	2	2	1	2	2	2	3	4	1	3	4	4	3	3	4
26-Sep	4	4	3	4	3	3	2	1	1	4	4	4	3	4	2	3	3	3	4	5	5	2	2	1	5
27-Sep	1	1	1	1	4	4	2	2	2	2	1	4	4	5	5	4	6	3	2	3	1	2	1	1	6
28-Sep	1	1	1	1	1	1	1	1	1	3	3	3	3	3	3	4	4	4	3	2	3	3	3	2	4
29-Sep	3	2	1	2	1	1	1	1	1	3	3	3	3	5	4	3	3	3	2	2	2	2	2	2	5
30-Sep	1	1	1	1	1	1	1	2	1	1	1	1	1	2	2	2	3	2	2	2	1	1	1	1	3
Diurnal Maximum																									



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	214	29.72	29.72
6 - 11	272	37.78	67.50
12 - 19	151	20.97	88.47
20 - 28	69	9.58	98.06
29 - 38	14	1.94	100.00
> 38	0	0.00	100.00

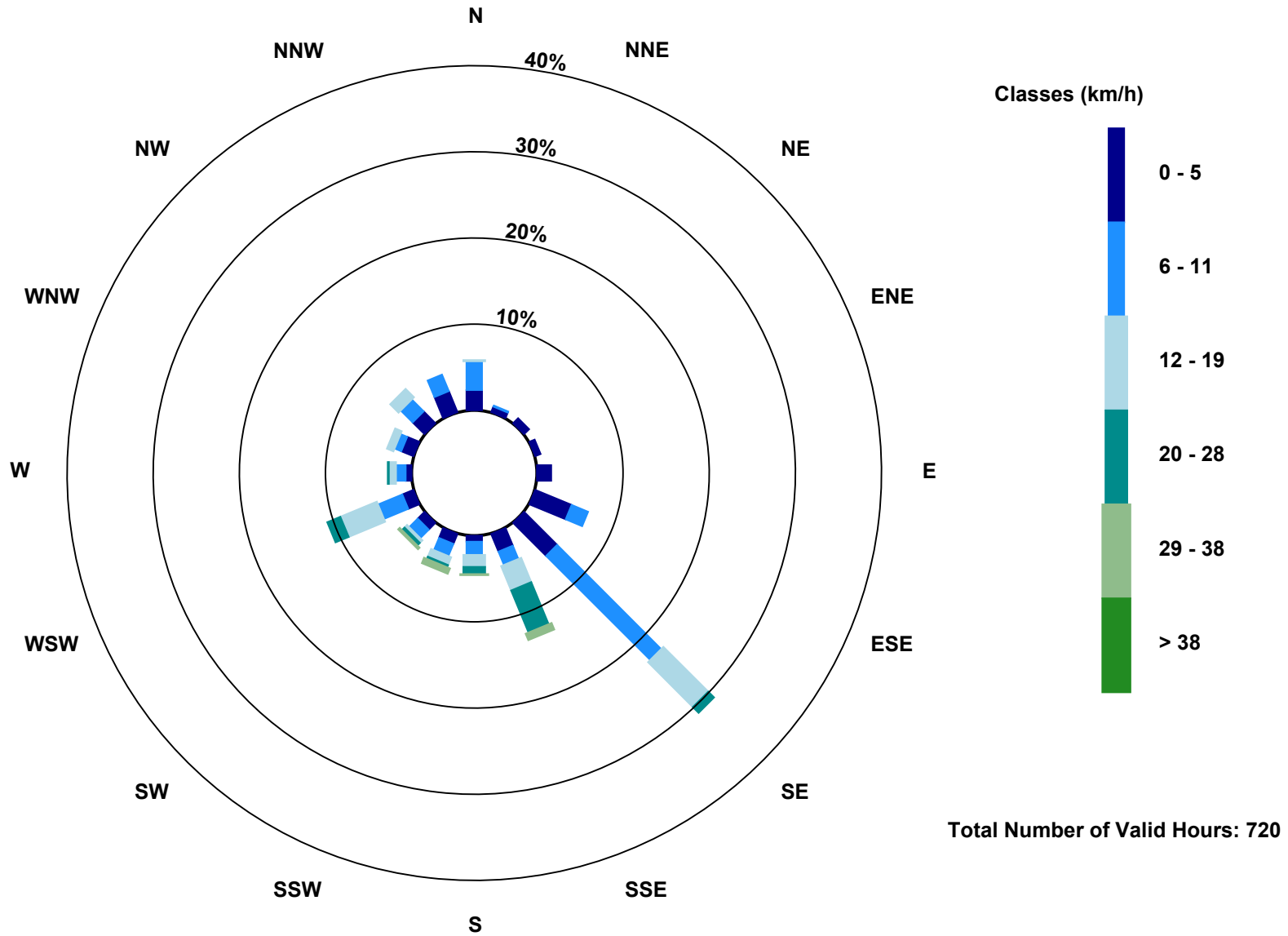
Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

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





Maximum Speed: 38 km/h on Sep 23 13:00	Maximum Daily Speed Average: 26.1 km/h on Sep 11	Hours in Service: 720
Minimum Speed Value: 0 km/h on Sep 20 07:00	Minimum Daily Speed Average: 1.1 km/h on Sep 25	Hours of Data: 718
Maximum Diurnal Speed Average: 9.3 km/h at hour 13	Minimum Diurnal Speed Average: 5.3 km/h at hour 1	Hours of Missing Data: 2
Monthly Average Velocity: 6.5 km/h 175.5 deg	Percentiles: P ₁ = 1 P ₁₀ = 4 Q ₁ = 7 Median = 12 Q ₃ = 18 P ₉₀ = 26 P ₉₉ = 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-Sep	WNW5	W3WSW11	WSW13	WSW17	WSW17	WSW15	WSW17	WSW16	WSW20	WSW20	WSW26	WSW30	WSW31	SW33	SW36	SW37	SW32	SW28	WSW23	SW20	WSW17	WSW16	WSW8	WSW20.2	SW37	
2-Sep	WSW6	S2	SW12	WSW14	W15	NW10	WNW7	WNW10	NW10	WNW11	WSW15	WSW17	WSW20	WSW19	WSW23	WSW26	WSW27	WNW22	WSW17	WSW18	WSW20	WSW22	WSW26	WSW23	W15.3	WSW27
3-Sep	WSW11	SSW9	S8	SSE7	SE8	SE13	SE13	SE13	SE10	SE15	SE15	SE14	SW9	SSE5	SSW13	W8	NNW11	NNW3	NNW3	W10	NW15	NW13	NW13	WNW15	S2.7	WNW15
4-Sep	WNW19	W20	W20	W18	WNW20	NW23	NW19	NW21	NW22	NW20	NW19	NNW16	NW15	NW16	NW10	NW8	NNE4	NNW3	W1	SE4	SSW5	SSW3	S6	SSE7	WNW10.8	NW23
5-Sep	S10	SE10	SE12	SE11	SE14	SE12	SE14	SE13	SE11	SE12	SE12	SSE16	SE15	SE17	SSE17	S15	S19	SSE24	SSE17	SE12	SE11	S14	S9	SSE13.2	SSE24	
6-Sep	ESE3	E4	E4	E7	ESE8	ESE11	ESE10	ESE8	ESE6	SE9	S13	SSW10	SW6	N6	ENE4	ESE3	SW10	SW15	SW13	SW9	SW7	SW8	SW5	WSW2	S3.8	SW15
7-Sep	WSW4	SW6	WSW4	S3	SW4	WSW15	SW5	SSW5	SSW7	SE8	SE11	SE10	SE9	SE10	SE8	ESE6	SE1	SSE4	SE8	SE8	SE5	SE8	SSE4	SE5	SSE4.7	WSW15
8-Sep	SE10	SE11	SE10	SE12	SE13	SE13	SE9	SE11	SE13	SE11	SE13	SE11	SSE4	WSW12	NNW7	N10	N11	N7	NNW6	N6	N2	NNW4	NW5	WNW1	ESE4.0	SE13
9-Sep	NW1	NNW3	NW2	NW1	SSE1	SE4	UO	UO	SE6	SE9	SE8	SE8	SE8	SE8	ESE6	E4	ESE4	SE8	ESE7	SE7	ESE12	ESE7	SE7	SE4	ESE5.0	ESE12
10-Sep	SE5	SE10	ESE5	ESE5	S1	SE4	SE3	SE4	SE4	SE8	SE10	SE10	SE13	SSE19	SE18	SE24	SE23	SE26	SE23	SE22	SE26	SE27	SE27	SE30	SE14.3	SE30
11-Sep	SE31	SE34	SE33	SE29	SSE24	SE20	SE21	SE22	SE23	SSE26	SSE30	SE30	SSE34	SSE34	SSE32	S34	SSE32	S26	SSE20	SE23	SE23	SE22	SE20	SSE16	SSE26.1	SE34
12-Sep	SE12	ESE6	SE13	SE20	SE20	SE17	SE14	SE17	SE12	SE11	SE10	SE11	SE9	SE8	SE11	ESE6	WSW10	WSW16	WSW15	SW8	WSW11	SSW6	SSW3	S5	SSE8.0	SE20
13-Sep	SSE8	SSE7	SE8	SE9	SE11	SE12	SSE11	SSE10	SSE9	SSW8	WSW21	WSW18	WSW27	WSW31	WSW29	WSW33	WSW33	WSW32	W33	WSW32	WSW25	WSW24	WSW23	WSW25	SW15.9	WSW33
14-Sep	W23	WNW18	WNW20	WNW17	WNW16	WNW16	WNW15	WNW14	WNW16	NW18	WNW19	WNW19	NW17	NNW10	NW15	NW19	NW17	NW14	NW16	WNW16	NW10	W5	SW7	SW8	WNW14.1	W23
15-Sep	SE8	SE9	SE9	SE11	SE12	SE12	SE15	SE13	SE14	SE14	SE16	SE22	SE23	SE24	SSE25	SSE24	SSE22	SSE22	SSE24	SSE28	SSE26	SE25	SE17	SSE18.0	SSE28	
16-Sep	SE14	SE18	SE20	SE9	SE12	SE12	SE10	SE13	SE11	SSE4	S4	SW8	WSW8	W10	WSW13	WSW15	WSW12	SSW8	S21	SSW21	S6	ESE7	SE11	SE13	SSE8.1	SSW21
17-Sep	SE13	SE13	SE10	SE11	SE9	SE11	SE9	SE2	SE1	N2	SE10	ESE7	S20	SSW16	SW17	SW12	SSW14	SW17	SW14	SW14	SW10	SSE6	SSE10	SSE8	S7.9	S20
18-Sep	SSE7	SE11	SE14	SE14	SE12	SE10	SE11	SE12	SE12	SSE11	WSW20	WSW24	WSW32	WSW25	WSW27	SSW14	SW16	SSW14	SE11	SSE13	SSE5	SW12	SSE8	SE9	SSW9.1	WSW32
19-Sep	SE13	SE15	SSE8	SE15	SE15	SE17	SE15	SE15	SE13	SSE12	SSW13	SSW16	WSW11	W11	WSW12	SW12	SW8	SSW10	SSW10	N1	SSW2	WSW6	S3	S2	S7.7	SE17
20-Sep	NW4	NW5	N1	WSW0	SSE1	ESE2	N0	SE3	SE1	N2	WNW3	NW6	NW7	NNW11	NNW10	N7	NNE9	N8	NNW11	NNW3	ESE3	SE9	NW2	SE7	N2.7	NNW11
21-Sep	SE10	SE9	SE10	SE13	SE13	SE16	SE17	SE19	SE20	SE16	SE19	SSW27	SSW34	SSW36	SSW33	SSW32	SSW34	SSW25	S21	SSE24	SSE26	SSE27	SSE27	SSE21	SSE19.7	SSW36
22-Sep	SE19	SE19	SE17	SE19	SE17	SE18	SE18	SE20	SE21	SE19	SSE22	S25	S26	S25	S28	S27	SSE24	SSE25	SSE22	SSE22	SSE21	SSE29	SSE26	SE17	SSE20.6	SSE29
23-Sep	SE13	SE16	SE17	SE21	SE23	SE22	SE22	SE23	SE23	SE27	SE28	SE36	SE38	SSE34	SSE33	SSE34	SSE30	SSE25	SSE27	SSE25	SSE25	SE29	SE28	SE29	SE25.8	SE38
24-Sep	SE33	SE31	SSE31	SSE29	SSE29	SSE30	SSE27	SSE25	SSE26	SSE21	SSE17	SE16	SSW13	WSW19	WSW15	SW10	SSW9	S12	S14	S13	SW13	WSW18	WSW15	SW8	S16.0	SE33
25-Sep	SW6	WSW11	SSE8	SSE9	SSE7	SE10	SE10	SSE8	S8	SE7	E3	S3	ESE1	N5	N6	N6	NNE9	NNE12	NNW6	N9	N14	N12	NNW8	NE4	ENE1.1	N14
26-Sep	E5	SE11	SE11	SE17	E7	N10	NNW6	N5	ESE3	SE16	SSE13	S19	SSW17	S15	S15	SSW11	WSW8	SSW5	SSE4	ESE14	W10	W5	SSE5	S3	SSE5.8	S19
27-Sep	SW3	S2	W5	WSW6	SSE5	SSE4	SW3	SSE6	SE7	ESE7	SE5	SW5	WSW20	WSW14	WSW18	WSW19	WSW23	WSW18	WSW13	W9	W7	NNW4	NW6	NNW5	WSW6.6	WSW23
28-Sep	W1	NE0	SE5	SE5	SSE2	W0	ENE2	E4	SE2	N4	N12	N13	NNW12	N13	N13	N17	N16	N15	N11	N11	N12	N14	NNW10	NNW11	N7.2	N17
29-Sep	N12	NNW9	N8	N7	WNW2	WNW4	NNW2	NW5	NNW5	NNW11	NNW12	NNW10	N13	N15	N9	N11	N13	N11	N8	N8	N8	N10	N8	N4	N8.3	N15
30-Sep	SSE1	ENE2	ESE1	SE2	SSE5	S4	S4	SE5	SSE4	SSE6	S6	S6	S7	SE6	ESE7	ESE9	SE11	SSE12	SSE10	SE9	ESE8	SE7	SE6	ESE3	SE5.4	SSE12

SSE5.3 SSE6.4 SSE6.9 SSE7.7 SSE7.4 SSE6.7 SE6.9 SE7.2 SE6.8 SE6.7 SSE6.8	S7.9 SSW9.3 SSW8.0 SSW8.8 SSW8.2 SSW8.1 SSW8.0 SSW8.0	S6.9 S5.6 S5.9 S6.0 S5.4	Diurnal Average
SE33 SE34 SE33 SSE29 SSE29 SSE30 SSE27 SSE25 SSE26 SE27 SSE30	SE36 SE38 SSW36 SSE33 SW36 SW37 SW32	W33 WSW32 SSE28 SSE29 SE28 SE30	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 - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 9 km/h on Sep 18 15:00	Hours of Data: 718
Minimum Value: 0 km/h on Sep 10 05:00	Hours of Missing Data: 2
Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 3 Q ₃ = 4 P ₉₀ = 5 P ₉₉ = 7	Hours of Calibration: 0
	Percent Operational Time: 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-Sep	3	2	4	7	5	4	6	4	3	3	5	5	5	6	6	7	7	7	6	4	3	4	4	4	7
2-Sep	3	2	5	4	4	4	3	4	4	4	4	3	4	5	4	5	5	6	3	3	3	3	4	5	6
3-Sep	5	3	3	2	2	2	3	2	4	6	4	3	6	4	3	3	2	1	1	8	4	4	4	5	8
4-Sep	4	4	4	5	5	5	5	5	6	5	5	4	4	5	4	5	2	2	1	1	2	2	2	2	6
5-Sep	2	2	2	2	3	5	4	4	3	3	4	4	4	4	4	4	4	4	4	4	2	2	3	5	5
6-Sep	2	2	2	3	3	2	3	2	2	4	2	2	2	2	2	1	6	3	2	5	3	3	3	2	6
7-Sep	2	4	3	2	2	6	4	2	2	3	2	3	3	3	3	3	2	2	2	4	2	1	1	2	6
8-Sep	1	2	2	3	2	3	2	3	3	3	3	3	4	3	4	2	2	2	1	1	1	3	2	1	4
9-Sep	1	2	1	1	1	2	UO	UO	2	2	2	2	3	3	2	2	2	2	1	3	3	2	1	2	3
10-Sep	3	3	1	1	0	1	1	2	2	2	3	3	7	4	4	5	5	5	4	3	4	4	4	4	7
11-Sep	5	4	4	4	4	3	2	3	3	5	5	5	7	7	7	6	6	6	4	3	2	2	2	2	7
12-Sep	3	2	4	1	1	2	2	3	3	3	3	2	3	2	2	2	6	3	2	5	5	3	2	2	6
13-Sep	2	2	2	1	2	2	2	2	3	4	5	5	5	7	8	7	6	7	7	7	5	4	4	5	8
14-Sep	5	4	5	4	3	5	5	4	5	5	6	5	5	5	5	5	5	4	2	3	2	3	2	2	6
15-Sep	2	1	1	2	2	2	2	2	2	3	3	5	3	4	5	5	4	4	4	4	4	4	3	4	5
16-Sep	2	4	4	3	5	3	2	3	3	3	2	2	3	4	4	4	3	4	4	3	5	2	2	2	5
17-Sep	2	2	3	3	2	3	2	1	1	1	7	2	5	4	4	3	3	4	2	2	3	2	2	1	7
18-Sep	2	2	3	2	2	2	2	2	3	2	6	6	5	7	9	3	3	3	3	4	3	3	3	3	9
19-Sep	3	2	3	3	2	2	2	4	3	3	3	3	5	4	3	3	3	1	5	1	3	2	3	2	5
20-Sep	2	1	1	0	1	1	1	1	1	2	2	2	2	3	3	2	3	1	3	2	2	3	1	4	4
21-Sep	2	2	3	3	4	3	3	3	3	4	5	8	7	7	6	6	6	6	3	3	3	3	3	4	8
22-Sep	3	2	2	2	2	1	2	3	3	3	4	5	4	5	5	5	5	4	3	4	5	4	5	4	5
23-Sep	2	1	1	2	2	2	2	3	3	5	5	7	6	6	6	6	6	5	5	5	5	4	5	4	7
24-Sep	4	5	5	5	5	5	4	5	4	4	3	3	3	4	3	2	2	2	4	4	3	3	3	3	5
25-Sep	2	4	3	1	2	2	3	2	2	3	2	2	1	3	2	2	3	4	2	2	3	4	3	2	4
26-Sep	5	6	5	5	6	3	3	2	3	2	4	4	3	4	2	3	3	2	4	5	7	2	3	2	7
27-Sep	1	2	1	3	3	2	2	2	2	1	1	4	3	4	5	4	5	3	2	3	2	1	1	1	5
28-Sep	1	1	2	2	2	1	1	1	1	4	3	4	3	3	3	5	4	4	3	3	3	4	3	3	5
29-Sep	4	3	2	3	1	1	1	1	2	3	3	3	4	5	4	3	4	3	2	2	3	2	3	3	5
30-Sep	1	1	0	1	1	2	1	2	2	1	1	1	1	2	2	1	3	1	2	2	1	1	2	2	3

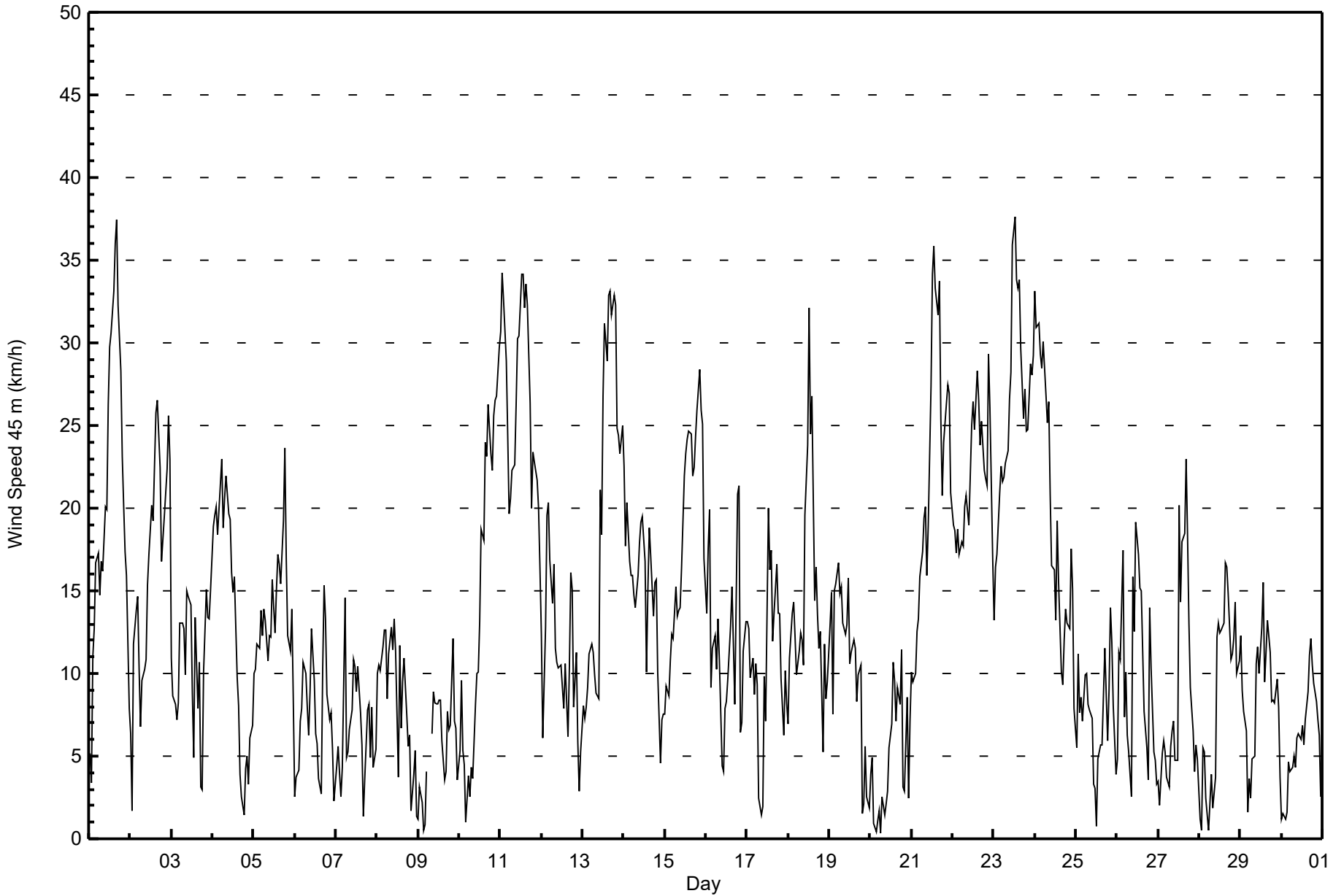
Diurnal Maximum

UO - Unstable Operation



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	128	17.83	17.83
6 - 11	225	31.34	49.16
12 - 19	204	28.41	77.58
20 - 28	115	16.02	93.59
29 - 38	46	6.41	100.00
> 38	0	0.00	100.00

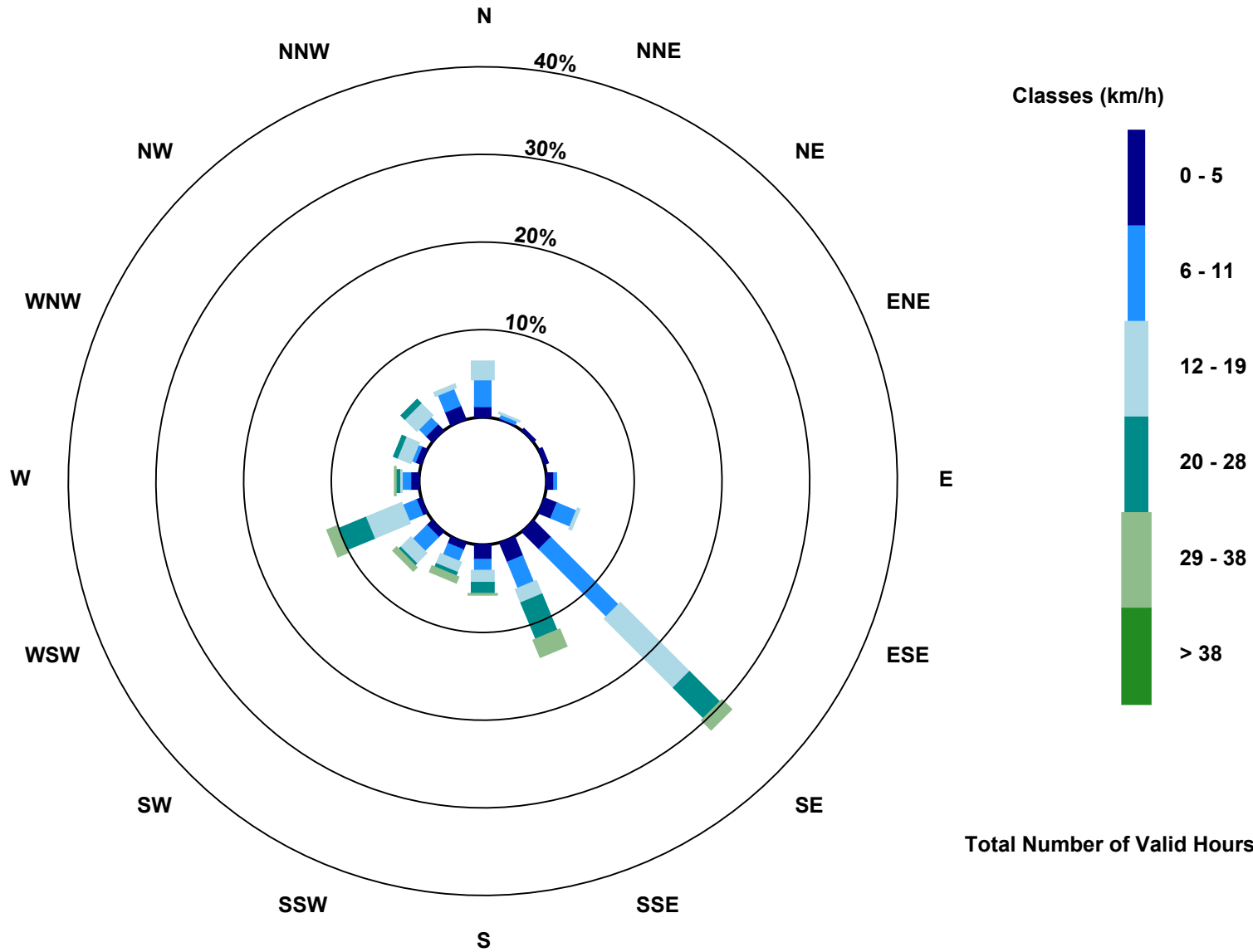
Total Number of Valid Hours: 718

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

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





Maximum Speed: 43 km/h on Sep 23 13:00	Maximum Daily Speed Average: 32.8 km/h on Sep 23	Hours in Service: 720
Minimum Speed Value: 1 km/h on Sep 9 00:00	Minimum Daily Speed Average: 2.4 km/h on Sep 25	Hours of Data: 719
Maximum Diurnal Speed Average: 11.0 km/h at hour 19	Minimum Diurnal Speed Average: 6.9 km/h at hour 1	Hours of Missing Data: 1
Monthly Average Velocity: 8.5 km/h 188.9 deg	Percentiles: P ₁ = 2 P ₁₀ = 6 Q ₁ = 9 Median = 15 Q ₃ = 23 P ₉₀ = 32 P ₉₉ = 39	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-Sep	WNW9	WNW6	WSW16	WSW18	WSW23	WSW22	WSW22	WSW20	WSW17	WSW21	WSW22	WSW28	WSW32	WSW34	SW37	SW39	SW42	SW37	SW35	WSW31	WSW29	WSW28	WSW26	WSW14	WSW24.8	SW42
2-Sep	W10	WSW4	SW18	W20	WNW20	WNW16	WNW11	WNW16	NW16	WNW16	WSW17	WSW18	WSW22	WSW21	WSW26	WSW28	WSW32	WNW28	WSW22	W26	WSW27	W31	WSW32	WSW32	W20.1	WSW32
3-Sep	WSW18	SW14	SW11	SSW8	SSW10	S13	SSE14	SE14	SSE13	SE17	SSE17	SSE10	WSW12	S6	SSW14	W8	NNW12	NNW4	WNW5	W16	NW24	NW23	NW20	WNW22	WSW5.4	NW24
4-Sep	WNW26	W25	W26	W24	WNW25	NW28	NW25	NW27	NW27	NW23	NW23	NW19	NW18	NW18	NW12	NW10	N5	NW4	W3	SSW4	SW9	WSW12	SW9	SW9	WNW14.9	NW28
5-Sep	SW12	S10	S13	S13	SSE16	SSE15	SSE16	SSE15	SE12	SE12	SE14	SSE17	SSE14	SE17	SSE19	SSE18	S17	S21	SSE29	SSE24	SSE17	SSE18	S20	WSW12	SSE15.6	SSE29
6-Sep	SE3	ESE8	ESE9	ESE14	ESE16	UO	ESE16	SE12	ESE10	SE12	S14	SSW10	SW7	N6	NE3	SE2	SW12	SW17	SW17	SW15	SW16	WSW16	WSW13	WSW9	S5.6	SW17
7-Sep	WSW11	WSW13	WSW8	WSW7	WSW7	WSW19	WSW9	SW6	SSW7	SE7	SE11	SE10	SE10	SE11	SE8	ESE8	SSW1	S4	S8	S9	SSE6	SSW5	SSW5	S4	SSW5.4	WSW19
8-Sep	S5	SSE9	SSE12	SSE14	SSE15	SSE15	SSE10	SE12	SE12	SE14	SE15	SE12	S4	WSW13	NNW8	N14	NNE15	NNE11	NNE8	NNE10	NNE6	NNE5	NNE3	ENE1	SE4.1	NNE15
9-Sep	W3	NNW2	N3	NNW3	SE3	S7	S6	SSE8	SSE12	SE11	SE10	SSE10	SSE10	SE10	SE7	ESE3	E4	ESE7	ESE9	ESE14	SE15	SE15	SE17	SE20	SE7.6	SE20
10-Sep	SE16	SSE14	SSE10	SE2	SE5	SE5	SE6	S5	SE9	SE13	SE14	SE13	SE17	SSE21	SE22	SE30	SE30	SE34	SE33	SE32	SE35	SE33	SSE33	SE36	SE19.3	SE36
11-Sep	SE39	SE39	SE37	SE34	SSE31	SSE29	SSE31	SSE27	SSE26	SSE31	SSE33	SE35	SSE38	SSE39	SSE36	S38	S37	S32	SSE26	SSE29	SSE28	SSE26	SSE23	SSE26	SSE31.7	SE39
12-Sep	SSE19	SSE15	SSE17	SSE25	SSE27	SSE22	SSE21	SSE22	SSE16	SE12	SE14	SE11	SE10	SE9	SE11	SE6	WSW14	WSW21	WSW23	WSW15	WSW20	SW11	SW10	SSW7	S11.6	SSE27
13-Sep	SSW6	SSW8	SSW8	SSW8	S11	S14	SSW12	SSW8	SSW8	SW12	WSW24	WSW21	WSW29	WSW35	WSW34	WSW38	WSW39	WSW40	W41	WSW40	WSW29	WSW29	WSW27	WSW29	WSW21.7	W41
14-Sep	W27	WNW21	WNW26	WNW21	WNW21	WNW21	WNW20	WNW18	WNW20	NW21	WNW22	NW22	NW19	NNW12	NW19	NW24	NW21	NW18	NW21	WNW25	WNW22	WNW7	WSW7	WSW11	WNW18.8	W27
15-Sep	SSW4	SSW8	S9	S12	SE13	SE15	SE18	SE16	SE14	SE15	SE19	SE25	SE25	SSE26	SSE26	SSE28	SSE34	SSE35	SSE35	SSE35	SSE36	SSE36	SSE28	SSE21.6	SSE36	
16-Sep	SE21	SSE24	SSE24	SSE16	SSE19	SSE16	SSW7	SSW10	SSW8	SW7	SW6	SW9	WSW9	WSW12	WSW15	WSW17	WSW14	SSW10	SSW27	SSW31	SSW19	SSW7	S10	S10	SSW11.8	SSW31
17-Sep	SSE15	SSE20	SSE12	SSE14	SSE6	SSE10	S7	ESE3	SSE5	SE8	SE22	SE11	S22	SSW18	SW19	SSW14	SSW15	SW20	SW18	SW20	WSW16	SSW9	SSW10	SW8	S10.8	SE22
18-Sep	SW9	SSW8	SSW12	S13	SSE13	SSE14	SSE14	SSE11	SSE11	SSW10	WSW23	WSW27	WSW34	W28	WSW31	SW21	SW24	SW18	S15	S18	SSW14	WSW20	SSW9	S9	SW14.0	WSW34
19-Sep	S12	S14	SSW12	S14	S15	S18	S17	SSE16	SSE15	S13	SSW14	SSW17	SW12	WSW14	WSW14	SW12	SW9	SSW11	SSW15	SSW7	SSW6	W11	NNW6	NW8	SSW10.0	S18
20-Sep	NW8	NNW11	NNW9	NNW10	N4	NW1	ESE2	SE2	NW1	NNW3	NW4	NNW7	NW7	N13	NNW11	N9	NNE10	N12	NNW17	NNW8	N4	SE8	SW5	S5	NNW5.2	NNW17
21-Sep	SSE10	SSE12	SSE13	SSE16	SSE20	SSE21	SE20	SSE19	SE18	SE17	SSE21	SSW31	SSW37	SSW40	SSW38	SSW36	SSW38	SSW31	S30	S34	SSE36	SSE37	SSE35	SSE28	S24.8	SSW40
22-Sep	SSE24	SE22	SSE19	SSE21	SSE18	SSE19	SSE18	SE22	SE24	SE21	S25	S27	S29	S27	S31	S30	SSE28	SSE31	SSE32	SSE31	SSE30	SSE38	SSE36	SSE28	SSE25.4	SSE38
23-Sep	SSE24	SSE25	SE27	SSE31	SE32	SE30	SE29	SE30	SE31	SE32	SE35	SE41	SE43	SSE37	SSE39	SSE38	SSE34	SSE31	SSE34	SSE30	SSE31	SE35	SE37	SE37	SSE32.8	SE43
24-Sep	SE39	SE38	SSE38	SSE36	SSE35	SSE36	SSE31	SSE30	SSE30	SSE22	SSE18	SSE17	SSW15	WSW21	WSW17	SW11	SW10	SSW13	S19	SSW21	SW21	WSW23	WSW22	SW17	S18.9	SE39
25-Sep	SW13	WSW22	SSW8	SSW8	SSW8	SSW11	SSW9	S8	SSW9	SSE6	ESE2	SE2	ESE1	N6	NNE6	NNE7	NE10	NNE16	NE5	E7	E9	E10	SE8	SE12	SSE2.4	WSW22
26-Sep	SE18	SE23	SE23	SE30	SE21	ESE6	ESE3	SSE4	SE18	SSE22	S14	S21	SSW18	S16	S16	SSW12	WSW12	WSW8	SSW4	ESE18	WSW13	NW5	SSW6	SW7	SSE11.1	SE30
27-Sep	W5	WSW3	W10	W11	SW6	WSW8	W9	SW9	SSW6	SSE4	SSE3	SW7	WSW21	WSW16	WSW20	WSW21	WSW26	WSW23	WSW21	W14	WNW8	NW7	NNW13	NNW13	WSW10.1	WSW26
28-Sep	NW8	NNW5	S3	WSW4	W5	N5	N11	NNE10	NNE4	N7	N14	N15	N16	N17	N17	N20	N20	N19	N14	N16	N16	N19	NNW14	NNW15	N11.4	N20
29-Sep	N17	N12	N15	N12	NNW6	NNW7	NNW7	NNW8	NW8	NNW15	NNW17	NNW13	N16	N18	N12	N13	N16	N14	N11	N11	N12	N14	N11	NNE5	N11.9	N18
30-Sep	SE1	ENE1	S2	SSE2	S5	SW7	SW6	S5	SSW6	S7	S7	S6	S7	SSE6	SE7	ESE9	SE12	S15	S18	SSE16	SSE13	SE14	SE14	SE12	SSE7.4	S18
S6.9 S7.8 S8.4 S8.9 S9.3 S9.0 S7.8 SSE7.5 SSE7.8 SSE7.5 S8.3 S8.4 SSW10.4 SSW9.3 SSW10.1 SSW9.4 SSW9.6 SSW9.5 SSW11.6 SSW10.5 SSW9.2 SSW8.4 S8.9 S8.2																								Diurnal Average		
SE39 SE39 SSE38 SSE36 SSE35 SSE36 SSE31 SE30 SE31 SE32 SE35 SE41 SE43 SSW40 SSE39 SW39 SW42 WSW40 W41 WSW40 SSE36 SSE38 SE37 SE37																								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

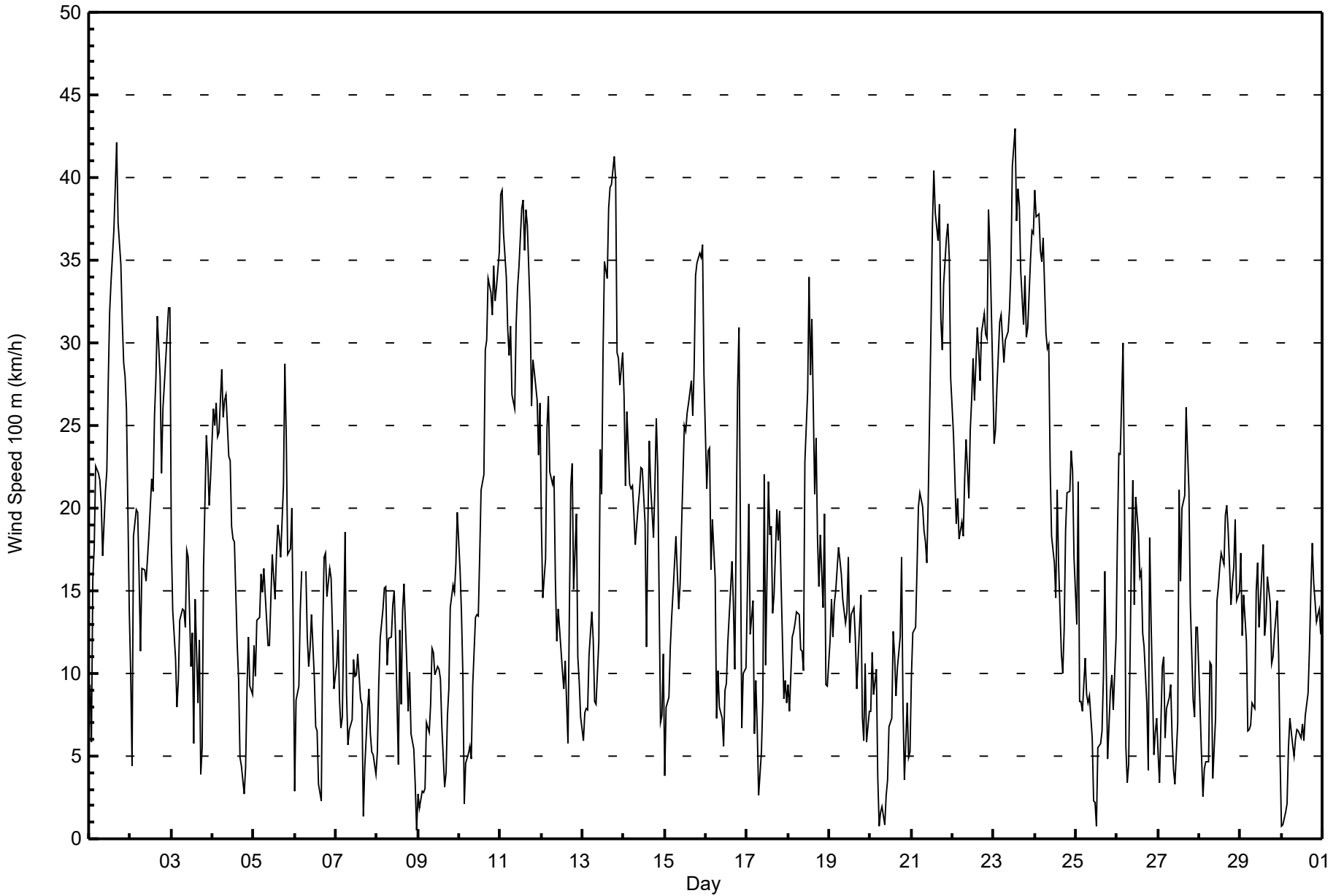
Wind Speed 100 m (WS100m) - km/h
Lower Camp Met Tower - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 10 km/h on Sep 16 21:00	Hours in Service: 720 Hours of Data: 719 Hours of Missing Data: 1 Hours of Calibration: 0 Percent Operational Time: 99.9
Minimum Value: 1 km/h on Sep 30 03:00	
Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 3 Q ₃ = 4 P ₉₀ = 5 P ₉₉ = 7	

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

Diurnal Maximum

UO - Unstable Operation





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	69	9.60	9.60
6 - 11	179	24.90	34.49
12 - 19	224	31.15	65.65
20 - 28	136	18.92	84.56
29 - 38	97	13.49	98.05
> 38	14	1.95	100.00

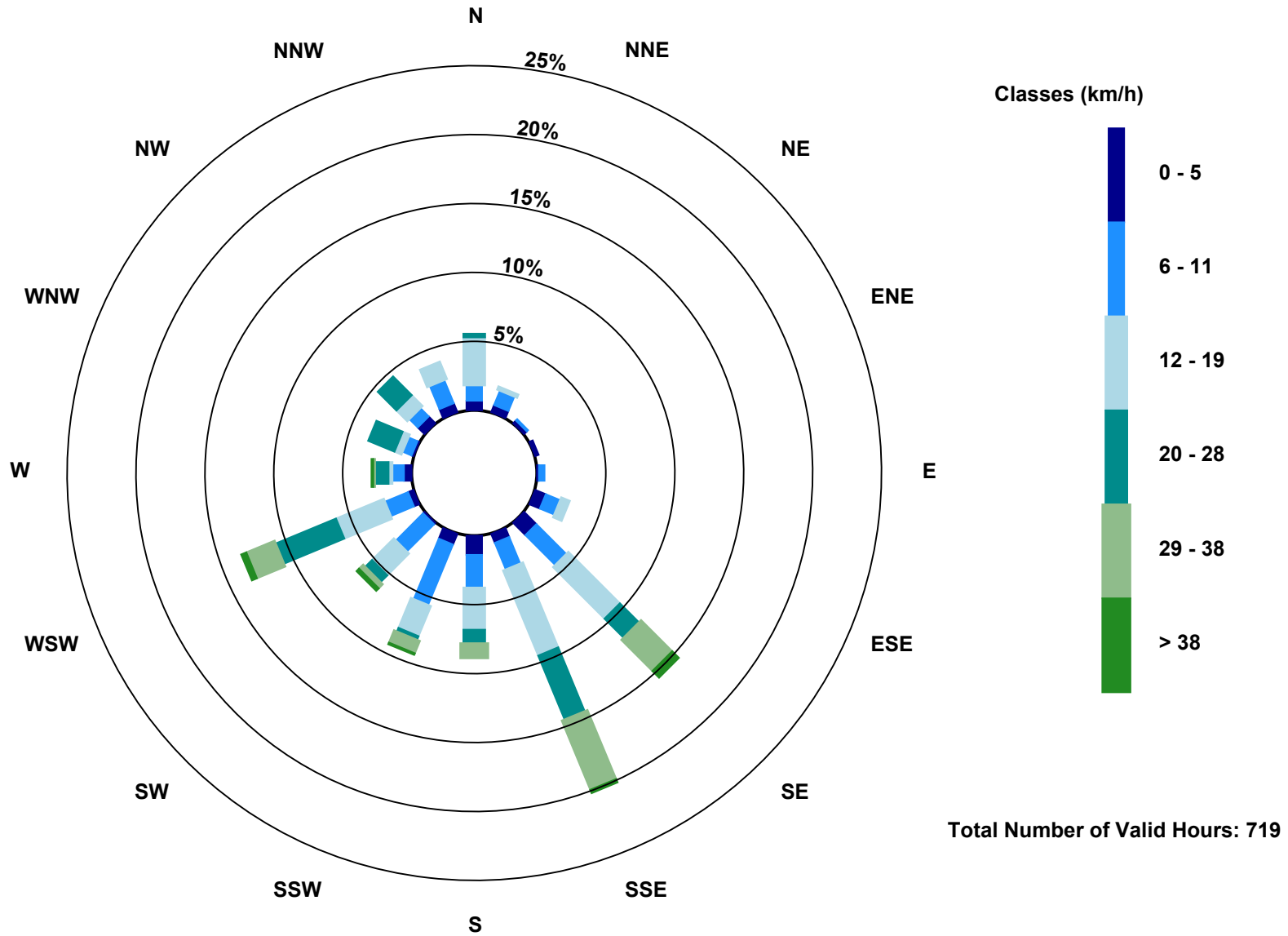
Total Number of Valid Hours: 719

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

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





Maximum Speed: 46 km/h on Sep 22 22:00		Maximum Daily Speed Average: 36.9 km/h on Sep 23		Hours in Service: 720																							
Minimum Speed Value: 1 km/h on Sep 25 13:00		Minimum Daily Speed Average: 2.9 km/h on Sep 8		Hours of Data: 720																							
Maximum Diurnal Speed Average: 11.8 km/h at hour 20		Minimum Diurnal Speed Average: 8.3 km/h at hour 10		Hours of Missing Data: 0																							
Monthly Average Velocity: 9.9 km/h 202.3 deg		Percentiles: P ₁ = 2 P ₁₀ = 8 Q ₁ = 12 Median = 17 Q ₃ = 27 P ₉₀ = 37 P ₉₉ = 44		Percent Operational Time: 100.0																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Sep	WNNW11	WNNW9	WNNW16	W19	W24	W27	W26	W22	WSW18	WSW22	WSW24	WSW29	WSW33	WSW35	SW38	SW42	SW45	SW41	WSW40	WSW38	WSW38	WSW39	WSW39	WSW20	WSW27.8	SW45	
2-Sep	W15	WSW10	WSW24	W25	WNNW24	WNNW23	WNNW17	WNNW23	NW22	WNNW19	W19	WSW20	WSW22	WSW23	W27	WSW29	W35	WNNW30	W23	W29	W33	W36	W38	W37	W24.1	W38	
3-Sep	W24	WSW20	WSW18	SW13	SW13	SSW15	SSW15	S11	SSE15	SSE17	S19	SSW10	WSW16	SW6	SSW15	W8	NNW11	NW4	W11	WNNW23	NNW32	NW30	NW25	NW27	WSW9.6	NNW32	
4-Sep	WNNW31	WNNW27	W31	W28	WNNW28	NW32	NNW29	NNW29	NNW28	NW25	NW24	NW20	NW19	NW13	NW10	N6	NW6	W3	SW4	WSW13	W22	WSW16	WSW17	WNNW17.9	NW32		
5-Sep	WSW17	SW12	SSW14	SSW14	SSW13	S15	S13	S12	S11	SSE14	S18	SSE15	SSE17	SSE19	SSE19	S18	S22	SSE32	SSE29	SSE25	SSE23	S23	SW13	S16.0	SSE32		
6-Sep	SSE3	ESE12	SE14	ESE20	SE20	SE20	SE16	SE12	SE13	S14	SW10	SW8	NNW6	NE2	S3	SW14	WSW19	WSW18	WSW16	WSW19	W21	W16	W15	S6.9	W21		
7-Sep	W13	WSW17	W12	WSW11	W12	WSW19	WSW14	SW7	SSW7	SSE7	SSE9	SSE10	SE10	SE10	SSE8	SE8	SW2	SSW4	SW6	SSW13	SW7	WSW5	SW6	SW6	SW6.5	WSW19	
8-Sep	WSW9	SSW8	SSW11	SSW14	SSW14	S15	SSW13	S11	S10	SSE13	SSE14	SSE12	SSW7	WSW13	NW8	NNE14	NNE18	NNE17	NE17	NNE19	NE11	E8	SE8	SSE9	SSE2.9	NNE19	
9-Sep	S7	SSE2	N1	N1	S2	S11	SSE16	SSE14	SSE14	SSE12	S11	S11	SSE11	SE10	SE7	ESE3	E3	ESE7	ESE9	ESE18	SE18	SSE20	SSE21	SSE26	SSE9.8	SSE26	
10-Sep	SSE24	SSE22	SSE17	SSE12	SSE8	SSE8	SE10	SSE8	SE16	SE16	SE16	SE16	SE16	SE19	SSE21	SE23	SE30	SE30	SE35	SE37	SE37	SE38	SSE37	SSE39	SSE38	SE23.2	SSE39
11-Sep	SSE41	SSE41	SSE39	SSE37	SSE37	SSE41	SSE40	SSE36	SSE32	SSE34	SSE34	SSE33	SSE40	SSE40	S38	S40	S39	S36	SSE32	SSE34	SSE36	SSE34	SSE30	S29	SSE35.9	SSE41	
12-Sep	SSE24	SSE24	S25	S28	S27	S28	S29	S28	S17	S12	SE13	SSE11	SSE10	SSE9	SSE10	SSE5	WSW15	WSW24	WSW28	WSW26	WSW28	WSW18	WSW17	WSW14	SSW15.4	S29	
13-Sep	WSW10	WSW12	SW11	SW11	SSW12	SW14	SW17	WSW14	SW13	SW17	WSW25	WSW22	WSW31	WSW37	WSW36	WSW41	WSW43	WSW44	W46	WSW45	WSW33	WSW33	WSW31	W32	WSW25.8	W46	
14-Sep	W30	WNNW24	WNNW30	NW26	WNNW25	WNNW26	WNNW23	WNNW21	WNNW22	NW22	WNNW24	NW24	NW20	NW14	NW22	NW26	NW23	NW20	NW23	NW30	NW32	NW12	NW5	WNNW5	NNW21.6	NW32	
15-Sep	WSW2	SW10	SSW13	SW11	SSW6	S11	S15	SSE19	S15	SSE14	SSE20	SSE25	SSE24	SSE25	S27	S29	S28	S32	S41	SSW43	SSE44	SSE42	SSE46	SSE41	WSW23.6	SSE46	
16-Sep	SSE28	SSE28	SSE28	SSE22	S21	SSW14	SW14	SW17	SW14	WSW12	WSW9	WSW9	WSW10	WSW13	WSW17	WSW18	WSW16	SSW12	SSW30	SW35	SW32	SW21	SSW17	SW14	SSW16.2	SW35	
17-Sep	S14	S15	S10	SSE15	SSE15	SSE15	SE14	SE14	SE18	SE26	SE27	SSE13	S22	SSW19	SW19	SW14	SSW16	SW21	WSW19	WSW24	WSW23	SW15	SW16	WSW18	SSW12.6	SE27	
18-Sep	WSW22	WSW15	SW17	SW13	SSW11	SSW11	SSW11	SSW11	SSW11	SW15	WSW25	W28	WSW34	W30	WSW33	SW24	WSW30	SW22	SSW16	SSW25	SW28	WSW27	SW15	SW12	SW19.0	WSW34	
19-Sep	SW14	SSW15	SW17	SW17	SW20	SW19	SW18	SSW17	S14	SSW14	SSW14	SSW18	WSW13	WSW14	WSW15	SW12	SW9	SSW11	SSW15	SW15	WSW14	WNNW15	NNW14	NNW12	SW12.3	SW20	
20-Sep	NNW16	NNW15	NNW13	NNW11	N8	NNW7	NNW12	NW11	NW9	NNW7	N6	N9	NNW8	N13	N11	NNE9	NNE10	N14	N20	NNW14	NNW7	SE6	S8	SSW13	NNW8.3	N20	
21-Sep	S20	S18	S14	S13	S20	SSE22	S17	S15	S15	SSE16	S22	SSW33	SSW38	SSW43	SSW40	SSW38	SSW41	SSW36	S36	S42	S44	S45	S43	S37	S29.0	S45	
22-Sep	S31	SSE26	S24	S24	S19	S22	S22	S22	SSE23	S21	S26	SSW27	S30	S28	S32	S31	S30	S34	S39	SSE39	SSE43	SSE46	SSE42	SSE36	S29.5	SSE46	
23-Sep	SSE36	SSE35	SSE36	SSE42	SSE38	SSE36	SSE34	SSE32	SE33	SE32	SE34	SE39	SE43	SSE39	SSE40	SSE40	SSE37	SSE35	SSE39	SSE35	SSE35	SSE39	SE40	SE41	SSE36.9	SE43	
24-Sep	SE44	SE41	SSE43	SSE40	SSE40	SSE40	SSE34	SSE32	SSE31	SSE25	S19	SSE17	SSW15	WSW22	WSW17	SW12	SW10	SSW13	SSW19	SW20	WSW27	W28	W22	WSW25	S19.4	SE44	
25-Sep	WSW23	W27	WSW15	WSW13	WSW13	SW13	SW14	SW9	SW11	SW6	S1	SSE2	ESE1	NE5	NE5	NE6	NE10	NE17	E12	ESE15	ESE18	ESE22	SE16	SE19	S3.3	W27	
26-Sep	SE30	SE31	SE31	SE37	SE32	SE17	SE19	SSE20	SE25	SSE24	S15	S21	SSW19	S16	S16	SSW14	WSW14	WSW11	SW6	ESE18	WSW12	W10	SW8	WSW6	SSE14.8	SE37	
27-Sep	NNW5	NW4	NW13	WNNW12	W12	W12	WNNW8	WSW11	SW8	SSW7	SSW5	WSW10	WSW21	WSW17	WSW21	WSW22	WSW28	WSW27	W23	W15	NW7	NNW9	N11	N12	W10.9	WSW28	
28-Sep	NNW9	N9	NNE3	NW6	NNW8	N13	NNE14	NNE14	NNE8	N12	N14	N15	N18	N18	NNE19	N20	N21	N21	N18	N21	N21	N25	N17	N16	N14.8	N25	
29-Sep	N21	N16	N21	N21	N13	NNW11	NNW11	NNW11	NNW12	NNW18	N20	N14	N17	N18	N13	N14	N17	N17	N13	N14	N16	N18	NNE15	NNE7	N15.0	N21	
30-Sep	E2	E1	SSW3	SSW3	S6	SW8	WSW6	SW5	SW6	SSW7	SSW7	SSW7	S7	S6	SE7	ESE8	SE11	S16	S20	SSE20	SSE20	SSE21	SSE22	SSE20	S9.0	SSE22	
SSW8.7SSW8.9SSW9.5SSW9.5SSW9.6SSW9.7SSW9.1 S8.4 S8.5 S8.3 S9.3SSW9.6SSW11.6SSW10.1SW10.1SSW10.1SW10.5SW10.5SSW11.6SSW11.6SSW11.6SSW11.6SSW10.6																								Diurnal Average			
SE44 SE41 SSE43 SSE42 SSE40 SSE41 SSE40 SSE36 SE33 SSE34 SSE34 SE39 SE43 SSW43 SSE40 SW42 SW45WSW44 W46WSW45 SSE44 SSE46 SSE46 SE41																								Diurnal Maximum			

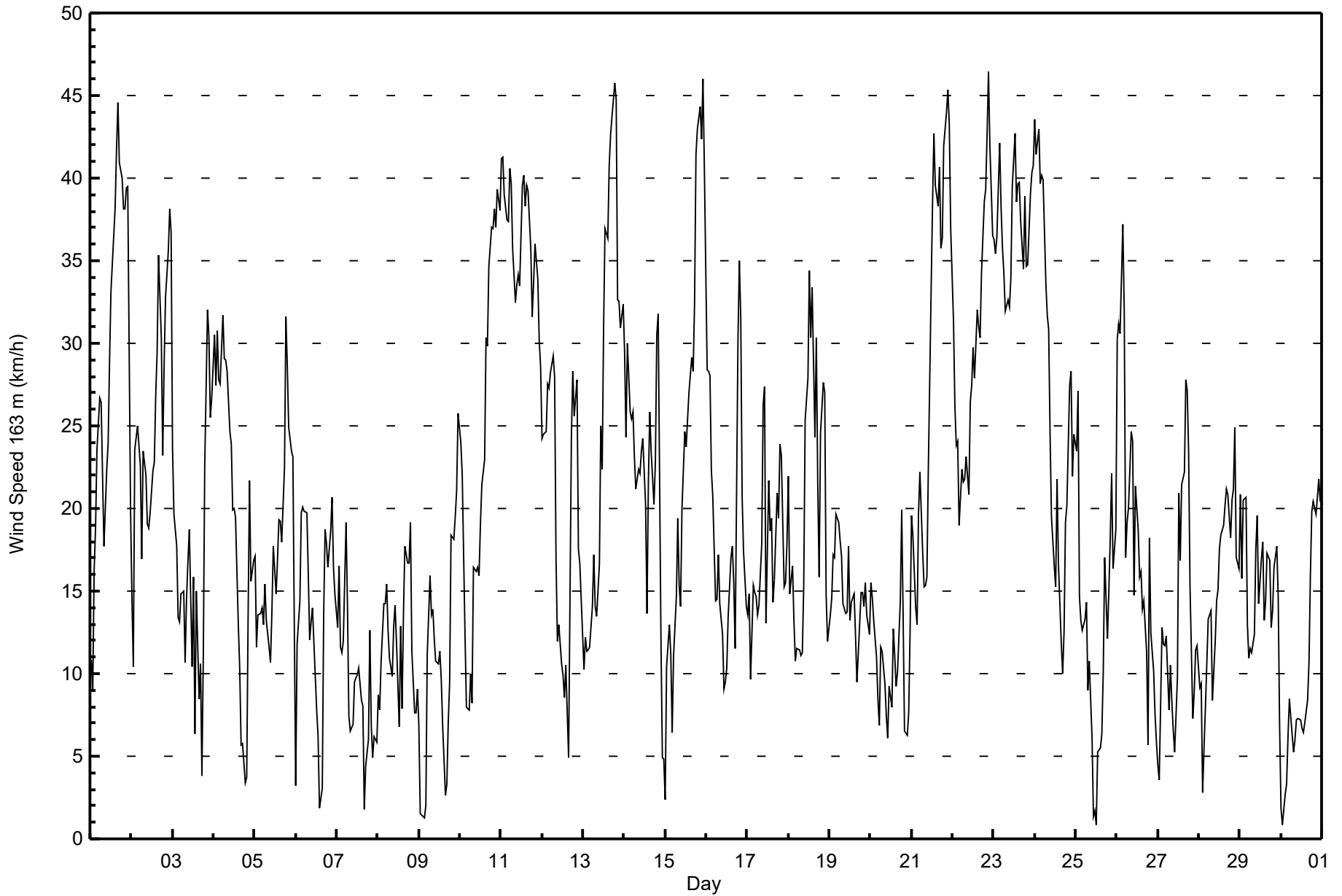
All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 12 km/h on Sep 2 00:00 Minimum Value: 0 km/h on Sep 30 04:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 3 Q ₃ = 4 P ₉₀ = 5 P ₉₉ = 7																	Hours in Service: 720 Hours of Data: 720 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-Sep	2	3	2	2	3	2	4	4	3	3	3	4	5	4	6	6	7	6	3	3	3	3	12	12	
2-Sep	5	4	4	3	4	4	6	5	5	6	3	3	3	3	3	4	4	5	2	2	2	1	2	3	6
3-Sep	5	4	4	3	2	2	2	2	3	5	4	4	7	5	3	2	3	1	3	8	4	4	5	6	8
4-Sep	4	3	3	3	5	4	4	4	5	4	3	3	5	5	5	3	3	3	1	2	5	2	2	3	5
5-Sep	3	3	2	1	2	3	2	2	2	2	3	4	3	4	4	4	5	3	2	3	2	3	7	7	
6-Sep	3	3	2	2	2	3	3	3	4	3	2	2	3	2	2	2	4	3	2	1	2	2	2	2	4
7-Sep	2	4	2	3	2	4	6	3	2	2	2	2	2	2	3	3	2	1	3	2	1	1	1	6	
8-Sep	1	2	1	1	1	2	2	2	2	2	2	3	4	3	3	1	2	3	2	2	3	3	3	1	4
9-Sep	1	2	1	1	2	4	2	1	1	2	2	2	3	2	2	2	1	3	1	4	2	2	3	3	4
10-Sep	2	2	3	2	1	1	1	4	1	2	3	3	6	4	4	3	4	3	4	3	3	4	5	3	6
11-Sep	4	4	3	3	3	2	1	3	4	4	4	4	7	8	8	6	5	5	4	4	3	3	2	2	8
12-Sep	2	2	3	1	2	2	2	4	2	3	1	1	2	2	3	2	7	1	2	6	6	4	2	2	7
13-Sep	3	3	3	2	2	2	3	4	3	5	4	5	5	6	6	4	4	5	6	5	4	3	3	3	6
14-Sep	3	5	4	3	3	4	4	5	5	4	5	4	5	6	5	4	5	3	2	3	3	6	2	2	6
15-Sep	1	2	1	2	2	2	5	2	2	3	2	3	3	4	5	4	5	4	3	4	4	3	2	6	6
16-Sep	4	4	3	1	3	2	2	2	3	3	2	2	2	3	3	3	2	5	3	1	3	6	2	2	6
17-Sep	2	3	2	2	3	2	4	4	5	2	4	4	4	4	4	3	2	6	2	2	2	5	2	4	6
18-Sep	2	4	2	2	2	2	2	3	3	4	5	4	4	7	7	3	3	3	3	2	3	3	7	3	7
19-Sep	2	2	4	2	1	2	1	2	2	3	3	3	5	3	2	3	2	2	1	2	3	3	3	3	5
20-Sep	2	1	1	2	1	1	2	1	1	1	1	2	2	3	3	2	2	3	3	3	2	2	3	1	3
21-Sep	3	2	2	2	3	2	2	3	3	2	3	8	6	5	5	5	5	6	4	3	2	2	2	4	8
22-Sep	3	3	3	3	2	2	2	2	3	3	4	5	4	5	5	4	5	4	2	6	6	4	2	3	6
23-Sep	2	3	3	3	3	2	3	2	4	4	4	7	5	7	6	6	5	6	5	6	6	5	4	4	7
24-Sep	4	4	5	6	5	5	5	5	3	4	3	3	2	1	2	1	2	2	2	2	2	2	3	3	6
25-Sep	4	2	4	2	2	3	5	2	2	3	2	2	1	3	3	3	3	4	4	4	4	4	5	5	5
26-Sep	7	5	4	4	5	6	4	3	3	4	4	4	3	3	2	3	3	3	4	4	5	2	2	2	7
27-Sep	2	1	3	2	3	2	2	3	2	1	1	3	2	4	4	6	3	1	1	5	1	2	2	3	6
28-Sep	2	2	2	1	2	2	1	2	2	2	2	3	3	2	2	4	4	4	3	3	3	3	3	3	4
29-Sep	5	3	3	5	2	2	1	1	1	4	3	3	3	5	4	2	4	3	3	2	3	3	3	4	5
30-Sep	1	1	1	0	1	1	1	1	1	1	1	2	1	2	2	1	4	2	1	1	1	2	1	1	4
Diurnal Maximum																								12	





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	33	4.58	4.58
6 - 11	131	18.19	22.78
12 - 19	243	33.75	56.53
20 - 28	156	21.67	78.19
29 - 38	102	14.17	92.36
> 38	55	7.64	100.00

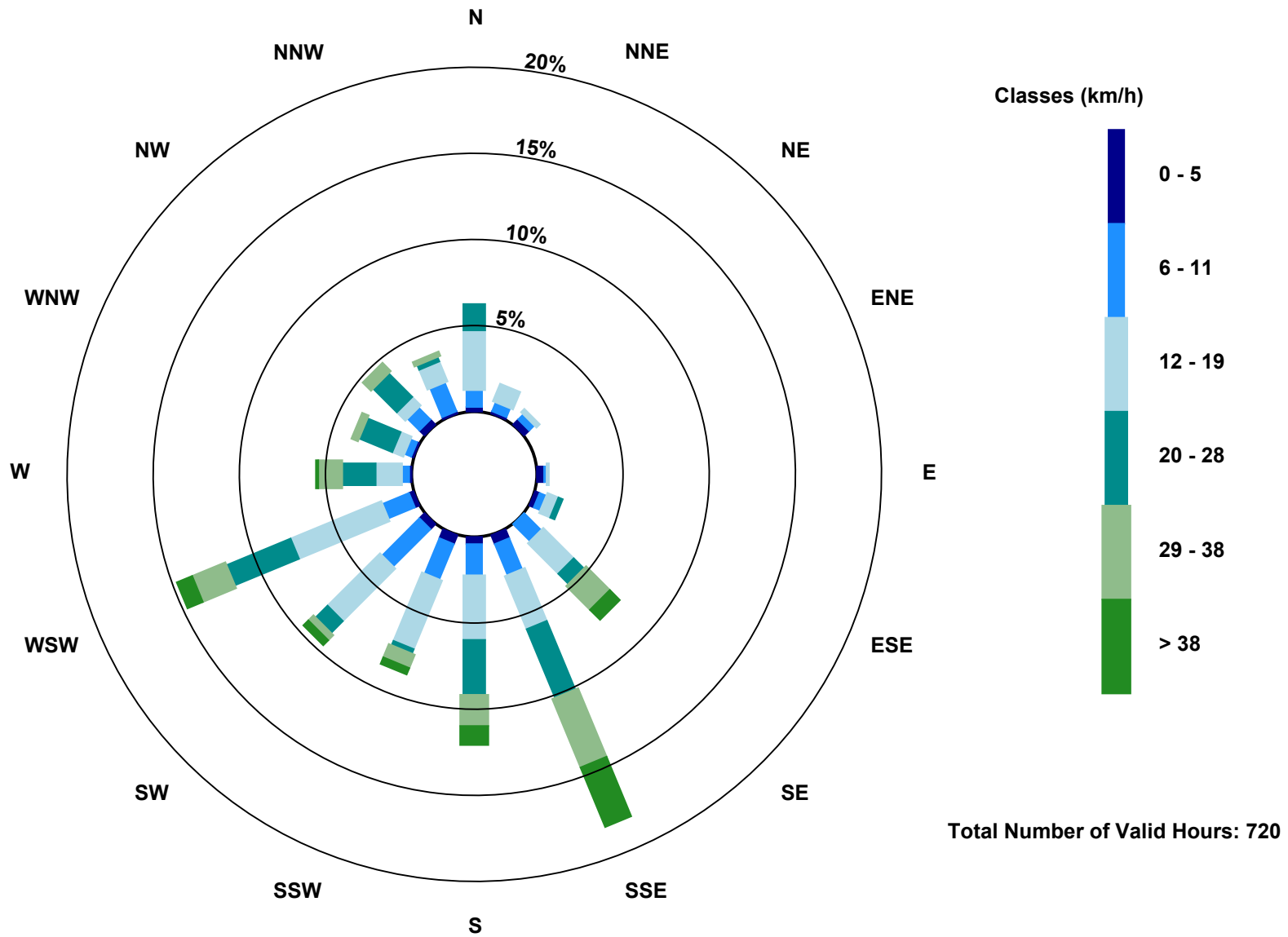
Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 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 - September 2023

Direction of Maximum Speed: 195 deg on Sep 21 14:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 153.5 deg on Sep 11	Hours of Data: 720
Direction of Minimum Speed: 349 deg on Sep 7 23:00	Hours of Missing Data: 0
Direction of Minimum Daily Speed Average: 1.2 deg on Sep 25	Percent Operational Time: 100.0
Monthly Average Direction: 174.4 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-Sep	307	263	269	259	247	249	256	250	239	238	242	241	241	239	236	233	231	229	235	243	238	247	266	262	240.7
2-Sep	250	161	210	261	272	305	290	293	323	305	255	248	244	250	256	243	258	293	244	254	252	256	256	260	258.3
3-Sep	252	176	171	134	125	132	125	127	143	145	138	137	220	149	197	264	334	291	349	274	327	328	317	306	167.9
4-Sep	294	276	269	271	289	305	319	320	324	319	311	329	316	318	315	310	22	336	155	118	143	147	150	135	304.6
5-Sep	159	136	127	118	140	145	150	149	129	138	135	168	157	147	152	160	175	174	168	165	136	140	167	180	153.4
6-Sep	100	54	72	88	110	110	109	114	113	134	178	200	223	10	54	126	213	234	218	226	243	241	225	292	178.5
7-Sep	284	208	239	141	205	247	213	192	193	149	135	139	126	130	134	105	117	150	130	118	135	144	349	140	155.7
8-Sep	122	121	129	129	125	131	121	124	129	135	134	134	159	244	330	351	356	334	325	347	301	325	321	189	125.0
9-Sep	337	338	303	305	286	133	133	130	130	136	123	135	130	131	126	97	104	131	124	148	122	98	78	24	124.9
10-Sep	112	118	96	92	49	131	40	117	143	147	145	151	145	154	146	135	144	142	137	135	136	146	148	145	140.9
11-Sep	145	149	150	151	154	143	140	143	147	153	153	147	157	167	167	171	167	173	156	141	141	139	137	139	153.5
12-Sep	118	98	133	134	133	131	126	136	136	135	133	129	125	123	127	116	245	258	246	217	243	178	109	142	146.1
13-Sep	137	137	129	129	128	132	139	136	134	177	244	246	243	245	249	250	245	253	262	257	250	238	245	258	234.0
14-Sep	264	287	291	297	294	302	301	304	301	314	301	299	317	347	315	322	309	316	306	304	349	255	182	198	301.9
15-Sep	131	128	122	130	131	131	139	132	132	125	128	138	145	147	162	164	162	163	163	153	151	147	145	134	147.0
16-Sep	139	142	139	118	125	124	120	130	130	126	138	221	251	265	249	244	244	200	181	190	150	108	132	131	165.1
17-Sep	133	125	129	127	124	123	128	130	117	0	138	117	180	200	233	213	199	233	217	222	223	151	138	136	176.1
18-Sep	136	133	126	122	123	128	124	134	130	134	240	257	241	260	255	211	213	196	136	128	126	214	127	132	186.8
19-Sep	135	139	123	136	141	139	137	141	139	152	201	205	236	266	254	231	224	207	196	347	139	230	141	79	172.2
20-Sep	311	318	105	358	112	82	39	114	115	0	293	336	324	340	345	1	8	343	343	300	131	137	357	131	3.9
21-Sep	131	138	141	142	142	149	148	148	135	126	134	192	198	195	205	202	195	194	167	154	153	153	151	144	170.3
22-Sep	135	131	127	131	130	131	133	130	135	135	165	187	189	176	178	181	166	165	164	151	155	152	154	141	157.0
23-Sep	133	135	137	138	141	140	141	138	135	139	139	142	144	158	153	158	158	157	157	154	152	150	141	139	147.0
24-Sep	143	142	153	156	161	156	150	153	153	159	164	147	188	255	240	230	204	190	174	170	221	255	246	219	170.0
25-Sep	209	236	142	146	155	143	140	137	181	134	80	183	129	348	352	355	23	2	325	357	352	354	344	1	39.2
26-Sep	354	111	103	138	20	341	333	335	113	132	159	183	196	180	188	192	246	186	133	130	271	250	141	196	177.8
27-Sep	130	163	336	247	132	124	132	134	125	133	141	219	239	249	245	241	243	240	254	262	269	314	310	330	227.4
28-Sep	201	141	128	121	74	157	99	123	148	340	351	350	344	356	11	4	4	354	349	352	351	348	330	331	357.2
29-Sep	351	341	5	7	251	293	307	306	323	338	337	338	352	353	349	356	1	3	354	347	359	359	1	13	348.8
30-Sep	133	70	89	121	137	165	158	128	142	149	178	177	175	139	119	108	134	164	147	111	123	138	52	74	142.9

149.2	145.9	147.0	144.9	148.0	147.0	141.5	143.3	144.8	147.4	172.0	186.4	201.2	203.4	206.3	204.5	204.6	203.3	189.9	180.3	177.0	175.3	166.5	156.2
Diurnal Average																							

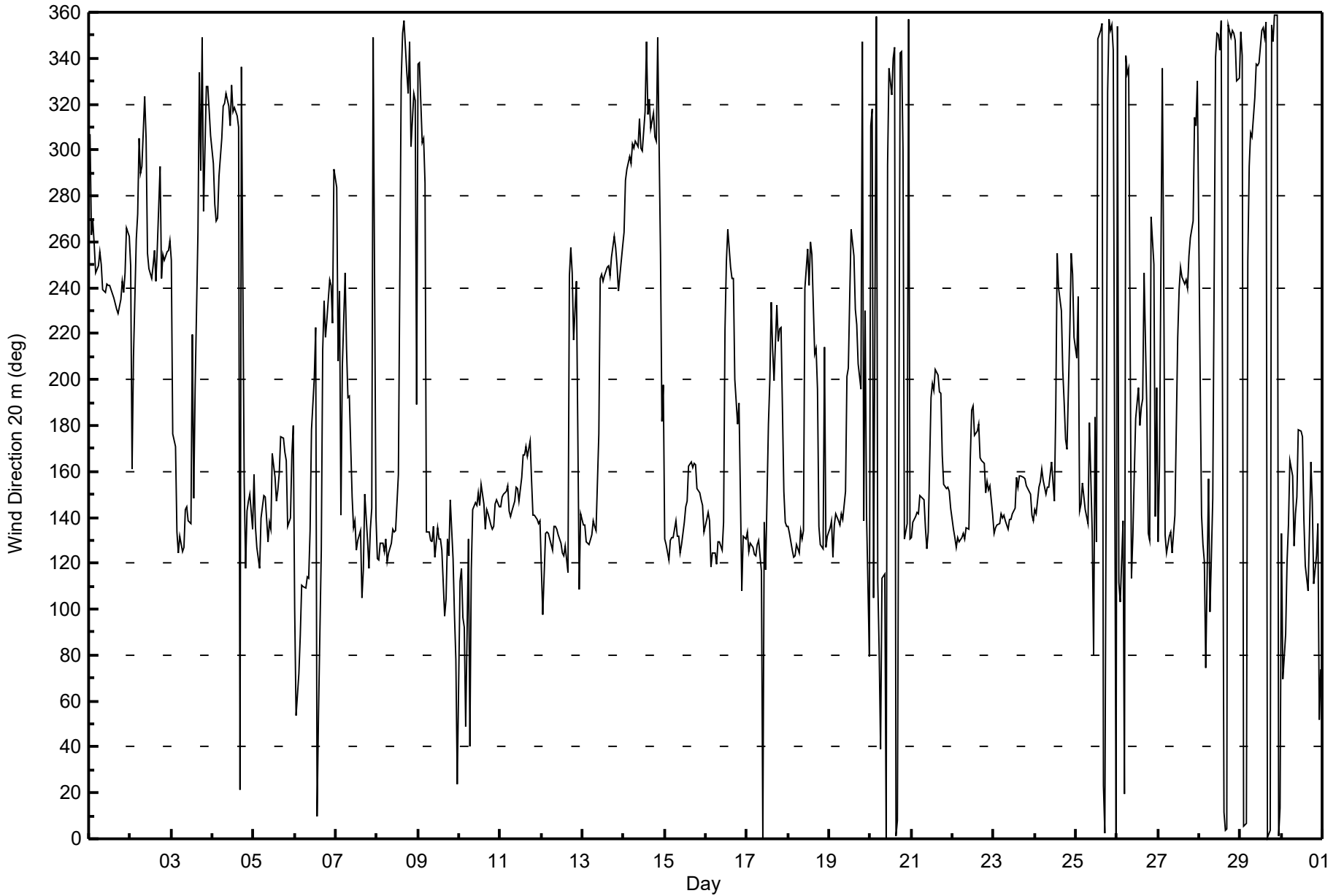
All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 102 deg on Sep 7 00:00 Minimum Value: 6 deg on Sep 21 21:00 Percentiles: P ₁ = 7 P ₁₀ = 10 Q ₁ = 14 Median = 19 Q ₃ = 33 P ₉₀ = 62 P ₉₉ = 93																			Hours in Service: 720 Hours of Data: 720 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-Sep	51	56	35	64	27	23	33	21	16	12	16	13	14	15	14	12	13	11	12	11	10	19	20	50	64
2-Sep	47	79	35	25	29	28	40	32	31	32	21	18	17	18	19	15	17	20	22	13	13	14	15	22	79
3-Sep	55	32	34	32	15	13	19	17	28	33	27	13	64	78	16	54	15	63	79	70	20	19	18	18	79
4-Sep	18	18	17	22	21	22	17	18	20	21	23	21	22	27	39	59	78	51	85	35	40	57	15	20	85
5-Sep	15	14	15	14	15	20	14	18	20	15	19	26	33	24	18	19	20	14	8	11	9	19	18	44	44
6-Sep	73	64	43	46	42	26	27	25	36	24	14	14	43	28	41	58	39	14	9	62	62	72	81	102	102
7-Sep	57	87	75	67	46	34	77	26	18	24	16	20	24	21	32	63	71	37	9	42	98	58	97	32	98
8-Sep	11	17	17	19	19	18	19	17	20	17	19	18	59	21	76	19	17	16	15	58	63	93	39	92	93
9-Sep	69	60	35	80	100	45	21	23	17	16	21	21	21	29	31	42	15	10	51	61	30	71	68	47	100
10-Sep	53	16	34	38	60	26	92	35	33	24	17	15	23	17	19	20	17	15	16	15	15	12	9	10	92
11-Sep	10	9	8	7	7	11	11	12	12	10	10	13	11	11	12	11	10	13	14	11	9	8	7	9	14
12-Sep	15	13	13	9	10	15	20	16	19	17	21	20	23	24	20	27	68	14	10	57	58	45	59	34	68
13-Sep	34	24	14	15	14	21	14	10	11	54	15	21	15	16	17	16	13	17	19	17	17	11	16	16	54
14-Sep	20	22	21	19	18	20	24	22	21	18	24	23	25	49	29	22	26	18	12	17	20	62	26	69	69
15-Sep	16	17	13	10	16	19	12	17	15	21	21	17	11	10	14	13	12	9	8	8	8	8	9	19	21
16-Sep	17	17	12	39	20	17	24	11	12	36	30	40	29	31	21	17	17	33	8	7	65	36	12	10	65
17-Sep	12	14	23	21	13	19	18	69	85	45	74	36	16	19	17	29	10	18	8	10	26	21	15	10	85
18-Sep	12	10	14	14	15	17	19	13	17	13	39	20	11	19	20	17	9	12	22	41	59	22	25	21	59
19-Sep	13	14	15	11	15	10	14	15	15	24	18	14	35	26	23	17	23	13	81	76	90	67	21	92	92
20-Sep	93	23	30	47	29	55	63	71	56	47	76	30	30	24	22	27	30	16	13	78	32	58	51	16	93
21-Sep	9	15	24	14	18	15	14	12	16	22	19	24	12	10	11	12	8	11	9	7	6	6	7	12	24
22-Sep	14	13	14	13	12	8	9	13	17	17	20	14	12	14	12	13	11	8	7	8	9	7	10	15	20
23-Sep	12	9	7	8	7	7	7	13	15	16	16	15	15	12	12	11	11	10	9	9	9	9	13	13	16
24-Sep	11	13	9	10	9	9	8	9	8	11	12	18	35	17	11	14	9	7	12	28	43	18	14	33	43
25-Sep	34	54	17	12	39	13	16	20	29	26	63	43	97	70	42	29	34	40	27	9	14	16	17	17	97
26-Sep	79	87	81	34	70	16	53	39	91	21	29	17	18	16	8	21	52	63	93	49	37	55	38	78	93
27-Sep	86	83	29	64	33	40	54	17	11	14	20	70	11	20	17	14	14	8	18	41	61	51	31	29	86
28-Sep	95	90	26	26	80	94	29	25	52	76	21	21	21	23	19	22	20	19	18	17	18	17	21	20	95
29-Sep	23	22	24	55	51	47	74	12	24	21	19	25	19	20	26	26	23	22	21	19	26	21	22	88	88
30-Sep	73	51	31	25	18	27	29	19	29	15	13	15	15	19	23	15	21	9	17	22	17	54	60	72	73
																			95 90 81 80 100 94 92 71 91 76 76 70 97 78 76 63 78 63 93 78 98 93 97 102						
Diurnal Maximum																									





Wood Buffalo Environmental Association
Summary of Hour Averages

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

Direction of Maximum Speed: 138 deg on Sep 23 13:00		Hours in Service: 720
Direction of Maximum Daily Speed Average: 150.8 deg on Sep 11		Hours of Data: 718
Direction of Minimum Speed: 359 deg on Sep 20 07:00	Direction of Minimum Daily Speed Average: 1.1 deg on Sep 25	Hours of Missing Data: 2
Monthly Average Direction: 175.5 deg		Percent Operational Time: 99.7

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Sep	288	275	257	253	245	246	251	249	238	238	242	240	240	238	234	232	229	227	233	241	236	243	258	258	240.0
2-Sep	256	189	223	257	271	304	283	295	318	303	252	248	245	249	256	243	257	291	242	251	250	254	254	258	259.1
3-Sep	251	197	184	149	146	141	131	127	139	137	135	135	234	152	198	270	337	331	332	280	325	326	316	302	190.9
4-Sep	294	276	267	266	287	305	320	319	324	319	311	328	315	316	313	311	13	329	275	140	202	209	176	162	300.7
5-Sep	176	144	136	131	139	141	144	139	128	129	128	165	150	144	150	159	175	172	165	164	138	145	171	188	152.0
6-Sep	118	94	99	96	105	110	111	112	107	130	178	201	225	8	59	115	214	234	222	223	217	225	236	257	171.5
7-Sep	256	233	244	183	223	244	222	199	193	139	129	132	124	126	132	117	127	163	145	132	146	143	149	136	159.7
8-Sep	135	132	135	133	131	132	130	127	129	126	129	130	166	244	331	7	11	353	343	4	357	347	323	293	116.0
9-Sep	309	336	323	326	157	141	UO	UO	124	128	125	132	134	126	122	99	106	127	107	131	119	121	127	128	123.1
10-Sep	127	129	118	121	173	131	140	133	129	131	136	138	139	150	139	130	135	135	132	131	132	142	145	141	136.2
11-Sep	140	143	145	146	148	141	140	139	139	151	151	142	157	167	167	170	167	174	157	141	142	140	138	151	150.8
12-Sep	133	114	132	138	140	134	128	133	134	130	126	130	126	124	128	118	242	256	244	228	242	194	192	169	151.6
13-Sep	148	154	144	142	137	135	148	151	148	197	242	246	242	244	248	249	244	252	260	256	249	238	245	257	234.8
14-Sep	262	286	291	295	294	299	297	301	300	310	299	300	316	342	316	321	307	317	307	296	320	277	219	224	299.0
15-Sep	142	142	135	138	132	134	139	133	130	124	127	136	142	145	161	164	163	164	162	153	150	149	145	135	146.3
16-Sep	130	138	142	131	131	132	132	134	137	156	172	229	256	261	252	243	244	205	186	196	175	119	132	134	168.4
17-Sep	133	132	132	131	131	131	136	128	124	349	137	119	179	199	233	214	200	231	219	222	225	161	149	153	175.7
18-Sep	161	141	135	131	132	137	130	135	134	151	243	256	240	258	255	212	217	203	145	150	162	221	148	139	192.4
19-Sep	142	137	149	138	141	142	143	138	135	160	201	205	237	262	253	231	227	209	200	356	197	248	170	173	176.0
20-Sep	326	326	352	241	150	123	359	129	125	349	300	326	322	346	346	6	14	358	346	330	102	134	318	138	355.6
21-Sep	133	136	136	140	136	141	140	141	133	125	134	192	198	195	205	202	194	196	172	159	157	156	153	147	167.5
22-Sep	138	131	127	129	130	133	133	130	133	130	165	188	189	175	178	179	166	165	164	154	156	151	152	145	154.4
23-Sep	138	141	143	140	141	139	139	136	133	134	133	135	138	155	149	156	156	157	155	152	148	146	136	135	143.6
24-Sep	139	137	150	152	159	153	148	151	151	159	163	144	192	253	239	227	207	189	178	176	217	254	243	219	169.8
25-Sep	221	245	157	161	168	152	152	154	187	134	79	169	116	350	357	2	28	17	338	3	4	359	348	55	58.4
26-Sep	87	127	131	132	99	352	344	349	122	139	158	182	195	179	188	193	244	213	160	121	262	270	167	188	165.8
27-Sep	236	185	275	247	150	168	231	166	132	121	129	223	238	248	246	241	242	237	246	262	267	328	323	329	238.1
28-Sep	280	50	142	142	148	265	59	93	128	349	354	355	348	0	10	5	5	359	356	357	355	354	338	337	0.4
29-Sep	354	344	354	354	295	298	330	323	335	339	337	341	356	357	351	357	2	5	356	351	3	2	4	10	351.4
30-Sep	163	66	111	143	151	186	188	141	163	154	179	178	173	136	120	109	133	167	163	130	116	129	129	113	145.5

157.6	149.6	154.2	150.4	152.5	150.9	145.9	143.5	142.7	144.9	168.6	183.4	201.4	206.1	209.3	204.8	208.2	207.2	194.5	183.7	182.7	178.4	175.2	168.8
Diurnal Average																							

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

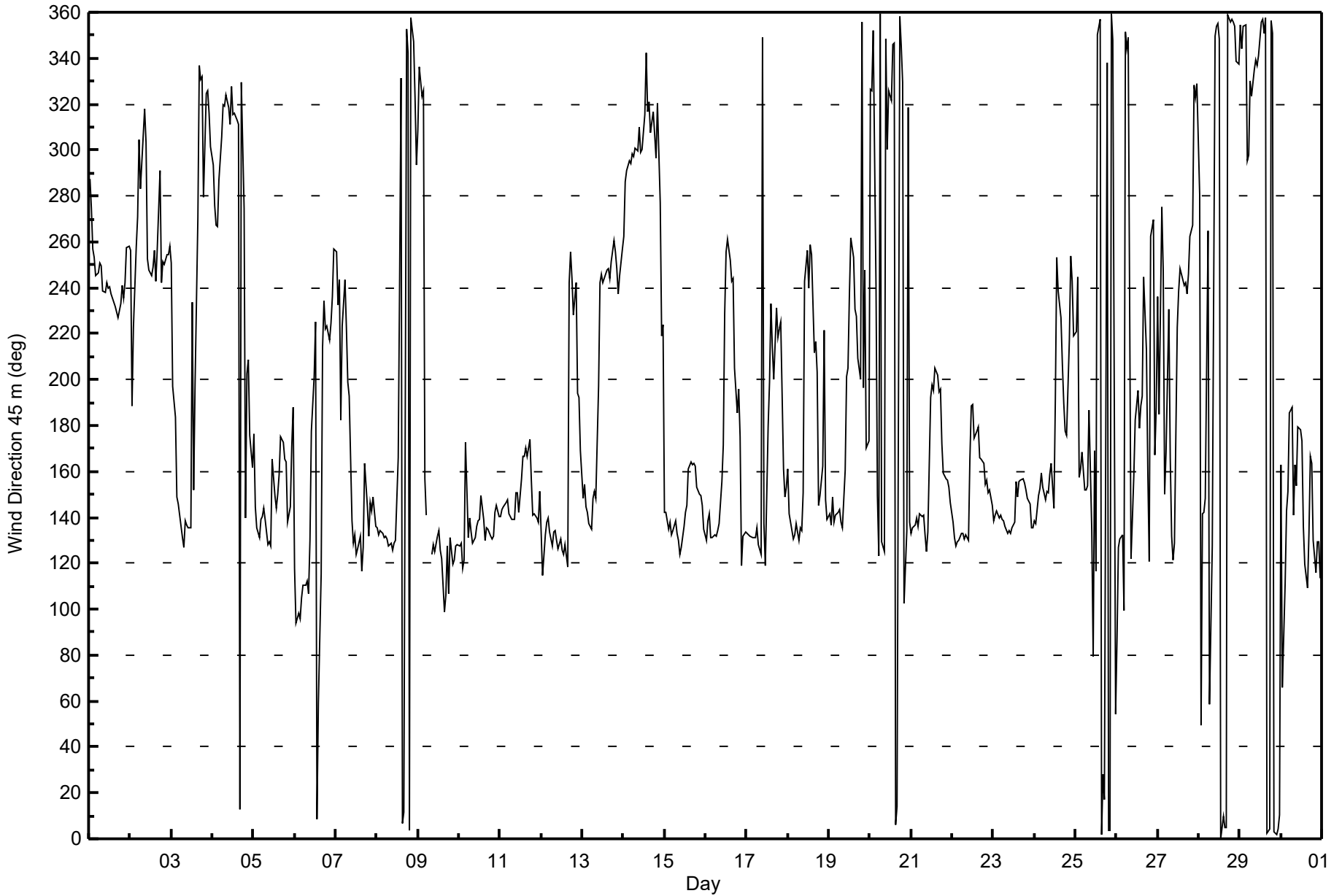
Wind Direction 45 m (WD45m) - deg
Lower Camp Met Tower - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 99 deg on Sep 25 13:00	Hours of Data: 718
Minimum Value: 3 deg on Sep 23 07:00	Hours of Missing Data: 2
Percentiles: P ₁ = 4 P ₁₀ = 7 Q ₁ = 9 Median = 13 Q ₃ = 22 P ₉₀ = 46 P ₉₉ = 82	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-Sep	36	35	15	28	12	12	17	12	10	9	12	9	11	12	12	9	10	9	9	7	6	11	13	18	36
2-Sep	34	88	27	14	22	16	23	22	23	24	13	12	13	12	12	10	10	11	18	9	8	8	8	10	88
3-Sep	22	29	29	33	19	10	12	9	22	20	20	7	59	78	16	52	9	36	34	30	13	11	13	12	78
4-Sep	10	11	11	13	14	18	11	12	12	15	16	13	16	21	30	49	48	49	68	29	34	51	18	23	68
5-Sep	15	18	9	9	10	17	12	17	14	11	14	25	32	20	17	18	19	13	7	8	8	17	14	36	36
6-Sep	69	48	23	19	19	12	13	15	21	20	13	13	43	21	26	50	39	11	8	23	14	16	34	81	81
7-Sep	42	66	57	64	38	18	62	26	18	24	11	15	16	15	22	48	78	32	18	10	11	4	20	13	78
8-Sep	5	8	9	11	9	10	11	11	11	13	13	12	63	16	66	9	10	10	13	23	56	72	16	47	72
9-Sep	65	42	18	93	65	15	UO	UO	12	12	13	15	18	18	23	38	16	12	15	26	9	6	9	38	93
10-Sep	38	10	11	9	28	20	22	30	26	16	14	12	19	16	16	10	11	9	8	8	7	9	7	6	38
11-Sep	7	6	5	6	6	9	6	7	8	9	8	11	11	11	11	11	9	13	13	8	6	5	4	8	13
12-Sep	10	8	7	4	5	8	7	6	12	11	14	11	11	14	12	20	56	9	6	46	41	51	48	19	56
13-Sep	13	16	16	11	7	10	17	16	23	46	10	14	12	11	12	11	8	10	13	9	12	8	10	9	46
14-Sep	11	13	13	10	10	13	14	15	16	12	16	15	17	37	19	14	22	15	9	7	18	35	13	17	37
15-Sep	14	7	9	6	7	10	8	12	9	11	10	10	8	8	13	12	11	9	8	7	6	7	8	11	14
16-Sep	6	7	4	14	11	9	9	8	17	47	37	29	22	24	16	12	12	27	8	6	48	21	6	7	48
17-Sep	7	8	10	8	7	11	10	50	54	64	48	21	18	17	17	25	9	16	6	6	11	28	12	14	64
18-Sep	23	13	8	6	8	10	11	8	12	20	34	13	7	13	15	15	8	11	20	18	48	14	34	13	48
19-Sep	12	8	19	8	8	7	11	9	11	23	16	13	30	17	17	14	20	12	34	76	88	36	57	66	88
20-Sep	21	11	73	80	55	37	93	39	35	48	48	23	25	15	14	23	20	13	8	72	51	40	49	25	93
21-Sep	4	8	14	8	11	9	9	7	9	12	12	25	11	9	10	11	8	11	9	7	6	6	6	10	25
22-Sep	10	7	7	6	5	4	4	7	9	9	19	14	11	13	11	12	10	8	7	7	8	6	8	12	19
23-Sep	8	6	4	5	4	3	3	6	8	8	9	9	10	10	13	10	10	9	8	8	8	8	7	7	13
24-Sep	6	8	8	9	8	8	8	8	6	10	11	15	33	10	7	13	10	7	7	11	22	13	9	22	33
25-Sep	28	46	27	12	17	10	18	17	28	22	62	50	99	52	32	25	25	17	23	15	11	14	30	60	99
26-Sep	65	32	27	10	51	22	19	14	57	7	29	17	17	15	8	18	34	37	77	48	30	21	44	44	77
27-Sep	25	49	21	21	62	35	41	30	21	9	19	59	7	13	12	9	10	4	9	17	41	24	23	17	62
28-Sep	57	92	25	18	82	85	34	31	52	75	14	13	14	15	10	13	13	13	12	11	11	11	15	12	92
29-Sep	15	13	10	16	58	16	30	11	12	11	11	14	14	14	18	20	15	14	16	14	14	13	14	48	58
30-Sep	61	32	29	33	13	22	17	16	27	15	11	14	16	16	16	8	17	8	11	9	6	6	9	43	61

69	92	73	93	82	85	93	50	57	75	62	59	99	78	66	52	78	49	77	76	88	72	57	81	
Diurnal Maximum																								

UO - Unstable Operation





Wood Buffalo Environmental Association
Summary of Hour Averages

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

Direction of Maximum Speed: 141 deg on Sep 23 13:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 146.4 deg on Sep 23	Hours of Data: 719
Direction of Minimum Speed: 62 deg on Sep 9 00:00	Hours of Missing Data: 1
Direction of Minimum Daily Speed Average: 2.4 deg on Sep 25	Percent Operational Time: 99.9
Monthly Average Direction: 188.9 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-Sep	284	287	258	256	249	251	251	252	238	238	241	239	239	237	232	230	228	227	234	242	240	241	246	248	240.7
2-Sep	265	240	236	261	282	298	288	297	307	298	252	249	247	249	255	243	258	290	250	261	258	260	253	255	262.7
3-Sep	250	229	224	209	201	178	156	143	151	144	147	156	243	184	201	267	344	348	290	278	322	322	312	303	238.5
4-Sep	295	279	269	267	285	307	322	320	325	321	313	325	315	315	314	310	360	313	266	199	229	250	231	217	298.2
5-Sep	228	187	176	173	163	154	151	148	144	138	134	168	149	146	152	159	177	172	163	163	157	161	176	203	163.0
6-Sep	126	109	111	108	115	UO	121	124	117	133	178	207	227	354	41	135	216	235	234	236	235	243	246	255	185.6
7-Sep	254	246	253	238	245	243	239	216	197	137	137	137	129	130	142	114	208	183	190	169	161	197	205	190	191.7
8-Sep	183	161	160	161	156	149	155	144	140	134	140	141	186	247	328	11	17	16	16	20	24	22	27	62	126.6
9-Sep	259	330	4	330	142	173	176	159	152	143	143	149	148	129	124	106	98	121	114	115	133	134	138	141	137.5
10-Sep	144	151	154	131	126	134	143	176	139	133	140	135	139	150	140	133	138	137	136	134	136	145	149	145	140.5
11-Sep	144	144	145	146	147	151	153	150	149	152	152	145	159	166	168	171	169	176	160	147	150	149	149	160	154.5
12-Sep	151	147	157	157	159	157	152	156	156	149	132	142	140	139	142	140	246	257	255	237	242	221	219	212	175.7
13-Sep	194	210	210	202	182	176	201	209	211	226	239	243	241	242	246	248	243	251	260	253	249	242	246	256	240.3
14-Sep	263	285	291	297	296	297	298	301	299	307	299	304	314	329	317	319	308	318	310	299	303	295	254	254	299.5
15-Sep	204	207	180	172	143	145	145	144	144	132	140	145	146	148	164	166	167	167	165	158	156	155	150	149	155.3
16-Sep	141	147	149	153	159	166	192	212	199	222	226	236	253	250	249	241	244	206	194	208	206	193	177	172	193.2
17-Sep	149	154	159	150	163	163	172	114	155	141	141	132	178	200	229	212	201	231	229	236	237	201	202	218	188.2
18-Sep	235	210	200	176	161	159	148	167	168	198	248	256	241	259	253	216	227	216	171	179	198	238	205	177	215.3
19-Sep	180	172	212	177	175	180	179	157	154	189	200	205	235	257	250	228	225	210	203	206	209	276	328	314	202.4
20-Sep	309	327	335	337	352	321	107	140	306	336	321	329	322	350	348	7	15	3	348	340	9	126	235	188	344.1
21-Sep	162	152	147	153	147	149	146	150	144	131	152	194	197	195	205	201	196	198	182	172	168	168	167	162	174.7
22-Sep	153	146	147	147	148	159	155	141	143	145	174	191	187	176	179	179	168	168	166	158	159	155	151	152	161.5
23-Sep	154	151	146	148	145	143	144	142	141	139	137	138	141	155	150	156	157	157	154	150	148	146	139	139	146.4
24-Sep	141	140	150	151	157	152	148	150	152	161	165	150	196	248	238	227	214	197	189	196	228	258	254	233	174.6
25-Sep	236	246	206	197	202	193	192	185	203	162	109	145	116	7	20	16	35	31	50	85	83	97	126	131	158.1
26-Sep	128	130	138	138	132	103	106	163	144	154	169	184	194	179	189	192	238	242	193	123	246	307	199	219	162.7
27-Sep	263	238	271	260	235	247	263	229	205	161	150	236	239	247	246	241	241	239	250	267	284	326	335	334	253.0
28-Sep	321	341	176	257	271	354	11	30	30	360	355	356	353	359	8	3	3	0	0	2	359	357	348	348	357.2
29-Sep	357	349	350	353	343	328	336	330	326	340	343	348	355	356	350	356	2	5	0	357	3	2	5	13	352.5
30-Sep	138	65	176	148	171	214	225	170	204	179	186	186	178	150	127	109	139	171	170	159	148	145	144	139	160.3

184.6 174.6 180.5 174.8 171.9 177.6 169.4 166.1 162.9 161.0 175.5 188.4 202.4 207.7 210.7 205.2 211.3 210.4 200.2 194.2 198.8 195.0 190.5 189.4

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

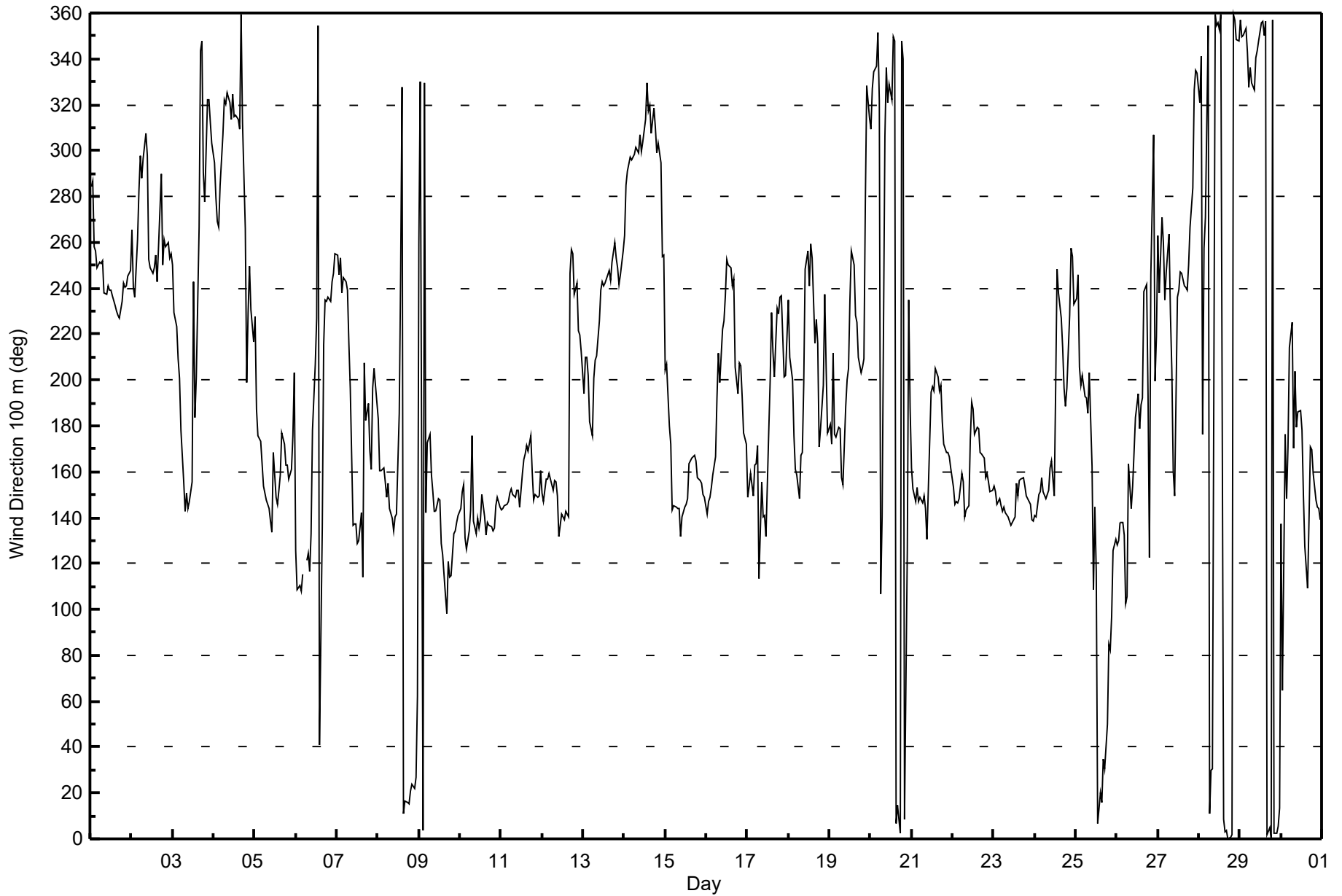
Wind Direction 100 m (WD100m) - deg
Lower Camp Met Tower - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 100 deg on Sep 25 13:00	Hours of Data: 719
Minimum Value: 2 deg on Sep 30 19:00	Hours of Missing Data: 1
Percentiles: P ₁ = 3 P ₁₀ = 5 Q ₁ = 7 Median = 10 Q ₃ = 16 P ₉₀ = 27 P ₉₉ = 70	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-Sep	21	24	9	10	6	7	10	8	8	7	9	8	8	9	10	8	9	8	8	4	3	5	5	8	24
2-Sep	27	75	13	12	15	12	19	13	16	19	12	10	10	9	8	8	8	9	15	7	5	7	5	3	75
3-Sep	9	14	21	22	15	9	15	9	22	16	17	24	29	67	14	54	8	26	22	19	8	6	9	9	67
4-Sep	7	8	10	8	11	17	7	7	9	12	12	10	13	18	27	37	35	42	40	34	22	8	18	18	42
5-Sep	13	21	10	13	8	13	11	10	12	16	9	21	25	19	15	15	18	12	5	4	8	8	9	27	27
6-Sep	63	11	11	7	8	UO	9	10	12	18	12	13	43	12	26	57	26	9	8	10	6	8	14	23	63
7-Sep	11	15	20	28	21	9	46	23	25	21	11	13	12	12	23	26	100	21	9	15	19	24	16	17	100
8-Sep	18	11	7	9	7	7	11	9	9	7	11	11	64	13	56	8	7	8	14	12	12	27	28	85	85
9-Sep	16	49	40	29	36	9	12	14	9	10	10	12	16	12	16	42	17	19	13	13	4	5	5	4	49
10-Sep	6	7	6	70	14	5	19	28	10	7	10	8	16	13	14	6	7	4	4	4	3	6	6	5	70
11-Sep	4	5	5	4	5	6	6	7	8	7	7	9	10	11	12	10	8	11	11	5	5	5	5	6	12
12-Sep	5	6	10	4	3	6	7	6	8	16	7	7	10	13	16	19	40	3	3	24	8	18	15	17	40
13-Sep	14	18	17	12	12	13	18	13	26	26	8	10	9	8	8	7	6	7	10	6	9	6	7	6	26
14-Sep	9	10	8	7	7	9	10	13	11	9	11	12	13	28	14	11	17	11	10	3	6	16	11	7	28
15-Sep	38	19	15	7	9	5	4	9	9	8	8	6	7	8	12	10	10	7	6	6	5	4	6	8	38
16-Sep	6	6	4	4	3	7	12	10	20	30	39	16	17	19	12	11	9	25	9	3	17	38	11	10	39
17-Sep	10	3	7	6	12	11	8	69	16	18	8	16	14	14	15	20	8	13	4	4	5	28	16	17	69
18-Sep	21	17	14	7	12	11	10	9	15	22	22	11	6	11	12	12	6	8	17	9	21	8	43	18	43
19-Sep	14	14	18	16	12	9	11	9	14	14	12	10	21	11	11	11	16	11	3	23	23	32	15	12	32
20-Sep	14	6	9	6	16	63	52	85	62	41	23	17	20	12	12	16	13	9	5	12	47	23	23	20	85
21-Sep	6	7	8	5	5	6	6	9	13	12	13	19	10	8	8	9	6	7	6	5	4	4	5	8	19
22-Sep	9	8	8	7	9	8	7	6	7	10	12	13	10	12	9	11	9	7	5	6	6	5	5	7	13
23-Sep	5	5	4	4	3	3	3	3	4	5	6	6	8	9	11	8	9	7	7	7	7	7	4	4	11
24-Sep	4	5	7	8	7	7	6	7	6	10	9	14	30	7	5	10	9	5	3	6	16	9	11	7	30
25-Sep	10	5	24	16	25	14	25	16	25	29	65	68	100	38	40	22	17	12	63	27	15	25	30	18	100
26-Sep	15	9	7	5	12	83	69	48	5	7	24	15	15	14	7	18	20	25	63	40	21	35	37	22	83
27-Sep	17	41	14	10	22	21	12	14	14	27	37	57	5	10	9	8	7	3	7	5	32	11	14	8	57
28-Sep	10	18	82	15	17	26	6	14	52	15	10	10	9	7	7	8	8	8	8	6	7	6	9	8	82
29-Sep	9	8	5	9	12	11	10	5	5	7	6	10	8	8	13	18	13	9	11	10	9	5	7	68	68
30-Sep	70	55	20	15	16	14	13	22	22	18	11	12	14	18	16	8	19	6	2	4	5	4	4	5	70
	70	75	82	70	36	83	69	85	62	41	65	68	100	67	56	57	100	42	63	40	47	38	43	85	

Diurnal Maximum

UO - Unstable Operation





Wood Buffalo Environmental Association
Summary of Hour Averages

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

Direction of Maximum Speed: 162 deg on Sep 22 22:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 151.0 deg on Sep 23	Hours of Data: 720
Direction of Minimum Speed: 116 deg on Sep 25 13:00	Hours of Missing Data: 0
Direction of Minimum Daily Speed Average: 2.9 deg on Sep 8	Percent Operational Time: 100.0
Monthly Average Direction: 202.3 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-Sep	296	298	283	279	274	270	266	268	246	243	242	242	240	235	233	232	231	240	248	248	246	249	242	248.1	
2-Sep	269	257	258	281	298	297	297	296	304	292	260	256	254	255	259	248	264	291	261	279	279	278	269	271	273.7
3-Sep	266	244	241	235	225	213	199	180	165	157	169	193	253	219	209	268	344	315	276	282	327	325	315	309	257.8
4-Sep	300	287	280	279	287	312	327	324	327	326	317	326	317	315	317	308	354	310	263	227	248	259	254	247	300.7
5-Sep	250	230	207	212	197	192	179	177	180	169	150	175	153	151	155	160	178	173	162	162	159	164	180	220	176.4
6-Sep	159	120	127	123	132	130	134	135	132	143	182	217	232	343	37	179	219	241	246	251	256	261	269	261	189.7
7-Sep	273	258	262	257	259	256	246	236	207	162	160	151	140	138	161	125	235	198	217	205	219	248	229	228	220.5
8-Sep	241	195	198	201	198	187	197	190	181	164	165	161	210	253	325	13	20	26	38	33	41	83	131	160	162.1
9-Sep	187	158	349	10	181	180	166	160	155	159	172	169	162	137	132	113	92	118	119	118	142	150	149	149	149.8
10-Sep	152	148	149	157	163	154	133	155	143	139	142	136	143	153	145	136	142	140	139	137	140	150	152	150	144.6
11-Sep	149	148	149	150	151	157	160	155	154	157	156	152	163	168	171	175	173	180	163	152	155	159	161	177	159.7
12-Sep	167	166	180	175	176	175	171	174	173	176	146	155	161	160	162	164	250	258	258	246	249	237	237	242	196.6
13-Sep	239	238	234	222	212	215	235	239	234	235	241	242	243	245	250	251	247	255	263	257	253	248	252	261	247.0
14-Sep	269	288	294	304	301	300	300	302	301	306	301	305	315	321	319	321	309	320	314	305	314	308	308	303	304.6
15-Sep	248	229	206	227	195	178	179	158	169	161	168	156	153	154	169	169	170	173	170	163	166	164	159	159	167.9
16-Sep	149	163	168	164	177	198	228	232	228	237	238	244	250	242	250	244	247	208	202	218	219	217	211	215	208.6
17-Sep	183	170	183	161	163	147	141	126	138	131	139	148	178	202	228	215	206	235	242	253	251	234	235	250	191.6
18-Sep	253	237	231	226	211	194	197	213	207	231	256	260	247	262	256	227	240	231	195	200	216	249	234	215	234.4
19-Sep	217	210	235	216	215	215	215	194	186	206	201	207	237	256	252	229	227	213	210	225	239	299	337	332	226.3
20-Sep	331	336	344	335	2	330	332	325	318	335	11	356	335	356	356	15	19	9	351	346	347	128	189	195	345.3
21-Sep	181	187	186	179	173	166	179	186	178	155	179	199	200	197	207	204	198	201	191	187	184	185	183	180	188.9
22-Sep	170	166	174	180	184	190	186	170	161	171	183	194	189	179	183	181	172	171	170	165	166	162	157	158	172.8
23-Sep	155	154	155	157	152	150	150	148	145	144	142	143	145	158	154	158	159	160	156	151	150	149	144	141	151.0
24-Sep	144	145	152	151	158	152	151	151	156	166	170	159	201	248	240	234	228	204	199	217	245	272	277	249	179.5
25-Sep	247	265	240	241	243	228	236	221	229	214	179	159	116	37	42	37	49	54	81	107	114	113	126	125	178.6
26-Sep	130	131	140	141	138	136	143	149	146	166	179	186	195	181	191	195	243	253	215	123	239	278	234	258	162.5
27-Sep	327	321	308	295	281	276	287	253	231	209	204	244	245	252	249	244	245	247	259	274	304	347	1	352	265.8
28-Sep	338	354	16	308	341	5	14	26	18	6	359	3	359	2	13	8	8	7	8	11	8	3	355	359	4.2
29-Sep	2	355	6	3	355	344	347	336	331	347	350	354	357	0	352	359	5	11	8	6	8	7	14	29	358.8
30-Sep	91	100	195	211	189	223	244	223	218	202	203	195	186	177	142	115	145	176	171	164	161	157	163	165	172.8

200.6 192.8 199.8 196.3 195.4 197.7 195.2 190.4 183.4 182.3 189.9 198.0 208.3 213.1 215.2 209.8 217.1 215.7 205.5 204.0 211.1 209.6 201.9 202.9

Diurnal Average

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

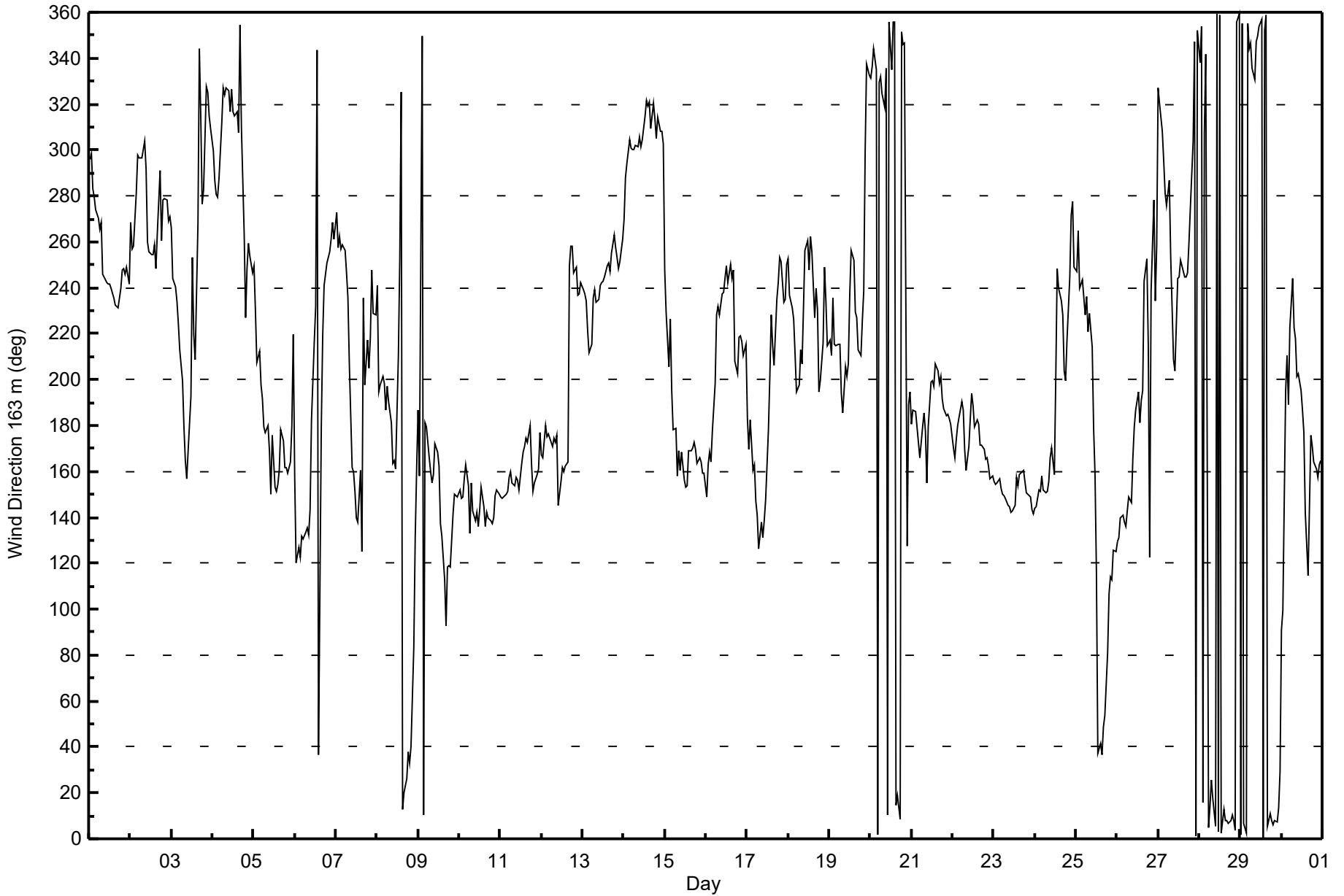
Wind Direction 163 m (WD163m) - deg
Lower Camp Met Tower - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0											Hours in Service: 720														
Maximum Value: 96 deg on Sep 25 13:00											Hours of Data: 720														
Minimum Value: 2 deg on Sep 12 19:00											Hours of Missing Data: 0														
Percentiles: P ₁ = 2 P ₁₀ = 4 Q ₁ = 6 Median = 9 Q ₃ = 13 P ₉₀ = 20 P ₉₉ = 71											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-Sep	15	16	7	7	5	6	13	13	8	6	7	7	8	7	10	7	8	7	7	3	3	3	2	17	17
2-Sep	27	35	11	8	9	8	11	9	11	17	9	8	9	7	7	8	7	8	14	8	5	5	4	2	35
3-Sep	7	8	11	9	10	7	13	16	16	16	13	20	21	60	14	53	7	20	10	20	5	5	7	7	60
4-Sep	7	7	8	5	8	18	6	6	8	12	10	9	10	15	22	32	28	36	31	33	20	4	5	8	36
5-Sep	6	20	9	11	11	12	10	13	12	14	15	18	24	17	14	13	16	11	4	3	5	4	10	27	27
6-Sep	72	7	4	6	7	6	6	7	11	16	12	14	40	15	43	55	22	8	8	5	5	5	9	8	72
7-Sep	8	8	10	11	8	9	16	17	27	21	13	15	15	16	27	20	95	27	10	9	12	10	8	11	95
8-Sep	10	9	7	11	10	12	11	10	11	16	10	14	46	13	50	7	4	6	6	4	10	26	17	21	50
9-Sep	9	92	77	69	41	7	6	6	6	7	9	11	15	15	21	53	16	21	10	11	3	5	4	5	92
10-Sep	4	4	5	5	9	18	11	11	5	6	8	8	13	12	13	6	9	5	4	3	4	6	4	5	18
11-Sep	5	5	4	4	4	3	3	5	6	7	7	9	10	10	10	9	7	9	11	5	4	5	5	5	11
12-Sep	4	6	6	3	4	4	4	5	5	16	8	8	11	18	19	25	31	2	2	8	5	8	4	7	31
13-Sep	10	13	15	11	12	9	13	12	15	13	6	9	9	7	7	6	4	7	8	4	7	5	5	5	15
14-Sep	8	7	8	5	6	7	7	11	10	9	10	10	12	24	13	10	15	10	10	2	4	14	20	23	24
15-Sep	47	10	12	10	31	8	14	9	8	9	7	7	8	8	10	9	8	6	4	4	4	4	3	6	47
16-Sep	6	11	5	6	7	10	8	9	9	13	13	13	12	16	10	10	6	24	10	3	4	11	8	11	24
17-Sep	13	10	10	6	6	7	5	9	12	4	4	14	14	13	14	18	7	12	5	4	5	15	10	8	18
18-Sep	6	11	7	8	16	9	12	11	14	13	12	9	6	9	9	12	6	8	14	7	17	6	24	14	24
19-Sep	12	14	15	12	5	6	6	10	11	12	11	10	18	11	9	11	15	9	4	7	15	29	6	11	29
20-Sep	7	5	8	9	7	8	5	5	6	6	20	17	18	12	15	15	12	7	7	12	23	27	12	7	27
21-Sep	5	4	6	8	13	8	9	15	22	17	13	12	9	7	8	9	6	6	4	3	4	4	4	6	22
22-Sep	6	7	7	6	9	5	6	10	8	11	8	11	10	10	8	9	8	6	4	5	5	4	2	4	11
23-Sep	3	3	4	4	4	4	4	4	5	7	6	8	8	8	9	8	7	6	5	6	7	7	5	4	9
24-Sep	5	6	6	7	6	5	6	6	10	9	14	27	5	4	9	9	7	6	7	12	10	11	7	7	27
25-Sep	4	7	8	9	18	10	17	19	18	27	81	71	96	44	35	27	16	17	9	13	8	8	15	12	96
26-Sep	7	6	5	4	5	21	10	5	6	8	20	14	16	13	7	17	18	19	49	39	21	15	25	37	49
27-Sep	10	21	9	9	13	13	9	17	11	13	19	23	5	8	7	7	5	2	5	9	35	10	10	4	35
28-Sep	15	5	74	20	9	6	5	4	12	8	9	8	7	7	6	7	7	8	7	5	6	5	8	8	74
29-Sep	8	7	6	7	7	9	7	7	4	7	5	8	8	8	13	16	13	7	10	9	8	4	5	17	17
30-Sep	42	44	22	5	8	10	8	24	13	11	10	11	14	18	19	9	22	5	2	2	4	3	3	4	44
											72 92 77 69 41 21 17 24 27 27 81 71 96 60 50 55 95 36 49 39 35 29 25 37														
Diurnal Maximum																									



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Summary of Hour Averages

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

Maximum Value: 0.5 km/h on Sep 26 00:00 Maximum Daily Average: 0.0 km/h on Sep 20 Minimum Value: -1.9 km/h on Sep 23 13:00 Minimum Daily Average: -1.1 km/h on Sep 11 Maximum Diurnal Average: -0.2 km/h at hour 24 Minimum Diurnal Average: -0.7 km/h at hour 13 Monthly Average: -0.39 km/h Percentiles: $P_1 = -1.6$ $P_{10} = -1.0$ $Q_1 = -0.6$ Median = -0.3 $Q_3 = 0.0$ $P_{90} = 0.0$ $P_{99} = 0.2$																						Hours in Service: 720 Hours of Data: 720 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-Sep	-0.1	-0.1	-0.3	-0.3	-0.3	-0.3	-0.2	-0.5	-0.7	-0.9	-0.8	-1.3	-1.3	-1.4	-1.5	-1.3	-1.4	-0.9	-1.0	-0.8	-0.5	-0.5	-0.5	-0.2	-0.7	-0.1
2-Sep	-0.3	-0.1	0.0	-0.4	-0.3	-0.2	-0.1	-0.3	-0.3	-0.4	-0.7	-0.8	-0.9	-0.7	-0.7	-0.9	-1.0	-0.6	-0.2	-0.6	-0.7	-0.9	-0.9	-0.4	-0.5	0.0
3-Sep	-0.2	0.0	0.0	0.2	0.1	0.0	-0.3	-0.5	-0.1	-0.6	-0.7	-0.4	-0.2	-0.3	-0.5	-0.4	-0.1	-0.1	0.0	-0.1	-0.3	-0.3	-0.2	-0.4	-0.2	0.2
4-Sep	-0.5	-0.7	-0.8	-0.5	-0.4	-0.8	-0.6	-0.6	-0.5	-0.4	-0.6	-0.2	-0.5	-0.4	-0.2	-0.4	0.1	-0.2	0.0	0.0	0.0	0.1	-0.1	0.0	-0.3	0.1
5-Sep	0.2	-0.1	-0.1	-0.1	-0.3	-0.3	-0.7	-0.9	-0.3	-0.4	-0.1	-0.9	-0.6	-0.6	-0.6	-0.8	-0.9	-1.0	-1.3	-0.6	-0.3	0.0	-0.2	-0.2	-0.5	0.2
6-Sep	0.0	0.0	-0.1	-0.2	-0.1	-0.4	-0.1	-0.3	-0.2	-0.2	-0.7	-0.4	-0.4	-0.3	-0.2	-0.3	-0.4	-0.4	-0.3	0.0	0.0	-0.1	0.0	0.0	-0.2	0.0
7-Sep	-0.3	0.0	-0.1	-0.2	-0.1	-0.3	0.1	-0.2	-0.3	-0.4	-0.2	-0.5	-0.1	-0.4	-0.2	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	-0.1	0.1
8-Sep	0.2	0.1	-0.1	-0.2	-0.3	-0.3	-0.2	-0.5	-0.2	-0.1	-0.3	-0.2	-0.1	-0.3	0.0	-0.2	0.0	-0.1	-0.1	0.0	0.0	0.1	-0.1	0.0	-0.1	0.2
9-Sep	0.0	0.0	0.0	0.0	0.0	0.0	-0.3	0.0	-0.1	-0.4	0.0	0.0	-0.2	0.1	0.1	-0.2	-0.2	-0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.1
10-Sep	0.0	0.0	0.0	0.1	0.0	0.0	0.0	-0.1	-0.1	-0.4	-0.6	-0.3	-0.2	-0.7	-0.6	-0.6	-0.7	-0.7	-0.4	-0.4	-0.6	-0.9	-1.4	-1.6	-0.4	0.1
11-Sep	-1.5	-1.8	-1.7	-1.2	-0.9	-0.8	-0.9	-1.2	-1.5	-1.0	-1.4	-1.2	-1.1	-1.6	-1.2	-1.7	-1.3	-1.3	-0.8	-0.8	-1.1	-1.0	-0.6	-0.2	-1.1	-0.2
12-Sep	0.0	0.0	-0.1	-0.6	-0.6	-0.3	-0.3	-0.5	-0.7	-0.4	0.2	-0.2	0.0	-0.1	-0.4	-0.2	-0.4	-0.4	-0.5	-0.1	-0.3	-0.1	0.1	0.0	-0.2	0.2
13-Sep	0.0	0.1	0.3	0.2	0.0	0.1	0.0	-0.2	-0.2	-0.4	-1.3	-0.6	-1.2	-1.3	-1.0	-1.3	-1.2	-1.0	-1.2	-1.1	-1.2	-0.7	-0.7	-1.0	-0.6	0.3
14-Sep	-0.6	-0.5	-0.4	-0.4	-0.5	-0.6	-0.4	-0.5	-0.5	-0.8	-0.5	-0.7	-0.6	-0.1	-0.2	-0.6	-0.5	-0.3	-0.3	-0.3	-0.1	-0.1	-0.1	0.0	-0.4	0.0
15-Sep	-0.1	0.0	0.0	0.1	-0.4	-0.4	-0.5	-0.8	-0.7	-0.4	-0.1	-0.8	-1.2	-1.2	-0.8	-0.9	-1.0	-0.9	-0.8	-0.8	-1.0	-1.0	-1.3	-0.6	-0.6	0.1
16-Sep	-0.4	-0.4	-0.6	-0.2	-0.1	-0.1	0.2	-0.2	-0.1	0.0	-0.2	-0.5	-0.5	-0.2	-0.7	-0.6	-0.6	-0.2	-0.8	-0.6	0.2	0.1	0.0	0.2	-0.3	0.2
17-Sep	-0.2	-0.2	0.0	-0.1	0.0	-0.1	0.0	0.0	0.0	-0.2	0.1	-0.3	-1.0	-0.6	-0.6	-0.5	-0.4	-0.5	-0.2	-0.1	0.0	0.1	0.1	0.2	-0.2	0.2
18-Sep	0.1	0.1	0.2	0.1	-0.3	-0.2	-0.3	-0.2	-0.3	-0.1	-0.8	-0.8	-1.5	-1.0	-1.0	-0.3	-0.4	-0.6	-0.2	0.3	0.1	-0.2	0.0	-0.1	-0.3	0.3
19-Sep	0.0	0.0	0.0	-0.3	-0.3	-0.1	-0.1	-0.6	-0.6	-0.5	-0.7	-0.8	-0.3	-0.1	-0.4	-0.4	-0.3	-0.3	0.1	0.0	0.1	-0.1	0.0	0.0	-0.2	0.1
20-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.3	0.0	-0.2	-0.4	-0.2	-0.3	-0.1	0.0	-0.1	0.0	0.0	-0.1	0.0	0.2	0.0	0.3
21-Sep	-0.1	-0.2	-0.3	-0.4	-0.3	-1.1	-1.0	-1.1	-0.8	-0.4	-0.5	-1.4	-1.6	-1.7	-1.7	-1.5	-1.9	-1.0	-0.7	-0.6	-0.8	-0.8	-0.9	-0.8	-0.9	-0.1
22-Sep	-0.7	-0.8	-0.9	-0.8	-0.5	-0.6	-0.6	-0.7	-0.4	-0.7	-0.9	-1.2	-1.4	-1.1	-1.4	-1.4	-1.1	-1.1	-1.0	-0.5	-0.6	-1.2	-0.8	-0.4	-0.9	-0.4
23-Sep	0.0	-0.2	-0.5	-0.8	-1.2	-1.1	-1.2	-0.7	-0.6	-0.8	-0.6	-1.4	-1.9	-1.5	-1.4	-1.7	-1.1	-1.1	-0.8	-0.8	-1.0	-1.4	-0.7	-0.9	-1.0	0.0
24-Sep	-1.4	-1.2	-1.3	-1.0	-1.2	-1.1	-1.4	-0.9	-1.2	-0.8	-0.6	-0.6	-0.4	-0.9	-0.7	-0.3	-0.4	-0.4	0.1	0.1	-0.1	-0.6	-0.3	-0.1	-0.7	0.1
25-Sep	0.0	-0.1	-0.1	0.0	0.0	0.0	0.0	-0.2	-0.5	-0.3	0.0	0.0	0.3	0.0	-0.2	-0.2	0.0	-0.2	-0.3	-0.1	-0.4	-0.2	0.0	0.5	-0.1	0.5
26-Sep	0.0	0.2	0.1	-0.2	0.3	-0.1	-0.1	0.0	-0.1	-0.1	-0.4	-0.9	-1.0	-0.7	-0.8	-0.4	-0.2	-0.2	-0.1	-0.4	-0.4	-0.3	0.0	0.0	-0.2	0.3
27-Sep	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	-0.5	-0.1	-0.4	-0.9	-0.7	-0.8	-0.6	-0.9	-0.4	-0.3	-0.1	-0.3	-0.1	-0.1	0.0	-0.2	0.1
28-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.2	-0.1	-0.3	-0.3	-0.2	-0.3	-0.5	-0.4	-0.2	-0.3	-0.3	-0.2	-0.3	-0.1	0.0	-0.2	0.0
29-Sep	-0.2	-0.1	0.0	0.1	-0.1	-0.1	0.0	-0.1	0.0	-0.1	-0.1	-0.1	0.0	-0.4	-0.5	-0.3	-0.2	-0.1	-0.3	-0.1	-0.1	-0.1	-0.3	-0.1	-0.1	0.1
30-Sep	0.0	-0.1	0.0	0.0	0.0	0.1	0.1	-0.1	0.0	-0.1	-0.3	-0.4	-0.5	-0.3	-0.1	-0.4	-0.3	-0.3	0.1	0.2	0.1	0.0	0.0	0.0	-0.1	0.2
																								Diurnal Average		
																								Diurnal Maximum		



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 4.4 km/h on Sep 23 12:00		Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0																								
Minimum Value: 0.1 km/h on Sep 10 05:00																										
Percentiles: $P_1 = 0.1$ $P_{10} = 0.4$ $Q_1 = 0.9$ Median = 1.5 $Q_3 = 2.1$ $P_{90} = 2.8$ $P_{99} = 3.6$																										
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-Sep	0.7	0.4	1.4	1.8	2.1	2.2	2.3	2.2	1.9	2.2	2.4	2.8	3.1	3.2	3.3	3.3	3.4	3.3	2.7	2.2	1.6	1.7	1.8	0.9	3.4	
2-Sep	0.9	0.8	1.5	2.0	1.9	1.1	0.9	1.2	1.6	1.7	2.0	2.1	2.3	2.4	2.9	2.6	3.2	2.9	1.6	1.7	1.9	2.3	2.8	2.8	3.2	
3-Sep	1.8	1.3	1.2	0.9	0.9	1.5	1.7	1.5	1.6	2.2	2.1	1.8	1.9	1.6	1.4	1.5	1.0	0.3	0.2	1.4	1.7	1.5	1.5	1.7	2.2	
4-Sep	2.2	2.3	2.5	2.5	2.7	3.0	2.4	2.7	3.0	2.8	2.9	2.3	2.3	2.6	2.0	1.8	1.2	0.7	0.4	0.4	0.4	0.7	0.6	0.9	3.0	
5-Sep	1.0	1.0	1.4	1.3	1.3	1.6	1.8	1.9	1.9	2.1	2.4	2.1	2.3	2.2	2.3	2.1	1.7	1.5	1.8	1.3	1.0	1.0	1.2	1.1	2.4	
6-Sep	0.4	0.5	0.6	1.1	1.2	1.3	1.5	1.1	1.1	1.5	1.3	1.2	1.1	1.0	0.9	1.2	1.3	1.5	1.0	0.8	0.7	0.7	0.8	0.7	1.5	
7-Sep	0.8	1.1	0.7	0.8	0.8	2.1	1.3	1.0	1.2	1.4	1.9	1.9	1.7	1.9	1.1	1.0	0.9	0.5	0.8	0.5	0.2	0.1	0.2	0.2	2.1	
8-Sep	0.6	1.0	1.2	1.2	1.4	1.5	1.1	1.7	2.1	2.1	2.2	2.0	1.7	1.8	1.1	0.8	0.9	0.7	0.4	0.5	0.3	0.3	0.3	0.2	2.2	
9-Sep	0.1	0.2	0.1	0.2	0.2	0.4	0.8	1.0	1.2	1.5	1.8	1.9	1.9	1.7	1.6	1.1	0.6	0.5	0.2	0.4	0.8	0.3	0.4	0.4	1.9	
10-Sep	0.8	0.8	0.5	0.3	0.1	0.1	0.1	0.8	0.9	1.6	1.5	1.6	2.2	2.3	2.4	3.2	2.9	3.2	2.6	2.5	3.0	2.5	2.5	2.9	3.2	
11-Sep	3.0	2.9	2.7	2.3	1.9	2.0	2.0	2.4	2.7	2.5	2.8	3.4	3.4	3.1	3.1	3.0	2.9	2.4	1.7	2.3	2.1	1.8	1.4	1.1	3.4	
12-Sep	0.6	0.3	1.0	1.7	2.1	1.9	1.8	2.0	1.6	1.7	1.9	1.8	1.6	1.6	1.7	1.1	1.6	1.7	1.1	1.2	1.3	0.8	0.5	0.6	2.1	
13-Sep	0.6	0.6	0.7	0.6	0.8	1.3	1.1	1.5	1.5	1.6	2.4	2.5	3.0	3.5	3.5	3.7	3.3	3.8	4.1	3.9	2.8	2.3	2.5	3.1	4.1	
14-Sep	2.9	2.4	2.6	2.1	2.0	2.1	2.2	2.1	2.3	2.5	2.9	2.9	2.8	2.1	2.4	2.7	2.5	1.6	1.0	1.2	0.9	0.5	0.4	0.5	2.9	
15-Sep	0.4	0.5	0.5	0.9	1.3	1.3	1.5	1.8	1.9	2.3	2.9	3.0	2.4	2.4	2.3	2.2	2.0	2.0	1.8	1.9	2.2	2.1	2.3	1.8	3.0	
16-Sep	1.2	1.3	1.7	1.1	1.3	1.4	1.0	1.7	1.7	1.3	1.3	1.5	1.8	2.0	2.0	1.8	1.4	0.7	1.2	1.2	0.8	0.7	0.7	0.9	2.0	
17-Sep	1.0	1.2	1.1	1.2	0.8	1.2	1.1	0.6	0.6	0.8	1.6	1.4	1.9	1.9	1.9	1.4	1.4	1.5	0.9	0.9	0.7	0.7	1.0	0.8	1.9	
18-Sep	1.1	0.8	1.3	1.4	1.2	1.0	1.3	1.5	1.6	1.6	2.6	3.2	3.0	3.3	3.4	1.4	1.5	1.2	1.0	1.2	1.3	1.0	1.0	0.7	3.4	
19-Sep	1.1	1.5	1.0	1.5	1.6	1.5	1.4	2.0	1.9	1.7	1.6	1.9	1.9	2.1	2.0	1.4	1.2	0.8	0.6	0.4	0.5	0.5	0.5	0.3	2.1	
20-Sep	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.4	0.6	0.9	1.3	1.5	1.7	1.8	1.5	1.3	1.2	0.4	0.8	0.3	0.3	0.6	0.4	0.4	1.8	
21-Sep	0.7	1.0	1.5	1.6	1.8	1.9	2.2	2.2	2.6	2.5	2.8	2.9	3.3	3.5	3.3	3.2	3.0	2.4	1.3	1.5	1.7	2.0	2.0	2.1	3.5	
22-Sep	2.0	2.0	2.0	2.0	1.6	1.3	1.5	2.3	2.9	2.5	2.3	2.5	2.5	2.4	2.4	2.4	2.1	2.0	1.4	1.6	1.7	2.2	2.1	1.7	2.9	
23-Sep	0.9	1.2	1.3	1.8	1.6	1.5	1.7	2.2	2.8	3.3	3.7	4.4	4.3	3.3	3.6	3.1	2.9	2.4	2.5	2.4	2.3	2.6	3.1	3.3	4.4	
24-Sep	3.4	3.4	2.8	2.8	2.5	2.8	2.3	2.4	2.2	2.0	1.6	1.9	1.7	2.4	1.4	1.0	0.9	0.8	1.0	1.1	1.3	1.6	1.3	0.7	3.4	
25-Sep	0.5	1.1	0.7	0.7	0.7	0.8	1.1	1.0	1.3	1.5	1.5	1.4	1.6	1.4	1.4	1.2	1.4	1.6	0.7	0.9	1.4	1.6	1.3	1.4	1.6	
26-Sep	1.6	1.6	1.5	1.9	1.7	1.1	0.8	0.4	0.3	1.2	1.8	1.9	1.8	1.4	1.2	1.2	0.9	0.5	0.5	2.0	1.5	0.5	0.5	0.4	2.0	
27-Sep	0.2	0.2	0.4	0.5	0.7	0.5	0.4	1.1	1.1	1.2	1.4	1.4	1.9	1.9	2.0	1.8	2.3	1.2	0.9	0.8	0.7	0.4	0.3	0.2	2.3	
28-Sep	0.2	0.2	0.4	0.3	0.2	0.2	0.3	0.5	0.7	1.0	1.8	1.9	1.6	1.6	1.8	2.3	2.3	2.1	1.5	1.4	1.5	1.8	1.2	1.3	2.3	
29-Sep	1.7	1.0	0.5	0.8	0.5	0.3	0.3	0.3	0.6	1.5	1.6	1.6	1.8	2.1	1.7	1.7	1.8	1.6	1.1	1.0	1.1	1.3	1.1	0.8	2.1	
30-Sep	0.3	0.4	0.1	0.1	0.2	0.7	0.6	0.5	0.7	0.8	0.8	0.9	0.9	1.2	1.3	1.2	1.3	0.5	0.6	0.5	0.3	0.2	0.2	0.2	1.3	
		3.4	3.4	2.8	2.8	2.7	3.0	2.4	2.7	3.0	3.3	3.7	4.4	4.3	3.5	3.6	3.7	3.4	3.8	4.1	3.9	3.0	2.6	3.1	3.3	
		Diurnal Maximum																								



Maximum Value: 1.3 km/h on Sep 19 06:00 Maximum Daily Average: 0.5 km/h on Sep 23																						Hours in Service: 720 Hours of Data: 718				
Minimum Value: -1.1 km/h on Sep 4 06:00 Minimum Daily Average: -0.4 km/h on Sep 14 Maximum Diurnal Average: 0.3 km/h at hour 2 Minimum Diurnal Average: 0.0 km/h at hour 16 Monthly Average: 0.15 km/h Percentiles: $P_1 = -0.8$ $P_{10} = -0.3$ $Q_1 = -0.1$ Median = 0.1 $Q_3 = 0.4$ $P_{90} = 0.6$ $P_{99} = 1.0$																						Hours of Missing Data: 2 Hours of Calibration: 0 Percent Operational Time: 99.7				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Sep	-0.2	0.0	0.4	0.4	0.9	0.8	0.8	0.2	0.2	0.1	-0.1	-0.1	-0.1	-0.1	0.1	0.0	0.4	0.7	0.1	0.2	0.3	0.2	-0.1	-0.1	0.2	0.9
2-Sep	-0.3	-0.1	1.1	0.1	-0.1	-0.3	-0.1	0.1	-0.5	-0.7	-0.1	0.0	0.0	0.4	-0.3	-0.1	-0.4	-0.7	0.4	-0.2	-0.2	-0.4	-0.1	0.5	-0.1	1.1
3-Sep	0.5	0.7	0.5	0.7	0.5	0.8	0.5	0.1	0.2	0.2	-0.1	0.1	0.1	0.1	0.3	-0.3	-0.3	0.0	0.0	0.0	-0.5	-0.3	-0.5	-0.5	0.1	0.8
4-Sep	-0.8	-0.6	-0.5	-0.5	-0.4	-1.1	-0.8	-1.0	-0.9	-0.9	-0.8	-0.8	-0.7	-0.7	-0.3	-0.2	0.0	-0.1	-0.1	0.3	0.1	0.0	0.1	0.2	-0.4	0.3
5-Sep	0.8	0.5	0.7	0.5	0.7	0.4	0.4	0.1	0.4	0.2	0.4	0.0	0.2	0.1	0.4	0.0	0.0	0.0	-0.4	0.2	0.3	0.5	0.5	0.3	0.3	0.8
6-Sep	0.2	0.1	-0.1	0.1	0.3	0.0	0.1	0.0	-0.1	0.0	0.1	0.1	0.1	-0.2	-0.2	-0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.3	-0.1	0.1	0.4
7-Sep	-0.5	0.7	-0.1	0.1	-0.1	0.7	0.6	0.2	0.0	0.1	0.3	0.1	0.2	0.0	0.1	0.2	0.1	0.1	0.3	0.8	0.2	0.5	0.2	0.3	0.2	0.8
8-Sep	1.0	0.7	0.2	0.2	0.1	0.0	0.0	-0.1	0.2	0.5	0.2	0.2	0.3	0.1	0.0	0.0	0.2	-0.1	-0.1	-0.1	0.1	0.2	-0.1	0.1	0.2	1.0
9-Sep	0.0	0.0	0.0	0.1	0.0	0.1	UO	UO	0.1	-0.1	0.3	0.3	0.2	0.5	0.5	0.0	0.1	0.3	0.4	0.3	0.5	0.4	0.4	0.3	0.2	0.5
10-Sep	0.1	0.3	0.2	0.2	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.3	0.7	0.2	0.3	0.4	0.5	0.8	0.6	0.5	0.5	0.7	0.8	0.7	0.3	0.8
11-Sep	0.7	0.8	0.8	0.8	0.9	0.7	0.3	0.1	0.2	0.2	0.0	0.2	0.4	-0.1	0.7	-0.3	-0.2	-0.2	0.1	0.5	0.4	0.5	0.8	0.7	0.4	0.9
12-Sep	0.6	0.3	0.5	0.5	0.7	0.7	0.1	0.3	-0.2	0.2	0.5	0.2	0.3	0.1	0.3	-0.2	0.1	-0.2	0.0	0.4	0.3	0.0	0.2	0.1	0.2	0.7
13-Sep	0.5	0.2	0.6	0.6	0.8	1.0	0.8	0.2	0.4	0.3	-0.2	0.1	-0.1	-0.1	0.0	-0.1	0.1	-0.1	-0.6	-0.4	-0.3	0.5	0.2	-0.3	0.2	1.0
14-Sep	-0.4	-0.5	-0.6	-0.6	-0.6	-0.6	-0.5	-0.6	-0.3	-0.7	-0.6	-0.7	-1.0	0.1	-0.2	-0.7	-0.6	-0.4	-0.5	-0.5	-0.4	0.0	0.2	0.1	-0.4	0.2
15-Sep	0.4	0.5	0.4	0.7	0.2	0.1	0.6	-0.5	-0.5	-0.1	0.2	0.3	0.2	0.2	0.6	0.1	0.0	0.1	-0.1	0.3	0.3	0.4	0.5	0.4	0.2	0.7
16-Sep	0.1	0.7	0.8	0.0	0.3	0.6	0.8	0.7	0.4	0.2	0.1	-0.1	0.0	-0.3	-0.1	-0.1	0.0	0.3	0.3	0.7	0.7	0.3	0.5	1.0	0.3	1.0
17-Sep	0.4	0.1	0.5	0.3	0.6	0.3	0.5	0.0	0.0	0.0	0.4	-0.1	-0.1	0.4	0.6	0.2	0.5	0.4	0.4	0.4	0.4	0.2	0.7	0.5	0.3	0.7
18-Sep	0.4	1.0	1.1	0.9	0.1	0.2	0.1	0.4	0.3	0.3	0.2	-0.3	0.1	-0.4	-0.4	0.4	0.5	0.1	0.4	1.3	0.1	0.2	0.4	0.4	0.3	1.3
19-Sep	0.8	1.1	0.3	0.6	0.9	1.3	1.1	0.2	-0.3	0.2	0.0	0.0	0.3	0.2	-0.1	0.3	0.2	0.3	0.9	0.2	0.1	0.0	0.3	0.2	0.4	1.3
20-Sep	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-0.1	0.5	0.2	-0.1	-0.4	-0.5	-0.3	0.0	0.0	-0.2	0.1	0.3	0.3	0.0	0.6	0.0	0.6
21-Sep	0.4	0.2	0.0	0.3	0.5	-0.5	0.1	0.3	0.2	0.2	0.0	0.3	0.0	0.1	0.1	0.2	-0.2	0.4	-0.1	0.0	0.2	0.3	0.5	0.4	0.2	0.5
22-Sep	0.2	0.0	-0.3	-0.1	0.1	-0.1	0.1	0.0	0.1	-0.2	0.2	0.3	0.1	0.4	0.1	-0.2	-0.2	-0.2	-0.3	0.2	0.2	0.3	0.5	0.5	0.1	0.5
23-Sep	0.7	0.8	0.6	0.3	0.3	0.1	0.2	0.5	0.4	0.6	0.7	0.6	0.5	0.1	0.4	0.0	0.3	0.0	0.4	0.8	0.8	0.7	0.6	0.6	0.5	0.8
24-Sep	0.6	0.5	0.6	0.8	-0.3	0.4	0.5	0.5	0.1	0.2	0.3	0.5	0.4	-0.3	0.1	0.3	0.1	0.4	0.8	0.9	0.7	-0.4	0.3	0.3	0.3	0.9
25-Sep	0.3	0.6	0.3	0.3	0.3	0.6	0.5	0.0	0.0	0.1	0.1	0.5	0.3	0.1	-0.1	-0.3	-0.1	0.2	-0.3	-0.4	-0.7	-0.3	-0.1	0.2	0.1	0.6
26-Sep	0.0	0.6	0.4	0.8	0.6	-0.3	0.0	0.0	0.1	0.9	0.8	0.0	-0.1	0.2	0.0	0.3	0.2	0.0	0.2	0.2	-0.1	-0.2	0.2	0.1	0.2	0.9
27-Sep	0.1	0.1	-0.1	-0.1	0.4	0.2	0.0	0.2	0.2	-0.1	0.1	-0.3	0.0	-0.2	-0.1	-0.1	0.0	0.2	0.1	0.0	-0.3	0.0	-0.1	0.0	0.0	0.4
28-Sep	0.0	0.1	0.3	0.3	0.2	0.1	0.0	-0.1	-0.1	-0.1	-0.5	-0.3	-0.2	0.0	-0.2	-0.2	-0.2	-0.3	0.1	-0.2	0.0	-0.1	-0.1	-0.2	-0.1	0.3
29-Sep	-0.1	-0.1	0.0	0.2	-0.1	-0.1	0.0	-0.1	-0.1	-0.4	-0.2	-0.1	-0.1	-0.4	-0.1	-0.2	-0.3	0.0	-0.2	-0.2	0.1	0.0	0.0	-0.1	-0.1	0.2
30-Sep	0.1	-0.1	0.1	0.1	0.2	0.1	0.5	0.2	0.2	0.2	0.0	0.0	-0.2	-0.1	0.2	-0.2	0.1	0.1	0.5	0.7	0.6	0.5	0.4	0.1	0.2	0.7
																								Diurnal Average		
																								Diurnal Maximum		
UO - Unstable Operation																										



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 4.1 km/h on Sep 13 19:00 Minimum Value: 0.1 km/h on Sep 20 04:00 Percentiles: P ₁ = 0.2 P ₁₀ = 0.5 Q ₁ = 0.9 Median = 1.4 Q ₃ = 2.0 P ₉₀ = 2.7 P ₉₉ = 3.7																					Hours in Service: 720 Hours of Data: 718 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-Sep	0.9	0.5	1.5	1.7	1.8	2.0	2.4	2.0	1.8	2.0	2.6	2.5	2.7	3.0	3.3	3.3	3.6	3.3	2.8	2.0	1.4	1.7	1.9	1.3	3.6
2-Sep	1.2	1.2	1.8	2.2	1.9	1.5	1.2	1.7	2.1	1.8	2.1	1.9	2.1	2.4	2.6	2.2	2.7	2.9	1.4	1.3	1.6	1.8	2.2	2.4	2.9
3-Sep	2.0	1.6	1.7	1.1	0.9	1.1	1.5	1.2	1.6	2.0	1.9	1.2	1.8	1.6	1.8	1.6	0.7	0.3	0.4	1.4	1.8	1.7	1.6	1.6	2.0
4-Sep	2.0	2.2	2.4	2.6	2.5	2.9	2.5	2.7	3.1	2.7	2.9	2.3	2.3	2.6	2.3	1.9	1.4	0.9	0.6	0.6	0.8	1.2	0.8	1.3	3.1
5-Sep	1.2	1.2	1.3	1.1	1.2	1.6	1.7	2.1	1.8	1.7	2.2	2.5	2.4	2.3	2.5	2.4	2.0	1.9	2.1	1.6	1.0	1.0	1.3	1.2	2.5
6-Sep	0.6	0.7	0.8	1.1	1.3	1.3	1.5	1.3	1.3	1.5	1.6	1.5	1.3	0.9	0.9	1.3	1.6	1.5	1.2	1.0	1.1	1.0	1.0	1.0	1.6
7-Sep	1.1	1.4	1.0	1.1	1.1	2.0	1.7	1.2	1.5	1.4	1.8	1.6	1.8	1.6	1.2	1.0	0.9	0.7	0.7	0.7	0.4	0.4	0.3	0.4	2.0
8-Sep	0.5	0.9	1.0	1.3	1.3	1.5	1.1	1.5	1.8	2.0	1.9	1.8	1.7	1.9	1.2	0.7	0.8	0.6	0.6	0.8	0.4	0.4	0.3	0.2	2.0
9-Sep	0.1	0.1	0.1	0.2	0.2	0.5	UO	UO	1.1	1.5	1.6	1.8	1.9	1.8	1.5	1.1	0.5	0.4	0.3	0.7	0.9	0.4	0.6	0.8	1.9
10-Sep	1.1	0.9	0.7	0.3	0.1	0.2	0.2	0.7	1.0	1.5	1.6	1.4	2.3	2.4	2.2	2.7	2.7	2.8	2.4	2.1	2.3	2.1	2.2	2.2	2.8
11-Sep	2.5	2.3	2.2	2.0	1.9	1.8	1.7	2.0	2.4	3.0	3.0	3.2	3.8	4.0	3.8	3.4	3.3	2.8	1.9	1.9	1.5	1.1	0.8	1.0	4.0
12-Sep	0.7	0.5	0.8	0.8	0.8	1.3	1.4	1.5	1.4	1.4	1.8	1.4	1.4	1.2	1.5	0.9	1.6	1.4	1.0	1.2	1.3	1.0	0.8	0.9	1.8
13-Sep	0.9	1.0	0.9	0.8	0.8	1.2	1.2	1.3	1.6	2.0	2.2	2.7	2.7	3.0	3.3	3.1	2.9	3.5	4.1	3.6	2.7	2.1	2.2	2.5	4.1
14-Sep	2.6	2.1	2.5	2.0	1.9	2.3	2.3	2.4	2.7	2.5	2.9	2.8	2.8	2.4	2.7	2.8	2.6	1.7	0.7	1.0	1.3	0.7	0.5	0.7	2.9
15-Sep	0.5	0.6	0.6	0.7	1.0	1.1	1.4	1.7	1.5	1.8	2.4	2.4	2.1	2.2	2.8	2.7	2.4	2.2	2.0	2.2	2.1	2.1	2.1	1.7	2.8
16-Sep	0.9	0.8	0.8	1.1	1.2	1.3	1.1	1.3	1.3	1.4	1.3	1.6	2.0	2.1	2.1	1.7	1.4	0.8	1.3	1.4	1.3	1.0	0.7	0.8	2.1
17-Sep	1.0	1.3	0.9	1.0	0.7	1.2	0.9	0.6	0.6	0.8	1.4	1.3	2.4	2.5	2.4	1.8	1.9	1.5	1.0	1.0	0.8	1.2	1.3	1.0	2.5
18-Sep	1.3	1.0	1.1	1.3	1.2	1.0	1.3	1.2	1.3	1.5	2.4	2.8	2.4	2.8	2.8	1.5	1.8	1.4	0.8	1.4	1.7	1.3	1.2	0.9	2.8
19-Sep	1.1	1.3	1.1	1.1	1.4	1.0	1.1	1.6	1.8	2.0	2.1	2.3	2.2	2.3	2.1	1.7	1.4	0.9	0.8	0.7	0.6	0.7	0.6	0.5	2.3
20-Sep	0.3	0.2	0.2	0.1	0.1	0.2	0.2	0.3	0.5	0.8	1.3	1.6	1.7	1.7	1.5	1.3	1.1	0.4	0.7	0.3	0.3	0.6	0.4	0.6	1.7
21-Sep	0.6	1.0	1.5	1.3	1.7	1.7	2.0	1.8	1.9	1.9	2.2	3.3	3.8	3.9	3.7	3.8	3.4	3.0	1.7	1.8	1.9	2.0	2.1	2.1	3.9
22-Sep	1.9	1.6	1.4	1.3	1.0	0.9	1.0	1.8	2.3	2.1	2.8	3.0	3.2	3.0	3.0	2.9	2.4	2.3	1.8	1.8	2.0	2.2	2.4	2.2	3.2
23-Sep	0.9	0.8	0.8	0.9	1.0	0.8	0.9	1.6	2.1	2.5	3.0	3.3	3.4	3.8	3.5	3.6	3.2	2.9	2.8	2.7	2.5	2.4	2.4	2.4	3.8
24-Sep	2.2	2.5	3.2	3.2	2.9	3.1	2.5	2.7	2.1	2.4	2.0	1.8	2.0	1.8	1.2	1.0	0.9	0.8	1.0	1.2	1.4	1.4	1.2	0.9	3.2
25-Sep	0.7	1.1	1.0	1.1	1.0	1.0	1.4	1.2	1.5	1.6	1.8	1.6	1.6	1.5	1.4	1.3	1.5	1.5	0.9	0.8	1.3	1.7	1.5	1.6	1.8
26-Sep	2.0	2.2	1.9	2.1	2.0	1.2	0.8	0.5	0.5	1.3	2.0	2.5	2.3	1.9	1.5	1.4	0.9	0.5	0.6	1.5	1.6	0.6	0.6	0.5	2.5
27-Sep	0.2	0.3	0.6	0.7	0.8	0.5	0.5	1.1	1.0	0.9	1.3	1.4	1.7	1.8	2.0	1.7	1.8	1.0	0.7	0.8	0.9	0.4	0.4	0.3	2.0
28-Sep	0.3	0.2	0.5	0.4	0.3	0.2	0.3	0.5	0.6	1.1	1.6	1.6	1.6	1.6	1.5	2.0	2.2	2.0	1.5	1.4	1.4	1.6	1.4	1.5	2.2
29-Sep	1.8	1.0	0.6	1.0	0.6	0.4	0.4	0.4	0.6	1.5	1.5	1.6	1.7	1.9	1.6	1.5	1.7	1.5	1.1	0.9	1.2	1.2	1.1	0.7	1.9
30-Sep	0.3	0.4	0.2	0.2	0.4	0.8	0.8	0.6	0.9	0.9	1.0	0.9	1.0	1.2	1.1	0.7	0.9	0.7	0.7	0.6	0.5	0.4	0.5	0.4	1.2
Diurnal Maximum																									
UO - Unstable Operation																									



Maximum Value: 2.1 km/h on Sep 24 20:00		Maximum Daily Average: 0.5 km/h on Sep 23		Hours in Service: 720																						
Minimum Value: -1.4 km/h on Sep 7 01:00		Minimum Daily Average: -0.5 km/h on Sep 4		Hours of Data: 719																						
Maximum Diurnal Average: 0.3 km/h at hour 2		Minimum Diurnal Average: -0.2 km/h at hour 16		Hours of Missing Data: 1																						
Monthly Average: 0.06 km/h		Percentiles: P ₁ = -1.1 P ₁₀ = -0.6 Q ₁ = -0.2 Median = 0.0 Q ₃ = 0.3 P ₉₀ = 0.7 P ₉₉ = 1.4		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-Sep	-0.3	-0.1	0.9	0.9	1.1	1.0	1.4	0.5	0.3	-0.2	-0.6	-0.9	-0.7	-0.8	-0.6	-0.8	-0.5	-0.2	-0.5	-0.6	-0.4	-0.3	-0.5	-0.1	-0.1	1.4
2-Sep	-0.6	-0.3	2.1	0.3	-0.2	-0.4	0.2	0.4	-1.2	-1.3	-0.1	-0.2	0.0	0.1	-0.3	-0.6	-0.6	-1.0	-0.1	-0.6	-0.6	-0.9	-0.6	1.2	-0.2	2.1
3-Sep	1.7	1.4	0.5	0.3	-0.1	-0.1	0.2	0.0	0.4	0.4	0.3	-0.4	0.1	0.3	-0.2	-0.5	-0.3	0.2	-0.1	-0.1	-0.4	-0.3	-0.5	-0.7	0.1	1.7
4-Sep	-1.2	-0.8	-0.8	-0.5	-0.8	-0.9	-0.6	-1.0	-1.0	-0.8	-0.7	-0.7	-0.7	-0.6	-0.2	0.1	0.0	0.1	-0.3	0.2	-0.1	-0.2	-0.2	0.0	-0.5	0.2
5-Sep	0.6	0.3	0.1	0.0	0.6	0.8	1.1	1.3	0.2	-0.1	0.3	0.3	0.4	0.4	0.1	-0.4	-0.1	-0.5	-0.8	0.1	0.7	0.5	0.3	0.3	0.3	1.3
6-Sep	0.2	0.5	0.2	1.1	1.5	UO	0.5	0.5	0.8	0.3	-0.1	-0.1	0.2	0.0	0.1	-0.1	0.1	0.1	-0.1	0.2	0.5	0.4	0.4	0.2	0.3	1.5
7-Sep	-1.4	1.6	-0.1	-0.3	-0.2	1.2	1.8	0.4	0.1	0.1	0.0	-0.3	0.2	-0.2	0.1	0.5	0.0	-0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.2	1.8
8-Sep	0.0	0.3	-0.1	0.0	-0.4	-0.1	-0.1	0.0	0.3	0.2	0.1	-0.3	0.3	-0.3	0.1	0.5	0.7	0.2	0.1	-0.3	0.1	0.3	0.2	0.1	0.1	0.7
9-Sep	0.0	0.1	0.1	0.0	0.1	-0.1	0.0	0.3	0.1	-0.2	0.2	0.0	-0.3	0.4	0.6	0.3	0.2	0.2	0.5	0.5	0.3	0.6	0.8	0.9	0.2	0.9
10-Sep	0.1	0.3	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.3	0.8	0.4	1.2	0.1	0.8	0.5	1.2	1.2	0.7	0.5	0.4	1.0	1.2	0.9	0.5	1.2
11-Sep	0.9	1.0	1.3	1.2	1.1	0.6	0.0	0.5	1.1	-0.3	-0.4	0.4	0.3	-0.5	0.9	-0.6	-0.7	-0.5	-0.2	0.5	0.5	-0.1	0.6	0.5	0.3	1.3
12-Sep	0.8	0.5	-0.2	-0.2	0.1	0.8	0.7	0.6	0.0	0.4	0.2	0.2	0.0	0.2	0.2	-0.2	-0.1	-0.1	0.0	0.3	0.3	0.2	0.1	0.0	0.2	0.8
13-Sep	0.0	-0.2	-0.1	-0.1	-0.1	0.5	0.3	-0.2	0.0	0.1	-0.8	-0.3	-0.7	-0.9	-0.6	-0.9	-0.8	-0.6	-1.1	-0.6	-0.6	-0.1	-0.1	-0.5	-0.4	0.5
14-Sep	-0.2	-0.2	-0.7	-0.6	-0.9	-0.8	-0.5	-0.5	-0.5	-0.7	-0.6	-0.5	-1.3	0.2	0.4	-0.8	-0.3	-0.4	-0.6	-0.5	-0.2	0.1	-0.1	-0.2	-0.4	0.4
15-Sep	0.0	-0.1	-0.3	-0.1	0.1	0.1	0.7	-1.1	-1.2	-0.3	-0.1	-0.1	-0.6	-0.1	0.4	-0.6	-0.2	-0.5	-0.7	-0.3	-0.2	0.2	0.5	0.6	-0.2	0.7
16-Sep	0.3	0.5	1.1	0.6	-0.1	0.3	-0.2	-0.3	-0.2	-0.1	-0.2	-0.1	-0.1	-0.6	-0.3	-0.4	-0.2	0.0	-0.1	0.2	1.1	-0.3	-0.2	0.0	0.0	1.1
17-Sep	0.3	0.2	0.4	0.3	0.2	0.0	0.0	0.1	0.0	0.1	1.0	-0.1	-0.7	0.0	0.4	-0.1	0.0	0.1	0.1	0.0	0.0	0.1	-0.2	-0.2	0.1	1.0
18-Sep	-0.4	-0.1	-0.1	-0.2	-0.5	-0.1	0.0	-0.1	-0.1	0.0	0.2	-0.6	-0.4	-0.9	-0.6	0.1	0.1	-0.2	0.3	1.1	0.0	-0.1	0.4	-0.2	-0.1	1.1
19-Sep	-0.2	0.2	0.1	-0.2	0.2	0.3	0.2	0.4	0.1	0.4	-0.4	-0.6	0.1	-0.2	-0.6	0.5	0.0	0.1	0.3	0.0	0.0	-0.3	0.0	-0.2	0.0	0.5
20-Sep	-0.2	-0.1	0.0	-0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.4	0.0	0.4	-0.3	-0.4	-0.1	0.4	0.2	-0.1	0.1	0.2	0.4	-0.1	-0.1	0.0	0.4
21-Sep	-0.3	0.1	0.2	0.6	1.0	-0.4	0.8	0.4	-0.4	0.2	0.1	0.2	-0.1	-1.1	-0.5	-0.6	-0.8	-0.3	-0.7	-1.0	-0.8	-0.6	-0.1	0.3	-0.2	1.0
22-Sep	-0.1	-0.3	-0.4	-0.3	-0.2	-0.9	-0.6	-0.4	0.2	-0.1	0.1	0.2	-0.6	0.2	-0.4	-0.7	-0.4	-0.5	-0.8	-0.2	-0.1	0.0	0.4	0.2	-0.2	0.4
23-Sep	0.7	0.7	0.6	0.3	-0.1	-0.3	-0.1	0.3	0.3	0.6	0.6	1.0	1.2	-0.1	0.5	-0.2	0.5	0.0	0.4	1.7	1.4	1.2	0.7	0.5	0.5	1.7
24-Sep	0.8	0.7	0.6	1.1	-0.2	0.2	1.0	0.9	-0.1	0.1	-0.1	0.6	0.4	-0.5	-0.2	0.1	0.1	0.4	1.1	2.1	0.8	-0.7	0.3	0.5	0.4	2.1
25-Sep	0.0	0.8	-0.1	-0.2	-0.1	0.0	-0.2	-0.3	-0.3	0.1	0.1	0.9	0.2	0.3	0.1	0.1	0.6	1.3	0.0	-0.1	-0.3	-0.1	-0.1	-0.1	0.1	1.3
26-Sep	0.3	1.0	0.9	0.9	0.9	0.2	0.2	0.0	0.4	0.2	0.8	-0.2	-0.6	0.1	-0.7	-0.2	0.2	0.0	0.0	0.9	0.0	-0.1	-0.1	0.0	0.2	1.0
27-Sep	0.0	0.0	-0.3	-0.4	0.0	0.0	-0.3	-0.1	-0.2	-0.1	0.1	0.1	-0.4	-0.3	-0.4	-0.6	-0.4	-0.3	-0.3	-0.2	-0.4	0.0	-0.1	0.0	-0.2	0.1
28-Sep	-0.1	0.0	0.2	-0.1	0.0	0.1	0.3	0.1	0.0	0.1	-0.1	0.2	0.3	0.6	0.3	0.4	0.4	0.2	0.7	0.4	0.3	0.4	0.3	0.3	0.2	0.7
29-Sep	0.5	0.1	0.0	0.7	-0.1	-0.1	-0.1	-0.2	-0.1	-0.2	-0.2	0.1	0.5	-0.1	-0.1	0.1	0.4	0.5	0.2	0.1	0.6	0.6	0.4	0.3	0.2	0.7
30-Sep	0.1	0.0	0.1	0.0	0.0	-0.3	0.7	-0.1	0.2	0.4	-0.1	0.2	-0.2	-0.2	0.0	-0.1	0.0	0.0	0.3	0.3	0.6	0.7	0.7	0.6	0.2	0.7
																								Diurnal Average		
																								Diurnal Maximum		
0.1 0.3 0.2 0.2 0.1 0.1 0.3 0.1 0.0 0.0 0.0 0.0 -0.1 -0.2 0.0 -0.2 0.0 0.0 -0.1 0.2 0.1 0.1 0.1 0.1 0.2																										
1.7 1.6 2.1 1.2 1.5 1.2 1.8 1.3 1.1 0.6 1.0 1.0 1.2 0.6 0.9 0.5 1.2 1.3 1.1 2.1 1.4 1.2 1.2 1.2																										
UO - Unstable Operation																										



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 4.5 km/h on Sep 11 14:00 Minimum Value: 0.1 km/h on Sep 20 05:00 Percentiles: P ₁ = 0.2 P ₁₀ = 0.5 Q ₁ = 0.9 Median = 1.4 Q ₃ = 2.1 P ₉₀ = 2.7 P ₉₉ = 3.8																						Hours in Service: 720 Hours of Data: 719 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-Sep	1.1	0.7	1.1	1.5	1.4	1.5	2.3	1.5	1.8	2.0	2.7	2.9	3.0	3.1	3.5	3.6	4.1	3.5	3.0	1.6	0.9	1.4	1.4	1.2	4.1
2-Sep	1.8	1.5	1.7	2.2	2.0	1.8	1.7	2.4	2.5	2.3	2.2	2.1	2.1	2.6	2.3	2.1	2.4	2.5	1.0	0.9	1.0	1.2	1.2	1.4	2.6
3-Sep	1.8	1.4	2.1	1.5	1.1	0.9	1.2	0.9	1.6	1.9	2.1	1.1	1.9	1.7	2.2	2.1	0.4	0.4	0.9	1.7	1.7	1.6	1.7	1.6	2.2
4-Sep	1.6	1.8	2.4	2.2	2.5	2.5	2.1	2.3	2.9	2.7	2.6	2.3	2.4	3.0	2.8	2.3	1.7	1.4	0.8	0.5	0.7	0.9	0.9	1.5	3.0
5-Sep	1.2	1.2	0.9	1.1	1.3	1.3	1.6	1.6	1.2	1.1	1.6	3.0	2.8	3.0	3.3	2.7	2.5	1.8	2.0	1.5	1.5	1.2	1.2	1.0	3.3
6-Sep	0.9	0.9	1.1	1.3	1.1	1.7	1.3	1.4	1.3	1.4	1.5	1.7	1.3	0.9	0.7	1.0	2.1	1.8	0.9	0.9	0.7	0.9	1.3	1.4	2.1
7-Sep	1.4	1.4	1.1	1.5	1.3	1.7	2.1	1.4	1.6	1.2	1.0	1.3	1.6	1.6	1.6	0.9	1.0	0.8	0.6	0.7	0.6	0.3	0.4	0.4	2.1
8-Sep	0.4	0.8	0.7	1.0	1.2	1.1	1.0	1.1	0.9	1.2	1.4	1.3	1.7	2.3	1.5	0.9	0.9	1.0	1.2	1.3	0.9	0.7	0.5	0.3	2.3
9-Sep	0.2	0.2	0.2	0.2	0.2	0.5	0.6	0.8	0.7	0.8	0.9	1.6	1.8	1.6	1.4	1.3	0.7	0.6	0.5	0.7	0.8	0.6	0.7	1.2	1.8
10-Sep	1.2	0.8	0.6	0.3	0.2	0.2	0.3	0.4	1.1	1.3	1.3	1.4	2.6	2.8	2.6	2.1	2.3	2.0	1.7	1.4	1.6	2.5	2.7	2.3	2.8
11-Sep	2.4	2.6	2.4	2.1	2.0	2.4	2.3	2.4	2.5	3.1	3.3	3.1	4.4	4.5	4.3	3.8	3.2	2.8	2.1	2.2	2.0	1.8	1.6	1.2	4.5
12-Sep	1.1	1.0	1.2	1.0	0.8	1.1	0.8	1.4	1.2	1.1	1.0	1.0	1.4	1.5	0.9	1.5	0.6	0.5	1.2	1.2	1.3	1.3	1.3	1.3	1.5
13-Sep	0.8	1.0	0.9	0.7	0.8	1.2	1.1	1.2	1.9	2.3	2.2	2.8	2.8	2.9	2.7	2.6	2.5	2.7	3.2	2.6	2.1	1.9	2.1	2.0	3.2
14-Sep	2.3	2.0	2.1	1.8	1.6	2.2	2.2	2.6	3.0	2.4	2.7	3.3	2.9	2.6	3.2	2.7	2.6	1.5	0.5	0.6	1.3	0.9	0.5	0.6	3.3
15-Sep	0.6	0.5	0.6	0.6	0.7	1.0	1.6	1.5	1.3	1.2	1.4	1.9	2.3	2.6	3.5	2.9	2.7	2.2	1.9	2.2	2.1	1.9	2.8	2.7	3.5
16-Sep	1.6	1.3	0.9	0.9	1.1	1.0	0.8	0.8	1.2	1.9	1.4	2.0	2.1	2.1	2.3	1.8	1.1	0.9	1.0	0.5	1.6	1.7	0.9	0.6	2.3
17-Sep	0.9	1.1	0.8	0.7	0.6	0.6	0.3	0.4	0.5	0.9	1.2	1.3	2.7	3.1	2.7	2.2	2.1	1.3	0.7	0.6	0.9	1.4	1.5	1.1	3.1
18-Sep	2.0	1.0	0.9	1.0	0.9	0.9	1.5	0.9	0.9	1.9	2.4	2.5	2.2	2.5	2.2	1.2	1.4	1.2	0.7	1.3	2.2	1.1	1.3	1.1	2.5
19-Sep	1.0	1.5	1.3	1.0	1.1	1.1	1.0	1.4	1.7	2.1	2.3	2.7	2.6	2.4	2.0	2.5	1.9	1.1	0.7	1.2	1.2	0.9	0.6	0.6	2.7
20-Sep	0.6	0.4	0.2	0.1	0.1	0.2	0.5	0.4	0.1	0.4	1.2	1.6	2.0	1.7	1.6	1.5	1.4	0.5	0.6	0.3	0.3	0.5	0.4	0.4	2.0
21-Sep	0.4	0.9	1.0	1.3	1.2	1.3	1.4	1.1	1.7	1.3	1.9	3.9	4.3	3.7	3.8	3.8	3.4	3.0	1.5	1.5	1.7	1.8	1.9	2.4	4.3
22-Sep	2.3	1.8	1.7	1.6	1.2	1.1	1.1	1.4	1.8	1.9	3.2	3.6	3.5	3.7	3.4	3.1	2.5	2.4	1.4	2.1	2.5	2.0	2.3	2.5	3.7
23-Sep	1.6	1.4	1.4	1.8	1.4	1.1	1.2	1.3	1.5	2.1	2.3	2.8	3.5	4.3	3.7	3.8	3.7	2.9	2.9	3.2	3.1	3.3	2.3	2.2	4.3
24-Sep	2.5	2.8	3.4	3.7	2.9	3.5	2.8	2.9	2.0	2.7	2.2	2.0	2.3	1.3	1.0	1.0	1.0	0.5	0.5	0.8	1.6	0.9	0.9	0.6	3.7
25-Sep	0.8	1.1	1.4	1.2	1.3	1.0	1.7	1.1	1.5	1.6	1.7	2.1	1.7	1.5	1.5	1.5	1.7	1.7	1.4	1.1	1.2	1.8	1.9	2.4	2.4
26-Sep	2.7	2.7	2.2	1.9	2.4	1.4	1.3	0.7	0.8	1.6	2.5	3.2	2.6	2.4	1.4	1.6	0.8	0.7	0.9	1.7	2.0	0.8	0.9	0.7	3.2
27-Sep	0.4	0.3	0.7	0.9	0.9	0.6	0.6	1.1	0.9	0.4	0.6	1.8	1.5	1.8	2.0	1.6	1.4	0.7	0.5	0.8	0.8	0.5	0.5	0.3	2.0
28-Sep	0.4	0.3	0.5	0.3	0.3	0.5	0.5	0.4	0.5	1.2	1.5	1.5	1.3	1.2	1.3	1.8	2.2	1.8	1.6	1.3	1.4	1.4	1.5	1.4	2.2
29-Sep	1.8	1.1	0.7	1.2	0.7	0.6	0.5	0.3	0.3	1.3	1.2	1.5	1.9	1.9	1.7	1.6	1.4	1.5	1.3	1.2	1.1	1.0	0.9	0.7	1.9
30-Sep	0.5	0.3	0.2	0.2	0.4	1.0	1.1	0.8	1.2	0.9	1.0	0.9	1.1	1.1	0.7	0.6	0.9	0.6	0.4	0.5	0.8	0.7	0.6	0.4	1.2
2.7 2.8 3.4 3.7 2.9 3.5 2.8 2.9 3.0 3.1 3.3 3.9 4.4 4.5 4.3 3.8 4.1 3.5 3.2 3.2 3.1 3.3 2.8 2.7																									
Diurnal Maximum																									
UO - Unstable Operation																									



Maximum Value: 4.7 km/h on Sep 2 03:00		Maximum Daily Average: 1.2 km/h on Sep 1		Hours in Service: 720																						
Minimum Value: -2.1 km/h on Sep 15 08:00		Minimum Daily Average: -0.3 km/h on Sep 22		Hours of Data: 720																						
Maximum Diurnal Average: 0.7 km/h at hour 20		Minimum Diurnal Average: 0.2 km/h at hour 9		Hours of Missing Data: 0																						
Monthly Average: 0.43 km/h		Percentiles: P ₁ = -1.0 P ₁₀ = -0.3 Q ₁ = 0.1 Median = 0.3 Q ₃ = 0.7 P ₉₀ = 1.2 P ₉₉ = 3.1		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-Sep	0.3	0.3	1.6	2.4	3.0	2.9	3.6	2.0	1.3	0.7	0.3	0.3	0.5	0.6	0.9	0.6	1.2	1.0	1.2	0.9	0.9	1.2	1.1	0.9	1.2	3.6
2-Sep	0.1	0.2	4.7	1.8	0.6	0.3	1.3	1.4	-0.8	-0.6	0.8	0.7	1.1	1.3	1.5	0.7	1.2	0.6	1.3	0.6	0.7	1.0	1.5	3.9	4.7	
3-Sep	4.3	3.3	1.6	1.0	0.3	0.2	-0.1	0.0	0.2	0.7	0.7	-0.6	0.7	0.9	0.1	-0.2	0.0	0.2	0.6	0.9	0.7	0.8	0.5	0.1	4.3	
4-Sep	-0.2	0.3	0.6	1.0	0.5	0.3	0.4	-0.1	-0.1	-0.2	0.0	0.0	0.0	0.2	-0.1	0.7	-0.5	0.3	-0.4	0.3	0.6	1.5	0.6	0.6	1.5	
5-Sep	1.3	0.8	0.3	0.2	0.5	0.7	1.1	1.2	-0.1	0.0	0.1	0.4	0.4	0.0	-0.1	-0.6	0.3	-0.3	-0.8	0.5	1.0	1.0	0.7	0.9	1.3	
6-Sep	0.2	0.2	0.1	0.9	1.5	0.5	0.6	0.9	1.0	0.5	0.1	0.3	0.8	0.0	0.0	-0.3	0.6	0.8	0.5	1.0	1.7	1.7	1.4	1.6	1.7	
7-Sep	-0.9	3.5	0.6	0.1	0.3	3.1	3.7	0.8	0.3	0.2	-0.2	-0.9	-0.4	-0.7	0.1	0.6	-0.3	0.1	0.2	0.3	0.2	0.2	0.3	0.2	3.7	
8-Sep	0.2	0.1	-0.2	-0.1	-0.4	-0.4	-0.3	-0.2	0.4	0.6	0.1	-0.8	0.4	0.0	0.0	0.6	1.0	0.7	0.4	0.2	-0.1	0.0	0.1	-0.1	1.0	
9-Sep	0.0	0.1	0.1	0.1	0.0	-0.2	-0.1	0.5	0.5	-0.3	0.1	-0.3	-0.6	0.2	0.4	0.1	0.1	0.1	0.3	0.4	0.3	0.6	0.8	0.7	0.8	
10-Sep	0.4	0.4	0.4	0.3	0.2	0.1	0.2	0.3	0.4	0.5	1.3	0.4	1.4	0.2	0.9	0.3	1.6	1.5	0.4	0.5	0.4	1.4	1.1	1.3	1.6	
11-Sep	1.3	1.5	1.7	1.7	1.3	0.7	0.2	0.3	1.2	-0.2	-0.7	0.9	0.5	0.4	1.5	-0.2	-0.5	-0.4	0.0	0.5	0.1	-0.2	0.4	0.1	1.7	
12-Sep	0.6	0.3	-1.0	-0.9	-0.6	0.1	0.5	0.4	-0.3	0.4	0.0	0.0	-0.3	-0.2	0.0	-0.2	0.7	1.3	1.8	2.1	2.0	1.1	0.7	0.7	2.1	
13-Sep	0.3	0.4	0.3	0.3	0.3	0.7	0.9	0.0	0.2	0.9	0.1	1.0	0.6	0.7	0.9	0.7	0.8	1.4	1.2	1.8	1.1	1.5	1.7	1.2	1.8	
14-Sep	1.2	1.0	0.7	0.3	0.3	0.3	0.7	0.1	0.2	0.1	0.2	0.7	-0.8	0.5	1.1	0.4	0.5	0.3	0.1	0.6	0.8	0.7	0.1	0.1	1.2	
15-Sep	0.2	0.3	0.1	0.3	0.2	-0.3	-0.1	-2.1	-2.1	-0.3	-0.2	-0.1	-0.9	-0.4	0.4	-0.5	0.0	-0.4	-0.6	-0.4	-0.4	0.2	0.8	1.2	1.2	
16-Sep	0.4	0.0	0.7	0.3	-0.9	0.4	0.2	0.2	0.5	0.6	0.3	0.2	0.0	0.2	0.2	0.2	0.2	0.2	0.3	1.4	3.1	0.4	0.1	0.4	3.1	
17-Sep	-0.1	-0.2	0.1	0.3	0.3	0.5	0.4	0.2	0.4	0.0	0.9	-0.3	-0.5	0.2	1.5	0.4	0.2	1.1	0.7	1.2	1.1	1.1	0.5	0.5	1.5	
18-Sep	-0.1	0.4	0.5	0.1	-0.2	-0.5	-0.6	-0.1	0.1	0.5	1.7	0.8	1.4	0.9	1.1	1.1	1.3	0.6	0.4	2.1	1.4	1.0	0.7	0.1	2.1	
19-Sep	0.1	0.6	0.5	0.6	1.4	1.0	0.8	0.8	0.5	1.2	-0.2	-0.4	0.2	0.2	-0.2	1.1	0.3	0.3	0.6	0.6	0.4	0.3	0.6	0.4	1.4	
20-Sep	0.2	0.5	0.4	0.3	0.2	0.2	0.3	0.2	0.1	0.1	0.3	0.1	0.7	-0.4	-0.1	0.0	0.5	0.3	0.4	0.5	0.1	0.3	0.0	-0.2	0.7	
21-Sep	-0.7	-0.2	-0.2	-0.3	0.6	-0.5	0.3	0.0	-0.7	0.0	-0.2	0.4	0.8	-0.6	0.3	0.1	0.0	-0.3	-0.7	-1.1	-1.0	-0.6	0.0	0.4	0.8	
22-Sep	0.0	-0.9	-1.1	-0.9	-0.9	-1.3	-1.3	-1.0	0.2	-0.1	0.4	0.8	-0.4	0.7	0.0	-0.5	-0.3	-0.3	-0.6	-0.4	0.0	-0.2	0.5	0.5	0.8	
23-Sep	1.0	1.1	0.6	0.3	0.1	0.2	0.3	0.6	0.3	0.8	0.9	1.4	1.5	-0.4	0.7	-0.2	0.3	0.0	0.3	1.8	1.6	1.3	0.6	0.4	1.8	
24-Sep	0.8	0.8	0.3	1.1	-0.2	0.0	0.9	0.7	-0.2	0.1	-0.2	0.4	0.9	0.5	0.4	0.6	0.4	0.6	1.7	2.7	2.0	0.6	1.3	2.2	2.7	
25-Sep	1.2	2.8	0.8	0.0	0.7	0.6	0.1	-0.1	0.1	0.0	0.0	0.3	-0.1	0.5	0.0	0.3	0.4	1.3	0.0	-0.3	-0.2	-0.4	-0.5	-0.7	2.8	
26-Sep	0.2	0.8	0.9	1.2	1.1	0.0	0.3	0.5	0.5	0.0	0.9	-0.1	-0.4	0.3	-0.7	0.0	0.9	0.6	0.3	0.8	0.3	0.3	0.3	0.3	1.2	
27-Sep	0.2	0.1	0.1	-0.1	0.5	0.5	0.2	0.5	0.1	0.1	0.2	0.5	0.4	0.5	0.5	0.3	0.8	0.5	1.1	0.8	0.1	0.5	0.3	0.4	1.1	
28-Sep	0.3	0.3	0.2	0.1	0.3	0.3	0.3	0.2	0.2	0.3	0.2	0.6	0.6	0.5	0.8	0.6	0.6	0.3	0.6	0.3	0.3	0.5	0.6	0.8	0.8	
29-Sep	0.5	0.2	0.1	1.1	0.2	0.3	0.2	0.1	0.3	0.5	0.5	0.3	0.7	0.1	0.1	0.6	0.7	0.7	0.4	0.2	0.8	0.7	0.9	0.2	1.1	
30-Sep	0.0	0.1	0.0	0.1	0.2	0.1	0.8	-0.3	0.4	0.4	0.1	0.1	0.1	-0.2	-0.2	-0.2	-0.2	0.3	0.7	0.6	0.3	0.5	0.3	0.2	0.8	
																								Diurnal Average		
																								Diurnal Maximum		



Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 4.8 km/h on Sep 11 14:00 Minimum Value: 0.1 km/h on Sep 9 05:00 Percentiles: P ₁ = 0.2 P ₁₀ = 0.5 Q ₁ = 0.9 Median = 1.4 Q ₃ = 2.1 P ₉₀ = 3.0 P ₉₉ = 4.3																						Hours in Service: 720 Hours of Data: 720 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-Sep	1.3	0.9	0.9	1.3	1.0	1.2	2.0	1.2	1.5	1.8	2.6	3.0	3.1	3.3	3.5	3.8	3.8	3.4	2.8	1.6	0.9	1.3	1.3	1.5	3.8
2-Sep	2.2	1.7	1.8	2.0	2.3	2.0	2.2	2.9	2.8	2.6	1.9	1.9	2.0	2.2	2.6	2.0	2.4	2.5	1.2	1.1	1.0	0.9	0.9	1.3	2.9
3-Sep	2.7	1.4	2.2	1.5	1.0	0.9	1.3	1.1	1.6	2.9	2.7	1.3	2.2	1.9	2.5	2.3	0.4	0.4	0.8	1.7	1.6	1.5	1.7	1.4	2.9
4-Sep	1.3	1.5	1.7	1.6	2.4	2.6	2.0	2.3	3.0	2.9	2.8	2.3	2.6	3.4	3.0	2.9	1.7	1.9	1.2	0.7	0.9	1.0	1.1	1.4	3.4
5-Sep	1.1	1.3	1.0	1.1	1.5	1.3	1.1	1.4	1.4	1.2	2.0	3.6	3.3	3.4	3.5	3.4	3.1	1.9	1.9	0.9	1.6	1.1	1.1	1.0	3.6
6-Sep	1.3	0.9	0.9	1.0	1.0	1.1	1.5	1.4	1.3	1.6	1.7	1.7	1.4	0.9	0.5	1.1	2.4	1.6	1.2	0.8	0.7	1.2	1.4	1.3	2.4
7-Sep	1.0	1.4	1.4	1.5	1.4	1.5	2.5	1.5	1.5	1.2	1.4	1.6	1.9	1.8	2.0	1.4	1.3	0.8	0.6	0.9	0.5	0.3	0.3	0.2	2.5
8-Sep	0.3	0.5	0.6	0.7	1.1	1.2	1.2	1.3	1.2	1.1	1.5	1.7	2.1	2.3	1.8	0.7	0.6	1.0	1.1	1.0	1.1	1.0	0.7	0.4	2.3
9-Sep	0.3	0.2	0.1	0.1	0.1	0.4	0.5	0.7	0.6	0.8	1.0	1.6	1.9	1.6	1.6	1.6	0.8	0.7	0.5	0.5	1.2	1.1	1.0	1.6	1.9
10-Sep	1.2	1.1	0.8	0.6	0.4	0.3	0.3	0.5	1.0	1.4	1.3	1.5	3.2	3.4	3.2	2.6	2.7	2.3	2.0	1.6	2.0	3.0	2.7	2.7	3.4
11-Sep	2.9	2.9	2.5	2.1	2.1	1.3	1.1	2.3	3.1	3.0	3.3	3.6	4.4	4.8	4.8	3.9	3.0	2.3	1.8	2.2	1.9	1.6	1.6	0.9	4.8
12-Sep	0.9	1.3	1.1	0.8	0.7	1.0	1.0	1.4	1.3	1.3	1.0	1.0	1.2	1.7	2.0	1.4	1.6	0.6	0.5	1.1	1.0	1.2	0.8	1.1	2.0
13-Sep	1.0	1.0	1.1	1.1	0.9	1.1	1.1	1.5	2.2	2.5	2.3	2.8	2.9	3.1	2.5	2.0	1.8	2.2	2.5	2.4	2.0	2.0	1.9	1.9	3.1
14-Sep	2.0	1.9	2.0	1.7	1.5	2.3	2.2	2.6	3.0	2.5	2.8	3.7	3.0	3.2	3.7	2.9	2.8	1.6	0.6	0.5	0.9	1.0	0.6	0.5	3.7
15-Sep	0.5	0.5	0.8	0.6	0.6	0.9	1.4	1.8	1.5	1.4	1.6	1.9	2.6	2.9	3.5	3.2	2.7	2.0	1.4	2.0	2.1	1.6	1.4	1.9	3.5
16-Sep	2.2	1.8	1.1	1.2	1.1	1.2	0.7	1.2	1.4	1.7	1.6	2.2	2.0	2.2	2.2	2.1	1.1	1.0	0.9	0.5	1.1	1.9	0.9	0.9	2.2
17-Sep	0.8	0.9	0.6	0.5	0.7	0.6	0.5	0.5	0.6	0.6	1.2	1.8	3.1	3.5	3.2	2.5	1.9	1.6	0.8	0.9	1.1	1.3	1.2	0.9	3.5
18-Sep	1.3	0.9	0.8	1.0	0.9	0.8	1.2	1.1	1.1	1.8	2.2	2.5	2.4	2.5	2.1	0.7	1.1	1.3	0.7	1.6	1.8	1.6	1.9	1.2	2.5
19-Sep	0.8	1.9	1.8	1.3	1.2	1.2	1.1	1.3	1.6	2.2	2.5	3.1	2.8	2.0	1.9	2.7	1.9	1.4	0.6	1.1	1.4	0.9	0.7	0.8	3.1
20-Sep	0.6	0.3	0.3	0.2	0.2	0.2	0.4	0.4	0.2	0.2	0.5	1.5	2.1	1.9	1.9	1.7	1.6	0.5	0.7	0.5	0.3	0.5	0.5	0.6	2.1
21-Sep	0.6	1.2	0.7	1.0	1.0	1.5	1.5	1.1	1.6	1.5	2.1	4.4	4.5	3.8	4.3	4.1	3.3	2.9	1.2	1.1	1.1	1.1	1.3	1.7	4.5
22-Sep	1.9	1.9	1.7	1.5	1.2	0.9	1.0	1.4	1.8	2.1	3.1	3.8	3.7	3.9	3.8	2.9	2.5	2.2	1.0	1.8	2.2	1.6	1.0	1.5	3.9
23-Sep	1.1	1.2	1.8	1.6	1.9	1.6	1.6	1.4	1.8	2.7	2.6	3.5	4.4	4.6	3.8	3.9	3.7	2.8	2.7	3.7	3.7	3.7	3.0	2.6	4.6
24-Sep	3.0	3.3	3.6	4.2	2.7	3.8	3.2	3.2	2.0	2.8	2.3	2.3	2.4	1.1	0.9	0.9	0.9	0.3	0.8	0.8	1.5	0.9	1.2	0.9	4.2
25-Sep	1.0	1.0	1.5	0.9	1.2	0.8	1.4	1.2	1.6	1.6	1.5	1.9	1.6	1.4	1.5	1.8	1.9	1.3	1.4	1.3	1.7	2.0	3.2	3.2	3.2
26-Sep	2.8	2.7	2.2	2.1	2.2	1.7	1.5	0.8	0.9	1.9	3.1	3.5	2.9	3.0	1.5	1.4	0.8	0.9	1.3	2.1	2.6	1.0	0.8	0.6	3.5
27-Sep	0.3	0.2	0.5	0.8	0.8	0.5	0.5	0.8	0.8	0.5	0.5	1.8	1.3	1.7	1.8	1.7	1.3	0.7	0.4	1.0	0.9	0.4	0.4	0.3	1.8
28-Sep	0.3	0.3	0.4	0.2	0.5	0.6	0.7	0.8	0.6	1.2	1.6	1.7	1.3	1.2	1.3	1.9	2.3	1.9	1.7	1.2	1.2	1.1	1.5	1.7	2.3
29-Sep	2.1	1.2	1.0	1.0	0.7	0.7	0.4	0.4	0.5	1.4	1.1	1.5	2.2	2.0	1.9	1.7	1.5	1.5	1.4	1.4	0.9	0.8	0.9	0.7	2.2
30-Sep	0.5	0.2	0.2	0.2	0.4	0.7	0.7	0.7	1.2	0.8	0.8	1.0	1.2	1.2	0.8	0.6	1.0	0.5	0.4	0.4	0.7	0.8	0.5	0.5	1.2
Diurnal Maximum																									



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS04 BUFFALO VIEWPOINT SEPTEMBER 2023

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

October 30, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BUFFALO VIEWPOINT (AMS04)
 SEPTEMBER 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	686	34	34	100	31.6	0	6.5	0
H2S (ppb) Average	686	34	34	100	2.3	0	0.6	0
THC (ppm) Average	686	34	34	100	4.3	-	2.5	-
NMHC(ppm) Average	686	34	34	100	0.617	-	0.237	-
CH4(ppm) Average	686	34	34	100	3.8	-	2.3	-
O3(ppb) Average	670	31	50	97.36	51.9	0	41.2	-
NO2(ppb) Average	684	36	36	100	26	0	8.5	-
NO(ppb) Average	684	36	36	100	34.1	-	5.9	-
NOX(ppb) Average	684	36	36	100	52.2	-	14.5	-
PM2.5(ug/m3) Average	718	2	2	100	505.9	159	349.8	19
Temperature (C) Average	720	0	0	100	26.8	-	20.7	-
Relative Humidity (%) Average	720	0	0	100	97.7	-	91	-
Wind Speed 10 m (km/h) Average	718	2	2	100	25	-	14	-
Wind Direction 10 m (deg) Average	718	2	2	100	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BUFFALO VIEWPOINT (AMS04)
 SEPTEMBER 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	686	0.43	2.2	-	0	0	0	0.2	0.3	0.6	31.6
H2S (ppb) Average	686	0.23	0.3	-	0	0	0.1	0.2	0.3	0.5	2.3
THC (ppm) Average	686	2.16	0.2	-	1.9	2	2	2.1	2.2	2.4	4.3
NMHC(ppm) Average	686	0.05	0.1	-	0	0	0	0	0	0.2	0.617
CH4(ppm) Average	686	2.11	0.1	-	1.9	2	2	2.1	2.2	2.2	3.8
O3(ppb) Average	670	24.56	11.9	-	1.7	9.1	15.1	24.4	33.5	40.6	51.9
NO2(ppb) Average	684	2.55	3.4	-	0	0.2	0.5	1.3	2.8	6.6	26
NO(ppb) Average	684	0.71	3.3	-	0	0	0	0	0.1	1	34.1
NOX(ppb) Average	684	3.26	6.1	-	0	0.2	0.5	1.4	3.1	8	52.2
PM2.5(ug/m3) Average	718	63.97	85.2	-	3.9	9.9	14.7	30.6	70.8	156.7	505.9
Temperature 2 m (C) Average	720	13.88	5.4	-	1.6	7.2	9.4	13.5	17.9	21.3	26.8
Relative Humidity (%) Average	720	64.86	19.3	-	23.8	37.9	49.8	66.1	80.9	91.4	97.7
Wind Speed 10 m (km/h) Average	718	8.6	4	-	0	4	6	8	11	15	25
Wind Direction 10 m (deg) Average	718	-	-	-	-	-	-	-	-	-	-

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

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
O3	12 Sep 2023 13:00	13 Sep 2023 07:00	19	Analyzer Failure - inconsistent response



Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 31.6 ppb on Sep 25 15:00	Maximum Daily Average: 6.5 ppb on Sep 25		Hours of Data:	686
Minimum Value: 0.0 ppb on Sep 2 23:00	Minimum Daily Average: 0.0 ppb on Sep 6		Hours of Missing Data:	34
Maximum Diurnal Average: 1.3 ppb at hour 15	Minimum Diurnal Average: 0.1 ppb at hour 2		Hours of Calibration:	34
Monthly Average: 0.43 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.2 Q ₃ = 0.3 P ₉₀ = 0.6 P ₉₉ = 5.1		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-Sep	0.1	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.3	0.1	0.2	0.2	0.4	0.4	0.5	0.6	0.7	0.4	0.5	0.5	0.5	0.5	0.4	1.1	0.3	1.1
2-Sep	0.8	0.1	0.1	0.1	0.1	Z	0.5	0.4	0.3	0.3	0.3	0.6	0.3	0.5	0.6	0.5	0.4	0.5	0.4	0.3	0.3	0.2	0.0	0.3	0.3	0.8
3-Sep	Z	0.1	0.0	0.0	0.3	0.2	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.2	2.2	0.3	0.4	0.4	0.1	0.1	0.1	0.1	0.2	2.2
4-Sep	0.0	Z	0.2	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.2	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	0.3
5-Sep	0.0	0.1	Z	0.0	0.0	0.0	0.2	0.2	0.1	0.0	0.0	0.1	0.1	0.1	0.2	0.5	0.7	0.3	0.5	0.4	0.2	0.2	0.3	0.1	0.2	0.7
6-Sep	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	0.0	0.0	0.1
7-Sep	0.0	0.0	0.0	0.0	Z	0.1	0.0	0.0	0.0	0.2	0.0	0.0	0.2	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.2
8-Sep	0.0	0.0	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	0.1	0.2	0.3	0.3	0.2	0.2	0.1	0.2	0.1	0.1	0.3
9-Sep	Z	0.2	0.2	0.2	0.3	0.2	0.2	0.1	0.2	0.2	0.2	1.1	1.0	0.7	0.5	0.5	0.3	0.6	0.6	0.4	0.3	0.1	0.3	0.0	0.4	1.1
10-Sep	0.1	Z	0.2	0.1	0.2	0.3	0.2	0.1	0.2	0.1	0.5	0.6	0.5	0.3	0.4	0.3	0.4	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.2	0.6
11-Sep	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.2
12-Sep	0.1	0.1	0.1	Z	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.3	0.1	0.1	0.1	0.1	0.0	0.1	0.2	0.1	0.7	0.3	0.3	0.2	0.7
13-Sep	0.1	0.1	0.0	0.0	Z	0.1	0.2	0.1	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2
14-Sep	0.0	0.0	0.1	0.0	0.1	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.3
15-Sep	Z	0.1	0.0	0.2	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.4	0.3	0.2	0.2	0.2	0.3	0.4	0.5	0.5	0.2	0.3	0.2	0.1	0.3	0.5
16-Sep	0.2	Z	0.2	0.1	0.1	0.2	0.2	0.3	0.4	0.4	0.3	0.6	0.4	0.6	0.3	0.4	0.6	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.3	0.6
17-Sep	0.0	0.2	Z	0.2	0.2	0.1	0.1	0.2	0.2	0.4	0.2	0.4	0.5	1.0	1.2	0.9	0.6	0.6	0.5	0.5	0.2	0.1	0.3	0.2	0.4	1.2
18-Sep	0.1	0.1	0.1	Z	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1
19-Sep	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.3	0.2	0.4	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4
20-Sep	0.0	0.0	0.0	0.1	0.1	Z	0.0	0.0	0.1	0.2	0.7	0.6	0.3	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.7
21-Sep	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.3	0.3	0.1	0.3
22-Sep	0.1	Z	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.4	0.4	0.5	0.5	0.4	0.5	0.4	0.5	0.3	0.4	0.3	0.3	0.5	0.3	0.5
23-Sep	0.7	0.7	Z	0.6	0.6	0.7	0.6	0.8	0.8	0.8	0.7	0.6	0.4	0.4	0.2	0.2	0.2	0.2	0.3	0.5	0.5	0.3	0.4	0.3	0.5	0.8
24-Sep	0.1	0.2	0.2	Z	0.4	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.2	0.4
25-Sep	0.2	0.1	0.0	0.1	Z	0.0	0.0	0.0	0.1	0.1	2.6	27.1	19.4	28.6	31.6	12.2	5.0	2.5	1.2	7.4	4.9	5.5	0.6	0.5	6.5	31.6
26-Sep	0.3	0.4	0.4	0.3	0.4	Z	0.7	0.9	1.1	0.5	0.5	0.9	0.8	0.6	0.9	0.8	0.6	0.5	0.6	0.7	0.8	0.6	0.7	0.4	0.6	1.1
27-Sep	Z	0.2	0.4	0.4	0.3	0.3	0.2	0.4	0.5	0.5	0.7	0.3	0.3	0.3	0.5	0.2	0.2	0.4	0.4	0.3	0.5	0.4	0.5	0.7	0.4	0.7
28-Sep	0.4	Z	0.4	0.4	0.0	0.3	0.7	0.3	0.1	0.0	0.0	0.2	0.4	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.7
29-Sep	0.2	0.2	Z	0.4	0.3	0.6	0.8	0.8	0.8	1.0	0.9	0.7	0.7	0.5	0.2	0.7	1.1	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.5	1.1
30-Sep	0.1	0.4	1.1	Z	0.3	0.2	0.2	0.3	0.3	0.3	0.1	0.0	0.0	0.1	0.3	0.5	0.3	0.3	0.3	0.3	0.1	0.2	0.2	0.1	0.3	1.1

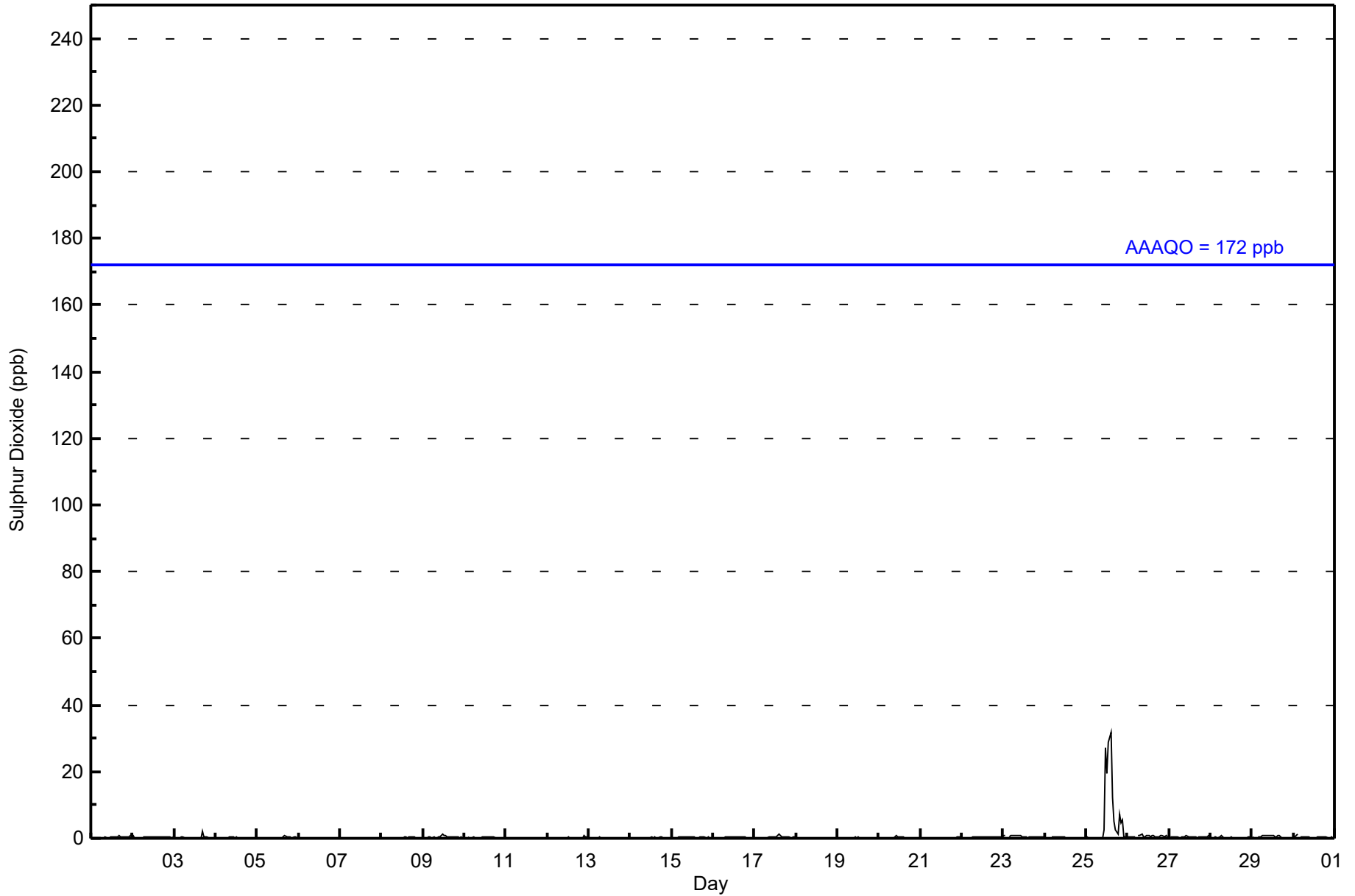
0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	1.2	0.9	1.2	1.3	0.7	0.5	0.3	0.3	0.5	0.3	0.4	0.2	0.2	Diurnal Average	
0.8	0.7	1.1	0.6	0.6	0.7	0.8	0.9	1.1	1.0	2.6	27.1	19.4	28.6	31.6	12.2	5.0	2.5	1.2	7.4	4.9	5.5	0.7	1.1	Diurnal Maximum		

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



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	681	99.27	99.27
11 - 20	2	0.29	99.56
21 - 60	3	0.44	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: 686

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Buffalo Viewpoint - September 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	16	6	2	1	6	55	183	98	57	42	64	50	28	24	14	679
11 - 20	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
21 - 60	1	1	1	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	35	18	7	2	1	6	55	183	98	57	42	64	50	28	24	14	684

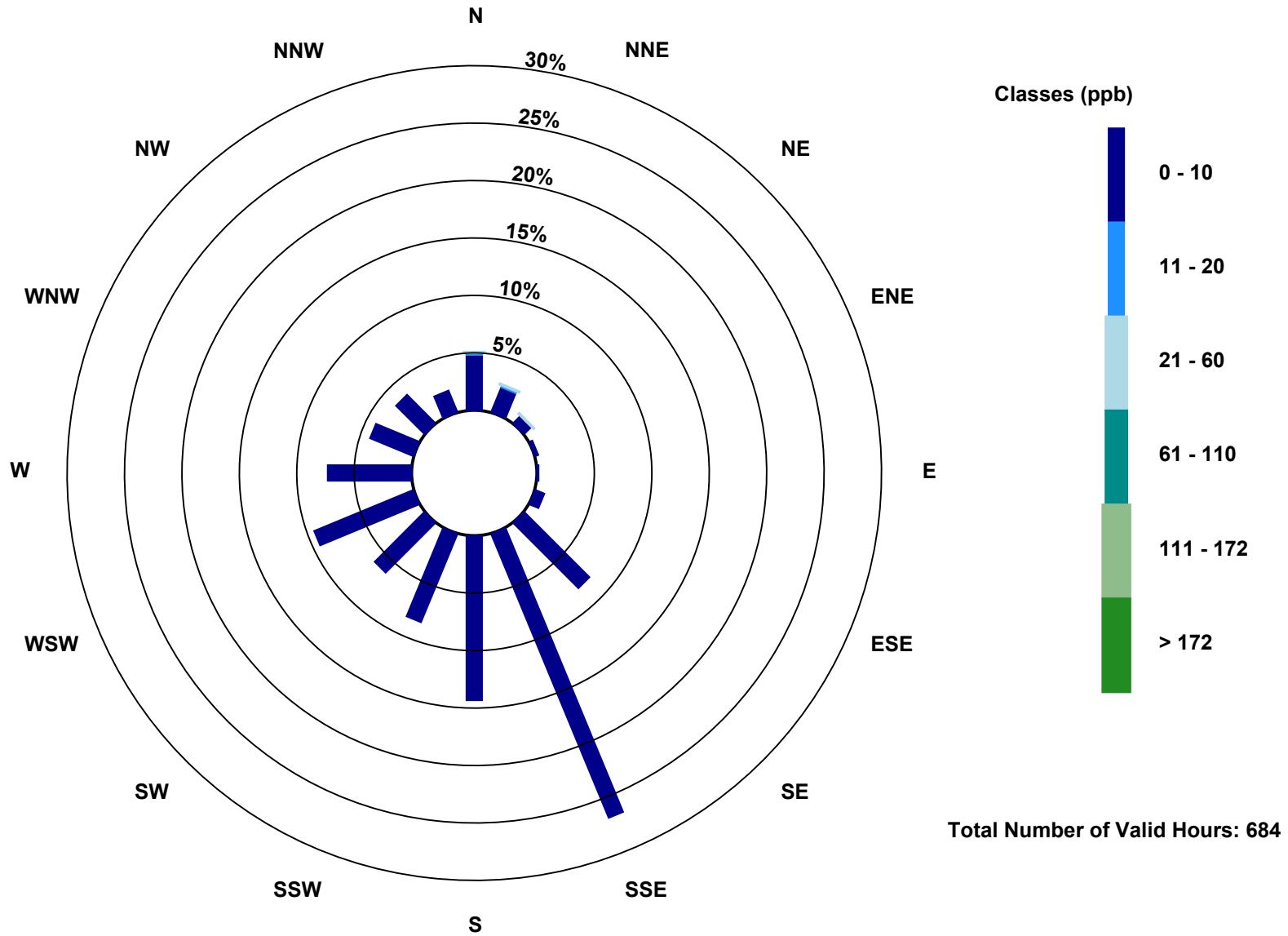
Total Number of Valid Hours: 684

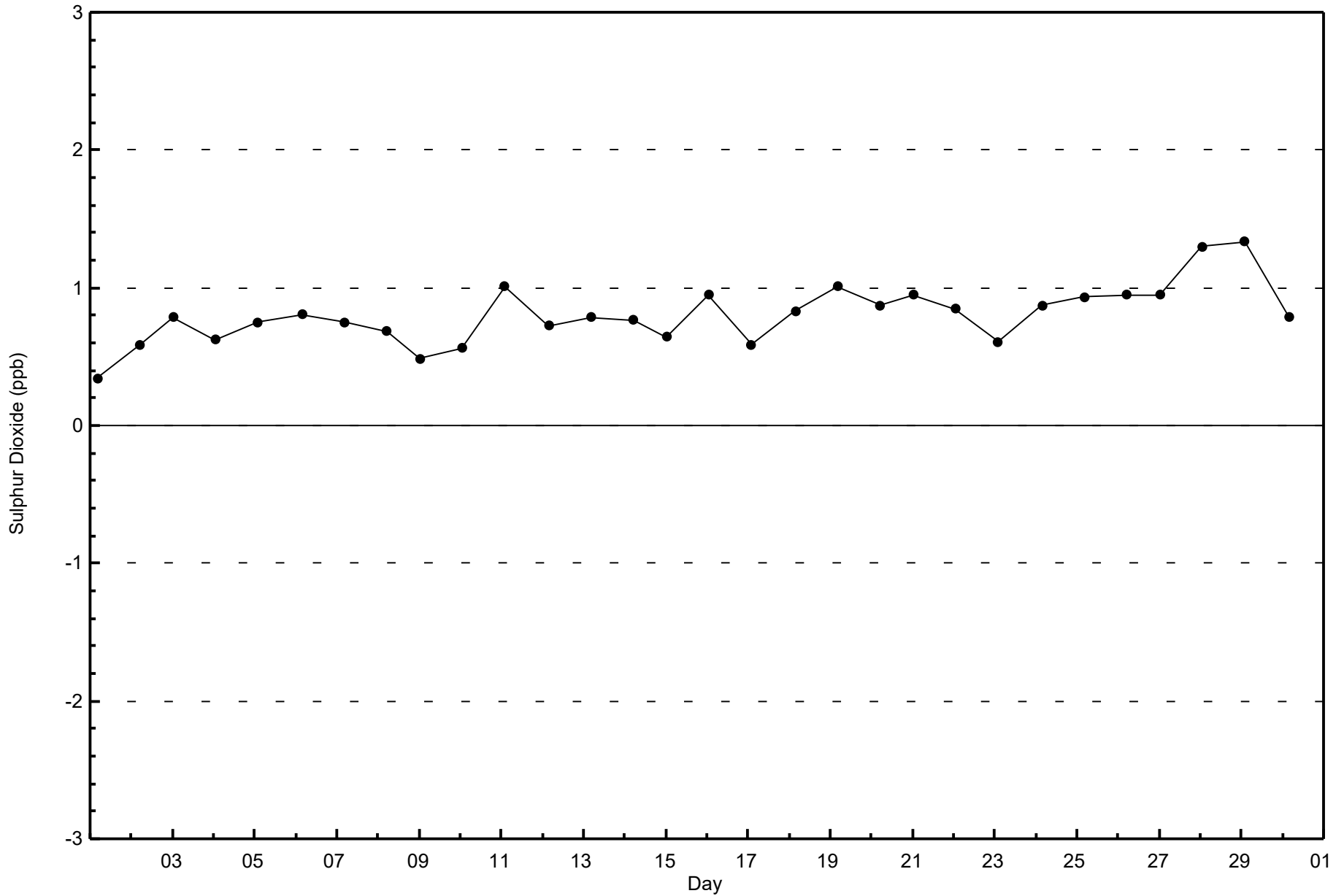
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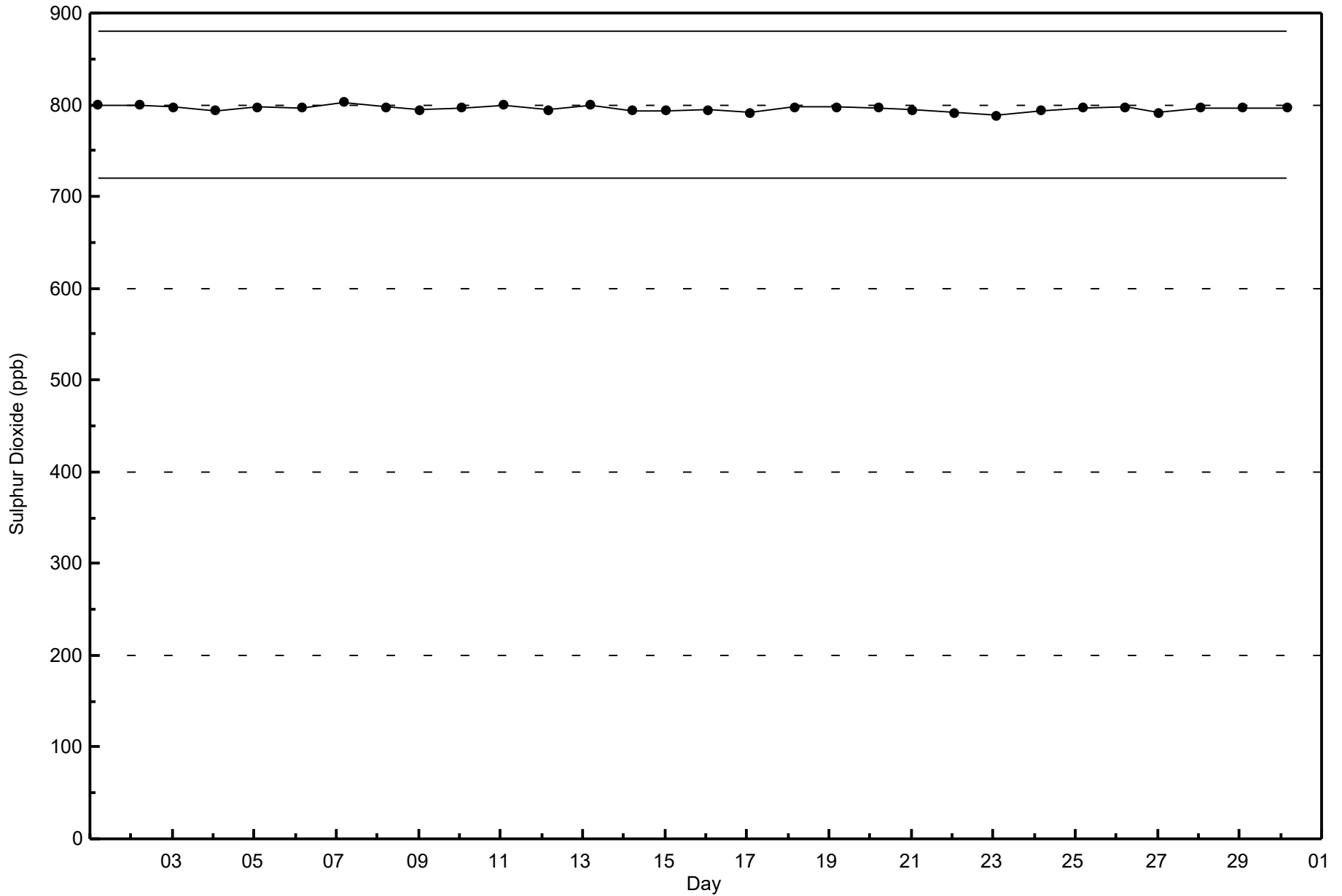


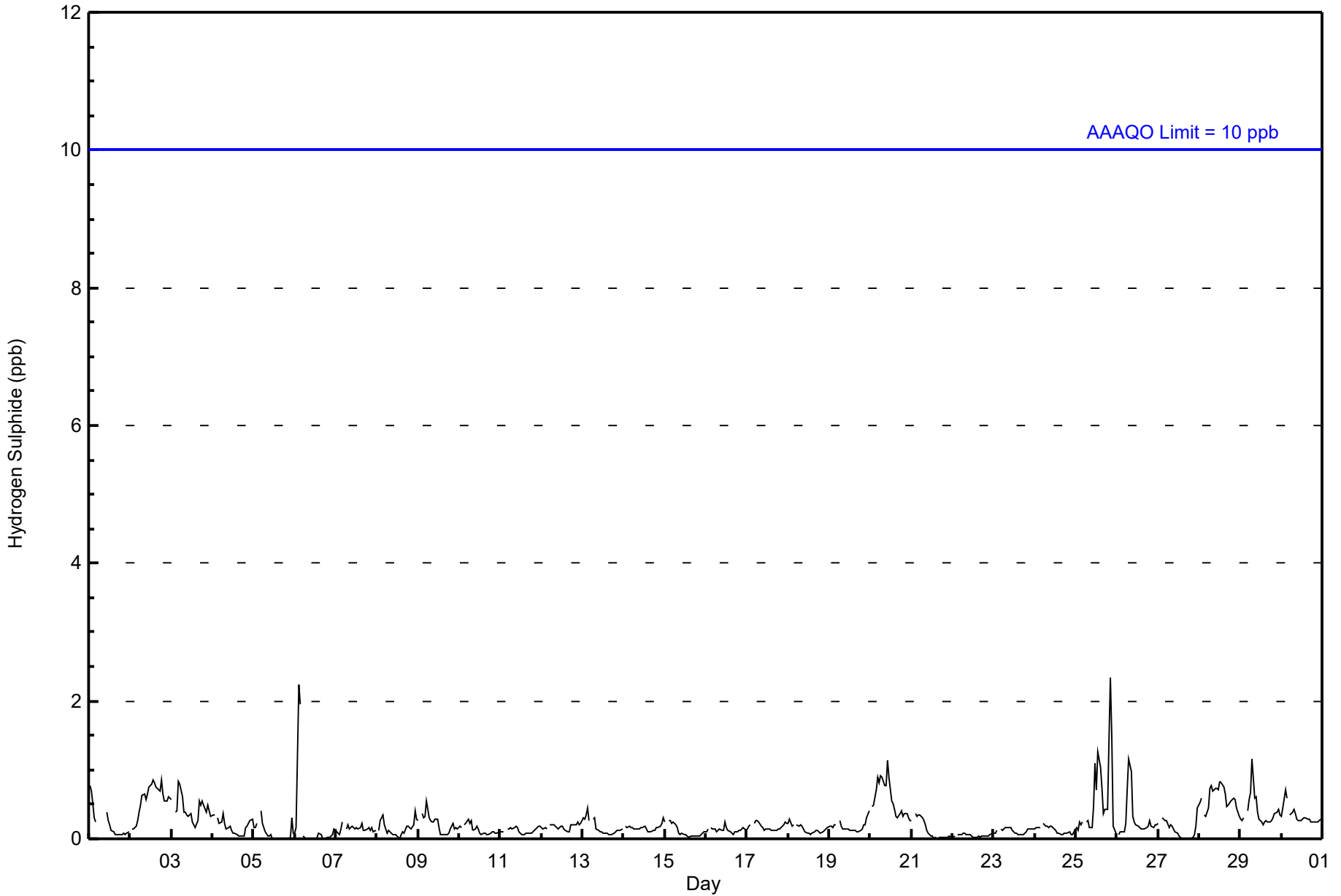
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Sulphur Dioxide (SO₂) - ppb
Buffalo Viewpoint











**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	686	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: 686

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

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

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	34	19	7	2	2	5	58	181	98	56	44	64	47	28	25	14	684
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	34	19	7	2	2	5	58	181	98	56	44	64	47	28	25	14	684

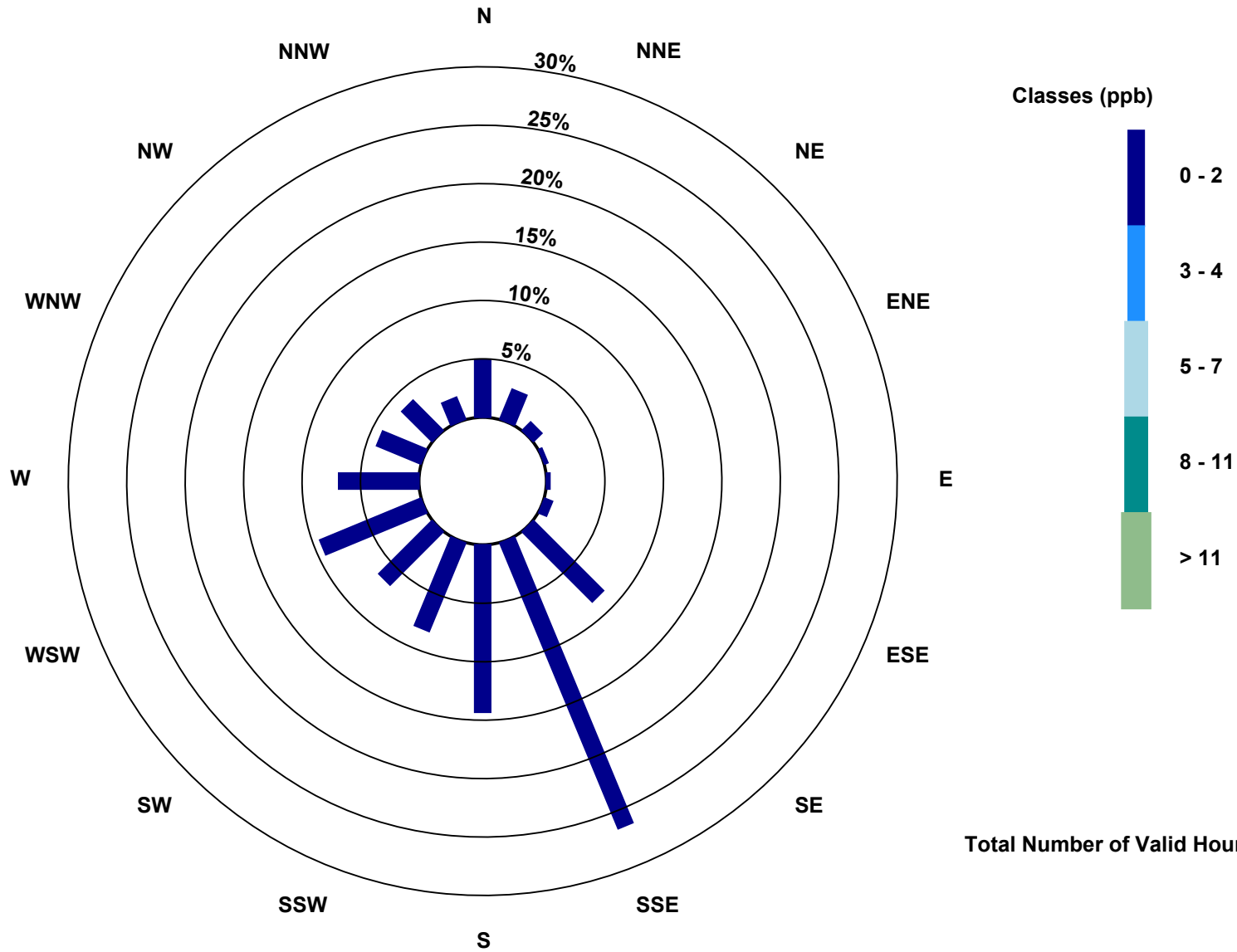
Total Number of Valid Hours: 684

Total Number of Hours: 720

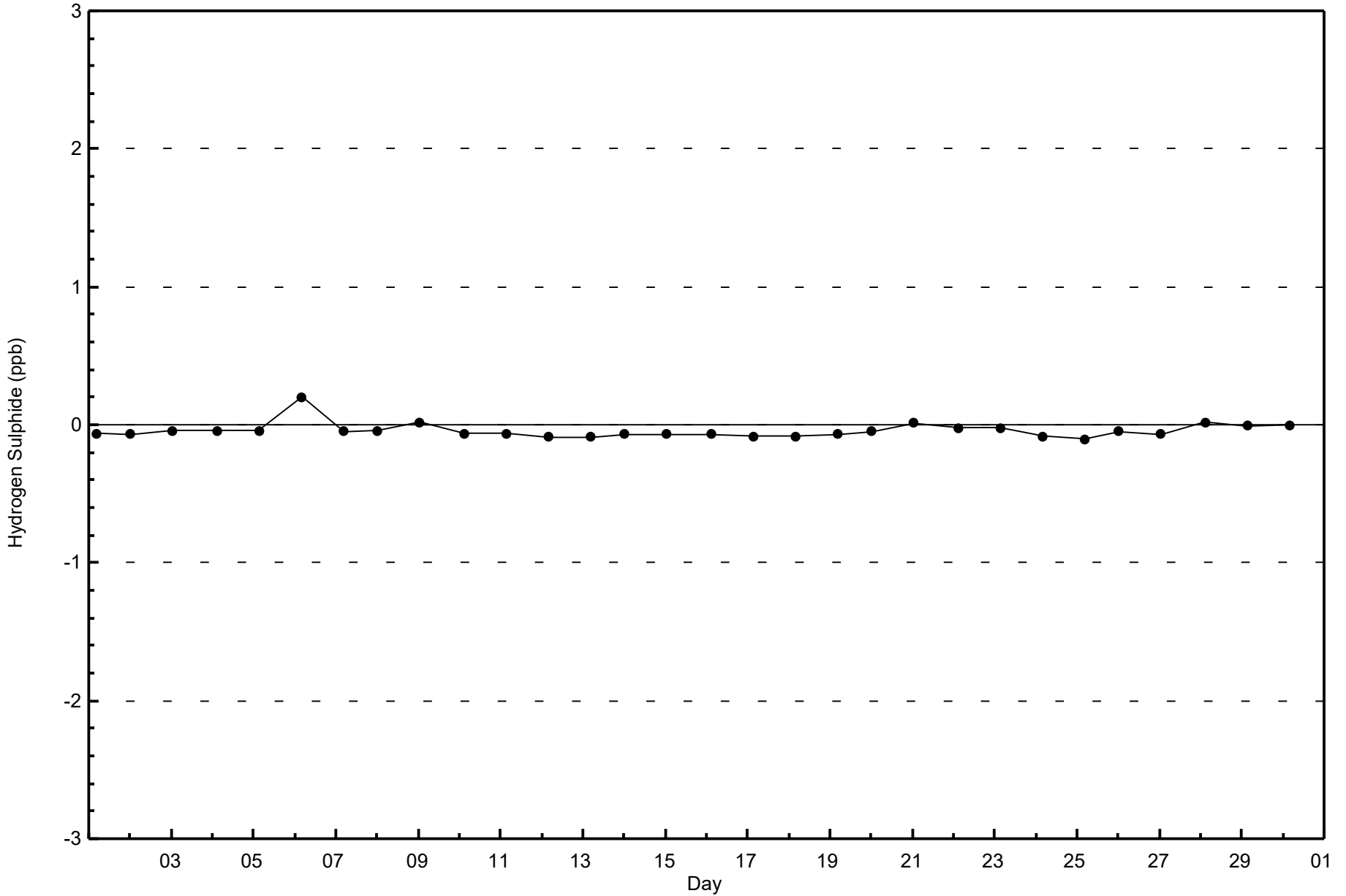


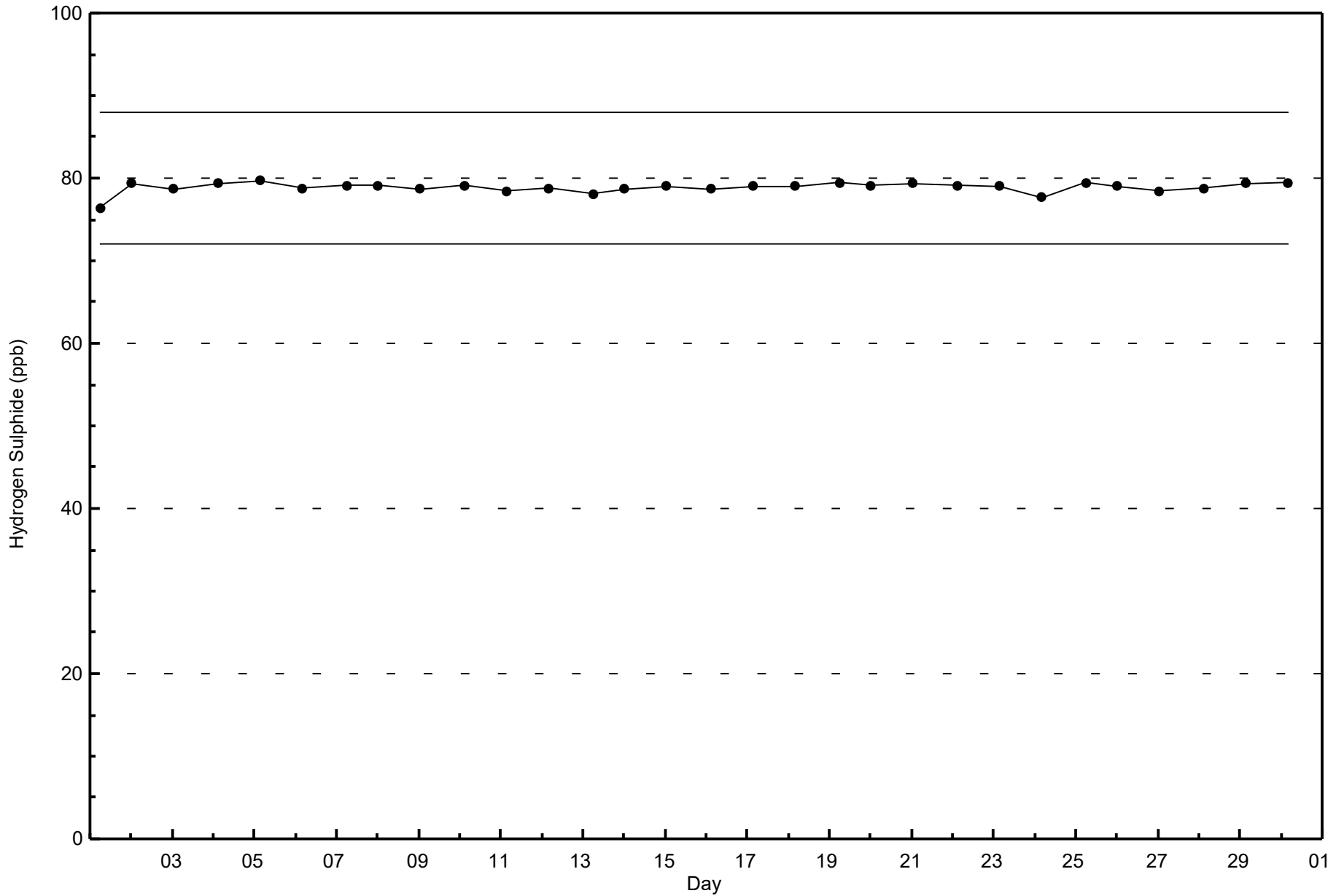
Wood Buffalo Environmental Association
Wind Rose Sep 2023

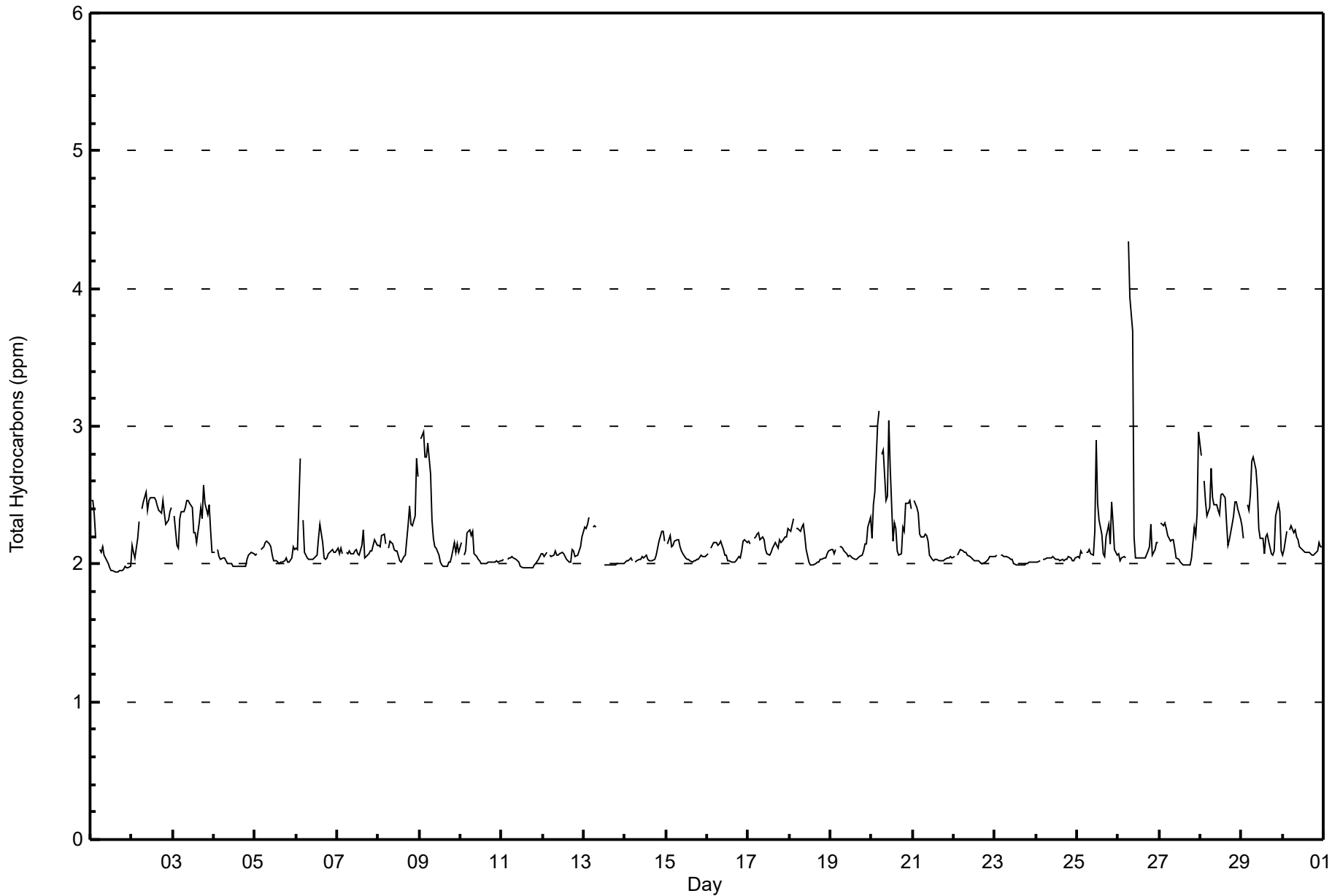
Hydrogen Sulphide (H₂S) - ppb
Buffalo Viewpoint



Total Number of Valid Hours: 684









Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	239	34.84	34.84
2.1 - 3.0	443	64.58	99.42
3.1 - 10.0	4	0.58	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 686

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Buffalo Viewpoint - September 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	2	20	59	33	25	23	37	15	15	8	2	239
2.1 - 3.0	35	18	7	2	1	4	35	124	64	32	19	27	35	13	15	10	441
3.1 - 10.0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	2	4
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	35	18	7	2	1	6	55	183	98	57	42	64	50	28	24	14	684

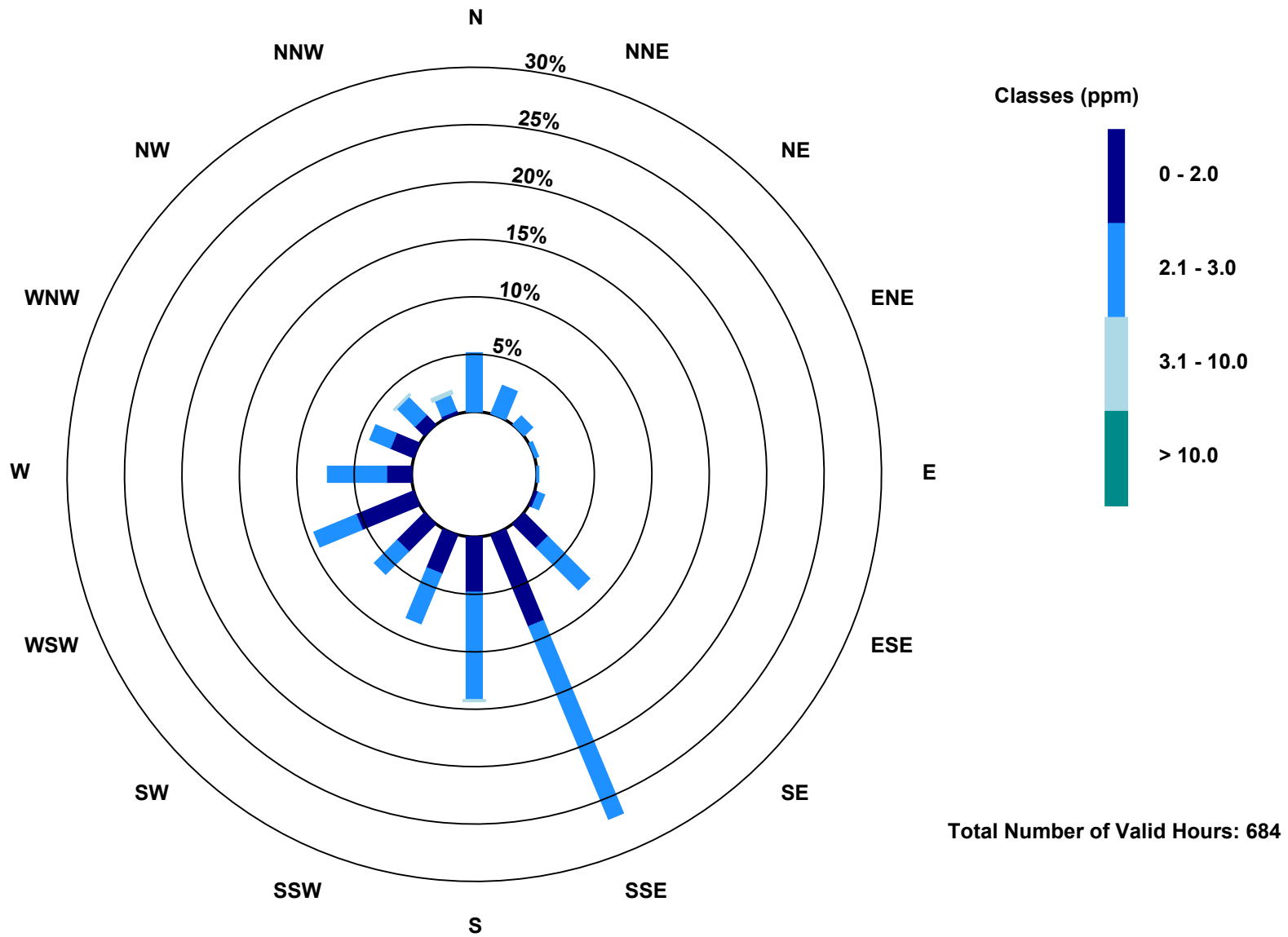
Total Number of Valid Hours: 684

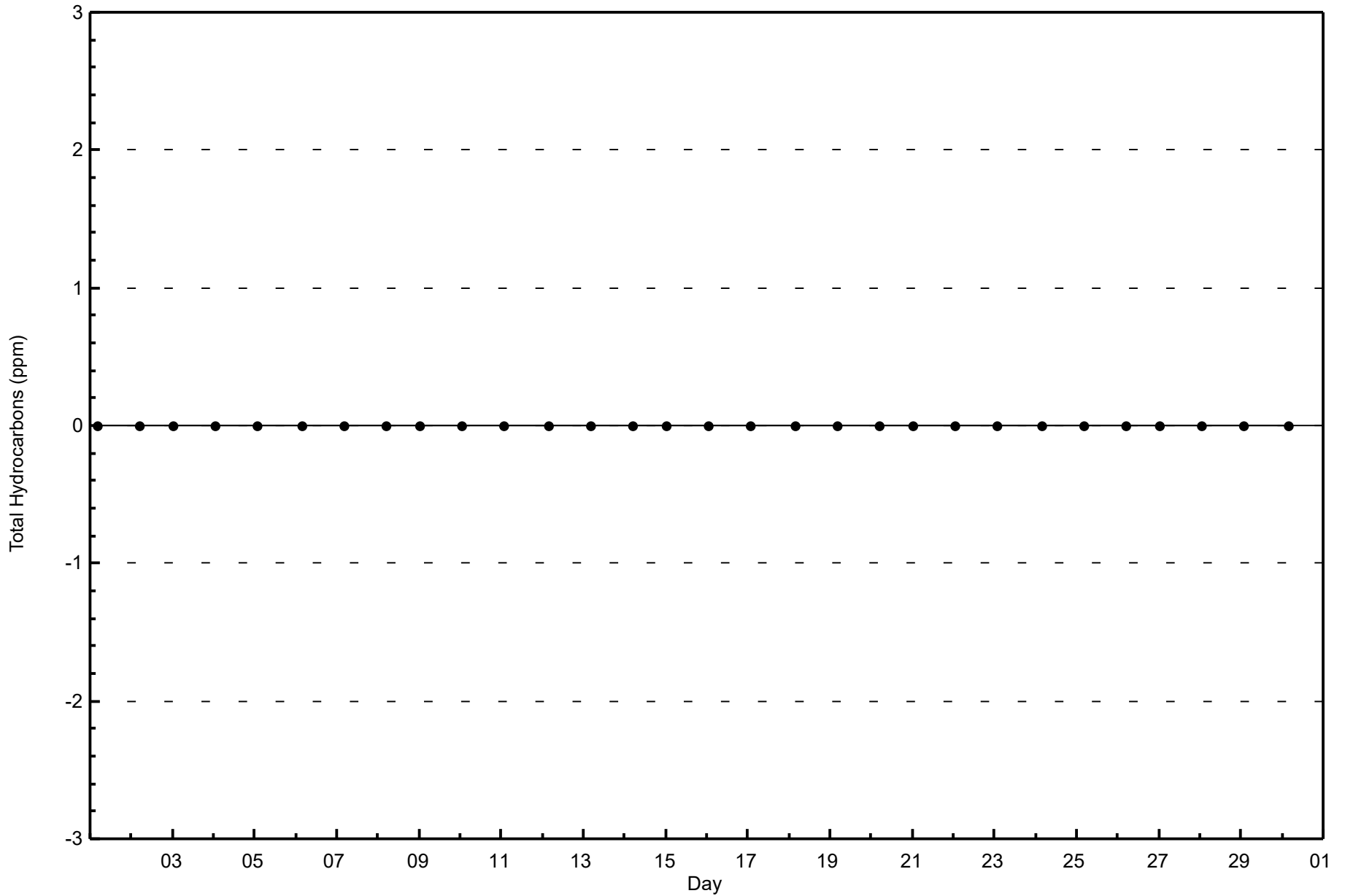
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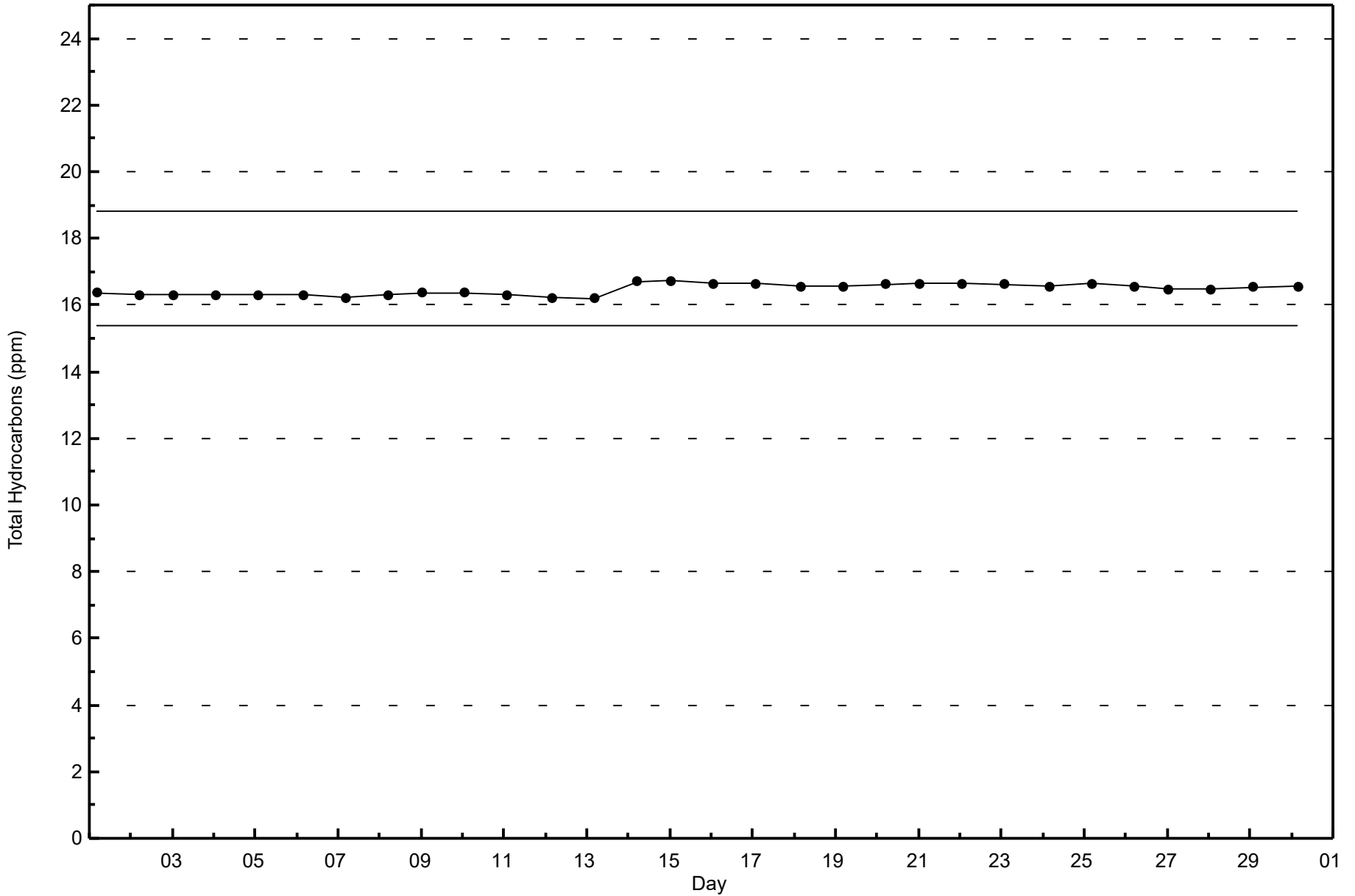


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Total Hydrocarbons (THC) - ppm
Buffalo Viewpoint

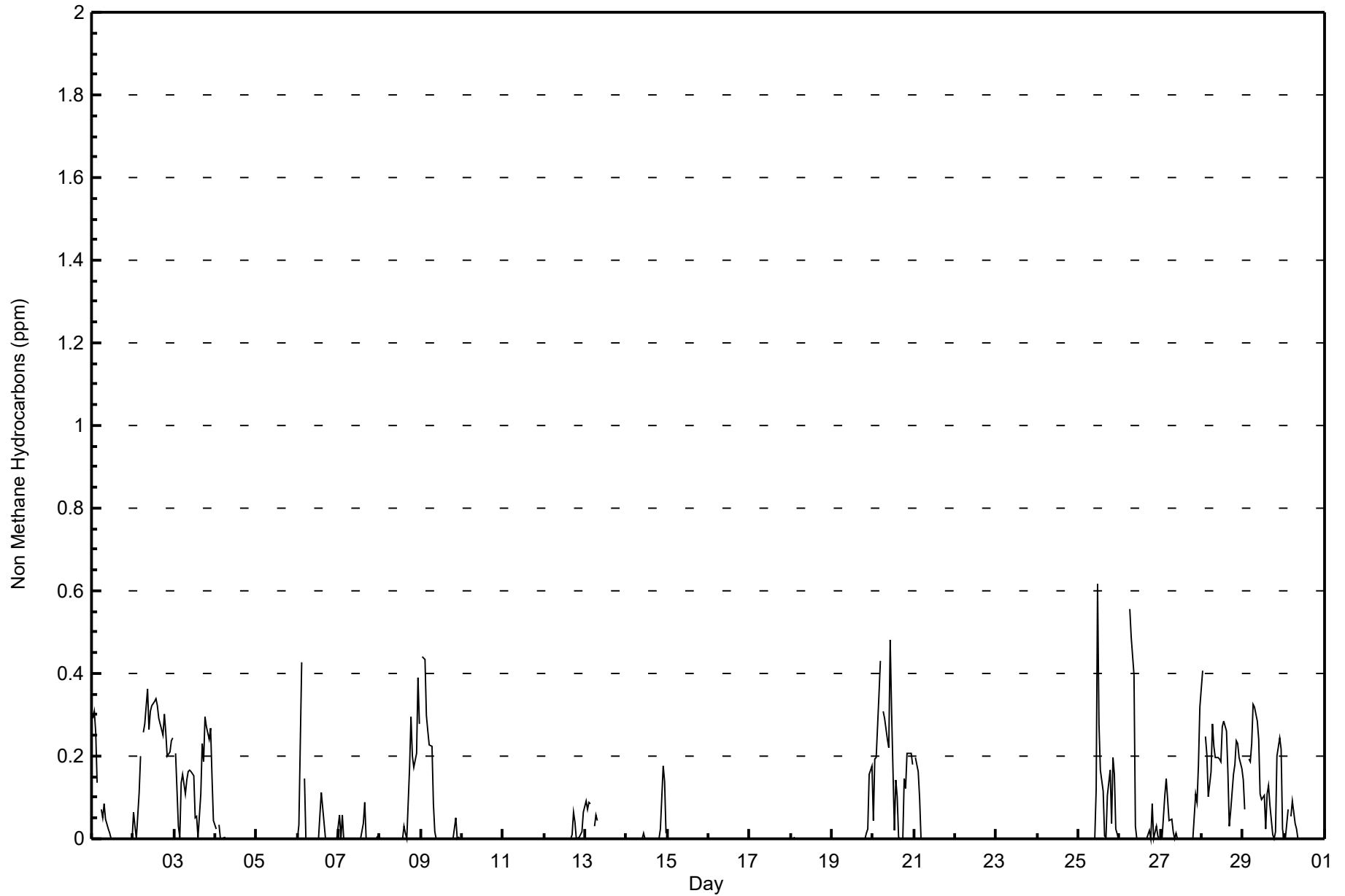








Maximum Value: 0.617 ppm on Sep 25 12:00																				Maximum Daily Average: 0.237 ppm on Sep 2					Hours in Service:	720
Minimum Value: 0.000 ppm on Sep 1 12:00																				Minimum Daily Average: 0.000 ppm on Sep 5					Hours of Data:	686
Maximum Diurnal Average: 0.084 ppm at hour 3																				Minimum Diurnal Average: 0.021 ppm at hour 17					Hours of Missing Data:	34
Monthly Average: 0.050 ppm																				Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.2 P ₉₉ = 0.4					Hours of Calibration:	34
																									Percent Operational Time:	100.0
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Sep	0.292	0.307	0.257	0.135	Z	0.071	0.052	0.086	0.047	0.024	0.015	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.056	0.307
2-Sep	0.064	0.030	0.000	0.113	0.199	Z	0.257	0.279	0.362	0.264	0.309	0.321	0.331	0.339	0.323	0.293	0.278	0.250	0.301	0.259	0.198	0.211	0.236	0.244	0.237	0.362
3-Sep	Z	0.206	0.031	0.005	0.136	0.155	0.109	0.143	0.163	0.166	0.162	0.154	0.050	0.055	0.004	0.110	0.231	0.187	0.295	0.270	0.242	0.269	0.150	0.043	0.145	0.295
4-Sep	0.025	Z	0.035	0.000	0.000	0.004	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	0.003	0.035
5-Sep	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
6-Sep	0.000	0.033	0.426	Z	0.146	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.056	0.112	0.039	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.035	0.426
7-Sep	0.056	0.000	0.058	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.036	0.090	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.011	0.011	0.090
8-Sep	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	0.029	0.015	0.000	0.172	0.296	0.201	0.173	0.206	0.391	0.277	0.077	0.391
9-Sep	Z	0.440	0.434	0.300	0.261	0.227	0.225	0.085	0.017	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.052	0.002	0.003	0.000	0.089	0.440
10-Sep	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
11-Sep	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-Sep	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	0.011	0.066	0.041	0.000	0.004	0.011	0.018	0.065	0.009	0.066
13-Sep	0.091	0.073	0.088	0.083	Z	0.032	0.057	0.043	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	0.025	0.091
14-Sep	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.015	0.001	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.023	0.176	0.138	0.014	0.016	0.176
15-Sep	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
16-Sep	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
17-Sep	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
18-Sep	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	0.002
19-Sep	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	0.012	0.025	0.156	0.177	0.016	0.177
20-Sep	0.043	0.192	0.195	0.351	0.430	Z	0.309	0.290	0.240	0.219	0.481	0.310	0.019	0.143	0.101	0.002	0.000	0.000	0.145	0.124	0.208	0.208	0.206	0.180	0.191	0.481
21-Sep	Z	0.198	0.162	0.099	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.020	0.198
22-Sep	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
23-Sep	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-Sep	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-Sep	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.119	0.617	0.277	0.165	0.114	0.007	0.004	0.104	0.166	0.037	0.197	0.154	0.024	0.000	0.086	0.617
26-Sep	0.000	0.000	0.000	0.000	0.000	Z	0.556	0.487	0.398	0.031	0.000	0.000	0.000	0.000	0.000	0.000	0.022	0.000	0.085	0.000	0.030	0.007	0.000	0.070	0.556	
27-Sep	Z	0.000	0.104	0.146	0.096	0.045	0.048	0.016	0.000	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.109	0.089	0.179	0.317	0.051	0.317	
28-Sep	0.407	Z	0.247	0.203	0.101	0.163	0.278	0.222	0.196	0.195	0.193	0.186	0.272	0.284	0.263	0.163	0.032	0.067	0.155	0.181	0.237	0.230	0.197	0.170	0.202	0.407
29-Sep	0.142	0.073	Z	0.193	0.185	0.230	0.327	0.320	0.284	0.241	0.109	0.095	0.106	0.022	0.109	0.128	0.080	0.010	0.000	0.016	0.200	0.243	0.217	0.025	0.146	0.327
30-Sep	0.000	0.000	0.070	Z	0.054	0.093	0.038	0.025	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	0.012	0.093	
																								Diurnal Average		
																								Diurnal Maximum		
0.045 0.062 0.084 0.065 0.064 0.041 0.075 0.067 0.059 0.040 0.048 0.058 0.035 0.035 0.036 0.028 0.021 0.029 0.047 0.039 0.055 0.062 0.064 0.051																										
0.407 0.440 0.434 0.351 0.430 0.230 0.556 0.487 0.398 0.264 0.481 0.617 0.331 0.339 0.323 0.293 0.278 0.250 0.301 0.270 0.242 0.269 0.391 0.317																										
Z - zerospan C - Calibration																										





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	476	69.39	69.39
0.006 - 0.05	51	7.43	76.82
0.06 - 0.1	50	7.29	84.11
> 0.1	109	15.89	100.00

Total Number of Valid Hours: 686

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

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

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	1	5	0	0	0	4	51	162	78	52	34	43	18	18	8	2	476
0.006 - 0.05	3	4	1	1	0	1	2	6	6	4	5	6	7	3	2	0	51
0.06 - 0.1	9	2	2	0	0	1	1	7	6	1	1	3	10	1	2	4	50
> 0.1	22	7	4	1	1	0	1	8	8	0	2	12	15	6	12	8	107
Totals	35	18	7	2	1	6	55	183	98	57	42	64	50	28	24	14	684

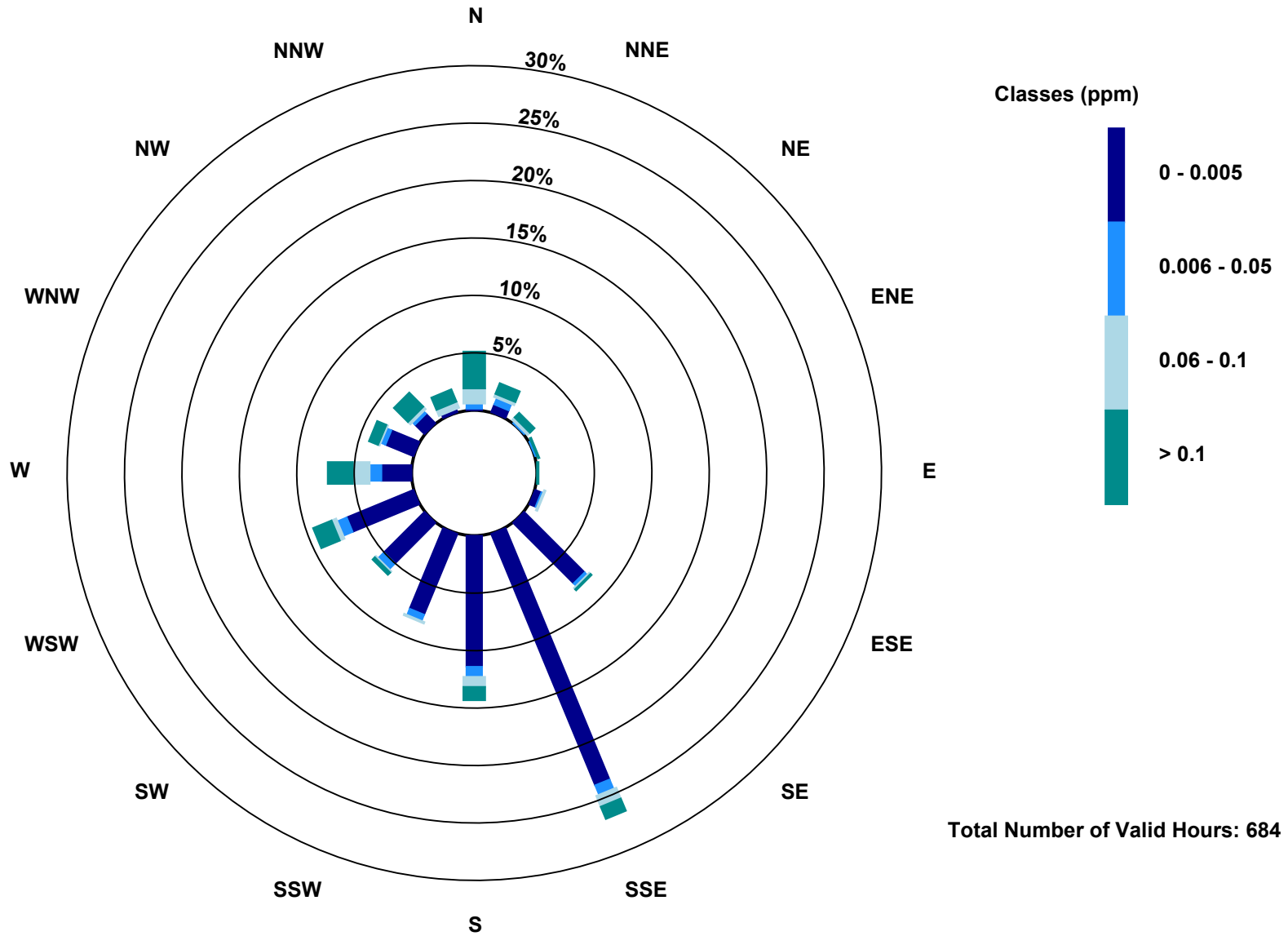
Total Number of Valid Hours: 684

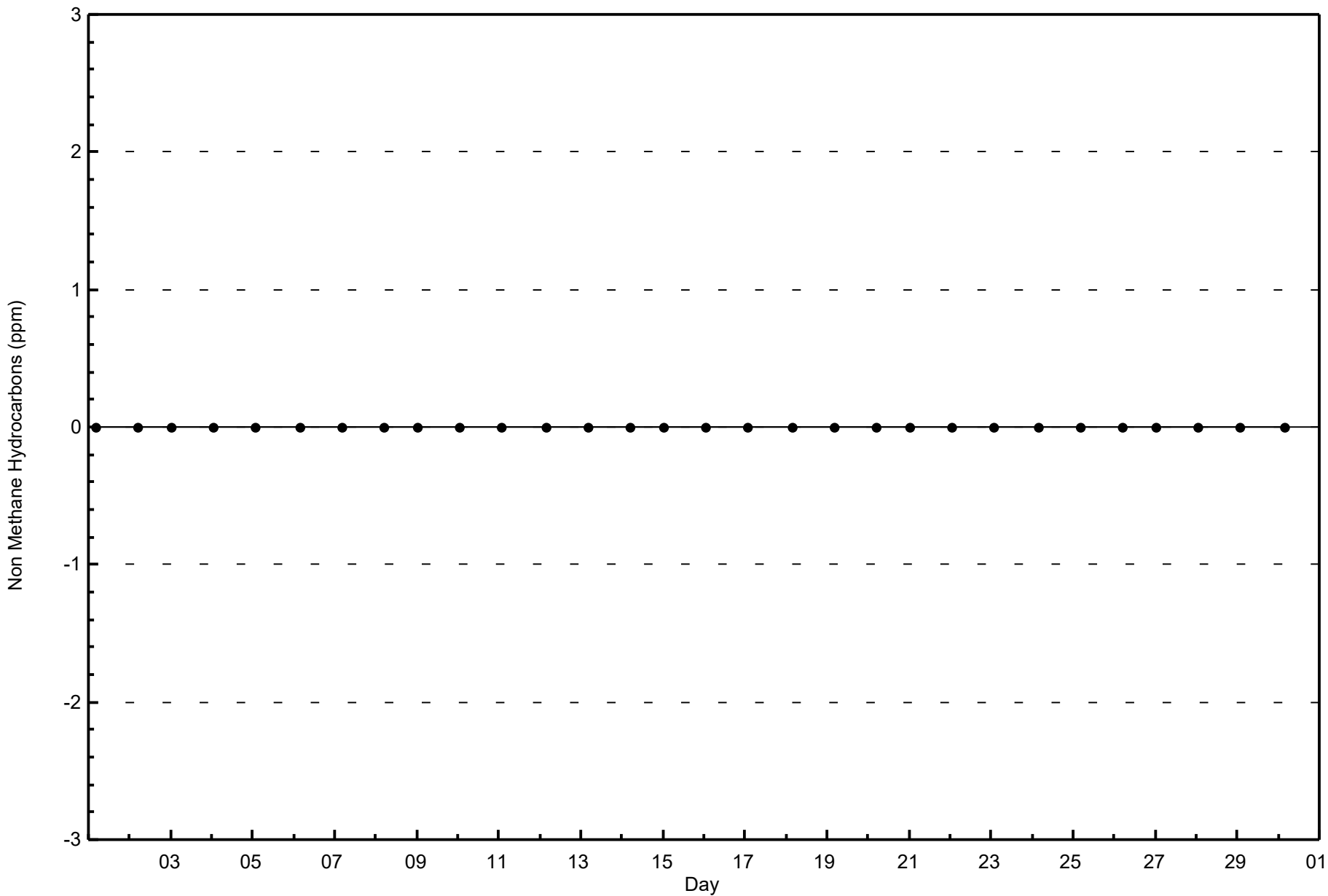
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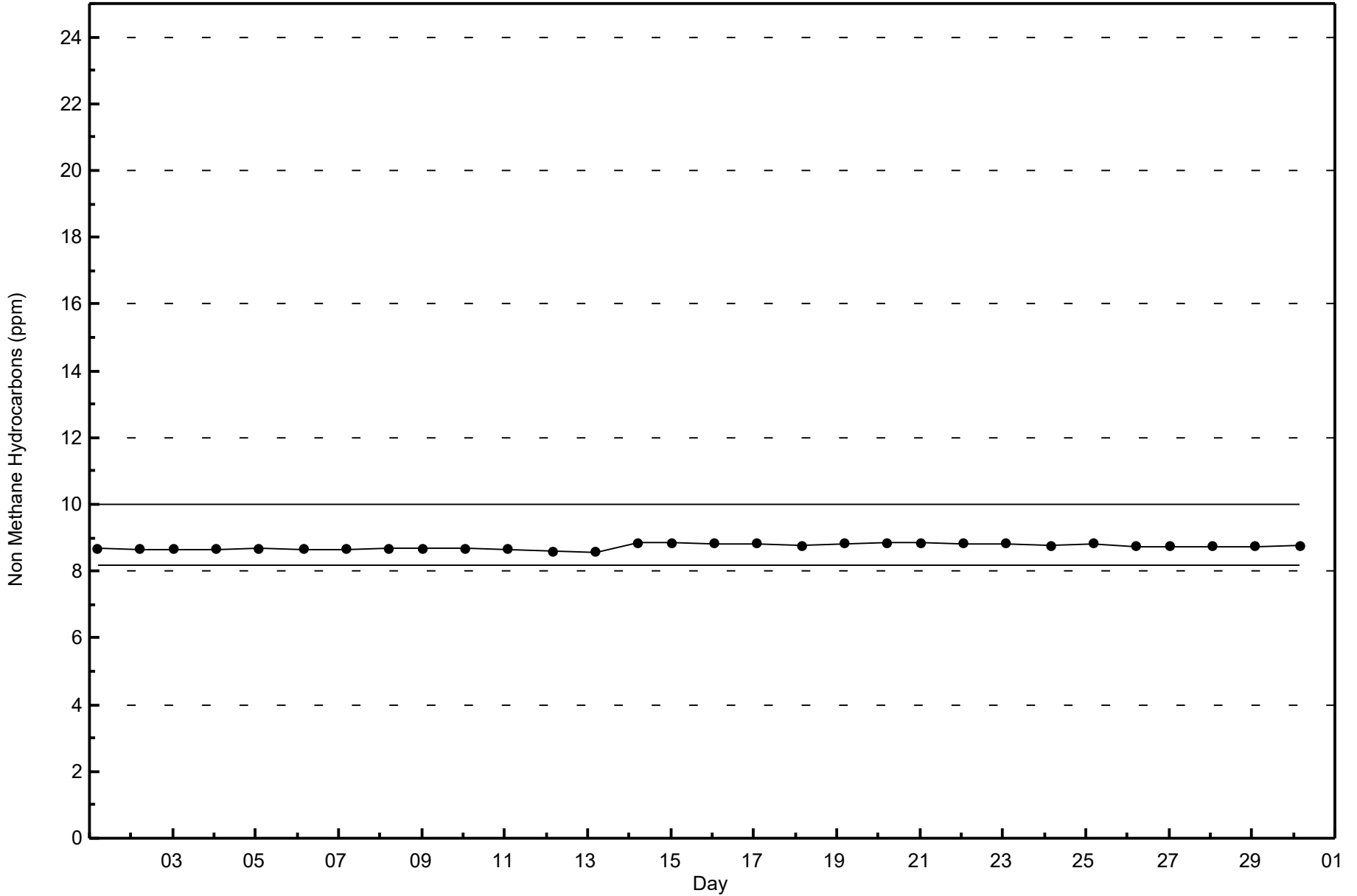


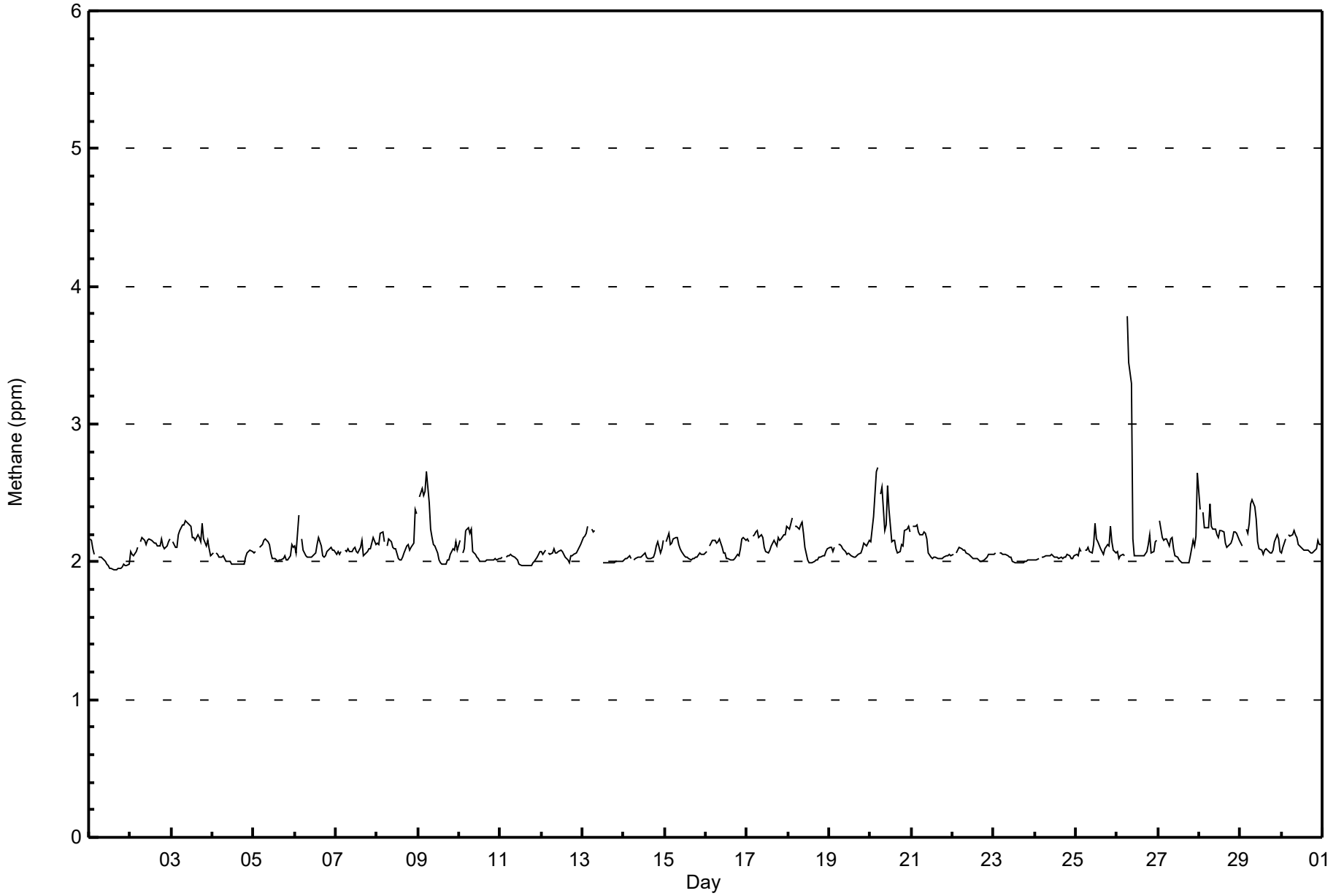
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Non Methane Hydrocarbons (NMHC) - ppm
Buffalo Viewpoint











Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Buffalo Viewpoint - September 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	249	36.30	36.30
2.1 - 3.0	434	63.27	99.56
3.1 - 10.0	3	0.44	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 686

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Methane (CH₄) - ppm
Buffalo Viewpoint - September 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	1	0	0	0	2	20	59	33	25	23	39	20	16	9	2	249
2.1 - 3.0	35	17	7	2	1	4	35	124	64	32	19	25	30	12	14	11	432
3.1 - 10.0	0	0	0	0	0	0	0	0	1	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	35	18	7	2	1	6	55	183	98	57	42	64	50	28	24	14	684

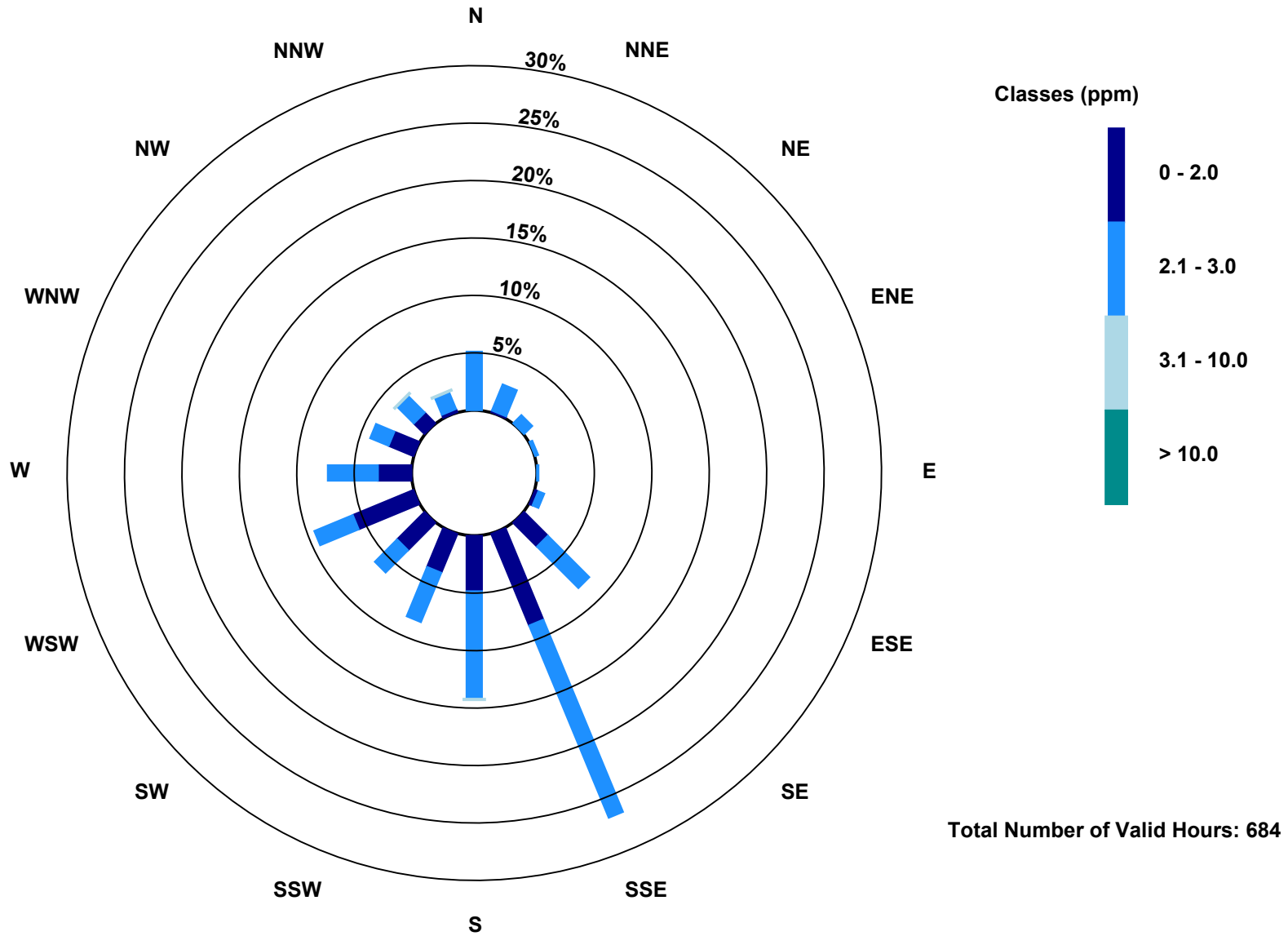
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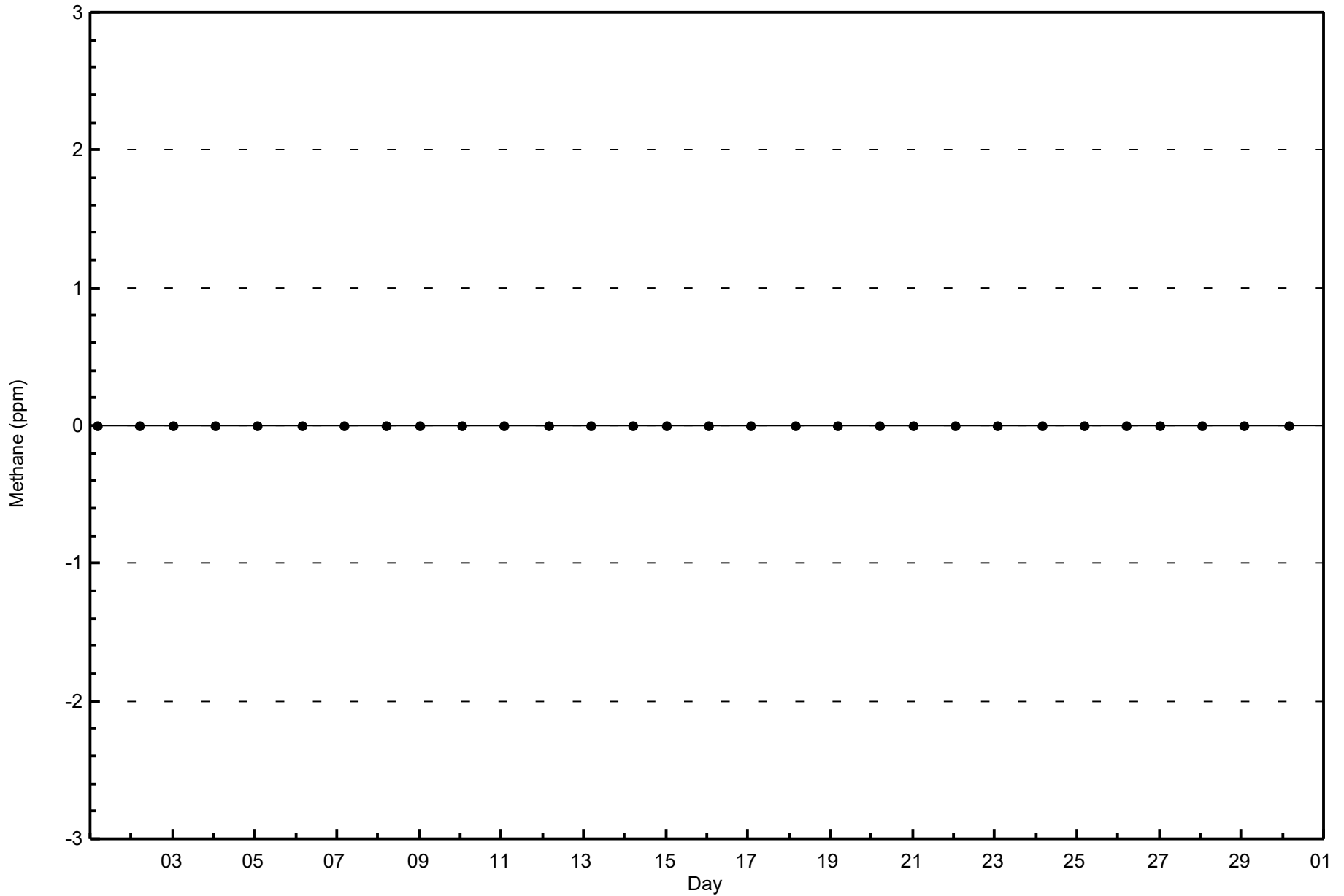
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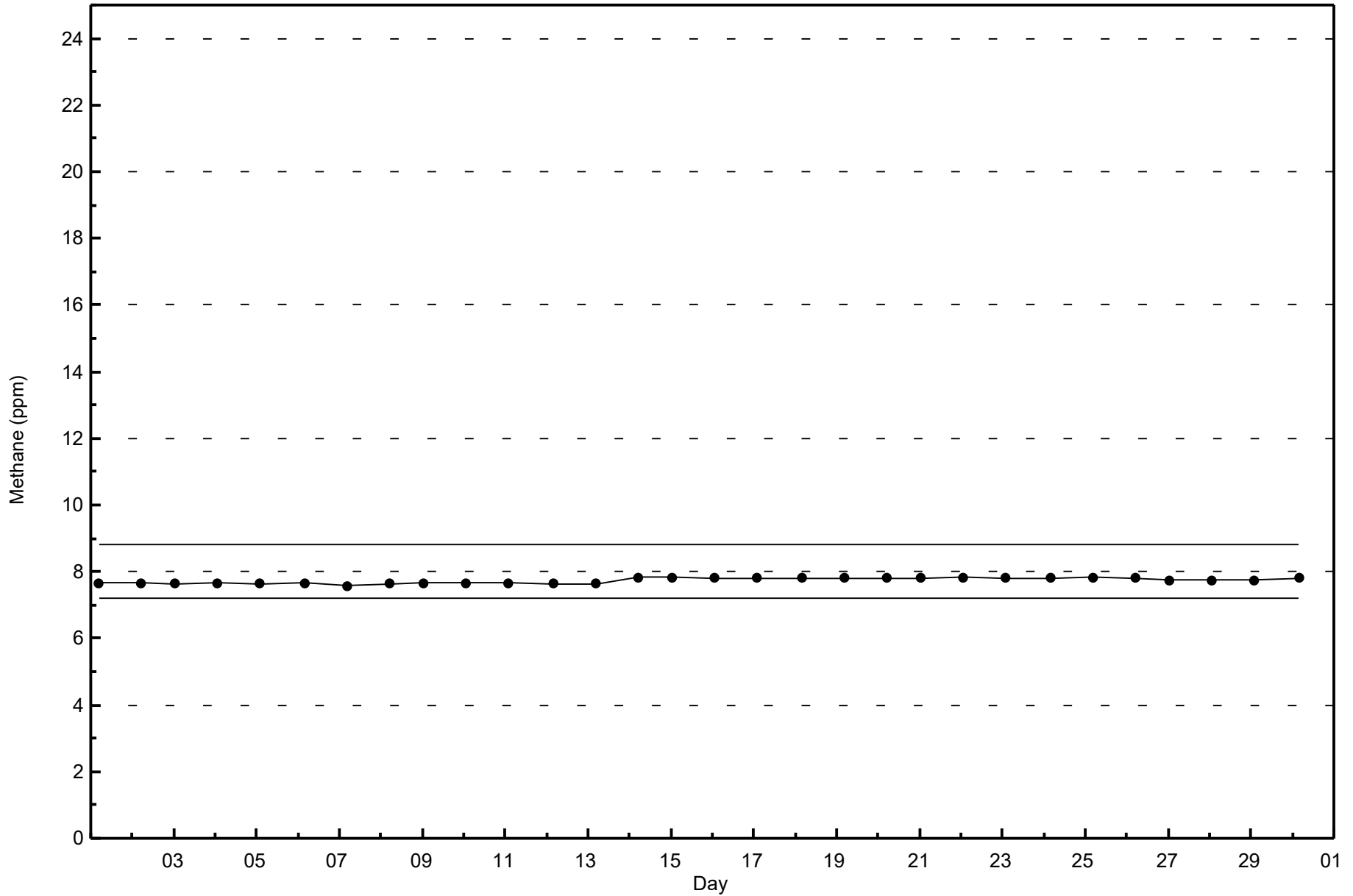


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Methane (CH₄) - ppm
Buffalo Viewpoint



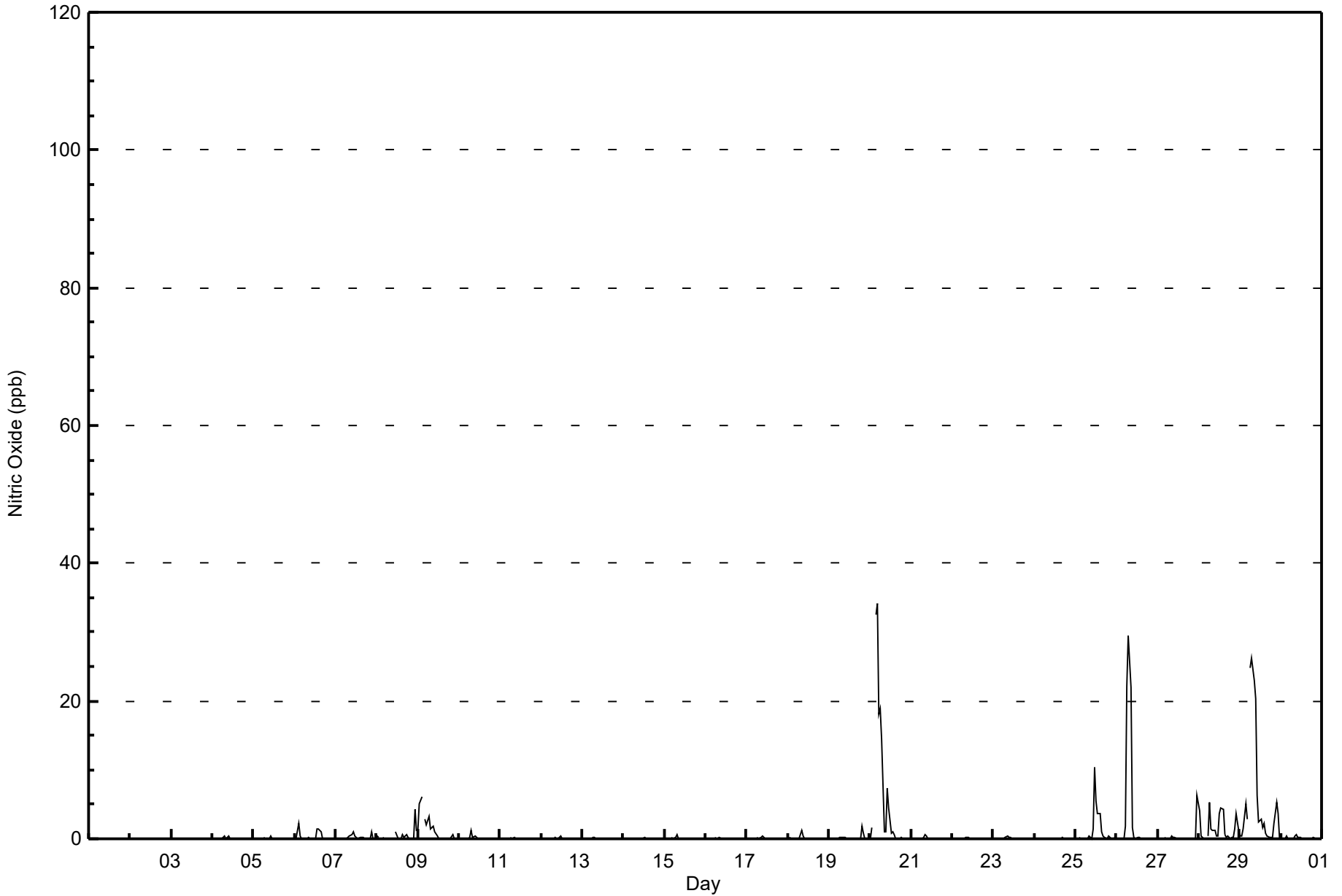






Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	676	98.83	98.83
21 - 40	8	1.17	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: 684

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Nitric Oxide (NO) - ppb
Buffalo Viewpoint - September 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	19	7	2	2	6	54	181	94	55	45	64	50	30	24	8	676
21 - 40	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	4	6
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	35	19	7	2	2	6	54	181	95	55	45	64	50	30	25	12	682

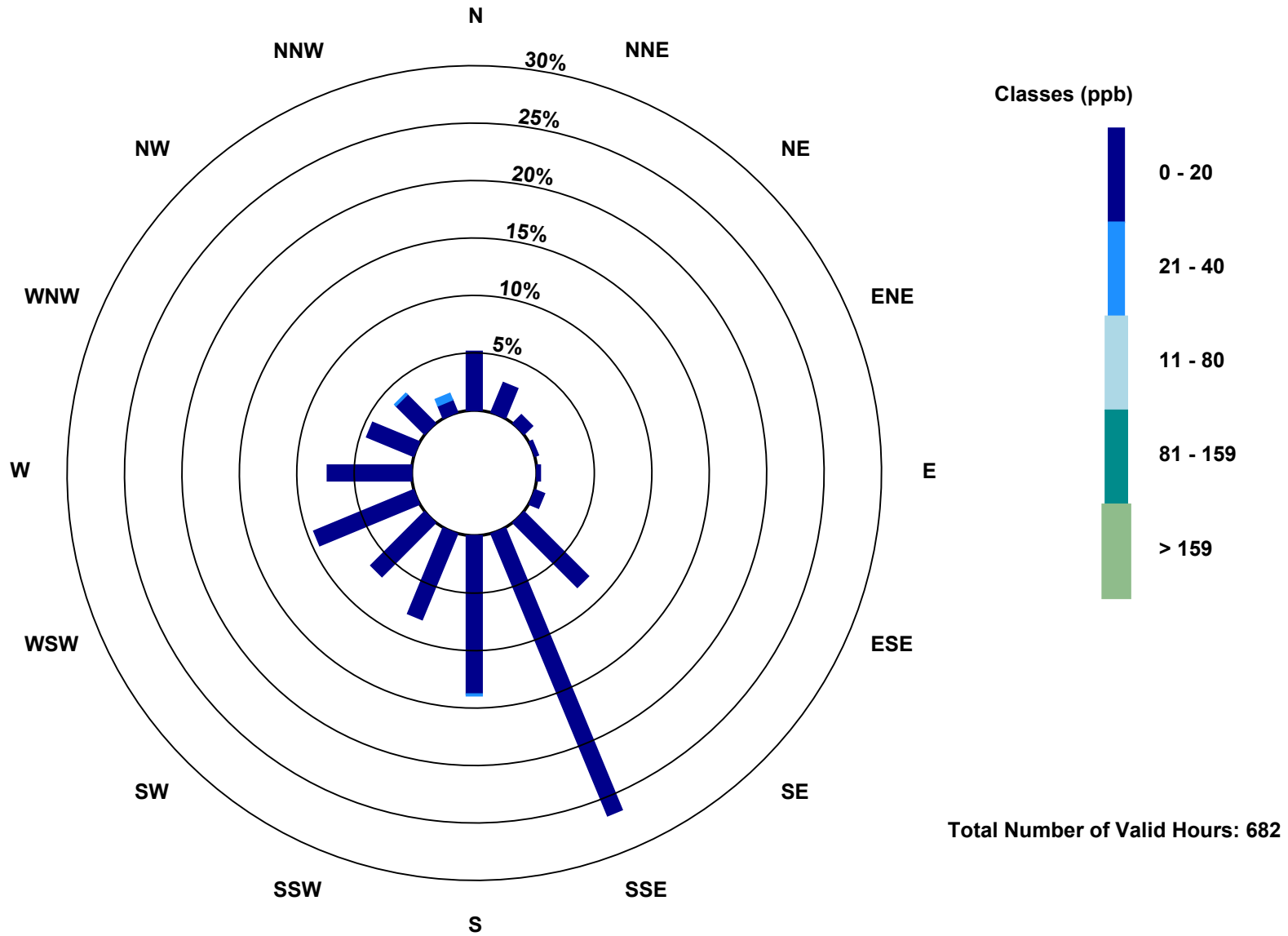
Total Number of Valid Hours: 682

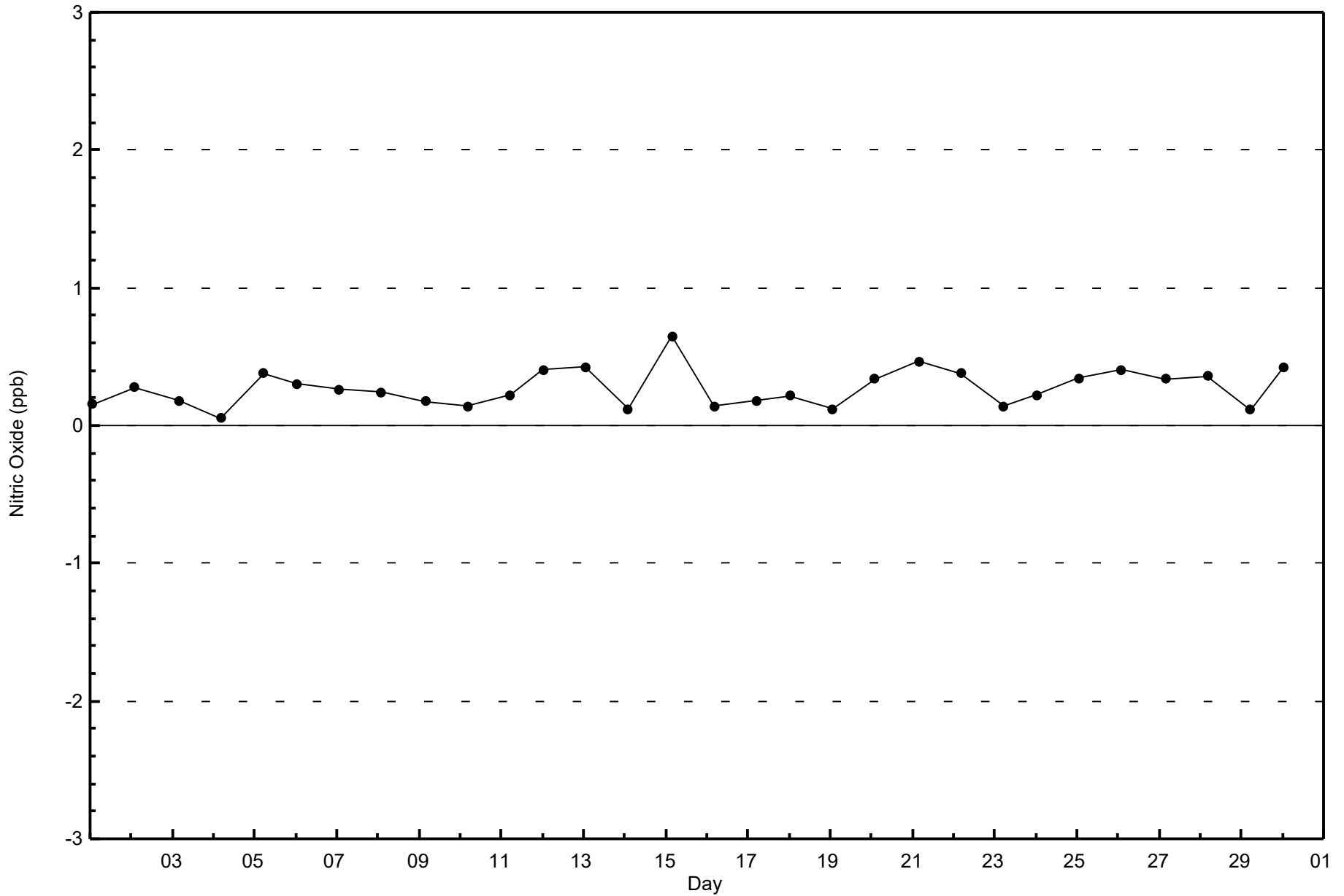
Total Number of Hours: 720

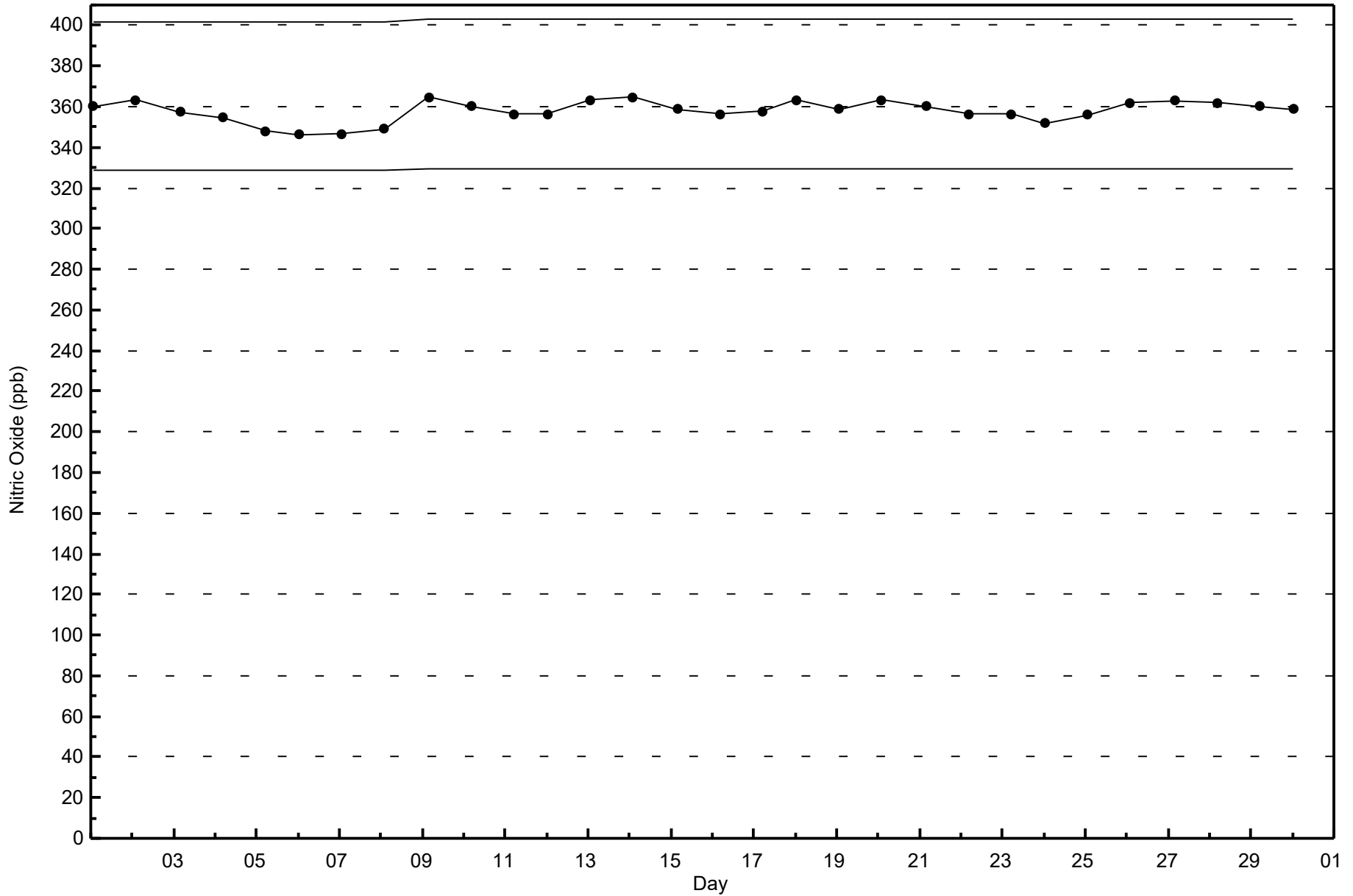


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitric Oxide (NO) - ppb
Buffalo Viewpoint









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

Buffalo Viewpoint - September 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 26.0 ppb on Sep 26 07:00	Maximum Daily Average: 8.5 ppb on Sep 20		Hours of Data:	684
Minimum Value: 0.0 ppb on Sep 1 05:00	Minimum Daily Average: 0.2 ppb on Sep 1		Hours of Missing Data:	36
Maximum Diurnal Average: 3.7 ppb at hour 7	Minimum Diurnal Average: 1.3 ppb at hour 17		Hours of Calibration:	36
Monthly Average: 2.55 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.2 Q ₁ = 0.5 Median = 1.3 Q ₃ = 2.8 P ₉₀ = 6.6 P ₉₉ = 16.3		Percent Operational Time:	100.0

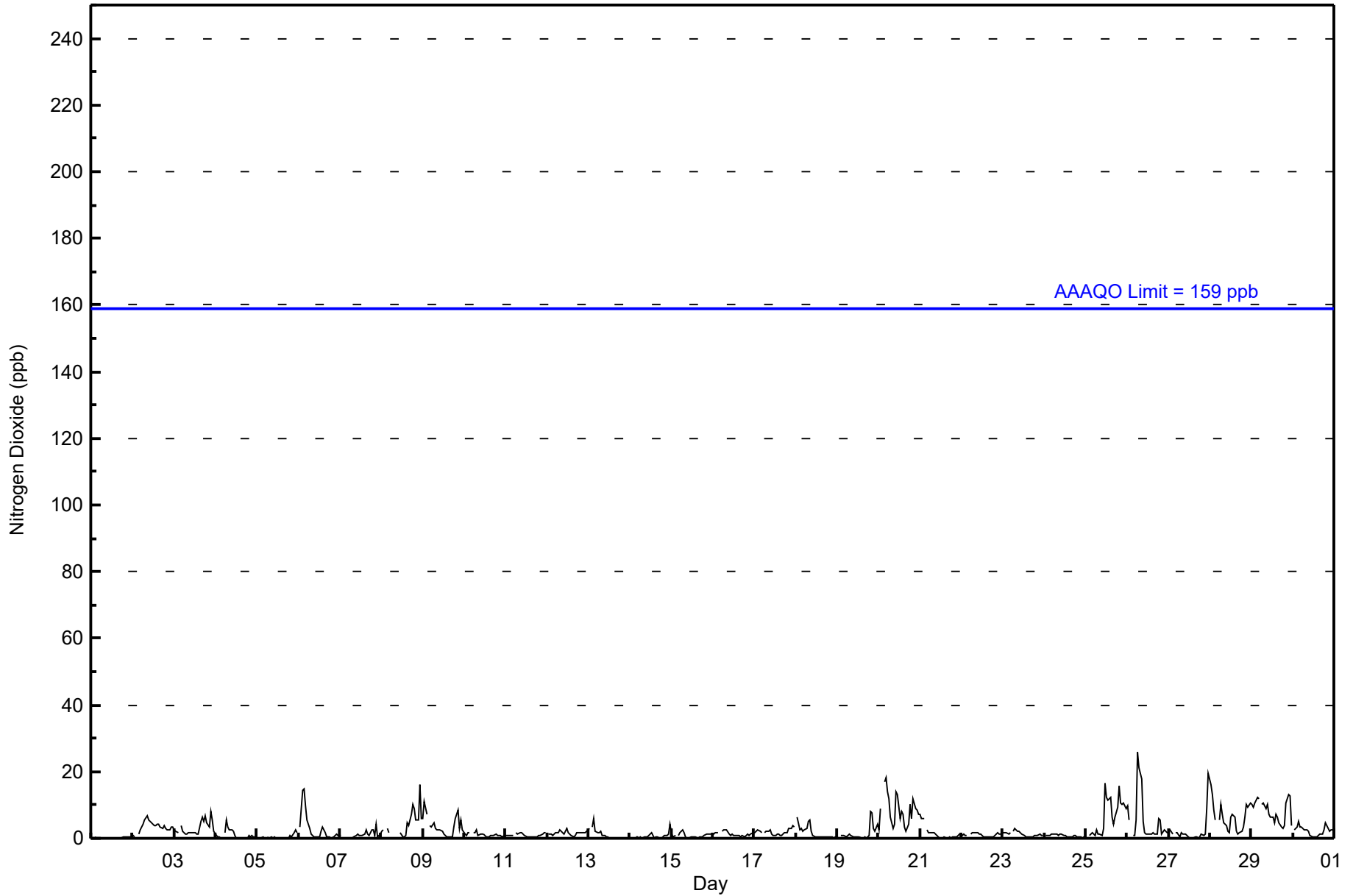
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Sep	1.3	Z	0.5	0.1	0.0	0.0	0.1	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.5	0.5	0.4	0.5	0.5	0.2	1.3																								
2-Sep	0.7	0.3	Z	1.1	2.5	3.5	4.3	5.5	6.6	5.4	5.1	4.5	4.0	4.0	4.2	4.1	3.4	3.1	4.0	3.1	2.5	2.7	3.4	3.2	3.5	6.6																							
3-Sep	2.6	2.0	1.5	Z	3.9	2.1	1.3	1.4	1.6	1.5	1.6	1.5	1.5	1.2	1.2	5.0	6.5	4.9	6.9	4.5	3.3	8.1	5.6	2.2	3.1	8.1																							
4-Sep	0.8	0.5	0.4	0.1	Z	1.9	5.4	3.6	2.5	2.5	2.0	0.9	0.2	0.1	0.0	0.0	0.0	0.1	0.0	0.7	0.4	0.9	0.5	0.3	1.0	5.4																							
5-Sep	0.1	0.1	0.0	0.3	0.2	Z	0.6	0.1	0.3	0.1	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.8	0.6	1.6	2.4	1.9	0.4	2.4																							
6-Sep	Z	3.5	14.6	14.8	9.6	5.5	3.0	1.4	1.0	0.5	0.4	0.5	0.3	2.1	3.3	1.9	0.3	0.4	0.3	0.2	0.6	0.8	1.4	0.7	2.9	14.8																							
7-Sep	0.7	Z	0.1	0.1	0.0	0.1	0.2	0.2	0.4	0.7	1.3	0.8	0.8	0.9	1.4	2.5	1.1	0.9	2.7	2.5	0.7	4.1	0.6	1.3	1.0	4.1																							
8-Sep	2.3	2.4	Z	3.1	1.7	C	C	C	C	C	C	1.5	0.4	0.3	1.0	4.8	4.0	7.1	10.3	9.1	5.7	5.7	16.2	5.9	--	16.2																							
9-Sep	5.8	10.9	7.3	Z	3.7	3.3	4.7	3.1	2.4	2.7	2.6	2.0	1.4	0.8	0.6	0.4	0.5	0.5	3.3	6.1	8.4	3.0	5.7	2.5	3.6	10.9																							
10-Sep	1.1	1.0	1.7	1.7	Z	1.9	1.9	2.5	0.9	1.3	1.3	1.1	0.9	0.4	0.6	0.7	0.7	0.7	1.1	1.0	1.0	0.7	0.6	0.9	1.1	2.5																							
11-Sep	0.9	0.9	0.7	0.8	0.9	Z	1.5	1.4	1.5	1.5	1.4	0.7	0.4	0.4	0.3	0.6	0.5	0.4	0.5	0.7	0.8	1.1	1.5	1.7	0.9	1.7																							
12-Sep	Z	1.3	1.2	1.0	1.2	1.7	1.6	2.7	2.0	1.5	1.3	2.8	1.8	1.2	0.9	0.5	0.8	1.5	1.7	1.6	1.7	1.6	1.6	2.2	1.5	2.8																							
13-Sep	3.1	Z	3.4	5.9	2.2	1.7	1.9	2.1	0.8	0.7	0.5	0.3	0.1	0.1	0.1	0.2	0.2	0.0	0.1	0.2	0.2	0.0	0.2	0.1	1.0	5.9																							
14-Sep	0.1	0.0	Z	0.5	0.4	0.2	0.3	0.2	0.3	0.3	0.4	1.0	1.6	0.9	0.2	0.3	0.3	0.1	0.1	0.3	0.7	0.9	1.1	4.3	0.6	4.3																							
15-Sep	1.5	0.6	0.7	Z	1.0	1.6	2.4	1.7	0.6	0.2	0.2	0.3	0.3	0.3	0.4	0.2	0.6	0.5	0.6	1.0	1.4	1.4	1.3	1.2	0.9	2.4																							
16-Sep	1.3	1.7	1.7	1.7	Z	2.2	2.5	2.5	2.4	1.3	0.9	1.4	0.8	0.8	0.7	0.7	0.6	0.7	0.5	0.9	1.4	0.9	1.4	1.5	1.3	2.5																							
17-Sep	1.6	2.0	2.4	2.0	1.7	Z	1.8	2.1	2.1	2.4	1.4	0.9	1.0	1.2	1.3	1.0	1.0	1.7	1.8	1.8	3.1	3.1	3.9	3.4	1.9	3.9																							
18-Sep	Z	6.3	2.6	2.8	2.0	2.4	2.8	5.2	5.3	2.1	0.9	0.6	0.4	0.3	0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.6	1.6	6.3																							
19-Sep	0.5	Z	0.7	0.9	0.9	0.4	0.9	1.1	0.8	0.5	0.4	0.3	0.3	0.3	0.2	0.2	0.3	0.2	0.7	7.9	7.7	3.1	2.3	4.2	1.5	7.9																							
20-Sep	2.6	8.9	Z	16.8	18.1	13.8	11.8	6.4	3.1	4.3	14.0	13.2	5.8	7.9	7.4	3.6	2.0	4.4	10.3	5.9	11.7	8.8	8.6	7.2	8.5	18.1																							
21-Sep	7.2	6.1	5.8	Z	2.4	1.7	1.5	1.6	1.6	1.3	0.8	0.2	0.2	0.2	0.3	0.1	0.1	0.3	0.2	0.3	0.3	0.6	0.8	1.1	1.5	7.2																							
22-Sep	1.0	1.1	1.0	0.9	Z	1.3	1.8	1.9	1.9	1.6	1.3	1.1	1.0	0.5	0.5	0.5	0.5	0.4	0.6	0.7	1.4	1.6	1.3	1.4	1.1	1.9																							
23-Sep	1.5	1.6	1.7	1.4	1.6	Z	2.1	2.8	2.3	2.0	1.6	1.2	0.7	0.6	0.5	0.5	0.4	0.5	0.8	1.0	1.0	1.1	1.0	0.7	1.2	2.8																							
24-Sep	Z	1.0	1.0	0.9	1.1	1.2	1.1	1.2	1.0	1.1	1.2	0.8	0.7	0.6	0.4	0.6	0.6	0.9	0.8	0.4	0.5	0.4	0.2	0.3	0.8	1.2																							
25-Sep	0.5	Z	1.0	1.3	1.9	0.7	2.6	1.3	1.3	0.8	2.9	16.5	12.4	11.4	12.1	6.2	4.3	6.5	9.4	15.6	10.6	10.0	10.5	9.0	6.5	16.5																							
26-Sep	9.7	5.5	Z	1.0	0.9	5.4	26.0	21.0	17.9	5.0	1.7	1.2	1.2	1.3	1.3	1.6	1.2	1.4	5.9	5.3	1.2	2.7	2.0	1.5	5.3	26.0																							
27-Sep	1.9	2.5	1.4	Z	1.7	1.6	0.5	1.6	1.4	1.1	1.2	0.5	0.2	0.2	0.2	0.3	0.4	0.2	0.4	1.4	1.0	1.4	8.9	19.6	2.2	19.6																							
28-Sep	16.2	13.2	8.5	5.4	Z	5.4	10.0	7.3	4.6	4.0	2.1	1.9	6.3	7.1	6.5	2.2	1.3	1.7	2.0	3.3	6.5	10.1	9.2	10.4	6.3	16.2																							
29-Sep	10.2	9.5	10.8	12.2	11.8	Z	10.3	10.8	9.1	10.0	7.1	6.4	6.5	4.7	7.0	6.2	4.6	3.4	3.0	4.0	10.4	13.3	12.6	3.7	8.2	13.3																							
30-Sep	Z	2.5	3.4	4.9	3.4	3.3	2.6	2.7	2.5	2.1	1.0	0.6	0.5	0.4	0.4	1.3	1.4	1.1	2.5	4.6	2.8	2.2	2.6	2.7	2.2	4.9																							
																								3.0	3.4	3.0	3.3	3.0	2.6	3.7	3.3	2.7	2.0	2.0	2.2	1.7	1.7	1.8	1.6	1.3	1.5	2.4	2.9	2.9	3.1	3.6	3.2	Diurnal Average	
																								16.2	13.2	14.6	16.8	18.1	13.8	26.0	21.0	17.9	10.0	14.0	16.5	12.4	11.4	12.1	6.2	6.5	7.1	10.3	15.6	11.7	13.3	16.2	19.6	Diurnal Maximum	

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



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	682	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: 684

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Nitrogen Dioxide (NO₂) - ppb
Buffalo Viewpoint - September 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	19	7	2	2	6	54	181	95	55	45	64	50	30	24	11	680
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	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	35	19	7	2	2	6	54	181	95	55	45	64	50	30	25	12	682

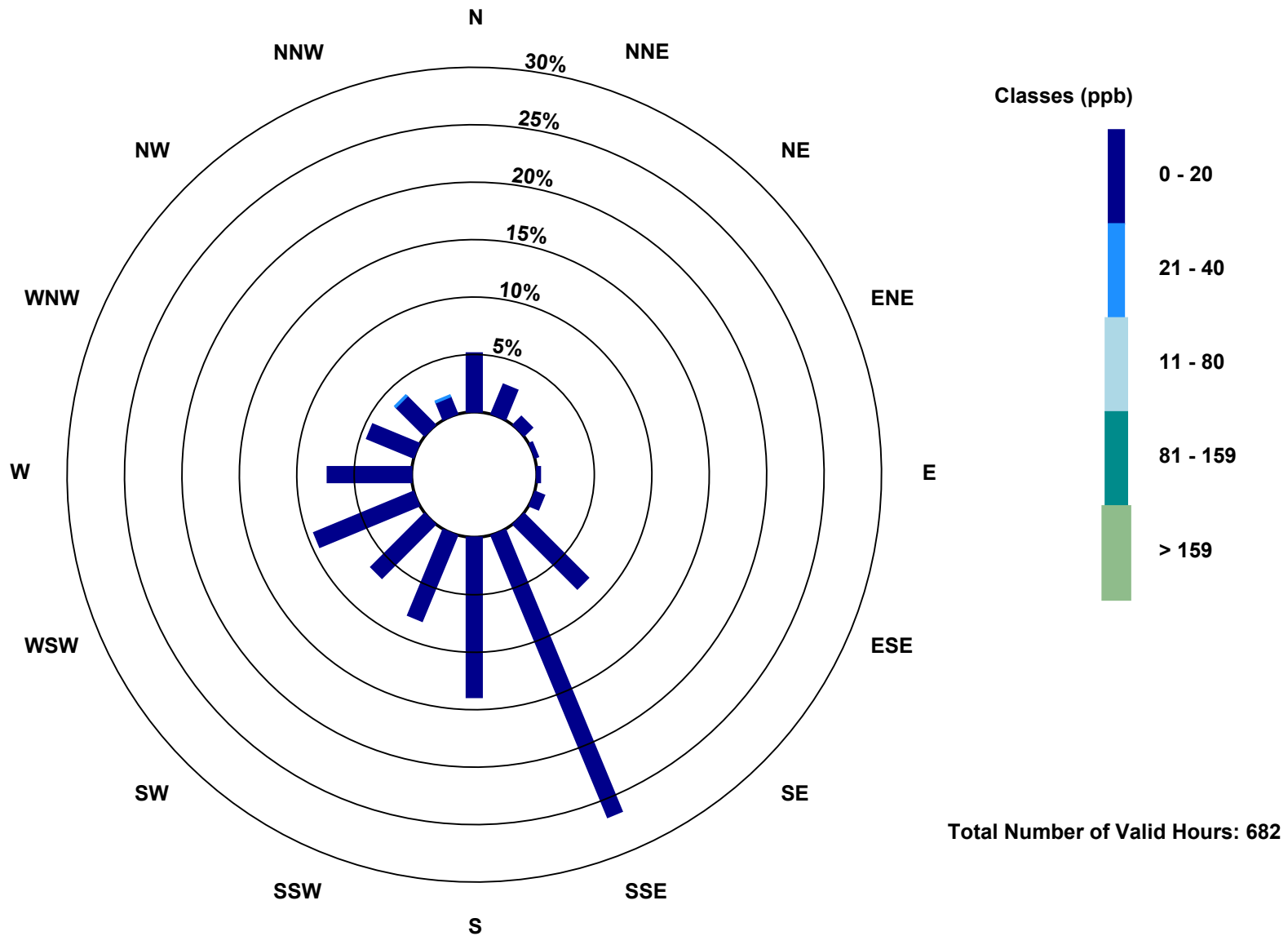
Total Number of Valid Hours: 682

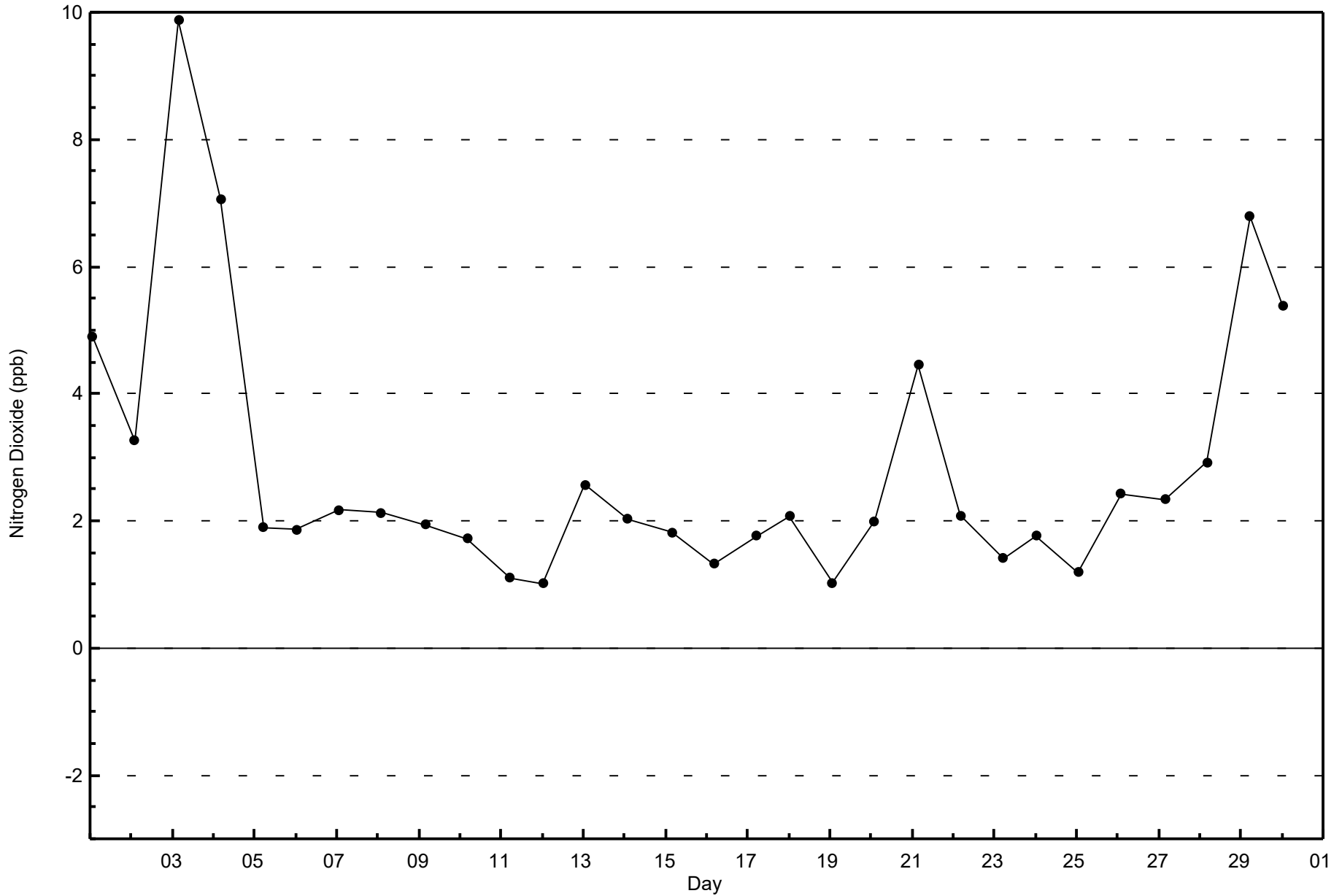
Total Number of Hours: 720

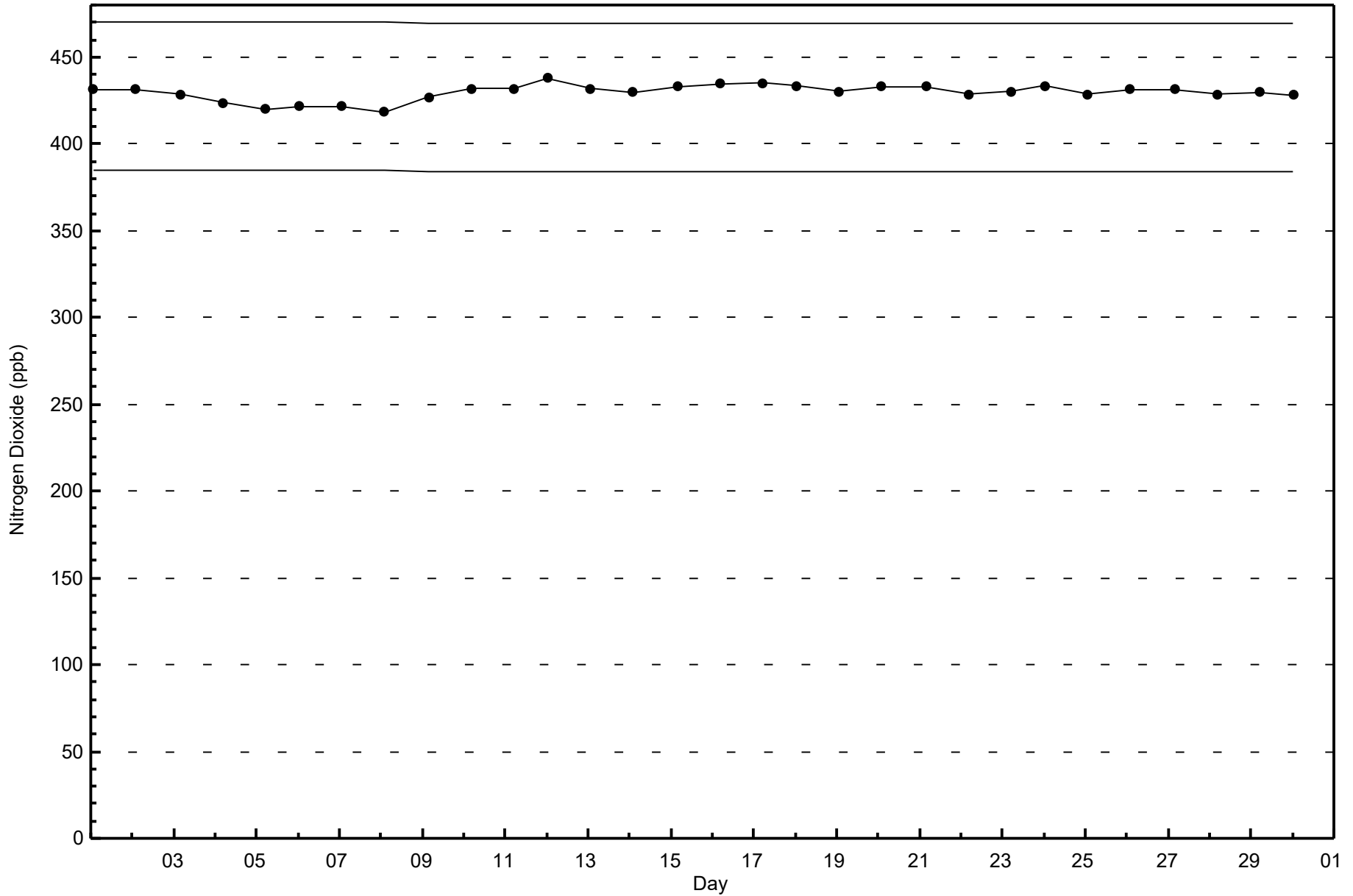


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitrogen Dioxide (NO₂) - ppb
Buffalo Viewpoint









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_x) - ppb

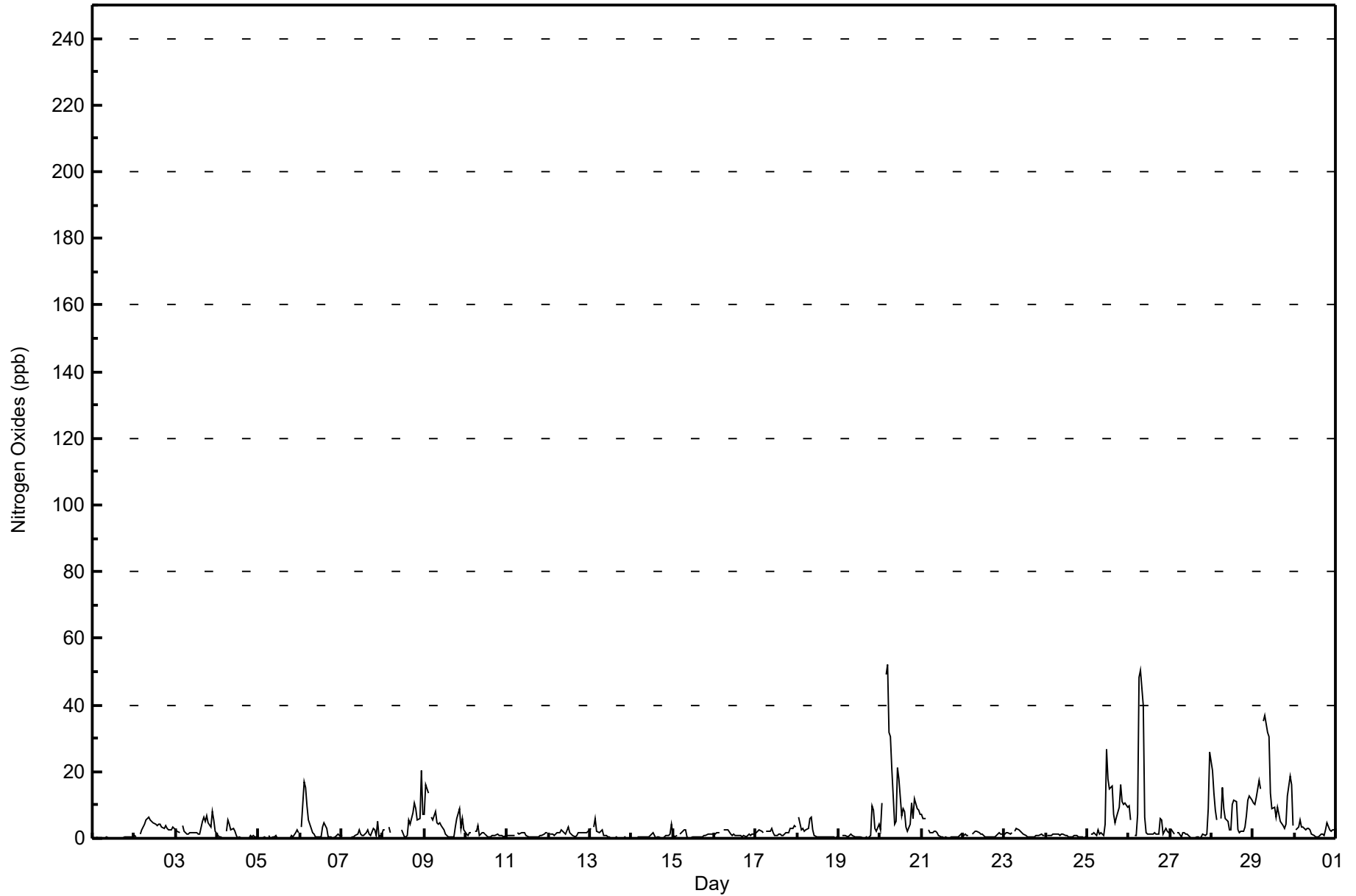
Buffalo Viewpoint - September 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 52.2 ppb on Sep 20 05:00	Maximum Daily Average: 14.5 ppb on Sep 20		Hours of Data:	684
Minimum Value: 0.0 ppb on Sep 1 06:00	Minimum Daily Average: 0.2 ppb on Sep 1		Hours of Missing Data:	36
Maximum Diurnal Average: 6.3 ppb at hour 7	Minimum Diurnal Average: 1.3 ppb at hour 17		Hours of Calibration:	36
Monthly Average: 3.26 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.2 Q ₁ = 0.5 Median = 1.4 Q ₃ = 3.1 P ₉₀ = 8.0 P ₉₉ = 32.5		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-Sep	1.3	Z	0.5	0.1	0.0	0.0	0.1	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.5	0.5	0.4	0.5	0.5	0.2	1.3	
2-Sep	0.7	0.3	Z	1.1	2.5	3.5	4.3	5.5	6.6	5.4	5.1	4.5	4.0	4.0	4.2	4.1	3.4	3.1	4.0	3.1	2.5	2.7	3.4	3.2	3.5	6.6
3-Sep	2.6	2.0	1.5	Z	3.9	2.1	1.3	1.4	1.6	1.5	1.6	1.5	1.5	1.2	1.2	5.0	6.5	4.9	6.9	4.5	3.3	8.1	5.6	2.2	3.1	8.1
4-Sep	0.8	0.5	0.4	0.1	Z	1.9	5.5	4.1	2.6	3.0	2.1	0.9	0.2	0.2	0.0	0.0	0.0	0.1	0.0	0.7	0.4	0.9	0.5	0.3	1.1	5.5
5-Sep	0.1	0.1	0.0	0.3	0.2	Z	0.7	0.2	0.4	0.2	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.8	0.6	1.6	2.4	1.9	0.5	2.4
6-Sep	Z	3.5	16.8	15.2	9.7	5.5	3.1	1.5	1.1	0.6	0.5	0.5	0.4	3.5	4.7	2.9	0.3	0.4	0.3	0.2	0.6	0.8	1.4	0.7	3.2	16.8
7-Sep	0.7	Z	0.2	0.1	0.0	0.1	0.2	0.4	0.8	1.3	2.3	1.1	0.9	0.9	1.6	2.7	1.3	0.9	2.8	2.5	0.7	5.2	0.6	1.4	1.2	5.2
8-Sep	2.6	2.6	Z	3.4	1.7	C	C	C	C	C	C	2.5	0.4	0.3	1.0	5.5	4.2	7.7	10.5	9.1	5.7	5.7	20.5	7.1	--	20.5
9-Sep	7.1	16.1	13.4	Z	6.4	5.3	8.0	4.6	4.1	4.6	3.7	2.4	1.4	0.8	0.6	0.4	0.5	0.5	3.3	6.1	9.1	3.0	5.7	2.5	4.8	16.1
10-Sep	1.1	1.0	1.7	1.7	Z	2.0	2.1	3.8	1.1	1.6	1.5	1.1	0.9	0.4	0.6	0.7	0.7	0.7	1.1	1.0	1.0	0.7	0.6	0.9	1.2	3.8
11-Sep	0.9	0.9	0.7	0.8	0.9	Z	1.6	1.5	1.7	1.5	1.5	0.7	0.4	0.4	0.3	0.6	0.5	0.4	0.5	0.7	0.8	1.1	1.5	1.7	0.9	1.7
12-Sep	Z	1.3	1.2	1.0	1.2	1.7	1.6	2.7	2.1	1.6	1.3	3.2	1.9	1.2	0.9	0.5	0.8	1.5	1.7	1.6	1.7	1.6	1.6	2.2	1.6	3.2
13-Sep	3.1	Z	3.4	5.9	2.2	1.7	2.0	2.3	0.8	0.7	0.5	0.3	0.1	0.1	0.1	0.2	0.2	0.0	0.1	0.2	0.2	0.0	0.2	0.1	1.1	5.9
14-Sep	0.1	0.0	Z	0.5	0.4	0.2	0.3	0.2	0.3	0.3	0.4	1.0	1.7	0.9	0.2	0.3	0.3	0.1	0.1	0.3	0.7	0.9	1.1	4.3	0.6	4.3
15-Sep	1.5	0.6	0.7	Z	1.1	1.7	2.7	2.4	0.6	0.2	0.2	0.4	0.3	0.3	0.4	0.2	0.6	0.5	0.6	1.0	1.4	1.4	1.3	1.2	0.9	2.7
16-Sep	1.3	1.7	1.7	1.7	Z	2.4	2.5	2.6	2.6	1.3	0.9	1.4	0.8	0.8	0.7	0.7	0.6	0.7	0.5	0.9	1.4	0.9	1.4	1.5	1.3	2.6
17-Sep	1.6	2.0	2.5	2.0	1.7	Z	2.0	2.2	2.3	2.8	1.5	0.9	1.0	1.2	1.3	1.0	1.0	1.7	1.8	1.8	3.1	3.1	3.9	3.5	2.0	3.9
18-Sep	Z	6.6	2.6	2.8	2.0	2.4	2.8	5.8	6.5	2.5	0.9	0.6	0.4	0.3	0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.6	1.7	6.6
19-Sep	0.5	Z	0.8	0.9	0.9	0.4	1.0	1.3	1.0	0.6	0.4	0.3	0.3	0.3	0.2	0.2	0.3	0.2	0.7	9.7	8.6	3.1	2.3	4.2	1.6	9.7
20-Sep	2.6	10.4	Z	49.3	52.2	31.8	30.7	20.8	4.1	5.2	21.2	17.7	6.7	9.0	8.0	3.6	2.0	4.4	10.4	5.9	11.7	8.8	8.6	7.2	14.5	52.2
21-Sep	7.2	6.1	5.8	Z	2.4	1.7	1.5	1.9	2.2	1.7	0.8	0.2	0.2	0.2	0.3	0.1	0.1	0.3	0.2	0.3	0.3	0.6	0.8	1.1	1.6	7.2
22-Sep	1.0	1.1	1.0	0.9	Z	1.4	1.8	2.0	2.1	1.7	1.4	1.1	1.0	0.5	0.5	0.5	0.5	0.5	0.6	0.7	1.4	1.6	1.3	1.4	1.1	2.1
23-Sep	1.5	1.6	1.7	1.4	1.6	Z	2.2	3.0	2.7	2.2	1.8	1.2	0.7	0.6	0.6	0.5	0.4	0.5	0.8	1.0	1.0	1.1	1.0	0.7	1.3	3.0
24-Sep	Z	1.0	1.0	0.9	1.1	1.2	1.1	1.2	1.0	1.1	1.2	0.8	0.7	0.6	0.5	0.6	0.7	0.9	0.8	0.4	0.5	0.4	0.2	0.3	0.8	1.2
25-Sep	0.5	Z	1.1	1.4	1.9	0.7	2.7	1.4	1.7	0.9	4.3	26.9	17.9	15.0	15.8	7.2	4.7	6.6	9.4	16.0	10.8	10.1	10.5	9.1	7.7	26.9
26-Sep	9.8	5.6	Z	1.0	0.9	7.2	48.2	50.5	39.9	6.5	1.9	1.3	1.4	1.4	1.3	1.6	1.2	1.4	5.9	5.3	1.2	2.8	2.0	1.5	8.7	50.5
27-Sep	1.9	2.5	1.4	Z	1.8	1.6	0.5	1.7	1.8	1.3	1.4	0.5	0.2	0.2	0.2	0.3	0.4	0.2	0.4	1.4	1.0	1.4	9.0	26.0	2.5	26.0
28-Sep	20.2	13.5	8.7	5.4	Z	5.8	15.3	8.8	5.8	5.2	2.5	2.4	10.0	11.6	10.8	2.7	1.5	2.1	2.1	3.4	6.7	11.6	12.9	11.5	7.8	20.2
29-Sep	10.6	10.0	12.1	17.4	14.6	Z	35.1	37.0	32.0	30.4	13.4	8.8	9.3	6.3	9.3	7.1	4.9	3.6	3.1	4.1	12.6	18.7	16.2	3.7	13.9	37.0
30-Sep	Z	2.5	3.4	5.4	3.4	3.4	2.6	2.8	2.8	2.7	1.3	0.8	0.5	0.4	0.4	1.3	1.4	1.1	2.5	4.7	2.8	2.2	2.6	2.7	2.3	5.4

3.3	3.7	3.4	4.8	4.6	3.6	6.3	6.0	4.6	3.1	2.7	2.8	2.2	2.1	2.2	1.7	1.3	1.5	2.4	2.9	3.1	3.4	4.0	3.5	Diurnal Average	
20.2	16.1	16.8	49.3	52.2	31.8	48.2	50.5	39.9	30.4	21.2	26.9	17.9	15.0	15.8	7.2	6.5	7.7	10.5	16.0	12.6	18.7	20.5	26.0	Diurnal Maximum	

Z - zerospan C - Calibration





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	669	97.81	97.81
21 - 40	11	1.61	99.42
41 - 80	4	0.58	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

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

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	33	19	7	2	2	6	54	181	94	55	45	63	49	30	22	7	669
21 - 40	2	0	0	0	0	0	0	0	1	0	0	1	1	0	2	2	9
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	4
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	35	19	7	2	2	6	54	181	95	55	45	64	50	30	25	12	682

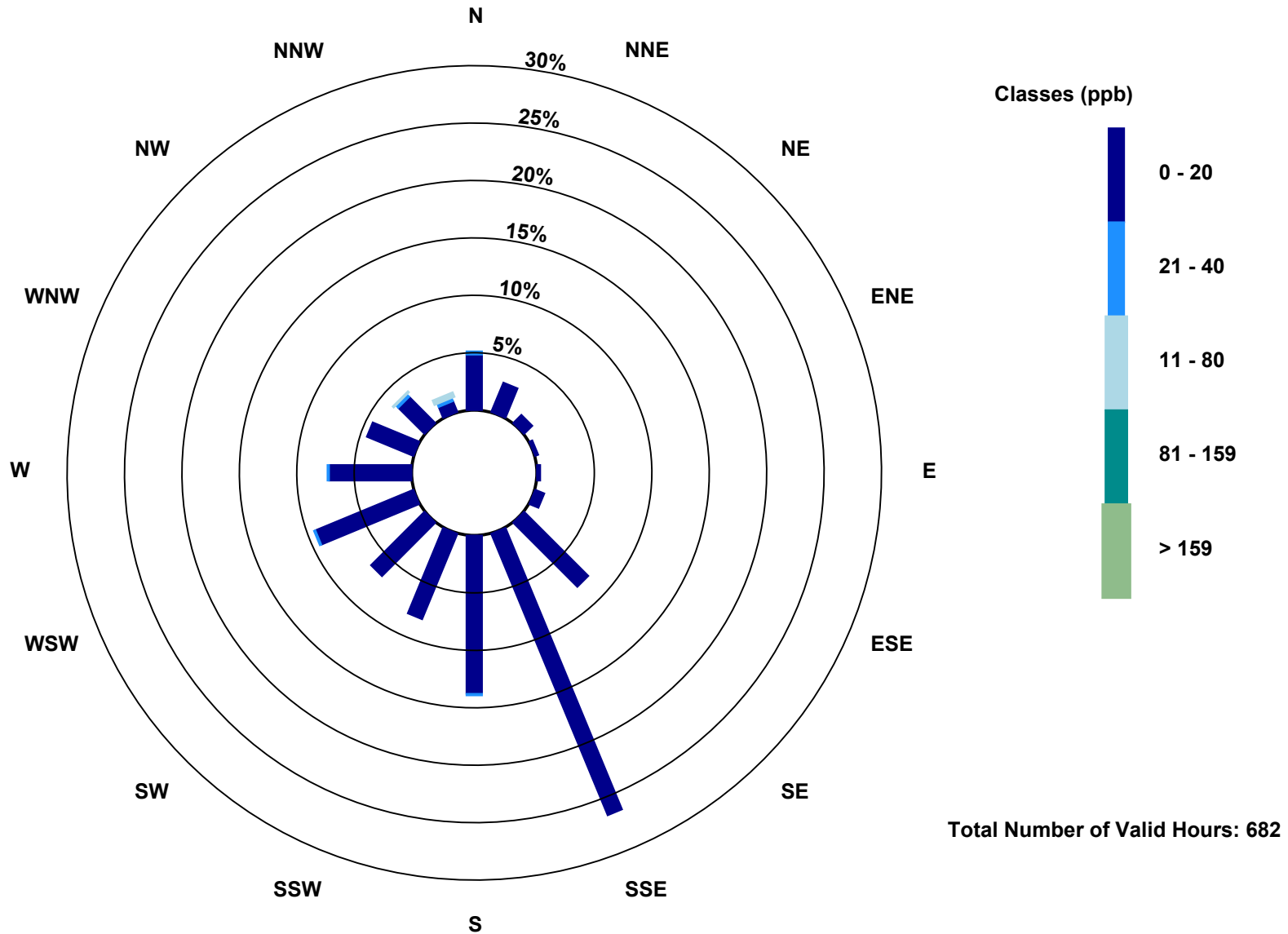
Total Number of Valid Hours: 682

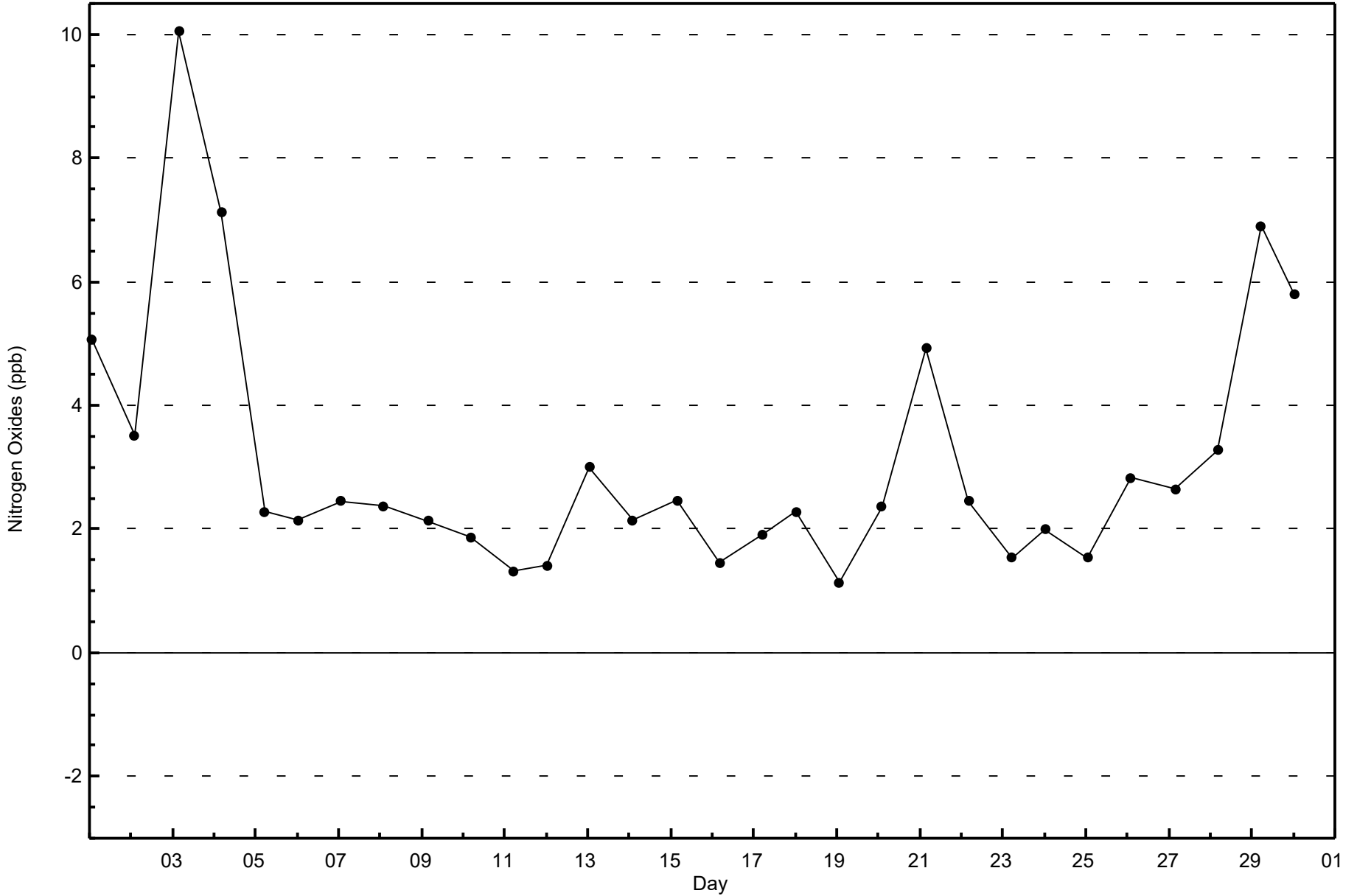
Total Number of Hours: 720

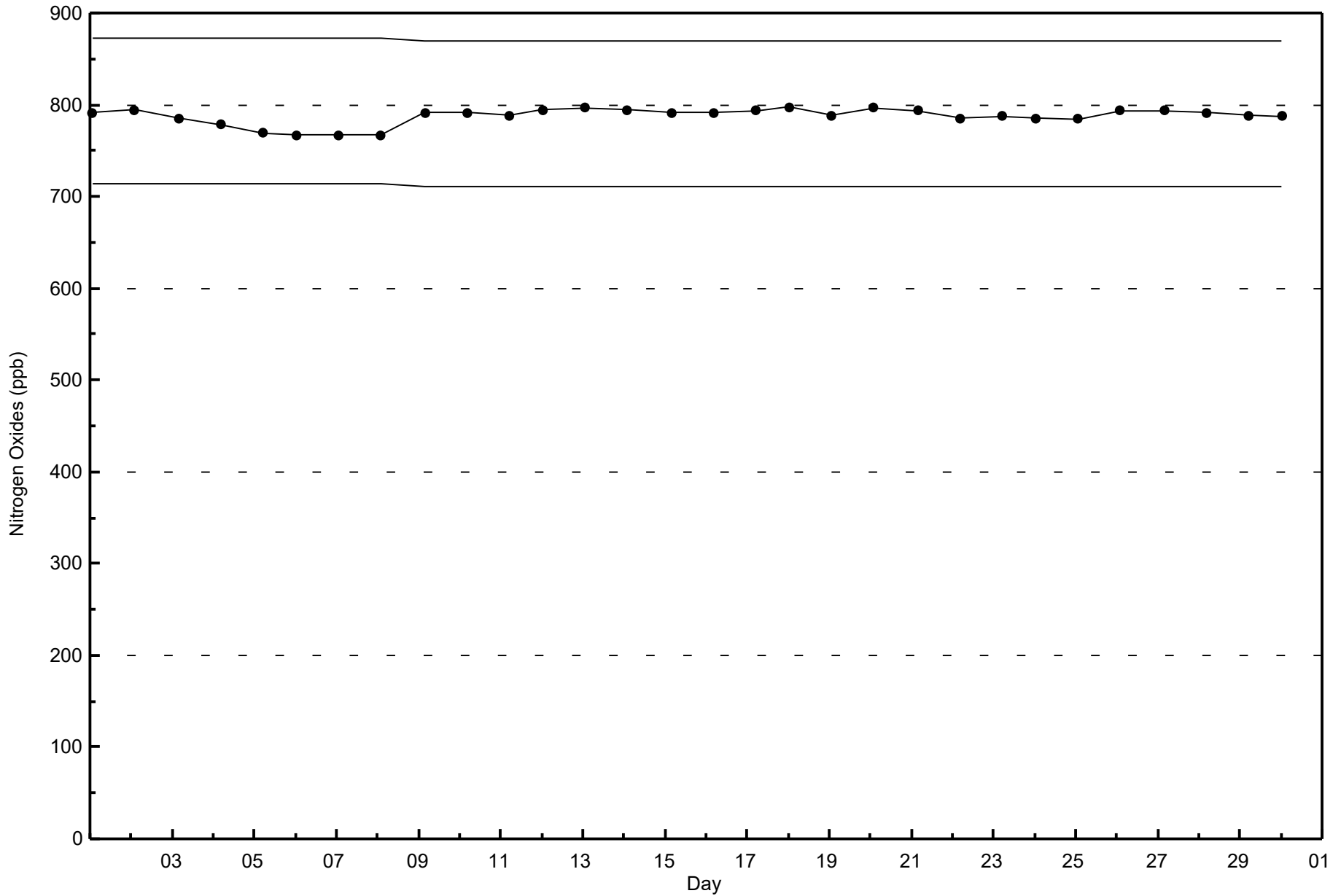


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitrogen Oxides (NO_x) - ppb
Buffalo Viewpoint









Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O₃) - ppb

Buffalo Viewpoint - September 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 51.9 ppb on Sep 15 18:00	Maximum Daily Average: 41.2 ppb on Sep 23		Hours of Data:	670
Minimum Value: 1.7 ppb on Sep 9 06:00	Minimum Daily Average: 7.7 ppb on Sep 29		Hours of Missing Data:	50
Maximum Diurnal Average: 34.0 ppb at hour 17	Minimum Diurnal Average: 15.4 ppb at hour 8		Hours of Calibration:	31
Monthly Average: 24.56 ppb	Percentiles: P ₁ = 2.8 P ₁₀ = 9.1 Q ₁ = 15.1 Median = 24.4 Q ₃ = 33.5 P ₉₀ = 40.6 P ₉₉ = 49.6		Percent Operational Time:	97.4

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-Sep	Z	16.8	19.3	20.6	20.4	20.4	19.6	19.3	20.6	22.6	26.4	30.6	36.3	38.3	39.1	40.8	42.0	40.5	40.7	43.4	42.2	41.7	41.1	39.6	31.4	43.4	
2-Sep	35.6	Z	33.0	30.3	26.8	23.8	21.3	18.9	18.6	19.4	17.0	18.0	20.5	23.0	26.4	26.3	26.5	27.6	22.7	24.4	26.0	26.9	27.1	23.2	24.5	35.6	
3-Sep	20.9	19.6	Z	19.8	13.5	12.7	11.7	11.2	10.0	9.6	10.3	12.3	20.9	20.5	25.6	28.5	30.2	27.3	27.6	26.3	21.3	16.9	18.2	19.1	18.9	30.2	
4-Sep	18.7	16.9	15.4	Z	15.1	16.1	19.5	21.3	23.1	26.1	25.8	27.2	26.9	26.8	30.0	33.8	36.1	36.6	35.7	27.2	25.1	24.2	24.2	24.0	25.0	36.6	
5-Sep	23.4	20.2	20.4	17.4	Z	13.5	11.4	12.0	13.7	16.8	22.9	28.8	29.8	32.4	34.3	35.3	35.0	32.2	29.4	31.0	29.0	26.5	24.2	22.3	24.4	35.3	
6-Sep	18.6	16.6	8.2	7.6	10.9	Z	13.2	14.7	16.0	15.1	15.1	13.6	13.9	12.3	12.5	16.5	24.7	24.7	22.8	17.1	12.6	11.9	9.8	12.7	14.8	24.7	
7-Sep	Z	12.3	12.0	10.9	10.0	11.1	11.1	9.5	10.4	12.5	14.2	17.5	24.1	28.4	27.6	24.8	28.3	23.6	18.0	14.0	13.1	5.6	6.8	7.7	15.4	28.4	
8-Sep	7.4	Z	5.5	5.2	6.7	6.9	7.2	7.6	10.0	14.5	17.6	19.2	26.2	27.1	26.0	21.0	23.1	21.8	22.0	23.2	24.5	21.9	11.4	4.1	15.7	27.1	
9-Sep	2.9	2.8	Z	2.4	2.0	1.7	2.9	7.2	9.7	12.8	18.0	26.2	33.9	37.4	36.6	36.7	36.7	34.1	29.4	19.8	15.5	19.0	13.5	18.5	18.2	37.4	
10-Sep	19.6	19.5	18.5	Z	9.1	8.1	9.4	10.4	16.8	20.0	25.3	31.1	37.1	38.9	41.3	44.9	44.7	41.7	40.0	37.9	35.3	32.5	29.7	28.6	27.8	44.9	
11-Sep	28.0	26.7	25.3	24.4	Z	21.6	21.3	23.9	28.0	32.5	37.8	46.2	48.5	49.5	49.7	49.2	47.7	47.4	45.7	43.2	42.0	41.3	39.4	37.1	37.2	49.7	
12-Sep	37.6	39.7	37.0	36.8	34.6	Z	27.0	24.7	25.5	28.6	29.9	27.3	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	39.7	
13-Sep	AF	AF	AF	AF	AF	AF	AF	Z	C	C	19.8	23.0	26.9	28.0	31.5	33.0	35.4	38.7	38.5	37.2	34.3	30.7	26.9	25.3	23.4	--	38.7
14-Sep	21.1	Z	19.1	18.0	19.6	21.7	21.0	19.1	18.6	19.0	20.9	23.0	26.9	30.4	30.6	29.7	29.5	29.2	27.9	26.3	24.6	23.2	20.2	12.3	23.1	30.6	
15-Sep	11.6	16.3	Z	14.9	12.5	9.4	9.1	12.0	17.9	22.6	27.2	32.6	36.8	40.7	44.8	47.6	50.0	51.9	49.3	46.9	43.3	40.7	40.9	40.4	31.3	51.9	
16-Sep	40.3	37.9	37.0	Z	31.5	30.2	29.9	27.9	25.8	33.0	35.2	37.4	39.7	41.9	44.1	45.5	45.5	42.3	38.7	37.3	32.3	28.0	28.2	28.6	35.6	45.5	
17-Sep	27.0	26.0	22.6	21.6	Z	17.8	17.4	18.5	18.6	22.9	33.9	38.5	41.5	46.4	48.5	46.1	43.9	47.0	42.7	38.6	33.9	29.7	26.3	22.1	31.8	48.5	
18-Sep	19.7	18.1	18.2	15.9	18.4	Z	16.9	14.0	12.0	21.5	31.1	38.8	39.9	40.6	40.7	33.6	29.0	27.3	24.6	21.6	22.2	25.9	24.2	21.2	25.0	40.7	
19-Sep	Z	17.1	19.8	15.8	15.3	15.1	14.2	13.6	15.9	18.9	21.0	21.3	22.9	24.4	24.9	25.7	26.2	24.9	22.5	12.2	11.3	15.9	17.4	14.4	18.7	26.2	
20-Sep	15.2	Z	6.0	2.8	2.7	2.1	2.7	3.2	11.4	15.9	14.6	22.9	33.1	39.5	42.5	39.0	32.4	24.4	19.5	23.4	16.3	13.9	13.2	14.8	17.9	42.5	
21-Sep	12.2	10.5	Z	13.3	13.6	12.7	10.3	9.3	11.9	16.1	26.5	30.2	32.1	33.9	34.1	34.8	33.4	33.2	33.1	32.3	30.9	32.0	32.1	32.8	24.4	34.8	
22-Sep	32.4	31.7	31.2	Z	28.5	27.2	27.6	27.1	29.2	32.7	38.6	40.6	42.8	43.8	44.5	44.0	45.5	45.1	42.8	40.2	38.6	38.8	38.7	37.7	36.9	45.5	
23-Sep	36.8	35.9	34.8	34.3	Z	33.5	33.0	31.8	34.8	37.1	39.8	45.2	48.0	48.3	50.0	49.8	50.3	49.6	46.3	44.1	43.0	41.5	40.4	39.8	41.2	50.3	
24-Sep	38.6	37.6	36.2	36.2	35.2	Z	32.5	31.3	30.9	30.0	29.7	34.1	33.1	31.7	30.9	29.6	29.8	28.2	27.9	27.1	28.3	35.0	34.8	33.2	32.3	38.6	
25-Sep	Z	30.9	26.4	24.9	21.2	21.8	18.4	18.1	17.9	19.5	21.2	20.2	26.0	29.1	28.9	36.2	37.3	37.1	33.5	19.9	21.8	19.2	22.3	23.6	25.0	37.3	
26-Sep	23.0	Z	30.7	33.1	33.5	26.7	3.2	3.9	7.3	25.5	35.0	37.6	40.6	42.0	41.7	40.6	39.0	36.1	27.7	30.8	33.4	30.5	27.1	27.2	29.4	42.0	
27-Sep	24.7	18.1	Z	22.0	22.1	22.5	24.6	21.6	21.7	27.3	32.4	32.7	35.2	37.1	39.7	40.2	39.0	37.7	36.8	32.0	30.2	29.1	18.6	6.2	28.3	40.2	
28-Sep	9.8	9.2	9.4	Z	11.4	10.1	3.9	6.7	8.2	7.6	9.3	9.7	6.4	5.8	5.3	9.6	12.6	11.9	10.6	8.8	6.5	2.8	3.0	3.9	7.9	12.6	
29-Sep	5.2	5.4	3.7	3.0	Z	3.1	2.8	2.7	2.9	3.9	6.6	9.5	11.6	15.1	13.7	13.7	14.1	14.4	13.3	10.3	4.5	2.9	4.3	10.7	7.7	15.1	
30-Sep	11.2	10.8	9.6	6.7	5.7	Z	6.5	5.5	5.4	6.6	9.0	10.4	13.1	15.6	15.1	15.7	15.6	17.1	15.1	11.3	12.4	7.6	7.6	8.8	10.5	17.1	

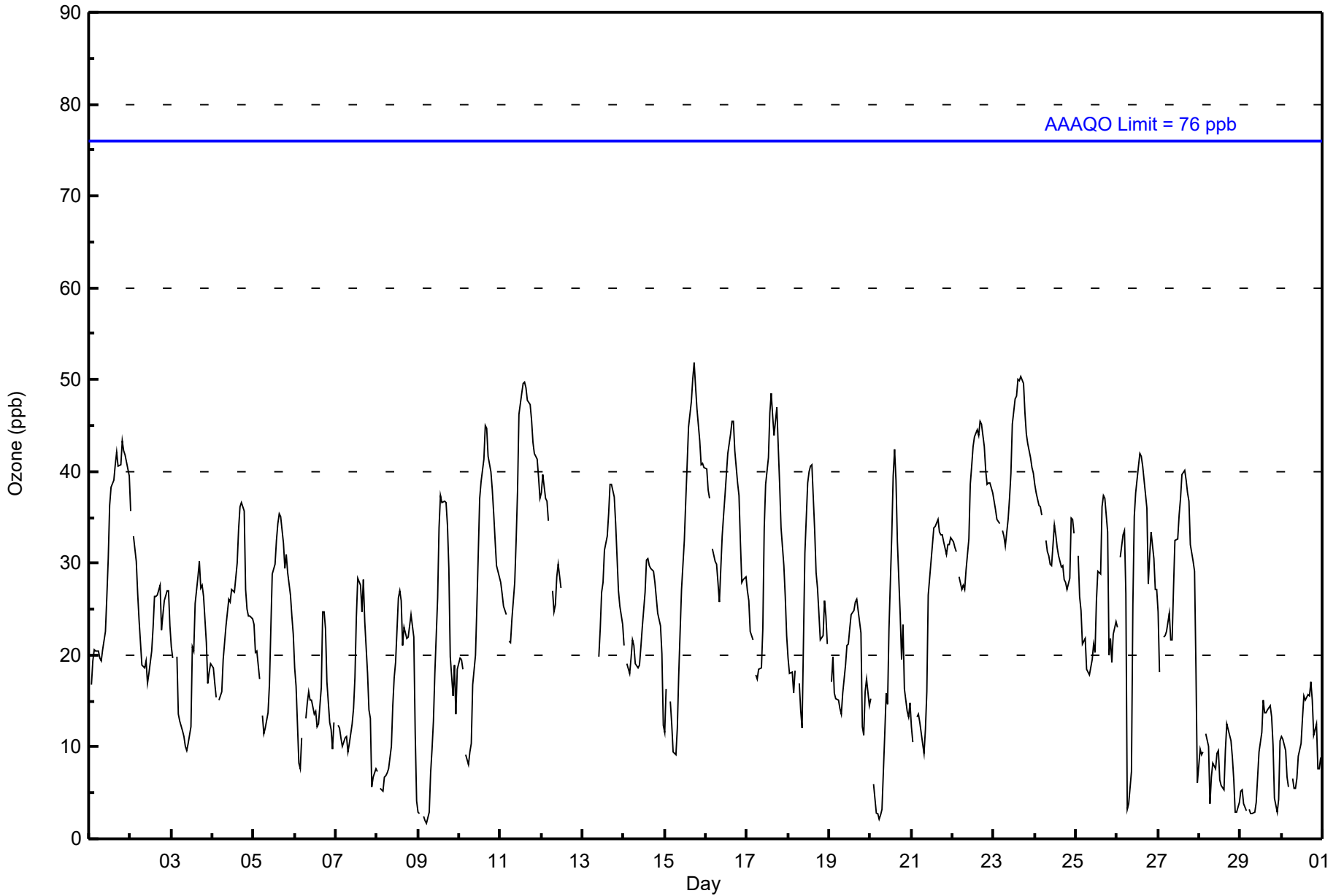
21.6	20.7	20.8	18.2	17.5	16.2	15.5	15.4	17.0	20.3	23.8	27.0	30.2	32.2	33.2	33.6	34.0	32.9	30.5	27.8	25.9	24.6	23.1	22.0	Diurnal Average	
40.3	39.7	37.0	36.8	35.2	33.5	33.0	31.8	34.8	37.1	39.8	46.2	48.5	49.5	50.0	49.8	50.3	51.9	49.3	46.9	43.3	41.7	41.1	40.4	Diurnal Maximum	

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



Wood Buffalo Environmental Association
Hourly Averages

Ozone (O₃) - ppb
Buffalo Viewpoint - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ozone (O₃) - ppb
Buffalo Viewpoint - September 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	262	39.10	39.10
21 - 50	407	60.75	99.85
51 - 82	1	0.15	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 670

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Ozone (O₃) - ppb
Buffalo Viewpoint - September 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	26	9	4	1	2	3	15	80	39	10	9	8	17	15	11	11	260
21 - 50	8	10	3	1	0	3	41	103	50	41	34	51	31	15	13	3	407
51 - 82	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	34	19	7	2	2	6	56	183	90	51	43	59	48	30	24	14	668

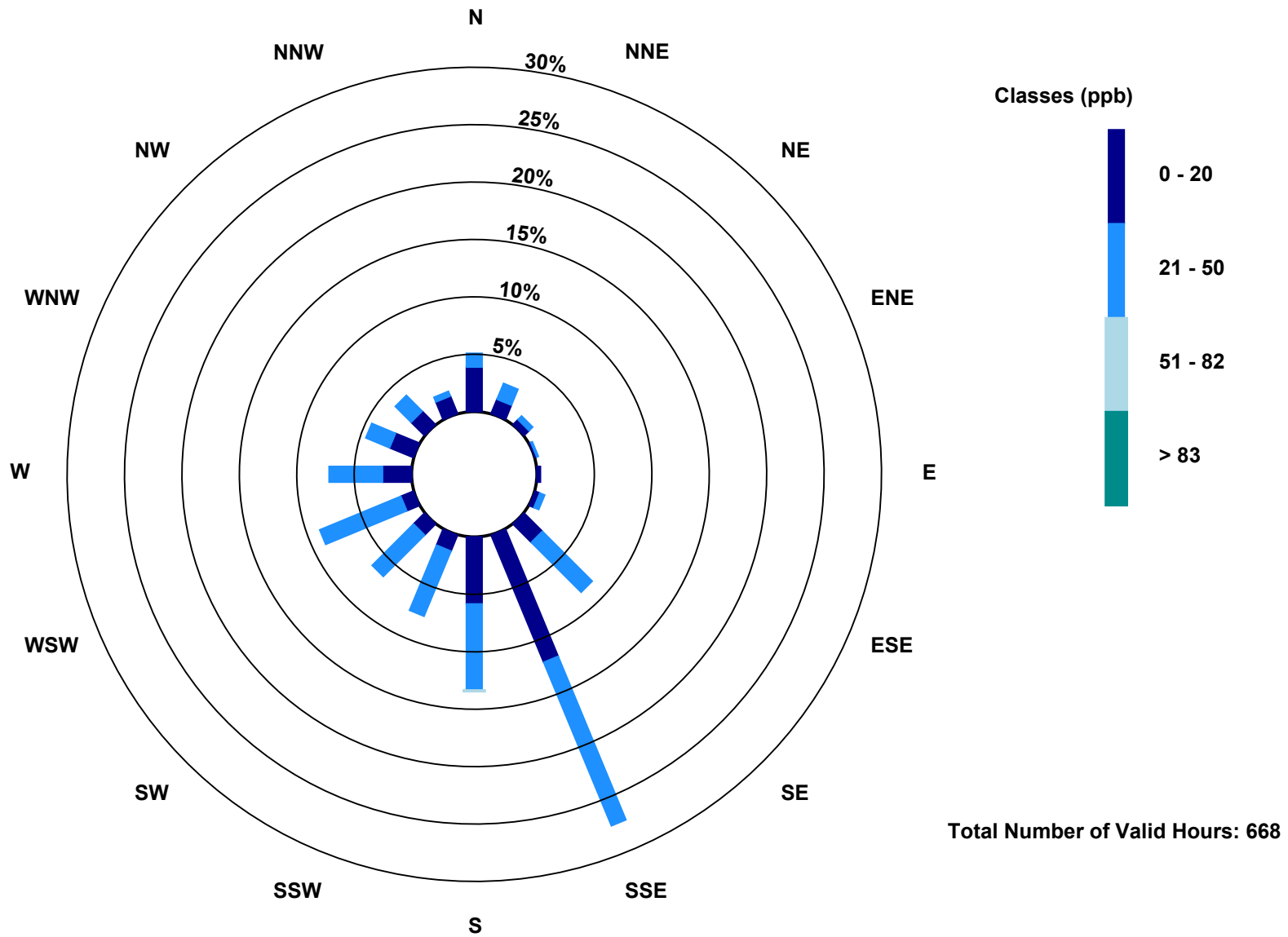
Total Number of Valid Hours: 668

Total Number of Hours: 720

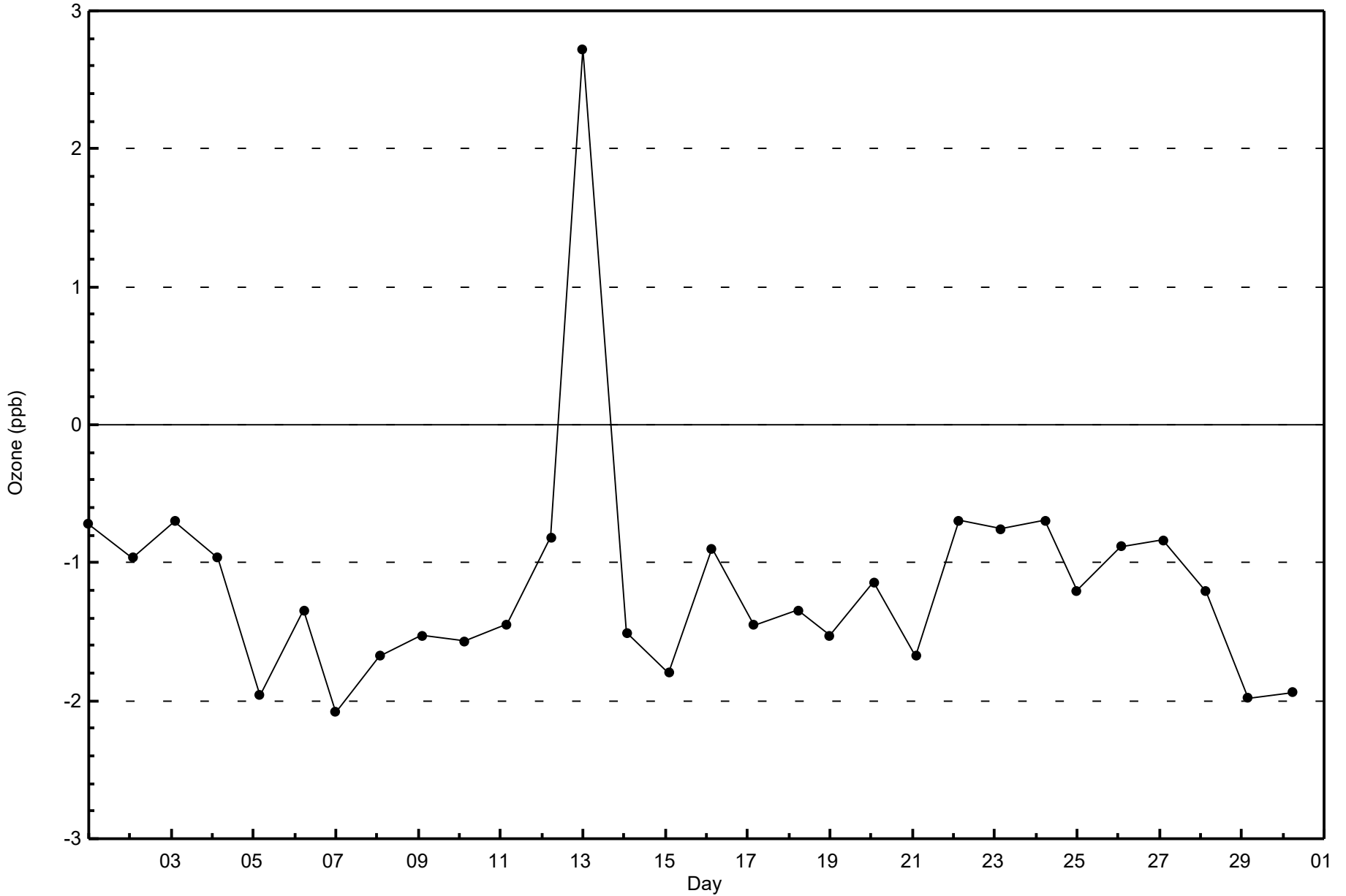


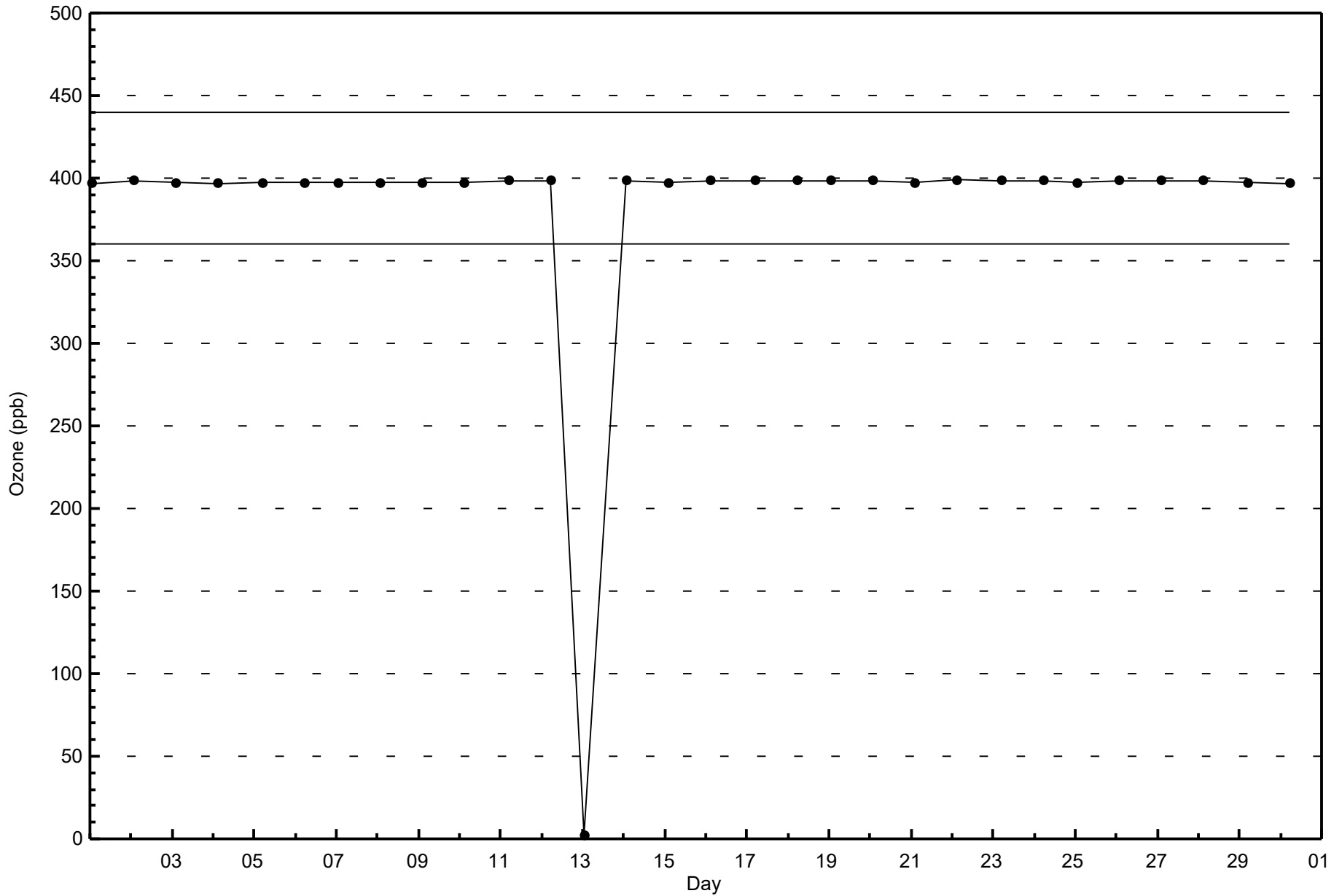
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Ozone (O₃) - ppb
Buffalo Viewpoint



Total Number of Valid Hours: 668







Wood Buffalo Environmental Association

Summary of Hour Averages

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

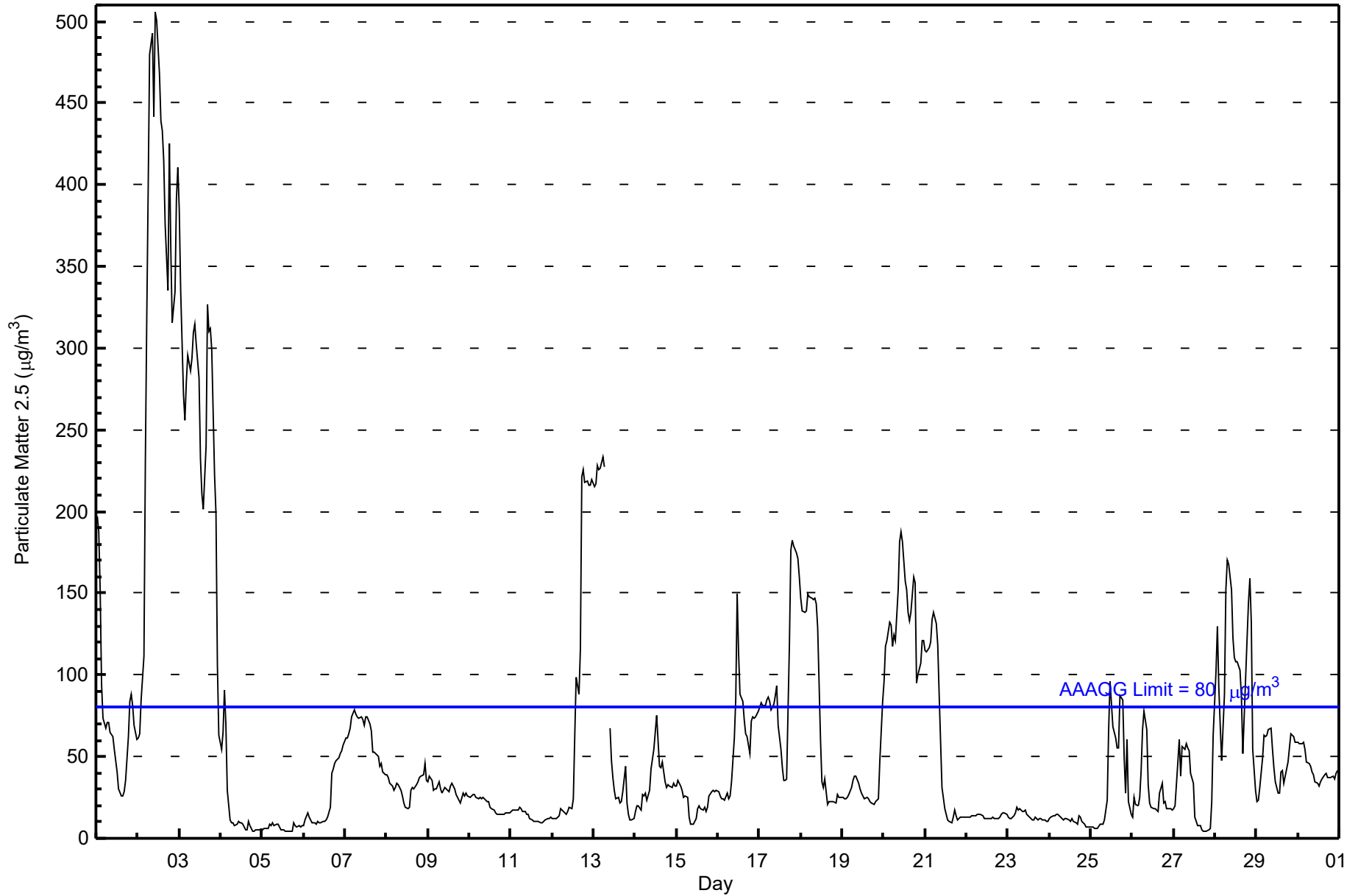
Buffalo Viewpoint - September 2023

Number of Exceedences (AAAQO):	1-hr: 159	24-hr: 19	Hours in Service:	720
Maximum Value: 505.9 µg/m ³ on Sep 2 11:00	Maximum Daily Average: 349.8 µg/m ³ on Sep 2		Hours of Data:	718
Minimum Value: 3.9 µg/m ³ on Sep 27 20:00	Minimum Daily Average: 6.7 µg/m ³ on Sep 5		Hours of Missing Data:	2
Maximum Diurnal Average: 74.9 µg/m ³ at hour 7	Minimum Diurnal Average: 53.6 µg/m ³ at hour 16		Hours of Calibration:	2
Monthly Average: 63.97 µg/m ³	Percentiles: P ₁ = 4.7 P ₁₀ = 9.9 Q ₁ = 14.7 Median = 30.6 Q ₃ = 70.8 P ₉₀ = 156.7 P ₉₉ = 431.8		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-Sep	196.7	187.6	152.5	94.5	73.6	67.3	70.9	70.5	64.6	62.1	54.5	47.1	40.8	30.2	26.1	25.6	28.8	35.5	61.8	83.5	88.2	80.8	69.3	60.7	73.9	196.7
2-Sep	61.5	64.2	85.0	111.2	230.8	319.4	398.0	479.9	492.5	442.0	505.9	500.8	467.8	439.0	433.1	414.6	376.0	335.0	425.6	361.5	315.8	334.9	391.8	410.3	349.8	505.9
3-Sep	384.7	335.7	271.0	255.7	278.8	295.3	285.8	294.0	309.8	314.6	302.6	281.8	232.8	210.8	201.6	240.4	326.5	309.9	312.2	298.8	222.1	198.4	106.6	63.3	263.9	384.7
4-Sep	54.8	65.2	90.4	70.0	29.4	11.2	9.6	9.5	7.5	8.5	10.8	9.8	9.2	8.4	5.6	5.2	10.0	7.9	4.7	4.4	4.9	4.8	4.8	5.3	18.8	90.4
5-Sep	5.6	5.7	5.8	6.4	9.0	7.9	9.2	7.6	8.5	8.9	7.0	5.1	4.9	4.7	4.4	4.6	4.4	4.6	9.8	7.5	6.9	7.5	6.6	7.9	6.7	9.8
6-Sep	7.8	11.0	15.8	12.7	10.9	9.5	9.1	8.6	10.6	9.3	9.9	10.5	10.7	11.3	12.7	19.3	39.6	42.7	45.5	47.1	49.2	51.9	53.2	57.0	23.6	57.0
7-Sep	61.0	61.0	64.2	67.2	74.1	78.3	76.1	74.4	73.6	74.4	72.2	69.0	74.1	74.0	69.8	65.7	52.5	52.4	50.9	50.1	44.3	45.8	40.3	38.5	62.7	78.3
8-Sep	39.2	36.9	34.0	32.3	29.7	30.7	33.6	32.5	29.7	25.7	21.4	19.1	18.4	19.1	29.4	30.7	30.0	32.6	34.4	36.8	37.6	39.2	45.6	35.2	31.4	45.6
9-Sep	34.3	38.3	35.6	29.2	30.6	30.4	34.5	30.0	28.0	29.5	30.9	29.2	28.4	32.0	34.1	30.6	26.5	25.2	23.3	22.0	27.4	26.3	27.4	25.9	29.6	38.3
10-Sep	25.3	25.8	26.7	27.0	24.7	24.6	25.1	24.6	24.9	23.7	22.6	22.2	18.9	17.9	17.3	15.6	14.8	14.6	14.5	14.7	15.0	15.2	15.6	15.8	20.3	27.0
11-Sep	16.2	16.9	17.2	17.5	17.7	19.4	17.8	16.8	16.0	15.0	14.4	11.9	11.2	10.6	10.0	9.9	10.1	9.8	9.8	10.6	11.0	11.9	12.3	12.6	13.6	19.4
12-Sep	12.5	12.0	12.5	13.0	13.6	18.3	16.4	15.4	15.1	16.3	18.7	17.8	24.2	62.4	98.2	88.6	116.2	221.6	225.7	217.4	218.6	216.1	216.4	219.8	87.8	225.7
13-Sep	215.2	217.4	228.5	225.6	226.7	233.7	227.1	C	C	67.6	47.9	37.2	29.4	23.9	25.1	21.2	22.4	28.6	44.3	22.0	14.4	11.0	11.3	12.0	90.6	233.7
14-Sep	16.6	19.9	19.5	17.0	26.8	26.3	27.3	23.1	29.5	42.3	48.6	54.1	74.9	59.5	44.2	43.0	46.9	34.6	31.0	32.5	32.4	30.7	33.9	31.8	35.3	74.9
15-Sep	31.6	35.7	31.9	29.1	25.5	25.9	24.8	13.2	9.1	8.5	8.8	12.1	17.9	20.1	18.2	17.2	19.1	16.3	18.6	26.1	28.4	29.3	28.8	29.4	21.9	35.7
16-Sep	28.1	26.3	24.6	24.0	22.9	27.6	24.2	25.7	34.9	61.5	85.9	149.1	113.0	87.9	84.3	72.8	63.6	62.6	52.0	71.5	74.1	73.2	74.7	77.6	60.1	149.1
17-Sep	80.3	82.9	81.6	81.5	84.3	86.2	84.0	78.4	81.8	87.1	93.8	68.9	54.5	43.5	35.5	35.2	36.2	119.0	176.3	182.3	178.8	174.7	171.2	159.9	98.3	182.3
18-Sep	146.8	138.9	137.9	139.4	149.8	147.5	147.1	146.3	147.0	143.4	128.9	60.6	34.6	31.4	36.1	20.8	22.6	22.9	22.4	22.1	21.7	26.9	25.2	24.8	81.0	149.8
19-Sep	25.2	24.3	24.1	24.8	27.2	31.3	35.2	37.8	37.9	33.7	30.2	27.9	25.7	24.4	25.1	24.2	22.8	21.7	21.1	22.4	22.9	24.1	47.9	83.9	30.2	83.9
20-Sep	96.2	117.2	120.6	132.0	130.9	117.7	124.6	121.2	152.4	181.4	187.4	181.5	157.7	152.0	138.4	133.3	138.5	160.2	156.3	95.0	100.5	107.2	121.4	120.8	135.2	187.4
21-Sep	114.7	114.4	116.3	120.4	133.8	137.9	131.8	118.6	88.5	59.4	30.9	17.9	15.1	11.6	10.3	9.9	13.3	17.0	13.9	11.0	12.7	13.4	13.2	12.8	55.8	137.9
22-Sep	12.7	13.2	13.3	13.5	13.7	14.2	14.5	14.3	14.4	13.6	12.2	12.3	12.2	12.4	12.0	13.0	11.7	11.9	12.0	13.1	14.5	15.1	15.2	14.7	13.3	15.2
23-Sep	13.2	12.3	12.3	13.4	15.1	18.6	16.9	17.7	16.2	16.7	17.6	14.6	12.7	12.4	11.2	11.5	12.9	11.5	12.2	11.8	11.0	11.5	10.1	10.3	13.5	18.6
24-Sep	11.9	13.4	14.1	13.9	14.7	14.4	12.7	12.1	11.6	11.8	11.9	11.0	10.7	11.8	10.6	9.3	8.7	13.9	12.9	10.8	8.9	7.1	7.0	7.1	11.3	14.7
25-Sep	7.1	6.7	6.4	6.2	6.1	8.5	9.0	8.4	11.4	22.9	67.0	95.8	82.5	68.5	61.0	55.1	55.7	87.6	84.7	49.1	27.9	60.3	22.9	14.7	38.6	95.8
26-Sep	12.7	25.1	21.0	20.1	25.5	41.2	66.3	77.8	66.3	32.9	21.8	18.9	18.5	18.0	17.1	16.7	28.0	33.3	21.8	22.1	18.1	18.0	17.9	17.5	28.2	77.8
27-Sep	18.3	19.6	46.8	60.4	38.1	56.1	54.5	57.9	55.6	53.4	39.8	33.3	12.9	10.6	7.8	7.7	5.3	4.7	4.2	3.9	5.4	6.1	22.1	62.7	28.6	62.7
28-Sep	102.3	129.8	92.8	68.9	47.5	88.3	152.4	170.2	167.7	151.8	123.1	110.6	107.9	107.9	103.1	86.5	51.9	75.6	122.0	143.9	159.4	132.4	54.2	29.3	107.5	170.2
29-Sep	22.5	22.9	31.0	49.4	63.2	62.0	63.1	66.9	67.2	54.2	43.5	34.9	27.9	27.2	40.5	41.3	33.5	42.4	47.1	55.6	64.0	62.5	58.4	59.2	47.5	67.2
30-Sep	58.4	58.3	57.8	58.4	54.6	46.5	46.1	43.7	40.5	39.0	35.0	33.3	32.3	34.8	36.4	38.7	40.0	36.8	37.6	36.8	38.1	36.1	39.7	41.4	42.5	58.4
63.8 64.6 63.0 61.1 64.3 69.9 74.9 72.3 72.9 70.4 70.2 66.6 59.4 56.0 55.3 53.6 55.6 63.1 70.3 66.2 62.5 62.4 58.8 58.7																								Diurnal Average		
384.7 335.7 271.0 255.7 278.8 319.4 398.0 479.9 492.5 442.0 505.9 500.8 467.8 439.0 433.1 414.6 376.0 335.0 425.6 361.5 315.8 334.9 391.8 410.3																								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}) - $\mu\text{g}/\text{m}^3$
Buffalo Viewpoint - September 2023**

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	19	2.65	2.65
6 - 15	173	24.09	26.74
16 - 25	114	15.88	42.62
26 - 80	254	35.38	77.99
> 81.0	158	22.01	100.00

Total Number of Valid Hours: 718

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - μg/m³
Buffalo Viewpoint - September 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	0	0	0	0	0	0	0	0	5	7	3	2	1	0	1	0	19
6 - 15	0	1	0	0	1	2	22	73	29	12	7	11	1	4	8	2	173
16 - 25	2	0	0	0	1	1	21	32	20	14	4	11	5	3	0	0	114
26 - 80	13	15	3	2	0	3	12	57	33	14	23	25	20	17	8	7	252
> 81.0	20	3	4	0	0	0	4	31	15	9	8	17	28	6	8	5	158
Totals	35	19	7	2	2	6	59	193	102	56	45	66	55	30	25	14	716

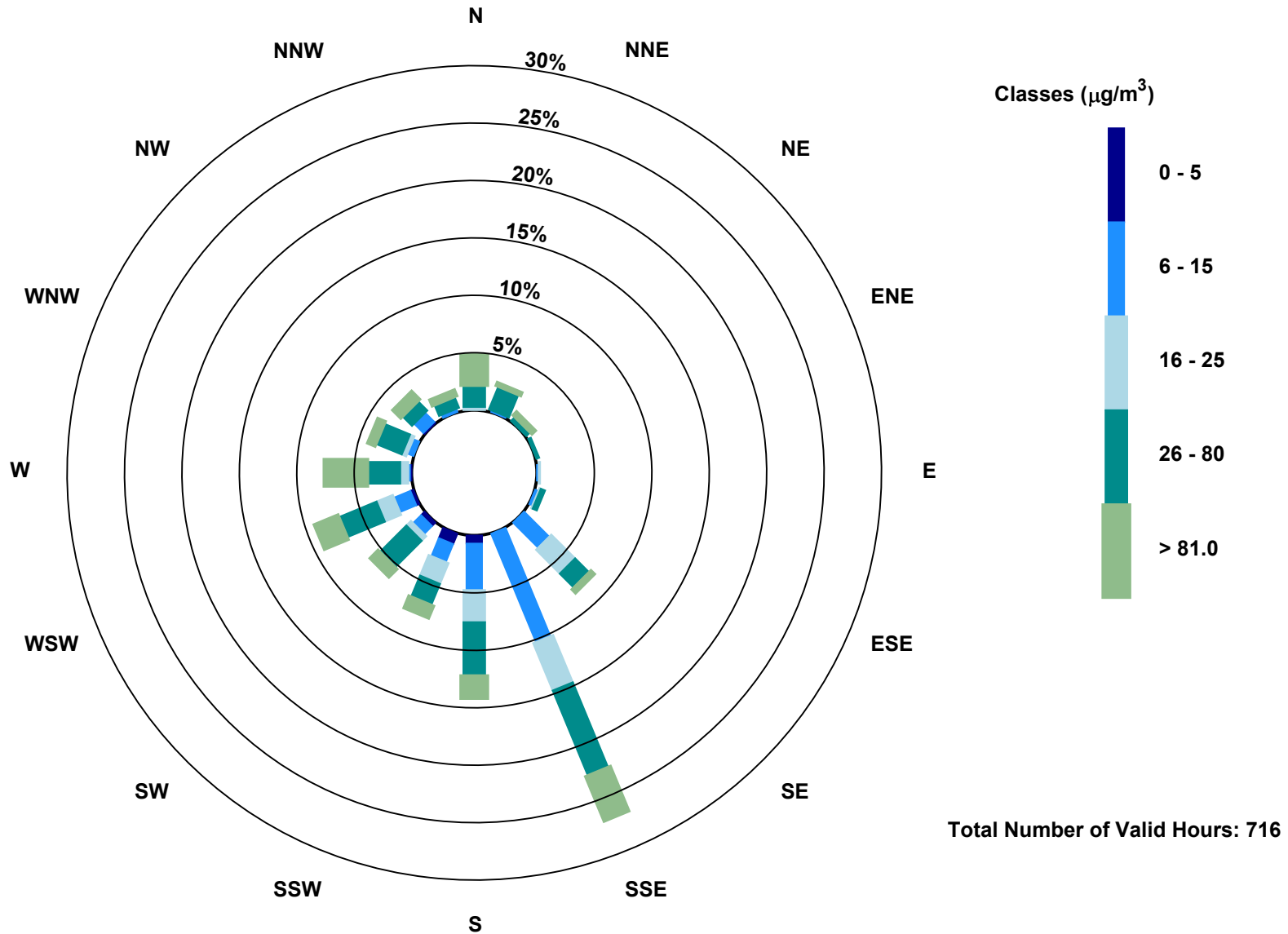
Total Number of Valid Hours: 716

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

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





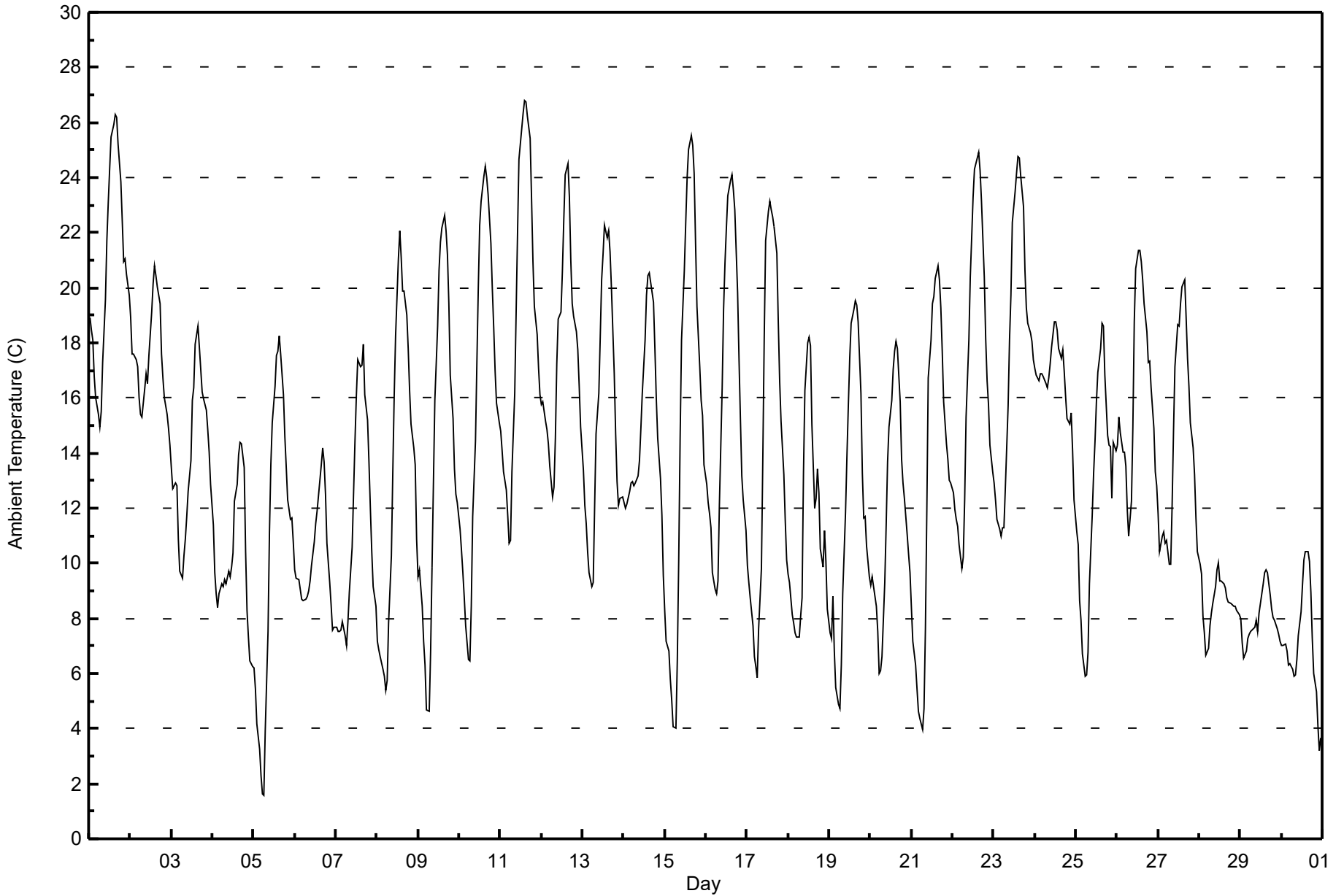
Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature (AT) - C

Buffalo Viewpoint - September 2023

Maximum Value: 26.8 C on Sep 11 15:00		Maximum Daily Average: 20.7 C on Sep 1		Hours in Service: 720																							
Minimum Value: 1.6 C on Sep 5 07:00		Minimum Daily Average: 7.1 C on Sep 30		Hours of Data: 720																							
Maximum Diurnal Average: 19.6 C at hour 16		Minimum Diurnal Average: 8.6 C at hour 7		Hours of Missing Data: 0																							
Monthly Average: 13.88 C		Percentiles: P ₁ = 4.0 P ₁₀ = 7.2 Q ₁ = 9.4 Median = 13.5 Q ₃ = 17.9 P ₉₀ = 21.3 P ₉₉ = 25.7		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-Sep	18.9	18.4	18.1	16.8	16.0	15.4	15.0	15.5	17.3	19.6	21.7	23.1	24.3	25.5	25.9	26.3	26.2	25.2	23.8	22.4	21.0	21.1	20.5	19.7	20.7	26.3	
2-Sep	18.9	17.6	17.6	17.4	17.1	16.0	15.4	15.3	16.3	16.9	16.5	17.6	19.1	20.1	20.8	20.4	20.0	19.4	17.6	16.7	16.0	15.4	14.9	14.3	17.4	20.8	
3-Sep	13.5	12.7	12.9	12.8	10.9	9.7	9.4	10.3	10.9	11.7	12.6	13.7	15.9	16.4	18.0	18.6	17.8	17.1	16.2	16.0	15.6	14.9	14.0	12.9	13.9	18.6	
4-Sep	11.4	9.6	8.9	8.4	8.9	9.2	9.1	9.4	9.2	9.7	9.5	9.8	10.4	12.2	12.9	13.9	14.4	14.3	13.5	10.4	8.3	7.3	6.4	6.2	10.1	14.4	
5-Sep	6.2	5.5	4.2	3.2	2.3	1.6	1.6	3.9	7.5	11.1	13.6	15.1	16.4	17.6	17.7	18.2	17.6	16.1	14.6	13.5	12.3	11.6	11.7	10.8	10.6	18.2	
6-Sep	9.8	9.5	9.4	9.0	8.7	8.7	8.7	8.8	9.0	9.4	9.9	10.8	11.5	11.9	12.5	13.6	14.2	13.7	12.5	10.7	9.3	8.5	7.6	7.7	10.2	14.2	
7-Sep	7.7	7.5	7.5	7.6	7.9	7.4	7.0	7.9	9.0	10.6	12.5	14.4	16.1	17.4	17.2	17.2	17.9	16.1	15.2	13.7	12.0	10.4	9.2	8.4	11.6	17.9	
8-Sep	7.2	6.9	6.6	6.2	5.9	5.4	5.7	7.8	10.3	13.2	16.1	18.2	21.0	22.1	21.1	19.9	19.9	19.0	17.8	16.3	15.0	14.2	13.6	10.9	13.3	22.1	
9-Sep	9.5	9.7	8.5	7.2	6.3	4.7	4.6	6.8	9.9	12.9	15.9	18.6	20.7	21.7	22.2	22.6	22.1	21.2	19.4	16.9	15.3	13.4	12.5	12.2	13.9	22.6	
10-Sep	11.2	10.5	9.6	8.7	7.7	6.5	6.4	8.4	11.7	14.5	17.3	20.0	22.3	23.1	24.1	24.4	24.0	23.4	21.6	20.0	18.6	17.0	15.8	15.1	15.9	24.4	
11-Sep	14.8	14.1	13.3	12.7	11.7	10.7	10.8	13.3	16.2	19.1	22.0	24.6	25.8	26.4	26.8	26.8	26.3	25.4	23.3	21.0	19.3	18.3	17.1	16.1	19.0	26.8	
12-Sep	15.8	15.8	15.1	14.8	14.3	13.5	12.4	12.8	14.5	17.2	18.9	19.1	20.6	22.5	24.1	24.5	23.3	21.0	19.4	18.9	18.4	17.7	16.4	15.0	17.8	24.5	
13-Sep	13.4	12.1	11.4	10.4	9.7	9.1	9.3	12.0	14.7	16.2	18.2	20.3	21.2	22.3	21.8	22.1	21.3	20.0	16.9	14.7	13.0	12.1	12.4	12.4	15.3	22.3	
14-Sep	12.2	12.0	12.2	12.6	12.9	13.0	12.8	12.9	13.2	13.7	14.9	16.2	18.1	19.7	20.4	20.6	20.2	19.5	17.8	16.0	14.5	13.1	11.7	9.6	15.0	20.6	
15-Sep	8.3	7.2	6.8	5.8	5.0	4.1	4.0	6.5	10.1	14.5	18.1	20.6	22.4	24.0	25.0	25.5	25.1	24.2	21.7	19.3	17.1	15.9	15.3	13.6	15.0	25.5	
16-Sep	12.9	12.2	11.8	11.3	9.6	9.1	8.9	9.4	12.1	16.4	19.2	20.9	22.2	23.3	23.9	24.1	23.5	22.8	19.8	17.4	15.3	13.2	12.3	11.2	15.9	24.1	
17-Sep	9.9	9.3	8.7	7.7	6.6	6.3	5.8	7.6	9.8	13.8	18.2	21.7	22.8	23.1	22.8	22.6	22.2	21.3	18.8	16.6	15.1	13.2	11.5	10.1	14.4	23.1	
18-Sep	9.6	9.3	8.1	7.8	7.5	7.3	7.3	8.1	8.7	13.3	16.3	18.0	18.2	17.9	15.1	12.0	12.3	13.4	12.5	10.5	9.8	11.2	10.1	8.3	11.4	18.2	
19-Sep	7.5	7.3	8.8	6.8	5.5	4.9	4.7	6.3	8.9	11.8	13.9	15.7	17.5	18.7	19.2	19.5	19.4	18.8	16.2	13.3	11.7	11.7	10.6	9.5	12.0	19.5	
20-Sep	9.2	9.5	9.1	8.5	7.5	6.0	6.1	6.6	9.3	11.4	13.7	15.0	15.9	17.0	17.7	18.0	17.8	15.9	13.8	12.9	12.3	11.0	10.3	9.7	11.8	18.0	
21-Sep	8.4	7.2	6.3	5.5	4.6	4.4	4.0	4.7	7.6	11.9	16.7	18.1	19.4	19.7	20.3	20.8	20.3	19.3	17.7	15.8	14.3	13.8	13.0	12.9	12.8	20.8	
22-Sep	12.6	12.0	11.6	11.3	10.7	9.8	10.2	12.3	15.3	18.1	20.4	21.8	23.3	24.3	24.7	24.9	24.2	23.1	20.4	18.2	16.6	15.7	14.3	13.3	17.0	24.9	
23-Sep	12.9	12.3	11.6	11.2	11.0	11.3	11.3	12.7	15.7	18.1	19.8	22.4	23.5	24.2	24.7	24.7	24.0	22.9	20.6	19.2	18.7	18.4	18.0	17.4	17.8	24.7	
24-Sep	17.1	16.8	16.6	16.9	16.9	16.8	16.5	16.4	16.7	17.2	17.9	18.8	18.8	18.5	17.8	17.4	17.8	17.0	16.1	15.2	15.0	15.5	14.1	12.3	16.7	18.8	
25-Sep	11.1	10.7	8.6	7.9	6.7	5.9	5.9	6.8	9.2	11.7	13.3	14.4	15.8	16.9	17.8	18.7	18.6	16.9	14.6	14.3	14.2	12.3	14.4	14.1	12.5	18.7	
26-Sep	14.3	15.3	14.7	14.0	14.0	13.5	11.9	11.0	12.3	14.9	18.8	20.7	21.3	21.4	20.9	20.3	19.4	18.4	17.3	17.3	16.4	14.9	13.3	12.8	16.2	21.4	
27-Sep	11.8	10.4	11.0	11.1	10.7	10.8	10.0	10.0	12.1	14.8	17.1	18.7	18.6	19.4	20.0	20.3	18.9	17.4	16.4	15.1	14.2	13.2	11.6	10.4	14.3	20.3	
28-Sep	10.0	9.6	8.1	7.5	6.6	6.9	7.7	8.2	8.5	9.2	9.8	10.0	9.4	9.4	9.2	9.1	8.7	8.6	8.5	8.5	8.4	8.4	8.3	8.1	8.6	10.0	
29-Sep	8.0	7.1	6.6	6.8	7.3	7.4	7.5	7.6	7.7	7.9	7.5	8.2	8.9	9.3	9.7	9.8	9.7	8.9	8.3	8.1	7.9	7.6	7.4	7.2	8.0	9.8	
30-Sep	7.0	7.0	7.1	6.8	6.3	6.3	6.2	5.9	6.0	6.5	7.4	8.3	9.2	10.1	10.4	10.4	10.1	8.9	7.2	6.0	5.4	4.1	3.2	3.7	7.1	10.4	
		11.4	10.8	10.4	9.8	9.2	8.7	8.6	9.5	11.3	13.6	15.6	17.2	18.4	19.2	19.5	19.6	19.2	18.3	16.7	15.2	14.0	13.2	12.4	11.5	Diurnal Average	
		18.9	18.4	18.1	17.4	17.1	16.8	16.5	16.4	17.3	19.6	22.0	24.6	25.8	26.4	26.8	26.8	26.3	25.4	23.8	22.4	21.0	21.1	20.5	19.7	Diurnal Maximum	





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	217	30.14	30.14
10 - 20	396	55.00	85.14
> 20	107	14.86	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

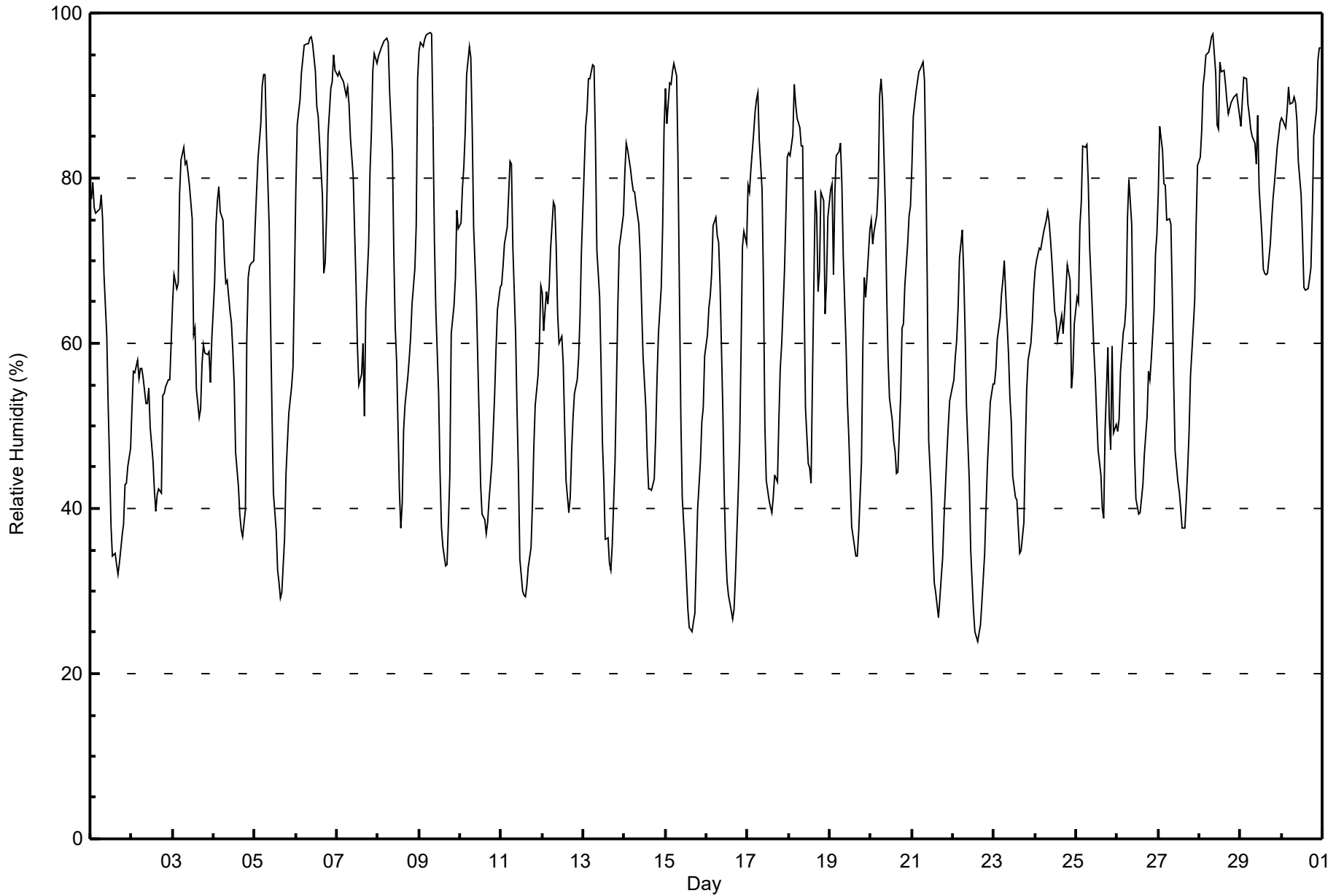
Buffalo Viewpoint - September 2023

Maximum Value: 97.7 % on Sep 9 07:00																						Maximum Daily Average: 91.0 % on Sep 28																						Hours in Service: 720			
Minimum Value: 23.8 % on Sep 22 15:00																						Minimum Daily Average: 46.2 % on Sep 22																						Hours of Data: 720			
Maximum Diurnal Average: 84.0 % at hour 7																						Minimum Diurnal Average: 44.7 % at hour 17																						Hours of Missing Data: 0			
Monthly Average: 64.86 %																						Percentiles: P₁ = 26.6 P₁₀ = 37.9 Q₁ = 49.8 Median = 66.1 Q₃ = 80.9 P₉₀ = 91.4 P₉₉ = 97.0																						Hours of Calibration: 0			
																																												Percent Operational Time: 100.0			
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																							
1-Sep	77.4	79.5	76.4	75.8	75.9	76.2	77.9	75.1	68.2	60.8	52.3	45.6	38.0	34.3	34.6	33.3	32.0	33.3	36.7	38.1	42.8	43.1	45.0	47.3	54.2	79.5																					
2-Sep	52.2	56.6	56.5	58.0	55.7	56.9	57.0	55.8	52.6	52.8	54.6	49.8	45.7	42.2	39.6	41.8	42.3	41.8	53.7	54.0	54.8	55.7	55.7	60.2	51.9	60.2																					
3-Sep	65.0	68.3	66.6	67.3	78.1	82.2	83.8	81.6	82.1	80.6	79.1	75.0	61.0	61.8	54.3	51.0	52.0	57.5	59.8	58.8	58.6	58.9	55.2	60.5	66.6	83.8																					
4-Sep	67.3	74.4	77.3	78.9	75.9	74.9	70.1	67.3	67.6	63.9	62.6	59.1	55.2	46.7	42.6	39.4	37.5	36.6	39.8	60.6	68.0	69.3	69.7	70.0	61.4	78.9																					
5-Sep	74.5	78.6	82.4	86.6	91.2	92.6	92.6	85.2	74.0	62.5	51.5	41.9	37.3	32.6	30.9	29.2	29.9	36.4	44.2	48.0	51.5	54.8	57.1	67.2	59.7	92.6																					
6-Sep	78.5	86.4	89.5	92.7	94.4	96.1	96.2	96.3	96.9	97.1	96.2	92.9	88.7	87.4	84.2	77.9	68.5	69.8	75.8	85.2	90.8	91.7	94.9	93.1	88.4	97.1																					
7-Sep	92.3	92.8	92.4	92.0	91.7	89.9	90.9	88.9	84.9	80.1	73.6	67.2	59.6	54.9	56.2	60.0	51.2	64.3	71.8	80.9	85.5	93.0	95.1	93.9	79.3	95.1																					
8-Sep	94.7	95.3	95.8	96.6	96.8	97.0	96.4	90.6	83.0	70.9	62.0	57.8	42.0	37.6	40.7	49.5	52.6	56.0	58.1	60.6	64.7	68.9	74.3	92.0	72.2	97.0																					
9-Sep	95.5	96.4	95.9	96.8	97.2	97.4	97.7	97.4	86.5	72.4	64.1	53.9	44.4	37.9	35.4	33.0	33.2	38.3	44.1	61.2	64.6	68.0	76.1	73.8	69.2	97.7																					
10-Sep	74.6	78.8	81.3	85.5	92.5	95.9	94.6	85.9	74.2	65.0	57.7	50.7	43.0	39.4	38.7	37.0	38.3	41.0	45.4	49.6	53.8	59.3	64.0	66.7	63.0	95.9																					
11-Sep	67.0	69.3	72.0	74.1	77.9	82.0	81.7	71.6	61.0	51.9	44.5	33.9	30.0	29.5	29.3	30.6	32.9	35.3	40.5	47.4	52.6	56.2	60.2	66.9	54.1	82.0																					
12-Sep	66.2	61.5	66.3	64.8	67.0	71.5	77.0	76.6	71.6	63.5	60.0	60.8	57.4	50.2	43.5	39.5	41.3	46.9	51.1	53.9	55.6	58.3	63.4	71.2	60.0	77.0																					
13-Sep	81.2	86.3	88.1	92.0	92.1	93.8	93.5	84.5	71.3	65.7	57.5	47.9	43.2	36.4	36.5	33.4	32.6	35.7	45.7	54.9	64.6	71.7	72.8	75.6	64.9	93.8																					
14-Sep	80.7	84.3	83.3	81.2	79.7	78.4	78.2	76.8	74.5	70.7	64.4	58.6	52.3	46.3	42.4	42.4	42.2	43.6	48.7	55.7	61.1	66.9	74.1	86.0	65.5	86.0																					
15-Sep	90.8	86.7	91.5	91.4	92.9	93.9	92.4	81.7	66.0	51.0	41.4	35.2	31.6	27.9	25.6	25.0	26.2	27.3	33.5	40.0	45.7	50.4	52.3	58.4	56.6	93.9																					
16-Sep	61.0	64.2	65.7	68.4	74.3	75.2	73.0	72.3	67.1	51.9	41.9	35.1	31.2	29.5	27.6	26.6	27.9	31.9	42.1	47.9	59.1	71.7	73.6	72.0	53.8	75.2																					
17-Sep	79.1	78.3	81.0	85.4	88.0	89.5	90.4	84.6	78.6	67.2	50.1	43.4	41.0	40.2	39.4	41.4	44.1	43.2	50.8	57.0	59.8	68.6	75.4	82.5	65.0	90.4																					
18-Sep	83.0	82.7	85.2	91.4	89.0	87.4	86.1	84.0	83.9	66.6	52.2	45.4	44.9	43.1	55.7	78.5	75.8	66.2	68.7	78.2	77.3	63.5	67.3	75.2	72.1	91.4																					
19-Sep	78.6	79.4	68.3	78.3	82.7	83.3	84.2	79.3	70.5	59.7	52.7	48.4	43.1	37.8	35.5	34.3	34.3	37.2	45.5	59.6	68.0	65.6	68.1	73.8	61.2	84.2																					
20-Sep	74.8	72.1	73.5	75.5	79.1	90.0	92.1	89.6	76.7	66.1	58.1	53.3	50.7	48.2	46.9	44.3	44.4	53.7	61.9	62.4	67.1	72.1	75.4	76.6	66.9	92.1																					
21-Sep	81.4	87.5	90.5	91.7	92.8	93.3	94.0	91.9	81.3	67.0	48.3	41.4	35.5	31.1	29.8	26.9	29.1	31.7	34.1	39.1	46.7	50.0	53.1	53.9	59.2	94.0																					
22-Sep	55.6	58.3	60.3	64.2	70.4	73.7	68.6	61.5	52.4	43.3	35.1	31.1	27.6	25.0	23.8	24.8	26.0	28.7	34.5	40.4	45.5	49.1	52.8	55.1	46.2	73.7																					
23-Sep	55.1	56.9	60.6	63.0	66.0	67.6	70.0	66.0	58.7	53.6	50.4	43.9	41.4	41.0	37.9	34.6	34.9	38.3	47.2	54.4	58.0	60.0	62.6	66.4	53.7	70.0																					
24-Sep	68.8	70.1	71.5	71.3	72.3	73.4	74.8	75.9	74.7	72.6	70.0	63.8	62.9	60.4	61.4	63.5	61.3	63.7	66.4	69.5	67.7	54.6	56.7	62.3	67.1	75.9																					
25-Sep	65.6	65.0	74.3	77.1	83.8	83.8	84.1	79.3	71.5	63.5	59.1	55.8	51.2	47.1	44.0	40.1	38.8	49.4	59.6	50.6	47.1	59.6	49.2	50.1	60.4	84.1																					
26-Sep	49.4	50.8	56.6	61.4	62.2	64.8	75.3	79.7	74.3	61.9	46.8	41.2	39.4	39.6	41.2	42.9	46.5	51.2	56.6	55.6	58.1	64.1	70.9	73.2	56.8	79.7																					
27-Sep	78.3	86.2	83.5	79.4	79.2	75.0	75.1	74.4	65.7	55.2	47.0	43.3	42.1	40.1	37.6	37.6	41.0	45.0	49.4	56.2	62.1	65.3	74.2	81.5	61.4	86.2																					
28-Sep	82.6	85.8	91.1	92.7	94.9	95.2	96.1	97.1	97.5	92.7	86.4	85.9	94.1	92.9	93.0	91.4	89.3	87.8	89.1	89.6	89.9	90.1	90.2	87.6	91.0	97.5																					
29-Sep	86.3	89.3	92.2	92.0	89.0	87.6	86.0	85.1	84.3	81.7	87.7	78.9	73.0	69.0	68.5	68.2	68.5	72.1	75.1	77.6	79.5	83.9	85.3	86.8	81.1	92.2																					
30-Sep	87.3	87.0	86.0	88.1	91.0	89.0	89.2	89.8	89.2	87.0	82.0	78.0	72.7	66.9	66.5	66.6	67.8	69.2	75.7	85.1	88.4	94.2	95.8	95.7	82.8	95.8																					
																						74.8	77.0	78.5	80.5	82.5	83.6	84.0	80.9	74.7	66.6	59.6	54.0	49.3	45.9	44.8	44.8	44.7	47.8	53.5	59.1	63.0	66.0	68.7	72.5	Diurnal Average	
																						95.5	96.4	95.9	96.8	97.2	97.4	97.7	97.4	97.5	97.1	96.2	92.9	94.1	92.9	93.0	91.4	89.3	87.8	89.1	89.6	90.8	94.2	95.8	95.7	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

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





Maximum Speed: 25 km/h on Sep 21 14:00	Maximum Daily Speed Average: 13.3 km/h on Sep 1	Hours in Service: 720
Minimum Speed Value: 0 km/h on Sep 26 06:00	Minimum Daily Speed Average: 1.7 km/h on Sep 8	Hours of Data: 718
Maximum Diurnal Speed Average: 6.5 km/h at hour 13	Minimum Diurnal Speed Average: 3.2 km/h at hour 1	Hours of Missing Data: 2
Monthly Average Velocity: 4.1 km/h 204.3 deg	Percentiles: P ₁ = 2 P ₁₀ = 4 Q ₁ = 6 Median = 8 Q ₃ = 11 P ₉₀ = 15 P ₉₉ = 21	Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Sep	W9	W6	W13	W13	WSW11	W16	W10	W12	W10	WSW10	SW12	WSW15	WSW18	WSW17	SW21	SW21	SW21	SW19	SW15	WSW13	SW12	WSW13	SW12	WSW12	WSW13.3	SW21	
2-Sep	W8	W9	W9	W11	W13	W14	W16	W15	WNW14	W12	WSW12	W13	W16	WSW16	WSW17	WSW14	W15	W12	SW9	WSW10	WSW13	WSW13	WSW15	WSW17	W12.8	WSW17	
3-Sep	W11	W7	SW4	SSW2	SSE6	SSE6	SSE7	SSE6	SSE7	SSE8	SSE7	SE3	W8	S4	SSW7	W5	N7	NW3	W6	W10	NW11	NW12	NW15	NW13	WSW3.2	NW15	
4-Sep	WNW11	W13	W16	W13	W14	NW16	NNW19	NW18	NW18	NW17	NW15	NW13	NW15	NW14	WNW11	W9	WNW10	WNW6	WSW7	SSW7	SSW7	SSW7	SSW7	SSW7	WNW9.4	NNW19	
5-Sep	WSW4	S5	SSE6	S7	S7	S7	SSE6	SSE7	SSE6	SSE6	S8	SSW11	S10	S9	S10	S9	SSW9	S6	SSE6	SSE6	SSE4	S4	SSE5	S2	S6.3	SSW11	
6-Sep	SE4	ESE5	E5	E4	SE5	SE5	SSE5	SE7	SSE7	SSE7	S7	SW5	SW4	NW2	NNE3	SSW2	SW8	WSW8	SW7	SSW7	SSW7	S5	SSE4	WNW5	S3.4	SW8	
7-Sep	W4	WSW5	W6	SW4	W4	WSW9	SW4	SSE3	S5	SE5	ESE6	SE6	ESE6	SE6	SE2	SE3	WSW2	S5	SSE5	S6	SW3	SSE6	SSW6	S4	S3.1	WSW9	
8-Sep	SSE7	SSE6	S7	S7	SSE7	SSE6	SSE6	SSE5	S5	SSE6	SSE7	SE6	WSW8	W10	NW6	NNE7	NNE7	NNE7	NNE7	NNE2	NW4	N4	NNW4	S4	SSE1.7	W10	
9-Sep	SW2	WNW3	WSW2	S3	S5	SSE6	S5	SSE7	SSE7	SE6	SE6	SSE7	SSE8	SSE7	SSE5	S5	ESE6	SE5	ESE5	SE5	SSE5	SSE4	SSE4	SSE5	SSE4.5	SSE8	
10-Sep	SSE5	SSE5	SSE5	S4	SSW4	S5	S5	S5	SSE7	SE8	SE10	SE9	SE10	SSE11	SE11	SE12	SE12	SE11	SE9	SE10	SSE9	SSE9	SSE9	SSE11	SSE7.8	SE12	
11-Sep	SSE12	SSE12	SSE12	SSE12	SSE11	SSE10	SSE11	SSE11	SSE12	SSE13	SSE14	S17	S20	S20	S18	S16	S16	S14	SSE9	SSE8	SSE8	SSE9	SE9	SE10	SSE12.3	S20	
12-Sep	SE8	SE9	SE8	SE7	SSE6	S7	S7	SSE7	SSE6	SSE5	SE6	SE8	SSE6	SSW6	SSW6	WSW5	W10	WSW10	WSW11	WSW11	WSW10	SSW7	SSW7	SSW5	S5.2	WSW11	
13-Sep	S3	SSE4	S3	SSE6	S6	SSE7	S6	SSW5	SW8	SW9	SW12	WSW15	WSW17	WSW21	WSW21	WSW20	WSW19	WSW20	W24	W23	WSW15	WSW13	WSW12	WSW15	WSW11.4	WSW24	
14-Sep	W15	W13	W13	WNW11	WNW11	WNW12	WNW12	WNW12	WNW12	WNW15	WNW13	WNW15	WNW13	NW9	WNW13	WNW15	WNW15	WNW15	WNW11	WNW8	WNW6	W9	W8	WSW6	SSE5	WNW10.9	WNW15
15-Sep	S6	SSE7	S7	SSE7	SSE7	S6	SSE7	SSE8	SSE8	SSE9	S11	S12	S13	S14	S13	S13	S12	SSE10	SSE11	SSE10	SSE11	SSE12	SSE8	SSE8	SSE9.4	S14	
16-Sep	SSE7	S5	SSW5	S4	S5	S6	S7	SSE7	SSE4	SW6	W6	W6	SW8	SW10	W12	WSW10	W9	SSW4	S6	S6	SSE7	SE9	SE8	SSE8	SSW5.0	W12	
17-Sep	SSE6	SSE6	SSE6	S8	SSE8	SSE8	SSE7	SSE4	SSE5	SE7	SE10	SSE10	SSW10	SSW10	SW12	SSW8	SSW7	SW9	SSW7	SSW7	SSW6	SSE7	SSE7	S6	S6.6	SW12	
18-Sep	S4	SSE5	SSE7	SE7	SSE7	S7	S6	S7	S6	SW7	W18	W18	W19	W18	WSW16	SSW7	SW9	SSW6	SSE6	SSE7	SSE8	SW11	S8	SSE8	SW6.6	W19	
19-Sep	SSE8	SE8	SSW6	SSE7	SE8	SSE8	SSE7	SSE7	SSW8	SSW9	SSW10	SSW10	SW10	WSW9	W10	SW8	SW6	SSW5	S6	SSE7	S4	WSW4	NW6	NW7	SSW5.2	SSW10	
20-Sep	WNW9	NW9	NNW7	NNW7	NNW2	W1	NW3	WSW2	WNW4	NW6	NNW3	N7	N8	N7	N7	NNE6	NNE4	N6	N8	NNW3	SSE1	S6	SSE5	SSE5	NNW3.2	WNW9	
21-Sep	SSE5	S7	S5	SSE7	SSE8	SSE8	SSE6	SSE6	SSE8	SSE7	SSW12	SSW21	SSW21	SSW25	SSW22	SW21	SSW18	SSW16	S10	SSE10	SSE11	SSE12	SSE12	SSE12	S11.1	SSW25	
22-Sep	SSE11	SSE10	SSE9	SE8	SE8	SE9	SSE7	SSE8	SSE8	S10	SSW18	SSW18	SSW15	S15	S16	S14	S14	S13	SSE8	SSE9	SSE11	SSE11	SSE7	SSE8	S10.3	SSW18	
23-Sep	SSE9	SSE10	SSE10	SSE8	SSE9	SSE9	SSE9	SSE8	SE11	SE13	SE14	SSE17	SSE19	SSE18	S18	SSE18	SSE17	S12	SSE11	SSE11	SSE12	SSE13	SE13	SE12	SSE12.3	SSE19	
24-Sep	SSE12	SE14	SSE14	SSE12	SSE12	SSE13	SSE11	SSE9	SSE11	SE10	S8	SSW8	SW9	WSW11	WSW8	SSW5	S4	SSE5	SSE6	SSW8	WSW14	SW10	SSW9	SSW9	S7.6	WSW14	
25-Sep	SW9	SW5	S5	SSE4	SE5	SSE5	SSE6	S5	SSW5	WSW2	NNW5	N4	N7	NNE9	NE7	NNE8	NNE9	NE10	NE10	ENE8	ENE6	NE4	SE6	SE6	ENE2.2	NE10	
26-Sep	SE8	SE10	SE9	SE10	SE7	NW0	NW2	NNW3	S4	SSE7	SSW8	S11	SSW10	SSW7	SSW5	SSW7	WSW6	SW3	SE4	S4	WSW3	WSW4	S7	S5	S4.6	S11	
27-Sep	S3	SW4	W7	WSW6	SW6	WSW7	WSW6	SW6	SSE2	SW3	WSW4	WSW10	W13	WSW11	WSW13	WSW13	SW13	SW8	WSW7	SW4	NW5	WNW7	WNW6	NW7	WSW6.3	WSW13	
28-Sep	WNW6	WNW3	SW3	WSW3	W4	WNW5	NNE6	NE7	NE5	N7	N11	N10	N12	N11	N10	N15	N12	NNE13	N10	N8	N9	N12	N14	N13	N7.5	N15	
29-Sep	N13	N8	NNE4	N9	N10	NNW7	NNW5	C	C	N10	N13	N13	N12	N13	N10	NNW8	NNW9	NNE12	NNE8	NNE5	NNE9	N9	NNE7	NE3	N8.9	N13	
30-Sep	S3	SSE3	S4	SSE4	S4	S4	S4	SSE5	SSE5	SSE4	S4	S5	S5	S5	SE5	SE6	SSE6	SSE5	SSE4	SSE4	S4	S4	SSE4	SSE5	SSE4.3	SSE6	

SSW3.2	S3.5	SSW4.0	S3.9	S4.1	SSW4.1	S3.3	S3.7	S4.0	S3.7	SSW4.1	SSW5.2	SW6.5	SW6.4	SW6.1	SW5.4	SW5.1	SW4.1	SSW3.2	SSW4.0	SSW3.7	SSW3.9	SSW3.7	SSW3.7	Diurnal Average
W15	SE14	W16	W13	W14	W16	NNW19	NNW18	NW18	NW17	W18	SSW21	SSW21	SSW25	SSW22	SW21	SW21	WSW20	WSW24	WSW23	WSW15	WSW14	WSW15	WSW17	Diurnal Maximum

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

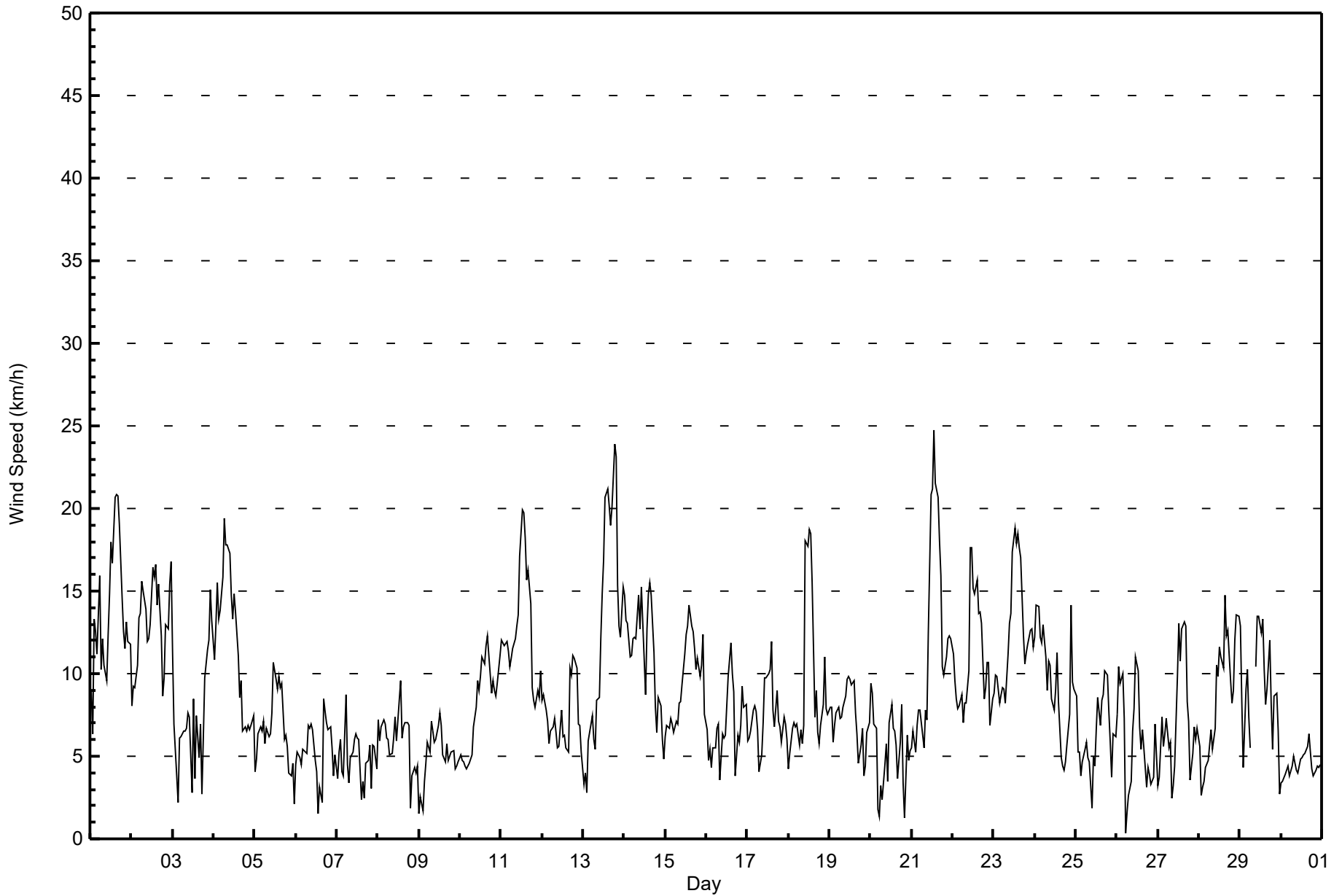
Wind Speed (WS) - km/h
Buffalo Viewpoint - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 7 km/h on Sep 18 15:00	Hours of Data: 718
Minimum Value: 0 km/h on Sep 30 22:00	Hours of Missing Data: 2
Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 3 P ₉₀ = 4 P ₉₉ = 6	Hours of Calibration: 2
	Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Sep	3	2	3	3	4	3	3	3	3	3	4	4	5	6	6	6	6	6	5	4	3	4	3	3	6
2-Sep	3	2	4	4	3	4	3	4	3	4	3	4	4	4	4	4	3	4	2	2	3	3	4	4	4
3-Sep	4	2	3	2	1	1	2	1	3	3	2	2	3	2	2	2	2	1	2	3	3	5	4	4	5
4-Sep	3	3	4	4	4	5	5	5	5	4	4	4	4	4	4	3	3	3	2	1	1	1	1	2	5
5-Sep	2	2	2	1	1	1	1	2	2	2	3	3	3	3	3	3	3	3	2	2	1	1	2	2	3
6-Sep	1	1	1	1	2	1	2	2	2	2	2	1	1	1	1	2	2	2	1	1	1	1	1	2	2
7-Sep	1	1	1	2	3	3	3	1	1	2	2	2	2	2	1	2	2	1	1	2	2	1	1	1	3
8-Sep	1	1	1	1	1	1	1	2	1	2	2	2	3	3	2	2	2	2	1	2	1	1	1	1	3
9-Sep	1	1	1	0	1	1	1	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	2
10-Sep	1	1	1	1	1	1	1	2	2	3	3	3	4	4	4	4	4	4	3	3	2	2	3	3	4
11-Sep	3	3	4	3	3	3	3	3	4	4	5	6	7	7	6	6	6	5	3	3	2	3	2	2	7
12-Sep	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	3	3	3	2	1	2	3
13-Sep	1	1	1	1	1	1	2	2	2	3	4	5	6	6	6	6	5	7	7	5	5	4	3	4	7
14-Sep	3	4	3	3	3	3	3	3	5	4	4	4	3	4	4	4	4	3	2	1	2	1	1	1	5
15-Sep	1	1	1	1	1	1	1	2	2	3	3	4	4	4	4	4	4	4	3	3	3	3	4	3	4
16-Sep	2	2	2	1	1	1	2	1	2	2	2	2	3	3	3	3	3	1	2	1	1	1	2	1	3
17-Sep	2	1	1	1	1	1	1	1	2	3	3	4	3	3	3	2	2	3	1	2	2	1	1	1	4
18-Sep	1	1	1	1	1	1	1	2	1	3	5	5	6	6	7	2	2	2	1	1	2	4	2	2	7
19-Sep	1	2	2	2	1	2	1	2	2	2	2	3	4	3	3	2	2	1	1	1	2	2	1	1	4
20-Sep	2	2	1	2	1	1	1	1	2	2	1	3	2	2	2	2	2	2	2	1	2	1	1	1	3
21-Sep	1	1	1	2	2	1	2	2	2	2	6	6	6	6	6	6	6	5	3	3	3	3	4	3	6
22-Sep	3	2	2	2	2	2	2	2	3	3	5	5	4	4	5	4	4	4	3	3	3	3	2	3	5
23-Sep	2	3	3	2	2	3	3	2	4	4	4	6	7	6	7	6	6	5	3	4	4	4	4	4	7
24-Sep	4	5	4	4	4	4	4	3	3	3	3	2	3	3	3	2	1	1	1	1	2	3	2	2	5
25-Sep	2	2	1	2	3	1	1	1	2	2	2	2	2	2	2	2	2	3	2	1	2	2	2	2	3
26-Sep	3	3	3	3	3	2	1	1	2	2	3	4	3	2	2	2	2	2	2	3	2	1	1	2	4
27-Sep	1	1	2	2	2	2	2	2	1	1	2	4	3	3	4	6	4	2	2	1	2	1	1	1	6
28-Sep	1	1	2	1	2	1	1	2	2	3	3	3	3	3	2	4	3	4	3	2	2	3	3	3	4
29-Sep	4	3	1	3	3	2	1	C	C	3	4	3	3	4	3	2	3	3	2	2	3	2	2	2	4
30-Sep	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	1	1	1	0	1	1	2
	4	5	4	4	4	5	5	5	5	5	6	6	7	7	7	6	6	7	7	5	5	5	4	4	

Diurnal Maximum

C - Calibration





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	171	23.82	23.82
6 - 11	381	53.06	76.88
12 - 19	150	20.89	97.77
20 - 28	16	2.23	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 718

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

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

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	2	5	3	0	2	3	11	42	43	11	13	12	5	5	7	7	171
6 - 11	22	12	4	2	0	3	41	128	39	36	21	23	24	13	8	5	381
12 - 19	11	2	0	0	0	0	7	23	18	6	8	25	26	12	10	2	150
20 - 28	0	0	0	0	0	0	0	0	2	4	4	6	0	0	0	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	35	19	7	2	2	6	59	193	102	57	46	66	55	30	25	14	718

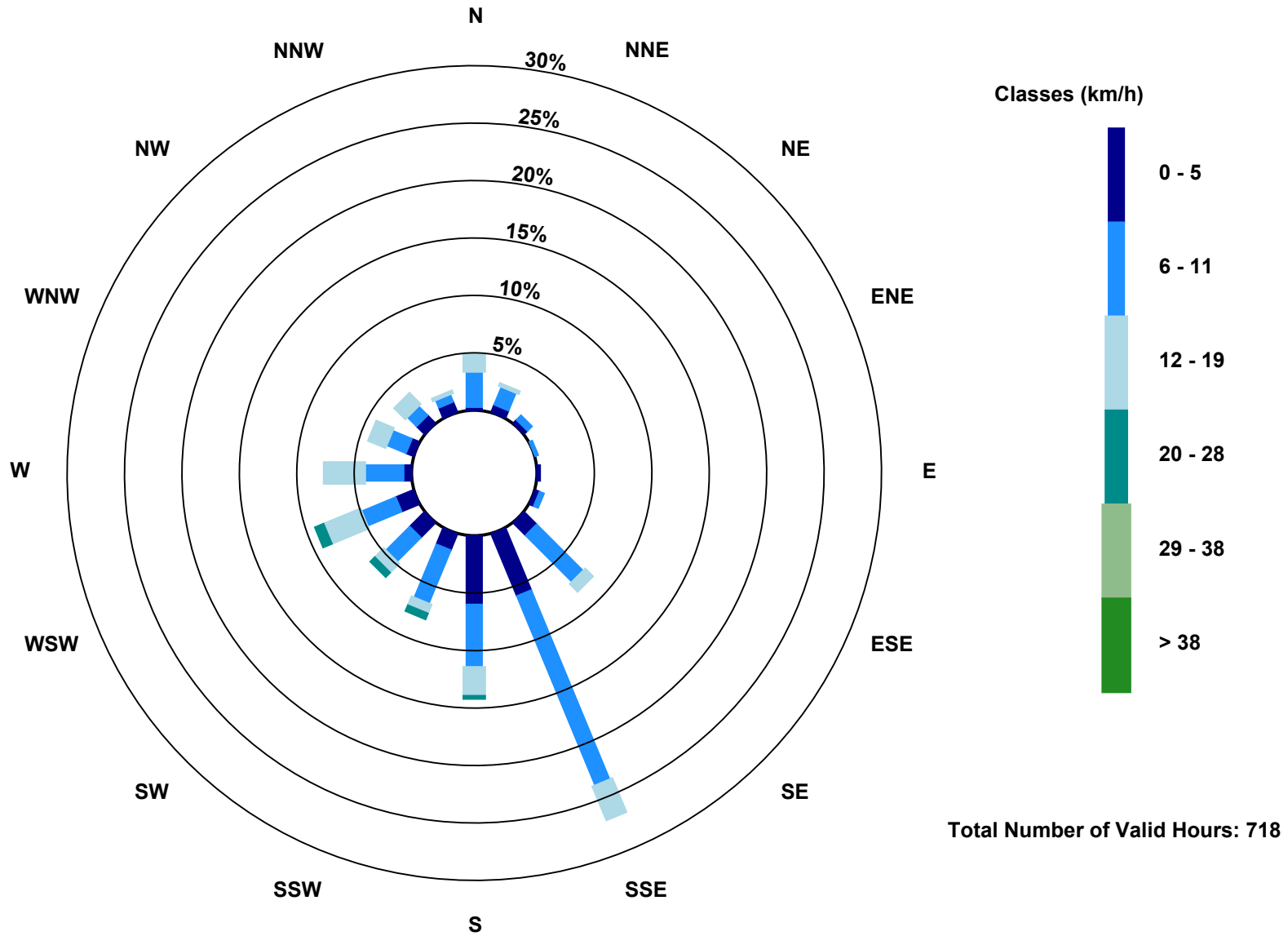
Total Number of Valid Hours: 718

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

Wind Speed (WS) - km/h
Buffalo Viewpoint





Wood Buffalo Environmental Association
Summary of Hour Averages

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

Direction of Maximum Speed: 210 deg on Sep 21 14:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 245.0 deg on Sep 1	Hours of Data: 718
Direction of Minimum Speed: 326 deg on Sep 26 06:00	Hours of Missing Data: 2
Direction of Minimum Daily Speed Average: 1.7 deg on Sep 8	Percent Operational Time: 100.0
Monthly Average Direction: 204.3 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-Sep	278	280	268	268	256	260	265	266	261	252	235	239	243	238	236	231	228	229	236	240	235	238	235	237	245.0
2-Sep	280	264	260	273	266	263	260	267	282	266	254	260	262	257	256	246	260	261	230	241	247	247	251	258	258.9
3-Sep	274	268	218	195	147	160	152	163	164	162	167	127	262	178	208	265	1	322	275	272	309	315	318	307	257.0
4-Sep	292	263	261	261	276	310	330	326	325	320	326	313	310	305	291	278	286	285	248	207	197	193	196	206	291.4
5-Sep	244	185	159	184	171	172	163	155	167	153	170	198	184	180	189	184	193	186	153	159	159	171	161	185	176.6
6-Sep	136	109	93	101	124	129	153	141	147	162	189	214	223	307	12	195	233	237	227	208	192	172	156	282	176.3
7-Sep	279	238	261	218	259	254	226	166	178	138	123	124	119	129	124	143	247	177	156	169	219	167	203	177	183.4
8-Sep	154	158	173	174	162	166	153	162	169	160	159	139	249	259	326	29	31	30	33	33	308	354	340	186	160.2
9-Sep	221	295	237	186	183	166	176	153	160	142	129	158	161	155	147	188	123	131	120	133	164	164	154	151	156.2
10-Sep	151	149	154	171	201	170	173	169	165	145	133	125	145	147	134	139	138	139	138	145	147	158	156	153	148.0
11-Sep	148	150	151	151	153	157	154	155	155	160	158	173	173	180	177	174	176	188	161	155	157	156	140	130	162.4
12-Sep	139	142	140	143	159	176	169	155	168	163	126	143	159	196	206	246	260	258	257	246	243	201	195	202	190.8
13-Sep	185	156	182	156	171	162	183	199	229	234	235	238	242	243	252	251	250	255	259	259	248	241	244	256	240.0
14-Sep	263	274	276	290	291	291	289	291	289	291	295	301	305	299	297	300	297	289	286	286	276	267	249	156	287.2
15-Sep	172	163	177	166	159	172	167	166	167	158	157	174	182	178	178	180	173	172	158	159	162	154	154	167	167.8
16-Sep	154	171	195	174	181	182	175	162	159	235	277	273	224	236	265	251	260	195	187	169	161	145	146	163	200.2
17-Sep	153	167	168	182	163	161	155	153	157	140	145	149	192	203	226	209	206	233	205	206	194	151	160	170	179.0
18-Sep	178	159	161	145	162	172	173	179	178	218	265	263	261	260	253	211	225	209	152	156	153	230	184	159	214.4
19-Sep	152	137	205	157	144	147	154	167	197	195	209	207	218	251	260	228	223	201	189	162	184	253	307	315	198.6
20-Sep	302	321	331	340	332	274	312	244	299	314	329	1	359	2	7	22	23	358	10	333	151	173	153	165	340.1
21-Sep	162	171	176	162	166	166	162	168	156	156	201	205	206	210	209	216	206	201	179	162	158	158	154	149	186.4
22-Sep	147	148	150	141	138	139	147	150	154	176	195	208	202	186	180	182	176	171	164	163	165	159	167	157	170.0
23-Sep	166	165	163	164	159	156	159	160	145	146	145	158	168	163	172	163	162	172	154	149	150	147	144	146	157.9
24-Sep	147	146	155	165	164	157	152	155	157	168	173	192	223	256	250	212	179	169	160	163	210	252	230	208	181.7
25-Sep	215	218	171	164	141	166	159	171	196	255	343	8	359	16	41	28	29	35	48	62	69	44	125	127	72.1
26-Sep	132	135	135	143	145	326	321	332	171	168	193	175	201	210	192	207	244	219	131	171	255	251	175	182	175.9
27-Sep	183	219	268	243	233	251	255	218	167	223	240	258	261	250	253	249	236	234	242	222	317	293	303	315	251.5
28-Sep	292	282	223	247	273	291	25	46	41	11	7	1	358	0	359	4	4	14	10	4	357	356	353	350	357.8
29-Sep	352	351	32	356	355	345	334	C	C	352	359	353	355	4	7	346	348	16	20	20	15	10	25	45	1.0
30-Sep	171	168	181	157	174	176	174	149	156	159	184	182	178	191	130	143	149	156	155	154	171	176	167	156	164.0

197.1 186.4 194.0 186.5 186.1 195.0 189.4 183.1 187.1 190.4 204.3 211.4 224.2 226.4 228.5 221.2 223.3 218.0 200.3 194.2 201.9 203.7 193.3 194.3

Diurnal Average

C - Calibration

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

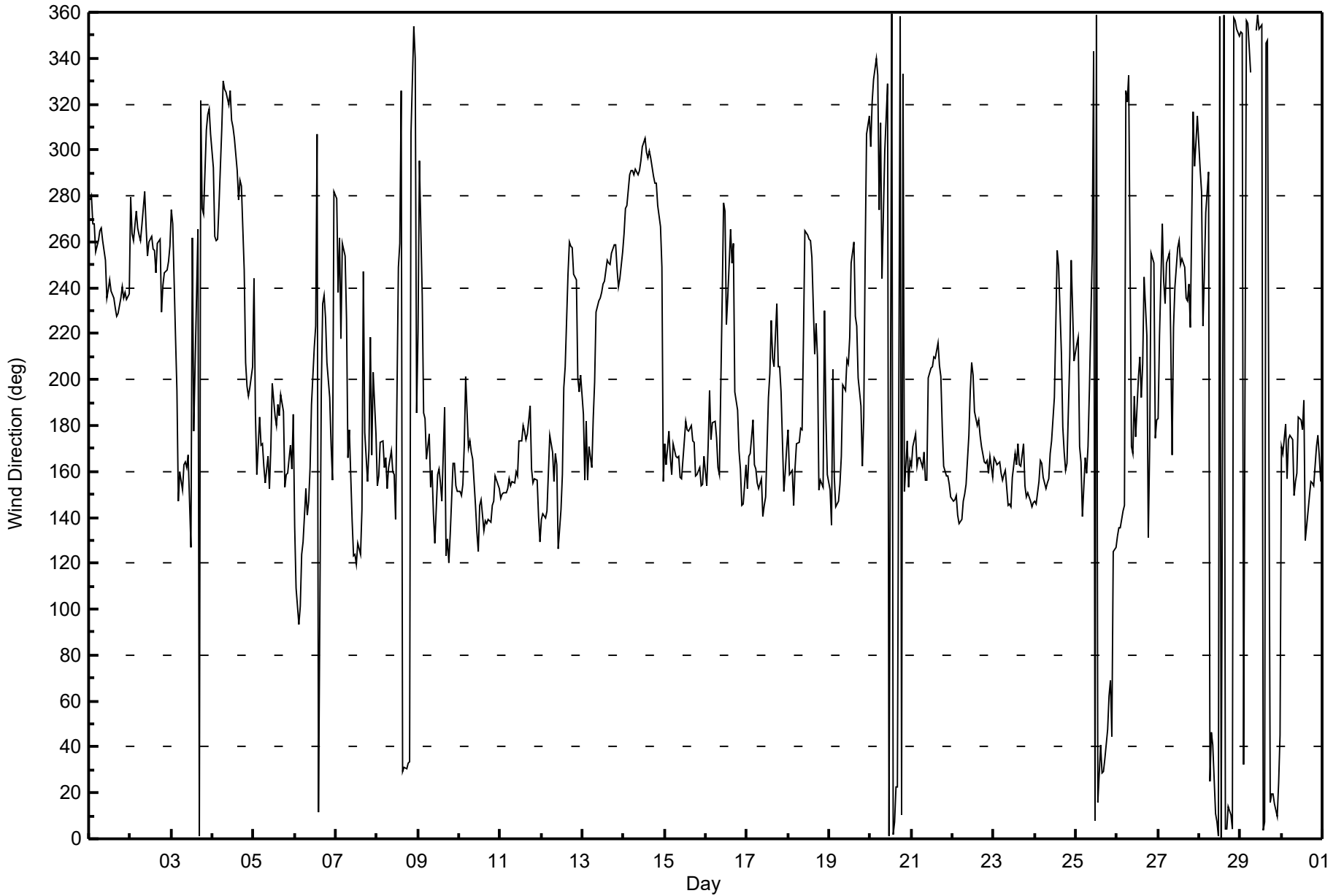
Wind Direction (WD) - deg
Buffalo Viewpoint - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 99 deg on Sep 26 06:00	Hours of Data: 718
Minimum Value: 9 deg on Sep 8 01:00	Hours of Missing Data: 2
Percentiles: P ₁ = 10 P ₁₀ = 15 Q ₁ = 19 Median = 24 Q ₃ = 30 P ₉₀ = 39 P ₉₉ = 79	Hours of Calibration: 2
	Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Sep	22	32	14	16	24	15	21	18	18	29	22	22	21	23	21	21	20	19	20	18	17	18	18	18	32
2-Sep	42	19	19	20	15	12	12	17	20	23	18	21	18	16	16	19	17	22	16	20	18	18	17	14	42
3-Sep	22	30	86	80	17	17	21	24	34	30	26	73	41	59	28	53	23	38	13	24	20	19	21	21	86
4-Sep	24	13	17	17	18	27	19	20	20	21	22	25	23	28	29	36	27	31	19	9	13	14	14	18	36
5-Sep	71	54	17	14	22	16	19	25	28	38	45	28	38	37	32	36	27	32	28	29	30	31	39	80	80
6-Sep	41	14	16	19	24	29	29	30	28	29	26	27	26	79	43	91	24	19	12	17	19	25	48	38	91
7-Sep	41	27	18	42	70	22	65	35	31	35	30	36	36	36	69	54	62	23	11	35	65	15	15	40	70
8-Sep	9	17	13	14	15	17	14	22	31	31	34	47	33	30	37	20	20	18	16	71	30	15	37	14	71
9-Sep	62	50	53	10	11	13	15	21	29	35	31	39	35	40	62	56	23	19	9	14	22	21	26	27	62
10-Sep	31	23	22	15	14	23	22	24	31	33	31	28	37	37	30	32	30	30	30	31	28	27	28	28	37
11-Sep	26	30	29	28	29	27	28	28	30	33	31	33	31	29	31	32	27	26	28	30	29	30	28	20	33
12-Sep	24	25	21	30	33	24	24	26	27	32	30	28	35	30	39	47	15	12	15	18	20	26	13	27	47
13-Sep	37	38	55	29	13	13	27	40	22	23	24	23	21	21	20	19	19	16	16	13	18	20	20	16	55
14-Sep	16	21	18	21	21	22	21	22	23	24	22	22	27	26	24	23	23	20	16	14	17	12	25	24	27
15-Sep	11	14	13	10	16	15	17	24	27	32	32	32	29	31	29	30	29	28	27	26	26	28	28	27	32
16-Sep	32	52	38	18	26	23	20	16	54	28	41	43	34	27	24	27	16	31	21	13	12	13	16	17	54
17-Sep	16	16	17	13	15	18	20	28	32	28	33	36	31	26	22	23	20	18	13	14	34	16	16	17	36
18-Sep	36	29	21	16	23	18	20	24	22	33	18	19	21	18	26	22	18	24	22	19	18	18	31	24	36
19-Sep	17	30	41	37	18	15	12	24	16	24	23	28	30	34	28	27	23	16	9	13	63	44	11	12	63
20-Sep	18	17	15	17	66	58	31	41	23	25	42	32	26	27	28	29	37	12	18	37	98	11	16	9	98
21-Sep	15	13	20	18	14	17	18	19	25	30	37	21	21	19	19	18	20	20	27	27	27	27	26	27	37
22-Sep	26	23	23	21	17	16	20	23	27	29	21	20	23	27	29	27	28	28	26	26	25	26	23	27	29
23-Sep	27	23	25	30	28	28	28	30	27	29	31	31	29	30	31	32	30	27	27	28	29	30	29	29	32
24-Sep	30	29	29	28	26	27	28	28	27	26	29	32	32	18	20	24	22	22	15	14	26	14	18	14	32
25-Sep	18	44	21	42	56	21	23	25	34	82	40	57	26	26	28	23	19	18	12	13	23	50	29	30	82
26-Sep	27	29	25	25	30	99	75	27	40	29	34	34	24	26	30	30	35	61	61	74	58	46	27	31	99
27-Sep	44	22	19	22	17	24	28	31	54	57	51	28	17	22	23	23	18	16	16	54	34	17	18	13	57
28-Sep	16	43	50	36	35	25	18	20	25	29	21	25	20	20	21	23	21	20	21	21	19	20	18	19	50
29-Sep	20	19	25	20	18	19	17	C	C	25	20	21	20	21	22	23	22	19	19	21	18	19	19	78	78
30-Sep	28	10	11	16	30	29	14	15	19	21	20	25	30	28	32	26	25	27	24	20	10	15	11	20	32

71	54	86	80	70	99	75	41	54	82	51	73	41	79	69	91	62	61	61	74	98	50	48	80	
Diurnal Maximum																								

C - Calibration





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

**AMS05
MANNIX
SEPTEMBER 2023**

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

October 30, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MANNIX (AMS05)
 SEPTEMBER 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	35	35	100	15.4	0	5.1	0
H2S (ppb) Average	682	36	38	99.72	10	1	1.5	0
THC (ppm) Average	682	35	38	99.58	3.4	-	2.5	-
NMHC(ppm) Average	682	35	38	99.58	0.789	-	0.225	-
CH4(ppm) Average	682	35	38	99.58	2.8	-	2.3	-
Temperature 2 m (C) Average	720	0	0	100	26.5	-	19.8	-
Temperature 20 m (C) Average	720	0	0	100	25.9	-	20.2	-
Temperature 45 m (C) Average	720	0	0	100	25.5	-	20.1	-
Temperature 75 m (C) Average	720	0	0	100	25.2	-	20	-
Temperature 90 m (C) Average	720	0	0	100	25.1	-	20.2	-
Relative Humidity 2 m (%) Average	720	0	0	100	98	-	91	-
Relative Humidity 20 m (%) Average	720	0	0	100	99	-	89	-
Relative Humidity 45 m (%) Average	720	0	0	100	99	-	89	-
Relative Humidity 75 m (%) Average	713	0	7	99.03	100	-	91	-
Relative Humidity 90 m (%) Average	713	0	7	99.03	100	-	89	-
Wind Speed 20 m (km/h) Average	720	0	0	100	30	-	17	-
Wind Speed 45 m (km/h) Average	719	0	1	99.86	39	-	25	-
Wind Speed 75 m (km/h) Average	720	0	0	100	43	-	30	-
Wind Speed 90 m (km/h) Average	720	0	0	100	44	-	31	-
Wind Direction 20 m (deg) Average	720	0	0	100	-	-	-	-
Wind Direction 45 m (deg) Average	719	0	1	99.86	-	-	-	-
Wind Direction 75 m (deg) Average	720	0	0	100	-	-	-	-
Wind Direction 90 m (deg) Average	720	0	0	100	-	-	-	-
Vertical Wind Speed 20 m (km/h) Average	720	0	0	100	1.4	-	0.9	-
Vertical Wind Speed 45 m (km/h) Average	719	0	1	99.86	1.7	-	1	-
Vertical Wind Speed 75 m (km/h) Average	720	0	0	100	2	-	0.6	-
Vertical Wind Speed 90 m (km/h) Average	720	0	0	100	2.2	-	0.3	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MANNIX (AMS05)

SEPTEMBER 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	0.5	1.5	-	0	0	0.1	0.1	0.3	0.7	15.4
H2S (ppb) Average	682	0.38	0.6	-	0	0.1	0.1	0.2	0.4	0.7	10.3
THC (ppm) Average	682	2.15	0.2	-	2	2	2	2.1	2.2	2.4	3.4
NMHC(ppm) Average	682	0.048	0.098	-	0	0	0	0	0	0.2	0.789
CH4(ppm) Average	682	2.1	0.1	-	2	2	2	2.1	2.1	2.2	2.8
Temperature 2 m (C) Average	720	13.42	5.6	-	1.1	6.5	8.9	12.8	17.6	21.3	26.5
Temperature 20 m (C) Average	720	14.2	5	-	2.9	7.6	9.8	14.1	17.9	21	25.9
Temperature 45 m (C) Average	720	14.27	4.8	-	2.8	7.7	10.1	14.4	17.7	20.8	25.5
Temperature 75 m (C) Average	720	14.41	4.6	-	3.6	8	10.9	14.7	17.7	20.5	25.2
Temperature 90 m (C) Average	720	14.56	4.6	-	4	8.1	11.2	14.9	17.8	20.6	25.1
Relative Humidity 2 m (%) Average	720	68	20	-	25	41	52	69	86	93	98
Relative Humidity 20 m (%) Average	720	62.6	18	-	25	38	48	63	78	87	99
Relative Humidity 45 m (%) Average	720	60.4	17	-	25	37	47	60	74	84	99
Relative Humidity 75 m (%) Average	713	59.1	17	-	25	37	46	58	71	81	100
Relative Humidity 90 m (%) Average	713	58.1	16	-	25	37	45	57	70	81	100
Wind Speed 20 m (km/h) Average	720	10.7	5	-	0	5	7	10	14	18	30
Wind Speed 45 m (km/h) Average	719	16	7	-	0	7	11	16	20	26	39
Wind Speed 75 m (km/h) Average	720	18.3	9	-	1	8	12	17	24	30	43
Wind Speed 90 m (km/h) Average	720	19	9	-	0	8	12	18	25	32	44
Wind Direction 20 m (deg) Average	720	-	-	-	-	-	-	-	-	-	-
Wind Direction 45 m (deg) Average	719	-	-	-	-	-	-	-	-	-	-
Wind Direction 75 m (deg) Average	720	-	-	-	-	-	-	-	-	-	-
Wind Direction 90 m (deg) Average	720	-	-	-	-	-	-	-	-	-	-
Vertical Wind Speed 20 m (km/h) Average	720	0.25	0.4	-	-1	-0.2	0	0.2	0.5	0.7	1.4
Vertical Wind Speed 45 m (km/h) Average	719	0.13	0.5	-	-1	-0.5	-0.3	0	0.6	0.9	1.7
Vertical Wind Speed 75 m (km/h) Average	720	0.21	0.3	-	-0.8	-0.2	0	0.2	0.4	0.7	2
Vertical Wind Speed 90 m (km/h) Average	720	-0.07	0.5	-	-1.5	-0.6	-0.4	-0.1	0.2	0.5	2.2

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MANNIX (AMS05)
 SEPTEMBER 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
THC/NMHC/CH4	08 Sep 2023 13:00	08 Sep 2023 15:00	3	Maintenance - replaced support gas cylinder
H2S	08 Sep 2023 13:00	08 Sep 2023 15:00	2	Maintenance - sample manifold cleaned
Relative Humidity 75 m	06 Sep 2023 10:00	06 Sep 2023 11:00	2	Sensor operated out of range
Relative Humidity 75 m	28 Sep 2023 07:00	28 Sep 2023 11:00	5	Sensor operated out of range
Relative Humidity 90m	06 Sep 2023 10:00	06 Sep 2023 11:00	2	Sensor operated out of range
Relative Humidity 90m	28 Sep 2023 07:00	28 Sep 2023 11:00	5	Sensor operated out of range
Wind Speed, Wind Direction, Vertical Wind Speed 45m	06 Sep 2023 09:00	06 Sep 2023 09:00	1	Flat line in sensor output signal



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb

Mannix - September 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 15.4 ppb on Sep 20 13:00	Maximum Daily Average: 5.1 ppb on Sep 20		Hours of Data:	685
Minimum Value: 0.0 ppb on Sep 1 20:00	Minimum Daily Average: 0.0 ppb on Sep 7		Hours of Missing Data:	35
Maximum Diurnal Average: 1.3 ppb at hour 11	Minimum Diurnal Average: 0.2 ppb at hour 8		Hours of Calibration:	35
Monthly Average: 0.50 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.1 Q ₃ = 0.3 P ₉₀ = 0.7 P ₉₉ = 9.3		Percent Operational Time:	100.0

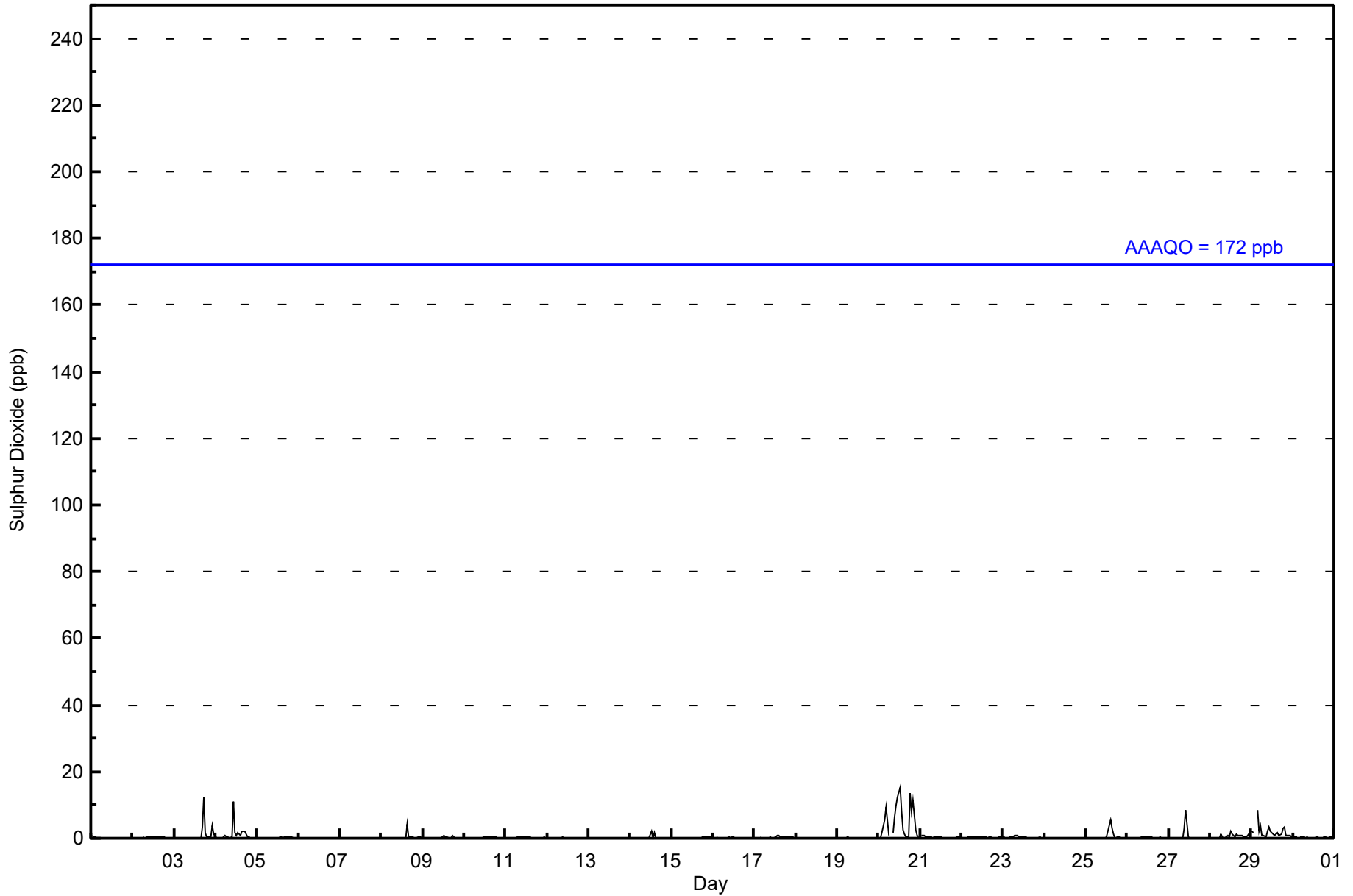
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Sep	0.7	0.5	0.4	0.2	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.1	0.1	0.2	0.2	0.7																					
2-Sep	0.0	0.1	0.0	0.0	0.1	Z	0.2	0.2	0.3	0.3	0.2	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.4																					
3-Sep	Z	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.0	3.3	12.1	1.5	0.6	0.6	0.6	3.8	1.2	1.1	12.1																						
4-Sep	0.4	Z	0.1	0.1	0.1	0.8	0.4	0.3	0.2	0.2	11.1	1.6	0.7	1.9	1.0	2.3	2.1	2.0	0.3	0.2	0.2	0.1	0.1	0.1	0.2	1.1	11.1																					
5-Sep	0.2	0.2	Z	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.2	0.3																					
6-Sep	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	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1																					
7-Sep	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																					
8-Sep	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	4.3	0.3	0.2	0.2	0.1	0.1	0.2	0.4	0.4	0.3	4.3																						
9-Sep	Z	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.1	0.6	0.7	0.4	0.2	0.1	0.1	1.0	0.3	0.2	0.1	0.1	0.0	0.0	0.2	1.0																						
10-Sep	0.0	Z	0.1	0.0	0.1	0.1	0.2	0.0	0.0	0.1	0.2	0.4	0.3	0.2	0.3	0.4	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.4																						
11-Sep	0.1	0.2	Z	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.5	0.4	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.5																						
12-Sep	0.2	0.1	0.1	Z	0.1	0.1	0.1	0.1	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	0.1	0.1	0.1	0.2																						
13-Sep	0.0	0.1	0.1	0.1	Z	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	0.0	0.0	0.0	0.0	0.0	0.2																						
14-Sep	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.2	1.9	0.2	1.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9																						
15-Sep	Z	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.2	C	C	C	C	C	0.0	0.0	0.0	0.2	0.3	0.3	0.2	0.2	0.3	0.3	0.1	0.3																						
16-Sep	0.3	Z	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3																						
17-Sep	0.1	0.2	Z	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.4	0.7	0.8	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.2	0.2	0.8																						
18-Sep	0.1	0.1	0.1	Z	0.1	0.0	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	0.0	0.1	0.1	0.1	0.1																						
19-Sep	0.1	0.0	0.1	0.1	Z	0.3	0.3	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.3																						
20-Sep	0.0	0.1	1.8	5.3	9.2	5.0	0.7	Z	1.9	6.5	9.6	12.4	15.4	8.0	2.4	1.3	0.5	0.5	13.7	8.1	11.5	2.7	0.9	0.6	5.1	15.4																						
21-Sep	Z	0.7	0.9	0.4	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.2	0.3	0.9																						
22-Sep	0.2	Z	0.2	0.2	0.2	0.3	0.4	0.6	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.2	0.3	0.3	0.2	0.1	0.1	0.1	0.3	0.5	0.3	0.6																						
23-Sep	0.6	0.4	Z	0.6	0.6	0.6	0.5	0.7	0.7	0.6	0.6	0.5	0.4	0.3	0.2	0.1	0.2	0.1	0.0	0.2	0.2	0.2	0.1	0.0	0.4	0.7																						
24-Sep	0.0	0.1	0.1	Z	0.1	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	0.0	0.0	0.0	0.0	0.0	0.1																						
25-Sep	0.0	0.0	0.0	0.1	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	2.3	5.7	3.1	1.2	0.1	0.2	0.3	0.0	0.0	0.1	0.0	0.6	5.7																						
26-Sep	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.1	0.4	0.5	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.1	0.1	0.1	0.0	0.2	0.5																						
27-Sep	Z	0.0	0.0	0.0	0.0	0.1	0.1	0.1	2.8	8.3	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.6	8.3																						
28-Sep	0.0	Z	0.2	0.0	0.1	0.2	1.3	0.3	0.1	0.6	0.7	0.5	2.2	1.1	0.3	1.2	0.8	0.6	0.8	0.3	0.6	0.4	0.9	1.9	0.7	2.2																						
29-Sep	2.0	1.8	Z	8.3	2.2	3.9	0.9	0.7	0.5	2.3	3.2	2.1	1.4	0.7	1.2	1.5	0.7	1.1	3.1	3.2	1.0	1.0	0.9	0.3	1.9	8.3																						
30-Sep	0.3	0.3	0.3	Z	0.5	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.3	0.2	0.1	0.1	0.3	0.3	0.2	0.3	0.3	0.2	0.2	0.5																						
																								0.2	0.2	0.2	0.7	0.6	0.5	0.2	0.2	0.2	0.6	1.3	0.8	0.9	0.6	0.5	0.6	0.4	0.7	0.8	0.5	0.5	0.3	0.3	0.2	Diurnal Average
																								2.0	1.8	1.8	8.3	9.2	5.0	1.3	0.7	1.9	6.5	11.1	12.4	15.4	8.0	5.7	4.3	3.3	12.1	13.7	8.1	11.5	2.7	3.8	1.9	Diurnal Maximum

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



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Mannix - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	679	99.12	99.12
11 - 20	6	0.88	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Mannix - September 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	30	15	5	6	4	7	89	194	51	56	46	75	57	19	9	16	679
11 - 20	4	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	6
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	34	15	5	6	4	7	89	194	51	56	46	75	57	19	11	16	685

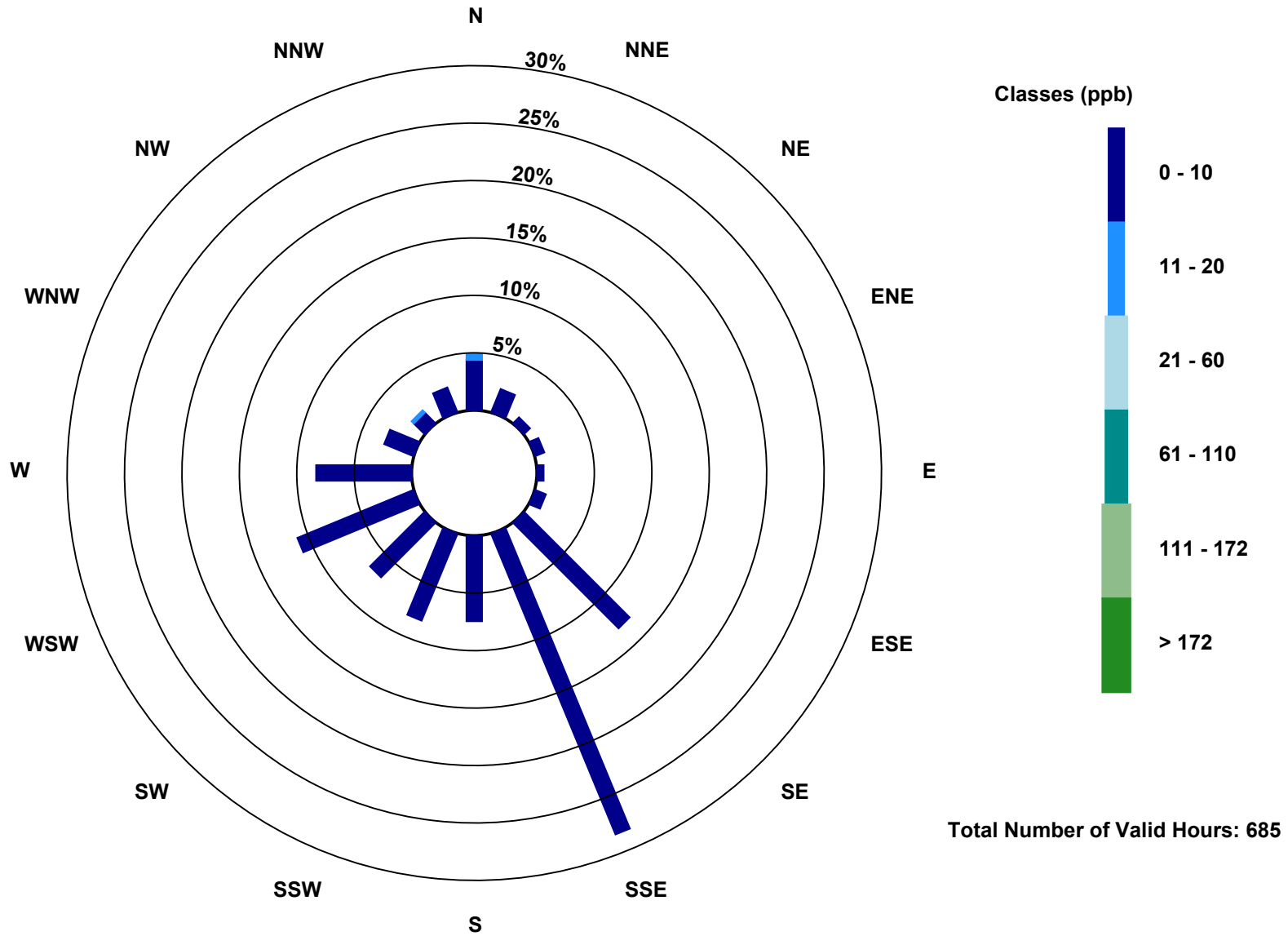
Total Number of Valid Hours: 685

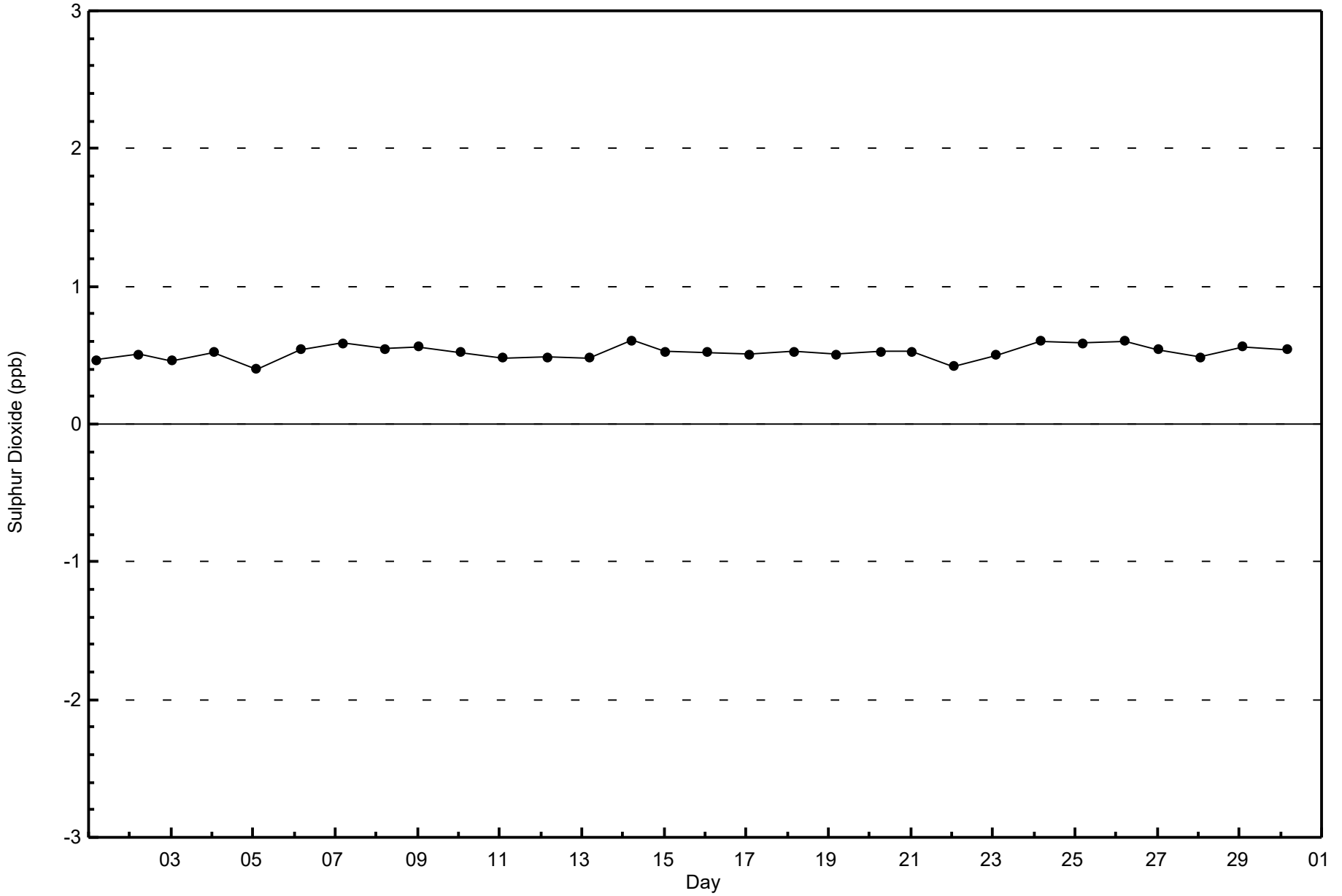
Total Number of Hours: 720

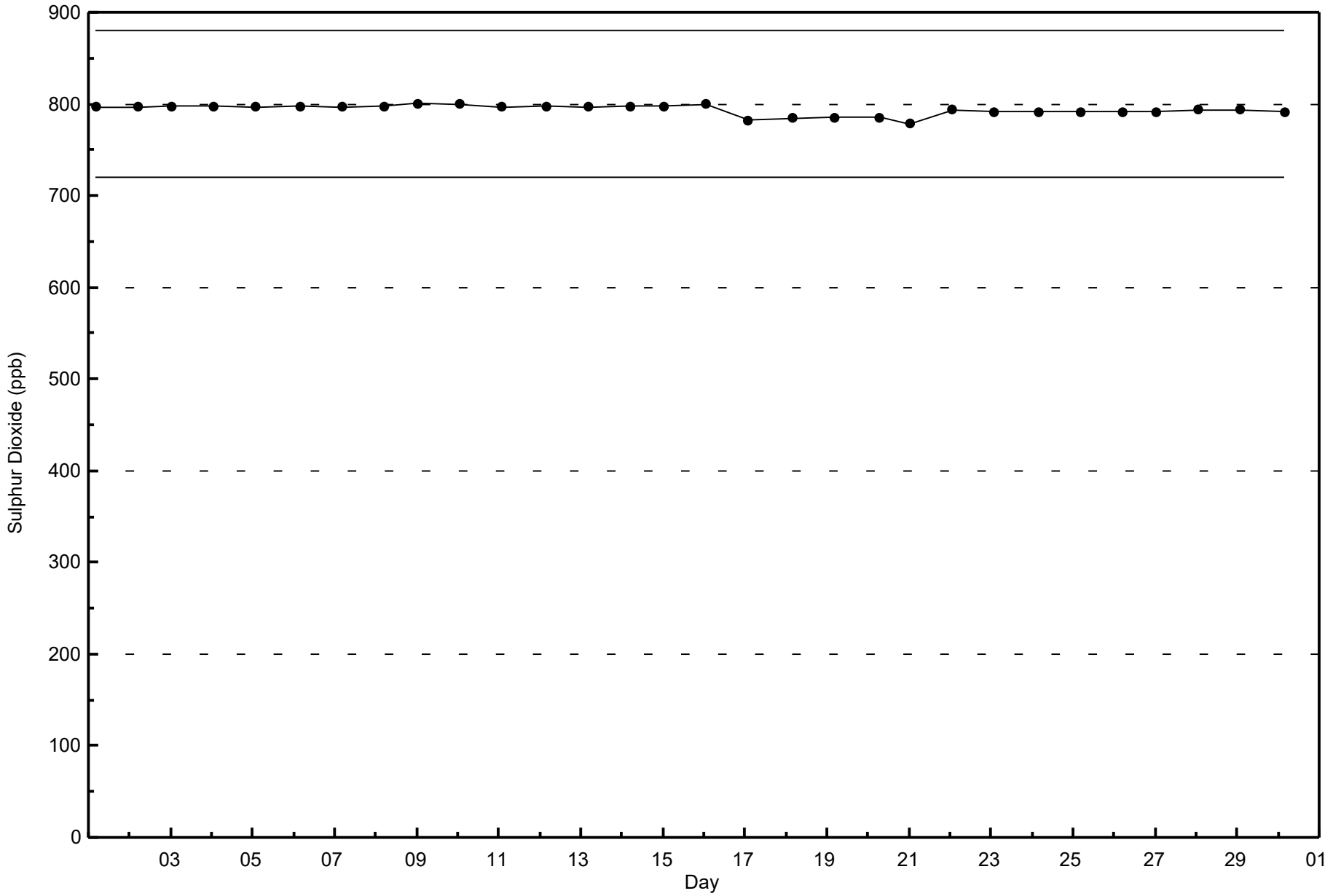


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Sulphur Dioxide (SO₂) - ppb
Mannix





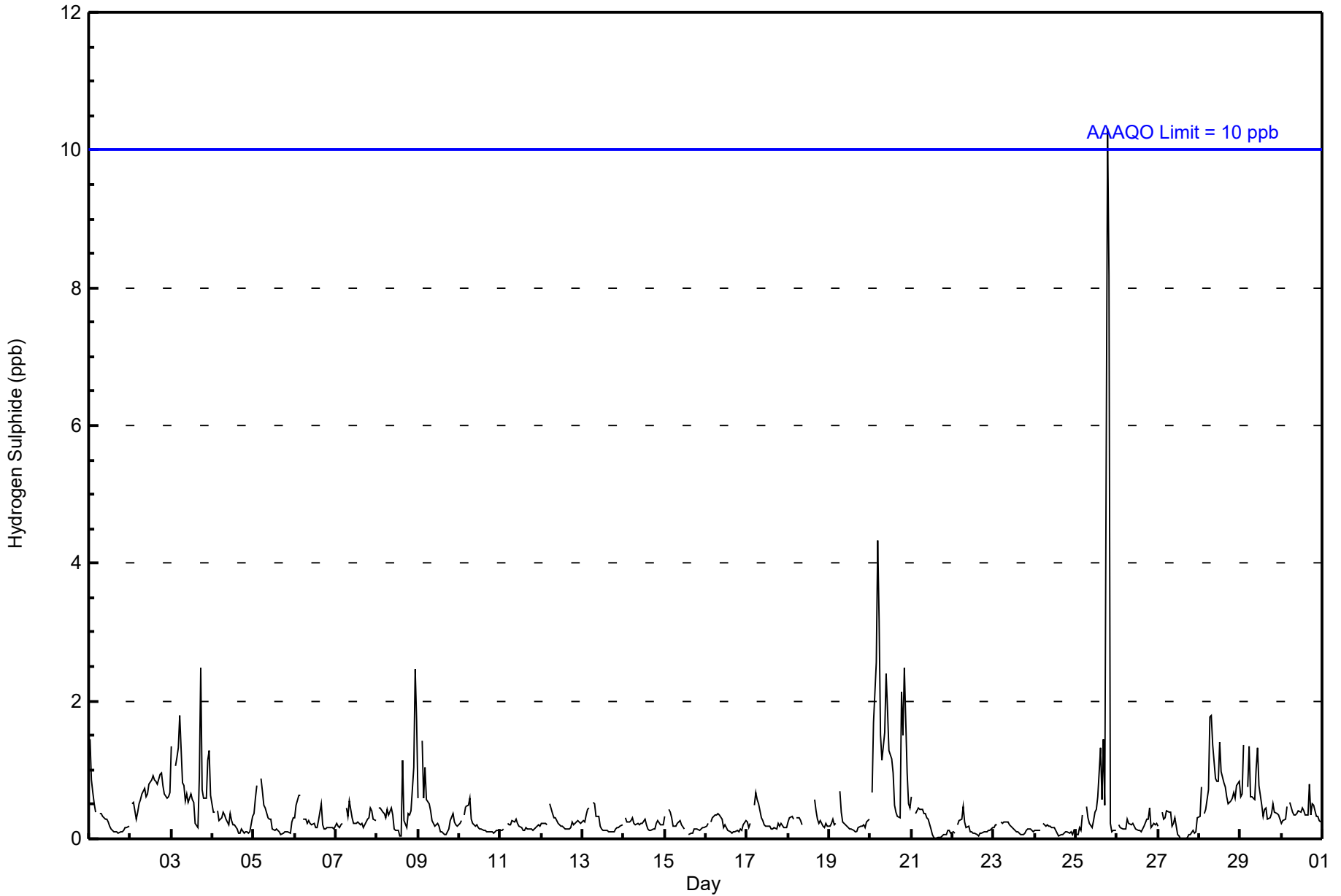




Number of Exceedences (AAAQO):	1-hr: 1	24-hr: 0	Hours in Service:	720
Maximum Value: 10.3 ppb on Sep 25 19:00	Maximum Daily Average: 1.5 ppb on Sep 20		Hours of Data:	682
Minimum Value: 0.0 ppb on Sep 27 15:00	Minimum Daily Average: 0.1 ppb on Sep 24		Hours of Missing Data:	38
Maximum Diurnal Average: 0.6 ppb at hour 19	Minimum Diurnal Average: 0.2 ppb at hour 15		Hours of Calibration:	36
Monthly Average: 0.38 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.1 Median = 0.2 Q ₃ = 0.4 P ₉₀ = 0.7 P ₉₉ = 2.5		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-Sep	1.4	0.8	0.7	0.5	0.4	Z	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	1.4																						
2-Sep	Z	0.5	0.5	0.3	0.4	0.5	0.6	0.7	0.7	0.6	0.7	0.8	0.8	0.9	0.9	0.8	0.8	0.9	0.9	0.8	0.6	0.6	0.6	0.7	0.7	0.9																						
3-Sep	1.4	Z	1.1	1.2	1.3	1.8	0.8	0.8	0.6	0.7	0.5	0.7	0.6	0.5	0.2	0.2	0.9	2.5	0.7	0.6	0.6	1.1	1.3	0.6	0.9	2.5																						
4-Sep	0.4	0.4	Z	0.4	0.3	0.3	0.4	0.4	0.3	0.2	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.2	0.4																					
5-Sep	0.4	0.6	0.8	Z	0.9	0.7	0.5	0.4	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.3	0.9																						
6-Sep	0.3	0.5	0.6	0.6	Z	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.5	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.3	0.6																						
7-Sep	0.2	0.2	0.2	0.2	0.2	Z	0.5	0.3	0.5	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.5	0.4	0.3	0.3	0.3	0.5																						
8-Sep	Z	0.4	0.5	0.4	0.4	0.3	0.4	0.3	0.4	0.3	0.1	0.1	0.1	0.0	0.0	1.1	0.3	0.2	0.4	0.4	0.4	1.0	2.5	1.7	0.5	2.5																						
9-Sep	0.6	Z	1.4	0.6	1.0	0.6	0.5	0.4	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.4	0.3	0.2	0.2	0.3	1.4																						
10-Sep	0.2	0.3	Z	0.3	0.5	0.5	0.6	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.6																						
11-Sep	0.1	0.1	0.1	Z	0.2	0.2	0.2	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	0.2	0.2	0.2	0.2	0.3																						
12-Sep	0.2	0.2	0.2	0.2	Z	0.5	0.4	0.3	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	0.3	0.2	0.2	0.5																						
13-Sep	0.3	0.2	0.3	0.4	0.4	Z	0.5	0.5	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.5																						
14-Sep	Z	0.3	0.3	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.2	0.2	0.2	0.3																						
15-Sep	0.3	Z	0.4	0.4	0.3	0.2	0.2	0.2	0.3	0.3	0.2	0.1	M	M	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.4																						
16-Sep	0.2	0.2	Z	0.2	0.3	0.4	0.3	0.4	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.2	0.4																						
17-Sep	0.2	0.2	0.2	Z	0.5	0.7	0.6	0.5	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.7																						
18-Sep	0.2	0.3	0.3	0.3	Z	0.3	0.3	0.3	0.2	C	C	C	C	C	C	0.6	0.4	0.3	0.2	0.3	0.2	0.2	0.2	0.2	--	0.6																						
19-Sep	0.2	0.2	0.3	0.2	0.2	Z	0.7	0.4	0.2	0.2	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	0.3	0.2	0.7																						
20-Sep	Z	0.7	1.7	2.6	4.3	3.2	1.5	1.1	1.5	2.4	1.9	1.3	1.2	1.0	0.5	0.4	0.3	0.3	2.1	1.5	2.5	1.0	0.5	0.4	1.5	4.3																						
21-Sep	0.6	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	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	0.2	0.6																						
22-Sep	0.1	0.1	Z	0.2	0.3	0.3	0.5	0.2	0.2	0.2	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	0.2	0.1	0.5																						
23-Sep	0.2	0.2	0.2	Z	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3																						
24-Sep	0.1	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	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2																						
25-Sep	0.1	0.1	0.2	0.1	0.4	Z	0.5	0.3	0.2	0.2	0.3	0.4	0.4	0.6	1.3	0.6	1.5	0.5	10.3	8.2	0.2	0.1	0.1	0.1	1.2	10.3																						
26-Sep	Z	0.2	0.2	0.1	0.1	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.4	0.2	0.2	0.2	0.2	0.2	0.4																						
27-Sep	0.2	Z	0.4	0.3	0.3	0.4	0.4	0.4	0.2	0.2	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.4																						
28-Sep	0.3	0.8	Z	0.4	0.4	0.7	1.8	1.8	1.4	0.9	0.8	0.8	1.4	1.0	0.8	0.7	0.6	0.5	0.6	0.6	0.7	0.6	0.8	0.8	0.8	1.8																						
29-Sep	0.6	0.6	1.4	Z	0.7	1.3	0.6	0.6	0.6	1.0	1.3	0.8	0.5	0.3	0.4	0.5	0.3	0.3	0.4	0.5	0.4	0.4	0.4	0.3	0.6	1.4																						
30-Sep	0.2	0.3	0.3	0.5	Z	0.5	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.8	0.4	0.5	0.5	0.3	0.3	0.3	0.2	0.4	0.8																						
																								0.4	0.3	0.5	0.4	0.6	0.6	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.6	0.6	0.3	0.3	0.3	0.3	Diurnal Average
																								1.4	0.8	1.7	2.6	4.3	3.2	1.8	1.8	1.5	2.4	1.9	1.3	1.4	1.0	1.3	1.1	1.5	2.5	10.3	8.2	2.5	1.1	2.5	1.7	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
Mannix - September 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	677	99.27	99.27
3 - 4	3	0.44	99.71
5 - 7	0	0.00	99.71
8 - 11	2	0.29	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 682

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Mannix - September 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	15	5	3	5	7	91	195	48	57	44	75	54	19	11	16	677
3 - 4	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	3
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	33	16	5	6	5	7	91	195	48	57	44	75	54	19	11	16	682

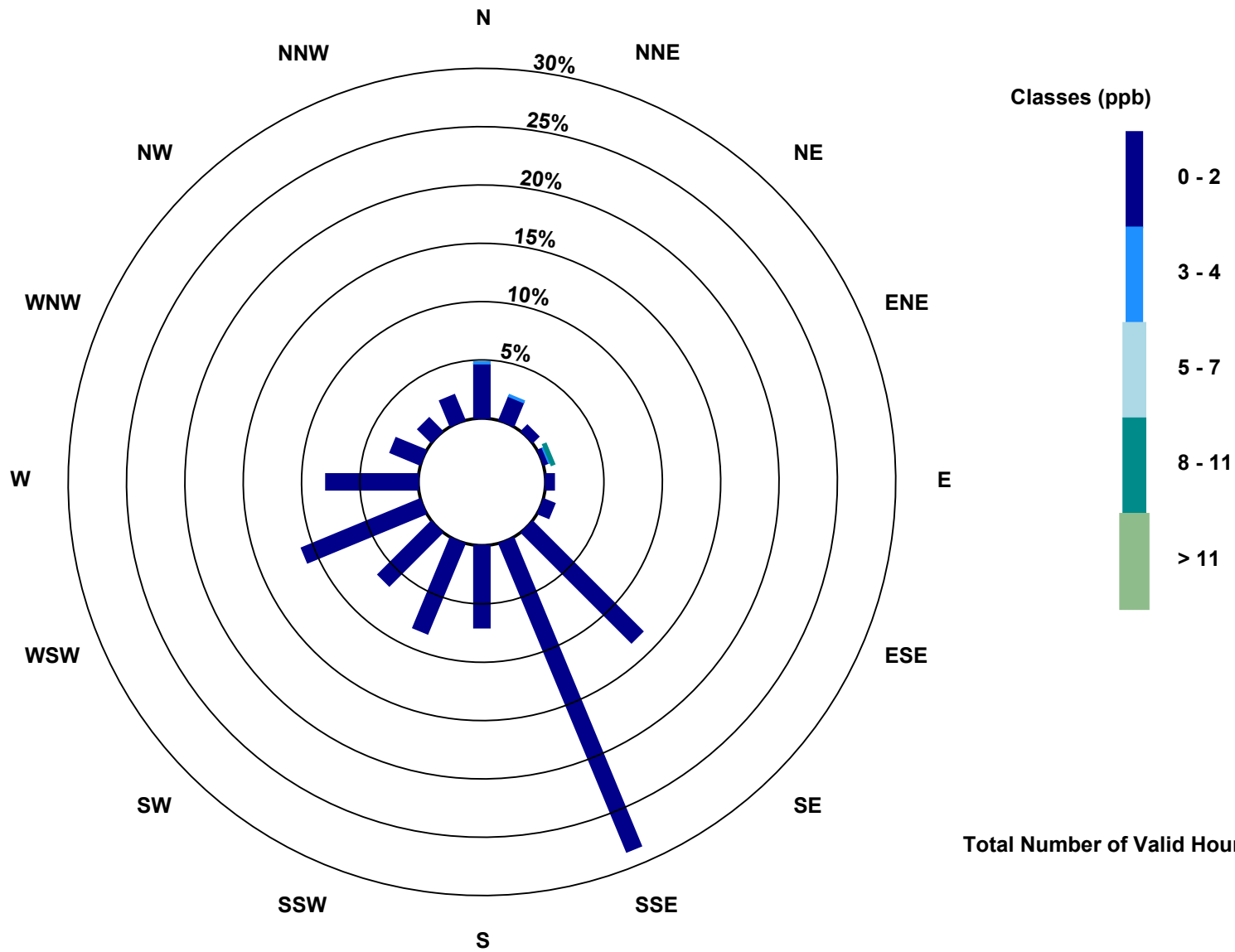
Total Number of Valid Hours: 682

Total Number of Hours: 720

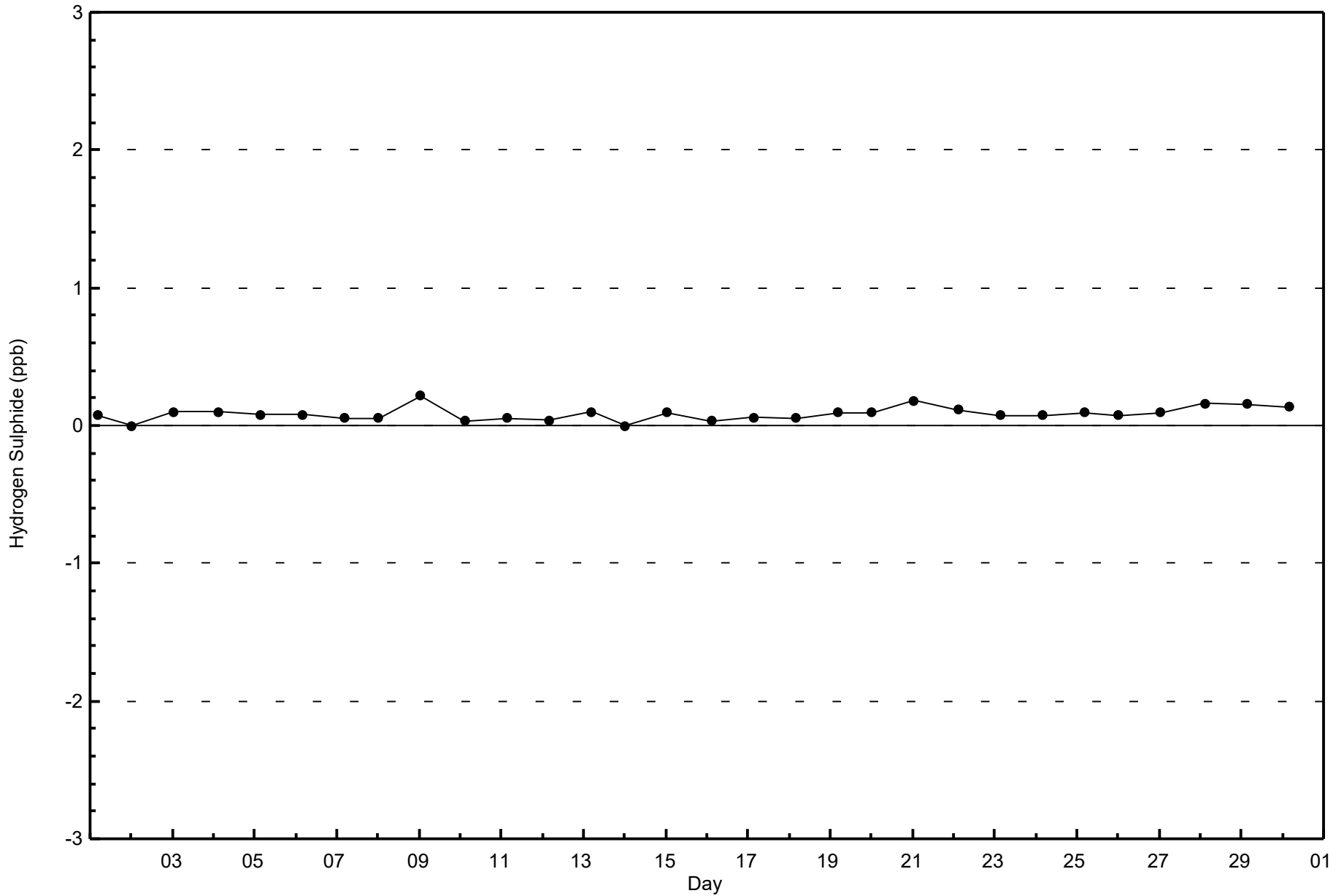


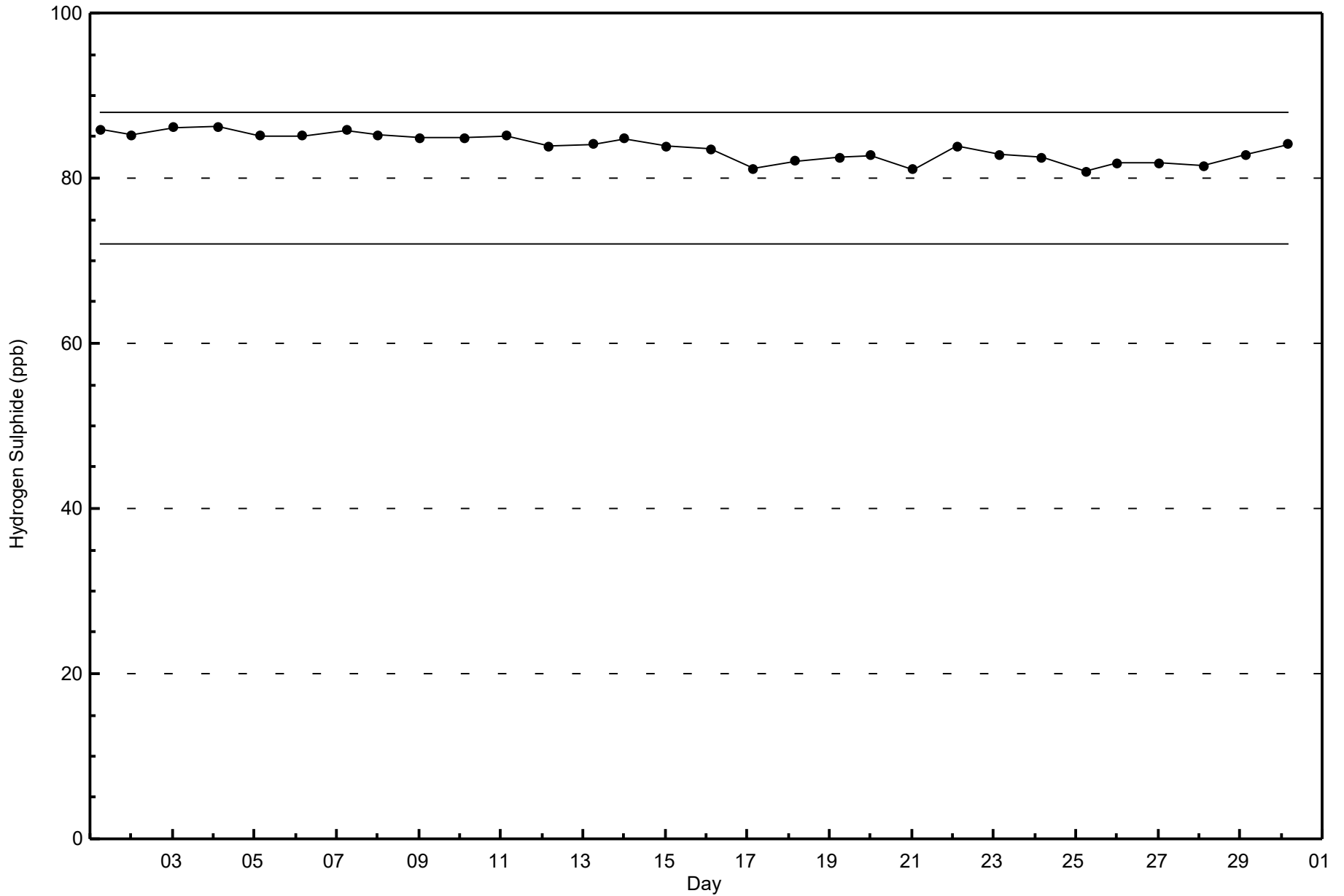
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Hydrogen Sulphide (H₂S) - ppb
Mannix



Total Number of Valid Hours: 682



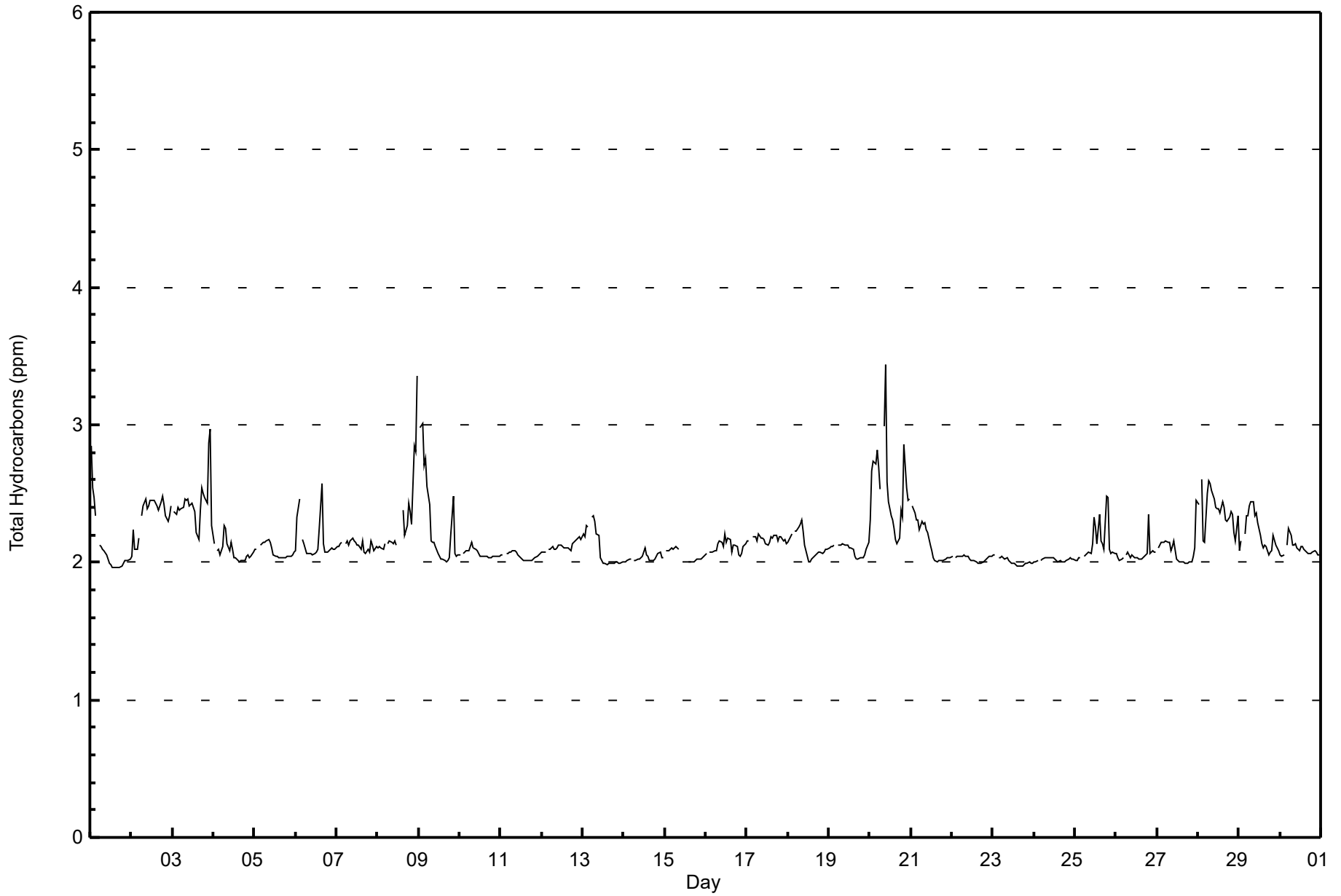




Wood Buffalo Environmental Association
Summary of Hour Averages

Total Hydrocarbons (THC) - ppm
Mannix - September 2023

Maximum Value: 3.4 ppm on Sep 20 10:00		Maximum Daily Average: 2.5 ppm on Sep 20		Hours in Service: 720																							
Minimum Value: 2.0 ppm on Sep 1 16:00		Minimum Daily Average: 2.0 ppm on Sep 23		Hours of Data: 682																							
Maximum Diurnal Average: 2.2 ppm at hour 3		Minimum Diurnal Average: 2.1 ppm at hour 17		Hours of Missing Data: 38																							
Monthly Average: 2.15 ppm		Percentiles: P ₁ = 2.0 P ₁₀ = 2.0 Q ₁ = 2.0 Median = 2.1 Q ₃ = 2.2 P ₉₀ = 2.4 P ₉₉ = 2.9		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-Sep	2.8	2.5	2.5	2.3	Z	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.8	
2-Sep	2.0	2.2	2.1	2.1	2.2	Z	2.3	2.4	2.5	2.4	2.4	2.5	2.4	2.5	2.4	2.4	2.4	2.4	2.5	2.4	2.3	2.3	2.3	2.4	2.3	2.5	
3-Sep	Z	2.4	2.3	2.4	2.4	2.4	2.4	2.5	2.5	2.5	2.4	2.4	2.4	2.2	2.2	2.4	2.5	2.5	2.5	2.4	2.9	3.0	2.3	2.4	3.0		
4-Sep	2.1	Z	2.1	2.1	2.1	2.1	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	2.1	2.0	2.0	2.1	2.1	2.3		
5-Sep	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2		
6-Sep	2.1	2.3	2.5	Z	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.6	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.6	
7-Sep	2.1	2.1	2.1	2.1	Z	2.1	2.2	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.2	
8-Sep	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.2	2.1	2.1	2.2	2.1	M	M	M	2.4	2.2	2.3	2.4	2.4	2.3	2.9	2.8	3.4	2.3	3.4	
9-Sep	Z	3.0	3.0	2.7	2.8	2.5	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	2.2	2.5	2.1	2.0	2.1	2.3	3.0	
10-Sep	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	
11-Sep	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	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.1	
12-Sep	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.2	
13-Sep	2.2	2.2	2.3	2.3	Z	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	2.0	2.0	2.0	2.0	2.0	2.1	2.3	
14-Sep	2.0	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	2.1	2.1	2.0	2.0	2.0	2.1	
15-Sep	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	C	C	C	C	C	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	
16-Sep	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.2	
17-Sep	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	
18-Sep	2.1	2.2	2.2	Z	2.2	2.2	2.3	2.3	2.3	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	
19-Sep	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	2.1	2.1	2.1	2.1	2.1	
20-Sep	2.3	2.7	2.7	2.7	2.8	2.7	2.5	Z	3.0	3.4	2.6	2.4	2.3	2.3	2.2	2.2	2.1	2.2	2.4	2.3	2.9	2.5	2.4	2.5	2.5	3.4	
21-Sep	Z	2.4	2.4	2.3	2.3	2.2	2.3	2.3	2.3	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.4
22-Sep	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
23-Sep	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	2.1
24-Sep	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
25-Sep	2.0	2.0	2.0	2.0	Z	2.0	2.1	2.1	2.1	2.1	2.1	2.3	2.3	2.1	2.4	2.2	2.1	2.1	2.5	2.5	2.1	2.1	2.1	2.1	2.1	2.5	
26-Sep	2.1	2.0	2.0	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	2.1	2.1	2.3	2.1	2.1	2.1	2.1	2.1	2.3	
27-Sep	Z	2.1	2.1	2.1	2.2	2.2	2.1	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	2.1	2.4	2.1	2.4	
28-Sep	2.4	Z	2.6	2.2	2.1	2.5	2.6	2.6	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.4	2.4	2.2	2.2	2.3	2.4	2.6	
29-Sep	2.1	2.2	Z	2.2	2.3	2.3	2.4	2.4	2.4	2.3	2.4	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.2	2.4	
30-Sep	2.1	2.0	2.1	Z	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	2.1	2.1	2.1	2.1	2.1	2.1	2.2	
																								Diurnal Average			
																								Diurnal Maximum			
																								2.1 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.2 2.2 2.2			
																								2.8 3.0 3.0 2.7 2.8 2.7 2.6 2.6 3.0 3.4 2.6 2.5 2.4 2.5 2.4 2.6 2.4 2.5 2.5 2.5 2.9 2.9 3.0 3.4			
																								Z - zerospan C - Calibration M - Maintenance			





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Mannix - September 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	230	33.72	33.72
2.1 - 3.0	450	65.98	99.71
3.1 - 10.0	2	0.29	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 682

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Mannix - September 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	43	61	21	19	15	37	25	9	0	0	230
2.1 - 3.0	33	15	4	6	4	7	46	133	30	36	31	38	31	9	11	16	450
3.1 - 10.0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	34	15	4	6	4	7	89	194	51	56	46	75	56	18	11	16	682

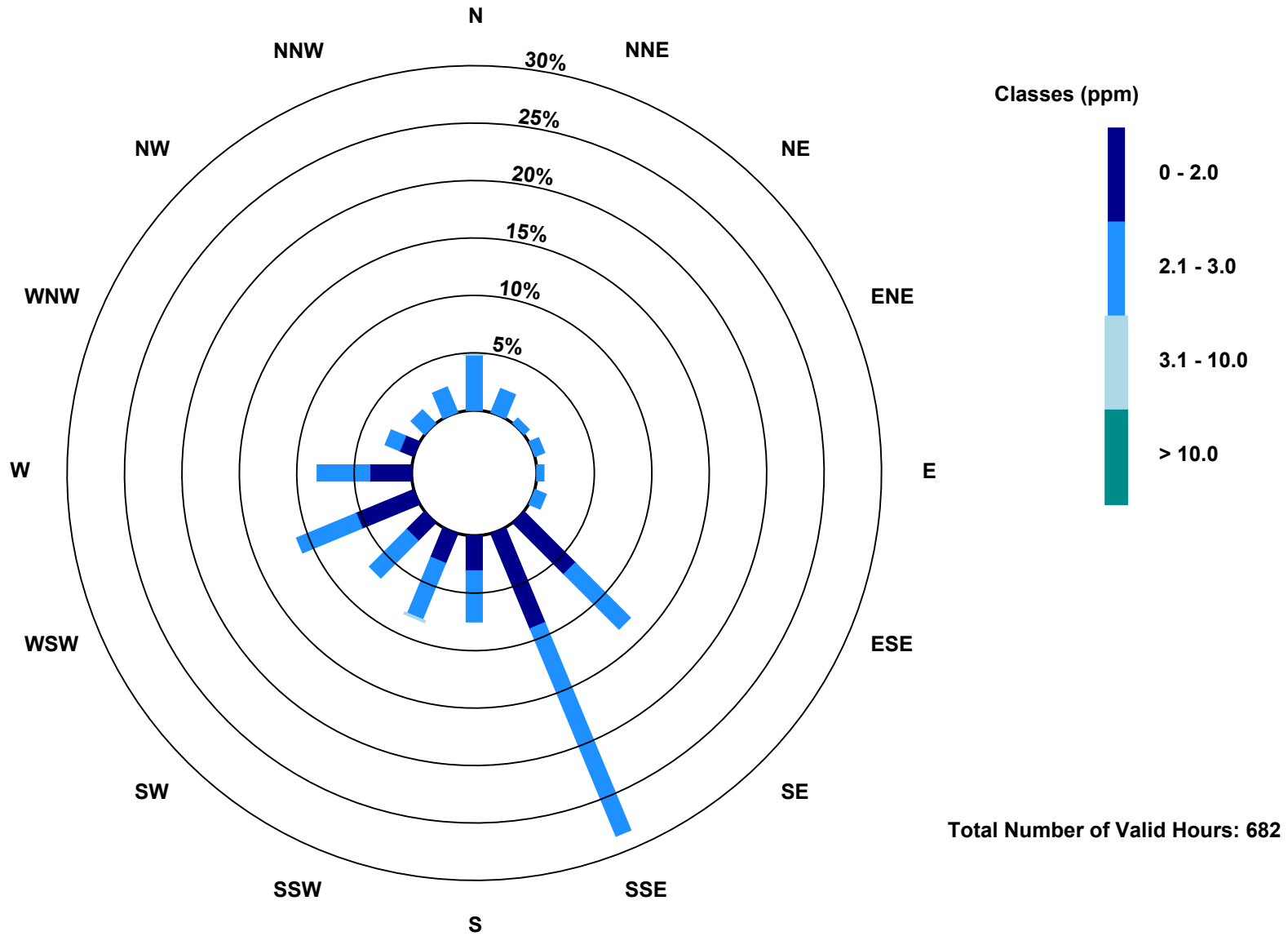
Total Number of Valid Hours: 682

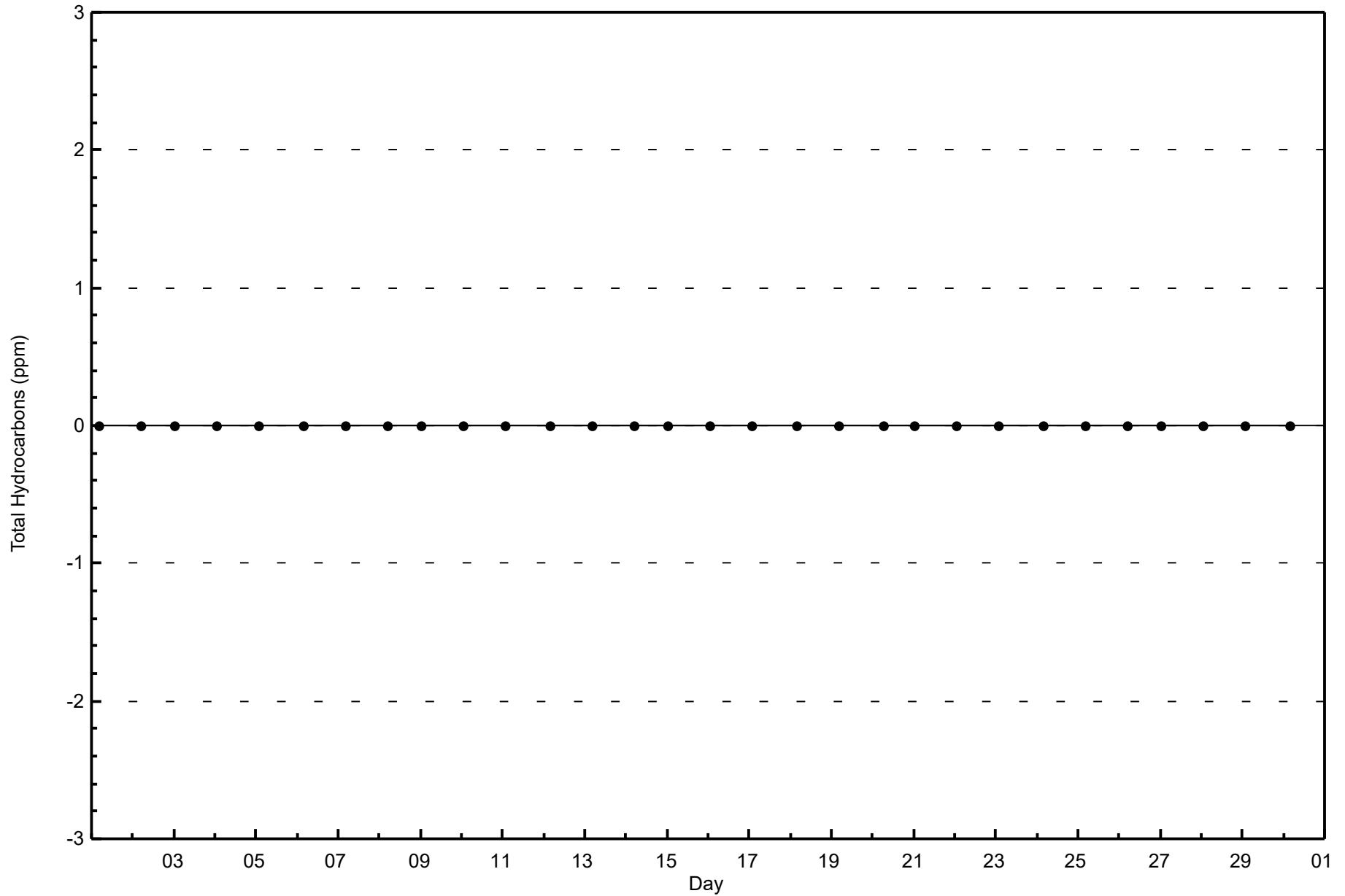
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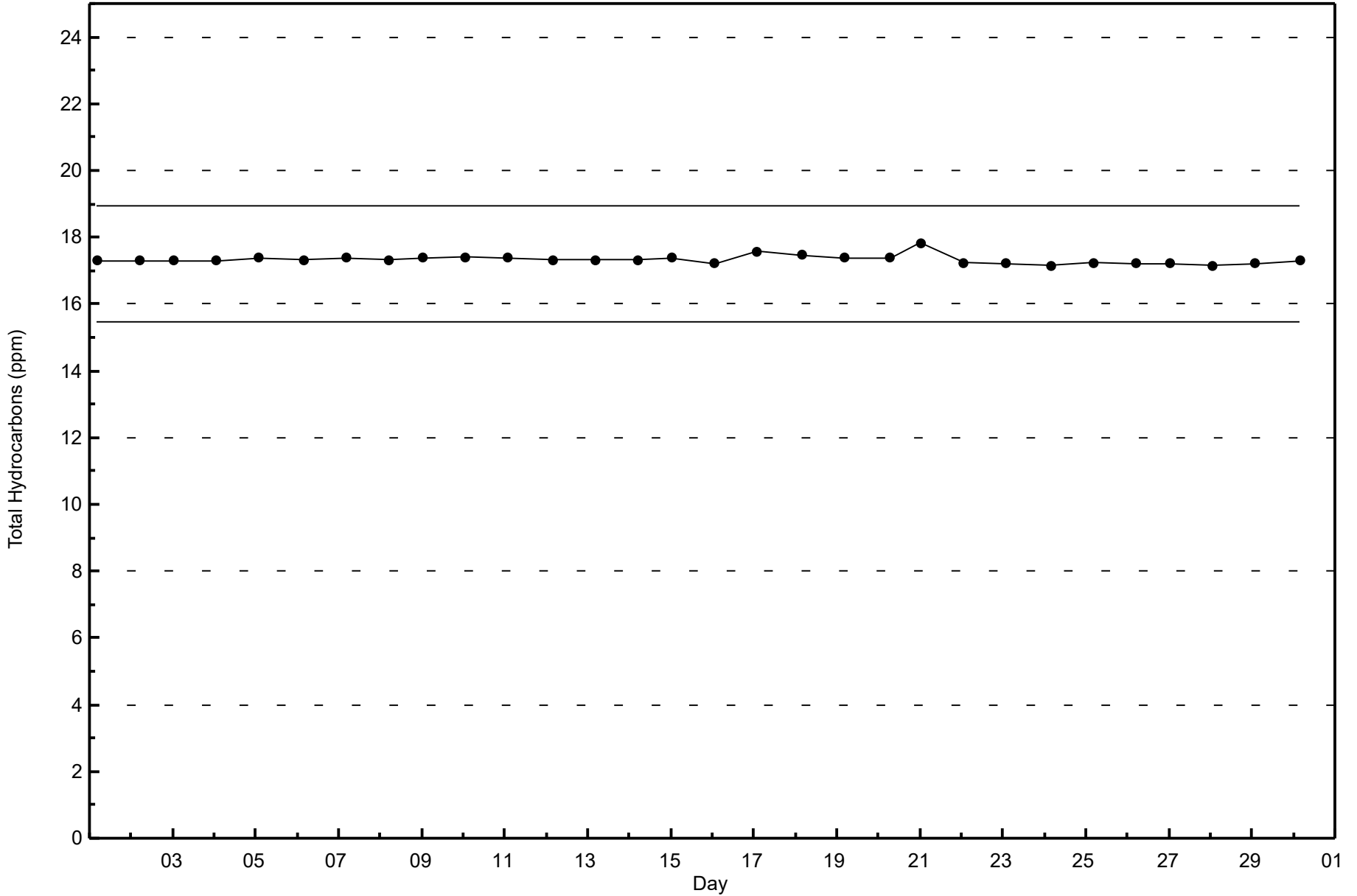


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Total Hydrocarbons (THC) - ppm
Mannix





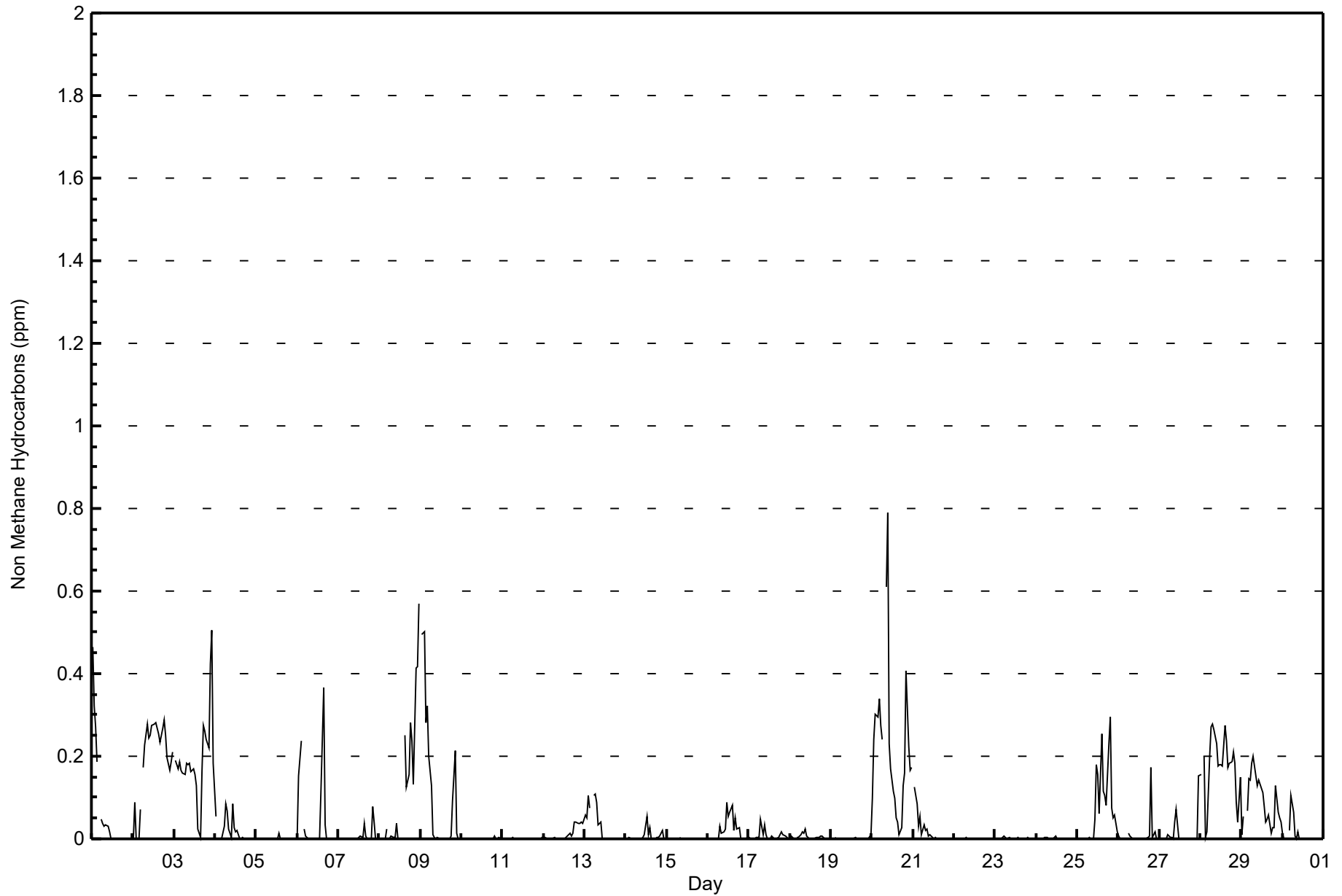




Summary of Hour Averages

Mannix - September 2023

Maximum Value: 0.789 ppm on Sep 20 10:00		Maximum Daily Average: 0.225 ppm on Sep 20		Hours in Service:	720																						
Minimum Value: 0.000 ppm on Sep 1 13:00		Minimum Daily Average: 0.000 ppm on Sep 15		Hours of Data:	682																						
Maximum Diurnal Average: 0.075 ppm at hour 3		Minimum Diurnal Average: 0.032 ppm at hour 17		Hours of Missing Data:	38																						
Monthly Average: 0.048 ppm		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.2 P ₉₉ = 0.4		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-Sep	0.464	0.322	0.270	0.186	Z	0.048	0.038	0.032	0.034	0.032	0.018	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	0.063	0.464	
2-Sep	0.003	0.087	0.000	0.000	0.070	Z	0.173	0.227	0.276	0.244	0.250	0.276	0.279	0.281	0.267	0.254	0.235	0.268	0.289	0.250	0.195	0.165	0.188	0.209	0.195	0.289	
3-Sep	Z	0.191	0.169	0.186	0.166	0.159	0.155	0.182	0.181	0.184	0.164	0.171	0.157	0.129	0.025	0.004	0.161	0.273	0.261	0.239	0.219	0.425	0.505	0.183	0.195	0.505	
4-Sep	0.054	Z	0.000	0.000	0.000	0.031	0.085	0.068	0.023	0.004	0.084	0.027	0.016	0.022	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.018	0.085	
5-Sep	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	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.014	
6-Sep	0.000	0.153	0.239	Z	0.025	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.115	0.366	0.035	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.041	0.366	
7-Sep	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	0.005	0.008	0.002	0.038	0.006	0.000	0.000	0.000	0.077	0.042	0.000	0.008	0.077	
8-Sep	0.000	0.000	0.000	0.000	0.024	Z	0.000	0.005	0.004	0.004	0.037	0.000	M	M	M	0.250	0.124	0.155	0.281	0.238	0.133	0.414	0.417	0.568	0.133	0.568	
9-Sep	Z	0.495	0.503	0.283	0.321	0.200	0.130	0.011	0.004	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.092	0.213	0.014	0.001	0.000	0.099	0.503	
10-Sep	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.007	0.000	0.000	0.002	0.000	0.000	0.007	
11-Sep	0.000	0.000	Z	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.004	
12-Sep	0.001	0.002	0.000	Z	0.000	0.000	0.003	0.000	0.000	0.002	0.000	0.002	0.000	0.002	0.007	0.012	0.005	0.013	0.042	0.041	0.039	0.037	0.040	0.036	0.012	0.042	
13-Sep	0.057	0.050	0.104	0.076	Z	0.106	0.110	0.088	0.034	0.042	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	0.029	0.110	
14-Sep	0.000	0.000	0.002	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.004	0.009	0.053	0.010	0.029	0.000	0.000	0.000	0.002	0.004	0.007	0.019	0.000	0.000	0.006	0.053	
15-Sep	Z	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.002	C	C	C	C	C	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.002	
16-Sep	0.002	Z	0.000	0.000	0.000	0.000	0.000	0.029	0.013	0.018	0.023	0.087	0.054	0.064	0.083	0.021	0.052	0.025	0.027	0.000	0.000	0.000	0.001	0.004	0.022	0.087	
17-Sep	0.003	0.000	Z	0.002	0.003	0.005	0.003	0.047	0.009	0.032	0.009	0.000	0.001	0.006	0.002	0.001	0.000	0.005	0.010	0.017	0.010	0.007	0.003	0.000	0.008	0.047	
18-Sep	0.002	0.006	0.000	Z	0.003	0.003	0.011	0.016	0.015	0.022	0.005	0.000	0.000	0.000	0.000	0.004	0.003	0.003	0.007	0.006	0.001	0.000	0.001	0.000	0.005	0.022	
19-Sep	0.000	0.000	0.000	0.004	Z	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.012	0.001	0.012	
20-Sep	0.099	0.240	0.301	0.296	0.340	0.276	0.239	Z	0.610	0.789	0.231	0.170	0.115	0.097	0.052	0.040	0.012	0.028	0.128	0.158	0.406	0.222	0.165	0.172	0.225	0.789	
21-Sep	Z	0.125	0.084	0.031	0.054	0.010	0.033	0.022	0.022	0.006	0.011	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	0.017	0.125	
22-Sep	0.000	Z	0.000	0.000	0.000	0.000	0.001	0.004	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.004	
23-Sep	0.000	0.000	Z	0.000	0.002	0.005	0.005	0.001	0.003	0.000	0.001	0.000	0.000	0.002	0.002	0.000	0.000	0.000	0.000	0.002	0.001	0.000	0.000	0.001	0.001	0.005	
24-Sep	0.005	0.000	0.001	Z	0.001	0.003	0.002	0.001	0.001	0.000	0.000	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	0.001	0.007	
25-Sep	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.004	0.000	0.000	0.046	0.181	0.155	0.062	0.254	0.115	0.104	0.082	0.232	0.295	0.074	0.051	0.057	0.017	0.075	0.295	
26-Sep	0.006	0.000	0.000	0.000	0.000	Z	0.013	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.007	0.173	0.005	0.016	0.000	0.000	0.010	0.173		
27-Sep	Z	0.000	0.001	0.000	0.000	0.009	0.002	0.002	0.000	0.042	0.071	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.152	0.012	0.152		
28-Sep	0.156	Z	0.200	0.004	0.016	0.201	0.272	0.277	0.265	0.231	0.177	0.180	0.179	0.177	0.274	0.236	0.174	0.183	0.187	0.210	0.185	0.087	0.042	0.150	0.177	0.277	
29-Sep	0.010	0.055	Z	0.068	0.146	0.144	0.183	0.199	0.153	0.130	0.144	0.134	0.111	0.077	0.039	0.048	0.057	0.014	0.026	0.026	0.129	0.065	0.051	0.040	0.089	0.199	
30-Sep	0.013	0.000	0.000	Z	0.019	0.104	0.064	0.007	0.000	0.018	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.010	0.010	0.104	
		0.035	0.069	0.075	0.045	0.048	0.050	0.051	0.042	0.055	0.062	0.044	0.043	0.040	0.034	0.040	0.046	0.032	0.035	0.050	0.059	0.056	0.052	0.049	0.052	Diurnal Average	
		0.464	0.495	0.503	0.296	0.340	0.276	0.272	0.277	0.610	0.789	0.250	0.276	0.279	0.281	0.274	0.366	0.235	0.273	0.289	0.295	0.406	0.425	0.505	0.568	Diurnal Maximum	
Z - zerospan		C - Calibration				M - Maintenance																					





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	424	62.17	62.17
0.006 - 0.05	107	15.69	77.86
0.06 - 0.1	49	7.18	85.04
> 0.1	102	14.96	100.00

Total Number of Valid Hours: 682

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

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

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	0	0	0	0	0	0	65	156	39	41	31	48	38	5	1	0	424
0.006 - 0.05	10	1	0	0	1	1	19	19	7	10	10	11	7	7	2	2	107
0.06 - 0.1	10	2	2	1	1	1	2	10	1	2	2	1	3	1	3	7	49
> 0.1	14	12	2	5	2	5	3	9	4	3	3	15	8	5	5	7	102
Totals	34	15	4	6	4	7	89	194	51	56	46	75	56	18	11	16	682

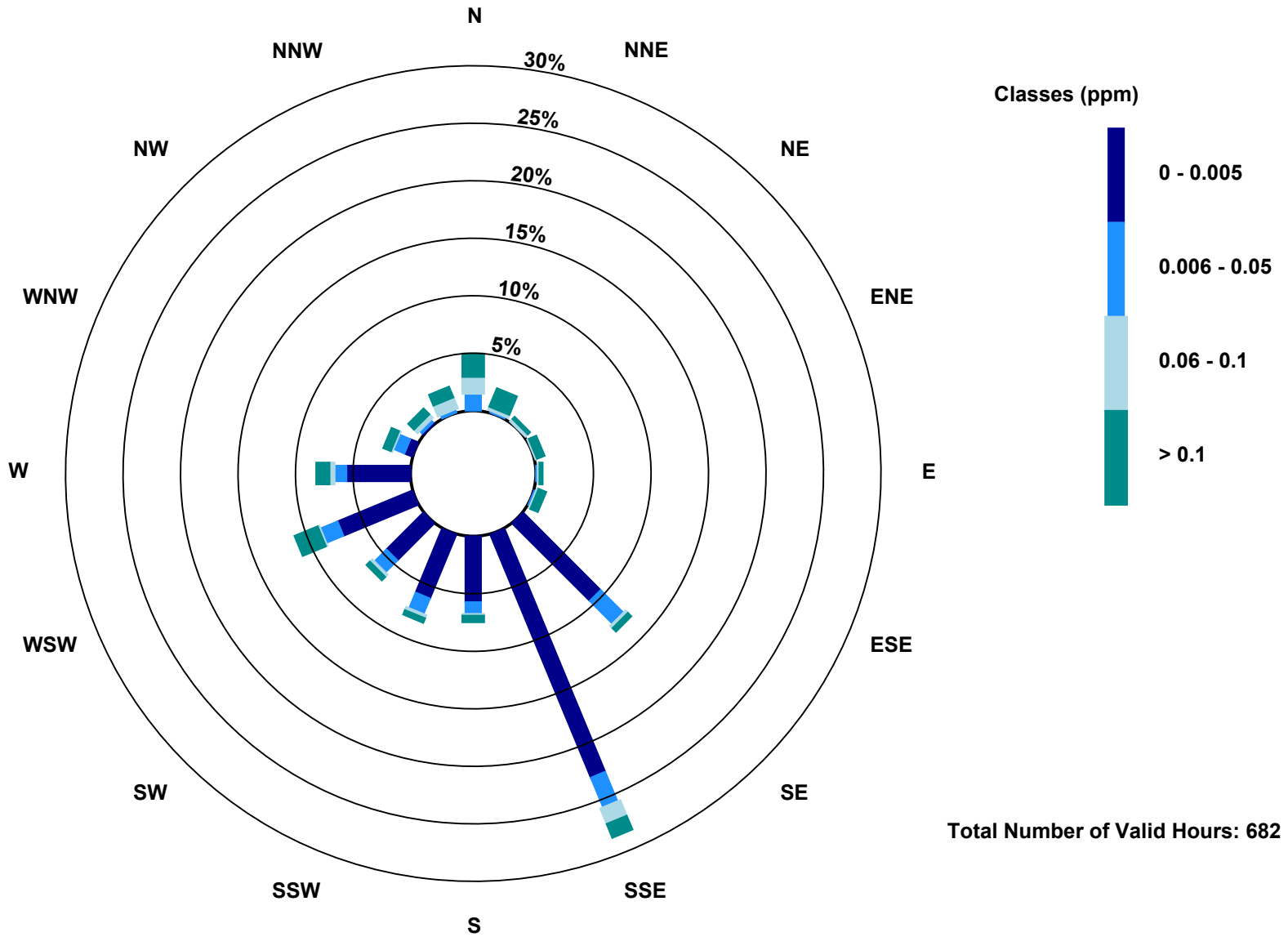
Total Number of Valid Hours: 682

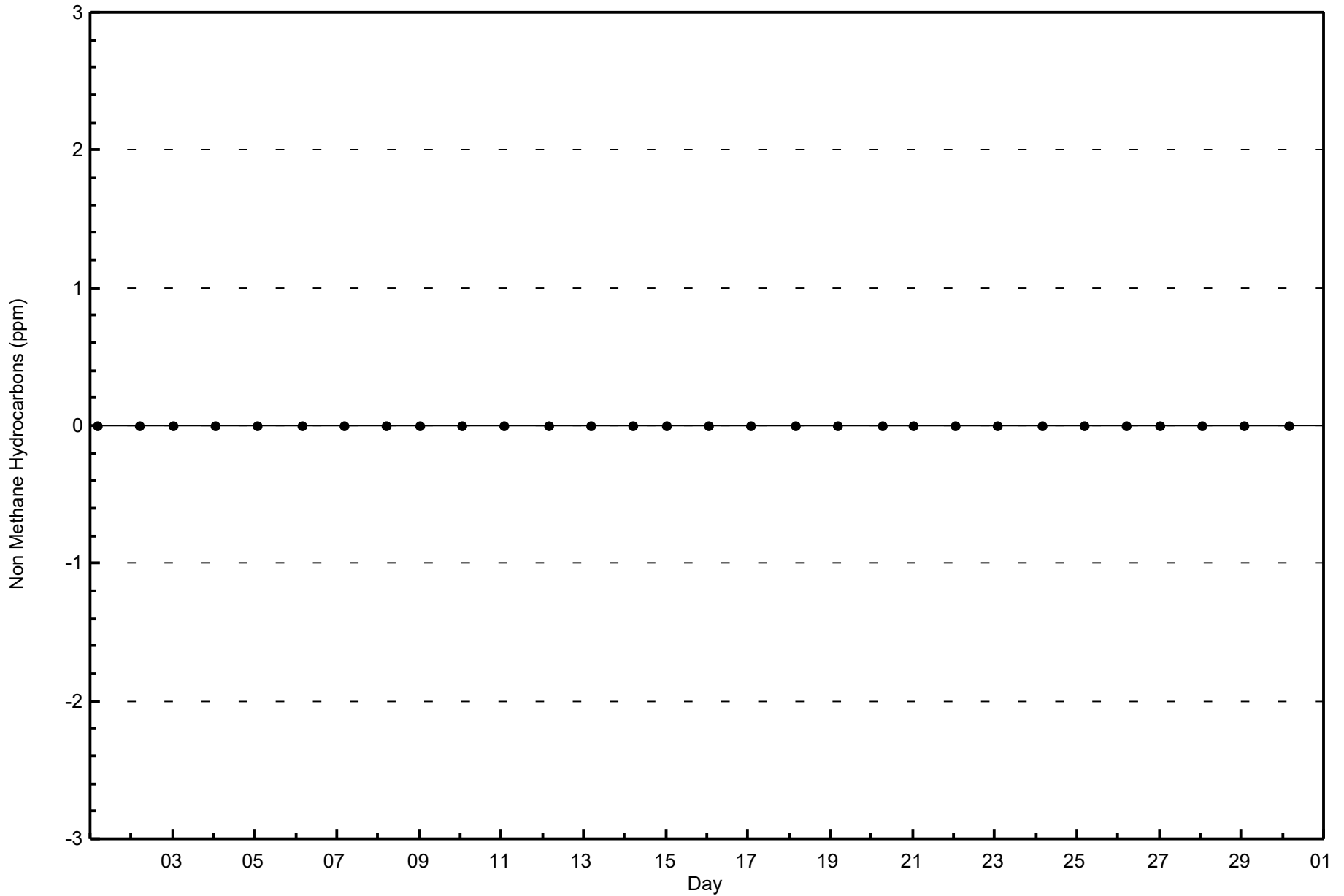
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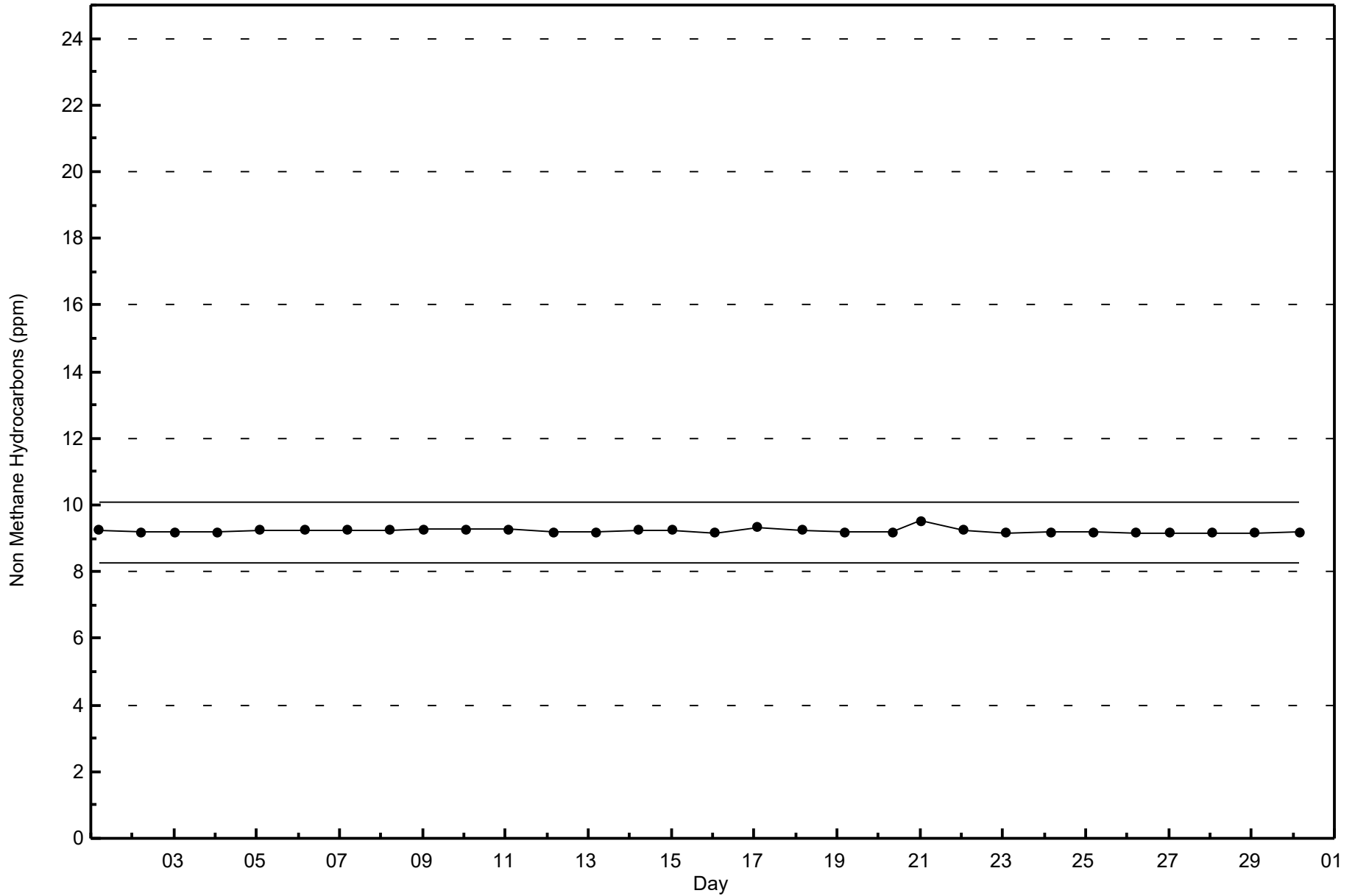


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Non Methane Hydrocarbons (NMHC) - ppm
Mannix



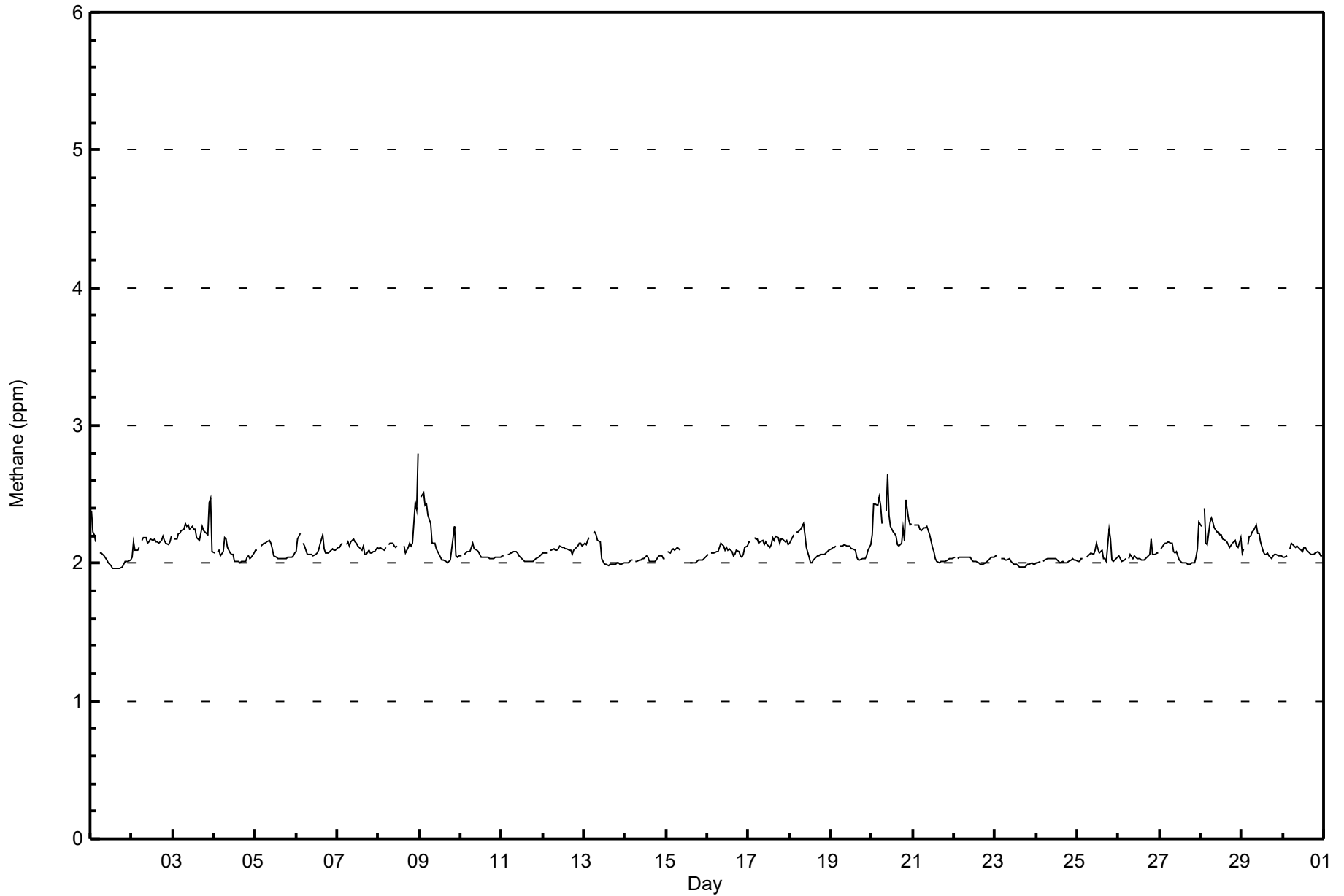






Wood Buffalo Environmental Association
Hourly Averages

Methane (CH₄) - ppm
Mannix - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Mannix - September 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	243	35.63	35.63
2.1 - 3.0	439	64.37	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 682

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Methane (CH₄) - ppm
Mannix - September 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	2	0	1	2	45	61	21	21	16	37	26	9	0	0	243
2.1 - 3.0	32	15	2	6	3	5	44	133	30	35	30	38	30	9	11	16	439
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	34	15	4	6	4	7	89	194	51	56	46	75	56	18	11	16	682

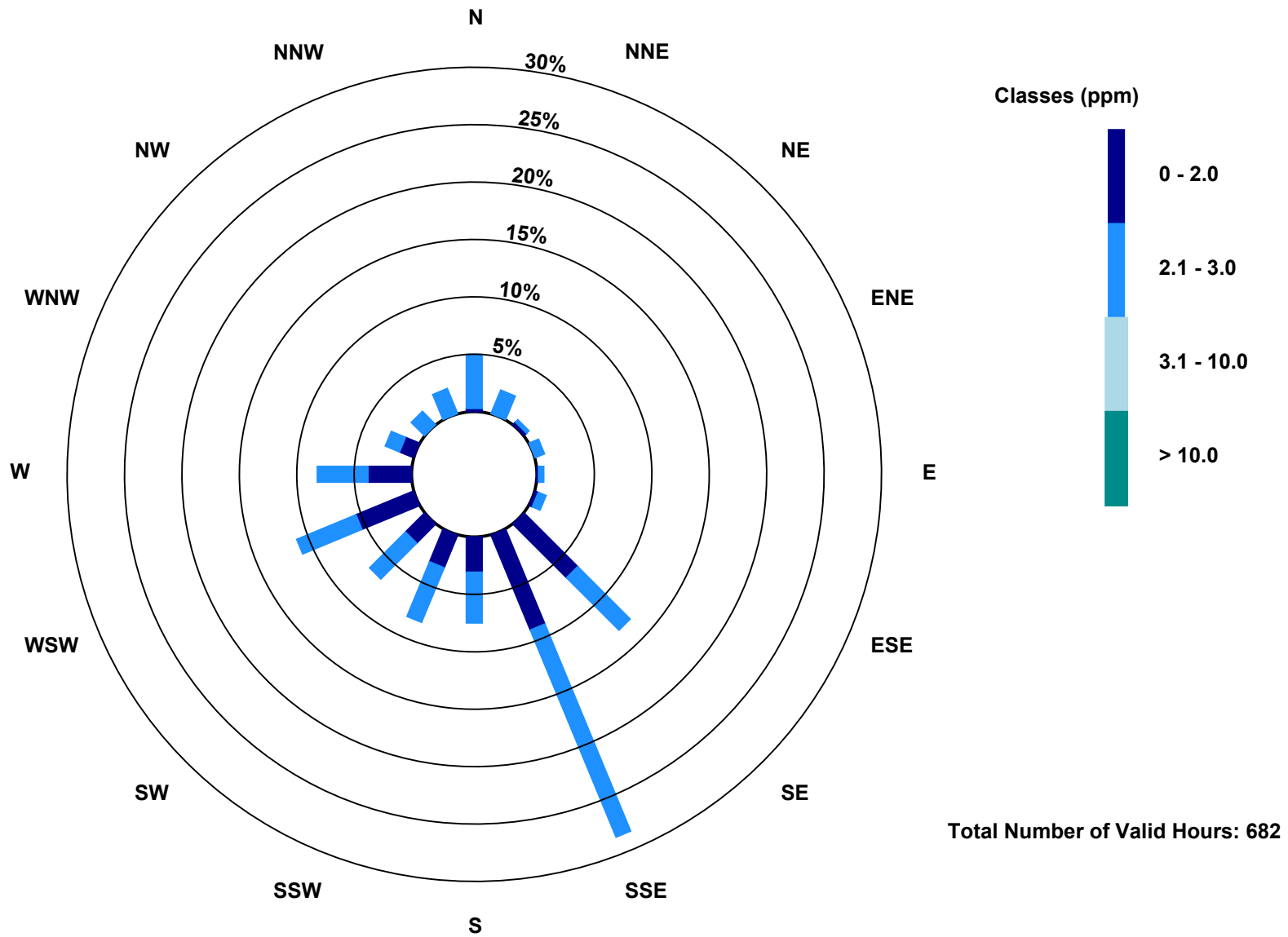
Total Number of Valid Hours: 682

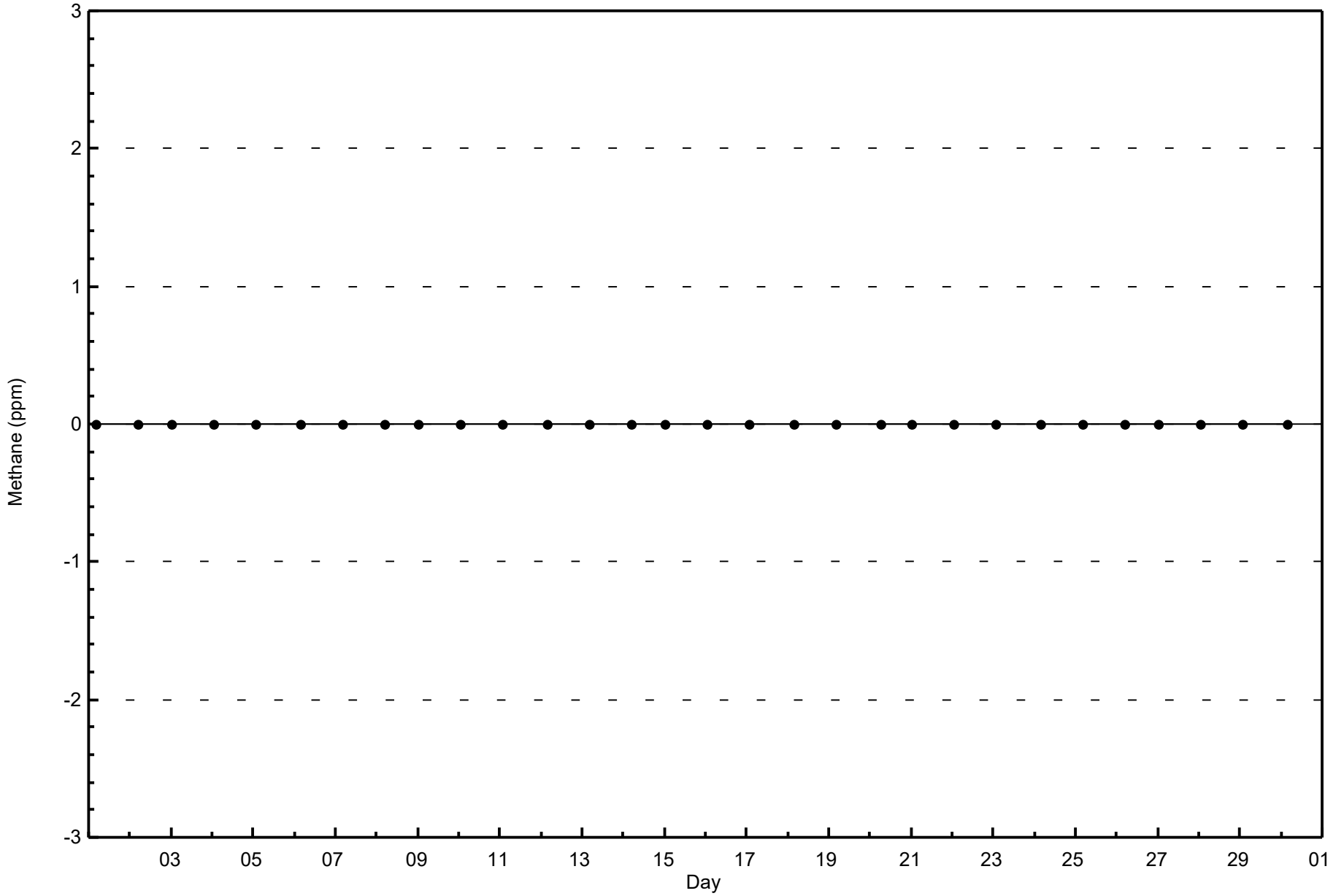
Total Number of Hours: 720

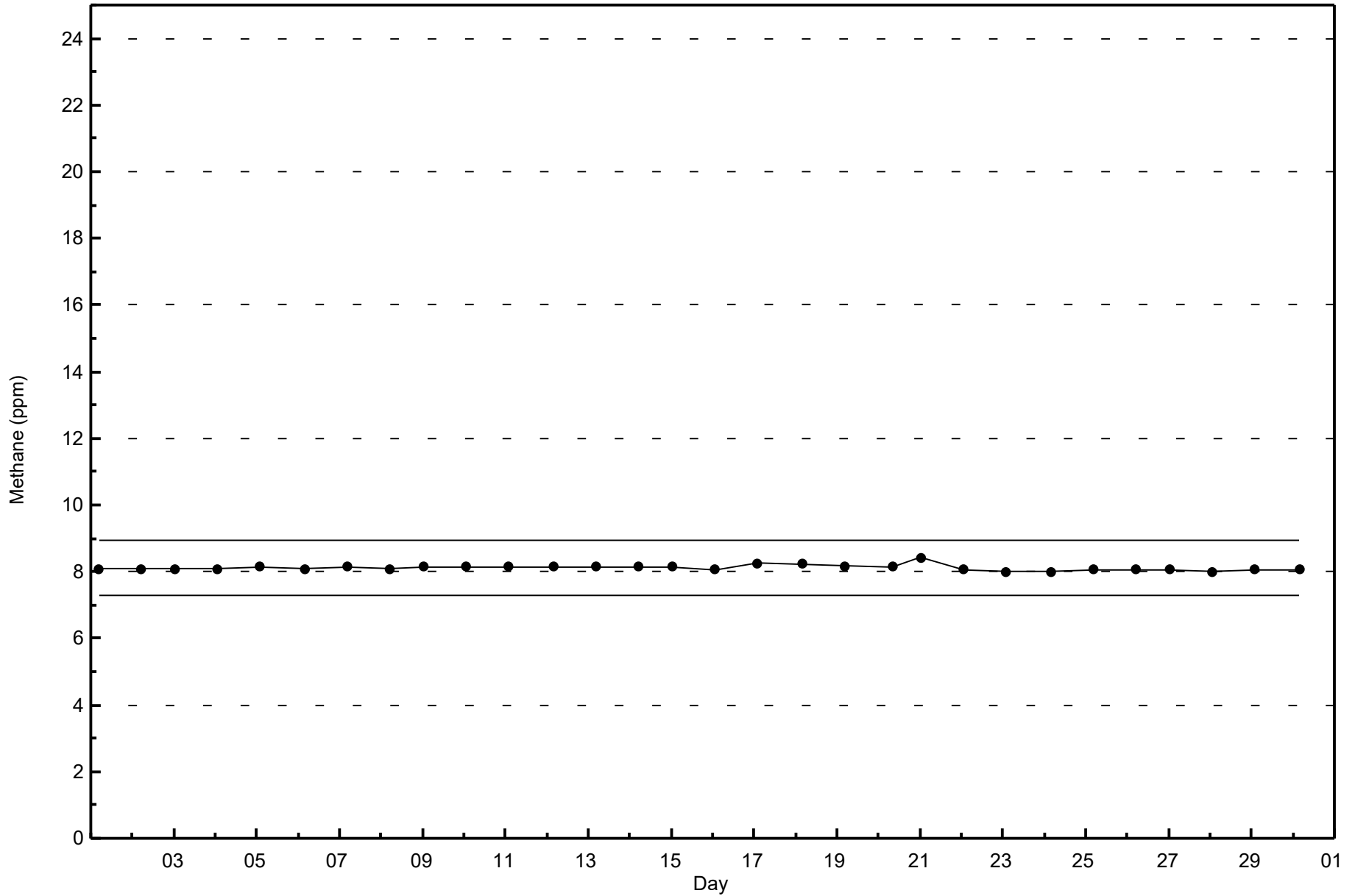


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Methane (CH₄) - ppm
Mannix

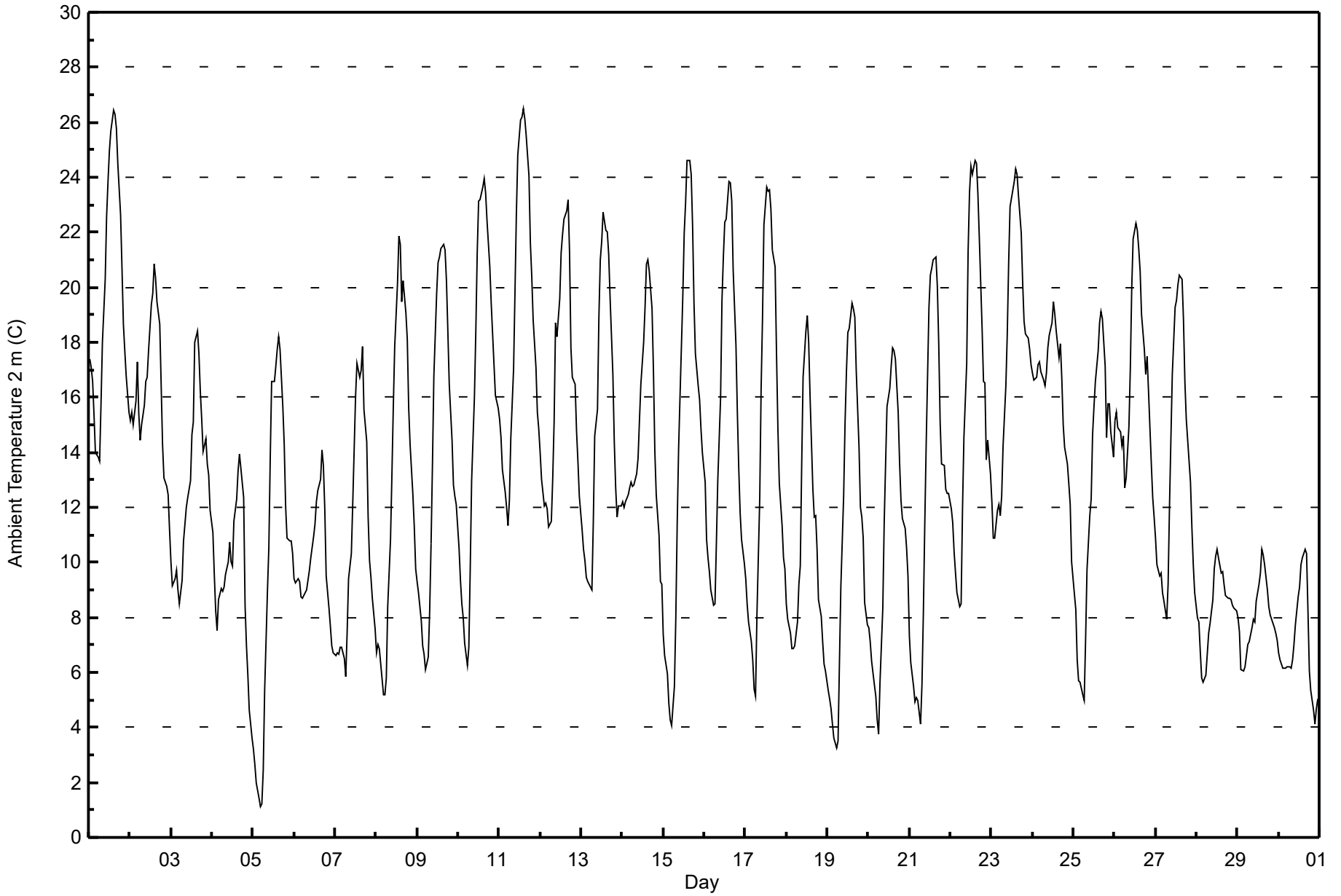








Maximum Value: 26.5 C on Sep 11 15:00		Maximum Daily Average: 19.8 C on Sep 1		Hours in Service: 720																																												
Minimum Value: 1.1 C on Sep 5 05:00		Minimum Daily Average: 7.0 C on Sep 30		Hours of Data: 720																																												
Maximum Diurnal Average: 19.6 C at hour 15		Minimum Diurnal Average: 8.2 C at hour 6		Hours of Missing Data: 0																																												
Monthly Average: 13.42 C		Percentiles: P ₁ = 3.3 P ₁₀ = 6.5 Q ₁ = 8.9 Median = 12.8 Q ₃ = 17.6 P ₉₀ = 21.3 P ₉₉ = 25.6		Hours of Calibration: 0																																												
				Percent Operational Time: 100.0																																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Sep	17.4	17.1	16.6	15.4	14.0	13.8	13.7	15.7	18.0	20.3	22.6	23.9	25.0	25.7	26.4	26.3	25.8	24.5	22.6	20.7	18.7	17.7	16.8	15.5	19.8	26.4																						
2-Sep	15.2	15.4	15.0	15.9	17.3	15.4	14.5	15.0	15.7	16.6	16.8	17.7	19.4	19.8	20.9	20.3	19.5	18.7	16.5	14.3	13.1	12.8	12.5	11.2	16.2	20.9																						
3-Sep	10.0	9.1	9.4	9.7	9.0	8.5	9.4	10.8	11.4	12.0	12.4	13.0	14.6	15.1	18.0	18.4	17.6	16.2	15.2	14.0	14.5	13.6	13.2	11.9	12.8	18.4																						
4-Sep	11.1	9.6	8.3	7.5	8.7	9.0	9.1	9.6	10.0	10.7	10.0	9.9	11.5	12.3	13.3	14.0	13.4	12.4	8.5	7.0	5.9	4.6	3.6		9.5	14.0																						
5-Sep	3.2	2.6	2.0	1.4	1.1	1.2	2.5	5.4	9.0	10.5	13.8	16.6	16.6	17.1	17.7	18.2	17.7	15.7	14.3	12.0	10.9	10.8	10.8	10.3	10.1	18.2																						
6-Sep	9.4	9.2	9.4	9.3	8.7	8.7	8.9	9.0	9.4	9.7	10.2	11.0	11.4	12.2	12.6	13.0	14.1	13.5	11.9	9.5	8.3	7.7	7.0	6.7	10.0	14.1																						
7-Sep	6.6	6.7	6.6	6.9	6.9	6.5	5.9	7.5	9.4	10.3	12.2	14.1	16.0	17.3	16.7	17.0	17.8	15.5	14.4	11.6	10.1	9.5	8.7	7.6	10.9	17.8																						
8-Sep	6.7	7.0	6.8	5.7	5.2	5.2	5.8	8.4	10.8	13.2	15.7	17.8	20.1	21.9	21.5	19.5	20.3	19.1	18.1	15.6	14.3	12.4	11.3	9.7	13.0	21.9																						
9-Sep	9.3	8.9	7.9	7.0	6.7	6.1	6.6	8.2	10.7	13.6	16.8	19.8	20.9	21.1	21.4	21.6	21.4	20.2	18.4	16.5	14.5	12.8	12.4	12.1	13.9	21.6																						
10-Sep	10.5	9.4	8.5	8.0	7.1	6.3	6.9	9.7	13.0	16.0	18.4	21.3	23.2	23.2	23.7	24.0	23.5	22.4	20.7	19.4	18.3	17.2	16.0	15.6	15.9	24.0																						
11-Sep	15.2	14.5	13.4	12.6	12.0	11.3	12.3	14.5	17.0	19.8	22.7	24.8	26.1	26.2	26.5	26.1	25.5	24.1	21.6	20.4	18.8	17.1	15.5	14.8	18.9	26.5																						
12-Sep	14.0	13.0	12.1	12.2	12.0	11.3	11.5	13.1	15.2	18.7	18.2	19.6	21.2	21.9	22.5	22.8	23.2	21.3	17.8	16.7	16.5	14.8	13.7	12.4	16.5	23.2																						
13-Sep	11.2	10.5	10.1	9.5	9.3	9.1	9.0	11.4	14.6	15.6	18.9	21.0	21.7	22.7	22.1	22.0	21.2	19.6	16.8	14.4	12.7	11.6	12.0	12.0	15.0	22.7																						
14-Sep	12.2	12.0	12.2	12.5	12.7	12.9	12.7	12.8	13.2	13.8	15.1	16.5	18.0	19.3	20.9	21.0	20.6	19.2	17.0	14.0	12.4	11.0	9.3	9.2	14.6	21.0																						
15-Sep	7.4	6.6	5.9	4.9	4.3	4.1	5.5	8.0	11.5	14.1	16.0	19.7	22.0	23.1	24.6	24.6	24.1	22.2	19.4	17.6	16.4	15.9	14.9	14.0	14.4	24.6																						
16-Sep	12.9	10.8	10.2	9.7	9.0	8.4	8.5	10.7	13.0	16.0	19.5	21.1	22.4	22.5	23.9	23.8	23.1	20.7	17.9	15.5	13.4	11.8	10.8	10.0	15.2	23.9																						
17-Sep	9.4	8.5	7.8	7.1	6.5	5.4	5.1	8.1	12.3	16.3	18.9	22.3	23.6	23.5	23.5	22.8	21.4	20.7	17.6	14.9	12.9	11.3	10.2	9.7	14.2	23.6																						
18-Sep	8.5	7.9	7.4	6.9	6.9	7.0	7.8	9.2	9.8	13.5	16.7	18.4	19.0	18.0	16.0	12.6	11.7	11.7	10.5	8.6	8.1	7.1	6.3	6.1	10.7	19.0																						
19-Sep	5.3	5.0	4.7	4.1	3.6	3.2	3.5	6.4	9.1	12.4	15.0	16.9	18.4	18.5	19.4	19.2	18.9	17.0	14.2	12.0	11.7	10.9	8.5	7.7	11.1	19.4																						
20-Sep	7.6	7.1	6.4	5.6	5.1	4.3	3.8	5.7	8.3	11.5	13.6	15.6	16.3	17.1	17.8	17.7	17.4	15.5	13.6	12.3	11.6	11.2	10.6	9.5	11.0	17.8																						
21-Sep	7.3	6.3	5.5	4.9	5.1	5.0	4.1	5.5	8.1	11.4	14.3	19.3	20.5	20.7	21.0	21.1	20.0	18.0	15.1	13.6	13.5	12.7	12.5	12.5	12.4	21.1																						
22-Sep	12.0	11.4	10.4	9.6	8.9	8.4	8.5	12.0	14.5	17.3	21.3	23.5	24.4	24.1	24.6	24.5	23.4	21.8	18.5	16.6	16.5	13.7	14.4	13.2	16.4	24.6																						
23-Sep	12.2	10.9	10.9	11.9	12.1	11.7	12.4	14.3	16.4	18.3	20.9	22.9	23.5	23.8	24.3	24.1	23.3	22.0	20.2	18.8	18.3	18.2	17.8	17.2	17.8	24.3																						
24-Sep	16.9	16.6	16.7	17.2	17.3	16.9	16.6	16.4	16.9	17.8	18.3	18.7	19.5	19.0	18.4	17.4	18.0	16.7	15.0	14.2	13.6	12.8	12.1	10.0	16.4	19.5																						
25-Sep	8.8	8.3	6.4	5.7	5.6	5.2	5.0	7.2	9.7	11.7	12.3	14.6	15.7	16.6	17.7	18.7	19.1	18.9	17.1	14.6	15.8	15.7	14.7	13.8	12.5	19.1																						
26-Sep	15.1	15.5	14.9	14.8	14.2	14.6	12.7	13.1	15.0	17.1	20.0	21.8	22.3	22.1	21.4	20.6	19.0	17.8	16.8	17.5	16.2	13.6	12.3	11.7	16.7	22.3																						
27-Sep	10.9	9.9	9.5	9.6	8.9	8.6	7.9	9.2	12.1	14.5	16.8	19.3	19.5	20.1	20.4	20.3	18.8	16.6	15.2	14.4	12.9	11.3	9.9	8.9	13.6	20.4																						
28-Sep	8.0	7.8	6.8	5.8	5.6	5.9	6.6	7.4	7.8	8.6	9.8	10.2	10.5	10.2	9.6	9.6	9.2	8.8	8.7	8.7	8.6	8.5	8.3	8.2	8.3	10.5																						
29-Sep	8.0	7.5	6.1	6.0	6.2	6.6	7.0	7.1	7.6	7.9	7.8	8.6	9.2	9.6	10.5	10.3	9.9	9.0	8.4	8.1	7.9	7.6	7.4	7.2	8.0	10.5																						
30-Sep	6.7	6.5	6.1	6.1	6.2	6.2	6.2	6.1	6.5	7.0	7.7	8.7	9.1	9.9	10.2	10.5	10.3	8.2	6.0	5.3	4.6	4.1	4.7	5.1	7.0	10.5																						
																								10.3	9.7	9.1	8.8	8.5	8.2	8.3	9.9	11.8	13.9	15.8	17.6	18.7	19.1	19.6	19.4	19.0	17.6	15.7	14.0	13.1	12.0	11.3	10.6	Diurnal Average
																								17.4	17.1	16.7	17.2	17.3	16.9	16.6	16.4	18.0	20.3	22.7	24.8	26.1	26.2	26.5	26.3	25.8	24.5	22.6	20.7	18.8	18.2	17.8	17.2	Diurnal Maximum





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

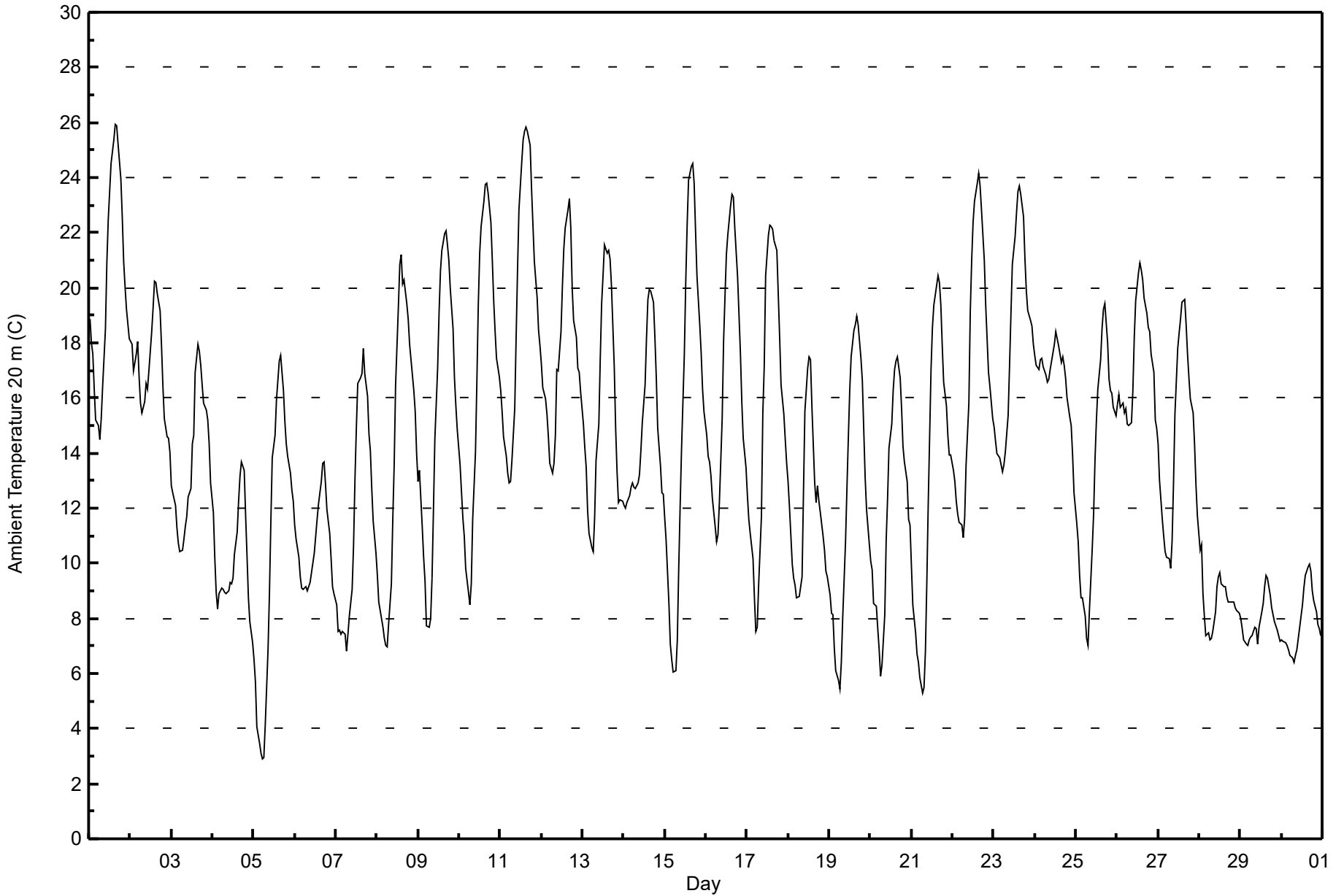
Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	238	33.06	33.06
10 - 20	376	52.22	85.28
> 20	106	14.72	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Maximum Value: 25.9 C on Sep 1 16:00		Maximum Daily Average: 20.2 C on Sep 1		Hours in Service: 720																							
Minimum Value: 2.9 C on Sep 5 06:00		Minimum Daily Average: 7.9 C on Sep 29		Hours of Data: 720																							
Maximum Diurnal Average: 19.0 C at hour 16		Minimum Diurnal Average: 9.5 C at hour 7		Hours of Missing Data: 0																							
Monthly Average: 14.20 C		Percentiles: P ₁ = 5.4 P ₁₀ = 7.6 Q ₁ = 9.8 Median = 14.1 Q ₃ = 17.9 P ₉₀ = 21.0 P ₉₉ = 25.2		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-Sep	18.9	18.0	17.6	16.3	15.2	15.0	14.5	15.2	16.4	18.5	20.9	22.5	23.5	24.5	25.4	25.9	25.9	25.2	23.9	22.6	21.0	20.0	19.2	18.1	20.2	25.9	
2-Sep	18.0	18.0	17.0	17.6	18.0	16.8	15.8	15.5	15.9	16.5	16.3	17.0	18.4	19.3	20.2	20.2	19.8	19.2	17.9	16.4	15.3	14.6	14.5	14.0	17.2	20.2	
3-Sep	12.8	12.5	12.1	11.3	10.7	10.4	10.5	10.9	11.3	11.7	12.4	12.7	14.3	14.6	17.0	17.9	17.7	17.2	16.5	15.8	15.6	15.2	14.3	12.9	13.7	17.9	
4-Sep	11.8	10.2	8.9	8.3	8.9	9.1	9.0	8.9	8.9	9.0	9.3	9.3	9.5	10.3	11.1	12.3	13.2	13.7	13.4	11.8	10.3	8.7	7.9	7.1	10.0	13.7	
5-Sep	6.5	5.7	4.0	3.4	3.1	2.9	2.9	4.1	6.9	8.9	11.5	13.8	14.7	15.9	16.6	17.3	17.5	16.3	15.2	14.4	13.9	13.2	12.7	12.3	10.6	17.5	
6-Sep	11.4	10.9	10.2	9.5	9.1	9.1	9.2	9.0	9.2	9.3	9.6	10.4	11.0	11.6	12.1	12.9	13.6	13.7	12.9	11.9	11.1	10.2	9.1	8.9	10.7	13.7	
7-Sep	8.5	7.5	7.6	7.4	7.5	7.4	6.8	7.4	8.1	9.1	10.7	13.0	14.9	16.5	16.7	16.9	17.8	16.9	16.1	14.7	14.1	12.7	11.6	10.4	11.7	17.8	
8-Sep	9.6	8.6	8.3	7.7	7.3	7.0	7.0	7.8	9.2	11.6	13.6	16.5	19.3	20.9	21.2	20.1	20.3	19.4	18.9	17.9	17.4	16.3	15.5	14.0	14.0	21.2	
9-Sep	13.0	13.4	11.3	10.2	9.4	7.7	7.7	8.0	9.5	11.9	14.5	17.1	19.1	20.6	21.4	21.9	22.0	21.6	21.0	20.0	18.5	16.8	15.7	14.8	15.3	22.0	
10-Sep	13.6	12.6	11.7	11.0	9.8	8.9	8.5	9.2	11.6	14.0	16.6	19.3	21.3	22.2	23.1	23.8	23.8	23.5	22.4	21.0	19.5	18.4	17.4	16.8	16.7	23.8	
11-Sep	16.3	15.5	14.6	13.9	13.3	12.9	13.0	13.7	15.6	18.2	20.7	22.8	24.5	25.4	25.7	25.8	25.7	25.2	23.6	22.3	20.9	19.6	18.4	17.9	19.4	25.8	
12-Sep	17.2	16.3	16.0	15.4	14.6	13.6	13.3	13.6	14.6	17.0	17.0	18.4	20.0	21.4	22.2	22.8	23.2	22.2	20.0	18.8	18.2	17.1	16.9	16.2	17.8	23.2	
13-Sep	15.1	14.2	13.5	11.9	11.1	10.6	10.4	11.6	13.7	15.1	17.4	19.4	20.5	21.6	21.3	21.4	21.0	20.1	17.2	14.9	13.3	12.2	12.3	12.3	15.5	21.6	
14-Sep	12.1	12.0	12.2	12.5	12.8	12.9	12.8	12.7	12.9	13.2	14.1	15.1	16.5	18.2	19.6	19.9	19.9	19.5	18.2	16.7	14.9	13.5	12.5	12.5	14.9	19.9	
15-Sep	11.7	10.8	8.5	7.1	6.5	6.1	6.1	7.2	9.8	12.1	14.1	17.6	20.2	22.3	23.9	24.4	24.5	23.8	22.1	20.4	18.7	17.7	16.3	15.5	15.3	24.5	
16-Sep	14.7	13.9	13.7	13.2	12.3	11.3	10.8	11.1	12.2	15.2	18.1	19.7	21.2	21.9	23.0	23.4	23.3	22.2	20.4	19.0	17.6	15.9	14.5	13.5	16.7	23.4	
17-Sep	12.5	11.6	11.1	10.2	8.7	7.5	7.7	9.2	11.7	15.5	17.1	20.4	21.9	22.3	22.2	22.1	21.7	21.3	19.8	18.2	16.5	15.4	14.5	13.6	15.5	22.3	
18-Sep	12.9	12.0	9.9	9.5	9.2	8.8	8.8	9.1	9.5	12.5	15.5	17.1	17.5	17.4	15.7	12.9	12.2	12.8	12.2	11.8	11.0	10.5	9.7	9.5	12.0	17.5	
19-Sep	8.8	8.2	8.1	6.9	6.1	5.8	5.4	6.4	8.0	10.8	12.7	14.5	16.3	17.5	18.5	18.6	19.0	18.7	17.4	16.6	14.8	13.1	11.9	10.7	12.3	19.0	
20-Sep	10.1	9.8	8.5	8.4	7.6	6.9	5.9	6.3	8.2	10.9	12.4	14.2	15.1	16.3	17.0	17.3	17.5	16.7	15.6	14.2	13.7	13.0	11.6	11.4	12.0	17.5	
21-Sep	9.9	8.5	7.5	6.7	6.4	5.9	5.3	5.5	6.8	9.3	12.2	17.0	18.5	19.4	19.7	20.4	20.2	19.4	17.9	16.6	15.7	14.6	13.9	13.9	13.0	20.4	
22-Sep	13.4	13.0	12.3	11.8	11.5	11.4	10.9	11.7	13.6	15.8	19.1	21.0	22.4	23.1	23.8	24.2	23.7	22.8	21.0	19.4	18.1	17.0	16.4	15.2	17.2	24.2	
23-Sep	15.0	14.4	14.0	13.8	13.6	13.3	13.6	14.0	15.4	17.2	19.0	20.8	21.9	22.7	23.5	23.7	23.4	22.6	21.1	19.9	19.2	18.8	18.6	18.0	18.2	23.7	
24-Sep	17.6	17.2	17.0	17.4	17.4	17.2	16.8	16.6	16.7	17.1	17.4	17.9	18.4	18.1	17.9	17.3	17.5	17.2	16.7	16.0	15.3	15.0	13.9	12.6	16.8	18.4	
25-Sep	11.4	10.8	9.6	8.7	8.7	8.1	7.3	7.0	8.3	10.5	11.8	13.8	15.2	16.3	17.4	18.5	19.2	19.4	18.0	16.7	16.3	16.2	15.7	15.4	13.3	19.4	
26-Sep	15.7	16.1	15.7	15.8	15.5	15.6	15.1	15.0	15.1	16.3	18.2	19.5	20.5	20.9	20.7	20.3	19.6	19.1	18.6	18.4	17.6	16.9	15.2	14.9	17.3	20.9	
27-Sep	14.3	13.0	11.6	11.0	10.4	10.2	10.2	9.8	10.8	12.9	15.4	17.8	18.3	18.9	19.5	19.6	18.6	17.6	16.7	16.0	15.4	14.3	12.9	11.7	14.5	19.6	
28-Sep	10.5	10.7	8.9	8.1	7.4	7.5	7.2	7.3	7.5	8.2	9.1	9.5	9.7	9.3	9.2	9.2	8.8	8.6	8.6	8.6	8.6	8.4	8.3	8.2	8.6	10.7	
29-Sep	8.0	7.6	7.2	7.1	7.0	7.2	7.3	7.4	7.7	7.6	7.1	7.7	8.2	8.5	9.2	9.6	9.5	8.9	8.4	8.1	7.9	7.6	7.4	7.2	7.9	9.6	
30-Sep	7.2	7.2	7.1	7.0	6.9	6.7	6.6	6.4	6.7	6.8	7.3	8.1	8.5	9.1	9.6	9.9	10.0	9.7	9.0	8.6	8.2	7.8	7.6	7.3	7.9	10.0	
		12.6	12.0	11.2	10.6	10.2	9.8	9.5	9.9	11.1	12.8	14.4	16.1	17.4	18.2	18.8	19.0	19.0	18.5	17.4	16.3	15.3	14.4	13.6	12.9	Diurnal Average	
		18.9	18.0	17.6	17.6	18.0	17.2	16.8	16.6	16.7	18.5	20.9	22.8	24.5	25.4	25.7	25.9	25.9	25.2	23.9	22.6	21.0	20.0	19.2	18.1	Diurnal Maximum	





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

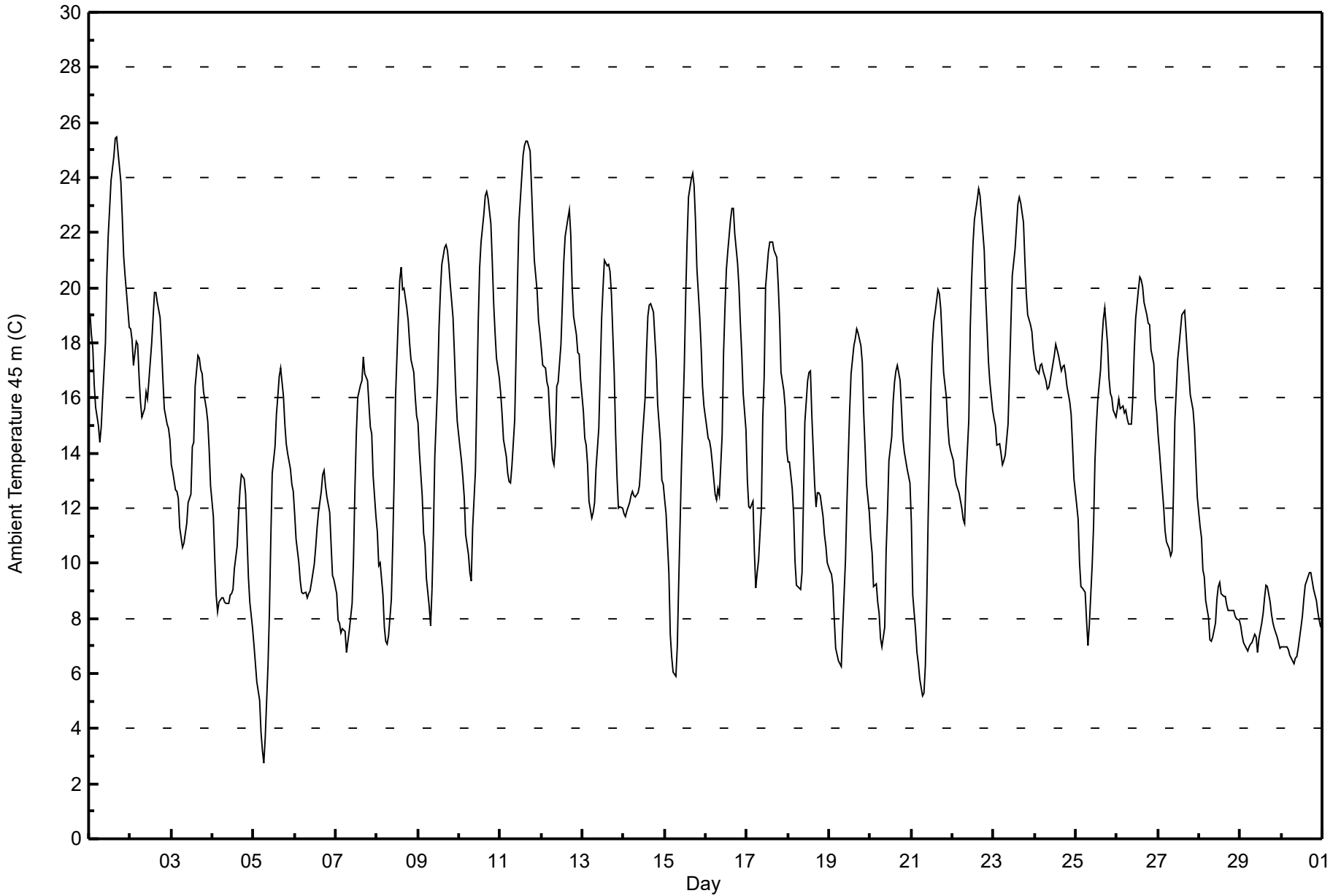
Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	187	25.97	25.97
10 - 20	434	60.28	86.25
> 20	99	13.75	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Maximum Value: 25.5 C on Sep 1 17:00 Maximum Daily Average: 20.1 C on Sep 1																				Hours in Service: 720 Hours of Data: 720						
Minimum Value: 2.8 C on Sep 5 07:00 Minimum Daily Average: 7.6 C on Sep 29 Maximum Diurnal Average: 18.7 C at hour 17 Minimum Diurnal Average: 9.9 C at hour 7 Monthly Average: 14.27 C Percentiles: P ₁ = 5.7 P ₁₀ = 7.7 Q ₁ = 10.1 Median = 14.4 Q ₃ = 17.7 P ₉₀ = 20.8 P ₉₉ = 24.8																				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-Sep	19.1	18.3	17.8	16.5	15.7	15.0	14.4	14.9	16.0	18.0	20.4	21.9	22.9	23.9	24.8	25.4	25.5	24.9	23.8	22.6	21.2	20.4	19.8	18.5	20.1	25.5
2-Sep	18.5	18.1	17.2	18.0	17.9	16.8	15.8	15.3	15.6	16.2	16.0	16.6	18.0	18.9	19.8	19.8	19.5	18.9	17.9	16.7	15.6	15.1	14.9	14.5	17.2	19.8
3-Sep	13.6	13.3	12.7	12.6	12.4	11.3	10.6	10.7	11.1	11.4	12.2	12.5	14.2	14.4	16.4	17.6	17.4	17.0	16.9	16.2	15.6	15.2	14.2	12.8	13.8	17.6
4-Sep	11.7	10.2	8.9	8.2	8.6	8.8	8.7	8.6	8.5	8.6	8.8	8.9	9.1	9.8	10.6	11.7	12.7	13.2	13.1	12.5	11.0	9.5	8.6	7.6	9.9	13.2
5-Sep	7.0	6.4	5.7	5.0	3.8	3.2	2.8	3.7	6.3	8.3	10.9	13.3	14.3	15.4	16.1	16.8	17.1	16.0	15.0	14.4	14.0	13.4	12.8	12.6	10.6	17.1
6-Sep	11.8	10.9	10.0	9.3	9.0	8.9	9.0	8.8	8.9	9.0	9.3	10.0	10.6	11.3	11.8	12.6	13.2	13.4	12.8	12.4	11.8	10.7	9.5	9.4	10.6	13.4
7-Sep	8.9	7.9	7.8	7.5	7.6	7.5	6.8	7.2	7.6	8.6	10.2	12.7	14.7	16.0	16.5	16.6	17.5	16.9	16.6	15.8	15.0	14.7	13.2	11.7	11.9	17.5
8-Sep	11.1	9.9	10.0	8.9	7.7	7.2	7.1	7.4	8.7	10.7	13.1	16.0	19.0	20.3	20.8	19.9	20.0	19.2	18.8	18.0	17.4	16.9	16.1	15.4	14.1	20.8
9-Sep	15.1	14.0	12.4	11.1	10.7	9.5	8.5	7.7	9.1	11.1	13.9	16.5	18.5	19.9	20.9	21.5	21.6	21.4	20.8	20.2	18.9	17.6	16.1	15.1	15.5	21.6
10-Sep	14.2	13.7	13.1	12.4	11.1	10.3	9.7	9.4	11.3	13.4	16.1	18.8	20.8	21.7	22.7	23.4	23.5	23.2	22.3	21.0	19.4	18.4	17.4	16.7	16.8	23.5
11-Sep	16.2	15.4	14.5	13.9	13.3	13.0	12.9	13.5	15.2	17.6	20.2	22.4	24.0	24.8	25.2	25.3	25.3	24.9	23.7	22.3	21.0	19.9	18.8	18.4	19.2	25.3
12-Sep	17.8	17.2	17.1	16.6	16.4	15.4	13.8	13.6	14.3	16.4	16.6	18.0	19.4	21.0	21.8	22.5	22.8	21.9	20.1	19.0	18.3	17.6	17.6	16.7	18.0	22.8
13-Sep	15.5	14.5	14.3	13.6	12.2	11.7	11.8	12.2	13.4	14.9	16.9	18.9	20.0	21.0	20.8	20.9	20.6	19.8	16.9	14.7	13.1	12.0	12.1	12.0	15.6	21.0
14-Sep	11.8	11.7	11.9	12.2	12.5	12.6	12.4	12.4	12.6	12.8	13.6	14.5	16.0	17.6	19.0	19.4	19.4	19.1	18.2	17.4	15.8	14.4	13.0	12.8	14.7	19.4
15-Sep	12.3	11.8	9.6	7.4	6.6	6.1	5.9	6.9	9.3	11.4	13.6	17.1	19.7	21.7	23.3	23.9	24.2	23.7	22.4	20.7	19.0	17.9	16.4	15.7	15.3	24.2
16-Sep	14.9	14.5	14.5	14.1	13.6	12.5	12.3	12.7	12.5	14.7	17.6	19.2	20.6	21.3	22.5	22.9	22.9	22.0	20.9	20.0	18.7	17.6	16.2	14.8	17.2	22.9
17-Sep	13.0	12.1	12.0	12.2	10.4	9.1	9.7	10.1	12.0	15.3	16.8	20.0	21.3	21.7	21.7	21.6	21.4	21.1	20.1	18.9	16.9	16.3	15.7	14.2	16.0	21.7
18-Sep	13.7	13.7	12.7	11.8	10.1	9.2	9.1	9.0	9.7	12.2	15.1	16.6	16.9	17.0	15.4	12.9	12.1	12.6	12.5	12.5	11.7	11.0	10.6	10.0	12.4	17.0
19-Sep	9.7	9.6	9.2	8.0	6.9	6.5	6.4	6.3	7.6	10.1	12.1	13.9	15.6	16.9	17.9	18.2	18.5	18.3	17.9	17.3	15.4	14.2	12.9	11.9	12.6	18.5
20-Sep	10.9	10.4	9.1	9.2	8.6	8.2	7.3	7.0	7.7	10.4	11.9	13.7	14.6	15.8	16.6	17.0	17.2	16.6	15.6	14.5	14.0	13.4	13.2	12.9	12.3	17.2
21-Sep	11.5	8.8	7.6	6.7	6.3	5.8	5.2	5.3	6.3	8.7	11.7	16.4	17.9	18.8	19.1	19.9	19.8	19.2	18.1	16.9	16.0	15.0	14.3	14.1	12.9	19.9
22-Sep	13.8	13.2	12.8	12.7	12.5	12.0	11.6	11.5	13.1	15.2	18.5	20.3	21.6	22.5	23.2	23.6	23.4	22.7	21.3	19.7	18.5	17.3	16.6	15.6	17.2	23.6
23-Sep	15.3	15.0	14.3	14.3	14.0	13.6	13.7	13.9	15.1	16.8	18.6	20.4	21.4	22.2	23.0	23.3	23.1	22.4	21.0	19.8	19.0	18.7	18.4	17.8	18.1	23.3
24-Sep	17.4	17.0	16.9	17.2	17.3	17.0	16.6	16.3	16.4	16.6	17.0	17.5	17.9	17.7	17.6	17.0	17.1	17.2	16.9	16.4	15.9	15.4	14.3	13.1	16.7	17.9
25-Sep	12.1	11.6	10.0	9.2	9.1	8.9	7.9	7.0	7.8	9.9	11.3	13.7	15.0	15.9	17.0	18.1	18.9	19.3	17.9	16.7	16.2	16.0	15.6	15.3	13.4	19.3
26-Sep	15.6	16.0	15.6	15.7	15.5	15.6	15.2	15.0	15.0	16.0	17.7	18.9	19.9	20.4	20.3	20.0	19.5	19.0	18.7	18.7	17.7	17.3	16.0	15.5	17.3	20.4
27-Sep	14.7	14.1	12.7	12.0	11.2	10.8	10.5	10.3	10.4	12.5	15.2	17.4	17.9	18.4	19.0	19.1	18.3	17.5	16.9	16.1	15.6	14.9	13.6	12.4	14.7	19.1
28-Sep	11.3	10.9	9.7	9.5	8.6	8.0	7.2	7.2	7.3	7.8	8.7	9.1	9.3	8.9	8.8	8.8	8.5	8.3	8.3	8.3	8.3	8.1	8.0	7.9	8.6	11.3
29-Sep	7.7	7.4	7.1	6.9	6.8	7.0	7.1	7.1	7.4	7.3	6.7	7.3	7.8	8.2	8.7	9.2	9.1	8.6	8.2	7.8	7.6	7.3	7.1	6.9	7.6	9.2
30-Sep	7.0	7.0	7.0	7.0	6.9	6.6	6.5	6.3	6.5	6.6	6.9	7.7	8.1	8.7	9.2	9.5	9.7	9.7	9.4	9.1	8.7	8.3	7.9	7.7	7.8	9.7
																								Diurnal Average		
																								Diurnal Maximum		





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

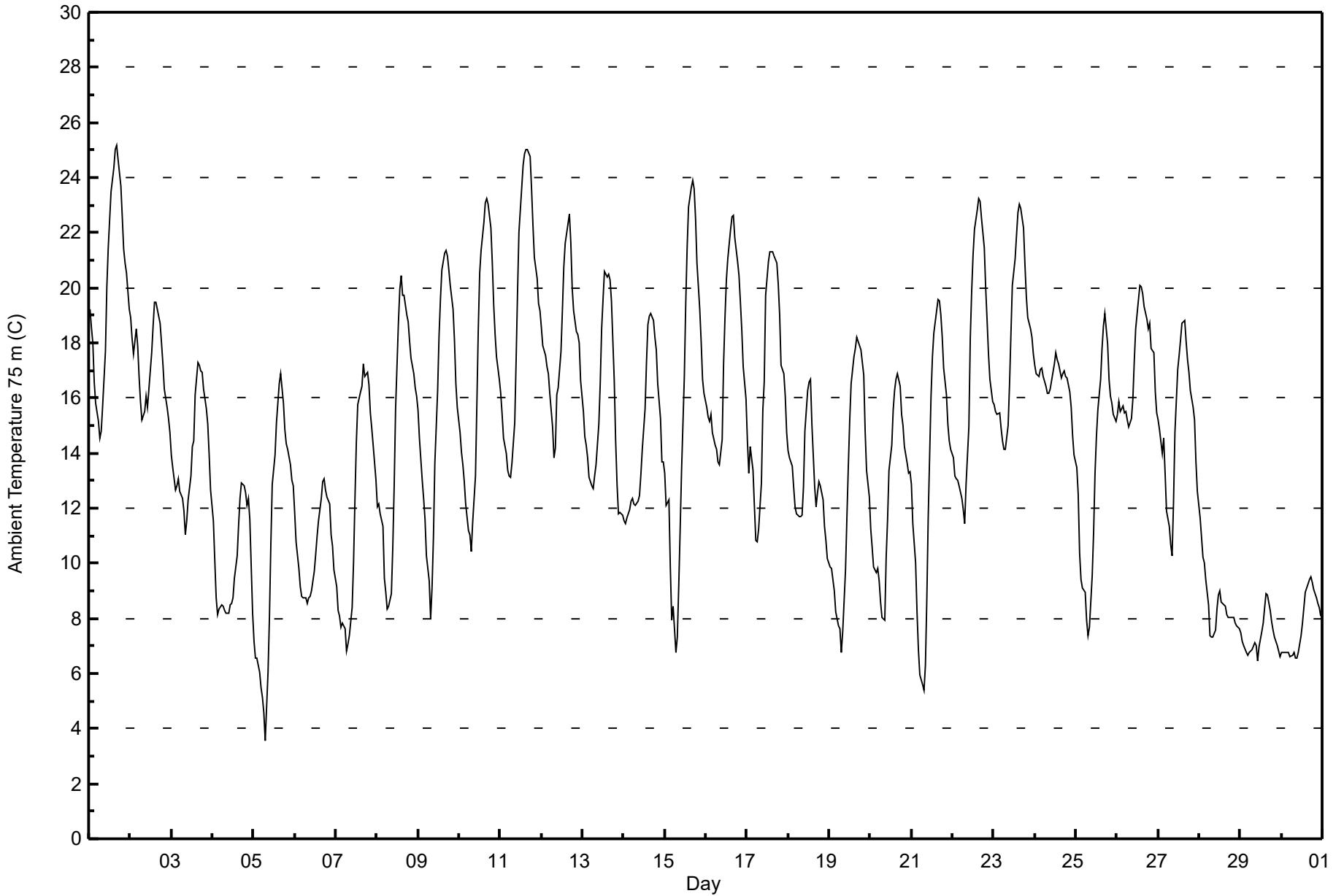
Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	174	24.17	24.17
10 - 20	455	63.19	87.36
> 20	91	12.64	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Maximum Value: 25.2 C on Sep 1 17:00 Maximum Daily Average: 20.0 C on Sep 1																				Hours in Service: 720 Hours of Data: 720						
Minimum Value: 3.6 C on Sep 5 08:00 Minimum Daily Average: 7.3 C on Sep 29 Maximum Diurnal Average: 18.4 C at hour 17 Minimum Diurnal Average: 10.3 C at hour 8 Monthly Average: 14.41 C Percentiles: P ₁ = 6.0 P ₁₀ = 8.0 Q ₁ = 10.9 Median = 14.7 Q ₃ = 17.7 P ₉₀ = 20.5 P ₉₉ = 24.4																				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-Sep	19.2	18.6	18.0	16.6	15.8	15.1	14.5	14.8	15.7	17.7	20.1	21.5	22.5	23.5	24.4	25.0	25.2	24.7	23.7	22.6	21.4	20.9	20.5	19.2	20.0	25.2
2-Sep	18.9	18.1	17.6	18.5	17.9	16.8	15.9	15.2	15.5	16.0	15.7	16.3	17.7	18.6	19.5	19.5	19.2	18.7	18.0	17.3	16.3	15.6	15.2	14.7	17.2	19.5
3-Sep	13.9	13.5	12.7	12.8	13.1	12.6	12.4	11.9	11.0	11.6	12.3	13.2	14.3	14.4	16.1	17.3	17.2	17.0	16.9	16.3	15.6	15.0	13.9	12.7	14.1	17.3
4-Sep	11.5	10.1	8.8	8.1	8.3	8.5	8.4	8.3	8.2	8.2	8.5	8.5	8.7	9.4	10.3	11.4	12.3	12.9	12.8	12.5	12.1	12.4	11.6	8.2	10.0	12.9
5-Sep	7.2	6.6	6.5	6.1	5.5	5.1	4.6	3.6	6.0	8.0	10.7	12.9	13.9	15.1	15.8	16.5	16.9	15.8	14.8	14.3	14.1	13.6	13.0	12.8	10.8	16.9
6-Sep	11.8	10.8	9.8	9.1	8.8	8.8	8.8	8.6	8.7	8.8	9.0	9.7	10.3	11.0	11.5	12.4	13.0	13.1	12.7	12.4	12.2	11.0	10.6	9.7	10.5	13.1
7-Sep	9.2	8.3	8.1	7.7	7.8	7.6	6.8	7.1	7.4	8.4	10.0	12.3	14.4	15.8	16.2	16.4	17.2	16.8	16.9	16.5	15.4	14.9	14.3	13.0	12.0	17.2
8-Sep	12.1	12.2	11.8	11.3	9.5	9.0	8.3	8.4	8.9	10.6	12.8	15.6	18.7	20.0	20.4	19.7	19.7	19.0	18.8	18.0	17.4	16.9	16.4	16.0	14.7	20.4
9-Sep	15.6	14.6	13.0	12.4	11.6	10.3	9.4	8.0	9.1	10.9	13.6	16.3	18.3	19.6	20.6	21.2	21.4	21.2	20.6	20.1	19.2	18.1	16.5	15.7	15.7	21.4
10-Sep	14.8	14.0	13.6	12.9	12.1	11.2	11.0	10.4	11.5	13.2	15.8	18.5	20.5	21.4	22.4	23.1	23.2	23.0	22.2	20.9	19.4	18.3	17.5	16.7	17.0	23.2
11-Sep	16.2	15.4	14.6	14.0	13.4	13.2	13.1	13.6	15.1	17.4	19.9	22.0	23.7	24.4	24.9	25.0	25.0	24.7	23.6	22.3	21.1	20.3	19.4	19.2	19.2	25.0
12-Sep	18.6	17.9	17.6	17.1	16.9	16.2	15.0	13.8	14.2	16.1	16.4	17.7	19.1	20.7	21.6	22.3	22.7	21.7	20.0	19.1	18.4	18.3	18.0	16.6	18.2	22.7
13-Sep	15.5	14.6	14.3	13.8	13.1	12.8	12.7	13.2	13.6	15.0	16.5	18.5	19.6	20.6	20.4	20.5	20.3	19.5	16.6	14.4	12.9	11.8	11.8	11.7	15.6	20.6
14-Sep	11.5	11.4	11.6	11.9	12.2	12.4	12.2	12.1	12.3	12.5	13.2	14.1	15.6	17.3	18.6	19.0	19.0	18.8	18.2	17.8	16.5	15.2	13.7	13.7	14.6	19.0
15-Sep	13.2	12.1	12.3	9.9	7.9	8.4	6.8	7.3	9.2	11.2	13.3	16.8	19.4	21.4	23.0	23.6	23.9	23.6	22.5	20.9	19.2	18.1	16.7	16.1	15.7	23.9
16-Sep	15.6	15.3	15.1	15.4	14.7	14.3	14.1	13.7	13.6	14.5	17.2	18.9	20.3	21.0	22.1	22.6	22.6	21.8	21.0	20.4	19.5	18.4	17.2	16.0	17.7	22.6
17-Sep	14.4	13.3	14.2	13.4	12.1	10.8	10.8	11.2	12.9	15.5	16.6	19.7	21.0	21.3	21.3	21.3	21.2	20.9	20.1	19.0	17.2	16.9	16.1	14.8	16.5	21.3
18-Sep	14.1	13.8	13.5	12.8	12.1	11.8	11.7	11.7	11.8	12.8	14.8	16.2	16.6	16.7	15.0	12.8	12.0	12.5	13.0	12.8	12.3	11.4	10.8	10.1	13.0	16.7
19-Sep	9.9	9.8	9.4	9.0	8.2	7.7	7.6	6.8	7.5	9.8	11.7	13.5	15.2	16.5	17.5	17.8	18.2	18.1	17.7	17.3	16.8	14.8	13.4	12.4	12.8	18.2
20-Sep	11.2	10.6	9.9	9.7	9.8	9.4	8.6	8.1	7.9	10.2	11.6	13.4	14.3	15.5	16.3	16.7	16.9	16.4	15.4	15.0	14.2	13.6	13.3	13.3	12.6	16.9
21-Sep	12.8	11.4	10.0	8.2	6.8	6.0	5.6	5.4	6.3	8.7	11.7	16.1	17.5	18.4	18.8	19.6	19.5	19.0	18.2	17.1	16.1	15.0	14.4	14.1	13.2	19.6
22-Sep	13.8	13.2	13.1	13.0	12.8	12.3	12.0	11.5	12.9	15.0	18.1	19.9	21.2	22.1	22.8	23.3	23.1	22.5	21.5	20.0	18.8	17.6	16.7	15.8	17.2	23.3
23-Sep	15.8	15.5	15.4	15.5	14.9	14.4	14.1	14.2	15.0	16.5	18.3	20.1	21.0	21.9	22.7	23.0	22.9	22.2	20.9	19.7	18.9	18.5	18.2	17.6	18.2	23.0
24-Sep	17.2	16.9	16.8	17.0	17.1	16.8	16.4	16.2	16.2	16.3	16.6	17.2	17.6	17.4	17.3	16.7	16.9	17.0	16.8	16.7	16.2	15.7	14.6	13.9	16.6	17.6
25-Sep	13.5	12.5	10.3	9.4	9.1	9.0	7.9	7.4	7.7	9.6	11.1	13.3	14.6	15.6	16.7	17.8	18.6	19.1	17.9	16.7	16.1	15.8	15.4	15.2	13.3	19.1
26-Sep	15.4	15.9	15.5	15.7	15.5	15.5	15.2	14.9	15.2	15.9	17.3	18.5	19.6	20.1	20.0	19.8	19.3	18.9	18.5	18.7	17.8	17.6	16.2	15.4	17.2	20.1
27-Sep	15.2	14.9	14.0	14.5	13.2	11.9	11.3	10.7	10.3	12.2	14.7	17.0	17.5	18.1	18.7	18.8	18.1	17.4	16.9	16.3	15.6	15.2	13.7	12.6	15.0	18.8
28-Sep	11.7	10.9	10.2	10.0	9.4	8.5	7.4	7.3	7.3	7.6	8.3	8.8	9.0	8.6	8.5	8.5	8.2	8.0	8.0	8.1	8.0	7.8	7.7	7.6	8.6	11.7
29-Sep	7.5	7.2	7.0	6.8	6.7	6.7	6.8	6.9	7.1	7.0	6.5	7.0	7.5	7.9	8.4	8.9	8.8	8.3	7.9	7.6	7.3	7.0	6.8	6.6	7.3	8.9
30-Sep	6.8	6.8	6.8	6.8	6.8	6.6	6.7	6.8	6.6	6.6	6.8	7.4	7.8	8.4	8.9	9.3	9.4	9.5	9.3	9.0	8.7	8.5	8.4	8.1	7.8	9.5
13.5 12.9 12.4 12.0 11.4 11.0 10.5 10.3 10.8 12.1 13.6 15.4 16.6 17.4 18.0 18.3 18.4 18.1 17.4 16.7 15.8 15.1 14.4 13.7																								Diurnal Average		
19.2 18.6 18.0 18.5 17.9 16.8 16.4 16.2 16.2 17.7 20.1 22.0 23.7 24.4 24.9 25.0 25.2 24.7 23.7 22.6 21.4 20.9 20.5 19.2																								Diurnal Maximum		





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

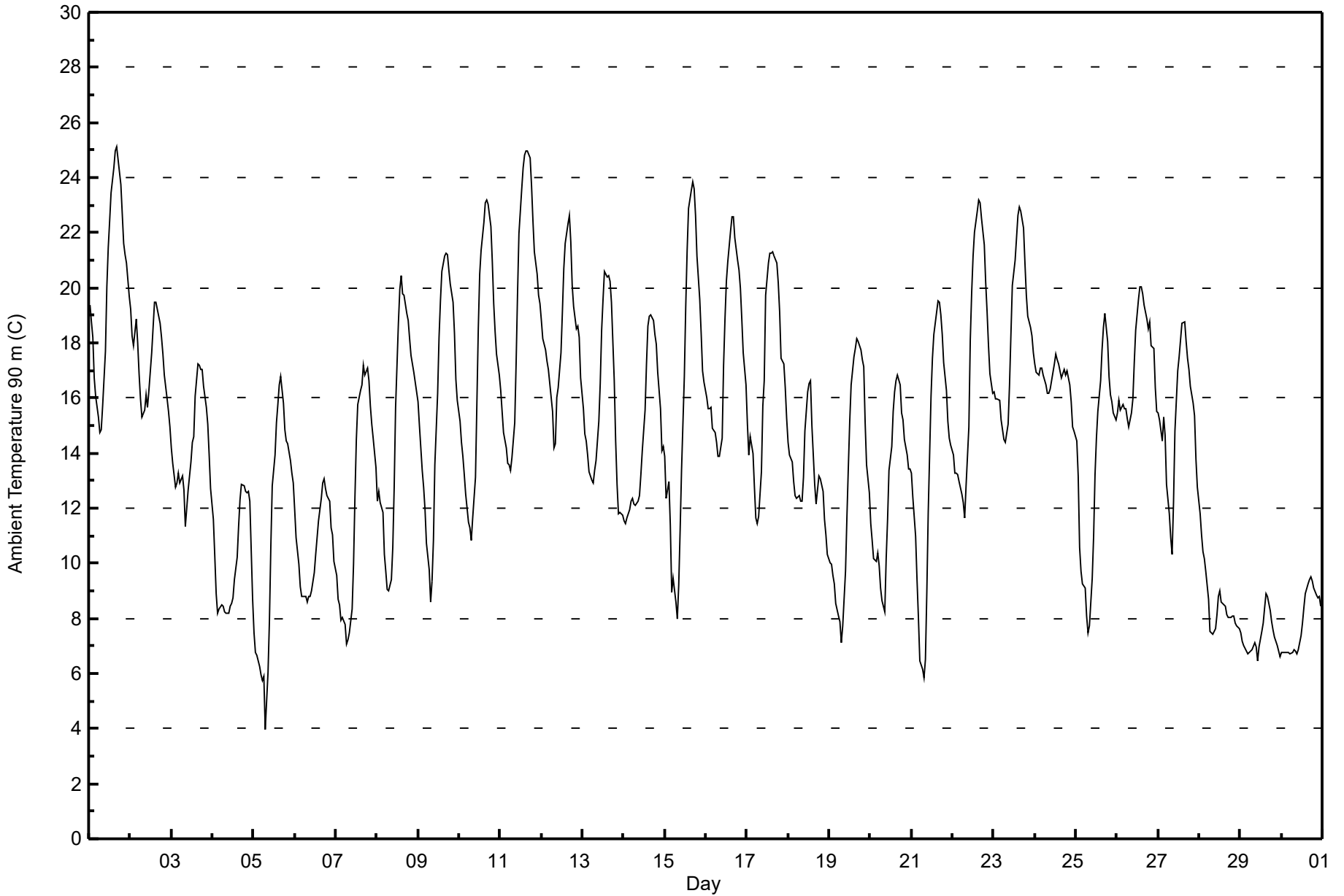
Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	157	21.81	21.81
10 - 20	476	66.11	87.92
> 20	87	12.08	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Maximum Value: 25.1 C on Sep 1 17:00 Maximum Daily Average: 20.2 C on Sep 1																						Hours in Service: 720 Hours of Data: 720				
Minimum Value: 4.0 C on Sep 5 08:00 Minimum Daily Average: 7.3 C on Sep 29 Maximum Diurnal Average: 18.4 C at hour 17 Minimum Diurnal Average: 10.6 C at hour 8 Monthly Average: 14.56 C Percentiles: P ₁ = 6.3 P ₁₀ = 8.1 Q ₁ = 11.2 Median = 14.9 Q ₃ = 17.8 P ₉₀ = 20.6 P ₉₉ = 24.4																						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-Sep	19.4	18.7	18.2	16.7	16.1	15.3	14.7	14.8	15.7	17.7	20.0	21.4	22.4	23.4	24.3	25.0	25.1	24.6	23.7	22.7	21.6	21.2	20.9	19.7	20.2	25.1
2-Sep	19.2	18.3	17.9	18.9	18.0	16.9	16.0	15.3	15.6	16.1	15.7	16.3	17.6	18.6	19.5	19.5	19.2	18.7	18.2	17.6	16.8	16.0	15.5	14.9	17.3	19.5
3-Sep	14.2	13.7	12.8	12.9	13.3	12.9	13.2	12.7	11.4	12.0	12.7	13.7	14.4	14.6	16.1	17.3	17.2	17.0	17.0	16.4	15.7	15.1	13.9	12.7	14.3	17.3
4-Sep	11.6	10.3	8.9	8.2	8.3	8.5	8.4	8.3	8.2	8.2	8.5	8.5	8.7	9.4	10.2	11.3	12.3	12.9	12.8	12.6	12.5	12.6	12.3	8.7	10.1	12.9
5-Sep	7.5	6.8	6.7	6.2	5.9	5.8	5.9	4.0	6.1	8.0	10.6	12.8	13.9	15.1	15.7	16.5	16.8	15.8	14.9	14.4	14.3	13.7	13.3	12.9	11.0	16.8
6-Sep	11.9	10.9	9.9	9.2	8.8	8.8	8.8	8.6	8.8	8.8	9.0	9.7	10.3	11.0	11.5	12.3	12.9	13.0	12.7	12.4	12.3	11.3	11.0	10.0	10.6	13.0
7-Sep	9.5	8.7	8.5	7.9	8.0	7.8	7.0	7.2	7.5	8.3	10.0	12.4	14.5	15.8	16.2	16.5	17.2	16.8	17.1	16.7	15.7	15.1	14.5	13.4	12.2	17.2
8-Sep	12.2	12.6	12.2	11.9	10.3	9.7	9.0	9.0	9.4	10.6	12.8	15.6	18.7	19.9	20.4	19.8	19.7	19.1	18.8	18.1	17.6	17.0	16.6	16.2	14.9	20.4
9-Sep	15.8	15.0	13.4	12.8	12.0	10.7	9.7	8.6	9.3	10.8	13.6	16.2	18.2	19.5	20.6	21.2	21.2	21.2	20.6	20.1	19.4	18.4	16.7	15.9	15.9	21.2
10-Sep	15.1	14.4	13.9	13.2	12.5	11.5	11.3	10.8	11.7	13.1	15.8	18.5	20.5	21.3	22.4	23.1	23.2	23.0	22.2	21.0	19.4	18.4	17.6	16.8	17.1	23.2
11-Sep	16.3	15.5	14.7	14.2	13.6	13.6	13.4	13.8	15.1	17.3	19.8	22.0	23.6	24.4	24.8	25.0	25.0	24.7	23.7	22.4	21.3	20.5	19.7	19.4	19.3	25.0
12-Sep	18.8	18.1	17.8	17.3	17.0	16.5	15.5	14.2	14.3	16.0	16.3	17.6	19.1	20.7	21.6	22.3	22.6	21.7	20.1	19.3	18.5	18.6	18.2	16.7	18.3	22.6
13-Sep	15.6	14.7	14.4	13.9	13.3	13.0	12.9	13.4	13.7	15.1	16.5	18.5	19.6	20.6	20.4	20.4	20.2	19.5	16.6	14.4	12.9	11.8	11.8	11.7	15.6	20.6
14-Sep	11.5	11.4	11.6	11.9	12.3	12.4	12.2	12.1	12.2	12.4	13.2	14.1	15.6	17.3	18.6	18.9	19.0	18.8	18.3	18.0	17.0	15.6	14.1	14.2	14.7	19.0
15-Sep	13.9	12.4	12.9	11.4	9.0	9.4	8.6	8.0	9.2	11.2	13.4	16.8	19.3	21.4	22.9	23.6	23.9	23.6	22.6	21.1	19.6	18.4	17.0	16.6	16.1	23.9
16-Sep	16.0	15.6	15.6	15.7	14.9	14.8	14.4	13.9	13.9	14.5	17.2	18.9	20.2	21.0	22.1	22.6	22.6	21.8	21.0	20.7	20.0	18.9	17.7	16.5	17.9	22.6
17-Sep	15.0	13.9	14.6	14.0	12.8	11.6	11.4	11.7	13.3	15.7	16.6	19.7	20.9	21.3	21.3	21.3	21.2	20.9	20.2	19.1	17.4	17.2	16.4	15.2	16.8	21.3
18-Sep	14.4	13.9	13.7	13.0	12.4	12.4	12.4	12.2	12.2	13.1	14.8	16.2	16.5	16.6	15.0	12.9	12.2	12.7	13.2	13.1	12.6	11.6	11.0	10.3	13.3	16.6
19-Sep	10.0	10.0	9.6	9.2	8.5	8.1	7.9	7.1	7.7	9.7	11.7	13.5	15.2	16.5	17.5	17.8	18.2	18.0	17.7	17.4	17.2	15.1	13.6	12.6	12.9	18.2
20-Sep	11.4	10.8	10.1	10.1	10.4	9.9	9.1	8.6	8.2	10.2	11.6	13.4	14.2	15.5	16.2	16.6	16.8	16.5	15.5	15.2	14.5	13.9	13.4	13.4	12.7	16.8
21-Sep	13.3	12.4	11.0	9.4	8.0	6.5	6.1	5.8	6.5	8.9	11.9	16.1	17.5	18.3	18.7	19.5	19.5	19.0	18.3	17.3	16.3	15.2	14.6	14.3	13.5	19.5
22-Sep	13.9	13.3	13.2	13.2	13.0	12.5	12.2	11.6	12.8	14.9	18.1	19.8	21.2	22.0	22.8	23.2	23.1	22.5	21.6	20.2	19.1	17.9	16.9	16.2	17.3	23.2
23-Sep	16.2	16.0	16.0	15.9	15.2	14.8	14.5	14.4	15.0	16.5	18.3	20.1	21.0	21.8	22.6	23.0	22.8	22.2	20.9	19.7	19.0	18.6	18.2	17.6	18.3	23.0
24-Sep	17.2	16.9	16.8	17.1	17.1	16.8	16.5	16.2	16.2	16.3	16.6	17.2	17.6	17.4	17.2	16.7	16.9	17.0	16.8	17.0	16.5	15.9	15.0	14.8	16.7	17.6
25-Sep	14.4	13.1	10.6	9.7	9.3	9.1	8.1	7.5	7.7	9.4	11.0	13.2	14.6	15.5	16.7	17.8	18.6	19.1	18.1	16.8	16.1	15.8	15.5	15.2	13.4	19.1
26-Sep	15.5	15.9	15.6	15.8	15.6	15.6	15.3	15.0	15.4	16.0	17.3	18.5	19.6	20.1	20.0	19.8	19.4	18.9	18.5	18.8	17.9	17.8	16.4	15.5	17.2	20.1
27-Sep	15.5	15.2	14.4	15.3	14.6	12.9	11.8	10.9	10.3	12.2	14.8	17.0	17.5	18.1	18.7	18.8	18.1	17.4	17.1	16.4	15.8	15.4	13.8	12.7	15.2	18.8
28-Sep	11.8	11.1	10.4	10.2	9.7	8.7	7.5	7.5	7.4	7.6	8.1	8.8	9.0	8.6	8.5	8.5	8.1	8.0	8.0	8.1	8.1	7.8	7.8	7.6	8.6	11.8
29-Sep	7.5	7.2	7.0	6.8	6.7	6.8	6.8	6.9	7.1	7.0	6.4	7.0	7.5	7.8	8.4	8.9	8.8	8.3	7.9	7.6	7.3	7.0	6.8	6.6	7.3	8.9
30-Sep	6.8	6.8	6.8	6.8	6.8	6.7	6.8	6.9	6.8	6.7	6.8	7.4	7.8	8.4	8.9	9.3	9.4	9.5	9.4	9.1	8.9	8.7	8.8	8.4	7.9	9.5
13.7 13.1 12.6 12.3 11.8 11.3 10.9 10.6 11.0 12.2 13.6 15.4 16.6 17.4 18.0 18.3 18.4 18.1 17.5 16.8 16.0 15.3 14.6 13.9																								Diurnal Average		
19.4 18.7 18.2 18.9 18.0 16.9 16.5 16.2 16.2 17.7 20.0 22.0 23.6 24.4 24.8 25.0 25.1 24.7 23.7 22.7 21.6 21.2 20.9 19.7																								Diurnal Maximum		





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	151	20.97	20.97
10 - 20	480	66.67	87.64
> 20	89	12.36	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

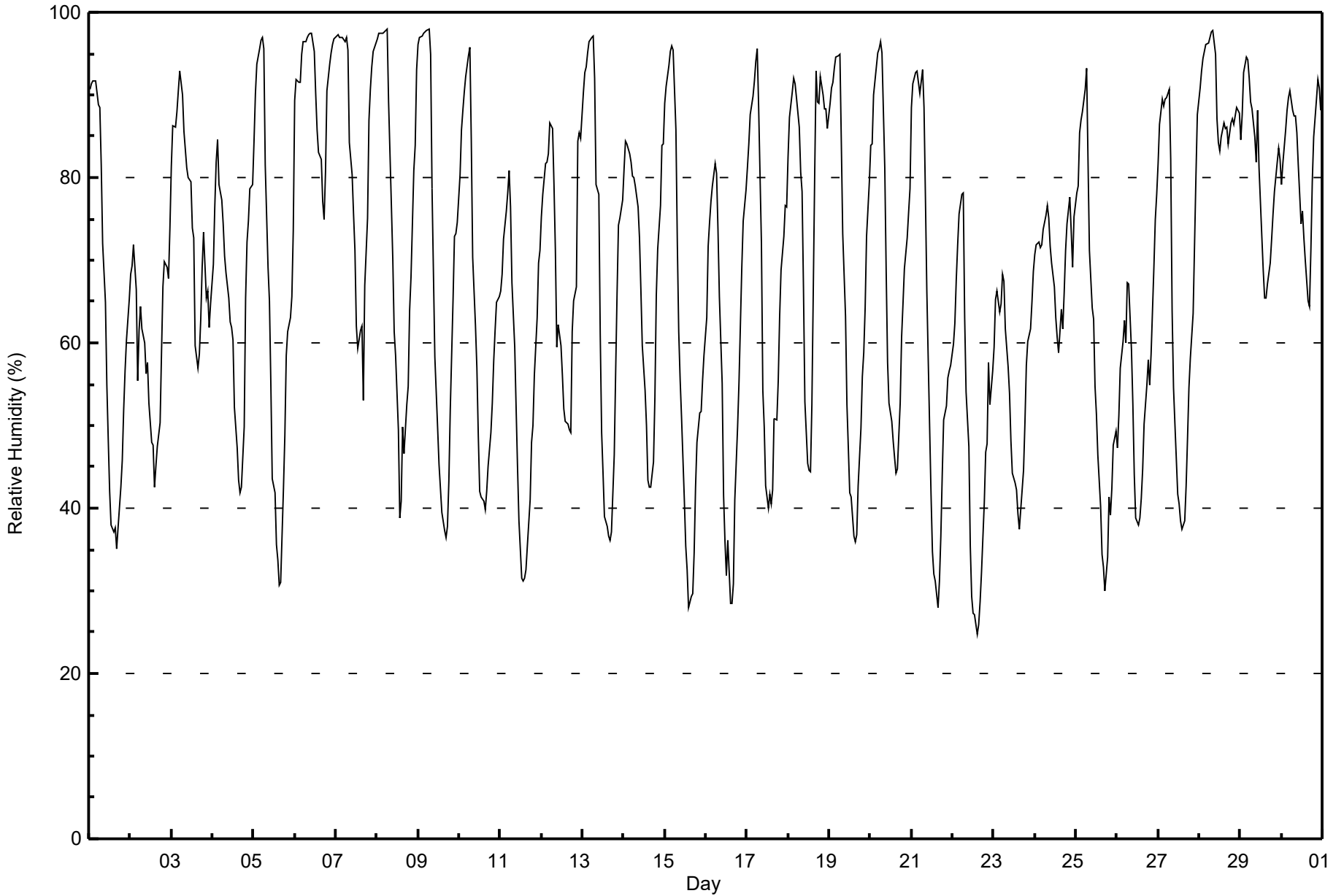
Mannix - September 2023

Maximum Value: 98 % on Sep 9 07:00 Maximum Daily Average: 90.9 % on Sep 6																	Hours in Service: 720 Hours of Data: 720									
Minimum Value: 25 % on Sep 22 15:00 Minimum Daily Average: 49.6 % on Sep 22 Maximum Diurnal Average: 87.5 % at hour 6 Minimum Diurnal Average: 45.9 % at hour 15 Monthly Average: 68.0 % Percentiles: P ₁ = 29 P ₁₀ = 41 Q ₁ = 52 Median = 69 Q ₃ = 86 P ₉₀ = 93 P ₉₉ = 98																	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-Sep	91	91	92	92	92	89	88	81	72	65	55	48	42	38	37	38	35	38	43	46	52	57	60	65	62.7	92
2-Sep	68	69	72	67	56	62	64	62	60	56	58	53	48	48	43	45	47	50	59	67	70	69	68	74	59.7	74
3-Sep	81	86	86	88	91	93	90	86	83	81	80	80	74	73	60	57	59	63	69	73	65	66	62	65	75.4	93
4-Sep	70	76	82	85	79	77	74	71	69	65	63	62	60	52	47	43	42	43	50	66	72	75	79	79	65.8	85
5-Sep	84	90	94	96	97	97	96	82	69	65	55	43	42	36	34	31	31	42	49	58	61	63	66	74	64.7	97
6-Sep	89	92	92	91	95	96	96	97	97	97	98	95	90	86	83	82	77	75	81	91	94	95	96	97	90.9	98
7-Sep	97	97	97	97	97	97	97	95	84	80	76	71	62	59	61	62	53	67	75	87	91	93	95	96	82.8	97
8-Sep	97	97	97	97	98	98	98	89	77	70	61	58	49	39	41	50	47	52	55	64	68	81	84	93	73.4	98
9-Sep	96	97	97	97	98	98	98	95	79	68	58	50	45	42	40	37	36	38	43	52	65	73	73	75	68.8	98
10-Sep	80	86	88	90	92	95	96	85	70	62	57	49	42	41	41	40	42	45	49	53	58	62	65	66	64.7	96
11-Sep	66	68	73	76	78	81	76	67	60	52	45	38	32	31	31	33	35	41	48	50	56	63	70	71	55.9	81
12-Sep	75	78	82	82	83	87	86	79	71	60	62	60	56	52	51	50	49	49	61	65	67	84	85	85	69.1	87
13-Sep	90	93	93	95	96	97	97	92	79	78	61	49	44	39	38	37	36	37	46	56	66	74	75	77	68.7	97
14-Sep	81	84	84	83	82	80	80	79	76	73	66	60	54	50	43	43	43	46	53	66	71	77	84	84	68.4	84
15-Sep	89	91	93	95	96	96	86	72	61	56	51	41	35	32	28	29	30	35	43	48	52	52	55	59	59.3	96
16-Sep	63	72	75	77	79	82	80	74	66	55	41	36	32	36	29	29	31	41	50	55	62	69	75	78	57.7	82
17-Sep	81	84	88	90	92	94	96	89	72	54	50	43	40	42	41	42	51	51	55	63	69	73	77	76	67.1	96
18-Sep	83	87	90	92	91	90	86	81	78	67	53	45	45	44	53	80	93	89	89	92	90	88	88	86	78.4	93
19-Sep	89	91	92	93	95	95	95	84	73	63	52	47	42	41	37	36	37	43	50	56	59	64	73	79	66.1	95
20-Sep	84	84	90	93	95	96	96	95	81	69	58	53	51	48	46	44	45	53	61	65	69	73	76	79	70.9	96
21-Sep	88	91	93	93	92	90	93	88	78	66	58	42	35	32	31	28	31	37	44	51	52	56	57	57	61.8	93
22-Sep	60	62	68	72	76	78	78	63	54	47	36	29	27	27	25	26	29	32	41	47	48	58	53	57	49.6	78
23-Sep	60	65	66	64	65	68	68	62	57	54	48	44	43	42	39	37	40	45	50	57	60	62	65	69	55.4	69
24-Sep	71	72	72	71	72	74	75	77	75	72	70	67	63	61	59	64	62	66	71	74	78	74	69	75	70.1	78
25-Sep	78	79	85	87	88	91	93	82	71	64	63	55	51	46	40	34	33	30	34	41	39	42	48	49	59.4	93
26-Sep	47	51	57	60	63	60	67	67	59	53	44	39	38	39	41	45	50	55	58	55	59	69	75	78	55.4	78
27-Sep	82	86	90	89	90	90	91	82	64	55	50	42	41	39	37	38	43	48	55	58	64	72	80	88	65.5	91
28-Sep	91	93	94	95	96	96	97	98	98	95	87	84	83	85	87	86	86	84	87	87	86	88	89	88	90.0	98
29-Sep	85	88	93	95	94	92	89	88	85	82	88	81	73	69	65	65	67	70	73	76	78	82	84	82	80.9	95
30-Sep	79	82	86	88	90	90	88	87	87	85	82	74	76	73	70	65	64	71	80	85	89	92	91	88	81.8	92
	79.8	82.8	85.3	86.4	86.8	87.5	87.2	81.6	73.5	67.0	60.8	54.6	50.5	48.1	45.9	46.6	47.4	51.2	57.3	63.5	67.0	71.5	73.8	76.3	Diurnal Average	
	97	97	97	97	98	98	98	98	98	97	98	95	90	86	87	86	93	89	89	92	94	95	96	97	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Mannix - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Mannix - September 2023

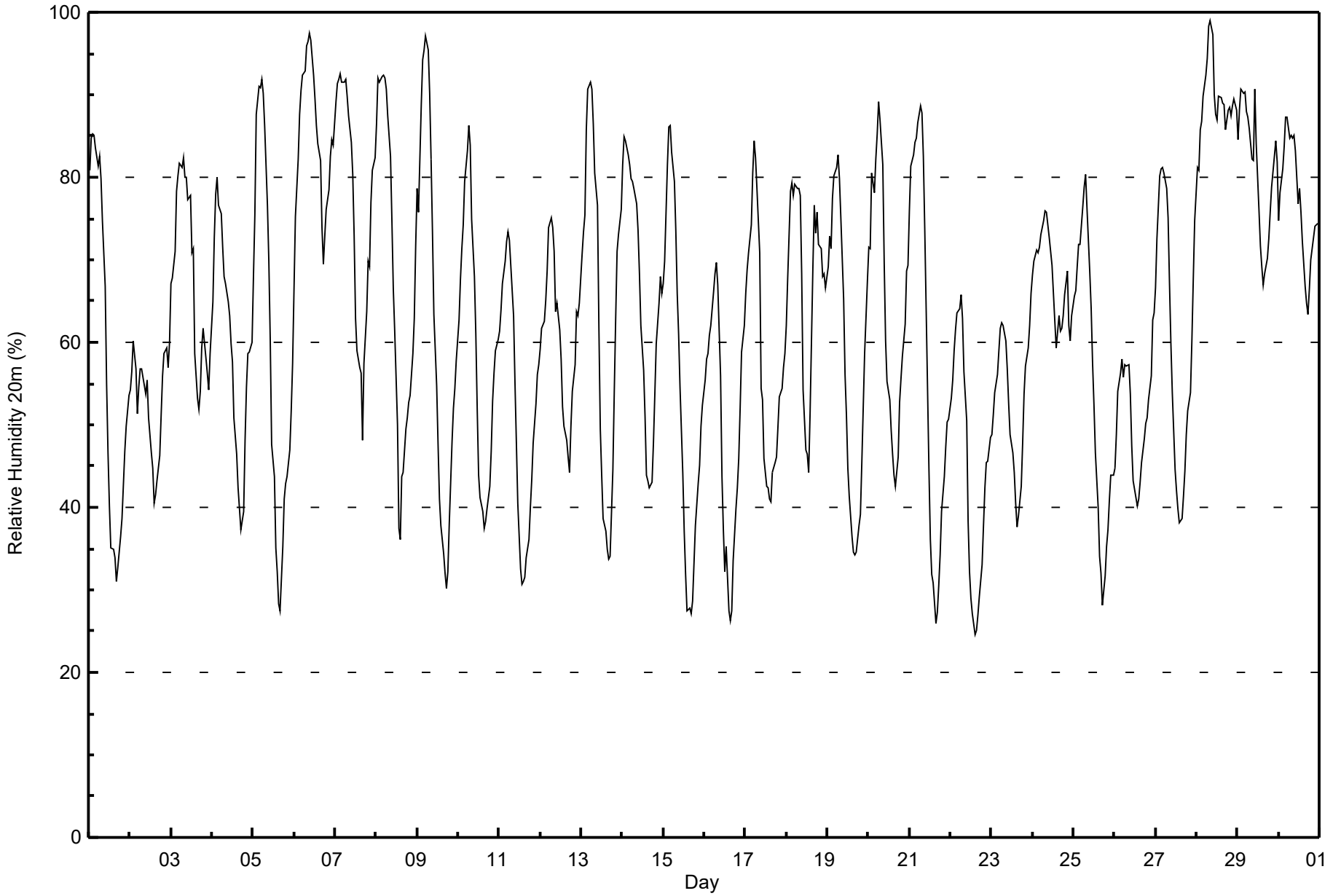
Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	69	9.58	9.58
40 - 60	189	26.25	35.83
60 - 80	215	29.86	65.69
80 - 100	247	34.31	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Maximum Value: 99 % on Sep 28 09:00 Maximum Daily Average: 89.3 % on Sep 28																			Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0							
Minimum Value: 25 % on Sep 22 15:00 Minimum Daily Average: 44.9 % on Sep 22 Maximum Diurnal Average: 80.3 % at hour 7 Minimum Diurnal Average: 44.4 % at hour 17 Monthly Average: 62.6 % Percentiles: P ₁ = 27 P ₁₀ = 38 Q ₁ = 48 Median = 63 Q ₃ = 78 P ₉₀ = 87 P ₉₉ = 96																										
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Sep	81	85	85	85	84	81	83	80	75	67	55	47	40	35	35	34	31	33	36	39	43	47	50	54	57.6	85
2-Sep	54	56	60	57	51	55	57	57	55	54	55	51	47	45	40	42	43	46	51	56	59	59	57	60	52.8	60
3-Sep	67	68	71	78	80	82	81	82	80	80	77	78	71	71	59	53	52	54	59	62	58	56	54	59	68.1	82
4-Sep	65	73	78	80	77	76	72	68	67	65	63	60	58	51	46	42	40	37	40	48	55	59	59	60	59.8	80
5-Sep	68	75	88	91	91	92	90	86	77	70	60	48	44	35	32	28	27	35	41	43	44	47	52	57	59.2	92
6-Sep	66	75	82	88	90	92	93	96	96	98	97	92	90	86	84	82	74	70	73	76	78	82	84	84	84.6	98
7-Sep	89	91	92	93	92	92	92	90	87	84	80	73	63	59	57	56	48	57	64	70	69	77	81	82	76.6	93
8-Sep	86	92	91	92	92	92	91	87	83	75	66	61	50	37	36	44	44	49	51	53	54	59	63	72	67.6	92
9-Sep	79	76	89	94	95	97	95	90	82	73	63	55	48	41	38	34	32	30	32	38	48	52	54	58	62.3	97
10-Sep	63	68	71	74	79	83	86	84	75	68	61	52	44	41	40	37	38	40	43	47	53	56	59	60	59.3	86
11-Sep	61	64	67	70	72	73	72	69	63	55	48	40	33	31	31	32	34	36	40	43	48	52	56	57	52.0	73
12-Sep	59	62	63	65	69	74	75	74	71	64	65	61	58	52	50	48	46	44	50	54	57	64	63	65	60.5	75
13-Sep	71	73	75	86	91	92	91	86	80	77	62	49	44	39	37	35	34	34	45	54	63	71	73	76	64.0	92
14-Sep	82	85	84	83	82	80	79	79	77	74	68	62	57	51	44	43	42	43	48	54	60	65	68	66	65.6	85
15-Sep	67	70	82	86	86	83	79	74	66	61	54	44	37	32	27	28	27	29	33	38	43	45	50	52	53.9	86
16-Sep	55	58	59	61	62	66	68	70	67	56	44	37	32	35	27	26	28	34	40	42	46	52	59	62	49.4	70
17-Sep	66	69	71	74	81	84	82	79	71	54	53	46	43	42	41	41	44	45	46	50	53	54	57	59	58.6	84
18-Sep	62	68	78	79	78	79	79	79	78	68	54	47	47	44	51	69	77	73	76	72	71	68	68	67	68.0	79
19-Sep	69	73	71	77	80	81	83	80	75	65	56	51	45	41	36	35	34	35	38	39	45	52	59	67	57.9	83
20-Sep	72	71	81	78	82	85	89	87	81	70	60	55	53	49	46	44	43	46	53	56	58	62	69	69	65.0	89
21-Sep	76	81	83	84	85	87	89	88	83	74	64	45	36	32	31	26	27	30	34	40	44	47	50	51	57.7	89
22-Sep	53	55	59	62	63	64	66	63	56	50	38	32	29	27	25	25	27	29	33	38	42	45	46	48	44.9	66
23-Sep	49	51	54	56	59	62	62	62	60	57	53	49	47	44	40	38	39	43	48	54	57	59	62	66	52.9	66
24-Sep	68	70	71	71	71	73	75	76	76	74	73	69	66	62	59	63	61	62	63	66	69	62	60	63	67.7	76
25-Sep	66	66	69	72	72	76	79	80	76	68	64	57	52	47	40	34	32	28	32	35	37	41	44	44	54.7	80
26-Sep	45	49	54	56	58	56	57	57	57	54	47	43	41	40	41	43	45	48	50	51	53	56	63	63	51.2	63
27-Sep	67	73	80	81	81	81	79	75	67	60	54	45	42	40	38	39	41	44	49	52	54	60	68	75	60.1	81
28-Sep	81	81	86	87	90	92	94	98	99	97	90	88	87	90	90	89	89	86	88	89	88	89	90	88	89.3	99
29-Sep	85	88	91	90	90	88	87	86	82	82	91	84	76	72	69	67	68	70	73	76	79	83	84	82	80.9	91
30-Sep	75	78	81	84	87	87	85	85	85	85	83	77	79	76	72	67	65	63	66	70	73	74	74	74	76.9	87
68.2 71.5 75.5 77.8 79.0 80.2 80.3 78.9 74.9 69.3 63.4 56.6 51.8 48.3 45.5 44.8 44.4 45.8 49.8 53.4 56.7 59.9 62.5 64.7																								Diurnal Average		
89 92 92 94 95 97 95 98 99 98 97 92 90 90 90 89 89 86 88 89 88 89 90 88																								Diurnal Maximum		





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	89	12.36	12.36
40 - 60	237	32.92	45.28
60 - 80	239	33.19	78.47
80 - 100	155	21.53	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720

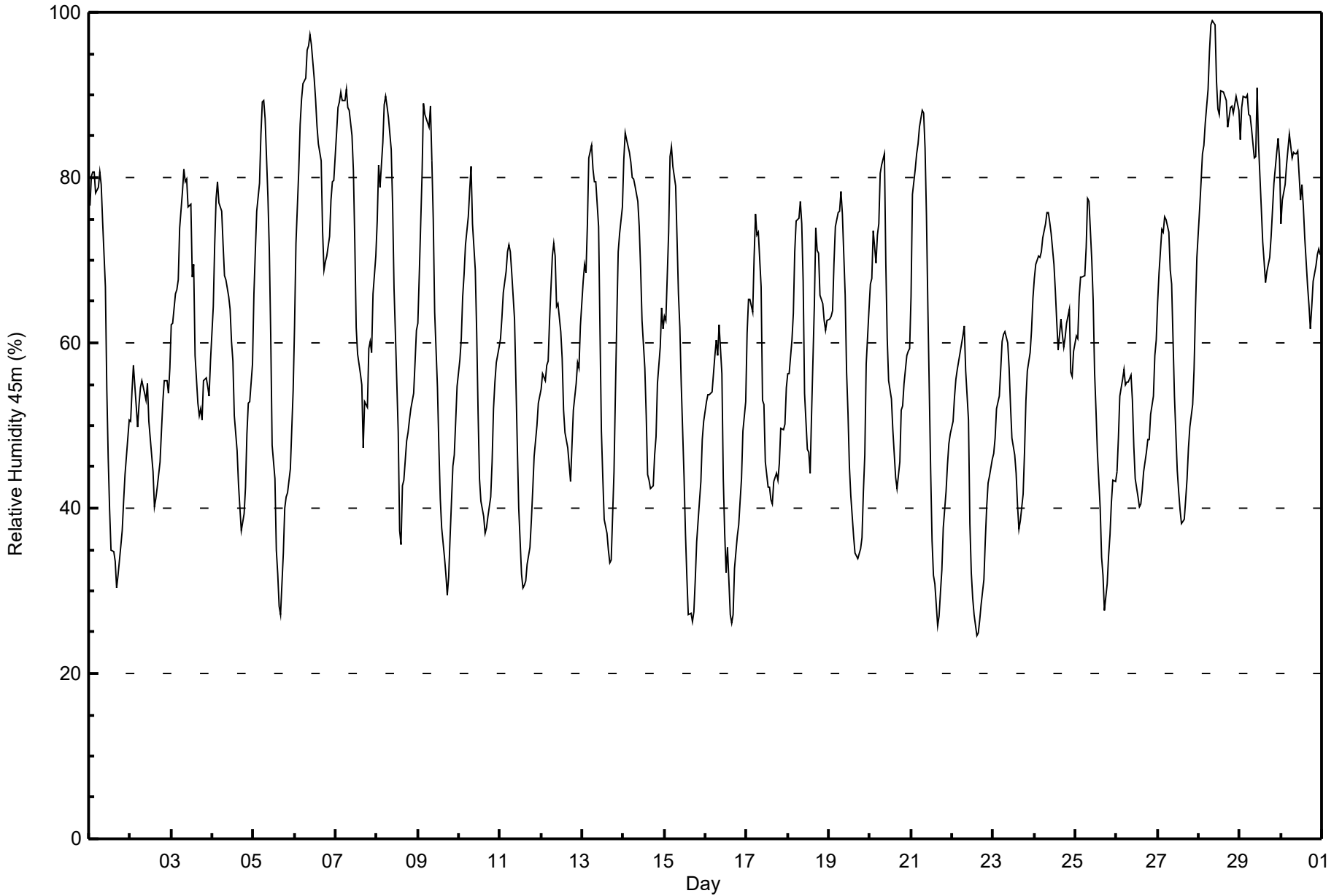


Maximum Value: 99 % on Sep 28 09:00														Maximum Daily Average: 89.0 % on Sep 28														Hours in Service: 720	
Minimum Value: 25 % on Sep 22 15:00														Minimum Daily Average: 43.1 % on Sep 22														Hours of Data: 720	
Maximum Diurnal Average: 77.0 % at hour 8														Minimum Diurnal Average: 44.0 % at hour 17														Hours of Missing Data: 0	
Monthly Average: 60.4 %														Percentiles: P ₁ = 27 P ₁₀ = 37 Q ₁ = 47 Median = 60 Q ₃ = 74 P ₉₀ = 84 P ₉₉ = 95														Hours of Calibration: 0	
																												Percent Operational Time: 100.0	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24					
1-Sep	77	80	81	81	78	79	81	79	75	67	54	46	40	35	35	33	30	32	35	37	41	44	46	51	55.7	81			
2-Sep	51	54	57	52	50	53	55	55	54	53	55	50	46	44	40	41	43	46	49	53	55	55	54	57	51.0	57			
3-Sep	62	62	66	66	68	74	78	81	79	80	77	77	68	69	58	53	51	52	51	55	56	55	54	58	64.6	81			
4-Sep	64	72	78	79	77	76	72	68	68	66	64	60	58	51	47	43	40	37	39	43	49	53	53	57	58.9	79			
5-Sep	66	71	76	79	85	89	89	87	78	71	61	48	44	35	32	28	27	35	40	41	42	45	49	54	57.2	89			
6-Sep	62	72	81	86	89	91	92	95	96	97	96	92	90	86	84	82	73	69	70	71	73	77	79	80	82.7	97			
7-Sep	85	89	89	90	89	89	91	89	88	85	81	72	62	59	56	55	47	53	52	59	60	59	66	70	72.3	91			
8-Sep	75	82	79	84	89	90	89	87	83	77	67	61	49	37	36	43	43	48	49	51	52	54	58	61	64.3	90			
9-Sep	62	68	80	89	88	87	86	89	82	75	64	55	47	41	38	34	32	30	32	36	45	47	50	55	58.8	89			
10-Sep	58	61	66	68	72	75	78	81	74	69	61	51	44	41	39	37	38	39	41	46	52	55	58	59	56.8	81			
11-Sep	61	63	66	69	71	72	71	68	63	55	47	40	32	30	31	31	33	35	39	42	46	50	53	54	50.9	72			
12-Sep	54	56	55	57	58	63	71	72	70	64	65	61	58	52	49	47	45	43	48	52	55	58	57	62	57.2	72			
13-Sep	67	69	69	74	82	84	81	79	80	74	62	49	44	39	37	35	33	34	44	54	63	71	73	76	61.4	84			
14-Sep	82	85	85	83	82	80	80	79	77	74	69	63	57	51	44	43	42	43	46	49	55	59	64	62	64.8	85			
15-Sep	63	63	73	83	84	81	79	73	66	62	55	44	37	32	27	27	26	27	31	36	41	43	48	50	52.1	84			
16-Sep	53	54	54	54	54	58	60	59	62	56	44	37	32	35	27	26	27	33	37	38	41	44	49	53	45.3	62			
17-Sep	61	65	65	64	70	76	73	73	67	53	46	43	43	41	41	43	44	43	45	50	49	50	55	55	54.7	76			
18-Sep	56	56	60	64	71	75	75	77	74	67	54	47	47	44	51	65	74	71	71	66	65	63	62	63	63.2	77			
19-Sep	63	63	64	70	74	76	76	78	76	66	56	51	45	42	37	35	34	34	35	37	42	46	57	64	55.0	78			
20-Sep	67	68	73	70	73	74	81	82	83	70	60	56	53	49	47	44	42	46	52	52	55	59	59	59	61.4	83			
21-Sep	66	78	81	83	84	86	88	88	84	75	64	45	36	32	31	26	27	30	33	38	42	45	48	49	56.5	88			
22-Sep	51	53	56	57	58	60	61	62	57	51	38	32	29	27	25	25	26	28	31	36	40	43	44	46	43.1	62			
23-Sep	47	49	52	54	57	60	61	61	60	57	52	49	47	44	40	37	39	42	47	53	57	59	62	66	52.0	66			
24-Sep	68	69	71	70	71	73	74	76	76	75	73	70	66	63	59	63	61	59	61	62	64	57	56	59	66.4	76			
25-Sep	61	61	66	68	68	68	72	78	77	70	65	57	52	47	40	34	32	28	31	34	37	41	43	43	52.9	78			
26-Sep	44	48	54	56	57	55	55	55	56	53	48	44	41	40	41	42	44	47	48	48	51	54	59	60	50.0	60			
27-Sep	65	68	74	73	75	75	73	69	67	60	54	45	42	40	38	39	41	44	47	50	53	57	64	70	57.6	75			
28-Sep	76	80	83	84	87	91	95	99	99	98	92	88	88	90	90	90	89	86	88	89	88	89	90	88	89.0	99			
29-Sep	85	89	90	90	90	88	87	86	82	82	91	84	76	72	70	67	69	70	73	76	79	83	85	82	81.1	91			
30-Sep	74	77	79	82	83	85	82	83	83	83	83	83	77	79	76	73	67	65	62	64	67	69	71	71	75.3	85			
	64.2	67.5	70.7	72.6	74.5	76.1	76.9	77.0	74.5	69.5	63.5	56.5	51.7	48.3	45.4	44.4	44.0	44.8	47.6	50.5	53.9	56.1	58.7	61.2	Diurnal Average				
	85	89	90	90	90	91	95	99	99	98	96	92	90	90	90	90	90	89	86	88	89	88	89	88	Diurnal Maximum				



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

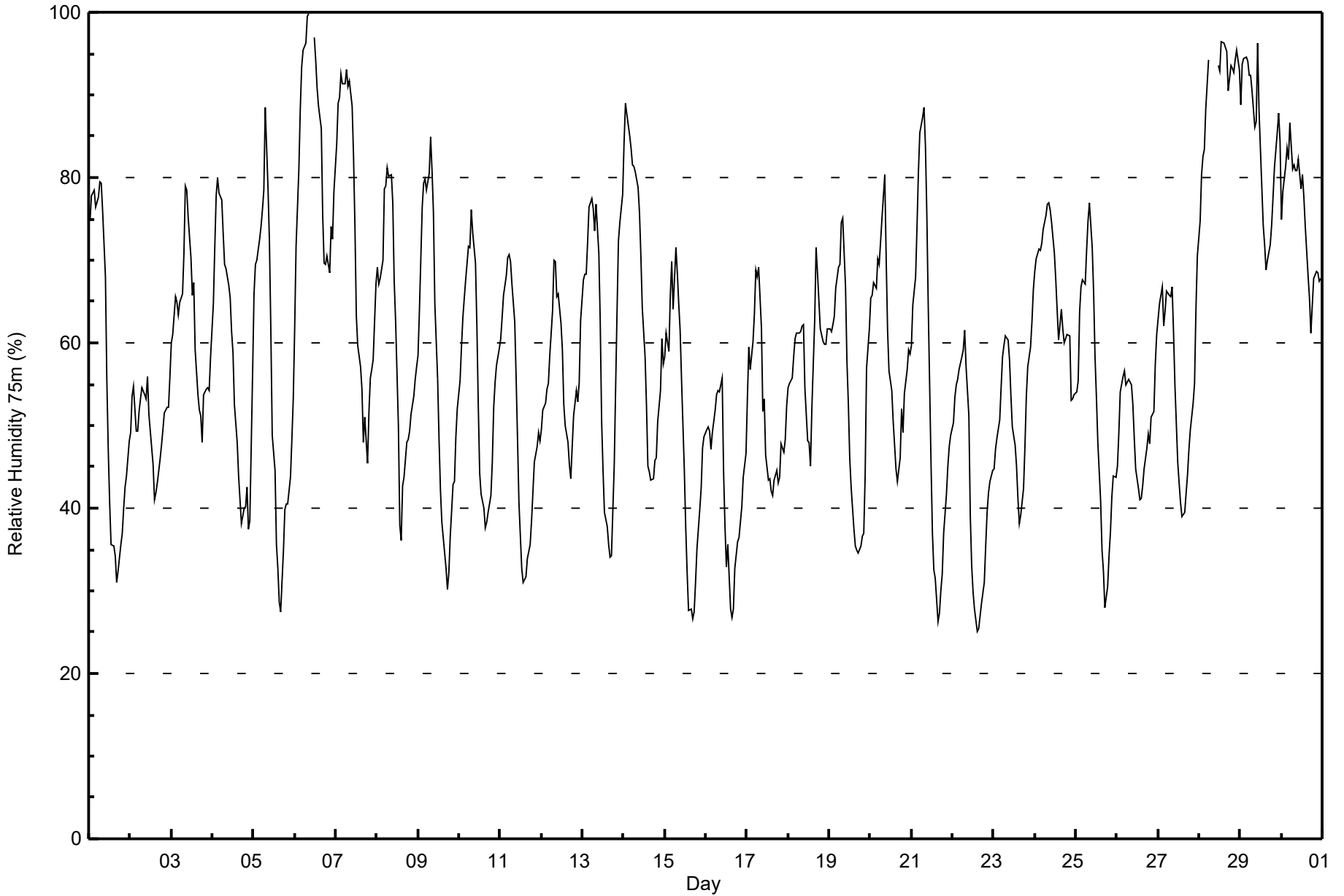
Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	94	13.06	13.06
40 - 60	265	36.81	49.86
60 - 80	245	34.03	83.89
80 - 100	116	16.11	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Maximum Value: 100 % on Sep 6 09:00 Maximum Daily Average: 90.9 % on Sep 28																	Hours in Service: 720 Hours of Data: 713 Hours of Missing Data: 7 Hours of Calibration: 0 Percent Operational Time: 99.0									
Minimum Value: 25 % on Sep 22 15:00 Minimum Daily Average: 42.6 % on Sep 16 Maximum Diurnal Average: 73.9 % at hour 8 Minimum Diurnal Average: 44.7 % at hour 17 Monthly Average: 59.1 % Percentiles: P ₁ = 27 P ₁₀ = 37 Q ₁ = 46 Median = 58 Q ₃ = 71 P ₉₀ = 81 P ₉₉ = 96																										
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Sep	75	78	78	78	76	78	79	79	76	68	55	47	41	36	36	34	31	32	36	37	40	42	44	48	55.2	79
2-Sep	49	53	55	49	49	52	53	55	54	53	56	51	47	45	41	42	43	46	48	49	51	52	52	56	50.1	56
3-Sep	60	61	66	65	63	65	66	71	79	78	75	70	66	67	59	54	52	51	48	54	54	55	54	58	62.2	79
4-Sep	65	71	78	80	78	77	73	70	69	67	65	61	59	52	48	44	41	38	40	40	42	37	38	56	58.0	80
5-Sep	66	69	70	73	74	76	78	88	79	72	61	49	45	36	33	29	28	35	40	40	41	44	48	53	55.3	88
6-Sep	62	72	81	88	93	95	96	100	100	OR	OR	97	94	91	89	86	75	70	70	71	69	74	72	78	82.8	100
7-Sep	84	89	90	93	91	91	93	91	92	89	83	74	63	60	57	54	48	51	45	52	56	57	58	67	72.0	93
8-Sep	69	67	68	70	79	79	81	80	80	77	67	63	50	38	36	43	44	48	48	49	51	53	56	57	60.6	81
9-Sep	59	64	76	79	80	78	81	85	81	76	65	56	48	42	38	35	33	30	32	37	43	43	49	52	56.7	85
10-Sep	55	59	63	65	68	72	71	76	73	70	62	52	44	42	40	38	38	39	42	46	52	55	57	59	55.8	76
11-Sep	60	63	66	68	70	71	70	67	63	56	48	41	33	31	31	32	34	36	38	42	46	47	49	48	50.4	71
12-Sep	50	52	53	54	55	59	64	70	70	66	66	62	59	53	50	48	45	44	47	51	54	53	55	63	55.9	70
13-Sep	68	68	68	72	76	77	76	74	77	71	63	50	45	40	38	36	34	34	45	55	64	72	75	78	60.6	78
14-Sep	84	89	88	85	84	82	81	81	79	76	71	64	58	52	45	44	43	44	46	46	51	54	61	57	65.2	89
15-Sep	58	61	59	66	70	64	72	68	65	62	56	45	38	32	28	28	27	27	31	35	40	42	47	49	48.7	72
16-Sep	49	50	49	47	49	52	54	54	54	56	44	38	33	36	28	27	28	33	36	36	38	40	44	47	42.6	56
17-Sep	53	60	57	60	63	69	68	69	62	52	53	46	43	43	42	41	43	45	43	44	48	47	48	52	52.2	69
18-Sep	55	55	56	58	61	61	61	61	62	62	55	48	48	45	52	63	71	69	65	62	60	60	60	62	58.8	71
19-Sep	62	61	62	63	67	69	70	74	75	67	58	53	46	43	38	35	35	35	35	37	37	44	57	62	53.5	75
20-Sep	65	66	67	67	70	69	72	75	80	70	61	57	54	50	48	45	43	46	52	49	54	57	59	59	59.9	80
21-Sep	60	65	68	74	81	85	87	88	84	76	65	45	37	33	31	26	27	30	32	37	42	45	47	49	54.8	88
22-Sep	50	53	55	56	57	58	59	62	57	51	39	33	30	28	25	25	27	29	31	35	40	42	43	45	42.9	62
23-Sep	45	47	49	51	55	58	60	61	60	58	54	50	48	45	41	38	39	42	47	54	57	60	62	66	51.9	66
24-Sep	69	70	71	71	72	74	75	77	77	76	75	71	68	64	60	64	62	60	61	61	61	53	53	54	66.6	77
25-Sep	54	55	64	67	68	67	71	75	77	71	66	58	53	48	41	35	32	28	30	34	37	41	44	44	52.6	77
26-Sep	45	49	54	56	57	55	55	56	55	53	48	45	42	41	41	43	45	47	49	48	51	52	58	61	50.2	61
27-Sep	63	65	67	62	64	66	66	66	67	61	55	46	43	41	39	40	42	44	47	50	53	55	64	71	55.6	71
28-Sep	75	80	83	83	88	94	OR	OR	OR	OR	OR	94	93	96	96	96	95	91	94	93	93	94	95	93	90.9	96
29-Sep	89	94	94	95	94	92	92	90	86	87	96	88	79	74	72	69	70	72	74	78	81	86	88	84	84.3	96
30-Sep	75	78	81	84	82	87	81	82	81	81	82	79	80	78	74	68	65	61	65	68	69	68	68	68	75.1	87
																								Diurnal Average		
																								Diurnal Maximum		
62.4 65.5 67.8 69.3 71.2 72.5 72.7 73.9 72.8 67.8 62.3 57.8 52.9 49.4 46.6 45.3 44.7 45.2 47.2 49.6 52.5 54.2 56.9 59.9 89 94 94 95 94 95 96 100 100 89 96 97 94 96 96 96 95 91 94 93 93 94 95 93																										
OR - Out of Range																										





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

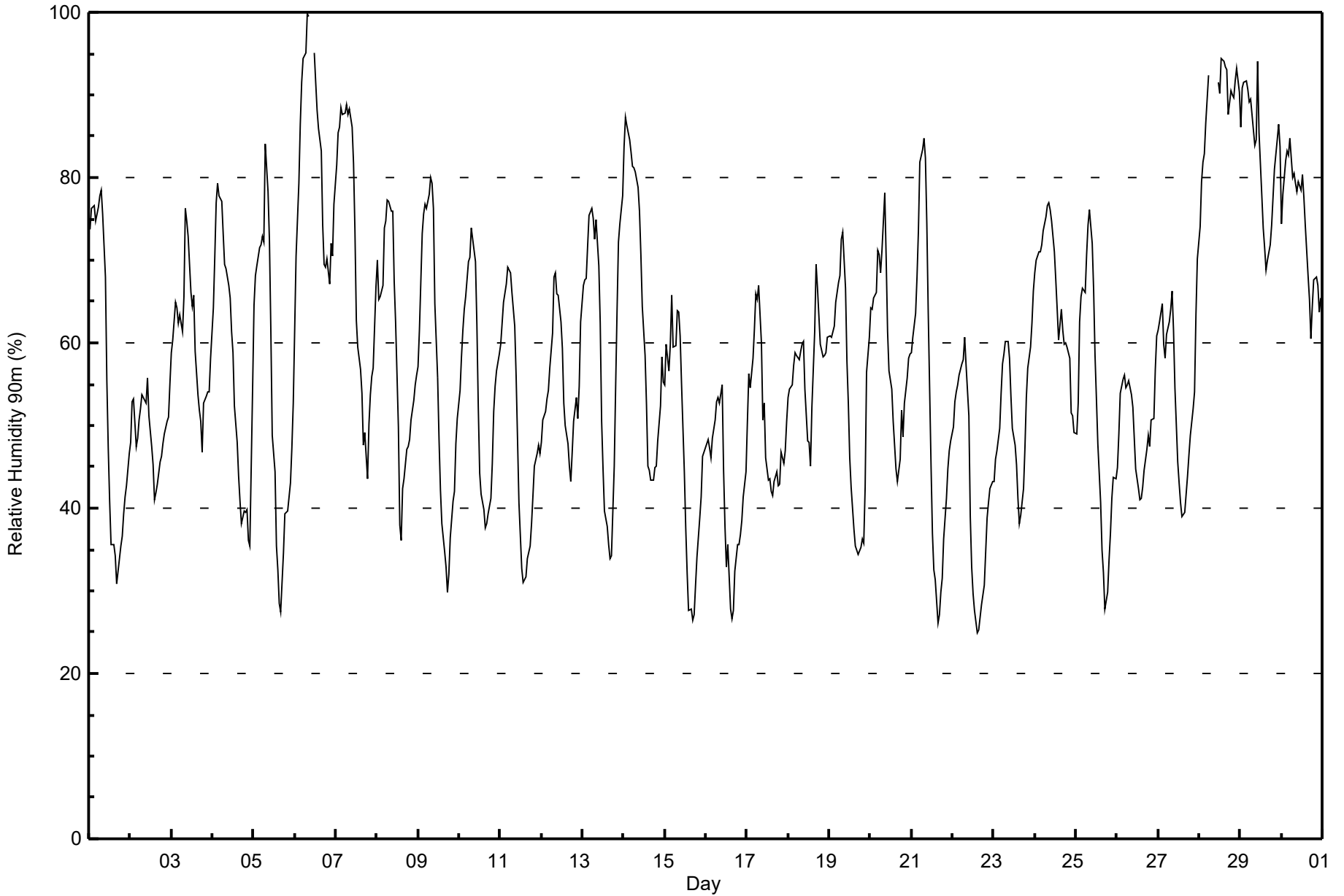
Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	96	13.46	13.46
40 - 60	286	40.11	53.58
60 - 80	242	33.94	87.52
80 - 100	89	12.48	100.00

Total Number of Valid Hours: 713

Total Number of Hours: 720



Maximum Value: 100 % on Sep 6 08:00 Maximum Daily Average: 88.8 % on Sep 28																		Hours in Service: 720 Hours of Data: 713 Hours of Missing Data: 7 Hours of Calibration: 0 Percent Operational Time: 99.0								
Minimum Value: 25 % on Sep 22 15:00 Minimum Daily Average: 41.7 % on Sep 16 Maximum Diurnal Average: 72.0 % at hour 8 Minimum Diurnal Average: 44.4 % at hour 17 Monthly Average: 58.1 % Percentiles: P ₁ = 27 P ₁₀ = 37 Q ₁ = 45 Median = 57 Q ₃ = 70 P ₉₀ = 81 P ₉₉ = 94																										
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Sep	74	76	76	77	75	76	78	78	76	68	55	47	41	36	36	34	31	32	35	37	39	41	43	47	54.5	78
2-Sep	48	53	53	47	48	51	52	54	53	53	56	51	47	45	41	42	43	46	46	48	49	51	51	55	49.3	56
3-Sep	59	60	65	64	62	63	61	66	76	75	73	66	64	66	59	54	52	51	47	53	54	54	54	58	60.6	76
4-Sep	64	70	77	79	78	77	73	70	69	67	65	61	59	52	48	44	41	38	40	40	40	36	35	55	57.4	79
5-Sep	65	68	69	71	72	73	72	84	78	72	62	49	44	35	33	29	27	35	39	39	40	43	47	53	54.2	84
6-Sep	62	70	79	86	92	94	95	100	99	OR	OR	95	92	88	86	83	74	69	69	70	67	72	70	77	81.4	100
7-Sep	82	85	86	89	88	88	89	88	88	86	82	74	63	60	57	54	48	49	44	50	54	56	57	67	70.0	89
8-Sep	70	65	66	67	74	75	77	77	76	76	68	63	50	38	36	42	44	47	48	48	51	53	55	56	59.2	77
9-Sep	57	61	73	76	77	76	78	80	79	76	65	56	48	42	38	35	33	30	32	36	41	42	48	51	55.4	80
10-Sep	54	58	61	64	66	70	70	74	73	70	62	52	44	42	40	38	38	39	41	45	52	55	57	59	55.1	74
11-Sep	60	62	65	67	69	69	68	66	62	56	48	41	33	31	31	32	34	35	38	42	45	47	48	47	49.8	69
12-Sep	48	51	52	53	54	57	61	68	69	66	66	62	59	53	50	48	45	43	47	50	53	51	55	63	55.1	69
13-Sep	67	68	68	72	75	76	75	73	75	69	62	51	45	40	38	36	34	34	45	55	64	72	74	78	60.2	78
14-Sep	84	87	86	84	83	81	81	81	79	76	71	64	58	53	45	45	43	43	45	45	48	52	58	55	64.6	87
15-Sep	55	60	57	60	66	59	60	64	64	61	55	44	38	32	28	28	26	27	31	34	39	41	46	47	46.7	66
16-Sep	48	48	47	46	49	51	53	53	53	55	45	38	33	36	28	27	28	32	36	36	37	39	41	44	41.7	55
17-Sep	50	56	55	58	62	66	65	67	60	51	53	46	43	44	42	41	43	44	43	43	47	45	47	51	50.9	67
18-Sep	53	54	55	57	59	59	58	59	60	60	54	48	48	45	52	61	70	67	63	60	58	58	59	61	57.5	70
19-Sep	61	61	61	62	65	67	68	72	73	67	58	53	46	43	38	35	35	34	35	36	36	43	56	61	52.8	73
20-Sep	64	64	65	66	71	71	68	71	78	70	61	57	54	51	48	45	43	46	52	49	53	56	58	59	59.2	78
21-Sep	59	61	64	68	74	82	83	85	82	74	64	45	37	33	31	26	27	30	32	36	41	45	47	48	53.1	85
22-Sep	50	53	54	55	56	58	58	61	57	51	39	33	30	28	25	25	27	28	31	35	39	41	42	43	42.4	61
23-Sep	43	46	47	50	54	57	59	60	60	58	54	50	48	45	41	38	39	42	47	53	57	59	62	66	51.5	66
24-Sep	69	70	71	71	72	73	75	77	77	76	75	71	68	64	60	64	61	60	60	59	58	52	51	49	66.0	77
25-Sep	49	53	62	66	67	66	71	74	76	72	66	58	53	48	41	35	32	28	30	34	37	41	44	44	51.9	76
26-Sep	45	49	54	56	56	55	55	55	54	52	48	45	42	41	41	43	45	47	49	47	51	51	57	61	49.9	61
27-Sep	62	63	65	60	58	61	63	64	66	61	55	46	43	41	39	40	42	44	47	49	52	54	63	70	54.4	70
28-Sep	74	79	82	83	87	92	OR	OR	OR	OR	OR	91	90	94	94	93	93	88	91	90	90	92	93	90	88.8	94
29-Sep	86	91	92	92	91	89	90	88	84	85	94	85	78	74	72	69	70	72	74	78	81	85	86	84	82.8	94
30-Sep	74	78	82	83	83	85	80	80	79	78	79	78	80	78	74	68	65	61	64	68	68	67	64	65	74.3	85
																								Diurnal Average		
																								Diurnal Maximum		
61.2 64.1 66.3 67.6 69.3 70.6 70.2 72.0 71.6 67.2 62.0 57.4 52.6 49.1 46.3 45.1 44.4 44.7 46.6 48.8 51.3 53.1 55.7 58.7 86 91 92 92 92 94 95 100 99 86 94 95 92 94 94 93 93 88 91 90 90 92 93 90																										
OR - Out of Range																										





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	102	14.31	14.31
40 - 60	301	42.22	56.52
60 - 80	235	32.96	89.48
80 - 100	75	10.52	100.00

Total Number of Valid Hours: 713

Total Number of Hours: 720



Maximum Speed: 30 km/h on Sep 13 19:00	Maximum Daily Speed Average: 17.0 km/h on Sep 23	Hours in Service: 720
Minimum Speed Value: 0 km/h on Sep 30 01:00	Minimum Daily Speed Average: 2.1 km/h on Sep 8	Hours of Data: 720
Maximum Diurnal Speed Average: 7.1 km/h at hour 15	Minimum Diurnal Speed Average: 4.7 km/h at hour 19	Hours of Missing Data: 0
Monthly Average Velocity: 5.4 km/h 191.2 deg	Percentiles: $P_1 = 1$ $P_{10} = 5$ $Q_1 = 7$ Median = 10 $Q_3 = 14$ $P_{90} = 18$ $P_{99} = 26$	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-Sep	W10	WSW7	WSW11	WSW9	WSW12	WSW9	WSW11	WSW7	SW8	SW10	WSW14	WSW21	WSW22	SW24	SW25	SW25	SW29	SW25	WSW20	WSW15	WSW13	WSW12	WSW13	SW6	WSW14.7	SW29
2-Sep	S3	W6	SW7	W12	W15	WNW11	W11	WNW12	WNW12	W15	WSW9	WSW9	W15	WSW16	W22	WSW19	WSW18	WSW16	WSW10	WSW11	WSW11	WSW13	WSW12	WSW9	W11.8	W22
3-Sep	S5	S8	S7	SSE8	SSE10	SSE10	SSE9	SSE7	SSE6	SSE8	SSE10	SE6	SW2	SSE8	SSW9	WSW9	NNW6	NW3	W9	W9	WNW12	NW9	NNW14	WNW15	SSW3.8	WNW15
4-Sep	WNW16	W17	W15	W12	W17	WNW17	NW17	NW18	NW18	NW17	NW17	NW13	WNW17	WNW16	W15	W13	W10	W8	WSW5	SSW8	SW9	WSW9	SW7	SSW7	WNW11.6	NW18
5-Sep	SSW7	SSE7	SSE10	SSE11	SSE12	SSE11	SSE10	SSE6	SE7	SSE10	S11	SE11	SE12	SSE13	SSE12	SSE13	SSE12	SSE12	SSE10	SSE10	SSE9	S9	S6	SSE9.8	SSE13	
6-Sep	SSE6	ESE4	ESE5	E8	SE11	SE12	SE13	SSE9	SE10	SSE9	S7	SW5	SSW2	W2	N2	ESE1	SW7	WSW10	WSW8	SW8	SSW9	SW8	WSW8	W8	S4.4	SE13
7-Sep	W7	WSW11	WSW9	WSW6	WSW7	SW6	SSW5	SSW6	SSE7	SE6	SSE7	SE7	SE8	SE7	SE5	SE5	W3	SSW5	SSE6	S8	SSE4	S9	SW5	S4	S4.5	WSW11
8-Sep	SSE8	SSE7	SSE8	SSE9	SSE8	SSE9	SSE6	SSE8	SSE7	SE6	SSE10	SE7	NE2	W12	WNW7	N7	NNE9	NNE10	NNE8	NNE5	N4	N4	NNE2	SSW4	SE2.1	W12
9-Sep	WSW5	N4	NNW1	SE1	SSE2	SSW6	S5	SSE7	SSE10	SSE8	SSE9	SSE9	SSE10	S6	SE4	SSW3	SSE3	SE5	SE2	SE5	SE9	SSE9	SSE11	SSE10	SSE5.2	SSE11
10-Sep	SSE10	SSE10	SSE9	S9	SSE5	SSE5	S5	SSE7	SSE9	SSE10	SSE8	SSE8	SSE14	SSE13	SE13	SE16	SSE15	SE14	SE13	SE16	SE18	SE17	SE15	SE16	SSE11.4	SE18
11-Sep	SE18	SE17	SE14	SE13	SE13	SSE13	SSE13	SSE13	SSE13	SSE17	SSE19	SSE20	SSE28	SSE26	SSE25	S26	S23	S17	SSE14	SE14	SE12	SE12	SE10	SE10	SSE16.4	SSE28
12-Sep	SE9	SSE8	SSE8	SE10	SSE11	SSE10	SSE9	SSE11	SSE11	SSE8	SE9	SSE8	SSE6	SE5	SE5	SE5	SSW4	W10	WSW8	WSW9	SW10	SW9	SW7	SSW7	S6.4	SSE11
13-Sep	SSW7	S8	SSE7	SSE10	SSE10	SSE9	SSE8	SSE7	S6	S5	SW11	SW17	WSW23	WSW26	WSW25	WSW27	WSW23	WSW25	W30	WSW26	WSW16	WSW16	WSW17	WSW17	SW13.3	W30
14-Sep	W18	W18	W17	W14	W15	W16	W16	WNW15	WNW18	WNW18	WNW19	WNW17	WNW15	W11	WNW17	W23	WNW21	W17	W12	W11	W11	WSW9	W5	W9	W15.0	W23
15-Sep	SSW4	S7	SSE6	SSE8	SSE8	SSE10	SE10	SSE14	SSE10	SE9	SE14	SSE15	SSE15	S17	SE17	SSE17	SSE16	SSE16	SSE17	SSE18	SE18	SE14	SSE15	SSE12.3	SSE18	
16-Sep	SE13	SSE8	SE10	SE11	SSE11	SSE12	S6	SSE3	SSE4	S2	WSW4	W6	WSW7	SSE8	WSW14	WSW13	WSW11	SSW9	S12	SSW11	S9	S9	SSE9	SSE8	S6.8	WSW14
17-Sep	SE10	SE9	SSE9	SSE10	SSE7	SSE7	SSE8	SSE3	SE7	SE17	SE12	SSE11	S14	SSW12	SW14	SW11	SSW7	SW9	SW9	SSW8	SW6	SSW8	SSW9	SSW8	S8.0	SE17
18-Sep	SSE6	SSE9	SSE10	SSE11	SSE11	SSE10	SSE8	SSE8	SSE9	S5	W18	W21	WSW23	W20	WSW22	SW10	SSW11	S7	SSE10	S9	S9	SW6	S8	SSW6	SSW7.9	WSW23
19-Sep	SSE8	SSE10	SSE8	SSE11	SSE11	SSE11	SSE10	SSE11	SSE9	S9	S9	SSW11	SW11	SW10	WSW7	WSW9	WSW6	SW6	SSW7	SSW8	SW9	WSW7	WSW7	W8	SSW7.3	SSE11
20-Sep	WNW10	NW6	NE4	NNE6	N2	ENE1	E1	SE1	ESE1	N3	N8	N7	N7	N8	N8	NNE7	N6	N8	N10	N7	N3	SSW3	SW6	S5	N3.7	N10
21-Sep	SSE8	SSE8	SSE9	SSE11	SSE11	SSE11	SSE9	SSE10	SE10	SE9	SE12	SSW20	SSW25	SSW23	SSW22	SSW23	SSW20	SSW16	S12	S15	SSE16	SSE15	SSE15	S15	S13.2	SSW25
22-Sep	SSE14	SSE13	SSE13	SSE13	SSE11	SSE11	SSE12	SSE12	SSE16	SSE15	S18	S18	S16	S18	S20	S16	SSE18	SSE18	SSE14	SSE17	SSE19	SSE14	SSE14	SSE15	SSE14.9	S20
23-Sep	SSE12	SSE11	SE10	SE13	SE14	SE13	SE13	SE13	SE17	SE19	SE21	SE23	SSE26	SSE24	SSE25	SSE23	SSE20	SSE17	SE16	SE16	SE17	SE17	SE21	SSE17.0	SSE26	
24-Sep	SE22	SE22	SSE20	SSE20	SSE20	SSE18	SE15	SE12	SSE12	SSE14	SSE13	SSE11	SSW9	WSW13	WSW10	WSW8	SSW6	SSW6	S6	S8	SSW9	WSW10	SW9	SW9	S10.2	SE22
25-Sep	WSW9	WSW9	SSW8	S6	S8	S7	S7	SSE6	SSE6	SSE4	E5	S2	E4	ENE7	NE6	NE8	NE11	E12	ENE10	ENE7	ESE12	ESE13	SE10	SE12	SE4.4	ESE13
26-Sep	SE16	SE18	SE17	SE18	SE16	SE12	SE4	SE9	SE12	SE11	S11	S14	SSW13	SSW9	SSW8	SSW6	SW5	SSW3	SSE2	ESE10	W9	W8	S7	SW6	SSE7.9	SE18
27-Sep	W7	W7	W11	W13	SW4	SW2	WSW3	SSW5	SSW5	SW3	SSW3	W7	W15	W15	W15	WSW16	WSW18	WSW12	WSW9	WSW5	WSW5	W9	W7	W7	WSW8.0	WSW18
28-Sep	WNW6	NNE2	SW4	WSW5	W7	NW2	NNE5	ENE4	ENE3	NNE6	N9	N10	NNW10	NNW11	NNE13	NNE15	N14	NNE16	NNE14	NNE14	N14	N12	NNW13	NNW13	N7.7	NNE16
29-Sep	N14	NNW12	N10	N11	NNW8	NNW7	N5	NNW7	NNW8	NNW10	NNW13	NNW12	N13	NNW13	NNW9	N11	N11	N14	N11	N10	NNE10	N8	N9	N6	N9.8	N14
30-Sep	SSW0	W2	SW3	SSW3	SSW5	SW5	SW6	SSW5	SSW4	S5	S4	S5	SSE6	SSE6	SE5	SSE7	SSE7	SSE9	SSE8	SSE9	SSE10	SSE10	SSE10	SSE10	S5.3	SSE10
S4.9 S4.9 S5.5 S6.0 S6.2 S6.1 S5.0 S5.1 SSE5.3 SSE5.0 S5.1 SSW6.1 SSW6.8 SSW7.0 SW7.1 SW6.8 SSW6.1 SSW5.6 SSW4.7 S5.1 SSW5.2 SSW5.4 SSW5.2 SSW5.2																								Diurnal Average		
SE22 SE22 SSE20 SSE20 SSE20 SSE18 NW17 NW18 NW18WNW18 SE19 W21 SSE28 SSE26 SW25WSW27 SW29 SW25 W30WSW26 SSE19 SSE18 SE17 SE21																								Diurnal Maximum		

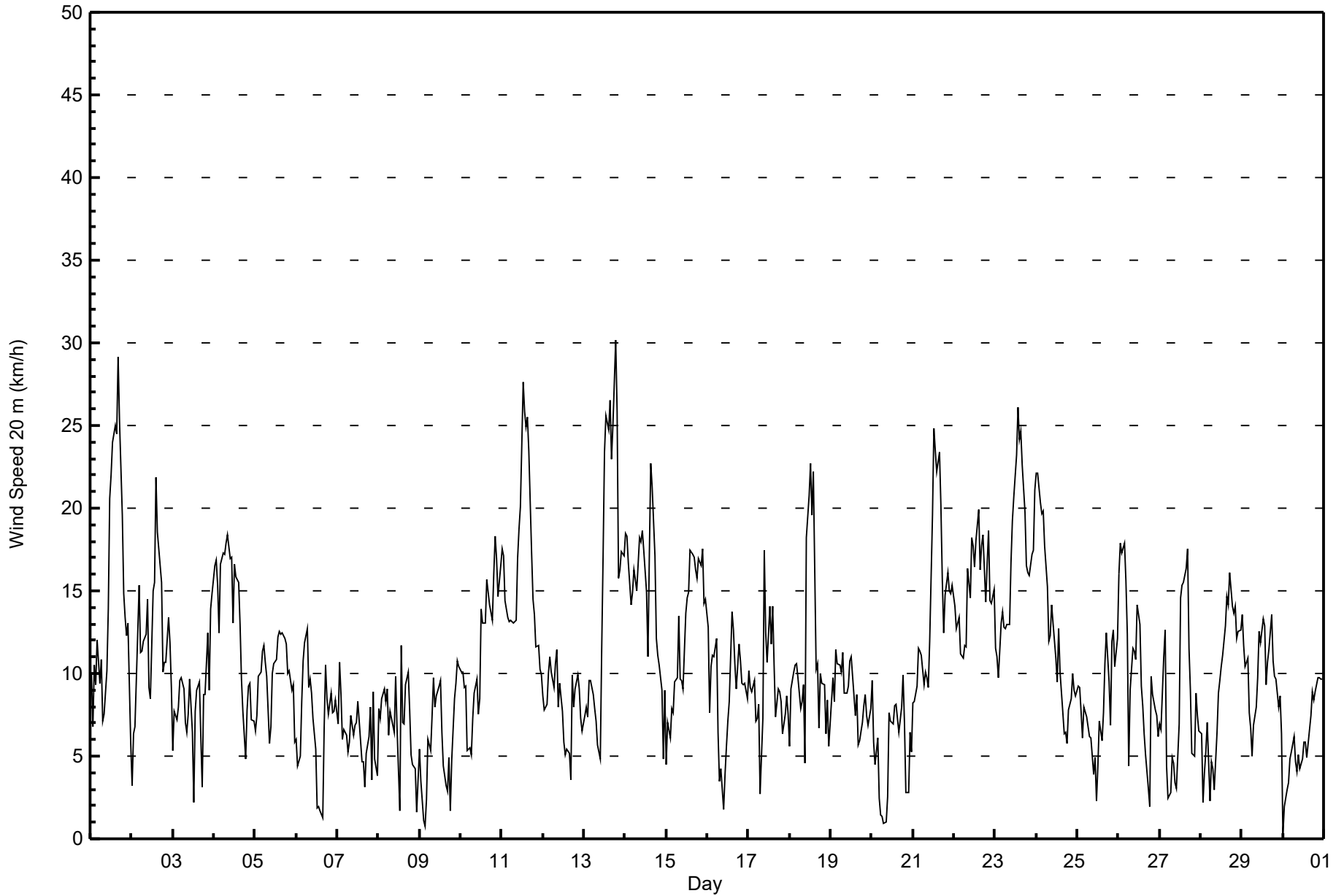
All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 10 km/h on Sep 21 14:00 Minimum Value: 1 km/h on Sep 20 03:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 3 Q ₃ = 4 P ₉₀ = 6 P ₉₉ = 9																	Hours in Service: 720 Hours of Data: 720 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-Sep	2	2	2	1	2	2	4	2	3	4	6	6	7	8	9	9	8	8	6	4	3	2	3	3	9
2-Sep	2	3	2	3	3	3	3	3	5	4	3	4	4	4	5	5	4	4	2	2	2	2	3	2	5
3-Sep	2	2	2	2	2	2	3	3	3	4	4	3	2	3	5	3	2	2	2	3	3	3	5	5	5
4-Sep	5	3	3	4	5	5	7	7	7	6	6	5	5	5	5	5	4	4	2	2	1	1	2	2	7
5-Sep	2	1	2	2	3	3	4	4	3	3	4	5	4	5	5	5	5	4	4	2	2	2	2	1	5
6-Sep	2	2	2	3	4	4	4	3	3	3	3	2	1	2	1	1	4	3	2	1	2	1	1	1	4
7-Sep	2	1	1	2	2	1	1	2	3	2	3	3	3	3	2	2	2	1	1	2	2	2	2	2	3
8-Sep	2	2	2	2	2	3	2	3	3	3	4	3	3	4	4	2	2	2	2	3	2	1	1	2	4
9-Sep	1	1	1	1	1	1	2	3	3	3	4	3	4	3	3	2	2	2	1	2	2	2	2	2	4
10-Sep	2	2	1	1	1	2	2	3	3	4	3	4	5	5	5	5	6	5	4	5	5	6	5	6	6
11-Sep	6	5	4	4	4	4	4	4	5	6	7	8	9	9	8	9	8	6	4	4	3	3	2	3	9
12-Sep	2	2	1	2	2	2	2	3	4	4	3	3	3	2	2	2	3	2	2	2	2	2	1	1	4
13-Sep	2	1	1	2	2	2	2	2	2	2	6	6	7	8	8	7	6	9	7	6	5	4	5	5	9
14-Sep	4	4	4	4	4	4	4	4	5	5	5	6	5	5	6	6	5	4	4	1	2	1	3	2	6
15-Sep	1	2	2	2	2	3	4	4	4	4	3	5	6	6	6	6	5	5	4	5	4	4	4	4	6
16-Sep	4	4	3	2	3	2	2	2	2	2	3	3	4	4	4	5	3	3	3	2	2	2	2	2	5
17-Sep	2	3	2	1	2	2	3	2	5	5	4	4	6	5	5	4	3	4	2	2	2	1	1	1	6
18-Sep	1	2	2	1	2	3	3	3	3	3	8	5	6	6	6	4	3	2	3	2	2	2	2	2	8
19-Sep	2	2	2	3	3	2	2	4	3	4	4	4	5	4	4	4	3	2	1	1	1	2	2	3	5
20-Sep	2	2	1	1	1	1	1	1	1	2	3	3	3	4	3	3	2	2	2	3	2	2	1	2	4
21-Sep	2	2	3	3	4	4	3	3	3	4	5	9	10	10	8	8	7	6	4	3	4	3	3	4	10
22-Sep	3	3	3	3	2	2	3	4	5	5	7	7	7	7	7	6	6	6	3	5	4	3	4	3	7
23-Sep	3	2	3	4	4	3	4	4	5	5	6	7	9	8	8	8	7	6	5	5	5	5	6	6	9
24-Sep	7	7	6	6	5	6	5	4	4	4	4	4	4	3	3	2	2	2	1	2	2	2	2	2	7
25-Sep	1	1	1	1	1	1	2	3	3	2	2	2	2	2	3	3	2	3	4	2	4	5	4	4	5
26-Sep	6	5	5	5	4	6	2	3	3	4	5	6	5	4	3	3	3	2	2	4	6	2	2	2	6
27-Sep	2	3	2	1	2	2	2	2	2	1	2	3	4	4	5	6	4	3	1	1	2	1	2	1	6
28-Sep	2	1	2	2	2	2	1	2	2	3	3	3	4	3	4	5	4	5	4	4	4	4	4	4	5
29-Sep	4	4	3	3	3	3	2	3	3	4	4	4	4	4	4	3	3	4	3	3	3	3	3	3	4
30-Sep	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	2
Diurnal Maximum																									





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	101	14.03	14.03
6 - 11	362	50.28	64.31
12 - 19	208	28.89	93.19
20 - 28	47	6.53	99.72
29 - 38	2	0.28	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed 20 m (WS20m) - km/h
Mannix - September 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	4	2	3	3	4	13	10	13	17	10	7	4	0	2	1	101
6 - 11	21	7	3	3	1	1	30	132	27	30	29	37	26	4	2	9	362
12 - 19	6	5	0	0	1	2	48	54	10	5	2	22	25	15	7	6	208
20 - 28	0	0	0	0	0	0	5	12	3	6	4	12	4	1	0	0	47
29 - 38	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	35	16	5	6	5	7	96	208	53	58	46	78	60	20	11	16	720

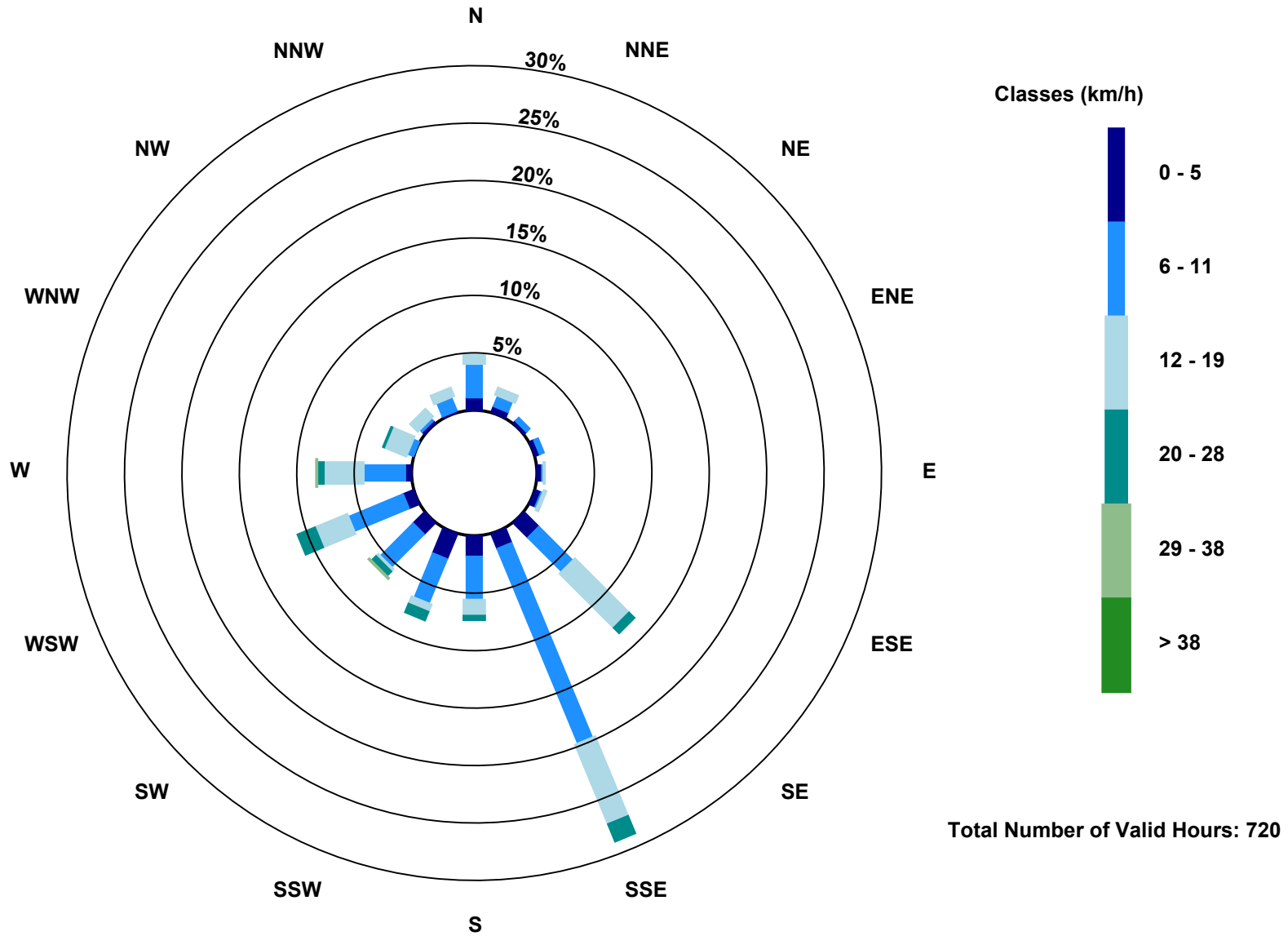
Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

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





Maximum Speed: 39 km/h on Sep 1 17:00	Maximum Daily Speed Average: 25.0 km/h on Sep 11	Hours in Service: 720
Minimum Speed Value: 0 km/h on Sep 30 01:00	Minimum Daily Speed Average: 4.4 km/h on Sep 8	Hours of Data: 719
Maximum Diurnal Speed Average: 10.0 km/h at hour 5	Minimum Diurnal Speed Average: 6.8 km/h at hour 10	Hours of Missing Data: 1
Monthly Average Velocity: 8.2 km/h 186.7 deg	Percentiles: P ₁ = 2 P ₁₀ = 7 Q ₁ = 11 Median = 16 Q ₃ = 20 P ₉₀ = 26 P ₉₉ = 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-Sep	W15	W11	W16	WSW13	WSW17	WSW15	WSW17	WSW10	SW9	SW13	SW18	WSW27	SW28	SW31	SW33	SW33	SW39	SW35	SW28	WSW22	WSW21	WSW21	WSW23	SW12	WSW20.8	SW39	
2-Sep	SW6	W12	SW12	W20	W21	W17	W17	W18	NNW18	W18	WSW12	WSW10	WSW19	WSW18	WSW26	WSW24	WSW24	WSW21	WSW17	WSW17	WSW18	WSW21	WSW19	WSW17	WSW17.0	WSW26	
3-Sep	SW8	SSW11	S10	SSE11	S15	SSE17	SSE16	SSE13	SSE11	SSE11	SSE16	SE10	WSW4	SSE12	SSW14	WSW12	NNW9	NW5	W15	W14	NNW20	NW16	NNW23	NNW24	SW6.2	NNW24	
4-Sep	NNW25	W22	W21	W18	W22	NNW24	NW28	NW29	NW28	NNW26	NNW24	NNW20	NNW23	NNW22	W18	W16	W13	W10	WSW6	SW13	SW16	WSW17	SW14	SW13	NNW17.0	NW29	
5-Sep	SW12	S11	SSE16	SSE17	SSE20	SSE20	SSE19	SSE14	SSE8	SE9	SE14	SSE15	SE14	SE17	SSE18	SSE18	SSE18	SSE18	SSE18	SSE17	SE17	SSE16	SSE18	S10	SSE15.0	SSE20	
6-Sep	SSE11	ESE6	ESE6	E11	SE15	SE16	SE18	SE13	UO	SE12	S11	SSW7	SSW2	WSW3	NNW2	SE1	SW9	WSW15	SW14	SW14	SW15	SW15	WSW13	W15	S6.2	SE18	
7-Sep	W13	WSW17	WSW15	WSW11	WSW10	WSW10	SW8	SSW9	SSE10	SE8	SE8	SE9	SE10	SE9	ESE5	SE6	W4	S8	SSE9	S14	S9	S9	SSW11	SW7	SSW6.4	WSW17	
8-Sep	S10	SSE16	SSE17	SSE19	SSE17	SSE18	SSE13	SSE11	SSE9	SE9	SE13	SE9	NW1	W14	NNW10	N11	NNE12	NNE14	NNE13	NNE10	NNE7	NNE6	ENE3	SSE6	SE4.4	SSE19	
9-Sep	SSE7	NE1	NNE4	ENE2	SSE7	S13	SSE13	SSE12	SSE13	SE11	SSE12	SSE12	SSE13	SSE9	SE6	SSW4	SSE4	SE6	SE3	SE8	SE14	SE17	SE18	SSE18	SSE8.9	SSE18	
10-Sep	SE19	SE17	SE16	SE16	SSE12	SSE13	SSE10	SSE12	SE13	SE13	SE11	SE12	SE19	SE18	SE18	SE21	SE21	SE21	SE20	SE25	SE27	SE26	SE23	SE26	SE17.8	SE27	
11-Sep	SE27	SE26	SE23	SE22	SE22	SE22	SSE21	SE21	SE20	SSE23	SSE26	SSE29	SSE38	SSE37	SSE34	SSE36	SSE34	S27	SSE23	SE22	SE19	SE20	SE18	SE19	SSE25.0	SSE38	
12-Sep	SE16	SE14	SSE15	SE18	SSE22	SSE19	SSE18	SSE18	SSE17	SSE11	SE12	SSE11	SSE8	SE6	SE7	SE7	SSW5	W13	WSW12	WSW15	SW17	SW17	SW14	SW11	S10.3	SSE22	
13-Sep	SSW10	SSW10	S8	SSE12	SSE15	SSE14	S13	S12	S8	SSW8	SW16	SW23	SW30	WSW32	WSW30	WSW34	WSW30	WSW32	WSW36	WSW33	WSW21	WSW22	WSW23	WSW22	SW18.3	WSW36	
14-Sep	W22	W23	W21	W19	W19	W21	W21	W20	W24	W24	NNW26	W24	NNW19	W14	NNW23	W28	W27	W22	W17	NNW18	W17	W14	W10	W13	W20.2	W28	
15-Sep	WSW5	S10	SSE13	SSE16	SSE14	SE16	SE17	SSE21	SSE15	SE14	SE13	SE19	SE20	SE21	S25	SSE24	SSE24	SSE26	SSE26	SSE28	SSE28	SSE28	SE24	SE25	SSE19.2	SSE28	
16-Sep	SE22	SE15	SE18	SE20	SSE21	SSE22	S14	SSW10	SSE6	S2	WSW5	WSW7	SW9	SSE12	WSW17	WSW16	WSW13	S16	S23	SSW20	S17	S18	SSE19	SSE15	S12.3	S23	
17-Sep	SE19	SE19	SE17	SE18	SSE14	SSE16	SE15	SE8	SE13	SE25	SE17	SSE14	SSE21	SSW17	SW19	SSW14	SSW13	SW14	SW16	SW16	SW12	SW14	SSW15	SW12	S12.8	SE25	
18-Sep	SSW7	S8	S13	SSE16	SSE18	SSE18	SSE14	SSE14	SSE15	S6	W22	WSW25	WSW27	WSW23	WSW28	SW18	SSW17	S11	SSE17	S18	S20	SW13	SSW14	SSW13	SSW12.7	WSW28	
19-Sep	S12	S15	S12	SSE20	S20	SSE19	SSE18	SSE17	SSE12	S13	S13	SSW15	SSW15	SW13	SW10	WSW10	SW7	SW9	SSW12	SSW13	SW14	WSW12	NNW9	NNW12	SSW10.9	SSE20	
20-Sep	NW13	NW12	N7	NNW11	NNW7	NNW5	NNW5	NNW2	W1	NNW4	N10	N10	N9	N11	N11	N10	N9	N12	N14	N13	N6	SE3	SSW10	S11	NNW6.3	N14	
21-Sep	SSE16	SSE16	SSE17	SSE19	SE19	SSE19	SSE16	SSE16	SE14	SE14	SE17	SSW31	SSW38	SSW37	SSW34	SSW35	SSW32	SSW26	S23	SSE25	SSE26	SSE24	SSE24	SSE25	S21.8	SSW38	
22-Sep	SSE24	SSE22	SSE22	SSE23	SSE19	SSE19	SSE21	SSE18	SSE22	SSE21	S29	S29	S26	S25	S29	S25	SSE25	SSE28	SSE24	SSE28	SSE30	SSE23	SE23	SSE25	SSE23.7	SSE30	
23-Sep	SE20	SSE19	SE18	SE23	SE24	SE22	SE21	SE20	SE19	SE22	SE25	SE27	SE32	SSE35	SSE33	SSE33	SSE31	SSE28	SE24	SE24	SE23	SE24	SE24	SE29	SE24.9	SSE35	
24-Sep	SE31	SE31	SE30	SE28	SSE28	SE26	SE23	SE17	SE17	SSE19	SSE15	S15	WSW16	WSW13	SW10	SSW9	S12	S12	S16	SSW17	WSW17	SW15	SW16	SSE15.0	SE31		
25-Sep	SW17	WSW18	SSW13	SSW8	SSW9	SSW13	SSW12	S9	S8	SSE5	E4	SSE2	ENE4	ENE8	NE7	NNE10	NE13	E16	ENE14	E10	E15	ESE15	SE14	SE16	SE4.7	WSW18	
26-Sep	ESE20	SE22	SE25	SE26	SE24	SE19	SE9	SE15	SE18	SE16	S16	S21	S18	S14	SSW13	SSW11	SW9	SSW5	SSE2	E14	WSW12	W12	S10	SW9	SSE11.5	SE26	
27-Sep	W8	NNW7	W17	W18	WSW9	W7	W8	SW8	SSW6	SW4	S4	WSW8	W17	W19	WSW19	WSW20	SW23	SW17	WSW15	SW10	W9	W14	NNW11	NNW10	WSW11.1	SW23	
28-Sep	NNW10	N4	SSW4	W8	NNW13	NW6	NNE7	NE7	NE5	N9	NNW12	N13	NNW14	NNW15	NNE17	N19	N19	N22	N19	N19	N19	N17	NNW18	NNW18	N11.4	NNE22	
29-Sep	NNW20	NNW17	N16	N16	NNW13	NNW11	NNW7	NNW10	NW12	NNW14	NNW18	NNW17	NNW17	NNW17	NNW17	NNW13	NNW14	N15	N18	N14	N13	N13	N11	N11	N8	NNW13.7	NNW20
30-Sep	ESE0	WSW2	SW3	SSW4	SSW7	SW8	SW10	SSW8	SSW7	S7	S6	S7	SSE7	SSE7	SE6	SE8	SSE9	SSE12	SSE14	SSE15	SSE16	SSE17	SSE16	SSE15	SSE7.8	SSE17	

S7.1	S7.2	S8.4	SSE9.1	S10.0	S10.0	S8.5	SSE7.9	SSE7.3	SSE6.8	S7.3	SSW8.5	SSW9.6	SSW9.5	SSW9.7	SSW9.4	SSW8.6	SSW8.5	SSW7.8	S8.5	S8.5	SSW8.4	SSW8.4	SSW8.2	Diurnal Average
SE31	SE31	SE30	SE28	SSE28	SE26	NW28	NW29	NW28	NW26	S29	SSW31	SSE38	SSW37	SSE34	SSE36	SW39	SW35	WSW36	WSW33	SSE30	SSE28	SE24	SE29	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

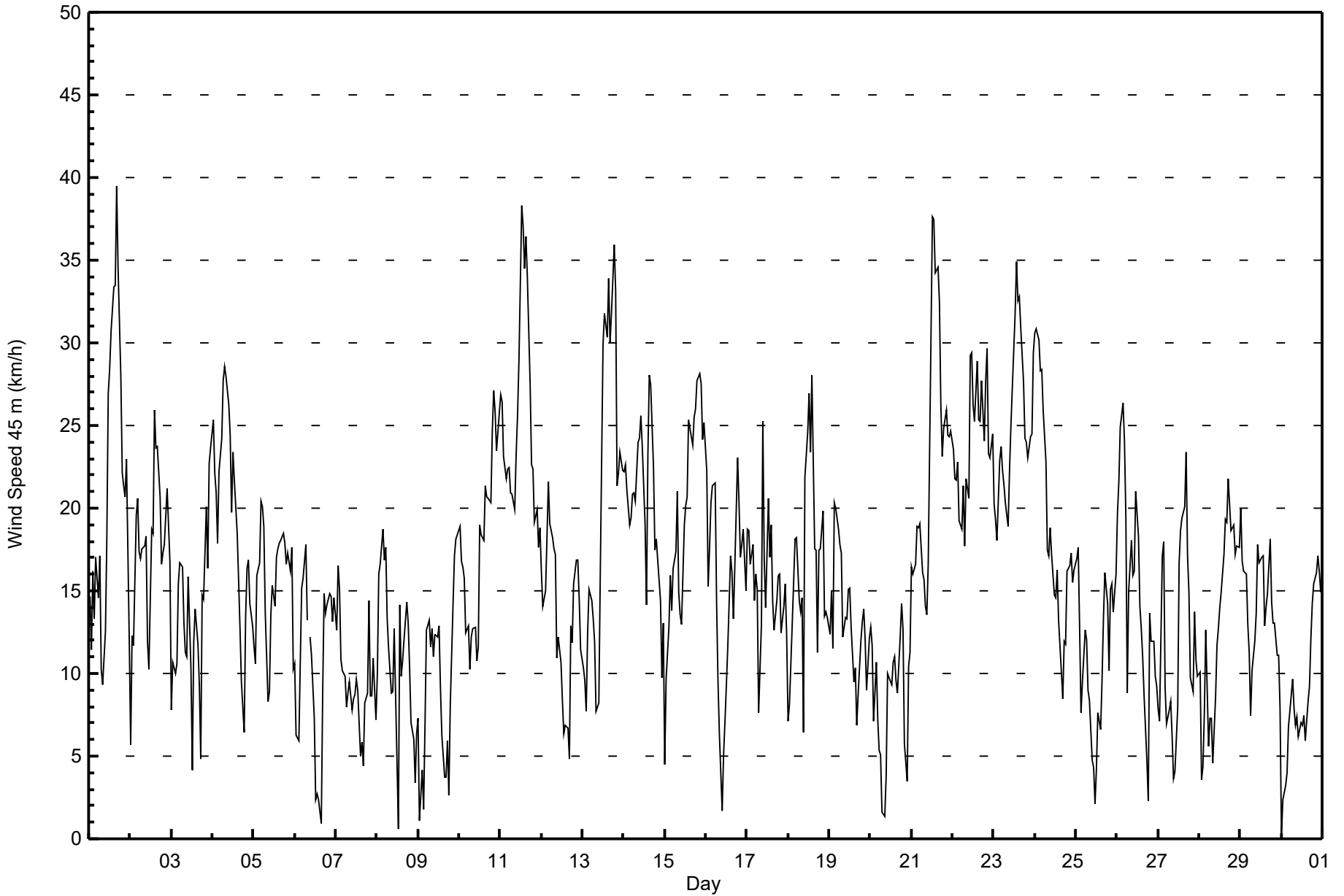
Wind Speed 45 m (WS45m) - km/h
Mannix - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 10 km/h on Sep 21 12:00	Hours in Service: 720 Hours of Data: 719 Hours of Missing Data: 1 Hours of Calibration: 0 Percent Operational Time: 99.9
Minimum Value: 1 km/h on Sep 30 05:00	
Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 3 Q ₃ = 4 P ₉₀ = 5 P ₉₉ = 8	

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

Diurnal Maximum

UO - Unstable Operation





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	41	5.70	5.70
6 - 11	157	21.84	27.54
12 - 19	325	45.20	72.74
20 - 28	157	21.84	94.58
29 - 38	38	5.29	99.86
> 38	1	0.14	100.00

Total Number of Valid Hours: 719

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Wind Speed 45 m (WS45m) - km/h
Mannix - September 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	2	3	1	2	3	4	2	6	2	5	2	0	2	5	41
6 - 11	14	5	2	1	2	2	22	21	21	18	18	10	8	4	3	6	157
12 - 19	17	4	1	1	3	1	57	85	23	17	32	31	30	6	3	14	325
20 - 28	0	1	0	0	0	1	46	41	10	2	4	19	17	10	5	1	157
29 - 38	0	0	0	0	0	0	5	11	3	6	5	7	0	0	1	0	38
> 38	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Totals	32	11	5	5	6	6	133	162	59	49	62	72	57	20	14	26	719

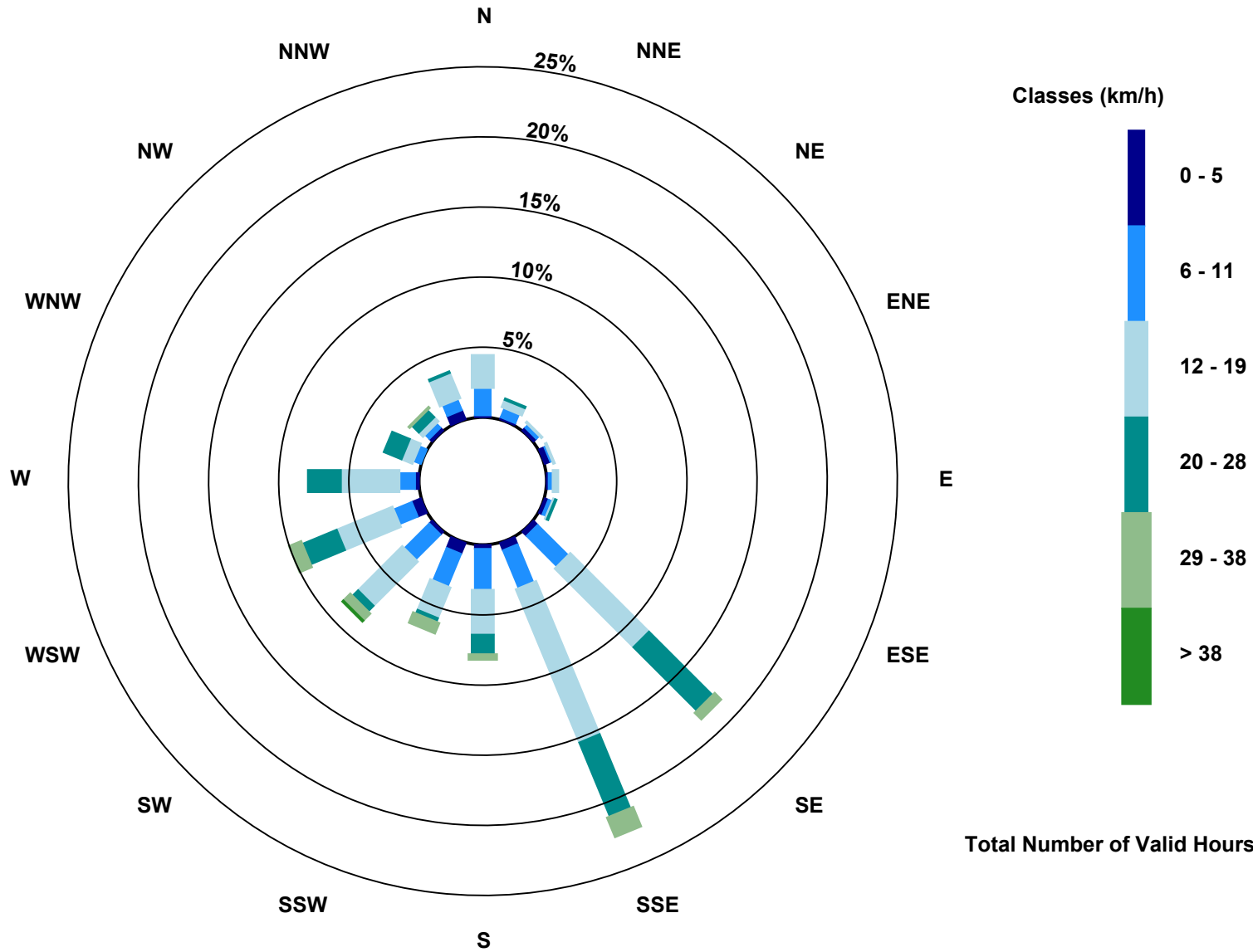
Total Number of Valid Hours: 719

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

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





Maximum Speed: 43 km/h on Sep 1 17:00	Maximum Daily Speed Average: 30.0 km/h on Sep 11	Hours in Service: 720
Minimum Speed Value: 1 km/h on Sep 30 01:00	Minimum Daily Speed Average: 3.8 km/h on Sep 8	Hours of Data: 720
Maximum Diurnal Speed Average: 10.6 km/h at hour 21	Minimum Diurnal Speed Average: 7.3 km/h at hour 10	Hours of Missing Data: 0
Monthly Average Velocity: 9.3 km/h 194.6 deg	Percentiles: P ₁ = 2 P ₁₀ = 8 Q ₁ = 12 Median = 17 Q ₃ = 24 P ₉₀ = 30 P ₉₉ = 39	Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Sep	W18	W15	W19	W17	WSW21	WSW20	WSW23	WSW13	SW10	SW13	SW20	WSW29	WSW31	SW33	SW36	SW37	SW43	SW38	SW32	WSW28	WSW29	WSW29	WSW31	SW20	WSW24.4	SW43
2-Sep	WSW11	W17	WSW17	W26	W25	W22	W21	NNW21	NNW21	W21	WSW14	WSW11	WSW20	WSW20	WSW28	WSW26	WSW27	WSW24	WSW23	WSW25	WSW26	WSW28	WSW26	WSW22	W21.2	WSW28
3-Sep	WSW12	SW12	SW11	SSW8	SSW10	S13	S17	SSE17	SSE15	SSE15	SSE20	SSE13	W7	S13	SSW15	WSW12	NNW10	NW5	W16	W18	NNW24	NW19	NW25	NNW27	SW7.8	NNW27
4-Sep	NNW29	W26	W25	W22	W25	NNW26	NW30	NW31	NW30	NW28	NW25	NNW25	NNW22	W19	W17	W13	W10	WSW8	SW14	WSW22	WSW23	WSW24	WSW20	NNW19.6	NW31	
5-Sep	WSW17	SSW11	SSW14	S13	SSE17	SSE18	SSE21	SSE16	SSE9	SE8	SSE13	S17	SE13	SE17	SSE18	SSE19	SSE19	SSE21	SSE22	SSE21	SSE23	SSE22	SSE22	S13	SSE15.8	SSE23
6-Sep	SSE12	ESE7	ESE5	ESE9	SE11	SE11	SE15	SE16	SE14	SE13	S13	SSW7	SW3	WSW3	N2	SSW1	SW10	WSW17	WSW16	WSW17	WSW19	WSW20	W19	SSW6.7	WSW20	
7-Sep	W18	WSW21	W20	WSW15	W15	WSW14	WSW12	SW10	S9	SE7	SE8	SE8	SE9	SE8	SE4	SE6	W5	SSW7	S8	SSW15	SSW10	SSW6	SW9	WSW7	SW7.3	WSW21
8-Sep	SSW8	S9	S10	SSE13	SSE19	SSE21	SSE17	SSE12	SSE10	SSE9	SE13	SE9	WSW1	W14	NNW10	N12	NNE13	NNE17	NNE17	NNE15	NNE9	ENE7	SE4	SSE10	SE3.8	SSE21
9-Sep	SSE10	ESE3	ENE3	NE1	SE6	SSE15	SSE16	SSE17	SE15	SSE11	SSE12	SSE12	SSE13	SSE10	SE7	SSW4	SSE4	SE6	SE3	SE8	SE13	SE21	SE22	SE25	SSE10.5	SE25
10-Sep	SSE25	SE21	SE21	SE20	SE11	SE11	SE11	SE14	SE13	SE13	SE11	SE12	SSE19	SSE19	SE18	SE22	SE22	SE23	SE25	SE29	SE31	SE31	SE30	SE32	SE20.1	SE32
11-Sep	SE33	SE33	SE30	SE29	SE29	SSE30	SSE28	SSE28	SSE24	SSE25	SSE28	SSE32	SSE41	SSE41	SSE36	SSE40	SSE37	S32	SSE28	SE29	SE25	SE25	SE23	SSE24	SSE30.0	SSE41
12-Sep	SSE22	SSE20	SSE20	SSE23	SSE26	SSE25	SSE27	SSE23	SSE20	SSE12	SE12	SSE11	SSE9	SE6	SE6	SE7	SSW5	W15	WSW16	WSW21	WSW22	SW24	SW20	SW14	S13.1	SSE27
13-Sep	SW12	SW11	SW8	S9	S11	SSW13	SW14	SSW13	SSW11	SW11	SW17	SW24	SW32	WSW34	WSW33	WSW37	WSW34	WSW35	W39	WSW37	WSW25	WSW26	WSW27	WSW25	WSW21.5	W39
14-Sep	W24	W24	W23	NNW21	W22	W23	W23	NNW22	NNW25	NNW25	NNW26	NNW25	NNW20	W15	NNW24	W29	W29	W24	W22	NNW24	NNW23	NNW18	W14	NNW16	NNW22.4	W29
15-Sep	NNW6	SSW9	S16	S15	SSE14	SSE18	SSE25	SSE28	SSE18	SSE15	SSE14	SSE20	SSE21	SSE22	S27	SSE26	SSE30	SSE32	SSE36	SSE36	SSE35	SSE32	SSE34	SSE22.5	SSE36	
16-Sep	SE30	SE23	SE22	SSE24	S24	S19	SSW12	SW11	SSW9	SSW3	WSW5	WSW7	SW10	S12	WSW18	WSW17	WSW14	SSW20	SSW28	SSW26	SSW23	SSW19	S18	S13	S14.4	SE30
17-Sep	SSE19	SSE22	SSE17	SE18	SSE17	SE10	SE14	ESE8	SE12	SE24	SE17	SSE15	SSE22	SSW18	SW20	SSW15	SSW15	SW17	SW19	SW20	WSW18	SW17	SW19	WSW18	S13.2	SE24
18-Sep	WSW10	SW9	SSW12	S11	SSE11	SSE14	SSE12	S11	S11	SW10	W23	WSW26	WSW28	WSW25	WSW31	SW22	SSW23	SSW14	S18	S23	SSW26	SW20	SW17	SW19	SW15.0	WSW31
19-Sep	SSW14	SSW16	SW13	S18	SSW19	S17	SSW16	S19	S14	S15	S14	SSW16	SSW17	SW13	SW11	WSW11	WSW7	SW9	SSW13	SW15	SW20	W16	NW13	NW16	SSW11.9	SW20
20-Sep	NW16	NNW16	NNW13	NNW14	NNW11	NNW10	NNW10	NW7	WNN5	NNW5	N11	N11	N10	N11	N11	NNE11	N9	N14	N17	N16	N7	E3	S10	S14	NNW8.3	N17
21-Sep	S20	S20	SSE18	SSE22	SSE25	SSE25	SSE22	SSE20	SSE17	SSE16	SSE18	SSW34	SSW42	SSW42	SSW38	SSW39	SSW36	SSW31	S29	S32	S33	SSE30	S30	S31	S26.7	SSW42
22-Sep	S29	S28	S27	S27	S24	S22	S24	SSE22	SSE24	SSE23	S32	S32	S29	S27	S31	S28	SSE28	SSE32	SSE30	SSE35	SSE37	SSE31	SSE30	SSE32	SSE27.9	SSE37
23-Sep	SSE28	SSE26	SE28	SE32	SE31	SE29	SE26	SE23	SE24	SE25	SE29	SE34	SSE38	SSE35	SSE36	SSE34	SSE31	SSE29	SE29	SE28	SE29	SE27	SE33	SE29.6	SSE38	
24-Sep	SE34	SE35	SSE37	SE34	SSE33	SSE32	SE27	SE22	SSE20	SSE20	SSE18	SSE16	S16	WSW17	WSW14	WSW11	SSW9	S13	S15	S21	SW20	WSW23	WSW20	SW23	S17.3	SSE37
25-Sep	WSW27	WSW25	W15	WSW11	SW11	SW16	SW14	SSW11	S9	S5	ESE3	SE2	ENE4	ENE7	NE7	NNE10	NE14	E16	E19	E12	ESE14	ESE14	ESE12	ESE12	SSE3.9	WSW27
26-Sep	ESE15	SE17	SE27	SE30	SE27	SE24	SE11	SE17	SE23	SSE19	S18	S23	S19	S15	S14	SSW13	SW11	SW7	S2	E13	WSW13	W14	SSW10	SW9	SSE12.5	SE30
27-Sep	NNW9	NNW6	NNW17	NNW20	W14	W15	W14	WSW11	SW7	SW3	SSW4	WSW8	W17	W19	WSW20	WSW22	SW25	SW21	WSW19	WSW14	W13	W17	NW10	NW10	W12.6	SW25
28-Sep	NNW12	NNW5	SSW1	NNW8	NW12	NNW9	N10	NNE12	NNE8	N10	N13	N14	NNW15	N16	NNE19	NNE21	N21	NNE25	N21	N22	N21	N21	NNW21	NNW20	N13.9	NNE25
29-Sep	N23	N19	N19	N19	NNW17	NNW14	NNW9	NNW12	NW13	NNW15	NNW20	NNW19	N18	NNW18	NNW14	NNW15	N16	N20	N15	N14	N15	N12	N12	NNE8	N15.4	N23
30-Sep	E1	W2	SW4	SSW4	SSW7	SW8	WSW9	SW5	SW7	SSW7	S7	S7	S7	SSE7	SE6	SE8	SSE10	SSE14	SSE17	SSE18	SSE19	SSE22	SSE22	SSE20	SSE8.8	SSE22

SSW8.1	SSW8.0	S9.3	S9.3	S10.0	S10.1	S9.3	S8.8	S8.2	S7.3	S8.0	SSW9.8	SSW10.6	SSW10.6	SSW10.6	SSW10.5	SSW9.8	SSW9.8	SSW9.6	SSW10.5	SSW10.6	SSW10.6	SSW10.6	SSW10.6	SSW10.6	SSW10.6	Diurnal Average
SE34	SE35	SSE37	SE34	SSE33	SSE32	NW30	NW31	NW30	NW28	S32	SSW34	SSW42	SSW42	SSW38	SSE40	SW43	SW38	W39	WSW37	SSE37	SSE35	SSE32	SSE34	Diurnal Maximum		

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



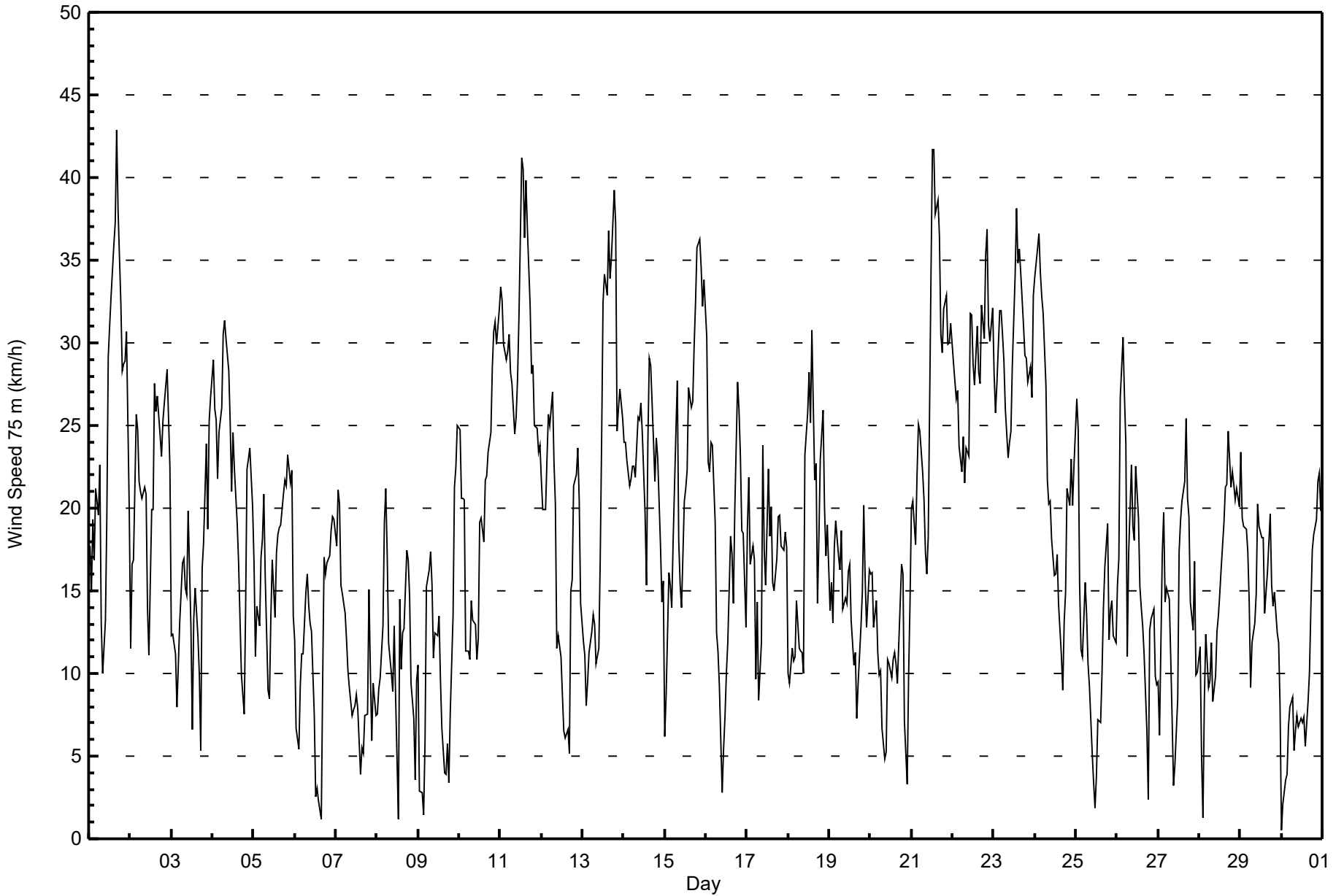
Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Speed 75 m (WS75m) - km/h

Mannix - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 10 km/h on Sep 21 12:00 Minimum Value: 1 km/h on Sep 30 03:00 Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 2 Median = 3 Q ₃ = 4 P ₉₀ = 5 P ₉₉ = 8																	Hours in Service: 720 Hours of Data: 720 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-Sep	2	2	2	2	2	2	4	4	2	4	6	5	6	6	8	8	7	6	5	3	3	3	2	7	8
2-Sep	3	3	3	3	3	3	2	3	5	4	3	4	5	4	4	4	4	4	2	1	2	2	4	3	5
3-Sep	4	2	3	2	2	2	3	4	4	5	5	5	3	3	5	3	2	2	2	3	3	4	4	5	5
4-Sep	5	2	3	3	4	4	5	5	5	4	5	4	4	4	4	3	4	3	2	2	2	1	2	4	5
5-Sep	4	1	2	2	3	5	3	3	2	3	4	4	5	5	5	5	4	3	3	2	1	2	2	3	5
6-Sep	4	3	2	3	5	5	5	3	4	2	2	2	1	2	2	1	4	3	1	2	1	2	2	2	5
7-Sep	2	2	1	2	2	2	1	2	2	2	3	3	3	3	2	3	3	2	2	3	6	2	2	1	6
8-Sep	2	2	3	3	2	2	2	2	1	2	3	4	3	3	4	2	2	2	1	2	2	2	2	2	4
9-Sep	1	2	2	1	3	2	2	3	4	2	3	3	3	3	3	2	2	2	2	3	5	2	2	1	5
10-Sep	1	2	1	2	2	2	3	2	4	4	3	4	5	5	5	5	5	5	5	5	5	5	3	4	5
11-Sep	4	4	3	3	3	3	3	4	4	5	5	8	7	8	6	7	6	6	3	3	2	2	2	2	8
12-Sep	2	2	2	2	1	2	2	3	2	4	2	2	3	2	2	2	4	2	3	3	2	1	2	2	4
13-Sep	2	2	1	1	2	2	2	1	2	3	5	5	6	7	8	5	6	8	6	5	5	4	4	3	8
14-Sep	3	3	3	3	3	3	3	3	4	4	4	4	4	6	5	4	4	3	2	2	2	1	2	3	6
15-Sep	3	3	2	3	3	4	2	3	4	3	2	3	4	5	5	4	5	3	4	3	4	3	3	3	5
16-Sep	3	7	3	1	2	4	2	2	2	2	3	3	3	5	4	4	3	4	2	1	3	3	2	3	7
17-Sep	5	3	2	2	2	4	4	4	6	6	5	4	4	5	4	3	2	3	2	2	2	2	2	2	6
18-Sep	2	2	1	2	2	3	4	2	3	4	7	5	7	7	6	3	3	3	4	2	2	3	2	3	7
19-Sep	2	2	3	3	1	2	1	2	2	3	3	4	4	4	4	3	3	2	1	2	1	2	3	1	4
20-Sep	2	2	2	1	2	1	2	1	2	2	3	3	2	3	3	2	3	2	3	5	2	2	2	3	5
21-Sep	1	2	3	1	3	3	1	3	2	3	3	10	8	8	7	7	7	5	3	2	3	3	3	3	10
22-Sep	3	3	2	2	4	2	2	2	3	4	5	5	5	6	5	5	5	4	3	5	4	3	3	3	6
23-Sep	2	2	3	2	2	2	2	4	5	5	7	7	8	6	7	7	6	6	4	5	5	6	7	7	8
24-Sep	6	7	5	5	4	5	4	3	3	4	3	3	3	3	2	2	1	2	1	1	2	2	2	2	7
25-Sep	2	3	2	4	2	2	1	2	2	3	2	2	2	3	3	2	2	5	5	4	5	5	5	5	5
26-Sep	7	7	6	5	6	8	4	2	2	3	4	4	5	3	3	3	4	2	2	5	5	2	1	2	8
27-Sep	2	2	5	2	4	5	5	2	4	2	2	3	3	4	5	6	3	2	2	1	2	2	2	1	6
28-Sep	1	2	1	2	1	3	1	2	4	2	2	2	3	3	3	5	4	4	4	3	4	3	4	4	5
29-Sep	4	5	4	3	3	3	2	2	2	3	4	3	3	4	3	3	3	3	3	3	3	3	2	3	5
30-Sep	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	2
Diurnal Maximum																									





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	36	5.00	5.00
6 - 11	137	19.03	24.03
12 - 19	241	33.47	57.50
20 - 28	206	28.61	86.11
29 - 38	92	12.78	98.89
> 38	8	1.11	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Wind Speed 75 m (WS75m) - km/h
Mannix - September 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	0	1	2	2	3	4	1	2	7	4	3	2	1	1	2	36
6 - 11	9	5	1	2	0	3	24	13	13	17	21	14	1	3	4	7	137
12 - 19	17	6	1	0	4	5	21	47	27	21	19	25	26	3	6	13	241
20 - 28	7	2	0	0	0	0	28	53	15	6	14	37	19	18	4	3	206
29 - 38	0	0	0	0	0	0	25	29	10	4	6	12	2	1	3	0	92
> 38	0	0	0	0	0	0	0	3	0	3	1	0	1	0	0	0	8
Totals	34	13	3	4	6	11	102	146	67	58	65	91	51	26	18	25	720

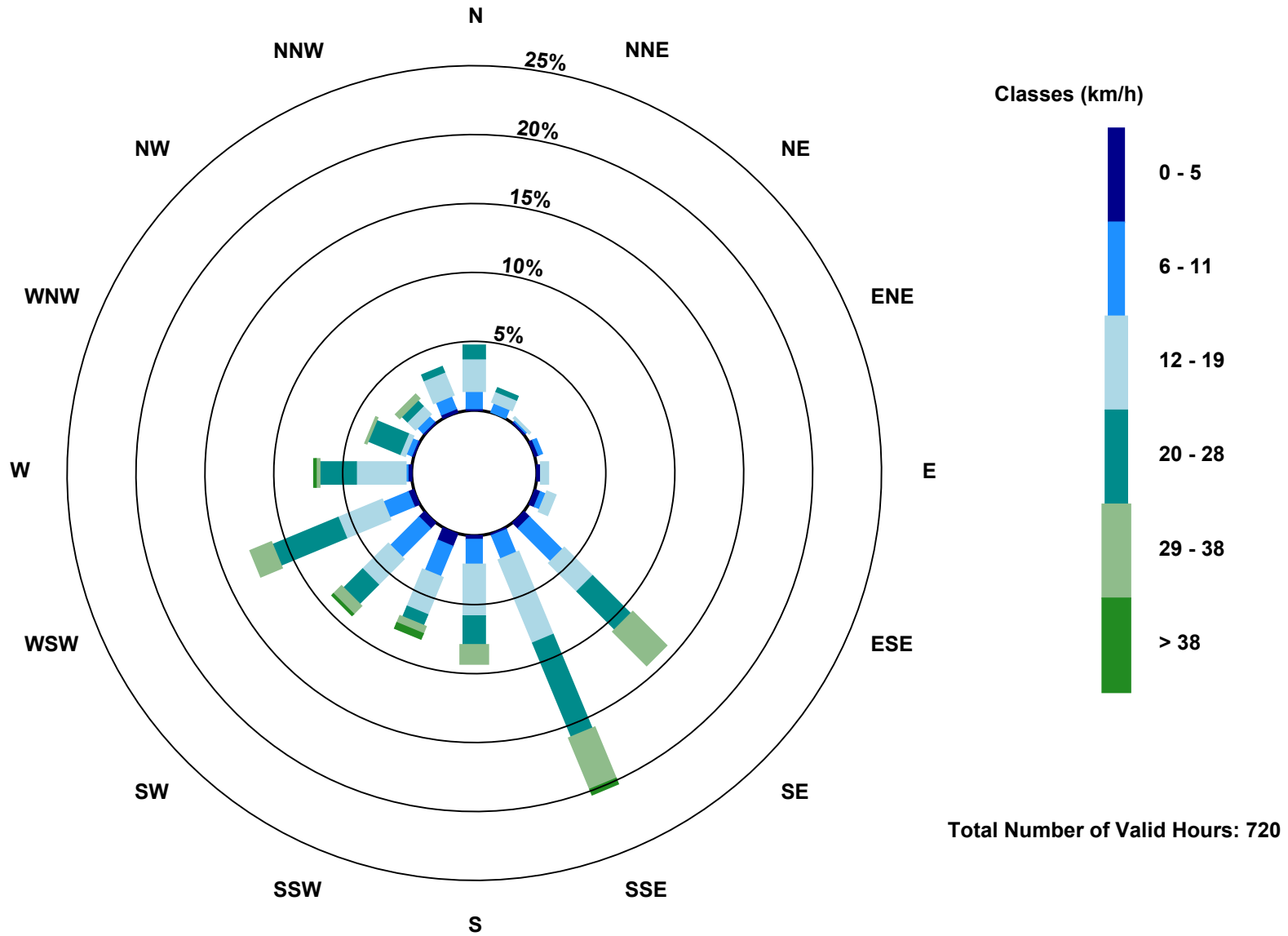
Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

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





Maximum Speed: 44 km/h on Sep 1 17:00	Maximum Daily Speed Average: 31.0 km/h on Sep 11	Hours in Service: 720
Minimum Speed Value: 0 km/h on Sep 30 01:00	Minimum Daily Speed Average: 2.6 km/h on Sep 8	Hours of Data: 720
Maximum Diurnal Speed Average: 11.1 km/h at hour 21	Minimum Diurnal Speed Average: 7.2 km/h at hour 10	Hours of Missing Data: 0
Monthly Average Velocity: 9.3 km/h 199.0 deg	Percentiles: P ₁ = 2 P ₁₀ = 8 Q ₁ = 12 Median = 18 Q ₃ = 25 P ₉₀ = 32 P ₉₉ = 39	Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																
1-Sep	W19WNNW17	W21	W18	W23	W21WSW25WSW14	SW10	SW13	SW20WSW29WSW31	SW33	SW37	SW38	SW44	SW39	SW34WSW31WSW32WSW33WSW34WSW24	WSW25.7	SW44																								
2-Sep	WSW15	W18WSW19	W29	W27	W24	W23WNNW22WNNW23	W22WSW15WSW12WSW20WSW20WSW28WSW26WSW27WSW25WSW25WSW28WSW30WSW31WSW28	W25	W23.0	WSW31																														
3-Sep	WSW15WSW14	SW13	SW8	SW9	SSW11	S13	SSE15	S16	SSE16	S20	S13	W8	S13	SSW15WSW12	NW10	NW6	W17	W19WNNW26	NW20	NW26WNNW28	WSW8.8	WNNW28																		
4-Sep	WNNW31	W28	W27	W23	W26WNNW27	NW32	NW33	NW31	NW29	NW26	NW22WNNW25WNNW23	W19	W17	W14	W10	WSW8	SW14WSW21WSW22WSW24WSW23	WNNW20.6	NW33																					
5-Sep	WSW19	SW12	SSW13	SSW12	S13	SSE14	S16	SSE16	SSE9	SE8	SSE13	S16	SE14	SE17	SSE18	SSE18	SSE19	SSE21	SSE23	SSE23	SE24	SSE23	S23	SSE14	SSE15.1	SE24														
6-Sep	S12	ESE8	ESE8	ESE11	ESE13	ESE13	SE16	SE17	SE14	SE14	S12	SW7	SW3	WSW3	NNW2	SW1	SW10WSW18WSW17WSW17WSW18WSW20	W21	W21	SSW6.6	W21																			
7-Sep	W20	W23	W22WSW17	W17WSW15WSW15	SW11	S9	SSE7	SE7	SE8	SE9	SE8	ESE4	SE5	W6	SSW7	SSW7	SSW14	SSW10	SW6	SW8	WSW6	SW7.5	W23																	
8-Sep	SSW6	S7	S7	S9	S14	SSE17	SSE13	SSE9	SSE10	SSE9	SSE13	SE9	WSW2	W14WNNW10	N13	NNE13	NNE18	NNE18	NNE16	NNE11	ENE8	SE5	SSE10	SE2.6	NNE18															
9-Sep	SSE11	SE5	E2	SE2	SSE6	SSE14	SSE16	SE20	SE16	SSE11	SSE12	SSE12	SSE13	SSE10	SE6	SSW4	SSE4	SE6	ESE4	SE9	SE16	SE22	SE23	SE26	SSE11.0	SE26														
10-Sep	SSE26	SE22	SE21	SE21	SE12	SE12	SE13	SE14	SE14	SE13	SE11	SE13	SE19	SSE19	SE18	SE22	SE22	SE25	SE26	SE30	SE32	SE33	SE31	SE34	SE20.9	SE34														
11-Sep	SE35	SE34	SE32	SE31	SE32	SSE33	SSE31	SSE30	SSE26	SSE26	SSE28	SSE32	SSE41	SSE40	SSE36	SSE40	S37	S33	SSE29	SE30	SE26	SE26	SSE25	SSE24	SSE31.0	SSE41														
12-Sep	SSE23	SSE21	S21	SSE24	SSE26	SSE26	SSE29	SSE24	SSE20	SSE11	SE12	SSE11	SSE8	SE6	SE6	SE6	SSW5	W16WSW17WSW24WSW24	SW25	SW23	SW16	S13.8	SSE29																	
13-Sep	WSW13WSW13	SW9	SSW9	SSW10	SSW12	SW14	SW14	SW12	SW13	SW17	SW25	SW33WSW35WSW33WSW37WSW34WSW36	W40WSW38WSW25WSW27WSW29WSW26	WSW22.5	W40																									
14-Sep	W25	W25	W24WNNW23	W23WNNW23WNNW23WNNW26WNNW26WNNW27WNNW25WNNW20	W16WNNW24	W29	W29	W25	W24WNNW27WNNW26WNNW19WNNW16WNNW15	WNNW23.3	W29																													
15-Sep	NW7	SSW8	S15	S13	S8	SSE12	SSE23	SSE30	SSE19	SE16	SSE14	SSE20	SSE21	SSE22	S27	SSE26	SSE27	SSE30	SSE34	SSE38	SSE39	SSE37	SSE35	SSE37	SSE22.4	SSE39														
16-Sep	SE32	SE24	SSE23	SSE23	S22	S15	SW12	SW10	SW4	WSW5	WSW8	SW10	S12WSW18WSW17WSW14	SSW20	SSW28	SSW28	SSW27	SSW21	SSW16	SSW12	SSW14.5	SE32																		
17-Sep	SSE15	SSE18	S14	SSE16	SSE16	ESE10	SE15	ESE10	SE15	SE24	SE18	SSE16	S22	SSW18	SW20	SW16	SSW16	SW18	SW20	SW21WSW20WSW19	SW20WSW21	S12.7	SE24																	
18-Sep	WSW12	SW11	SW12	SSW10	S8	SSE10	S8	S9	S10	SW11	W23WSW26WSW28	W25WSW31	SW23	SW25	SSW15	S17	SSW24	SSW28WSW23	SW19	SW21	SW16.0	WSW31																		
19-Sep	SSW14	SSW15	SW14	SSW16	SSW19	SSW17	SSW16	S17	S14	S14	SSW14	SSW16	SSW17	SW13	SW11WSW11	WSW7	SW9	SSW13	SW15WSW20	W17	NW15	NW18	SW12.1	WSW20																
20-Sep	NW18	NNW18	NNW15	NW16	NNW12	NNW11	NNW13	NW10	NW7	NNW6	N12	N11	N10	N11	N11	NNE11	N10	N15	N18	N16	N8	ENE4	S9	S14	NNW9.4	NNW18														
21-Sep	S20	S20	S14	S18	SSE24	SSE25	SSE22	SSE21	SSE18	SSE17	SSE19	SSW35	SSW42	SSW42	SSW38	SSW39	SSW37	SSW31	S31	S34	S35	S31	S32	S33	S27.2	SSW42														
22-Sep	S30	S29	S28	S28	S25	S23	S25	S23	SSE23	S23	S31	S32	S28	S27	S31	S28	SSE28	SSE33	SSE32	SSE37	SSE39	SSE34	SSE32	SSE35	S28.6	SSE39														
23-Sep	SSE31	SSE29	SE30	SE34	SE33	SE32	SE31	SE27	SE24	SE25	SE25	SE29	SE35	SSE38	SSE35	SSE36	SSE34	SSE31	SSE30	SE31	SE29	SE30	SE29	SE35	SE30.7	SSE38														
24-Sep	SE35	SE36	SSE38	SE36	SSE34	SSE33	SE28	SE23	SSE21	SSE20	SSE18	SSE16	SSW16WSW17WSW14WSW11	SW9	SSW13	S16	SSW22	SW22WSW25WSW22WSW26	WSW17.4	SSE38																				
25-Sep	WSW30WSW27	SW18WSW14	SW13	SW17	SW14	SW11	SSW9	S5	ESE3	SE2	ENE3	ENE7	NE7	NNE10	NE14	E19	E21	E15	ESE20	ESE20	ESE15	ESE15	SSE3.9	WSW30																
26-Sep	ESE20	ESE21	SE29	SE33	SE29	SE25	SE12	SE18	SE24	SSE19	S18	S22	S19	S15	SSW14	SSW13	SW12	SW7	S2	E16WSW13	W14	SW10	WSW9	SSE12.9	SE33															
27-Sep	NW11	NNW7WNNW17WNNW18WNNW15	W18	W17	W12	SW8	SW3	SSW4	WSW9	W18	W19WSW21WSW22	SW26WSW22WSW21WSW16	W14	W17	NW10	NNW10	N14.9	N26																						
28-Sep	NNW13	NNW7	WNNW1	WNNW7	NW12	NNW11	N11	NNE14	NNE10	N10	NNW13	N14	NNW15	N17	NNE20	N22	N22	N26	N22	N24	N22	N22	NNW23	NNW21	N16.2	N25														
29-Sep	N25	N21	N20	N20	NNW19	NNW16	NNW10	NNW13	NW14	NNW16	NNW22	NNW20	NNW19	NNW19	NNW14	NNW15	N17	N20	N16	N15	N16	N13	N12	NNE8	N16.2	N25														
30-Sep	ENE0	W2	SW4	SW4	SSW6	SSW8	WSW8	SW5	SW6	SSW7	SSW7	SSW7	S7	SSE7	SE5	SE8	SE10	SSE14	SSE18	SSE19	SSE20	SSE23	SSE23	SSE20	S8.6	SSE23														
SSW8.1SSW8.0SSW9.1														S8.9	S9.3	S9.2	S8.7	S8.4	S8.0	S7.2	S7.9	SSW9.2	SSW10.5	SSW10.4	SSW10.6	SSW10.5	SSW9.9	SSW10.0	SSW9.9	SSW10.9	SSW11.0	SSW10.5	SSW10.6	SSW10.6	Diurnal Average					
SE35														SE36	SSE38	SE36	SSE34	SSE33	NW32	NW33	NW31	NW29	S31	SSW35	SSW42	SSW42	SSW38	SSE40	SW44	SW39	W40	SSE38	SSE39	SSE37	SSE35	SSE37	Diurnal Maximum			

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



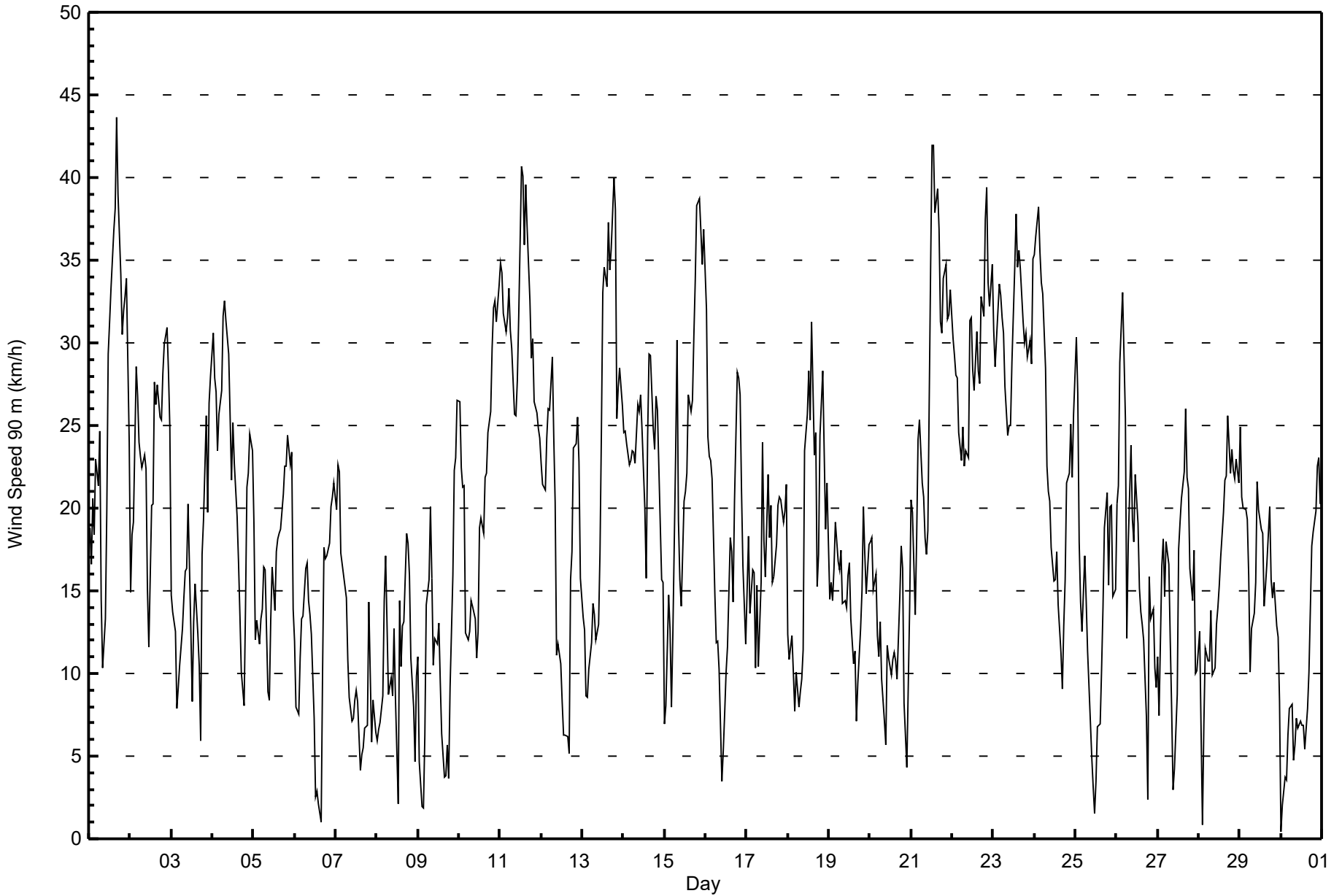
Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Speed 90 m (WS90m) - km/h

Mannix - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 10 km/h on Sep 21 12:00 Minimum Value: 1 km/h on Sep 30 21:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 3 Q ₃ = 4 P ₉₀ = 5 P ₉₉ = 8																	Hours in Service: 720 Hours of Data: 720 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-Sep	2	2	2	1	2	2	4	4	3	3	6	5	6	5	8	8	7	6	5	3	3	3	2	7	8
2-Sep	4	3	3	3	3	2	2	3	5	5	3	4	5	4	4	4	3	3	1	1	2	2	4	3	5
3-Sep	4	2	3	2	2	2	3	4	5	4	5	4	3	4	5	3	2	3	1	4	3	4	4	5	5
4-Sep	5	2	3	3	4	4	4	5	5	5	4	5	4	4	4	4	3	4	2	2	1	1	2	3	5
5-Sep	4	2	2	1	2	4	3	2	2	2	4	4	4	4	4	4	4	3	3	1	1	1	2	3	4
6-Sep	4	2	2	3	4	4	3	3	3	2	2	2	1	2	1	2	4	3	2	2	1	2	1	3	4
7-Sep	1	1	1	2	2	2	1	2	2	2	2	2	2	3	2	3	3	2	2	3	5	1	2	1	5
8-Sep	1	1	2	2	3	2	2	2	1	2	2	3	3	3	4	2	2	2	1	2	2	2	1	1	4
9-Sep	1	3	2	1	3	2	2	2	5	2	3	3	3	2	3	2	2	2	2	3	4	2	2	1	5
10-Sep	1	2	1	2	2	2	2	2	3	3	2	4	4	4	5	4	5	4	4	3	4	4	3	4	5
11-Sep	4	4	3	3	2	2	2	3	3	5	5	8	7	8	6	7	6	6	3	3	2	2	2	2	8
12-Sep	1	2	2	2	1	1	1	2	2	3	2	2	3	2	2	2	4	2	3	2	2	1	2	2	4
13-Sep	2	2	1	1	2	2	2	1	2	3	5	5	6	7	8	5	6	8	6	5	5	4	3	3	8
14-Sep	3	3	3	3	3	3	3	3	4	4	4	4	4	6	4	4	3	3	2	2	2	2	2	2	6
15-Sep	4	2	2	3	3	4	2	3	4	3	2	3	4	4	5	4	4	3	4	3	4	3	3	2	5
16-Sep	3	7	3	1	3	4	2	2	3	2	2	3	3	5	4	4	3	3	2	2	3	4	2	2	7
17-Sep	5	3	2	2	3	3	4	3	5	5	5	4	4	5	4	3	2	4	2	3	2	2	3	2	5
18-Sep	3	2	2	2	2	2	3	2	2	4	6	5	6	7	6	3	3	3	3	3	2	3	3	3	7
19-Sep	3	2	3	2	1	1	2	2	2	3	3	4	3	4	3	3	3	2	1	2	1	2	3	1	4
20-Sep	3	2	2	1	1	1	2	1	2	2	3	3	2	3	3	2	3	2	3	4	2	2	2	3	4
21-Sep	1	3	3	2	3	2	2	2	2	4	3	10	8	8	7	7	7	5	3	2	3	3	3	3	10
22-Sep	3	2	2	2	4	2	2	2	3	4	5	4	5	6	5	5	5	4	3	5	4	2	3	2	6
23-Sep	2	2	2	2	1	2	2	3	4	4	5	6	7	5	7	7	6	6	4	4	4	5	5	6	7
24-Sep	5	5	5	5	4	5	4	3	3	4	3	3	3	2	2	2	1	2	2	1	2	2	2	2	5
25-Sep	1	3	2	4	2	2	1	3	2	3	2	2	2	3	3	2	2	4	4	4	5	6	5	4	6
26-Sep	6	5	5	3	5	8	4	2	2	3	4	4	4	3	2	3	4	2	2	6	5	2	2	2	8
27-Sep	2	1	5	2	3	4	4	3	4	2	2	3	3	4	5	6	3	2	2	1	2	2	2	1	6
28-Sep	1	2	1	2	1	3	2	2	4	2	2	3	3	3	3	5	4	5	4	3	4	4	4	4	5
29-Sep	4	5	3	3	3	3	2	2	2	3	4	3	4	4	3	3	3	3	3	3	3	3	2	3	5
30-Sep	1	1	1	1	1	1	1	1	2	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	2
Diurnal Maximum																									





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	32	4.44	4.44
6 - 11	126	17.50	21.94
12 - 19	237	32.92	54.86
20 - 28	206	28.61	83.47
29 - 38	108	15.00	98.47
> 38	11	1.53	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed 90 m (WS90m) - km/h
Mannix - September 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	0	0	3	1	4	5	1	2	3	7	3	1	1	0	1	32
6 - 11	8	5	1	2	0	5	15	15	11	15	21	9	3	2	7	7	126
12 - 19	13	5	1	0	3	4	22	36	26	26	23	29	21	7	5	16	237
20 - 28	12	1	0	0	1	4	23	39	18	8	13	36	23	20	4	4	206
29 - 38	0	0	0	0	0	0	30	31	13	4	5	17	3	1	4	0	108
> 38	0	0	0	0	0	0	0	5	0	3	2	0	1	0	0	0	11
Totals	33	11	2	5	5	17	95	127	70	59	71	94	52	31	20	28	720

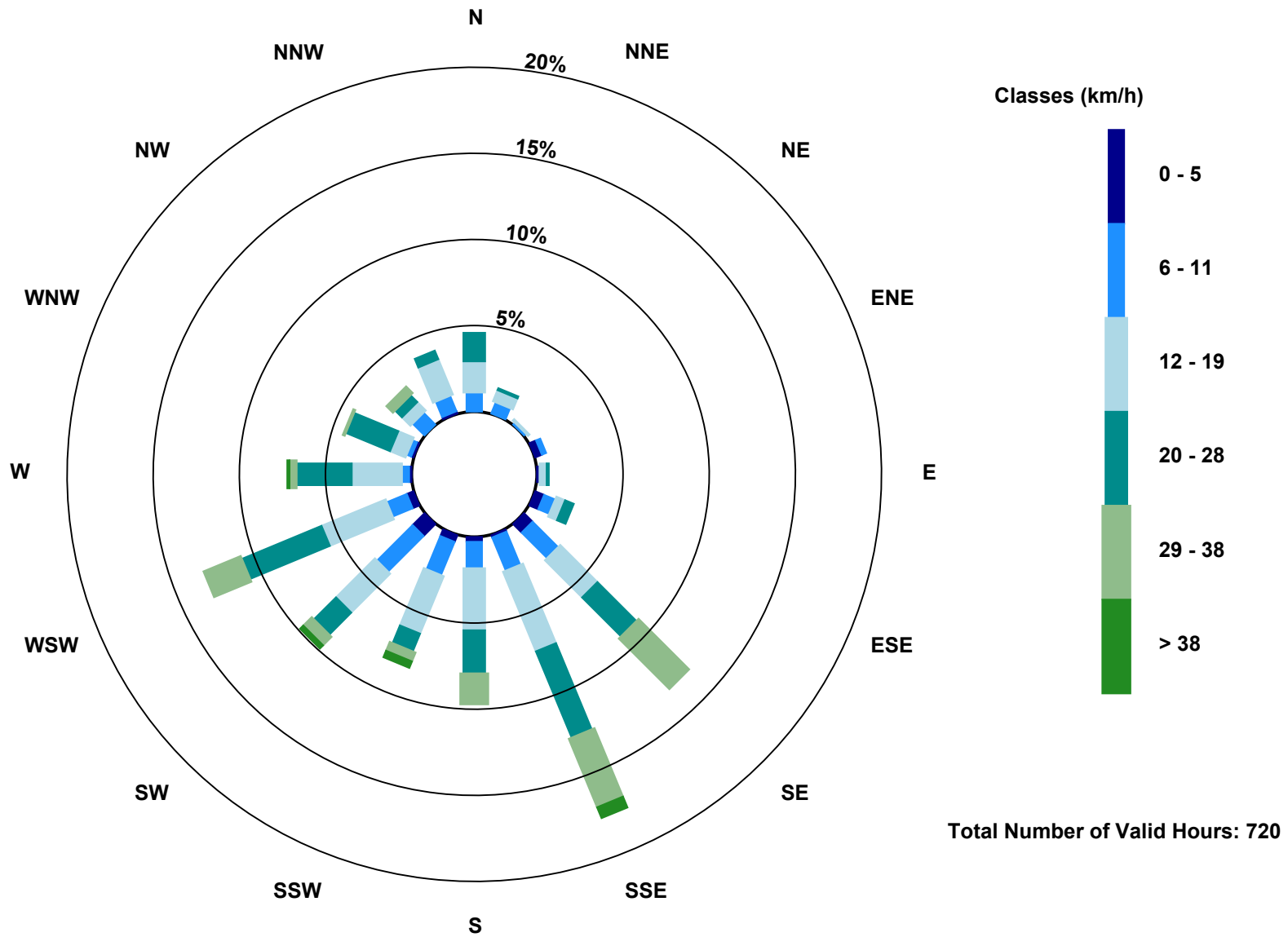
Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

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





Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction 20 m (WD20m) - deg

Mannix - September 2023

Direction of Maximum Speed: 263 deg on Sep 13 19:00		Hours in Service:	720
Direction of Maximum Daily Speed Average: 147.0 deg on Sep 23		Hours of Data:	720
Direction of Minimum Speed: 196 deg on Sep 30 01:00		Hours of Missing Data:	0
Direction of Minimum Daily Speed Average: 2.1 deg on Sep 8		Percent Operational Time:	100.0
Monthly Average Direction: 191.2 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-Sep	259	255	255	238	240	245	248	238	221	231	240	242	241	234	235	228	231	235	237	247	246	242	240	215	238.4
2-Sep	172	271	219	268	273	282	280	283	285	273	253	252	260	253	260	247	252	254	251	258	256	254	255	249	260.2
3-Sep	180	186	171	159	166	164	160	157	165	154	159	145	227	162	201	252	329	321	281	259	290	308	308	294	213.7
4-Sep	290	268	263	264	281	289	320	320	322	322	305	318	292	289	277	277	279	269	245	212	227	250	232	211	285.1
5-Sep	197	163	160	162	162	161	161	162	157	139	147	169	141	144	151	156	156	162	154	156	151	164	170	176	158.2
6-Sep	155	119	113	100	135	136	136	148	144	153	180	216	205	266	9	121	222	246	237	232	209	229	250	269	179.3
7-Sep	269	245	254	242	237	221	205	200	165	143	147	132	134	133	126	141	261	194	166	176	168	171	228	183	188.3
8-Sep	163	155	162	160	154	154	152	156	149	145	147	138	37	275	292	4	19	16	29	21	5	1	19	200	133.3
9-Sep	254	3	331	137	162	201	183	158	154	148	157	158	160	170	137	194	155	140	140	132	143	150	151	153	158.0
10-Sep	152	148	160	169	164	162	181	167	151	154	149	151	151	151	141	144	147	143	143	141	138	142	146	143	148.6
11-Sep	142	142	143	145	146	150	150	148	148	153	151	152	161	163	160	169	170	178	157	145	143	143	143	141	154.1
12-Sep	143	155	151	145	150	156	154	160	160	155	145	160	160	145	132	132	192	268	241	238	235	220	229	203	173.9
13-Sep	194	181	160	162	166	158	163	163	169	188	225	234	240	250	256	246	244	250	263	257	246	241	244	255	235.0
14-Sep	264	276	278	281	278	278	281	284	283	285	288	284	288	280	289	280	283	279	273	275	269	256	275	273	279.3
15-Sep	209	187	159	162	152	148	145	156	159	150	139	145	151	151	172	163	162	165	160	156	158	153	146	148	156.8
16-Sep	145	158	143	145	152	161	170	158	147	180	249	263	244	164	254	247	247	195	191	196	178	174	162	155	183.9
17-Sep	143	142	148	157	167	166	167	151	146	139	143	155	171	198	226	218	207	223	224	210	218	207	200	200	179.0
18-Sep	164	161	160	155	154	163	153	157	161	176	264	261	258	263	251	224	211	182	162	169	185	216	185	198	206.9
19-Sep	159	158	168	162	167	160	161	164	166	178	191	197	217	229	240	249	241	222	201	197	224	241	257	273	196.0
20-Sep	287	309	45	13	3	74	80	130	112	5	7	352	355	1	358	16	9	353	357	357	9	196	235	171	354.2
21-Sep	153	152	152	155	150	154	149	151	143	140	144	198	206	202	202	211	205	198	179	169	167	163	162	169	177.3
22-Sep	163	164	160	163	159	156	161	153	163	160	190	190	191	173	175	180	164	166	161	158	160	156	149	155	166.4
23-Sep	150	161	143	146	146	144	145	144	142	139	141	143	146	155	155	156	155	156	149	141	142	141	137	138	147.0
24-Sep	138	140	151	149	155	148	143	143	150	162	165	165	197	244	244	239	213	195	180	179	208	244	230	226	170.9
25-Sep	238	243	195	179	179	188	185	164	165	157	96	172	82	73	56	36	51	90	71	69	102	110	141	140	126.4
26-Sep	129	132	136	134	133	141	140	142	142	144	175	191	192	192	200	201	235	200	153	106	266	270	179	223	160.0
27-Sep	260	263	275	265	214	223	252	208	208	222	201	264	268	266	260	255	237	239	246	244	257	265	280	278	254.2
28-Sep	283	32	216	237	272	311	30	62	60	15	351	353	346	347	19	15	9	16	12	12	5	355	344	338	358.3
29-Sep	351	346	352	352	342	340	350	340	327	342	339	340	351	343	343	349	358	3	8	4	13	3	9	11	351.4
30-Sep	196	266	233	204	206	221	231	204	206	178	180	189	160	147	139	148	156	160	162	156	154	152	155	164	171.4

183.5 180.0 175.2 172.0 176.0 174.1 172.7 169.1 168.0 166.4 184.3 199.8 208.3 210.7 219.5 215.9 213.6 209.4 201.1 188.3 191.3 195.2 195.4 191.9

Diurnal Average

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



Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

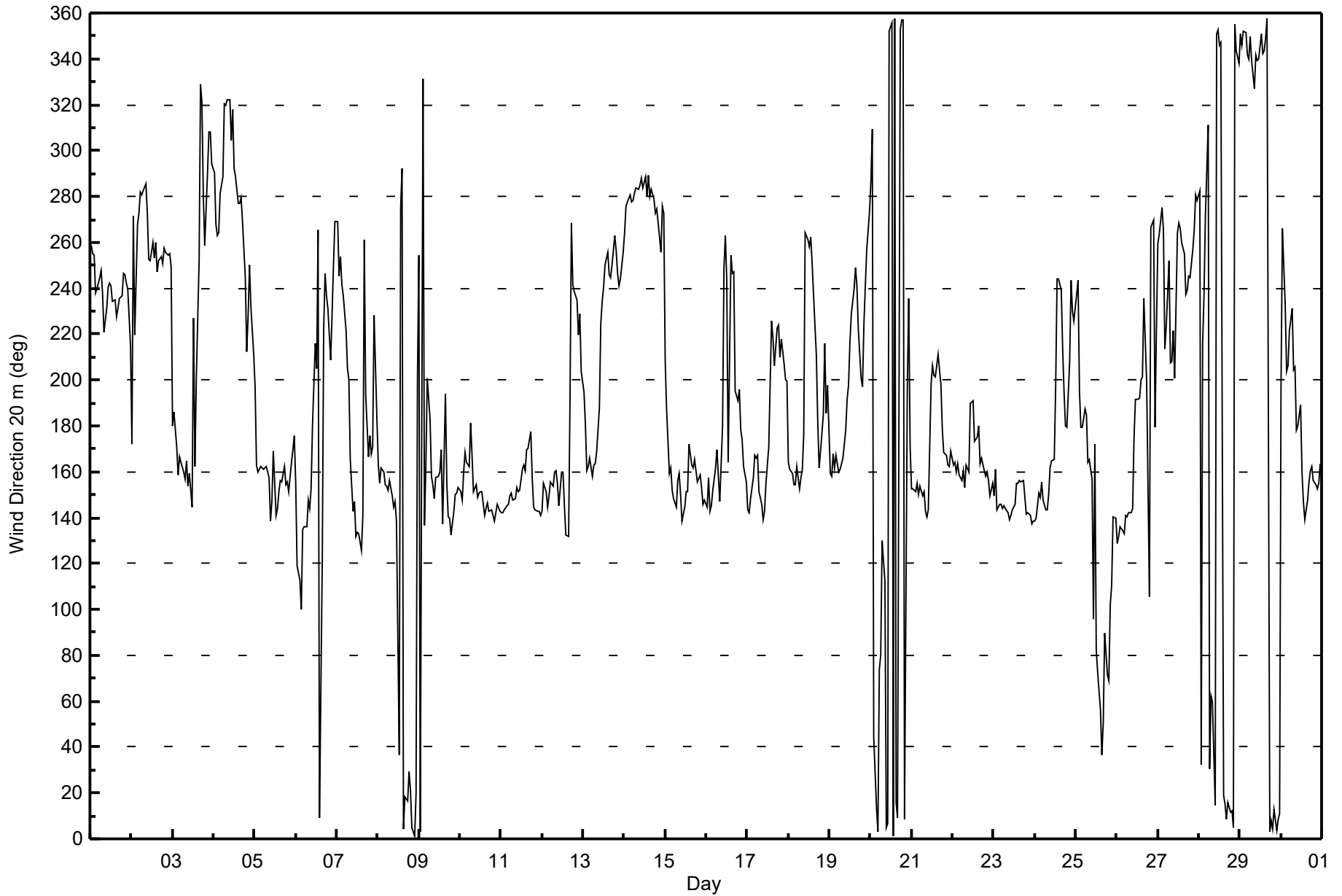
Wind Direction 20 m (WD20m) - deg

Mannix - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 89 deg on Sep 30 01:00	Hours of Data: 720
Minimum Value: 4 deg on Sep 30 21:00	Hours of Missing Data: 0
Percentiles: P ₁ = 6 P ₁₀ = 9 Q ₁ = 11 Median = 14 Q ₃ = 19 P ₉₀ = 32 P ₉₉ = 74	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-Sep	9	10	8	9	9	12	16	22	19	23	19	14	16	15	15	13	12	12	11	9	8	10	46	46	
2-Sep	58	40	18	14	10	12	16	13	17	12	18	25	15	14	12	14	12	11	10	9	9	9	11	12	58
3-Sep	36	17	19	10	9	9	14	15	31	25	15	28	57	18	28	29	32	32	10	10	17	17	16	13	57
4-Sep	12	9	11	12	11	21	15	17	15	17	18	22	14	17	15	19	26	29	31	10	13	6	18	21	31
5-Sep	25	14	8	8	9	10	13	16	25	18	16	27	25	20	17	19	19	17	12	10	9	11	12	14	27
6-Sep	23	23	15	20	12	11	11	13	13	14	22	28	52	62	74	84	41	12	9	8	7	11	12	12	84
7-Sep	16	7	7	31	18	16	18	18	16	16	18	19	14	26	23	20	86	19	10	14	50	9	24	61	86
8-Sep	13	10	10	10	11	12	15	16	16	18	15	25	80	21	41	19	14	11	10	35	22	31	50	41	80
9-Sep	19	31	67	77	46	21	15	15	15	18	21	18	21	32	44	49	71	15	42	33	12	8	8	8	77
10-Sep	9	7	7	7	10	10	26	19	16	16	20	21	16	21	16	16	14	13	12	11	11	12	12	12	26
11-Sep	12	12	12	11	12	11	11	12	13	13	14	17	14	15	13	16	14	18	13	12	10	10	10	11	18
12-Sep	8	11	9	8	8	11	13	12	13	25	17	17	29	24	19	19	54	12	9	10	12	9	12	9	54
13-Sep	10	12	12	9	10	9	10	12	19	30	26	17	14	17	14	14	13	10	11	13	12	11	12	30	
14-Sep	10	10	10	10	11	11	10	11	11	12	13	14	17	24	17	13	11	10	8	6	8	8	20	9	24
15-Sep	35	16	12	12	11	11	14	13	16	16	15	13	16	16	15	13	12	10	10	11	10	11	11	35	
16-Sep	11	45	10	8	9	9	14	37	26	77	46	37	40	30	19	22	15	22	12	8	8	10	9	10	77
17-Sep	10	11	8	12	12	13	11	66	40	11	15	20	20	30	23	17	19	27	10	15	13	10	12	13	66
18-Sep	18	8	7	6	9	13	15	13	16	33	23	12	15	13	15	18	15	24	10	10	14	16	21	21	33
19-Sep	15	8	17	15	13	8	10	12	14	23	27	29	26	27	41	27	36	17	8	9	14	11	19	23	41
20-Sep	12	39	12	9	50	57	58	63	69	55	21	29	27	29	29	23	24	11	10	34	63	60	15	35	69
21-Sep	10	10	11	10	12	13	12	13	14	16	15	25	19	18	18	17	17	16	14	10	10	10	10	11	25
22-Sep	10	11	9	9	9	8	9	11	13	16	18	18	21	17	17	18	16	13	10	10	9	9	10	9	21
23-Sep	9	8	11	10	10	10	10	11	13	12	13	12	14	12	13	11	12	11	11	11	11	12	12	11	14
24-Sep	10	11	11	11	11	11	12	12	13	13	16	20	16	16	15	16	13	11	12	11	13	9	10	20	20
25-Sep	6	19	18	16	13	12	19	21	23	39	22	68	39	21	40	23	10	16	13	22	12	15	21	15	68
26-Sep	13	12	11	9	9	34	60	13	11	11	28	20	22	20	17	23	42	56	79	45	20	23	18	27	79
27-Sep	15	12	8	4	42	55	43	23	24	28	49	27	15	18	20	20	10	8	7	18	11	9	13	19	55
28-Sep	14	48	61	17	21	49	15	26	55	24	18	17	15	14	16	16	14	13	12	12	14	14	15	15	61
29-Sep	15	14	13	13	18	18	20	14	15	16	16	16	14	16	20	15	14	14	12	14	16	16	17	16	20
30-Sep	89	45	14	19	15	10	9	18	15	16	18	22	17	16	18	14	10	6	5	5	4	5	7	6	89

89	48	67	77	50	57	60	66	69	77	49	68	80	62	74	84	86	56	79	45	63	60	50	61	
Diurnal Maximum																								





Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction 45 m (WD45m) - deg

Mannix - September 2023

Direction of Maximum Speed: 225 deg on Sep 1 17:00		Hours in Service:	720
Direction of Maximum Daily Speed Average: 149.2 deg on Sep 11		Hours of Data:	719
Direction of Minimum Speed: 105 deg on Sep 30 01:00		Hours of Missing Data:	1
Direction of Minimum Daily Speed Average: 4.4 deg on Sep 8		Percent Operational Time:	99.9
Monthly Average Direction: 186.7 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-Sep	265	268	260	249	249	250	249	242	215	227	234	238	236	230	230	221	225	230	231	243	241	239	237	223	236.4
2-Sep	229	270	233	267	269	277	277	280	282	269	249	249	255	248	255	242	248	249	246	251	249	251	254	253	257.2
3-Sep	220	211	190	168	169	163	158	152	160	151	158	145	240	160	197	248	327	319	280	263	292	307	306	292	218.6
4-Sep	288	266	259	261	277	287	317	316	318	319	301	315	289	286	276	272	276	267	241	219	231	239	233	226	281.9
5-Sep	222	180	167	162	155	156	156	157	158	135	142	167	136	141	147	151	151	158	149	149	146	155	165	182	156.2
6-Sep	159	113	111	97	126	126	127	139	UO	146	176	211	203	257	347	125	217	239	233	233	221	225	248	267	185.3
7-Sep	267	248	256	245	251	240	223	202	163	138	139	127	127	124	120	136	263	191	168	180	185	179	208	220	198.8
8-Sep	169	154	156	154	150	150	150	153	149	145	141	135	321	270	286	360	16	14	23	21	16	30	67	151	131.6
9-Sep	159	44	32	72	155	170	160	148	147	145	154	152	157	164	142	195	152	134	125	128	128	142	141	147	147.2
10-Sep	146	131	135	142	153	147	148	153	139	144	141	144	146	146	135	139	141	137	137	136	133	138	142	139	140.4
11-Sep	138	138	140	140	141	146	147	143	144	148	147	149	157	158	156	165	166	173	153	141	139	139	136	136	149.2
12-Sep	139	138	154	144	148	149	150	156	156	152	141	155	158	140	130	131	194	260	244	239	235	222	228	217	171.6
13-Sep	211	199	188	166	167	163	180	177	179	199	220	229	234	244	249	240	240	245	258	252	243	238	241	251	230.5
14-Sep	260	273	273	278	275	276	278	280	280	281	283	281	285	277	286	277	279	275	271	284	279	266	272	272	277.2
15-Sep	243	186	160	154	147	145	143	153	157	151	138	141	146	146	169	158	158	161	157	150	152	149	144	145	152.8
16-Sep	140	143	134	140	153	163	182	193	164	185	246	254	235	162	248	240	240	189	188	198	188	177	164	163	179.4
17-Sep	143	140	146	140	157	147	146	130	132	132	137	149	167	193	219	212	202	215	223	217	226	215	211	219	173.5
18-Sep	208	189	173	158	149	155	148	153	157	185	259	255	253	258	246	217	208	184	160	173	188	226	201	207	202.3
19-Sep	176	171	191	162	172	163	165	161	164	179	188	195	210	221	231	240	236	220	203	207	228	256	298	297	195.8
20-Sep	304	323	354	337	336	346	348	337	264	331	0	350	350	357	353	11	5	350	354	354	1	129	206	176	344.5
21-Sep	158	150	147	149	146	150	147	148	143	142	145	193	199	195	195	205	199	192	177	166	164	162	163	168	173.2
22-Sep	164	165	164	167	168	161	163	155	160	158	185	185	185	170	171	175	159	163	158	153	153	148	145	149	163.9
23-Sep	146	154	142	138	141	140	141	138	138	134	135	139	142	150	150	151	150	151	145	138	139	136	133	133	142.2
24-Sep	133	135	146	143	150	143	140	140	145	157	162	163	190	239	240	236	209	188	180	178	209	245	232	225	168.5
25-Sep	235	243	209	210	196	207	199	176	169	165	95	154	77	63	48	30	44	85	71	82	99	105	127	128	135.7
26-Sep	121	124	130	129	129	135	140	135	135	143	170	186	187	186	192	194	231	213	165	99	253	269	189	224	156.3
27-Sep	281	285	278	271	256	263	276	233	208	215	190	256	262	260	254	248	232	234	241	236	263	273	293	306	256.8
28-Sep	304	8	200	275	287	324	12	41	34	6	346	350	343	345	14	10	6	11	7	9	1	352	340	335	353.2
29-Sep	348	344	354	350	339	337	339	333	322	336	336	336	347	340	341	343	355	359	4	1	8	0	5	10	347.6
30-Sep	105	258	222	195	198	222	231	208	205	180	179	186	161	148	138	144	147	155	155	149	148	148	149	153	166.5

182.8 178.0 174.2 167.1 171.1 169.1 169.7 166.8 166.2 164.1 179.9 193.4 201.3 202.3 211.8 208.1 207.1 201.5 194.3 186.5 191.2 194.7 193.0 192.0

Diurnal Average

UO - Unstable Operation

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



Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

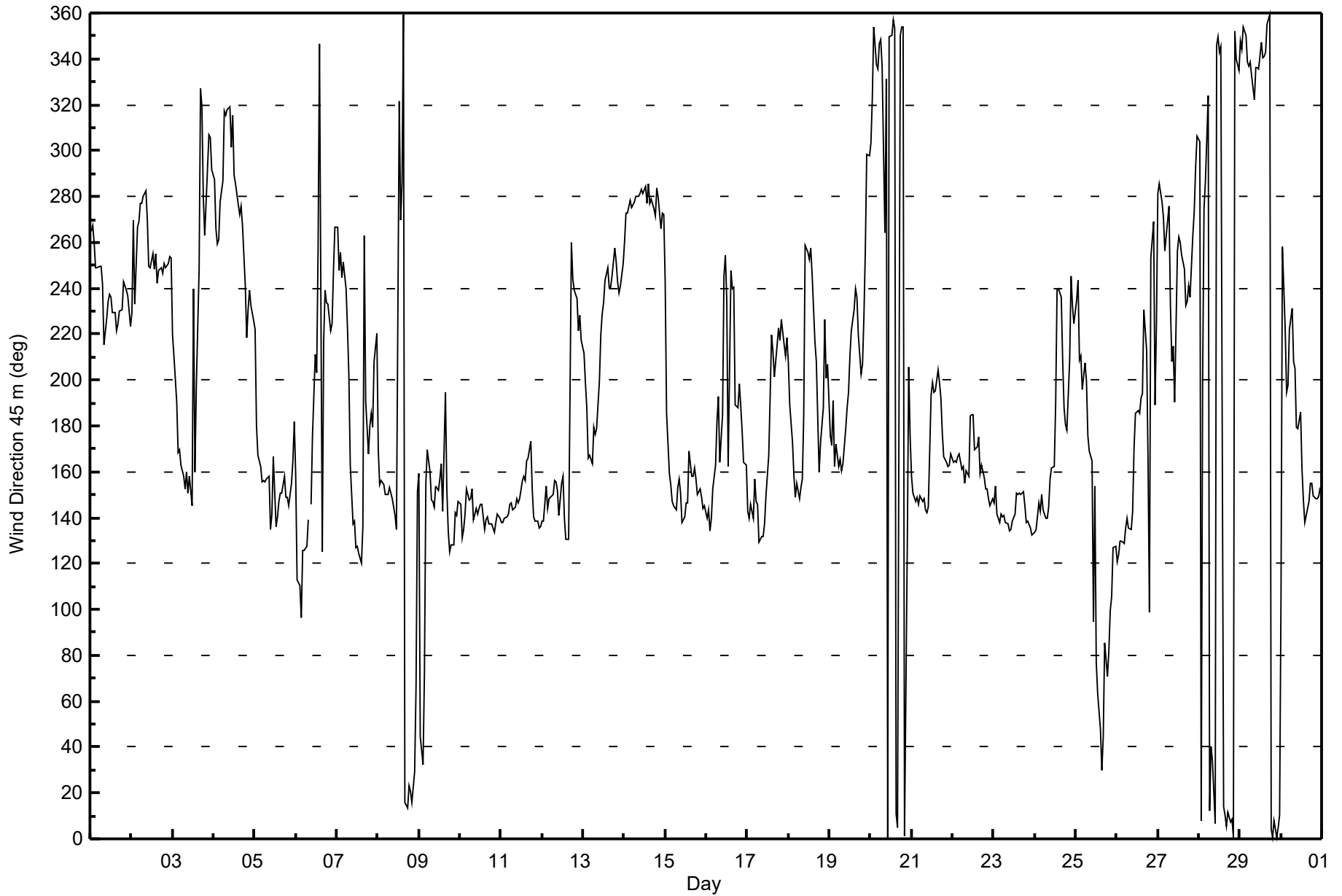
Wind Direction 45 m (WD45m) - deg

Mannix - September 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 93 deg on Sep 6 16:00			Hours of Data:	719
Minimum Value: 2 deg on Sep 30 21:00			Hours of Missing Data:	1
Percentiles: P ₁ = 3 P ₁₀ = 5 Q ₁ = 7 Median = 10 Q ₃ = 14 P ₉₀ = 23 P ₉₉ = 68			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-Sep	7	8	6	6	4	8	11	19	14	18	14	10	12	10	12	10	9	8	8	7	5	6	4	29	
2-Sep	44	27	10	9	7	8	11	9	13	10	14	16	12	11	8	10	8	7	6	6	7	6	7	7	
3-Sep	36	22	20	7	5	6	8	9	23	20	9	14	45	13	21	28	29	30	6	7	14	11	10	7	
4-Sep	8	6	8	8	8	18	9	10	9	11	14	18	10	12	12	15	19	27	25	7	5	2	9	16	
5-Sep	17	16	6	8	3	5	6	8	16	12	12	21	20	14	12	14	13	13	7	5	4	7	6	9	
6-Sep	22	19	14	16	7	7	5	8	UO	8	16	20	46	48	61	93	34	8	5	4	6	9	6	11	
7-Sep	11	5	5	10	10	11	16	15	11	10	12	11	10	20	28	15	84	13	10	13	38	10	21	20	
8-Sep	15	3	3	4	5	5	8	8	8	10	9	18	90	17	40	16	9	7	6	10	10	19	20	23	
9-Sep	7	88	23	40	24	9	4	9	8	10	12	11	14	25	29	48	68	12	36	20	6	3	4	4	
10-Sep	5	3	4	3	3	5	18	10	10	11	12	13	11	16	12	12	9	8	7	6	6	7	6	7	
11-Sep	7	7	7	7	6	6	6	6	8	9	9	13	10	11	10	12	8	12	10	6	5	4	5	4	
12-Sep	4	8	5	5	4	7	5	6	6	16	11	12	18	15	14	14	46	9	7	5	8	5	4	6	
13-Sep	7	9	13	4	8	6	13	7	14	21	20	13	11	15	11	11	10	11	9	8	9	7	8	8	
14-Sep	8	8	7	7	8	7	7	8	7	8	9	10	13	19	12	10	7	7	5	4	6	7	11	5	
15-Sep	38	18	10	4	6	5	7	7	9	10	8	8	10	11	11	8	7	6	6	6	6	6	6	6	
16-Sep	6	38	5	4	5	5	11	13	27	81	34	29	32	28	14	19	13	18	5	4	7	12	5	9	
17-Sep	6	4	6	6	3	7	8	23	18	6	14	14	13	22	17	11	10	24	6	6	6	9	7	7	
18-Sep	16	12	9	7	4	5	9	7	12	23	15	10	13	10	12	12	9	21	4	6	10	9	16	9	
19-Sep	17	10	21	10	8	4	6	6	9	15	20	22	20	21	26	22	30	12	3	7	9	10	13	10	
20-Sep	10	16	11	7	16	14	21	30	63	37	14	19	19	19	21	16	17	6	7	16	43	47	9	12	
21-Sep	8	5	5	5	6	6	6	7	8	8	11	18	12	11	11	11	9	9	8	5	5	5	5	6	
22-Sep	5	5	4	4	6	4	3	7	8	12	10	9	14	12	11	12	11	8	6	5	5	5	6	5	
23-Sep	5	4	6	6	6	5	5	6	9	8	9	10	9	10	9	9	8	7	7	7	8	8	7	10	
24-Sep	7	8	7	8	7	7	8	8	9	10	11	16	12	12	11	12	9	6	5	4	13	8	5	5	
25-Sep	4	10	10	15	13	9	11	21	20	37	25	66	39	19	49	18	8	14	9	18	11	13	17	12	
26-Sep	10	10	7	5	5	23	44	7	6	7	23	14	14	11	10	15	31	48	85	39	13	17	22	27	
27-Sep	19	30	8	3	27	36	12	17	24	32	36	23	12	14	19	17	7	5	4	11	15	7	10	7	
28-Sep	10	25	60	8	12	30	9	15	50	18	13	11	11	10	11	12	10	9	9	9	9	10	12	11	
29-Sep	10	9	9	9	12	12	14	10	10	12	11	12	10	11	16	11	10	9	9	11	11	11	11	12	
30-Sep	85	37	20	15	12	6	4	17	11	13	11	12	14	10	14	10	7	4	3	2	2	2	4	4	
85	88	60	40	27	36	44	30	63	81	36	66	90	48	61	93	84	48	85	39	43	47	22	29		
Diurnal Maximum																									

UO - Unstable Operation





Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction 75 m (WD75m) - deg

Mannix - September 2023

Direction of Maximum Speed: 225 deg on Sep 1 17:00		Hours in Service:	720
Direction of Maximum Daily Speed Average: 152.1 deg on Sep 11		Hours of Data:	720
Direction of Minimum Speed: 99 deg on Sep 30 01:00		Hours of Missing Data:	0
Direction of Minimum Daily Speed Average: 3.8 deg on Sep 8		Percent Operational Time:	100.0
Monthly Average Direction: 194.6 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-Sep	275	281	268	260	258	257	255	252	221	231	235	239	237	231	230	221	225	231	232	244	242	242	242	236	240.4
2-Sep	250	270	248	272	273	279	280	284	286	274	252	251	256	249	255	244	250	251	250	255	253	254	256	258	260.4
3-Sep	251	235	217	201	197	180	170	157	167	161	168	165	259	171	203	249	328	316	281	267	300	313	310	295	234.2
4-Sep	292	272	263	265	279	291	321	319	322	305	319	293	289	278	273	276	270	244	229	242	252	239	239	283.9	
5-Sep	238	209	194	188	167	163	166	163	163	142	147	169	141	144	150	152	153	160	151	151	147	154	168	191	163.1
6-Sep	168	117	116	103	125	125	130	138	134	146	177	213	214	243	351	197	220	240	237	242	239	240	254	266	196.7
7-Sep	269	257	259	254	260	253	240	218	172	146	143	135	133	128	125	142	265	199	186	196	200	209	221	242	220.7
8-Sep	196	177	174	166	162	161	162	159	156	157	146	140	244	269	290	2	20	18	29	28	32	59	125	156	136.3
9-Sep	152	121	65	54	143	159	151	148	145	150	159	156	160	164	146	192	161	137	127	132	133	143	141	146	147.6
10-Sep	147	138	137	136	135	133	133	136	136	142	143	144	147	148	139	142	144	139	138	137	136	142	145	143	140.4
11-Sep	142	142	142	144	146	150	150	147	147	152	150	152	159	160	158	167	168	175	156	145	143	143	143	150	152.1
12-Sep	151	150	166	162	162	160	155	162	162	159	145	157	163	146	139	141	206	260	251	245	240	228	233	229	182.0
13-Sep	230	228	214	191	191	197	216	212	204	220	222	230	234	244	249	241	242	247	259	253	245	240	243	252	237.6
14-Sep	263	276	276	282	280	280	281	283	283	284	286	285	287	279	288	279	281	277	277	292	292	284	280	286	281.6
15-Sep	292	194	178	170	163	159	154	160	165	163	151	147	150	150	171	161	161	166	160	154	155	152	149	150	158.7
16-Sep	144	145	146	158	169	175	212	224	208	212	249	253	230	169	247	242	240	192	193	205	207	203	183	191	191.1
17-Sep	155	155	165	146	151	131	134	122	129	132	140	151	168	194	220	212	204	218	229	229	237	232	225	241	182.7
18-Sep	245	223	209	186	158	157	158	170	171	215	261	257	254	258	247	218	212	198	175	186	203	235	217	215	217.1
19-Sep	198	193	217	182	197	191	196	173	175	185	190	196	211	222	233	240	237	221	206	217	234	264	324	318	211.0
20-Sep	317	333	335	330	335	332	327	313	296	329	2	355	353	1	356	15	10	355	357	359	356	87	179	172	344.5
21-Sep	174	173	166	160	152	157	158	159	152	157	159	195	200	196	196	206	200	193	182	172	169	168	170	173	178.3
22-Sep	171	171	175	179	181	176	176	166	165	165	186	187	187	172	172	176	162	166	161	157	155	151	149	152	168.5
23-Sep	149	154	144	140	142	141	143	140	142	138	138	142	144	153	151	153	152	154	149	142	143	140	137	137	144.9
24-Sep	138	140	149	146	152	147	144	144	148	159	164	165	191	240	240	237	212	191	187	189	224	253	244	234	173.3
25-Sep	239	249	226	237	219	221	219	209	188	180	102	137	74	63	53	33	51	89	80	92	103	108	122	121	159.2
26-Sep	122	125	134	135	135	138	142	137	138	151	173	186	188	186	191	195	233	225	188	97	248	270	213	234	161.7
27-Sep	315	334	290	292	276	274	276	253	223	220	195	257	263	260	255	248	234	236	244	238	266	277	312	325	263.9
28-Sep	328	346	205	286	306	337	10	32	27	8	350	354	347	351	16	13	9	13	10	11	4	357	345	341	358.2
29-Sep	352	350	1	356	347	343	338	334	326	340	341	342	350	345	344	345	358	3	7	4	9	4	9	18	351.7
30-Sep	99	261	221	204	195	214	243	229	221	197	190	190	170	157	144	146	147	158	159	154	148	151	155	160	168.5

196.0 191.5 188.7 182.4 183.3 181.0 181.8 174.9 172.3 174.2 185.8 195.6 203.9 203.8 213.3 209.5 208.6 204.1 198.2 194.5 201.6 204.2 200.8 200.8

Diurnal Average

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



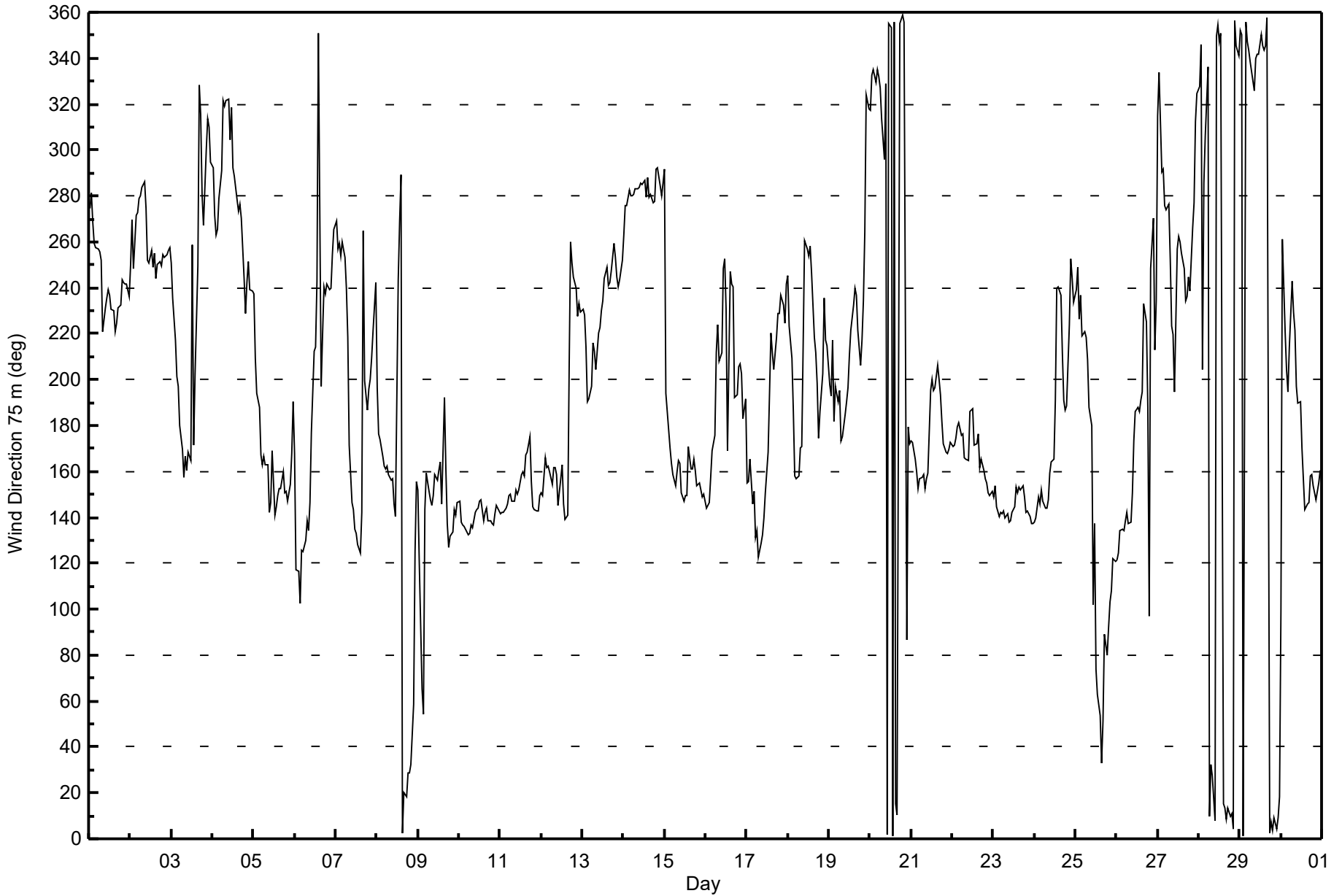
Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Direction 75 m (WD75m) - deg

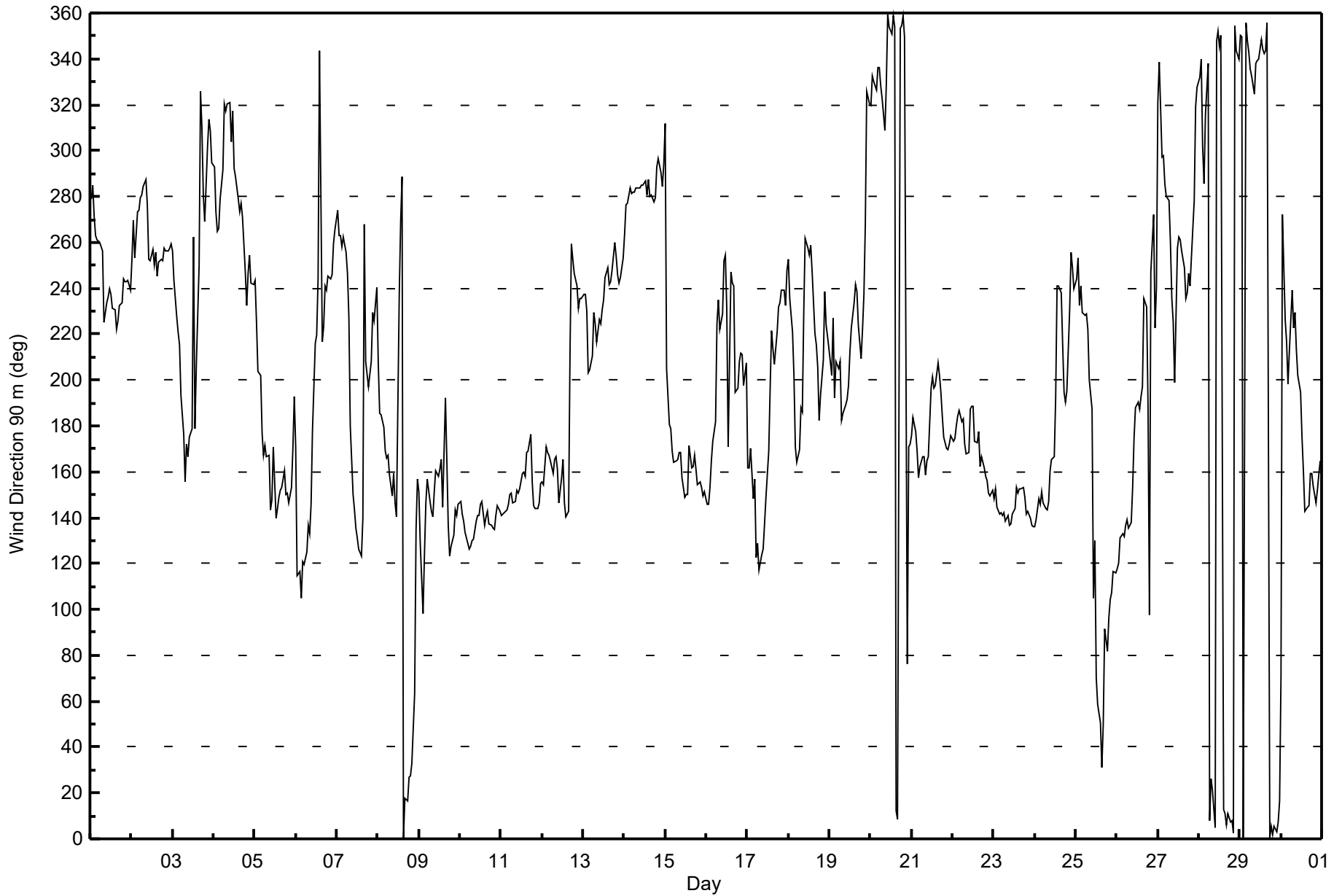
Mannix - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0											Hours in Service: 720														
Maximum Value: 100 deg on Sep 8 13:00											Hours of Data: 720														
Minimum Value: 2 deg on Sep 30 20:00											Hours of Missing Data: 0														
Percentiles: P ₁ = 2 P ₁₀ = 4 Q ₁ = 6 Median = 9 Q ₃ = 13 P ₉₀ = 20 P ₉₉ = 66											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-Sep	7	6	7	5	3	7	8	18	14	15	13	9	11	10	12	9	8	8	7	6	4	5	4	9	18
2-Sep	22	20	6	7	6	6	7	8	9	10	12	17	11	10	7	9	8	6	3	3	5	4	5	5	22
3-Sep	19	19	17	14	11	8	9	7	18	17	8	13	30	15	17	28	27	31	5	5	13	9	10	6	31
4-Sep	6	7	7	7	7	18	7	8	8	10	13	17	9	11	11	13	16	26	18	10	4	3	6	12	26
5-Sep	9	17	9	14	6	5	6	8	12	13	12	17	18	13	11	11	12	12	5	3	2	5	7	13	18
6-Sep	23	19	17	15	12	12	8	6	7	8	14	16	42	43	56	85	28	6	4	4	4	7	4	10	85
7-Sep	8	4	6	6	6	6	9	15	10	13	13	13	12	22	28	21	83	11	11	14	28	20	15	16	83
8-Sep	24	7	10	11	3	2	4	6	7	12	8	17	100	17	38	13	7	6	4	5	10	15	30	7	100
9-Sep	7	35	52	36	32	4	7	6	7	9	11	9	11	20	21	44	62	12	32	19	8	5	4	2	62
10-Sep	3	3	2	3	4	6	10	5	10	11	11	12	9	13	10	11	7	7	6	5	5	5	4	5	13
11-Sep	5	5	4	4	4	4	4	5	6	7	8	11	9	10	9	11	7	11	9	5	4	3	4	3	11
12-Sep	4	5	6	5	4	9	4	5	5	14	10	10	18	16	18	15	43	8	5	4	7	4	3	7	43
13-Sep	5	7	9	9	12	10	14	6	12	13	17	12	10	14	11	11	9	9	8	7	8	7	7	7	17
14-Sep	7	8	7	7	7	7	7	7	7	7	7	10	12	18	11	9	6	6	6	2	4	7	7	8	18
15-Sep	26	25	3	6	4	6	4	5	7	9	9	8	9	10	10	9	7	6	5	4	4	4	4	3	26
16-Sep	4	21	5	5	4	6	14	10	14	67	29	27	30	27	13	18	13	17	5	3	2	12	10	11	67
17-Sep	5	4	7	4	6	10	5	21	11	5	13	13	11	19	16	9	9	23	5	6	6	6	6	6	23
18-Sep	10	10	11	15	15	6	14	11	17	19	12	9	11	9	11	9	7	16	5	6	9	8	12	5	19
19-Sep	15	10	17	12	10	7	11	7	9	13	17	20	18	20	22	21	29	12	3	9	8	13	9	5	29
20-Sep	8	8	5	4	5	10	12	9	17	30	11	17	17	17	19	14	15	5	6	12	34	32	13	5	34
21-Sep	5	4	5	5	3	4	4	6	6	8	12	14	10	10	10	9	8	7	6	4	4	4	4	4	14
22-Sep	5	4	4	4	5	4	5	6	6	11	8	8	12	10	9	11	10	7	5	4	3	3	4	3	12
23-Sep	3	3	5	3	3	3	3	4	7	6	8	8	9	8	9	8	7	6	6	6	6	7	7	6	9
24-Sep	5	7	6	6	6	5	6	6	8	9	10	14	10	10	9	11	9	5	3	3	12	6	5	5	14
25-Sep	3	7	8	4	10	6	10	20	20	36	33	76	44	22	34	15	10	13	6	16	12	15	18	16	76
26-Sep	12	12	6	4	4	14	25	5	5	6	19	12	12	10	10	12	28	36	74	36	11	18	26	30	74
27-Sep	22	31	7	7	17	11	8	16	26	46	28	21	11	13	18	15	6	4	5	7	17	7	11	5	46
28-Sep	6	19	82	12	13	15	7	8	22	16	13	10	10	8	9	9	9	8	7	7	7	8	9	9	82
29-Sep	8	9	8	7	9	10	12	8	8	11	9	10	8	10	14	10	9	8	8	10	10	10	9	11	14
30-Sep	75	40	15	21	10	10	6	13	10	16	9	11	14	12	18	8	6	4	2	2	4	2	3	3	75
											Diurnal Maximum														





Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0											Hours in Service: 720														
Maximum Value: 93 deg on Sep 28 03:00											Hours of Data: 720														
Minimum Value: 1 deg on Sep 30 20:00											Hours of Missing Data: 0														
Percentiles: P ₁ = 2 P ₁₀ = 4 Q ₁ = 6 Median = 9 Q ₃ = 13 P ₉₀ = 19 P ₉₉ = 58											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-Sep	7	6	6	4	3	6	8	16	14	15	11	8	10	9	11	8	7	7	6	5	3	4	3	7	16
2-Sep	17	18	4	6	5	5	6	7	8	11	11	15	10	9	7	9	7	5	3	3	4	3	4	4	18
3-Sep	13	16	15	17	13	11	13	12	16	17	10	12	24	18	15	27	25	27	5	6	12	8	9	5	27
4-Sep	5	7	6	6	7	18	6	7	7	9	12	16	8	10	11	13	16	23	16	10	5	3	6	11	23
5-Sep	8	15	10	16	10	7	7	8	12	15	13	17	19	13	11	11	12	12	5	3	2	4	8	15	19
6-Sep	22	17	13	13	10	9	7	6	7	8	14	16	43	46	47	92	24	6	3	4	3	7	4	9	92
7-Sep	7	4	7	4	4	5	7	14	11	14	17	14	13	20	36	28	71	10	12	15	30	22	12	15	71
8-Sep	28	12	12	18	5	3	5	8	8	14	9	18	92	16	34	13	7	5	4	4	11	15	29	9	92
9-Sep	9	14	59	45	15	5	7	5	8	9	11	10	11	20	20	41	54	12	32	18	8	5	4	2	59
10-Sep	2	2	3	1	4	5	7	4	11	11	12	13	10	13	11	11	8	7	5	5	5	5	4	4	13
11-Sep	4	4	4	3	3	3	3	4	5	7	9	12	10	10	9	11	7	11	10	4	3	3	5	3	12
12-Sep	4	5	7	5	3	8	4	5	5	15	11	10	19	18	19	16	40	7	5	4	7	5	2	6	40
13-Sep	4	6	9	10	12	9	13	7	10	12	15	11	10	13	10	10	8	9	8	7	8	6	6	7	15
14-Sep	7	7	6	6	7	7	6	7	7	6	7	10	11	17	11	8	5	5	2	3	6	9	7	7	17
15-Sep	31	29	4	11	13	8	5	4	7	9	10	9	9	11	10	10	8	7	5	3	4	4	3	3	31
16-Sep	3	12	6	5	5	11	14	9	11	57	28	23	28	28	13	17	12	17	5	3	2	10	11	8	57
17-Sep	11	4	8	5	12	6	5	17	8	5	13	13	10	19	15	8	8	22	5	6	4	5	5	5	22
18-Sep	6	9	9	15	23	9	25	14	19	15	12	8	10	8	11	9	6	13	6	7	8	7	10	5	25
19-Sep	13	9	14	13	7	6	10	10	9	13	16	20	17	19	20	19	30	12	2	9	8	13	8	4	30
20-Sep	7	5	4	3	8	12	9	5	11	25	10	16	17	16	18	14	15	5	6	11	30	29	13	5	30
21-Sep	7	6	9	5	4	4	3	5	7	7	12	13	9	10	9	8	8	7	6	4	4	4	4	4	13
22-Sep	4	4	4	4	5	4	5	7	6	11	8	7	12	10	9	11	10	7	5	4	3	3	3	3	12
23-Sep	2	2	4	2	2	2	2	4	7	6	9	8	9	8	9	9	8	7	6	6	6	7	7	6	9
24-Sep	5	7	6	6	6	5	5	5	7	9	10	14	10	9	9	10	9	6	3	4	10	5	5	6	14
25-Sep	3	7	6	4	9	6	9	17	21	39	41	78	47	23	30	14	11	12	6	14	9	12	16	14	78
26-Sep	10	10	5	4	4	13	19	5	6	7	19	12	12	11	10	12	27	32	74	35	10	19	23	31	74
27-Sep	18	19	7	8	13	10	9	16	28	44	27	20	10	13	16	15	5	4	5	6	17	8	10	6	44
28-Sep	6	15	93	11	13	8	7	6	13	15	12	10	10	8	8	8	8	7	6	6	7	8	8	9	93
29-Sep	8	8	8	7	8	10	11	7	8	11	8	10	8	9	13	10	8	7	8	10	10	9	9	10	13
30-Sep	79	38	15	24	11	8	6	10	11	15	7	11	14	13	21	9	5	5	2	1	4	3	4	3	79
											Diurnal Maximum														





Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 4.2 km/h on Sep 21 14:00 Minimum Value: 0.1 km/h on Sep 30 03:00 Percentiles: $P_1 = 0.2$ $P_{10} = 0.5$ $Q_1 = 0.8$ Median = 1.4 $Q_3 = 2.0$ $P_{90} = 2.5$ $P_{99} = 3.5$																								Hours in Service: 720 Hours of Data: 720 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-Sep	0.8	0.6	1.0	0.7	0.9	1.1	1.4	1.2	1.2	1.7	2.2	3.0	3.1	3.2	3.4	3.4	3.9	3.1	2.7	2.0	1.5	1.2	1.2	0.7	3.9
2-Sep	0.6	0.9	0.7	1.2	1.5	1.3	1.2	1.5	1.7	1.7	1.6	1.4	2.2	2.0	2.4	2.4	2.3	1.9	1.2	0.8	1.0	1.1	1.1	1.0	2.4
3-Sep	0.6	0.7	0.8	0.8	1.1	1.2	1.3	1.2	1.3	1.3	1.5	1.1	0.8	1.3	1.9	1.5	1.1	0.5	0.8	0.8	1.8	1.6	2.4	2.2	2.4
4-Sep	2.3	1.3	1.6	1.6	2.3	2.4	3.1	3.2	3.0	3.1	2.6	2.3	2.3	2.4	2.0	2.0	1.7	1.3	0.7	0.8	0.7	0.6	0.6	0.6	3.2
5-Sep	0.7	0.7	1.1	1.0	1.4	1.5	1.7	1.6	1.4	1.5	1.8	2.2	2.0	2.1	2.1	2.1	2.1	1.8	1.6	1.2	1.2	1.1	1.3	0.5	2.2
6-Sep	0.7	0.9	0.9	1.3	1.7	1.8	1.8	1.4	1.4	1.4	1.4	1.1	0.7	1.0	0.9	1.0	1.3	1.6	0.9	0.4	0.7	0.6	0.4	0.5	1.8
7-Sep	0.3	0.7	0.7	0.6	0.6	0.6	0.7	0.9	1.3	1.2	1.4	1.5	1.5	1.7	0.9	0.7	1.0	0.7	0.5	0.7	0.5	0.7	0.3	0.3	1.7
8-Sep	0.8	0.8	0.9	0.9	1.1	1.3	1.0	1.2	1.3	1.4	1.7	1.6	1.5	1.8	1.6	1.2	1.2	1.3	1.0	0.8	0.5	0.6	0.2	0.2	1.8
9-Sep	0.3	0.2	0.2	0.2	0.2	0.4	0.6	1.2	1.4	1.5	1.7	1.7	1.7	1.7	1.4	1.1	1.0	0.7	0.4	0.9	1.2	0.8	1.0	1.1	1.7
10-Sep	1.0	0.9	0.4	0.6	0.6	0.7	0.5	1.0	1.4	1.6	1.6	1.7	2.2	2.2	2.1	2.2	2.1	2.2	2.0	2.2	2.6	2.5	2.1	2.7	2.7
11-Sep	2.6	2.6	2.2	1.9	2.0	1.9	1.8	2.0	2.1	2.4	2.7	3.0	3.6	3.5	3.3	3.5	3.3	2.8	1.9	2.0	1.5	1.5	1.2	1.3	3.6
12-Sep	0.9	0.6	0.6	1.0	1.0	0.9	1.2	1.5	1.7	1.6	1.4	1.3	1.4	1.3	1.2	1.0	1.0	1.0	0.7	0.9	1.1	0.9	0.4	0.5	1.7
13-Sep	0.6	0.6	0.5	0.8	1.0	0.8	0.7	0.9	1.0	1.1	2.0	2.6	3.0	3.2	3.0	3.3	3.1	3.0	3.0	3.1	2.2	2.1	2.2	2.2	3.3
14-Sep	1.9	2.0	1.9	1.9	1.7	1.9	2.0	2.0	2.5	2.5	2.6	2.6	2.3	2.0	2.6	2.6	2.6	2.0	1.0	0.5	0.4	0.4	0.4	0.3	2.6
15-Sep	0.3	0.4	0.6	1.0	1.0	1.3	1.7	2.0	1.7	1.7	1.7	2.1	2.3	2.3	2.7	2.3	2.3	2.2	1.9	2.1	2.2	2.1	2.1	2.0	2.7
16-Sep	1.8	1.3	1.1	1.1	1.1	1.2	0.8	0.5	0.8	1.3	1.2	1.6	1.8	1.8	2.0	1.9	1.5	1.6	1.7	1.0	0.8	1.0	0.9	0.7	2.0
17-Sep	1.3	1.3	0.7	0.8	0.7	1.0	0.8	0.8	1.4	2.5	1.9	1.7	2.3	2.2	2.1	1.8	1.3	1.5	0.8	0.8	0.7	0.6	0.6	0.6	2.5
18-Sep	0.4	0.6	0.7	0.8	1.1	1.3	1.1	1.2	1.3	1.1	2.1	2.4	2.6	2.2	2.7	1.5	1.8	1.1	1.2	1.0	1.2	0.7	0.9	0.6	2.7
19-Sep	0.7	0.8	0.6	1.3	1.3	1.0	1.1	1.6	1.4	1.8	2.0	2.2	2.3	2.0	1.7	1.4	1.3	0.9	0.7	0.6	0.6	0.4	0.5	0.5	2.3
20-Sep	0.8	0.7	0.3	0.3	0.3	0.2	0.2	0.3	0.6	1.2	1.6	1.7	1.8	1.7	1.7	1.6	1.2	1.0	1.1	0.9	0.5	0.4	0.5	0.5	1.8
21-Sep	0.8	0.9	1.3	1.4	1.7	1.6	1.4	1.5	1.7	1.7	1.9	3.6	4.0	4.2	3.8	3.6	3.5	2.7	1.9	1.8	1.9	1.7	1.6	2.0	4.2
22-Sep	1.7	1.6	1.4	1.3	1.1	1.0	1.3	1.5	2.1	2.1	3.3	3.3	3.1	2.7	2.9	2.8	2.4	2.5	1.6	1.9	2.0	1.5	1.8	1.6	3.3
23-Sep	1.4	1.1	1.3	1.7	1.6	1.7	1.7	1.8	2.0	2.3	2.5	2.7	3.2	3.0	3.0	2.9	2.7	2.4	2.1	2.3	2.2	2.4	2.4	2.8	3.2
24-Sep	2.9	3.0	2.7	2.5	2.4	2.5	2.2	1.7	1.7	1.8	1.8	1.6	1.8	1.8	1.4	1.1	0.9	0.8	0.7	0.9	0.9	0.9	0.6	0.7	3.0
25-Sep	0.4	0.5	0.7	0.3	0.6	0.6	0.6	0.9	1.2	1.3	1.4	1.4	1.6	1.6	1.5	1.5	1.4	1.7	1.2	1.3	1.8	2.5	2.1	2.0	2.5
26-Sep	2.3	2.4	2.1	2.2	1.9	1.9	0.9	1.1	1.6	1.6	2.1	2.5	2.4	1.8	1.4	1.1	0.9	0.5	0.5	1.3	0.8	0.4	0.6	0.4	2.5
27-Sep	0.2	0.2	0.5	0.4	0.6	0.5	0.5	0.6	1.0	1.1	1.3	1.5	1.7	1.8	1.9	2.0	2.0	1.2	0.7	0.4	0.3	0.4	0.4	0.4	2.0
28-Sep	0.3	0.2	0.4	0.3	0.5	0.6	0.5	0.8	0.8	1.2	1.5	1.6	1.7	1.7	2.0	2.1	2.2	2.4	2.0	2.0	2.0	2.0	2.0	1.9	2.4
29-Sep	2.3	1.8	1.6	1.6	1.4	1.4	1.0	1.1	1.4	1.7	2.1	2.0	2.0	2.0	1.7	1.6	1.6	2.0	1.4	1.5	1.5	1.3	1.2	0.8	2.3
30-Sep	0.2	0.2	0.1	0.2	0.4	0.5	0.6	0.6	0.5	0.7	0.9	1.0	0.9	1.0	1.0	0.9	0.8	0.5	0.4	0.4	0.4	0.5	0.8	0.5	1.0
Diurnal Maximum																									



Maximum Value: 1.7 km/h on Sep 23 13:00		Maximum Daily Average: 1.0 km/h on Sep 11		Hours in Service: 720																						
Minimum Value: -1.0 km/h on Sep 13 20:00		Minimum Daily Average: -0.5 km/h on Sep 1		Hours of Data: 719																						
Maximum Diurnal Average: 0.3 km/h at hour 9		Minimum Diurnal Average: 0.0 km/h at hour 22		Hours of Missing Data: 1																						
Monthly Average: 0.13 km/h		Percentiles: P ₁ = -0.7 P ₁₀ = -0.5 Q ₁ = -0.3 Median = 0.0 Q ₃ = 0.6 P ₉₀ = 0.9 P ₉₉ = 1.4		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-Sep	-0.5	-0.3	-0.5	-0.5	-0.7	-0.7	-0.6	-0.3	-0.2	-0.6	-0.2	-0.7	-0.4	-0.5	-0.4	-0.2	-0.6	-0.8	-0.4	-0.6	-0.7	-0.7	-0.7	-0.3	-0.5	-0.2
2-Sep	-0.3	-0.3	-0.4	-0.3	-0.3	-0.4	-0.6	-0.4	-0.3	-0.1	0.2	-0.1	0.0	-0.4	-0.5	-0.6	-0.6	-0.6	-0.5	-0.6	-0.6	-0.9	-0.5	-0.4	-0.4	0.2
3-Sep	-0.2	-0.3	-0.2	-0.1	0.0	0.1	0.4	0.7	0.4	0.4	0.5	0.6	0.0	0.5	-0.1	-0.3	-0.3	-0.2	-0.3	-0.4	-0.5	-0.3	-0.3	-0.5	0.0	0.7
4-Sep	-0.5	-0.5	-0.3	-0.2	-0.3	-0.5	-0.7	-0.5	-0.8	-0.7	-0.4	-0.3	-0.4	-0.2	-0.3	-0.5	-0.2	0.2	0.0	-0.3	-0.6	-0.7	-0.6	-0.5	-0.4	0.2
5-Sep	-0.4	-0.1	0.1	0.2	0.6	0.5	0.8	0.7	0.6	0.3	0.4	0.8	0.4	0.7	0.8	0.7	1.1	0.5	0.8	0.7	0.5	0.5	0.4	-0.1	0.5	1.1
6-Sep	0.2	0.8	0.3	1.6	0.8	0.6	0.1	0.3	UO	0.1	0.2	-0.3	0.0	0.0	0.2	0.0	0.1	-0.1	-0.4	-0.4	-0.5	-0.4	-0.5	-0.5	0.1	1.6
7-Sep	-0.5	-0.6	-0.6	-0.3	-0.5	-0.5	-0.4	-0.3	0.2	0.1	0.2	0.1	-0.1	0.8	0.1	0.1	-0.2	-0.1	-0.1	-0.2	-0.1	-0.1	-0.1	-0.3	-0.1	0.8
8-Sep	0.1	0.5	0.3	0.4	0.6	0.8	0.6	0.5	0.5	0.3	0.7	0.4	0.3	-0.6	0.2	-0.2	-0.3	-0.2	-0.1	-0.1	-0.2	0.0	0.1	0.1	0.2	0.8
9-Sep	0.1	0.0	0.0	0.0	0.1	0.0	0.2	0.6	0.7	0.7	0.2	1.0	0.5	0.4	-0.1	0.2	0.3	0.4	0.0	0.7	0.9	0.5	0.5	0.6	0.4	1.0
10-Sep	0.6	0.9	0.5	0.2	0.7	0.8	0.0	0.0	0.5	0.4	0.2	0.6	0.7	1.0	0.7	0.8	0.9	0.9	0.7	0.8	0.8	1.0	0.9	1.0	0.7	1.0
11-Sep	0.9	1.0	0.8	0.8	0.8	1.2	1.1	1.0	0.8	1.1	1.4	1.4	1.3	1.7	1.4	0.8	0.6	0.5	0.9	1.0	0.7	0.8	0.6	0.8	1.0	1.7
12-Sep	0.5	0.4	0.3	0.6	0.6	0.5	0.6	0.7	0.9	0.7	0.9	0.8	1.0	0.3	0.0	0.1	0.0	-0.2	-0.5	-0.6	-0.5	-0.6	-0.5	-0.4	0.2	1.0
13-Sep	-0.3	-0.2	-0.2	-0.1	0.1	0.0	-0.1	0.0	0.2	0.2	-0.2	-0.3	-0.7	-0.2	-0.4	-0.5	-0.1	-0.8	-0.8	-1.0	-0.7	-0.4	-0.5	-0.5	-0.3	0.2
14-Sep	-0.3	-0.2	-0.3	-0.3	-0.2	-0.4	-0.4	-0.2	-0.3	-0.2	-0.2	0.0	-0.2	-0.1	-0.2	-0.5	-0.6	-0.2	-0.3	-0.6	-0.5	-0.5	-0.4	-0.3	-0.3	0.0
15-Sep	-0.2	-0.1	0.2	0.3	0.4	0.5	1.0	1.0	1.0	0.6	0.7	0.9	1.1	1.2	0.4	0.9	0.9	0.9	1.0	1.3	1.2	1.1	1.0	1.0	0.8	1.3
16-Sep	0.9	0.6	0.6	0.6	0.7	0.4	-0.2	-0.2	0.0	0.0	0.4	0.0	0.3	0.8	-0.4	-0.4	-0.4	-0.1	-0.3	-0.5	-0.1	0.1	0.4	0.2	0.1	0.9
17-Sep	0.7	0.8	0.4	0.5	0.2	1.2	0.7	0.4	1.0	0.7	0.1	0.4	0.7	0.4	-0.3	0.0	-0.2	-0.1	-0.5	-0.5	-0.4	-0.5	-0.5	-0.4	0.2	1.2
18-Sep	-0.2	-0.2	-0.1	0.0	0.6	0.7	0.5	0.5	0.3	0.2	-0.6	-0.7	-0.4	0.0	-0.5	-0.4	-0.5	0.0	0.5	0.2	-0.2	-0.4	-0.3	-0.4	-0.1	0.7
19-Sep	0.0	0.1	-0.1	0.4	0.2	0.4	0.4	0.6	0.3	0.4	0.1	-0.2	-0.3	-0.1	-0.1	-0.6	-0.3	-0.1	-0.3	-0.4	-0.5	-0.3	-0.2	-0.3	0.0	0.6
20-Sep	-0.4	-0.4	-0.2	-0.3	-0.3	-0.2	-0.2	-0.1	0.3	0.6	-0.3	0.2	-0.5	0.7	0.1	0.2	-0.1	-0.5	-0.5	-0.3	-0.2	0.0	-0.3	0.0	-0.1	0.7
21-Sep	0.5	0.6	0.6	0.7	0.9	0.9	0.8	0.7	0.8	0.7	0.8	-0.2	-0.5	0.1	-0.3	-0.3	-0.3	-0.2	0.1	0.3	0.6	0.7	0.7	0.4	0.4	0.9
22-Sep	0.8	0.7	0.6	0.5	0.4	0.6	0.7	0.9	0.9	1.0	0.0	0.1	0.2	1.0	0.7	0.9	0.8	0.8	0.8	1.0	1.1	0.8	0.8	0.8	0.7	1.1
23-Sep	0.6	0.6	0.4	0.5	0.6	0.6	0.6	0.7	0.8	0.8	0.7	1.2	1.7	1.4	1.6	1.2	1.4	1.2	1.0	0.9	0.8	0.9	1.0	1.0	0.9	1.7
24-Sep	0.9	0.7	1.5	1.3	1.2	1.2	0.9	0.7	0.8	0.8	0.7	0.6	0.1	-0.2	-0.3	-0.3	-0.3	-0.1	0.0	0.1	-0.4	-0.6	-0.5	-0.5	0.3	1.5
25-Sep	-0.7	-0.7	-0.4	-0.2	-0.2	-0.4	-0.2	0.0	0.4	0.6	0.0	0.0	0.3	0.0	0.5	0.2	0.0	0.7	0.4	0.3	0.7	0.5	1.1	0.9	0.2	1.1
26-Sep	1.3	0.8	0.6	0.8	0.7	0.7	0.4	0.5	0.6	0.5	0.6	0.1	0.2	0.1	-0.2	0.0	-0.1	-0.1	0.0	0.8	-0.4	-0.4	-0.1	-0.3	0.3	1.3
27-Sep	-0.3	-0.3	-0.5	-0.4	-0.3	-0.3	-0.3	-0.3	-0.2	-0.2	0.3	-0.4	-0.3	-0.6	-0.4	-0.5	-0.7	-0.5	-0.5	-0.3	-0.3	-0.4	-0.2	-0.3	-0.3	0.3
28-Sep	-0.3	-0.1	-0.2	-0.3	-0.6	-0.2	0.0	0.2	0.0	-0.1	-0.3	-0.3	-0.3	-0.5	0.2	-0.2	-0.2	-0.1	-0.2	-0.2	-0.5	-0.6	-0.5	-1.0	-0.3	0.2
29-Sep	-0.4	-0.7	-0.3	-0.6	-0.3	-0.3	-0.2	-0.4	-0.3	-0.1	-0.6	-0.3	-0.6	-0.5	-0.4	-0.7	-0.5	-0.3	0.0	-0.1	0.0	0.2	-0.3	-0.2	-0.3	0.2
30-Sep	-0.1	-0.3	-0.2	-0.1	-0.2	-0.3	-0.4	-0.2	-0.2	0.0	0.1	0.0	0.2	0.2	0.3	0.2	0.3	0.4	0.4	0.4	0.3	0.4	0.4	0.3	0.1	0.4
																								Diurnal Average		
																								Diurnal Maximum		
UO - Unstable Operation																										



Summary of Hour Standard Deviations

Mannix - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0																				Hours in Service: 720					
Maximum Value: 4.1 km/h on Sep 23 13:00																				Hours of Data: 719					
Minimum Value: 0.1 km/h on Sep 30 04:00																				Hours of Missing Data: 1					
Percentiles: P ₁ = 0.2 P ₁₀ = 0.4 Q ₁ = 0.7 Median = 1.4 Q ₃ = 2.1 P ₉₀ = 2.6 P ₉₉ = 3.7																				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-Sep	0.6	0.4	0.5	0.6	0.6	1.1	1.3	1.2	1.5	1.9	2.8	3.2	3.2	3.5	3.6	3.6	4.1	3.3	2.8	2.1	1.4	1.4	0.8	0.7	4.1
2-Sep	0.8	0.9	0.6	1.1	1.6	1.3	1.2	1.2	1.7	1.6	2.1	2.0	2.7	2.4	2.6	2.5	2.3	2.0	1.2	0.7	1.0	0.8	1.0	0.9	2.7
3-Sep	0.6	0.7	0.8	0.5	0.5	0.5	0.9	1.1	1.2	1.3	1.2	1.1	1.0	1.2	1.9	1.6	1.2	0.4	0.3	0.8	1.4	1.3	2.1	1.7	2.1
4-Sep	2.0	1.3	1.5	1.5	2.3	2.3	2.9	3.1	2.9	2.8	2.5	2.4	2.3	2.4	2.3	2.6	2.0	1.7	0.9	0.3	0.3	0.5	0.7	0.8	3.1
5-Sep	0.7	0.4	0.5	0.4	0.6	0.7	1.0	1.4	1.7	1.7	2.1	2.8	2.5	2.6	2.5	2.5	2.6	1.7	1.6	1.1	1.0	0.8	0.8	0.5	2.8
6-Sep	0.6	1.0	1.2	1.4	1.9	2.0	1.5	1.5	UO	1.9	1.4	1.3	1.1	1.2	1.1	1.3	1.6	1.7	0.8	0.3	0.2	0.5	0.5	0.4	2.0
7-Sep	0.3	0.4	0.4	0.4	0.4	0.5	0.6	1.0	1.1	1.3	1.7	1.6	1.8	2.1	1.2	0.7	1.4	0.4	0.3	0.3	0.4	0.5	0.3	0.3	2.1
8-Sep	0.4	0.4	0.3	0.5	0.8	0.9	0.9	1.0	1.1	1.4	2.1	2.0	1.8	2.0	1.8	1.1	1.2	1.3	1.0	0.9	0.6	0.7	0.3	0.2	2.1
9-Sep	0.2	0.2	0.2	0.1	0.2	0.2	0.4	1.3	1.6	1.9	1.7	2.1	2.4	2.2	1.9	1.9	1.4	0.9	0.6	1.3	1.0	0.6	0.7	0.8	2.4
10-Sep	0.7	0.5	0.4	0.4	0.3	0.4	0.5	0.8	1.7	2.0	2.1	2.4	2.4	2.5	2.6	2.5	2.4	2.6	2.3	2.2	2.4	2.6	2.2	2.7	2.7
11-Sep	2.8	2.8	2.3	2.2	2.1	1.9	1.8	2.1	2.3	2.7	3.3	3.5	3.7	3.9	3.3	3.2	3.0	2.7	1.8	2.2	1.5	1.1	0.9	0.9	3.9
12-Sep	0.6	0.6	0.7	0.8	0.7	0.5	0.9	1.2	1.6	1.9	1.7	1.7	1.7	1.7	1.4	1.2	1.0	1.1	0.8	0.8	1.0	0.6	0.4	0.6	1.9
13-Sep	0.4	0.5	0.4	0.5	0.6	0.5	0.6	0.6	1.0	1.2	2.2	2.9	3.1	3.7	3.6	3.7	3.6	3.2	3.2	3.3	2.5	2.4	2.3	2.3	3.7
14-Sep	2.2	2.0	1.9	1.8	1.6	1.7	1.8	1.9	2.2	2.2	2.3	2.5	2.6	2.4	2.8	2.6	2.3	1.9	1.0	0.4	0.4	0.3	0.5	0.3	2.8
15-Sep	0.2	0.4	0.3	0.5	0.8	1.2	1.8	1.7	1.8	1.7	1.7	2.4	2.5	2.7	2.5	2.6	2.3	2.0	1.6	2.1	2.0	2.0	2.1	2.0	2.7
16-Sep	1.7	1.4	0.9	0.6	0.7	0.7	0.6	0.7	0.8	1.4	1.9	2.1	2.2	2.3	2.5	2.4	1.7	1.3	1.0	0.4	0.4	0.6	0.6	0.4	2.5
17-Sep	0.8	0.9	0.4	0.4	0.3	0.6	0.4	1.1	1.5	2.4	1.9	2.2	2.5	2.4	2.4	1.8	1.0	1.4	0.6	0.5	0.9	0.5	0.4	0.5	2.5
18-Sep	0.3	0.7	0.6	0.6	0.8	0.7	1.0	0.8	0.9	1.3	2.2	2.6	2.9	2.5	2.9	1.4	1.4	1.0	0.7	0.7	0.9	0.8	0.6	0.7	2.9
19-Sep	0.7	0.8	0.7	0.7	0.6	0.5	0.8	1.1	1.2	1.9	2.2	2.3	2.4	2.4	2.2	1.8	1.6	0.8	0.2	0.2	0.3	0.4	0.8	0.6	2.4
20-Sep	0.7	0.7	0.5	0.3	0.3	0.2	0.2	0.2	0.8	1.5	2.0	2.3	2.1	2.3	2.3	1.9	1.3	0.7	1.0	0.7	0.4	0.4	0.3	0.3	2.3
21-Sep	0.4	0.6	1.1	1.0	1.7	1.6	1.4	1.4	1.6	1.5	1.8	3.4	3.9	3.9	3.7	3.5	2.9	2.4	1.5	1.5	1.7	1.4	1.5	1.7	3.9
22-Sep	1.5	1.6	1.0	0.9	0.9	0.7	0.7	1.2	2.0	2.4	2.8	3.0	3.0	3.1	2.9	2.7	2.4	2.5	1.5	1.6	1.7	1.6	1.9	1.7	3.1
23-Sep	1.4	0.8	1.4	1.7	1.4	1.4	1.6	1.7	2.1	2.6	2.8	3.3	4.1	3.6	3.6	3.5	3.1	2.6	2.2	2.5	2.7	2.7	2.8	3.1	4.1
24-Sep	3.1	3.2	3.2	3.1	2.5	2.8	2.4	1.9	1.9	1.9	2.0	1.8	1.7	1.8	1.4	1.0	0.8	0.3	0.3	0.4	0.6	0.8	0.5	0.5	3.2
25-Sep	0.4	0.5	0.4	0.3	0.7	0.4	0.4	0.7	1.3	1.7	1.6	1.9	2.0	1.8	1.8	1.7	1.3	1.9	1.5	1.8	2.4	3.2	2.8	2.6	3.2
26-Sep	2.9	2.7	2.0	2.1	1.6	2.0	1.1	0.8	1.3	1.6	2.4	2.5	2.5	1.7	1.2	1.0	0.7	0.6	0.5	1.2	1.0	0.3	0.5	0.5	2.9
27-Sep	0.2	0.3	0.3	0.2	0.4	0.6	0.4	0.4	1.1	1.3	1.6	1.9	2.0	1.9	2.0	2.1	1.9	1.1	0.5	0.3	0.5	0.3	0.3	0.3	2.1
28-Sep	0.3	0.2	0.3	0.3	0.3	0.5	0.6	1.0	0.9	1.5	1.8	1.6	1.8	1.9	2.2	2.1	2.1	2.3	2.0	1.9	1.9	2.2	2.3	2.1	2.3
29-Sep	2.4	2.0	1.7	1.4	1.6	1.6	1.1	1.2	1.4	1.8	2.3	2.3	2.2	2.2	2.0	1.8	1.6	1.8	1.6	1.6	1.6	1.4	1.3	1.0	2.4
30-Sep	0.3	0.2	0.1	0.1	0.2	0.3	0.4	0.3	0.3	0.5	0.8	1.0	1.1	1.3	1.3	1.1	0.9	0.5	0.3	0.3	0.3	0.5	0.7	0.4	1.3
Diurnal Maximum																									
UO - Unstable Operation																									



Maximum Value: 2.0 km/h on Sep 6 04:00 Maximum Daily Average: 0.6 km/h on Sep 22																				Hours in Service: 720 Hours of Data: 720						
Minimum Value: -0.8 km/h on Sep 6 07:00 Minimum Daily Average: 0.0 km/h on Sep 10 Maximum Diurnal Average: 0.4 km/h at hour 14 Minimum Diurnal Average: 0.1 km/h at hour 21 Monthly Average: 0.21 km/h Percentiles: P ₁ = -0.5 P ₁₀ = -0.2 Q ₁ = 0.0 Median = 0.2 Q ₃ = 0.4 P ₉₀ = 0.7 P ₉₉ = 1.0																				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-Sep	0.0	0.2	0.1	0.0	-0.1	-0.3	0.1	0.3	0.1	-0.5	0.0	-0.3	0.6	0.1	0.3	0.4	0.0	-0.2	0.0	0.0	-0.2	-0.2	-0.1	0.0	0.0	0.6
2-Sep	0.1	0.4	0.0	0.4	0.5	0.2	0.0	0.3	0.4	0.5	0.7	0.1	0.5	0.3	0.1	0.1	0.0	0.1	0.0	0.0	-0.1	-0.2	0.1	0.3	0.2	0.7
3-Sep	0.3	0.0	0.0	0.0	0.0	0.1	0.4	0.8	0.3	0.2	0.5	0.5	0.4	0.4	-0.1	0.1	0.1	0.2	0.2	0.2	0.5	0.5	0.5	0.5	0.3	0.8
4-Sep	0.6	0.3	0.3	0.5	0.4	0.5	0.0	0.3	-0.4	0.0	0.8	0.3	0.6	0.7	0.1	-0.1	0.4	0.7	0.4	0.1	-0.2	-0.1	-0.1	-0.2	0.3	0.8
5-Sep	-0.1	0.0	0.0	0.0	0.4	0.4	0.6	0.5	0.4	0.0	0.1	0.9	0.0	0.2	0.3	0.3	0.9	0.6	0.4	0.3	0.0	0.5	0.5	0.0	0.3	0.9
6-Sep	0.3	1.1	0.5	2.0	0.3	-0.2	-0.8	-0.2	-0.7	0.2	0.3	-0.1	0.2	0.2	0.5	0.1	0.5	0.4	0.0	0.0	-0.1	0.0	-0.1	0.0	0.2	2.0
7-Sep	-0.1	0.0	-0.1	0.1	-0.1	0.0	-0.1	-0.1	0.3	-0.1	0.0	-0.2	-0.3	0.8	0.0	0.1	0.3	0.1	0.0	0.0	0.1	0.1	0.1	0.2	0.0	0.8
8-Sep	0.1	0.3	0.2	0.3	0.7	1.0	0.8	0.5	0.6	0.1	0.4	0.3	0.6	-0.1	0.7	0.1	-0.1	0.0	0.2	0.3	0.0	0.2	0.3	0.3	0.3	1.0
9-Sep	0.3	0.2	0.2	0.2	0.2	0.4	0.4	0.4	0.5	0.5	0.1	0.9	0.5	0.4	-0.3	0.6	0.8	0.6	0.5	0.9	0.2	0.1	-0.1	0.1	0.4	0.9
10-Sep	0.2	0.0	-0.1	-0.3	0.1	0.1	0.0	-0.1	0.0	-0.1	-0.1	0.1	0.4	0.5	0.1	0.0	0.3	-0.1	-0.3	-0.4	-0.3	0.1	0.0	-0.1	0.0	0.5
11-Sep	-0.1	-0.1	-0.2	-0.2	0.0	0.6	0.5	0.1	0.2	0.6	0.7	0.8	0.8	1.4	1.2	0.1	0.5	0.4	0.5	0.2	-0.1	0.0	0.0	0.3	0.3	1.4
12-Sep	0.3	0.1	0.3	0.6	0.5	0.4	0.6	0.7	0.8	0.6	0.7	1.1	1.1	0.2	-0.1	0.1	0.2	0.3	0.0	-0.1	0.0	-0.4	-0.1	-0.1	0.3	1.1
13-Sep	0.0	0.0	-0.1	0.0	0.1	0.0	-0.1	0.0	0.3	0.7	0.1	0.3	0.1	0.6	0.7	0.4	0.8	-0.1	0.4	0.1	-0.1	0.2	0.0	0.2	0.2	0.8
14-Sep	0.3	0.5	0.5	0.3	0.4	0.4	0.5	0.6	0.7	0.7	0.8	0.7	0.5	0.5	0.7	0.2	0.1	0.6	0.4	0.2	0.3	0.0	0.1	0.3	0.4	0.8
15-Sep	0.2	0.1	0.4	0.2	0.4	0.3	0.8	0.8	0.9	0.5	0.3	0.2	0.8	0.8	0.6	0.9	0.8	0.7	0.8	0.8	0.8	0.6	0.3	0.4	0.6	0.9
16-Sep	0.1	0.2	0.1	0.5	0.4	0.3	0.0	0.1	0.1	0.1	0.6	0.4	0.9	0.9	0.0	0.2	-0.1	0.2	-0.1	-0.5	-0.3	0.0	0.3	0.1	0.2	0.9
17-Sep	0.5	0.7	0.4	0.2	0.3	0.3	0.1	0.4	0.7	-0.2	-0.4	0.0	0.5	0.5	-0.2	0.1	-0.1	0.2	-0.1	-0.2	0.0	0.0	-0.1	-0.1	0.2	0.7
18-Sep	0.2	0.0	-0.1	0.0	0.3	0.6	0.4	0.4	0.1	0.2	-0.1	0.1	0.7	0.8	0.3	-0.1	-0.2	0.0	0.3	0.1	-0.2	0.0	-0.2	-0.2	0.1	0.8
19-Sep	0.0	0.0	0.0	0.1	-0.1	0.1	0.1	0.3	0.3	0.5	0.3	-0.2	-0.1	0.4	0.2	-0.6	-0.2	0.1	-0.1	-0.1	-0.2	0.2	0.1	0.2	0.0	0.5
20-Sep	-0.1	-0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.4	0.9	-0.3	0.4	-0.3	1.0	0.4	0.3	0.1	-0.2	-0.2	0.1	0.1	0.2	0.2	0.3	0.2	1.0
21-Sep	0.3	0.4	0.6	0.7	0.8	1.0	0.8	0.6	0.7	0.5	0.6	-0.1	-0.4	0.4	-0.1	-0.3	-0.3	-0.2	0.1	0.2	0.3	0.5	0.4	0.4	0.3	1.0
22-Sep	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.8	0.8	0.8	0.0	-0.1	0.3	1.0	0.6	1.1	0.8	0.6	0.9	0.9	0.8	0.3	0.3	0.4	0.6	1.1
23-Sep	0.1	0.6	-0.1	-0.3	-0.2	-0.3	-0.2	-0.2	-0.1	-0.1	-0.5	0.0	0.4	0.5	0.9	0.6	0.9	0.6	0.1	-0.1	0.2	-0.2	-0.2	-0.4	0.1	0.9
24-Sep	-0.5	-0.6	0.6	0.2	0.6	0.3	0.1	0.0	0.4	0.8	0.7	0.3	0.1	0.0	0.0	0.0	0.0	0.1	0.0	-0.2	0.1	-0.1	-0.1	-0.2	0.1	0.8
25-Sep	-0.4	-0.2	-0.1	0.0	-0.1	-0.2	-0.1	0.1	0.3	0.8	0.0	0.5	0.5	-0.1	0.6	0.3	-0.1	0.7	0.1	0.1	0.0	-0.1	1.0	0.6	0.2	1.0
26-Sep	0.6	0.1	-0.5	-0.4	-0.4	-0.2	0.1	-0.1	0.0	0.3	0.4	0.1	0.2	0.2	0.0	0.2	0.2	0.1	0.2	0.6	0.1	0.1	0.2	0.1	0.1	0.6
27-Sep	0.1	0.1	0.3	0.3	0.4	0.2	0.3	0.1	0.0	-0.1	0.4	-0.2	0.0	0.1	0.3	0.1	-0.2	-0.1	-0.1	-0.1	0.1	0.1	0.2	0.0	0.1	0.4
28-Sep	0.0	-0.1	0.1	0.2	0.1	0.0	0.1	0.3	0.3	0.1	0.1	0.0	0.2	-0.3	0.5	0.2	0.3	0.1	0.3	0.1	0.0	-0.1	-0.1	-0.7	0.1	0.5
29-Sep	0.1	-0.1	0.2	-0.1	0.2	0.3	0.2	0.1	0.2	0.4	-0.5	-0.2	-0.5	0.0	-0.1	-0.2	-0.1	0.2	0.5	0.4	0.4	0.7	-0.1	0.1	0.1	0.7
30-Sep	0.1	-0.1	0.0	0.1	0.0	0.0	0.0	0.2	0.1	0.2	0.1	0.0	0.3	0.1	0.3	0.0	0.0	0.4	0.5	0.4	0.1	0.2	0.4	0.4	0.2	0.5
																								Diurnal Average		
																								Diurnal Maximum		



Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0																				Hours in Service: 720					
Maximum Value: 4.1 km/h on Sep 1 17:00																				Hours of Data: 720					
Minimum Value: 0.1 km/h on Sep 30 06:00																				Hours of Missing Data: 0					
Percentiles: P ₁ = 0.2 P ₁₀ = 0.4 Q ₁ = 0.7 Median = 1.3 Q ₃ = 2.1 P ₉₀ = 2.8 P ₉₉ = 3.9																				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-Sep	0.5	0.5	0.4	0.6	0.5	1.0	1.0	1.1	1.6	1.8	2.6	3.0	3.2	3.5	3.9	3.6	4.1	3.5	2.8	2.0	1.3	1.4	0.7	0.9	4.1
2-Sep	1.1	0.9	0.6	1.2	1.6	1.3	1.2	1.3	1.9	1.6	2.1	2.1	2.7	2.4	2.7	2.4	2.0	1.6	0.7	0.5	0.8	0.7	1.1	1.2	2.7
3-Sep	0.9	0.8	1.0	0.8	0.7	0.6	0.7	0.7	1.0	1.1	1.0	0.9	1.0	0.9	1.9	1.9	1.3	0.4	0.2	0.9	1.5	1.4	2.1	1.5	2.1
4-Sep	1.8	1.2	1.3	1.5	2.3	2.3	2.8	3.0	2.9	3.0	2.8	2.3	2.3	2.8	2.6	2.9	2.3	1.9	1.1	0.3	0.2	0.2	0.5	1.0	3.0
5-Sep	0.7	0.5	0.7	0.6	0.7	0.6	0.7	1.1	1.4	1.5	2.1	3.1	2.6	2.8	2.7	2.7	2.5	1.4	1.5	0.8	0.6	0.6	0.7	0.7	3.1
6-Sep	0.8	1.4	1.5	1.9	2.3	2.4	1.6	1.3	1.3	1.3	1.4	1.4	1.1	1.2	1.3	1.4	1.6	1.7	0.6	0.5	0.3	0.5	0.3	0.5	2.4
7-Sep	0.4	0.3	0.3	0.4	0.4	0.5	0.5	0.9	0.9	1.0	1.7	1.6	2.1	2.4	1.5	0.7	1.7	0.4	0.3	0.3	0.5	0.6	0.3	0.3	2.4
8-Sep	0.3	0.4	0.3	0.7	0.5	0.5	0.7	0.6	0.6	1.2	1.9	2.0	2.0	2.3	2.0	0.9	1.2	1.1	0.7	0.6	0.6	1.1	0.5	0.3	2.3
9-Sep	0.3	0.4	0.2	0.3	0.4	0.3	0.4	1.3	1.6	1.7	1.6	2.2	2.6	2.4	2.0	2.1	1.7	1.0	0.8	1.4	1.2	0.4	0.5	0.5	2.6
10-Sep	0.4	0.5	0.5	0.6	0.6	0.9	1.0	0.7	1.9	1.9	2.0	2.4	2.7	2.7	3.0	2.7	2.4	2.4	2.2	2.0	2.0	2.2	1.7	2.2	3.0
11-Sep	2.3	2.2	1.8	1.5	1.4	1.4	1.5	1.6	2.0	2.5	3.2	3.5	3.8	4.0	3.3	3.0	2.9	2.5	1.5	1.7	1.0	0.7	0.7	0.6	4.0
12-Sep	0.6	0.7	0.8	0.9	0.8	0.6	0.7	1.1	1.2	2.0	1.6	1.8	1.9	1.8	1.5	1.2	1.0	1.1	1.0	0.7	0.8	0.5	0.5	0.7	2.0
13-Sep	0.5	0.8	0.5	0.6	0.8	0.7	0.8	0.7	1.1	1.4	2.2	3.1	3.3	3.9	3.9	3.9	3.7	3.0	3.6	3.4	2.6	2.3	2.2	2.2	3.9
14-Sep	2.1	2.1	2.0	1.7	1.6	1.7	1.8	1.9	2.3	2.2	2.6	2.7	2.8	2.9	3.1	2.7	2.2	1.9	0.9	0.4	0.4	0.3	0.6	0.4	3.1
15-Sep	0.3	0.4	0.3	0.3	0.5	0.6	1.0	1.1	1.6	1.5	1.4	2.1	2.7	2.9	2.9	2.5	2.2	1.7	1.3	1.6	1.5	1.4	1.6	1.4	2.9
16-Sep	0.9	0.9	0.8	0.6	0.5	0.7	0.8	0.9	1.0	1.3	2.0	2.5	2.5	2.5	2.7	2.6	1.8	1.2	0.8	0.4	0.3	0.7	0.7	0.6	2.7
17-Sep	0.6	0.6	0.4	0.4	0.3	1.0	0.8	1.3	1.8	1.9	1.8	2.3	2.6	2.7	2.3	1.9	0.9	1.5	0.5	0.5	1.0	0.6	0.4	0.6	2.7
18-Sep	0.6	0.9	0.8	0.8	0.6	0.6	0.7	0.6	0.7	1.1	2.2	2.6	3.1	2.6	2.8	1.3	1.2	0.9	0.6	0.8	0.7	1.0	0.7	0.7	3.1
19-Sep	0.8	1.1	0.9	0.7	0.6	0.7	1.0	0.8	1.0	1.9	2.4	2.4	2.8	2.9	2.7	2.0	1.8	0.8	0.2	0.2	0.4	0.5	0.9	0.7	2.9
20-Sep	0.8	0.8	0.5	0.4	0.2	0.2	0.3	0.2	0.8	1.6	1.8	2.6	2.3	2.7	2.7	2.3	1.5	0.6	0.9	0.5	0.5	0.6	0.3	0.2	2.7
21-Sep	0.2	0.3	0.6	0.7	1.0	1.0	0.9	1.0	1.2	1.1	1.7	3.5	3.7	4.0	3.8	3.5	2.9	2.3	1.4	1.2	1.5	1.5	1.5	1.6	4.0
22-Sep	1.5	1.4	1.1	1.1	1.2	0.9	0.8	0.9	1.8	2.1	3.0	3.0	3.0	3.3	2.7	2.7	2.1	2.2	1.4	1.2	1.3	1.2	1.5	1.3	3.3
23-Sep	1.0	0.9	0.8	1.0	0.7	0.8	1.0	1.2	1.9	2.4	3.0	3.2	4.0	3.3	3.8	3.3	3.2	2.3	2.0	2.4	2.5	2.8	2.8	2.8	4.0
24-Sep	2.6	3.0	2.9	2.9	2.5	2.5	2.1	1.7	1.9	2.0	2.1	1.8	2.0	1.7	1.3	0.8	0.6	0.2	0.3	0.4	0.7	0.9	0.5	0.3	3.0
25-Sep	0.3	0.3	0.5	0.3	0.9	0.5	0.4	0.7	1.2	1.8	1.5	2.2	2.1	2.0	2.0	1.8	1.2	2.5	1.4	2.5	3.4	4.0	3.3	2.9	4.0
26-Sep	3.5	3.2	1.8	1.9	1.5	1.8	1.1	0.8	0.9	1.3	2.4	2.7	2.8	1.8	1.2	1.0	0.6	0.7	0.7	1.9	1.2	0.4	0.6	0.5	3.5
27-Sep	0.3	0.3	0.3	0.4	0.4	0.5	0.4	0.5	1.0	1.3	1.8	2.0	2.1	2.1	2.0	2.1	1.8	1.1	0.4	0.5	0.5	0.3	0.3	0.3	2.1
28-Sep	0.3	0.3	0.3	0.3	0.3	0.5	0.5	0.9	0.9	1.5	1.7	1.8	1.9	1.8	2.0	2.0	1.9	2.5	1.8	1.8	1.9	2.2	2.3	2.1	2.5
29-Sep	2.3	2.0	1.9	1.5	1.5	1.7	1.0	1.1	1.4	2.1	2.2	2.3	2.2	2.4	2.0	1.8	1.6	1.8	1.8	1.7	1.7	1.6	1.3	1.0	2.4
30-Sep	0.4	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.3	0.3	0.6	1.1	1.2	1.1	1.5	1.2	0.8	0.4	0.3	0.2	0.3	0.3	0.4	0.2	1.5
	Diurnal Maximum																								



Maximum Value: 2.2 km/h on Sep 6 04:00		Maximum Daily Average: 0.3 km/h on Sep 28		Hours in Service: 720																							
Minimum Value: -1.5 km/h on Sep 21 13:00		Minimum Daily Average: -0.7 km/h on Sep 1		Hours of Data: 720																							
Maximum Diurnal Average: 0.1 km/h at hour 8		Minimum Diurnal Average: -0.2 km/h at hour 16		Hours of Missing Data: 0																							
Monthly Average: -0.07 km/h		Percentiles: P ₁ = -1.2 P ₁₀ = -0.6 Q ₁ = -0.4 Median = -0.1 Q ₃ = 0.2 P ₉₀ = 0.5 P ₉₉ = 1.0		Hours of Calibration: 0																							
				Percent Operational Time: 100.0																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Sep	-0.4	-0.1	-0.4	-0.4	-0.7	-0.8	-0.5	-0.1	-0.4	-0.9	-0.7	-1.2	-0.3	-0.9	-0.7	-0.5	-1.2	-1.4	-1.1	-0.9	-1.1	-1.1	-1.0	-0.6	-0.7	-0.1	
2-Sep	-0.3	0.1	-0.3	-0.2	-0.1	-0.4	-0.4	-0.2	0.1	0.0	0.2	-0.3	-0.1	-0.1	-0.6	-0.6	-0.7	-0.5	-0.5	-0.6	-0.7	-0.9	-0.5	-0.3	-0.3	0.2	
3-Sep	0.0	-0.3	-0.5	-0.3	-0.3	-0.4	-0.2	0.4	-0.2	-0.1	-0.1	0.0	0.3	0.0	-0.8	-0.4	0.0	0.1	-0.1	-0.2	0.3	0.5	0.5	0.2	-0.1	0.5	
4-Sep	0.1	-0.4	-0.3	0.1	-0.2	0.2	0.1	0.4	-0.3	0.0	0.7	0.2	0.2	0.2	-0.6	-0.6	0.1	0.5	0.1	-0.3	-0.6	-0.6	-0.7	-0.8	-0.1	0.7	
5-Sep	-0.5	-0.4	-0.5	-0.4	-0.1	-0.2	0.0	-0.1	0.0	-0.1	0.0	0.6	-0.1	0.0	0.0	0.1	0.8	0.2	0.2	0.1	0.1	0.1	-0.2	-0.5	0.0	0.8	
6-Sep	0.0	1.2	0.5	2.2	-0.1	-0.4	-1.3	0.0	-0.7	0.2	-0.1	-0.5	0.0	-0.2	0.3	-0.2	0.2	-0.2	-0.5	-0.5	-0.6	-0.5	-0.5	-0.5	-0.1	2.2	
7-Sep	-0.4	-0.5	-0.6	-0.2	-0.5	-0.4	-0.5	-0.5	-0.1	-0.3	-0.1	-0.3	-0.4	0.8	-0.2	-0.1	0.0	-0.2	-0.2	-0.5	-0.2	-0.2	-0.2	-0.1	-0.3	0.8	
8-Sep	-0.1	-0.1	-0.1	-0.2	0.0	0.2	0.1	0.1	0.4	-0.1	0.3	0.1	0.5	-0.6	0.4	0.2	0.1	0.5	0.7	0.8	0.2	0.2	0.2	0.0	0.2	0.8	
9-Sep	0.1	0.1	0.1	0.0	0.0	0.0	0.3	0.6	0.7	0.3	-0.3	0.6	0.2	0.0	-0.7	0.5	0.6	0.7	0.6	1.0	0.3	0.4	0.4	0.2	0.3	1.0	
10-Sep	0.3	0.7	0.6	0.2	0.1	-0.2	0.0	0.0	-0.2	-0.3	-0.3	-0.3	0.2	0.2	0.0	-0.1	0.4	0.2	0.2	0.0	0.3	0.6	0.4	0.5	0.1	0.7	
11-Sep	0.6	0.5	0.5	0.3	0.3	0.7	0.4	0.2	0.2	0.4	0.7	0.5	0.3	0.9	0.8	-0.9	-0.3	-0.5	0.1	0.4	0.3	0.4	0.3	0.1	0.3	0.9	
12-Sep	0.1	0.0	-0.2	0.0	-0.3	-0.2	0.1	0.1	0.1	0.4	0.6	0.8	0.9	-0.1	-0.4	-0.1	-0.1	-0.1	-0.4	-0.7	-0.7	-1.0	-0.8	-0.6	-0.1	0.9	
13-Sep	-0.5	-0.3	-0.3	-0.4	-0.3	-0.5	-0.5	-0.4	-0.1	0.2	-0.4	-0.3	-0.8	-0.3	-0.1	-0.6	-0.1	-1.1	-0.5	-0.9	-0.8	-0.7	-0.8	-0.5	-0.5	0.2	
14-Sep	-0.3	0.0	-0.1	-0.2	-0.1	-0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.2	0.3	-0.5	-0.5	0.1	-0.1	-0.2	0.1	-0.3	-0.2	0.0	0.0	0.3	
15-Sep	0.1	-0.2	-0.1	-0.2	0.0	-0.1	0.3	0.1	0.4	0.1	0.1	0.0	0.6	0.7	0.0	0.4	0.3	-0.1	0.1	0.4	0.3	0.3	0.2	0.3	0.2	0.7	
16-Sep	0.5	0.6	0.1	-0.1	-0.2	-0.3	-0.4	-0.3	-0.3	-0.1	0.4	-0.1	0.5	0.6	-0.6	-0.4	-0.7	-0.5	-1.0	-1.2	-0.9	-0.6	-0.3	-0.4	-0.2	0.6	
17-Sep	0.0	0.2	-0.1	0.3	0.0	0.2	0.0	0.3	0.4	-0.7	-0.4	-0.2	-0.1	0.0	-0.8	-0.4	-0.6	-0.4	-0.6	-0.7	-0.6	-0.6	-0.7	-0.5	-0.2	0.4	
18-Sep	-0.1	-0.4	-0.4	-0.4	0.0	0.1	0.0	-0.1	-0.3	-0.1	-0.8	-0.6	0.1	0.2	-0.5	-0.8	-0.9	-0.5	-0.2	-0.6	-1.1	-0.7	-0.7	-0.8	-0.4	0.2	
19-Sep	-0.5	-0.5	-0.4	-0.5	-0.7	-0.5	-0.5	-0.2	-0.2	-0.1	-0.3	-0.9	-0.6	-0.2	-0.4	-1.1	-0.6	-0.3	-0.5	-0.5	-0.7	-0.2	0.1	0.1	-0.4	0.1	
20-Sep	-0.3	0.0	0.1	0.0	0.1	0.0	0.0	-0.1	0.0	0.7	-0.2	0.5	-0.3	1.1	0.5	0.5	0.2	-0.1	0.0	0.4	0.1	0.1	0.0	-0.1	0.1	1.1	
21-Sep	-0.2	-0.1	-0.1	0.0	0.6	0.4	0.1	0.0	0.3	0.1	0.2	-1.0	-1.5	-0.5	-1.0	-1.3	-1.3	-1.0	-0.6	-0.5	-0.4	-0.2	-0.4	-0.4	-0.4	0.6	
22-Sep	-0.2	-0.1	-0.1	-0.4	-0.3	-0.2	-0.1	0.2	0.3	0.2	-0.8	-0.9	-0.3	0.4	-0.1	0.4	0.4	-0.1	0.2	0.3	0.3	0.2	0.2	0.1	0.0	0.4	
23-Sep	0.1	0.2	0.4	0.6	0.7	0.8	0.4	0.7	0.2	0.4	-0.2	0.3	0.6	0.0	0.6	0.4	0.5	0.3	0.1	0.2	0.3	0.0	0.1	0.0	0.3	0.8	
24-Sep	0.1	-0.1	0.6	0.3	0.5	0.4	0.4	0.2	0.2	0.3	0.2	0.3	-0.1	-0.5	-0.6	-0.4	-0.4	-0.4	-0.4	-0.6	-0.8	-0.4	-0.6	-0.9	-0.1	0.6	
25-Sep	-1.2	-0.8	-0.6	-0.4	-0.5	-0.6	-0.5	-0.3	-0.1	0.5	-0.3	0.4	0.3	-0.1	0.5	0.5	0.2	1.2	0.7	0.2	0.3	0.4	1.0	0.8	0.1	1.2	
26-Sep	0.6	0.0	-0.3	0.0	-0.1	0.3	0.0	0.3	0.5	0.1	0.0	-0.5	-0.4	-0.3	-0.4	-0.3	-0.2	-0.3	0.1	0.9	-0.3	-0.2	-0.1	-0.3	0.0	0.9	
27-Sep	-0.1	0.0	0.0	0.1	0.2	0.0	0.0	-0.2	-0.3	-0.5	0.1	-0.5	-0.5	-0.4	-0.2	-0.7	-1.0	-0.7	-0.7	-0.6	-0.2	-0.2	0.1	0.0	-0.3	0.2	
28-Sep	0.1	-0.2	0.0	-0.1	0.0	0.0	0.2	0.6	0.3	0.2	0.1	0.1	0.4	-0.1	1.0	0.8	0.9	0.9	1.1	0.7	0.6	0.3	0.2	-0.4	0.3	1.1	
29-Sep	0.7	0.3	0.6	0.3	0.6	0.5	0.2	0.1	0.2	0.4	-0.4	-0.1	-0.3	0.1	-0.1	-0.1	0.2	0.6	0.7	0.8	0.7	1.0	0.1	0.2	0.3	1.0	
30-Sep	0.0	-0.3	-0.2	-0.1	-0.2	-0.3	-0.3	-0.1	-0.1	-0.1	-0.2	-0.3	0.0	-0.2	0.0	-0.2	-0.1	0.0	0.0	0.0	0.1	0.0	-0.1	-0.1	-0.1	0.1	0.1
																								Diurnal Average			
																								Diurnal Maximum			



Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 4.3 km/h on Sep 21 14:00 Minimum Value: 0.1 km/h on Sep 3 19:00 Percentiles: P ₁ = 0.2 P ₁₀ = 0.3 Q ₁ = 0.7 Median = 1.2 Q ₃ = 2.1 P ₉₀ = 2.9 P ₉₉ = 4.0																						Hours in Service: 720 Hours of Data: 720 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-Sep	0.5	0.5	0.3	0.6	0.5	0.9	0.8	1.1	1.7	1.9	2.8	3.0	3.4	3.8	4.2	3.8	4.2	3.5	2.9	2.0	1.2	1.3	0.7	1.0	4.2
2-Sep	1.2	0.9	0.5	1.2	1.6	1.4	1.1	1.3	1.9	1.6	2.1	2.1	2.7	2.5	2.7	2.5	2.0	1.5	0.5	0.4	0.7	0.6	1.1	1.2	2.7
3-Sep	0.9	0.9	1.1	0.8	0.7	0.6	0.7	0.6	0.8	1.2	1.0	0.9	1.2	0.9	1.9	1.9	1.3	0.3	0.1	0.9	1.5	1.4	2.1	1.4	2.1
4-Sep	1.8	1.1	1.3	1.5	2.2	2.3	2.7	3.0	3.0	3.1	3.0	2.3	2.3	3.0	2.7	3.2	2.6	2.1	1.1	0.3	0.2	0.2	0.3	0.9	3.2
5-Sep	0.6	0.6	0.8	0.6	0.8	0.5	0.7	1.0	1.3	1.6	2.3	3.4	2.8	3.1	2.9	2.9	2.7	1.4	1.4	0.7	0.4	0.4	0.6	0.7	3.4
6-Sep	0.9	1.5	1.4	1.8	2.6	2.6	1.7	1.2	1.4	1.2	1.4	1.4	1.2	1.3	1.5	1.5	1.7	1.7	0.6	0.5	0.3	0.5	0.3	0.5	2.6
7-Sep	0.3	0.3	0.3	0.4	0.4	0.5	0.4	0.8	0.9	0.9	1.8	1.8	2.4	2.5	1.5	0.7	1.8	0.4	0.3	0.3	0.6	0.7	0.3	0.2	2.5
8-Sep	0.3	0.3	0.3	0.8	0.5	0.5	0.6	0.5	0.6	1.1	1.9	2.0	2.4	2.4	2.3	0.8	1.2	1.0	0.7	0.7	0.6	1.2	0.4	0.3	2.4
9-Sep	0.3	0.4	0.3	0.3	0.3	0.2	0.3	1.1	1.5	1.8	1.6	2.3	3.0	2.7	2.3	2.3	2.0	1.1	0.9	1.5	1.0	0.4	0.6	0.4	3.0
10-Sep	0.4	0.5	0.5	0.2	0.5	0.7	1.1	0.6	1.8	1.9	2.1	2.4	3.0	3.0	3.2	2.9	2.3	2.5	2.1	2.0	2.0	2.2	1.6	2.1	3.2
11-Sep	2.2	2.1	1.7	1.4	1.3	1.2	1.2	1.5	1.9	2.7	3.4	3.7	3.8	4.1	3.6	3.1	3.0	2.5	1.5	1.6	1.1	0.8	0.8	0.6	4.1
12-Sep	0.7	0.7	0.9	0.9	0.7	0.6	0.6	1.0	1.0	2.1	1.6	2.0	2.0	2.0	1.7	1.3	1.1	1.0	1.0	0.6	0.8	0.5	0.6	0.8	2.1
13-Sep	0.5	0.8	0.6	0.6	0.9	0.8	0.8	0.8	1.2	1.5	2.3	3.4	3.4	4.1	4.1	4.0	3.8	2.8	3.6	3.4	2.6	2.3	2.2	2.2	4.1
14-Sep	2.0	2.1	1.9	1.7	1.7	1.7	1.8	1.9	2.2	2.1	2.6	2.7	3.0	3.1	3.3	2.8	2.2	1.9	0.8	0.4	0.4	0.3	0.6	0.4	3.3
15-Sep	0.2	0.4	0.3	0.2	0.5	0.6	0.7	1.0	1.6	1.5	1.4	2.2	2.8	3.0	3.2	2.6	2.2	1.8	1.2	1.4	1.4	1.2	1.4	1.2	3.2
16-Sep	0.9	1.1	0.9	0.7	0.5	0.9	0.8	1.1	1.1	1.4	2.3	2.7	2.7	2.8	2.9	2.8	1.9	1.2	0.8	0.4	0.3	0.6	0.7	0.5	2.9
17-Sep	0.7	0.5	0.4	0.3	0.3	0.7	0.7	1.3	1.9	1.7	1.7	2.5	2.7	2.9	2.5	2.0	0.9	1.5	0.6	0.6	1.0	0.6	0.4	0.6	2.9
18-Sep	0.8	1.0	0.9	0.8	0.7	0.7	0.8	0.7	0.7	1.1	2.3	2.6	3.3	2.6	2.9	1.2	1.1	1.0	0.7	0.8	0.8	1.0	0.7	0.7	3.3
19-Sep	0.9	1.1	1.0	0.8	0.7	0.7	1.0	0.8	1.0	2.0	2.5	2.6	2.9	3.2	3.0	2.2	1.9	0.8	0.2	0.2	0.4	0.5	1.0	0.6	3.2
20-Sep	0.7	0.9	0.5	0.4	0.3	0.3	0.3	0.2	0.8	1.7	1.9	2.7	2.4	2.9	2.8	2.4	1.6	0.6	0.9	0.5	0.6	0.4	0.3	0.2	2.9
21-Sep	0.2	0.4	0.5	0.7	0.8	0.9	0.8	0.8	1.0	1.0	1.8	3.7	3.9	4.3	3.9	3.5	2.9	2.3	1.5	1.2	1.3	1.4	1.6	1.6	4.3
22-Sep	1.5	1.4	1.2	1.3	1.4	1.1	1.0	0.9	1.8	2.2	3.1	3.0	3.2	3.5	2.9	2.9	2.2	2.1	1.3	1.1	1.1	1.0	1.5	1.2	3.5
23-Sep	1.0	0.8	0.8	1.1	0.8	0.8	0.9	1.0	1.8	2.4	3.2	3.4	4.2	3.5	4.0	3.4	3.2	2.5	2.0	2.5	2.6	2.8	3.0	2.8	4.2
24-Sep	2.6	3.0	2.9	2.8	2.4	2.3	2.0	1.6	1.8	2.2	2.3	1.9	2.1	1.7	1.3	0.7	0.5	0.2	0.3	0.4	0.7	0.9	0.5	0.2	3.0
25-Sep	0.2	0.3	0.6	0.3	0.9	0.5	0.4	0.7	1.2	1.8	1.6	2.3	2.4	2.1	2.0	2.0	1.4	2.1	1.4	2.2	3.0	3.7	3.6	3.2	3.7
26-Sep	3.7	3.3	1.6	1.7	1.3	1.6	1.2	0.7	0.7	1.4	2.5	2.8	3.1	1.9	1.2	0.9	0.6	0.8	0.8	1.5	1.2	0.4	0.7	0.6	3.7
27-Sep	0.4	0.3	0.3	0.4	0.5	0.5	0.4	0.5	1.0	1.4	2.0	2.2	2.1	2.1	2.2	2.1	1.9	1.0	0.4	0.5	0.4	0.3	0.3	0.3	2.2
28-Sep	0.4	0.4	0.3	0.2	0.2	0.5	0.5	0.8	1.0	1.5	1.8	1.9	2.0	1.8	2.1	2.0	1.9	2.4	1.9	1.8	2.0	2.3	2.3	2.2	2.4
29-Sep	2.3	2.2	2.1	1.7	1.6	1.7	1.0	1.1	1.5	2.1	2.1	2.4	2.3	2.6	2.2	1.9	1.8	2.0	1.9	1.8	1.8	1.7	1.3	1.1	2.6
30-Sep	0.5	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.3	0.5	1.1	1.3	1.2	1.5	1.3	0.7	0.3	0.2	0.2	0.2	0.2	0.2	0.2	1.5
Diurnal Maximum																									



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS06
PATRICIA MCINNES
SEPTEMBER 2023

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

October 30, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - PATRICIA McINNES (AMS06)
 SEPTEMBER 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	669	33	51	97.5	7.6	0	1.2	0
TRS (ppb) Average	683	35	37	99.72	2.2	0	1	0
THC (ppm) Average	684	34	36	99.72	2.5	-	2.2	-
NMHC(ppm) Average	684	34	36	99.72	0.154	-	0.106	-
CH4(ppm) Average	684	34	36	99.72	2.5	-	2.2	-
O3 (ppb) Average	684	33	36	99.58	49.9	0	40.7	-
NO2 (ppb) Average	684	36	36	100	22.7	0	4.7	-
NO (ppb) Average	684	36	36	100	17.9	-	2	-
NOX (ppb) Average	684	36	36	100	32.4	-	6	-
NH3 (ppb) Average	603	39	117	89.17	64.4	0	30.9	-
PM2.5 (ug/m3) Average	719	1	1	100	441.2	140	321.2	15
Temperature 2 m (C) Average	720	0	0	100	26.3	-	20.1	-
Relative Humidity (%) Average	720	0	0	100	98.2	-	89.1	-
Wind Speed 10 m (km/h) Average	720	0	0	100	30	-	16	-
Wind Direction 10 m (deg) Average	720	0	0	100	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - PATRICIA McINNES (AMS06)
 SEPTEMBER 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	669	0.28	0.6	-	0	0	0	0.1	0.3	0.6	7.6
TRS (ppb) Average	683	0.41	0.3	-	0.2	0.2	0.3	0.3	0.4	0.7	2.2
THC (ppm) Average	684	2.12	0.1	-	2	2	2	2.1	2.2	2.3	2.5
NMHC(ppm) Average	684	0.03	0.025	-	0	0	0	0	0	0.1	0.154
CH4(ppm) Average	684	2.09	0.1	-	1.9	2	2	2.1	2.1	2.2	2.5
O3 (ppb) Average	684	24.99	11.2	-	2.9	10	15.6	24.7	33.5	40.2	49.9
NO2 (ppb) Average	684	2.27	2.5	-	0	0.1	0.5	1.5	3.1	5.3	22.7
NO (ppb) Average	684	0.69	1.2	-	0	0	0.1	0.3	0.8	1.7	17.9
NOX (ppb) Average	684	2.96	3.3	-	0	0.2	0.7	2	3.9	6.7	32.4
NH3 (ppb) Average	603	2.44	7.6	-	0	0	0	0	0	11.4	64.4
PM2.5 (ug/m3) Average	719	55.35	78.9	-	2.4	6.5	12.8	24.7	55	155.1	441.2
Temperature 2 m (C) Average	720	13.34	5.7	-	1.3	6.1	8.6	13.1	17.6	21.3	26.3
Relative Humidity (%) Average	720	65.17	19.3	-	25.3	37.3	48.7	66.7	81.7	90.3	98.2
Wind Speed 10 m (km/h) Average	720	9.8	5	-	1	4	6	9	13	17	30
Wind Direction 10 m (deg) Average	720	-	-	-	-	-	-	-	-	-	-

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

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2, NH3,O3, THC/NMHC/CH4, TRS	20 Sep 2023 13:00	20 Sep 2023 14:00	2	Maintenance - sample manifold cleaned
SO2	07 Sep 2023 18:00	08 Sep 2023 08:00	15	Unstable Operation - flatline in analyzer output signal
SO2	08 Sep 2023 09:00	08 Sep 2023 09:00	1	Maintenance - analyzer rebooted
O3	06 Sep 2023 13:00	06 Sep 2023 13:00	1	Maintenance - verify daily QA response
NH3	01 Sep 2023 03:00	30 Sep 2023 03:00	76	Stabilization after daily span



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb

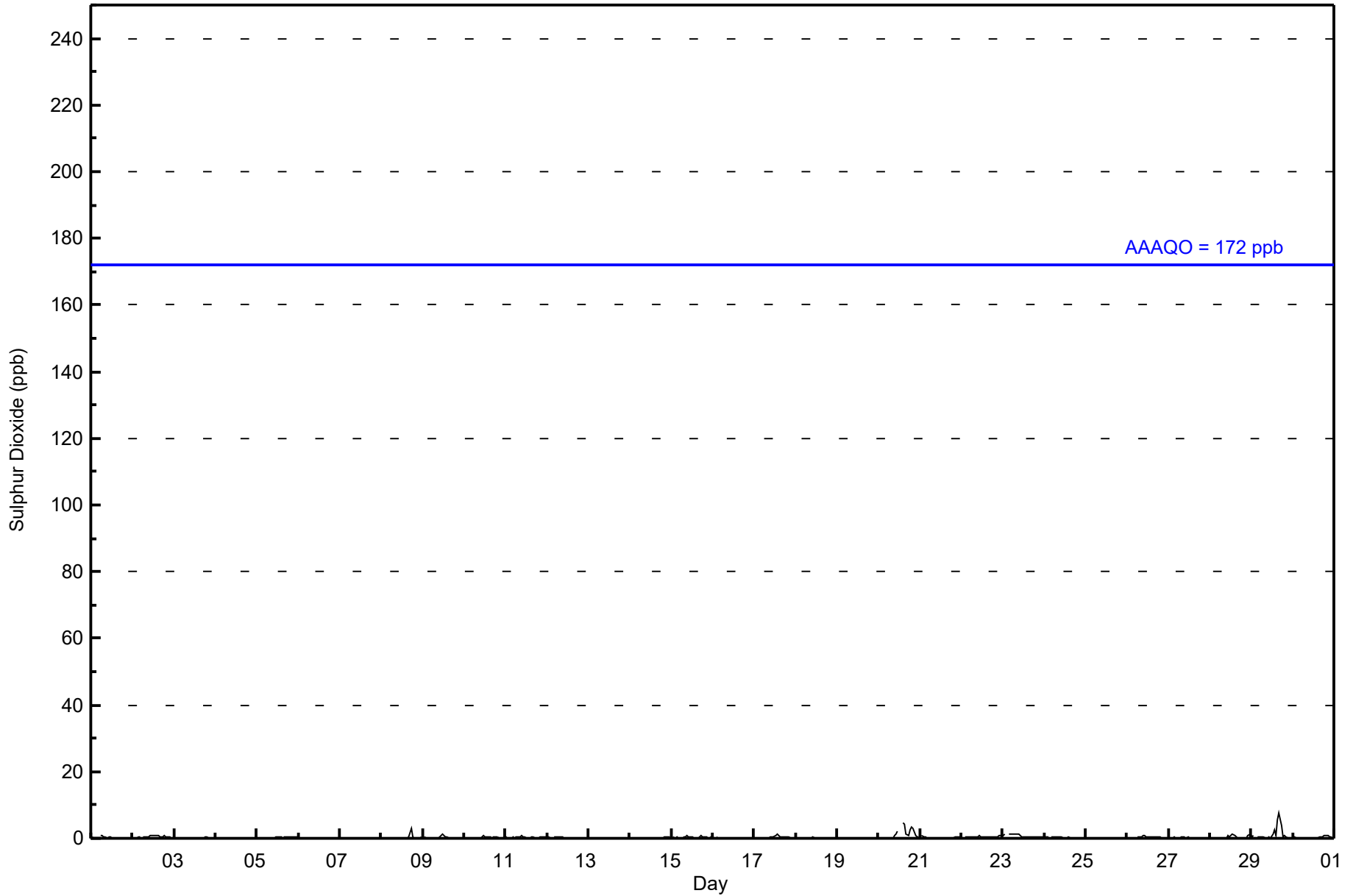
Patricia McInnes - September 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		720																		
Maximum Value: 7.6 ppb on Sep 29 17:00		Maximum Daily Average: 1.2 ppb on Sep 20				Hours of Data:		669																		
Minimum Value: 0.0 ppb on Sep 2 00:00		Minimum Daily Average: 0.0 ppb on Sep 19				Hours of Missing Data:		51																		
Maximum Diurnal Average: 0.5 ppb at hour 16		Minimum Diurnal Average: 0.1 ppb at hour 3				Hours of Calibration:		33																		
Monthly Average: 0.28 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 = 3.1				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-Sep	0.3	0.2	0.1	0.0	Z	0.8	0.8	0.5	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.0	0.2	0.8
2-Sep	0.0	0.0	0.1	0.4	0.5	Z	0.6	0.5	0.4	0.3	0.6	0.9	0.9	0.8	0.7	0.7	0.6	0.6	0.7	0.3	0.3	0.2	0.2	0.1	0.5	0.9
3-Sep	Z	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.3
4-Sep	0.0	Z	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2
5-Sep	0.0	0.0	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.2	0.3	0.5	0.3	0.2	0.3	0.4	0.6	0.5	0.5	0.4	0.4	0.3	0.2	0.6
6-Sep	0.2	0.2	0.2	Z	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2
7-Sep	0.0	0.0	0.1	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	UO	UO	UO	UO	UO	UO	UO	UO	--	0.1
8-Sep	UO	UO	UO	UO	UO	UO	UO	UO	M	0.2	0.1	0.0	0.0	0.0	0.1	0.0	0.3	3.1	0.6	0.1	0.1	0.0	0.1	0.2	--	3.1
9-Sep	Z	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.5	0.7	0.5	0.3	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.2	0.2	1.5
10-Sep	0.1	Z	0.2	0.0	0.1	0.0	0.0	0.1	0.1	0.2	0.5	0.7	0.6	0.6	0.4	0.3	0.2	0.3	0.4	0.3	0.2	0.1	0.2	0.3	0.3	0.7
11-Sep	0.3	0.1	Z	0.2	0.2	0.2	0.3	0.5	0.6	0.7	0.4	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.1	0.2	0.3	0.3	0.2	0.2	0.3	0.7
12-Sep	0.3	0.3	0.2	Z	0.3	0.3	0.4	0.4	0.4	0.2	0.1	0.2	0.1	0.2	0.2	0.1	0.1	0.0	0.2	0.1	0.0	0.1	0.0	0.0	0.2	0.4
13-Sep	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	0.0	0.0	0.0	0.0	0.1	0.0	0.1
14-Sep	0.1	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.2	0.1	0.3
15-Sep	Z	0.3	0.0	0.2	0.1	0.1	0.2	0.2	0.5	0.8	0.3	0.4	0.4	0.1	0.0	0.1	0.2	0.8	0.6	0.4	0.4	0.2	0.1	0.2	0.3	0.8
16-Sep	0.4	Z	0.2	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.4
17-Sep	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.3	0.3	0.7	1.1	0.9	0.5	0.4	0.4	0.4	0.4	0.3	0.1	0.1	0.0	0.3	1.1
18-Sep	0.0	0.0	0.0	Z	0.0	0.1	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
19-Sep	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
20-Sep	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	1.0	1.3	2.0	M	M	4.6	4.1	1.1	1.0	2.5	3.2	3.0	1.0	0.5	0.6	1.2	4.6
21-Sep	Z	1.0	0.5	0.3	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	0.0	0.1	0.1	0.2	0.6	0.4	0.3	0.2	1.0
22-Sep	0.3	Z	0.3	0.4	0.5	0.5	0.6	0.5	0.5	0.6	0.7	0.5	0.6	0.5	0.4	0.5	0.6	0.4	0.3	0.5	0.4	0.4	0.7	0.9	0.5	0.9
23-Sep	1.1	1.1	Z	1.3	1.3	1.2	1.2	1.4	1.3	1.2	1.0	0.4	0.5	0.3	0.3	0.4	0.4	0.5	0.4	0.5	0.4	0.5	0.3	0.3	0.7	1.4
24-Sep	0.3	0.3	0.4	Z	0.5	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.1	0.1	0.3	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.5
25-Sep	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.2
26-Sep	0.0	0.0	0.0	0.0	0.0	Z	0.5	0.5	0.4	0.7	0.7	0.5	0.4	0.4	0.3	0.4	0.3	0.3	0.3	0.4	0.2	0.2	0.2	0.2	0.3	0.7
27-Sep	Z	0.1	0.1	0.4	0.2	0.1	0.0	0.4	0.6	0.5	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.6
28-Sep	0.0	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.8	0.3	0.7	1.1	0.6	0.6	0.1	0.1	0.1	0.2	0.1	0.1	0.9	1.3	0.3	1.3
29-Sep	0.3	0.8	Z	0.5	0.3	0.3	0.3	0.3	0.2	0.1	0.2	0.0	1.3	2.5	0.9	5.5	7.6	3.7	0.5	0.8	0.4	0.1	0.1	0.1	1.2	7.6
30-Sep	0.2	0.3	0.2	Z	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.3	0.2	0.3	0.7	0.8	0.8	0.5	0.2	0.1	0.2	0.8
																								Diurnal Average		
																								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
Patricia McInnes - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	669	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: 669

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

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

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	27	2	2	5	11	33	78	50	68	92	95	86	44	31	26	19	669
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	27	2	2	5	11	33	78	50	68	92	95	86	44	31	26	19	669

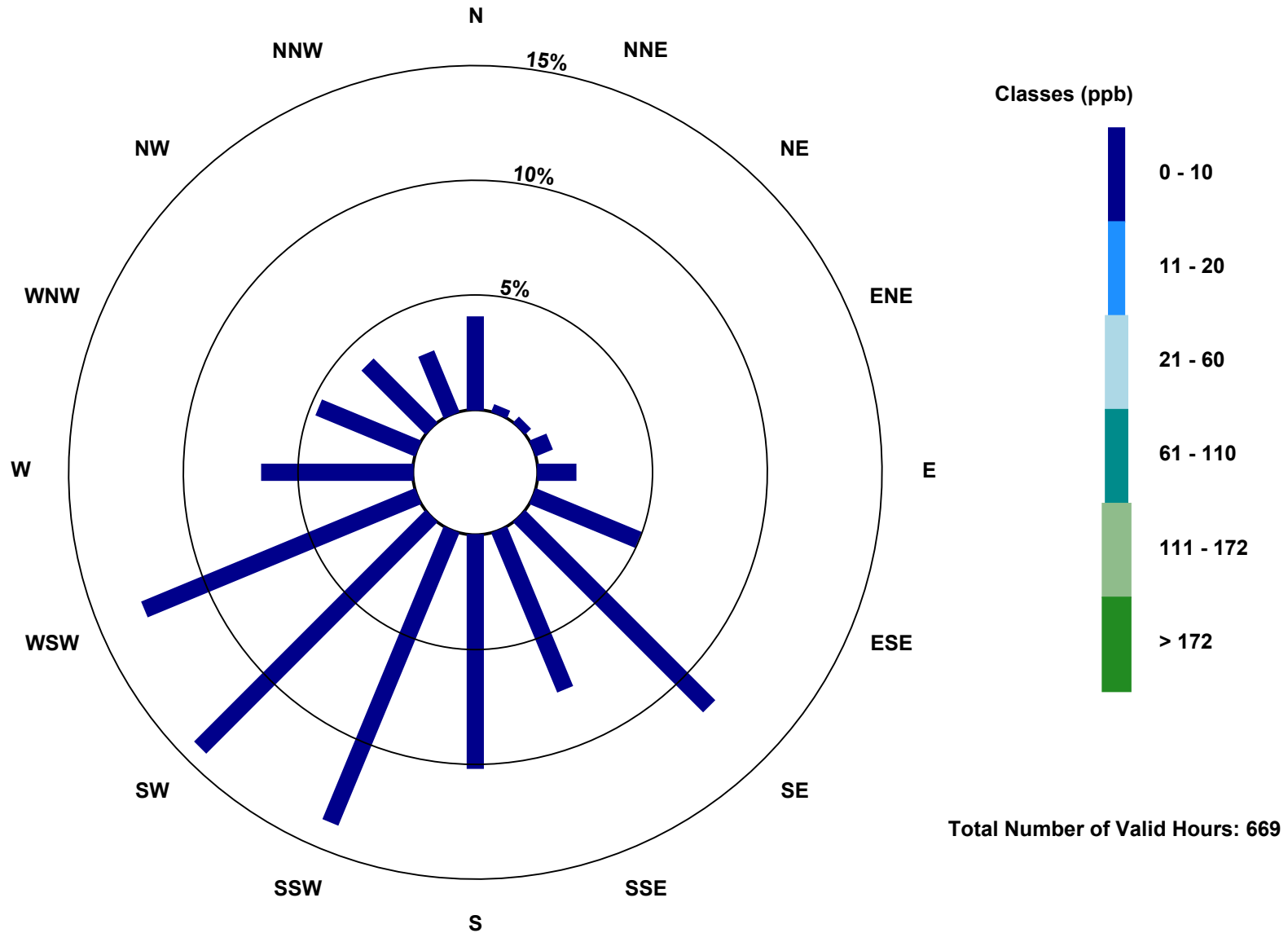
Total Number of Valid Hours: 669

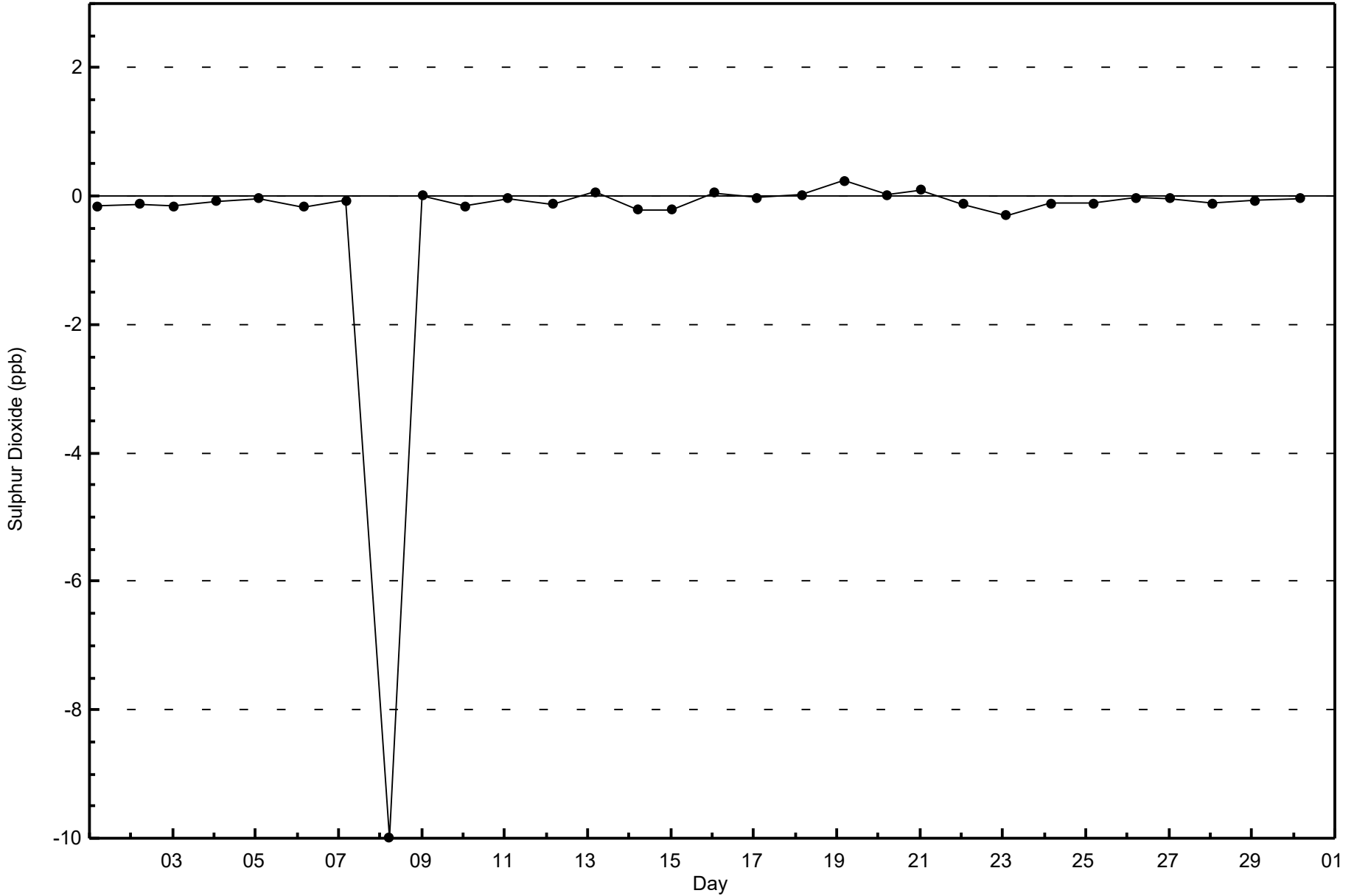
Total Number of Hours: 720

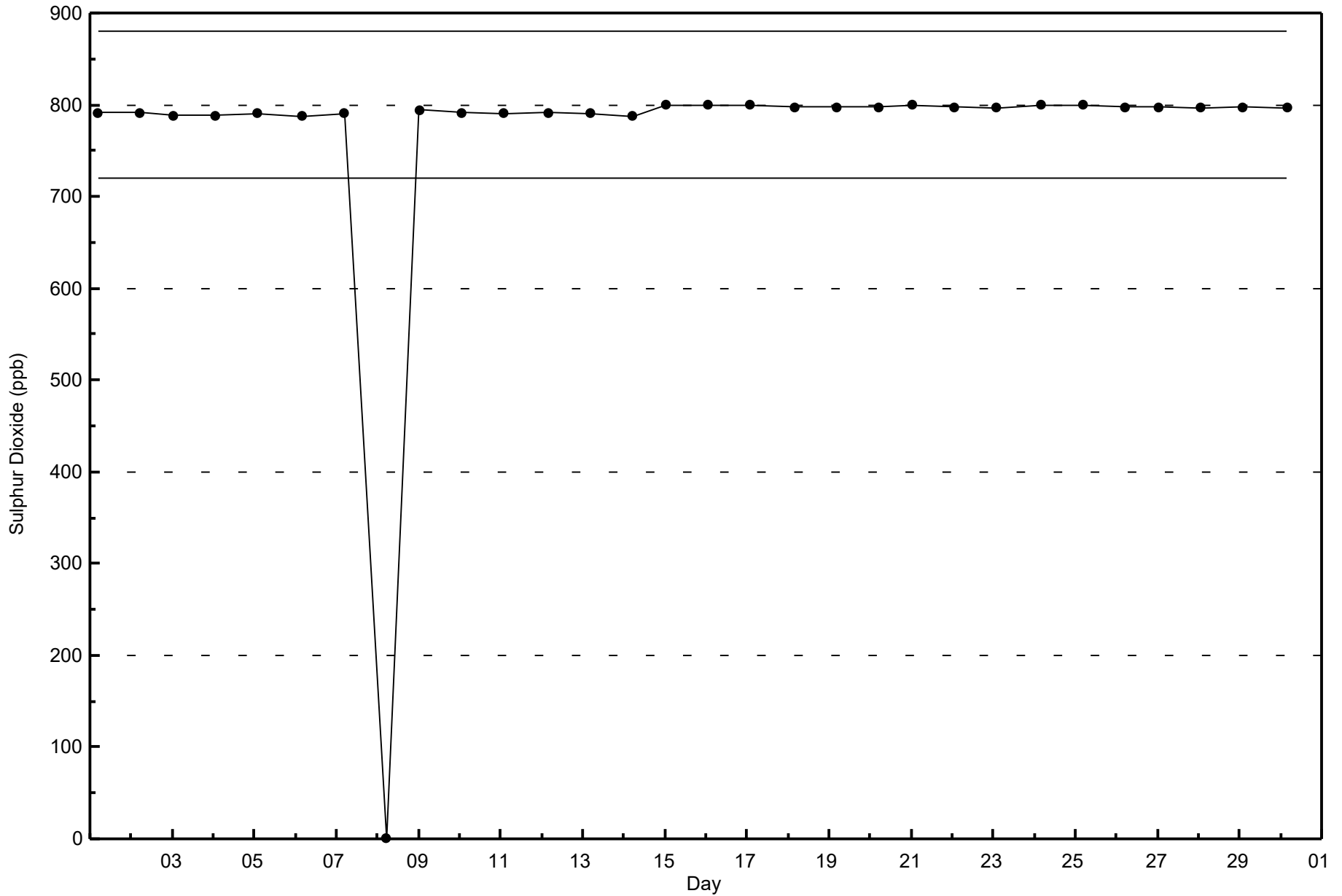


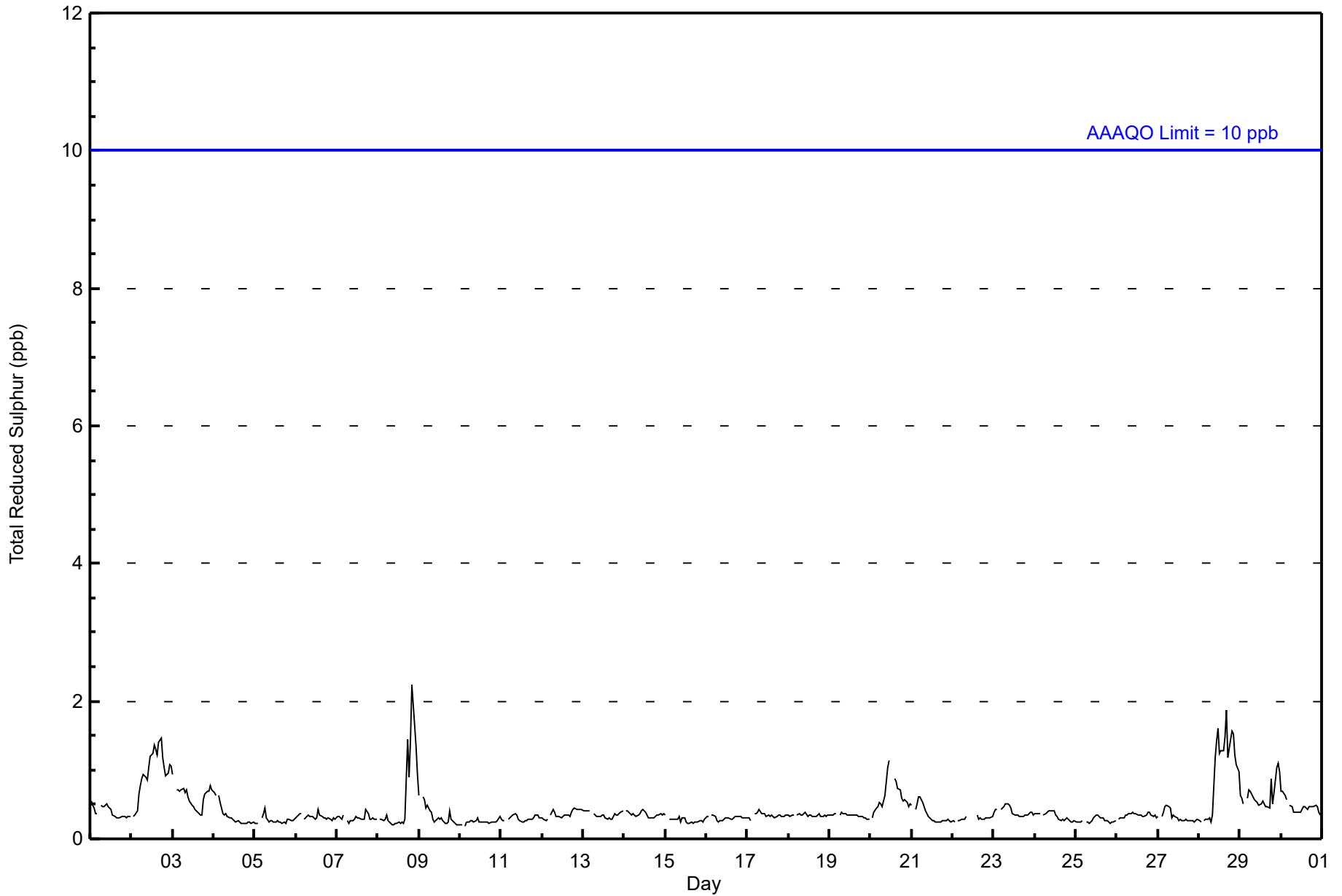
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Sulphur Dioxide (SO₂) - ppb
Patricia McInnes











**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Patricia McInnes - September 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: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Patricia McInnes - September 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	2	2	5	11	34	77	51	71	97	93	87	41	38	28	18	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	28	2	2	5	11	34	77	51	71	97	93	87	41	38	28	18	683

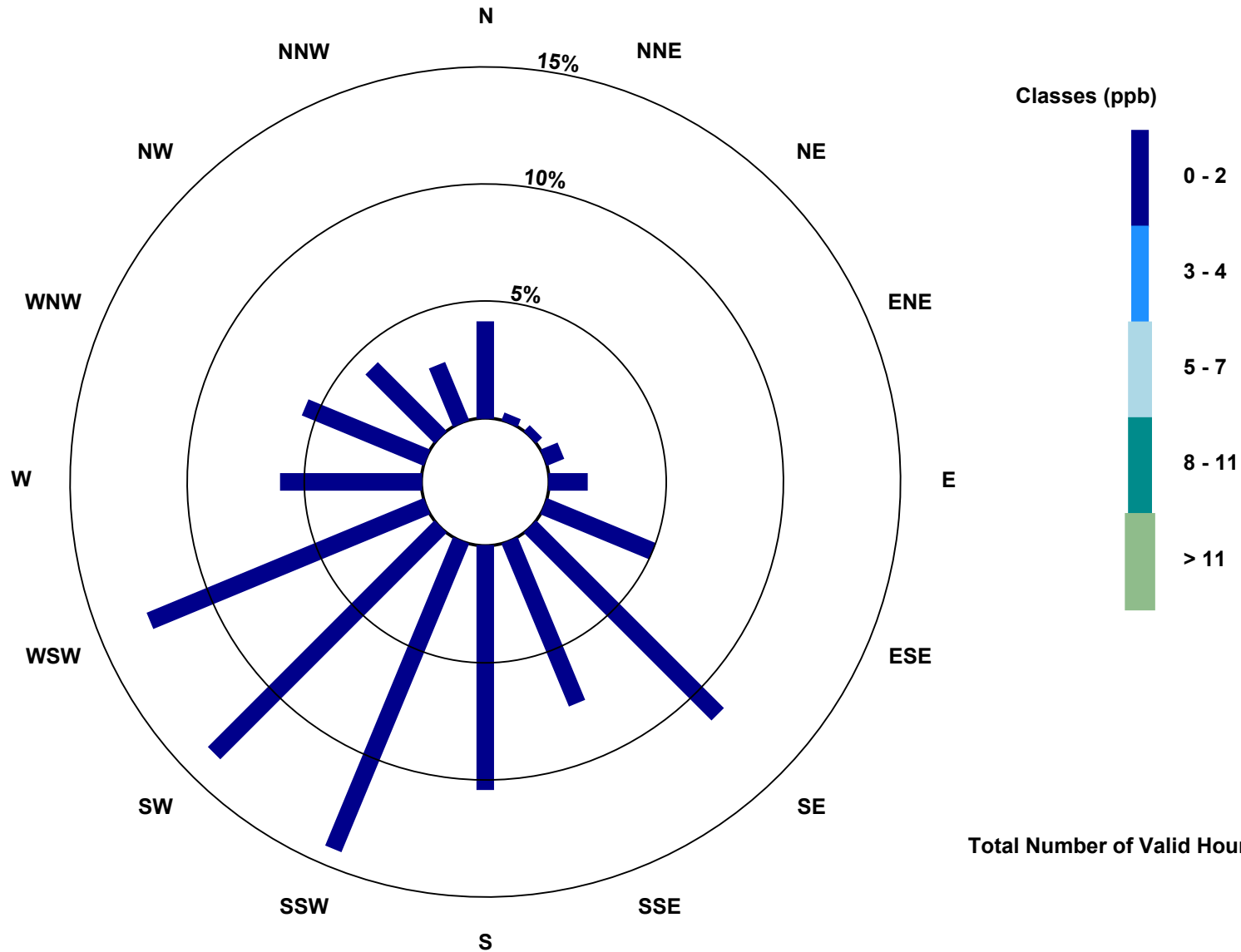
Total Number of Valid Hours: 683

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

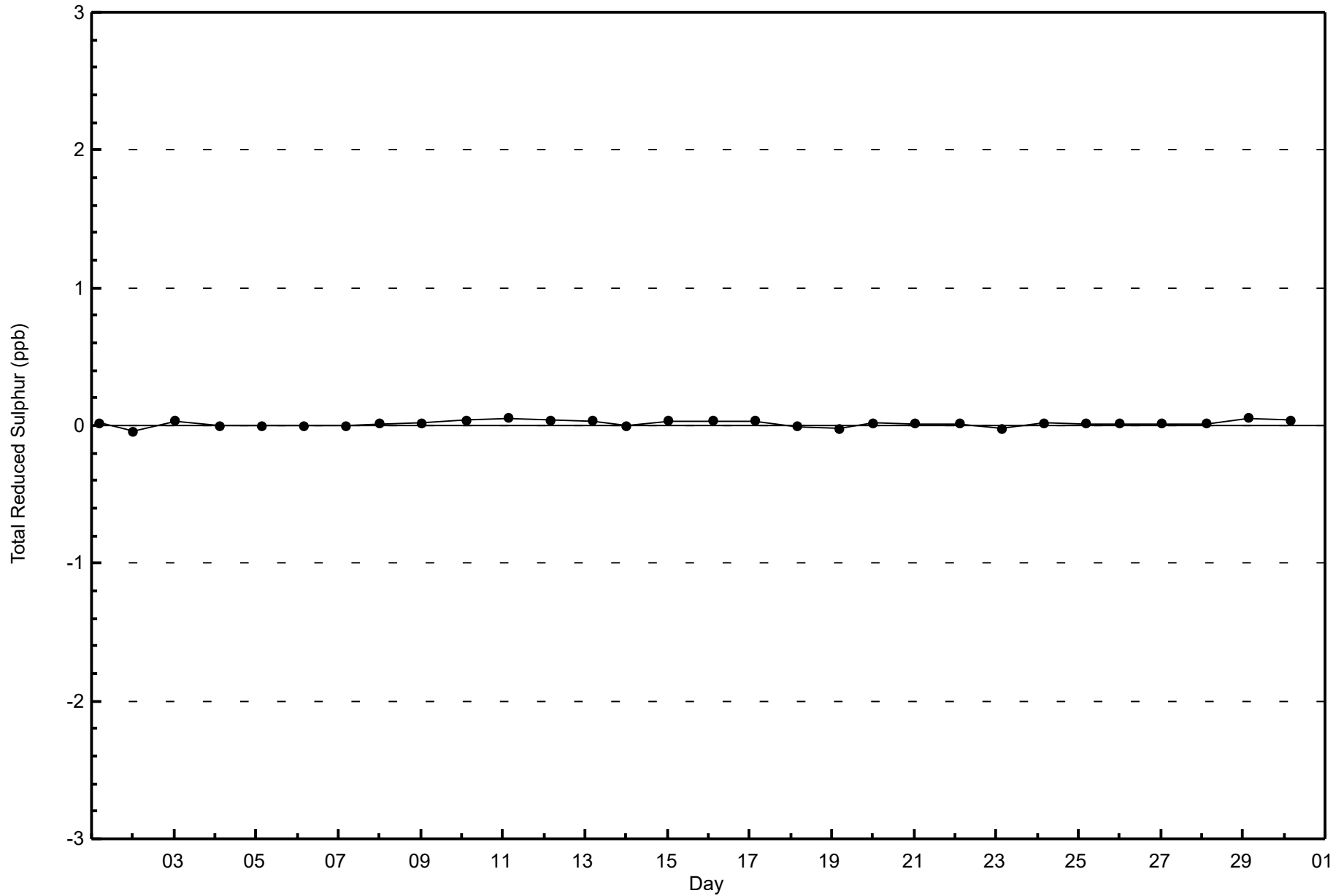
Total Reduced Sulphur (TRS) - ppb
Patricia McInnes

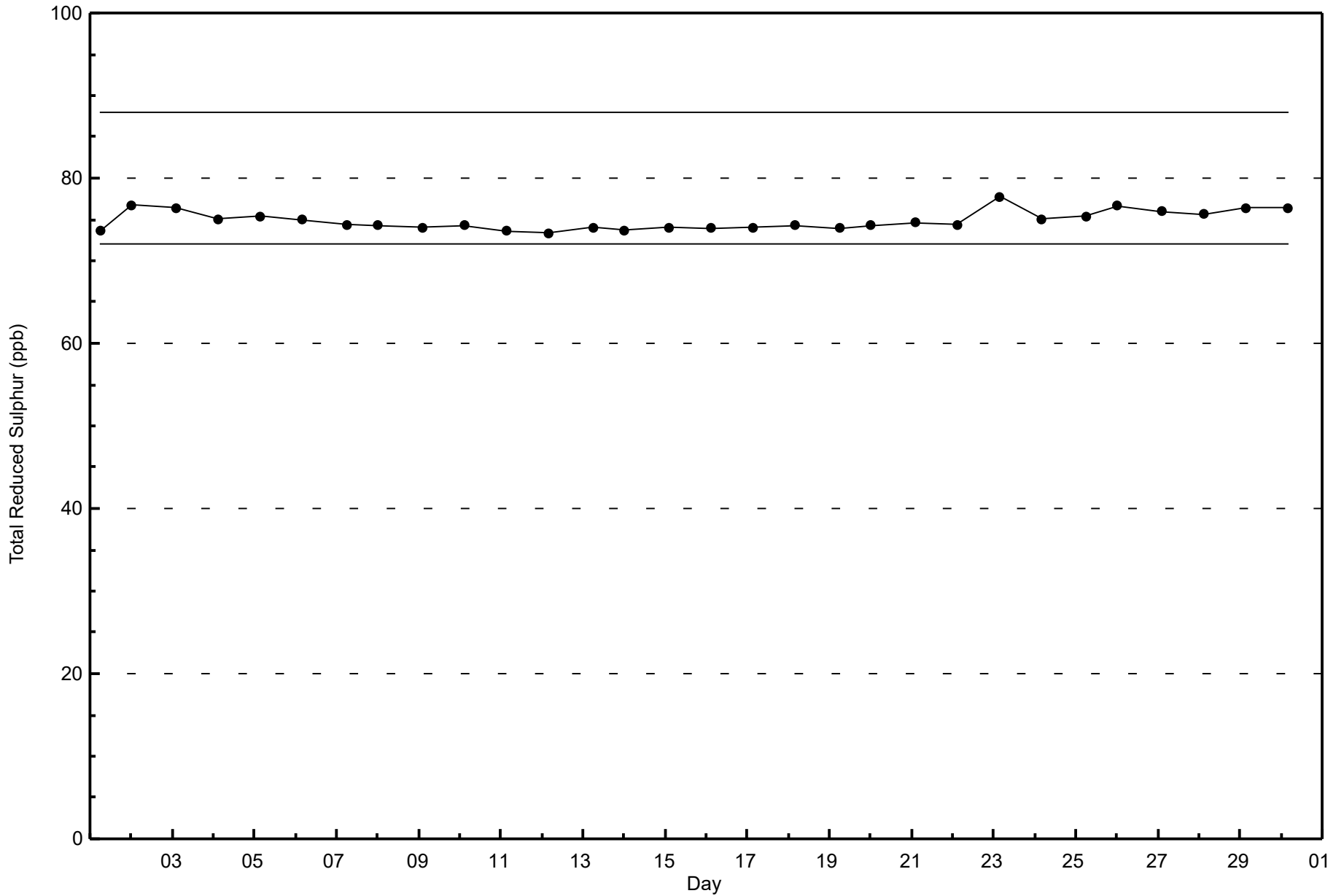




Wood Buffalo Environmental Association
Zero Responses

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







Wood Buffalo Environmental Association
Summary of Hour Averages

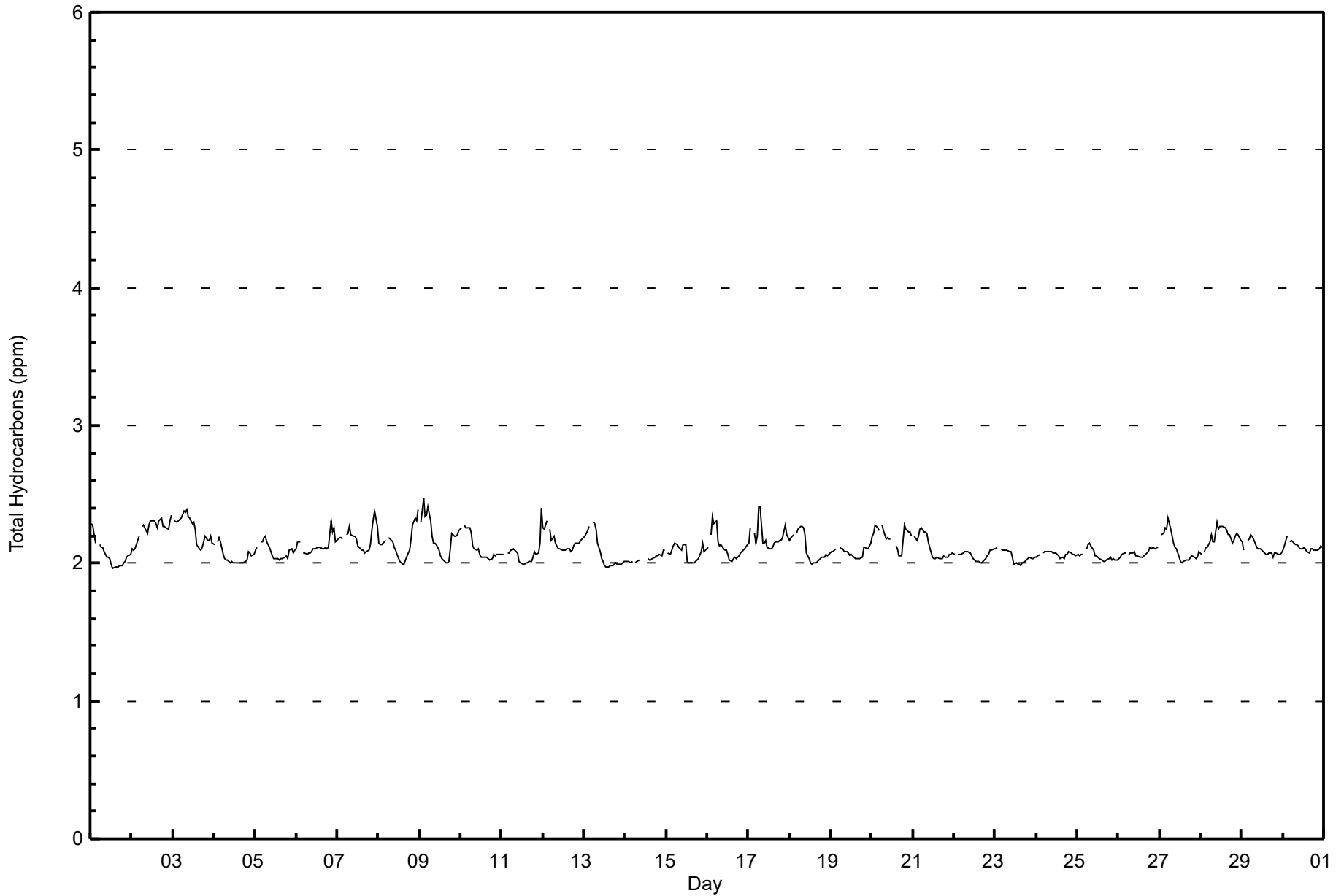
Total Hydrocarbons (THC) - ppm
Patricia McInnes - September 2023

Maximum Value: 2.5 ppm on Sep 9 03:00		Maximum Daily Average: 2.2 ppm on Sep 2		Hours in Service: 720																							
Minimum Value: 2.0 ppm on Sep 1 14:00		Minimum Daily Average: 2.0 ppm on Sep 14		Hours of Data: 684																							
Maximum Diurnal Average: 2.2 ppm at hour 6		Minimum Diurnal Average: 2.1 ppm at hour 16		Hours of Missing Data: 36																							
Monthly Average: 2.12 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 = 2.4		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-Sep	2.3	2.3	2.2	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	2.1	2.1	2.1	2.1	2.1	2.3
2-Sep	2.1	2.1	2.1	2.2	2.2	Z	2.3	2.3	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.3	2.2	2.2	2.3
3-Sep	Z	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.3	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4
4-Sep	2.1	Z	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	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.2
5-Sep	2.1	2.1	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.2
6-Sep	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	2.3	2.2	2.3	2.2	2.1	2.1	2.3
7-Sep	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.4	2.3	2.2	2.2	2.4
8-Sep	2.1	2.1	2.1	2.2	2.2	Z	2.2	2.2	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.3	2.3	2.3	2.4	2.1	2.4
9-Sep	Z	2.3	2.5	2.3	2.4	2.4	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.5
10-Sep	2.3	Z	2.3	2.3	2.3	2.3	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	2.1	2.1	2.1	2.1	2.1	2.1	2.3
11-Sep	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.4	2.1	2.1	2.4
12-Sep	2.3	2.2	2.3	Z	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.3
13-Sep	2.2	2.2	2.2	2.3	Z	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	2.0	2.0	2.0	2.1	2.1	2.3
14-Sep	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	C	C	C	C	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
15-Sep	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	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1
16-Sep	2.1	Z	2.2	2.3	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3
17-Sep	2.2	2.3	Z	2.2	2.1	2.2	2.4	2.4	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.4
18-Sep	2.2	2.2	2.2	Z	2.2	2.3	2.3	2.3	2.3	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.3
19-Sep	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
20-Sep	2.2	2.2	2.3	2.3	2.2	Z	2.3	2.2	2.2	2.2	2.2	2.2	M	M	2.1	2.1	2.1	2.1	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.3
21-Sep	Z	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.3
22-Sep	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
23-Sep	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
24-Sep	2.0	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
25-Sep	2.1	2.1	2.1	2.1	Z	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	2.0	2.0	2.1
26-Sep	2.0	2.0	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
27-Sep	Z	2.2	2.2	2.3	2.2	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	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.3
28-Sep	2.1	Z	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.3	2.2	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.3
29-Sep	2.2	2.1	Z	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2
30-Sep	2.1	2.1	2.2	Z	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerospan C - Calibration M - Maintenance																											



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	183	26.75	26.75
2.1 - 3.0	501	73.25	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Patricia McInnes - September 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	1	4	7	10	15	13	25	15	14	34	18	14	9	3	183
2.1 - 3.0	26	2	1	1	4	24	64	38	47	83	83	52	26	17	17	16	501
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	27	2	2	5	11	34	79	51	72	98	97	86	44	31	26	19	684

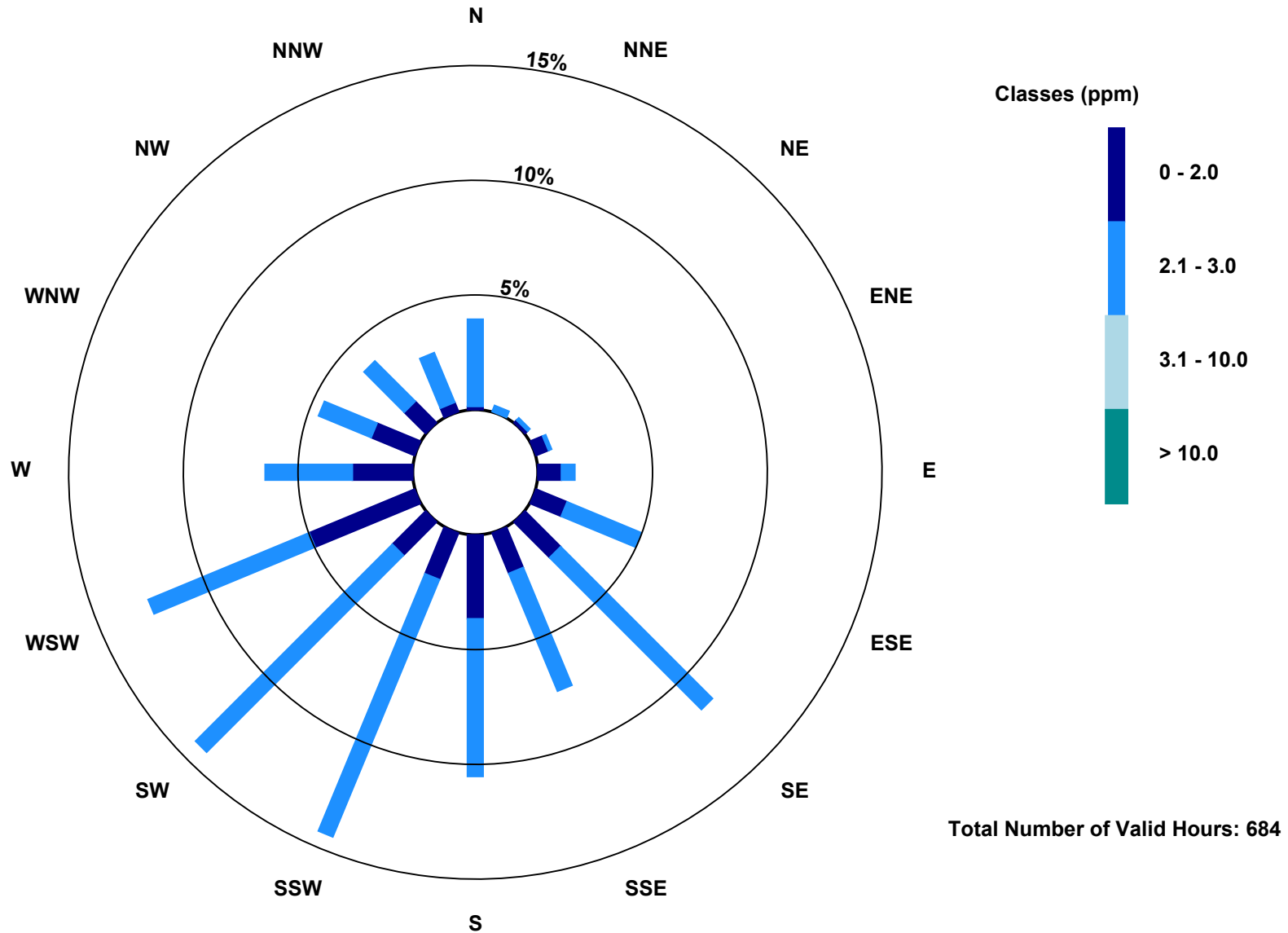
Total Number of Valid Hours: 684

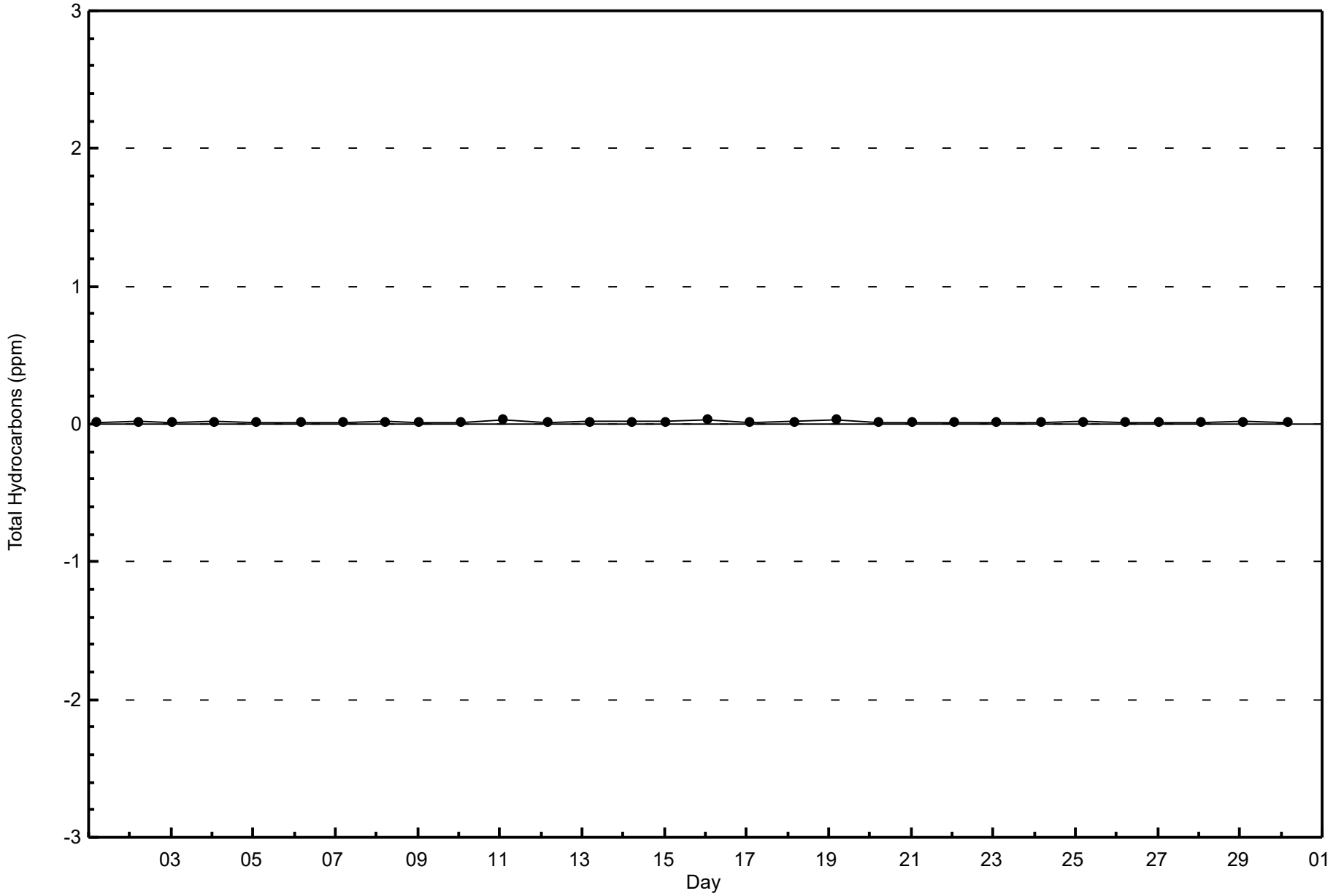
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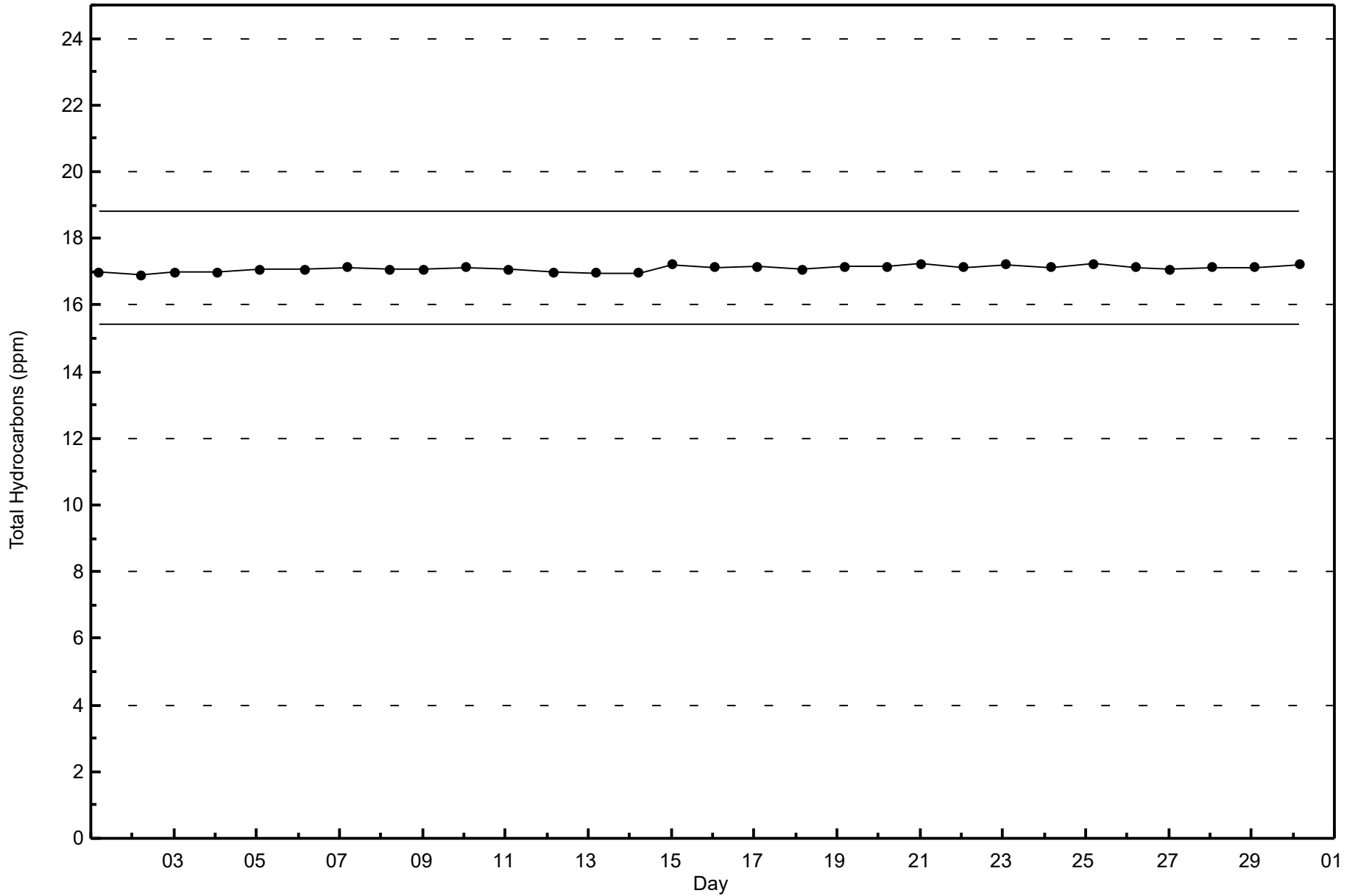


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Total Hydrocarbons (THC) - ppm
Patricia McInnes

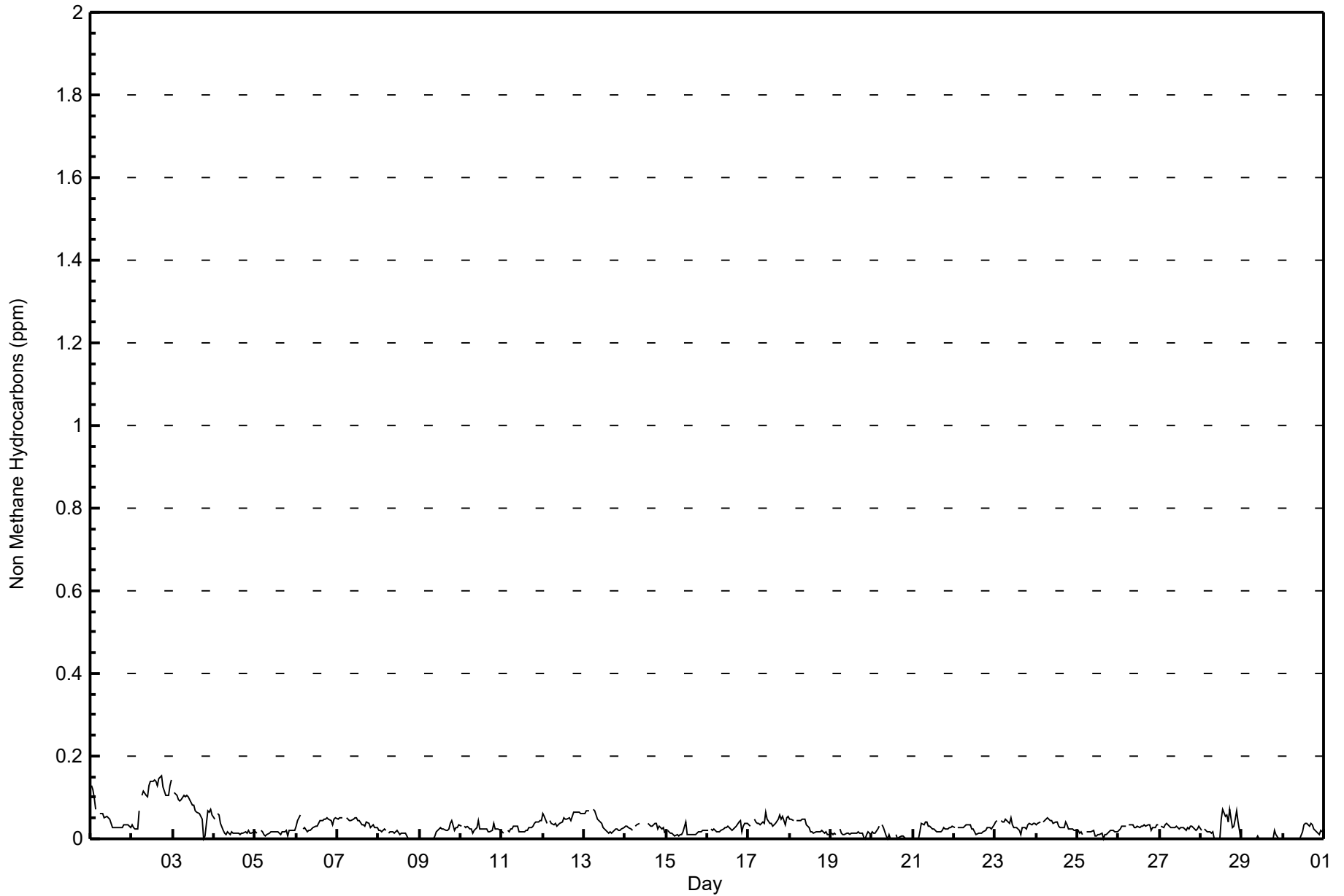








Maximum Value: 0.154 ppm on Sep 2 18:00		Maximum Daily Average: 0.106 ppm on Sep 2		Hours in Service:	720																					
Minimum Value: 0.000 ppm on Sep 3 19:00		Minimum Daily Average: 0.002 ppm on Sep 29		Hours of Data:	684																					
Maximum Diurnal Average: 0.034 ppm at hour 3		Minimum Diurnal Average: 0.027 ppm at hour 16		Hours of Missing Data:	36																					
Monthly Average: 0.030 ppm		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.1 P ₉₉ = 0.1		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-Sep	0.128	0.118	0.098	0.071	Z	0.062	0.059	0.060	0.052	0.053	0.052	0.048	0.038	0.027	0.026	0.026	0.028	0.028	0.028	0.034	0.032	0.035	0.033	0.029	0.051	0.128
2-Sep	0.033	0.027	0.023	0.025	0.068	Z	0.106	0.116	0.106	0.103	0.129	0.138	0.140	0.143	0.140	0.127	0.144	0.154	0.127	0.115	0.104	0.106	0.130	0.142	0.106	0.154
3-Sep	Z	0.111	0.105	0.096	0.093	0.095	0.107	0.102	0.104	0.101	0.093	0.080	0.080	0.069	0.063	0.062	0.054	0.047	0.000	0.007	0.068	0.065	0.072	0.059	0.075	0.111
4-Sep	0.048	Z	0.060	0.058	0.038	0.020	0.013	0.011	0.017	0.009	0.016	0.013	0.015	0.014	0.013	0.011	0.013	0.013	0.017	0.012	0.019	0.014	0.014	0.017	0.021	0.060
5-Sep	0.017	0.015	Z	0.019	0.018	0.009	0.005	0.010	0.014	0.016	0.016	0.017	0.016	0.016	0.014	0.012	0.016	0.017	0.020	0.005	0.021	0.020	0.019	0.021	0.015	0.021
6-Sep	0.032	0.043	0.056	Z	0.024	0.028	0.016	0.021	0.022	0.024	0.027	0.029	0.030	0.036	0.045	0.045	0.046	0.047	0.051	0.048	0.043	0.035	0.047	0.050	0.037	0.056
7-Sep	0.046	0.050	0.051	0.052	Z	0.052	0.047	0.043	0.046	0.048	0.051	0.050	0.043	0.043	0.034	0.033	0.031	0.039	0.036	0.028	0.031	0.035	0.027	0.027	0.041	0.052
8-Sep	0.020	0.020	0.016	0.023	0.021	Z	0.014	0.017	0.017	0.014	0.017	0.022	0.010	0.015	0.015	0.014	0.013	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.012	0.023
9-Sep	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.018	0.025	0.028	0.023	0.023	0.021	0.022	0.023	0.038	0.044	0.022	0.028	0.026	0.033	0.017	0.044
10-Sep	0.030	Z	0.029	0.028	0.030	0.025	0.023	0.015	0.022	0.028	0.046	0.023	0.022	0.024	0.022	0.025	0.017	0.017	0.020	0.036	0.023	0.024	0.023	0.021	0.025	0.046
11-Sep	0.018	0.013	Z	0.019	0.018	0.025	0.023	0.029	0.030	0.030	0.019	0.017	0.016	0.017	0.020	0.021	0.026	0.026	0.031	0.039	0.042	0.041	0.045	0.044	0.026	0.045
12-Sep	0.060	0.055	0.037	Z	0.043	0.039	0.035	0.036	0.029	0.033	0.039	0.042	0.049	0.048	0.049	0.050	0.044	0.056	0.064	0.064	0.065	0.064	0.061	0.060	0.049	0.065
13-Sep	0.061	0.067	0.069	0.068	Z	0.071	0.066	0.059	0.047	0.039	0.037	0.027	0.023	0.019	0.014	0.018	0.015	0.017	0.025	0.023	0.021	0.022	0.024	0.027	0.037	0.071
14-Sep	0.029	0.031	0.028	0.023	0.022	Z	0.029	0.033	0.039	Z	Z	Z	Z	0.039	0.035	0.032	0.031	0.037	0.037	0.023	0.030	0.024	0.026	0.014	0.030	0.039
15-Sep	Z	0.020	0.015	0.013	0.011	0.008	0.009	0.006	0.010	0.010	0.016	0.040	0.010	0.009	0.010	0.009	0.009	0.010	0.014	0.017	0.017	0.019	0.019	0.021	0.014	0.040
16-Sep	0.021	Z	0.025	0.021	0.023	0.018	0.016	0.017	0.021	0.023	0.027	0.028	0.029	0.027	0.022	0.025	0.027	0.031	0.041	0.045	0.018	0.031	0.036	0.037	0.027	0.045
17-Sep	0.034	0.032	Z	0.046	0.041	0.037	0.036	0.034	0.040	0.036	0.064	0.047	0.037	0.036	0.029	0.034	0.037	0.046	0.058	0.046	0.054	0.034	0.052	0.055	0.042	0.064
18-Sep	0.047	0.047	0.046	Z	0.046	0.044	0.044	0.048	0.047	0.048	0.035	0.026	0.018	0.017	0.015	0.018	0.017	0.016	0.015	0.019	0.013	0.017	0.011	0.010	0.029	0.048
19-Sep	0.013	0.009	0.013	0.011	Z	0.022	0.015	0.012	0.010	0.013	0.014	0.010	0.015	0.014	0.012	0.012	0.016	0.012	0.013	0.004	0.000	0.009	0.016	0.009	0.012	0.022
20-Sep	0.016	0.014	0.013	0.024	0.029	Z	0.032	0.027	0.006	0.000	0.010	0.000	M	M	0.011	0.000	0.004	0.005	0.008	0.002	0.000	0.000	0.000	0.000	0.010	0.032
21-Sep	Z	0.000	0.000	0.001	0.016	0.036	0.035	0.040	0.039	0.032	0.030	0.023	0.024	0.020	0.019	0.018	0.018	0.020	0.026	0.024	0.023	0.027	0.026	0.030	0.023	0.040
22-Sep	0.027	Z	0.027	0.027	0.027	0.028	0.031	0.032	0.035	0.035	0.025	0.022	0.017	0.012	0.015	0.015	0.015	0.017	0.021	0.027	0.026	0.028	0.025	0.034	0.025	0.035
23-Sep	0.041	0.043	Z	0.045	0.042	0.039	0.048	0.043	0.037	0.050	0.035	0.027	0.028	0.025	0.019	0.010	0.026	0.028	0.024	0.035	0.036	0.034	0.036	0.037	0.034	0.050
24-Sep	0.036	0.037	0.041	Z	0.042	0.044	0.049	0.046	0.044	0.044	0.039	0.039	0.039	0.030	0.027	0.025	0.028	0.041	0.034	0.025	0.022	0.023	0.019	0.020	0.034	0.049
25-Sep	0.019	0.015	0.017	0.011	Z	0.017	0.018	0.017	0.016	0.021	0.008	0.008	0.009	0.010	0.013	0.000	0.009	0.010	0.017	0.022	0.019	0.020	0.018	0.016	0.014	0.022
26-Sep	0.021	0.024	0.030	0.031	0.029	Z	0.033	0.032	0.034	0.028	0.029	0.031	0.028	0.031	0.030	0.032	0.031	0.032	0.032	0.021	0.028	0.028	0.034	0.034	0.030	0.034
27-Sep	Z	0.032	0.029	0.032	0.036	0.034	0.028	0.029	0.027	0.029	0.031	0.024	0.027	0.026	0.026	0.022	0.026	0.024	0.030	0.032	0.024	0.022	0.025	0.030	0.028	0.036
28-Sep	0.021	Z	0.025	0.021	0.018	0.018	0.013	0.016	0.001	0.000	0.000	0.000	0.049	0.071	0.055	0.057	0.042	0.071	0.027	0.032	0.048	0.068	0.041	0.000	0.030	0.071
29-Sep	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.021	0.009	0.000	0.000	0.000	0.002	0.021
30-Sep	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.016	0.034	0.038	0.038	0.030	0.038	0.035	0.025	0.019	0.013	0.010	0.021	0.015	0.038
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan		C - Calibration				M - Maintenance																				





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	70	10.23	10.23
0.006 - 0.05	543	79.39	89.62
0.06 - 0.1	70	10.23	99.85
> 0.1	1	0.15	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Patricia McInnes - September 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	14	1	1	1	0	0	1	2	7	6	6	2	3	3	9	14	70
0.006 - 0.05	10	1	1	4	10	33	75	48	61	86	76	70	30	20	14	4	543
0.06 - 0.1	3	0	0	0	1	1	3	1	4	6	15	14	10	8	3	1	70
> 0.1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Totals	27	2	2	5	11	34	79	51	72	98	97	86	44	31	26	19	684

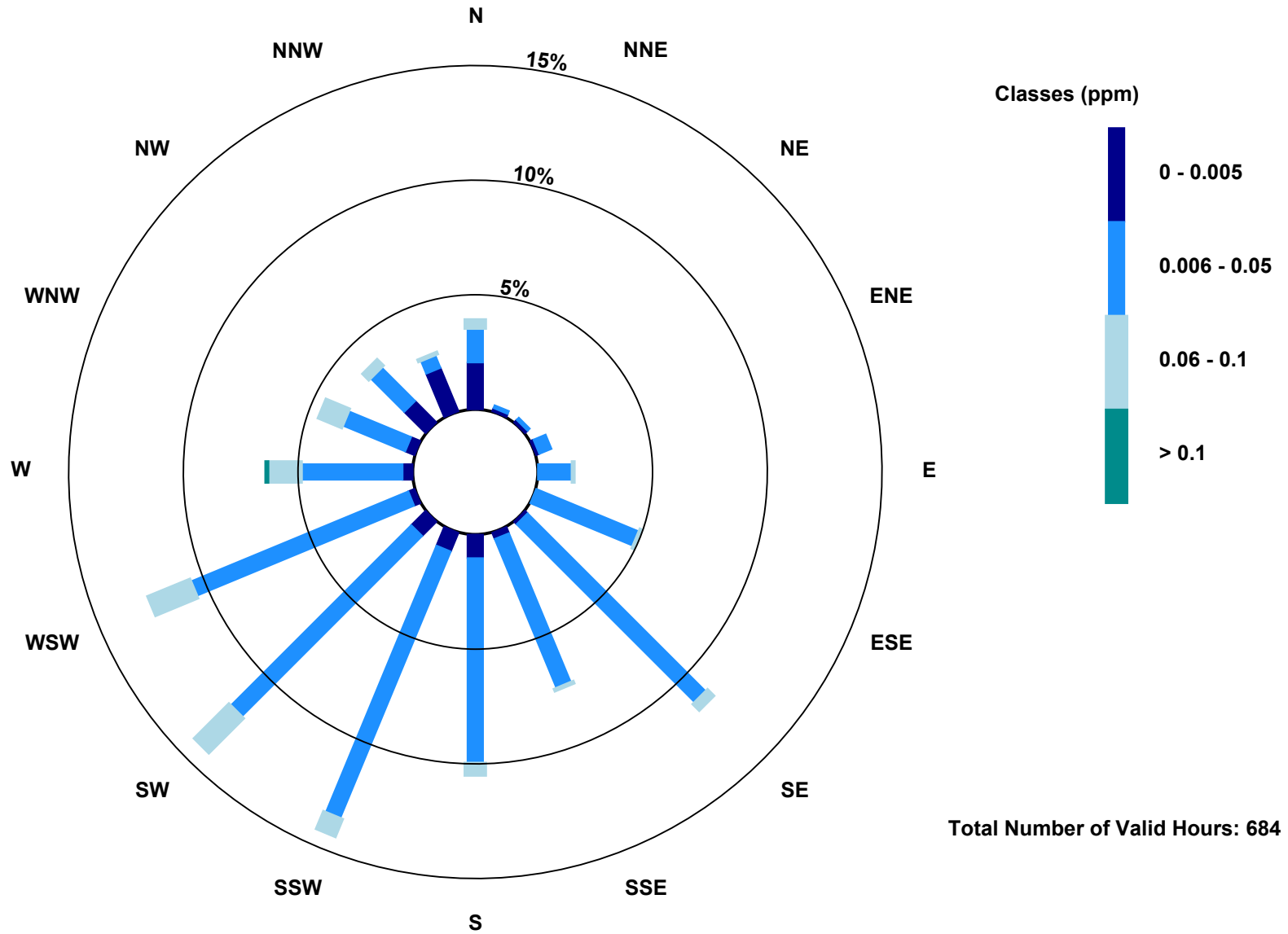
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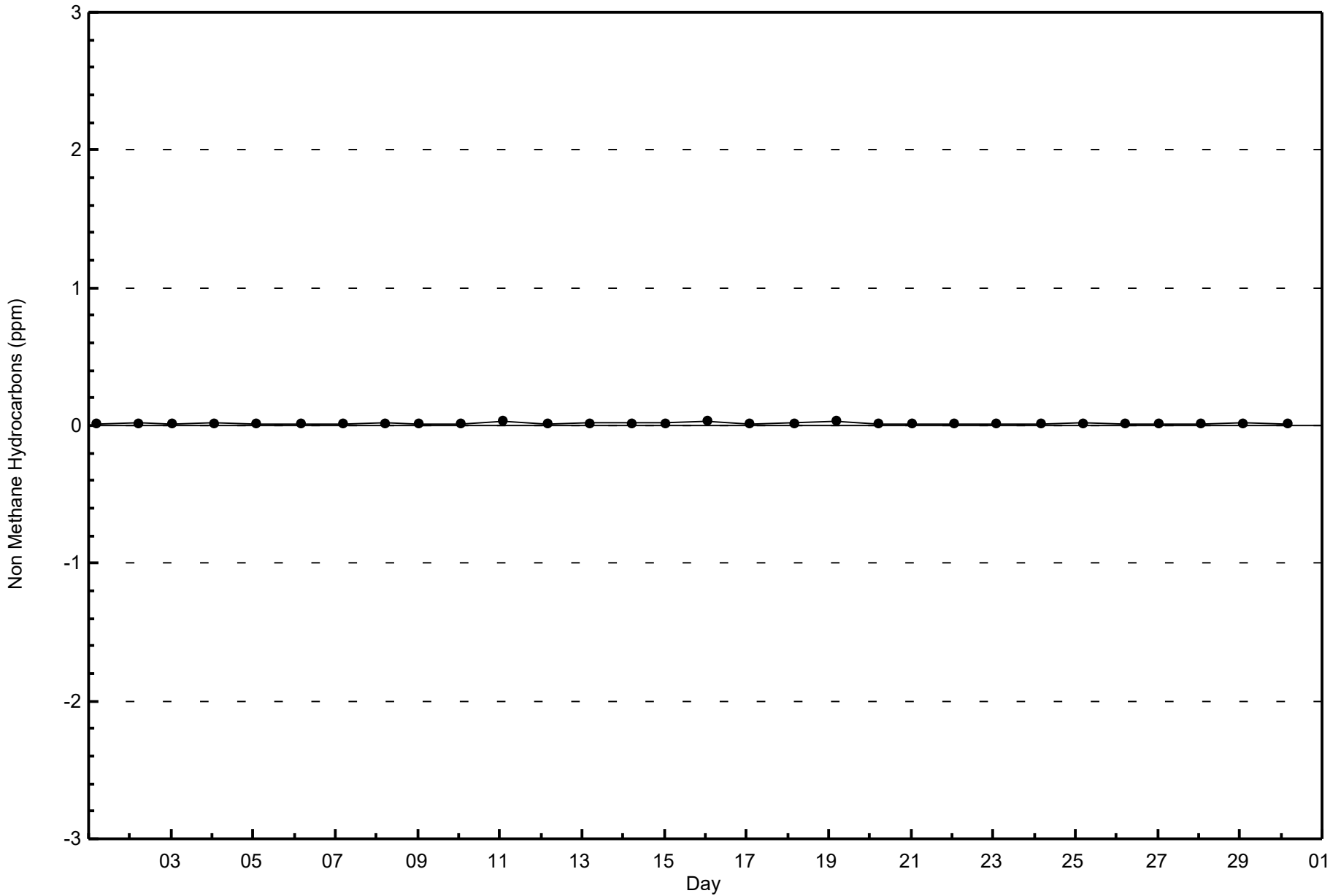
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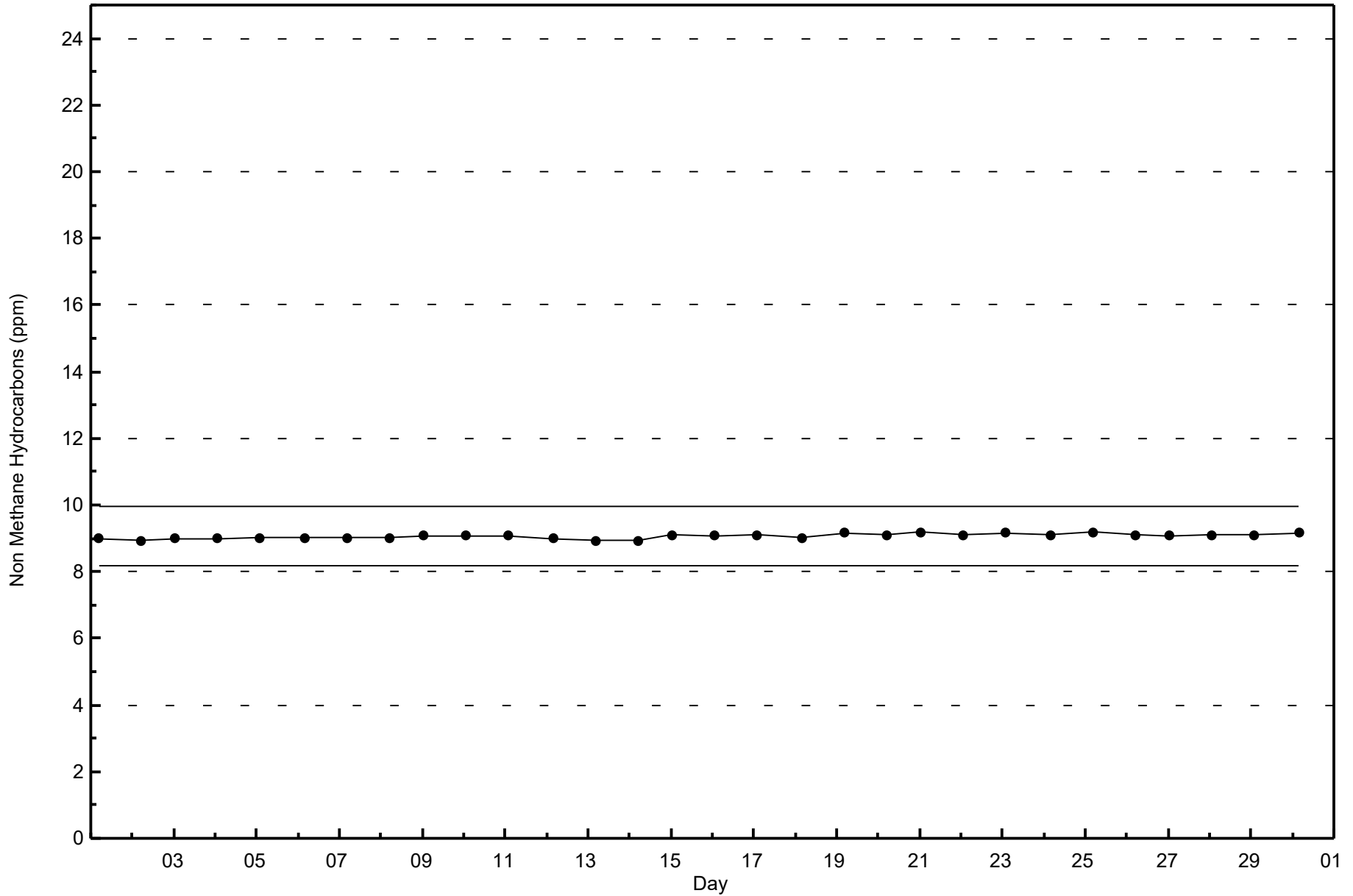


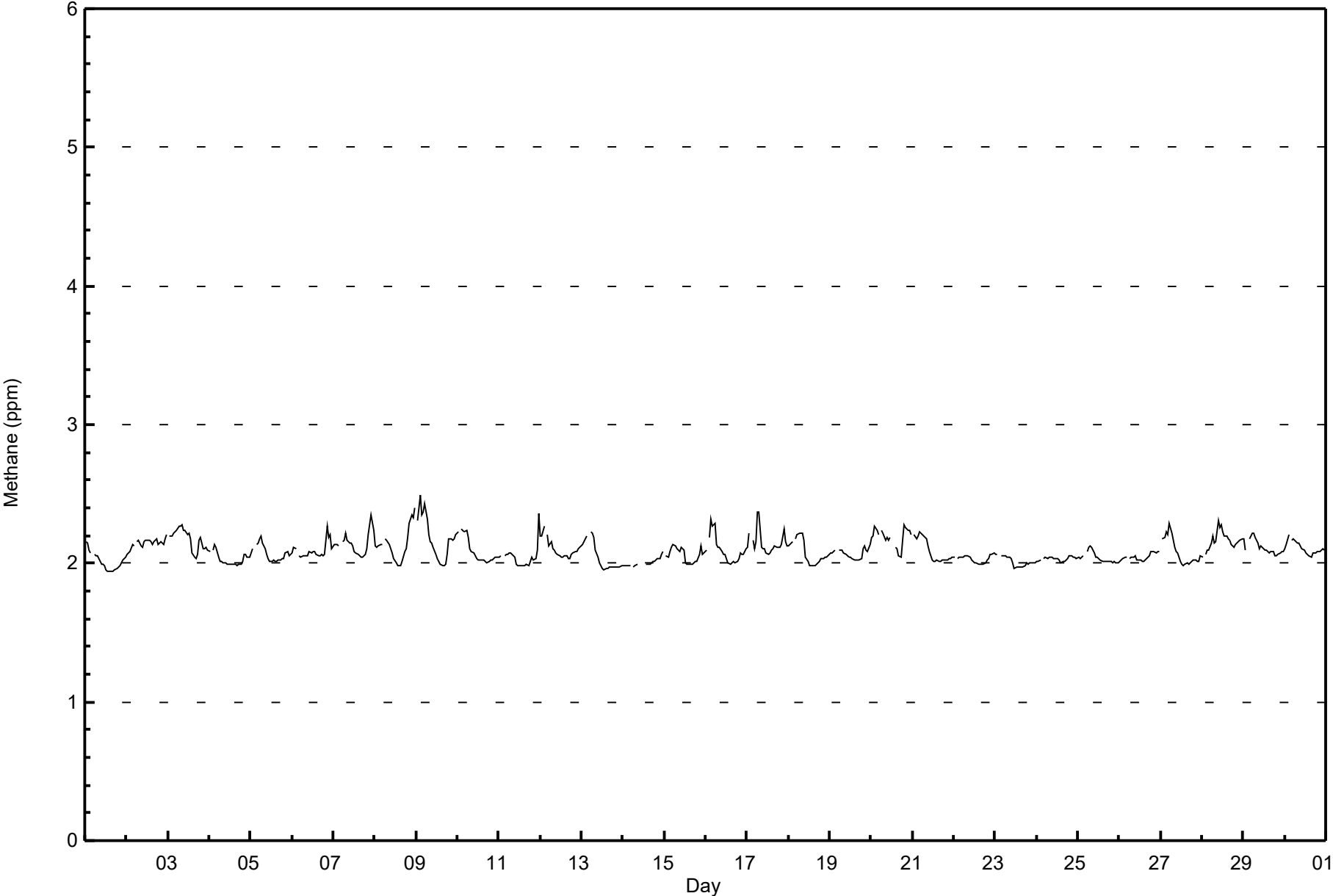
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Non Methane Hydrocarbons (NMHC) - ppm
Patricia McInnes











Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Patricia McInnes - September 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	277	40.50	40.50
2.1 - 3.0	407	59.50	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Methane (CH₄) - ppm
Patricia McInnes - September 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	1	1	4	7	19	37	20	30	31	29	46	24	15	9	4	277
2.1 - 3.0	27	1	1	1	4	15	42	31	42	67	68	40	20	16	17	15	407
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	27	2	2	5	11	34	79	51	72	98	97	86	44	31	26	19	684

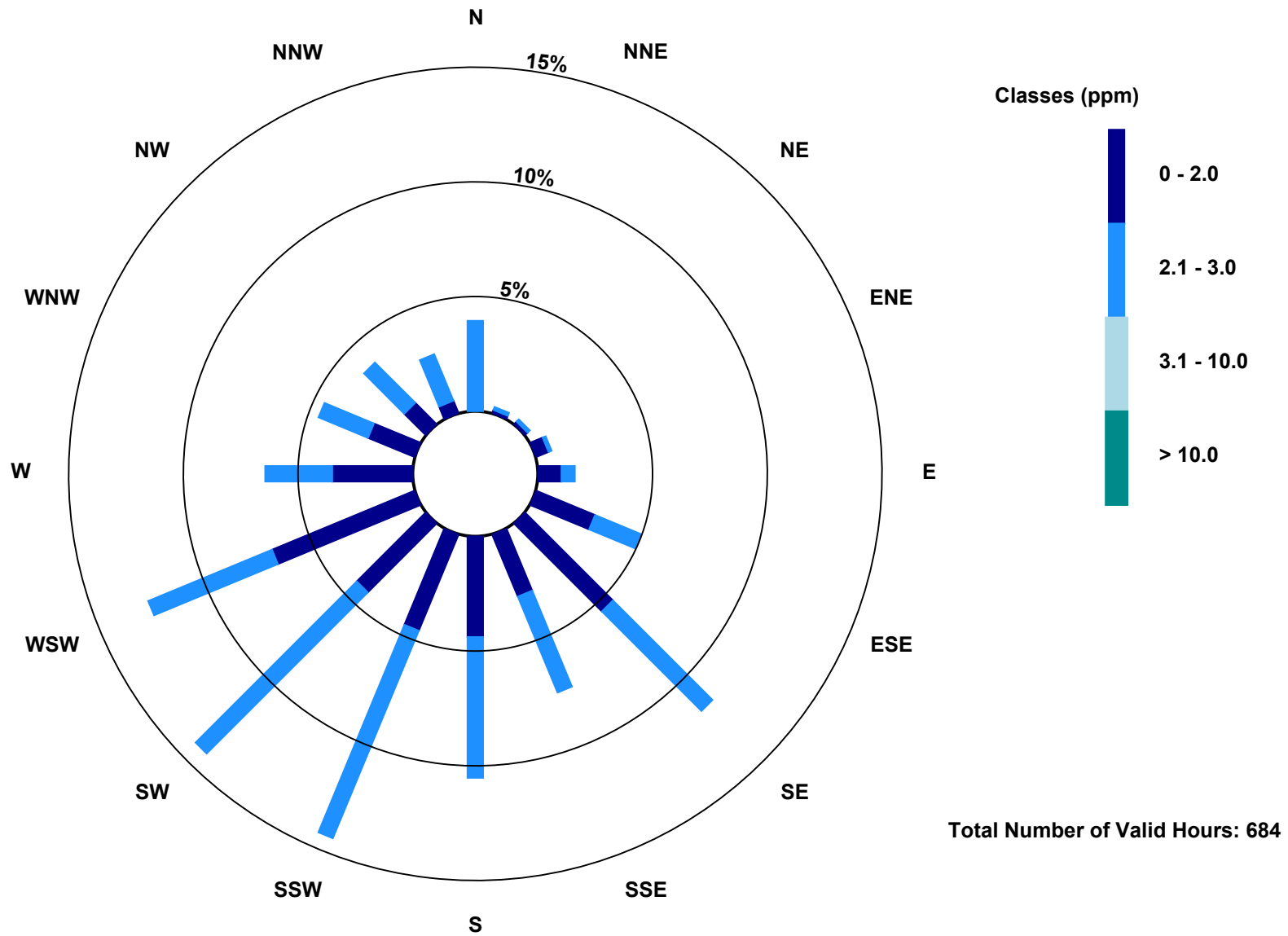
Total Number of Valid Hours: 684

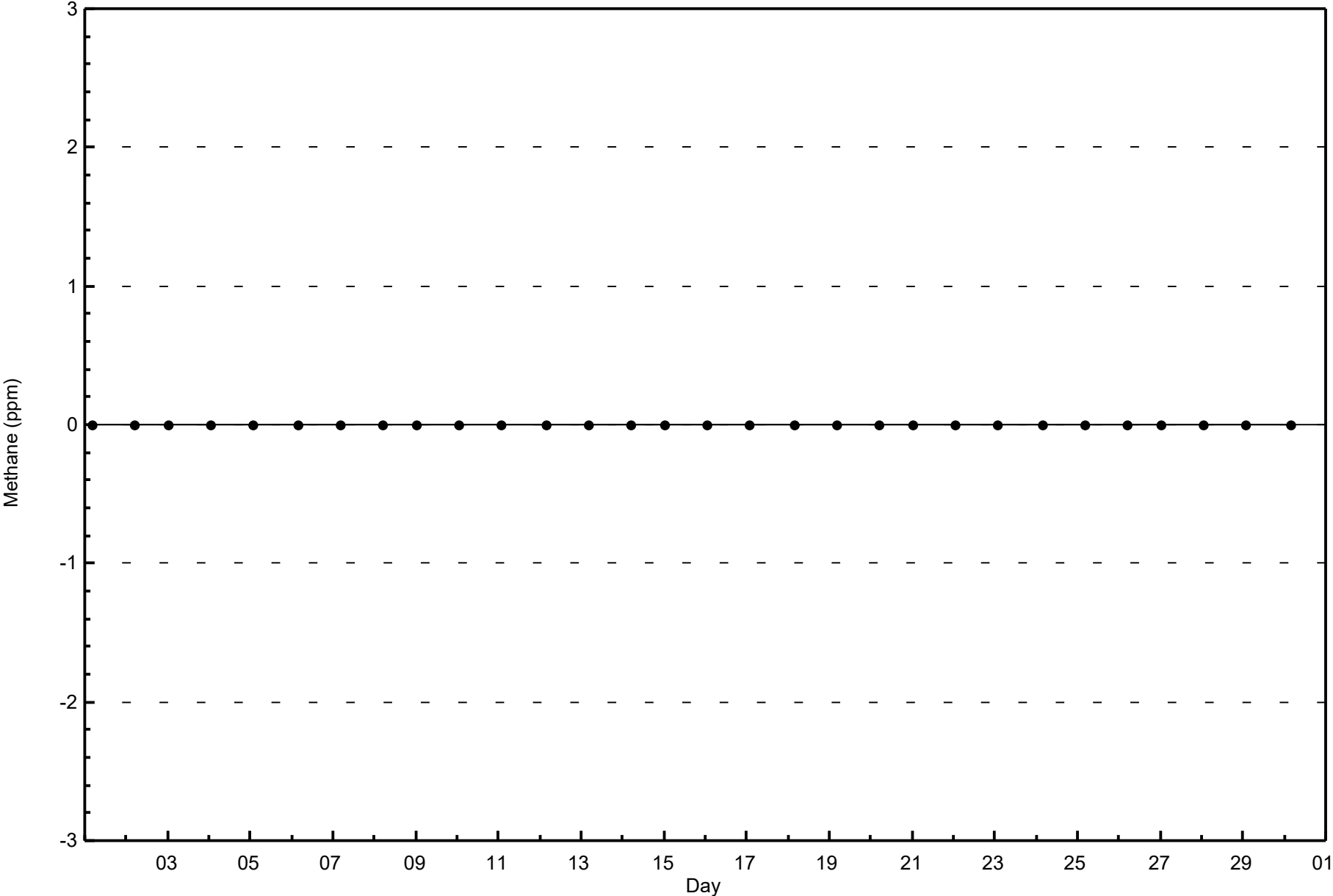
Total Number of Hours: 720

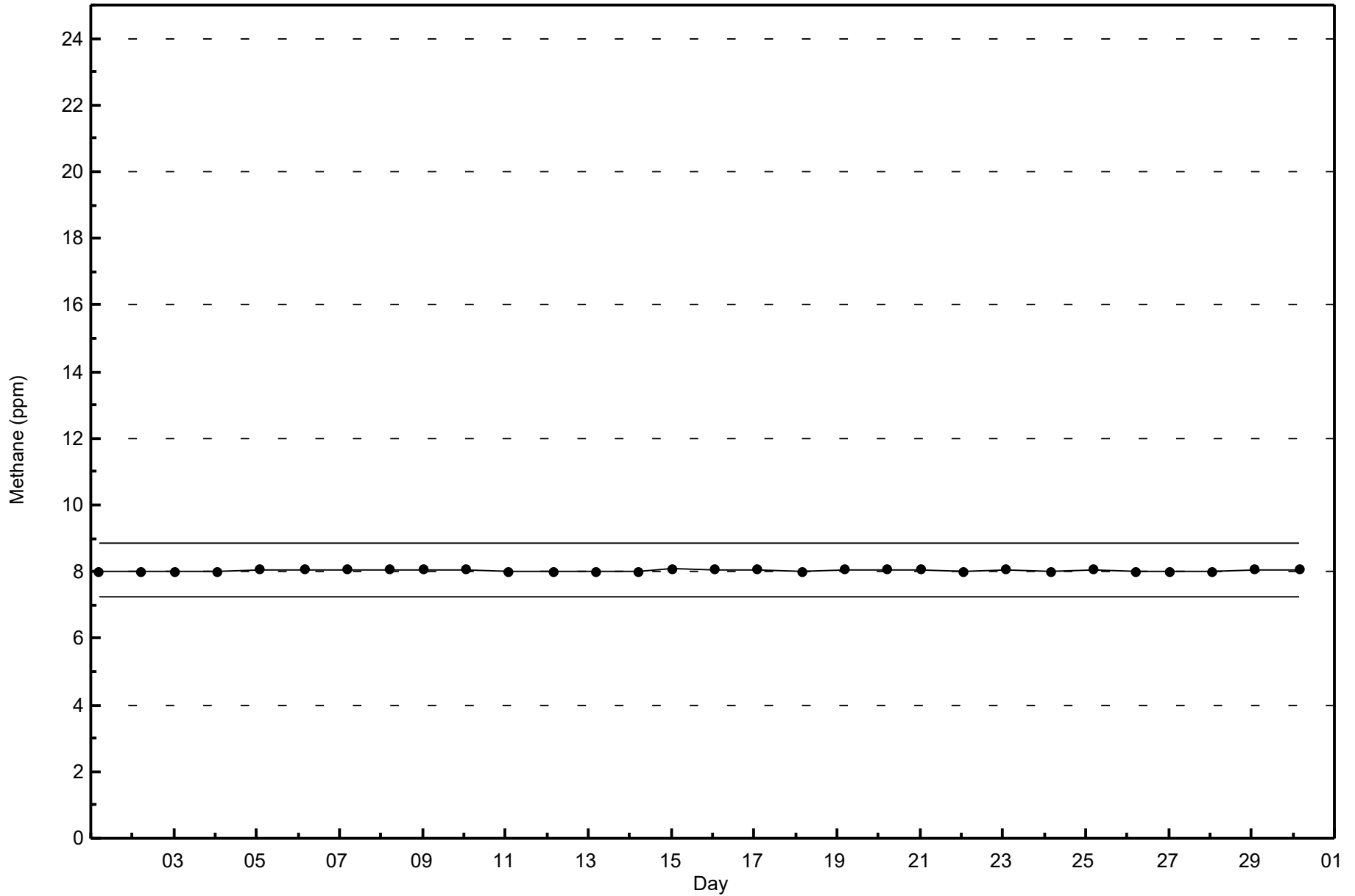


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Methane (CH₄) - ppm
Patricia McInnes









Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O₃) - ppb

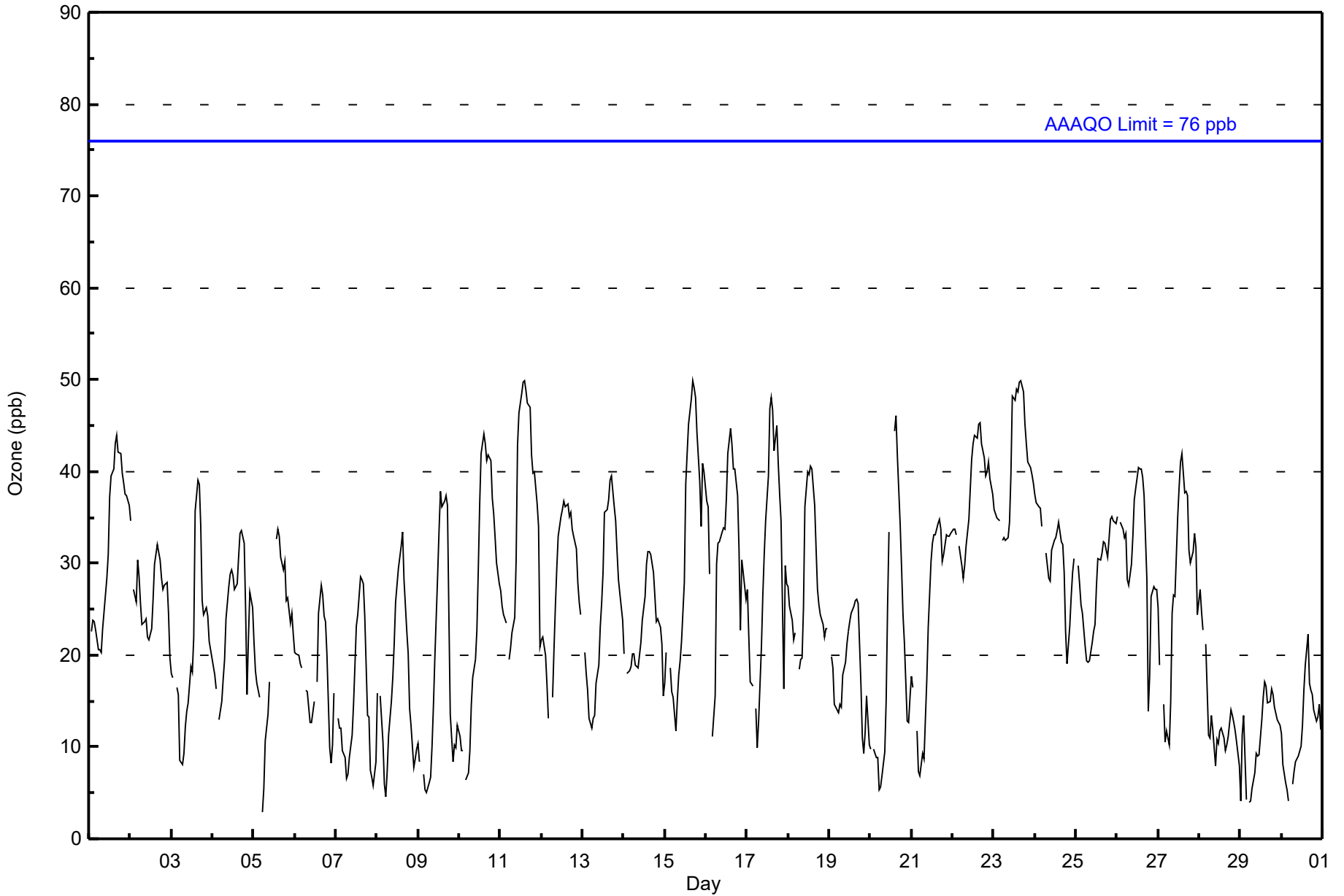
Patricia McInnes - September 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 49.9 ppb on Sep 23 17:00	Maximum Daily Average: 40.7 ppb on Sep 23		Hours of Data:	684
Minimum Value: 2.9 ppb on Sep 5 06:00	Minimum Daily Average: 11.2 ppb on Sep 29		Hours of Missing Data:	36
Maximum Diurnal Average: 35.4 ppb at hour 16	Minimum Diurnal Average: 14.7 ppb at hour 6		Hours of Calibration:	33
Monthly Average: 24.99 ppb	Percentiles: P ₁ = 5.0 P ₁₀ = 10.0 Q ₁ = 15.6 Median = 24.7 Q ₃ = 33.5 P ₉₀ = 40.2 P ₉₉ = 48.8		Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Sep	Z	22.6	23.8	23.6	22.7	20.7	20.5	20.3	22.9	26.6	28.3	31.0	37.3	39.6	40.3	43.1	43.9	42.1	41.9	39.8	38.8	37.5	37.3	36.3	32.2	43.9
2-Sep	34.6	Z	27.1	25.8	30.4	28.6	25.7	23.3	23.7	23.9	22.0	21.7	22.9	26.1	29.9	31.0	32.1	30.4	28.3	27.2	27.6	27.9	24.6	19.7	26.7	34.6
3-Sep	18.0	17.5	Z	16.5	15.7	8.6	8.1	9.3	12.2	13.8	14.7	18.8	18.1	22.0	35.6	39.1	38.6	34.1	25.9	24.3	25.2	24.2	21.5	20.6	21.0	39.1
4-Sep	18.8	17.9	16.4	Z	12.9	14.9	17.3	19.6	23.9	27.4	28.8	29.3	28.7	27.2	27.7	30.6	33.2	33.5	32.2	25.1	15.7	21.7	26.8	25.2	24.1	33.5
5-Sep	21.3	18.3	17.0	15.4	Z	2.9	5.4	10.7	13.6	17.1	C	C	C	32.6	33.8	32.9	30.7	29.3	30.2	26.0	26.2	23.5	24.6	22.3	21.7	33.8
6-Sep	20.3	20.1	20.0	19.0	18.6	Z	16.2	16.0	14.3	12.7	12.7	14.9	M	17.1	24.5	27.6	26.5	24.2	23.7	20.2	10.0	8.2	10.2	15.8	17.9	27.6
7-Sep	Z	13.1	12.1	12.1	9.6	8.8	6.5	7.0	8.9	11.3	14.6	18.9	23.2	24.4	28.5	28.3	27.7	24.3	13.4	13.3	7.5	6.7	5.7	8.4	14.5	28.5
8-Sep	15.9	Z	15.5	10.5	6.0	4.6	7.3	11.2	15.0	17.6	21.2	25.8	29.5	30.6	31.8	33.4	28.3	22.6	20.1	14.2	12.3	7.8	8.7	9.7	17.4	33.4
9-Sep	10.3	8.4	Z	7.0	5.3	5.0	6.0	6.7	10.1	14.5	19.7	28.7	33.5	37.9	36.2	36.8	37.4	36.3	24.8	13.6	8.4	10.3	10.0	12.4	18.2	37.9
10-Sep	11.2	9.6	9.6	Z	6.4	7.2	9.6	14.6	17.5	19.6	22.7	29.3	36.5	41.9	44.1	43.0	41.2	41.8	41.1	37.0	35.4	32.8	30.0	27.7	26.5	44.1
11-Sep	27.0	25.3	24.4	23.5	Z	19.5	20.8	22.4	24.1	30.4	42.8	46.3	48.5	49.8	49.9	48.8	47.5	46.9	41.7	39.7	40.0	36.4	34.1	20.9	35.3	49.9
12-Sep	21.6	22.0	20.0	16.7	13.1	Z	15.4	20.6	25.4	29.4	32.9	35.1	35.9	36.7	36.2	36.4	35.1	35.6	33.6	32.9	31.6	28.0	25.7	24.4	28.0	36.7
13-Sep	Z	20.2	18.1	16.2	13.1	12.0	13.1	13.4	16.9	19.0	23.1	25.6	28.9	35.6	35.9	36.9	39.1	39.4	36.2	34.6	31.2	28.2	26.7	23.8	25.5	39.4
14-Sep	20.1	Z	18.0	18.4	18.7	20.1	20.2	18.9	18.6	20.0	21.4	23.8	26.3	30.0	31.2	31.3	30.9	28.9	26.4	23.7	23.9	23.1	21.2	15.6	23.1	31.3
15-Sep	17.0	20.4	Z	18.6	15.9	15.3	11.7	15.0	17.9	19.4	21.5	27.9	38.6	41.9	45.1	47.9	49.8	49.1	48.1	44.2	38.9	34.1	40.9	39.9	31.3	49.8
16-Sep	36.7	36.2	28.8	Z	11.2	15.6	29.8	32.2	32.4	33.4	33.8	33.8	37.0	42.0	44.8	42.8	40.2	40.3	37.3	31.5	22.8	30.4	28.9	26.1	32.5	44.8
17-Sep	27.1	22.0	17.1	16.7	Z	14.1	9.8	12.8	20.9	26.6	30.9	34.6	39.5	46.9	48.0	46.7	42.3	45.0	40.9	37.6	34.7	16.4	29.7	27.7	29.9	48.0
18-Sep	27.4	25.4	23.8	21.6	22.4	Z	18.4	19.5	19.6	25.2	36.1	40.0	39.7	40.6	40.3	36.4	31.6	27.2	25.4	24.4	23.4	21.9	22.8	22.8	27.6	40.6
19-Sep	Z	19.9	18.6	14.7	14.4	13.7	14.7	14.4	17.8	19.2	21.3	22.6	23.6	24.6	25.4	25.9	26.1	25.6	16.8	11.1	9.3	11.6	15.5	10.3	18.1	26.1
20-Sep	9.8	Z	9.8	8.8	8.8	5.4	5.7	6.8	9.4	15.1	25.3	33.4	M	M	44.4	46.1	41.7	34.2	29.5	24.4	21.4	12.8	12.7	15.4	20.0	46.1
21-Sep	17.6	16.5	Z	11.7	7.4	6.9	9.3	8.7	13.2	17.4	23.0	30.3	32.2	33.1	33.1	34.4	34.7	33.7	30.2	30.9	33.1	32.9	33.0	33.3	24.2	34.7
22-Sep	33.7	33.7	33.1	Z	31.8	29.7	28.4	29.7	31.9	34.7	38.2	41.4	42.9	43.9	43.7	45.2	45.4	43.0	41.5	39.5	39.9	41.0	39.2	37.5	37.8	45.4
23-Sep	35.9	35.3	34.9	34.7	Z	32.5	32.8	32.4	32.9	34.5	39.7	48.1	47.8	48.9	48.6	49.8	49.9	48.7	45.2	43.0	41.0	40.4	39.7	38.7	40.7	49.9
24-Sep	37.5	36.5	36.2	36.0	34.1	Z	31.2	29.7	28.4	28.0	31.5	32.4	32.8	33.6	34.5	32.3	32.1	29.0	22.6	19.1	23.1	26.4	29.0	30.5	30.7	37.5
25-Sep	Z	29.7	27.8	25.5	24.5	21.0	19.3	19.2	19.3	21.4	22.6	23.3	27.5	30.5	30.3	31.1	32.4	32.1	30.7	32.6	34.8	35.0	34.6	34.3	27.8	35.0
26-Sep	35.1	Z	34.4	33.6	32.9	33.2	28.3	27.6	29.8	32.9	37.0	38.1	40.3	40.3	40.3	39.4	37.4	28.1	13.9	17.8	26.4	27.5	27.1	27.1	31.7	40.3
27-Sep	25.1	18.9	Z	14.6	10.5	11.8	10.2	15.0	24.5	26.6	26.3	35.1	38.4	41.0	42.0	37.7	37.8	37.4	31.5	30.1	31.2	33.3	31.7	24.3	27.6	42.0
28-Sep	27.2	24.7	22.7	Z	21.3	11.3	11.0	13.4	12.0	7.9	10.8	10.4	11.8	12.0	11.0	9.6	10.2	11.2	14.0	13.4	12.6	11.7	10.5	7.9	13.4	27.2
29-Sep	4.1	11.2	13.3	4.3	Z	4.0	4.1	5.5	7.1	9.2	9.0	9.1	13.0	15.4	17.1	16.6	14.8	14.9	16.3	15.7	14.3	13.0	12.7	12.4	11.2	17.1
30-Sep	11.5	8.1	6.0	5.3	4.1	Z	5.9	7.4	8.4	8.8	9.0	10.0	12.4	16.2	19.0	22.3	16.9	16.2	15.7	14.0	12.7	13.2	14.6	11.9	11.7	22.3

22.6	21.3	21.1	18.0	16.5	14.7	15.4	16.8	19.1	21.5	24.9	28.3	31.4	33.2	35.1	35.4	34.5	32.8	29.3	26.7	25.1	23.9	24.3	22.8	Diurnal Average	
37.5	36.5	36.2	36.0	34.1	33.2	32.8	32.4	32.9	34.7	42.8	48.1	48.5	49.8	49.9	49.8	49.9	49.1	48.1	44.2	41.0	41.0	40.9	39.9	Diurnal Maximum	

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ozone (O₃) - ppb
Patricia McInnes - September 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	259	37.87	37.87
21 - 50	425	62.13	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: 720



Wood Buffalo Environmental Association
Frequency Distribution

Ozone (O₃) - ppb
Patricia McInnes - September 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	0	1	1	2	9	17	20	39	46	38	16	7	15	11	15	259
21 - 50	5	2	1	4	9	26	60	30	31	57	53	71	35	22	15	4	425
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	27	2	2	5	11	35	77	50	70	103	91	87	42	37	26	19	684

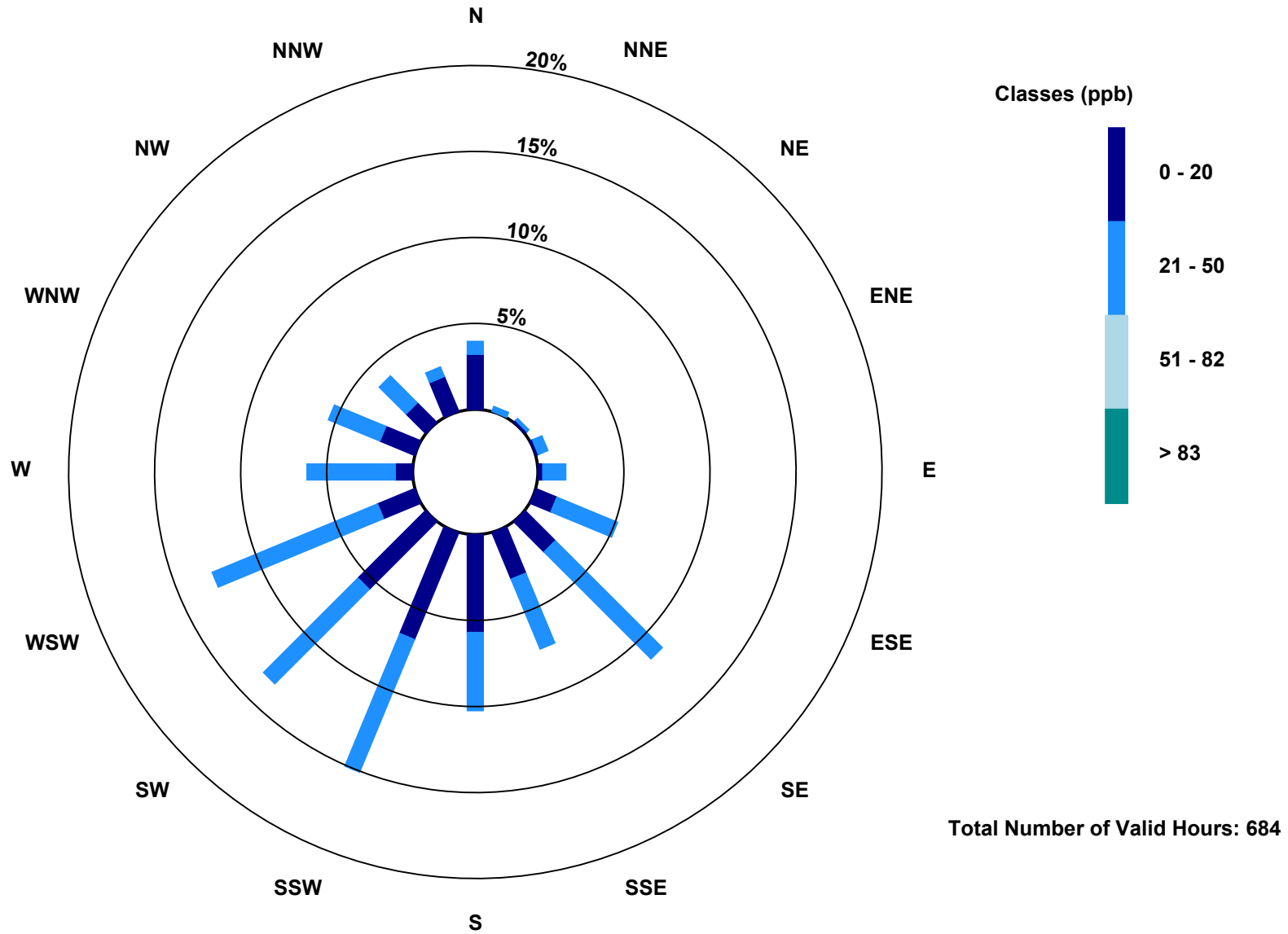
Total Number of Valid Hours: 684

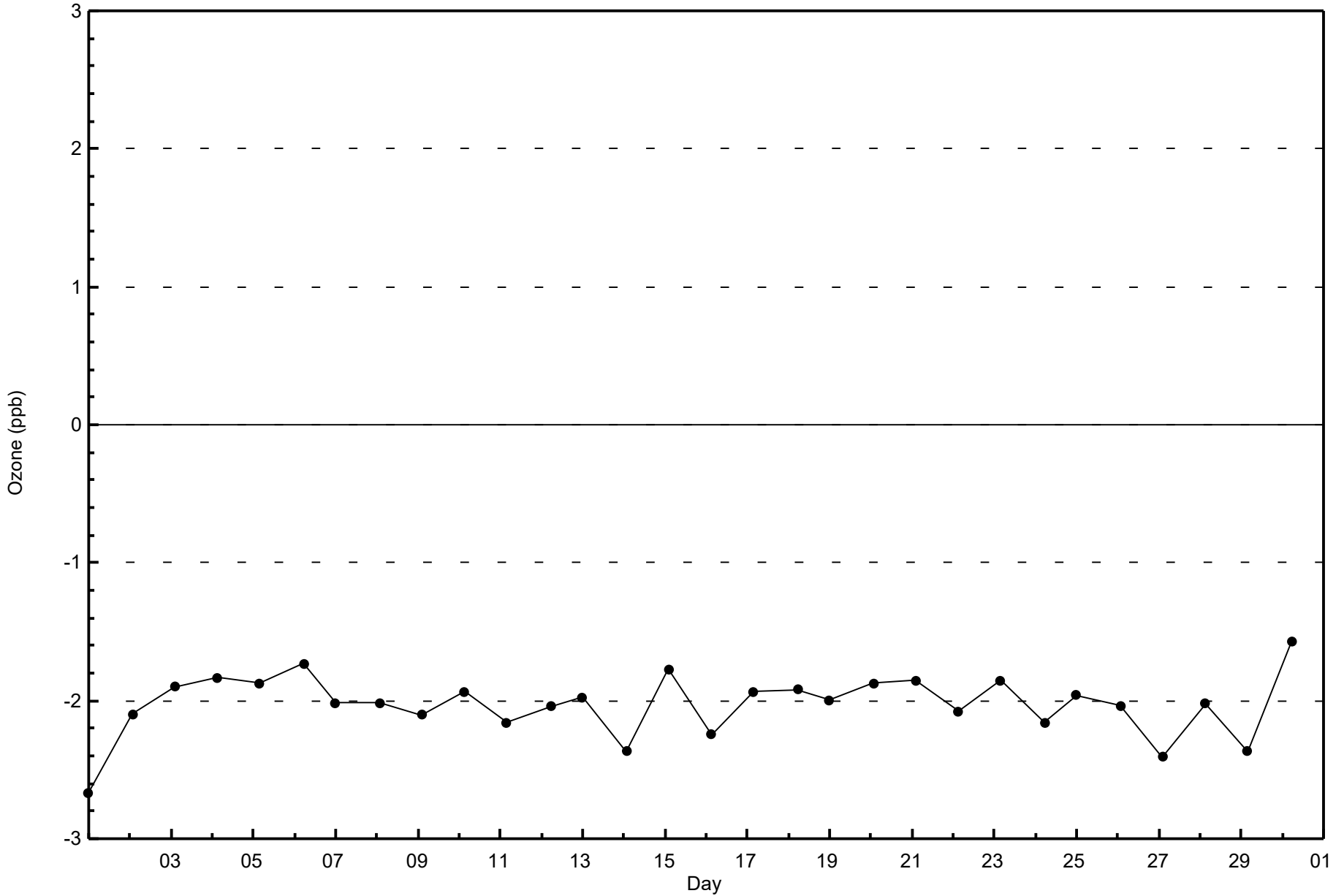
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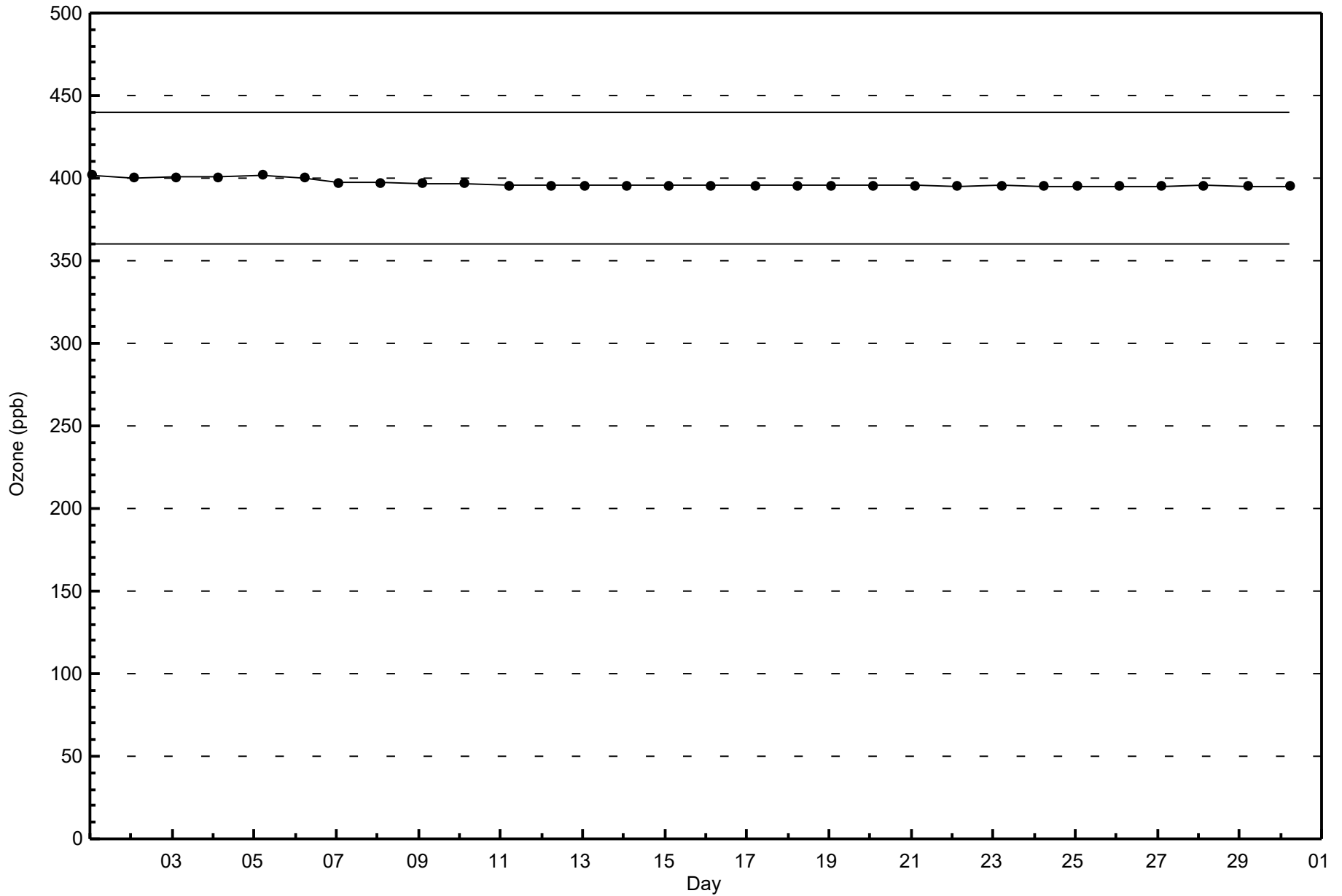


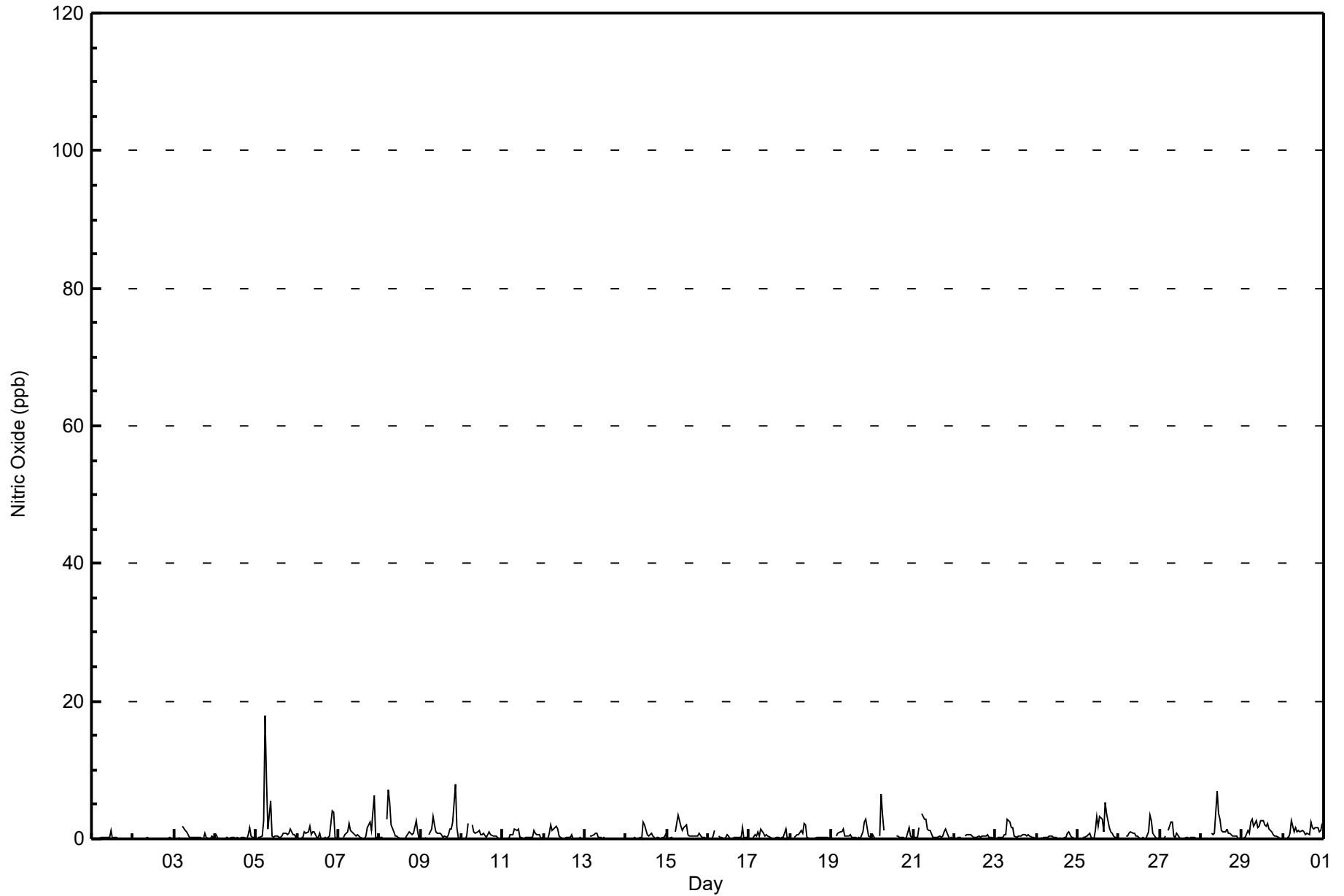
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Ozone (O₃) - ppb
Patricia McInnes











Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	684	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: 684

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Nitric Oxide (NO) - ppb
Patricia McInnes - September 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	26	2	1	5	11	33	81	49	72	97	95	87	43	36	28	18	684
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	26	2	1	5	11	33	81	49	72	97	95	87	43	36	28	18	684

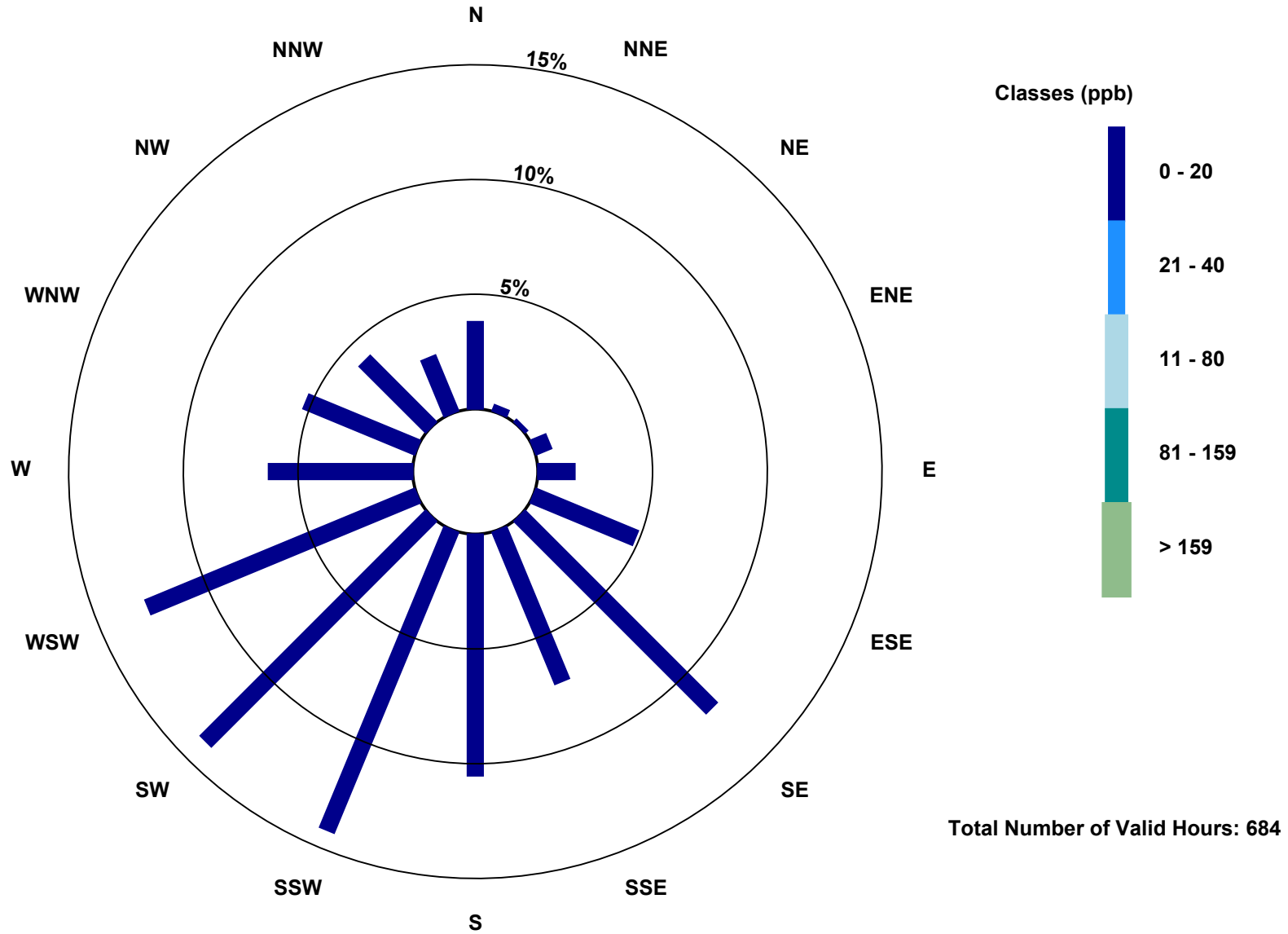
Total Number of Valid Hours: 684

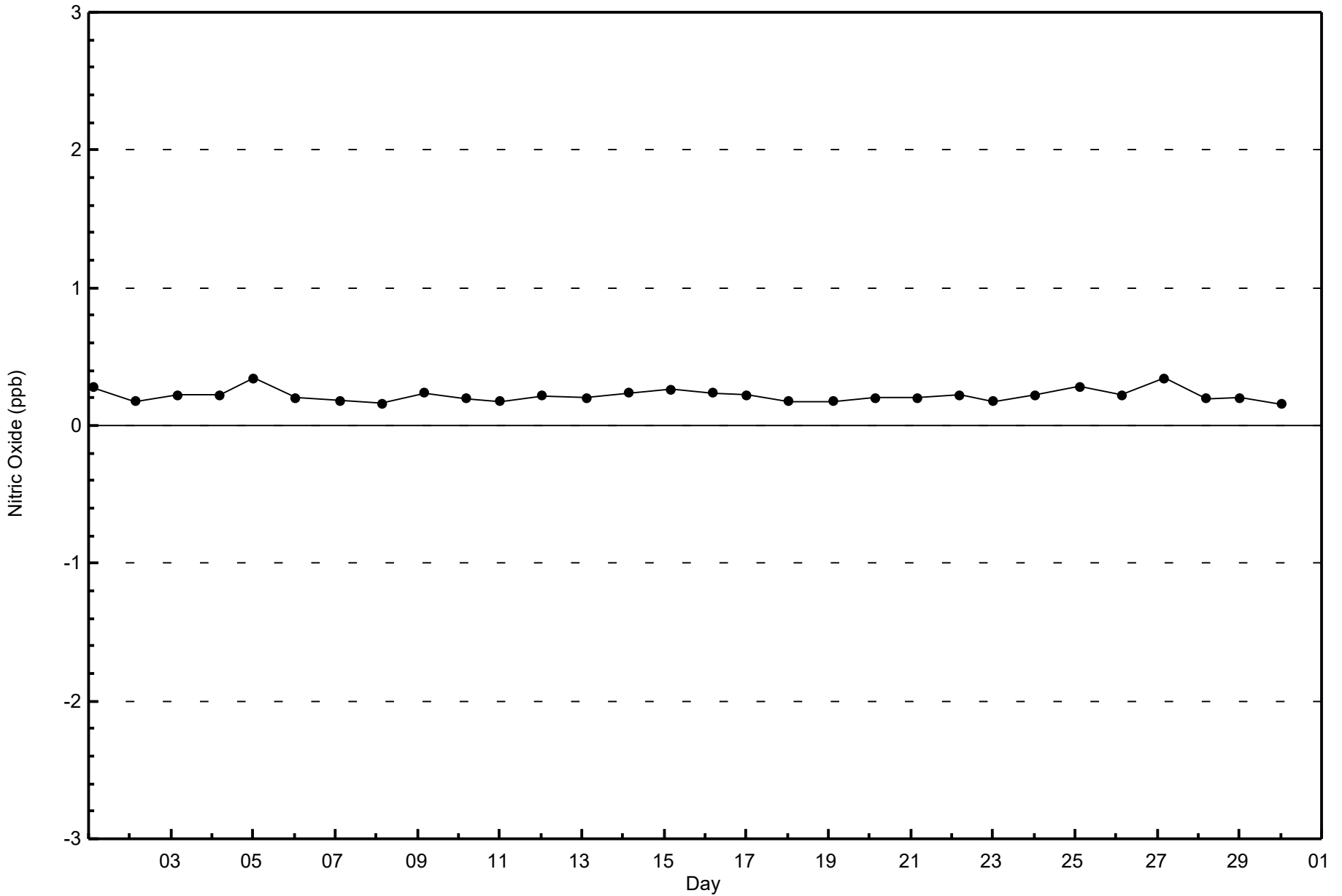
Total Number of Hours: 720

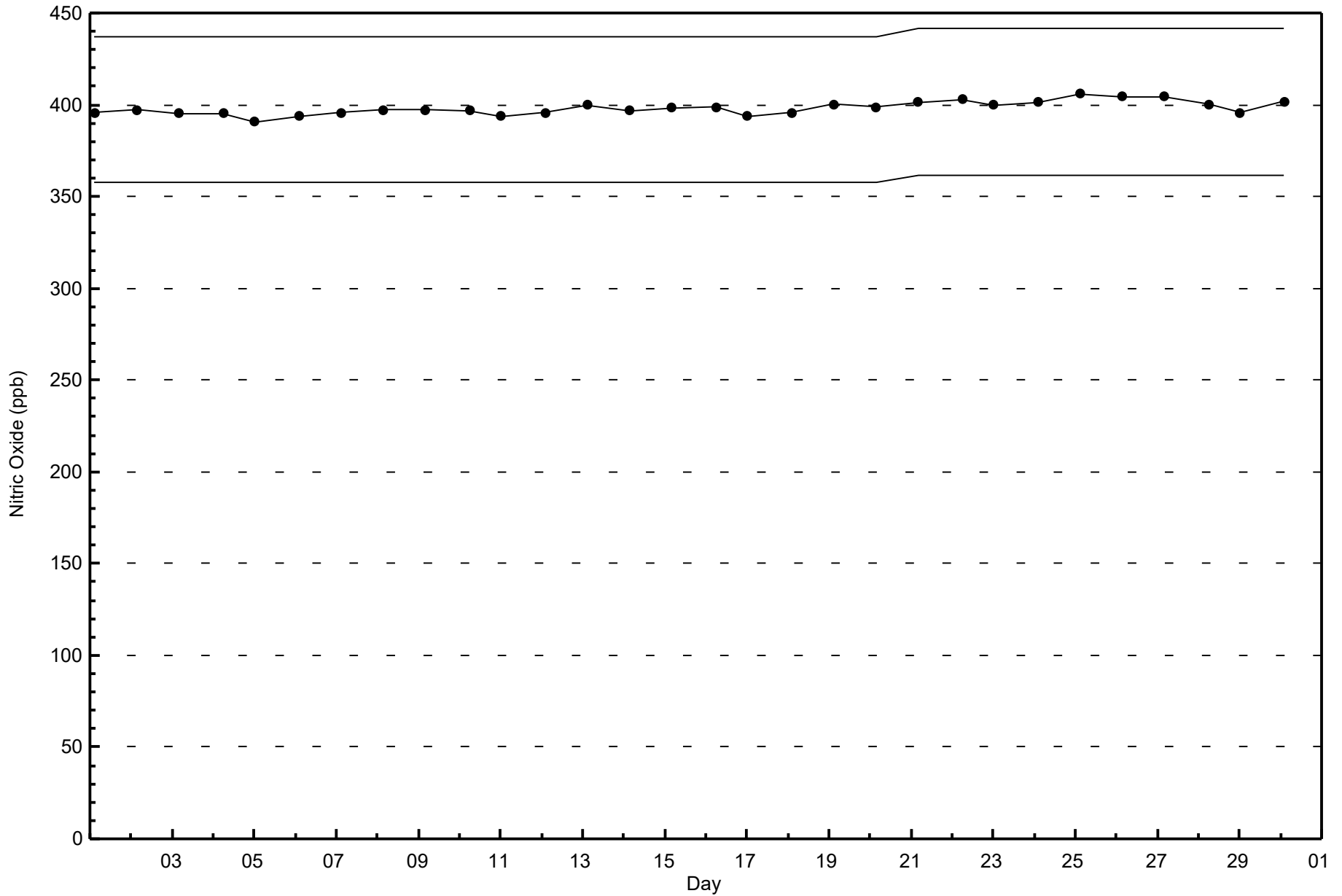


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitric Oxide (NO) - ppb
Patricia McInnes









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

Patricia McInnes - September 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 22.7 ppb on Sep 26 19:00	Maximum Daily Average: 4.7 ppb on Sep 29		Hours of Data:	684
Minimum Value: 0.0 ppb on Sep 1 04:00	Minimum Daily Average: 0.3 ppb on Sep 1		Hours of Missing Data:	36
Maximum Diurnal Average: 4.7 ppb at hour 6	Minimum Diurnal Average: 0.9 ppb at hour 13		Hours of Calibration:	36
Monthly Average: 2.27 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.5 Median = 1.5 Q ₃ = 3.1 P ₉₀ = 5.3 P ₉₉ = 11.4		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-Sep	0.3	0.2	Z	0.0	0.2	0.7	0.4	0.1	0.1	0.1	0.0	0.7	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.6	0.5	0.8	0.9	1.1	0.3	1.1
2-Sep	0.5	0.7	2.5	Z	3.6	4.3	4.8	4.8	5.1	4.6	4.9	4.1	4.0	3.9	4.1	3.7	4.1	4.5	3.8	3.0	2.5	2.8	3.2	3.1	3.6	5.1
3-Sep	2.5	2.0	1.8	2.0	Z	8.4	6.8	4.8	2.4	1.8	1.4	1.6	1.5	1.5	2.1	2.3	1.9	1.8	7.9	6.2	1.6	1.2	2.1	1.1	2.9	8.4
4-Sep	1.3	0.6	0.5	0.4	0.3	Z	0.0	0.1	0.0	0.4	0.2	0.3	0.1	0.1	0.0	0.1	0.2	0.2	0.8	3.7	9.5	3.2	0.7	0.4	1.0	9.5
5-Sep	Z	0.5	0.4	1.8	8.7	14.5	7.9	1.0	0.6	0.2	0.1	0.1	0.2	0.1	0.3	0.6	1.5	2.6	2.8	5.6	4.4	4.6	2.0	1.0	2.7	14.5
6-Sep	2.3	Z	1.7	1.0	1.6	1.5	1.9	3.0	1.9	1.8	1.0	0.1	0.2	1.0	0.3	0.4	0.4	0.4	0.9	2.8	3.1	2.5	1.0	0.7	1.4	3.1
7-Sep	0.3	0.6	Z	0.5	1.6	1.0	1.4	0.4	0.6	0.5	0.4	0.4	0.5	0.1	0.0	0.0	1.7	5.1	11.6	4.2	6.5	8.9	3.7	1.8	2.3	11.6
8-Sep	0.9	0.7	0.3	Z	4.6	6.3	5.3	1.7	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	1.2	7.6	8.6	6.6	5.3	6.8	4.3	3.2	2.8	8.6
9-Sep	2.4	2.1	1.6	2.2	Z	2.2	2.5	2.4	1.5	0.8	1.0	1.8	1.6	1.2	0.6	0.4	0.8	3.0	9.4	5.0	4.8	3.8	2.2	1.5	2.4	9.4
10-Sep	0.5	0.2	1.0	1.3	5.6	Z	4.3	2.0	0.8	0.8	1.1	1.0	0.9	1.1	0.7	1.4	1.7	2.0	2.3	3.0	2.3	2.1	1.5	1.3	1.7	5.6
11-Sep	Z	1.0	1.0	1.1	2.2	5.2	3.4	3.1	2.2	1.9	0.7	0.4	0.3	0.4	0.4	0.5	1.0	1.1	4.2	5.9	4.0	4.9	3.5	4.1	2.3	5.9
12-Sep	5.3	Z	0.4	5.9	12.5	9.3	11.4	8.0	3.6	0.8	0.5	0.5	0.5	0.8	0.5	0.9	1.8	1.2	1.5	1.5	1.6	2.8	1.9	1.8	3.3	12.5
13-Sep	0.9	0.6	Z	1.8	1.4	1.9	1.0	0.8	0.3	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	0.4	1.9
14-Sep	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.3	0.0	0.0	0.8	0.6	0.5	0.8	1.3	0.6	0.0	0.8	1.4	0.3	1.2	1.2	1.2	5.2	0.7	5.2
15-Sep	2.8	0.3	0.2	0.4	Z	3.0	4.8	4.0	2.0	1.5	1.9	3.0	1.2	1.0	1.1	1.9	2.2	2.6	3.5	4.3	5.6	5.7	2.9	2.6	2.5	5.7
16-Sep	2.5	2.4	2.3	1.9	9.1	Z	3.8	1.4	0.8	0.6	0.9	1.2	1.2	0.6	0.3	0.9	1.4	1.5	3.9	6.5	11.5	3.8	3.1	2.4	2.8	11.5
17-Sep	Z	1.3	0.2	3.1	3.7	7.1	3.6	2.6	2.3	1.4	1.3	1.3	1.0	1.1	1.1	0.9	1.4	2.8	5.0	6.0	3.5	7.6	1.9	1.3	2.7	7.6
18-Sep	0.7	Z	1.3	3.0	2.0	4.4	4.3	2.7	3.6	1.2	0.6	0.1	0.0	0.0	0.4	0.6	0.7	1.3	1.3	0.7	0.2	0.1	0.0	1.3	4.4	
19-Sep	0.0	0.0	Z	2.7	2.8	3.4	1.5	2.2	0.4	0.1	0.2	0.5	0.2	0.1	0.2	0.0	0.2	0.2	4.4	3.9	4.3	5.6	2.4	2.2	1.6	5.6
20-Sep	1.4	1.6	0.2	Z	1.4	5.4	2.8	1.6	C	C	C	C	C	C	4.4	6.0	3.4	2.8	2.8	3.8	5.6	7.3	5.3	6.8	--	7.3
21-Sep	5.9	4.5	3.9	5.6	Z	6.2	3.7	3.7	1.4	0.9	1.1	0.0	0.0	0.0	0.1	0.2	0.2	0.6	3.0	2.9	1.4	1.8	2.0	1.9	2.2	6.2
22-Sep	1.4	1.4	1.6	2.6	2.3	Z	3.7	2.8	2.0	1.8	1.4	0.9	0.8	0.7	1.1	1.1	1.6	2.6	2.6	4.3	3.3	2.3	3.2	2.3	2.1	4.3
23-Sep	Z	2.2	2.2	2.5	3.0	4.7	4.1	4.6	3.9	2.8	2.6	0.8	0.5	0.9	1.1	1.0	0.7	1.4	2.4	3.2	2.1	1.4	0.8	0.5	2.1	4.7
24-Sep	0.5	Z	0.9	1.0	1.9	2.0	1.9	1.9	2.0	1.6	0.9	0.9	0.6	0.3	0.2	0.3	1.4	2.9	8.2	8.2	2.5	0.7	0.5	0.4	1.8	8.2
25-Sep	0.3	0.1	Z	0.9	0.8	2.3	1.7	1.1	0.2	0.0	1.2	2.2	1.9	3.5	2.9	2.3	5.6	5.3	6.0	3.6	1.6	1.3	0.4	0.2	2.0	6.0
26-Sep	0.1	0.2	0.4	Z	1.7	2.4	6.7	7.5	5.0	2.9	1.6	1.4	1.2	1.5	1.5	1.8	1.7	9.3	22.7	18.6	5.2	3.0	1.0	0.6	4.3	22.7
27-Sep	0.5	0.9	1.0	2.5	Z	4.6	9.2	8.6	1.1	0.7	1.0	0.1	0.0	0.0	0.1	0.5	0.5	0.8	3.1	3.0	2.2	0.6	1.0	2.2	1.9	9.2
28-Sep	0.4	0.1	0.0	0.7	0.5	Z	3.5	1.3	1.9	10.2	5.5	4.7	2.0	1.9	2.3	2.6	1.5	1.9	1.7	1.6	1.4	2.2	2.3	3.3	2.3	10.2
29-Sep	Z	2.9	1.5	10.7	10.7	11.4	10.4	7.9	4.1	1.3	3.4	4.8	3.9	4.5	4.3	5.8	6.6	5.0	2.2	1.8	1.3	0.9	1.0	0.7	4.7	11.4
30-Sep	0.6	Z	2.3	4.2	5.0	6.5	4.9	2.8	1.8	1.3	0.9	0.3	0.1	0.0	0.2	0.5	3.8	3.5	4.6	5.7	5.0	4.7	4.4	4.6	2.9	6.5

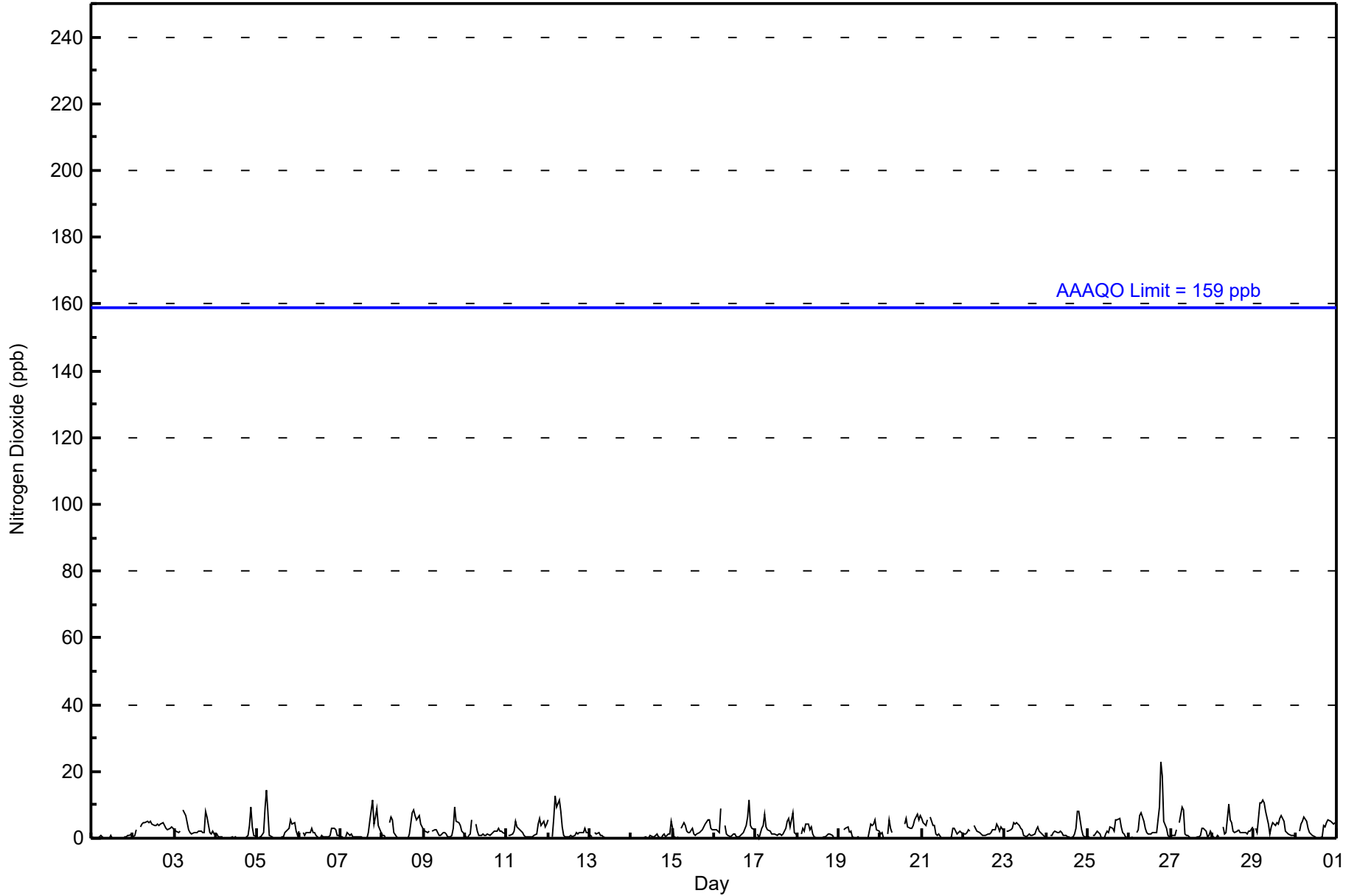
1.4	1.1	1.2	2.4	3.5	4.7	4.1	3.0	1.8	1.5	1.2	1.2	0.9	0.9	1.0	1.3	1.7	2.4	4.4	4.3	3.5	3.2	2.0	1.9	Diurnal Average	
5.9	4.5	3.9	10.7	12.5	14.5	11.4	8.6	5.1	10.2	5.5	4.8	4.0	4.5	4.4	6.0	6.6	9.3	22.7	18.6	11.5	8.9	5.3	6.8	Diurnal Maximum	

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



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	683	99.85	99.85
21 - 40	1	0.15	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: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Patricia McInnes - September 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	26	2	1	5	11	32	81	49	72	97	95	87	43	36	28	18	683
21 - 40	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	26	2	1	5	11	33	81	49	72	97	95	87	43	36	28	18	684

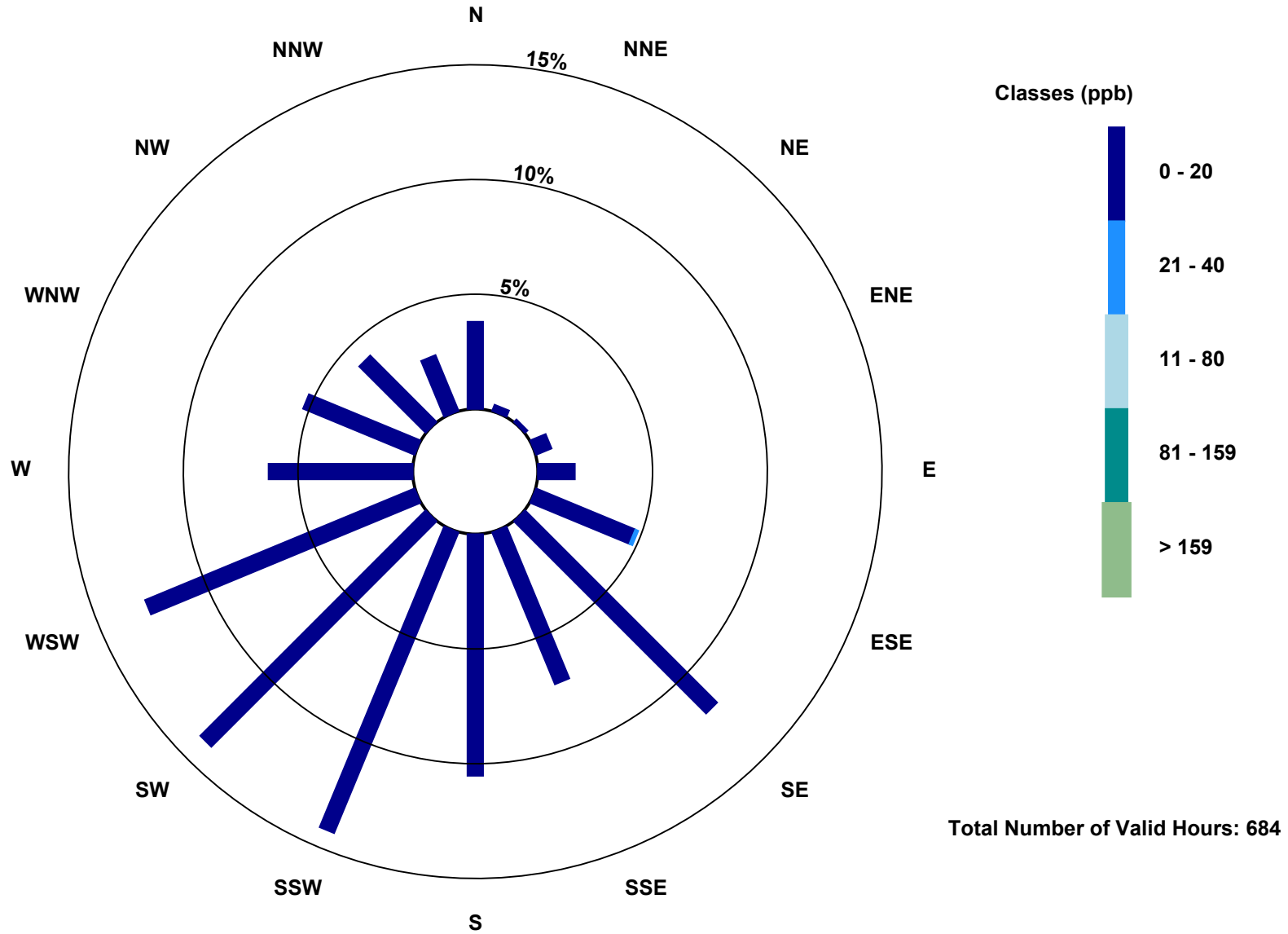
Total Number of Valid Hours: 684

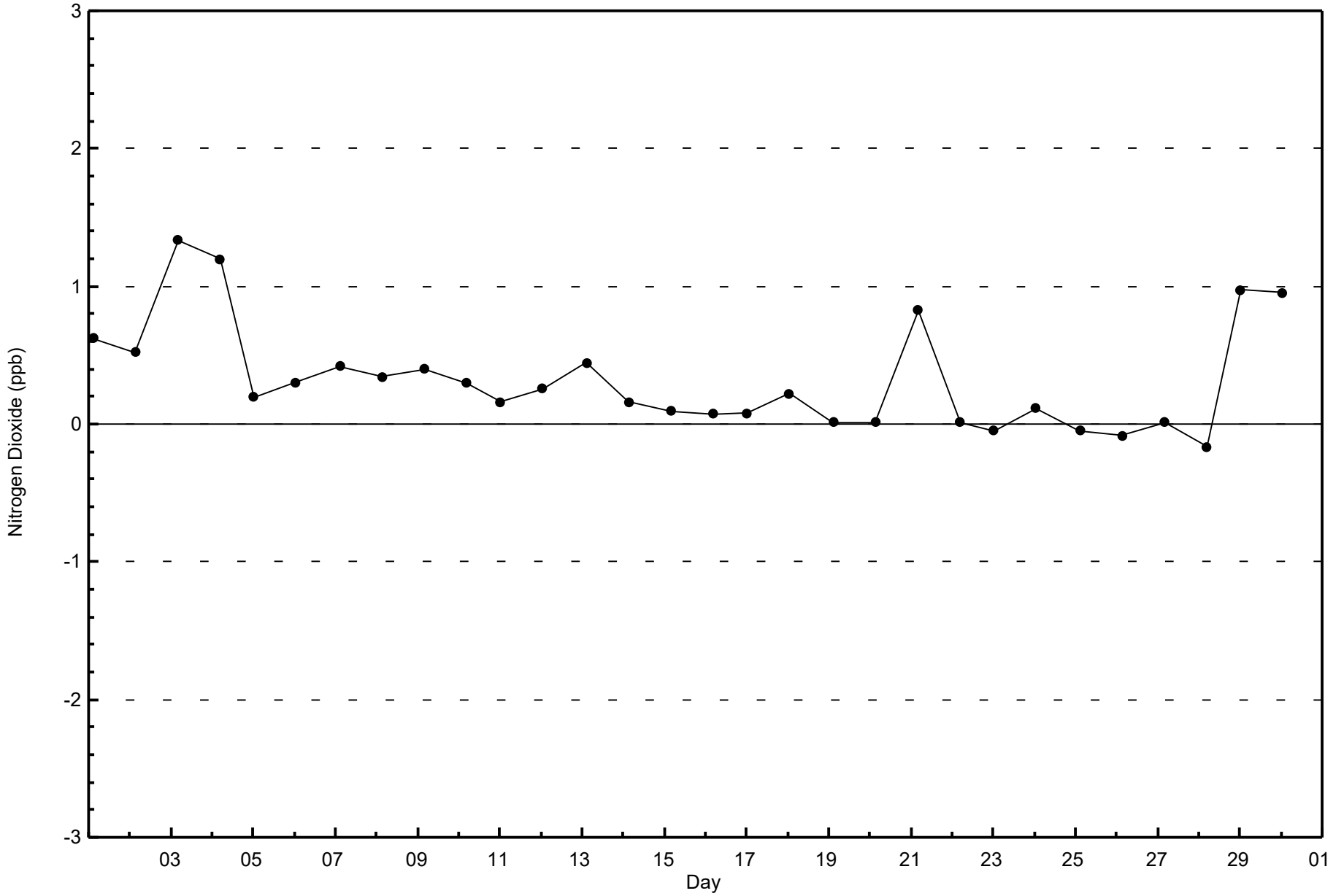
Total Number of Hours: 720

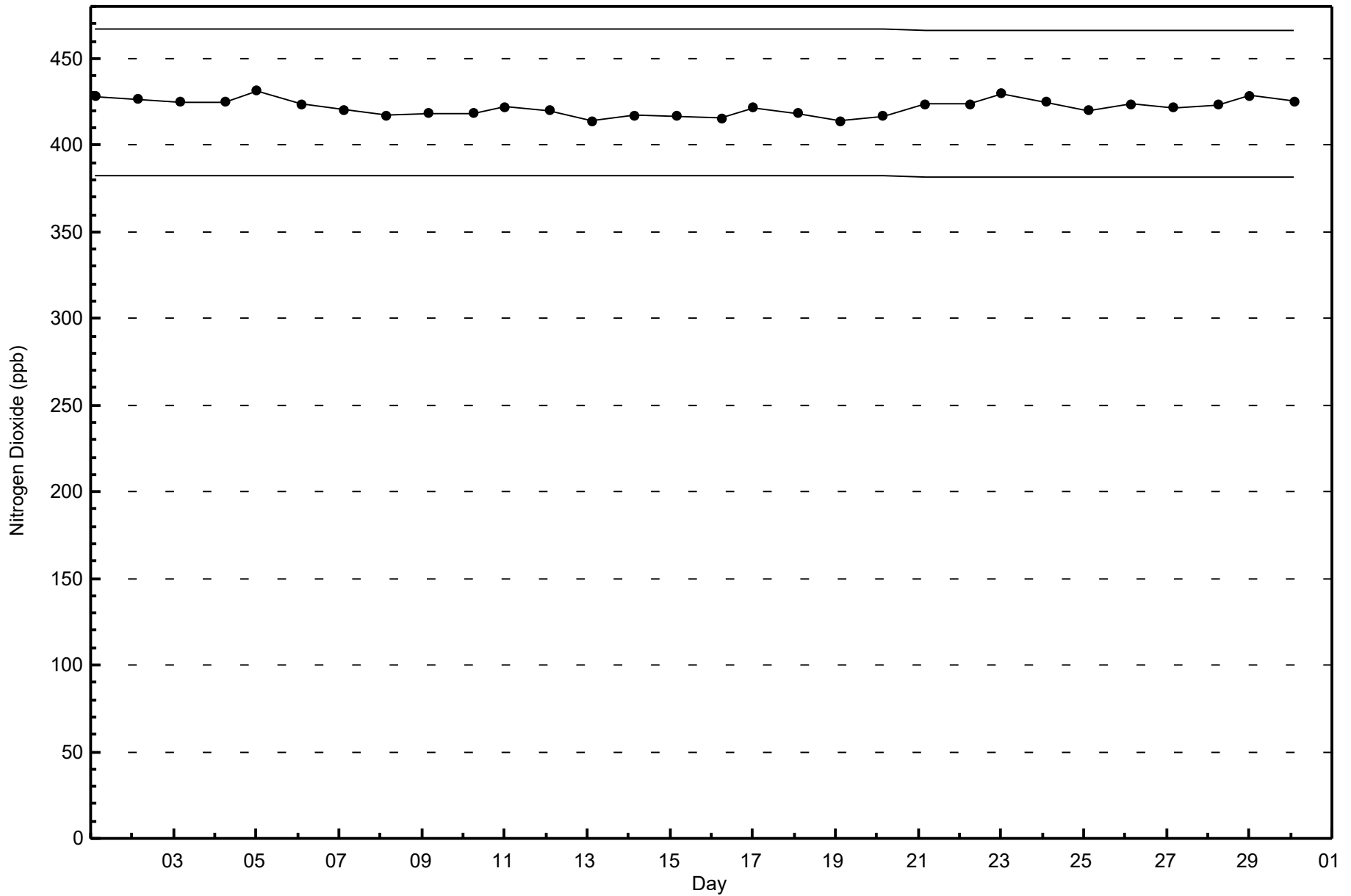


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitrogen Dioxide (NO₂) - ppb
Patricia McInnes









Wood Buffalo Environmental Association
Summary of Hour Averages

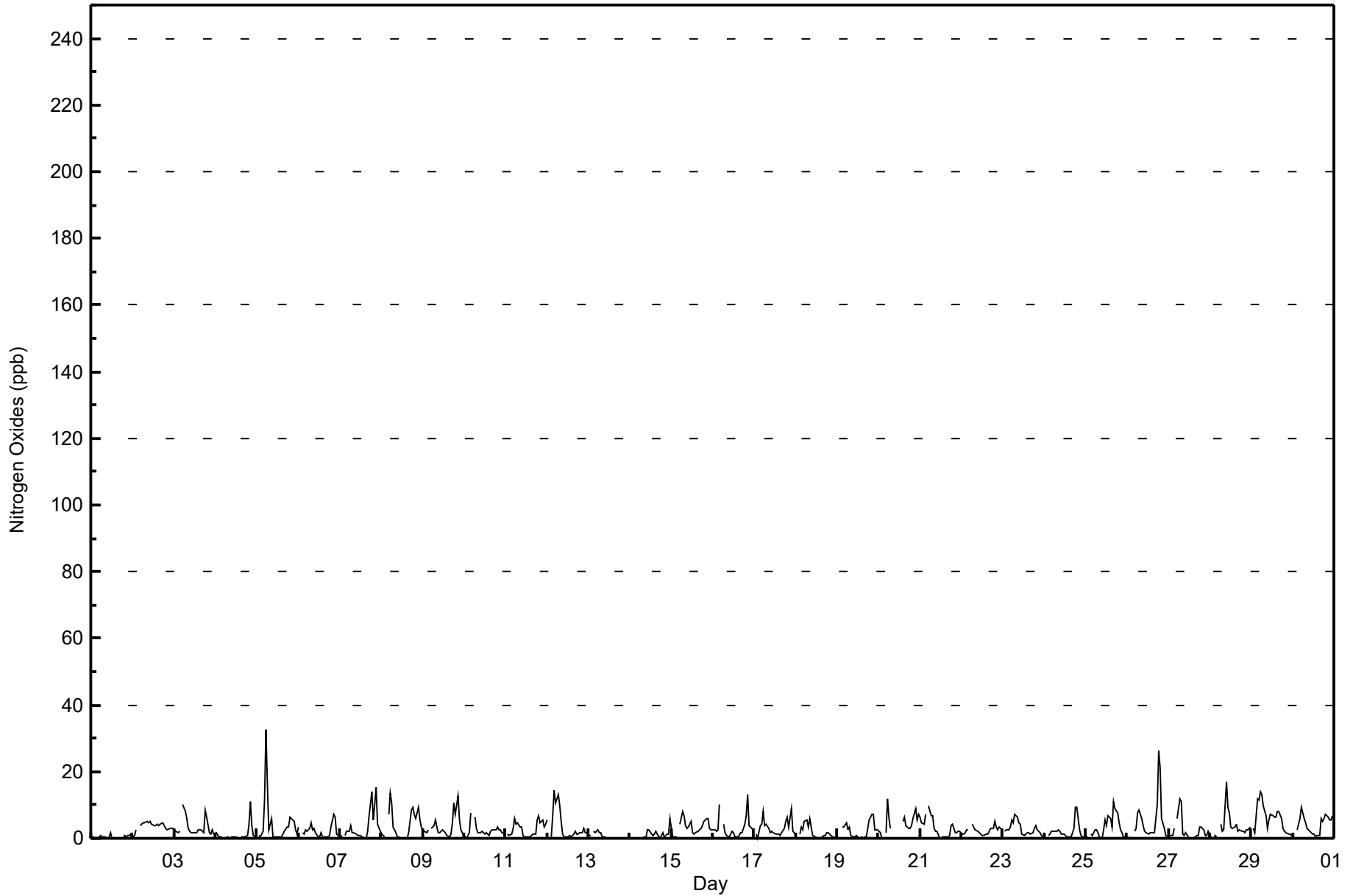
Nitrogen Oxides (NO_x) - ppb
Patricia McInnes - September 2023

Maximum Value: 32.4 ppb on Sep 5 06:00		Maximum Daily Average: 6.0 ppb on Sep 29		Hours in Service: 720																							
Minimum Value: 0.0 ppb on Sep 1 04:00		Minimum Daily Average: 0.4 ppb on Sep 1		Hours of Data: 684																							
Maximum Diurnal Average: 6.9 ppb at hour 6		Minimum Diurnal Average: 1.2 ppb at hour 2		Hours of Missing Data: 36																							
Monthly Average: 2.96 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.2 Q ₁ = 0.7 Median = 2.0 Q ₃ = 3.9 P ₉₀ = 6.7 P ₉₉ = 14.1		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-Sep	0.3	0.2	Z	0.0	0.2	0.8	0.5	0.2	0.2	0.2	0.2	1.9	0.1	0.1	0.1	0.0	0.2	0.0	0.1	0.6	0.5	0.8	1.0	1.1	0.4	1.9	
2-Sep	0.5	0.7	2.5	Z	3.6	4.4	4.8	4.8	5.2	4.6	4.9	4.1	4.0	3.9	4.1	3.7	4.1	4.5	3.8	3.0	2.5	2.9	3.2	3.1	3.6	5.2	
3-Sep	2.5	2.0	1.8	2.1	Z	10.2	8.0	5.8	2.9	2.0	1.6	1.9	1.8	1.7	2.3	2.4	2.0	1.8	8.7	6.5	1.7	1.3	2.6	1.3	3.3	10.2	
4-Sep	1.8	0.7	0.5	0.4	0.4	Z	0.2	0.3	0.1	0.6	0.4	0.4	0.2	0.2	0.1	0.3	0.3	0.3	0.9	4.3	11.2	3.7	0.9	0.5	1.3	11.2	
5-Sep	Z	0.8	0.6	2.2	11.4	32.4	16.7	2.5	6.1	0.6	0.3	0.6	0.6	0.3	0.5	1.1	2.3	3.5	6.3	5.9	5.1	2.7	1.1	4.7	32.4		
6-Sep	3.2	Z	1.8	1.3	2.7	2.3	2.8	4.8	2.6	2.8	1.9	0.3	0.5	1.8	0.3	0.4	0.5	0.5	1.0	3.2	7.3	6.5	1.2	0.8	2.2	7.3	
7-Sep	0.4	0.7	Z	0.7	2.3	1.9	3.7	1.6	1.7	1.1	0.8	0.9	0.8	0.3	0.1	0.0	2.0	6.7	14.1	5.4	10.4	15.3	4.0	2.0	3.4	15.3	
8-Sep	1.1	0.9	0.5	Z	7.4	13.4	10.5	3.6	1.5	0.6	0.4	0.2	0.1	0.0	0.0	0.0	1.6	8.6	9.3	7.3	6.1	9.5	5.4	3.3	4.0	13.4	
9-Sep	2.5	2.2	1.7	2.3	Z	2.8	4.0	5.6	3.5	1.7	1.8	2.7	2.2	1.5	0.9	0.6	1.3	4.5	10.8	7.4	12.7	5.4	2.3	1.5	3.6	12.7	
10-Sep	0.5	0.2	1.0	1.6	7.7	Z	6.4	3.1	1.6	1.8	2.3	1.6	1.5	1.8	0.9	2.0	2.7	2.6	2.7	3.4	2.6	2.4	1.6	1.4	2.3	7.7	
11-Sep	Z	1.1	1.0	1.2	2.9	5.8	4.0	4.5	3.4	3.3	1.0	0.6	0.4	0.6	0.5	0.8	1.3	1.3	5.4	6.8	4.6	5.6	3.5	4.3	2.8	6.8	
12-Sep	5.5	Z	0.4	6.8	14.4	10.5	13.1	9.9	5.1	1.2	0.6	0.5	0.5	1.0	0.6	1.1	2.3	1.2	1.5	1.5	1.7	3.0	1.9	1.8	3.7	14.4	
13-Sep	0.9	0.7	Z	2.1	1.8	2.5	1.8	1.7	0.5	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.5	2.5	
14-Sep	0.0	0.0	0.0	Z	0.1	0.1	0.0	0.0	0.5	0.1	2.5	2.7	1.2	0.9	1.4	2.2	1.1	0.1	0.9	1.6	0.4	1.5	1.3	5.8	1.1	5.8	
15-Sep	3.0	0.4	0.3	0.6	Z	4.1	8.2	6.6	3.9	2.8	3.5	5.0	1.8	1.3	1.5	2.3	2.5	3.0	3.9	5.0	5.8	6.0	3.0	2.7	3.4	8.2	
16-Sep	2.5	2.4	2.3	2.3	10.4	Z	4.2	1.7	0.9	0.6	1.2	1.9	1.6	0.6	0.3	1.0	1.6	1.7	4.1	6.7	13.2	3.9	3.2	2.6	3.1	13.2	
17-Sep	Z	1.3	0.2	3.8	4.1	8.0	4.0	4.1	3.1	1.9	2.0	1.8	1.2	1.2	1.1	0.9	1.6	2.9	5.1	6.2	3.6	9.0	2.0	1.5	3.1	9.0	
18-Sep	0.8	Z	1.4	3.5	2.5	5.1	5.5	3.5	5.8	3.3	0.8	0.2	0.1	0.0	0.0	0.5	0.8	1.0	1.6	1.6	0.9	0.4	0.2	0.1	1.7	5.8	
19-Sep	0.1	0.1	Z	3.2	3.6	4.5	2.5	3.6	0.7	0.4	0.5	1.0	0.4	0.2	0.4	0.0	0.5	0.3	5.5	6.3	7.1	7.2	2.7	2.4	2.3	7.2	
20-Sep	1.9	1.9	0.2	Z	1.8	12.0	6.3	2.8	C	C	C	C	C	C	4.9	6.5	3.6	2.9	2.9	3.8	5.8	9.0	5.6	7.0	--	12.0	
21-Sep	6.2	4.7	4.1	7.2	Z	9.9	6.6	6.6	2.8	2.1	2.2	0.2	0.1	0.2	0.3	0.5	0.4	1.0	4.0	4.4	1.8	1.8	2.2	1.9	3.1	9.9	
22-Sep	1.4	1.4	1.8	2.7	2.4	Z	4.1	3.4	2.6	2.3	1.8	1.2	1.0	0.9	1.4	1.4	2.0	3.0	3.0	4.9	3.6	2.6	3.5	2.4	2.4	4.9	
23-Sep	Z	2.3	2.4	2.7	3.2	5.4	4.8	7.4	6.4	4.5	4.3	1.1	0.7	1.3	1.6	1.5	1.4	1.9	2.8	3.7	2.5	1.6	1.0	0.6	2.8	7.4	
24-Sep	0.6	Z	1.0	1.1	2.0	2.2	2.1	2.2	2.4	2.1	1.1	1.1	0.7	0.3	0.2	0.3	1.6	3.1	9.1	9.2	2.7	0.9	0.5	0.4	2.0	9.2	
25-Sep	0.3	0.1	Z	1.1	1.0	2.7	2.4	1.8	0.5	0.1	2.5	5.4	3.8	6.8	5.8	3.3	10.9	9.0	7.6	4.7	2.4	1.7	0.6	0.4	3.3	10.9	
26-Sep	0.1	0.2	0.5	Z	2.2	2.8	7.5	8.6	5.9	3.8	2.0	1.7	1.3	1.6	1.7	1.8	1.7	10.3	26.1	21.2	5.9	3.1	1.0	0.6	4.8	26.1	
27-Sep	0.5	0.9	1.0	2.8	Z	5.9	11.7	11.1	1.4	0.9	1.8	0.3	0.0	0.0	0.1	0.6	0.7	0.9	3.3	3.2	2.5	0.7	1.0	2.2	2.3	11.7	
28-Sep	0.4	0.1	0.0	0.7	0.6	Z	4.4	2.0	2.7	17.1	9.1	7.5	3.3	2.8	3.4	4.1	2.3	2.7	2.2	2.0	1.8	2.5	2.4	3.5	3.4	17.1	
29-Sep	Z	3.0	1.6	11.9	11.5	13.8	13.3	9.8	6.8	2.9	5.3	7.3	6.6	6.5	6.2	8.0	8.0	6.0	2.8	2.1	1.6	1.1	1.1	0.7	6.0	13.8	
30-Sep	0.7	Z	2.6	4.4	5.9	9.2	6.0	4.5	2.8	2.5	2.0	1.5	1.2	0.6	1.0	1.0	6.1	5.1	6.0	7.3	6.5	5.6	5.7	6.9	4.1	9.2	
		1.5	1.2	1.2	2.7	4.2	6.9	5.7	4.3	2.9	2.3	2.0	1.9	1.3	1.3	1.4	1.6	2.2	3.0	5.1	5.0	4.5	4.0	2.2	2.1	Diurnal Average	
		6.2	4.7	4.1	11.9	14.4	32.4	16.7	11.1	6.8	17.1	9.1	7.5	6.6	6.8	6.2	8.0	10.9	10.3	26.1	21.2	13.2	15.3	5.7	7.0	Diurnal Maximum	
Z - zerspan		C - Calibration																									



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	681	99.56	99.56
21 - 40	3	0.44	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: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Patricia McInnes - September 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	26	2	1	5	11	31	81	49	71	97	95	87	43	36	28	18	681
21 - 40	0	0	0	0	0	2	0	0	1	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	26	2	1	5	11	33	81	49	72	97	95	87	43	36	28	18	684

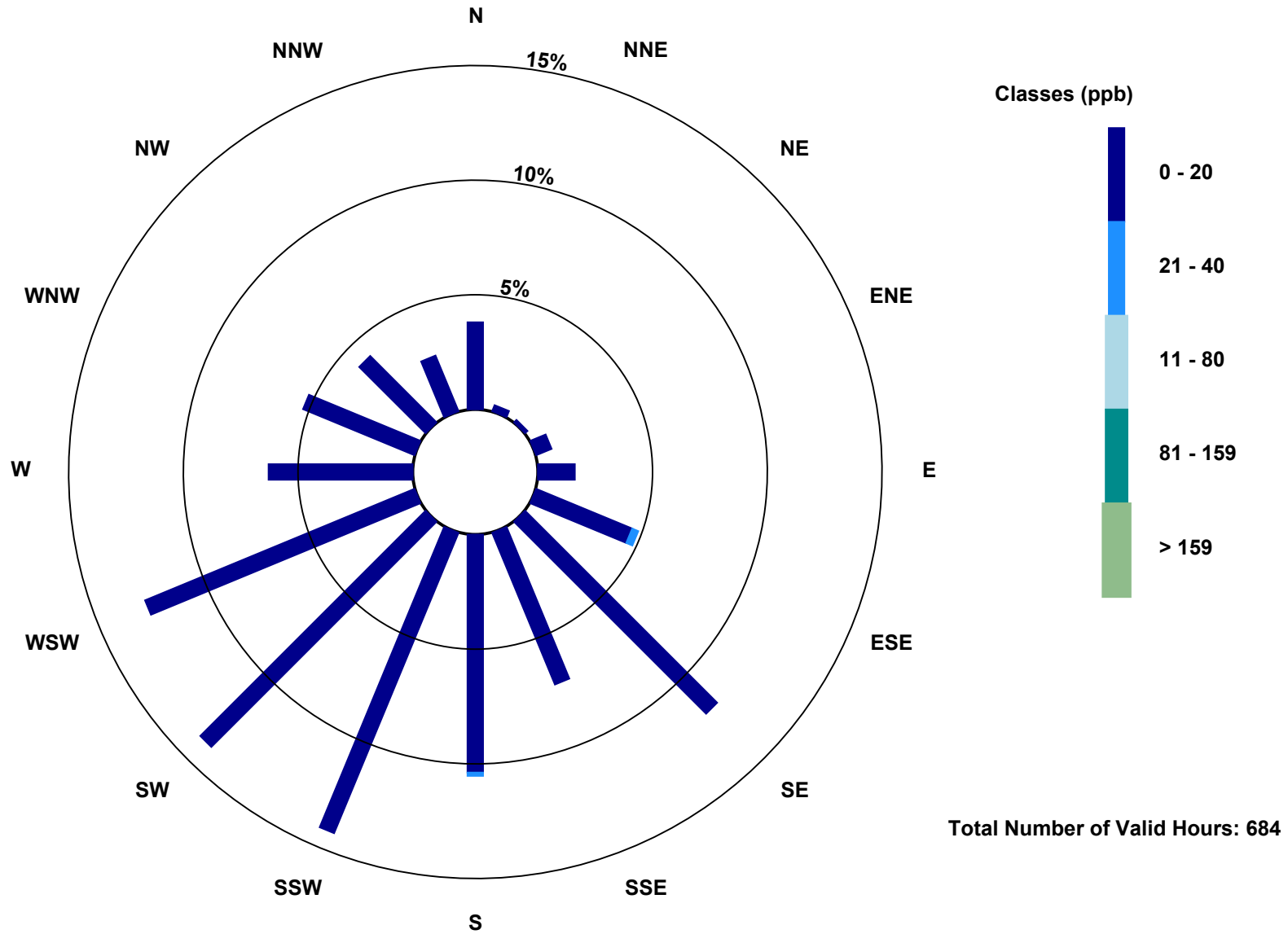
Total Number of Valid Hours: 684

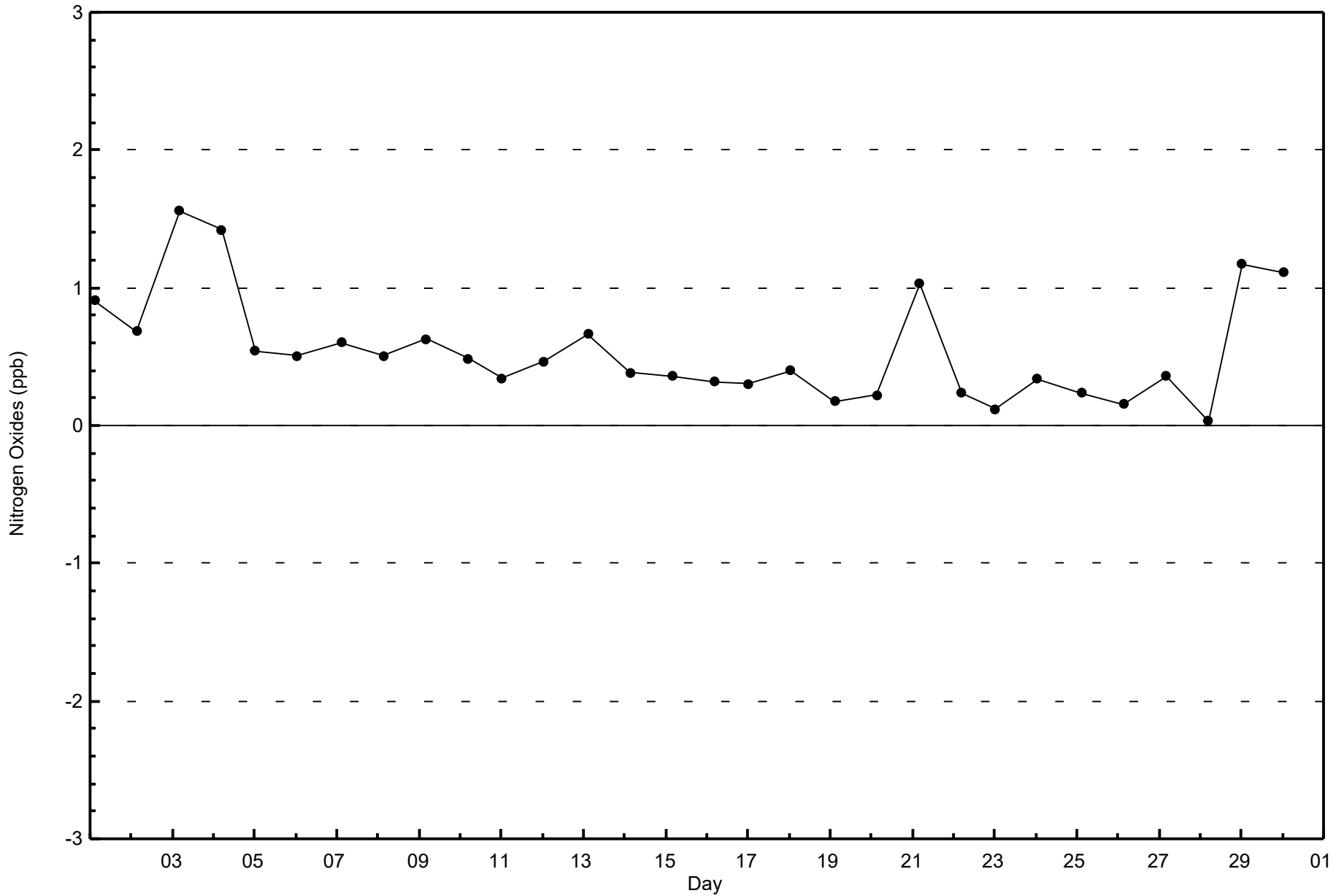
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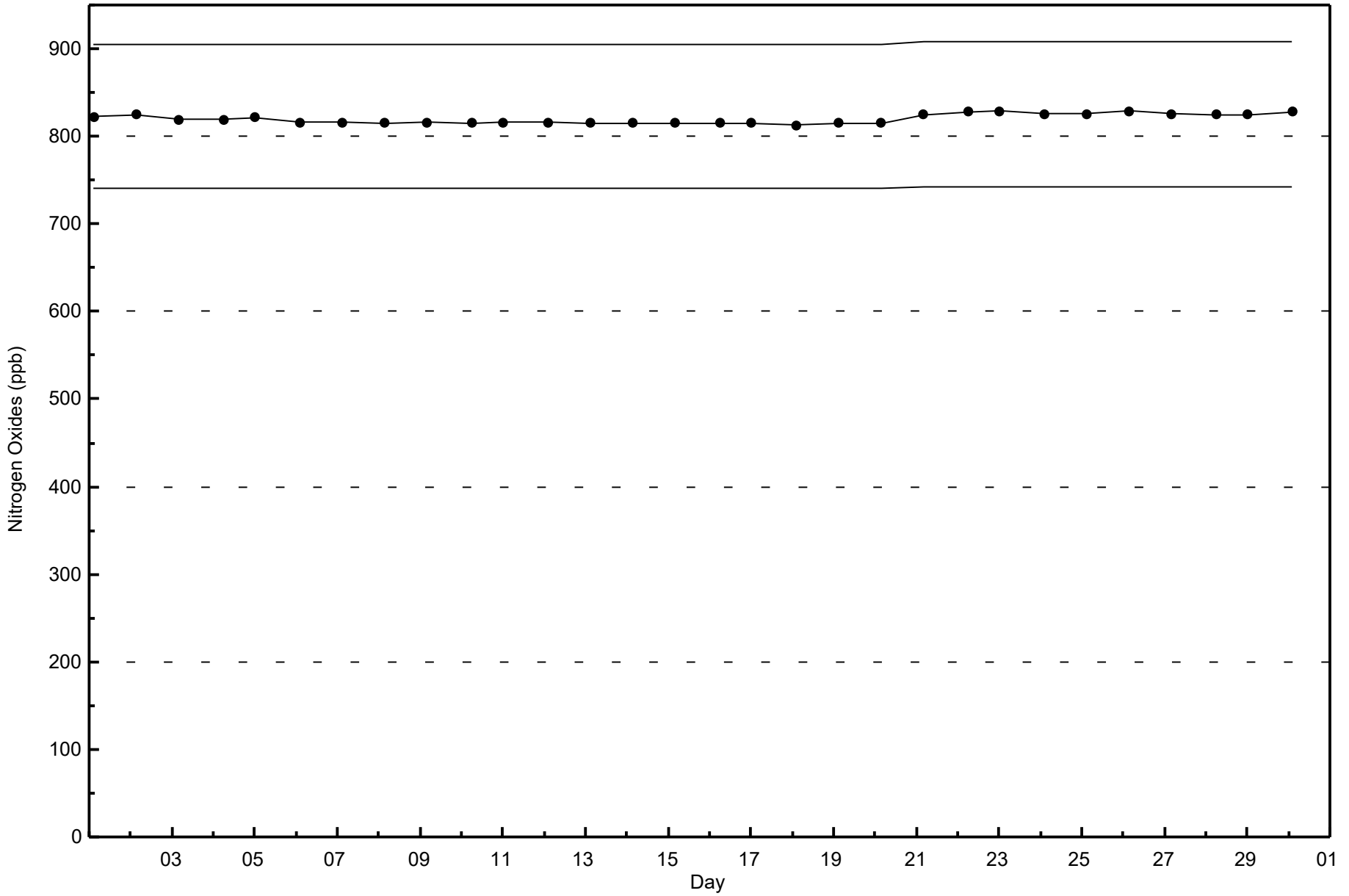


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitrogen Oxides (NO_x) - ppb
Patricia McInnes









Number of Exceedences (AAAQO): 1-hr: 0	Maximum Value: 64.4 ppb on Sep 2 18:00	Maximum Daily Average: 30.9 ppb on Sep 2	Hours in Service: 720
Minimum Value: 0.0 ppb on Sep 1 06:00	Maximum Diurnal Average: 3.7 ppb at hour 18	Minimum Daily Average: 0.0 ppb on Sep 5	Hours of Data: 603
Monthly Average: 2.44 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 11.4 P ₉₉ = 38.1	Minimum Diurnal Average: 0.0 ppb at hour 5	Hours of Missing Data: 117
			Hours of Calibration: 39
			Percent Operational Time: 89.2

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-Sep	14.3	Z	RE	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	14.3
2-Sep	0.0	0.0	Z	RE	RE	15.9	19.5	23.2	24.1	25.0	29.0	30.7	32.8	42.8	47.7	48.3	51.7	64.4	48.2	35.8	28.2	26.2	28.4	26.9	30.9	64.4
3-Sep	22.5	18.5	15.7	Z	RE	RE	RE	13.3	12.4	12.0	11.0	10.2	0.0	0.0	0.0	0.0	0.0	0.0	11.8	13.3	13.7	14.6	16.7	15.7	10.1	22.5
4-Sep	15.8	16.0	17.3	15.3	Z	RE	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	17.3
5-Sep	0.0	0.0	0.0	0.0	0.0	Z	RE	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6-Sep	Z	RE	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7-Sep	0.0	Z	RE	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8-Sep	0.0	0.0	Z	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9-Sep	0.0	0.0	0.0	Z	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-Sep	0.0	0.0	0.0	0.0	Z	RE	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11-Sep	0.0	0.0	0.0	0.0	0.0	Z	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12-Sep	Z	RE	RE	RE	0.0	0.0	0.0	0.0	C	C	C	C	C	C	C	C	C	RE	RE	14.9	13.5	12.6	11.4	11.5	--	14.9
13-Sep	11.0	Z	RE	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	11.0
14-Sep	0.0	0.0	Z	RE	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15-Sep	0.0	0.0	0.0	Z	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16-Sep	0.0	0.0	0.0	0.0	Z	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17-Sep	0.0	0.0	0.0	0.0	0.0	Z	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18-Sep	Z	RE	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19-Sep	0.0	Z	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20-Sep	0.0	0.0	Z	RE	RE	0.0	0.0	0.0	0.0	0.0	22.6	38.2	M	M	23.3	20.0	15.4	14.6	12.7	11.5	11.4	10.5	0.0	0.0	9.5	38.2
21-Sep	0.0	0.0	0.0	Z	RE	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22-Sep	0.0	0.0	0.0	0.0	Z	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
23-Sep	0.0	0.0	0.0	0.0	0.0	Z	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24-Sep	Z	RE	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25-Sep	0.0	Z	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26-Sep	0.0	0.0	Z	RE	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27-Sep	0.0	0.0	0.0	Z	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28-Sep	0.0	0.0	0.0	0.0	Z	RE	RE	0.0	0.0	0.0	10.8	10.9	13.2	14.3	15.0	15.4	16.2	17.1	16.1	16.7	17.3	17.6	17.4	14.6	10.1	17.6
29-Sep	11.0	0.0	0.0	0.0	0.0	Z	RE	RE	10.8	10.4	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	1.5	11.0
30-Sep	Z	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.2	11.4	10.9	10.7	0.0	0.0	0.0	0.0	2.1	11.4

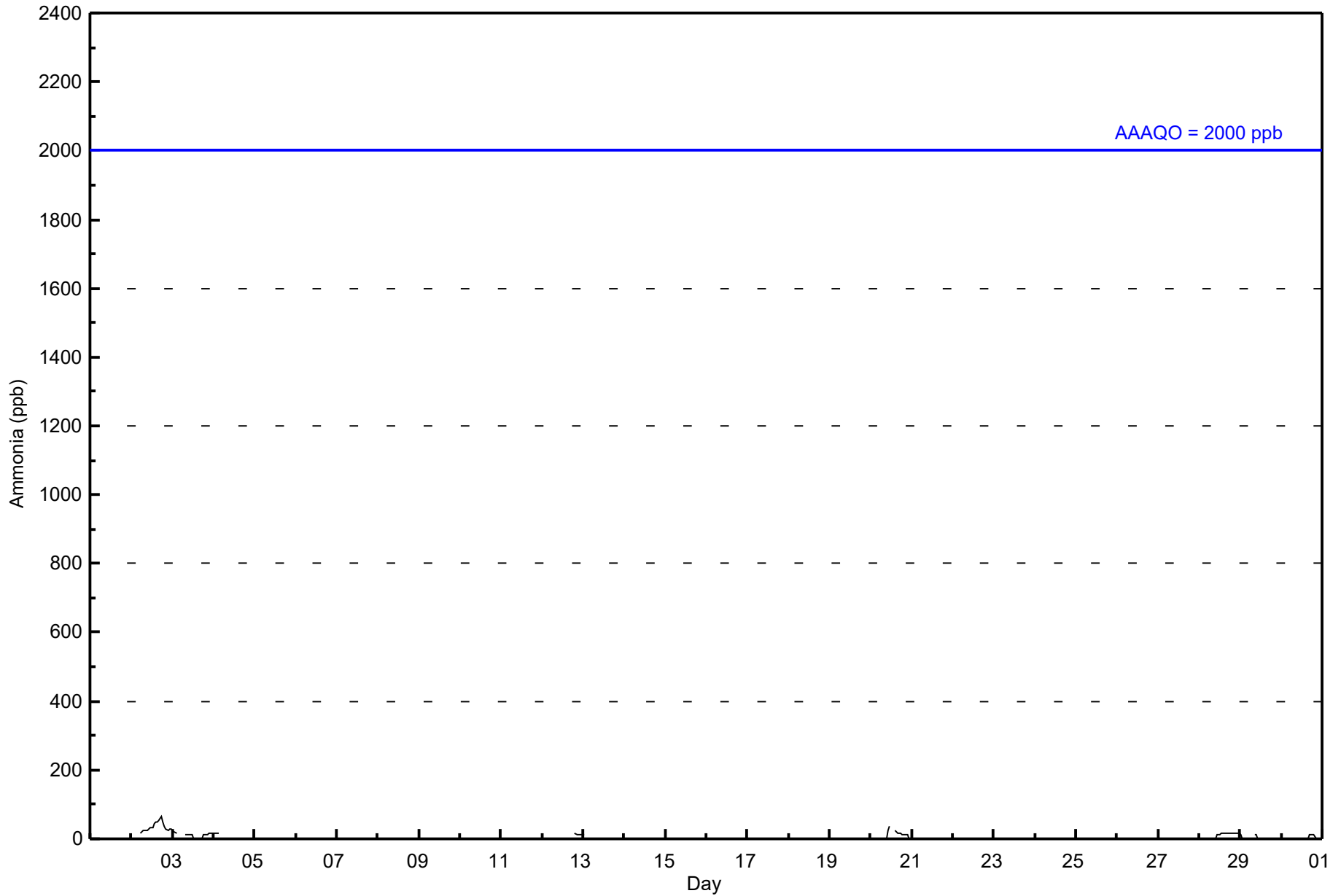
3.0	1.7	2.2	1.4	0.0	1.2	1.1	1.6	1.7	1.6	2.5	3.1	1.6	2.0	3.0	2.9	3.2	3.7	3.4	3.4	2.8	2.7	2.5	2.3	Diurnal Average	
22.5	18.5	17.3	15.3	0.0	15.9	19.5	23.2	24.1	25.0	29.0	38.2	32.8	42.8	47.7	48.3	51.7	64.4	48.2	35.8	28.2	26.2	28.4	26.9	Diurnal Maximum	

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



Wood Buffalo Environmental Association
Hourly Averages

Ammonia (NH₃) - ppb
Patricia McInnes - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ammonia (NH₃) - ppb
Patricia McInnes - September 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 5	528	87.56	87.56
6 - 10	4	0.66	88.23
11 - 15	33	5.47	93.70
16 - 20	17	2.82	96.52
21 - 25	6	1.00	97.51
> 26	15	2.49	100.00

Total Number of Valid Hours: 603

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Ammonia (NH₃) - ppb
Patricia McInnes - September 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	12	2	2	5	9	31	61	42	60	81	77	67	30	21	17	11	528
6 - 10	0	0	0	0	0	1	0	0	0	0	1	1	0	0	1	0	4
11 - 15	5	0	0	0	0	0	3	0	3	2	4	2	1	4	4	5	33
16 - 20	8	0	0	0	0	0	0	0	0	0	2	0	1	3	3	0	17
21 - 25	2	0	0	0	0	0	0	0	0	0	0	1	1	2	0	0	6
> 26	1	0	0	0	0	0	0	0	0	0	0	7	7	0	0	0	15
Totals	28	2	2	5	9	32	64	42	63	83	84	78	40	30	25	16	603

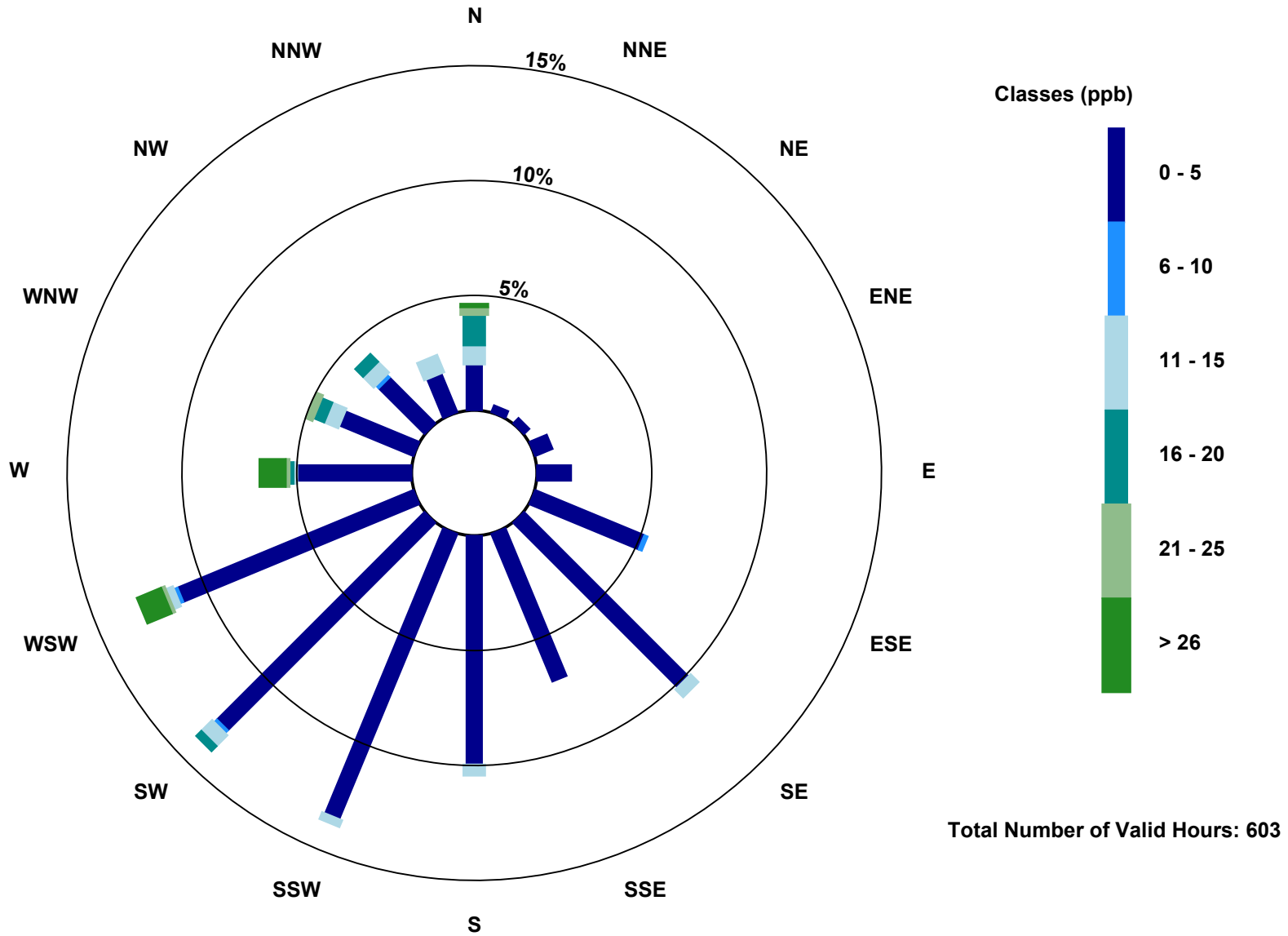
Total Number of Valid Hours: 603

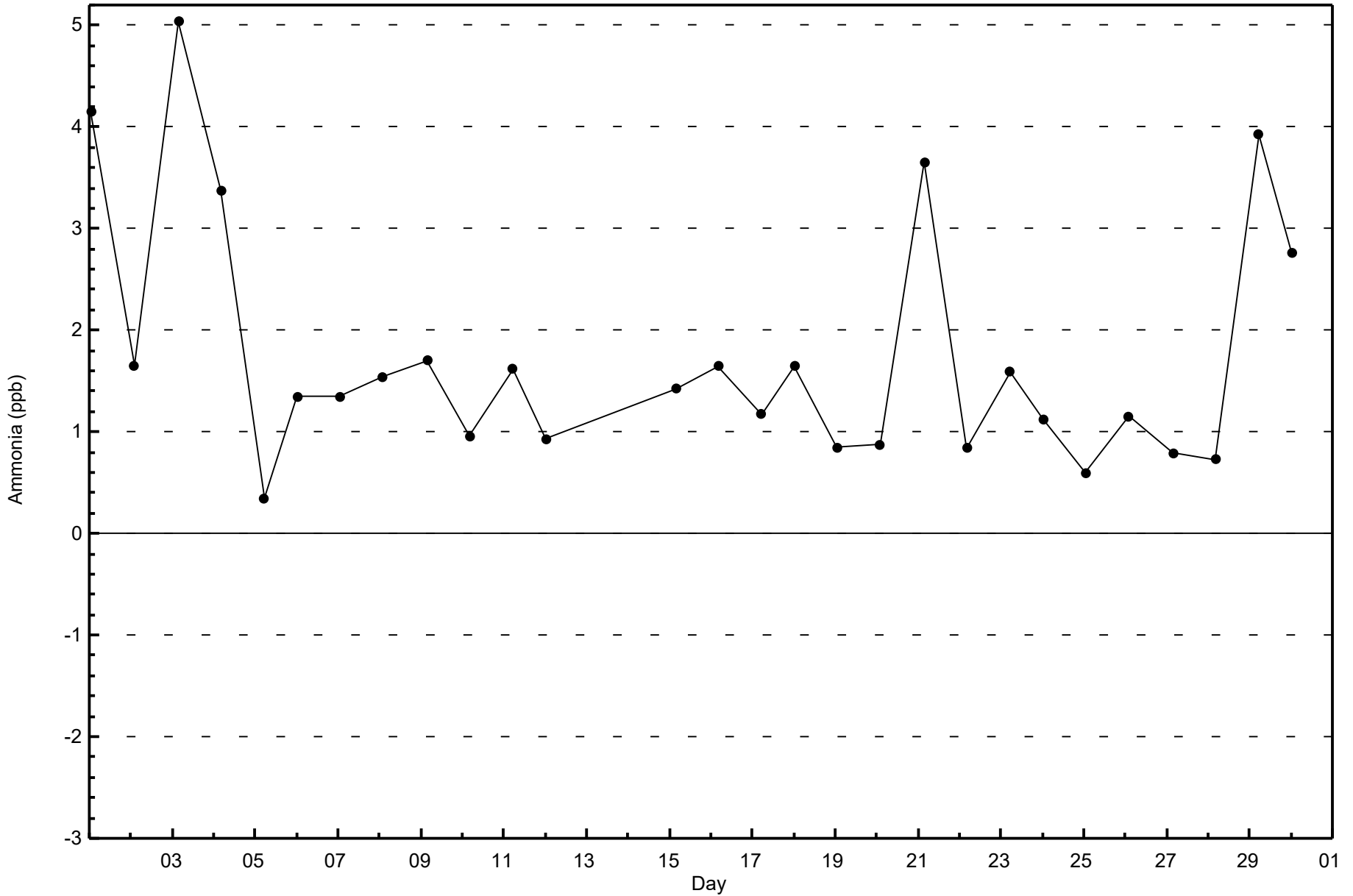
Total Number of Hours: 720

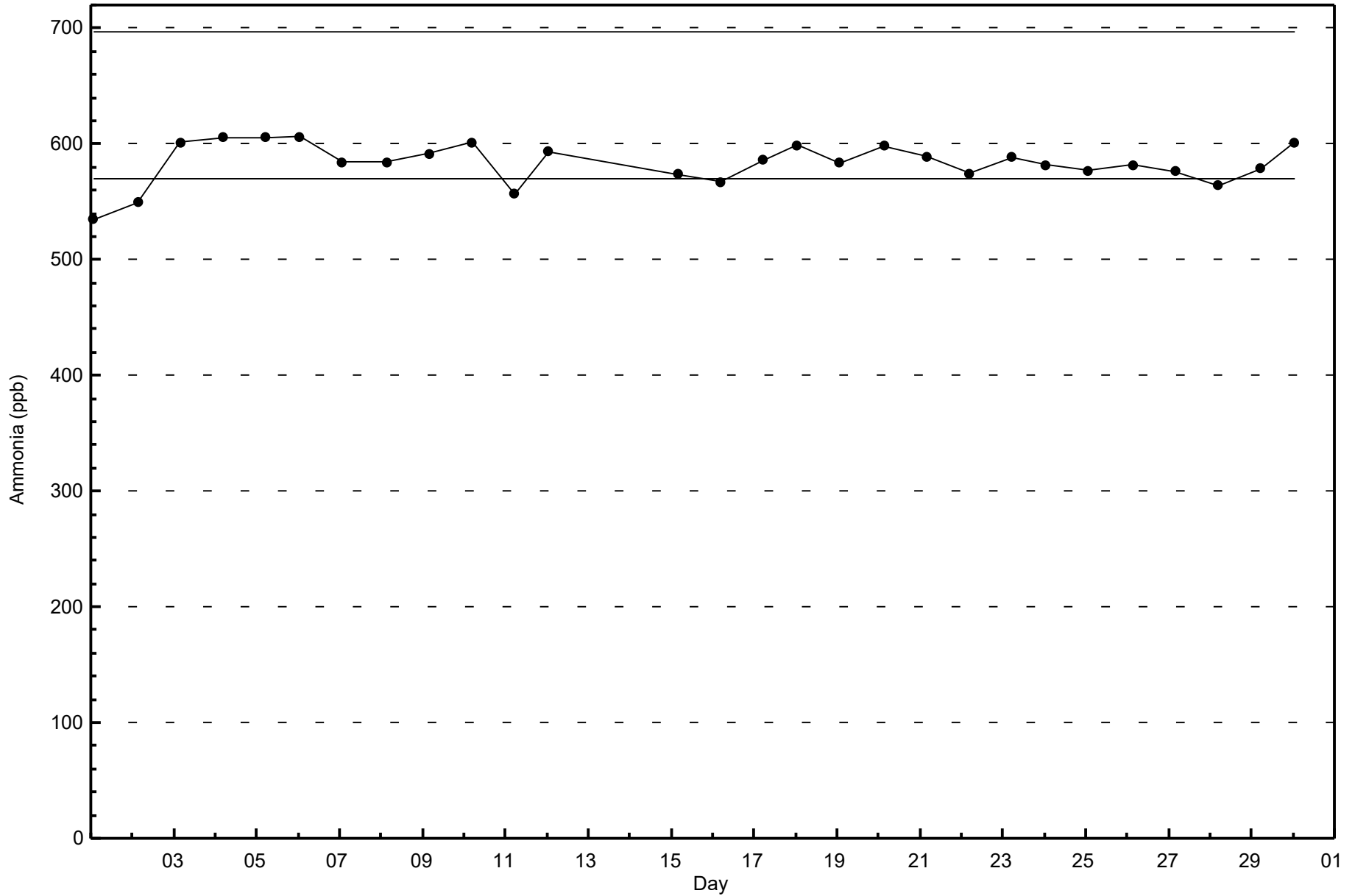


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Ammonia (NH₃) - ppb
Patricia McInnes





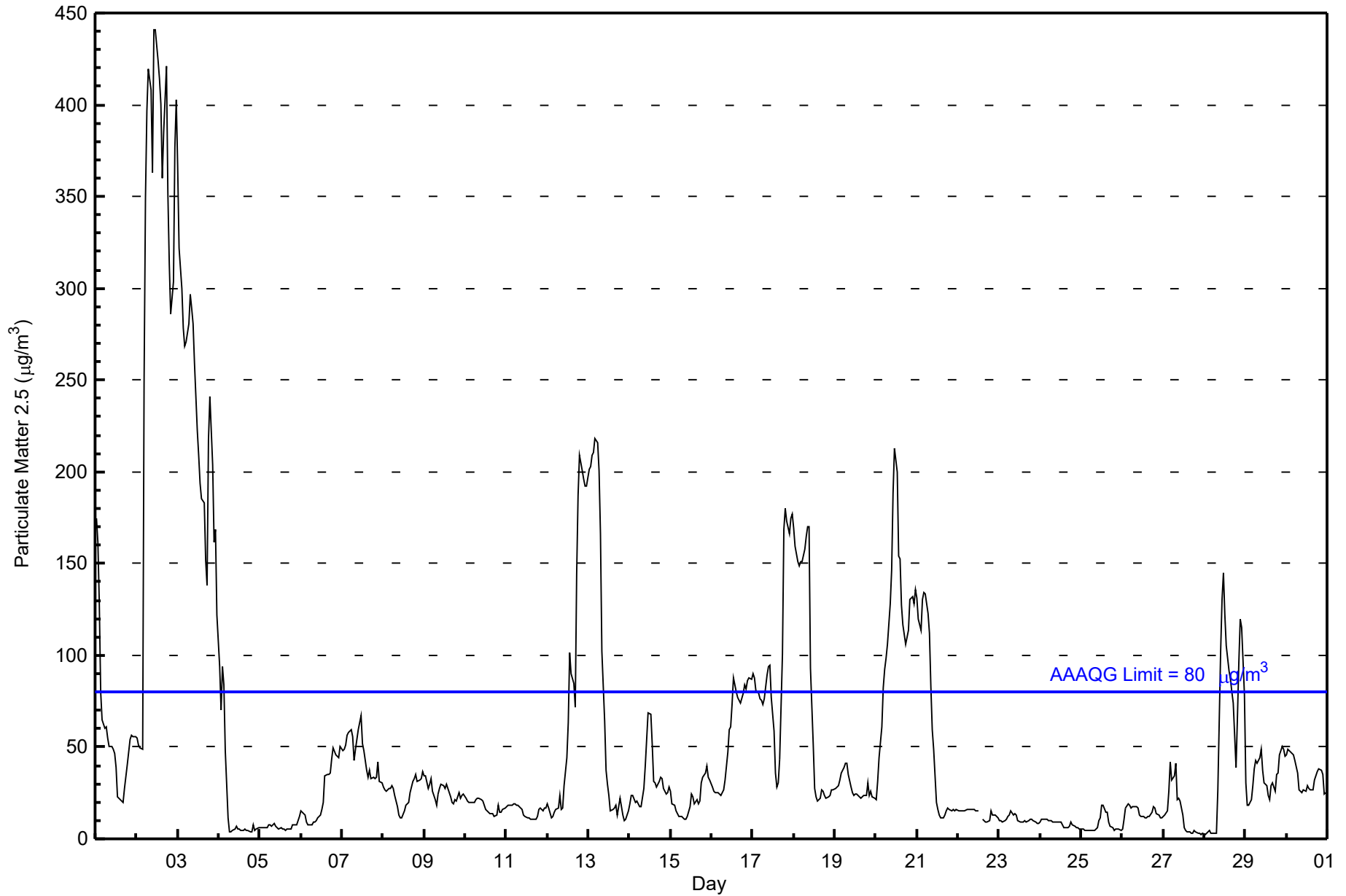




Number of Exceedences (AAAQO):	1-hr: 140	24-hr: 15	Hours in Service:	720
Maximum Value: 441.2 µg/m ³ on Sep 2 11:00	Maximum Daily Average: 321.2 µg/m ³ on Sep 2		Hours of Data:	719
Minimum Value: 2.4 µg/m ³ on Sep 28 01:00	Minimum Daily Average: 6.8 µg/m ³ on Sep 5		Hours of Missing Data:	1
Maximum Diurnal Average: 61.5 µg/m ³ at hour 7	Minimum Diurnal Average: 44.6 µg/m ³ at hour 17		Hours of Calibration:	1
Monthly Average: 55.35 µg/m ³	Percentiles: P ₁ = 3.2 P ₁₀ = 6.5 Q ₁ = 12.8 Median = 24.7 Q ₃ = 55.0 P ₉₀ = 155.1 P ₉₉ = 402.0		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-Sep	174.6	161.7	129.2	80.4	64.9	60.3	60.9	55.2	50.7	50.3	48.6	46.2	38.8	22.9	21.4	20.3	20.0	27.4	40.7	47.3	54.1	56.1	55.8	55.8	60.1	174.6
2-Sep	54.8	51.3	49.2	49.0	248.9	349.1	396.6	419.8	407.7	363.0	441.2	440.9	423.8	413.9	400.3	359.9	385.3	421.0	351.6	313.8	286.1	303.7	376.6	402.4	321.2	441.2
3-Sep	366.0	321.9	299.4	278.6	268.4	270.7	281.1	296.9	289.0	280.5	259.7	222.7	209.0	194.0	185.2	183.3	151.4	138.2	217.1	240.9	203.8	162.1	168.3	122.3	233.8	366.0
4-Sep	93.5	69.9	94.1	83.7	48.2	11.4	3.8	4.2	4.6	5.3	6.7	5.3	5.1	4.8	4.9	5.5	4.9	4.4	3.9	3.8	7.5	4.9	5.1	6.1	20.5	94.1
5-Sep	6.0	5.8	5.8	5.8	6.2	8.0	7.4	6.7	8.6	6.7	6.0	5.5	5.9	5.6	5.2	4.9	5.4	5.6	5.7	7.4	7.9	7.7	10.2	12.2	6.8	12.2
6-Sep	14.9	14.8	13.2	9.1	7.7	7.7	7.5	9.0	9.1	10.2	11.2	12.6	16.0	20.0	34.7	35.1	35.0	35.7	43.6	49.5	46.0	45.4	44.2	50.1	24.3	50.1
7-Sep	47.9	49.1	51.1	56.6	57.9	59.6	55.7	42.9	49.0	59.1	63.1	67.4	51.7	48.4	37.2	33.8	37.1	32.6	33.6	32.5	33.7	41.6	31.4	30.3	46.0	67.4
8-Sep	28.1	26.4	26.0	27.5	27.5	29.3	27.8	23.6	17.9	13.1	11.8	11.4	15.5	18.2	18.8	19.5	25.1	31.4	33.0	35.4	31.6	31.9	32.5	36.7	25.0	36.7
9-Sep	34.7	34.3	27.3	29.8	33.0	26.0	21.1	18.1	24.1	27.1	29.9	29.0	27.6	29.8	27.2	23.2	20.0	19.3	21.7	20.8	25.4	22.0	23.5	24.8	25.8	34.7
10-Sep	21.9	20.6	19.9	20.1	19.9	20.1	21.6	22.3	21.8	21.4	20.5	18.3	15.8	15.0	13.8	13.9	13.6	12.6	13.1	18.1	14.6	14.6	16.4	16.7	17.8	22.3
11-Sep	17.5	18.3	18.6	18.6	18.7	18.8	18.7	18.3	17.1	15.9	13.1	12.1	11.5	11.1	10.8	10.4	10.7	10.5	11.8	16.4	16.5	15.2	16.6	16.9	15.2	18.8
12-Sep	19.1	16.7	11.8	12.0	14.6	16.0	16.5	23.3	15.6	16.5	28.7	44.3	63.6	101.4	90.0	84.9	71.7	144.0	186.7	208.6	200.6	196.4	192.1	191.9	82.0	208.6
13-Sep	201.1	202.9	209.0	210.3	218.3	216.0	200.3	166.1	102.1	63.8	37.1	29.5	23.8	15.1	15.8	16.8	18.0	12.6	22.5	17.8	12.9	9.9	11.0	15.1	85.3	218.3
14-Sep	19.3	23.8	24.0	19.9	21.0	19.4	17.7	17.7	27.3	39.5	54.0	68.9	67.6	51.4	31.6	30.4	28.3	31.1	33.7	32.8	27.3	24.5	25.4	28.1	31.9	68.9
15-Sep	26.1	19.1	18.3	15.5	13.4	11.9	12.0	11.5	10.9	10.9	12.0	17.6	24.7	23.3	19.3	21.2	18.8	20.5	30.1	33.8	36.0	39.8	33.7	32.2	21.4	39.8
16-Sep	28.1	25.6	24.8	24.9	25.4	23.4	25.0	26.3	31.8	47.1	59.5	60.7	73.0	88.0	79.9	77.2	75.3	73.8	79.5	83.7	81.7	86.3	87.5	86.8	57.3	88.0
17-Sep	90.2	87.5	80.7	79.4	76.2	75.7	73.5	76.0	89.6	94.1	94.6	77.3	59.1	35.5	28.4	30.4	43.6	100.6	168.4	180.3	173.5	166.0	174.7	176.9	97.2	180.3
18-Sep	169.4	159.4	150.8	148.8	151.3	151.3	158.1	164.4	170.3	169.9	93.2	51.4	27.2	23.0	20.6	22.4	26.3	26.0	23.9	22.4	23.1	24.0	26.8	26.7	84.6	170.3
19-Sep	27.6	28.3	29.3	32.2	36.0	38.6	41.4	40.9	34.7	27.9	25.3	24.0	24.5	24.1	22.9	21.8	23.1	23.7	23.3	30.3	23.8	26.0	23.1	22.0	28.1	41.4
20-Sep	21.5	31.0	44.2	60.6	82.7	92.2	98.4	106.3	128.5	146.5	188.2	212.8	200.0	154.4	152.4	127.6	116.9	106.0	109.5	113.6	130.3	132.0	128.3	136.1	117.5	212.8
21-Sep	131.1	119.4	113.4	130.4	134.2	133.2	122.6	112.3	83.0	59.8	48.6	19.8	15.8	12.8	11.3	11.7	13.2	15.1	16.4	15.7	15.1	15.8	15.5	16.1	57.6	134.2
22-Sep	15.1	15.5	15.1	15.1	15.2	15.9	16.1	16.2	16.0	15.7	15.4	15.6	15.2	C	10.4	10.1	9.4	9.5	10.2	15.1	12.9	12.7	12.6	11.3	13.8	16.2
23-Sep	9.8	9.8	9.2	9.6	10.9	12.4	13.0	15.4	13.0	13.5	12.9	9.7	9.3	9.0	9.5	9.8	9.4	9.8	10.7	10.7	9.6	9.3	8.3	8.1	10.5	15.4
24-Sep	9.4	10.4	10.6	10.6	10.3	10.0	9.6	9.1	8.9	9.5	8.9	8.8	8.9	7.5	6.4	6.1	6.3	7.2	9.1	7.9	6.8	6.1	5.8	5.4	8.3	10.6
25-Sep	5.3	5.0	4.8	4.8	4.6	4.5	4.5	4.5	4.7	6.3	10.0	11.3	18.2	18.1	14.7	14.3	9.4	7.2	6.5	4.7	5.5	5.4	5.0	4.9	7.7	18.2
26-Sep	5.7	10.5	16.5	19.1	18.6	17.0	17.5	17.7	17.8	16.6	13.3	12.2	12.0	11.5	11.4	12.0	12.4	14.3	17.4	16.5	14.0	13.3	11.8	11.7	14.2	19.1
27-Sep	12.5	12.8	15.6	25.9	42.3	32.2	34.5	40.9	21.4	21.8	20.7	12.9	6.5	4.3	3.8	3.5	3.2	3.1	4.2	4.0	3.3	3.1	2.6	3.2	14.1	42.3
28-Sep	2.4	2.7	3.9	4.7	3.1	3.4	3.1	3.2	27.0	102.2	130.6	145.0	122.1	105.4	91.3	87.2	80.3	73.7	38.6	66.6	95.9	119.6	114.8	78.5	62.7	145.0
29-Sep	30.6	18.6	18.3	21.7	29.3	38.0	42.6	41.0	44.5	48.5	37.7	30.7	28.8	23.4	21.4	29.2	30.4	25.6	34.8	35.8	45.5	50.2	49.0	44.8	34.2	50.2
30-Sep	45.9	48.8	47.7	46.5	45.7	42.6	35.6	26.8	25.6	25.3	26.7	26.3	28.7	27.2	26.3	26.4	31.9	34.0	36.9	38.4	37.6	35.3	24.7	25.3	34.0	48.8
57.7 54.1 52.7 51.7 58.5 60.5 61.5 61.2 59.1 59.6 61.0 58.3 55.0 52.4 47.6 45.1 44.6 49.2 54.6 57.5 56.1 56.0 57.8 56.6																								Diurnal Average		
366.0 321.9 299.4 278.6 268.4 349.1 396.6 419.8 407.7 363.0 441.2 440.9 423.8 413.9 400.3 359.9 385.3 421.0 351.6 313.8 286.1 303.7 376.6 402.4																								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 - September 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	51	7.09	7.09
6 - 15	170	23.64	30.74
16 - 25	151	21.00	51.74
26 - 80	209	29.07	80.81
> 81.0	138	19.19	100.00

Total Number of Valid Hours: 719

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Patricia McInnes - September 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	0	0	0	0	1	3	0	0	3	3	11	17	3	5	3	2	51
6 - 15	0	0	1	1	4	14	38	23	25	30	12	14	5	1	2	0	170
16 - 25	4	0	0	3	2	13	23	17	19	20	16	9	13	8	2	2	151
26 - 80	12	2	0	1	3	4	19	11	14	28	32	35	9	13	14	12	209
> 81.0	13	0	1	0	1	2	3	1	13	25	28	15	14	11	7	4	138
Totals	29	2	2	5	11	36	83	52	74	106	99	90	44	38	28	20	719

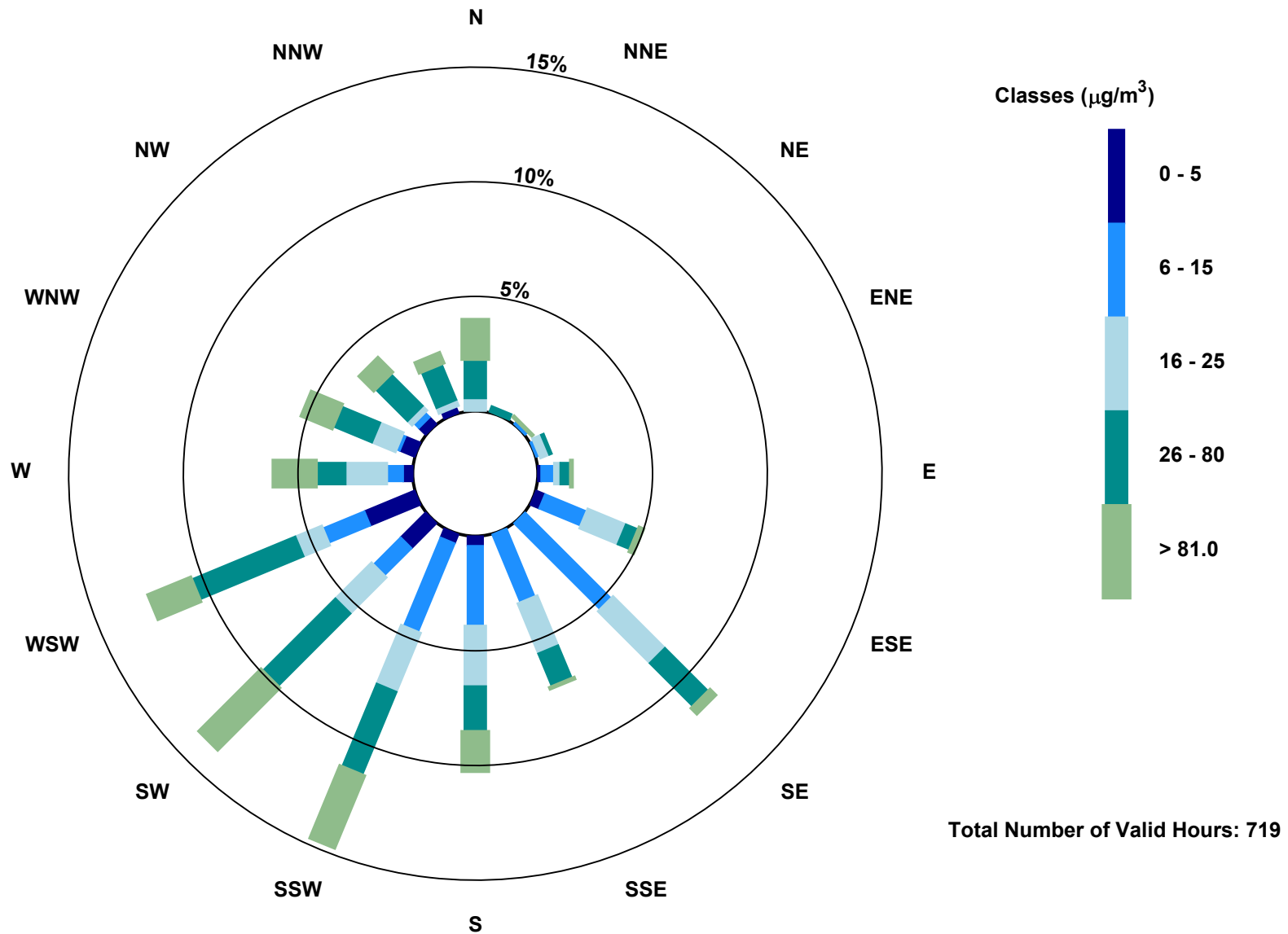
Total Number of Valid Hours: 719

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

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





Wood Buffalo Environmental Association
Summary of Hour Averages

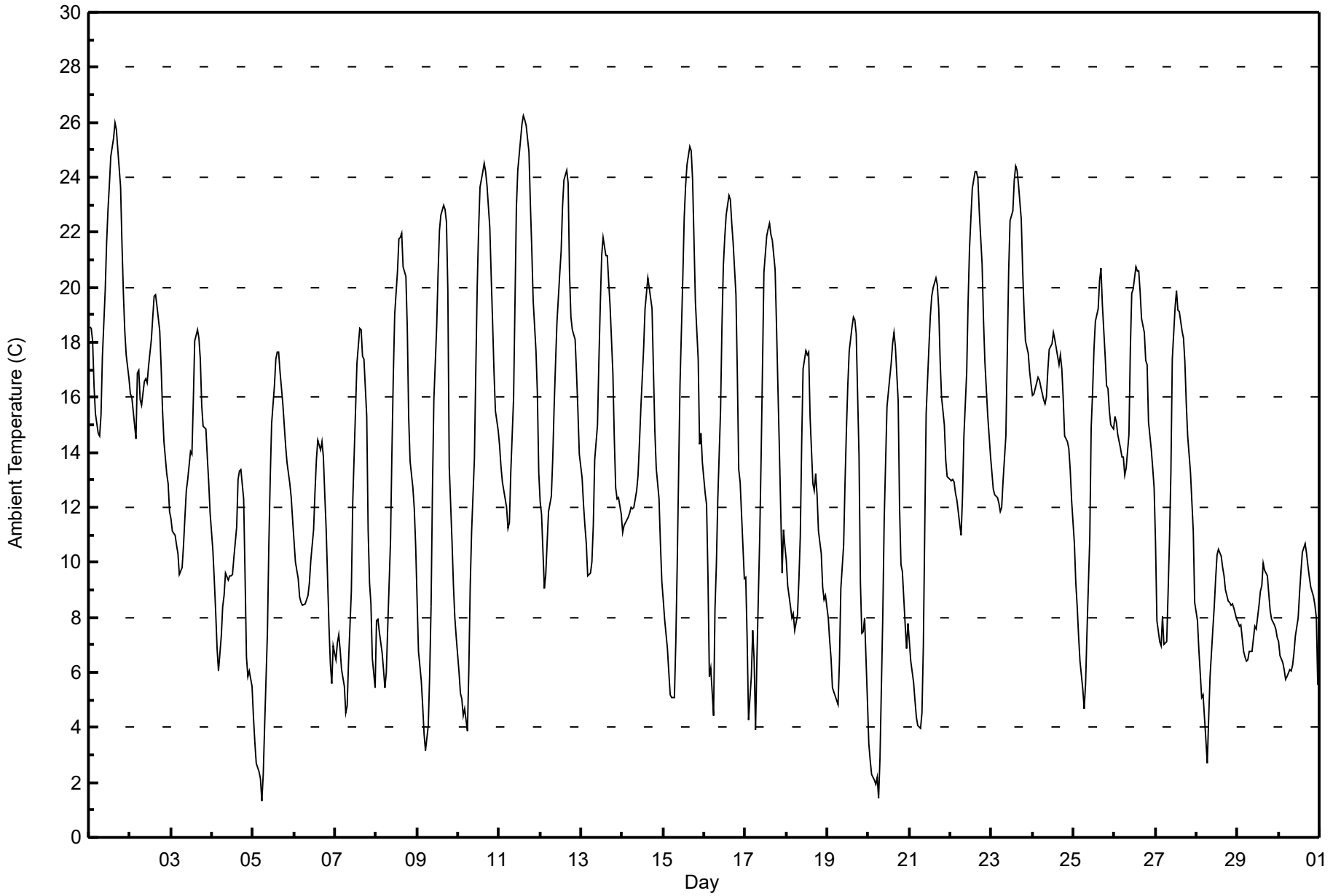
Ambient Temperature (AT) - C
Patricia McInnes - September 2023

Maximum Value: 26.3 C on Sep 11 15:00		Maximum Daily Average: 20.1 C on Sep 1		Hours in Service: 720																																												
Minimum Value: 1.3 C on Sep 5 06:00		Minimum Daily Average: 7.6 C on Sep 28		Hours of Data: 720																																												
Maximum Diurnal Average: 19.5 C at hour 16		Minimum Diurnal Average: 7.9 C at hour 6		Hours of Missing Data: 0																																												
Monthly Average: 13.34 C		Percentiles: P ₁ = 2.3 P ₁₀ = 6.1 Q ₁ = 8.6 Median = 13.1 Q ₃ = 17.6 P ₉₀ = 21.3 P ₉₉ = 25.3		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-Sep	18.6	18.5	18.1	16.4	15.4	14.7	14.6	15.3	17.5	19.9	21.6	22.8	23.8	24.7	25.4	26.0	25.7	25.0	23.6	21.6	19.8	18.4	17.5	16.7	20.1	26.0																						
2-Sep	16.1	16.0	15.5	14.5	16.9	17.0	15.9	15.7	16.6	16.7	16.5	17.1	18.1	18.9	19.7	19.7	19.3	18.4	17.1	15.5	14.4	13.2	12.9	11.9	16.4	19.7																						
3-Sep	11.6	11.1	11.0	10.6	10.3	9.6	9.8	10.6	11.7	12.6	13.0	14.0	13.9	15.9	18.1	18.5	18.1	17.4	15.7	14.9	14.9	13.8	12.9	11.8	13.4	18.5																						
4-Sep	10.4	9.3	8.2	6.9	6.1	7.3	8.4	8.8	9.6	9.4	9.5	9.6	10.2	11.3	13.0	13.3	13.4	12.3	9.5	6.6	5.9	6.0	5.5	9.2	13.4																							
5-Sep	4.4	3.4	2.7	2.4	2.2	1.3	2.3	4.0	7.5	10.6	13.1	15.0	16.4	17.4	17.6	17.7	16.9	15.8	15.0	14.2	13.6	12.9	12.4	11.5	10.4	17.7																						
6-Sep	10.8	10.0	9.4	8.8	8.5	8.4	8.5	8.6	8.8	9.2	10.1	11.2	12.6	13.8	14.4	14.1	14.4	13.8	12.5	11.2	7.7	6.3	5.6	7.0	10.2	14.4																						
7-Sep	6.4	7.1	7.4	6.8	6.1	5.5	4.6	4.8	6.4	9.0	12.2	13.9	15.5	17.3	18.5	18.5	17.5	17.4	15.3	11.2	9.3	8.5	6.5	5.4	10.5	18.5																						
8-Sep	7.9	7.9	7.5	6.7	6.1	5.5	6.0	7.6	10.8	14.0	16.8	19.0	20.6	21.8	21.8	22.0	20.7	20.4	18.5	15.2	13.7	12.7	11.9	10.6	13.6	22.0																						
9-Sep	8.7	6.8	5.7	4.8	3.8	3.1	4.0	5.9	8.4	12.7	15.9	18.6	20.5	22.0	22.6	23.0	22.8	22.4	19.9	13.5	10.7	9.1	8.0	7.3	12.5	23.0																						
10-Sep	6.0	5.2	5.0	4.4	4.7	3.8	6.1	9.1	11.1	13.8	17.0	20.0	22.1	23.6	24.2	24.5	24.2	23.7	22.2	20.4	18.7	16.9	15.5	14.8	14.9	24.5																						
11-Sep	14.2	13.4	12.9	12.3	12.0	11.2	11.5	13.3	15.9	19.4	22.9	24.2	25.4	25.9	26.3	26.1	25.9	24.9	23.0	21.4	19.5	17.7	16.2	13.3	18.7	26.3																						
12-Sep	12.2	11.8	9.0	9.6	10.7	11.8	12.4	13.8	15.7	17.2	18.7	20.5	21.3	22.9	23.9	24.3	23.8	20.5	18.9	18.5	18.1	16.9	15.5	13.9	16.7	24.3																						
13-Sep	13.1	12.1	11.3	10.7	9.5	9.6	10.0	11.3	13.7	15.0	17.3	19.4	21.1	21.8	21.2	21.1	20.2	19.3	16.9	14.5	12.7	12.3	12.3	11.8	14.9	21.8																						
14-Sep	11.1	11.3	11.4	11.7	11.8	12.0	11.9	12.0	12.6	13.2	14.3	15.6	17.8	19.2	19.8	20.3	20.0	19.2	17.0	14.8	13.4	12.3	10.7	9.3	14.3	20.3																						
15-Sep	8.7	7.9	6.9	6.0	5.2	5.1	5.1	7.1	9.9	13.2	16.5	20.3	22.5	23.7	24.5	25.1	25.0	23.9	21.7	19.5	17.4	14.3	14.7	13.6	14.9	25.1																						
16-Sep	12.5	12.1	9.4	5.9	6.1	4.4	8.3	9.9	12.3	15.5	18.6	20.8	21.8	22.7	23.3	23.2	22.3	21.6	19.7	16.8	13.4	12.9	11.8	9.4	14.8	23.3																						
17-Sep	9.5	7.2	4.3	5.8	7.5	6.5	3.9	6.5	10.9	13.9	17.1	20.5	21.9	22.1	22.3	21.9	21.7	20.6	18.6	16.4	14.2	9.6	11.2	10.6	13.5	22.3																						
18-Sep	10.1	9.2	8.4	8.0	8.1	7.5	8.1	9.3	10.9	14.4	17.0	17.7	17.5	17.6	15.3	12.9	12.6	13.2	12.5	11.1	10.3	9.1	8.7	8.8	11.6	17.7																						
19-Sep	8.0	7.2	6.5	5.5	5.3	5.0	4.8	6.4	9.1	10.6	12.9	14.9	16.5	17.7	18.6	18.9	18.8	18.3	13.9	9.3	7.4	7.5	8.0	5.0	10.7	18.9																						
20-Sep	3.4	2.8	2.3	2.1	1.9	2.2	1.4	2.9	8.1	11.6	13.6	15.6	16.7	17.2	17.9	18.4	17.8	15.9	11.9	9.9	9.7	7.7	6.9	7.8	9.4	18.4																						
21-Sep	7.1	6.4	5.7	5.0	4.4	4.1	4.0	4.5	7.0	11.2	15.4	17.9	18.9	19.7	20.0	20.3	20.1	19.2	17.3	16.0	15.0	13.7	13.1	13.1	12.5	20.3																						
22-Sep	12.9	13.0	12.9	12.5	12.3	11.4	11.0	12.4	14.6	17.0	19.5	21.4	22.5	23.6	24.2	24.2	24.0	22.7	20.9	18.8	17.3	16.3	15.4	13.9	17.3	24.2																						
23-Sep	13.3	12.6	12.4	12.4	12.2	11.8	12.0	12.9	14.6	17.6	20.6	22.4	22.8	23.9	24.4	24.3	23.7	22.5	20.6	19.2	18.0	17.6	16.9	16.5	17.7	24.4																						
24-Sep	16.1	16.1	16.5	16.7	16.6	16.4	15.9	15.8	16.0	17.0	17.7	17.9	18.3	18.1	17.8	17.2	17.5	17.0	16.0	14.6	14.4	14.2	13.4	12.3	16.2	18.3																						
25-Sep	10.7	9.2	8.4	7.3	6.4	5.4	4.7	5.6	7.5	10.9	14.9	16.2	17.8	18.7	19.2	20.3	20.7	19.4	17.5	16.4	16.3	15.5	15.0	14.9	13.3	20.7																						
26-Sep	15.3	15.1	14.7	14.1	13.8	13.8	13.2	13.4	14.6	17.7	19.8	19.9	20.8	20.6	20.6	19.9	18.9	18.4	17.3	17.2	15.1	14.1	13.4	12.7	16.4	20.8																						
27-Sep	10.7	7.9	7.1	7.0	8.0	7.0	7.1	8.9	10.8	13.3	17.4	19.2	19.9	19.2	19.1	18.4	18.1	17.3	15.8	14.6	13.3	12.2	11.1	8.6	13.0	19.9																						
28-Sep	7.9	6.8	5.9	5.1	5.2	3.6	2.7	4.3	5.9	7.6	8.4	9.4	10.3	10.5	10.2	9.8	9.5	9.0	8.6	8.5	8.4	8.5	8.3	8.0	7.6	10.5																						
29-Sep	7.8	7.7	7.7	6.7	6.6	6.4	6.4	6.8	6.8	7.2	7.7	7.6	8.4	8.9	9.1	9.9	9.7	9.5	8.8	8.2	7.9	7.7	7.6	7.3	7.9	9.9																						
30-Sep	7.1	6.6	6.4	6.1	5.7	5.9	6.1	6.1	6.3	6.7	7.3	8.0	8.9	9.6	10.4	10.7	10.3	9.9	9.5	9.1	8.8	8.4	8.0	5.5	7.8	10.7																						
																								10.4	9.7	9.0	8.4	8.3	7.9	8.0	9.1	11.1	13.3	15.4	17.0	18.1	19.0	19.4	19.5	19.1	18.3	16.6	14.7	13.3	12.2	11.6	10.6	Diurnal Average
																								18.6	18.5	18.1	16.7	16.9	17.0	15.9	15.8	17.5	19.9	22.9	24.2	25.4	25.9	26.3	26.1	25.9	25.0	23.6	21.6	19.8	18.4	17.5	16.7	Diurnal Maximum



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

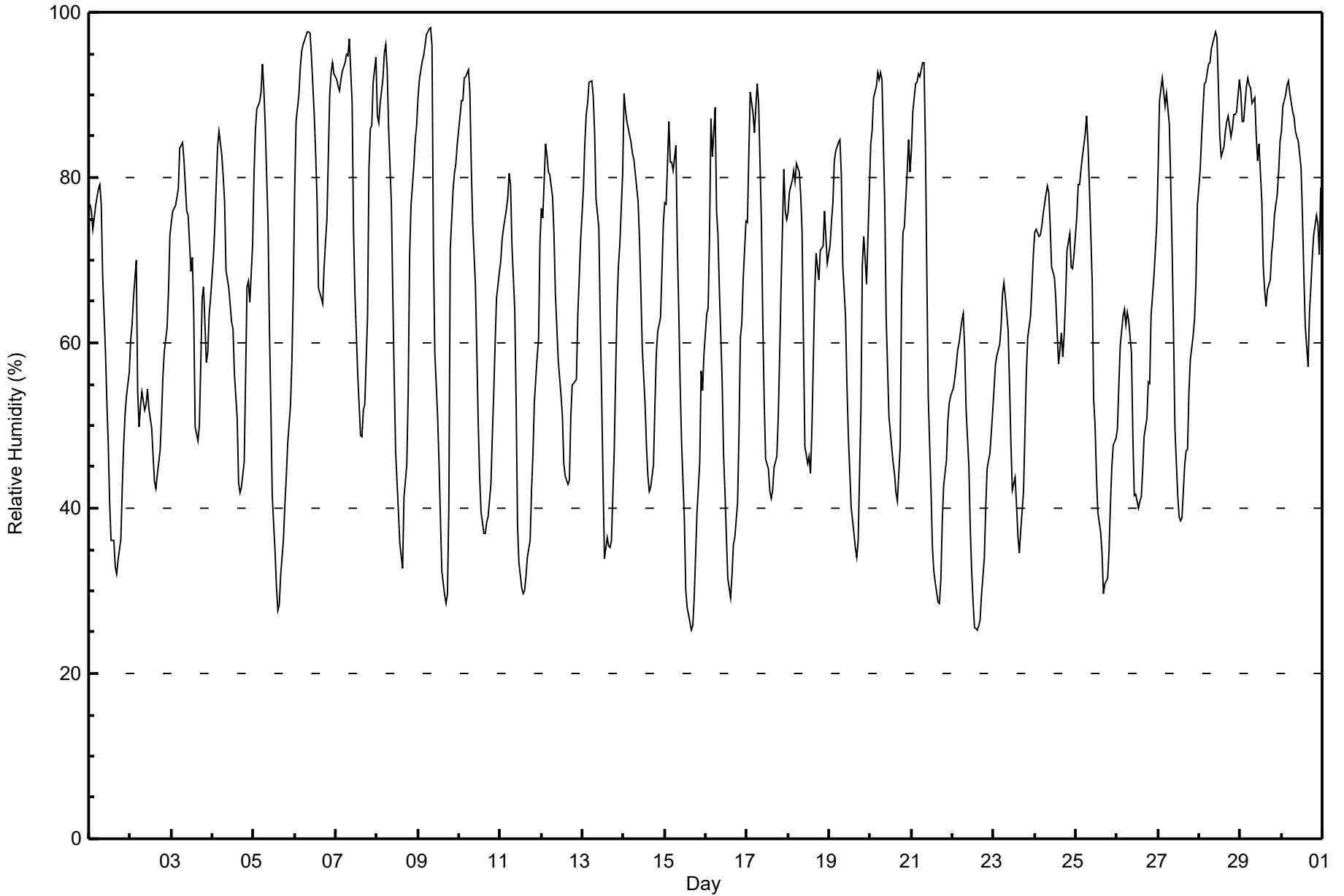
Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	241	33.47	33.47
10 - 20	379	52.64	86.11
> 20	100	13.89	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Maximum Value: 98.2 % on Sep 9 08:00 Maximum Daily Average: 89.1 % on Sep 28																						Hours in Service:	720			
Minimum Value: 25.3 % on Sep 15 16:00 Minimum Daily Average: 44.3 % on Sep 22																						Hours of Data:	720			
Maximum Diurnal Average: 84.2 % at hour 6 Minimum Diurnal Average: 42.8 % at hour 16																						Hours of Missing Data:	0			
Monthly Average: 65.17 % Percentiles: P ₁ = 27.7 P ₁₀ = 37.3 Q ₁ = 48.7 Median = 66.7 Q ₃ = 81.7 P ₉₀ = 90.3 P ₉₉ = 97.1																						Hours of Calibration:	0			
																						Percent Operational Time:	100.0			
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Sep	76.7	75.9	73.8	75.1	76.6	78.7	79.2	76.7	68.1	59.0	52.8	47.8	40.7	36.1	36.0	32.9	32.1	33.7	36.2	42.5	47.7	51.3	53.6	56.4	55.8	79.2
2-Sep	60.3	62.2	65.4	70.0	54.0	49.9	52.4	54.1	51.9	52.5	54.4	52.0	49.7	46.2	43.2	42.4	44.1	46.9	51.1	55.9	59.1	61.8	66.2	73.1	55.0	73.1
3-Sep	74.5	75.9	76.6	77.6	78.7	83.6	84.3	82.3	78.9	76.0	75.4	68.7	70.4	63.4	49.8	48.2	50.0	57.3	65.4	66.8	57.6	58.9	63.4	65.4	68.7	84.3
4-Sep	70.3	74.0	79.0	83.8	85.6	82.7	80.2	77.1	68.7	66.7	64.5	62.5	61.7	56.3	50.8	43.0	41.9	42.6	45.7	55.9	66.9	67.5	65.0	71.9	65.2	85.6
5-Sep	80.3	85.7	88.3	89.1	90.3	93.7	90.6	86.2	74.4	61.7	52.3	41.5	34.8	30.6	27.6	28.3	31.9	36.2	40.4	43.8	47.8	52.4	57.5	66.2	59.7	93.7
6-Sep	78.5	86.8	90.1	93.2	95.2	96.1	97.2	97.6	97.6	97.5	94.5	87.5	82.7	77.1	66.6	65.4	64.7	69.2	72.1	75.0	89.9	92.7	93.8	92.5	85.6	97.6
7-Sep	91.9	91.1	90.6	91.9	92.9	93.9	94.9	94.7	96.8	89.0	73.6	66.0	60.9	56.0	48.7	48.7	51.8	52.6	63.3	81.3	86.0	86.2	91.6	94.5	78.7	96.8
8-Sep	87.5	86.7	89.0	92.1	95.1	96.2	93.1	86.1	76.8	65.9	56.0	47.0	39.7	35.8	34.2	32.8	41.4	45.2	54.0	70.4	76.6	81.3	84.5	86.3	68.9	96.2
9-Sep	89.6	91.9	94.0	94.8	95.9	97.3	97.9	98.2	96.0	71.1	58.9	51.1	45.5	38.6	32.4	29.5	28.5	29.7	40.2	71.4	78.4	80.5	81.6	84.1	69.9	98.2
10-Sep	87.5	89.3	89.4	92.0	92.1	93.1	90.4	81.4	74.6	66.8	58.5	50.0	43.5	39.4	37.0	36.9	38.3	39.0	42.9	48.6	53.9	59.9	65.5	68.4	64.1	93.1
11-Sep	69.9	72.5	73.9	76.2	77.4	80.6	79.1	71.8	64.0	53.0	37.9	33.3	30.4	29.7	30.0	31.7	34.0	36.2	42.2	46.6	52.8	58.3	60.5	72.0	54.7	80.6
12-Sep	76.3	75.2	84.1	82.7	80.7	80.3	77.6	73.3	66.0	62.0	57.9	53.7	51.3	45.4	43.9	43.0	43.4	51.0	54.9	55.1	55.5	63.4	67.7	72.4	63.2	84.1
13-Sep	78.7	84.1	87.6	89.0	91.6	91.7	89.8	85.5	77.5	74.0	63.1	53.8	43.4	33.9	36.5	35.3	35.3	36.1	47.2	56.0	64.6	69.4	72.0	80.4	65.7	91.7
14-Sep	90.1	88.1	86.9	85.0	84.2	82.9	82.2	80.5	77.1	72.7	66.2	59.3	52.6	47.5	44.0	42.1	42.5	45.3	52.3	58.6	61.4	63.1	68.5	74.4	67.0	90.1
15-Sep	77.0	76.8	86.7	81.9	81.9	80.8	83.8	71.9	64.1	55.1	48.1	38.8	30.2	28.0	27.1	25.3	25.8	29.0	34.1	39.4	45.5	56.6	54.2	58.6	54.2	86.7
16-Sep	63.6	64.3	73.3	87.2	82.6	88.4	75.9	73.0	66.4	55.3	46.4	41.8	36.6	31.6	29.1	31.8	35.5	36.4	40.7	49.1	60.6	62.5	67.8	74.7	57.3	88.4
17-Sep	74.6	82.8	90.3	87.7	85.5	88.5	91.4	89.0	74.6	62.4	52.8	46.0	44.8	42.1	41.2	42.2	44.9	46.2	51.1	58.5	66.6	81.0	76.0	74.9	66.5	91.4
18-Sep	75.7	78.3	79.6	80.8	79.5	81.8	80.7	77.9	73.5	60.3	47.5	45.5	46.2	44.2	49.5	66.1	70.8	69.1	67.6	71.1	71.7	75.9	72.7	69.7	68.1	81.8
19-Sep	71.8	74.7	76.9	82.0	83.2	84.2	84.6	80.4	69.5	63.3	54.9	48.8	44.6	40.1	36.9	35.3	34.1	35.9	52.0	69.5	72.9	70.2	67.1	78.5	63.0	84.6
20-Sep	84.2	85.8	89.7	91.0	92.7	91.8	92.7	91.9	76.6	63.0	56.9	51.0	47.2	45.5	44.0	41.8	40.9	47.5	66.1	73.4	74.1	80.9	84.6	80.7	70.6	92.7
21-Sep	83.4	88.1	91.4	91.6	92.6	92.2	93.9	93.9	83.9	68.4	53.5	42.0	35.2	32.3	31.0	28.7	28.6	31.3	38.4	42.6	45.8	50.4	52.7	53.5	60.2	93.9
22-Sep	54.6	55.8	57.2	59.1	59.9	62.7	63.5	59.2	52.0	45.1	37.4	32.3	28.7	25.5	25.3	25.7	26.5	29.4	34.0	39.8	44.8	45.8	46.5	51.7	44.3	63.5
23-Sep	54.6	57.4	58.4	59.9	62.0	65.9	67.2	65.6	61.6	55.1	47.8	42.3	43.7	40.3	36.6	34.5	37.3	42.0	49.4	56.3	60.7	63.2	66.8	70.7	54.1	70.7
24-Sep	73.4	73.8	72.8	73.0	74.0	75.6	78.0	79.0	78.2	74.3	69.1	68.0	65.4	61.2	57.4	61.1	58.2	60.9	65.5	71.2	73.3	69.1	69.1	70.7	69.7	79.0
25-Sep	75.3	79.1	79.1	81.0	82.5	85.3	87.4	83.9	78.8	67.2	53.2	50.1	44.0	39.5	37.1	34.6	29.7	30.9	31.5	35.0	40.6	45.1	47.6	48.6	57.0	87.4
26-Sep	49.7	55.0	59.6	63.1	64.0	62.2	63.8	62.7	58.8	48.7	41.6	41.7	40.1	40.9	41.4	44.5	48.7	50.9	55.2	55.2	63.3	67.9	71.1	74.2	55.2	74.2
27-Sep	81.0	89.3	92.0	90.3	88.6	90.2	86.4	79.5	71.3	61.4	49.7	41.6	39.0	38.5	38.8	45.3	46.9	47.2	54.0	57.9	60.9	62.9	67.2	76.6	64.9	92.0
28-Sep	80.9	84.8	88.2	91.4	91.5	93.7	93.9	95.6	96.2	97.6	96.9	91.1	85.1	82.6	83.7	85.7	86.8	87.4	85.0	85.9	87.6	87.6	87.9	91.9	89.1	97.6
29-Sep	90.3	86.8	86.7	91.1	92.0	91.2	90.8	89.0	89.7	85.1	82.0	84.1	77.1	69.4	66.5	64.4	66.5	67.6	70.8	72.5	75.4	78.0	80.7	84.3	80.5	92.0
30-Sep	85.5	88.7	90.1	91.3	91.8	90.2	88.0	87.3	85.5	84.9	84.5	81.2	75.2	68.1	62.0	57.1	63.8	66.8	70.4	73.0	75.3	74.5	70.6	78.8	78.5	91.8
																								Diurnal Average		
																								Diurnal Maximum		





Maximum Speed: 30 km/h on Sep 13 14:00	Maximum Daily Speed Average: 15.8 km/h on Sep 23	Hours in Service: 720
Minimum Speed Value: 1 km/h on Sep 9 05:00	Minimum Daily Speed Average: 1.3 km/h on Sep 6	Hours of Data: 720
Maximum Diurnal Speed Average: 7.9 km/h at hour 13	Minimum Diurnal Speed Average: 3.3 km/h at hour 19	Hours of Missing Data: 0
Monthly Average Velocity: 4.8 km/h 214.7 deg	Percentiles: P ₁ = 1 P ₁₀ = 4 Q ₁ = 6 Median = 9 Q ₃ = 13 P ₉₀ = 17 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-Sep	WNW8WNW10	W10	WSW9	WSW7	WSW9	WSW8	WSW10	SW9	WSW14	SW16	WSW20	WSW22	WSW25	SW26	SW27	WSW28	WSW24	WSW21	WSW14	WSW14	WSW13	WSW14	WSW11	WSW14.8	WSW28		
2-Sep	WSW9	W5	SSW2	SSW7	WNW12	WNW16	WNW16	WNW16	WNW15	W12	W11	WSW6	W8	W14	W19	W18	W19	W14	WSW10	WSW12	WSW12	WSW12	WSW15	WSW12	W11.4	W19	
3-Sep	WSW12	SW11	SW10	SSW6	SSW7	SE3	SE3	S4	S7	SW10	SW11	SSW8	WNW3	SW14	SW15	WSW14	W7	WNW5	W7	WNW12	NW10	NW11	NW11	WSW6.4	SW15		
4-Sep	NW12	WNW13	W12	WSW12	W8	WNW12	WNW16	NW13	NNW19	NNW19	NW19	NW16	NW17	NW16	NW12	NW13	WNW11	WNW9	W6	WSW6	SW5	SW6	SW9	SW10	WNW10.6	NNW19	
5-Sep	SW11	SW9	SSW7	S6	S4	S2	S4	SSW7	SSW8	S9	S11	S12	SSW10	S10	S11	S12	SSW12	SSE9	SE10	SE8	SE6	SSE5	SSW5	SSW3	S7.2	SSW12	
6-Sep	SE2	ESE5	E5	ESE8	ESE9	ESE10	ESE10	ESE11	ESE10	SE7	SSW5	WSW6	SW5	NW6	WNW15	WNW14	NW10	WNW9	WSW8	WSW6	WNW4	WSW4	SW4	SW8	SW1.3	WNW15	
7-Sep	WSW7	WSW6	WSW5	WSW7	SW6	SW9	SSW4	SSW7	S8	S7	S8	S9	SSW12	SSW10	SW14	WSW12	NNE7	ESE4	S2	SW4	SSW3	SE1	SSW1	SW4	SW5.1	SW14	
8-Sep	SSW7	SSW6	SSW7	SSE4	S7	SSE6	S7	S7	SSW8	S9	S9	SW11	WSW17	W13	WNW11	WNW9	NNW8	NNE8	N7	NW4	WNW5	W2	NW3	NNW3	SW3.5	WSW17	
9-Sep	NW2	W2	N2	W2	S1	SW2	S3	S5	S5	SSE5	SE6	SE5	SE5	E7	E6	ENE4	E5	ESE4	E3	W2	SSE3	SSE3	SSE4	S2	SE2.3	E7	
10-Sep	SSW2	S2	SE5	SSE5	SSE5	SSE4	S3	SSE5	SE9	SE9	ESE10	ESE13	ESE16	ESE16	SE18	SE18	SE17	SE15	SE14	SE13	SE11	SE10	ESE11	SE12	SE9.8	SE18	
11-Sep	ESE14	ESE11	ESE12	SE12	SE10	SE7	SE10	SE12	SE11	SE13	S17	S23	S23	SSE23	S23	S22	S20	S17	SE11	SE11	SE10	SE6	S5	ESE3	SSE12.3	S23	
12-Sep	SE5	SSE4	SSW3	S5	SE6	SE6	SSE6	SSE6	SSE7	S8	S8	SSW6	SW6	SW2	SSE1	SE4	SSE6	W7	WSW7	WSW12	SW9	SSW4	SSW5	SW6	SSW4.3	WSW12	
13-Sep	SW13	SW11	SW9	SSW7	S7	S6	SW9	SW11	SW12	WSW13	WSW21	SW19	WSW23	WSW30	W25	W25	W22	W18	W24	W20	WSW17	WSW14	WSW15	W19	WSW15.4	WSW30	
14-Sep	W15	W15	WNW15	WNW16	WNW16	WNW17	WNW17	WNW15	WNW14	WNW15	WNW19	WNW19	NW15	NW19	NW20	NW19	WNW18	NW12	W7	WSW9	W11	W9	W5	ENE2	WNW13.5	NW20	
15-Sep	SSW5	SSW7	SW8	NW10	SSW8	SSW9	S7	S6	SSW6	SSE7	SSE7	SSE7	S13	S16	S17	S15	S16	S13	SSE12	SSE11	SE7	SE6	SE9	SE8	S8.9	S17	
16-Sep	SE9	SE9	SE3	NW2	SSE3	SSW3	SW10	SW11	SW12	SW8	SSW5	ESE10	SSW11	SW15	W13	SW13	SSW12	SSW9	SSW7	SSW6	SW6	SSW6	SSW6	SW6	SSW6.6	SW15	
17-Sep	SSW7	SSW2	SSW2	SSE6	SE7	SE5	SE1	E4	E4	ESE9	ESE11	ESE12	SW11	SW16	SW13	WSW12	SW9	SW10	SW6	SW8	WSW7	SSW5	SW8	SW8	SSW5.3	SW16	
18-Sep	SW11	SSW7	SSW7	SSW10	SSW10	S7	S7	SSW7	SSW9	WSW10	W17	W21	W23	WSW24	WSW25	SW12	SW15	SSW11	SW9	SW10	SW12	SW12	WSW14	WSW16	SW11.5	WSW25	
19-Sep	SW15	WSW14	SW11	SSW6	SSW7	SW8	SW9	SSW7	SW9	SSW12	SSW13	SW16	SW16	WSW13	SW11	W8	W7	WSW6	SW4	SW5	SW5	SW6	SW4	SSW3	SW8.5	SW16	
20-Sep	SSW3	SW2	WSW1	SW1	SW4	SSW2	SW3	SW3	SSW1	NE3	N8	N11	NNW12	N11	N9	N9	N10	NNW6	NW7	NW7	NW7	WSW3	SW3	SSW5	NNW3.1	NNW12	
21-Sep	SSW7	S6	S7	S6	S6	S6	SSW6	SSW5	S6	SSE8	S10	SSW20	SSW25	SSW25	SSW24	SSW24	SSW22	SSW17	S10	S11	S10	SSE10	SSE9	S8	SSW11.4	SSW25	
22-Sep	S9	SSW11	SSW11	SSW10	SSW11	SSW10	SSW9	SSW12	S13	SSW14	SSW20	SSW19	SSW19	S18	S17	S17	S18	S15	SSE13	SSE10	SSE11	SSE11	SSE8	SE8	S12.3	SSW20	
23-Sep	SE11	SE11	SE13	SE13	SE10	SE10	SE13	SE13	ESE15	ESE14	SE16	S25	SSE25	SSE25	SSE22	SSE24	SSE21	SSE19	SSE15	SE14	SE15	SE18	SE16	ESE18	SE15.8	S25	
24-Sep	SE17	SE15	SE12	SE14	SE10	SE12	SE11	SE11	SSE8	SSW9	SSW10	SSW9	WSW11	W9	WSW7	SW6	SSW6	SSW4	SSW4	SSW7	SW9	WSW9	WSW10	SW10	S6.5	SE17	
25-Sep	SW11	WSW13	WSW12	SW10	WSW12	SW7	SSW8	SW10	SW10	SW7	ESE3	SE6	ENE5	ENE6	NE6	ENE8	E12	E12	E10	E11	ESE13	ESE10	ESE11	ESE13	SSE3.6	ESE13	
26-Sep	ESE16	SE14	SE16	ESE14	ESE12	SE11	SE8	SE7	SE8	SSE10	SSW14	SSW15	SSW15	SSW9	SW9	SW7	W6	SSW3	ESE3	ESE3	W6	SSW6	WSW11	WSW10	S6.3	ESE16	
27-Sep	WSW5	SW4	SW5	S2	S4	SW2	S3	S5	SSW8	SSW7	SE8	W10	W14	W17	WSW16	WSW14	WSW12	WSW8	WSW5	WSW8	WSW10	WSW10	W3	SW4	WSW6.7	W17	
28-Sep	SW6	SW8	WSW7	WSW5	WSW6	SSW3	SW4	WSW4	WNW4	NW3	N9	N8	NNW11	N12	N13	N13	N14	N16	N14	N9	N10	N12	N11	NNW10	NNW6.1	N16	
29-Sep	NNW12	N12	N10	NNW7	NW6	NNW8	NNW5	NNW5	NW8	NW8	NNW11	NNW13	N14	N14	N15	N12	N11	NNW9	N10	N9	N8	NNW6	NNW6	NNW4	NNW9.2	N15	
30-Sep	NW4	WSW4	NW3	WNW2	SW2	SSW3	SW5	SSW5	SSW4	SSW4	SSW5	S5	SSE5	S4	SE5	SE3	ESE7	SE7	SE7	SE7	SE7	SE7	SSE6	SSE5	SSW3	S3.2	SE7

SSW4.4 SW4.2SSW3.8SSW4.2SSW4.2SSW3.5SSW3.8SSW4.3SSW4.4SSW4.6SSW5.5 SW7.0 SW7.9 SW7.6 SW7.8 SW7.0 SW5.9 SW4.4SSW3.3SSW3.9 SW3.8SSW3.8 SW4.0 SW3.9	Diurnal Average
SE17 SE15 SE16WNW16WNW16WNW17WNW17WNW16NNW19NNW19 WSW21 S25 SSE25 WSW30 SW26 SW27 WSW28WSW24 W24 W20 WSW17 SE18 SE16 WSW19	Diurnal Maximum

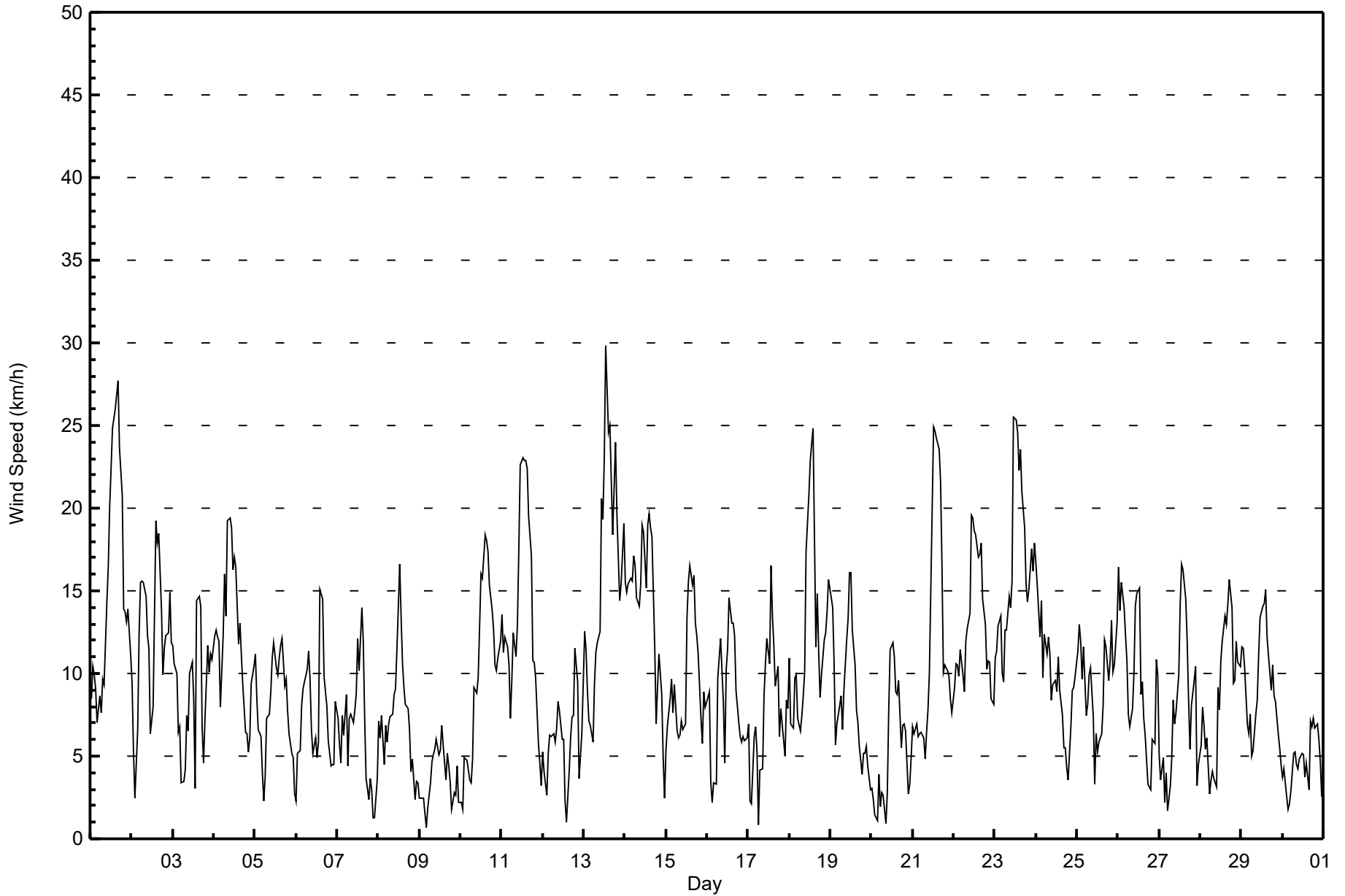
All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Sep 13 14:00 Minimum Value: 0 km/h on Sep 9 02:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 3 P ₉₀ = 4 P ₉₉ = 6																	Hours in Service: 720 Hours of Data: 720 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-Sep	1	2	2	1	2	2	2	2	3	3	4	4	5	5	7	7	7	6	4	3	2	2	2	2	7
2-Sep	2	3	2	2	5	3	2	3	3	3	2	3	3	3	4	4	4	3	2	2	2	2	2	2	5
3-Sep	2	3	2	2	3	1	1	1	2	2	3	2	2	2	4	4	3	2	2	2	2	2	2	2	4
4-Sep	2	3	2	2	3	3	3	3	5	4	3	3	4	4	3	4	3	2	1	1	1	1	2	1	5
5-Sep	2	2	2	2	2	1	1	2	2	3	4	4	3	4	4	3	4	3	2	1	1	1	2	1	4
6-Sep	1	1	1	2	2	3	2	2	2	1	2	2	3	3	3	3	2	2	1	1	1	1	1	2	3
7-Sep	1	1	1	1	2	2	2	2	2	2	2	3	3	3	4	4	2	1	1	1	2	2	1	1	4
8-Sep	1	1	2	1	1	1	2	2	3	2	2	3	4	4	4	2	2	2	2	1	1	1	1	1	4
9-Sep	1	0	1	1	1	1	1	1	1	1	2	2	2	3	2	2	2	2	2	1	1	2	1	1	3
10-Sep	2	1	1	1	1	1	2	2	2	2	2	4	4	4	5	4	4	4	3	3	2	2	2	3	5
11-Sep	3	2	2	2	2	1	2	3	2	3	5	6	6	6	6	5	5	6	2	2	2	1	2	1	6
12-Sep	2	1	1	1	1	1	1	1	2	2	2	2	2	2	2	3	3	2	2	2	2	1	1	2	3
13-Sep	3	2	2	2	2	1	2	3	3	4	5	4	5	7	6	6	5	6	7	4	6	4	3	4	7
14-Sep	3	3	3	3	3	4	3	3	3	4	4	4	4	5	4	4	4	4	1	2	1	2	2	1	5
15-Sep	2	1	2	2	1	2	2	1	1	2	2	4	4	4	4	4	5	4	3	2	3	2	1	1	5
16-Sep	1	1	2	2	2	1	3	2	2	3	2	2	4	4	4	4	4	3	1	1	1	1	1	1	4
17-Sep	1	2	1	2	2	1	1	1	3	2	3	4	5	4	3	3	2	2	1	2	3	1	2	1	5
18-Sep	2	2	2	2	2	1	1	2	3	4	4	5	5	5	6	4	4	3	2	2	2	2	2	2	6
19-Sep	2	2	3	1	1	1	2	2	3	3	4	4	4	3	3	3	2	1	1	2	1	1	2	1	4
20-Sep	1	1	1	1	1	1	1	1	1	1	2	2	3	3	2	2	2	1	1	1	1	1	1	1	3
21-Sep	1	2	1	1	1	1	1	1	2	2	4	5	6	7	6	7	6	5	2	2	2	2	1	2	7
22-Sep	2	3	3	2	3	2	2	3	3	4	5	5	5	5	5	5	5	4	3	2	2	2	2	2	5
23-Sep	2	2	2	2	3	2	2	3	3	3	7	6	6	6	6	6	6	5	4	3	3	4	3	4	7
24-Sep	3	4	3	4	3	3	2	3	3	2	3	3	2	2	2	1	2	1	1	1	2	2	1	1	4
25-Sep	2	2	2	2	2	2	2	2	2	3	2	2	2	2	2	3	3	3	2	2	3	3	2	4	4
26-Sep	4	4	4	3	3	2	1	1	2	4	5	4	4	3	2	3	2	2	2	3	2	2	3	2	5
27-Sep	2	1	1	1	1	1	3	2	2	2	2	4	4	4	4	3	2	2	1	1	1	1	3	1	4
28-Sep	1	2	2	1	1	1	1	2	1	1	2	2	2	2	3	3	3	3	3	2	2	3	3	2	3
29-Sep	2	3	3	1	1	1	1	1	1	2	2	3	3	3	3	3	2	2	3	2	2	1	1	1	3
30-Sep	1	1	1	1	1	1	1	2	1	1	1	1	1	1	2	2	1	1	1	1	1	2	1	1	2
																	Diurnal Maximum								





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	156	21.67	21.67
6 - 11	331	45.97	67.64
12 - 19	193	26.81	94.44
20 - 28	39	5.42	99.86
29 - 38	1	0.14	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Wind Speed (WS) - km/h
Patricia McInnes - September 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	0	1	3	5	7	14	16	19	33	24	9	7	6	7	4	156
6 - 11	17	2	1	2	4	15	42	26	34	54	54	36	16	8	10	10	331
12 - 19	11	0	0	0	2	14	27	4	16	12	19	34	14	24	10	6	193
20 - 28	0	0	0	0	0	0	0	6	6	7	2	10	7	0	1	0	39
29 - 38	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	29	2	2	5	11	36	83	52	75	106	99	90	44	38	28	20	720

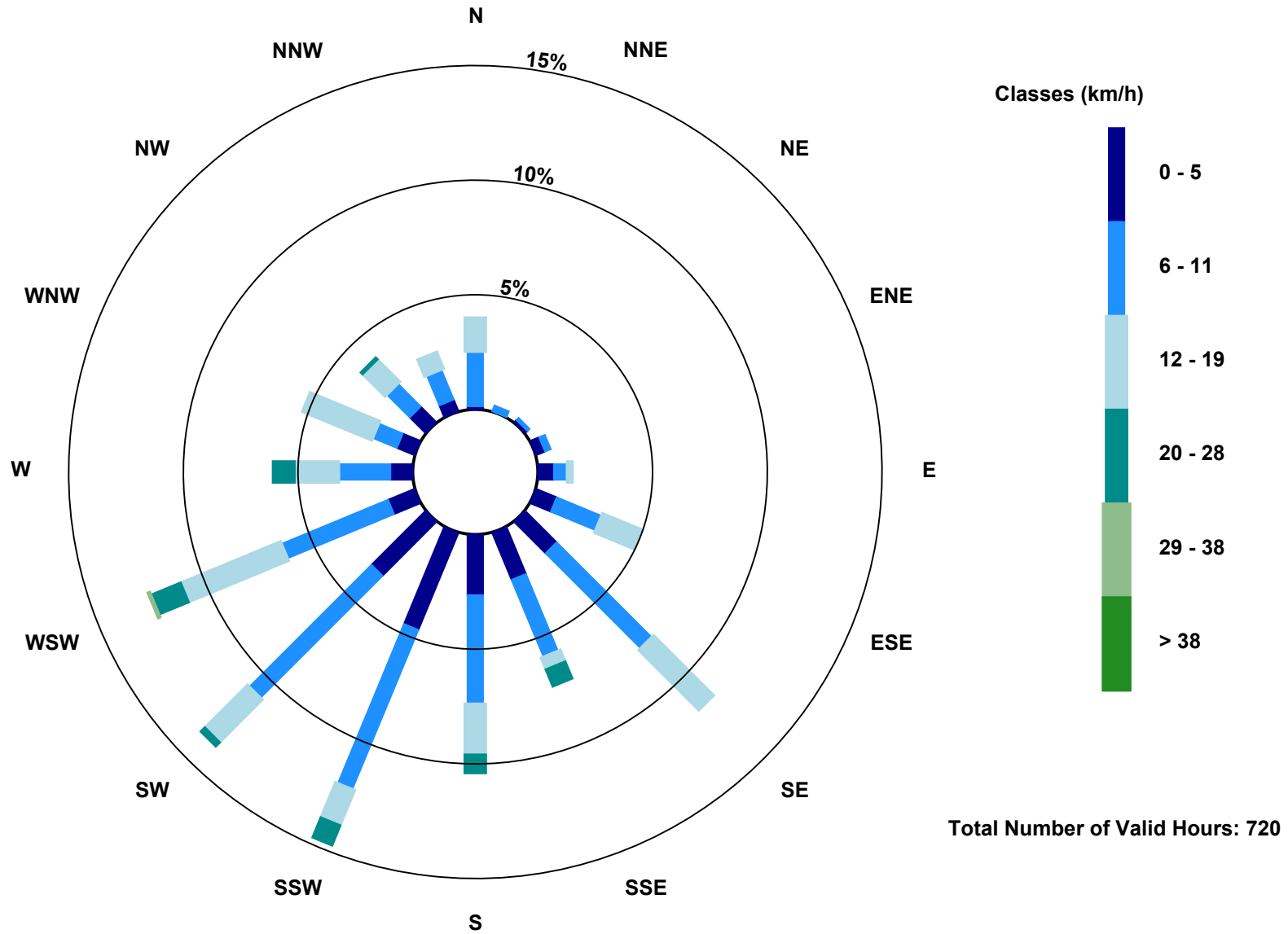
Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

Wind Speed (WS) - km/h
Patricia McInnes





Wood Buffalo Environmental Association
Summary of Hour Averages

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

Direction of Maximum Speed: 252 deg on Sep 13 14:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 142.1 deg on Sep 23	Hours of Data: 720
Direction of Minimum Speed: 175 deg on Sep 9 05:00	Hours of Missing Data: 0
Direction of Minimum Daily Speed Average: 1.3 deg on Sep 6	Percent Operational Time: 100.0
Monthly Average Direction: 214.7 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-Sep	293	302	278	257	253	256	246	242	232	239	233	237	238	239	232	230	239	247	250	251	253	247	237	238	244.5
2-Sep	241	268	195	202	293	292	289	288	296	281	261	258	260	265	264	270	264	270	255	255	258	249	253	238	266.5
3-Sep	238	233	220	197	196	143	136	174	182	179	216	225	209	296	224	225	238	276	289	264	286	310	311	313	238.2
4-Sep	307	295	268	254	263	284	300	315	329	330	317	308	304	304	308	315	287	287	260	239	224	221	226	235	293.4
5-Sep	232	219	194	181	172	178	169	193	198	189	184	174	165	176	186	189	194	154	138	143	137	148	207	204	181.1
6-Sep	130	103	90	103	106	119	117	114	123	146	208	255	217	309	299	303	305	295	257	249	292	255	234	236	221.5
7-Sep	251	246	252	254	224	235	193	203	190	186	182	180	206	211	233	257	19	108	169	223	211	132	197	216	217.3
8-Sep	201	197	194	160	178	168	177	176	204	181	188	217	243	279	290	300	346	23	9	315	301	277	319	347	235.3
9-Sep	311	266	352	267	175	227	191	172	170	152	142	141	146	100	90	64	84	116	89	275	163	162	153	173	138.6
10-Sep	207	191	143	160	159	151	171	154	139	124	120	118	115	122	131	133	132	130	136	137	139	130	121	124	132.1
11-Sep	117	117	121	128	125	127	128	126	128	134	170	176	171	167	173	182	182	180	145	131	132	146	173	110	153.0
12-Sep	132	162	207	170	128	128	153	149	163	179	191	210	214	232	156	143	157	274	253	248	234	193	199	214	191.4
13-Sep	230	235	229	199	188	187	215	225	235	237	246	236	246	252	259	261	267	267	274	265	258	256	252	259	248.8
14-Sep	269	273	286	286	286	290	294	295	295	298	301	301	319	311	308	306	301	311	280	256	266	276	271	68	293.4
15-Sep	204	212	216	221	196	194	174	174	166	150	150	158	180	183	186	179	178	178	157	153	144	139	139	141	175.1
16-Sep	137	141	137	310	162	199	222	229	227	230	194	118	193	232	259	219	204	201	210	207	219	209	210	214	207.2
17-Sep	197	193	201	161	145	144	143	101	99	119	119	117	223	235	231	238	219	227	217	228	237	204	233	223	199.5
18-Sep	226	204	193	196	197	183	187	195	208	238	270	263	262	258	254	236	216	213	214	222	221	225	246	238	233.2
19-Sep	227	238	224	202	209	215	216	197	217	207	209	222	232	250	233	261	260	256	234	231	221	216	215	203	225.6
20-Sep	200	218	251	229	231	195	218	227	205	48	4	356	347	6	6	1	8	334	304	309	326	256	214	211	333.1
21-Sep	193	188	187	179	180	188	192	193	180	166	169	213	212	206	207	212	203	205	184	176	170	160	163	170	194.1
22-Sep	186	197	199	195	209	211	199	192	189	206	209	212	199	187	187	187	178	173	164	155	157	158	150	133	187.4
23-Sep	129	130	125	127	134	129	124	126	122	122	141	172	160	162	153	153	159	157	148	139	138	128	124	123	142.1
24-Sep	124	132	130	133	141	134	128	134	135	149	192	193	202	250	259	247	220	207	208	208	240	229	237	237	173.2
25-Sep	234	246	243	232	238	221	209	215	227	236	117	136	63	60	54	66	97	93	88	98	109	115	113	110	152.3
26-Sep	115	129	130	121	121	129	144	133	134	163	209	212	216	209	217	234	262	196	107	103	266	203	239	245	172.8
27-Sep	240	231	223	190	175	227	182	182	211	208	138	261	278	266	247	242	244	252	239	238	244	242	261	216	238.0
28-Sep	225	232	252	237	241	195	229	239	284	313	353	349	348	349	356	7	358	4	5	2	2	3	349	343	341.0
29-Sep	343	357	2	336	326	342	340	336	320	321	343	341	349	357	359	358	351	344	4	353	352	340	342	327	346.8
30-Sep	313	254	306	286	226	203	217	210	208	192	192	183	168	175	131	144	122	134	132	130	132	155	155	212	170.1

212.4 214.2 205.6 192.6 194.6 198.5 200.0 195.6 200.0 199.7 210.7 215.7 223.1 235.1 235.2 233.0 224.2 221.0 211.0 213.0 219.6 207.9 216.5 214.4

Diurnal Average

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

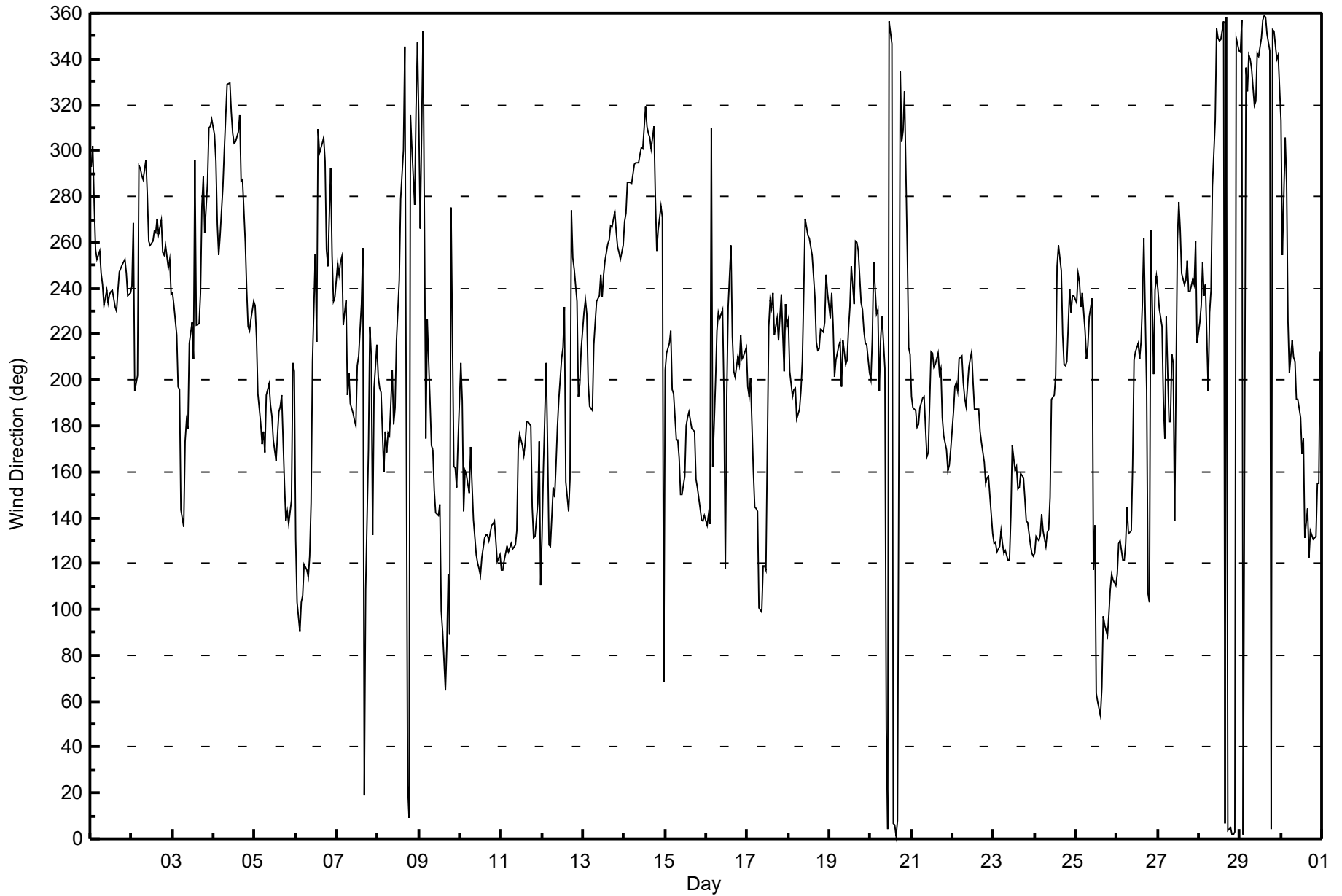
Wind Direction (WD) - deg
Patricia McInnes - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 97 deg on Sep 12 15:00 Minimum Value: 5 deg on Sep 20 19:00 Percentiles: P ₁ = 8 P ₁₀ = 11 Q ₁ = 13 Median = 16 Q ₃ = 22 P ₉₀ = 33 P ₉₉ = 77																			Hours in Service: 720 Hours of Data: 720 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-Sep	11	12	12	11	17	22	23	20	17	15	17	16	14	15	18	15	13	13	12	11	8	8	9	10	23
2-Sep	11	68	75	27	19	10	10	11	14	14	15	21	23	16	11	12	10	11	14	8	12	11	10	14	75
3-Sep	15	11	14	18	30	23	36	34	21	28	18	13	29	69	15	17	14	31	31	15	10	12	10	11	69
4-Sep	9	10	11	12	37	11	13	13	15	14	15	14	18	16	19	25	24	16	14	9	7	11	14	9	37
5-Sep	9	15	17	19	27	40	20	18	24	22	23	27	31	30	27	21	19	23	13	12	19	20	25	43	43
6-Sep	50	11	13	16	14	14	13	12	16	23	30	26	52	57	16	12	15	15	11	13	13	18	24	17	57
7-Sep	9	14	18	15	23	20	55	18	19	20	20	24	24	27	24	27	25	53	43	16	59	67	51	26	67
8-Sep	14	16	21	30	16	15	17	17	27	18	24	23	18	22	18	27	16	16	17	29	12	47	42	30	47
9-Sep	27	25	25	57	10	23	19	16	23	29	28	42	41	36	52	65	36	25	18	63	23	19	9	25	65
10-Sep	21	40	9	13	14	16	34	21	21	21	18	19	19	20	17	17	15	14	13	12	13	11	11	11	40
11-Sep	11	13	12	12	12	12	11	12	14	14	22	18	18	17	18	16	16	19	12	12	12	11	22	23	23
12-Sep	19	32	26	25	9	9	12	16	21	18	23	40	44	78	97	95	43	15	11	8	12	30	15	15	97
13-Sep	10	9	10	18	18	18	15	14	13	14	13	15	17	15	12	14	12	14	13	11	14	13	11	12	18
14-Sep	10	12	11	10	10	10	10	11	12	12	13	14	19	20	17	15	14	13	22	9	8	9	47	53	53
15-Sep	22	18	14	12	17	15	16	20	20	20	26	39	25	20	17	19	16	16	13	12	12	13	8	11	39
16-Sep	7	9	65	87	27	17	12	12	13	18	45	22	33	20	23	24	17	16	15	11	10	15	13	12	87
17-Sep	14	33	36	15	12	17	86	18	61	21	21	20	42	18	20	19	20	12	12	11	13	14	8	12	86
18-Sep	11	20	20	16	16	16	16	21	19	23	14	16	17	16	13	19	14	15	14	11	11	11	14	10	23
19-Sep	12	10	15	19	14	12	13	19	21	19	21	18	18	25	31	24	28	11	13	10	22	14	36	20	36
20-Sep	25	21	36	81	19	42	21	31	64	60	24	20	18	23	28	25	22	21	5	16	17	40	20	16	81
21-Sep	11	14	17	13	14	13	14	16	23	18	33	18	18	19	17	17	16	17	16	15	14	12	13	14	33
22-Sep	14	16	16	16	15	13	16	16	15	18	18	17	18	17	18	23	16	16	13	12	12	11	11	10	23
23-Sep	11	11	11	11	14	12	12	14	12	13	26	16	17	19	16	16	13	12	12	12	13	12	13	12	26
24-Sep	13	13	16	14	18	12	12	15	14	25	24	19	24	19	13	9	21	14	14	16	15	15	8	8	25
25-Sep	9	8	9	12	10	17	16	18	12	24	74	40	51	34	36	25	18	14	12	13	14	13	13	13	74
26-Sep	13	18	13	12	12	14	12	12	16	18	21	17	17	22	22	26	34	69	62	59	24	33	9	12	69
27-Sep	26	24	26	54	28	78	57	26	16	32	24	48	25	23	15	12	15	13	22	12	7	9	83	16	83
28-Sep	16	15	9	14	13	39	23	29	30	21	17	21	18	16	18	17	15	15	14	15	14	15	14	11	39
29-Sep	12	16	19	9	12	12	17	18	11	13	15	16	17	18	18	21	15	14	15	15	15	12	13	12	21
30-Sep	19	16	26	23	17	19	14	19	18	18	19	20	26	32	36	69	15	13	11	10	10	15	13	50	69
																			50 68 75 87 37 78 86 34 64 60 74 48 52 78 97 95 43 69 62 63 59 67 83 53						
Diurnal Maximum																									



Wood Buffalo Environmental Association
Hourly Averages

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





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS07 ATHABASCA VALLEY SEPTEMBER 2023

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

October 30, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ATHABASCA VALLEY (AMS07)
 SEPTEMBER 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	668	32	52	97.22	3.1	0	0.8	0
TRS (ppb) Average	684	36	36	100	1.9	0	0.8	0
THC (ppm) Average	624	31	96	90.97	2.5	-	2.3	-
NMHC (ppm) Average	624	31	96	90.97	0.319	-	0.034	-
CH4(ppm) Average	624	31	96	90.97	2.5	-	2.2	-
O3 (ppb) Average	684	36	36	100	48.7	0	38.5	-
NO2 (ppb) Average	683	37	37	100	28.9	0	7.5	-
NO (ppb) Average	683	37	37	100	19.1	-	3.8	-
NOX (ppb) Average	683	37	37	100	36	-	11	-
PM2.5 (ug/m3) Average	718	2	2	100	512.7	122	321	14
CO(ppm) Average	686	34	34	100	2.1	0	1.4	-
Temperature 2 m (C) Average	720	0	0	100	27.4	-	21.1	-
Relative Humidity (%) Average	720	0	0	100	96.1	-	84.9	-
Barometric Pressure (inHg) Average	709	0	11	98.47	29.4	-	29.3	-
Wind Speed 10 m (km/h) Average	717	3	3	100	29	-	14	-
Wind Direction 10 m (deg) Average	717	3	3	100	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ATHABASCA VALLEY (AMS07)
 SEPTEMBER 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	668	0.21	0.3	-	0	0	0.1	0.1	0.3	0.5	3.1
TRS (ppb) Average	684	0.31	0.2	-	0.1	0.1	0.2	0.2	0.3	0.6	1.9
THC (ppm) Average	624	2.12	0.1	-	2	2	2	2.1	2.2	2.3	2.5
NMHC (ppm) Average	624	0.006	0.029	-	0	0	0	0	0	0	0.319
CH4(ppm) Average	624	2.11	0.1	-	2	2	2	2.1	2.2	2.2	2.5
O3 (ppb) Average	684	21.57	11.4	-	3.5	7.1	11.6	20	30.4	37.9	48.7
NO2 (ppb) Average	683	5.13	3.6	-	0.5	1.6	2.6	4.3	6.7	9.7	28.9
NO (ppb) Average	683	1.76	2.6	-	0	0.1	0.3	0.9	1.9	4.2	19.1
NOX (ppb) Average	683	6.9	5.3	-	0.6	1.9	3.4	5.5	8.8	13.2	36
PM2.5 (ug/m3) Average	718	52.61	81.6	-	3.1	7	12.5	21.2	53	134.1	512.7
CO(ppm) Average	686	0.38	0.3	-	0.1	0.2	0.2	0.3	0.4	0.7	2.1
Temperature 2 m (C) Average	720	14.14	5.6	-	0.8	7.3	9.6	13.7	18.4	22.1	27.4
Relative Humidity (%) Average	720	65.31	19.1	-	23.8	36.9	49.8	68.1	81.7	88.7	96.1
Barometric Pressure (inHg) Average	709	28.94	0.2	-	28.5	28.7	28.8	28.9	29.1	29.2	29.4
Wind Speed 10 m (km/h) Average	717	8.7	5	-	0	3	5	7	12	17	29
Wind Direction 10 m (deg) Average	717	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WASKŌW OHCI PIMĀTISIWIN (AMS25)

SEPTEMBER 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
H2S, SO2	28 Sep 2023 07:00	28 Sep 2023 07:00	1	Maintenance - sample manifold cleaned
Wind Speed, Wind Direction	30 Sep 2023 20:00	30 Sep 2023 23:00	6	Intermittent unstable operation

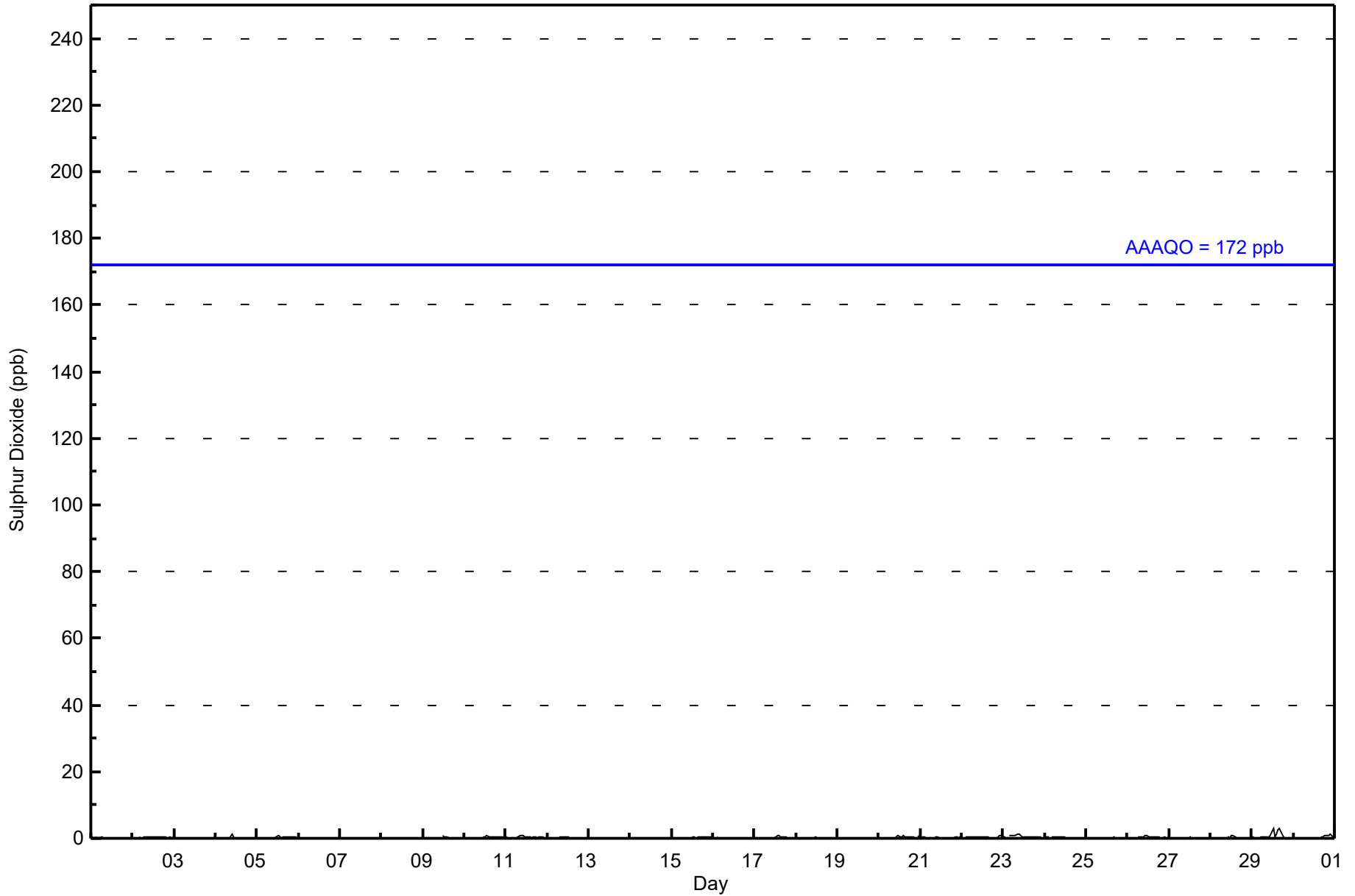


Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 720																	Hours of Data: 668					
Maximum Value: 3.1 ppb on Sep 29 17:00		Maximum Daily Average: 0.8 ppb on Sep 29																	Hours of Missing Data: 52							
Minimum Value: 0.0 ppb on Sep 5 01:00		Minimum Daily Average: 0.0 ppb on Sep 6																	Hours of Calibration: 32							
Maximum Diurnal Average: 0.4 ppb at hour 13		Minimum Diurnal Average: 0.1 ppb at hour 3																	Percent Operational Time: 97.2							
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 = 1.2																								
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-Sep	0.2	0.2	0.1	0.3	Z	0.4	0.2	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	0.0	0.0	0.1	0.1	0.4
2-Sep	0.1	0.0	0.0	0.1	0.2	Z	0.4	0.5	0.6	0.4	0.5	0.6	0.5	0.6	0.6	0.6	0.6	0.5	0.4	0.3	0.2	0.2	0.2	0.3	0.4	0.6
3-Sep	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	0.2	0.2	0.2	0.1	0.1	0.1	0.2
4-Sep	0.1	Z	0.1	0.1	0.2	0.1	0.1	0.1	0.0	1.3	0.5	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	0.1	1.3
5-Sep	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.3	0.7	0.3	0.2	0.3	0.3	0.6	0.6	0.5	0.4	0.2	0.2	0.1	0.2
6-Sep	0.1	0.1	0.1	Z	0.1	0.0	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	0.0	0.1
7-Sep	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	0.1	0.1	0.1	0.1	0.1	0.1
8-Sep	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	UO	UO	UO	UO	UO	UO	UO	UO	UO	0.2
9-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	1.0	0.6	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	1.0
10-Sep	0.0	Z	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.5	0.5	0.7	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.2	0.2	0.3	0.7	
11-Sep	0.3	0.2	Z	0.1	0.1	0.1	0.1	0.4	0.7	0.8	0.7	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.1	0.3	0.6	0.3	0.2	0.1	0.3	0.8
12-Sep	0.1	0.1	0.1	Z	0.1	0.1	0.2	0.2	0.3	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4
13-Sep	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	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1
14-Sep	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	0.1	0.1	0.1	0.0	0.0	0.1
15-Sep	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.4	0.3	0.2	0.2	0.4	0.5	0.6	0.5	0.4	0.3	0.3	0.5	0.2	0.6
16-Sep	0.6	Z	0.5	0.2	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	0.1	0.1	0.1	0.1	0.1	0.6
17-Sep	0.1	0.1	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.5	0.9	0.9	0.5	0.4	0.4	0.4	0.2	0.2	0.1	0.1	0.1	0.1	0.9
18-Sep	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.3
19-Sep	0.0	0.0	0.0	0.0	Z	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	0.0	0.0	0.1	0.0	0.1	0.1
20-Sep	0.0	0.0	0.0	0.0	0.1	Z	0.1	0.1	0.1	0.1	0.4	0.9	0.6	0.5	0.6	0.6	0.4	0.3	0.2	0.3	0.4	0.1	0.2	0.7	0.3	0.9
21-Sep	Z	0.6	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.3	0.4	0.2	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.5	0.3	0.2	0.3	0.2	0.6
22-Sep	0.3	Z	0.3	0.3	0.3	0.4	0.3	0.5	0.5	0.6	0.6	0.3	0.4	0.4	0.4	0.4	0.2	0.2	0.2	0.2	0.2	0.4	0.7	0.8	0.4	0.8
23-Sep	0.4	0.6	Z	0.9	0.8	0.8	0.7	1.0	1.1	1.2	0.9	0.4	0.4	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.3	0.2	0.1	0.5	1.2
24-Sep	0.2	0.2	0.4	Z	0.5	0.5	0.4	0.3	0.2	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	0.0	0.2	0.5
25-Sep	0.0	0.0	0.0	0.0	DF	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	0.1	0.1	0.1	0.1	0.1	0.1	0.2
26-Sep	0.0	0.0	0.1	0.1	0.1	Z	0.3	0.3	0.4	0.5	0.7	0.8	0.4	0.4	0.4	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.3	0.8
27-Sep	Z	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	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.2
28-Sep	0.0	Z	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.5	0.2	0.7	0.9	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.9
29-Sep	0.6	0.3	Z	0.1	0.1	0.5	0.6	0.4	0.5	0.4	0.3	1.3	2.8	0.5	1.4	2.4	3.1	1.1	0.3	0.2	0.2	0.1	0.1	0.1	0.8	3.1
30-Sep	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	0.1	0.2	0.4	0.5	0.7	0.7	0.9	1.4	0.9	0.4	0.4	1.4
																								Diurnal Average		
																								Diurnal Maximum		
																								0.1 0.1 0.1 0.1 0.1 0.2 0.2 0.2 0.2 0.3 0.3 0.3 0.4 0.3 0.3 0.3 0.3 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2		
																								0.6 0.6 0.5 0.9 0.8 0.8 0.7 1.0 1.1 1.3 0.9 1.3 2.8 0.9 1.4 2.4 3.1 1.1 0.7 0.7 0.9 1.4 0.9 0.8		
Z - zerospan C - Calibration M - Maintenance DF - DAS Failure 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
Athabasca Valley - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Athabasca Valley - September 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	668	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: 668

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

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

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	10	1	3	10	18	66	189	66	43	45	64	45	25	16	32	32	665
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	10	1	3	10	18	66	189	66	43	45	64	45	25	16	32	32	665

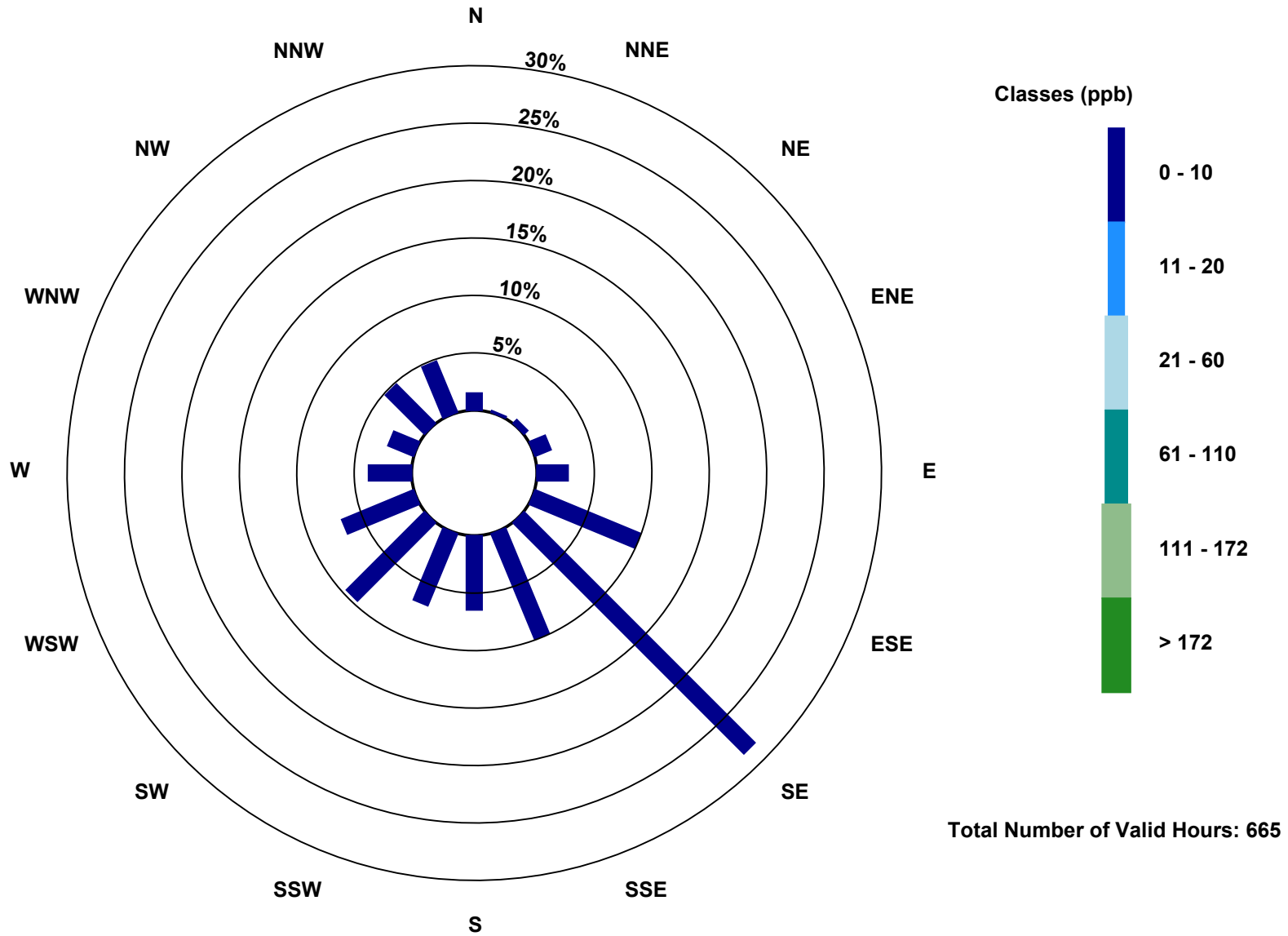
Total Number of Valid Hours: 665

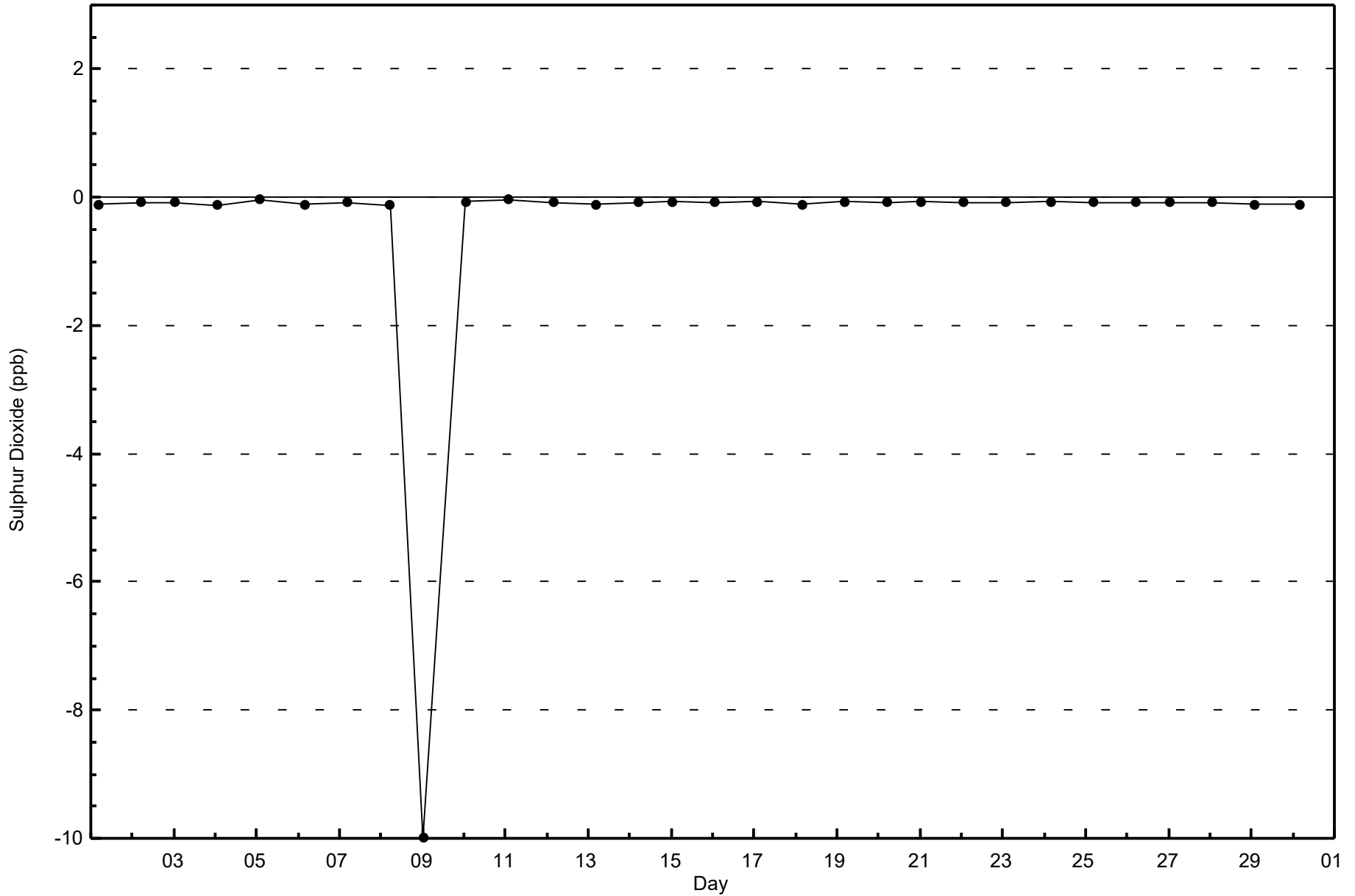
Total Number of Hours: 720

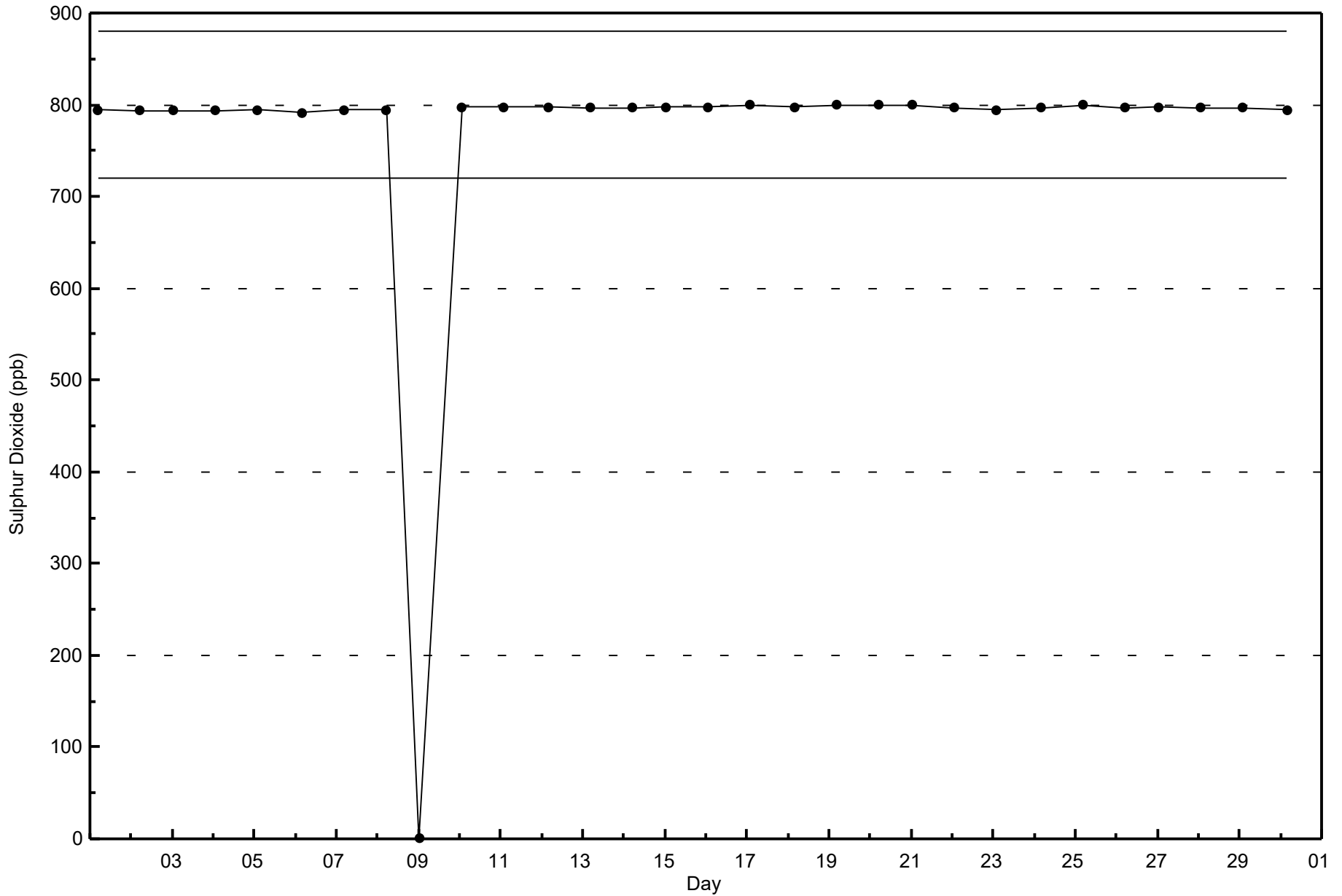


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Sulphur Dioxide (SO₂) - ppb
Athabasca Valley





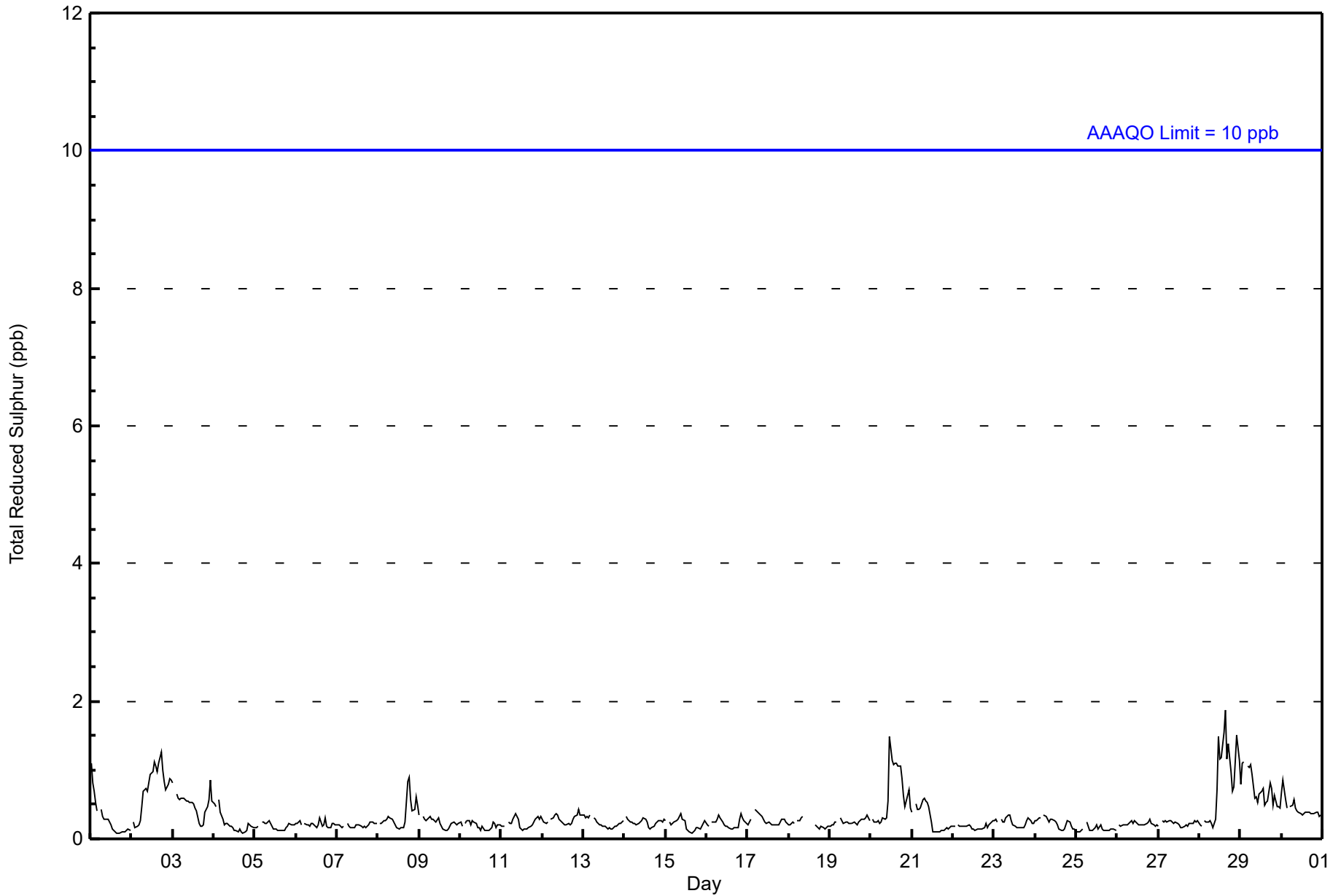




Wood Buffalo Environmental Association
Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb
Athabasca Valley - September 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	720				
Maximum Value: 1.9 ppb on Sep 28 16:00		Maximum Daily Average: 0.8 ppb on Sep 28																	Hours of Data:	684						
Minimum Value: 0.1 ppb on Sep 1 17:00		Minimum Daily Average: 0.1 ppb on Sep 25																	Hours of Missing Data:	36						
Maximum Diurnal Average: 0.4 ppb at hour 12		Minimum Diurnal Average: 0.3 ppb at hour 17																	Hours of Calibration:	36						
Monthly Average: 0.31 ppb		Percentiles: P ₁ = 0.1 P ₁₀ = 0.1 Q ₁ = 0.2 Median = 0.2 Q ₃ = 0.3 P ₉₀ = 0.6 P ₉₉ = 1.2																	Percent Operational Time:	100.0						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Sep	1.1	0.8	0.7	0.5	0.4	Z	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	1.1
2-Sep	Z	0.2	0.2	0.2	0.2	0.3	0.5	0.7	0.7	0.7	0.8	0.9	1.0	1.1	1.1	1.0	1.1	1.3	1.0	0.8	0.7	0.8	0.9	0.8	0.7	1.3
3-Sep	0.8	Z	0.7	0.6	0.6	0.6	0.6	0.6	0.5	0.6	0.5	0.5	0.5	0.4	0.4	0.2	0.2	0.2	0.2	0.4	0.5	0.6	0.8	0.6	0.5	0.8
4-Sep	0.5	0.5	Z	0.6	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.6
5-Sep	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3
6-Sep	0.2	0.2	0.3	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
7-Sep	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
8-Sep	Z	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.8	0.9	0.6	0.4	0.4	0.6	0.5	0.3	0.9
9-Sep	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
10-Sep	0.2	0.2	Z	0.2	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
11-Sep	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.3	0.4	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.4
12-Sep	0.3	0.2	0.2	0.2	Z	0.3	0.3	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.4
13-Sep	0.3	0.3	0.3	0.3	0.3	Z	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3
14-Sep	Z	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.3
15-Sep	0.3	Z	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.3	0.2	0.4
16-Sep	0.2	0.2	Z	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.3	0.4	0.3	0.3	0.2	0.2	0.4
17-Sep	0.2	0.3	0.3	Z	0.4	0.4	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.3	0.4
18-Sep	0.2	0.2	0.2	0.2	Z	0.3	0.3	0.3	0.3	C	C	C	C	C	C	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.2	--	0.3
19-Sep	0.2	0.2	0.2	0.2	0.3	Z	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.3	0.2	0.4
20-Sep	Z	0.3	0.2	0.2	0.3	0.2	0.2	0.3	0.3	0.3	0.5	1.5	1.1	1.1	1.1	1.1	1.1	1.1	0.9	0.6	0.5	0.6	0.7	0.4	0.6	1.5
21-Sep	0.4	Z	0.5	0.4	0.4	0.5	0.6	0.6	0.6	0.5	0.5	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.3	0.6
22-Sep	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3
23-Sep	0.3	0.3	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	0.3	0.3	0.3	0.2	0.2	0.2	0.3
24-Sep	0.3	0.3	0.3	0.3	Z	0.4	0.3	0.3	0.2	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.2	0.1	0.1	0.2	0.4
25-Sep	0.1	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	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
26-Sep	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.3
27-Sep	0.2	Z	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	0.3	0.3	0.3	0.2	0.3
28-Sep	0.2	0.2	Z	0.3	0.3	0.2	0.3	0.2	0.2	0.3	0.7	1.5	1.2	1.2	1.5	1.9	1.2	1.4	1.0	0.7	0.7	1.1	1.5	1.1	0.8	1.9
29-Sep	0.8	1.1	1.1	Z	1.1	1.0	1.1	0.9	0.6	0.6	0.5	0.7	0.7	0.7	0.5	0.5	0.5	0.8	0.7	0.5	0.6	0.5	0.5	0.4	0.7	1.1
30-Sep	0.7	0.9	0.6	0.4	Z	0.5	0.5	0.6	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	0.3	0.3	0.4	0.9
																								Diurnal Average		
																								Diurnal Maximum		
																								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		
																								1.1 1.1 1.1 0.6 1.1 1.0 1.1 0.9 0.7 0.7 0.8 1.5 1.2 1.2 1.5 1.9 1.2 1.4 1.0 0.8 0.7 1.1 1.5 1.1 0.4 0.9		
Z - zerospan C - Calibration																										
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb																										





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	684	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: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Athabasca Valley - September 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	1	3	10	19	69	195	66	45	47	64	44	26	15	32	35	681
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	1	3	10	19	69	195	66	45	47	64	44	26	15	32	35	681

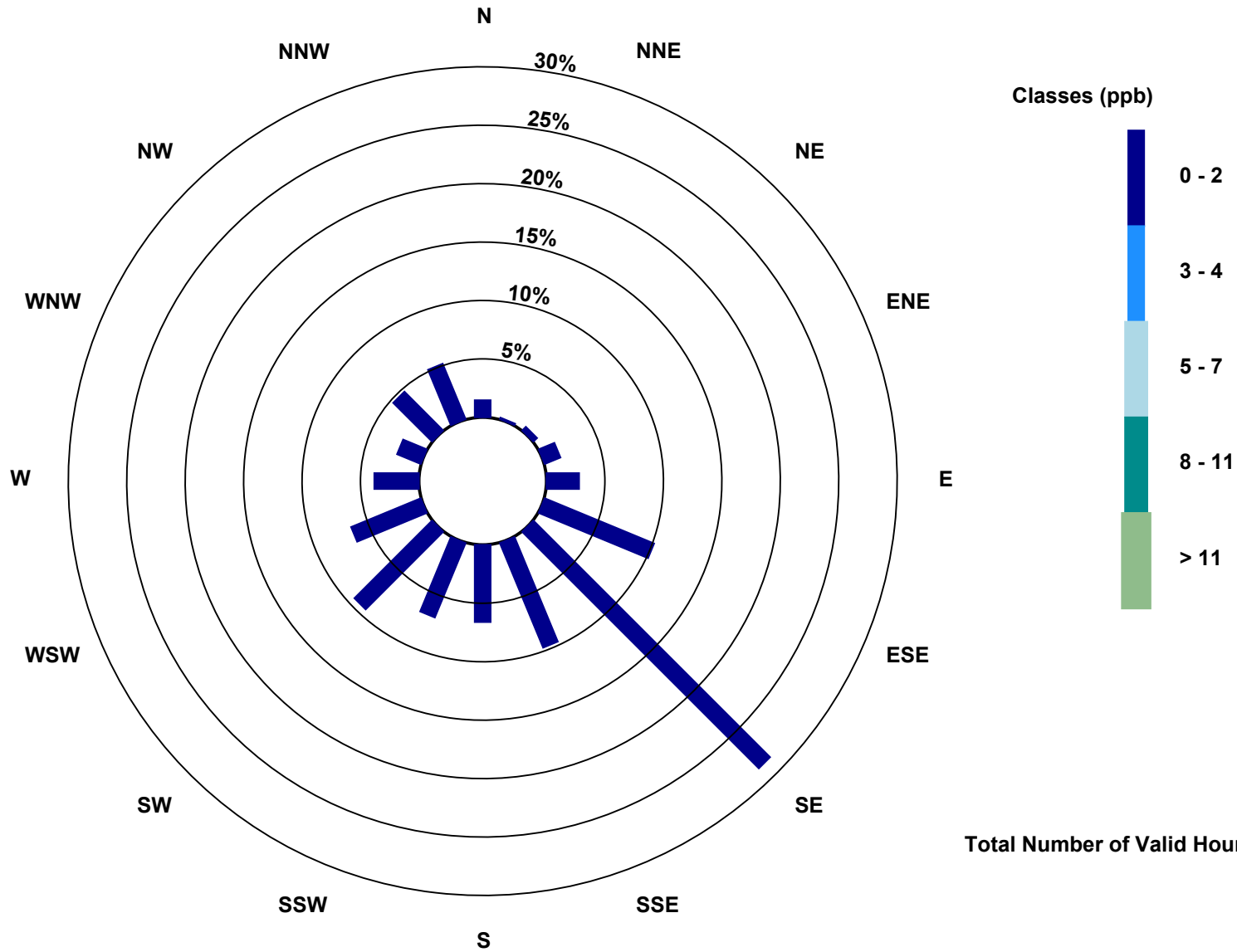
Total Number of Valid Hours: 681

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

Total Reduced Sulphur (TRS) - ppb
Athabasca Valley

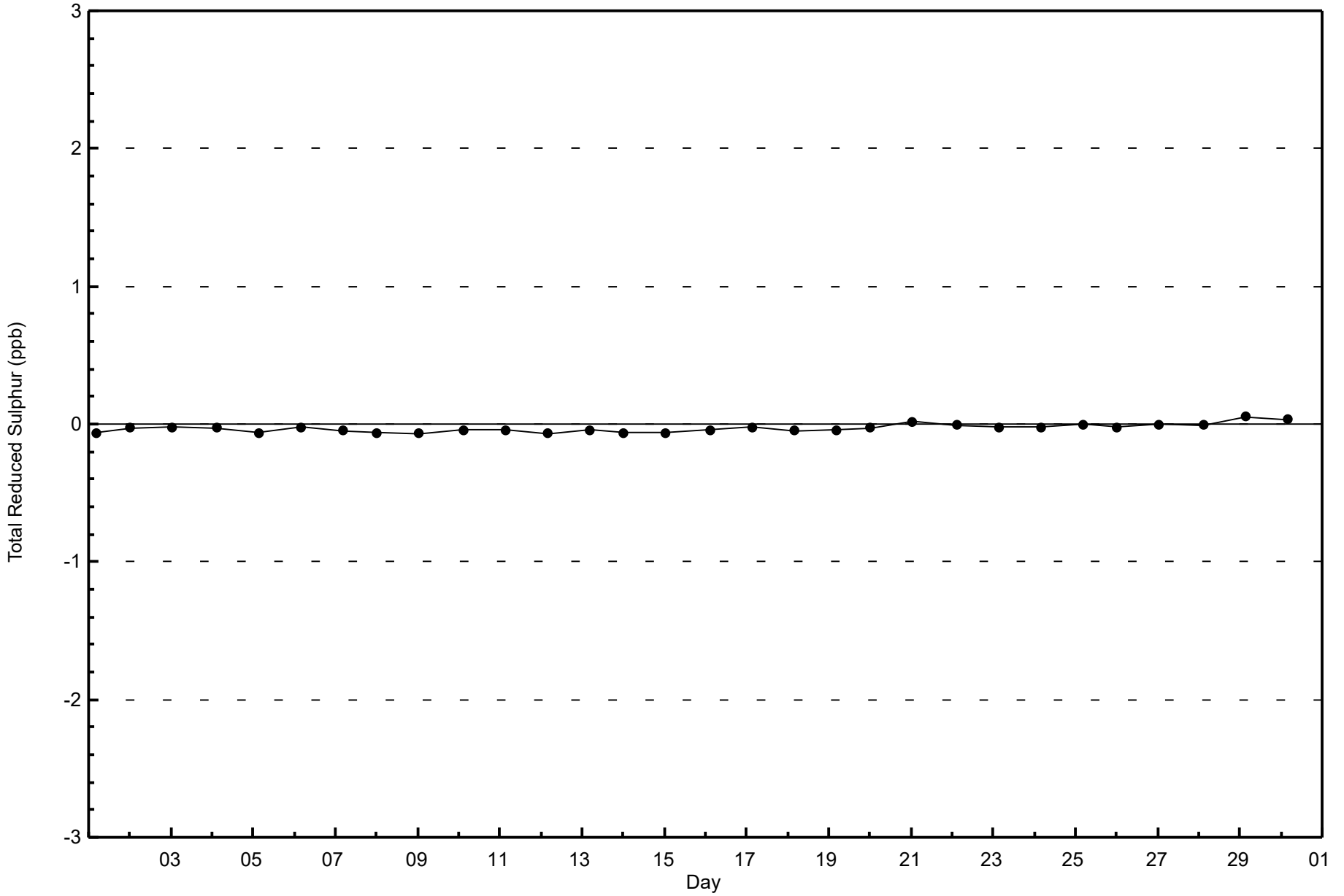


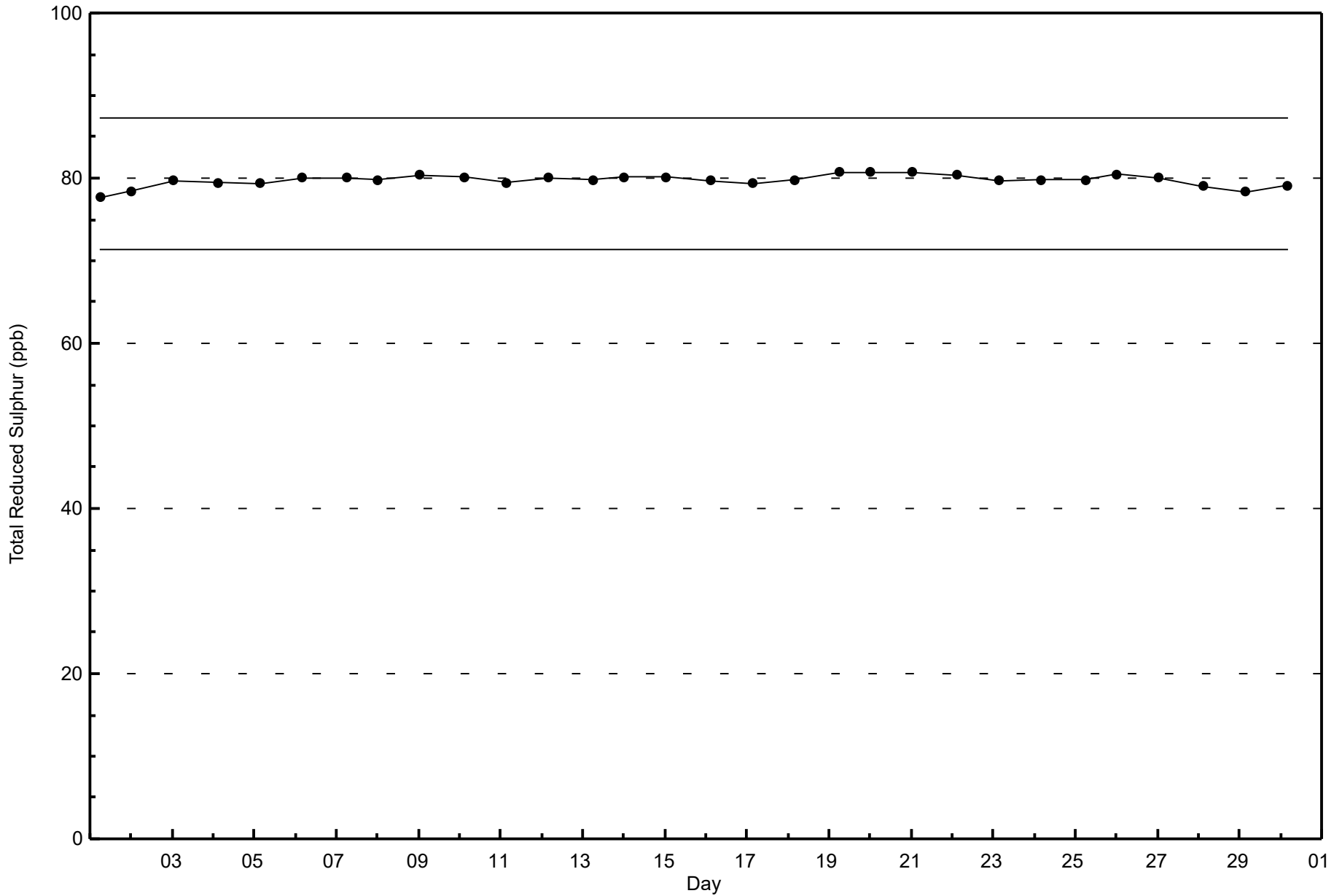
Total Number of Valid Hours: 681



Wood Buffalo Environmental Association
Zero Responses

Total Reduced Sulphur (TRS) - ppb
Athabasca Valley - September 2023







Wood Buffalo Environmental Association
Summary of Hour Averages

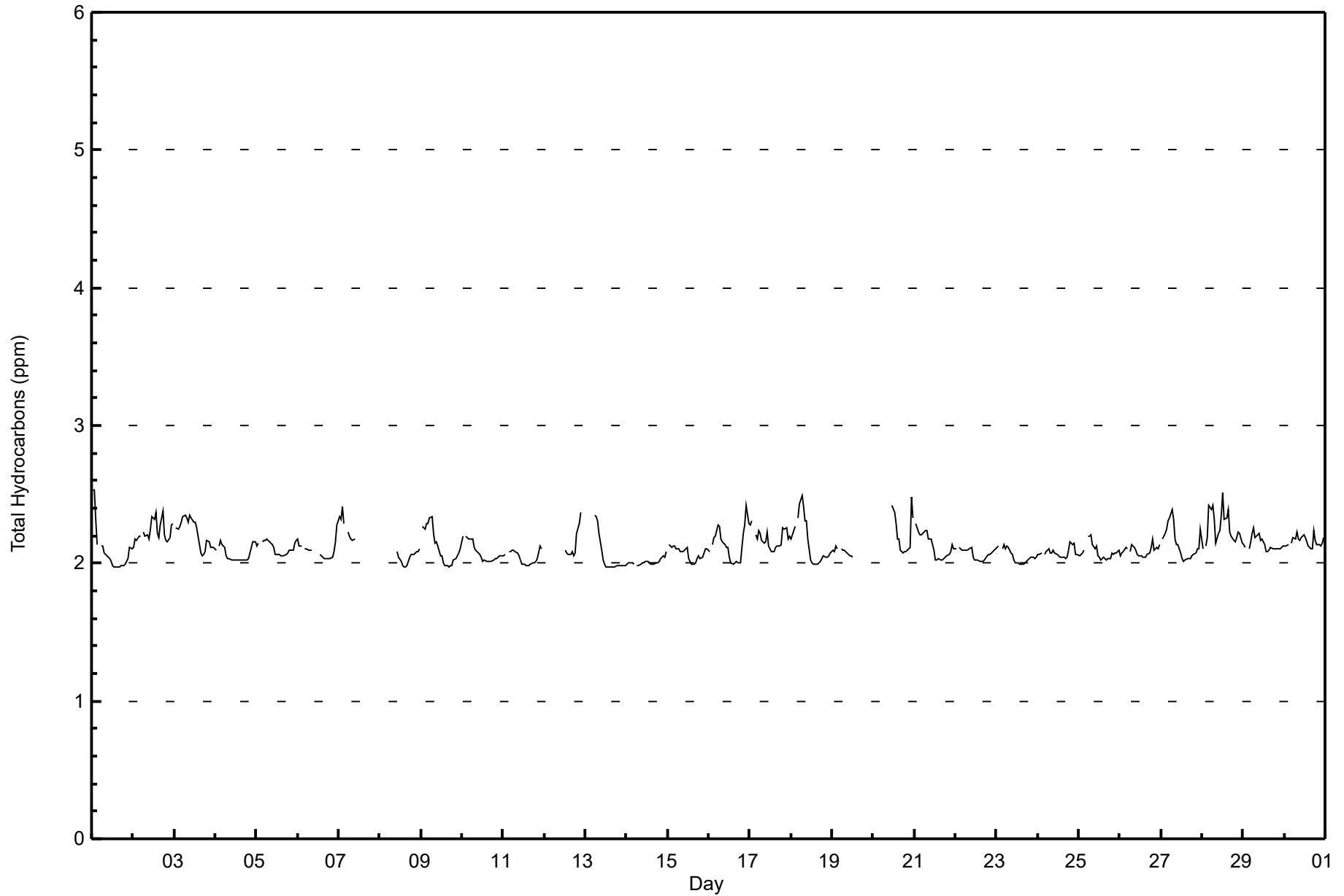
Total Hydrocarbons (THC) - ppm
Athabasca Valley - September 2023

Maximum Value: 2.5 ppm on Sep 1 01:00		Maximum Daily Average: 2.3 ppm on Sep 28		Hours in Service: 720																									
Minimum Value: 2.0 ppm on Sep 8 16:00		Minimum Daily Average: 2.0 ppm on Sep 14		Hours of Data: 624																									
Maximum Diurnal Average: 2.2 ppm at hour 6		Minimum Diurnal Average: 2.0 ppm at hour 17		Hours of Missing Data: 96																									
Monthly Average: 2.12 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 = 2.4		Hours of Calibration: 31																									
				Percent Operational Time: 91.0																									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24					
1-Sep	2.5	2.5	2.3	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	2.1	2.1	2.1	2.1	2.1	2.5		
2-Sep	2.1	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.4	2.2	2.2	2.3	2.4	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.4			
3-Sep	Z	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.3			
4-Sep	2.1	Z	2.1	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.2	2.1	2.2	2.2			
5-Sep	2.1	2.1	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	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2			
6-Sep	2.2	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	C	C	C	C	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.3	2.1	2.3			
7-Sep	2.3	2.3	2.4	2.3	Z	2.2	2.2	2.2	2.2	2.2	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	2.4			
8-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1			
9-Sep	Z	2.3	2.2	2.3	2.3	2.3	2.3	2.2	2.1	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.3			
10-Sep	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2			
11-Sep	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	UO	2.0	2.1			
12-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.4	UO	UO	2.4				
13-Sep	UO	UO	UO	UO	Z	2.3	2.3	2.3	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3			
14-Sep	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.0	2.1			
15-Sep	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1			
16-Sep	2.1	Z	2.1	2.2	2.2	2.3	2.3	2.2	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.3	2.4	2.3	2.1	2.4			
17-Sep	2.3	2.3	Z	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.3	2.3	2.2	2.2	2.2	2.3			
18-Sep	2.2	2.2	2.3	Z	2.3	2.4	2.5	2.4	2.3	2.3	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.1	2.1	2.5			
19-Sep	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	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	2.1			
20-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	2.4	2.4	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.5	2.3	--	2.5			
21-Sep	Z	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.3			
22-Sep	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1			
23-Sep	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1			
24-Sep	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.2			
25-Sep	2.1	2.1	2.1	2.1	Z	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.2			
26-Sep	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	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.2			
27-Sep	Z	2.2	2.2	2.2	2.3	2.3	2.4	2.3	2.2	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	2.4			
28-Sep	2.1	Z	2.1	2.2	2.4	2.4	2.4	2.3	2.1	2.2	2.2	2.3	2.5	2.3	2.4	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.5			
29-Sep	2.1	2.1	Z	2.1	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3			
30-Sep	2.1	2.1	2.1	Z	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2			
																								Diurnal Average					
																								Diurnal Maximum					
Z - zerospan																								C - Calibration		M - Maintenance		UO - Unstable Operation	



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	182	29.17	29.17
2.1 - 3.0	442	70.83	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 624

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Athabasca Valley - September 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	1	0	0	2	4	23	15	14	16	29	23	19	12	20	4	182
2.1 - 3.0	10	0	2	9	13	58	149	41	29	26	27	22	8	4	10	31	439
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	10	1	2	9	15	62	172	56	43	42	56	45	27	16	30	35	621

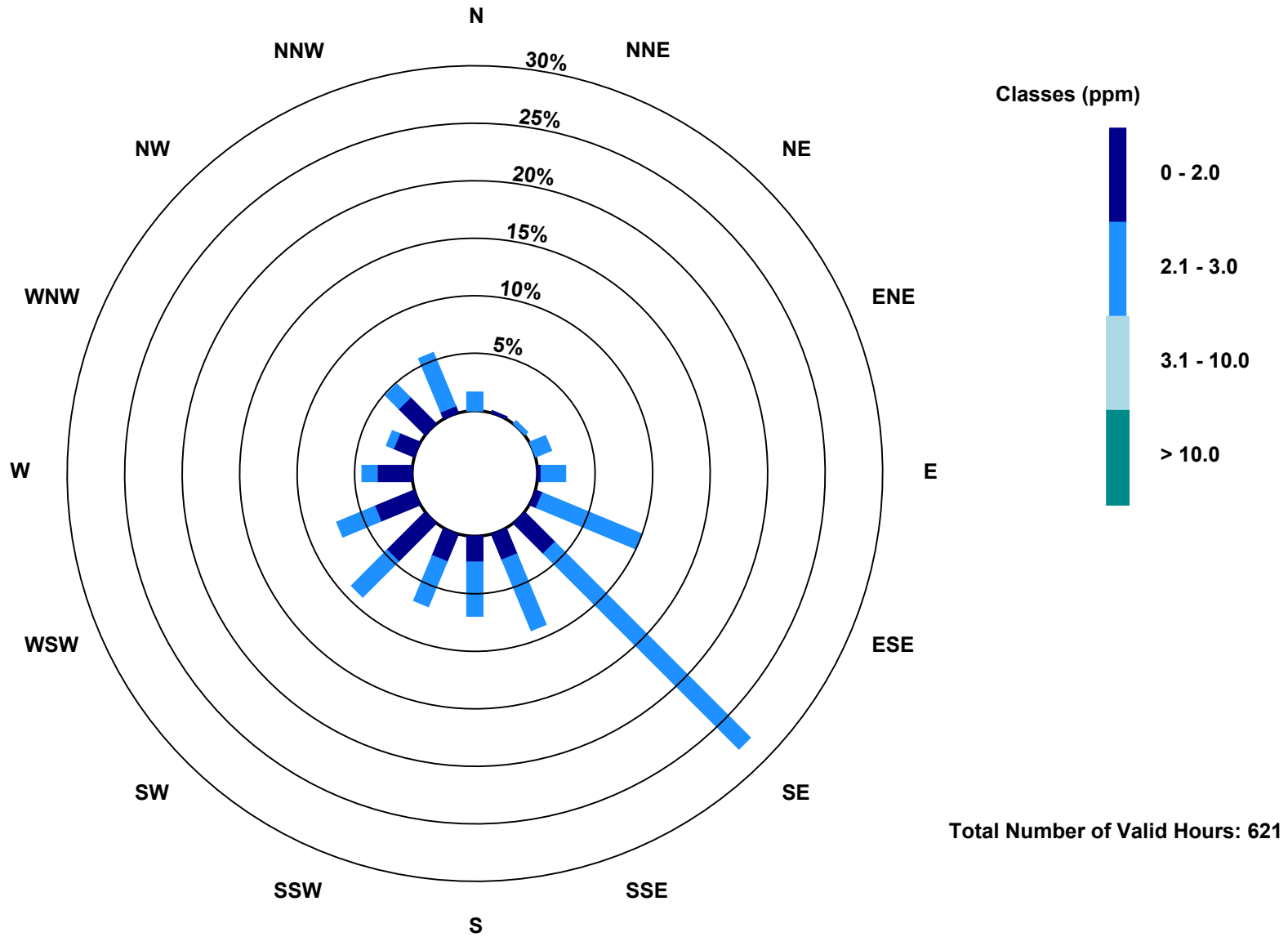
Total Number of Valid Hours: 621

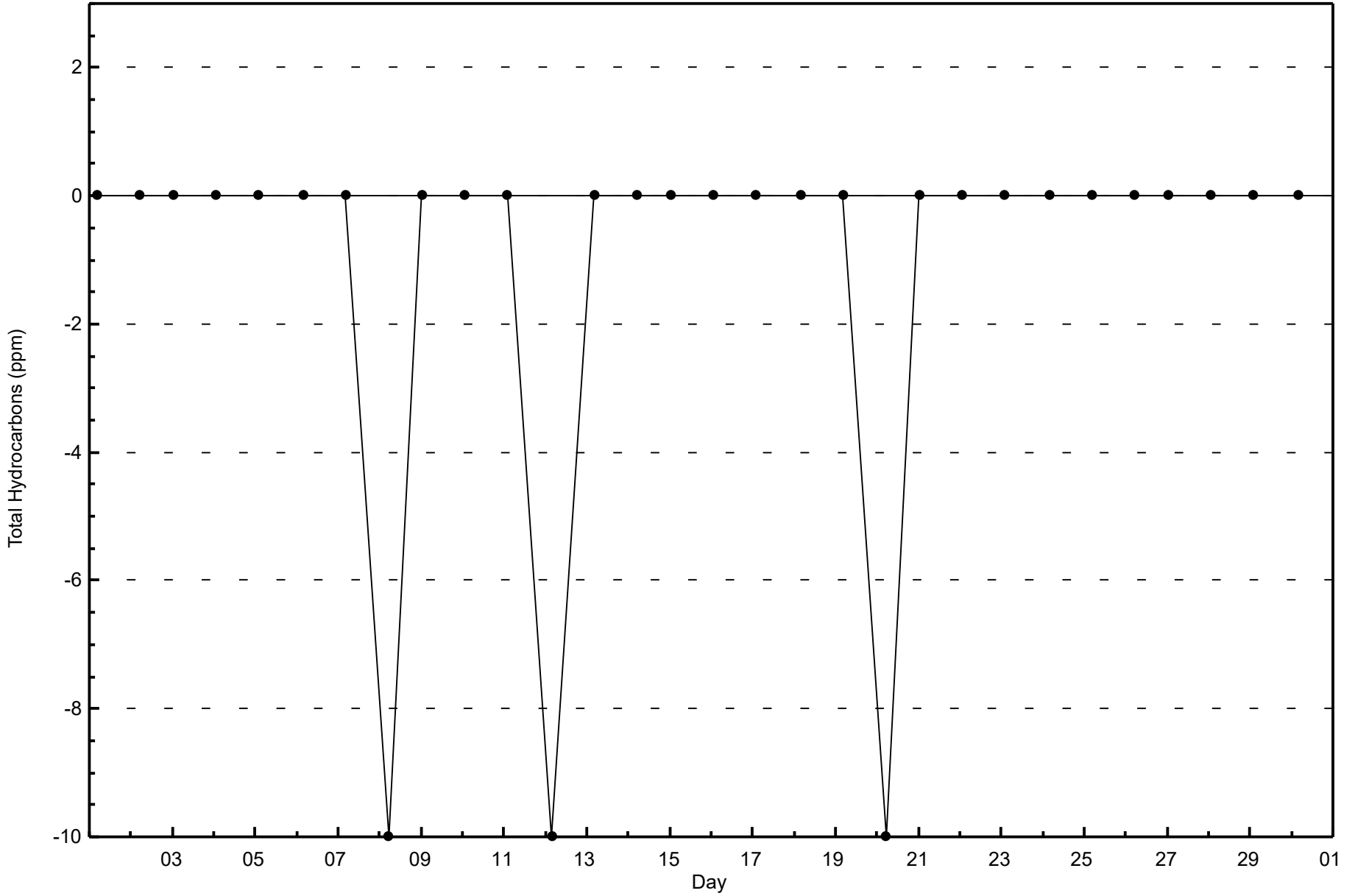
Total Number of Hours: 720

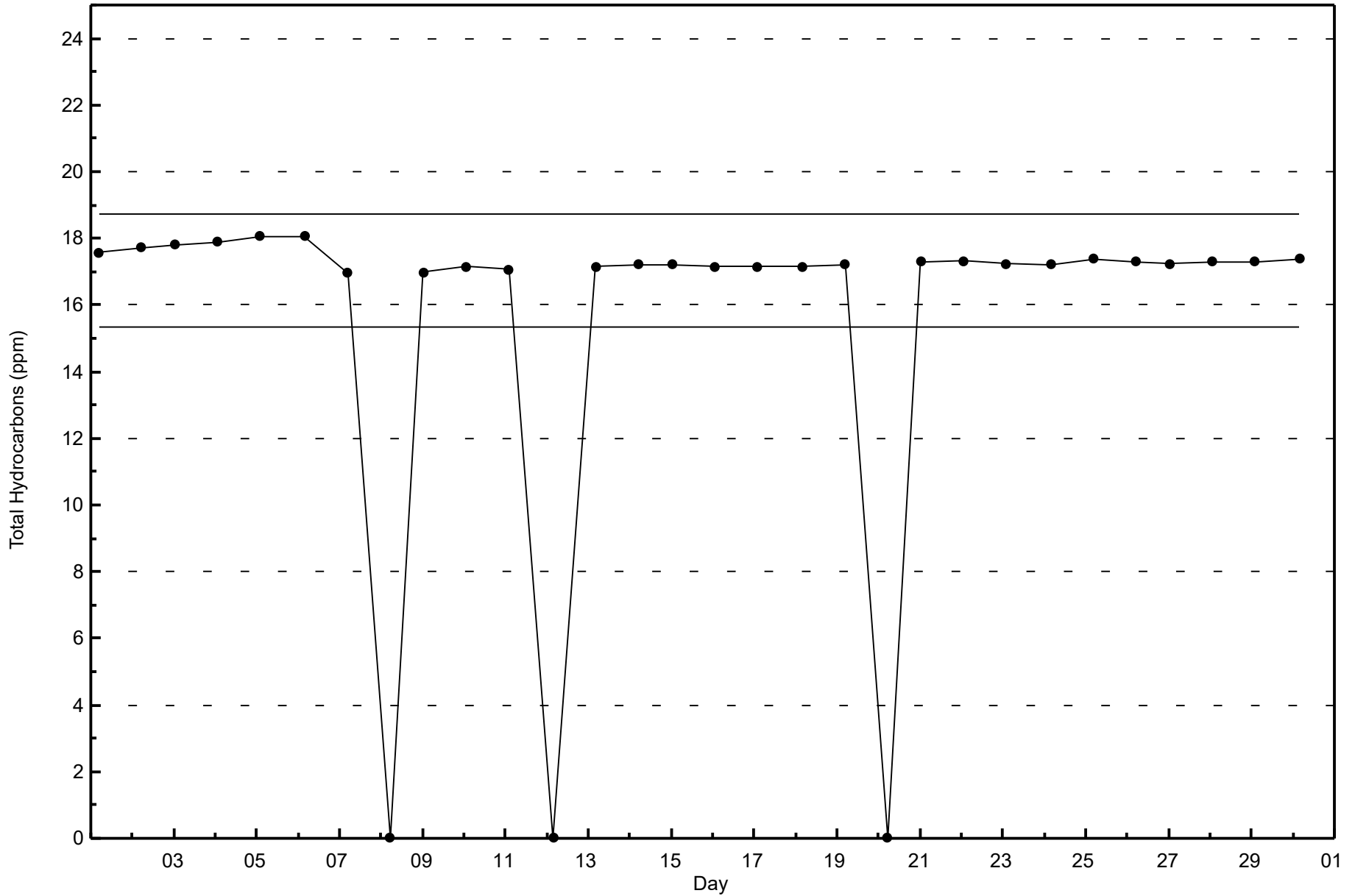


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Total Hydrocarbons (THC) - ppm
Athabasca Valley







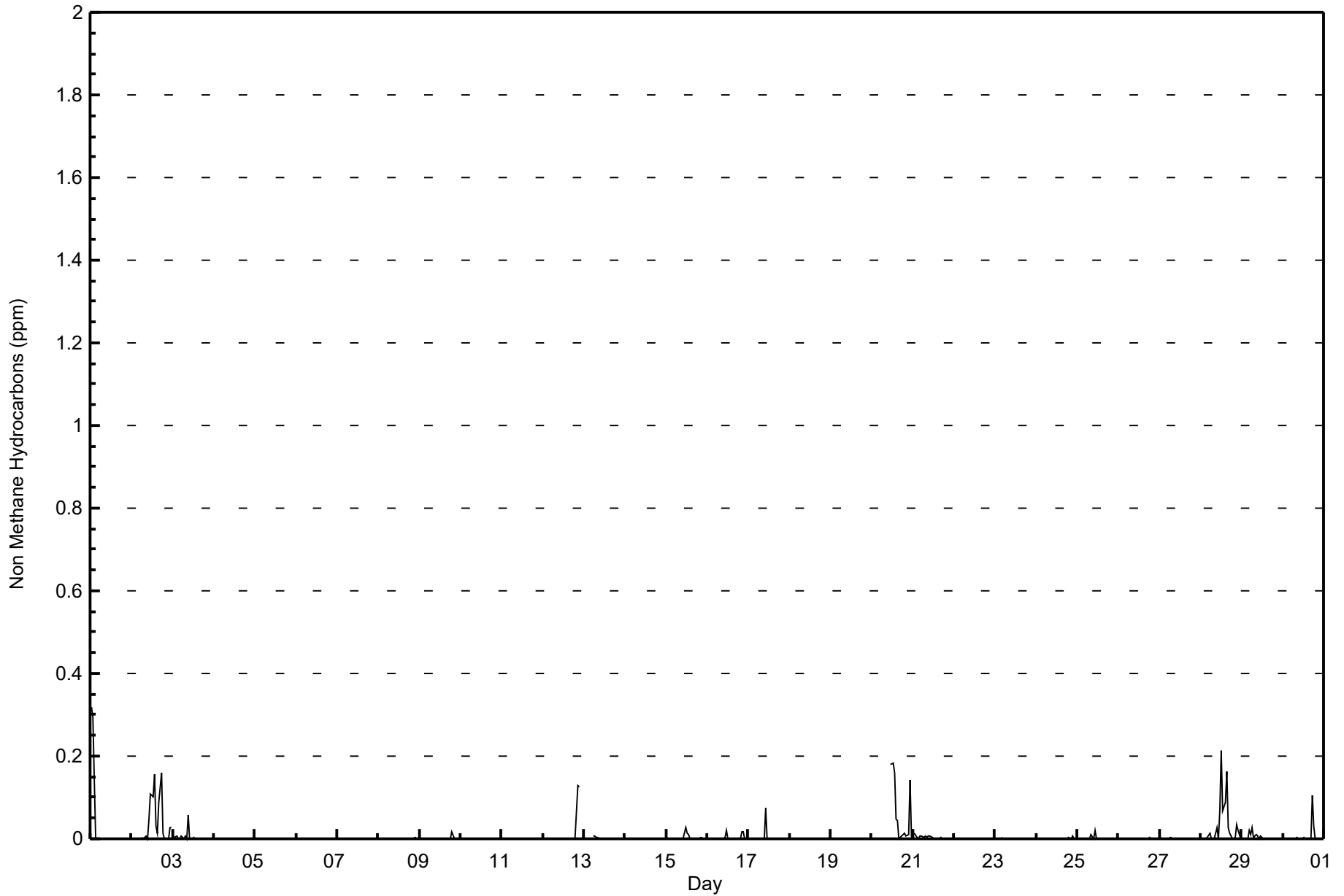


Maximum Value: 0.319 ppm on Sep 1 01:00	Maximum Daily Average: 0.034 ppm on Sep 2	Hours in Service: 720
Minimum Value: 0.000 ppm on Sep 1 04:00	Minimum Daily Average: 0.000 ppm on Sep 5	Hours of Data: 624
Maximum Diurnal Average: 0.019 ppm at hour 13	Minimum Diurnal Average: 0.000 ppm at hour 4	Hours of Missing Data: 96
Monthly Average: 0.006 ppm	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.0 P ₉₉ = 0.2	Hours of Calibration: 31
		Percent Operational Time: 91.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Sep	0.319	0.293	0.141	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	0.033	0.319
2-Sep	0.000	0.000	0.000	0.000	0.000	Z	0.005	0.000	0.007	0.000	0.049	0.109	0.101	0.157	0.031	0.014	0.090	0.158	0.014	0.000	0.000	0.000	0.028	0.028	0.034	0.158	
3-Sep	Z	0.004	0.006	0.000	0.000	0.006	0.000	0.006	0.000	0.058	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	0.004	0.058	
4-Sep	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	0.002	0.000	0.000	0.002	
5-Sep	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	
6-Sep	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	C	C	C	C	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
7-Sep	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	0.000
8-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	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	--	0.003	
9-Sep	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	0.017	0.000	0.000	0.000	0.001	0.017	
10-Sep	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	
11-Sep	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	UO	0.000	
12-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.130	0.125	UO	UO	--	0.130	
13-Sep	UO	UO	UO	UO	Z	0.006	0.008	0.003	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.008	
14-Sep	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-Sep	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.027	0.012	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.000	0.002	0.027	
16-Sep	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.019	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.018	0.016	0.000	0.000	0.002	0.019	
17-Sep	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.075	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.075	
18-Sep	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	
19-Sep	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-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	0.179	0.182	0.160	0.047	0.046	0.000	0.005	0.009	0.013	0.006	0.010	0.143	0.003	--	0.182	
21-Sep	Z	0.015	0.003	0.000	0.005	0.007	0.004	0.008	0.003	0.006	0.006	0.002	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.015	
22-Sep	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	
23-Sep	0.000	0.000	Z	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	
24-Sep	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	0.003	0.000	0.007	0.000	0.000	0.000	0.000	0.007	
25-Sep	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.010	0.000	0.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.020	
26-Sep	0.000	0.002	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	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	
27-Sep	Z	0.000	0.000	0.000	0.000	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	
28-Sep	0.000	Z	0.000	0.000	0.004	0.015	0.000	0.000	0.000	0.026	0.000	0.067	0.215	0.066	0.088	0.161	0.026	0.012	0.000	0.000	0.004	0.034	0.022	0.000	0.032	0.215	
29-Sep	0.000	0.000	Z	0.000	0.019	0.010	0.026	0.003	0.010	0.007	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	0.003	0.026	
30-Sep	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.005	0.000	0.000	0.000	0.003	0.000	0.000	0.002	0.000	0.106	0.031	0.000	0.000	0.000	0.000	0.000	0.006	0.106	

0.015	0.015	0.007	0.000	0.001	0.002	0.002	0.001	0.001	0.004	0.006	0.015	0.019	0.014	0.006	0.008	0.004	0.010	0.002	0.001	0.006	0.007	0.007	0.001			Diurnal Average	
0.319	0.293	0.141	0.002	0.019	0.015	0.026	0.008	0.010	0.058	0.075	0.179	0.215	0.160	0.088	0.161	0.090	0.158	0.031	0.017	0.130	0.125	0.143	0.028			Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance UO - Unstable Operation





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	556	89.10	89.10
0.006 - 0.05	46	7.37	96.47
0.06 - 0.1	13	2.08	98.56
> 0.1	9	1.44	100.00

Total Number of Valid Hours: 624

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Athabasca Valley - September 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	2	8	13	55	160	53	42	39	50	38	23	16	27	20	556
0.006 - 0.05	0	0	0	1	2	4	9	2	1	3	4	4	3	0	3	9	45
0.06 - 0.1	1	0	0	0	0	2	3	1	0	0	2	2	0	0	0	2	13
> 0.1	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	4	7
Totals	10	1	2	9	15	62	172	56	43	42	56	45	27	16	30	35	621

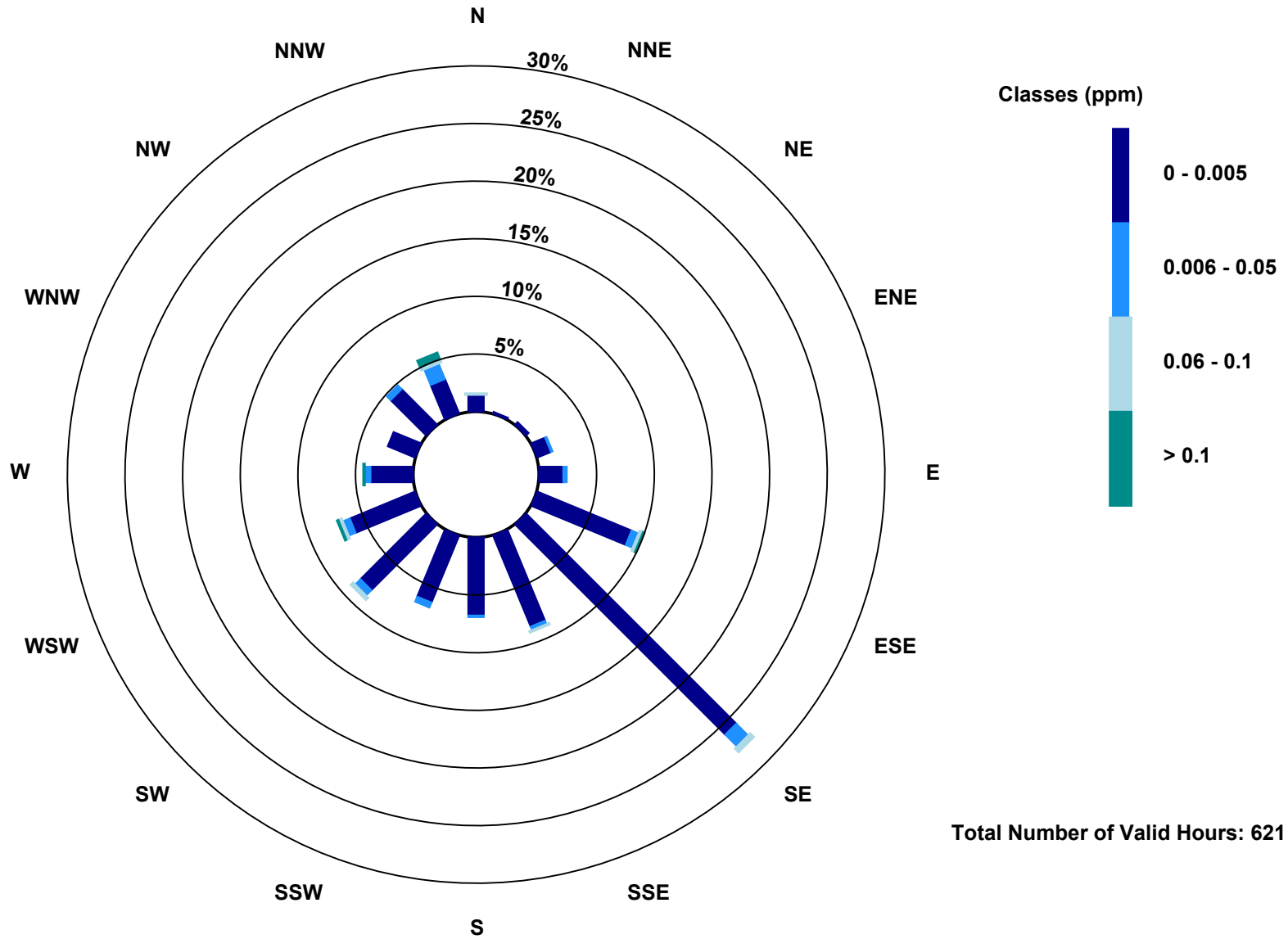
Total Number of Valid Hours: 621

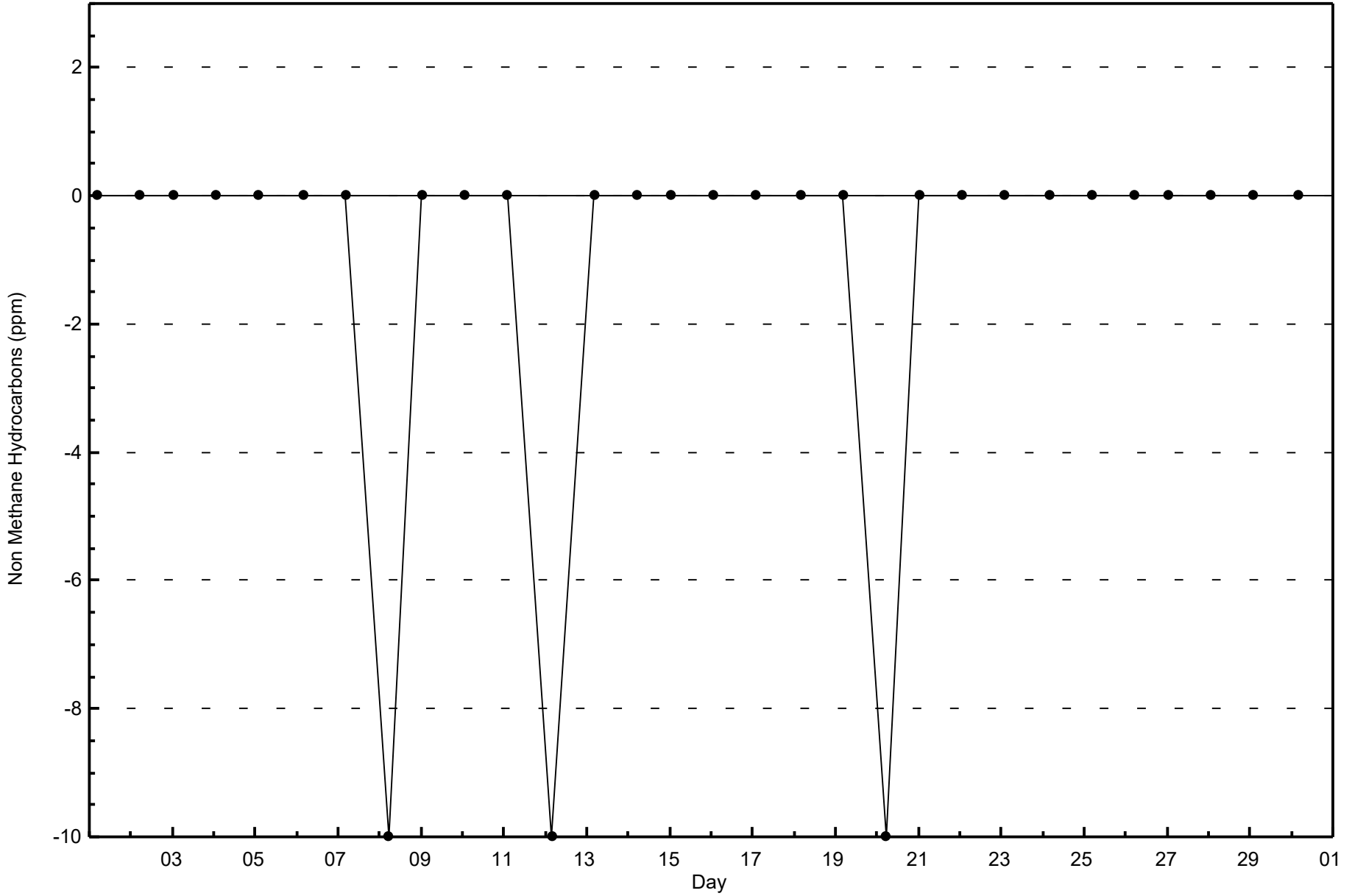
Total Number of Hours: 720

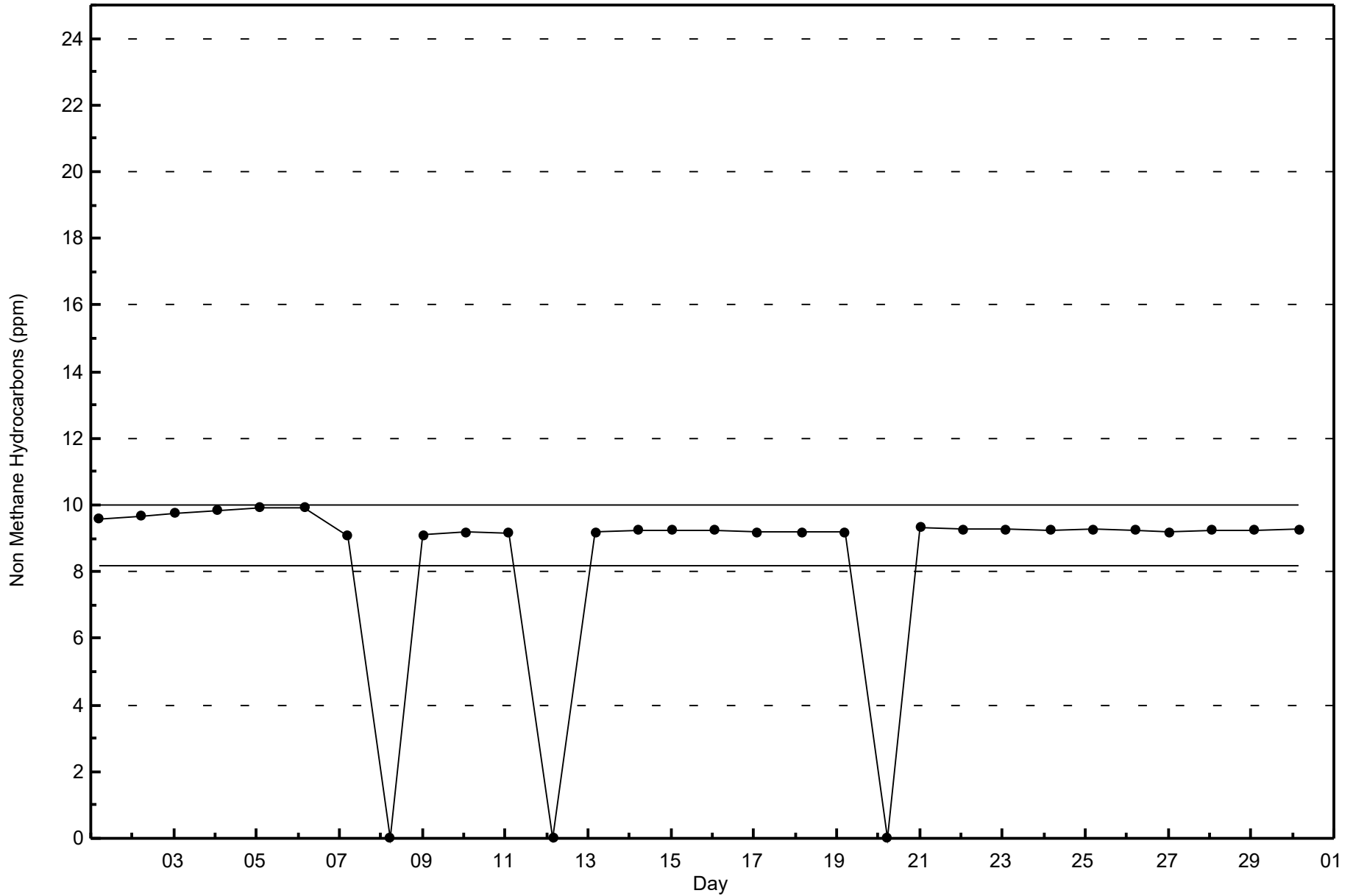


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Non Methane Hydrocarbons (NMHC) - ppm
Athabasca Valley









Wood Buffalo Environmental Association

Summary of Hour Averages

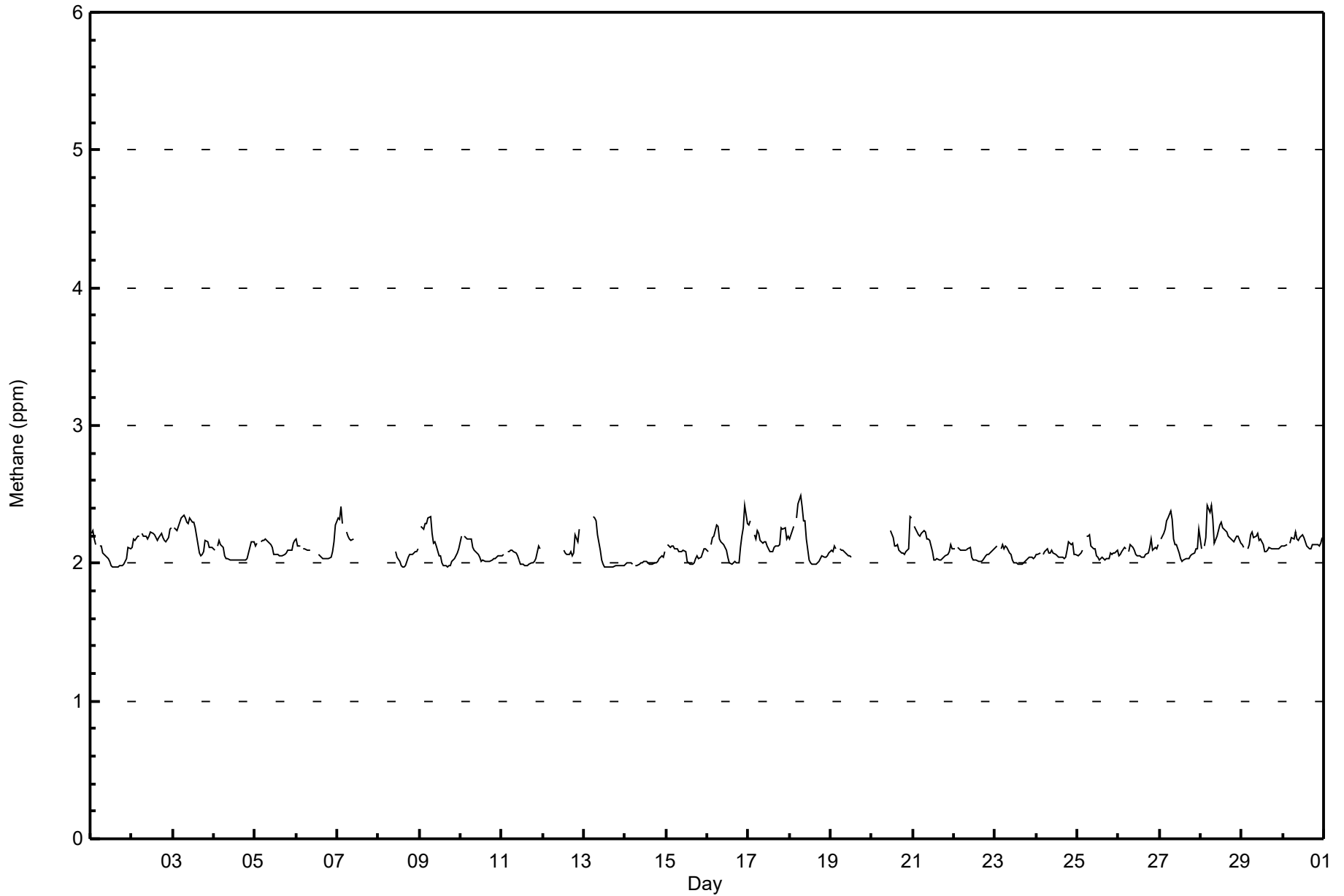
Methane (CH₄) - ppm

Athabasca Valley - September 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 2.5 ppm on Sep 18 07:00	Maximum Daily Average: 2.2 ppm on Sep 28		Hours of Data:	624
Minimum Value: 2.0 ppm on Sep 8 16:00	Minimum Daily Average: 2.0 ppm on Sep 14		Hours of Missing Data:	96
Maximum Diurnal Average: 2.2 ppm at hour 6	Minimum Diurnal Average: 2.0 ppm at hour 16		Hours of Calibration:	31
Monthly Average: 2.11 ppm	Percentiles: P ₁ = 2.0 P ₁₀ = 2.0 Q ₁ = 2.0 Median = 2.1 Q ₃ = 2.2 P ₉₀ = 2.2 P ₉₉ = 2.4		Percent Operational Time:	91.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Sep	2.2	2.2	2.2	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	2.1	2.1	2.1	2.1																								
2-Sep	2.1	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2																								
3-Sep	Z	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.2																								
4-Sep	2.1	Z	2.1	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.2	2.1																								
5-Sep	2.1	2.1	Z	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1																								
6-Sep	2.2	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	C	C	C	C	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.3	2.1																								
7-Sep	2.3	2.3	2.4	2.3	Z	2.2	2.2	2.2	2.2	2.2	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--																								
8-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	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	--																								
9-Sep	Z	2.3	2.2	2.3	2.3	2.3	2.3	2.2	2.1	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1																								
10-Sep	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1																								
11-Sep	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	UO	2.0																								
12-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	UO	UO	--																								
13-Sep	UO	UO	UO	UO	Z	2.3	2.3	2.3	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1																								
14-Sep	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.0																								
15-Sep	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.1	2.1	2.1																								
16-Sep	2.1	Z	2.1	2.2	2.2	2.3	2.3	2.2	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.3	2.4	2.3	2.1																								
17-Sep	2.3	2.3	Z	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.3	2.3	2.2	2.2	2.2																								
18-Sep	2.2	2.2	2.3	Z	2.3	2.4	2.5	2.4	2.3	2.3	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.1	2.1																								
19-Sep	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	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--																								
20-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.3	--																								
21-Sep	Z	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1																								
22-Sep	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1																								
23-Sep	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1																								
24-Sep	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.1	2.1	2.1	2.1																								
25-Sep	2.1	2.1	2.1	2.1	Z	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1																								
26-Sep	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	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1																								
27-Sep	Z	2.2	2.2	2.2	2.3	2.3	2.4	2.3	2.2	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	2.2	2.1																								
28-Sep	2.1	Z	2.1	2.2	2.4	2.4	2.4	2.3	2.1	2.2	2.2	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2																								
29-Sep	2.1	2.1	Z	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																								
30-Sep	2.1	2.1	2.1	Z	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	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	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	Diurnal Average	
																								2.3	2.3	2.4	2.3	2.4	2.4	2.5	2.4	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	2.4	2.3	Diurnal Maximum

Z - zerspan C - Calibration M - Maintenance UO - Unstable Operation





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Athabasca Valley - September 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	182	29.17	29.17
2.1 - 3.0	442	70.83	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 624

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Methane (CH₄) - ppm
Athabasca Valley - September 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	1	0	0	2	4	23	15	14	16	29	23	19	12	20	4	182
2.1 - 3.0	10	0	2	9	13	58	149	41	29	26	27	22	8	4	10	31	439
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	10	1	2	9	15	62	172	56	43	42	56	45	27	16	30	35	621

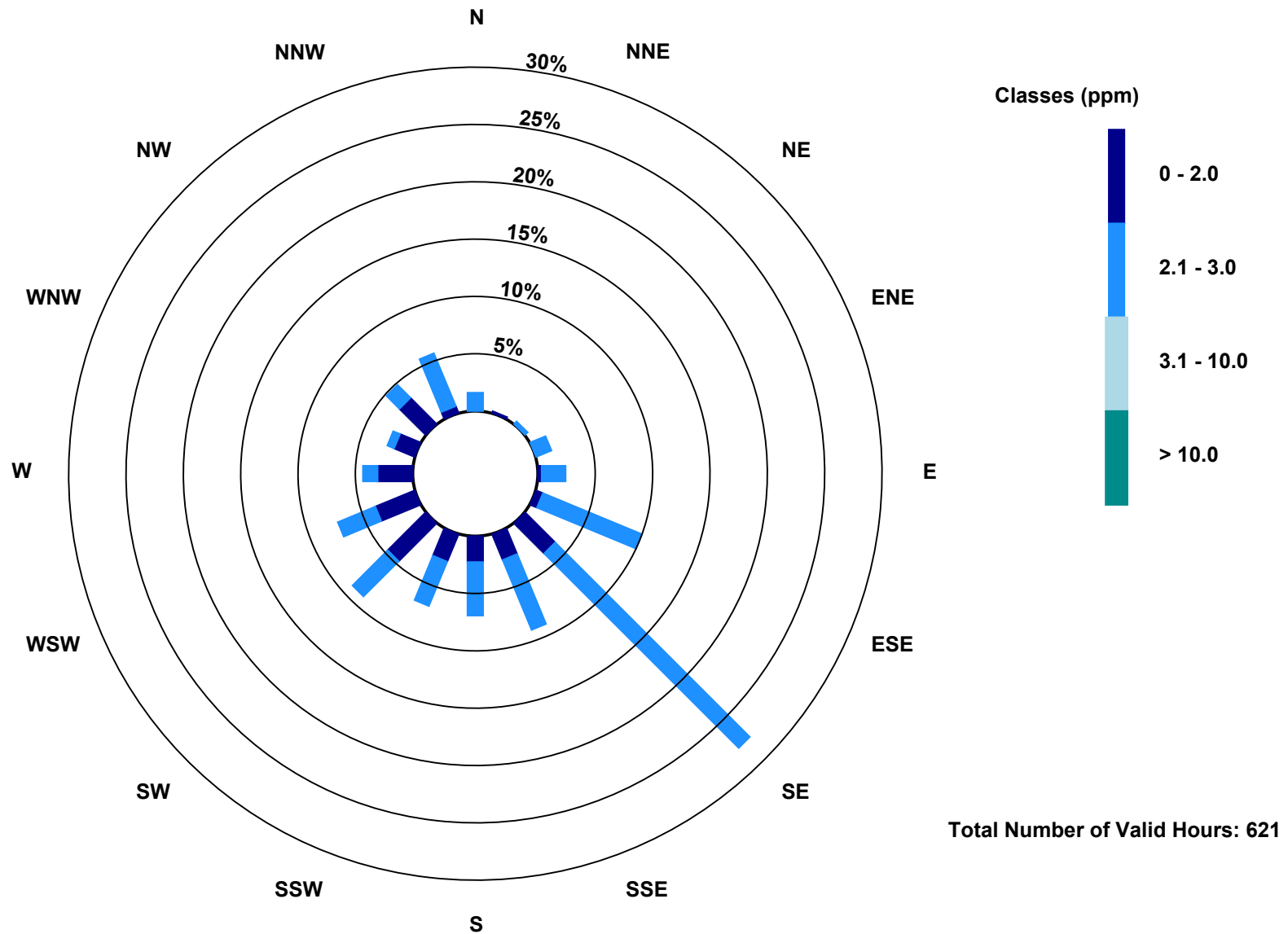
Total Number of Valid Hours: 621

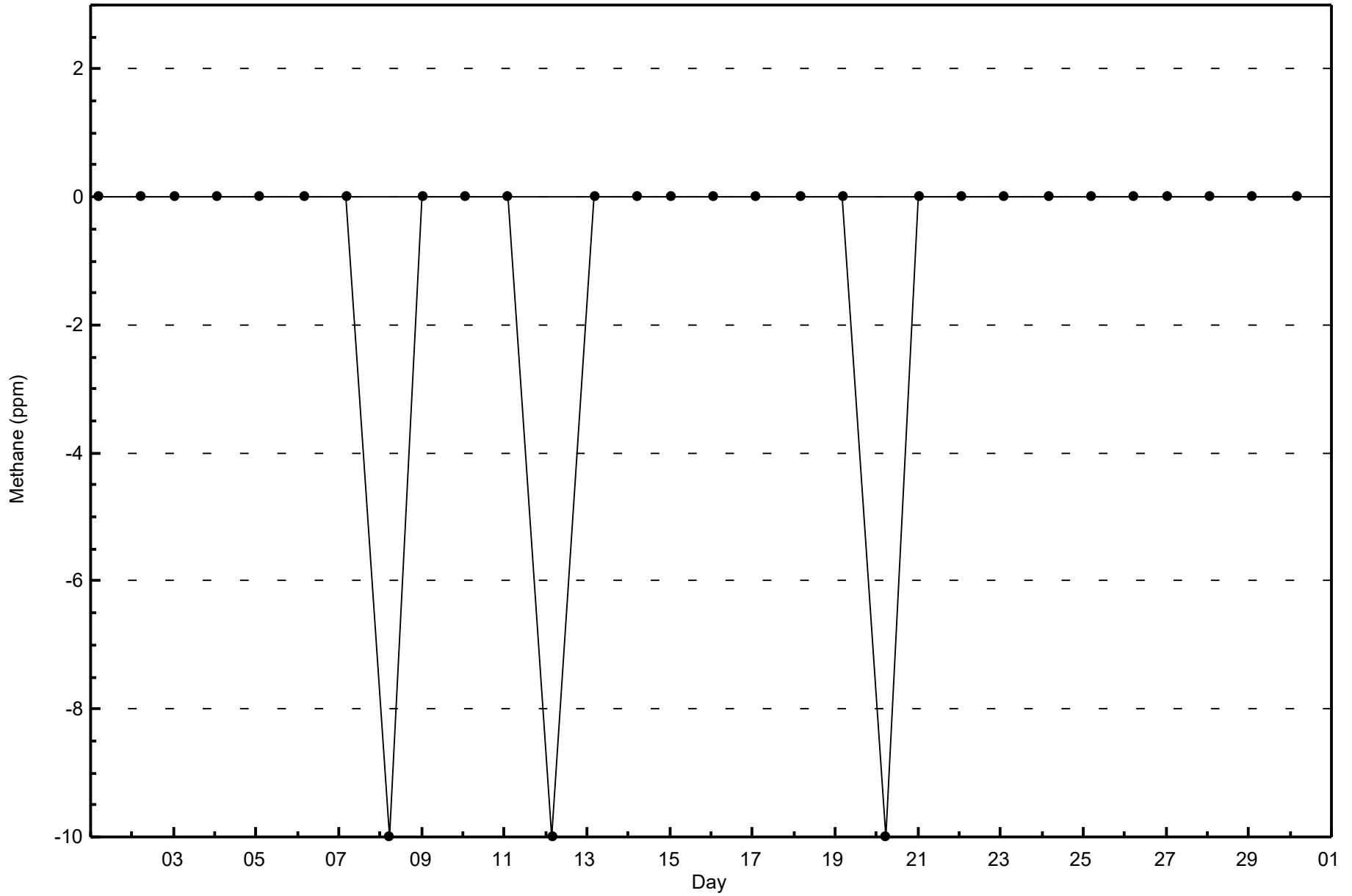
Total Number of Hours: 720

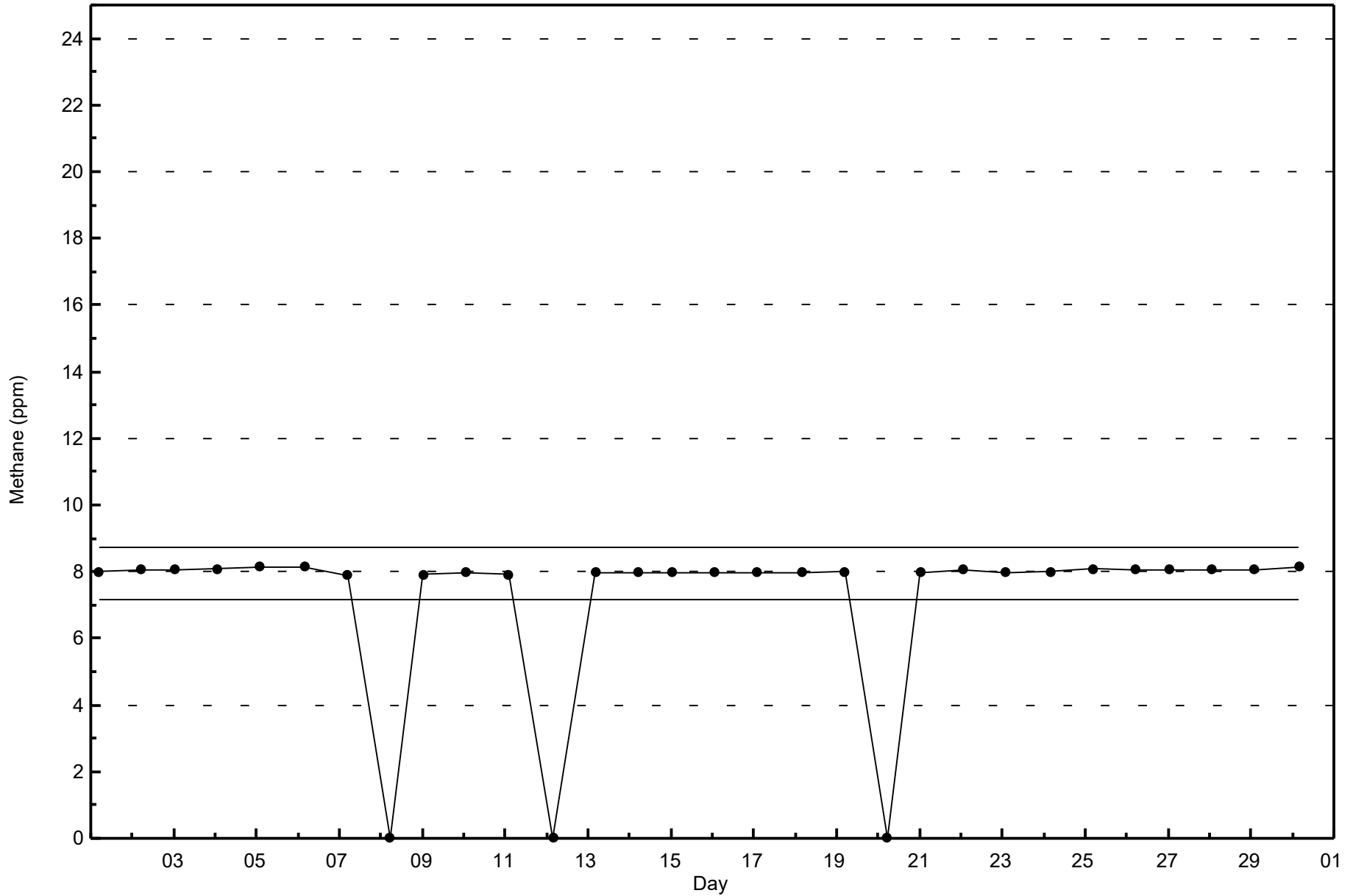


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Methane (CH₄) - ppm
Athabasca Valley









Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 48.7 ppb on Sep 11 15:00	Maximum Daily Average: 38.5 ppb on Sep 23		Hours of Data:	684
Minimum Value: 3.5 ppb on Sep 9 06:00	Minimum Daily Average: 10.8 ppb on Sep 30		Hours of Missing Data:	36
Maximum Diurnal Average: 34.2 ppb at hour 16	Minimum Diurnal Average: 10.8 ppb at hour 6		Hours of Calibration:	36
Monthly Average: 21.57 ppb	Percentiles: P ₁ = 4.3 P ₁₀ = 7.1 Q ₁ = 11.6 Median = 20.0 Q ₃ = 30.4 P ₉₀ = 37.9 P ₉₉ = 46.8		Percent Operational Time:	100.0

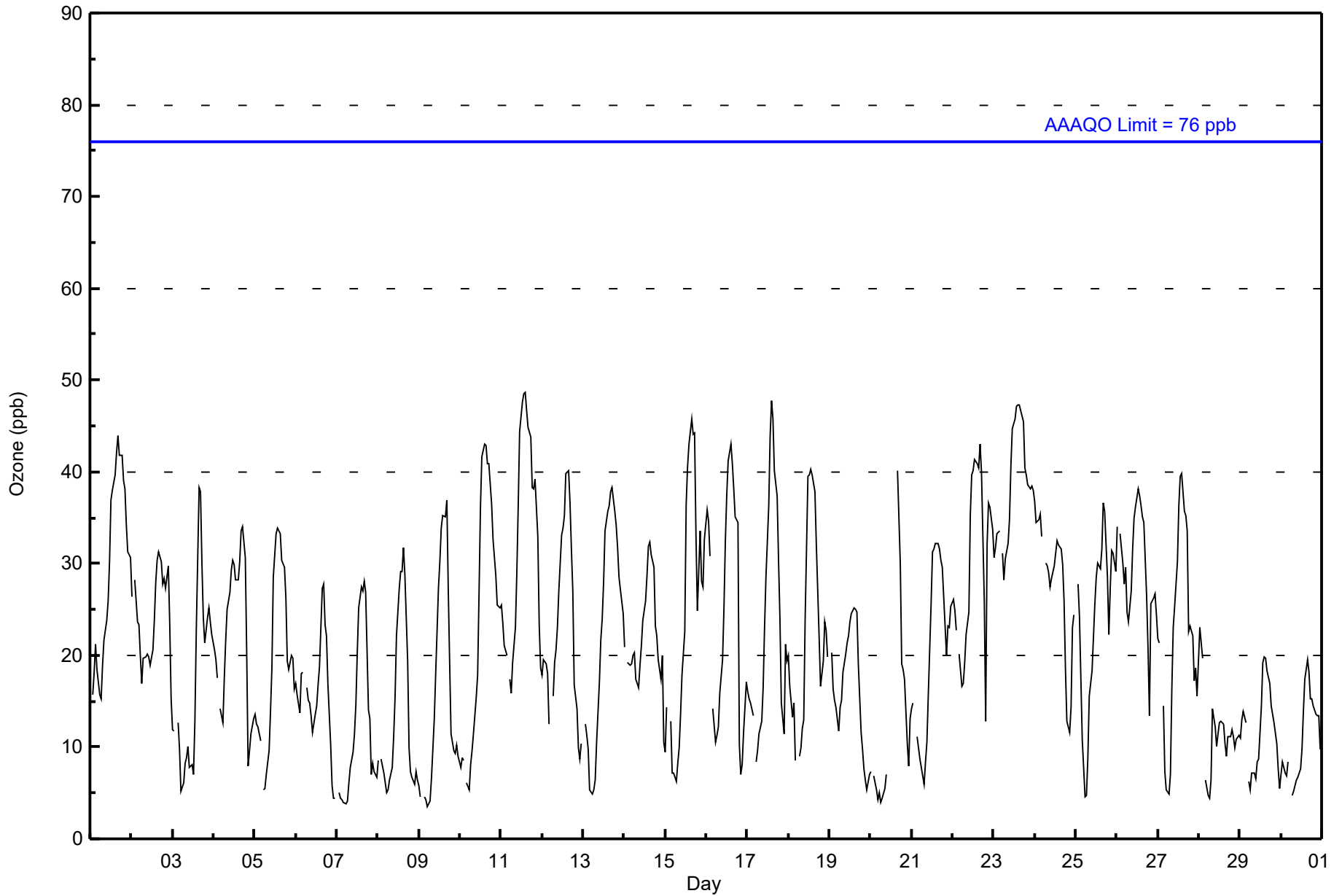
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Sep	Z	15.8	18.2	21.1	18.4	15.7	15.3	18.9	21.6	23.8	25.9	30.2	37.0	38.0	39.7	42.1	44.0	41.8	41.9	39.0	38.2	34.1	31.3	30.7	29.7	44.0
2-Sep	26.3	Z	28.2	23.6	23.3	20.0	17.0	19.7	19.8	20.2	19.8	19.0	20.5	23.8	27.9	30.3	31.3	30.2	27.7	28.4	27.3	29.8	23.5	15.3	24.0	31.3
3-Sep	11.9	11.7	Z	12.6	9.7	5.2	6.0	8.2	8.9	10.0	7.7	8.1	7.0	12.9	22.9	38.2	37.8	30.1	24.0	21.3	24.2	25.2	23.7	22.2	17.0	38.2
4-Sep	20.6	19.5	17.5	Z	14.2	12.7	17.6	21.7	25.0	26.8	29.4	30.4	29.9	28.2	30.2	33.5	34.1	30.6	20.3	7.9	9.7	11.5	13.2	22.3	34.1	
5-Sep	13.6	12.5	12.3	10.7	Z	5.4	5.5	7.0	9.5	13.9	18.6	28.6	33.3	33.8	33.5	33.3	30.4	29.5	26.2	19.4	18.4	20.0	19.8	16.3	19.6	33.8
6-Sep	16.9	15.7	13.7	18.0	18.1	Z	16.4	15.2	14.8	13.4	11.6	13.6	14.4	16.7	18.8	27.4	27.8	23.3	22.1	16.9	10.2	5.9	4.5	4.5	15.6	27.8
7-Sep	Z	5.0	4.4	4.3	4.0	3.8	4.2	6.2	7.8	9.5	11.4	14.7	20.2	25.2	27.4	27.1	28.0	26.8	14.1	13.2	7.1	8.3	7.4	6.7	12.5	28.0
8-Sep	8.5	Z	8.7	7.2	6.1	5.0	5.4	6.4	7.7	11.1	15.4	22.0	27.3	29.1	29.2	31.7	28.9	19.3	9.9	7.3	6.6	6.0	7.4	6.4	13.6	31.7
9-Sep	5.7	4.6	Z	4.6	4.3	3.5	4.1	6.5	9.8	12.9	17.8	27.4	30.1	33.8	35.3	35.1	36.9	27.4	19.3	11.4	9.7	9.2	10.2	9.0	16.0	36.9
10-Sep	7.8	8.9	8.6	Z	6.1	5.4	8.0	9.6	11.4	15.4	17.8	26.7	36.0	41.6	43.0	42.8	41.0	40.9	36.5	32.6	30.7	28.7	25.5	25.2	23.9	43.0
11-Sep	25.5	23.5	21.0	19.9	Z	17.4	15.8	19.2	23.0	29.0	36.4	44.3	47.5	48.5	48.7	46.7	44.9	43.8	38.3	38.2	39.2	32.9	23.4	18.6	32.4	48.7
12-Sep	17.8	19.5	19.1	18.0	12.5	Z	15.6	19.2	20.6	23.0	26.9	33.1	33.8	35.2	39.8	40.2	36.6	31.6	27.0	16.8	14.2	9.9	8.7	10.4	23.0	40.2
13-Sep	Z	12.6	11.2	9.8	5.4	5.0	5.4	6.3	10.6	17.1	21.7	24.0	27.9	33.6	35.7	36.4	37.8	38.2	35.6	34.2	31.8	28.5	27.2	24.6	22.6	38.2
14-Sep	20.9	Z	19.3	18.9	19.0	20.0	20.3	17.3	16.5	18.9	21.0	23.8	25.9	28.7	31.9	32.4	31.0	29.5	23.1	22.1	19.5	17.3	20.0	10.5	22.1	32.4
15-Sep	9.4	14.4	Z	12.8	7.1	7.1	6.2	8.2	10.0	13.6	17.8	22.8	36.5	40.6	43.0	45.7	44.1	44.2	33.1	24.8	33.5	28.1	27.4	32.7	24.5	45.7
16-Sep	35.8	34.6	30.8	Z	14.2	10.6	11.3	12.2	15.9	19.5	25.2	32.5	37.4	41.2	43.0	40.9	38.1	35.1	34.4	10.3	7.1	8.1	11.6	17.1	24.6	43.0
17-Sep	16.0	15.2	14.8	13.4	Z	8.4	9.5	11.4	12.8	16.5	23.0	28.6	36.3	44.0	47.7	45.7	40.1	37.4	30.4	24.0	14.8	11.5	21.3	19.4	23.6	47.7
18-Sep	20.0	16.7	13.3	14.8	8.5	Z	9.0	9.9	12.0	13.0	23.9	39.5	39.7	40.3	39.7	37.8	32.0	27.1	22.0	16.6	19.3	23.7	22.7	19.8	22.7	40.3
19-Sep	Z	20.4	16.4	15.1	14.4	11.8	14.4	15.1	18.2	20.2	21.3	22.1	23.7	24.5	25.1	25.0	24.6	19.1	11.6	9.7	7.7	6.4	5.3	7.1	16.5	25.1
20-Sep	7.3	Z	6.8	5.3	4.2	5.1	3.9	4.4	5.5	7.0	C	C	C	C	C	C	40.1	29.9	19.0	18.5	17.4	10.3	7.9	13.1	--	40.1
21-Sep	14.2	14.8	Z	11.1	10.0	8.7	6.8	5.9	8.4	10.6	15.7	25.6	31.3	31.6	32.2	32.1	31.6	30.4	29.6	26.4	20.0	23.2	23.1	25.3	20.4	32.2
22-Sep	26.1	24.9	22.7	Z	20.1	16.6	16.9	19.2	22.3	24.7	35.2	39.6	40.2	41.3	40.9	40.5	43.0	40.0	26.0	12.8	32.1	36.6	36.1	33.8	30.1	43.0
23-Sep	30.7	31.7	33.2	33.5	Z	31.1	28.2	30.6	32.3	34.7	40.5	44.8	45.8	47.2	47.3	47.3	46.6	45.5	40.4	39.7	38.6	38.2	38.5	38.0	38.5	47.3
24-Sep	36.7	34.5	34.8	35.3	32.9	Z	30.1	29.8	28.9	27.5	28.4	29.8	31.1	32.4	32.0	31.6	29.8	26.0	18.4	12.8	11.7	14.4	23.0	24.4	27.7	36.7
25-Sep	Z	27.7	24.3	17.5	10.8	4.6	4.7	8.9	15.6	18.3	22.0	25.6	28.5	30.0	29.5	31.6	36.6	35.6	28.5	22.3	27.4	31.4	31.0	29.1	23.5	36.6
26-Sep	33.9	Z	33.2	30.0	27.8	29.6	24.8	23.6	27.1	31.6	35.0	36.2	38.1	37.4	36.3	35.0	34.4	26.3	20.8	13.5	25.6	26.3	26.8	24.4	29.5	38.1
27-Sep	21.8	21.3	Z	14.4	7.4	5.3	4.9	7.1	16.3	23.0	25.4	30.2	36.3	39.5	39.8	35.6	35.3	33.6	22.6	23.2	22.1	17.2	18.6	15.5	22.4	39.8
28-Sep	23.0	21.3	19.7	Z	6.4	4.7	4.5	6.4	14.1	12.1	10.0	11.4	12.6	12.8	12.5	10.4	9.0	11.2	11.2	11.9	11.1	9.9	10.8	11.2	11.7	23.0
29-Sep	10.9	12.9	13.9	12.6	Z	6.3	5.3	7.1	7.1	6.6	8.4	8.8	14.5	19.2	19.9	19.7	18.3	17.0	14.5	13.5	12.7	10.3	7.6	5.5	11.9	19.9
30-Sep	7.0	8.4	7.1	6.8	8.4	Z	4.8	5.1	5.8	6.5	6.7	7.7	9.8	13.9	17.4	19.6	18.1	15.3	15.2	14.5	13.5	13.5	13.4	9.7	10.8	19.6
18.7 17.9 18.1 15.7 12.5 10.8 11.4 12.9 15.3 17.7 21.4 25.9 29.4 31.9 33.4 34.2 33.7 30.7 25.1 20.5 20.0 19.2 19.0 18.0																								Diurnal Average		
36.7 34.6 34.8 35.3 32.9 31.1 30.1 30.6 32.3 34.7 40.5 44.8 47.5 48.5 48.7 47.3 46.6 45.5 41.9 39.7 39.2 38.2 38.5 38.0																								Diurnal Maximum		

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



Wood Buffalo Environmental Association
Hourly Averages

Ozone (O₃) - ppb
Athabasca Valley - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ozone (O₃) - ppb
Athabasca Valley - September 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	350	51.17	51.17
21 - 50	334	48.83	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: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Ozone (O₃) - ppb
Athabasca Valley - September 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	0	1	8	10	46	128	38	20	19	17	6	9	5	4	29	350
21 - 50	0	1	2	3	9	20	73	27	25	27	47	39	20	11	26	4	334
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	1	3	11	19	66	201	65	45	46	64	45	29	16	30	33	684

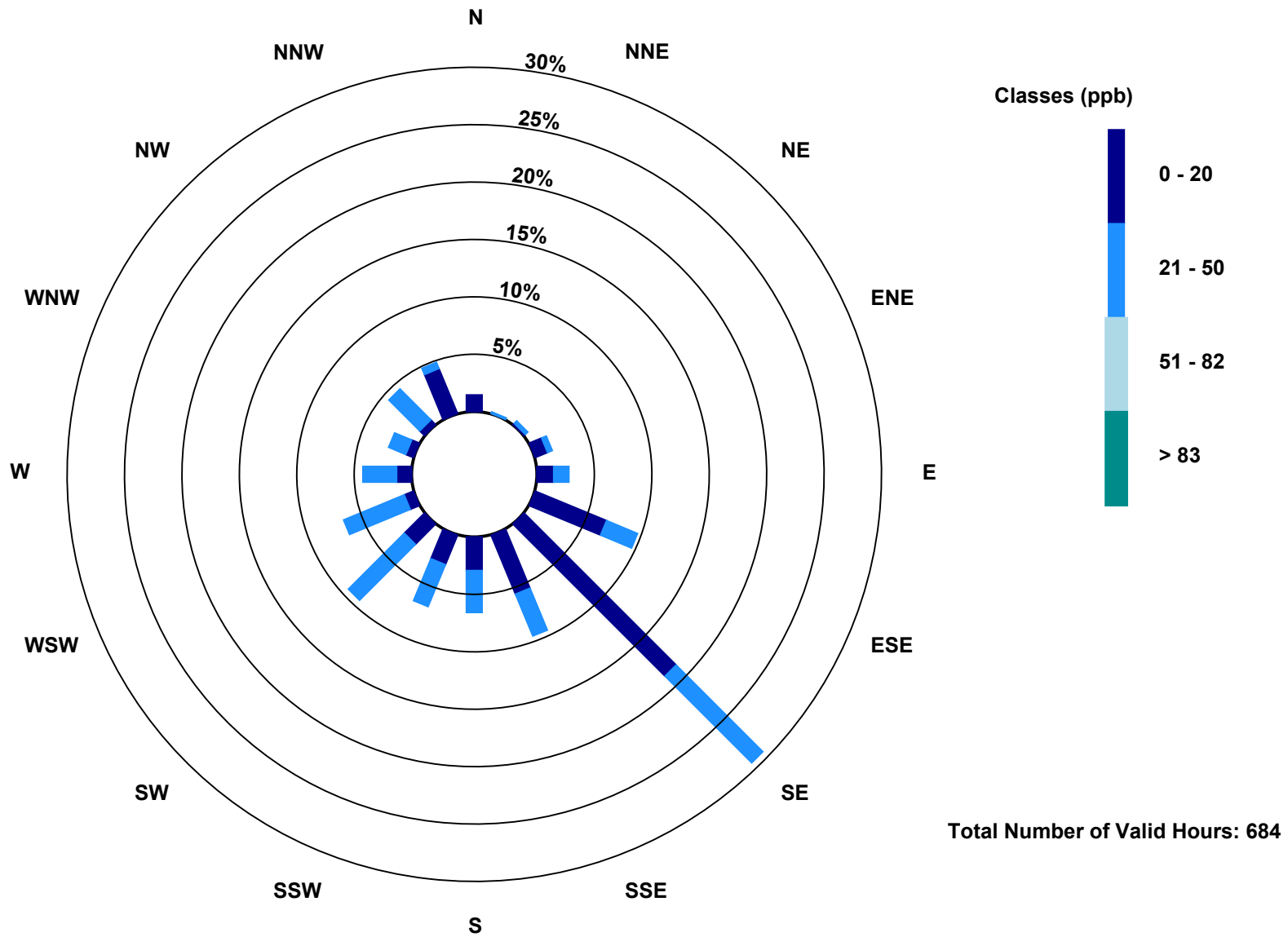
Total Number of Valid Hours: 684

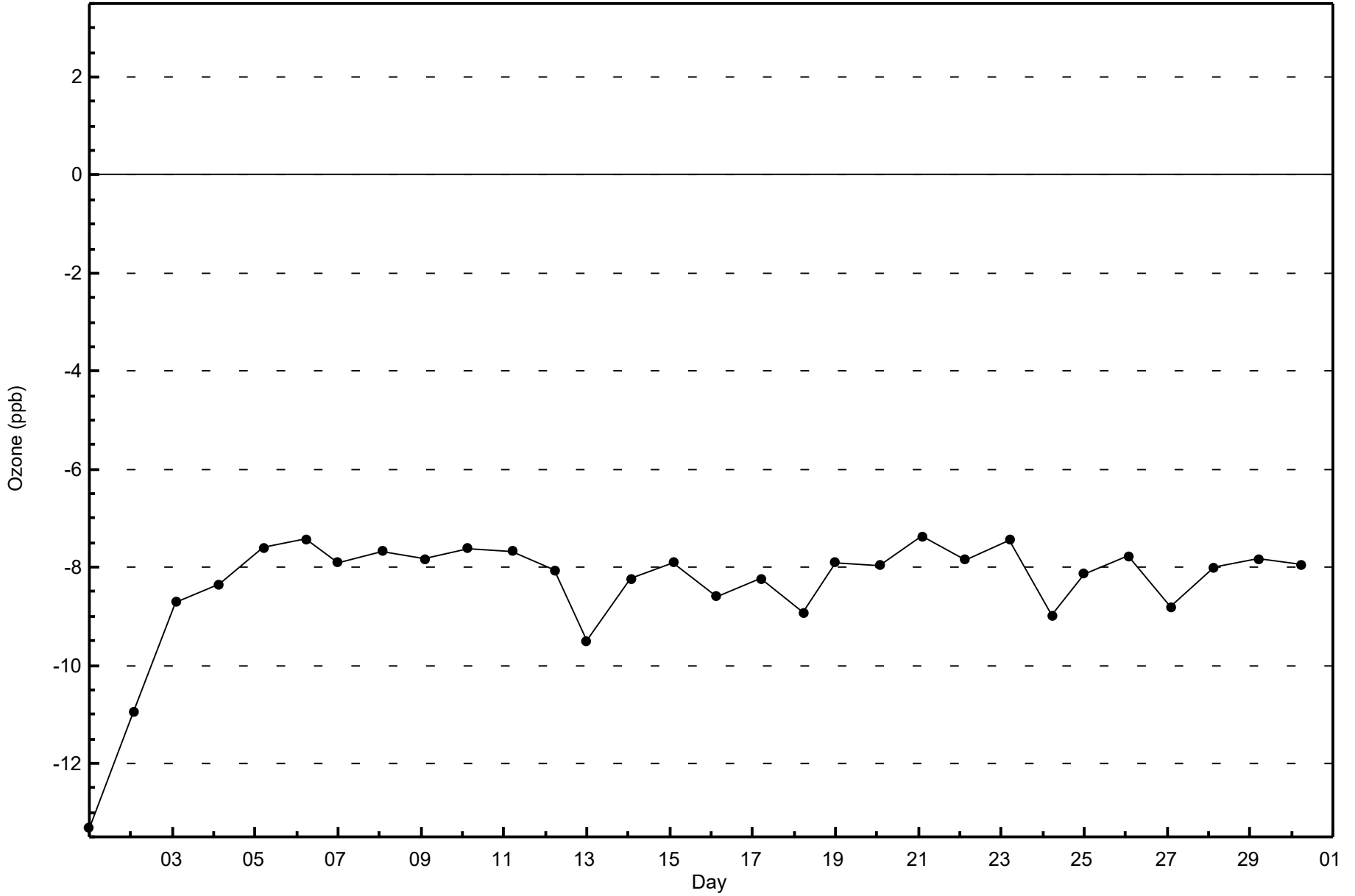
Total Number of Hours: 720

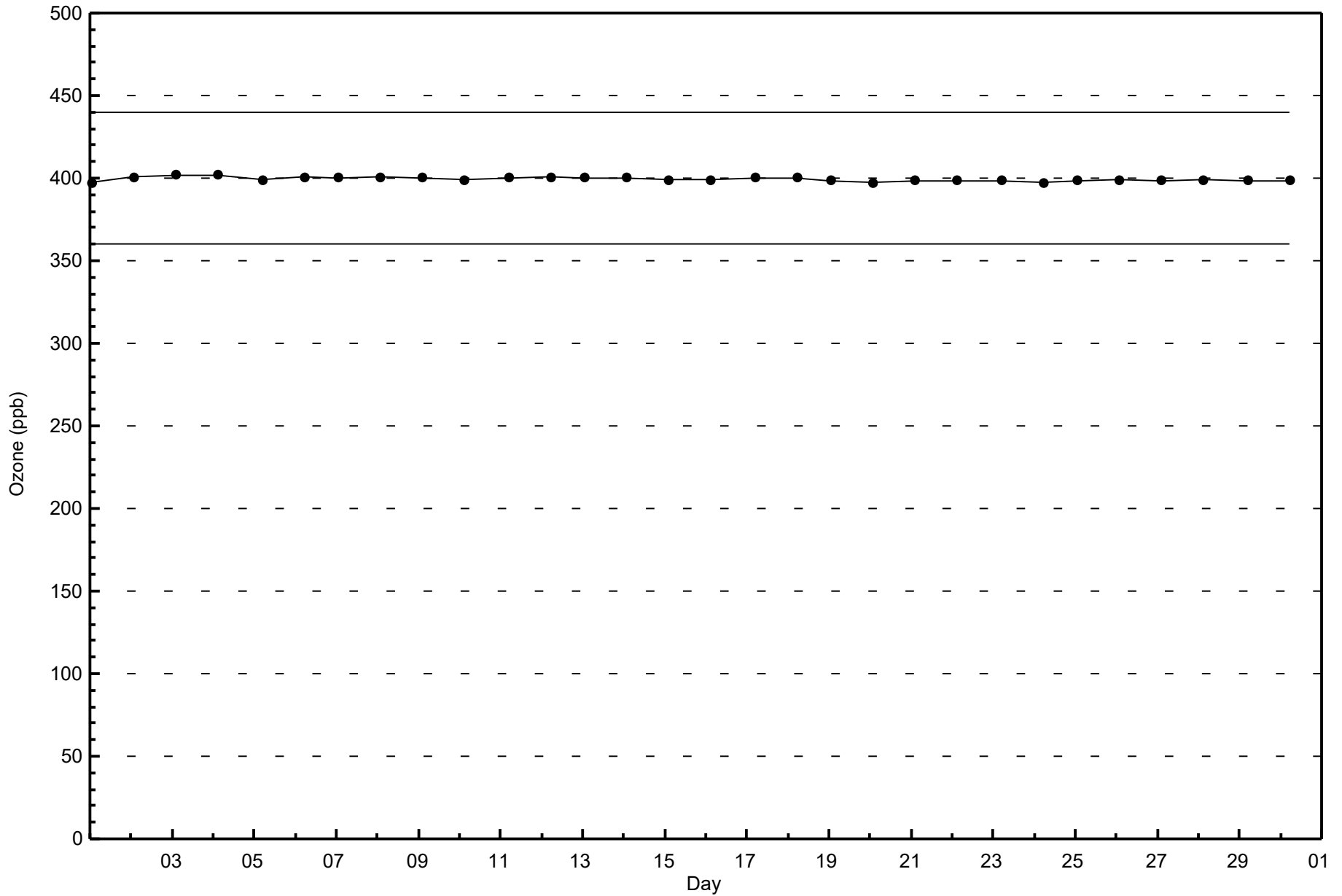


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Ozone (O₃) - ppb
Athabasca Valley









Wood Buffalo Environmental Association
Summary of Hour Averages

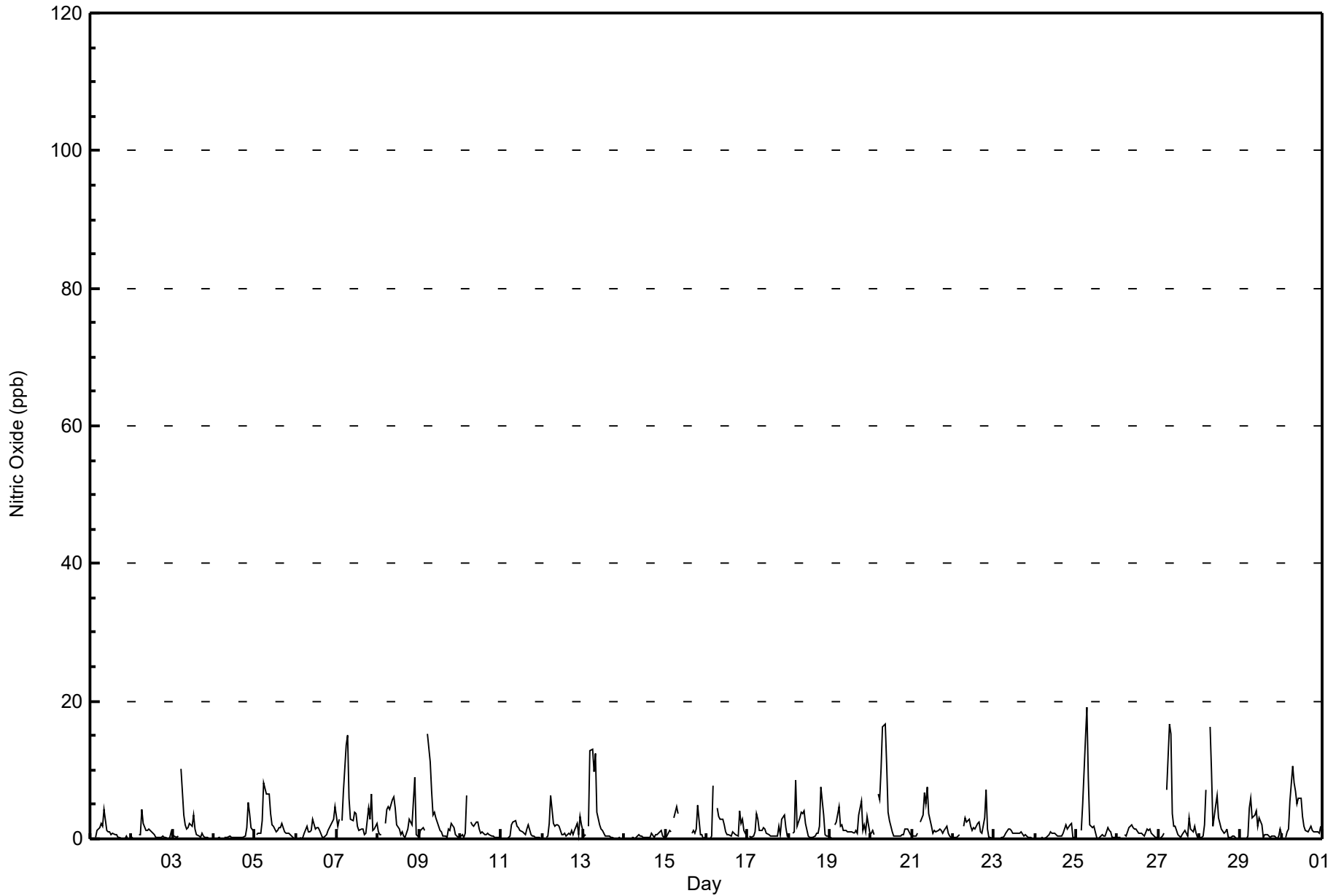
Nitric Oxide (NO) - ppb
Athabasca Valley - September 2023

Maximum Value: 19.1 ppb on Sep 25 07:00																				Maximum Daily Average: 3.8 ppb on Sep 7					Hours in Service: 720				
Minimum Value: 0.0 ppb on Sep 29 03:00																				Minimum Daily Average: 0.3 ppb on Sep 14					Hours of Data: 683				
Maximum Diurnal Average: 5.6 ppb at hour 7																				Minimum Diurnal Average: 0.4 ppb at hour 3					Hours of Missing Data: 37				
Monthly Average: 1.76 ppb																				Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.3 Median = 0.9 Q ₃ = 1.9 P ₉₀ = 4.2 P ₉₉ = 15.1					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-Sep	0.0	0.1	Z	0.2	1.2	1.6	2.2	1.8	4.2	1.2	1.1	1.0	0.6	0.8	0.5	0.5	0.3	0.2	0.1	0.0	0.0	0.5	0.1	0.1	0.8	4.2			
2-Sep	0.1	0.1	0.0	Z	0.6	0.6	4.2	2.3	1.2	1.1	1.4	1.2	0.7	0.7	0.2	0.1	0.3	0.2	0.5	0.2	0.2	0.1	0.2	1.0	0.7	4.2			
3-Sep	0.6	0.5	0.3	0.4	Z	10.3	3.4	2.0	1.4	1.6	2.3	1.7	3.5	1.4	0.5	0.3	0.3	0.8	0.4	0.3	0.1	0.0	0.0	0.0	1.4	10.3			
4-Sep	0.0	0.0	0.1	0.1	0.2	Z	0.2	0.2	0.2	0.4	0.2	0.2	0.1	0.2	0.1	0.2	0.1	0.2	0.4	1.6	5.3	3.6	1.7	0.9	0.7	5.3			
5-Sep	Z	0.7	0.8	0.9	2.7	8.1	7.3	6.5	6.5	3.6	2.0	1.8	0.9	1.2	1.7	1.7	2.2	1.1	0.8	0.9	0.7	0.3	0.2	0.1	2.3	8.1			
6-Sep	0.1	Z	0.1	0.1	0.2	0.8	1.7	1.0	1.1	1.2	2.8	1.4	1.5	1.5	1.3	0.1	0.2	0.4	0.7	1.3	2.0	2.4	2.9	4.6	1.3	4.6			
7-Sep	1.9	2.8	Z	2.7	6.9	13.7	15.1	5.9	2.9	2.7	3.8	3.7	1.8	1.3	1.3	1.3	0.6	0.8	4.4	2.9	6.5	1.3	1.5	2.3	3.8	15.1			
8-Sep	1.0	0.6	0.7	Z	2.2	4.3	4.8	4.3	5.7	6.1	4.4	2.0	1.3	0.7	0.9	0.4	0.2	1.5	2.8	2.5	2.0	8.9	0.6	0.4	2.5	8.9			
9-Sep	0.5	1.2	1.7	1.2	Z	15.3	11.2	6.9	3.4	3.8	3.1	1.7	1.3	1.0	0.5	0.3	0.1	1.4	1.1	2.3	1.5	0.7	0.4	0.2	2.6	15.3			
10-Sep	0.4	0.6	0.2	0.7	6.4	Z	2.4	2.1	1.9	2.4	2.5	1.3	0.7	0.9	0.6	0.7	0.9	0.5	0.4	0.4	0.3	0.2	0.1	0.1	1.2	6.4			
11-Sep	Z	0.1	0.1	0.1	0.2	0.5	2.0	2.3	2.7	1.9	1.6	1.2	1.0	0.8	0.7	1.4	2.1	0.6	0.4	0.3	0.2	0.2	0.2	0.0	0.9	2.7			
12-Sep	0.0	Z	0.2	0.4	2.2	6.3	2.2	1.9	2.1	1.9	1.9	0.6	0.7	0.8	0.5	0.8	0.6	1.2	0.6	1.3	2.2	0.5	3.3	2.0	1.5	6.3			
13-Sep	0.4	0.7	Z	1.9	12.8	13.0	9.7	12.4	3.9	2.1	1.4	1.2	0.8	0.5	0.4	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.0	2.7	13.0			
14-Sep	0.1	0.0	0.0	Z	0.1	0.1	0.0	0.3	0.7	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.9	0.2	0.6	0.6	0.7	1.2	0.3	0.3	0.3	0.3	1.2		
15-Sep	0.6	0.4	1.3	1.1	Z	3.0	4.7	3.8	C	C	C	C	C	C	C	0.9	1.3	0.7	1.4	4.9	0.6	0.7	0.1	0.1	--	4.9			
16-Sep	0.0	0.0	0.0	0.4	7.7	Z	4.6	3.3	2.8	2.9	2.1	1.0	0.5	0.6	0.5	1.0	0.8	0.7	0.4	4.0	2.3	2.9	1.3	0.3	1.7	7.7			
17-Sep	Z	0.3	0.2	0.5	1.0	3.6	2.8	1.2	1.1	1.6	1.3	0.9	0.5	0.3	0.4	0.4	0.4	0.4	1.9	0.6	2.8	3.5	1.6	0.5	1.2	3.6			
18-Sep	0.3	Z	0.8	1.1	8.6	1.8	3.1	3.8	3.7	4.0	2.3	0.3	0.3	0.3	0.3	0.5	0.9	0.8	1.7	7.5	3.5	0.6	0.3	0.4	2.0	8.6			
19-Sep	0.1	0.1	Z	2.0	2.5	4.7	1.7	2.0	1.2	1.2	1.0	1.1	1.0	1.1	0.8	1.2	0.9	3.4	5.6	1.3	2.0	1.0	3.3	0.9	1.7	5.6			
20-Sep	0.7	1.3	0.7	Z	6.5	5.6	10.1	16.3	16.6	10.8	3.9	2.6	1.1	0.3	0.3	0.5	0.4	0.4	0.6	0.6	1.5	1.5	1.1	0.7	3.7	16.6			
21-Sep	0.6	0.4	0.4	0.8	Z	2.3	3.4	6.7	5.1	7.5	3.6	1.8	0.9	1.3	1.0	1.3	1.4	1.2	0.8	1.1	1.7	0.9	0.4	0.2	1.9	7.5			
22-Sep	0.1	0.2	0.2	0.4	0.6	Z	1.9	3.0	2.5	2.8	1.9	1.2	1.6	1.5	2.2	2.5	1.1	0.8	3.1	7.1	1.5	0.2	0.1	0.1	1.6	7.1			
23-Sep	Z	0.1	0.1	0.1	0.2	0.1	0.4	0.8	1.5	1.5	1.1	0.8	0.8	0.7	0.7	0.8	0.9	0.5	0.6	0.4	0.3	0.2	0.1	0.1	0.5	1.5			
24-Sep	0.0	Z	0.0	0.0	0.2	0.1	0.2	0.4	0.5	1.0	0.8	0.8	0.6	0.5	0.4	0.4	0.7	1.5	2.1	1.4	2.0	2.2	0.2	0.3	0.7	2.2			
25-Sep	0.0	0.1	Z	1.2	5.0	14.6	19.1	9.0	2.1	1.6	1.7	0.9	0.2	0.1	0.4	0.7	0.3	0.4	1.5	1.3	0.9	0.3	0.3	0.1	2.7	19.1			
26-Sep	0.1	0.1	0.1	Z	0.5	0.4	1.1	1.6	2.1	1.7	1.5	1.4	0.9	0.7	0.8	0.7	0.4	1.4	1.2	1.5	0.8	0.4	0.1	0.1	0.9	2.1			
27-Sep	0.2	0.1	0.3	0.8	Z	7.1	16.7	15.2	3.8	1.7	1.9	0.7	0.4	0.3	0.5	1.2	0.7	0.5	3.0	1.4	1.1	1.9	0.8	0.1	2.6	16.7			
28-Sep	0.2	0.1	0.4	1.9	7.0	Z	16.2	9.8	1.9	4.9	6.3	3.1	2.3	1.4	0.9	1.0	1.3	0.3	0.2	0.4	0.4	0.2	0.1	0.0	2.6	16.2			
29-Sep	Z	0.0	0.0	0.0	0.5	4.5	5.9	3.1	3.5	4.0	1.9	3.0	2.0	0.2	0.5	0.7	0.6	0.2	0.5	0.4	0.3	0.1	0.3	1.5	1.5	5.9			
30-Sep	0.5	Z	0.2	1.1	1.5	5.5	10.6	8.1	7.0	5.1	5.9	5.9	3.3	1.8	1.3	1.1	1.3	1.9	1.2	1.1	1.0	1.1	0.8	1.7	3.0	10.6			
																								Diurnal Average					
																								Diurnal Maximum					
0.4 0.4 0.4 0.8 3.1 5.1 5.6 4.6 3.2 2.9 2.3 1.5 1.1 0.8 0.7 0.8 0.8 0.8 1.3 1.7 1.5 1.3 0.7 0.6																													
1.9 2.8 1.7 2.7 12.8 15.3 19.1 16.3 16.6 10.8 6.3 5.9 3.5 1.8 2.2 2.5 2.2 3.4 5.6 7.5 6.5 8.9 3.3 4.6																													
Z - zerospan C - Calibration																													



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	683	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: 683

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Nitric Oxide (NO) - ppb
Athabasca Valley - September 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	3	10	20	70	194	64	41	48	63	47	28	16	32	34	680
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	9	1	3	10	20	70	194	64	41	48	63	47	28	16	32	34	680

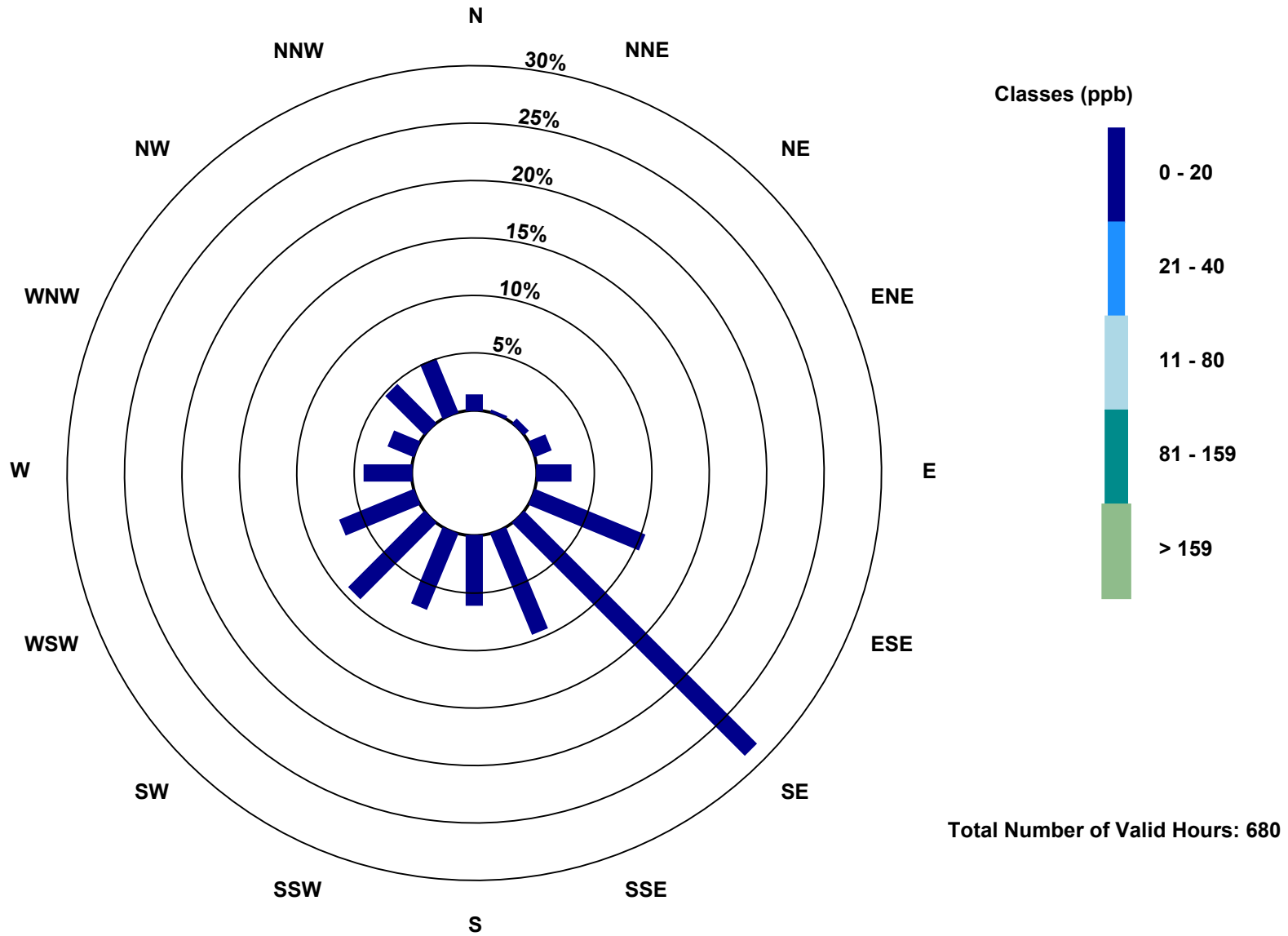
Total Number of Valid Hours: 680

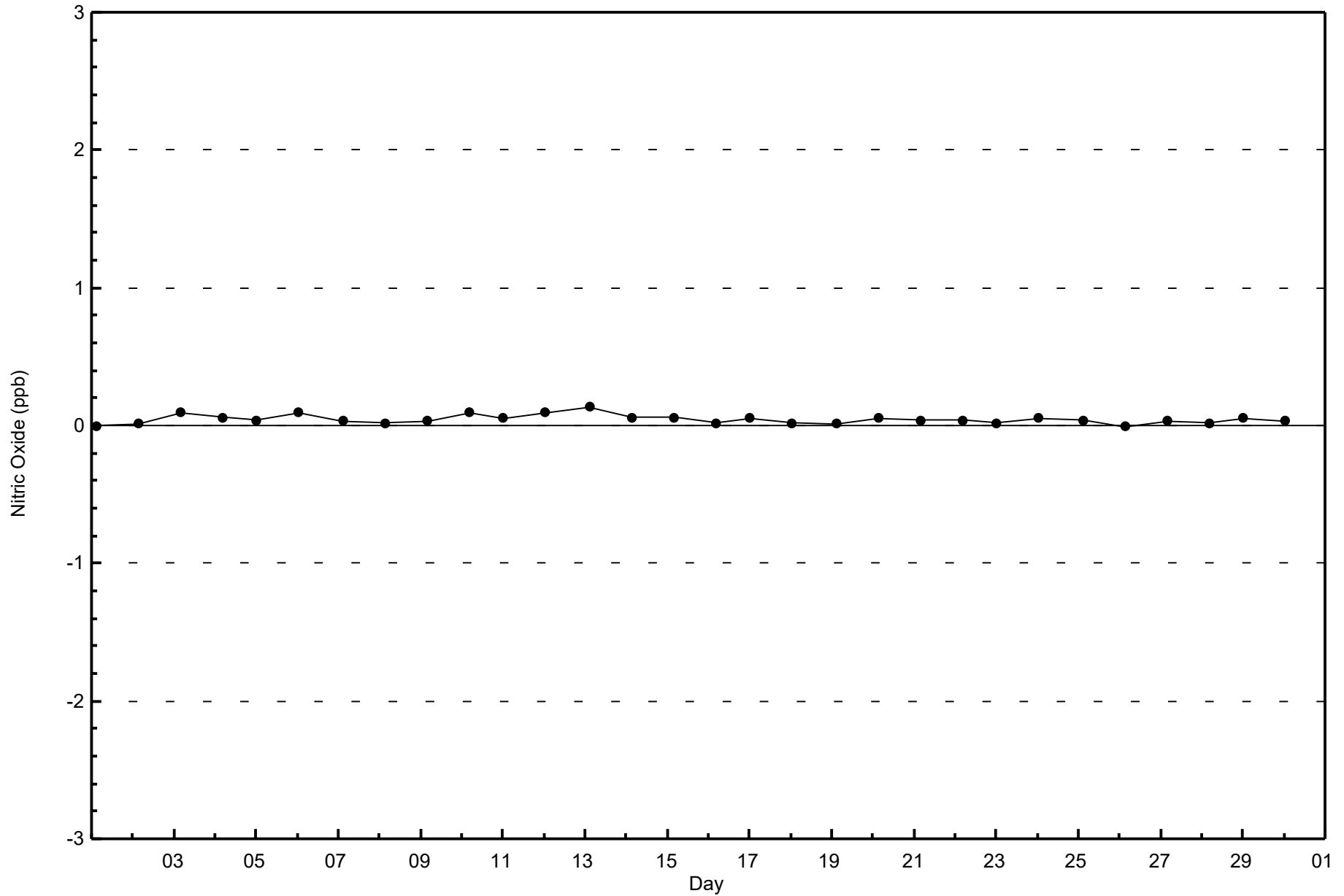
Total Number of Hours: 720

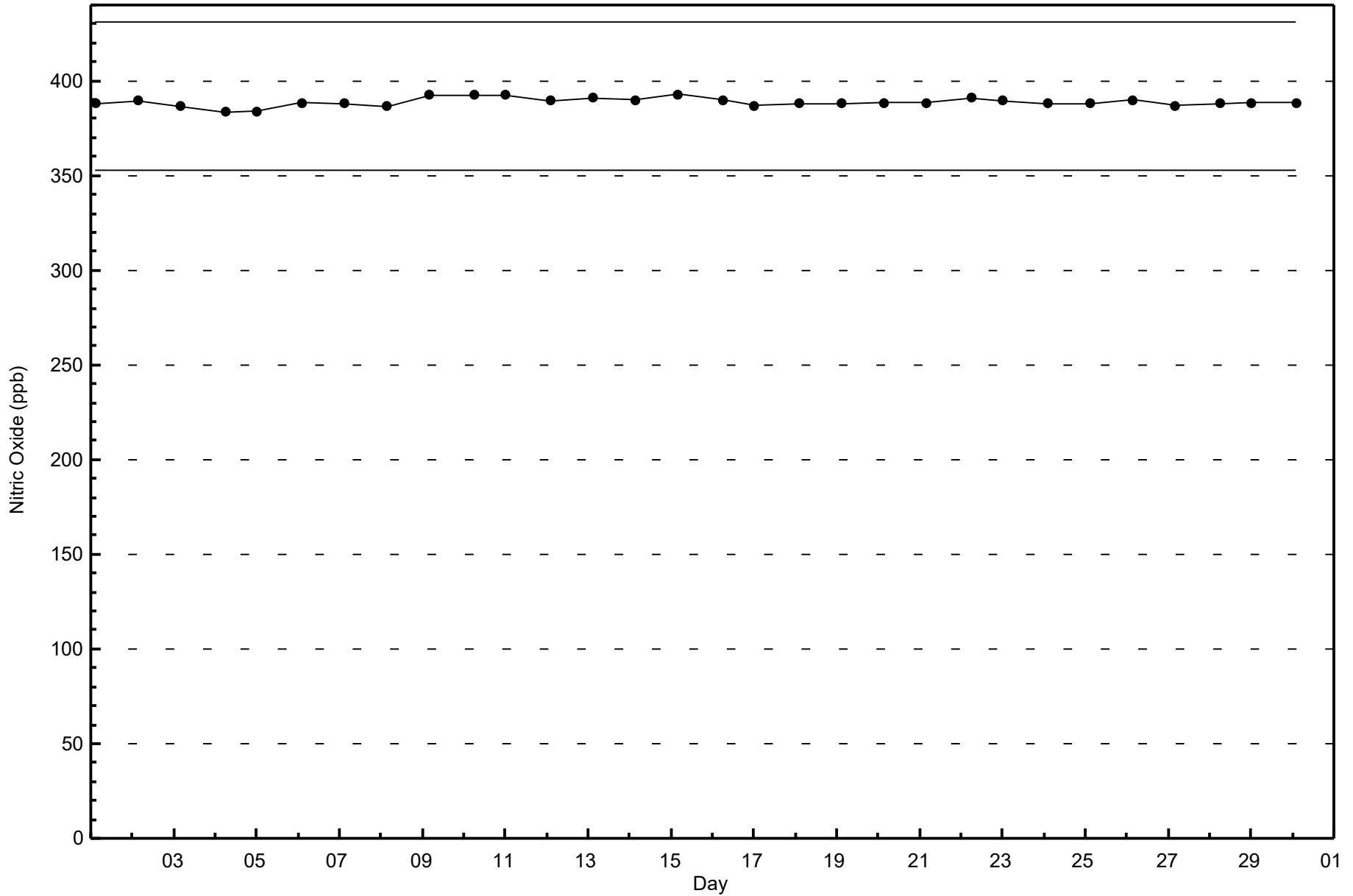


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitric Oxide (NO) - ppb
Athabasca Valley









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

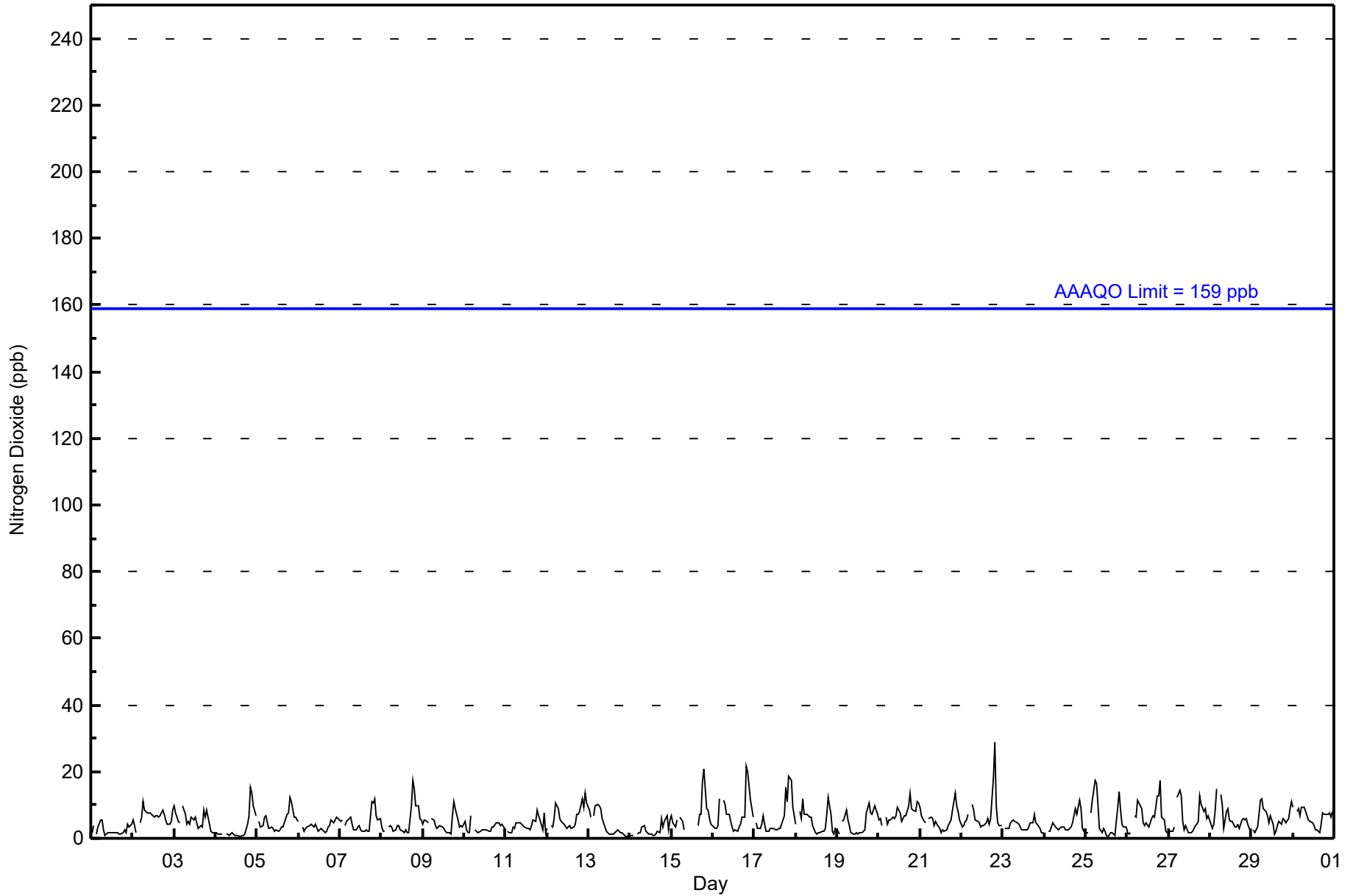
Athabasca Valley - September 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 720																	Daily Average		Daily Maximum																										
Maximum Value: 28.9 ppb on Sep 22 20:00		Maximum Daily Average: 7.5 ppb on Sep 16																	Hours of Data: 683		Hours of Missing Data: 37																												
Minimum Value: 0.5 ppb on Sep 25 14:00		Minimum Daily Average: 2.5 ppb on Sep 14																	Hours of Calibration: 37		Percent Operational Time: 100.0																												
Maximum Diurnal Average: 9.7 ppb at hour 20		Minimum Diurnal Average: 2.6 ppb at hour 14																																															
Monthly Average: 5.13 ppb		Percentiles: P ₁ = 0.7 P ₁₀ = 1.6 Q ₁ = 2.6 Median = 4.3 Q ₃ = 6.7 P ₉₀ = 9.7 P ₉₉ = 17.4																																															
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-Sep	1.9	3.7	Z	1.2	3.5	5.7	5.4	2.5	0.9	1.7	1.9	1.8	1.7	1.7	1.5	1.7	1.3	1.4	1.6	2.4	1.8	4.4	3.6	4.1	2.5	5.7																							
2-Sep	5.3	3.7	1.6	Z	4.5	6.4	11.0	8.4	7.8	7.5	7.5	7.2	6.3	6.6	6.7	6.3	6.8	8.3	7.0	5.3	4.3	4.1	4.9	8.6	6.4	11.0																							
3-Sep	9.7	7.8	5.2	4.8	Z	9.9	7.0	4.4	4.9	4.4	6.2	5.3	6.3	4.6	3.1	3.8	3.6	8.6	6.4	8.5	4.2	2.3	1.9	1.5	5.4	9.9																							
4-Sep	1.5	1.1	1.3	1.2	1.3	Z	1.2	1.2	0.9	1.7	1.3	0.8	0.8	0.7	0.6	0.7	0.7	1.2	4.2	6.7	15.1	13.5	9.6	6.9	3.2	15.1																							
5-Sep	Z	5.0	3.5	3.9	6.2	6.7	4.5	3.0	3.2	2.8	2.3	2.6	2.1	2.4	3.4	3.6	4.8	7.1	7.7	12.3	11.1	6.3	6.3	5.7	5.1	12.3																							
6-Sep	4.9	Z	3.5	2.0	3.1	3.6	3.9	4.2	3.7	3.3	4.1	2.2	2.5	3.0	2.7	1.5	2.0	3.5	3.8	5.7	4.7	5.5	6.3	6.1	3.7	6.3																							
7-Sep	5.0	5.4	Z	3.7	4.9	5.9	6.2	4.2	2.6	2.4	3.3	3.9	2.5	2.2	2.3	2.6	2.1	2.2	10.9	10.8	12.0	6.7	5.6	5.8	4.9	12.0																							
8-Sep	3.6	2.3	2.1	Z	3.2	3.8	3.2	2.2	2.5	3.7	4.0	2.6	2.1	1.6	2.5	1.6	1.7	9.6	17.3	14.8	9.8	9.6	6.1	5.3	5.0	17.3																							
9-Sep	4.1	5.3	5.2	4.7	Z	5.8	5.5	4.0	2.8	3.3	3.7	3.5	2.8	2.3	1.5	1.5	1.2	6.8	11.1	8.9	5.3	3.5	3.7	3.2	4.3	11.1																							
10-Sep	5.2	2.6	1.5	1.9	6.7	Z	2.7	2.1	1.6	2.2	2.7	2.6	2.4	2.5	2.1	2.3	3.3	3.6	4.7	4.8	4.7	3.8	4.2	2.9	3.2	6.7																							
11-Sep	Z	2.1	1.9	1.8	3.5	2.8	4.6	4.5	4.6	4.1	3.8	3.6	3.0	2.9	2.7	4.0	5.4	4.9	8.6	6.9	5.7	2.6	7.5	1.8	4.1	8.6																							
12-Sep	2.9	Z	3.9	3.6	6.0	10.4	9.1	6.0	5.2	4.7	4.4	2.9	3.5	3.7	2.8	3.2	4.2	7.3	7.0	8.2	11.7	9.3	13.4	10.4	6.3	13.4																							
13-Sep	8.5	6.5	Z	6.6	9.7	10.3	9.6	9.0	5.9	3.2	2.0	1.7	1.3	1.2	1.4	1.6	2.0	2.6	1.5	1.8	1.2	1.0	0.6	0.7	3.9	10.3																							
14-Sep	0.7	0.8	0.7	Z	1.3	1.7	1.9	3.5	3.8	2.0	1.6	1.4	1.3	1.0	1.0	1.2	2.3	1.8	5.8	3.4	4.9	6.8	2.5	5.3	2.5	6.8																							
15-Sep	6.7	4.5	3.6	5.3	Z	6.4	5.2	2.6	C	C	C	C	C	C	C	4.0	7.1	7.2	16.8	20.9	8.8	8.5	5.9	4.3	--	20.9																							
16-Sep	3.5	3.1	2.9	3.7	11.8	Z	11.5	10.0	7.2	7.3	5.2	3.3	2.2	2.4	2.3	3.5	4.2	6.2	6.4	21.4	20.0	15.6	11.6	6.4	7.5	21.4																							
17-Sep	Z	4.5	2.8	3.1	4.4	6.7	4.3	2.3	2.0	2.9	3.0	3.0	2.4	2.5	2.8	3.1	4.4	6.8	15.4	10.9	18.7	17.4	9.2	6.8	6.1	18.7																							
18-Sep	4.4	Z	8.2	6.1	11.9	7.3	7.1	6.7	6.2	6.2	3.7	1.6	1.2	1.5	1.5	2.2	2.3	2.9	7.0	12.1	7.4	2.0	1.3	2.9	4.9	12.1																							
19-Sep	2.1	1.1	Z	4.9	5.7	8.4	5.3	4.0	1.6	1.4	1.4	1.5	1.4	1.6	1.6	2.2	2.7	7.6	10.6	7.5	7.3	8.3	9.9	7.3	4.6	10.6																							
20-Sep	5.7	5.9	4.0	Z	6.5	4.4	5.7	5.6	6.3	5.8	6.9	9.4	7.8	5.2	5.8	6.8	6.8	9.7	13.6	8.7	8.3	8.2	11.2	10.7	7.3	13.6																							
21-Sep	9.3	6.7	5.2	4.7	Z	5.9	6.4	6.0	3.8	4.9	4.2	2.9	1.5	2.5	2.1	2.7	4.0	4.8	5.3	8.6	13.4	9.8	7.9	5.4	5.6	13.4																							
22-Sep	3.4	3.7	5.2	5.7	7.4	Z	10.0	8.5	5.4	4.9	4.5	3.2	3.9	3.9	4.8	6.1	4.3	6.0	18.2	28.9	9.8	4.6	4.0	3.7	7.0	28.9																							
23-Sep	Z	3.1	3.1	3.1	4.7	5.1	5.7	5.1	4.6	4.1	3.5	2.7	2.7	2.7	2.6	3.4	4.5	4.6	7.0	4.8	4.1	2.8	1.8	1.5	3.8	7.0																							
24-Sep	1.4	Z	2.0	2.1	3.3	4.7	3.5	3.0	2.7	3.1	3.4	3.6	2.7	2.4	2.6	3.2	4.6	6.9	9.0	7.3	11.5	9.1	2.9	2.2	4.2	11.5																							
25-Sep	1.5	1.7	Z	7.5	11.6	17.5	16.7	10.2	2.9	1.9	3.1	2.1	0.9	0.5	1.8	1.9	1.2	0.8	9.2	13.9	8.4	4.1	3.6	3.6	5.5	17.5																							
26-Sep	1.6	1.4	1.8	Z	6.6	6.4	11.4	10.5	8.8	4.7	4.0	4.6	3.6	4.7	5.8	6.7	6.3	12.6	12.6	17.4	6.5	5.3	2.2	1.8	6.4	17.4																							
27-Sep	1.7	2.1	2.1	3.4	Z	12.1	14.2	12.9	5.2	2.4	3.7	1.6	1.8	1.6	2.1	3.7	4.3	5.0	12.5	10.0	8.0	8.7	6.1	6.9	5.7	14.2																							
28-Sep	4.2	2.9	4.4	8.3	14.9	Z	13.2	10.0	2.8	8.2	8.9	5.5	5.2	4.9	3.3	3.5	4.3	3.1	5.4	5.8	5.3	6.1	4.1	2.0	5.9	14.9																							
29-Sep	Z	2.4	1.9	3.4	7.3	11.3	12.0	9.1	7.9	6.8	4.6	6.8	4.4	1.3	2.1	3.7	5.0	4.3	5.9	5.7	4.6	6.0	8.8	11.0	5.9	12.0																							
30-Sep	9.5	Z	7.9	8.8	6.8	9.4	9.2	7.9	6.8	5.3	5.1	4.6	3.8	2.7	2.6	1.9	4.1	7.6	7.4	7.2	7.2	7.8	6.5	8.1	6.4	9.5																							
																								4.3	3.6	3.4	4.2	6.3	7.1	7.2	5.8	4.3	4.0	3.9	3.4	2.9	2.6	2.7	3.1	3.7	5.5	8.7	9.7	8.2	6.8	5.8	5.1	Diurnal Average	
																								9.7	7.8	8.2	8.8	14.9	17.5	16.7	12.9	8.8	8.2	8.9	9.4	7.8	6.6	6.7	6.8	7.1	12.6	18.2	28.9	20.0	17.4	13.4	11.0	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
Athabasca Valley - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	680	99.56	99.56
21 - 40	3	0.44	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: 683

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Athabasca Valley - September 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	3	10	20	70	193	62	41	48	63	47	28	16	32	34	677
21 - 40	0	0	0	0	0	0	1	2	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	9	1	3	10	20	70	194	64	41	48	63	47	28	16	32	34	680

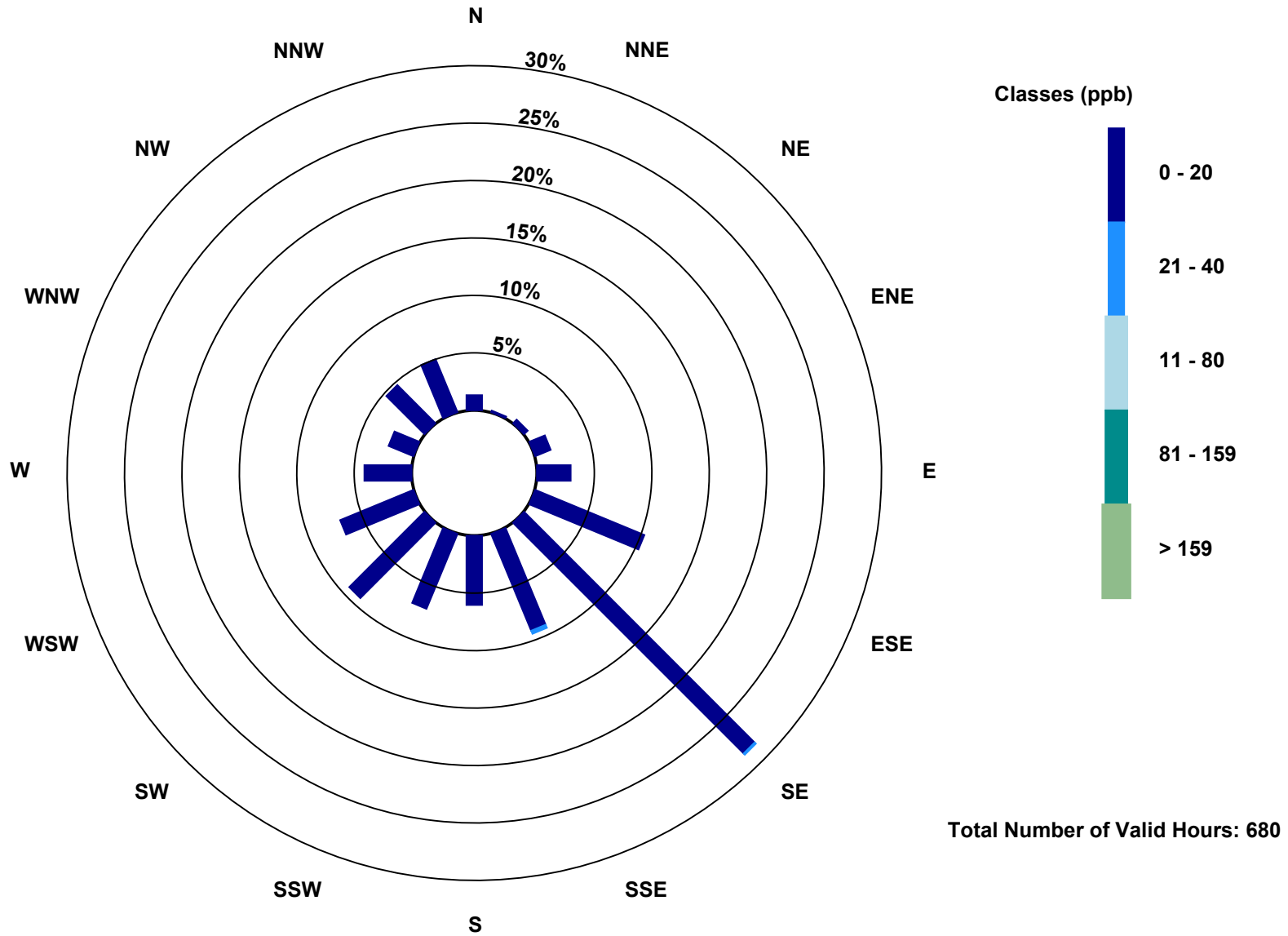
Total Number of Valid Hours: 680

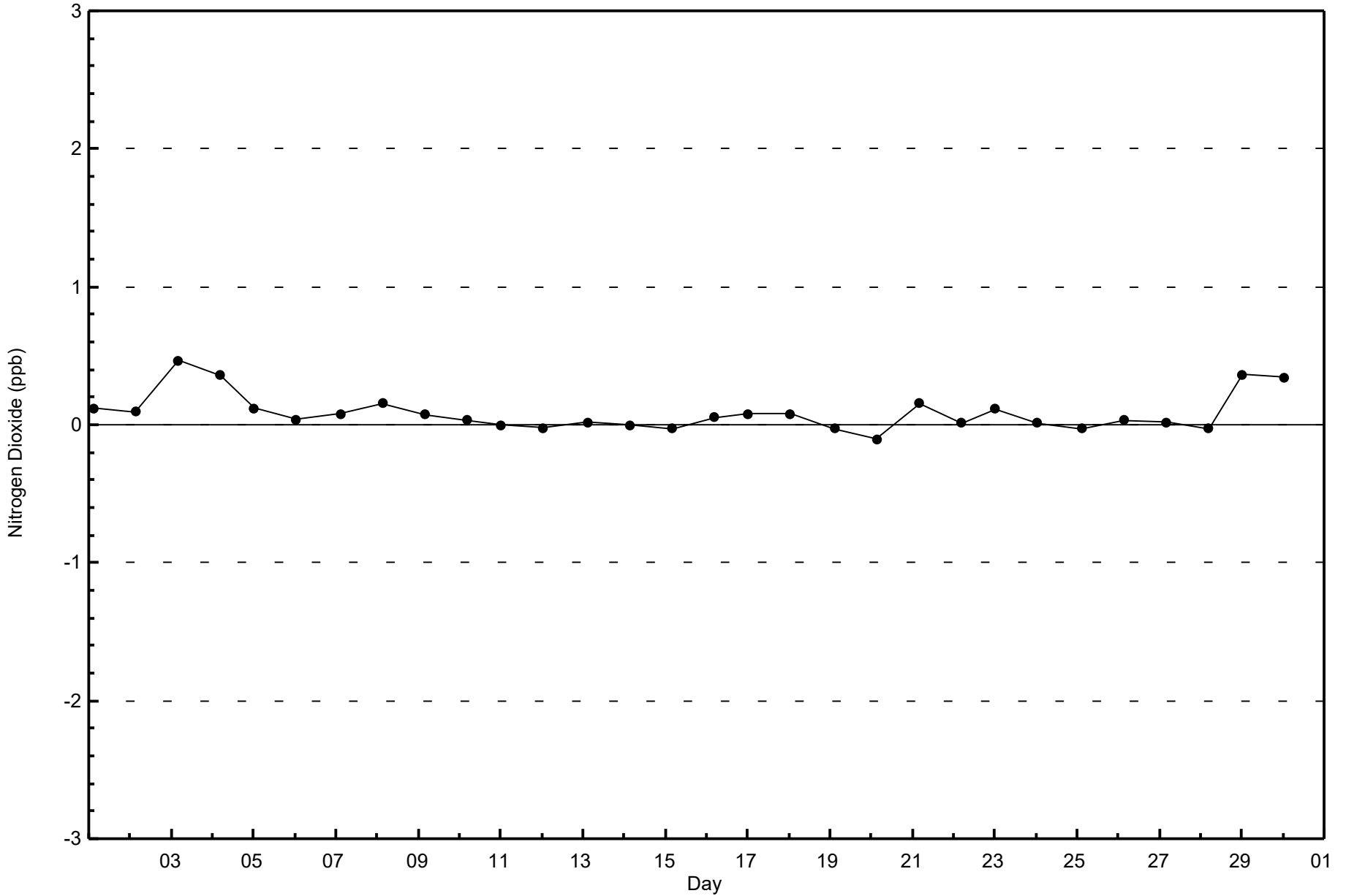
Total Number of Hours: 720

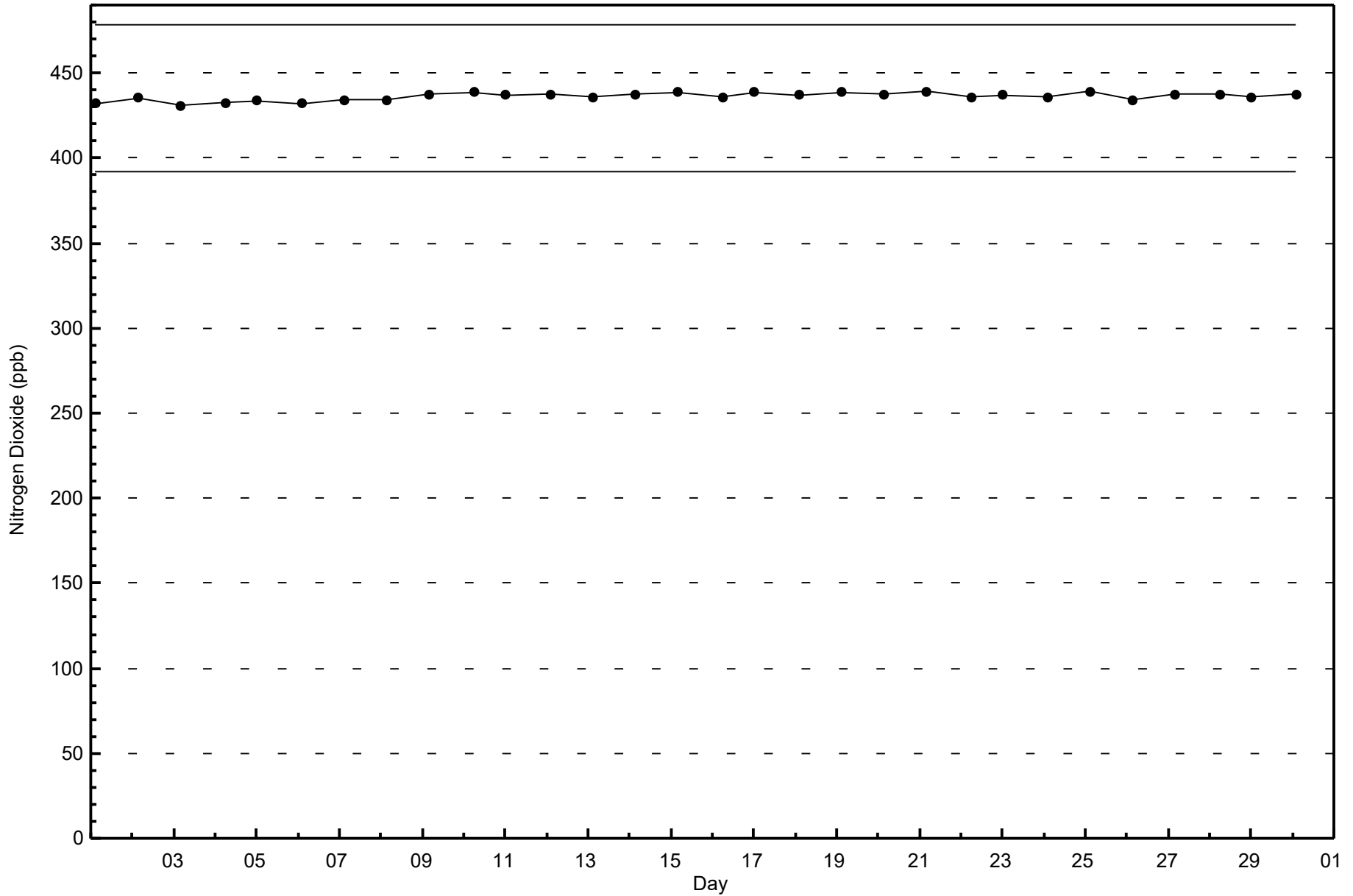


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitrogen Dioxide (NO₂) - ppb
Athabasca Valley









Wood Buffalo Environmental Association
Summary of Hour Averages

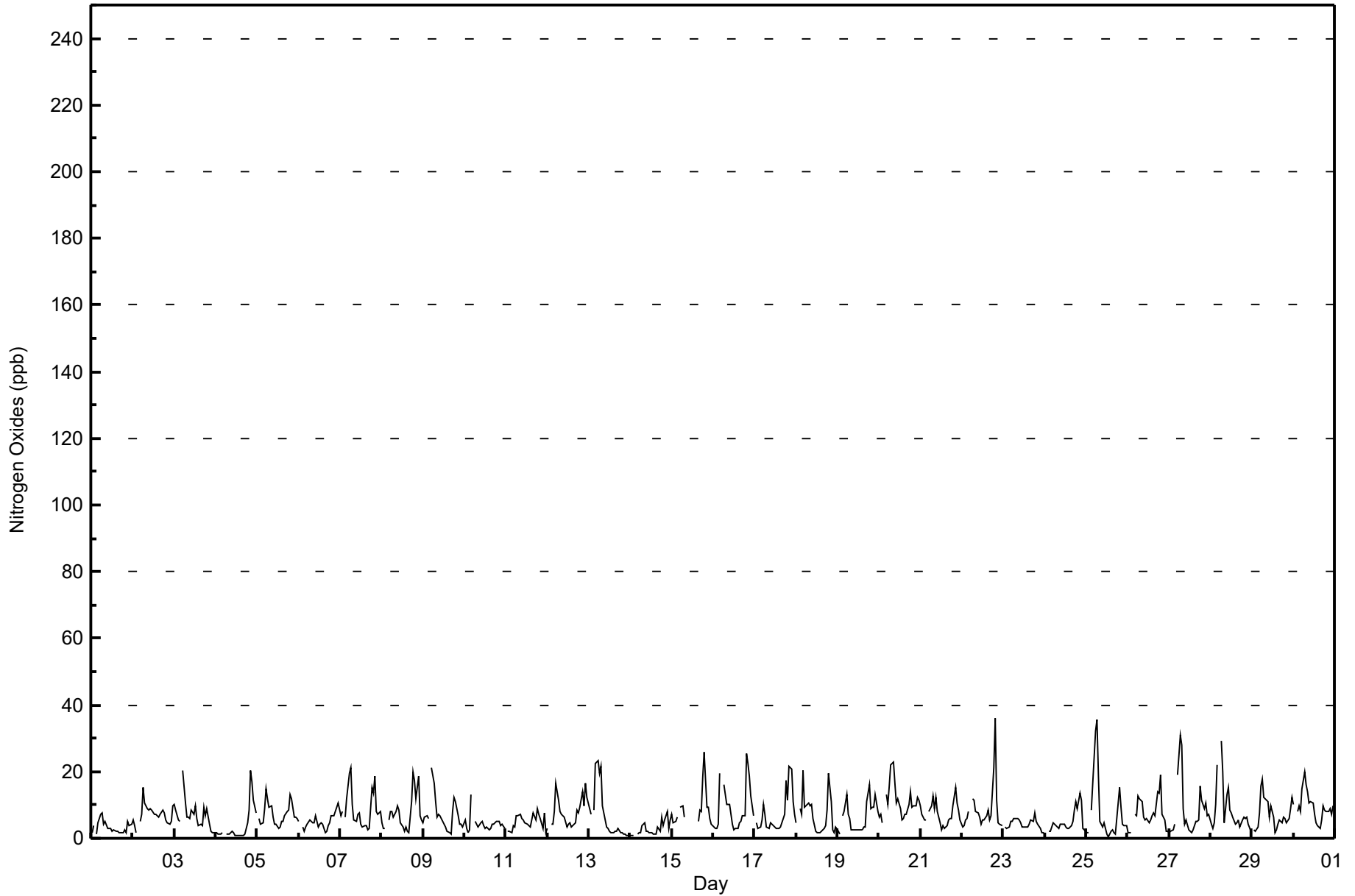
Nitrogen Oxides (NO_x) - ppb
Athabasca Valley - September 2023

Maximum Value: 36.0 ppb on Sep 22 20:00 Maximum Daily Average: 11.0 ppb on Sep 20																					Hours in Service:	720				
Minimum Value: 0.6 ppb on Sep 25 14:00 Minimum Daily Average: 2.8 ppb on Sep 14																					Hours of Data:	683				
Maximum Diurnal Average: 12.9 ppb at hour 7 Minimum Diurnal Average: 3.4 ppb at hour 15																					Hours of Missing Data:	37				
Monthly Average: 6.90 ppb Percentiles: P ₁ = 0.8 P ₁₀ = 1.9 Q ₁ = 3.4 Median = 5.5 Q ₃ = 8.8 P ₉₀ = 13.2 P ₉₉ = 25.5																					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-Sep	1.9	3.8	Z	1.4	4.7	7.3	7.6	4.3	5.1	2.9	3.0	2.8	2.3	2.5	2.0	2.2	1.6	1.6	1.7	2.4	1.8	4.9	3.7	4.2	3.3	7.6
2-Sep	5.4	3.8	1.6	Z	5.1	7.0	15.2	10.7	9.0	8.6	8.9	8.4	7.0	7.3	6.9	6.4	7.1	8.5	7.5	5.5	4.5	4.2	5.1	9.6	7.1	15.2
3-Sep	10.3	8.3	5.5	5.2	Z	20.2	10.4	6.4	6.3	6.0	8.5	7.0	9.8	6.0	3.6	4.1	3.9	9.4	6.8	8.8	4.3	2.3	1.9	1.5	6.8	20.2
4-Sep	1.5	1.1	1.4	1.3	1.5	Z	1.4	1.4	1.1	2.1	1.5	1.0	0.9	0.9	0.7	0.9	0.8	1.4	4.6	8.3	20.4	17.1	11.3	7.8	3.9	20.4
5-Sep	Z	5.7	4.3	4.8	8.9	14.8	11.8	9.5	9.7	6.4	4.3	4.4	3.0	3.6	5.1	5.3	7.0	8.2	8.5	13.2	11.8	6.6	6.5	5.8	7.3	14.8
6-Sep	5.0	Z	3.6	2.1	3.3	4.4	5.6	5.2	4.8	4.5	6.9	3.6	4.0	4.5	4.0	1.6	2.2	3.9	4.5	7.0	6.7	7.9	9.2	10.7	5.0	10.7
7-Sep	6.9	8.2	Z	6.4	11.8	19.6	21.3	10.1	5.5	5.1	7.1	7.6	4.3	3.5	3.6	3.9	2.7	3.0	15.3	13.7	18.5	8.0	7.1	8.1	8.8	21.3
8-Sep	4.6	2.9	2.8	Z	5.4	8.1	8.0	6.5	8.2	9.8	8.4	4.6	3.4	2.3	3.4	2.0	1.9	11.1	20.1	17.3	11.8	18.5	6.7	5.7	7.5	20.1
9-Sep	4.6	6.5	6.9	5.9	Z	21.1	16.7	10.9	6.2	7.1	6.8	5.2	4.1	3.3	2.0	1.8	1.3	8.2	12.2	11.2	6.8	4.2	4.1	3.4	7.0	21.1
10-Sep	5.6	3.2	1.7	2.6	13.1	Z	5.1	4.2	3.5	4.6	5.2	3.9	3.1	3.4	2.7	3.0	4.2	4.1	5.1	5.2	5.0	4.0	4.3	3.0	4.3	13.1
11-Sep	Z	2.2	2.0	1.9	3.7	3.3	6.6	6.8	7.3	6.0	5.4	4.8	4.0	3.7	3.4	5.4	7.5	5.5	9.0	7.2	5.9	2.8	7.7	1.8	5.0	9.0
12-Sep	2.9	Z	4.1	4.0	8.2	16.7	11.3	7.9	7.3	6.6	6.3	3.5	4.2	4.5	3.3	4.0	4.8	8.5	7.6	9.5	13.9	9.8	16.7	12.4	7.7	16.7
13-Sep	8.9	7.2	Z	8.5	22.5	23.3	19.3	21.4	9.8	5.3	3.4	2.9	2.1	1.7	1.8	2.0	2.3	2.8	1.6	1.9	1.3	1.1	0.7	0.7	6.6	23.3
14-Sep	0.8	0.8	0.7	Z	1.4	1.8	1.9	3.8	4.5	2.3	1.9	1.6	1.6	1.2	1.2	1.4	3.2	2.0	6.4	4.0	5.6	8.0	2.8	5.6	2.8	8.0
15-Sep	7.3	4.9	4.9	6.4	Z	9.4	9.9	6.4	C	C	C	C	C	C	C	4.9	8.4	7.9	18.2	25.8	9.4	9.2	6.0	4.4	--	25.8
16-Sep	3.5	3.1	2.9	4.1	19.5	Z	16.1	13.3	10.0	10.2	7.3	4.3	2.7	3.0	2.8	4.5	5.0	6.9	6.8	25.4	22.3	18.5	12.9	6.7	9.2	25.4
17-Sep	Z	4.8	3.0	3.6	5.4	10.3	7.1	3.5	3.1	4.5	4.3	3.9	2.9	2.8	3.2	3.5	4.8	7.2	17.3	11.5	21.5	20.9	10.8	7.3	7.3	21.5
18-Sep	4.7	Z	9.0	7.2	20.5	9.1	10.2	10.5	9.9	10.2	6.0	1.9	1.5	1.8	1.8	2.7	3.2	3.7	8.7	19.6	10.9	2.6	1.6	3.3	7.0	20.5
19-Sep	2.2	1.2	Z	6.9	8.2	13.1	7.0	6.0	2.8	2.6	2.4	2.6	2.4	2.7	2.4	3.4	3.6	11.0	16.2	8.8	9.3	9.3	13.2	8.2	6.3	16.2
20-Sep	6.4	7.2	4.7	Z	13.0	10.0	15.8	21.9	22.9	16.6	10.8	12.0	8.9	5.5	6.1	7.3	7.2	10.1	14.2	9.3	9.8	9.7	12.3	11.4	11.0	22.9
21-Sep	9.9	7.1	5.6	5.5	Z	8.2	9.8	12.7	8.9	12.4	7.8	4.7	2.4	3.8	3.1	4.0	5.4	6.0	6.1	9.7	15.1	10.7	8.3	5.6	7.5	15.1
22-Sep	3.5	3.9	5.4	6.1	8.0	Z	11.9	11.5	7.9	7.7	6.4	4.4	5.5	5.4	7.0	8.6	5.4	6.8	21.3	36.0	11.3	4.8	4.1	3.8	8.5	36.0
23-Sep	Z	3.2	3.2	3.2	4.9	5.2	6.1	5.9	6.1	5.6	4.6	3.5	3.5	3.4	3.3	4.2	5.4	5.1	7.6	5.2	4.4	3.0	1.9	1.6	4.3	7.6
24-Sep	1.4	Z	2.0	2.1	3.5	4.8	3.7	3.4	3.2	4.1	4.2	4.4	3.3	2.9	3.0	3.6	5.3	8.4	11.1	8.7	13.5	11.3	3.1	2.5	4.9	13.5
25-Sep	1.5	1.8	Z	8.7	16.6	32.1	35.8	19.2	5.0	3.5	4.8	3.0	1.1	0.6	2.2	2.6	1.5	1.2	10.7	15.2	9.3	4.4	3.9	3.7	8.2	35.8
26-Sep	1.7	1.5	1.9	Z	7.1	6.8	12.5	12.1	10.9	6.4	5.5	6.0	4.5	5.4	6.6	7.4	6.7	14.0	13.8	18.9	7.3	5.7	2.3	1.9	7.2	18.9
27-Sep	1.9	2.2	2.4	4.2	Z	19.2	30.9	28.1	9.0	4.1	5.6	2.3	2.2	1.9	2.6	4.9	5.0	5.5	15.5	11.4	9.1	10.6	6.9	7.0	8.4	30.9
28-Sep	4.4	3.0	4.8	10.2	21.9	Z	29.4	19.8	4.7	13.1	15.2	8.6	7.5	6.3	4.2	4.5	5.6	3.4	5.6	6.2	5.7	6.3	4.2	2.0	8.6	29.4
29-Sep	Z	2.4	1.9	3.4	7.8	15.8	17.9	12.2	11.4	10.8	6.5	9.8	6.4	1.5	2.6	4.4	5.6	4.5	6.4	6.1	4.9	6.1	9.1	12.5	7.4	17.9
30-Sep	10.0	Z	8.1	9.9	8.3	14.9	19.8	16.0	13.8	10.4	11.0	10.5	7.1	4.5	3.9	3.0	5.4	9.5	8.6	8.3	8.2	8.9	7.3	9.8	9.4	19.8
																								Diurnal Average		
																								Diurnal Maximum		
																								4.7 4.0 3.8 5.0 9.4 12.3 12.9 10.4 7.5 6.9 6.2 4.9 4.0 3.4 3.4 3.9 4.5 6.3 10.0 11.4 9.7 8.0 6.5 5.7		
																								10.3 8.3 9.0 10.2 22.5 32.1 35.8 28.1 22.9 16.6 15.2 12.0 9.8 7.3 7.0 8.6 8.4 14.0 21.3 36.0 22.3 20.9 16.7 12.5		
																								Z - zerospan C - Calibration		



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	663	97.07	97.07
21 - 40	20	2.93	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 683

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Athabasca Valley - September 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	3	10	17	68	184	59	41	48	63	47	28	16	32	34	660
21 - 40	0	0	0	0	3	2	10	5	0	0	0	0	0	0	0	0	20
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	1	3	10	20	70	194	64	41	48	63	47	28	16	32	34	680

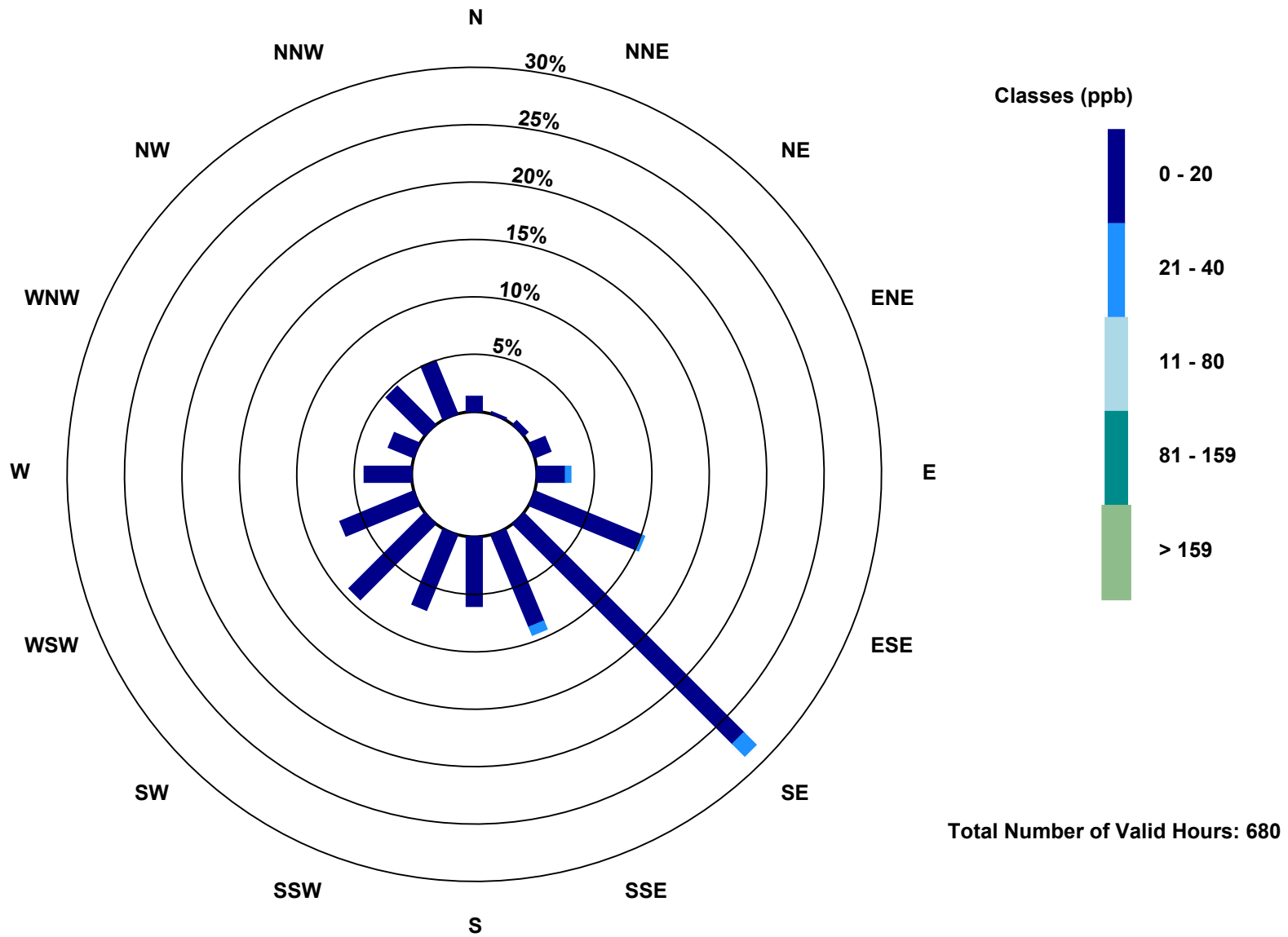
Total Number of Valid Hours: 680

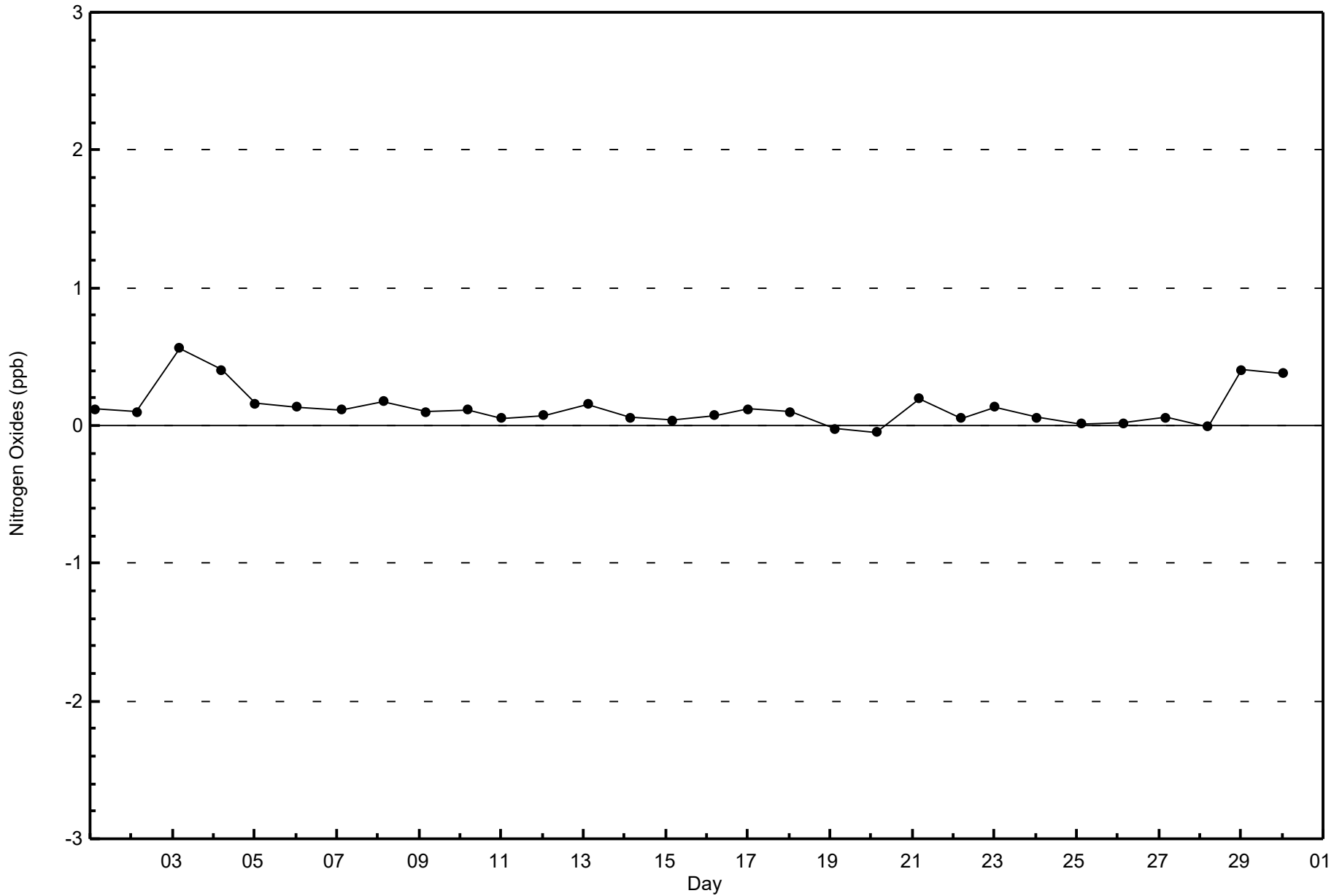
Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitrogen Oxides (NO_x) - ppb
Athabasca Valley

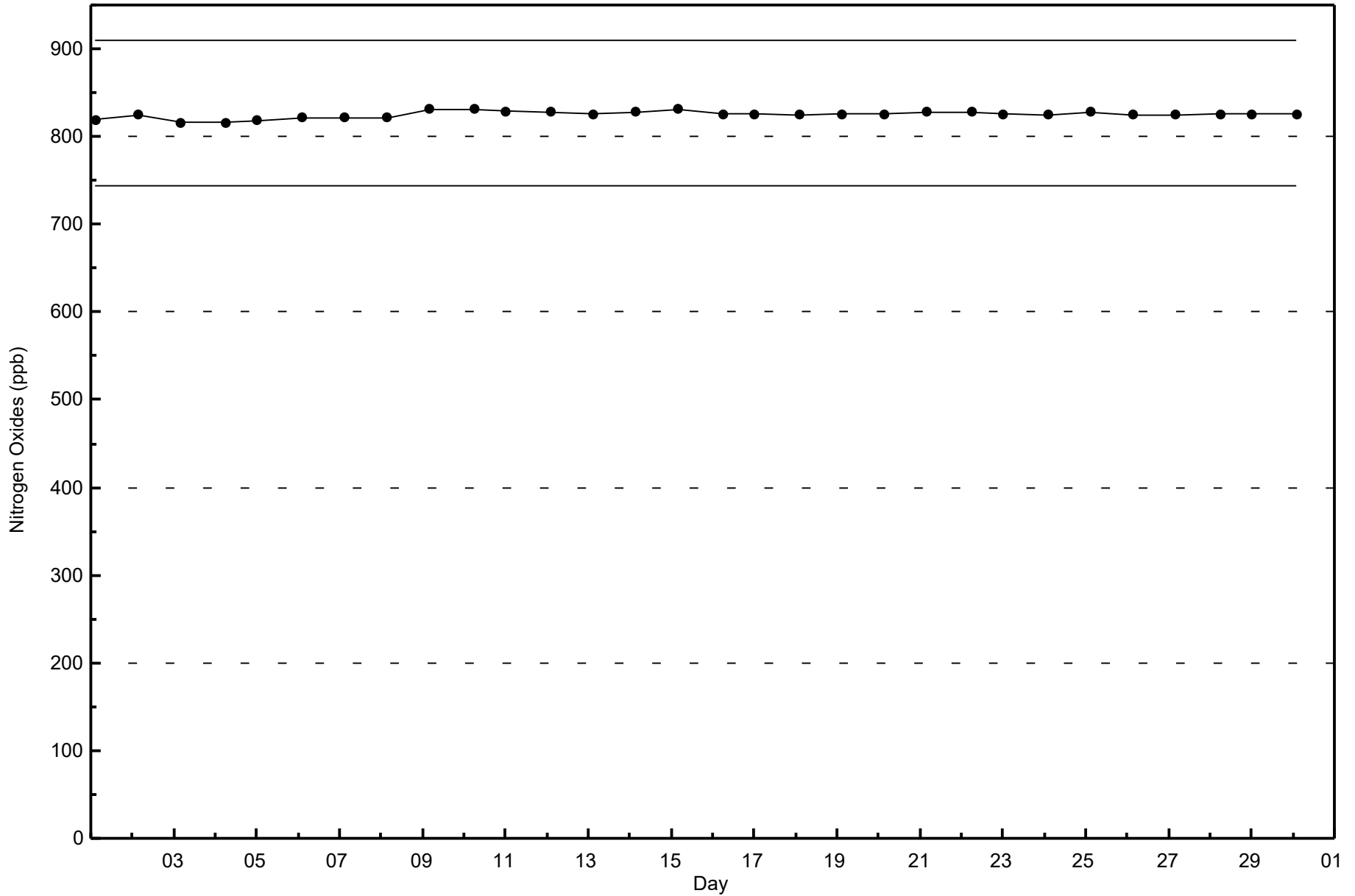






Wood Buffalo Environmental Association
Span Responses

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

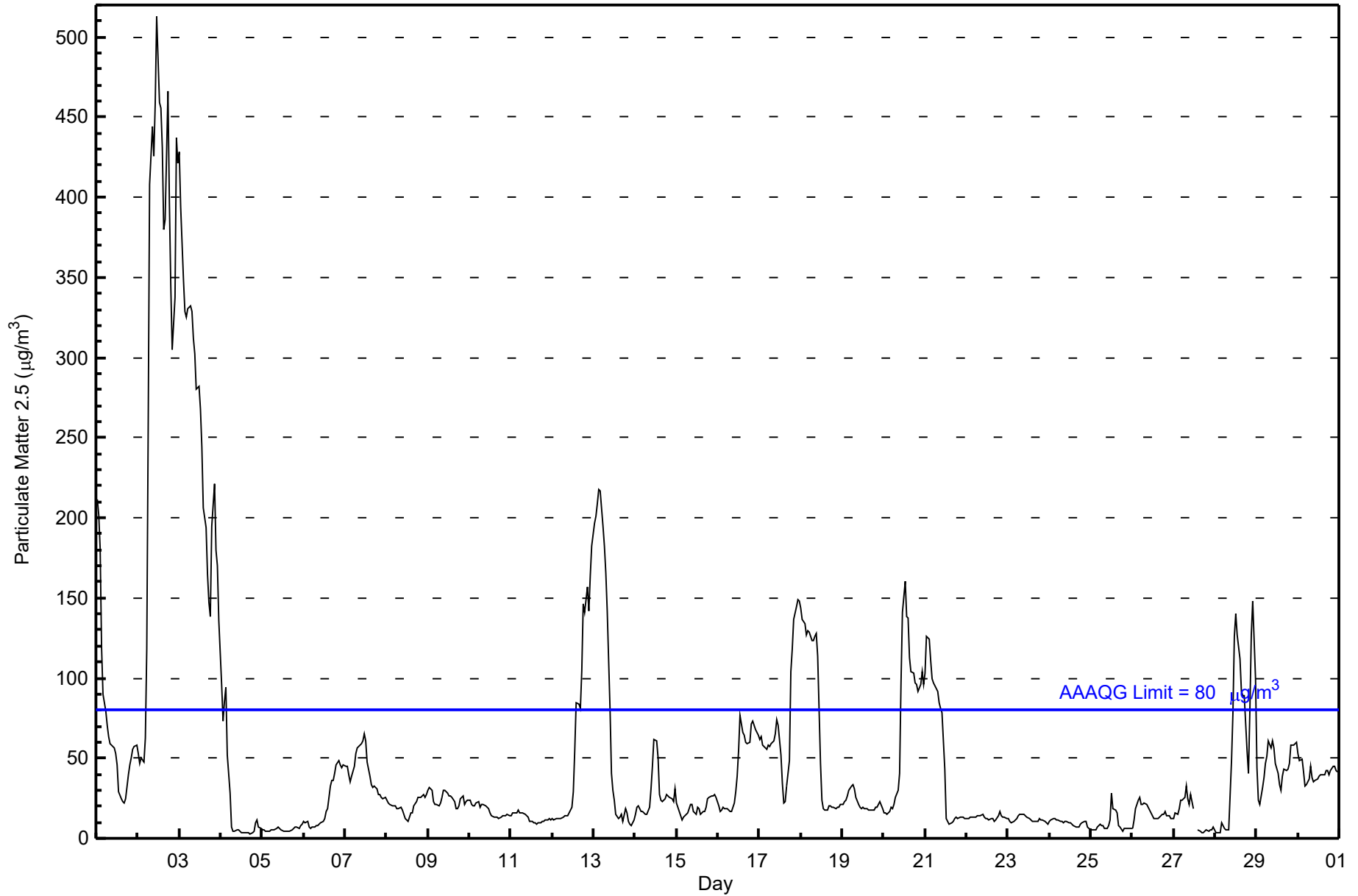




Number of Exceedences (AAAQO):	1-hr: 122	24-hr: 14	Hours in Service:	720
Maximum Value: 512.7 µg/m ³ on Sep 2 12:00	Maximum Daily Average: 321.0 µg/m ³ on Sep 2		Hours of Data:	718
Minimum Value: 3.1 µg/m ³ on Sep 4 18:00	Minimum Daily Average: 5.6 µg/m ³ on Sep 5		Hours of Missing Data:	2
Maximum Diurnal Average: 59.2 µg/m ³ at hour 12	Minimum Diurnal Average: 44.0 µg/m ³ at hour 17		Hours of Calibration:	2
Monthly Average: 52.61 µg/m ³	Percentiles: P ₁ = 3.8 P ₁₀ = 7.0 Q ₁ = 12.5 Median = 21.2 Q ₃ = 53.0 P ₉₀ = 134.1 P ₉₉ = 430.7		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-Sep	211.8	202.0	180.6	118.6	90.3	79.1	70.9	63.3	59.2	57.5	56.6	52.5	45.8	28.8	24.3	23.2	22.3	24.4	39.6	45.7	49.9	55.9	56.9	58.5	71.6	211.8																						
2-Sep	53.2	46.6	50.4	47.8	62.2	118.4	255.8	408.1	444.4	425.5	459.4	512.7	459.0	455.2	431.2	379.6	385.8	466.3	397.1	345.0	305.2	337.2	436.9	421.6	321.0	512.7																						
3-Sep	428.4	394.4	348.2	329.0	325.3	330.7	332.4	328.4	311.9	302.7	279.9	282.3	268.2	244.1	206.1	194.0	164.9	147.6	138.1	194.9	220.9	179.4	169.8	135.4	260.7	428.4																						
4-Sep	96.3	72.9	85.3	94.0	51.7	27.8	6.7	4.4	4.0	5.0	5.6	4.7	3.9	3.2	3.4	3.8	3.3	3.1	3.5	4.7	9.8	11.2	6.9	6.2	21.7	96.3																						
5-Sep	5.7	5.1	4.6	4.5	4.7	5.1	5.0	4.9	6.0	6.7	6.4	5.6	4.6	4.4	4.2	4.2	4.5	5.6	6.3	6.8	6.9	5.8	8.2	8.5	5.6	8.5																						
6-Sep	10.3	9.9	10.4	7.0	6.5	6.8	7.4	7.8	8.1	8.9	9.4	10.3	11.9	16.3	18.5	33.0	36.0	35.8	40.8	46.2	48.3	46.1	44.4	45.6	21.9	48.3																						
7-Sep	44.8	44.8	39.9	35.4	38.7	45.3	53.1	56.4	57.0	58.8	60.7	65.2	60.6	47.5	38.8	33.8	32.0	33.0	30.9	27.2	27.2	25.9	25.1	25.8	42.0	65.2																						
8-Sep	23.9	22.1	21.2	20.5	20.1	19.9	18.7	18.2	19.0	17.7	14.9	12.0	10.6	13.7	16.0	15.7	20.5	22.7	25.3	25.4	25.9	27.3	26.0	27.4	20.2	27.4																						
9-Sep	30.2	32.1	29.7	23.3	21.2	21.4	20.5	22.1	25.8	29.6	30.2	28.6	26.1	26.8	25.8	22.8	18.6	18.4	20.3	24.4	26.3	21.4	23.3	23.4	24.7	32.1																						
10-Sep	24.2	20.9	20.1	20.1	21.9	22.9	19.7	21.5	21.1	20.7	19.2	18.2	15.5	14.4	12.8	12.8	13.1	12.7	13.1	13.8	14.4	14.5	14.6	14.3	17.3	24.2																						
11-Sep	14.4	15.9	16.1	15.8	17.2	16.2	16.0	15.5	15.2	14.1	12.9	10.7	10.5	9.6	9.6	9.0	9.3	9.6	10.7	10.7	11.0	11.1	12.1	11.4	12.7	17.2																						
12-Sep	11.9	11.9	12.2	12.2	11.9	12.7	13.3	13.8	13.7	13.8	15.8	19.2	29.2	54.4	84.5	84.1	81.5	105.1	146.2	141.2	157.1	141.9	163.8	182.4	63.9	182.4																						
13-Sep	196.8	200.9	209.3	218.1	217.2	195.1	182.4	165.7	142.2	80.6	40.7	29.6	23.7	15.2	12.5	13.0	15.0	10.6	18.4	15.8	10.6	8.6	8.3	11.2	85.0	218.1																						
14-Sep	15.0	19.2	20.2	17.1	16.5	16.3	15.0	15.0	19.2	31.3	44.6	61.9	60.7	50.6	27.1	23.5	22.6	24.9	26.9	26.3	25.5	24.8	23.0	30.7	27.4	61.9																						
15-Sep	22.1	19.2	14.3	11.8	13.2	14.1	16.0	18.8	20.8	20.8	17.1	15.3	19.2	18.6	14.9	16.8	16.6	19.2	24.9	25.9	26.0	26.7	27.4	25.3	19.4	27.4																						
16-Sep	19.8	17.0	17.4	19.0	18.8	18.2	17.3	16.3	17.0	21.9	28.7	38.9	54.4	77.1	66.3	64.3	60.2	58.9	60.3	71.1	73.4	70.5	68.0	64.5	43.3	77.1																						
17-Sep	62.1	63.3	58.0	56.7	55.8	58.4	57.7	59.0	60.7	65.0	74.4	70.2	51.8	34.7	22.2	23.0	32.3	48.3	104.3	118.2	136.2	144.7	149.2	147.8	73.1	149.2																						
18-Sep	143.9	136.9	133.6	127.2	129.7	129.0	123.4	123.6	125.7	127.4	113.3	46.4	24.2	18.9	17.2	17.5	20.6	20.7	19.3	19.0	18.8	19.7	19.8	21.0	70.7	143.9																						
19-Sep	20.9	22.6	23.6	26.6	30.3	32.8	33.2	30.9	25.5	21.3	19.6	18.5	19.2	18.9	18.1	17.5	17.3	17.2	17.8	19.1	19.8	21.6	22.9	18.4	22.2	33.2																						
20-Sep	16.1	15.6	15.1	17.1	19.5	18.6	21.2	25.8	29.9	40.5	97.1	140.9	160.8	138.3	137.1	112.7	104.4	102.8	97.3	95.8	92.0	95.9	104.0	95.7	74.8	160.8																						
21-Sep	103.1	126.4	124.3	111.4	99.5	97.2	93.4	91.7	84.2	80.8	78.7	42.8	12.1	10.2	8.9	9.8	10.6	12.1	13.6	12.6	13.3	12.9	13.6	12.5	53.2	126.4																						
22-Sep	12.6	12.6	12.9	13.1	13.2	13.7	13.8	14.2	14.3	14.9	13.1	12.2	12.0	11.5	12.2	12.2	10.3	11.3	13.9	16.9	14.3	13.5	13.4	12.7	13.1	16.9																						
23-Sep	12.2	10.9	9.9	10.4	11.1	12.6	14.2	14.9	15.0	14.9	14.2	13.0	11.9	11.5	10.9	10.9	10.6	10.9	12.3	11.2	11.2	10.8	9.6	9.3	11.8	15.0																						
24-Sep	10.7	11.9	12.3	12.0	11.6	11.1	10.9	10.3	10.0	10.2	10.2	10.0	9.2	8.1	7.2	7.4	7.5	8.5	9.6	10.3	10.9	7.1	6.3	6.3	9.7	12.3																						
25-Sep	5.3	5.1	5.3	5.3	6.9	9.1	8.3	7.8	5.8	6.1	8.0	11.4	28.3	18.8	17.8	16.0	8.0	7.3	4.8	6.1	6.5	6.5	6.2	6.2	9.0	28.3																						
26-Sep	6.4	11.1	18.3	23.4	25.6	21.5	21.6	21.7	21.5	19.4	17.5	15.7	12.8	12.5	12.0	12.5	13.4	14.6	15.2	16.8	14.3	13.8	12.0	12.2	16.1	25.6																						
27-Sep	12.7	15.5	15.1	18.7	24.1	24.0	25.2	32.9	24.6	21.5	27.7	18.7	C	C	4.9	4.6	3.8	3.9	4.8	5.0	4.8	5.0	4.9	7.3	14.1	32.9																						
28-Sep	3.8	3.5	3.3	3.8	9.6	6.6	5.3	5.1	5.1	48.2	78.9	125.8	139.9	126.9	111.6	91.7	88.8	88.6	54.8	40.3	79.8	126.5	147.7	99.4	62.3	147.7																						
29-Sep	43.7	23.8	21.1	31.8	37.7	46.9	51.5	61.0	56.1	60.5	56.6	46.8	40.8	33.1	29.9	38.6	42.9	42.1	43.2	46.6	58.3	58.4	58.7	60.2	45.4	61.0																						
30-Sep	52.8	48.9	49.6	41.1	32.8	33.3	37.3	45.0	38.3	35.5	35.8	36.6	38.5	39.5	39.5	39.4	42.5	42.0	40.0	42.7	45.4	44.6	42.6	41.3	41.0	52.8																						
																								57.2	54.8	52.7	49.8	48.2	48.8	52.2	57.5	56.7	56.0	58.2	59.2	57.5	53.9	48.2	44.9	44.0	47.6	48.4	49.5	52.1	53.1	57.5	54.8	Diurnal Average
																								428.4	394.4	348.2	329.0	325.3	330.7	332.4	408.1	444.4	425.5	459.4	512.7	459.0	455.2	431.2	379.6	385.8	466.3	397.1	345.0	305.2	337.2	436.9	421.6	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}) - µg/m³
Athabasca Valley - September 2023

Concentration Ranges (µg/m³)	Number of Hours	%	Cumulative %
0 - 5	45	6.27	6.27
6 - 15	210	29.25	35.52
16 - 25	157	21.87	57.38
26 - 80	184	25.63	83.01
> 81.0	122	16.99	100.00

Total Number of Valid Hours: 718

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - μg/m³
Athabasca Valley - September 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	0	0	0	0	0	3	7	8	7	4	2	3	1	4	6	0	45
6 - 15	0	0	0	3	5	21	90	18	19	21	11	12	3	3	3	1	210
16 - 25	1	1	1	4	3	13	46	10	13	12	16	10	11	3	6	7	157
26 - 80	8	0	1	4	9	28	34	19	4	8	24	7	7	4	11	16	184
> 81.0	1	0	1	0	3	6	34	15	3	4	12	15	5	2	6	12	119
Totals	10	1	3	11	20	71	211	70	46	49	65	47	27	16	32	36	715

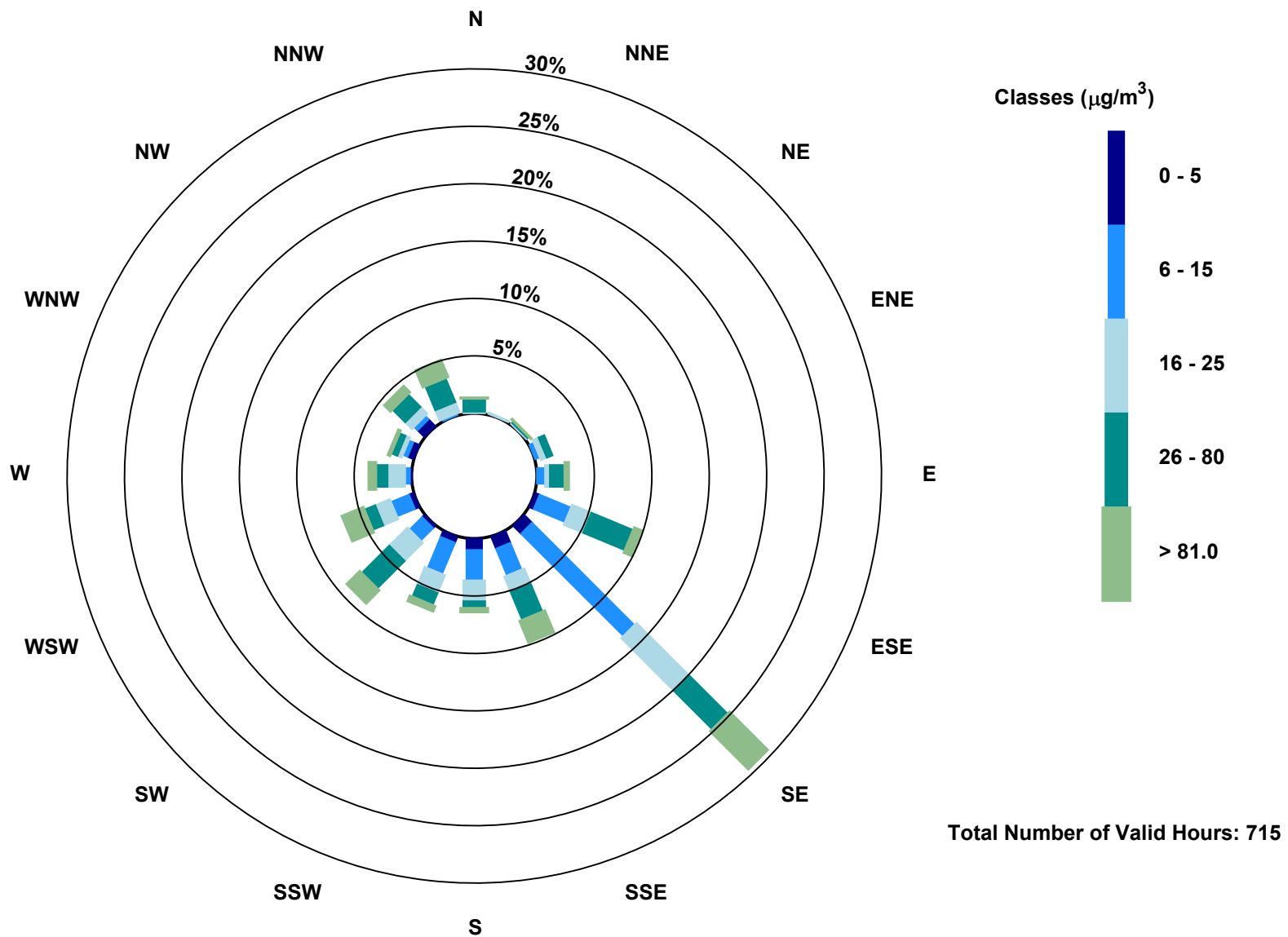
Total Number of Valid Hours: 715

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

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





Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 2.1 ppm on Sep 2 18:00	Maximum Daily Average: 1.4 ppm on Sep 2		Hours of Data:	686
Minimum Value: 0.1 ppm on Sep 28 02:00	Minimum Daily Average: 0.2 ppm on Sep 23		Hours of Missing Data:	34
Maximum Diurnal Average: 0.4 ppm at hour 1	Minimum Diurnal Average: 0.3 ppm at hour 4		Hours of Calibration:	34
Monthly Average: 0.38 ppm	Percentiles: P ₁ = 0.2 P ₁₀ = 0.2 Q ₁ = 0.2 Median = 0.3 Q ₃ = 0.4 P ₉₀ = 0.7 P ₉₉ = 1.8		Percent Operational Time:	100.0

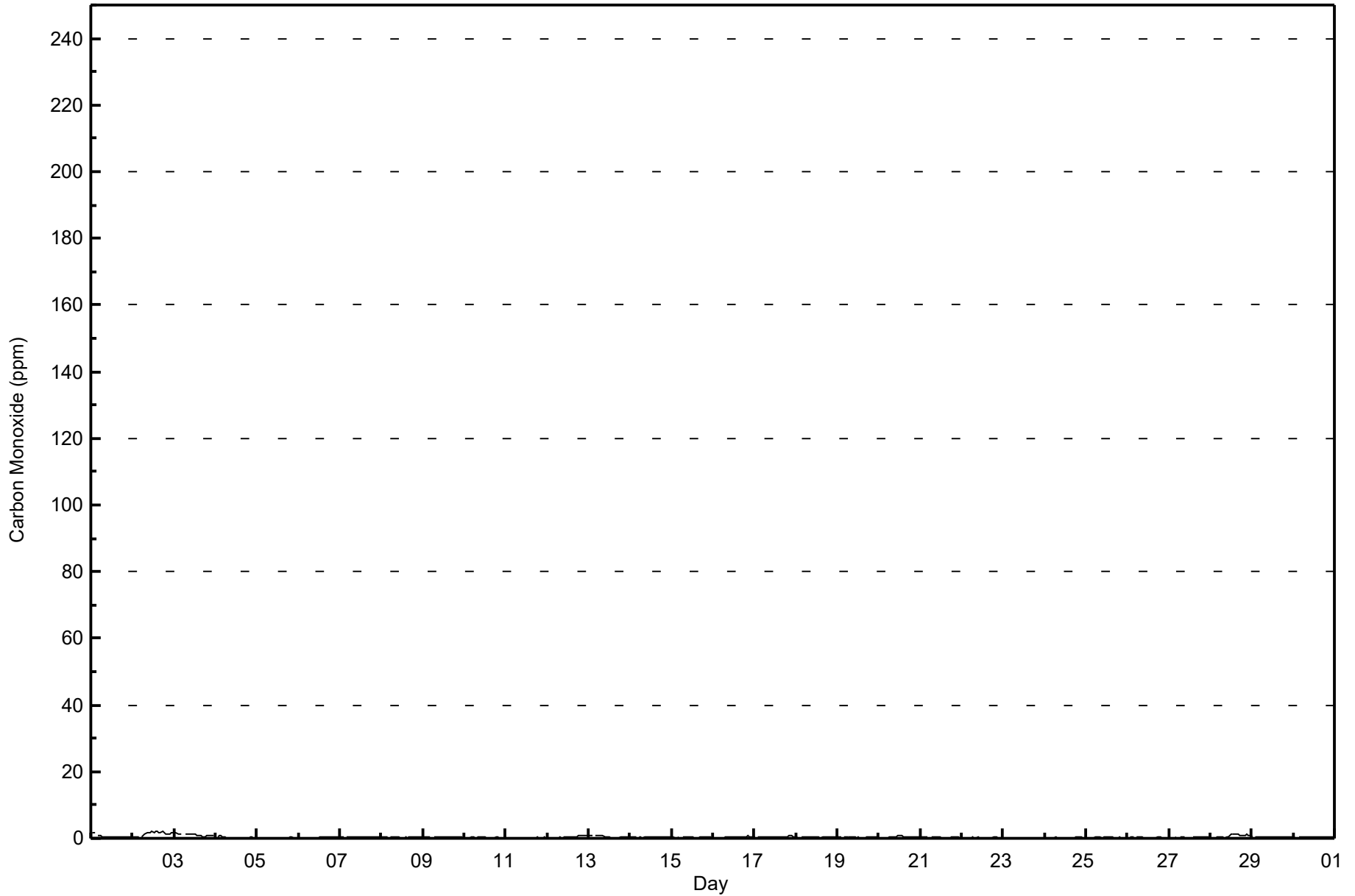
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Sep	1.9	1.8	1.5	Z	0.8	0.7	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.6	1.9																						
2-Sep	0.3	0.3	0.3	0.3	Z	0.5	0.9	1.4	1.5	1.5	1.7	1.9	1.9	2.1	1.9	1.7	1.9	2.1	1.7	1.4	1.3	1.4	1.7	1.7	1.4	2.1																						
3-Sep	1.7	1.5	1.3	1.3	1.3	Z	1.3	1.2	1.2	1.2	1.1	1.1	1.1	1.0	0.8	0.7	0.6	0.6	0.6	0.8	0.9	0.9	0.9	0.8	1.0	1.7																						
4-Sep	Z	0.6	0.7	0.7	0.5	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.3	0.7																						
5-Sep	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																						
6-Sep	0.2	0.2	Z	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4																						
7-Sep	0.4	0.4	0.4	Z	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.6																						
8-Sep	0.3	0.2	0.2	0.2	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	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.4																						
9-Sep	0.3	0.3	0.3	0.2	0.2	Z	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.3																						
10-Sep	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																						
11-Sep	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																						
12-Sep	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.5	0.5	0.5	0.6	0.8	0.8	0.9	0.8	0.9	0.9	0.4	0.9																						
13-Sep	0.9	0.9	0.9	Z	1.0	0.9	0.9	0.9	0.7	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.5	1.0																						
14-Sep	0.3	0.3	0.3	0.3	Z	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.4																						
15-Sep	0.3	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.3	0.3	0.2	0.2	0.4																						
16-Sep	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.6	0.7	0.5	0.4	0.3	0.3	0.7																						
17-Sep	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.2	0.2	0.3	0.3	0.5	0.6	0.6	0.7	0.6	0.6	0.4	0.7																						
18-Sep	0.6	0.6	Z	0.5	0.6	0.5	0.5	0.5	0.6	0.6	0.5	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.4	0.6																						
19-Sep	0.2	0.2	0.2	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	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.2	0.3																						
20-Sep	0.2	0.2	0.2	0.2	Z	0.2	0.3	0.3	0.3	0.3	0.6	0.7	0.8	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.4	0.8																						
21-Sep	0.4	0.5	0.5	0.5	0.5	Z	0.5	0.5	0.5	0.5	0.5	0.3	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	0.5																						
22-Sep	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.2	0.2	0.2	0.2	0.2	0.4																						
23-Sep	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	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-Sep	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	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.3																						
25-Sep	0.2	0.2	0.2	Z	0.2	0.3	0.3	0.4	0.2	0.2	0.2	0.3	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.4																						
26-Sep	0.2	0.2	0.2	0.3	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3																						
27-Sep	0.2	0.2	0.2	0.2	0.3	Z	0.3	0.3	0.3	0.3	C	C	C	C	0.3	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3																						
28-Sep	Z	0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.2	0.3	0.5	0.9	1.1	1.2	1.2	1.2	1.1	1.0	0.9	0.8	1.0	1.1	1.0	0.8	0.7	1.2																						
29-Sep	0.5	Z	0.4	0.4	0.4	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.5	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.5	0.6																						
30-Sep	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5																						
																								0.4	0.4	0.4	0.3	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	Diurnal Average
																								1.9	1.8	1.5	1.3	1.3	0.9	1.3	1.4	1.5	1.5	1.7	1.9	1.9	2.1	1.9	1.7	1.9	2.1	1.7	1.4	1.3	1.4	1.7	1.7	Diurnal Maximum

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



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.3	467	68.08	68.08
0.4 - 0.5	119	17.35	85.42
0.6 - 0.7	32	4.66	90.09
0.8 - 1.4	50	7.29	97.38
1.5 - 10	17	2.48	99.85
> 10	0	0.00	99.85

Total Number of Valid Hours: 686

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Carbon Monoxide (CO) - ppm
Athabasca Valley - September 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	1	1	2	8	13	46	144	46	39	40	41	32	18	13	16	7	467
0.4 - 0.5	6	0	0	3	2	19	34	6	1	4	15	0	3	2	10	14	119
0.6 - 0.7	0	0	0	0	2	0	4	5	4	1	1	6	1	0	3	3	30
0.8 - 1.4	3	0	1	0	1	1	12	8	1	2	2	4	1	1	2	10	49
1.5 - 10	0	0	0	0	0	1	2	1	0	0	4	5	3	0	0	1	17
> 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	10	1	3	11	18	67	196	66	45	47	63	47	26	16	31	35	682

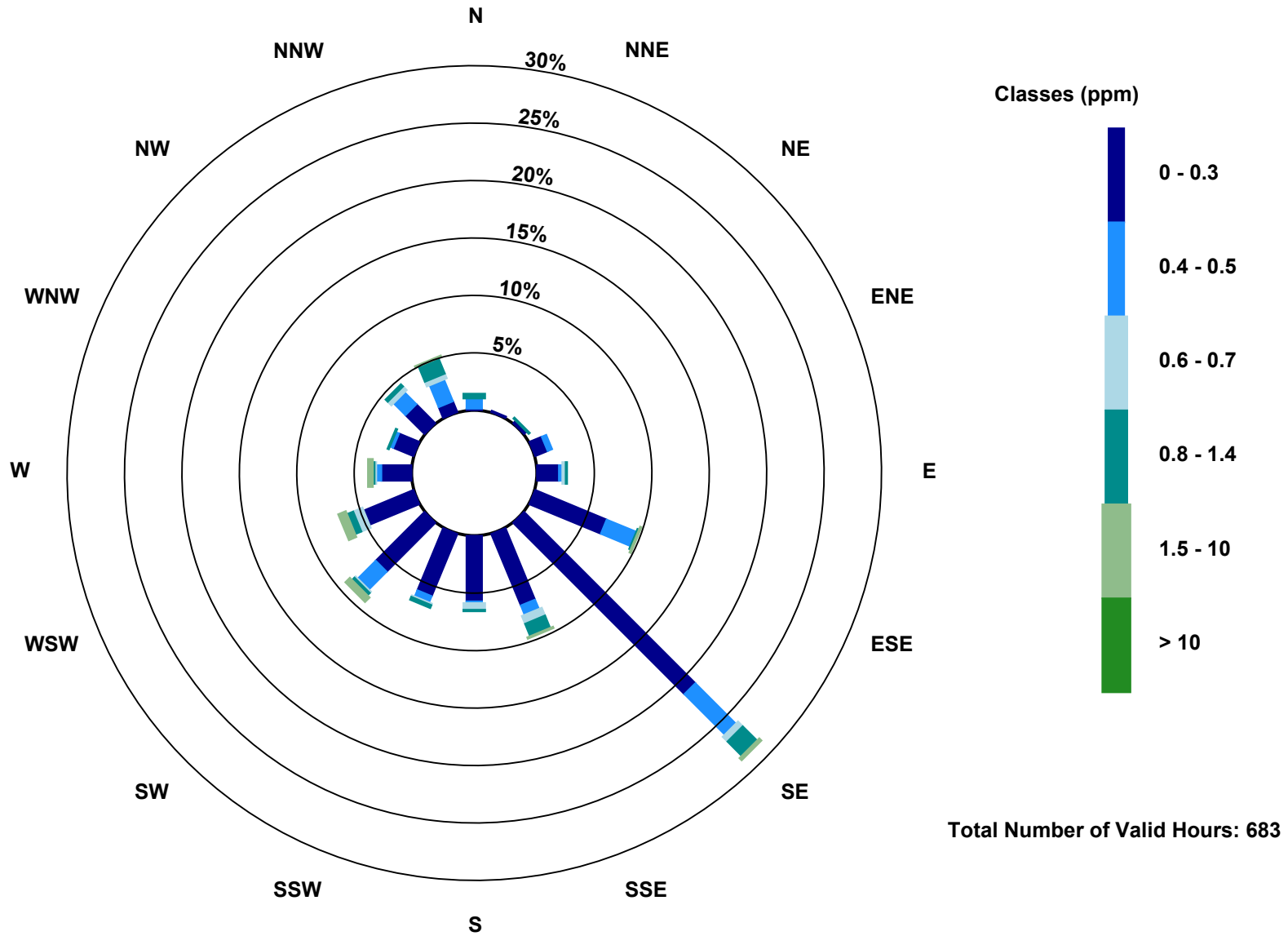
Total Number of Valid Hours: 683

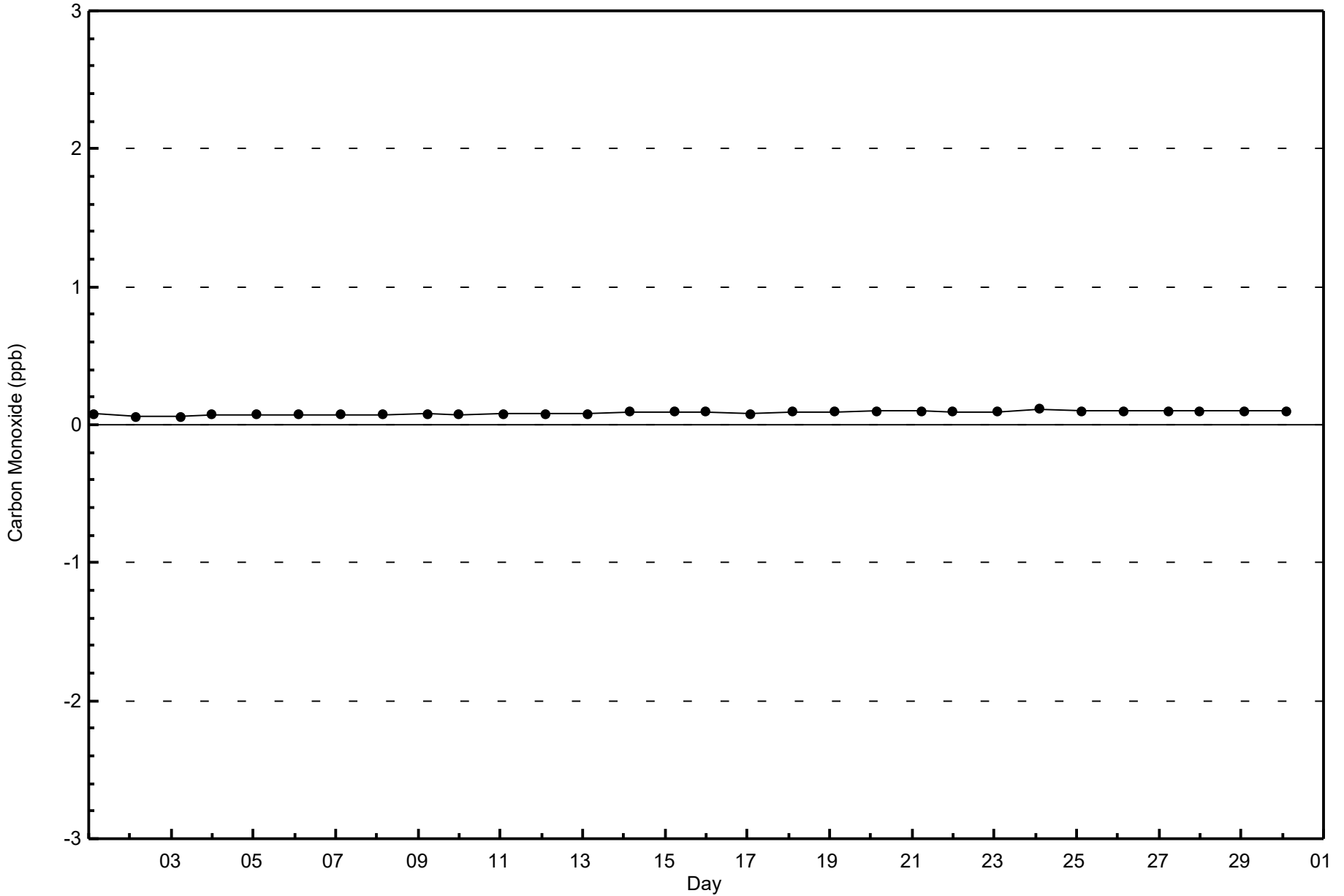
Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

Carbon Monoxide (CO) - ppm
Athabasca Valley

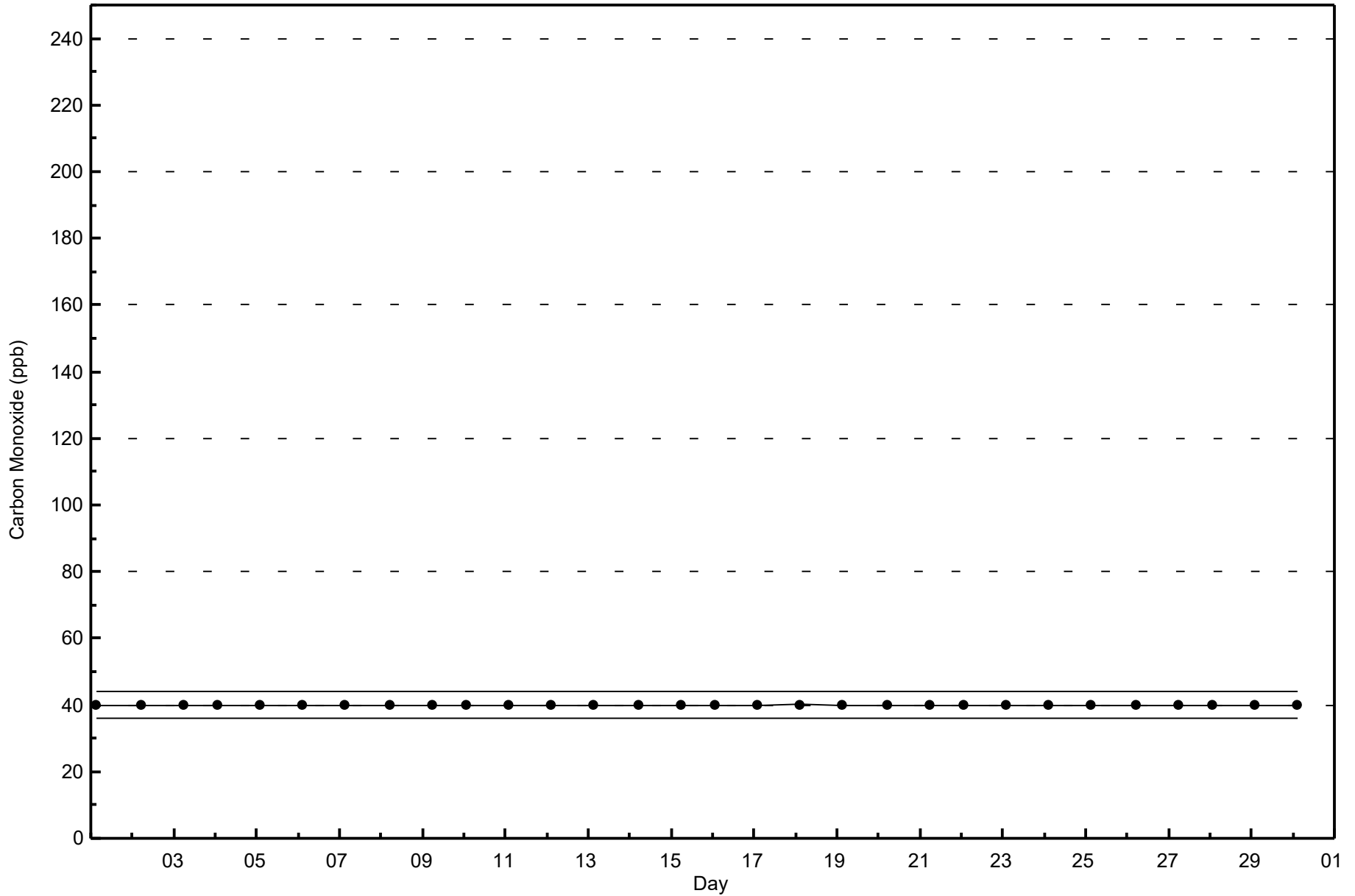






Wood Buffalo Environmental Association
Span Responses

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

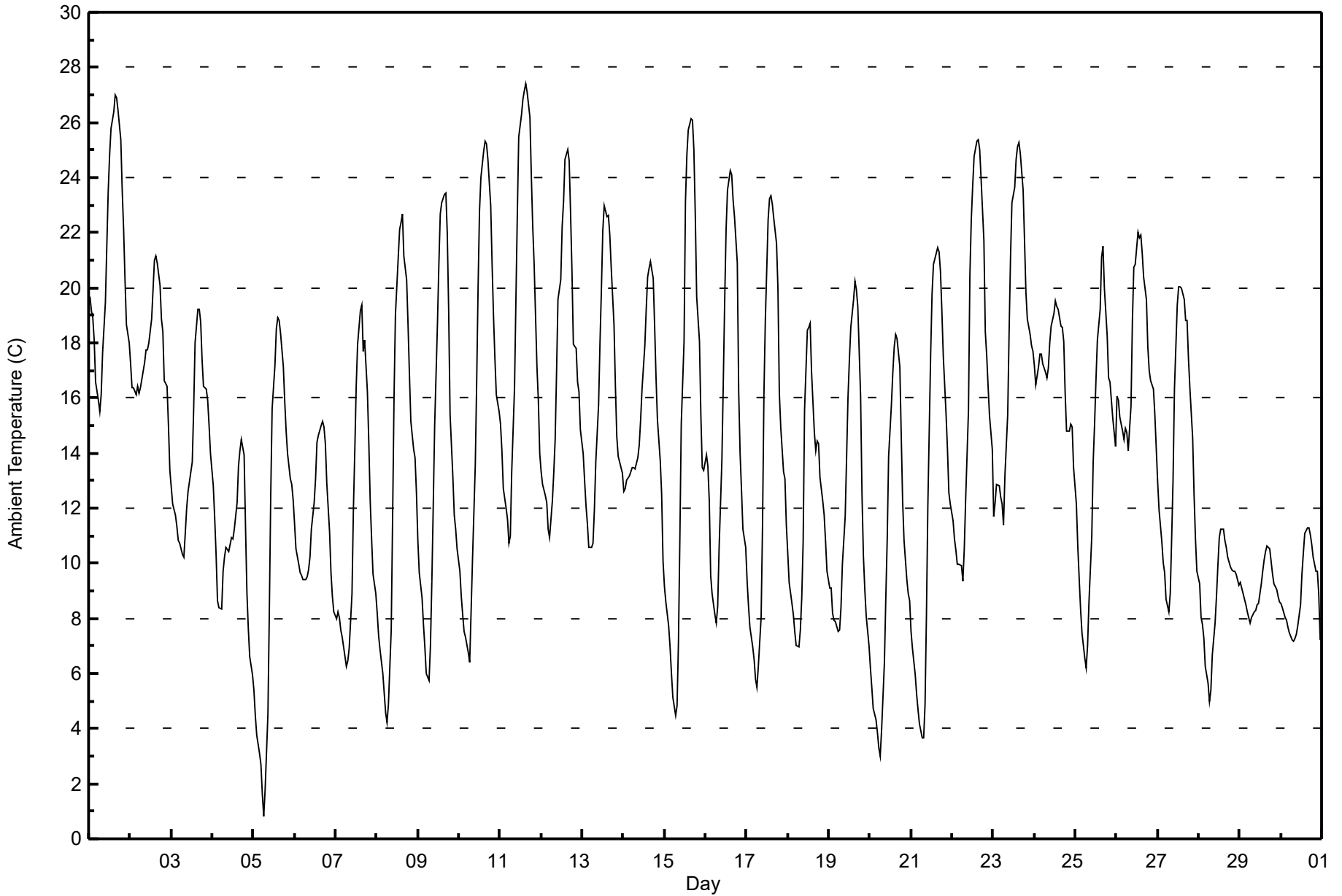




Wood Buffalo Environmental Association
Summary of Hour Averages

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

Maximum Value: 27.4 C on Sep 11 16:00		Maximum Daily Average: 21.1 C on Sep 1		Hours in Service: 720																							
Minimum Value: 0.8 C on Sep 5 07:00		Minimum Daily Average: 8.8 C on Sep 28		Hours of Data: 720																							
Maximum Diurnal Average: 20.4 C at hour 16		Minimum Diurnal Average: 8.6 C at hour 7		Hours of Missing Data: 0																							
Monthly Average: 14.14 C		Percentiles: P ₁ = 3.7 P ₁₀ = 7.3 Q ₁ = 9.6 Median = 13.7 Q ₃ = 18.4 P ₉₀ = 22.1 P ₉₉ = 26.4		Hours of Calibration: 0																							
				Percent Operational Time: 100.0																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Sep	19.7	19.2	18.9	18.1	16.6	15.9	15.5	16.1	17.6	19.5	21.5	23.5	24.8	25.8	26.4	27.0	26.9	26.4	25.4	23.5	22.1	20.3	18.7	18.0	21.1	27.0	
2-Sep	17.2	16.4	16.4	16.1	16.4	16.2	16.4	16.7	17.3	17.7	17.7	18.0	18.9	20.0	21.0	21.1	20.9	20.1	18.9	18.4	16.6	16.4	15.0	13.4	17.6	21.1	
3-Sep	12.8	12.2	11.8	11.3	10.8	10.7	10.3	10.2	11.1	12.0	12.6	13.3	13.7	15.6	18.0	19.2	19.2	18.7	17.4	16.4	16.3	15.9	15.0	14.0	14.1	19.2	
4-Sep	12.8	11.7	10.3	8.6	8.4	8.3	9.7	10.2	10.6	10.4	10.7	10.9	11.2	12.2	13.5	14.1	14.5	13.9	11.3	9.0	7.6	6.6	5.9	10.6	14.5		
5-Sep	5.4	4.5	3.8	3.1	2.7	1.6	0.8	1.8	4.5	8.2	12.4	15.6	17.2	18.5	18.9	18.8	18.3	17.1	15.9	14.8	14.0	13.1	12.9	12.3	10.7	18.9	
6-Sep	11.4	10.5	10.0	9.6	9.5	9.4	9.4	9.5	9.8	10.2	11.2	12.2	13.1	14.4	14.7	15.0	15.2	15.0	14.3	12.9	11.1	9.7	8.8	8.2	11.5	15.2	
7-Sep	8.0	8.3	8.1	7.6	7.3	6.6	6.2	6.4	6.9	8.9	11.9	14.1	16.4	17.9	19.2	19.4	17.7	18.1	16.2	14.4	12.3	10.9	9.6	8.9	11.7	19.4	
8-Sep	8.2	7.4	6.9	6.0	5.3	4.6	4.2	4.9	7.6	11.7	16.0	19.0	21.1	22.1	22.3	22.7	21.2	20.3	18.7	16.8	15.1	14.1	13.8	12.6	13.4	22.7	
9-Sep	10.8	9.7	8.8	7.8	7.0	6.0	5.8	7.0	9.4	12.1	15.0	18.7	20.8	22.7	23.1	23.4	23.4	22.0	19.2	15.4	13.1	11.7	11.2	10.5	13.9	23.4	
10-Sep	9.7	8.8	8.1	7.5	7.3	6.8	6.4	8.3	10.1	13.6	16.6	20.0	22.8	24.0	25.0	25.3	25.2	24.7	23.0	20.8	19.0	17.4	16.1	15.5	15.9	25.3	
11-Sep	15.0	14.1	12.7	12.0	11.6	10.7	11.0	13.3	16.4	19.6	22.7	25.5	26.3	26.8	27.2	27.4	27.1	26.2	24.1	22.2	20.8	17.1	15.9	14.0	19.2	27.4	
12-Sep	13.3	12.9	12.4	12.2	11.2	10.9	12.2	13.3	14.5	17.0	19.6	20.3	22.2	23.1	24.7	25.0	24.6	22.7	20.6	17.9	17.8	16.6	16.2	14.8	17.3	25.0	
13-Sep	14.0	13.0	12.1	11.4	10.6	10.6	10.7	11.9	13.7	15.8	18.0	20.0	22.1	23.0	22.6	22.7	21.9	20.8	18.7	16.4	14.6	13.9	13.7	13.3	16.1	23.0	
14-Sep	12.6	12.7	13.0	13.2	13.3	13.5	13.5	13.4	13.8	14.3	15.2	16.3	17.9	19.2	20.4	20.7	20.9	20.4	18.6	16.8	15.2	13.7	12.5	10.1	15.5	20.9	
15-Sep	9.2	8.6	7.7	7.0	6.0	5.1	4.5	4.8	7.1	10.9	15.0	18.0	23.1	24.8	25.7	26.1	26.1	25.0	22.7	19.7	18.0	15.4	13.5	13.4	14.9	26.1	
16-Sep	14.0	13.5	12.2	9.6	8.9	8.2	7.8	8.4	10.5	13.7	16.6	19.5	22.1	23.5	24.2	24.1	23.2	22.6	20.9	16.2	14.0	12.6	11.3	10.6	15.4	24.2	
17-Sep	9.3	8.5	7.7	7.0	6.5	5.8	5.5	6.3	8.0	11.3	16.1	18.8	22.5	23.2	23.3	23.0	22.5	21.6	20.0	16.2	15.0	13.3	13.1	11.4	14.0	23.3	
18-Sep	10.4	9.3	8.5	8.2	7.5	7.0	6.9	7.6	8.7	10.8	15.5	18.5	18.6	18.7	16.9	14.8	14.1	14.4	14.3	13.1	12.2	11.7	10.8	9.7	12.0	18.7	
19-Sep	9.1	9.1	8.2	7.9	7.9	7.5	7.6	8.4	9.9	11.7	13.8	16.0	17.4	18.5	19.6	20.2	19.9	19.3	16.1	12.5	10.3	9.0	8.1	7.0	12.3	20.2	
20-Sep	6.2	5.5	4.7	4.3	3.8	3.3	3.0	3.9	6.4	8.7	10.9	13.9	15.8	16.9	17.9	18.3	18.1	17.1	14.7	12.3	10.8	9.4	8.9	8.6	10.1	18.3	
21-Sep	7.5	6.9	6.0	5.3	4.7	4.2	3.7	3.7	4.9	8.1	12.1	17.6	19.8	20.8	21.1	21.4	21.3	20.6	19.2	17.6	15.4	14.1	12.6	12.2	12.5	21.4	
22-Sep	11.5	10.9	10.5	10.0	10.0	9.9	9.4	10.5	12.3	15.6	20.4	22.5	23.7	24.7	25.3	25.4	25.0	24.0	21.7	18.4	17.6	16.4	15.4	14.1	16.9	25.4	
23-Sep	11.7	12.2	12.9	12.8	12.4	12.2	11.4	13.2	15.4	18.4	21.1	23.1	23.6	24.7	25.1	25.3	24.9	23.6	21.7	19.8	18.9	18.3	17.9	17.7	18.3	25.3	
24-Sep	17.2	16.5	17.1	17.6	17.6	17.2	16.9	16.7	17.1	18.0	18.6	19.1	19.5	19.3	19.2	18.6	18.6	18.1	16.2	14.8	14.8	15.0	14.9	13.5	17.2	19.5	
25-Sep	12.1	10.6	9.4	8.4	7.5	6.5	6.2	7.0	8.6	11.0	13.7	15.1	16.7	18.1	19.2	21.1	21.5	20.0	18.3	16.7	16.6	15.9	15.3	14.2	13.7	21.5	
26-Sep	16.1	15.9	15.3	14.8	14.5	14.9	14.7	14.1	15.7	18.8	20.7	20.8	22.0	21.8	21.9	21.2	20.4	19.6	17.9	17.0	16.6	16.3	15.4	14.2	17.5	22.0	
27-Sep	13.0	12.0	10.8	10.0	9.6	8.7	8.2	8.9	10.9	13.0	16.3	19.4	20.0	20.0	20.0	19.6	18.8	18.8	17.4	16.4	14.5	12.5	10.9	9.7	14.1	20.0	
28-Sep	9.3	8.0	7.8	7.2	6.3	5.6	5.0	5.4	6.6	7.8	8.8	9.9	10.9	11.3	11.3	10.8	10.6	10.2	9.9	9.7	9.7	9.7	9.6	9.2	8.8	11.3	
29-Sep	9.3	9.1	8.9	8.5	8.2	8.0	7.8	8.0	8.2	8.3	8.5	8.5	9.3	9.7	10.1	10.4	10.6	10.5	10.1	9.6	9.3	9.0	8.8	8.6	9.1	10.6	
30-Sep	8.5	8.4	8.1	7.9	7.7	7.5	7.2	7.2	7.3	7.4	7.8	8.5	9.6	10.4	11.1	11.3	11.3	11.1	10.7	10.2	9.7	9.7	8.9	7.2	8.9	11.3	
		11.5	10.9	10.3	9.7	9.2	8.8	8.6	9.2	10.7	12.8	15.2	17.2	18.8	19.7	20.2	20.4	20.1	19.4	17.9	15.9	14.7	13.6	12.7	11.8	Diurnal Average	
		19.7	19.2	18.9	18.1	17.6	17.2	16.9	16.7	17.6	19.6	22.7	25.5	26.3	26.8	27.2	27.4	27.1	26.4	25.4	23.5	22.1	20.3	18.7	18.0	Diurnal Maximum	





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	202	28.06	28.06
10 - 20	397	55.14	83.19
> 20	121	16.81	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

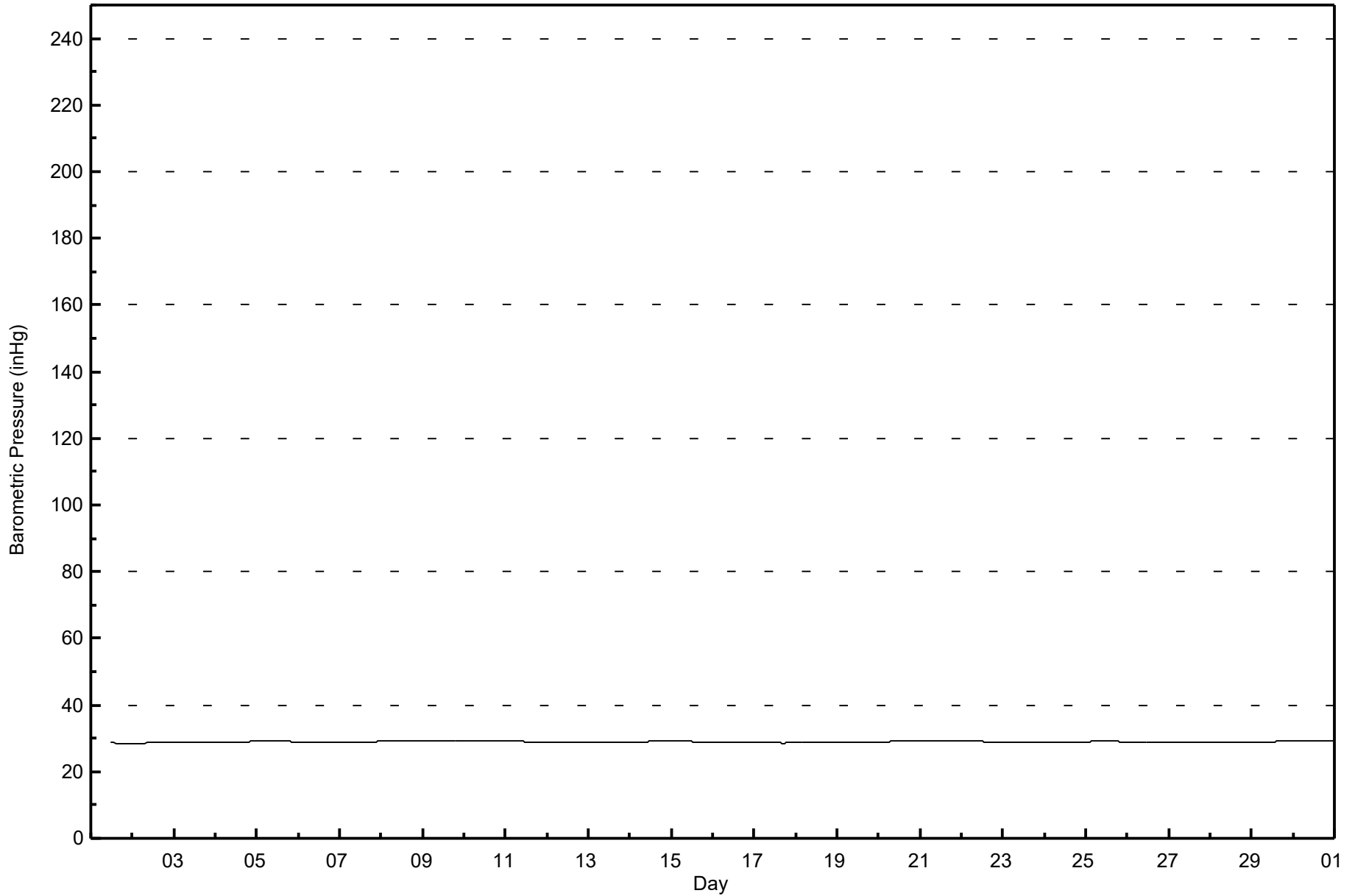
Barometric Pressure (BP) - inHg
Athabasca Valley - September 2023

Maximum Value: 29.4 inHg on Sep 9 11:00 Maximum Daily Average: 29.3 inHg on Sep 9																				Hours in Service: 720 Hours of Data: 709							
Minimum Value: 28.5 inHg on Sep 1 20:00 Minimum Daily Average: 28.6 inHg on Sep 2 Maximum Diurnal Average: 29.0 inHg at hour 10 Minimum Diurnal Average: 28.9 inHg at hour 16 Monthly Average: 28.94 inHg Percentiles: P ₁ = 28.5 P ₁₀ = 28.7 Q ₁ = 28.8 Median = 28.9 Q ₃ = 29.1 P ₉₀ = 29.2 P ₉₉ = 29.4																				Hours of Missing Data: 11 Hours of Calibration: 0 Percent Operational Time: 98.5							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	28.7	28.7	28.6	28.6	28.6	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	--	28.7
2-Sep	28.5	28.5	28.5	28.5	28.5	28.6	28.6	28.6	28.6	28.6	28.7	28.7	28.7	28.7	28.6	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8	28.8	28.6	28.8	
3-Sep	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8	28.8	28.8	28.8	28.7	28.8	
4-Sep	28.8	28.8	28.8	28.8	28.9	28.9	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.1	29.1	29.0	29.1	
5-Sep	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.1	29.1	
6-Sep	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	28.9	28.9	28.9	28.9	28.9	29.0	
7-Sep	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	28.9	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	
8-Sep	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.2	29.1	29.1	29.1	29.1	29.1	29.2	29.2	29.2	29.2	29.2	29.3	29.3	29.3	29.2	29.3	
9-Sep	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	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.4	
10-Sep	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	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.3	29.4	
11-Sep	29.2	29.2	29.2	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0	29.2	
12-Sep	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.9	
13-Sep	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	28.7	28.7	28.7	28.8	28.8	28.8	28.8	28.9	28.9	28.8	28.8	28.8	28.9	
14-Sep	28.8	28.9	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.0	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.0	29.1	
15-Sep	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	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0	29.1	
16-Sep	28.8	28.9	28.8	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	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	29.0	
17-Sep	28.9	28.9	28.8	28.8	28.8	28.8	28.8	28.8	28.7	28.7	28.7	28.7	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.7	28.9	
18-Sep	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	
19-Sep	28.7	28.7	28.7	28.7	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.9	28.9	28.8	28.9	
20-Sep	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.2	29.2	29.2	29.1	29.2	
21-Sep	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.2	
22-Sep	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.1	
23-Sep	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	28.9	28.9	28.9	28.8	28.8	28.9	29.0	
24-Sep	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0	29.0	29.0	28.9	29.0	
25-Sep	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	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	29.0	29.1	
26-Sep	28.9	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.7	28.8	28.7	28.7	28.7	28.7	28.8	28.8	28.8	28.7	28.7	28.7	28.7	28.7	28.8	28.9	
27-Sep	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	
28-Sep	28.8	28.8	28.8	28.8	28.8	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	
29-Sep	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	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.0	29.1	
30-Sep	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	
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 28.9 28.9 28.9																								Diurnal Average			
29.4 29.4 29.4 29.3 29.3 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																								Diurnal Maximum			
M - Maintenance UO - Unstable Operation																											



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Summary of Hour Averages

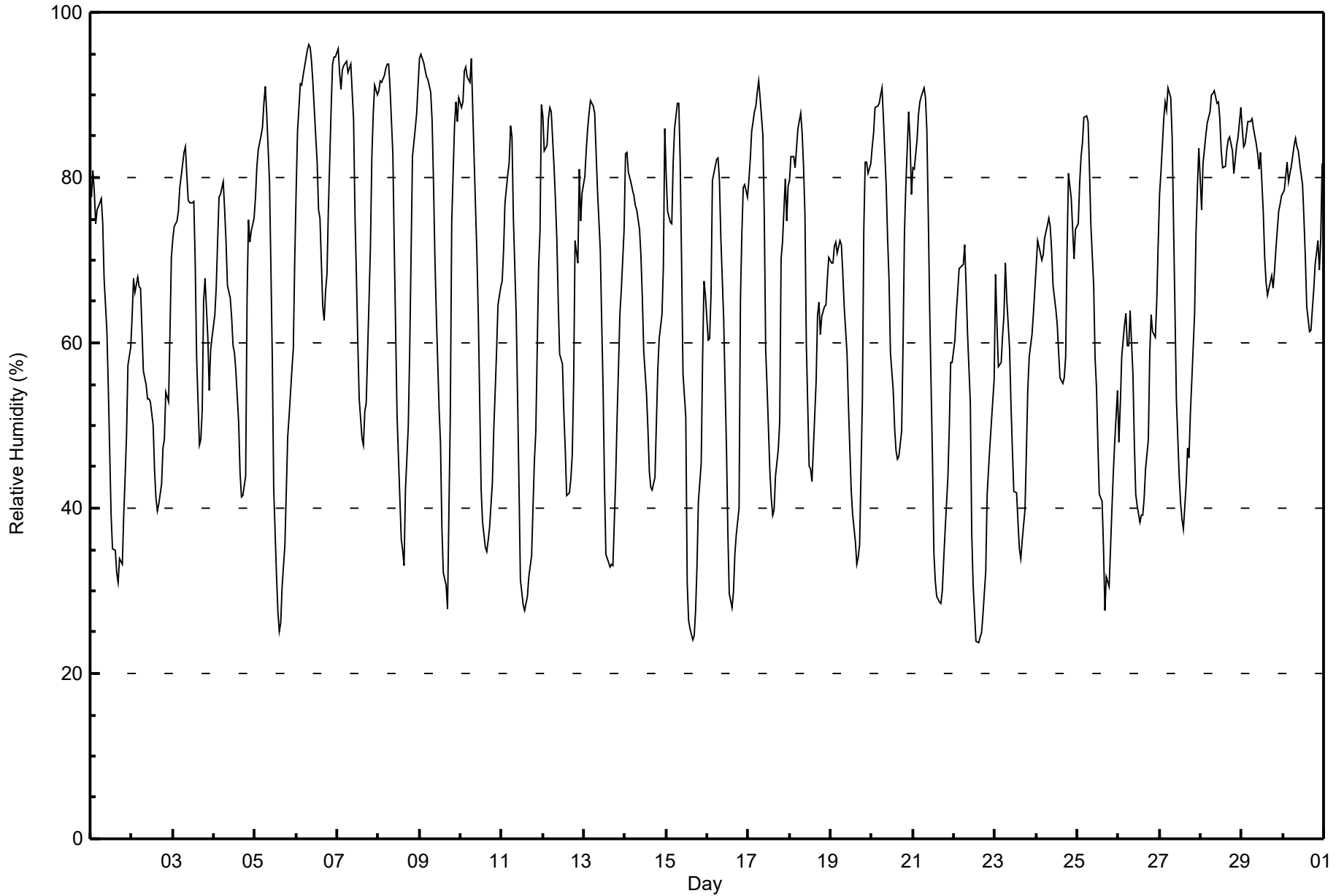
Relative Humidity (RH) - %
Athabasca Valley - September 2023

Maximum Value: 96.1 % on Sep 6 08:00 Maximum Daily Average: 84.9 % on Sep 28																						Hours in Service:	720																								
Minimum Value: 23.8 % on Sep 22 15:00 Minimum Daily Average: 47.6 % on Sep 22																						Hours of Data:	720																								
Maximum Diurnal Average: 83.5 % at hour 7 Minimum Diurnal Average: 41.6 % at hour 16																						Hours of Missing Data:	0																								
Monthly Average: 65.31 % Percentiles: P ₁ = 25.6 P ₁₀ = 36.9 Q ₁ = 49.8 Median = 68.1 Q ₃ = 81.7 P ₉₀ = 88.7 P ₉₉ = 94.4																						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-Sep	77.7	80.9	78.3	74.4	76.1	77.0	77.4	74.6	67.8	61.4	54.6	46.7	39.2	35.1	34.9	32.2	31.0	34.0	33.1	39.2	43.7	48.8	57.2	59.6	55.6	80.9																					
2-Sep	63.1	67.8	66.1	68.0	66.7	66.5	61.6	56.7	55.0	53.3	53.2	52.8	50.0	44.6	41.2	39.7	40.4	42.8	47.4	48.3	54.1	52.8	61.4	70.3	55.2	70.3																					
3-Sep	72.5	74.1	74.8	76.0	78.9	80.2	83.0	83.7	80.4	77.3	77.0	77.2	69.7	58.3	47.6	48.4	51.8	65.0	67.9	60.8	54.2	59.2	60.7	69.0	64.1	83.7																					
4-Sep	63.4	66.8	72.3	77.6	78.0	79.4	76.2	72.3	66.9	65.5	63.0	59.7	58.8	56.6	50.3	44.3	41.4	41.6	43.9	65.4	74.9	72.3	73.6	75.0	64.1	79.4																					
5-Sep	77.6	81.3	83.4	85.0	86.1	89.0	91.0	87.8	79.5	69.2	58.1	42.4	31.9	27.5	25.0	26.2	30.5	35.5	42.2	48.6	51.1	56.9	59.3	70.0	59.8	91.0																					
6-Sep	78.3	85.6	91.4	91.2	92.3	93.4	95.4	96.1	95.7	94.1	91.4	84.9	81.8	76.1	75.2	64.4	62.7	66.3	68.4	76.0	88.4	93.8	94.6	94.6	84.7	96.1																					
7-Sep	95.6	92.7	90.7	93.1	93.6	94.0	92.8	93.2	93.7	87.0	75.5	68.2	60.0	53.2	48.4	47.6	51.7	52.6	65.1	71.5	82.3	87.6	91.2	89.9	78.0	95.6																					
8-Sep	90.5	91.8	91.6	92.4	93.2	93.8	93.7	90.8	82.8	71.8	61.6	51.2	41.1	36.2	34.9	33.0	42.2	49.8	58.9	70.5	82.6	86.0	87.8	91.2	71.6	93.8																					
9-Sep	94.4	95.0	93.9	93.1	92.1	91.8	90.4	87.0	79.5	70.4	63.6	52.0	47.8	37.7	32.1	30.6	27.7	39.5	51.3	74.6	86.2	89.2	86.7	89.6	70.7	95.0																					
10-Sep	88.5	89.2	92.8	93.4	92.2	91.5	94.4	88.2	82.3	70.6	63.0	52.6	42.2	38.2	35.3	34.8	36.2	37.6	43.0	49.5	54.1	59.0	64.5	66.8	65.0	94.4																					
11-Sep	67.5	71.2	77.0	80.4	81.9	86.2	84.9	75.1	63.5	53.4	42.7	31.3	28.3	27.6	28.4	29.3	31.7	34.2	40.2	45.8	49.4	69.2	73.5	88.9	56.7	88.9																					
12-Sep	87.4	83.1	83.8	87.1	88.6	87.9	81.4	77.2	72.5	64.9	58.6	57.4	51.4	47.1	41.5	41.8	43.6	46.4	55.4	72.4	69.6	81.0	74.7	78.1	68.0	88.6																					
13-Sep	80.2	83.5	85.9	87.8	89.3	88.7	87.8	83.1	78.5	71.3	62.6	54.4	42.8	34.3	33.3	32.9	33.2	33.1	43.8	50.9	57.1	63.5	66.5	73.8	63.3	89.3																					
14-Sep	82.8	83.0	80.6	79.3	78.6	77.9	76.6	76.1	73.8	70.5	65.4	59.0	53.7	49.6	44.4	42.5	42.3	43.8	50.2	56.6	60.4	63.5	69.2	86.0	65.2	86.0																					
15-Sep	80.3	75.9	74.6	74.4	81.9	85.9	89.0	88.9	81.9	69.6	56.3	51.1	31.0	26.5	25.4	24.1	24.6	27.6	33.0	40.8	45.4	58.4	67.5	65.7	57.5	89.0																					
16-Sep	60.3	60.6	65.9	79.6	80.6	82.2	82.4	79.6	72.7	63.1	55.0	47.5	37.0	29.7	27.9	29.9	34.4	36.8	39.9	65.3	73.3	78.9	79.2	77.6	60.0	82.4																					
17-Sep	79.7	82.2	85.6	88.1	88.6	90.3	91.7	89.6	85.2	75.2	59.2	54.6	44.3	41.1	39.1	39.8	43.8	47.2	50.6	70.2	72.2	79.9	74.7	79.1	68.8	91.7																					
18-Sep	79.6	82.5	82.6	81.2	83.6	85.9	87.7	85.4	81.4	75.6	59.9	45.0	44.8	43.3	47.1	55.4	63.5	64.9	61.1	63.2	64.4	64.5	67.8	70.4	68.4	87.7																					
19-Sep	69.7	69.6	71.7	72.3	70.8	72.3	71.8	68.6	64.4	58.7	52.8	47.3	42.2	39.4	36.0	33.2	34.0	35.7	53.2	73.7	81.9	81.9	80.6	81.7	61.0	81.9																					
20-Sep	83.8	85.4	88.5	88.7	89.0	90.0	90.9	87.1	78.8	72.5	67.7	58.8	54.2	49.7	47.0	45.9	46.3	49.4	59.9	73.3	79.2	87.9	84.5	78.1	72.4	90.9																					
21-Sep	81.3	81.0	84.6	87.7	89.1	89.9	90.8	89.7	85.7	75.5	64.1	45.8	34.6	31.2	29.4	28.6	28.6	29.9	33.8	37.4	43.7	49.9	57.7	57.7	59.5	90.8																					
22-Sep	60.3	63.8	66.2	68.9	69.2	69.4	71.8	66.8	61.2	52.8	36.9	30.6	27.2	23.8	23.8	24.4	25.0	27.1	32.4	41.7	44.7	47.6	50.4	55.6	47.6	71.8																					
23-Sep	68.3	62.3	57.1	57.7	60.8	63.4	69.6	65.2	59.3	52.5	47.0	42.0	41.8	38.4	35.0	33.9	36.2	39.8	47.0	54.4	58.3	61.0	63.6	66.4	53.4	69.6																					
24-Sep	69.3	72.4	70.9	69.9	70.6	72.7	74.2	75.1	74.1	71.2	67.0	64.0	62.2	58.8	55.7	55.2	55.7	58.3	70.9	80.5	77.4	73.8	70.1	73.8	68.5	80.5																					
25-Sep	74.4	79.2	82.6	84.3	87.3	87.4	86.8	81.1	74.3	66.9	58.2	54.6	47.8	41.7	40.8	35.3	27.6	31.6	30.4	35.1	39.8	44.3	48.0	54.3	58.1	87.4																					
26-Sep	47.9	52.6	58.4	62.2	63.6	59.7	59.7	63.9	56.3	48.0	41.7	40.4	38.3	39.1	39.1	41.1	44.7	48.3	58.6	63.4	61.3	60.7	65.2	71.9	53.6	71.9																					
27-Sep	77.9	80.7	87.2	89.2	88.2	90.9	89.6	84.7	74.3	63.9	53.2	43.9	40.6	38.7	37.5	42.8	47.3	46.1	51.6	55.5	63.5	73.2	78.8	83.5	66.0	90.9																					
28-Sep	76.1	81.7	83.4	85.1	86.5	88.0	90.1	90.3	90.5	88.9	89.1	87.2	83.2	81.2	81.4	83.4	84.7	85.0	83.3	80.5	82.2	83.9	84.9	88.4	84.9	90.5																					
29-Sep	86.0	83.8	84.1	86.8	86.8	86.7	87.1	86.0	84.0	82.9	80.9	83.1	75.8	70.4	67.3	65.8	66.7	68.1	66.7	68.6	71.4	75.9	76.8	77.8	77.9	87.1																					
30-Sep	78.1	78.4	81.9	79.5	80.4	81.4	83.8	84.8	83.8	83.2	81.7	79.2	75.0	70.4	64.4	61.4	61.6	64.1	66.5	69.4	72.3	68.8	72.6	81.7	75.2	84.8																					
																						76.4	77.9	79.6	81.1	82.1	83.1	83.5	81.0	76.0	69.4	62.0	55.5	49.5	45.2	42.7	41.6	42.9	45.6	51.6	60.3	64.9	68.9	71.4	75.3	Diurnal Average	
																						95.6	95.0	93.9	93.4	93.6	94.0	95.4	96.1	95.7	94.1	91.4	87.2	83.2	81.2	81.4	83.4	84.7	85.0	83.3	80.5	88.4	93.8	94.6	94.6	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

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





Maximum Speed: 29 km/h on Sep 13 19:00	Maximum Daily Speed Average: 12.6 km/h on Sep 14	Hours in Service: 720
Minimum Speed Value: 0 km/h on Sep 9 20:00	Minimum Daily Speed Average: 0.8 km/h on Sep 20	Hours of Data: 717
Maximum Diurnal Speed Average: 7.7 km/h at hour 16	Minimum Diurnal Speed Average: 2.6 km/h at hour 11	Hours of Missing Data: 3
Monthly Average Velocity: 3.5 km/h 187.2 deg	Percentiles: P ₁ = 1 P ₁₀ = 3 Q ₁ = 5 Median = 7 Q ₃ = 12 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-Sep	NNW2	ESE1	SW6	SW10	SSW8	S5	S6	SW10	SSW11	SSW14	SW17	SW18	SW21	SW20	SW23	SW24	WSW24	WSW17	WSW17	W10	WSW13	SW11	ESE4	ESE3	SW11.3	SW24
2-Sep	SE5	SSE5	SSW6	S4	S5	SSE3	S4	SW9	SW6	SW9	SW10	SW10	WSW11	WSW12	W17	W22	WSW18	W17	WSW12	WSW15	WSW17	WSW21	WSW17	SSE5	WSW9.2	W22
3-Sep	SE6	SE6	SE7	SE7	SE7	SE6	SE8	SE10	SE7	SE9	SE8	SE7	SSE10	E2	NE2	WSW13	WSW11	SW5	WSW4	WSW4	W11	WNW9	NW8	NW12	S3.0	WSW13
4-Sep	NW9	W13	WSW17	WSW17	W8	SW10	WNW18	NW17	NW22	NW24	NW20	NW20	WNW20	WNW18	NW14	WNW13	NW13	WNW11	W8	SSW5	SE4	SE5	SE6	SE7	WNW10.2	NW24
5-Sep	SE7	SE7	SE8	SE8	SE8	SE9	SE11	SE12	SE10	SE9	ENE5	S2	S10	SSE10	S10	SSW11	S11	SE11	SE6	SE5	SE8	SE6	S4	ESE3	SSE7.3	SE12
6-Sep	SE4	ESE3	ESE2	ESE5	ESE6	ESE8	SE7	ESE6	ESE9	SE7	S3	WSW6	SE1	NE2	N7	NW17	NW10	NW5	W7	SW5	SW2	SE2	ESE3	ESE2	SE1.0	NW17
7-Sep	ESE3	SSE4	SE6	SE6	SE6	SE5	ESE5	SE7	SE8	SE4	ESE3	SSE3	SW8	SW11	SW14	SW13	NE7	E4	SSE3	SE6	SSE3	ESE3	SE3	SE5	SSE4.0	SW14
8-Sep	SE7	SE9	SE10	SE10	SE11	SE11	SE11	SE12	SE9	SE8	ESE5	SSW7	SW13	WSW11	W7	NW6	NNW6	NNW6	NNW6	W3	WSW4	SSW2	W4	S1	SSE3.1	SW13
9-Sep	ESE3	E4	ESE3	ESE4	SE4	SE4	SE5	SE8	SE6	ESE5	E0	ESE5	SE6	ESE5	WSW3	W5	WNW3	NNW2	WNW3	WSW0	SE1	SSE2	S3	ESE2	SE2.3	SE8
10-Sep	SE2	SSW4	SSW4	SSW5	S4	S4	SSW4	SE2	ESE4	SE6	WSW1	SE5	ESE14	ESE16	SE16	SE17	SE15	SE14	SE11	SE11	SE11	SE8	SE6	SE9	SE7.4	SE17
11-Sep	SE10	ESE7	ENE4	ENE6	E6	ENE6	ENE6	ESE8	SE14	SE15	SE16	S18	S22	SSE23	SSE23	S20	S18	S13	SE13	SE14	SE11	ESE6	SSE1	ESE2	SSE10.1	SSE23
12-Sep	SSE1	S4	SSW6	SSW3	SSW4	SSW2	SE8	SE9	SE9	SE9	E5	NW6	WSW4	SW6	ESE1	E4	ESE5	WSW7	SW4	SSW3	SSE3	ESE3	SSE3	SSE4	SSE2.9	SE9
13-Sep	SSE3	SSE4	SSE5	SSE4	SE4	SSE6	SE5	SE5	E5	SW9	SW15	SW16	SW19	WSW26	WSW23	W26	W23	W19	W29	W15	WSW13	WSW13	WSW16	WSW18	WSW10.7	W29
14-Sep	WSW16	WSW17	W20	W21	W21	W17	NW8	WNW10	WNW12	WNW14	WNW18	WNW21	NW16	NW15	WNW22	NW22	NW18	NW17	W10	WSW11	SW4	S5	SW5	ESE3	WNW12.6	WNW22
15-Sep	SE5	SE7	SE6	SE7	SE8	SE10	SE10	SE9	SE8	SE8	SE5	NNW4	SSW10	S13	S13	S15	S15	SSE14	SSE9	SE7	SSE9	SE2	ESE4	ESE11	SSE7.8	S15
16-Sep	SE14	SE13	SE7	SW3	S4	S2	SSE4	S6	ESE6	ESE6	ESE7	E9	SSE4	SW15	SW14	SW15	SW13	SW7	SSW5	SSE4	E2	ESE1	SE3	SSE6	S5.1	SSW15
17-Sep	SSE6	SSE5	SSE5	SSE7	SSE6	SSE5	SE5	SE6	ESE5	SSE3	SE2	NW4	SSW10	SW15	WSW14	SW12	SW8	SW7	SSW4	SE2	SE3	SSE5	S4	S4	S4.3	SW15
18-Sep	SSW4	SSE4	SE5	SSE7	SSE6	SE7	SE8	SE9	SE10	SE8	WNW2	W22	W23	W22	WSW25	WSW14	SW16	SW9	S8	S8	SSW11	SW16	SW12	S6	SW7.4	WSW25
19-Sep	SE6	SSE5	SE6	SE5	SE6	SE5	SSE6	SSE6	SSW9	SW13	WSW10	SW11	SW15	SW14	SW11	SW9	WSW6	SW7	SSW3	E1	ESE1	ESE3	SE3	SE3	SSW5.2	SW15
20-Sep	SE3	SE2	ESE6	SE4	SE4	SE8	ESE4	E4	E4	ENE3	NW4	NNW9	C	C	C	NNW11	NW11	NW5	W3	SW3	SW5	ESE3	ESE4	SE6	ENE0.8	NNW11
21-Sep	SE6	SE8	SE9	SE9	SE11	SE13	SE11	SE12	SE13	SE10	SE8	SSW9	SW24	SSW21	SW23	SSW20	S17	S12	SSE11	SE12	SSE6	SE7	SE9	SE11	SSE9.8	SW24
22-Sep	SE12	SE13	SE11	SE12	SE13	SE12	SE12	SE14	SE14	ESE11	SSW14	SSW18	SSW16	SSW17	SSW15	S15	SSE19	SSE13	SSE8	SSE5	SE10	SE11	SE13	ESE9	SSE11.2	SSE19
23-Sep	ENE6	E7	SE9	SE9	ESE9	ESE10	E4	ESE11	SE13	SE14	SE18	SE21	SSE22	SSE20	SSE21	SSE18	SSE16	SSE15	SE12	SE13	SE12	SE10	SE13	SE14	SE12.6	SSE22
24-Sep	SE14	SE11	SE12	SE14	SE11	SE8	ESE10	SE13	SE12	SE10	S6	S8	SW8	SW11	SW9	WSW8	SSW7	S4	SE2	ESE2	SE2	SSW5	SSW8	SSW4	SSE6.1	SE14
25-Sep	S5	S6	SSE6	SSE6	S4	SE4	SE4	SE5	SSW4	S2	ENE4	NW5	NW6	NW5	NNW7	NNE1	E12	E11	ESE4	SE3	SE7	SE6	SSE5	SE3	SE2.6	E12
26-Sep	SE10	SSE10	SSE9	SSE7	SE8	SE8	SSE6	SE7	SE7	SE8	SE12	SSE8	WSW10	SW7	SW6	WSW7	WNW2	SSW3	E1	ESE2	SSW7	S5	SSW8	SW9	S5.2	SE12
27-Sep	SW7	SW5	SSW7	S3	SE4	ESE3	SE6	SE5	S5	SSW8	ESE3	SSW5	W12	W17	WSW15	SW14	WSW9	WSW8	SW4	S2	SSW2	SSE3	S3	SE3	SW4.6	W17
28-Sep	SSE6	SSE4	SSE4	SSE4	SE4	SE5	ESE3	ESE2	SSW5	WSW2	NNW3	NNW7	NNW8	N10	NNW13	NNW14	NNW14	NNW15	NNW13	N9	N8	NNW11	NNW15	NNW14	NNW5.0	NNW15
29-Sep	NNW15	NNW13	NNW12	NNW12	NW12	NNW10	NW8	NW10	NW9	NNW6	NNW7	NNW14	NNW16	NNW17	NNW15	NNW12	NNW9	NNW9	N9	N8	N7	NNW9	N6	N5	NNW10.2	NNW17
30-Sep	NNW4	N1	E3	SE4	ESE3	ESE5	SE4	SE6	SE6	SE7	SE6	ESE5	E6	ENE7	ENE3	ENE5	ESE6	SE6	ESE6	ESE6	ESE6	SE8	SE6	ESE4	ESE4.5	SE8

SSE3.5 SSE4.0 SSE4.0 SSE4.1 SSE4.4 SE4.7 SE4.4 SE5.1 SE4.9 SSE4.3 S2.6 SW4.1 SW7.1 SW7.4 SW7.6	WSW7.7 SW5.1 SW3.9 SW2.9 S2.8 S3.3 S2.9 S3.0 SSE3.0	Diurnal Average
WSW16 WSW17 W20 W21 W21 W17 WNW18 NW17 NW22 NW24 NW20 W22 SW24 WSW26 WSW25 W26 WSW24 W19 W29 WSW15 WSW17 WSW21 WSW17 WSW18		Diurnal Maximum

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

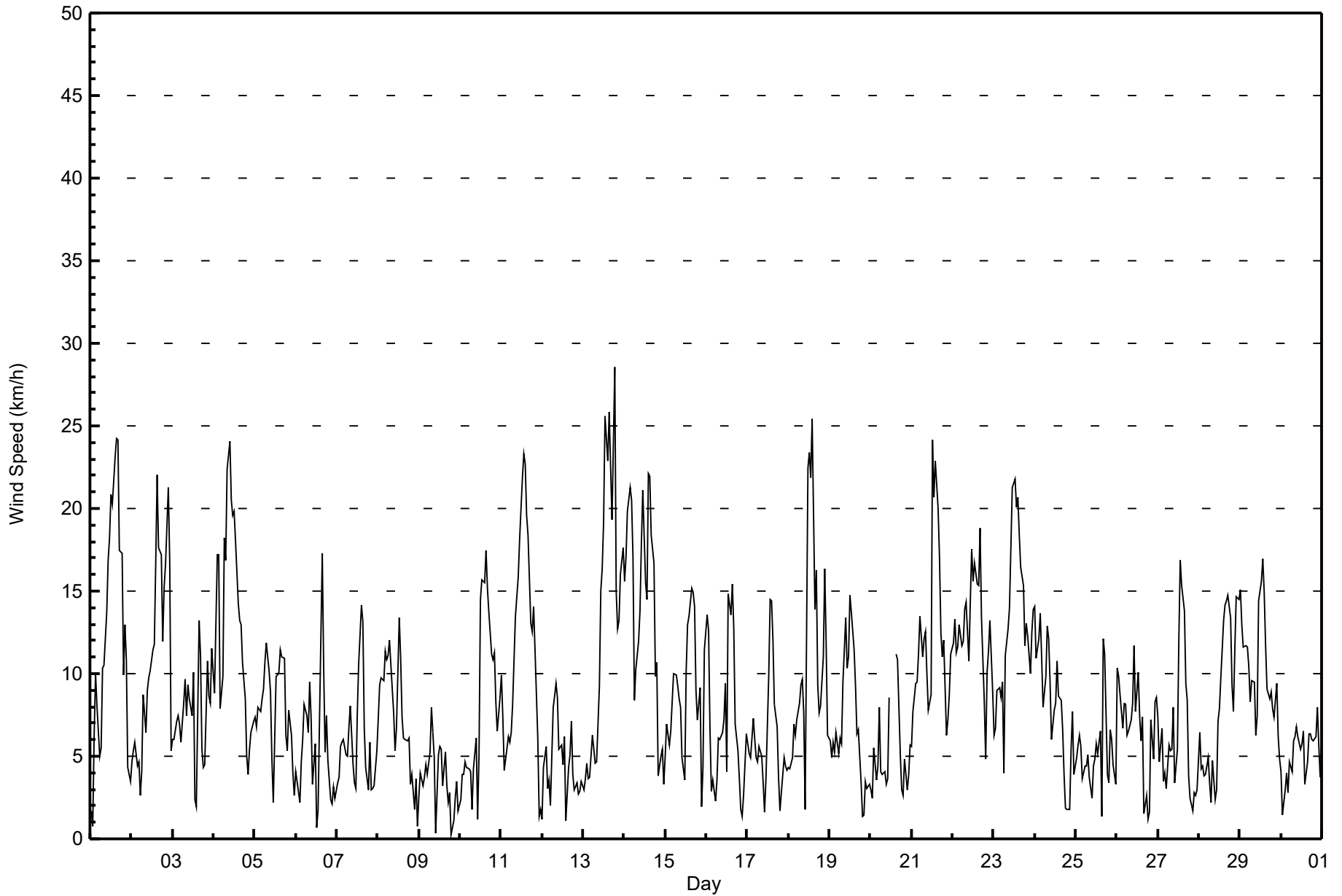
Wind Speed (WS) - km/h
Athabasca Valley - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 9 km/h on Sep 13 19:00	Hours of Data: 717
Minimum Value: 1 km/h on Sep 9 17:00	Hours of Missing Data: 3
Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 3 P ₉₀ = 4 P ₉₉ = 6	Hours of Calibration: 3
	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-Sep	1	2	2	2	2	1	2	2	2	4	3	4	5	5	5	5	6	5	4	3	4	4	2	2	6
2-Sep	1	3	3	2	2	1	1	3	3	3	2	2	3	3	5	4	4	3	2	2	3	4	5	3	5
3-Sep	1	1	1	2	1	1	2	2	3	2	2	2	3	2	1	3	3	1	1	2	4	4	3	2	4
4-Sep	3	3	3	3	3	3	4	3	4	4	4	4	4	4	3	5	4	3	2	2	1	2	1	1	5
5-Sep	1	1	2	2	1	1	2	2	2	2	1	3	4	3	3	3	3	3	2	1	2	3	2	1	4
6-Sep	2	2	1	1	2	2	2	2	2	2	1	2	2	2	2	3	3	2	2	2	2	1	1	1	3
7-Sep	1	1	1	1	2	1	1	1	2	2	2	2	2	3	4	4	3	1	2	2	1	2	2	1	4
8-Sep	2	2	2	2	2	2	2	2	2	2	1	5	3	4	3	3	2	1	1	1	1	2	1	2	5
9-Sep	1	1	1	1	1	1	1	2	1	1	2	2	2	2	2	1	1	1	1	2	1	2	1	1	2
10-Sep	1	1	1	1	1	1	2	1	2	2	1	5	4	4	5	5	4	3	3	2	2	2	2	2	5
11-Sep	2	2	1	1	1	1	1	3	3	3	4	4	6	6	6	5	5	5	2	2	3	2	1	1	6
12-Sep	2	1	1	1	1	1	3	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	3
13-Sep	1	1	1	1	2	2	1	2	1	4	3	4	4	7	6	6	5	7	9	4	4	3	3	3	9
14-Sep	3	3	3	3	3	3	4	3	2	4	4	4	4	5	5	4	4	4	1	2	3	2	3	1	5
15-Sep	1	1	1	1	1	2	2	2	2	2	2	2	4	4	4	4	4	3	2	3	3	1	3	2	4
16-Sep	3	3	3	2	2	1	1	1	1	2	2	2	4	3	4	4	3	3	1	1	1	2	2	3	4
17-Sep	1	2	2	2	2	2	1	2	2	2	1	2	3	3	3	2	2	2	2	2	1	1	1	1	3
18-Sep	1	1	2	1	2	2	2	2	2	2	5	5	6	6	7	5	5	2	2	2	3	5	4	2	7
19-Sep	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	4	1	2	1	1	2	1	1	4
20-Sep	1	1	1	1	2	2	1	1	1	1	2	2	C	C	C	2	2	3	2	2	2	1	2	2	3
21-Sep	2	3	2	2	2	2	2	2	2	3	3	7	6	5	6	6	5	5	3	2	2	1	1	2	7
22-Sep	2	2	1	2	2	3	2	3	2	2	6	4	4	5	4	4	4	3	2	1	3	2	2	3	6
23-Sep	1	2	2	2	2	2	2	3	3	3	5	6	5	6	5	6	5	4	3	3	3	2	3	3	6
24-Sep	4	2	3	3	3	2	3	3	3	2	2	2	2	3	2	2	2	2	1	2	2	3	3	3	4
25-Sep	1	1	2	1	1	1	1	2	2	2	2	1	1	1	2	3	3	2	3	2	2	2	2	3	3
26-Sep	2	2	2	2	3	2	2	2	2	3	4	3	2	2	2	2	1	2	2	1	3	2	2	2	4
27-Sep	2	3	3	3	1	2	2	1	3	2	2	3	5	4	4	3	2	2	1	2	1	2	1	1	5
28-Sep	1	2	1	1	1	2	1	1	2	1	2	1	2	2	4	3	3	4	4	3	2	3	2	2	4
29-Sep	3	2	2	2	2	2	2	1	2	1	2	4	4	3	4	3	2	2	2	2	2	3	2	1	4
30-Sep	1	1	1	1	1	1	1	1	1	2	1	1	2	1	1	1	1	2	1	1	2	2	1	1	2

4	3	3	3	3	3	4	3	4	4	4	6	7	6	7	7	6	6	7	9	4	4	5	5	3	
Diurnal Maximum																									

C - Calibration





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	241	33.61	33.61
6 - 11	290	40.45	74.06
12 - 19	147	20.50	94.56
20 - 28	38	5.30	99.86
29 - 38	1	0.14	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 717

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

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

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	2	1	2	6	14	46	52	34	24	23	10	8	4	4	6	5	241
6 - 11	8	0	1	5	5	23	118	25	10	17	29	13	7	3	11	15	290
12 - 19	0	0	0	0	1	2	40	6	10	7	20	21	8	6	10	16	147
20 - 28	0	0	0	0	0	0	1	5	2	2	6	5	9	3	5	0	38
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	10	1	3	11	20	71	211	70	46	49	65	47	29	16	32	36	717

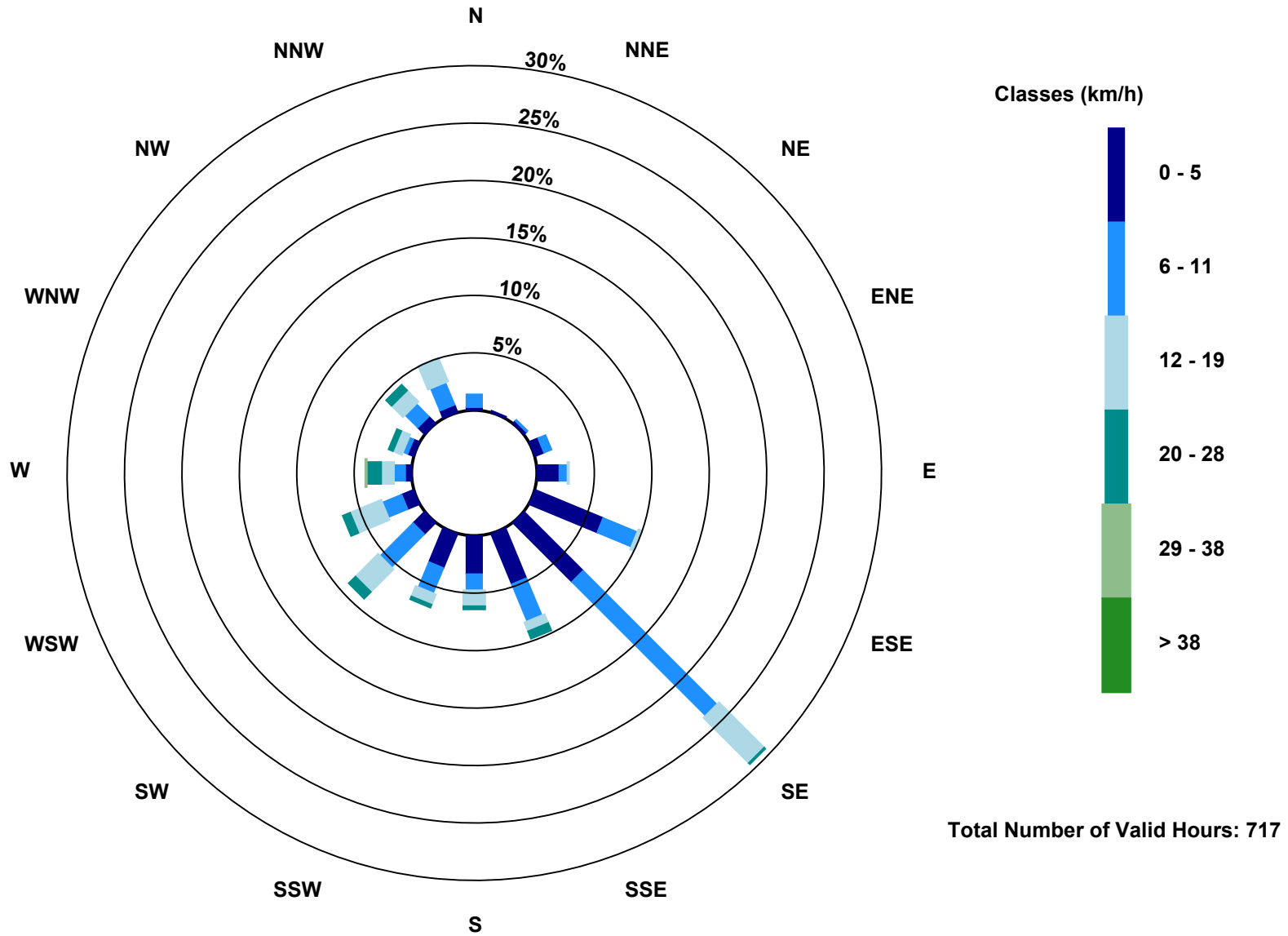
Total Number of Valid Hours: 717

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

Wind Speed (WS) - km/h
Athabasca Valley





Wood Buffalo Environmental Association
Summary of Hour Averages

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

Direction of Maximum Speed: 276 deg on Sep 13 19:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 286.9 deg on Sep 14	Hours of Data: 717
Direction of Minimum Speed: 248 deg on Sep 9 20:00	Hours of Missing Data: 3
Direction of Minimum Daily Speed Average: 0.8 deg on Sep 20	Percent Operational Time: 100.0
Monthly Average Direction: 187.2 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-Sep	333	118	223	232	210	184	187	223	209	211	219	221	230	225	234	233	241	247	255	260	258	224	119	121	229.1
2-Sep	130	147	192	169	173	150	171	234	230	230	226	229	238	247	266	270	257	264	248	256	248	250	237	151	240.2
3-Sep	146	137	139	140	131	138	138	137	129	132	132	132	148	85	40	239	241	219	254	246	267	298	322	320	173.4
4-Sep	315	269	257	241	266	228	287	314	322	320	313	306	298	290	305	293	307	289	272	208	141	138	139	147	289.9
5-Sep	143	142	136	138	133	134	134	132	130	128	77	174	172	168	170	203	186	144	130	141	136	125	171	111	146.5
6-Sep	130	119	116	110	117	123	125	118	122	141	180	244	131	56	351	307	326	325	259	225	227	131	116	116	135.8
7-Sep	119	153	138	132	136	129	123	140	137	124	112	164	230	217	225	50	94	156	136	149	102	129	145	156.8	
8-Sep	145	144	138	137	135	131	132	129	129	126	113	195	218	258	266	325	348	338	334	276	256	199	276	175	160.1
9-Sep	114	94	116	115	133	144	140	133	129	107	84	121	132	117	252	269	292	328	288	248	146	162	182	120	135.8
10-Sep	138	198	210	209	180	182	211	129	122	132	249	132	121	120	128	133	129	130	138	129	133	143	142	135	138.2
11-Sep	134	122	69	70	88	69	64	116	137	137	146	174	169	167	165	183	176	170	139	140	140	108	154	105	148.3
12-Sep	168	187	201	208	209	211	145	142	137	130	84	325	239	216	107	90	103	243	216	207	158	104	165	154	165.2
13-Sep	155	168	164	155	136	148	142	134	99	215	222	219	236	255	251	261	268	267	276	259	252	253	240	249	243.9
14-Sep	255	258	276	274	274	279	314	282	283	293	303	302	311	321	303	305	311	307	273	249	223	181	214	107	286.9
15-Sep	134	144	146	144	141	137	133	135	130	130	131	341	197	184	185	180	174	165	150	144	150	127	117	119	153.0
16-Sep	138	144	142	226	190	188	151	143	119	116	116	92	147	217	226	214	217	214	206	165	98	122	140	147	170.5
17-Sep	165	151	150	151	148	152	128	130	103	151	132	315	199	233	238	226	227	230	198	141	128	151	181	186	187.9
18-Sep	203	167	143	151	149	144	138	141	139	132	290	270	268	263	258	239	233	218	173	182	203	222	227	171	218.3
19-Sep	125	150	140	137	141	139	148	167	210	223	238	229	235	217	217	224	247	222	207	93	120	106	129	131	198.3
20-Sep	129	135	112	142	125	134	120	92	96	76	310	345	C	C	C	334	322	312	269	235	235	106	103	140	76.6
21-Sep	142	137	130	130	133	133	132	131	134	134	124	211	216	207	217	207	191	186	153	136	147	136	129	131	164.5
22-Sep	133	133	135	141	137	133	130	135	130	122	209	210	205	196	196	173	166	163	148	160	143	144	137	121	156.9
23-Sep	73	95	137	134	111	123	91	119	124	125	133	139	150	148	152	152	157	152	144	135	135	130	129	129	135.9
24-Sep	126	132	129	129	136	132	123	132	128	126	189	172	229	229	233	242	211	189	146	106	135	198	210	205	158.8
25-Sep	175	173	159	157	175	145	145	138	205	187	69	309	315	311	335	18	100	84	122	128	139	137	151	145	134.9
26-Sep	131	152	166	148	138	136	151	125	140	133	130	167	237	228	221	237	286	201	84	113	212	169	213	216	169.5
27-Sep	214	214	212	191	141	115	129	134	190	205	103	209	271	272	237	228	242	247	217	185	202	166	176	126	218.1
28-Sep	158	155	162	165	136	138	122	113	208	243	347	338	341	349	344	336	337	340	344	351	357	343	330	332	341.8
29-Sep	329	329	327	328	324	332	319	316	311	335	334	335	337	338	342	341	340	337	5	358	356	337	6	6	335.9
30-Sep	340	3	92	135	117	123	131	129	130	129	128	121	84	71	69	74	119	130	123	113	117	134	130	118	114.3

146.4	156.0	162.9	162.4	149.9	143.6	138.3	140.3	143.6	152.7	178.7	228.4	224.1	227.5	234.4	237.8	229.6	223.4	216.9	183.7	183.9	179.1	180.2	147.1
Diurnal Average																							

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 108 deg on Sep 6 13:00	Hours of Data: 717
Minimum Value: 8 deg on Sep 22 01:00	Hours of Missing Data: 3
Percentiles: P ₁ = 9 P ₁₀ = 13 Q ₁ = 15 Median = 20 Q ₃ = 34 P ₉₀ = 60 P ₉₉ = 92	Hours of Calibration: 3
	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-Sep	71	94	27	10	18	33	29	15	14	12	12	16	16	15	15	14	14	15	13	16	14	21	69	61	94
2-Sep	36	47	53	43	48	66	42	20	56	12	12	10	14	16	16	12	15	12	10	9	13	11	20	30	66
3-Sep	14	16	15	17	20	18	11	16	25	24	19	16	22	75	72	15	14	25	42	33	18	37	27	12	75
4-Sep	20	25	14	10	32	18	19	11	13	12	16	15	20	14	17	23	17	23	21	53	31	22	16	12	53
5-Sep	9	14	13	14	11	12	11	11	14	18	32	82	44	31	34	25	33	18	26	24	14	47	37	66	82
6-Sep	58	36	62	27	23	18	20	21	17	19	43	21	108	87	27	13	17	29	32	32	69	56	35	60	108
7-Sep	42	31	17	23	25	46	31	20	17	45	60	70	29	16	13	47	33	23	63	24	45	55	40	24	70
8-Sep	16	14	16	16	13	14	13	13	12	16	35	59	16	29	44	41	23	15	12	34	32	74	51	82	82
9-Sep	47	22	41	25	27	25	13	13	21	34	105	43	46	52	68	20	22	79	13	91	77	59	42	61	105
10-Sep	30	37	16	15	22	32	33	72	59	32	100	87	21	20	20	17	16	16	16	13	15	17	19	15	100
11-Sep	15	25	33	17	21	10	9	30	14	15	22	20	16	16	16	19	15	23	14	12	15	27	58	48	58
12-Sep	81	34	21	63	19	32	21	16	15	18	31	27	38	47	101	32	29	35	33	51	48	48	60	32	101
13-Sep	41	24	15	41	43	32	27	28	34	14	14	16	19	16	17	14	13	14	16	16	18	11	13	43	43
14-Sep	14	13	10	9	9	11	37	13	13	15	13	16	23	27	16	15	15	10	25	11	70	40	80	44	80
15-Sep	25	14	16	15	11	12	13	18	19	27	57	63	34	26	23	24	17	12	16	21	19	78	75	16	78
16-Sep	12	14	46	72	45	74	41	12	31	28	22	20	78	13	21	13	12	18	14	50	82	79	61	24	82
17-Sep	19	30	27	18	21	33	35	26	29	76	93	61	35	13	13	14	13	16	30	78	51	19	22	25	93
18-Sep	16	31	40	16	18	21	16	17	17	21	90	13	16	16	16	15	14	20	15	17	16	16	18	44	90
19-Sep	43	61	23	27	22	30	29	44	23	15	19	20	15	12	14	20	36	14	82	84	79	45	39	41	84
20-Sep	42	52	23	31	26	17	20	17	25	58	29	18	C	C	C	11	13	22	44	65	28	41	44	18	65
21-Sep	20	18	14	12	12	10	14	14	11	14	29	87	18	19	18	21	21	24	18	14	27	10	9	9	87
22-Sep	8	9	8	10	10	13	13	11	11	19	44	20	23	24	27	18	15	15	16	20	15	14	12	25	44
23-Sep	18	25	17	20	20	14	50	17	14	15	19	19	19	20	19	20	17	17	18	14	14	15	14	14	50
24-Sep	13	16	16	16	20	19	14	15	17	17	47	25	20	14	16	11	13	43	45	76	82	31	21	73	82
25-Sep	29	17	18	13	30	17	21	42	52	76	45	14	12	11	22	92	20	10	45	42	21	28	45	68	92
26-Sep	17	23	15	23	16	19	29	23	21	33	18	50	18	18	27	21	92	72	87	80	27	49	17	14	92
27-Sep	21	62	21	60	43	43	31	27	41	25	54	52	27	21	17	19	15	19	31	75	89	57	69	60	89
28-Sep	15	24	18	34	21	15	34	57	30	60	67	17	18	18	17	13	17	17	20	19	21	19	9	8	67
29-Sep	9	10	9	10	12	11	14	11	12	21	18	11	14	14	17	17	17	17	18	22	24	15	19	23	24
30-Sep	24	67	47	30	51	18	24	14	19	17	15	13	22	16	57	20	23	16	15	18	21	15	16	46	67

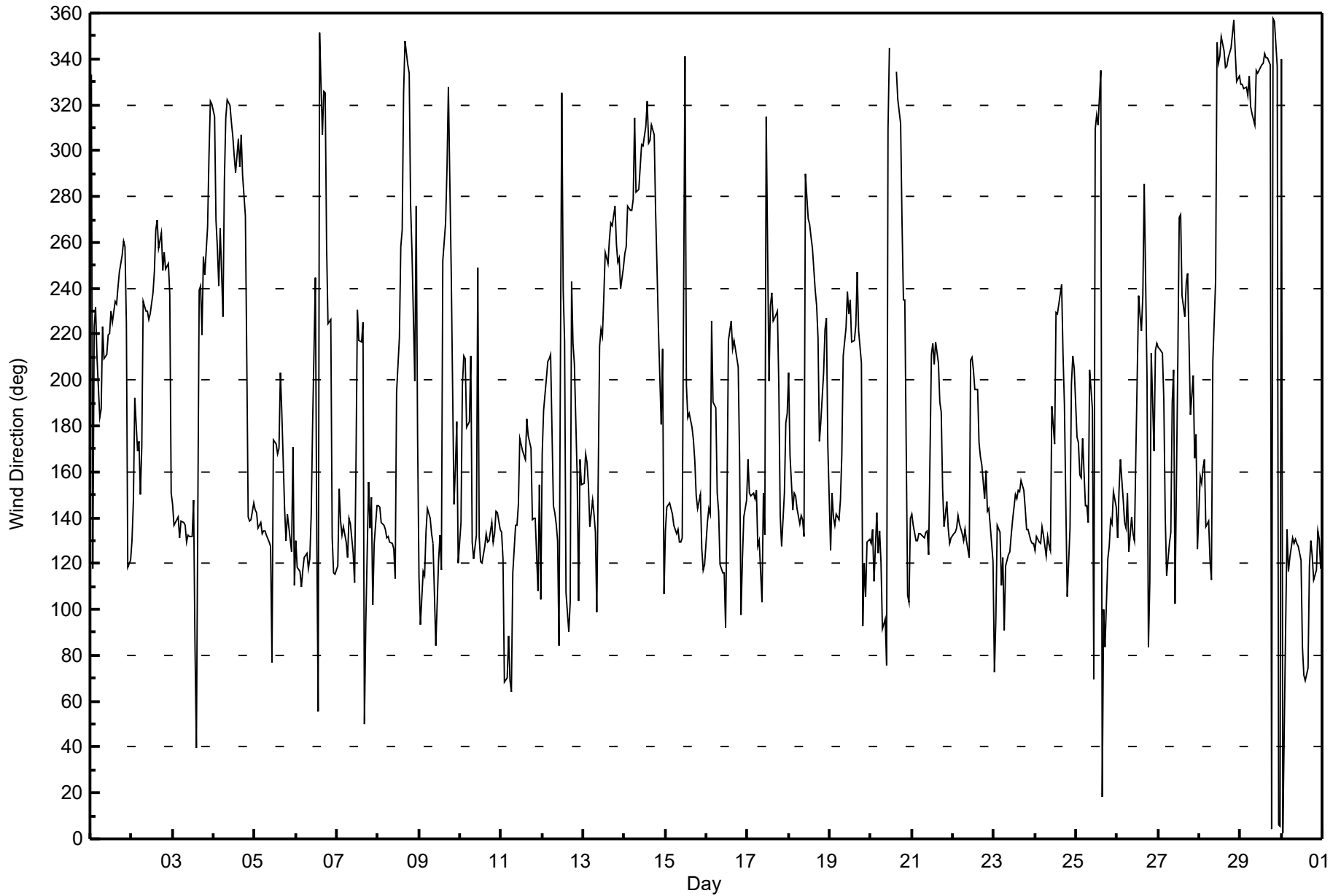
81	94	62	72	51	74	50	72	59	76	105	87	108	87	101	92	92	79	87	91	89	79	80	82	
Diurnal Maximum																								

C - Calibration



Wood Buffalo Environmental Association
Hourly Averages

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





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS08 FORT CHIPEWYAN SEPTEMBER 2023

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

October 30, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT CHIPEWYAN (AMS08)
 SEPTEMBER 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	680	33	40	99.03	7	0	2.7	0
TRS (ppb) Average	682	35	38	99.58	4.5	0	1.2	0
O3(ppb) Average	684	33	36	99.58	55.6	0	41.6	-
NO2(ppb) Average	678	35	42	99.03	14.1	0	6.3	-
NO(ppb) Average	678	35	42	99.03	7.4	-	1.2	-
NOX(ppb) Average	678	35	42	99.03	15.1	-	6.6	-
PM2.5(ug/m3) Average	717	1	3	99.72	687.4	282	288.7	20
CO(ppm) Average	673	32	47	97.92	4.5	0	1.2	-
CO2(ppm) Average	682	33	38	99.31	507.7	-	450.3	-
Temperature 2 m (C) Average	720	0	0	100	25.4	-	19.3	-
Relative Humidity (%) Average	720	0	0	100	99.9	-	83.2	-
Wind Speed 10 m (km/h) Average	720	0	0	100	40	-	28	-
Wind Direction 10 m (deg) Average	720	0	0	100	-	-	-	-
PC(mm) Total	720	0	0	100	3	-	5.1	-
Leaf Wetness (% of range) Average	720	0	0	100	74.5	-	35.9	-
Global Solar Radiation (W/m2) Average	720	0	0	100	602.1	-	195.5	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT CHIPEWYAN (AMS08)
 SEPTEMBER 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	680	0.65	0.9	-	0	0	0.2	0.3	0.8	1.6	7
TRS (ppb) Average	682	0.42	0.4	-	0.1	0.2	0.2	0.3	0.5	0.9	4.5
O3(ppb) Average	684	24.94	9.4	-	5.5	13.6	18	23.6	31	37.4	55.6
NO2(ppb) Average	678	1.31	1.8	-	0	0	0.3	0.8	1.6	2.9	14.1
NO(ppb) Average	678	0.26	0.5	-	0	0	0	0	0.3	1.1	7.4
NOX(ppb) Average	678	1.57	2	-	0	0.1	0.5	1.1	1.8	3.1	15.1
PM2.5(ug/m3) Average	717	90.32	100.2	-	4	12.9	19.5	42.1	135.9	226	687.4
CO(ppm) Average	673	0.36	0.5	-	0	0	0	0.1	0.5	1.1	4.5
CO2(ppm) Average	682	432.87	12.9	-	410.3	418.6	424.2	431.1	439.2	448	507.7
Temperature 2 m (C) Average	720	13.69	4.1	-	6	8.6	10.6	13.5	16.3	19.1	25.4
Relative Humidity (%) Average	720	71.27	15.5	-	32.7	48.7	59.8	74	82.9	90	99.9
Wind Speed 10 m (km/h) Average	720	13.2	7	-	1	6	8	11	17	24	40
Wind Direction 10 m (deg) Average	720	-	-	-	-	-	-	-	-	-	-
Precipitation (mm) Total	720	-	-	14.28	-	-	-	-	-	-	-
Leaf Wetness (% of range) Average	720	6.34	14.7	-	0.5	0.9	1.1	1.3	1.5	19.5	74.5
Global Solar Radiation (W/m2) Average	720	117.61	167.6	-	0	0	0	12.5	194.8	409.3	602.1

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

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
CO2, SO2, O3, PM2.5, TRS	04 Sep 2023 12:00	04 Sep 2023 12:00	1	Station power failure
CO, CO2, SO2, O3, PM2.5, TRS	16 Sep 2023 15:00	16 Sep 2023 15:00	1	Station power failure
CO,NO2	04 Sep 2023 12:00	04 Sep 2023 13:00	2	Station power failure
CO,CO2,NO2, O3, SO2, TRS	05 Sep 2023 07:00	05 Sep 2023 07:00	1	Station power failure
SO2	01 Sep 2023 11:00	01 Sep 2023 12:00	2	Maintenance - verify daily QA response
SO2	05 Sep 2023 11:00	05 Sep 2023 12:00	2	Maintenance - verify daily QA response
NO2	05 Sep 2023 12:00	05 Sep 2023 13:00	2	Maintenance - verify daily QA response
NO2	16 Sep 2023 15:00	16 Sep 2023 16:00	2	Station power failure
CO	04 Sep 2023 21:00	05 Sep 2023 06:00	10	Unstable Operation - flatline in analyzer output signal
CO	06 Sep 2023 04:00	06 Sep 2023 04:00	1	Unstable Operation - flatline in analyzer output signal
CO2	01 Sep 2023 11:00	01 Sep 2023 11:00	1	Maintenance - verify daily QA response
CO2	06 Sep 2023 04:00	06 Sep 2023 04:00	1	Unstable Operation - flatline in analyzer output signal



Wood Buffalo Environmental Association
Summary of Hour Averages

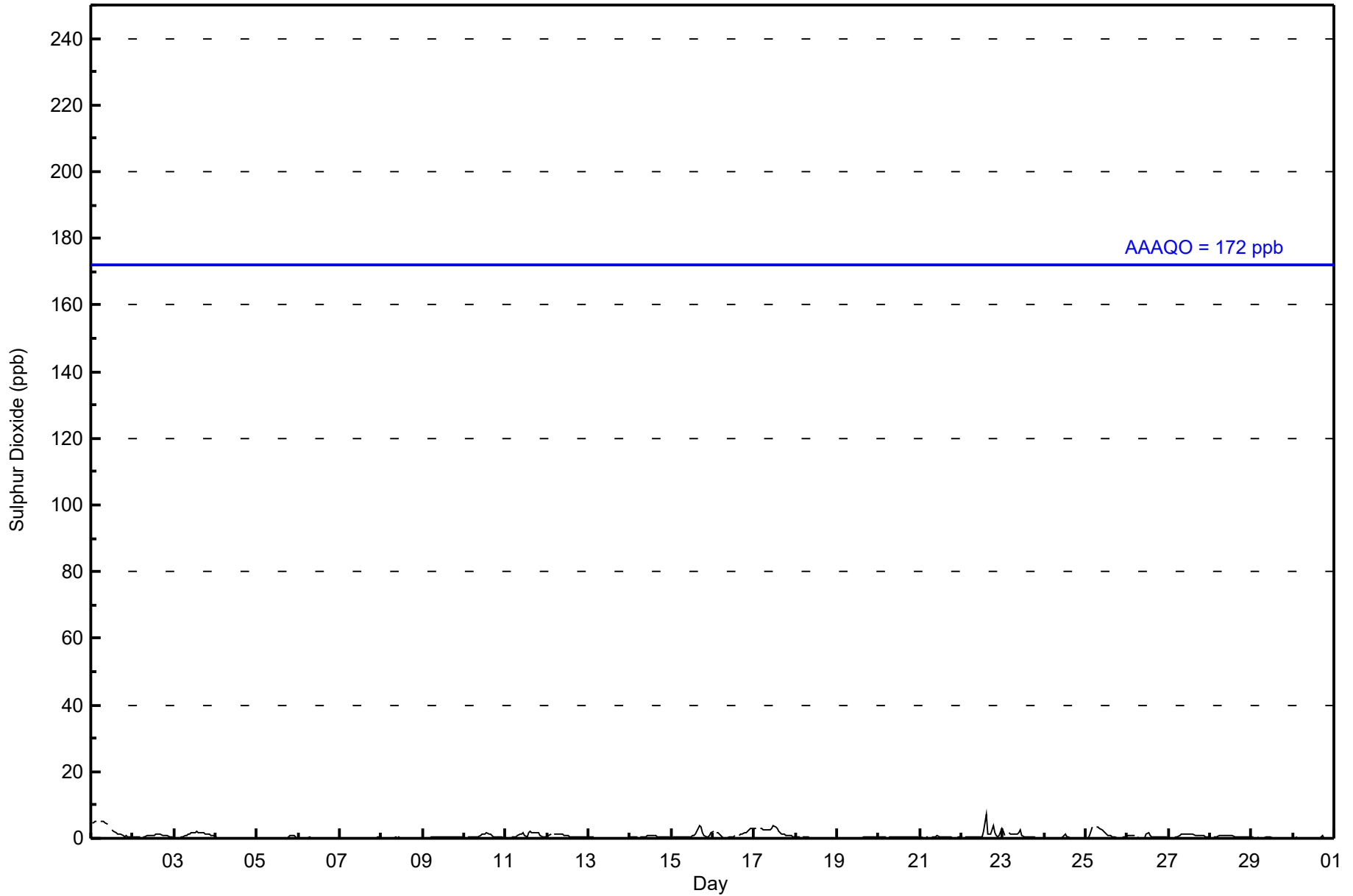
Sulphur Dioxide (SO₂) - ppb
Fort Chipewyan - September 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	720					
Maximum Value: 7.0 ppb on Sep 22 15:00		Maximum Daily Average: 2.7 ppb on Sep 1																	Hours of Data:	680							
Minimum Value: 0.0 ppb on Sep 4 05:00		Minimum Daily Average: 0.0 ppb on Sep 4																	Hours of Missing Data:	40							
Maximum Diurnal Average: 0.8 ppb at hour 15		Minimum Diurnal Average: 0.4 ppb at hour 22																	Hours of Calibration:	33							
Monthly Average: 0.65 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.2 Median = 0.3 Q ₃ = 0.8 P ₉₀ = 1.6 P ₉₉ = 4.7																	Percent Operational Time:	99.0							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Sep	4.5	4.9	4.9	5.0	Z	5.0	5.0	4.9	4.7	4.3	M	M	2.5	2.2	1.8	1.5	1.3	1.2	0.9	0.6	0.7	0.6	0.5	0.4	2.7	5.0	
2-Sep	0.3	0.6	0.6	0.5	0.5	Z	0.6	0.6	0.7	0.8	0.8	0.9	1.0	1.1	1.2	1.1	1.1	1.0	0.8	0.7	0.7	0.6	0.5	0.5	0.8	1.2	
3-Sep	Z	0.2	0.2	0.2	0.3	0.5	0.7	1.0	1.2	1.4	1.6	1.7	1.8	1.9	1.8	1.8	1.8	1.6	1.4	1.3	1.1	1.0	0.9	0.7	1.1	1.9	
4-Sep	0.5	Z	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	0.5	
5-Sep	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	M	M	0.0	0.0	0.0	0.0	0.1	0.1	0.2	1.0	1.0	0.7	0.3	0.2	0.2	1.0
6-Sep	0.1	0.1	0.1	Z	0.1	0.1	0.2	0.2	0.2	0.1	0.2	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	
7-Sep	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	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
8-Sep	0.2	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
9-Sep	Z	0.2	0.1	0.1	0.2	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.4	0.4	0.2	0.3	0.4	0.3	0.3	0.2	0.3	0.5	0.5
10-Sep	0.2	Z	0.2	0.3	0.5	0.3	0.4	0.4	0.6	1.0	1.2	1.2	1.3	1.5	1.2	1.1	0.8	0.5	0.3	0.3	0.3	0.2	0.2	0.2	0.6	1.5	
11-Sep	0.2	0.2	Z	0.3	0.3	0.3	0.3	0.8	1.2	1.3	1.6	1.0	0.6	1.5	2.0	1.8	1.6	1.7	1.7	1.6	1.0	0.6	0.6	0.5	1.0	2.0	
12-Sep	0.6	0.9	1.3	Z	1.1	1.2	1.1	1.2	1.1	1.1	1.0	0.8	0.8	0.6	0.5	0.4	0.3	0.3	0.3	0.3	0.4	0.5	0.5	0.4	0.7	1.3	
13-Sep	0.4	0.3	0.3	0.3	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.4	0.4	
14-Sep	0.3	0.3	0.3	0.3	0.3	Z	0.4	0.4	0.5	0.6	0.7	0.8	0.8	0.8	0.7	0.6	0.6	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.8	
15-Sep	Z	0.3	0.3	0.3	0.2	0.3	0.2	0.3	0.6	0.3	0.3	0.4	0.7	0.7	1.1	2.8	4.0	3.3	1.5	0.8	0.3	0.5	0.9	1.6	0.9	4.0	
16-Sep	2.3	Z	1.8	1.7	1.2	0.5	0.2	0.2	0.2	0.3	0.4	0.5	0.6	0.7	0.9	0.9	1.1	1.3	1.6	1.9	2.3	2.6	2.9	3.1	1.3	3.1	
17-Sep	3.2	3.2	Z	2.8	2.8	2.6	2.4	2.3	2.4	2.7	3.0	3.8	3.5	3.2	2.1	1.6	1.3	1.1	0.9	0.8	0.8	0.7	0.6	0.5	2.1	3.8	
18-Sep	0.5	0.4	0.4	Z	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.5	
19-Sep	0.1	0.1	0.1	0.2	Z	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.3	0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.2	0.5	
20-Sep	0.4	0.3	0.3	0.3	0.4	Z	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.4	0.3	0.4	0.3	0.3	0.4	
21-Sep	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.5	0.7	0.6	0.6	0.6	0.4	0.3	0.3	0.2	0.2	0.2	0.1	0.2	0.3	0.4	0.3	0.7	
22-Sep	0.7	Z	0.4	0.3	0.3	0.4	0.5	0.5	0.4	0.5	0.6	0.6	0.5	2.3	7.0	1.3	1.2	1.3	3.9	1.8	0.8	0.4	0.8	3.1	1.3	7.0	
23-Sep	2.0	0.9	Z	1.6	1.1	1.1	1.2	1.3	1.4	1.8	2.4	0.8	0.5	0.3	0.4	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.8	2.4	
24-Sep	0.1	0.1	0.2	Z	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.8	1.1	0.5	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.1	
25-Sep	0.0	0.0	0.7	2.1	3.2	Z	3.6	3.3	2.9	2.5	2.1	1.6	1.2	0.9	0.7	0.5	0.3	0.2	0.1	0.1	0.1	0.1	0.4	0.6	1.2	3.6	
26-Sep	0.8	1.0	1.0	0.8	0.7	Z	0.3	0.1	0.0	0.0	0.0	1.3	1.6	0.9	0.5	0.4	0.4	0.3	0.3	0.2	0.3	0.5	0.5	0.3	0.5	1.6	
27-Sep	Z	0.1	0.1	0.1	0.3	0.5	0.8	1.1	1.2	1.3	1.4	1.4	1.3	1.2	1.1	1.0	0.9	0.8	0.7	0.7	0.6	0.6	0.5	0.5	0.8	1.4	
28-Sep	0.4	Z	0.4	0.4	0.5	0.7	0.9	0.9	1.0	1.0	1.0	0.9	0.8	0.7	0.6	0.6	0.5	0.5	0.5	0.4	0.4	0.3	0.3	0.4	0.6	1.0	
29-Sep	0.3	0.4	Z	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.4	
30-Sep	0.2	0.2	0.3	Z	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.7	0.2	0.1	0.0	0.0	0.0	0.1	0.1	0.7	
																								Diurnal Average			
																								Diurnal Maximum			
0.7 0.6 0.6 0.7 0.6 0.6 0.7 0.7 0.7 0.8 0.7 0.8 0.8 0.8 0.8 0.6 0.7 0.6 0.6 0.5 0.4 0.4 0.4 0.5																								Diurnal Average			
4.5 4.9 4.9 5.0 3.2 5.0 5.0 4.9 4.7 4.3 3.0 3.8 3.5 3.2 7.0 2.8 4.0 3.3 3.9 1.9 2.3 2.6 2.9 3.1																								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
Fort Chipewyan - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	680	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: 680

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Fort Chipewyan - September 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	0	4	40	58	39	23	67	63	39	44	57	68	60	51	54	680
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	13	0	4	40	58	39	23	67	63	39	44	57	68	60	51	54	680

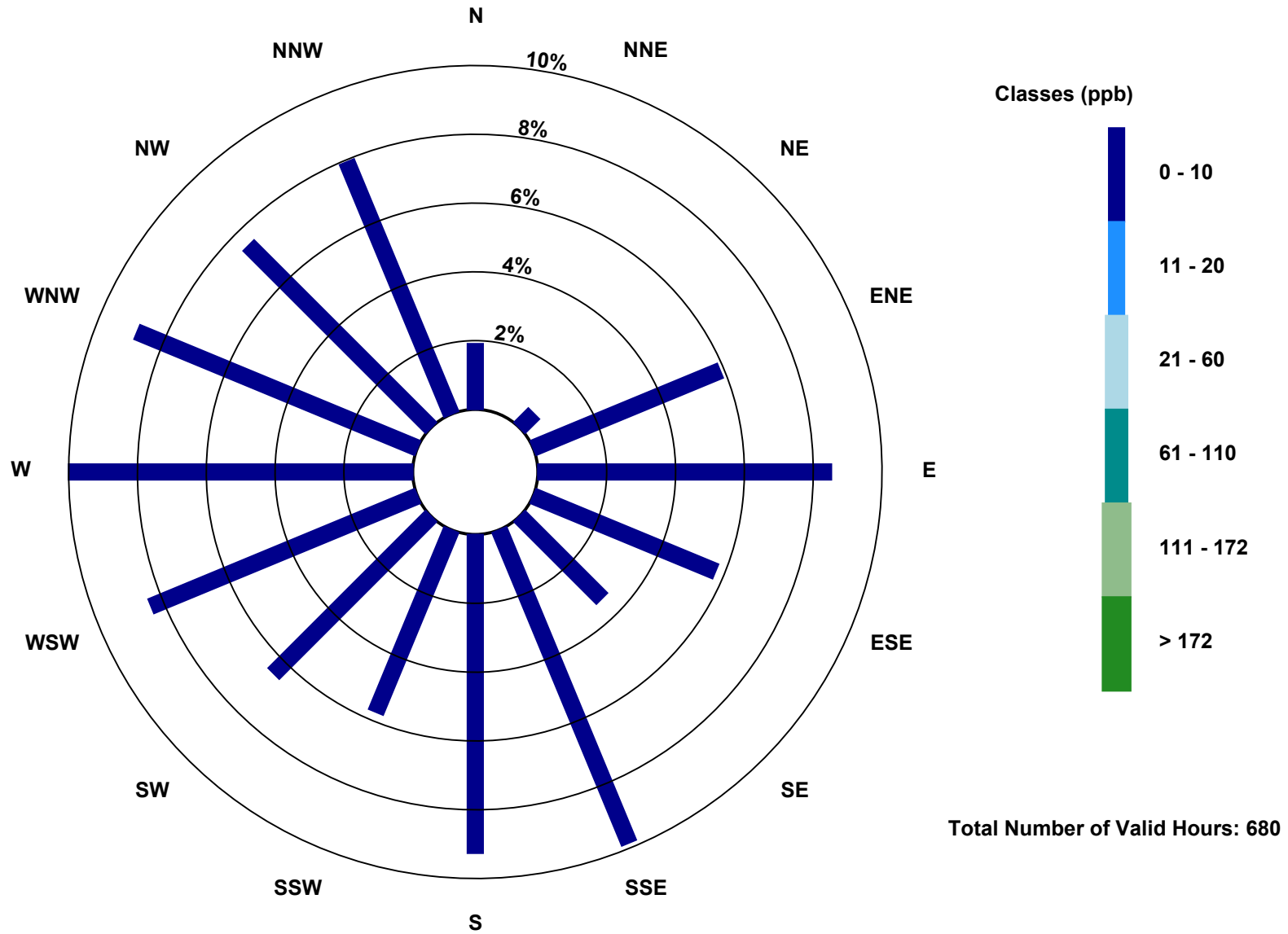
Total Number of Valid Hours: 680

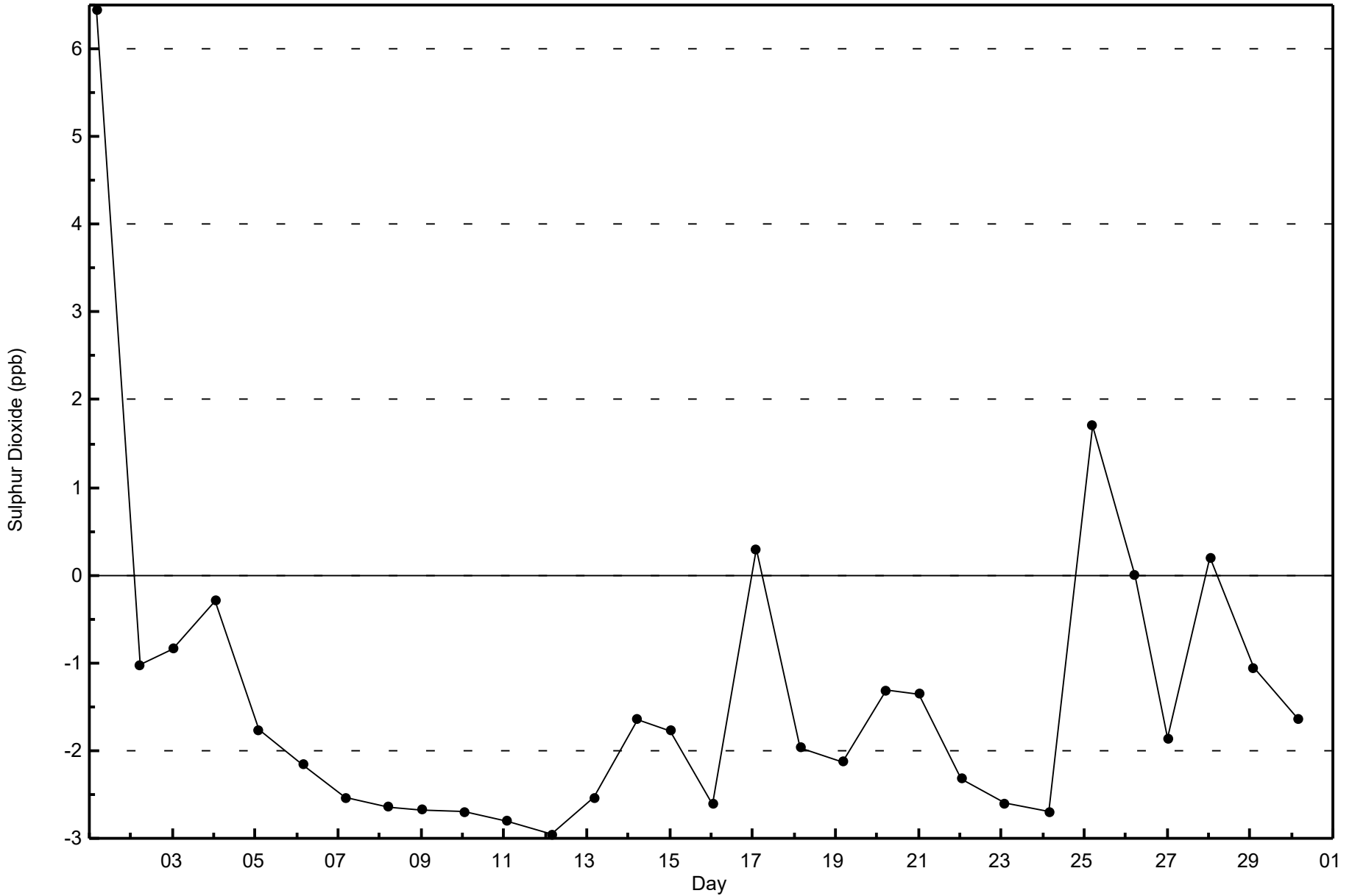
Total Number of Hours: 720

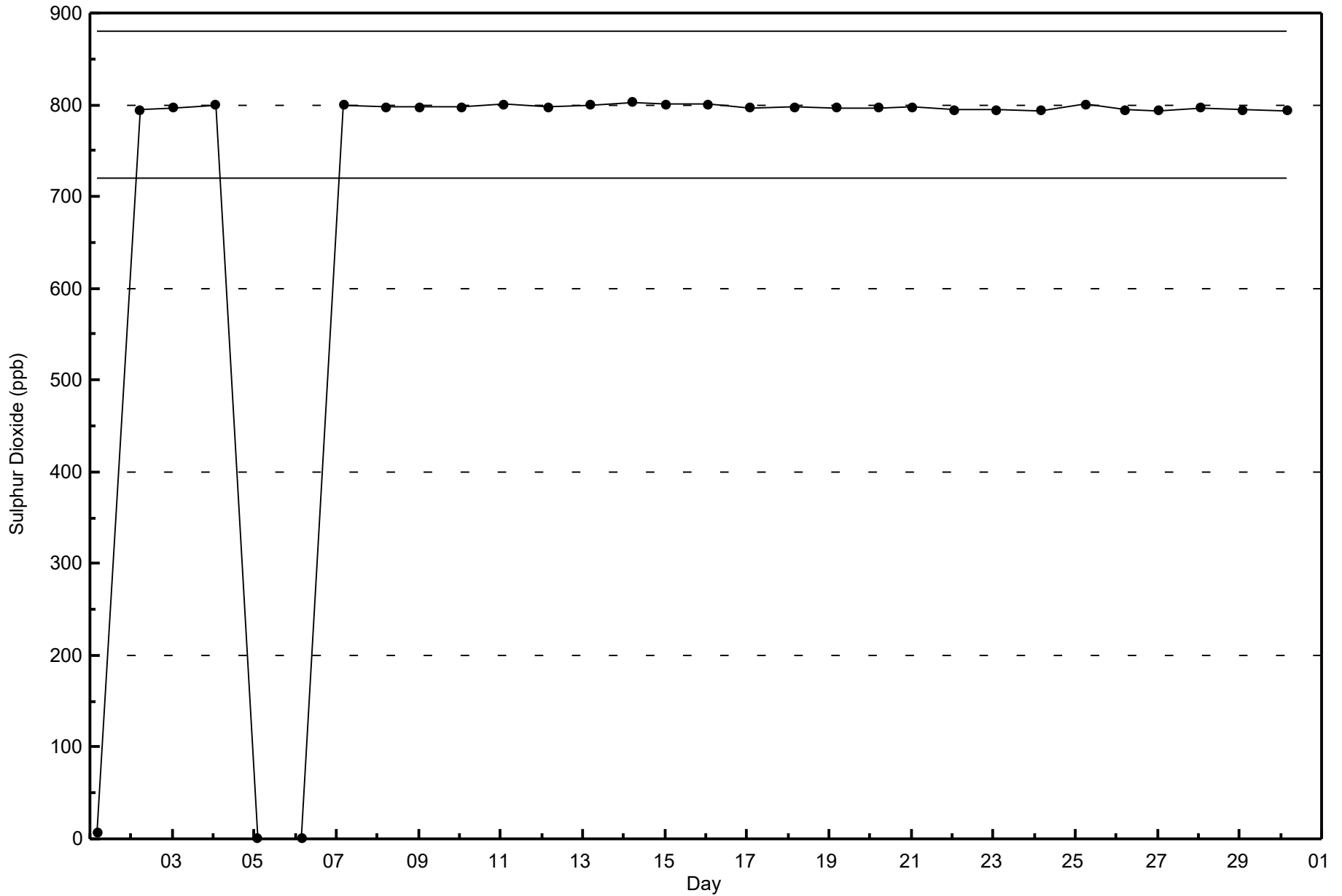


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Sulphur Dioxide (SO₂) - ppb
Fort Chipewyan









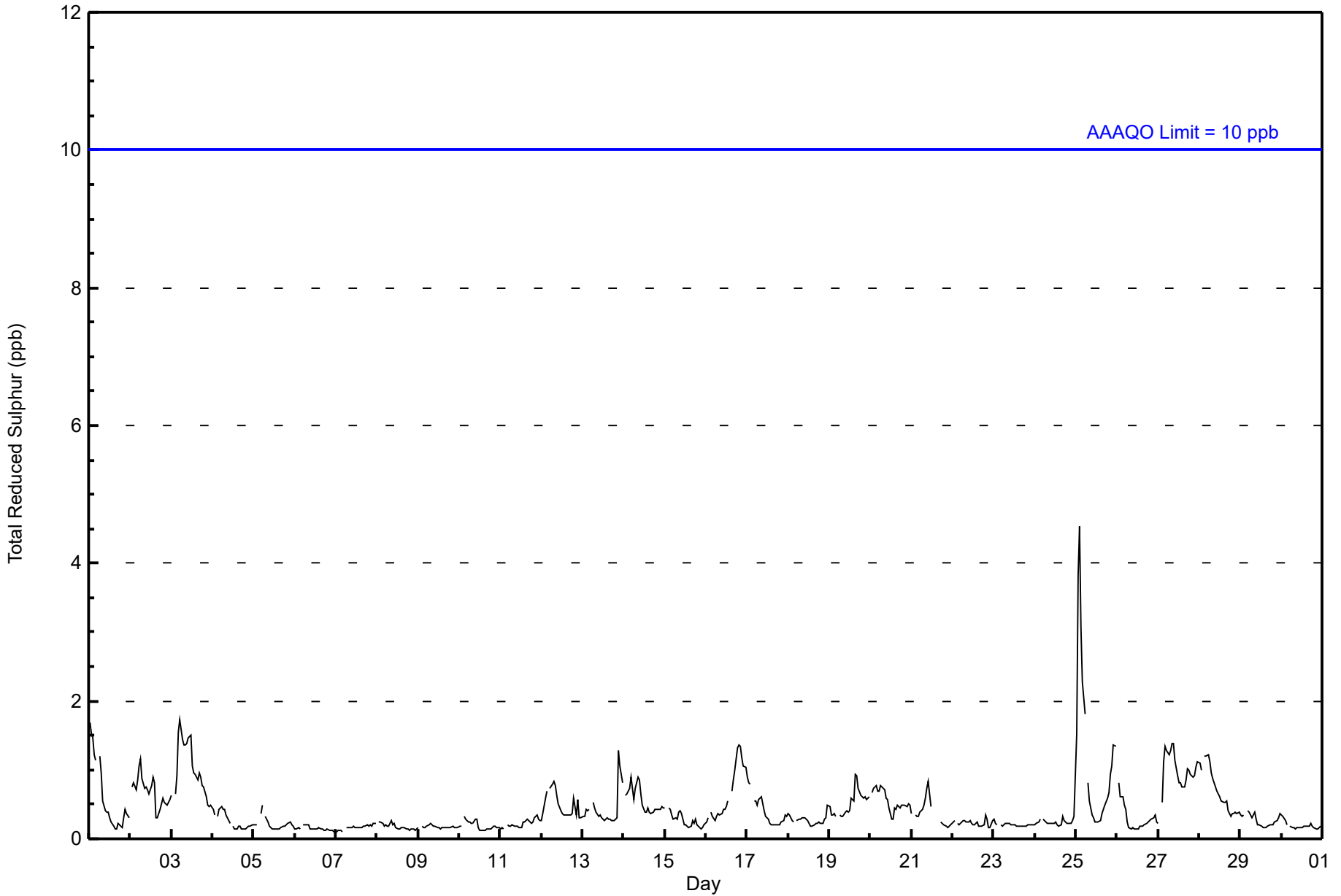
Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

Fort Chipewyan - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 4.5 ppb on Sep 25 03:00 Maximum Daily Average: 1.2 ppb on Sep 25		Hours in Service: 720 Hours of Data: 682 Hours of Missing Data: 38 Hours of Calibration: 35 Percent Operational Time: 99.6																								
Minimum Value: 0.1 ppb on Sep 7 05:00 Minimum Daily Average: 0.2 ppb on Sep 6 Maximum Diurnal Average: 0.6 ppb at hour 3 Minimum Diurnal Average: 0.3 ppb at hour 15 Monthly Average: 0.42 ppb Percentiles: P ₁ = 0.1 P ₁₀ = 0.2 Q ₁ = 0.2 Median = 0.3 Q ₃ = 0.5 P ₉₀ = 0.9 P ₉₉ = 1.6																										
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-Sep	1.7	1.5	1.5	1.2	1.1	Z	1.2	1.0	0.5	0.4	0.4	0.4	0.3	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.3	0.4	0.4	0.3	0.6	1.7
2-Sep	Z	0.8	0.8	0.7	0.9	1.1	1.2	0.9	0.7	0.8	0.7	0.7	0.8	0.9	0.8	0.3	0.3	0.4	0.5	0.6	0.5	0.5	0.5	0.6	0.7	1.2
3-Sep	0.6	Z	0.7	0.9	1.5	1.7	1.4	1.4	1.4	1.4	1.5	1.5	1.1	1.0	0.9	0.9	1.0	0.9	0.8	0.8	0.6	0.5	0.5	0.5	1.0	1.7
4-Sep	0.4	0.4	Z	0.3	0.4	0.5	0.4	0.4	0.3	0.3	0.2	0.2	PF	0.2	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.5
5-Sep	0.2	0.2	0.2	Z	0.4	0.5	PF	0.3	0.2	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	0.5
6-Sep	0.1	0.1	0.2	0.1	Z	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	0.2	0.2
7-Sep	0.1	0.1	0.1	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
8-Sep	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3
9-Sep	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	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
10-Sep	0.2	0.2	Z	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3
11-Sep	0.1	0.2	0.1	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.3	0.4	0.3	0.3	0.2	0.4	0.4
12-Sep	0.3	0.4	0.6	0.7	Z	0.7	0.8	0.8	0.8	0.6	0.5	0.4	0.4	0.4	0.3	0.3	0.4	0.3	0.4	0.6	0.4	0.6	0.3	0.3	0.5	0.8
13-Sep	0.3	0.3	0.4	0.4	0.4	Z	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	1.3	1.1	0.8	0.4	1.3	
14-Sep	Z	0.6	0.7	0.7	0.9	0.7	0.6	0.7	0.9	0.9	0.6	0.5	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.9
15-Sep	0.4	Z	0.5	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.2	0.1	0.2	0.2	0.3	0.5
16-Sep	0.3	0.3	Z	0.4	0.3	0.3	0.3	0.4	0.3	0.4	0.4	0.4	0.5	0.6	PF	0.7	0.8	1.0	1.3	1.4	1.4	1.2	1.1	1.0	0.7	1.4
17-Sep	0.9	0.8	0.8	Z	0.6	0.5	0.5	0.6	0.6	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.9
18-Sep	0.4	0.3	0.3	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	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.5	0.3	0.5
19-Sep	0.5	0.3	0.3	0.4	0.3	Z	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.6	0.5	0.9	0.9	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.9
20-Sep	Z	0.7	0.7	0.8	0.7	0.7	0.8	0.7	0.7	0.6	0.6	0.4	0.3	0.3	0.4	0.4	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.8
21-Sep	0.4	Z	0.3	0.3	0.3	0.4	0.4	0.5	0.6	0.7	0.8	0.5	C	C	C	C	C	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.8
22-Sep	0.3	0.3	Z	0.2	0.2	0.2	0.3	0.3	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.3	0.2	0.3
23-Sep	0.3	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
24-Sep	0.2	0.2	0.2	0.3	Z	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.2	0.3	0.3
25-Sep	1.5	3.8	4.5	3.1	2.3	1.8	Z	0.8	0.6	0.4	0.3	0.2	0.2	0.2	0.2	0.3	0.4	0.5	0.6	0.7	0.9	1.0	1.4	1.4	1.2	4.5
26-Sep	Z	0.8	0.6	0.6	0.5	0.4	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.3	0.8
27-Sep	0.2	Z	0.5	1.1	1.3	1.3	1.2	1.3	1.4	1.4	1.1	0.9	0.8	0.8	0.8	0.7	0.8	1.0	1.0	0.9	0.9	0.9	1.0	1.1	1.0	1.4
28-Sep	1.1	1.0	Z	1.2	1.2	1.2	1.1	1.0	0.9	0.8	0.7	0.6	0.6	0.5	0.5	0.5	0.5	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.7	1.2
29-Sep	0.3	0.3	0.3	Z	0.4	0.4	0.3	0.3	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.3	0.4
30-Sep	0.3	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	0.1	0.1	0.2	0.2	0.2	0.3
																								Diurnal Average		
																								Diurnal Maximum		
																								0.5 0.6 0.6 0.6 0.6 0.6 0.5 0.5 0.5 0.4 0.4 0.4 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4		
																								1.7 3.8 4.5 3.1 2.3 1.8 1.4 1.4 1.4 1.4 1.5 1.5 1.1 1.0 0.9 0.9 1.0 1.0 1.3 1.4 1.4 1.3 1.4 1.4 0.2 0.3		
Z - zerospan C - Calibration PF - Power Failure																										
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb																										





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	679	99.56	99.56
3 - 4	2	0.29	99.85
5 - 7	1	0.15	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 682

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

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

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	13	0	4	42	58	42	23	66	63	35	44	59	66	62	52	50	679
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	13	0	4	42	58	42	23	66	63	35	44	59	66	62	52	53	682

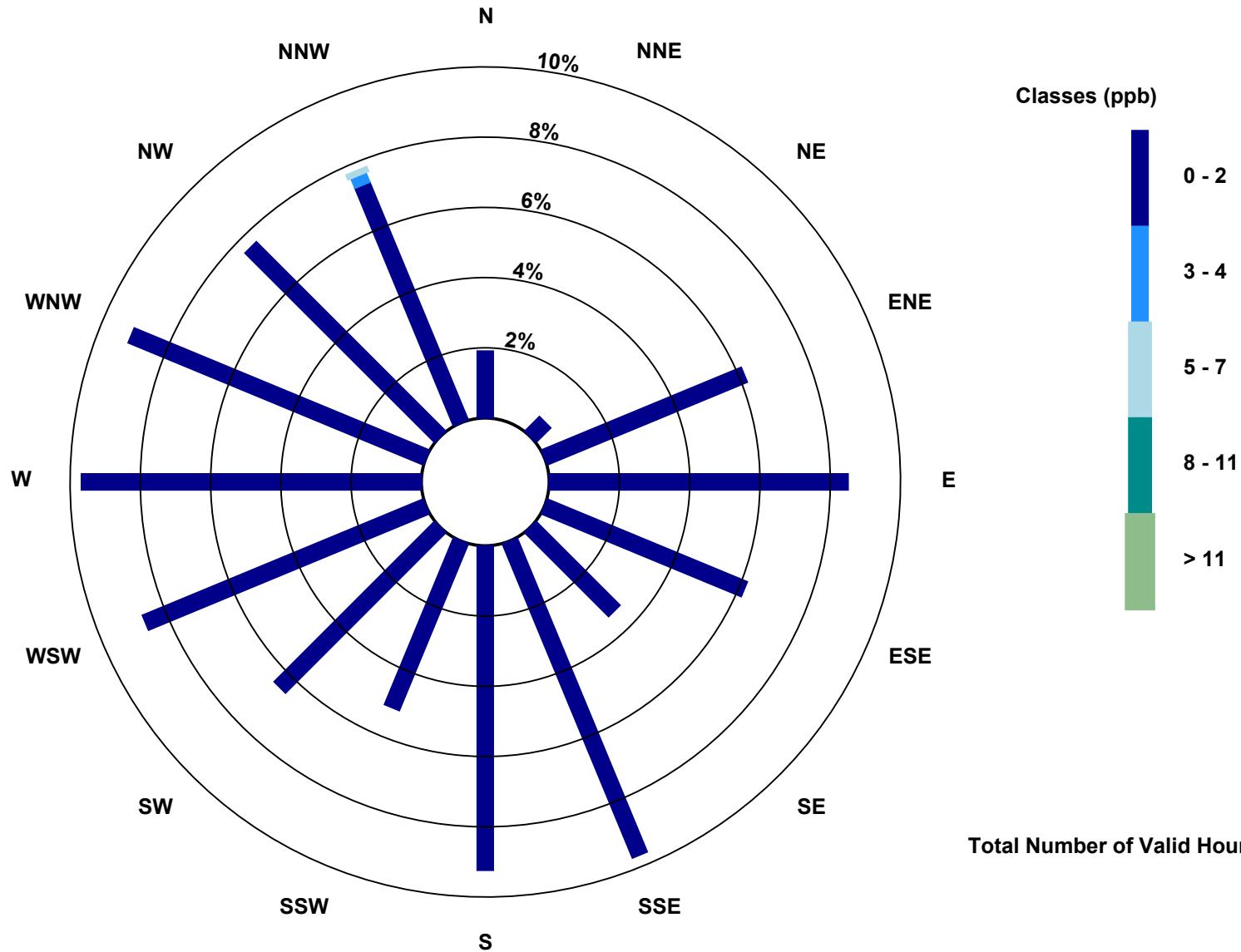
Total Number of Valid Hours: 682

Total Number of Hours: 720

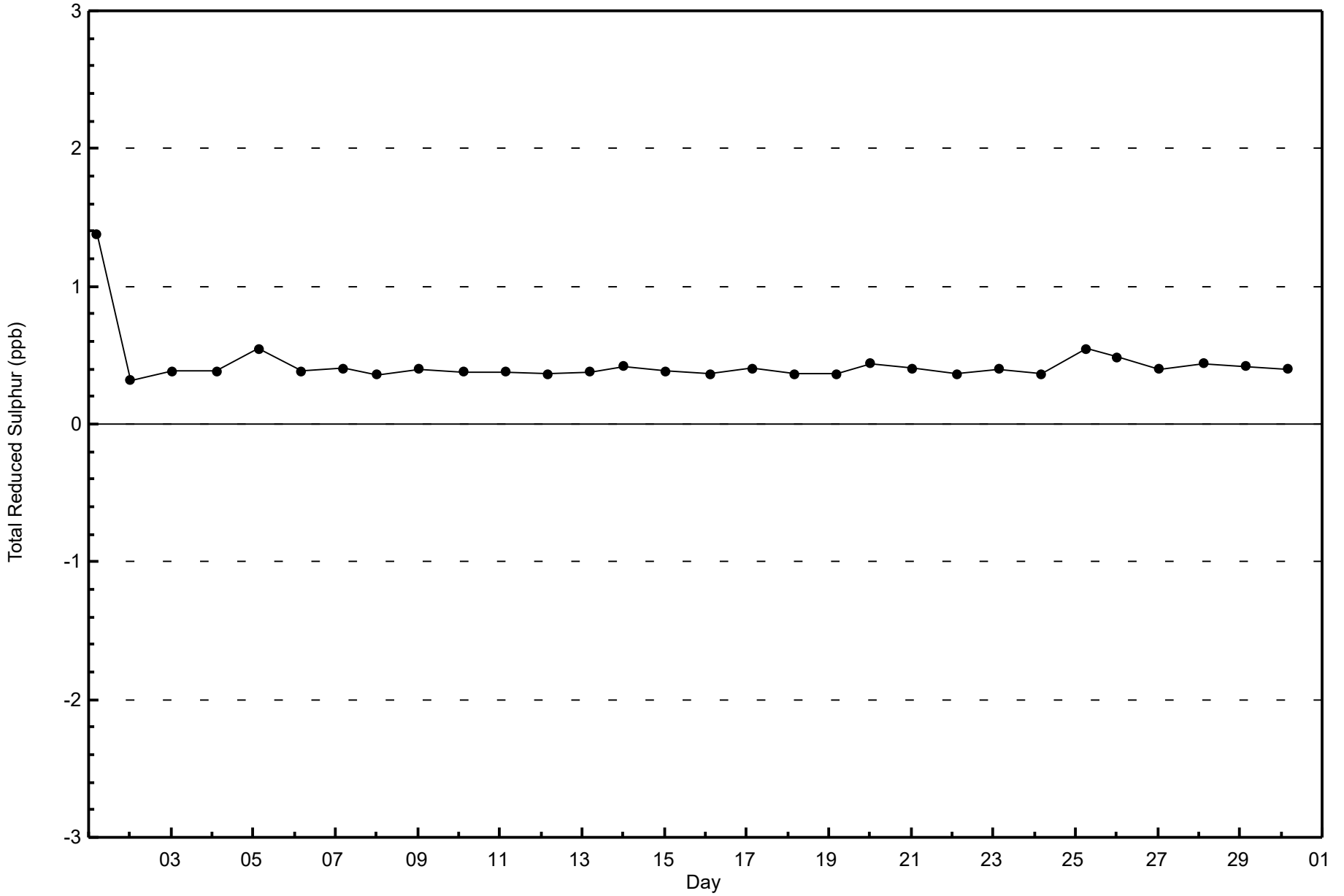


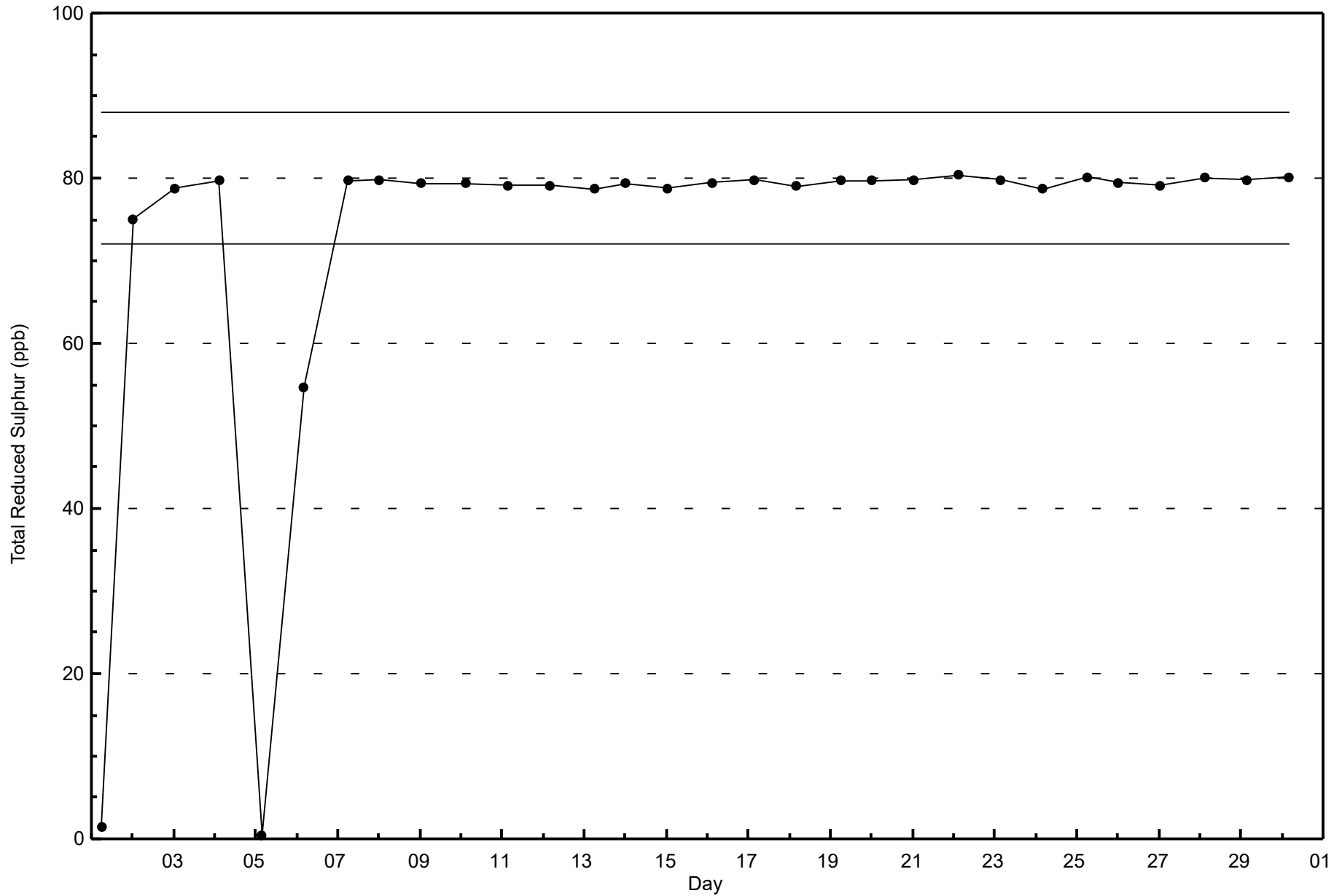
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Total Reduced Sulphur (TRS) - ppb
Fort Chipewyan



Total Number of Valid Hours: 682







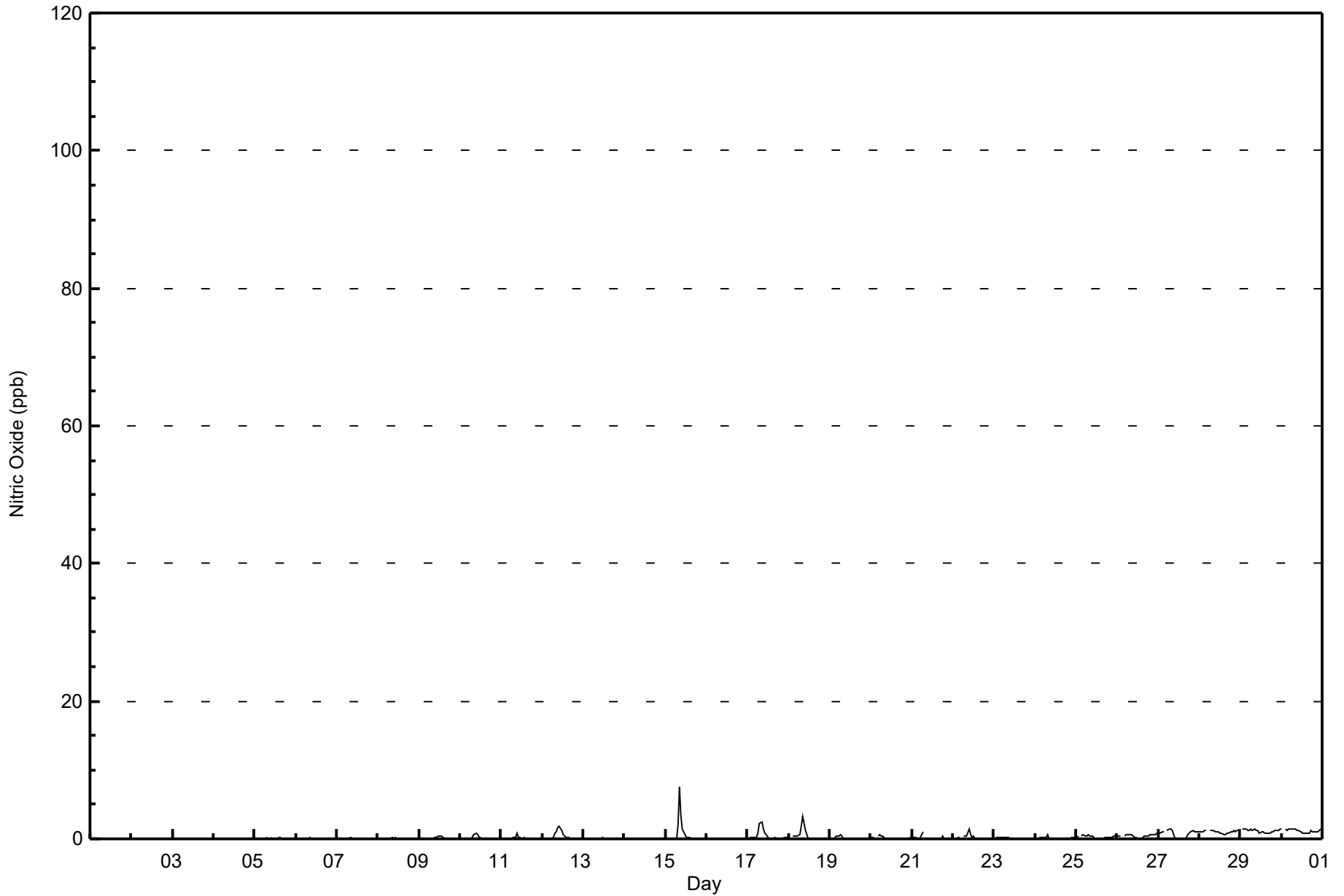
Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

Fort Chipewyan - September 2023

Maximum Value: 7.4 ppb on Sep 15 09:00		Maximum Daily Average: 1.2 ppb on Sep 29		Hours in Service: 720																																		
Minimum Value: 0.0 ppb on Sep 1 01:00		Minimum Daily Average: 0.0 ppb on Sep 16		Hours of Data: 678																																		
Maximum Diurnal Average: 0.8 ppb at hour 9		Minimum Diurnal Average: 0.1 ppb at hour 16		Hours of Missing Data: 42																																		
Monthly Average: 0.26 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.3 P ₉₀ = 1.1 P ₉₉ = 1.9		Hours of Calibration: 35																																		
				Percent Operational Time: 99.0																																		
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum												
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24														
1-Sep	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	0.0	0.0	0.0						
2-Sep	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0						
3-Sep	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0						
4-Sep	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	PF	PF	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						
5-Sep	Z	0.0	0.0	0.0	0.0	0.0	0.0	PF	0.2	0.1	0.0	0.3	M	M	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	0.1	0.3					
6-Sep	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0					
7-Sep	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	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	Z	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0					
9-Sep	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.4	0.4	0.3	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	0.1	0.4				
10-Sep	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.1	0.5	0.9	0.7	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.9					
11-Sep	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.8	0.2	0.2	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.8					
12-Sep	0.0	Z	0.0	0.0	0.0	0.0	0.2	0.8	1.0	1.7	1.8	1.3	0.7	0.4	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.8					
13-Sep	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1					
14-Sep	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0					
15-Sep	0.0	0.0	0.0	0.0	Z	0.0	0.0	2.0	7.4	3.5	1.5	0.5	0.2	0.2	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	7.4					
16-Sep	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	PF	PF	0.0	0.0	0.0	0.0	0.0	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-Sep	Z	0.1	0.1	0.2	0.2	0.3	0.8	2.3	2.3	1.4	0.8	0.6	0.1	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.4	2.3					
18-Sep	0.3	Z	0.3	0.4	0.4	0.4	0.6	1.8	3.2	2.2	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	3.2						
19-Sep	0.1	0.1	Z	0.3	0.3	0.4	0.5	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	0.1	0.1	0.1	0.1	0.1	0.1	0.5					
20-Sep	0.1	0.2	0.3	Z	0.4	0.6	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.6	0.6					
21-Sep	0.1	0.1	0.1	0.1	Z	0.3	1.1	C	C	C	C	C	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	0.1	1.1	1.1					
22-Sep	0.0	0.0	0.1	0.1	0.2	Z	0.4	0.4	0.4	1.4	0.7	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	1.4					
23-Sep	Z	0.1	0.1	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2					
24-Sep	0.1	Z	0.2	0.2	0.1	0.1	0.1	0.5	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	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.5	0.5					
25-Sep	0.3	0.3	Z	0.4	0.5	0.4	0.5	0.6	0.5	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.6	0.6				
26-Sep	0.4	0.5	0.5	Z	0.5	0.5	0.6	0.6	0.6	0.5	0.3	0.1	0.0	0.0	0.1	0.3	0.4	0.5	0.5	0.6	0.6	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8				
27-Sep	0.8	0.8	1.0	1.1	Z	1.2	1.4	1.4	1.1	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.5	0.8	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.4	1.4				
28-Sep	1.1	1.1	1.1	1.1	1.1	Z	1.2	1.3	1.2	1.0	1.0	1.0	0.8	0.9	0.6	0.7	0.8	0.9	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.3	1.3			
29-Sep	Z	1.3	1.4	1.3	1.3	1.3	1.3	1.3	1.3	1.5	1.3	1.3	0.9	1.0	0.9	0.9	0.8	0.8	0.9	1.0	1.1	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.5	1.5			
30-Sep	1.3	Z	1.4	1.3	1.3	1.3	1.3	1.4	1.4	1.4	1.2	1.3	1.1	0.8	0.8	0.7	0.7	0.9	1.2	1.1	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.4	1.4			
		0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.6	0.8	0.6	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	Diurnal Average				
		1.3	1.3	1.4	1.3	1.3	1.3	1.4	2.3	7.4	3.5	1.8	1.3	1.0	0.9	0.9	0.8	0.9	1.2	1.1	1.1	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.5	Diurnal Maximum			
Z - zerospan		C - Calibration					M - Maintenance					PF - Power Failure																										





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	678	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: 678

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Fort Chipewyan - September 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	14	0	4	42	58	40	26	65	59	37	44	58	68	62	50	51	678
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	14	0	4	42	58	40	26	65	59	37	44	58	68	62	50	51	678

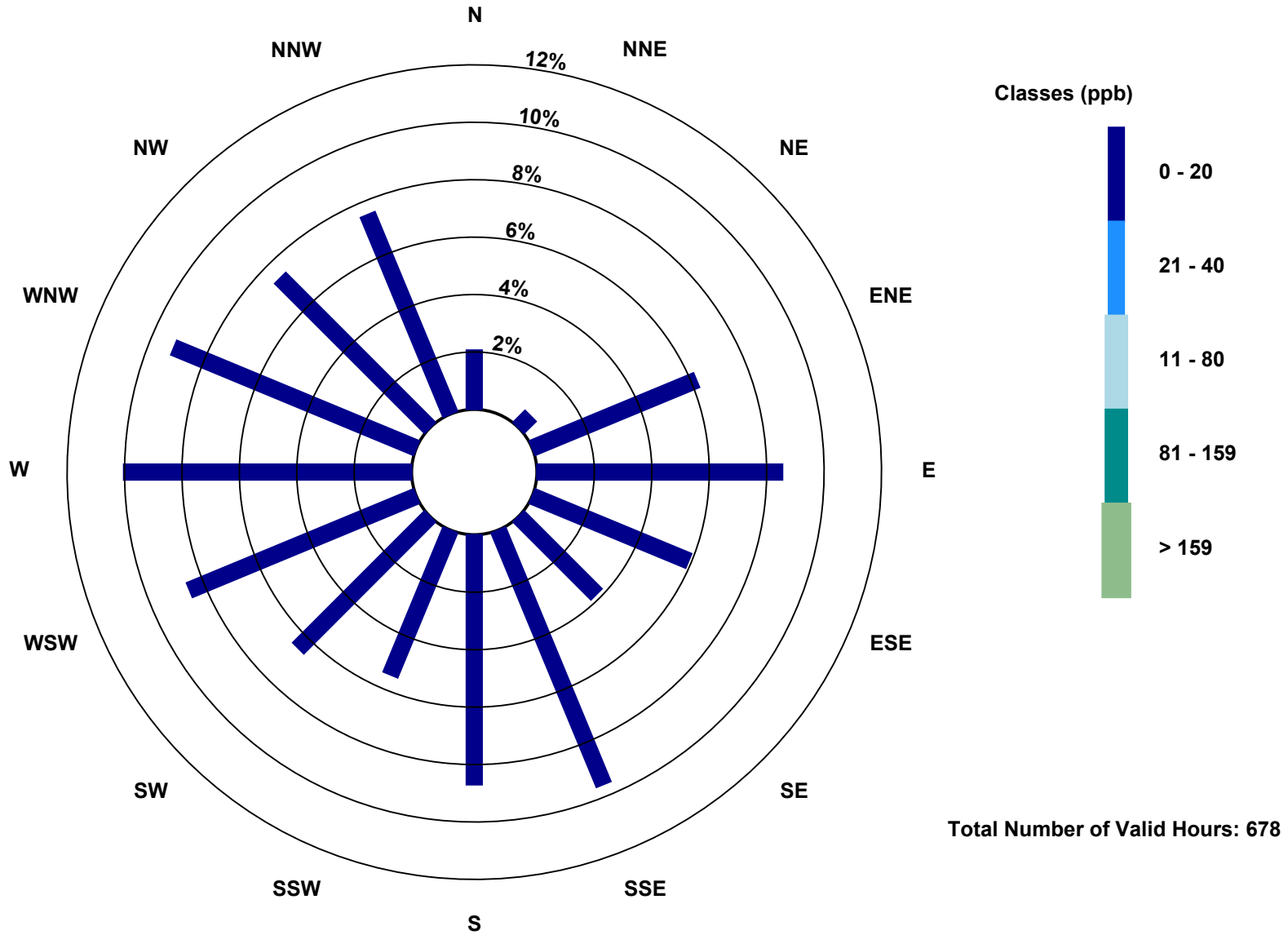
Total Number of Valid Hours: 678

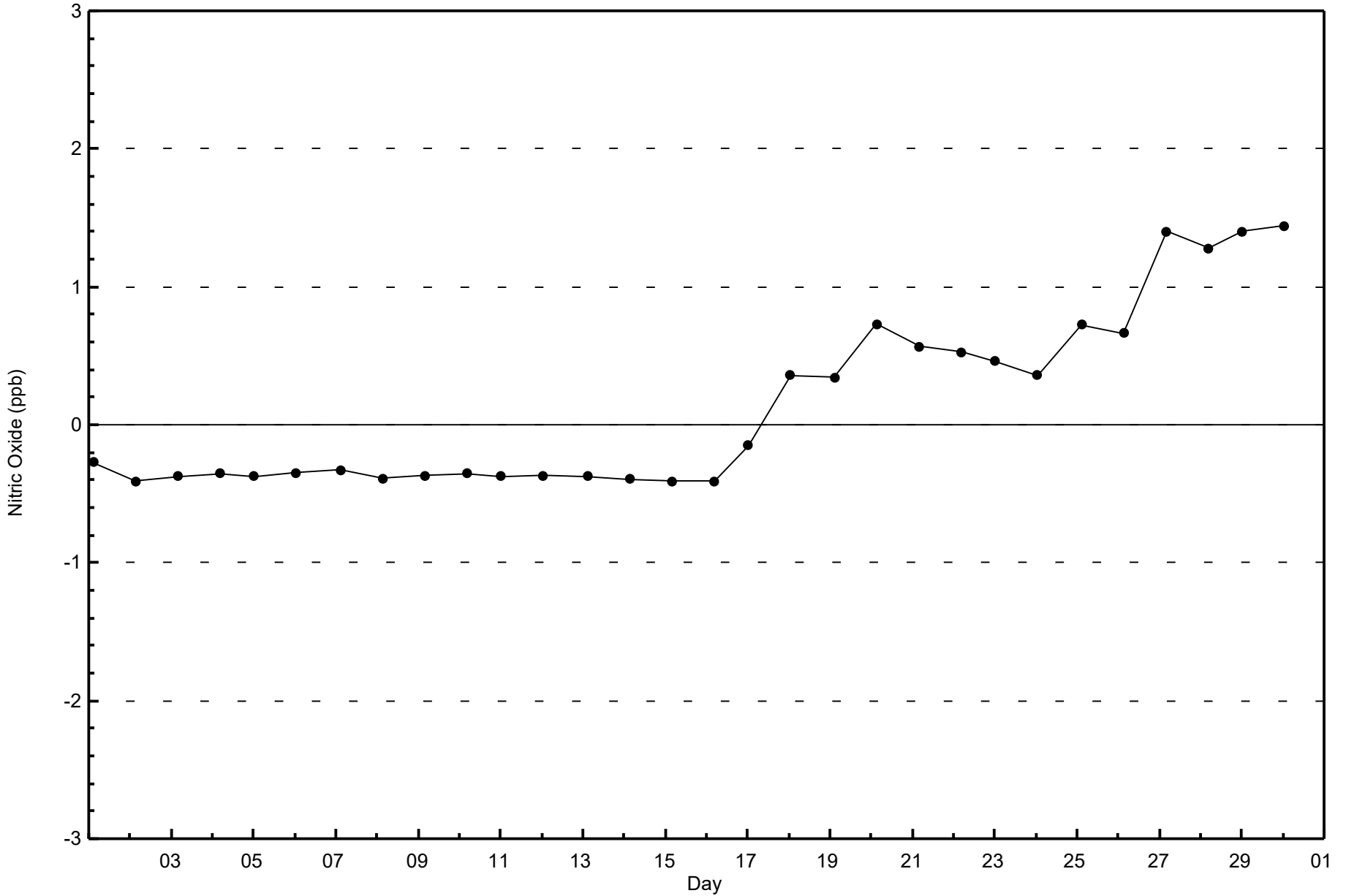
Total Number of Hours: 720

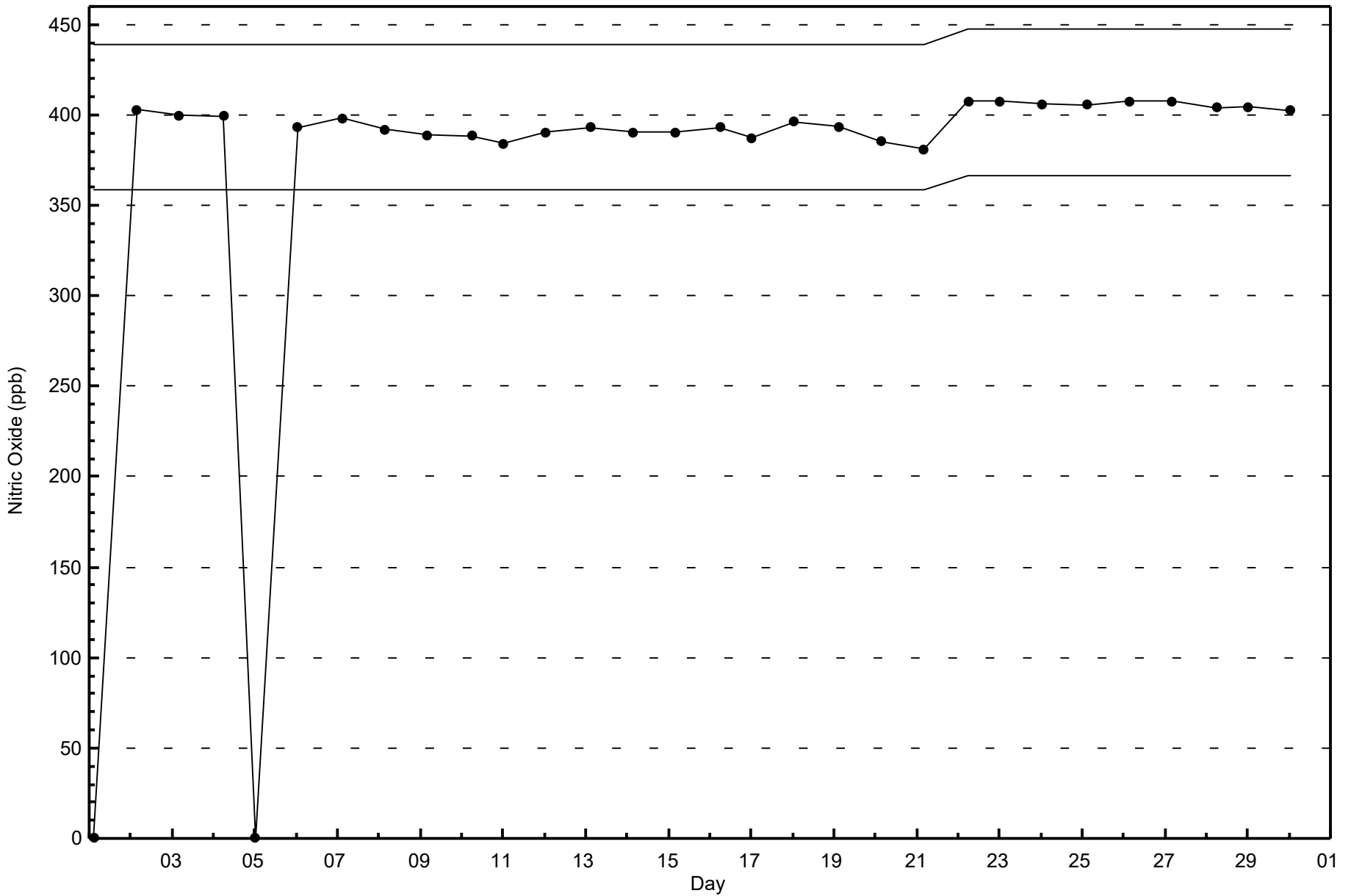


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitric Oxide (NO) - ppb
Fort Chipewyan









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

Fort Chipewyan - September 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 14.1 ppb on Sep 12 08:00	Maximum Daily Average: 6.3 ppb on Sep 12		Hours of Data:	678
Minimum Value: 0.0 ppb on Sep 1 14:00	Minimum Daily Average: 0.0 ppb on Sep 4		Hours of Missing Data:	42
Maximum Diurnal Average: 2.4 ppb at hour 9	Minimum Diurnal Average: 0.8 ppb at hour 16		Hours of Calibration:	35
Monthly Average: 1.31 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.3 Median = 0.8 Q ₃ = 1.6 P ₉₀ = 2.9 P ₉₉ = 9.5		Percent Operational Time:	99.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Sep	1.4	1.1	Z	0.7	0.7	0.8	0.6	0.4	0.1	0.2	0.2	0.3	0.1	0.0	0.0	0.0	0.0	1.4	0.7	0.0	1.2	1.8	0.9	0.6	0.6	1.8	
2-Sep	1.1	3.3	4.0	Z	3.4	3.5	3.4	2.8	2.2	2.5	2.6	2.3	3.3	3.8	2.6	0.5	0.5	1.2	1.4	1.5	1.0	0.6	0.6	0.8	2.1	4.0	
3-Sep	0.8	0.6	0.5	1.1	Z	3.3	2.3	2.2	2.5	2.6	3.3	3.6	2.6	2.4	2.1	1.7	2.0	1.7	1.5	1.7	1.5	1.2	0.8	0.4	1.8	3.6	
4-Sep	0.2	0.1	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	PF	PF	0.0	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-Sep	Z	0.0	0.0	0.2	0.0	0.1	PF	0.0	0.0	0.1	0.5	M	M	0.5	1.1	1.0	1.3	1.2	1.2	1.1	1.0	0.8	0.5	0.5	0.6	1.3	
6-Sep	0.2	Z	0.2	0.2	0.7	1.6	0.8	0.9	1.6	0.5	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.3	0.4	0.3	0.4	0.7	0.5	0.6	0.5	1.6	
7-Sep	0.5	0.4	Z	0.4	0.4	0.4	0.5	0.5	1.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1.9	2.1	1.2	0.6	0.5	0.7	2.1	
8-Sep	0.5	0.5	0.4	Z	0.5	0.6	0.7	0.8	1.7	0.9	1.1	0.6	0.4	0.5	0.6	0.7	0.7	0.5	0.9	0.5	0.5	0.3	0.3	0.4	0.6	1.7	
9-Sep	0.4	0.6	0.5	0.5	Z	0.6	0.6	0.6	0.6	0.7	0.9	1.4	1.7	1.3	1.2	1.0	0.9	0.5	0.8	0.6	0.8	0.8	0.7	0.8	0.8	1.7	
10-Sep	0.8	0.6	0.7	0.9	1.6	Z	1.4	1.2	1.6	2.0	1.9	1.2	1.0	1.0	0.9	0.8	0.8	0.7	0.6	0.5	0.5	0.5	0.5	0.4	1.0	2.0	
11-Sep	Z	0.5	0.5	0.6	0.6	0.7	0.8	1.5	1.5	1.5	1.5	1.4	1.3	2.0	2.1	2.0	2.0	2.1	2.2	2.0	1.5	1.6	2.2	1.8	1.5	2.2	
12-Sep	2.9	Z	6.2	6.9	8.8	10.2	11.8	14.1	14.1	11.1	7.9	5.2	4.1	4.2	3.8	3.6	3.8	4.9	4.4	6.2	3.0	2.5	2.1	2.0	6.3	14.1	
13-Sep	1.9	1.6	Z	1.5	1.4	1.3	1.2	1.2	1.1	1.1	1.4	1.3	1.1	1.0	1.1	0.9	0.9	0.8	2.5	1.6	0.8	1.8	1.1	0.7	1.3	2.5	
14-Sep	0.6	0.5	0.6	Z	1.0	0.9	0.8	1.3	1.6	1.6	1.2	0.9	0.8	0.8	1.1	0.9	0.7	0.5	0.6	0.8	2.0	0.7	0.5	0.4	0.9	2.0	
15-Sep	0.4	0.3	0.2	0.1	Z	0.0	0.0	4.1	7.6	4.7	2.8	1.6	1.5	1.7	1.8	1.4	1.5	1.6	1.5	1.3	0.6	0.5	0.9	2.0	1.7	7.6	
16-Sep	3.2	4.3	5.1	5.2	4.0	Z	1.8	2.3	2.1	1.8	1.6	1.3	1.2	1.4	PF	PF	1.8	2.3	2.9	2.9	2.9	2.7	2.4	2.5	2.7	5.2	
17-Sep	Z	1.7	1.7	1.5	1.9	2.2	6.3	9.7	8.9	7.2	5.8	4.3	3.8	2.3	1.7	1.5	2.2	1.3	1.6	1.2	1.2	1.3	1.3	1.2	3.1	9.7	
18-Sep	1.1	Z	1.0	0.8	0.8	0.9	4.8	9.5	9.1	7.9	4.8	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.2	0.5	1.8	9.5	
19-Sep	0.5	0.3	Z	0.4	0.2	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.2	0.0	0.6	0.5	0.2	0.2	0.1	0.2	0.3	0.2	0.2	0.2	0.6	
20-Sep	0.3	0.3	0.3	Z	1.5	1.3	0.6	0.6	0.6	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	0.2	1.5	
21-Sep	0.0	0.0	0.0	0.7	Z	8.8	11.5	C	C	C	C	C	1.9	1.5	0.0	0.0	0.0	0.1	0.6	0.1	0.0	0.0	1.4	2.9	1.6	11.5	
22-Sep	4.1	3.8	3.3	2.8	3.4	Z	6.1	5.3	4.7	4.6	2.8	2.3	3.4	2.7	2.0	0.7	1.2	2.2	3.1	1.2	0.9	0.6	1.2	2.9	2.8	6.1	
23-Sep	Z	2.0	1.9	1.7	1.4	1.4	1.7	2.0	2.3	1.9	1.5	0.3	0.0	0.0	0.0	0.0	0.0	0.5	0.3	0.2	0.1	0.3	0.4	0.3	0.9	2.3	
24-Sep	0.1	Z	0.2	0.4	0.4	0.4	0.3	0.6	0.3	0.3	0.5	1.1	1.7	1.7	1.5	1.2	1.3	1.2	1.9	1.0	1.1	1.0	0.9	0.9	0.9	1.9	
25-Sep	2.1	5.3	Z	5.5	4.5	3.7	2.2	1.4	0.5	0.2	0.4	0.0	0.0	0.0	0.0	0.0	0.6	0.8	0.6	0.7	1.0	1.1	1.4	1.2	1.4	5.5	
26-Sep	0.9	0.5	0.3	Z	0.2	0.3	0.1	0.1	0.0	0.0	0.3	1.1	1.3	1.0	1.2	1.4	1.7	1.5	1.3	2.3	1.2	1.1	1.2	0.4	0.8	2.3	
27-Sep	0.0	0.3	1.0	3.1	Z	2.7	1.9	1.6	1.6	1.4	1.1	0.5	0.3	0.7	0.3	0.6	0.8	1.1	0.9	0.8	0.8	0.8	1.1	1.1	1.1	3.1	
28-Sep	1.3	1.1	1.3	1.6	1.5	Z	1.3	1.0	0.6	0.6	0.4	0.5	0.4	0.5	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.6	1.6
29-Sep	Z	0.2	0.2	0.2	0.2	0.3	0.4	0.3	0.3	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.1	1.0	0.4	0.2	0.1	0.2	0.6	0.2	1.0	
30-Sep	0.4	Z	0.2	0.2	0.2	0.2	0.4	0.2	0.2	0.5	1.2	1.3	0.4	0.2	0.2	0.2	0.6	1.6	0.6	0.1	0.1	0.1	0.1	0.6	0.4	1.6	

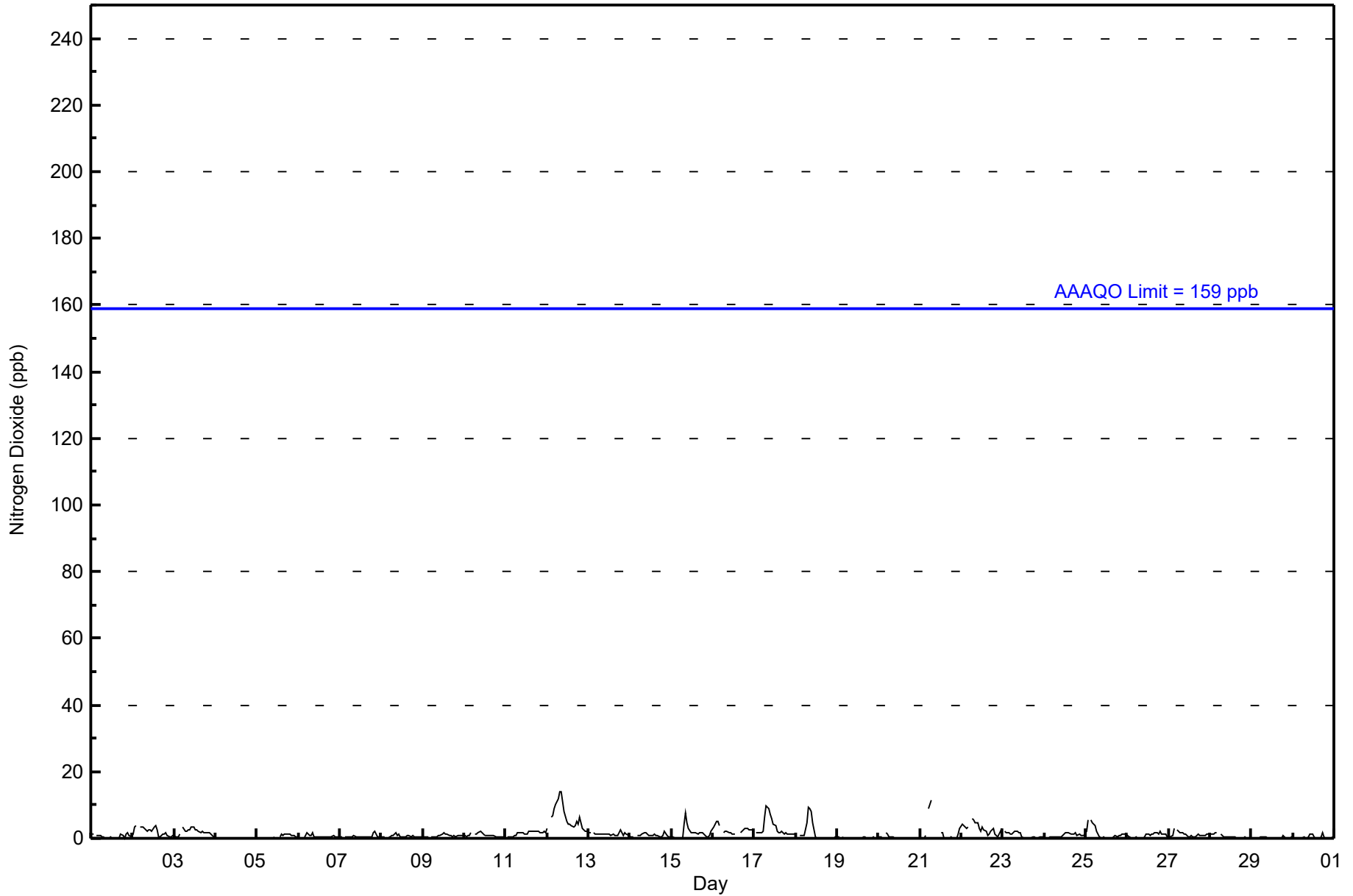
1.0	1.2	1.2	1.5	1.6	1.9	2.2	2.3	2.4	1.9	1.6	1.3	1.2	1.1	0.9	0.8	0.9	1.0	1.1	1.1	0.9	0.8	0.8	0.9			Diurnal Average
4.1	5.3	6.2	6.9	8.8	10.2	11.8	14.1	14.1	11.1	7.9	5.2	4.1	4.2	3.8	3.6	3.8	4.9	4.4	6.2	3.0	2.7	2.4	2.9			Diurnal Maximum

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



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	678	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: 678

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

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

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	14	0	4	42	58	40	26	65	59	37	44	58	68	62	50	51	678
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	14	0	4	42	58	40	26	65	59	37	44	58	68	62	50	51	678

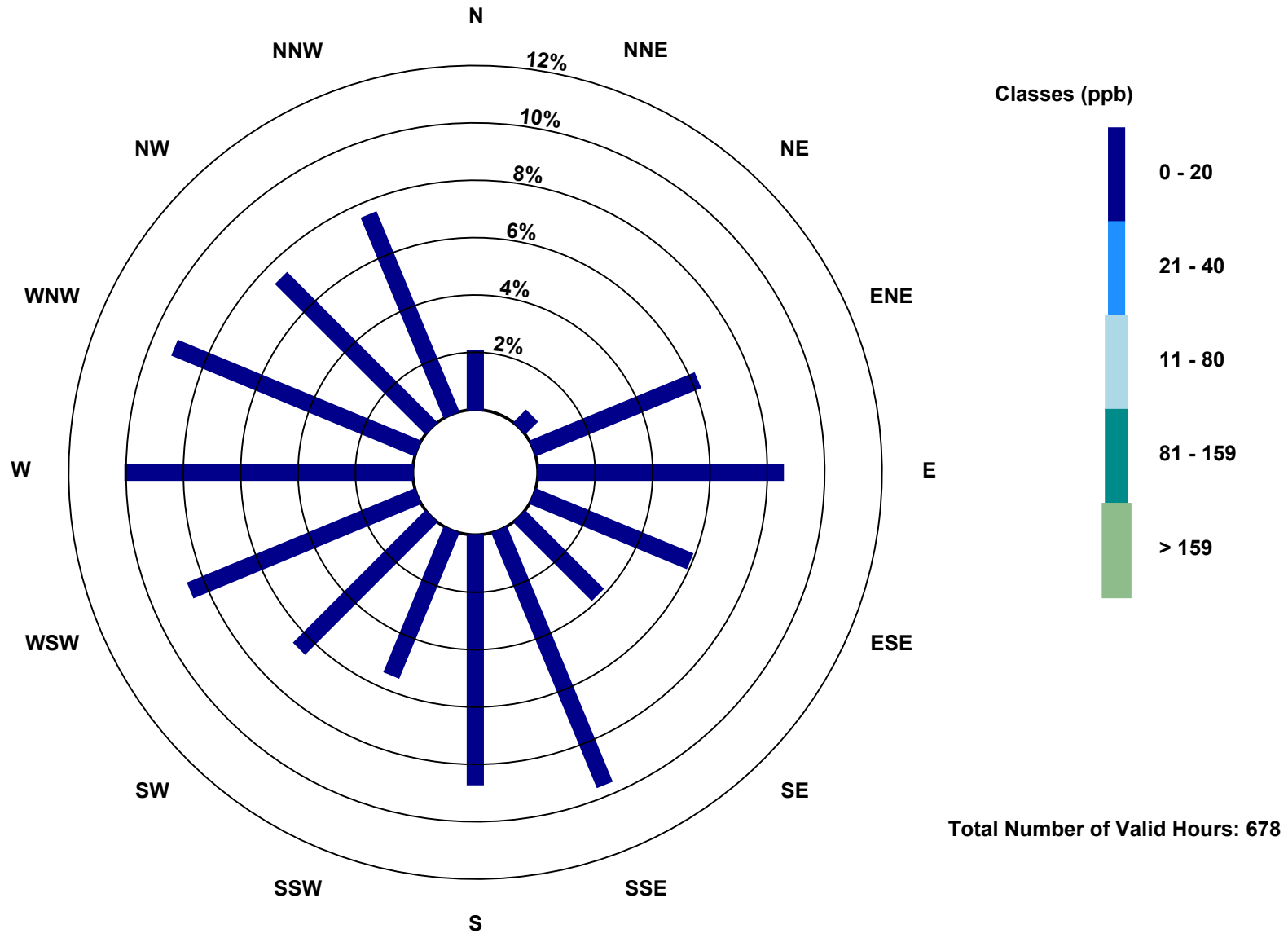
Total Number of Valid Hours: 678

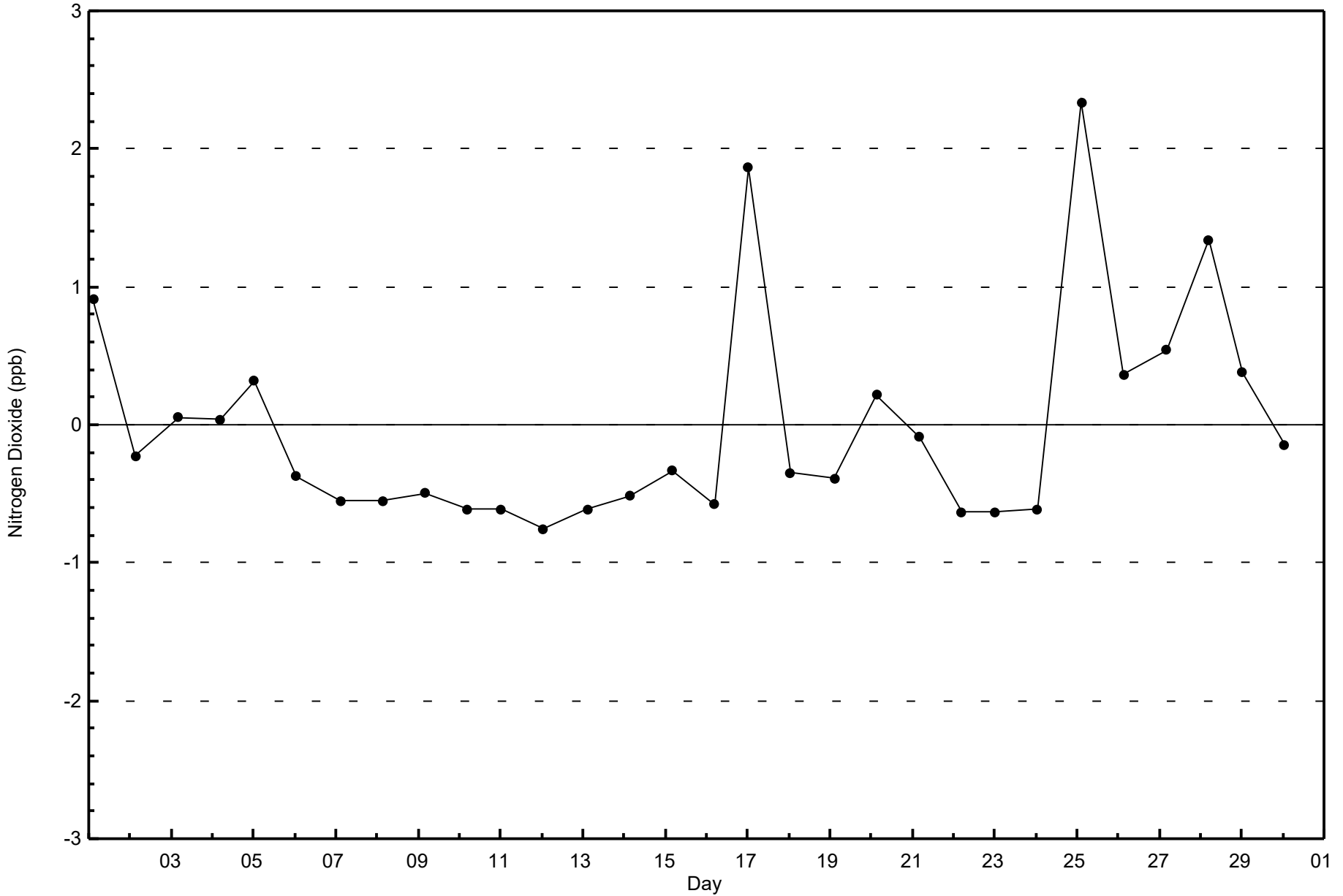
Total Number of Hours: 720

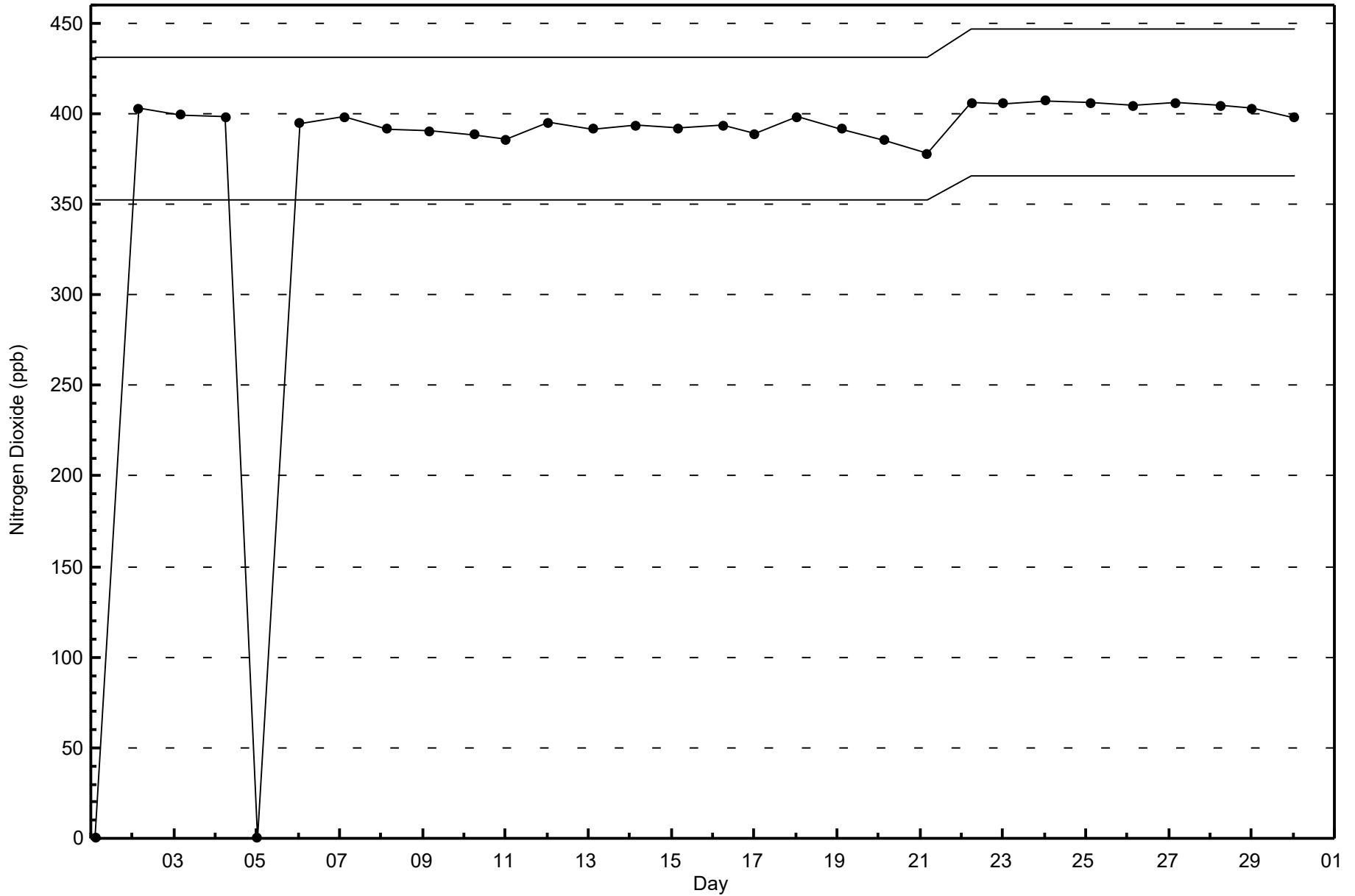


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitrogen Dioxide (NO₂) - ppb
Fort Chipewyan









Wood Buffalo Environmental Association
Summary of Hour Averages

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

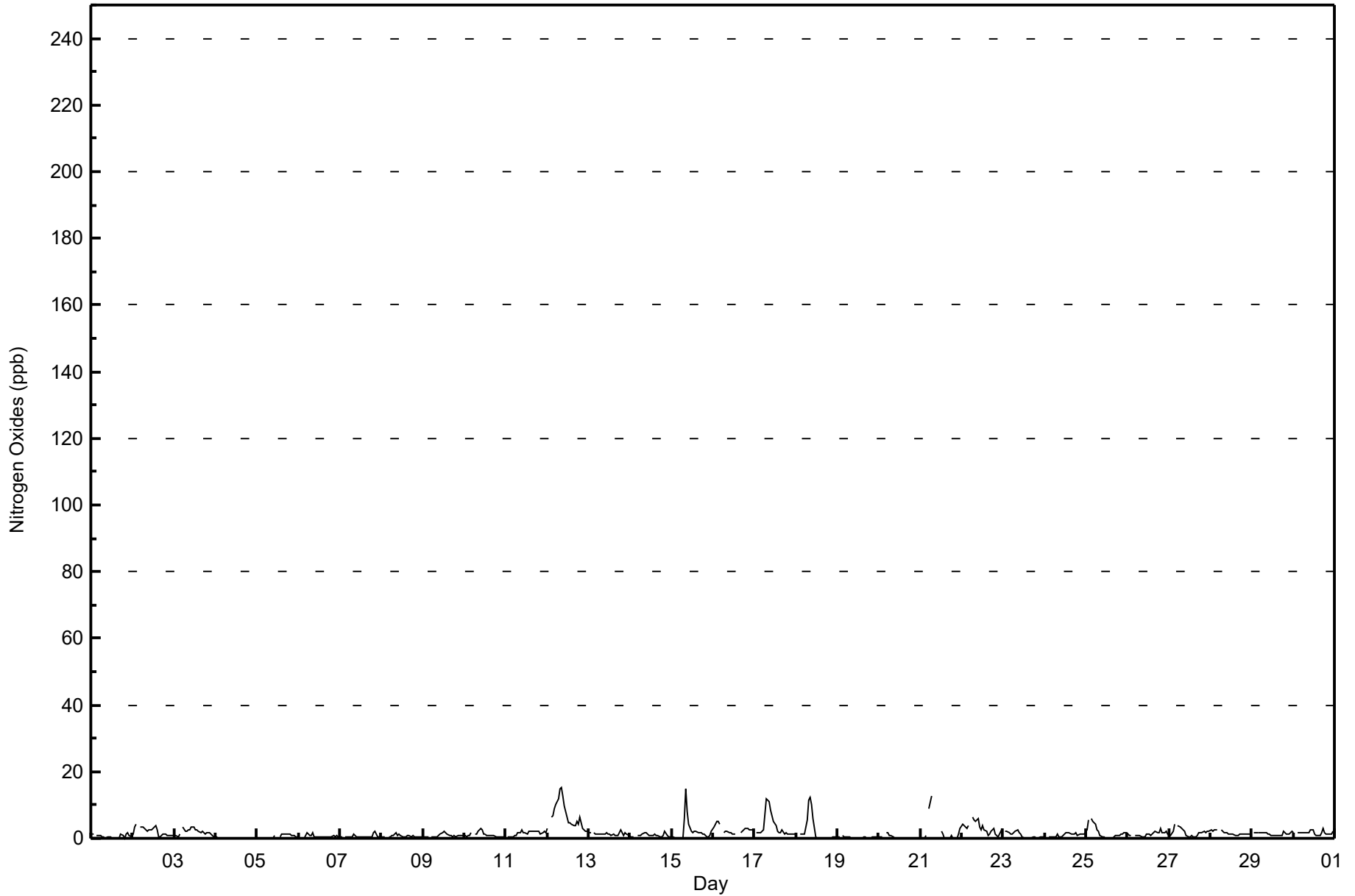
Maximum Value: 15.1 ppb on Sep 12 09:00																				Maximum Daily Average: 6.6 ppb on Sep 12					Hours in Service: 720				
Minimum Value: 0.0 ppb on Sep 1 15:00										Minimum Daily Average: 0.0 ppb on Sep 4										Hours of Data: 678									
Maximum Diurnal Average: 3.1 ppb at hour 9										Minimum Diurnal Average: 0.9 ppb at hour 16										Hours of Missing Data: 42									
Monthly Average: 1.57 ppb										Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.5 Median = 1.1 Q ₃ = 1.8 P ₉₀ = 3.1 P ₉₉ = 12.0										Hours of Calibration: 35									
																				Percent Operational Time: 99.0									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24					
1-Sep	1.4	1.1	Z	0.7	0.7	0.8	0.6	0.4	0.1	0.2	0.2	0.3	0.1	0.0	0.0	0.0	0.0	1.4	0.7	0.0	1.2	1.8	0.9	0.6	0.6	1.8			
2-Sep	1.1	3.3	4.0	Z	3.4	3.5	3.4	2.8	2.2	2.5	2.6	2.4	3.4	3.9	2.6	0.5	0.5	1.2	1.4	1.5	1.0	0.6	0.6	0.8	2.1	4.0			
3-Sep	0.8	0.6	0.5	1.1	Z	3.3	2.3	2.2	2.5	2.7	3.3	3.6	2.6	2.4	2.1	1.7	2.0	1.7	1.5	1.7	1.5	1.2	0.8	0.4	1.9	3.6			
4-Sep	0.2	0.1	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	PF	PF	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			
5-Sep	Z	0.0	0.0	0.2	0.0	0.1	PF	0.2	0.1	0.1	0.8	M	M	0.6	1.3	1.1	1.4	1.2	1.2	1.1	1.0	0.8	0.5	0.5	0.6	1.4			
6-Sep	0.2	Z	0.2	0.2	0.7	1.6	0.8	0.9	1.8	0.5	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.3	0.4	0.7	0.5	0.6	0.5	0.5	1.8				
7-Sep	0.5	0.4	Z	0.4	0.4	0.4	0.5	0.5	1.1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1.9	2.1	1.2	0.6	0.5	0.7	2.1			
8-Sep	0.5	0.5	0.4	Z	0.5	0.6	0.7	0.8	1.9	1.0	1.3	0.6	0.4	0.5	0.6	0.7	0.7	0.5	0.9	0.5	0.5	0.3	0.3	0.4	0.7	1.9			
9-Sep	0.4	0.6	0.5	0.5	Z	0.6	0.6	0.6	0.6	0.8	1.1	1.7	2.1	1.7	1.5	1.0	0.9	0.5	0.8	0.6	0.8	0.8	0.7	0.8	0.9	2.1			
10-Sep	0.8	0.6	0.7	0.9	1.6	Z	1.4	1.3	2.1	2.9	2.6	1.5	1.1	1.0	0.9	0.8	0.8	0.7	0.6	0.5	0.5	0.5	0.5	0.4	1.1	2.9			
11-Sep	Z	0.5	0.5	0.6	0.6	0.7	0.8	1.6	1.7	2.3	1.7	1.6	1.4	2.2	2.2	2.0	2.0	2.1	2.2	2.0	1.5	1.6	2.2	1.8	1.6	2.3			
12-Sep	2.9	Z	6.2	6.9	8.8	10.2	12.0	14.9	15.1	12.8	9.7	6.5	4.8	4.6	4.1	3.8	3.9	4.9	4.4	6.2	3.0	2.5	2.1	2.0	6.6	15.1			
13-Sep	1.9	1.6	Z	1.5	1.4	1.3	1.2	1.2	1.1	1.1	1.5	1.4	1.2	1.0	1.1	0.9	0.9	0.8	2.5	1.6	0.8	1.8	1.1	0.7	1.3	2.5			
14-Sep	0.6	0.5	0.6	Z	1.0	0.9	0.8	1.3	1.6	1.6	1.2	1.0	0.8	0.8	1.1	0.9	0.7	0.5	0.6	0.8	2.0	0.7	0.5	0.4	0.9	2.0			
15-Sep	0.4	0.3	0.2	0.1	Z	0.0	0.0	6.1	15.0	8.2	4.3	2.1	1.7	1.9	2.1	1.5	1.5	1.6	1.5	1.3	0.6	0.5	0.9	2.0	2.3	15.0			
16-Sep	3.2	4.3	5.1	5.2	4.0	Z	1.8	2.3	2.1	1.8	1.6	1.3	1.2	1.4	PF	PF	1.8	2.3	2.9	2.9	2.9	2.7	2.4	2.5	2.7	5.2			
17-Sep	Z	1.8	1.8	1.7	2.1	2.5	7.1	12.0	11.2	8.6	6.6	4.9	3.9	2.3	1.7	1.5	2.4	1.3	1.6	1.2	1.2	1.4	1.4	1.4	3.5	12.0			
18-Sep	1.4	Z	1.3	1.2	1.2	1.3	5.4	11.3	12.3	10.1	6.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.3	0.6	2.3	12.3			
19-Sep	0.6	0.4	Z	0.7	0.5	0.5	0.6	0.6	0.1	0.0	0.0	0.0	0.0	0.2	0.0	0.6	0.5	0.2	0.2	0.1	0.2	0.3	0.3	0.3	0.3	0.7			
20-Sep	0.4	0.5	0.6	Z	1.9	1.9	1.0	1.0	0.6	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	0.1	0.4	1.9			
21-Sep	0.1	0.1	0.1	0.8	Z	9.1	12.6	C	C	C	C	C	1.9	1.5	0.0	0.0	0.0	0.1	1.0	0.1	0.0	0.0	1.4	2.9	1.8	12.6			
22-Sep	4.1	3.8	3.4	2.9	3.6	Z	6.5	5.7	5.1	6.0	3.5	2.5	3.7	2.7	2.0	0.7	1.2	2.2	3.1	1.2	0.9	0.6	1.2	3.0	3.0	6.5			
23-Sep	Z	2.1	2.0	1.8	1.5	1.5	1.8	2.2	2.4	1.9	1.5	0.3	0.0	0.0	0.0	0.0	0.0	0.5	0.3	0.2	0.1	0.3	0.4	0.4	0.9	2.4			
24-Sep	0.2	Z	0.4	0.6	0.5	0.5	0.4	1.1	0.3	0.3	0.5	1.1	1.8	1.8	1.5	1.2	1.3	1.2	1.9	1.0	1.2	1.1	1.1	1.1	1.0	1.9			
25-Sep	2.4	5.6	Z	5.9	5.0	4.1	2.7	2.0	1.0	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.6	0.9	0.9	1.0	1.3	1.4	1.7	1.6	1.7	5.9			
26-Sep	1.3	1.0	0.8	Z	0.7	0.8	0.7	0.7	0.6	0.5	0.6	1.2	1.3	1.0	1.2	1.5	2.0	1.9	1.8	2.8	1.8	1.7	1.9	1.2	1.3	2.8			
27-Sep	0.8	1.1	2.0	4.2	Z	3.9	3.3	3.0	2.7	2.0	1.1	0.5	0.3	0.7	0.3	0.6	1.0	1.6	1.7	1.8	1.9	1.9	2.1	2.2	1.8	4.2			
28-Sep	2.4	2.2	2.4	2.7	2.6	Z	2.5	2.3	1.8	1.6	1.4	1.5	1.2	1.4	0.9	0.9	1.0	1.1	1.2	1.3	1.4	1.3	1.4	1.4	1.7	2.7			
29-Sep	Z	1.5	1.6	1.5	1.5	1.6	1.7	1.6	1.8	1.4	1.5	0.9	1.0	0.9	0.9	0.8	0.9	1.0	2.0	1.5	1.4	1.4	1.5	2.1	1.4	2.1			
30-Sep	1.7	Z	1.6	1.5	1.5	1.5	1.8	1.6	1.6	1.7	2.5	2.4	1.2	1.0	0.9	0.9	1.5	2.8	1.7	1.1	1.2	1.2	1.2	2.0	1.6	2.8			
																								Diurnal Average					
																								Diurnal Maximum					
																								Diurnal Average					
																								Diurnal Maximum					

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



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	678	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: 678

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

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

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	14	0	4	42	58	40	26	65	59	37	44	58	68	62	50	51	678
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	14	0	4	42	58	40	26	65	59	37	44	58	68	62	50	51	678

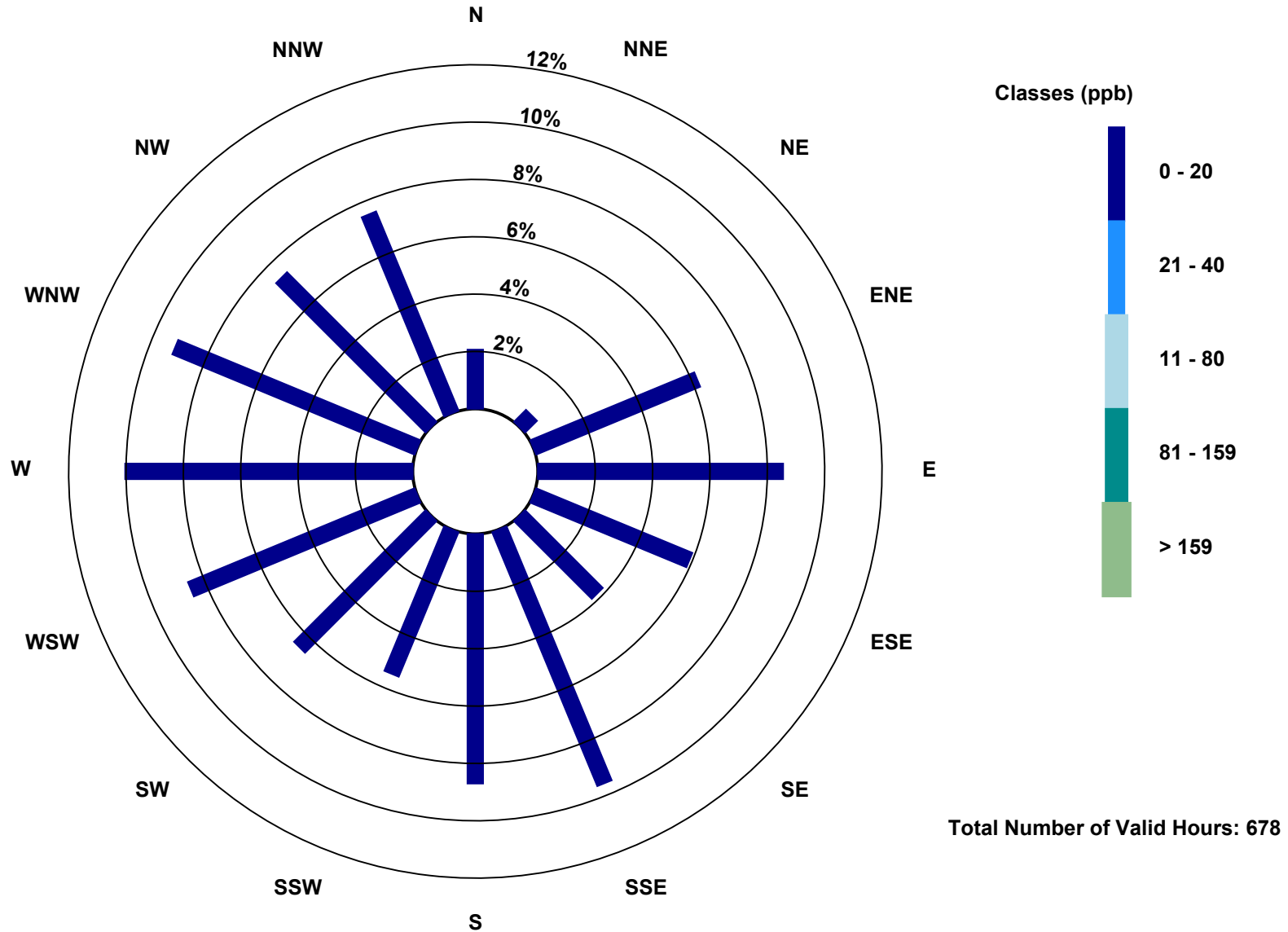
Total Number of Valid Hours: 678

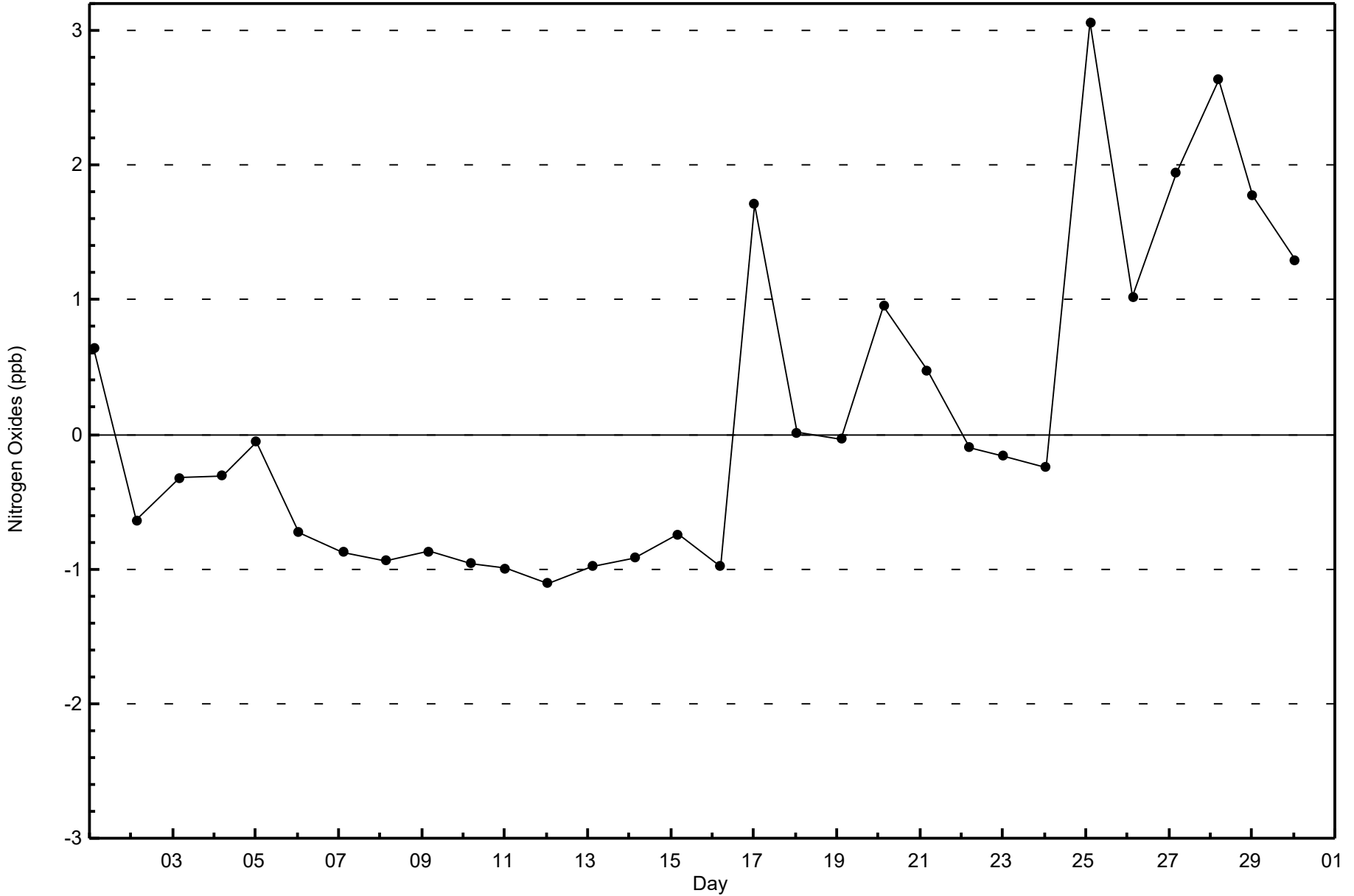
Total Number of Hours: 720

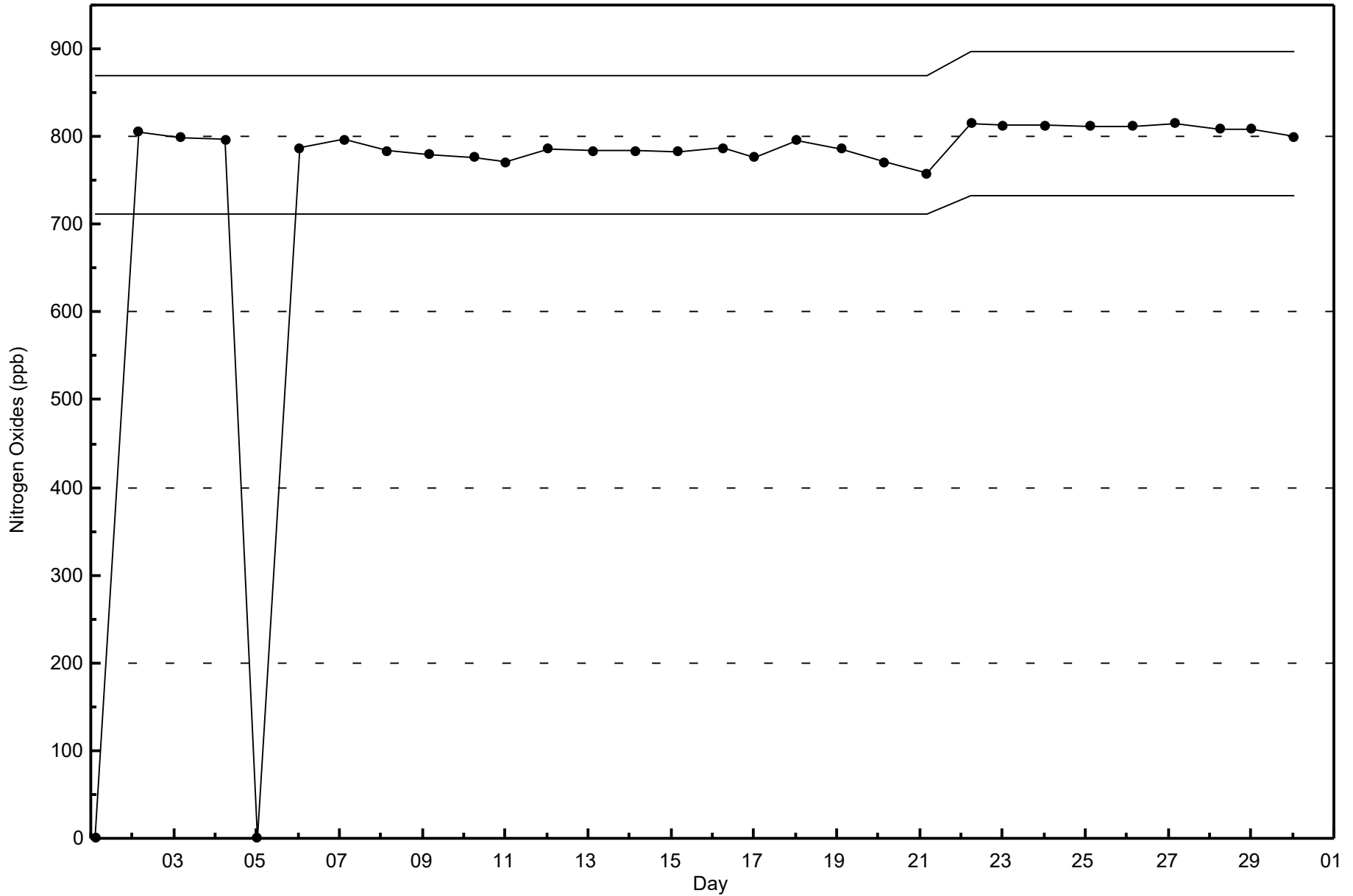


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitrogen Oxides (NO_x) - ppb
Fort Chipewyan









Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O₃) - ppb

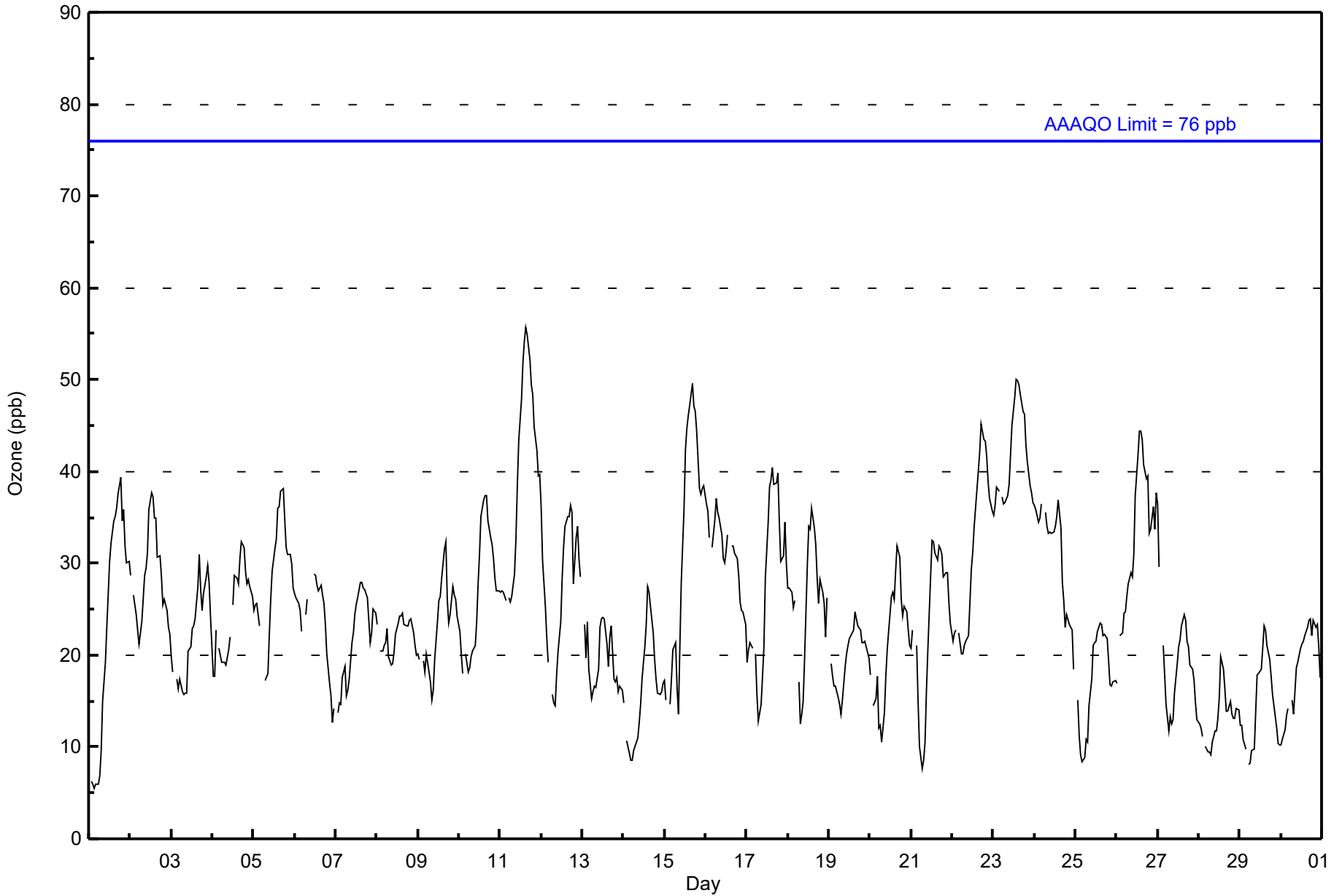
Fort Chipewyan - September 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 55.6 ppb on Sep 11 16:00	Maximum Daily Average: 41.6 ppb on Sep 23		Hours of Data:	684
Minimum Value: 5.5 ppb on Sep 1 04:00	Minimum Daily Average: 13.1 ppb on Sep 28		Hours of Missing Data:	36
Maximum Diurnal Average: 32.1 ppb at hour 16	Minimum Diurnal Average: 17.8 ppb at hour 6		Hours of Calibration:	33
Monthly Average: 24.94 ppb	Percentiles: P ₁ = 8.0 P ₁₀ = 13.6 Q ₁ = 18.0 Median = 23.6 Q ₃ = 31.0 P ₉₀ = 37.4 P ₉₉ = 49.6		Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Sep	Z	6.3	6.0	5.5	5.9	6.0	6.9	9.6	14.9	19.2	23.0	26.5	30.1	32.3	34.7	35.0	36.0	37.5	39.4	34.6	35.9	31.9	30.1	30.2	23.4	39.4
2-Sep	28.7	Z	26.6	24.3	22.8	21.2	22.4	23.7	28.6	29.5	31.1	35.8	37.7	37.3	34.9	34.9	30.7	30.8	28.6	25.4	26.0	24.8	23.1	22.2	28.3	37.7
3-Sep	19.9	18.2	Z	17.4	16.4	17.4	16.1	15.7	15.8	15.9	20.4	20.8	22.8	23.1	24.0	27.4	31.0	27.2	24.8	26.6	28.4	29.8	28.0	24.2	22.2	31.0
4-Sep	17.7	17.6	22.7	Z	20.8	19.2	19.3	19.2	18.9	20.6	21.9	PF	25.5	28.7	28.4	27.7	30.5	32.4	31.8	29.1	27.8	28.2	27.5	26.4	24.6	32.4
5-Sep	24.9	25.5	25.6	23.1	Z	15.6	PF	17.3	18.0	22.2	26.0	29.2	31.5	32.7	36.1	36.1	37.9	38.1	34.8	31.7	31.0	30.9	29.9	27.4	28.4	38.1
6-Sep	26.8	26.3	25.7	24.8	22.5	Z	24.5	26.1	C	C	C	28.8	28.6	27.6	26.9	27.6	26.5	25.6	23.3	20.1	16.9	15.6	12.7	14.2	23.6	28.8
7-Sep	Z	13.8	14.8	14.6	17.5	18.8	15.6	16.1	17.5	21.3	22.4	24.5	25.4	26.3	28.0	27.9	27.3	27.2	26.3	23.8	21.4	22.5	25.1	24.5	21.8	28.0
8-Sep	23.4	Z	20.5	20.5	21.1	21.3	22.9	19.8	18.9	19.0	20.4	22.3	23.5	24.3	24.3	24.5	23.4	23.2	23.3	23.8	24.0	22.5	21.1	20.0	22.1	24.5
9-Sep	20.1	19.5	Z	19.3	18.1	20.2	18.2	17.1	15.1	16.2	19.5	23.7	25.9	26.4	28.4	31.5	32.3	26.0	23.5	24.5	27.5	26.5	26.1	24.2	23.0	32.3
10-Sep	22.6	20.2	17.9	Z	20.1	18.1	18.6	19.8	20.4	21.1	23.6	27.7	30.9	35.1	36.9	37.4	37.3	34.6	32.8	32.0	30.5	28.3	27.0	27.0	27.0	37.4
11-Sep	26.8	26.9	26.9	26.0	Z	26.2	25.8	26.3	28.8	32.7	38.4	43.3	47.9	51.8	54.2	55.6	54.8	52.1	49.4	48.3	44.8	42.3	39.5	39.6	39.5	55.6
12-Sep	36.1	30.4	25.4	22.0	19.2	Z	15.7	14.7	14.4	17.8	20.3	23.6	28.4	31.7	34.0	35.1	35.1	36.2	35.6	27.8	32.8	34.0	30.5	28.5	27.4	36.2
13-Sep	Z	23.3	19.7	23.6	18.5	15.3	16.1	16.6	16.5	18.5	23.0	23.9	24.1	23.9	21.3	18.8	21.9	23.1	17.5	17.1	17.5	16.1	16.6	16.2	19.5	24.1
14-Sep	14.8	Z	10.7	9.4	8.5	8.5	9.6	10.1	11.0	12.6	14.7	17.3	20.8	23.3	27.4	26.9	25.3	22.4	19.6	17.4	15.9	15.8	16.0	17.0	16.3	27.4
15-Sep	17.2	15.1	Z	14.6	17.4	20.5	21.3	16.5	13.6	20.9	27.8	36.0	42.4	44.7	46.0	48.4	49.5	47.1	46.5	44.4	38.2	37.5	38.1	38.4	32.3	49.5
16-Sep	36.4	35.6	32.9	Z	31.7	34.8	37.0	35.5	34.9	33.1	30.5	30.0	31.2	33.1	PF	31.9	31.8	31.1	30.5	28.7	25.7	24.9	24.7	23.4	31.3	37.0
17-Sep	19.2	20.5	21.4	20.7	Z	20.2	15.7	12.9	14.7	17.7	20.8	28.4	34.3	38.3	39.1	40.4	38.5	38.7	39.8	34.5	30.2	30.8	34.5	30.1	27.9	40.4
18-Sep	27.3	27.3	26.8	25.1	26.0	Z	17.1	12.5	13.6	14.9	19.6	29.9	34.1	33.7	36.0	33.9	32.1	28.4	25.6	28.2	26.8	25.6	21.9	26.2	25.8	36.0
19-Sep	Z	19.0	17.7	16.6	16.7	15.4	14.7	13.6	15.1	18.8	20.1	21.0	21.8	22.2	22.7	24.7	23.9	23.2	22.7	21.3	21.4	21.5	20.9	19.7	19.8	24.7
20-Sep	17.9	Z	14.5	15.3	17.8	12.0	12.3	10.5	13.8	17.7	20.6	22.6	26.4	26.9	26.0	29.1	31.9	30.6	26.0	24.2	25.3	24.7	22.7	21.1	21.3	31.9
21-Sep	20.8	22.7	Z	21.0	15.1	10.1	7.7	8.6	10.5	16.2	20.6	28.6	32.4	32.4	31.1	30.4	31.9	31.6	31.0	28.6	29.0	29.0	25.8	23.5	23.4	32.4
22-Sep	21.4	22.4	22.7	Z	22.4	20.1	20.1	21.0	21.5	22.0	25.7	29.3	31.2	33.8	38.0	39.9	42.1	45.1	43.5	43.3	41.6	38.8	37.0	35.7	31.2	45.1
23-Sep	35.2	36.3	38.4	37.8	Z	37.2	36.4	36.7	37.4	38.7	41.8	45.0	48.0	50.0	49.9	49.5	48.3	46.5	46.2	42.9	41.0	38.5	37.7	36.5	41.6	50.0
24-Sep	36.4	35.8	34.5	34.9	36.4	Z	35.6	34.0	33.3	33.4	33.3	33.5	34.0	35.1	36.9	33.9	27.9	25.9	23.0	24.4	23.3	23.0	22.7	18.4	30.8	36.9
25-Sep	Z	15.1	11.3	9.2	8.4	8.9	10.8	10.5	14.4	17.4	21.0	21.4	21.6	22.6	23.4	23.3	22.1	22.3	21.8	19.4	16.8	16.6	17.0	17.2	17.1	23.4
26-Sep	17.0	Z	22.1	22.4	24.5	24.7	26.5	27.7	29.0	28.5	31.0	37.3	41.7	44.4	44.4	43.5	40.7	39.3	39.6	33.3	33.8	36.2	33.7	37.7	33.0	44.4
27-Sep	36.5	29.5	Z	21.0	17.8	14.7	11.8	13.2	12.5	13.0	15.8	19.1	20.9	21.7	23.2	24.4	23.8	21.4	20.9	19.0	18.4	17.3	14.8	13.0	19.3	36.5
28-Sep	12.5	12.1	11.1	Z	10.1	9.5	9.5	9.2	10.6	11.7	11.7	13.1	15.4	19.8	18.4	16.4	13.8	14.0	15.0	13.6	13.1	13.2	14.3	14.1	13.1	19.8
29-Sep	12.4	12.4	10.8	9.7	Z	8.0	8.2	9.6	9.8	13.8	17.8	18.1	18.4	20.7	23.2	22.7	21.1	19.6	17.7	15.7	14.6	12.1	10.4	10.2	14.6	23.2
30-Sep	10.3	10.9	11.8	13.4	14.2	Z	15.1	13.6	15.9	18.6	19.3	20.7	21.2	21.5	22.1	23.1	23.8	23.9	22.1	23.7	23.1	23.3	20.8	17.6	18.7	23.9

23.3	21.7	20.7	19.7	18.8	17.8	18.3	17.9	18.6	20.8	23.5	26.9	29.3	30.8	31.7	32.1	31.8	30.8	29.4	27.6	26.7	26.1	25.0	24.2	Diurnal Average	
36.5	36.3	38.4	37.8	36.4	37.2	37.0	36.7	37.4	38.7	41.8	45.0	48.0	51.8	54.2	55.6	54.8	52.1	49.4	48.3	44.8	42.3	39.5	39.6	Diurnal Maximum	

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ozone (O₃) - ppb
Fort Chipewyan - September 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	229	33.48	33.48
21 - 50	450	65.79	99.27
51 - 82	5	0.73	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Ozone (O₃) - ppb
Fort Chipewyan - September 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	0	3	8	17	16	4	5	14	6	18	9	18	31	27	45	229
21 - 50	6	0	1	34	42	24	19	60	45	31	28	50	49	31	20	10	450
51 - 82	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	5
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	14	0	4	42	59	40	23	65	64	37	46	59	67	62	47	55	684

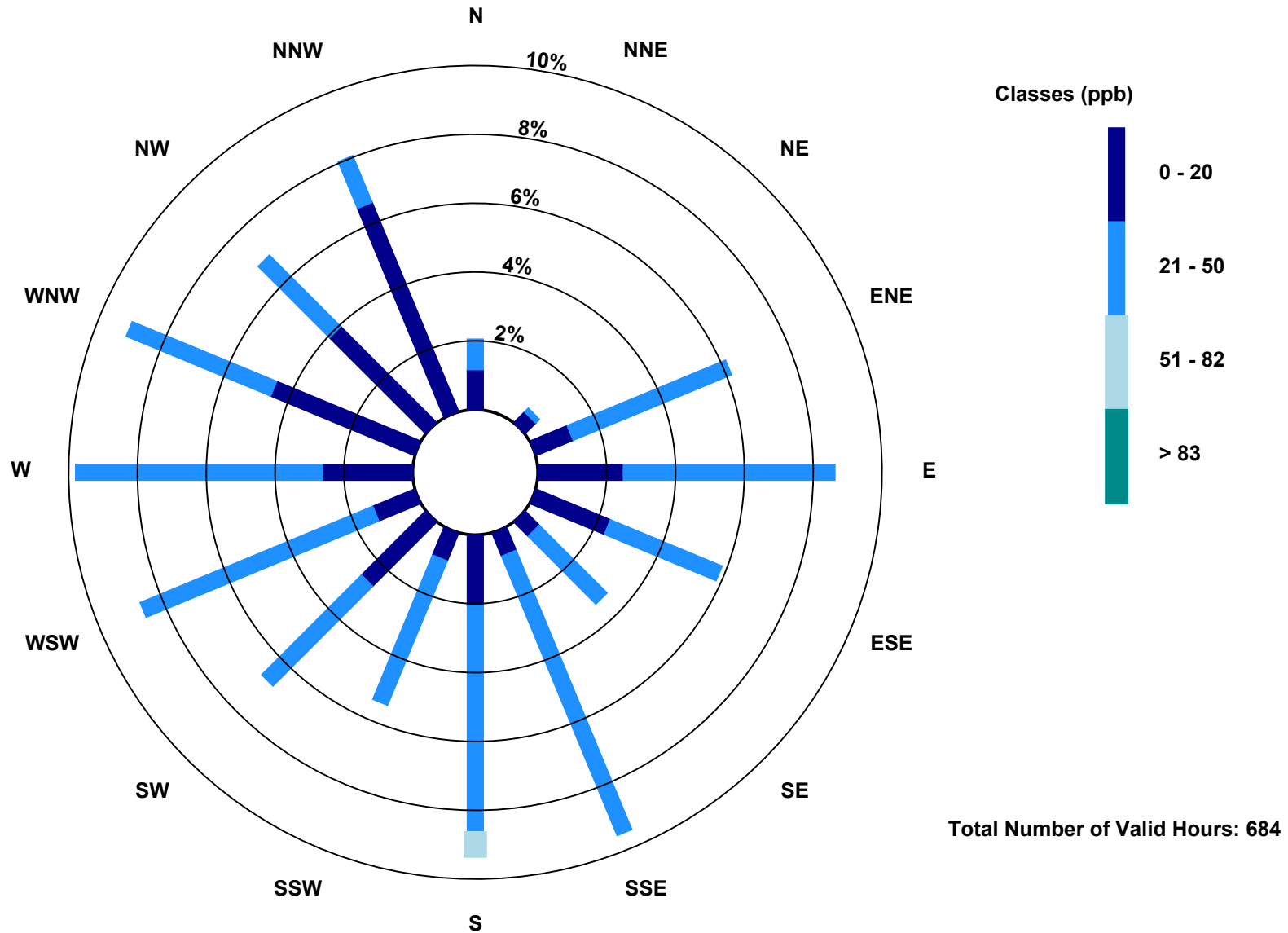
Total Number of Valid Hours: 684

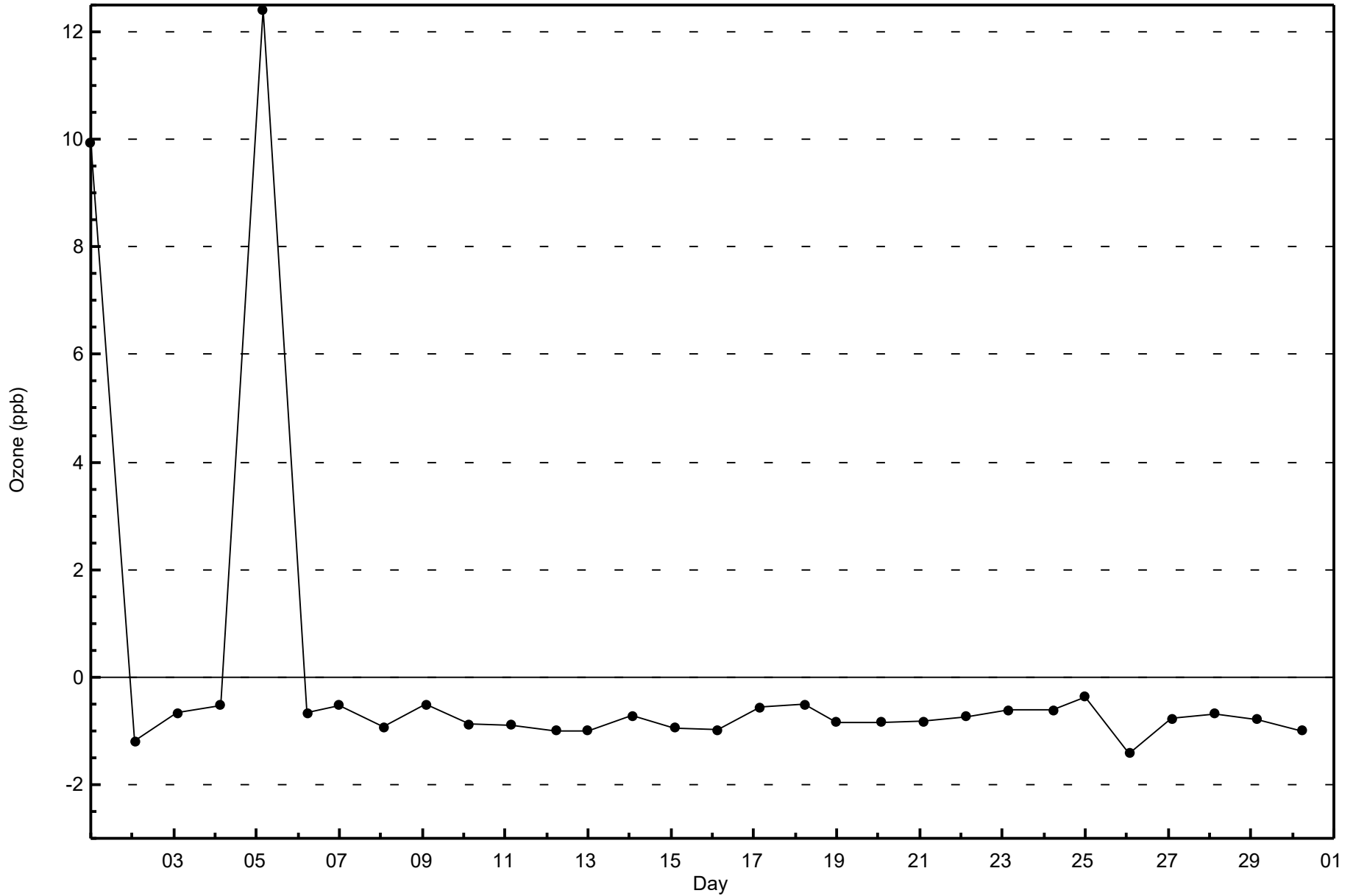
Total Number of Hours: 720

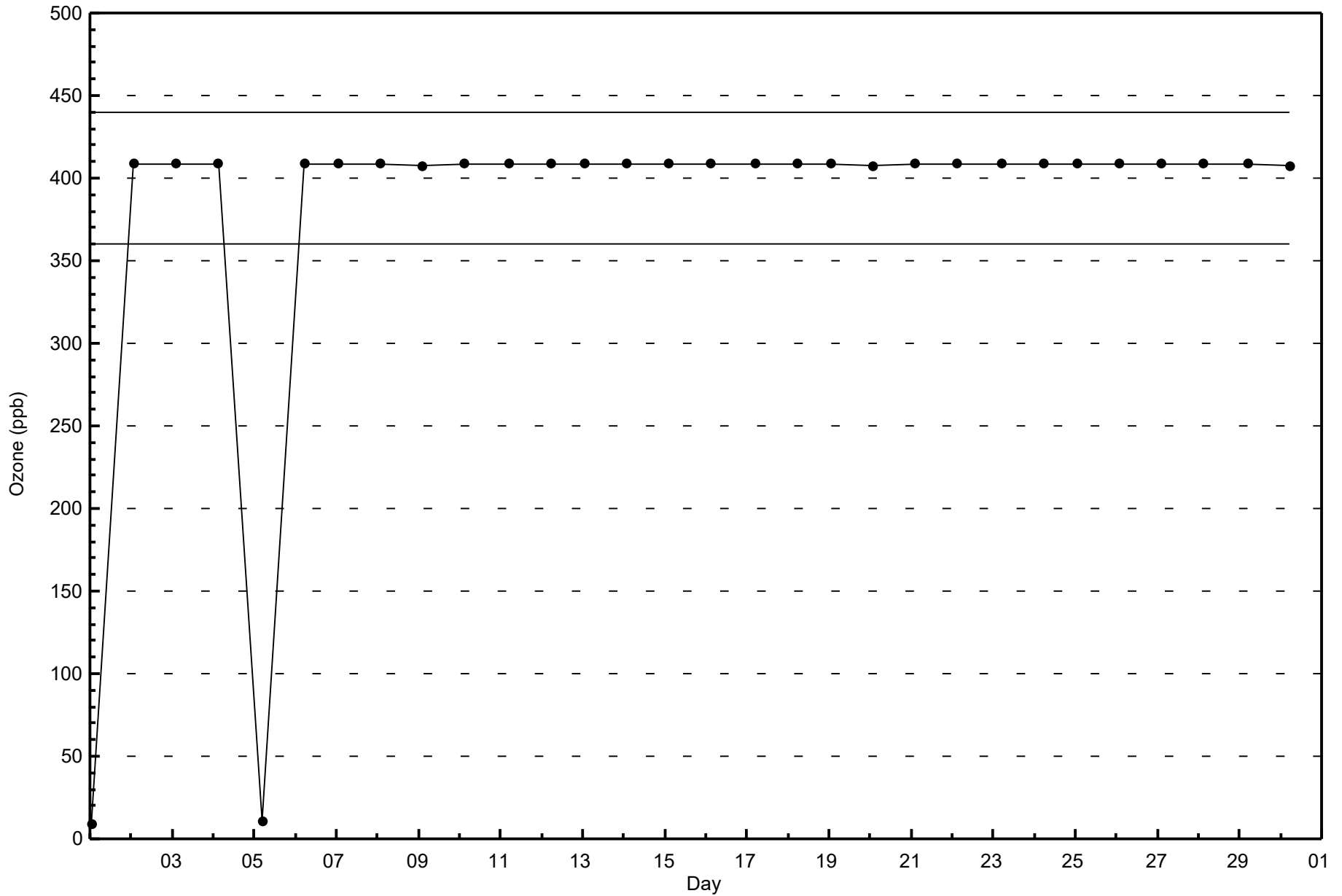


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Ozone (O₃) - ppb
Fort Chipewyan









Wood Buffalo Environmental Association

Summary of Hour Averages

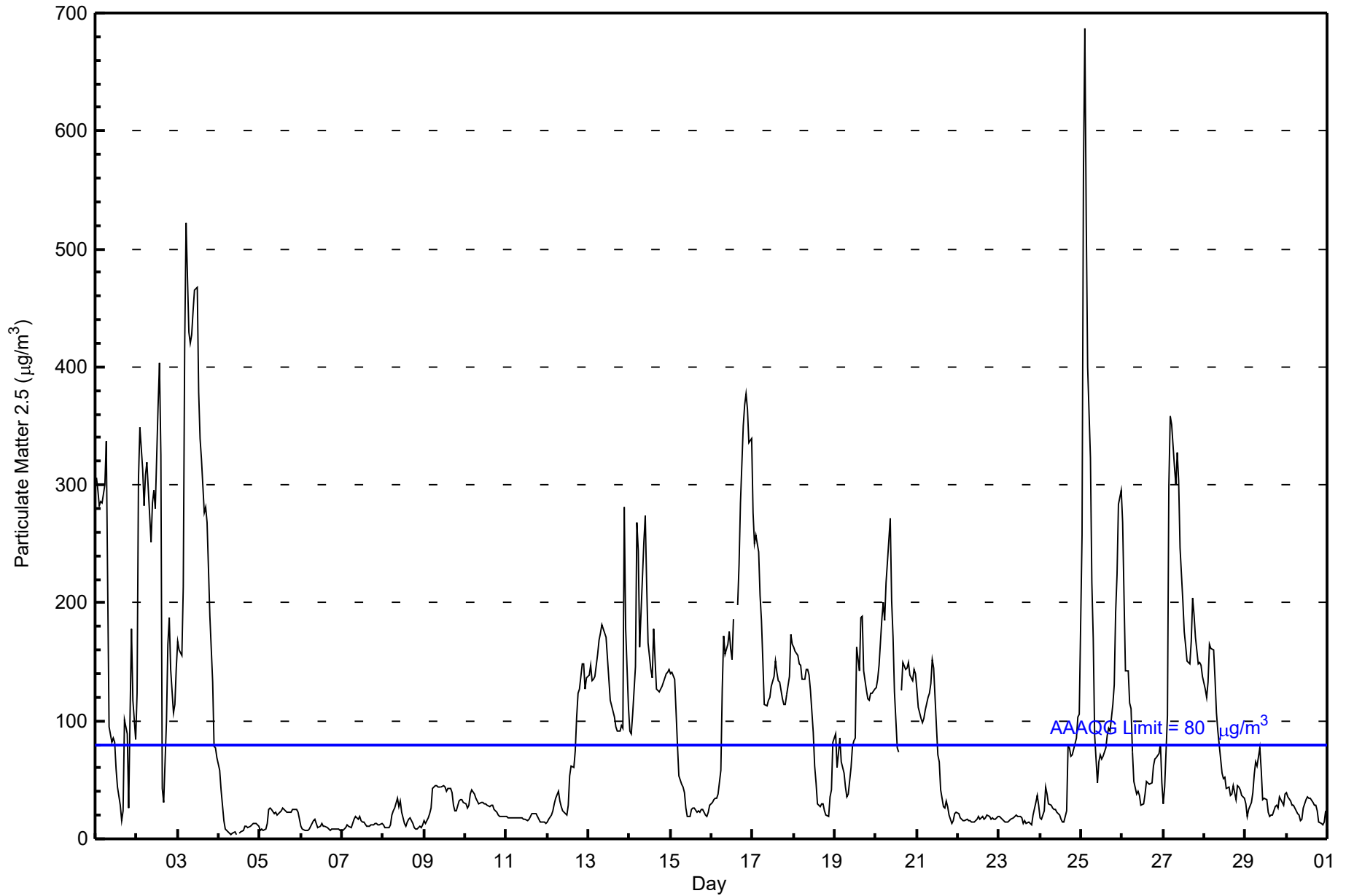
Particulate Matter 2.5 (PM_{2.5}) - µg/m³

Fort Chipewyan - September 2023

Number of Exceedences (AAAQO):	1-hr: 282	24-hr: 20	Hours in Service:	720
Maximum Value: 687.4 µg/m ³ on Sep 25 03:00	Maximum Daily Average: 288.7 µg/m ³ on Sep 3		Hours of Data:	717
Minimum Value: 4.0 µg/m ³ on Sep 4 08:00	Minimum Daily Average: 9.7 µg/m ³ on Sep 6		Hours of Missing Data:	3
Maximum Diurnal Average: 120.1 µg/m ³ at hour 6	Minimum Diurnal Average: 65.4 µg/m ³ at hour 16		Hours of Calibration:	1
Monthly Average: 90.32 µg/m ³	Percentiles: P ₁ = 6.1 P ₁₀ = 12.9 Q ₁ = 19.5 Median = 42.1 Q ₃ = 135.9 P ₉₀ = 226.0 P ₉₉ = 428.8		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-Sep	305.7	295.1	282.3	285.4	284.4	300.6	337.2	215.3	95.4	81.8	85.7	81.4	59.3	44.1	27.9	15.8	24.3	100.4	88.7	26.4	106.2	178.3	117.0	84.2	146.8	337.2
2-Sep	123.1	304.7	349.1	313.2	282.2	308.2	319.7	296.8	252.0	284.7	294.9	279.5	366.7	402.9	324.9	43.0	30.4	99.6	165.0	188.0	144.0	107.1	114.2	144.3	230.8	402.9
3-Sep	166.9	160.3	155.2	213.3	416.2	522.6	429.2	420.2	426.8	447.3	465.7	467.9	378.2	339.0	321.1	276.2	281.5	268.0	229.0	188.4	132.6	78.0	76.8	69.2	288.7	522.6
4-Sep	58.1	40.9	28.1	15.8	7.9	5.4	4.8	4.0	5.0	5.7	4.0	PF	4.6	6.1	7.1	10.4	10.1	9.5	10.3	11.6	12.5	12.6	13.5	10.5	13.0	58.1
5-Sep	7.7	7.9	7.7	7.9	13.0	25.4	26.0	25.0	21.3	22.2	19.8	20.9	23.7	25.7	24.4	23.4	22.8	22.4	22.8	24.5	24.7	25.0	23.0	17.0	20.2	26.0
6-Sep	10.7	8.1	7.0	6.6	6.7	7.7	12.9	15.4	16.4	12.9	9.6	10.3	12.5	10.5	11.2	10.1	8.8	7.6	7.7	7.8	8.1	8.1	8.2	7.5	9.7	16.4
7-Sep	7.3	8.4	9.6	11.7	10.6	9.9	13.6	16.9	19.2	17.0	18.7	15.0	14.1	13.9	11.1	10.2	10.4	12.2	12.3	13.1	13.5	12.4	11.9	13.1	12.8	19.2
8-Sep	11.5	9.7	9.4	10.0	12.2	20.5	23.6	25.8	34.7	27.4	31.5	22.3	13.1	10.6	14.6	16.7	17.7	13.4	9.9	8.7	8.6	10.7	9.3	11.6	16.0	34.7
9-Sep	14.8	13.6	17.3	20.9	26.5	43.2	45.5	44.9	43.7	43.7	43.6	44.5	43.8	40.3	42.3	42.7	39.1	28.3	24.2	24.1	31.8	32.7	32.8	30.7	34.0	45.5
10-Sep	29.4	26.2	28.6	38.4	41.3	38.4	34.5	31.6	30.2	30.5	30.8	29.7	29.3	27.9	27.8	28.1	28.6	24.8	22.0	20.0	18.9	18.7	19.0	19.4	28.1	41.3
11-Sep	18.7	18.0	17.7	17.8	17.8	18.0	18.0	18.3	17.9	17.4	16.5	16.1	15.7	17.0	19.4	20.8	21.9	21.0	18.7	16.4	14.3	14.5	14.5	13.1	17.5	21.9
12-Sep	14.2	17.0	19.9	23.4	30.0	34.7	40.3	32.4	27.0	23.5	22.6	20.6	28.6	53.0	61.1	60.4	74.9	103.1	123.7	127.3	148.8	147.8	126.6	136.2	62.4	148.8
13-Sep	138.3	147.6	134.6	135.5	137.6	156.8	167.9	174.7	181.1	175.0	171.0	153.5	135.8	117.9	108.3	102.9	95.5	91.6	90.9	95.6	93.4	281.1	177.9	111.8	140.7	281.1
14-Sep	91.8	88.8	105.8	145.8	268.4	244.4	162.5	192.3	251.0	273.8	215.6	166.4	143.7	135.9	177.5	152.4	127.5	124.4	126.8	129.4	133.1	140.5	141.6	144.0	161.8	273.8
15-Sep	139.6	140.9	135.7	108.3	79.8	53.6	46.1	43.8	39.5	26.7	18.4	19.5	24.5	26.0	26.0	23.0	23.8	22.1	24.9	25.5	19.8	18.6	22.5	27.9	47.4	140.9
16-Sep	30.5	33.5	34.1	34.9	38.5	57.5	127.0	171.7	156.4	165.2	176.0	161.3	151.7	185.8	PF	198.4	232.3	284.6	350.5	367.3	376.8	364.8	335.9	338.9	190.2	376.8
17-Sep	276.0	250.8	257.4	242.8	206.6	184.8	150.9	114.1	113.1	117.1	120.0	129.8	137.2	150.4	141.1	133.7	132.8	119.0	113.7	114.1	121.7	137.9	173.7	165.0	158.5	276.0
18-Sep	162.2	159.4	155.0	148.4	147.5	135.4	135.6	143.2	143.1	138.7	125.6	90.6	61.9	48.0	29.3	27.2	29.7	29.4	23.7	19.6	19.5	35.3	42.1	82.0	88.8	162.2
19-Sep	89.5	60.4	72.3	85.3	65.3	56.2	43.8	35.9	38.4	59.9	78.5	83.1	85.4	162.6	141.9	187.4	188.4	142.8	125.4	118.6	117.3	123.5	123.2	127.1	100.5	188.4
20-Sep	127.6	135.4	147.2	186.6	200.5	185.0	216.9	235.0	271.8	201.4	170.9	124.2	77.1	73.7	C	125.4	149.8	143.0	144.2	149.1	138.4	134.0	143.6	139.6	157.4	271.8
21-Sep	126.9	111.7	102.4	97.9	102.0	108.7	119.9	123.8	131.4	151.4	144.7	95.3	71.4	65.6	42.1	26.9	26.5	31.7	27.4	20.7	13.4	15.9	21.2	23.0	75.1	151.4
22-Sep	20.9	18.3	16.6	15.6	15.2	16.1	15.8	15.4	14.3	14.5	14.9	16.3	18.4	16.3	18.7	16.5	17.3	20.1	19.6	17.2	17.3	16.1	16.3	18.8	16.9	20.9
23-Sep	19.2	18.2	16.1	14.0	13.8	14.3	15.4	16.7	17.9	19.1	19.7	19.3	19.5	17.4	13.1	15.8	12.9	13.9	12.9	11.8	19.8	31.3	37.2	28.4	18.2	37.2
24-Sep	18.4	16.1	23.8	44.2	38.2	29.8	28.4	26.2	25.4	24.5	22.1	20.4	17.1	14.2	14.3	23.3	77.8	76.6	70.2	71.5	80.4	86.0	103.1	105.9	44.1	105.9
25-Sep	257.5	562.4	687.4	523.2	400.2	322.3	217.3	169.8	87.3	47.5	65.1	70.9	68.1	70.2	76.9	87.8	93.2	91.4	113.7	130.9	191.7	224.0	283.0	295.4	214.1	687.4
26-Sep	268.5	204.0	142.1	142.9	115.3	110.2	73.1	48.2	38.5	39.9	36.7	27.9	29.6	38.1	49.0	48.0	46.2	48.0	62.3	67.6	68.8	72.6	80.4	47.7	79.4	268.5
27-Sep	29.2	43.7	104.2	298.7	358.7	350.8	316.2	299.9	327.3	304.1	246.9	201.6	175.5	164.1	150.7	148.1	167.8	204.7	189.8	170.4	147.8	148.9	147.2	137.3	201.4	358.7
28-Sep	126.7	119.5	133.0	164.4	161.7	160.6	135.2	106.5	91.5	67.9	55.2	51.5	51.8	43.2	43.5	37.0	38.4	45.5	33.2	44.5	43.8	41.7	36.8	34.5	77.8	164.4
29-Sep	29.5	19.4	24.6	30.7	39.5	54.5	64.7	61.5	77.5	58.3	33.4	34.7	33.2	22.7	19.3	19.9	20.0	27.1	28.4	25.9	35.2	31.1	28.1	37.7	35.7	77.5
30-Sep	39.0	36.0	32.3	28.9	28.8	26.4	20.8	19.8	15.9	16.7	25.9	33.7	35.0	34.1	34.0	30.8	28.3	28.3	23.7	14.8	13.1	11.6	14.0	23.8	25.7	39.0
92.0 102.5 108.6 113.8 118.9 120.1 112.1 104.8 100.4 97.2 92.8 86.5 77.5 79.2 70.7 65.4 69.3 75.2 77.2 75.0 77.2 85.4 83.2 81.5																								Diurnal Average		
305.7 562.4 687.4 523.2 416.2 522.6 429.2 420.2 426.8 447.3 465.7 467.9 378.2 402.9 324.9 276.2 281.5 284.6 350.5 367.3 376.8 364.8 335.9 338.9																								Diurnal Maximum		

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	6	0.84	0.84
6 - 15	104	14.50	15.34
16 - 25	137	19.11	34.45
26 - 80	190	26.50	60.95
> 81.0	280	39.05	100.00

Total Number of Valid Hours: 717

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Particulate Matter 2.5 (PM_{2.5}) - μg/m³
Fort Chipewyan - September 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	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5	0	6
6 - 15	0	0	1	11	3	15	5	16	10	7	3	10	10	11	2	0	104
16 - 25	1	0	1	5	8	6	8	41	34	13	6	0	1	5	3	5	137
26 - 80	1	0	1	7	34	13	8	9	10	14	16	6	12	14	21	24	190
> 81.0	12	0	1	21	15	8	5	4	11	8	23	43	45	35	22	27	280
Totals	14	0	4	44	60	42	26	70	65	42	48	59	68	66	53	56	717

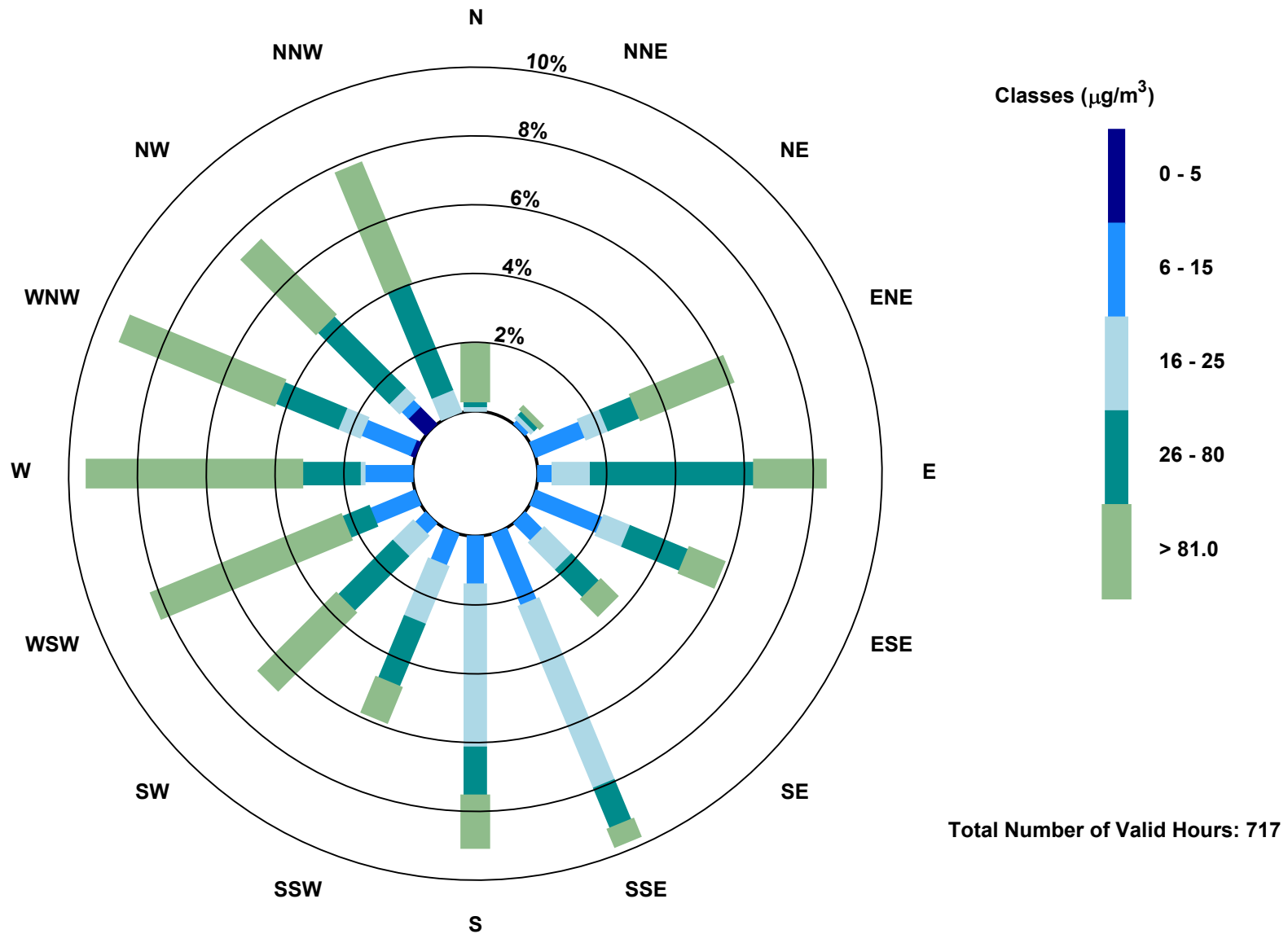
Total Number of Valid Hours: 717

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 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 - September 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 4.5 ppm on Sep 25 03:00	Maximum Daily Average: 1.2 ppm on Sep 3		Hours of Data:	673
Minimum Value: 0.0 ppm on Sep 6 10:00	Minimum Daily Average: 0.0 ppm on Sep 22		Hours of Missing Data:	47
Maximum Diurnal Average: 0.6 ppm at hour 3	Minimum Diurnal Average: 0.2 ppm at hour 16		Hours of Calibration:	32
Monthly Average: 0.36 ppm	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.5 P ₉₀ = 1.1 P ₉₉ = 2.7		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-Sep	2.8	2.7	2.7	Z	2.7	3.1	2.7	1.5	0.5	0.5	0.5	0.4	0.3	0.2	0.1	0.1	0.1	0.3	0.2	0.1	0.3	0.6	0.4	0.2	1.0	3.1
2-Sep	0.3	0.9	1.1	1.0	Z	1.3	1.5	1.4	1.3	1.4	1.4	1.3	1.5	1.5	1.2	0.3	0.2	0.6	0.9	1.0	0.8	0.5	0.6	0.7	1.0	1.5
3-Sep	0.8	0.8	0.8	1.1	2.1	Z	1.9	1.7	1.6	1.7	1.9	2.0	1.4	1.3	1.2	1.1	1.2	1.1	1.0	0.9	0.7	0.5	0.5	0.4	1.2	2.1
4-Sep	Z	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	PF	PF	0.0	0.0	0.1	0.1	0.1	0.1	UO	UO	UO	UO	--	0.3
5-Sep	UO	UO	UO	UO	UO	UO	PF	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	0.0	--	0.1
6-Sep	0.0	0.0	Z	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	0.0	0.0
7-Sep	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
8-Sep	0.0	0.0	0.0	0.0	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
9-Sep	0.0	0.0	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	0.2
10-Sep	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	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
11-Sep	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12-Sep	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.3	0.4	0.4	0.5	0.5	0.4	0.4	0.2	0.5
13-Sep	0.4	0.4	0.4	Z	0.4	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.5	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.3	1.5	0.9	0.6	0.5	1.5
14-Sep	0.5	0.5	0.6	0.7	Z	1.2	0.8	1.0	1.2	1.3	0.9	0.6	0.5	0.5	0.7	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.7	1.3
15-Sep	0.6	0.5	0.5	0.4	0.3	Z	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6
16-Sep	Z	0.0	0.0	0.0	0.0	0.1	0.3	0.4	0.4	0.5	0.5	0.5	0.6	0.7	PF	0.7	0.9	1.1	1.5	1.5	1.5	1.4	1.2	1.2	0.7	1.5
17-Sep	1.0	Z	0.9	0.8	0.6	0.5	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	0.2	0.2	0.2	0.4	0.3	0.3	1.0
18-Sep	0.3	0.3	Z	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.3
19-Sep	0.2	0.1	0.1	Z	0.1	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.5	0.4	0.7	0.7	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.7
20-Sep	0.4	0.4	0.5	0.6	Z	0.6	0.7	0.8	0.9	0.7	0.6	0.4	0.2	0.2	0.5	0.5	0.6	0.5	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.9
21-Sep	0.4	0.4	0.3	0.3	0.2	Z	0.3	0.3	0.3	0.4	0.4	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4
22-Sep	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
23-Sep	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-Sep	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	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.1	0.3
25-Sep	1.5	3.7	4.5	3.1	Z	1.8	1.0	0.7	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.5	0.5	0.6	0.7	1.1	1.3	1.7	1.7	1.2	4.5
26-Sep	1.6	1.2	0.8	0.8	Z	0.6	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.3	1.6
27-Sep	0.1	0.1	0.4	1.2	1.4	Z	1.3	1.3	1.4	1.4	1.2	1.0	0.9	0.9	0.8	0.8	0.9	1.1	1.1	1.0	0.9	0.9	1.1	1.2	1.0	1.4
28-Sep	Z	1.1	1.1	1.3	1.2	1.2	1.1	0.9	0.8	0.7	0.6	0.6	0.6	0.6	0.5	0.5	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.6	1.3
29-Sep	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.3
30-Sep	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	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2

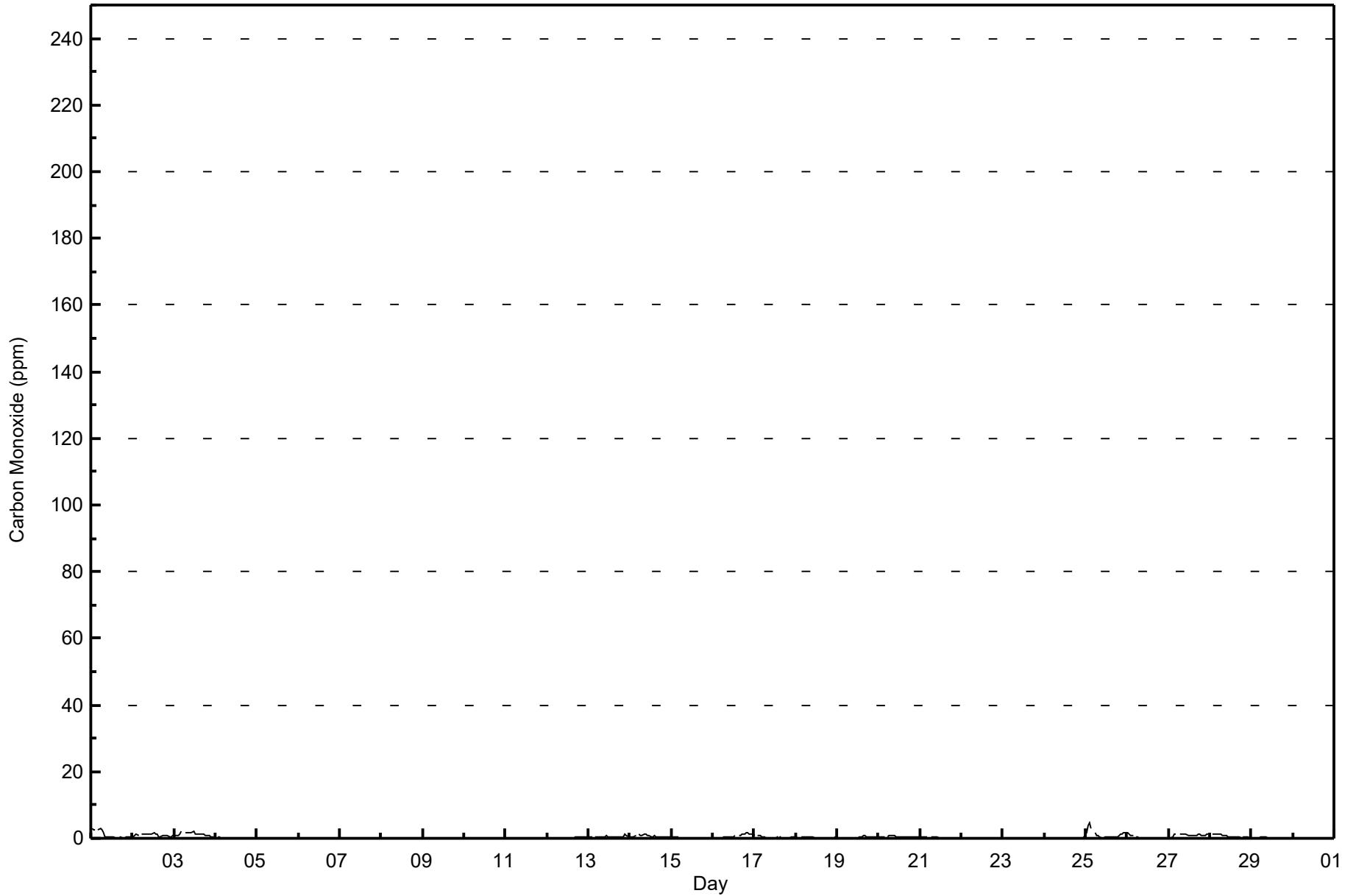
0.5	0.6	0.6	0.5	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	Diurnal Average
2.8	3.7	4.5	3.1	2.7	3.1	2.7	1.7	1.6	1.7	1.9	2.0	1.5	1.5	1.2	1.1	1.2	1.1	1.5	1.5	1.5	1.5	1.7	1.7	1.7	1.7	1.7	Diurnal Maximum

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



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.3	448	66.57	66.57
0.4 - 0.5	78	11.59	78.16
0.6 - 0.7	42	6.24	84.40
0.8 - 1.4	76	11.29	95.69
1.5 - 10	24	3.57	99.26
> 10	0	0.00	99.26

Total Number of Valid Hours: 673

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Carbon Monoxide (CO) - ppm
Fort Chipewyan - September 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	2	0	3	27	48	37	22	63	56	33	29	21	26	33	24	24	448
0.4 - 0.5	2	0	1	7	2	2	2	1	2	2	8	18	11	6	9	5	78
0.6 - 0.7	0	0	0	2	1	1	2	2	0	0	6	5	7	4	7	5	42
0.8 - 1.4	9	0	0	5	3	0	0	0	1	2	0	6	11	15	9	15	76
1.5 - 10	0	0	0	0	3	0	0	0	0	0	1	6	5	3	2	4	24
> 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	13	0	4	41	57	40	26	66	59	37	44	56	60	61	51	53	668

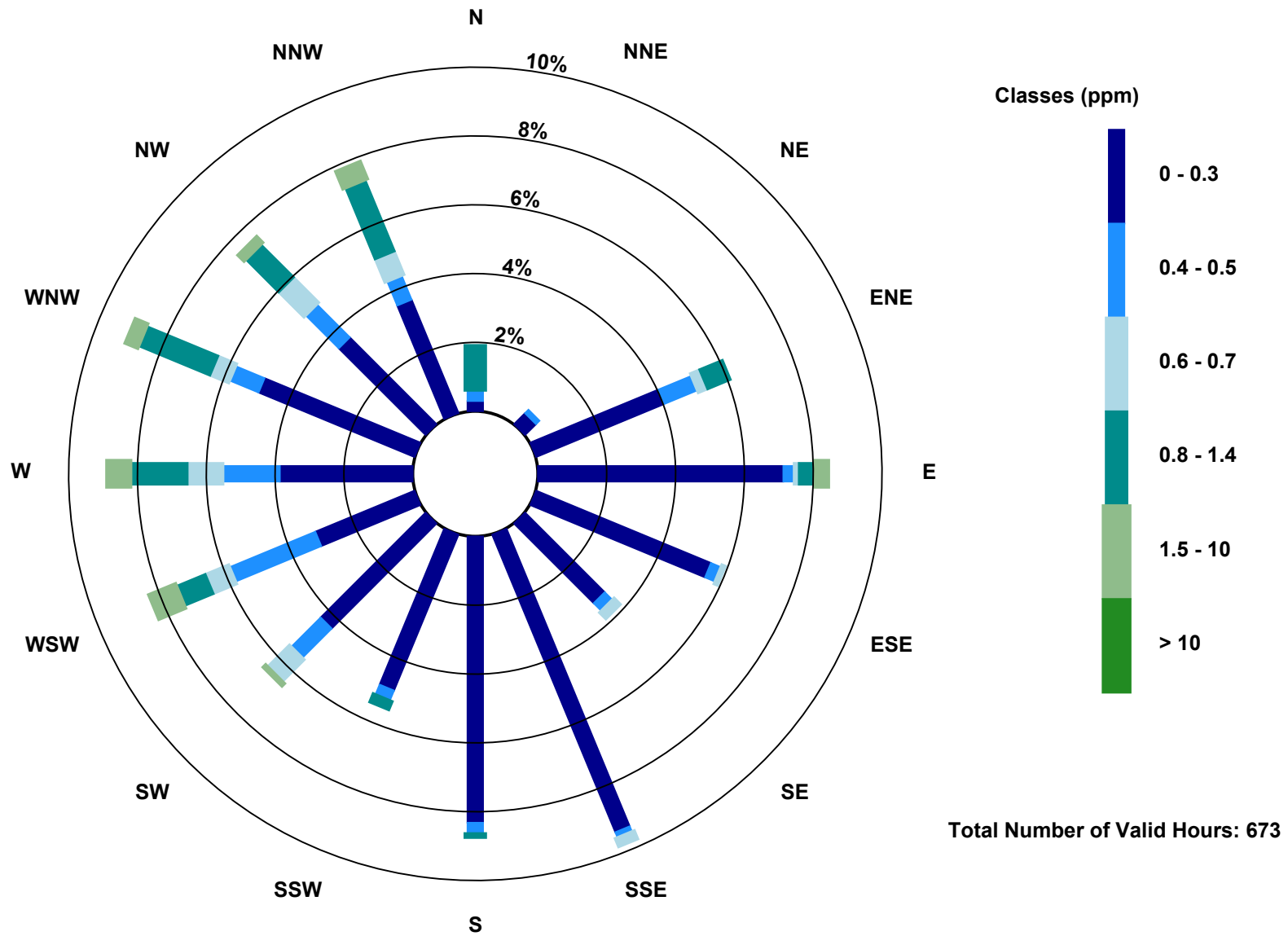
Total Number of Valid Hours: 673

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

Carbon Monoxide (CO) - ppm
Fort Chipewyan



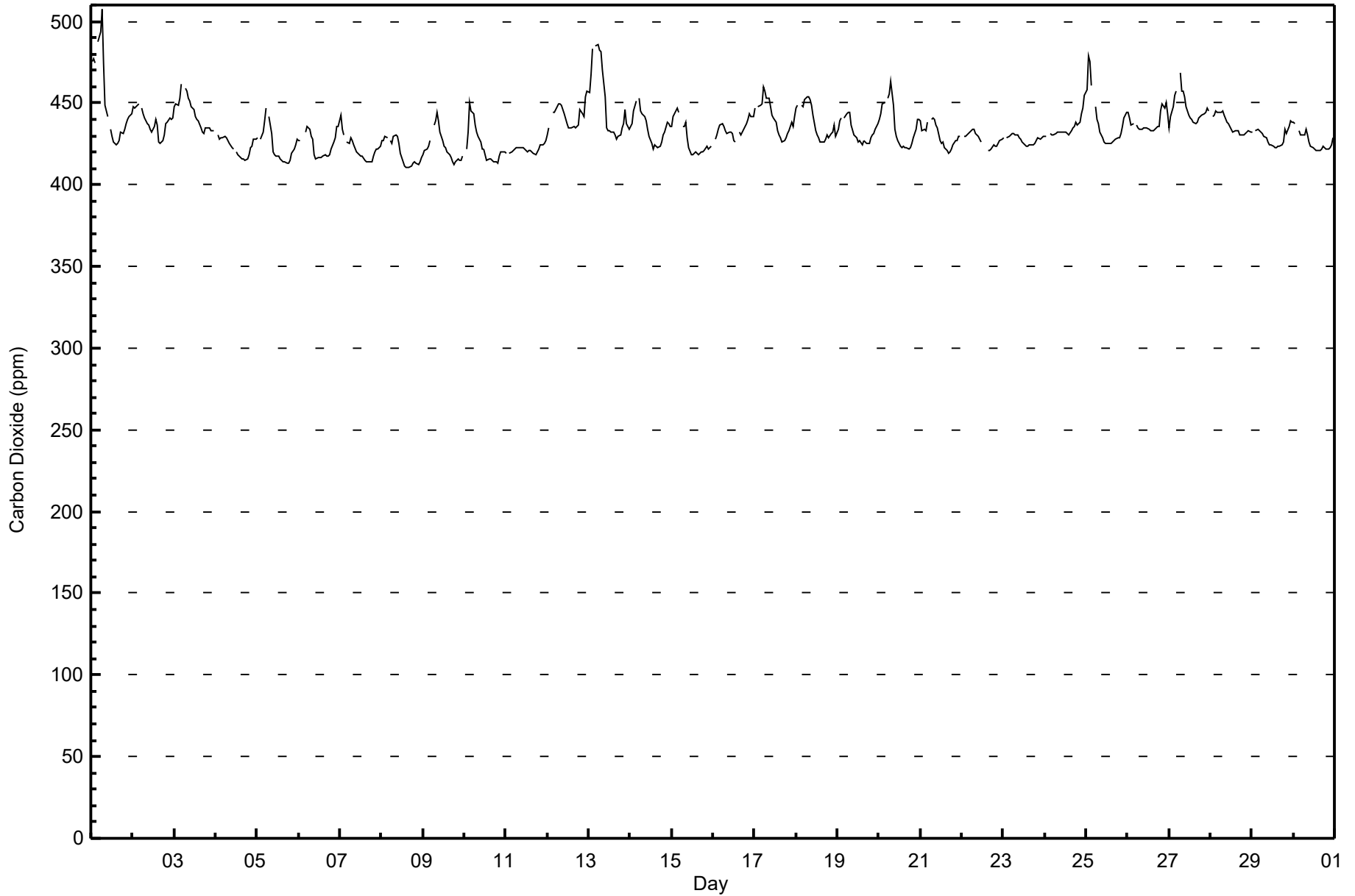


Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:																720				
Maximum Value: 507.7 ppm on Sep 1 07:00				Maximum Daily Average: 450.3 ppm on Sep 1		Hours of Data:																682				
Minimum Value: 410.3 ppm on Sep 8 15:00				Minimum Daily Average: 419.7 ppm on Sep 8		Hours of Missing Data:																38				
Maximum Diurnal Average: 443.7 ppm at hour 7				Minimum Diurnal Average: 424.0 ppm at hour 17		Hours of Calibration:																33				
Monthly Average: 432.87 ppm				Percentiles: P ₁ = 413.3 P ₁₀ = 418.6 Q ₁ = 424.2 Median = 431.1 Q ₃ = 439.2 P ₉₀ = 448.0 P ₉₉ = 481.6		Percent Operational Time:																99.3				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Sep	475.6	477.3	474.6	Z	487.5	493.5	507.7	474.7	448.3	442.0	M	433.6	429.3	426.0	424.8	424.9	427.2	432.5	431.5	433.9	437.6	440.4	441.6	443.2	450.3	507.7
2-Sep	447.7	446.6	448.2	449.2	Z	446.8	443.2	441.3	437.0	436.4	434.2	432.1	435.8	439.6	436.1	426.5	424.9	427.0	430.8	437.0	438.0	440.8	439.9	441.0	438.3	449.2
3-Sep	448.0	449.3	448.9	452.7	462.0	Z	459.1	457.1	453.0	451.1	447.7	446.1	441.5	440.0	439.4	434.7	432.0	431.6	434.7	435.1	434.7	433.2	432.8	433.3	443.4	462.0
4-Sep	Z	430.1	427.7	428.6	429.0	429.6	428.7	426.9	424.9	423.0	422.0	PF	420.5	418.2	416.8	415.9	415.5	415.2	416.0	418.4	422.7	424.0	427.6	428.2	423.2	430.1
5-Sep	428.6	Z	428.0	432.4	439.1	446.5	PF	441.4	431.5	420.4	418.1	417.4	417.3	415.7	415.0	413.9	413.6	413.6	413.5	415.1	419.3	422.0	424.3	427.9	423.4	446.5
6-Sep	426.8	427.0	Z	UO	432.1	435.8	434.3	430.0	427.9	418.3	416.1	416.6	416.2	416.3	417.6	418.2	417.8	417.7	418.6	421.8	426.1	429.0	436.0	435.8	424.4	436.0
7-Sep	442.3	434.1	430.4	Z	426.2	425.5	428.9	427.3	424.6	420.5	419.3	418.2	417.9	417.7	415.0	414.4	414.2	414.0	414.4	417.8	419.8	421.6	421.4	423.8	422.1	442.3
8-Sep	426.8	426.8	429.6	429.0	Z	427.2	425.4	429.5	430.4	429.6	424.9	419.3	414.2	411.6	410.3	410.4	411.0	411.6	413.5	414.1	413.5	412.4	414.0	416.7	419.7	430.4
9-Sep	418.3	420.6	421.7	423.4	427.4	Z	436.3	439.5	444.1	438.8	431.8	426.8	423.4	423.1	420.5	418.1	416.7	414.4	412.7	414.3	415.4	414.7	414.8	417.1	423.2	444.1
10-Sep	Z	421.9	432.1	450.5	445.0	443.7	436.8	432.6	429.8	426.3	421.5	421.9	418.6	415.3	415.5	415.5	414.5	414.2	414.2	413.4	417.6	420.1	420.4	419.7	424.4	450.5
11-Sep	418.8	Z	419.1	420.2	420.7	421.5	422.7	422.8	423.0	422.9	422.6	421.4	420.0	420.6	420.6	419.7	418.9	418.7	420.1	421.5	424.5	424.1	425.3	427.4	421.6	427.4
12-Sep	430.1	434.8	Z	444.0	444.4	446.1	449.7	449.4	448.4	446.0	443.8	437.7	434.9	434.6	435.1	435.6	435.2	435.3	436.6	445.8	443.3	442.1	454.2	457.7	441.9	457.7
13-Sep	456.6	467.4	483.3	Z	485.1	485.9	482.5	481.3	470.2	453.4	435.2	433.2	432.9	432.3	432.2	430.3	428.3	429.9	430.4	434.6	437.1	446.4	437.1	434.2	449.6	485.9
14-Sep	435.4	437.2	445.1	451.3	Z	453.0	444.7	443.1	442.1	439.3	434.2	429.4	425.0	422.1	424.5	423.4	422.6	423.9	426.6	430.4	431.9	437.9	437.5	435.9	434.6	453.0
15-Sep	436.0	441.3	445.3	446.6	444.1	Z	435.3	435.6	438.5	429.2	422.4	418.5	418.5	419.1	419.9	418.5	419.1	420.1	420.0	421.3	424.0	421.7	422.4	423.8	427.9	446.6
16-Sep	Z	427.6	430.8	434.2	436.1	437.6	435.5	433.0	431.5	432.3	432.5	431.0	427.1	426.3	PF	432.0	430.6	431.8	435.7	437.2	439.6	443.1	442.0	441.9	434.1	443.1
17-Sep	446.5	Z	448.0	449.0	449.8	459.8	457.4	453.4	452.5	447.4	443.0	440.9	438.3	432.7	430.3	428.7	426.0	426.8	428.9	431.6	433.2	438.2	435.9	442.0	440.9	459.8
18-Sep	446.9	448.7	Z	448.5	447.6	451.7	453.7	453.5	451.8	448.3	442.1	433.2	430.2	428.9	425.8	425.9	426.0	428.0	430.2	429.0	431.2	432.6	436.2	429.8	438.3	453.7
19-Sep	433.8	439.5	440.6	Z	441.1	443.7	444.6	444.3	436.7	430.8	429.9	428.3	426.2	426.7	424.4	426.8	426.3	424.9	425.5	429.1	430.7	431.5	433.9	437.4	432.9	444.6
20-Sep	439.8	443.1	449.8	450.7	Z	453.3	455.4	462.9	449.0	434.3	430.0	427.2	423.8	422.8	423.9	422.4	422.4	422.2	423.0	425.4	428.8	433.9	439.7	440.2	435.8	462.9
21-Sep	439.3	433.2	434.0	433.3	437.8	Z	440.0	440.7	440.0	436.1	434.9	427.3	425.4	425.7	422.4	420.6	419.3	420.4	421.7	424.6	427.1	427.2	429.5	429.5	430.0	440.7
22-Sep	Z	429.3	429.9	430.5	431.6	433.0	433.7	433.7	431.7	429.7	427.6	426.1	C	C	C	420.9	421.3	422.1	424.5	423.8	423.8	425.6	426.9	428.3	427.7	433.7
23-Sep	429.0	Z	428.7	429.7	430.1	431.3	431.6	430.7	430.4	429.2	428.0	426.4	424.8	423.4	423.6	424.3	424.3	424.1	425.0	426.7	428.5	428.0	428.4	429.3	427.6	431.6
24-Sep	429.7	429.9	Z	431.6	430.5	430.1	431.1	431.9	432.4	431.9	431.8	432.5	432.5	431.0	430.1	433.2	435.2	435.5	438.0	436.2	438.2	443.1	446.6	454.4	434.7	454.4
25-Sep	457.8	479.2	475.6	460.8	Z	447.8	439.7	437.8	432.3	428.7	426.0	425.5	425.3	425.1	425.1	425.9	426.8	427.6	428.5	428.4	431.7	435.5	441.3	444.0	438.1	479.2
26-Sep	444.4	441.0	436.8	437.3	Z	436.1	434.5	433.6	433.8	434.6	435.0	434.7	433.5	433.2	433.3	432.8	433.8	435.8	436.0	445.5	449.1	446.5	450.5	443.2	438.0	450.5
27-Sep	434.9	441.9	447.6	454.7	457.3	Z	468.8	457.4	457.1	453.9	447.5	443.0	441.1	440.1	438.2	437.0	438.4	440.5	441.9	443.0	443.3	444.5	447.0	444.8	446.3	468.8
28-Sep	Z	441.7	442.4	444.9	444.1	444.0	444.1	444.8	442.3	438.1	437.3	435.7	434.1	432.3	433.0	433.3	433.4	430.8	430.6	430.7	431.2	432.3	432.8	432.0	436.8	444.9
29-Sep	431.8	Z	433.1	434.2	433.5	432.4	431.1	429.8	429.2	425.9	424.2	424.2	424.0	423.0	422.8	423.2	423.2	424.1	426.0	434.2	431.1	435.4	439.3	438.0	429.3	439.3
30-Sep	438.5	437.4	Z	433.5	430.9	430.1	430.3	433.5	430.9	426.3	423.5	422.8	421.8	421.0	420.9	420.9	421.7	423.4	422.9	421.6	422.3	423.0	424.5	428.6	426.5	438.5
438.5 440.3 441.3 440.0 442.2 443.4 443.7 441.8 438.5 434.2 430.6 428.7 426.7 425.7 424.9 424.3 424.0 424.6 425.7 428.1 429.8 431.7 433.5 434.3																								Diurnal Average		
475.6 479.2 483.3 460.8 487.5 493.5 507.7 481.3 470.2 453.9 447.7 446.1 441.5 440.1 439.4 437.0 438.4 440.5 441.9 445.8 449.1 446.5 454.2 457.7																								Diurnal Maximum		
Z - zerospan				C - Calibration				M - Maintenance				UO - Unstable Operation				PF - Power Failure										



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
400 - 420	96	14.08	14.08
420 - 440	433	63.49	77.57
440 - 460	133	19.50	97.07
460 - 480	12	1.76	98.83
480 - 500	7	1.03	99.85
> 500	1	0.15	100.00

Total Number of Valid Hours: 682

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Carbon Dioxide (CO₂) - ppm
Fort Chipewyan - September 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	1	17	17	8	7	14	9	5	2	6	6	4	0	0	96
420 - 440	6	0	3	19	31	22	16	48	46	25	27	41	44	35	34	36	433
440 - 460	7	0	0	6	9	10	3	2	5	10	10	7	14	21	16	13	133
460 - 480	0	0	0	0	0	0	0	0	0	0	1	3	0	2	2	4	12
480 - 500	0	0	0	0	0	0	0	1	0	0	4	1	0	1	0	0	7
> 500	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
Totals	13	0	4	42	57	40	26	65	60	40	44	59	64	63	52	53	682

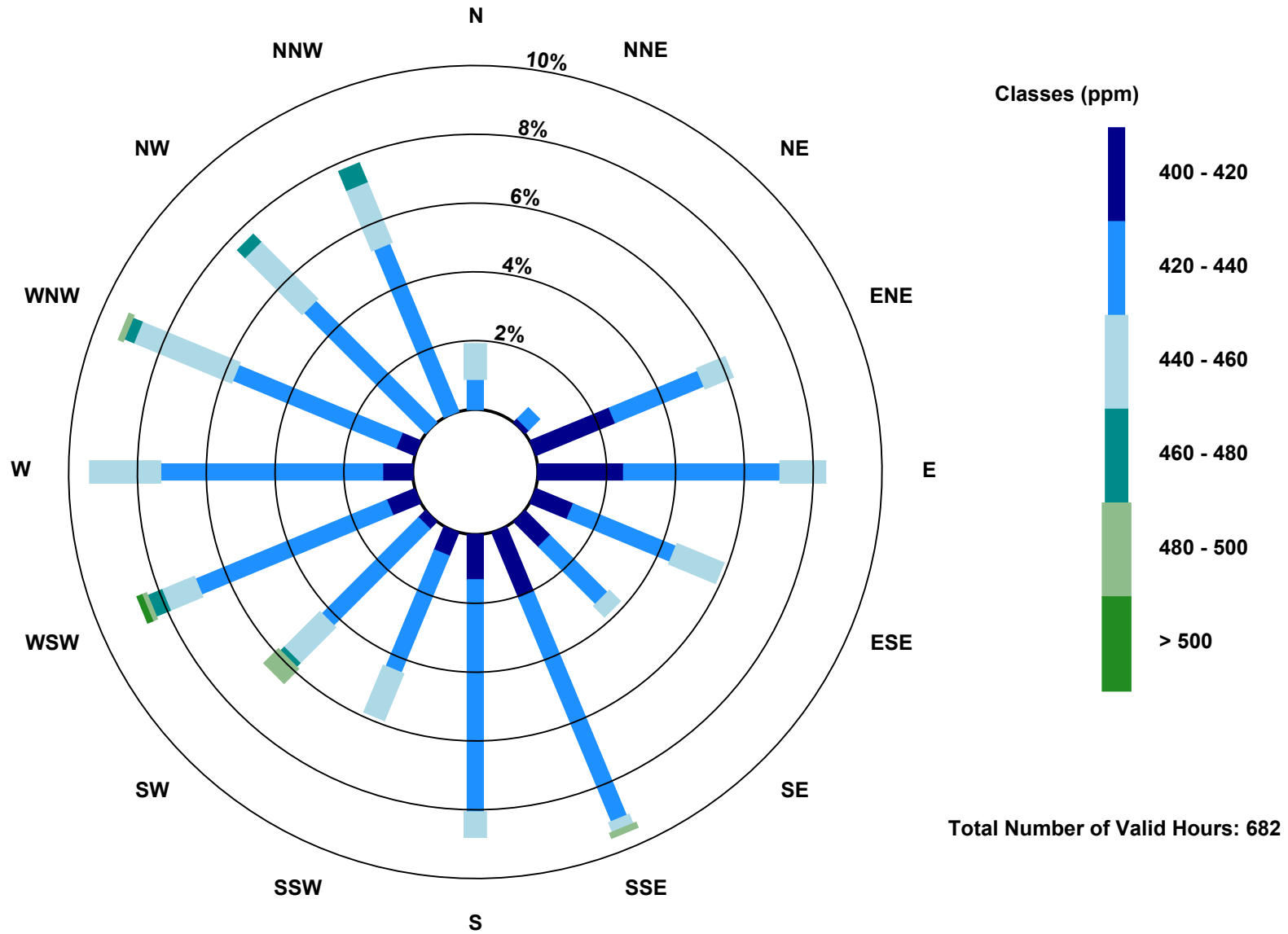
Total Number of Valid Hours: 682

Total Number of Hours: 720



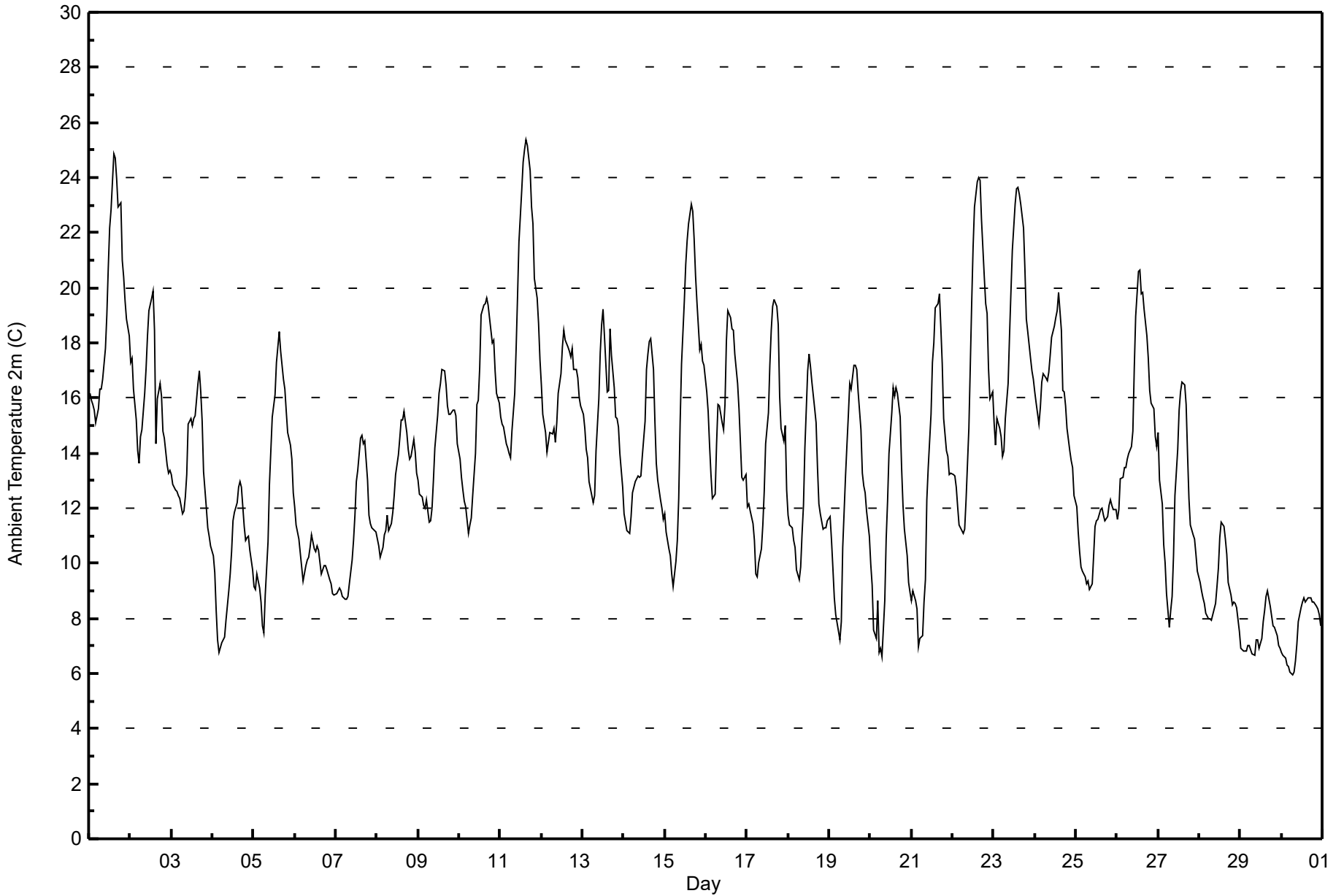
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Carbon Dioxide (CO₂) - ppm
Fort Chipewyan





Maximum Value: 25.4 C on Sep 11 16:00		Maximum Daily Average: 19.3 C on Sep 1		Hours in Service: 720																																												
Minimum Value: 6.0 C on Sep 30 07:00		Minimum Daily Average: 7.4 C on Sep 29		Hours of Data: 720																																												
Maximum Diurnal Average: 17.2 C at hour 15		Minimum Diurnal Average: 10.7 C at hour 6		Hours of Missing Data: 0																																												
Monthly Average: 13.69 C		Percentiles: P ₁ = 6.6 P ₁₀ = 8.6 Q ₁ = 10.6 Median = 13.5 Q ₃ = 16.3 P ₉₀ = 19.1 P ₉₉ = 24.0		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-Sep	16.2	15.9	15.8	15.5	15.1	15.6	16.3	16.3	16.7	17.8	19.0	20.7	22.1	22.8	24.8	24.7	23.9	22.9	23.1	21.0	20.4	19.5	18.9	18.3	19.3	24.8																						
2-Sep	17.3	17.5	16.3	15.2	14.1	13.6	14.6	14.9	16.2	17.1	18.2	19.2	19.6	19.9	18.5	14.3	16.0	16.5	16.1	14.8	14.5	13.6	13.3	13.4	16.0	19.9																						
3-Sep	13.2	12.8	12.7	12.6	12.5	12.4	11.8	11.9	12.4	13.2	15.0	15.2	15.0	15.2	15.4	16.5	17.0	16.2	15.2	13.3	12.0	11.3	11.0	10.6	13.5	17.0																						
4-Sep	10.3	9.6	8.3	7.2	6.8	7.1	7.2	7.3	7.9	9.0	9.6	10.4	11.6	11.9	12.2	12.7	13.0	12.8	11.4	10.8	10.9	11.0	10.5	9.8	10.0	13.0																						
5-Sep	9.2	9.1	9.6	9.1	8.6	7.7	7.4	8.8	10.8	12.9	14.1	15.3	16.1	17.3	17.8	18.4	17.7	16.7	16.3	15.5	14.8	14.3	13.8	12.5	13.1	18.4																						
6-Sep	12.1	11.4	10.9	10.4	9.8	9.4	9.9	10.1	10.2	10.6	11.0	10.5	10.4	10.6	10.5	9.6	9.7	9.9	9.9	9.7	9.4	9.2	8.9	8.8	10.1	12.1																						
7-Sep	8.9	9.0	9.1	9.0	8.8	8.7	8.7	8.8	9.3	10.1	10.8	11.8	13.0	13.4	14.6	14.6	14.3	14.4	13.0	11.7	11.4	11.3	11.2	11.1	11.1	14.6																						
8-Sep	10.9	10.6	10.2	10.6	11.0	11.2	11.7	11.2	11.4	11.8	12.5	13.2	13.9	14.5	15.2	15.2	15.5	14.7	14.2	13.8	13.9	14.5	14.0	13.3	12.9	15.5																						
9-Sep	13.0	12.5	12.4	12.1	12.0	12.3	11.5	11.5	12.0	13.0	14.2	15.3	16.2	16.5	17.0	17.0	16.5	15.7	15.4	15.4	15.5	15.6	15.3	14.3	14.3	17.0																						
10-Sep	13.8	13.1	12.7	12.3	12.1	11.1	11.4	11.7	12.5	14.0	15.8	15.9	17.1	19.0	19.4	19.4	19.6	19.4	18.4	18.0	18.1	17.0	16.2	15.8	15.6	19.6																						
11-Sep	15.3	15.1	14.9	14.4	14.2	14.0	13.8	14.8	16.2	17.8	19.7	21.6	23.6	24.6	25.0	25.4	25.2	24.2	22.9	22.3	20.3	19.6	18.7	17.4	19.2	25.4																						
12-Sep	16.5	15.4	14.8	14.0	14.4	14.7	14.7	14.9	14.4	15.1	16.2	16.9	17.8	18.5	18.1	17.8	17.7	17.5	17.8	17.0	17.0	16.7	16.0	15.7	16.2	18.5																						
13-Sep	15.4	14.9	14.1	13.8	13.0	12.5	12.2	12.5	14.1	16.0	17.7	18.6	19.2	18.2	16.2	16.3	18.5	17.5	16.4	15.3	15.3	14.9	14.0	12.8	15.4	19.2																						
14-Sep	11.8	11.5	11.2	11.1	11.7	12.5	12.8	13.0	13.2	13.1	13.2	13.9	15.2	17.0	17.6	18.0	18.2	17.0	15.2	13.6	13.0	12.3	12.0	11.6	13.7	18.2																						
15-Sep	11.8	11.1	10.5	10.3	9.6	9.1	10.1	10.8	12.4	15.1	17.2	19.5	20.8	21.7	22.3	23.0	22.8	21.8	20.4	19.5	17.7	18.0	17.4	17.2	16.3	23.0																						
16-Sep	16.2	15.5	14.3	13.2	12.3	12.5	14.3	15.8	15.7	15.1	14.8	15.8	18.0	19.2	18.9	18.5	18.5	17.6	16.5	15.6	14.4	13.1	13.0	13.2	15.5	19.2																						
17-Sep	12.0	12.2	11.9	11.4	10.8	9.6	9.5	10.0	10.5	11.4	12.6	14.4	15.5	17.2	18.5	19.3	19.6	19.3	18.6	16.1	14.9	14.5	15.0	12.7	14.1	19.6																						
18-Sep	11.8	11.4	11.3	10.8	10.6	9.7	9.4	9.8	11.1	12.1	14.2	17.0	17.6	17.1	16.6	15.6	15.1	13.5	12.2	11.8	11.3	11.3	11.3	11.5	12.7	17.6																						
19-Sep	11.7	10.8	9.8	8.8	8.1	7.5	7.2	7.9	10.6	13.2	14.3	15.3	16.5	16.3	17.2	17.2	17.0	16.2	14.8	13.3	12.8	12.6	11.9	11.0	12.6	17.2																						
20-Sep	10.0	9.2	7.6	7.3	8.6	6.7	6.9	6.6	8.6	10.9	12.2	14.0	15.5	16.4	16.1	16.4	16.2	15.3	13.4	12.1	11.2	10.3	9.3	9.0	11.2	16.4																						
21-Sep	8.7	9.0	8.7	8.3	7.0	7.3	7.4	8.6	9.4	12.3	13.5	15.4	17.3	18.0	19.3	19.4	19.8	18.6	17.2	15.2	14.1	13.9	13.2	13.2	13.1	19.8																						
22-Sep	13.2	13.2	12.7	12.1	11.4	11.2	11.1	11.2	12.3	14.9	17.1	19.4	21.4	23.0	23.8	24.0	23.9	22.5	20.4	19.4	19.1	17.1	16.0	16.2	16.9	24.0																						
23-Sep	15.1	14.3	15.2	14.9	14.6	13.9	14.1	15.3	16.5	18.2	19.8	21.4	23.0	23.6	23.4	23.0	22.2	20.7	18.8	18.4	17.4	17.0	16.7	18.4	23.6																							
24-Sep	16.2	15.8	15.1	15.7	16.6	16.9	16.7	17.0	17.5	18.2	18.6	18.9	19.2	19.9	18.5	16.3	16.2	15.7	14.9	14.1	13.7	13.5	12.5	16.4	19.9																							
25-Sep	12.1	11.1	10.4	9.9	9.7	9.5	9.3	9.4	9.1	9.3	10.3	11.4	11.6	11.6	12.0	12.0	11.7	11.5	11.7	12.1	12.3	12.1	12.0	11.9	11.0	12.3																						
26-Sep	11.6	12.0	13.0	13.1	13.5	13.5	13.8	14.0	14.2	14.8	17.1	19.0	20.6	20.7	19.8	19.8	19.2	18.2	17.5	16.3	15.8	15.6	14.6	14.2	15.9	20.7																						
27-Sep	14.8	13.0	12.2	10.7	10.0	8.9	7.7	8.3	8.8	10.3	12.4	14.1	15.5	16.2	16.6	16.5	15.8	14.0	12.3	11.4	11.0	10.9	10.3	9.7	12.1	16.6																						
28-Sep	9.3	9.0	8.8	8.5	8.2	8.0	8.0	7.9	8.1	8.5	9.1	9.8	10.9	11.5	11.3	10.9	10.3	9.3	8.8	8.5	8.6	8.6	8.4	7.5	9.1	11.5																						
29-Sep	6.9	6.8	6.8	6.8	7.0	7.0	6.9	6.7	6.7	7.2	7.2	6.9	7.2	7.9	8.3	8.8	9.0	8.5	8.1	7.7	7.7	7.4	7.0	6.9	7.4	9.0																						
30-Sep	6.8	6.6	6.6	6.3	6.3	6.0	6.0	6.0	6.4	7.0	7.9	8.4	8.6	8.7	8.6	8.7	8.8	8.7	8.6	8.6	8.5	8.3	8.1	7.7	7.6	8.8																						
																								12.4	12.0	11.6	11.2	10.9	10.7	10.7	11.1	11.8	13.0	14.2	15.3	16.3	16.9	17.2	17.1	17.0	16.3	15.4	14.5	13.9	13.5	13.1	12.6	Diurnal Average
																								17.3	17.5	16.3	15.7	16.6	16.9	16.7	16.7	17.0	18.2	19.8	21.6	23.6	24.6	25.0	25.4	25.2	24.2	23.1	22.3	20.4	19.6	18.9	18.3	Diurnal Maximum





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	153	21.25	21.25
10 - 20	523	72.64	93.89
> 20	44	6.11	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



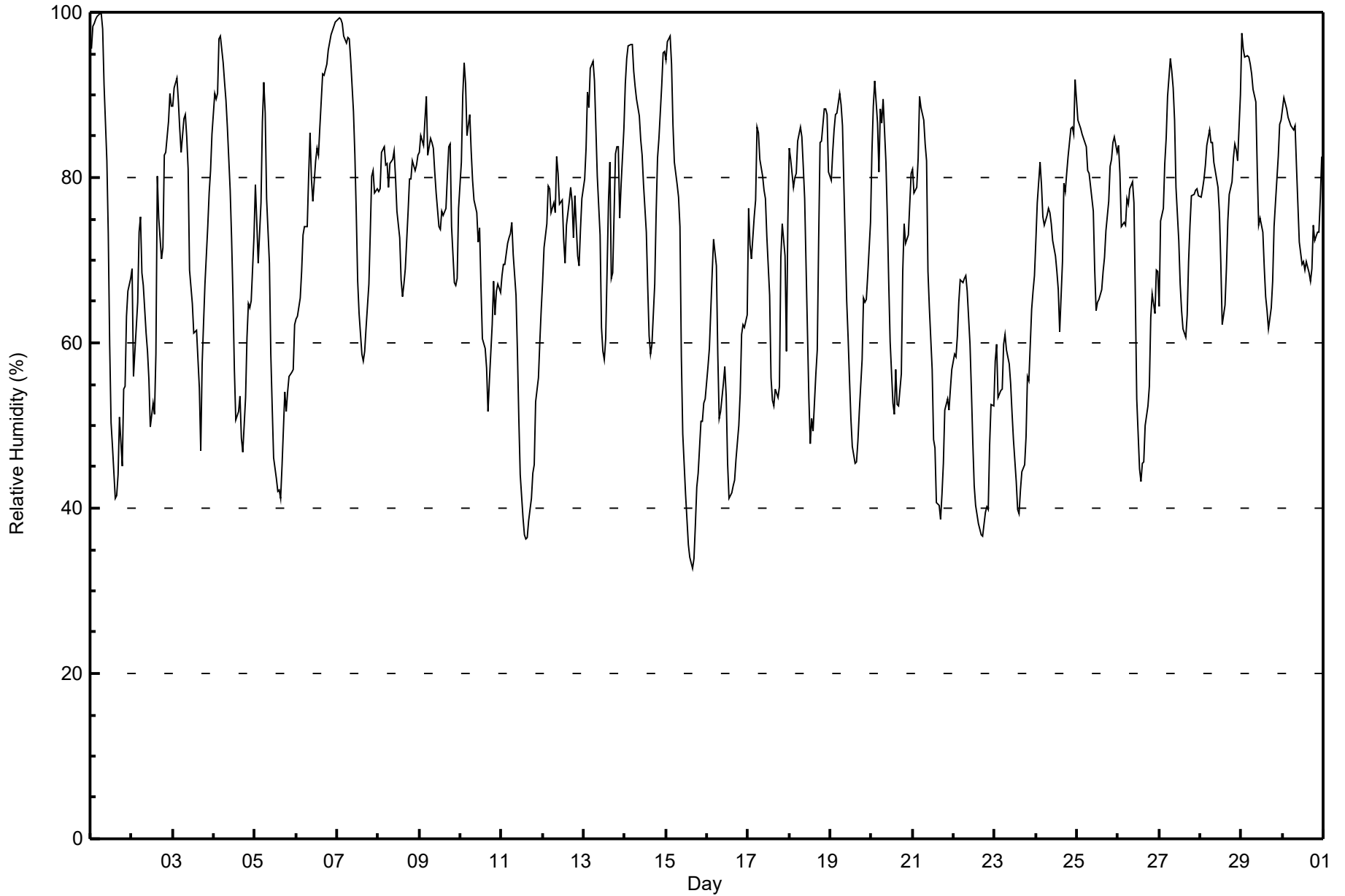
Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Fort Chipewyan - September 2023

Maximum Value: 99.9 % on Sep 1 06:00 Maximum Daily Average: 83.2 % on Sep 6																						Hours in Service: 720 Hours of Data: 720																											
Minimum Value: 32.7 % on Sep 15 16:00 Minimum Daily Average: 51.9 % on Sep 22																						Hours of Missing Data: 0 Hours of Calibration: 0																											
Maximum Diurnal Average: 83.6 % at hour 6 Minimum Diurnal Average: 56.1 % at hour 15																						Percent Operational Time: 100.0																											
Monthly Average: 71.27 % Percentiles: P₁ = 36.8 P₁₀ = 48.7 Q₁ = 59.8 Median = 74.0 Q₃ = 82.9 P₉₀ = 90.0 P₉₉ = 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-Sep	95.5	98.3	98.6	99.2	99.5	99.9	99.8	97.9	91.3	82.1	73.2	59.8	50.3	47.5	41.2	41.6	44.0	51.0	45.1	54.4	54.8	63.2	66.2	67.9	71.8	99.9																							
2-Sep	69.0	55.9	59.0	64.8	73.4	75.2	68.6	66.9	61.2	58.9	55.5	49.8	52.8	51.3	58.7	80.2	75.1	70.2	71.6	82.7	83.1	86.7	90.2	88.7	68.7	90.2																							
3-Sep	88.6	90.9	92.1	89.4	85.9	83.0	87.2	87.7	84.9	81.1	68.9	64.8	61.1	61.3	61.5	54.5	46.9	57.4	62.3	67.2	74.0	78.1	80.9	85.3	74.8	92.1																							
4-Sep	90.2	89.4	90.1	96.8	97.1	93.8	91.5	89.3	86.1	78.5	72.8	65.5	56.7	50.7	51.6	53.5	48.5	46.7	53.4	60.7	64.7	64.3	65.1	72.9	72.1	97.1																							
5-Sep	79.1	74.6	69.7	76.9	86.8	91.5	87.7	77.5	69.7	58.7	52.3	46.1	35.7	42.1	42.1	41.2	45.1	54.0	51.7	54.1	56.0	56.4	56.8	62.2	61.5	91.5																							
6-Sep	62.9	63.2	65.4	68.7	73.1	74.1	74.0	80.2	85.4	79.9	77.2	82.0	83.6	82.7	86.1	92.6	92.4	93.0	93.7	95.4	97.2	97.8	98.3	98.9	83.2	98.9																							
7-Sep	99.2	99.3	99.2	98.6	97.1	96.3	96.9	96.7	94.3	87.9	82.7	75.6	67.4	63.6	58.7	57.7	59.0	61.8	67.2	73.4	80.1	80.9	78.1	78.6	81.3	99.3																							
8-Sep	78.4	78.6	83.1	83.7	81.6	81.7	78.8	81.8	82.2	83.3	79.9	75.9	72.7	67.6	65.6	67.1	68.9	75.9	79.9	79.8	82.0	80.8	81.5	82.7	78.1	83.7																							
9-Sep	83.1	85.1	83.9	86.9	89.9	82.7	84.7	84.2	83.6	80.6	78.2	74.0	73.7	76.0	75.4	76.2	80.2	83.7	84.1	74.1	67.3	66.9	67.8	76.3	79.1	89.9																							
10-Sep	81.9	90.0	93.9	91.4	85.1	87.7	83.2	79.7	77.3	75.7	72.2	73.9	66.8	60.5	59.4	56.9	51.7	55.5	62.3	67.5	63.3	66.3	67.1	66.0	72.3	93.9																							
11-Sep	68.1	69.5	69.5	72.0	72.7	73.2	74.6	70.8	65.8	58.9	50.9	44.0	38.8	36.8	36.4	36.5	38.4	41.3	44.2	45.2	52.9	55.7	60.1	64.0	55.8	74.6																							
12-Sep	67.5	71.6	74.4	78.9	78.6	75.8	77.0	75.8	82.6	80.6	76.7	77.3	72.5	69.6	74.2	77.1	78.8	77.1	72.7	77.8	70.6	69.2	73.7	77.5	75.3	82.6																							
13-Sep	79.9	83.5	90.4	88.5	93.3	94.0	91.7	85.9	80.1	73.1	61.8	58.9	58.0	60.5	77.1	81.8	67.7	68.5	82.8	83.7	83.8	75.1	79.2	86.0	78.6	94.0																							
14-Sep	91.4	94.4	95.9	96.1	96.0	92.9	91.1	89.4	87.4	84.6	82.7	79.2	73.3	66.9	60.9	58.6	59.8	67.1	75.8	82.3	84.8	91.2	95.0	95.3	83.0	96.1																							
15-Sep	94.2	96.4	97.1	93.7	86.5	81.8	79.2	77.6	74.1	58.3	48.9	41.7	38.6	35.7	34.0	32.7	33.9	37.9	42.5	44.2	50.5	50.5	52.7	53.2	59.8	97.1																							
16-Sep	57.2	59.3	63.8	68.5	72.6	69.4	58.7	50.9	51.8	55.2	57.1	53.6	45.5	41.2	41.9	42.7	43.4	45.9	50.0	53.9	61.0	62.1	61.8	63.3	55.4	72.6																							
17-Sep	76.3	71.8	70.2	75.2	77.3	86.1	85.5	82.2	80.1	78.5	77.5	72.9	65.7	55.7	53.1	52.3	54.5	53.4	54.8	70.4	74.4	70.5	59.1	74.7	69.7	86.1																							
18-Sep	83.6	82.1	78.8	80.0	80.5	84.4	86.0	84.9	81.3	77.5	69.3	53.4	47.9	50.8	49.4	56.4	59.1	72.6	84.3	84.5	88.3	88.3	87.7	80.7	74.7	88.3																							
19-Sep	79.7	83.0	85.7	87.6	87.8	90.1	88.7	86.2	79.0	65.1	60.7	55.5	50.8	47.4	45.4	45.6	48.2	51.7	57.9	65.5	64.9	65.2	68.1	74.6	68.1	90.1																							
20-Sep	83.1	88.6	91.7	86.6	80.7	88.4	86.6	89.5	81.9	75.3	67.2	60.1	52.8	51.4	56.7	52.5	52.3	56.2	68.6	74.4	72.1	73.1	76.8	80.4	72.8	91.7																							
21-Sep	81.0	78.2	78.8	82.3	89.8	88.4	87.0	84.1	82.0	68.6	64.3	56.8	48.2	47.3	40.7	40.3	38.6	41.8	45.4	51.8	53.3	51.9	54.5	56.8	63.0	89.8																							
22-Sep	58.6	58.3	60.8	64.9	67.6	67.2	67.9	68.1	66.3	59.8	54.2	47.9	42.7	40.3	38.1	37.4	36.8	36.6	39.6	40.2	39.8	47.7	52.5	52.4	51.9	68.1																							
23-Sep	57.8	59.9	53.4	54.2	54.4	59.8	61.0	59.1	57.5	55.1	51.5	48.4	43.2	39.9	39.3	42.1	44.4	45.3	48.7	55.9	55.4	64.1	66.2	68.2	53.5	68.2																							
24-Sep	72.3	77.0	81.8	79.1	75.3	74.2	75.4	76.3	75.8	74.4	72.3	70.4	68.6	66.4	61.4	69.8	79.3	78.4	80.5	82.6	86.0	86.1	85.2	91.9	76.7	91.9																							
25-Sep	86.9	86.5	86.0	85.2	84.8	83.8	80.9	80.4	78.9	76.0	68.9	63.8	64.9	65.2	66.4	68.6	70.3	73.6	77.2	81.4	82.1	84.2	84.8	83.1	77.7	86.9																							
26-Sep	84.0	80.5	74.1	74.5	74.3	77.4	76.8	78.6	79.5	77.0	65.6	53.2	44.8	43.2	45.4	45.7	50.0	52.5	54.7	63.1	66.0	63.6	68.7	68.6	65.1	84.0																							
27-Sep	64.4	74.8	76.2	81.7	84.8	89.8	94.4	92.9	90.9	86.9	78.8	72.4	67.2	63.8	61.7	60.7	63.5	69.8	74.3	77.7	78.0	78.4	78.6	77.8	76.6	94.4																							
28-Sep	77.6	78.6	79.9	81.5	83.8	85.8	84.3	84.3	81.8	79.7	78.8	75.7	69.6	62.2	64.6	69.0	74.7	78.0	79.4	82.4	84.0	83.3	82.1	90.0	78.8	90.0																							
29-Sep	97.4	95.6	94.6	94.8	94.7	93.8	92.6	90.7	89.2	81.0	74.3	75.1	73.4	69.1	65.6	63.9	61.7	64.2	67.4	74.1	76.9	82.5	86.4	86.9	81.1	97.4																							
30-Sep	88.3	89.7	88.3	87.4	86.9	86.3	85.7	86.3	81.3	76.8	72.3	69.5	69.8	68.8	69.9	68.5	67.5	69.0	74.2	72.4	73.3	73.3	77.5	82.5	77.7	89.7																							
																								79.2	80.2	80.9	82.3	83.1	83.6	82.6	81.2	78.8	73.6	68.2	63.2	58.8	56.2	56.1	57.5	57.8	61.0	64.9	69.1	70.7	71.9	73.4	76.2	Diurnal Average	
																								99.2	99.3	99.2	99.2	99.5	99.9	99.8	97.9	94.3	87.9	82.7	82.0	83.6	82.7	86.1	92.6	92.4	93.0	93.7	95.4	97.2	97.8	98.3	98.9	Diurnal Maximum	





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

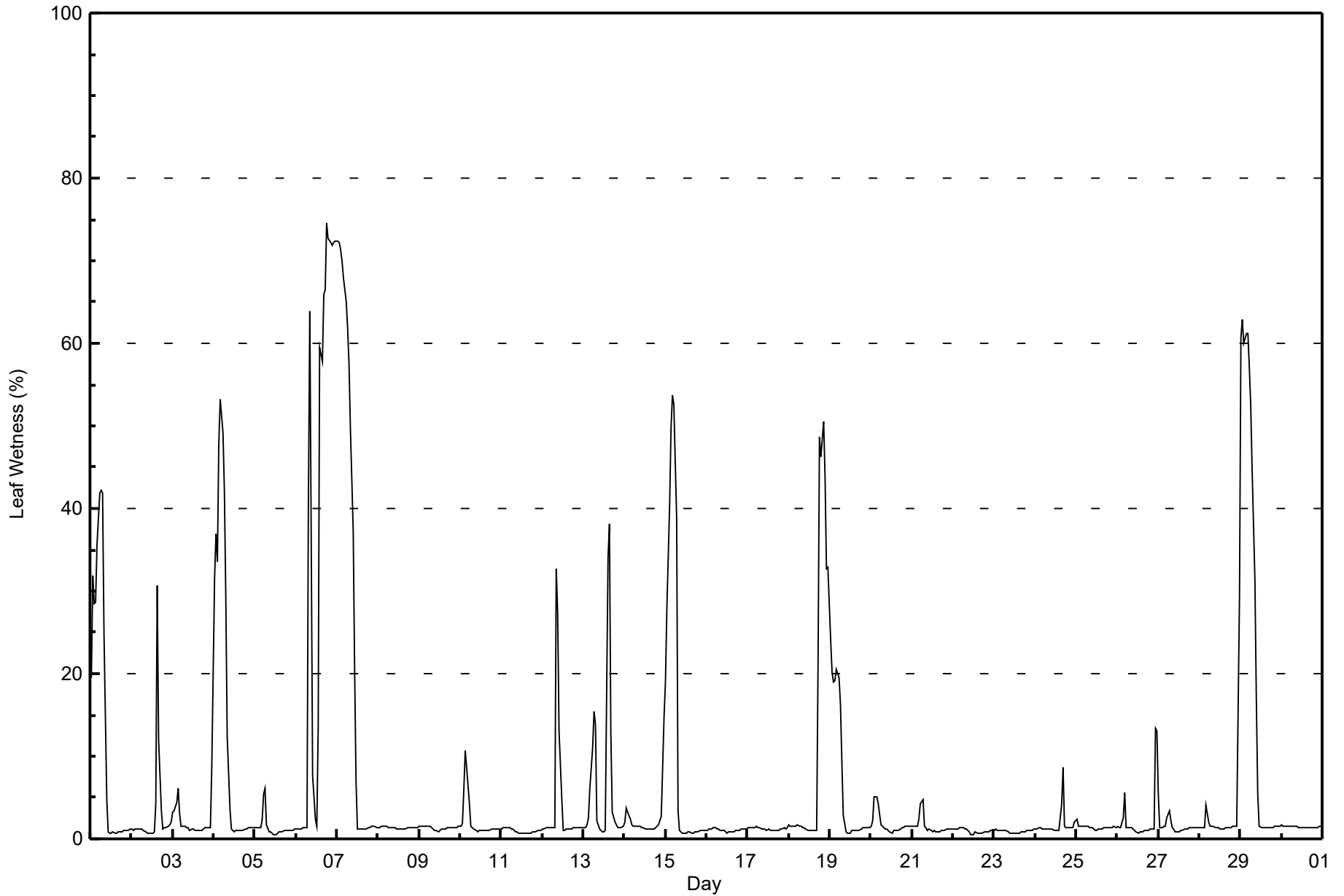
Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	20	2.78	2.78
40 - 60	162	22.50	25.28
60 - 80	298	41.39	66.67
80 - 100	240	33.33	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Maximum Value: 74.5 % on Sep 6 19:00																				Maximum Daily Average: 35.9 % on Sep 6					Hours in Service: 720	
Minimum Value: 0.5 % on Sep 22 13:00																				Minimum Daily Average: 0.9 % on Sep 23					Hours of Data: 720	
Maximum Diurnal Average: 11.7 % at hour 5																				Minimum Diurnal Average: 0.9 % at hour 13					Hours of Missing Data: 0	
Monthly Average: 6.34 %																				Percentiles: P ₁ = 0.6 P ₁₀ = 0.9 Q ₁ = 1.1 Median = 1.3 Q ₃ = 1.5 P ₉₀ = 19.5 P ₉₉ = 71.7					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-Sep	19.5	31.9	28.4	28.7	35.6	41.9	42.3	41.9	25.0	4.8	0.8	0.7	0.7	0.8	0.7	0.7	0.8	0.9	0.9	1.0	1.0	1.1	1.1	1.1	13.0	42.3
2-Sep	1.2	1.1	1.1	1.2	1.2	1.3	1.1	1.0	0.8	0.7	0.7	0.7	0.7	0.8	4.2	30.6	12.0	3.4	1.2	1.3	1.4	1.4	1.8	2.0	3.0	30.6
3-Sep	3.2	3.3	4.4	6.2	3.1	1.5	1.5	1.5	1.4	1.3	1.0	1.1	1.1	1.1	1.1	1.0	1.0	1.1	1.2	1.3	1.3	1.3	1.4	8.9	2.1	8.9
4-Sep	31.7	37.0	33.6	47.9	53.3	49.1	42.0	29.3	12.4	3.5	1.1	1.1	0.9	1.1	1.1	1.1	1.1	1.1	1.2	1.2	1.3	1.3	1.3	1.3	14.8	53.3
5-Sep	1.4	1.4	1.4	1.4	2.4	5.5	6.1	1.6	0.9	0.9	0.6	0.5	0.5	0.8	0.9	0.9	0.9	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.5	6.1
6-Sep	1.2	1.2	1.2	1.2	1.3	1.3	1.4	41.0	63.8	36.5	7.6	2.3	1.5	13.6	59.4	57.7	66.0	66.4	74.5	72.7	72.2	71.8	72.2	72.4	35.9	74.5
7-Sep	72.4	72.2	71.4	70.0	68.0	65.1	61.8	57.4	49.7	37.3	20.7	7.2	1.1	1.1	1.1	1.1	1.2	1.2	1.3	1.4	1.5	1.5	1.5	1.4	27.9	72.4
8-Sep	1.4	1.4	1.5	1.5	1.4	1.5	1.4	1.4	1.4	1.4	1.3	1.3	1.2	1.2	1.2	1.2	1.2	1.3	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.5
9-Sep	1.5	1.5	1.5	1.5	1.6	1.5	1.5	1.3	1.1	1.0	0.9	0.9	1.0	1.2	1.2	1.2	1.3	1.3	1.4	1.4	1.4	1.4	1.4	1.5	1.3	1.6
10-Sep	1.5	1.9	5.9	10.7	8.6	4.2	1.6	1.3	1.1	1.0	0.9	1.0	1.0	1.1	1.1	1.1	1.0	1.0	1.1	1.2	1.2	1.2	1.2	1.2	2.2	10.7
11-Sep	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.1	0.9	0.8	0.7	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.8	0.9	0.9	1.0	1.0	1.1	1.0	1.3
12-Sep	1.2	1.2	1.3	1.3	1.3	1.3	1.3	1.3	32.8	27.5	13.1	4.8	1.1	1.1	1.1	1.2	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.3	4.3	32.8
13-Sep	1.4	1.4	1.7	2.6	6.2	11.1	15.4	13.9	2.2	1.1	1.0	0.8	0.8	1.1	34.1	38.1	12.7	3.2	2.1	1.6	1.4	1.4	1.4	1.5	6.6	38.1
14-Sep	2.0	3.7	3.3	2.5	1.6	1.6	1.5	1.5	1.5	1.5	1.4	1.4	1.2	1.2	1.1	1.1	1.1	1.2	1.4	1.6	1.8	2.8	8.7	14.7	2.6	14.7
15-Sep	19.0	27.8	40.5	49.8	53.7	52.5	38.7	3.5	1.0	0.8	0.7	0.6	0.6	0.8	0.8	0.8	0.7	0.8	0.9	0.9	1.0	1.0	1.0	1.0	12.5	53.7
16-Sep	1.1	1.1	1.2	1.2	1.3	1.3	1.3	1.1	1.1	1.1	1.1	0.9	0.7	0.9	0.8	0.9	0.9	1.0	1.0	1.1	1.2	1.3	1.3	1.3	1.1	1.3
17-Sep	1.3	1.3	1.4	1.4	1.4	1.5	1.4	1.3	1.2	1.2	1.2	1.2	1.1	1.1	1.0	1.0	1.0	1.0	1.1	1.2	1.3	1.3	1.2	1.4	1.2	1.5
18-Sep	1.6	1.6	1.5	1.5	1.5	1.6	1.6	1.5	1.3	1.3	1.2	1.0	0.9	1.0	1.0	1.0	1.1	21.4	48.7	46.3	50.5	43.7	32.7	32.8	12.4	50.5
19-Sep	24.1	20.2	19.0	19.2	20.5	19.5	16.2	9.2	2.9	0.8	0.7	0.7	0.7	0.9	0.9	1.0	1.0	1.1	1.2	1.3	1.3	1.3	1.3	1.4	6.9	24.1
20-Sep	1.4	2.2	5.0	5.1	4.2	2.9	1.6	1.5	1.3	1.1	0.9	0.8	0.7	1.0	1.0	1.1	1.1	1.1	1.3	1.4	1.5	1.5	1.6	1.6	1.8	5.1
21-Sep	1.6	1.6	1.5	1.6	2.3	4.3	4.7	1.5	1.3	1.1	1.2	1.0	0.9	0.9	0.9	0.9	0.9	0.9	1.0	1.1	1.1	1.1	1.2	1.2	1.5	4.7
22-Sep	1.2	1.2	1.2	1.3	1.3	1.3	1.3	1.2	1.1	0.8	0.6	0.5	0.5	0.8	0.7	0.7	0.7	0.8	0.8	0.9	0.8	0.9	1.0	1.0	0.9	1.3
23-Sep	1.1	1.1	1.1	1.1	1.1	1.1	1.1	0.9	0.8	0.7	0.6	0.6	0.6	0.7	0.7	0.8	0.8	0.8	0.9	1.0	1.0	1.0	1.1	1.1	0.9	1.1
24-Sep	1.2	1.2	1.3	1.3	1.2	1.2	1.2	1.2	1.2	1.2	1.1	1.1	1.0	1.0	1.0	4.2	8.6	1.5	1.3	1.4	1.4	1.4	1.4	2.0	1.7	8.6
25-Sep	2.4	1.5	1.5	1.5	1.5	1.5	1.5	1.4	1.4	1.3	1.1	1.0	1.1	1.1	1.1	1.2	1.2	1.3	1.3	1.4	1.4	1.4	1.4	1.4	1.4	2.4
26-Sep	1.4	1.4	1.4	2.6	5.6	1.4	1.4	1.4	1.3	1.2	0.9	0.8	0.6	0.8	0.9	0.9	1.0	1.0	1.1	1.1	1.2	1.2	13.4	13.1	2.4	13.4
27-Sep	5.5	1.4	1.4	1.5	1.5	2.5	3.5	2.2	1.4	1.2	0.9	0.9	0.9	1.1	1.1	1.1	1.1	1.3	1.3	1.4	1.4	1.4	1.4	1.4	1.6	5.5
28-Sep	1.4	1.4	1.4	1.4	4.0	2.0	1.5	1.5	1.4	1.4	1.4	1.3	1.2	1.2	1.3	1.3	1.4	1.4	1.5	1.5	1.5	1.5	29.6	2.7	2.7	29.6
29-Sep	60.7	62.9	60.0	61.2	61.2	57.1	52.5	44.7	31.4	17.1	5.7	1.5	1.4	1.4	1.3	1.3	1.3	1.4	1.4	1.4	1.5	1.5	1.5	1.5	22.2	62.9
30-Sep	1.7	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.5	1.5	1.4	1.4	1.4	1.3	1.3	1.3	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.5	1.5	1.7
																								Diurnal Average		
																								Diurnal Maximum		





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 0.3	0	0.00	0.00
0.4 - 0.5	4	0.56	0.56
0.6 - 0.7	37	5.14	5.69
0.8 - 1.4	448	62.22	67.92
1.5 - 10	108	15.00	82.92
> 10	90	12.50	95.42

Total Number of Valid Hours: 720

Total Number of Hours: 720

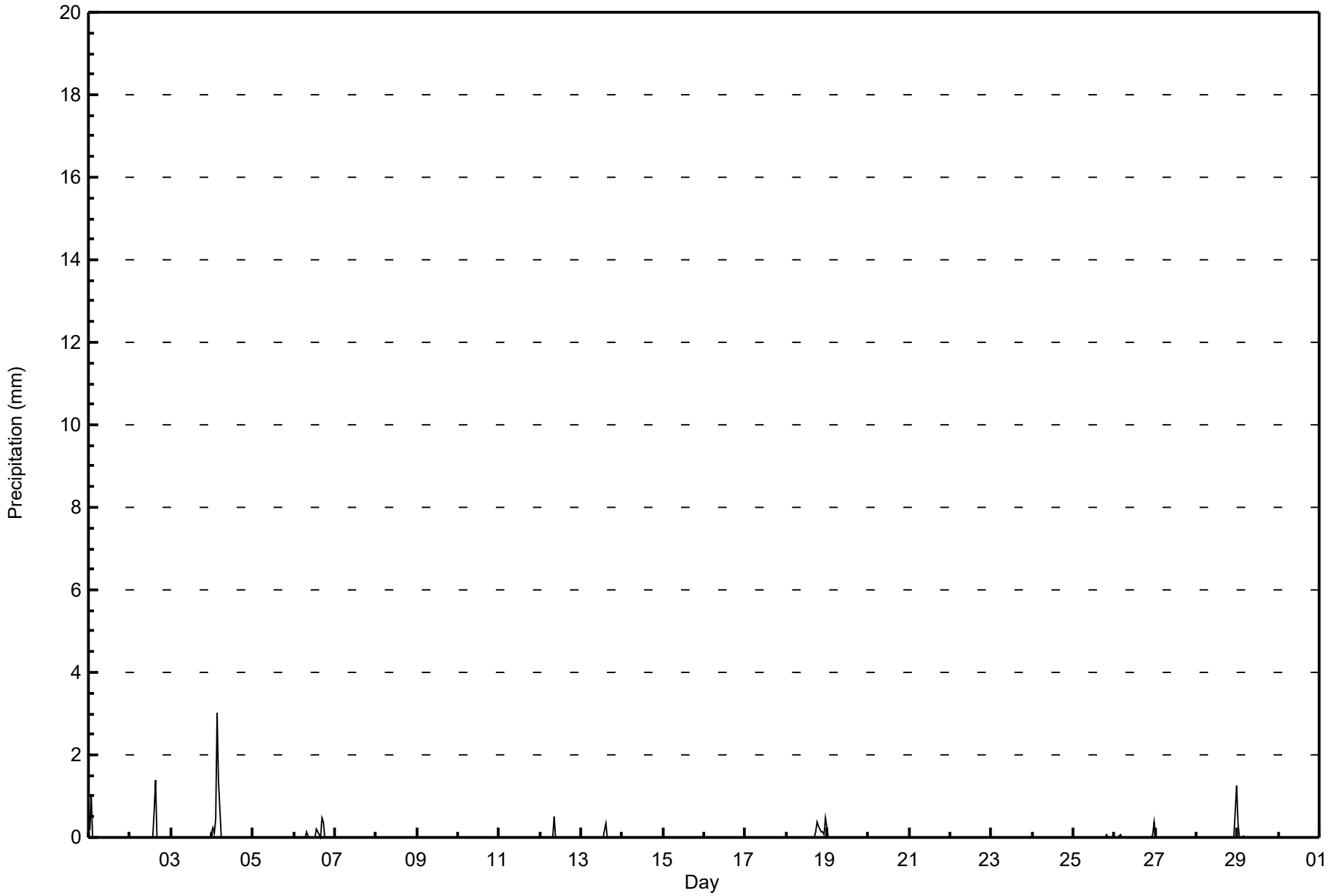


Maximum Value: 3.0 mm on Sep 4 04:00		Maximum Daily Total: 5.1 mm on Sep 4		Hours in Service: 720																							
Minimum Value: 0.0 mm on Sep 1 03:00		Minimum Daily Total: 0.0 mm on Sep 3		Hours of Data: 720																							
Maximum Diurnal Total: 3.1 mm at hour 4		Minimum Diurnal Total: 0.0 mm at hour 6		Hours of Missing Data: 0																							
Monthly Total: 14.28 mm		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.0 P ₉₉ = 0.5		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-Sep	0.2	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	1.0	
2-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	1.4	
3-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.2	0.1	0.4	3.0	1.3	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	5.1	3.0	
5-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	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	0.2	0.1	0.0	0.5	0.4	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.5	
7-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	
13-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	
14-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.3	0.1	0.1	0.1	0.5	1.6	0.5	
19-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1
26-Sep	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	0.1	0.4	0.5	0.4	0.4
27-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	1.3	1.3	1.3
29-Sep	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	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.3	0.3
30-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
																								Diurnal Average			
																								Diurnal Maximum			



Wood Buffalo Environmental Association
Hourly Averages

Precipitation (PC) - mm
Fort Chipewyan - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Precipitation (PC) - mm
Fort Chipewyan - September 2023

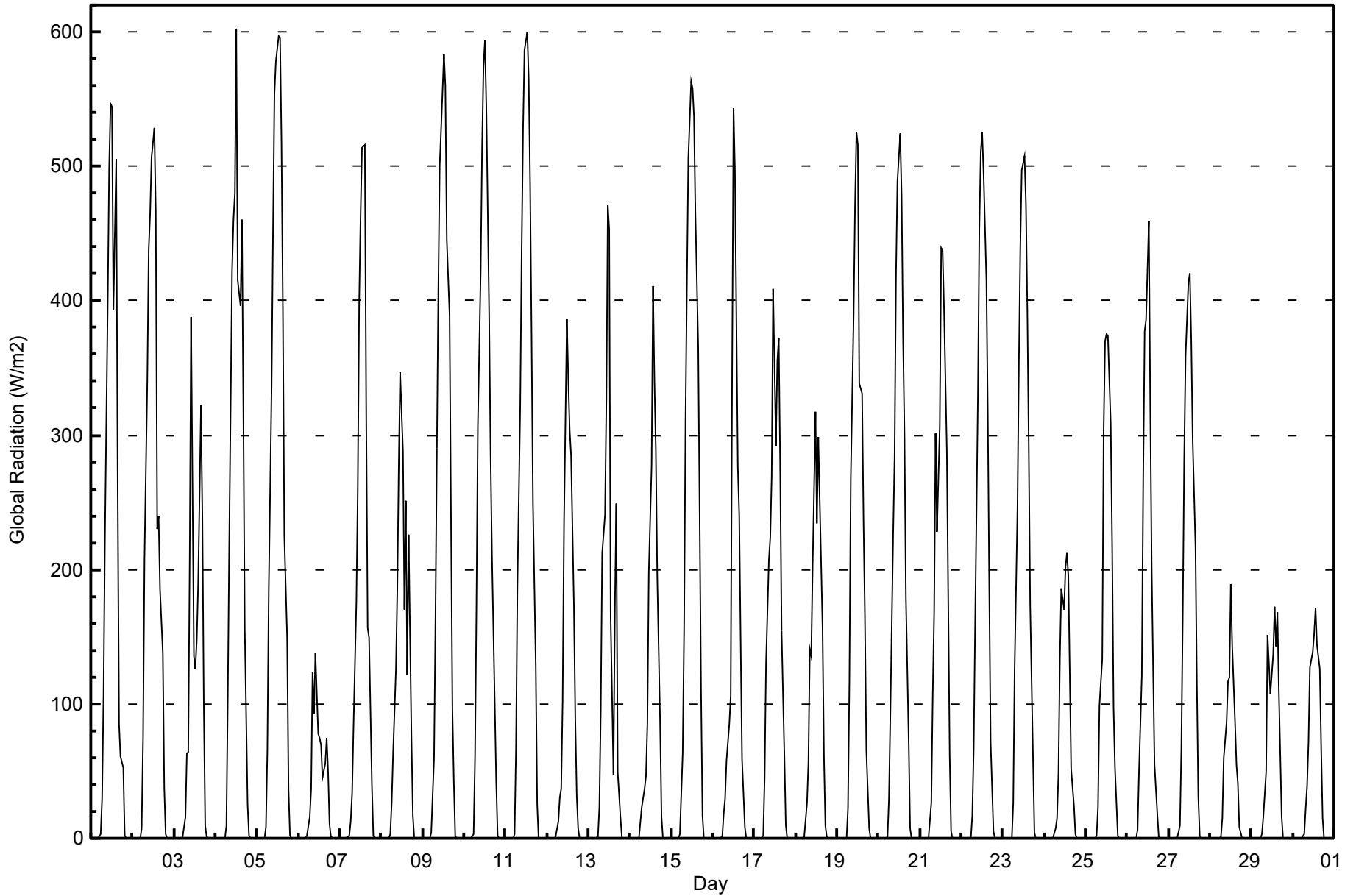
Concentration Ranges (mm)	Number of Hours	%	Cumulative %
0 - 0.3	707	98.19	98.19
0.4 - 0.5	7	0.97	99.17
0.6 - 0.7	1	0.14	99.31
0.8 - 1.4	4	0.56	99.86
1.5 - 10	1	0.14	100.00
> 10	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Maximum Value: 602.1 W/m2 on Sep 4 13:00 Maximum Daily Average: 195.5 W/m2 on Sep 5																							Hours in Service:	720		
Minimum Value: 0.0 W/m2 on Sep 1 01:00 Minimum Daily Average: 36.1 W/m2 on Sep 6																							Hours of Data:	720		
Maximum Diurnal Average: 405.0 W/m2 at hour 13 Minimum Diurnal Average: 0.0 W/m2 at hour 22																							Hours of Missing Data:	0		
Monthly Average: 117.61 W/m2 Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 12.5 Q ₃ = 194.8 P ₉₀ = 409.3 P ₉₉ = 577.2																							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-Sep	0.0	0.0	0.0	0.0	0.0	2.7	29.5	106.1	222.8	399.6	499.2	546.4	544.7	392.7	505.2	267.5	85.4	60.7	52.8	2.5	0.0	0.0	0.0	0.0	154.9	546.4
2-Sep	0.0	0.0	0.0	0.0	0.0	7.1	74.9	207.9	340.8	438.0	464.9	507.0	528.5	466.9	230.3	240.1	185.0	137.2	37.6	3.3	0.0	0.0	0.0	0.0	161.2	528.5
3-Sep	0.0	0.0	0.0	0.0	0.0	1.5	16.3	62.6	63.6	206.3	387.4	135.1	126.5	147.1	189.5	322.3	238.2	99.0	9.4	1.1	0.0	0.0	0.0	0.0	83.6	387.4
4-Sep	0.0	0.0	0.0	0.0	0.0	0.5	9.8	106.4	221.0	422.5	460.0	479.9	602.1	414.8	395.7	459.8	319.1	156.9	24.9	1.7	0.0	0.0	0.0	0.0	169.8	602.1
5-Sep	0.0	0.0	0.0	0.0	0.0	8.7	65.2	184.5	336.9	452.4	553.6	577.9	596.4	595.7	517.1	391.8	224.9	148.8	35.7	1.8	0.0	0.0	0.0	0.0	195.5	596.4
6-Sep	0.0	0.0	0.0	0.0	0.0	2.3	15.7	37.3	123.9	93.0	137.7	77.3	75.1	69.5	44.9	55.3	74.6	49.8	10.4	0.6	0.0	0.0	0.0	0.0	36.1	137.7
7-Sep	0.0	0.0	0.0	0.0	0.0	1.7	12.7	33.2	84.1	175.4	259.2	399.2	463.3	513.6	515.9	311.7	156.3	149.5	39.5	1.8	0.0	0.0	0.0	0.0	129.9	515.9
8-Sep	0.0	0.0	0.0	0.0	0.0	3.0	26.4	63.2	124.6	185.1	276.3	346.3	287.6	170.1	251.6	122.4	225.7	75.6	17.1	0.4	0.0	0.0	0.0	0.0	90.6	346.3
9-Sep	0.0	0.0	0.0	0.0	0.0	4.2	59.7	163.6	289.9	406.1	500.1	555.7	583.6	559.9	445.0	388.7	237.2	96.0	41.8	1.3	0.0	0.0	0.0	0.0	180.5	583.6
10-Sep	0.0	0.0	0.0	0.0	0.1	3.5	60.3	171.7	307.4	421.6	514.4	574.3	594.1	544.7	389.6	285.3	210.6	154.6	42.3	2.0	0.0	0.0	0.0	0.0	178.2	594.1
11-Sep	0.0	0.0	0.0	0.0	0.0	3.5	66.1	187.3	322.6	437.4	527.8	586.8	599.6	565.2	486.5	374.6	248.6	127.8	25.7	0.5	0.0	0.0	0.0	0.0	190.0	599.6
12-Sep	0.0	0.0	0.0	0.0	0.0	0.8	12.2	30.9	36.3	102.0	234.9	386.2	342.7	303.9	284.8	172.9	87.1	31.1	7.5	0.1	0.0	0.0	0.0	0.0	84.7	386.2
13-Sep	0.0	0.0	0.0	0.0	0.0	0.9	22.7	94.1	212.6	240.7	326.4	470.3	452.6	163.7	47.4	171.1	249.4	49.0	14.3	0.2	0.0	0.0	0.0	0.0	104.8	470.3
14-Sep	0.0	0.0	0.0	0.0	0.0	0.3	11.2	23.4	36.4	46.7	85.2	197.6	277.4	411.1	340.9	288.7	194.6	87.6	15.9	0.1	0.0	0.0	0.0	0.0	84.0	411.1
15-Sep	0.0	0.0	0.0	0.0	0.0	3.5	63.5	156.3	312.3	414.6	506.2	563.3	558.2	536.7	465.9	365.3	239.1	109.5	16.8	0.0	0.0	0.0	0.0	0.0	179.6	563.3
16-Sep	0.0	0.0	0.0	0.0	0.0	0.8	17.6	29.2	58.2	84.7	106.2	347.8	543.6	495.7	277.1	240.7	148.1	59.3	8.5	0.0	0.0	0.0	0.0	0.0	100.7	543.6
17-Sep	0.0	0.0	0.0	0.0	0.0	1.9	44.7	130.2	207.5	223.8	268.5	409.1	292.6	355.2	371.6	277.6	154.0	60.7	9.5	0.0	0.0	0.0	0.0	0.0	117.0	409.1
18-Sep	0.0	0.0	0.0	0.0	0.0	1.0	25.9	56.3	140.7	135.8	203.0	317.3	233.8	298.5	252.0	156.7	60.8	9.8	0.9	0.0	0.0	0.0	0.0	0.0	78.9	317.3
19-Sep	0.0	0.0	0.0	0.0	0.0	0.4	22.2	116.4	268.5	388.4	471.1	525.1	516.5	338.8	331.5	236.6	165.3	65.0	7.1	0.0	0.0	0.0	0.0	0.0	143.9	525.1
20-Sep	0.0	0.0	0.1	0.0	0.0	0.8	29.3	91.7	226.5	284.9	417.7	489.1	524.7	477.5	373.1	301.4	179.6	71.5	7.0	0.0	0.0	0.0	0.0	0.0	144.8	524.7
21-Sep	0.0	0.0	0.0	0.0	0.0	0.3	26.5	106.4	168.5	302.1	228.1	306.4	439.4	437.6	394.6	288.0	175.2	61.7	5.7	0.0	0.0	0.0	0.0	0.0	122.5	439.4
22-Sep	0.0	0.0	0.0	0.0	0.0	0.2	16.4	66.6	157.7	331.5	453.3	510.6	524.9	494.7	415.4	315.6	189.1	71.3	5.5	0.0	0.0	0.0	0.0	0.0	148.0	524.9
23-Sep	0.0	0.0	0.0	0.0	0.0	0.2	26.3	127.4	245.9	354.0	439.1	496.6	507.8	471.3	391.4	289.8	173.0	59.6	4.2	0.0	0.0	0.0	0.0	0.0	149.4	507.8
24-Sep	0.0	0.0	0.0	0.0	0.0	0.0	7.5	14.4	48.2	132.4	186.1	170.0	202.1	212.3	195.2	52.0	37.4	24.4	3.1	0.0	0.0	0.0	0.0	0.0	53.5	212.3
25-Sep	0.0	0.0	0.0	0.0	0.0	0.0	2.5	23.1	99.0	134.0	304.4	369.7	375.4	374.2	308.7	217.2	97.8	52.3	1.7	0.0	0.0	0.0	0.0	0.0	98.3	375.4
26-Sep	0.0	0.0	0.0	0.0	0.0	0.0	6.5	49.7	120.8	268.1	376.9	386.0	458.7	319.5	199.9	127.1	55.1	17.4	1.6	0.0	0.0	0.0	0.0	0.0	99.5	458.7
27-Sep	0.0	0.1	0.0	0.0	0.0	0.0	9.4	67.3	166.6	282.6	359.8	414.2	420.4	371.3	296.0	216.0	113.4	30.6	2.0	0.0	0.0	0.0	0.0	0.0	114.6	420.4
28-Sep	0.0	0.0	0.0	0.0	0.0	0.0	1.5	14.3	59.8	86.2	116.7	119.6	189.4	142.8	86.2	54.1	41.2	8.7	0.4	0.0	0.0	0.0	0.0	0.0	38.4	189.4
29-Sep	0.0	0.0	0.0	0.0	0.0	0.0	3.1	15.7	49.5	151.1	130.3	107.4	137.0	172.6	143.4	168.1	110.7	15.4	0.3	0.0	0.0	0.0	0.0	0.0	50.2	172.6
30-Sep	0.0	0.0	0.0	0.0	0.0	0.0	3.4	22.2	39.2	71.5	127.0	139.0	152.5	171.5	144.0	125.9	66.6	15.1	0.4	0.0	0.0	0.0	0.0	0.0	44.9	171.5
																							Diurnal Average			
																							Diurnal Maximum			





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (W/m2)	Number of Hours	%	Cumulative %
0 - 20	375	52.08	52.08
21 - 100	90	12.50	64.58
101 - 300	131	18.19	82.78
301 - 600	123	17.08	99.86
601 - 900	1	0.14	100.00
> 900	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Maximum Speed: 40 km/h on Sep 11 14:00	Maximum Daily Speed Average: 28.0 km/h on Sep 11	Hours in Service: 720
Minimum Speed Value: 1 km/h on Sep 17 00:00	Minimum Daily Speed Average: 2.7 km/h on Sep 12	Hours of Data: 720
Maximum Diurnal Speed Average: 6.6 km/h at hour 13	Minimum Diurnal Speed Average: 1.5 km/h at hour 3	Hours of Missing Data: 0
Monthly Average Velocity: 4.0 km/h 190.7 deg	Percentiles: P ₁ = 2 P ₁₀ = 6 Q ₁ = 8 Median = 11 Q ₃ = 17 P ₉₀ = 24 P ₉₉ = 35	Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Sep	WNW7	NW9	NW10	WNW6	WNW4	SW4	WSW10	WSW10	WSW11	WSW15	WSW19	WSW20	WSW21	SW15	SSW17	SW17	SW14	WSW14	W18	WSW16	WSW17	W13	W12	W12	WSW12.0	WSW21	
2-Sep	WNW14	NW12	NW11	WNW12	W14	WNW17	WNW19	WNW19	WNW22	WNW21	W19	W18	W21	W23	W27	WNW11	W10	W12	W12	W12	W12	W12	W9	W9	W14.9	W27	
3-Sep	WSW10	W9	WNW6	W10	WSW10	W12	W9	W11	W10	W10	WSW16	WNW11	WNW11	W9	W9	W12	WSW16	WSW13	WNW14	NNW13	WNW10	NW12	NW12	NW9	W10.1	WSW16	
4-Sep	NNW12	NW14	NNW15	NW15	NW15	NW16	NW18	NW21	NW19	NW20	NW19	NW18	WNW16	WNW15	W15	WSW18	WSW18	WSW15	W10	W7	WSW8	WSW8	W9	W8	WNW13.1	NW21	
5-Sep	WSW5	W2	ENE3	SSW4	SSW6	SSW4	SW7	SSW4	S7	SE10	S12	SSW12	SW13	SSW10	S6	S8	ESE7	E11	SE11	SSE12	SSE13	SSE17	SSE18	S16	S7.4	SSE18	
6-Sep	SSE15	SSE17	SSE15	SSE9	SSE7	SSW7	WSW8	SSE7	SSE15	SE26	ESE34	SE25	ESE22	E20	ESE23	ESE20	ESE17	ESE13	SE8	S3	W5	WNW4	WNW4	WNW5	SE10.7	ESE34	
7-Sep	WNW5	WNW7	WNW9	WNW11	WNW10	WNW10	WNW8	WNW10	WNW9	WNW9	WNW9	WNW11	W10	WSW11	W10	WSW7	W6	SW5	SW9	WSW7	ESE2	E3	ESE5	SE9	SSE9	W5.5	WNW11
8-Sep	SSE11	SSE12	ESE12	ESE15	ESE16	ESE19	ESE19	E15	E17	E18	E16	E18	E17	ENE15	ENE14	ENE14	ENE10	ENE10	ENE9	NE12	ENE14	ENE17	ENE14	ENE12	E13.3	ESE19	
9-Sep	ENE10	ENE10	ENE11	ENE11	E10	ESE12	ESE12	ESE9	E8	E7	E9	E8	E9	E10	E8	E11	E14	E14	E10	ENE10	ENE7	ENE7	ENE6	ENE6	E9.3	E14	
10-Sep	E7	E9	E8	E8	E9	E11	ESE14	ESE15	ESE14	ESE13	E12	E18	E17	E18	E18	E17	ENE18	E18	E18	E17	SE21	SE21	SSE21	SSE22	ESE13.9	SSE22	
11-Sep	S25	SSE25	SSE23	SSE24	S27	SSE27	S29	S32	S33	S35	SSE34	SSE34	S39	S40	S39	S34	S25	S22	S20	S25	S25	S21	S21	S18	S28.0	S40	
12-Sep	SSW10	SSW7	SW11	SW11	SW11	SSW10	SSW8	SSW7	SSW7	S6	ESE3	E6	E6	E5	E10	E10	E4	E5	ENE4	ENE6	ENE4	ENE4	WNW8	WNW3	S2.7	SW11	
13-Sep	NW5	WSW2	SSE2	SW7	SW7	WSW4	SW7	SW10	SW9	SW9	WSW12	W15	WSW14	W11	WNW8	NNW5	WNW2	NNW3	E3	W6	W7	W14	W14	W11	WSW6.6	W15	
14-Sep	W8	WSW7	WNW9	WNW8	WNW11	WNW13	WNW14	WNW15	WNW15	WNW15	WNW16	WNW14	WNW14	NW12	NW15	NW10	NNW6	N7	N6	NE5	ENE6	SE4	SSE6	SSE9	WNW7.5	WNW16	
15-Sep	SE7	SE7	SE5	ESE7	SSE6	S6	S17	S18	S19	SE18	S22	SSE25	S27	SSE25	S27	SSE24	SSE24	SSE25	SSE24	SSE24	SSE27	SSE24	SSE24	S28	SSW19.0	SSE29	
16-Sep	S24	S17	SSW15	SW17	SW13	SW10	WSW14	W21	W22	WSW18	WSW17	WSW23	WSW24	WSW23	WSW23	SW23	WSW18	WSW16	WSW14	WSW12	WSW5	SSW8	S2	SSW1	WSW14.4	S24	
17-Sep	ENE7	E5	ENE7	E9	ESE9	ESE11	ESE12	ESE11	ESE12	ESE13	E17	E19	E18	E19	ENE19	ENE18	ENE12	ENE10	ENE7	WSW6	W10	WNW13	WNW8	WSW7	E7.7	E19	
18-Sep	SW12	SSW10	SSW5	ESE6	SE6	SSE4	S6	S6	SW11	SW9	WSW9	W17	W17	W18	W20	W11	W13	WSW11	SSW14	S14	SW10	SW10	SW9	WSW10	SW8.5	W20	
19-Sep	S11	S10	SSW8	SW10	SW9	SW10	SW12	SW8	SW12	SW15	SW17	SW17	SW16	WSW16	SW16	SW14	SW13	WSW10	WSW10	SW8	WSW8	WSW8	W9	W9	SW11.0	SW17	
20-Sep	WNW9	W6	NW8	NNW5	ENE3	NW9	NW7	NNW13	NNW13	NNW10	NNW12	NNW9	NNW9	W10	WSW13	W12	W11	WSW8	WSW6	WSW4	SW7	SW8	SW8	SW12	WNW6.5	WSW13	
21-Sep	SSW14	SSW14	SSW12	SSW11	SW10	S9	S11	S11	S17	S23	S22	S25	S33	S33	SSW37	SSW32	SSW23	SSW19	SSW18	SSW16	SSW18	SSW17	SW15	SSW14	SSW18.6	SSW37	
22-Sep	SSW12	SSW14	SSW14	SSW12	SSW9	S9	S8	S7	S8	SSE8	S16	S17	S14	SSE15	SSE16	SE19	SSE24	SSE26	S25	SSE26	SSE23	S21	S15	S20	S15.2	SSE26	
23-Sep	SSE17	S22	SSE26	SSE25	SSE32	S31	SSE30	SSE31	S33	SSE27	SSE32	SSE32	SSE32	SSE38	SSE36	S34	S26	SSE21	SSE17	SE18	SE22	SE18	SSE22	SSE23	SSE26.5	SSE38	
24-Sep	SE20	ESE20	E18	SE19	SE18	SE18	SE18	SE18	SE18	S21	S21	S20	S20	SSW19	SW13	W14	WNW9	WNW5	W6	WSW5	W6	W8	W7	NNW7	S8.9	S21	
25-Sep	NW9	NNW12	NNW13	NNW14	NNW13	NNW11	NNW8	NW8	NW9	NW10	NW9	W2	SE7	ESE8	E10	E12	ENE13	ENE18	ENE22	E28	E32	E32	E31	E32	NE9.5	E32	
26-Sep	E28	ENE31	ENE32	ENE37	ENE34	ENE31	ENE28	E28	E23	E19	S16	SSW20	SW13	WSW9	WNW9	WNW5	NW3	NW4	NW5	NW3	WSW2	WNW6	WNW6	NW15	E9.2	ENE37	
27-Sep	WNW10	WNW9	NW10	NW10	NNW8	W5	WNW10	NW13	NW13	NW11	NW7	NNW9	NW7	NW6	NNW6	N8	N8	N8	N9	NNW10	N9	NNW6	N8	N11	NW8.1	NW13	
28-Sep	N11	N9	N8	NNW6	NNW9	NNW9	NNW9	NNW8	NNW9	NNW9	NNW8	NW6	NW6	NW6	NW8	NNW8	NNW10	NNW10	NNW8	NNW7	NNW9	NNW10	NNW9	NNW11	NNW8.3	NNW11	
29-Sep	NW9	NW9	WNW6	NW8	NW8	NW8	NNW9	NNW9	NNW11	NW12	NNW10	NNW10	NNW10	NNW10	NNW8	NNW9	N8	N3	WNW4	W6	WNW6	W5	WNW5	WNW5	NW7.3	NNW12	
30-Sep	NW6	NNW6	NNW6	NNW5	NNW4	WNW2	NW6	NNW5	NNW1	NE2	NE3	SSE4	SSE6	ESE6	ESE7	ESE7	ESE10	SE13	ESE13	ESE17	ESE21	ESE22	ESE22	SE16	ESE5.4	ESE22	
SSW3.4 S2.7 S1.5 S2.2 S2.8 S3.0 SSW3.8 SSW3.3 SSW4.4 SSW4.7 SSW5.4 SSW6.0 SSW6.6 SSW6.3 SSW6.3 S4.9 S3.8 S3.5 S3.4 SSE3.6 S4.3 S4.0 S3.7 S4.4																								Diurnal Average			
E28 ENE31 ENE32 ENE37 ENE34 S31 SSE30 S32 S33 S35 ESE34 SSE34 S39 S40 S39 S34 S26 SSE26 S25 E28 E32 E32 E31 E32																								Diurnal Maximum			

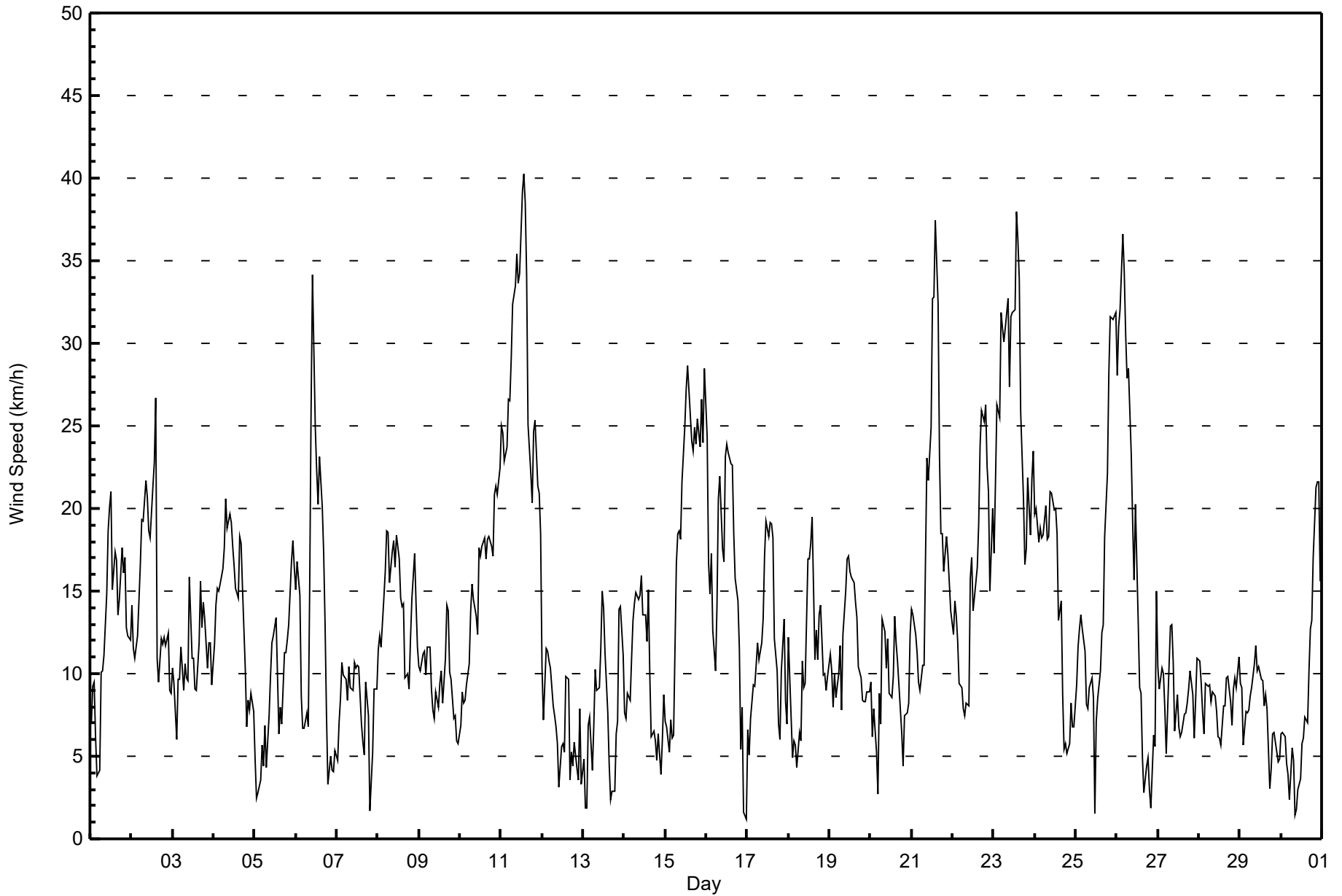
All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 8 km/h on Sep 2 15:00 Minimum Value: 1 km/h on Sep 24 20:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 2 Q ₃ = 3 P ₉₀ = 4 P ₉₉ = 6																	Hours in Service: 720 Hours of Data: 720 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-Sep	2	3	3	2	2	2	2	3	2	4	4	4	5	4	4	3	3	4	4	3	4	3	3	3	5
2-Sep	3	3	3	2	3	4	4	5	5	5	5	5	6	7	8	8	2	3	3	3	2	3	2	2	8
3-Sep	2	2	2	2	3	3	2	3	2	3	5	3	3	2	2	3	4	3	5	4	3	3	3	3	5
4-Sep	4	5	5	5	5	4	5	6	6	6	6	6	5	5	4	4	5	4	3	1	2	2	1	1	6
5-Sep	2	2	1	2	2	1	3	1	2	2	3	3	3	3	3	4	2	2	2	1	2	2	2	3	3
6-Sep	2	2	2	3	1	2	2	3	3	5	3	5	2	2	4	3	2	2	2	1	1	1	1	1	5
7-Sep	1	2	2	2	2	2	2	2	2	2	2	3	3	3	2	2	2	2	1	1	1	1	3	1	3
8-Sep	2	2	2	1	2	2	2	1	2	2	2	1	2	2	2	2	2	1	2	2	3	2	2	1	3
9-Sep	2	1	2	1	2	1	1	2	1	1	1	1	1	1	1	2	2	2	1	1	1	1	1	2	2
10-Sep	1	1	1	2	1	2	2	1	1	1	2	1	1	2	2	2	2	2	2	1	2	3	3	4	4
11-Sep	3	3	3	3	3	3	3	4	4	4	4	6	6	7	5	5	5	3	2	2	2	4	3	4	7
12-Sep	4	2	3	2	2	2	2	2	3	2	1	1	1	2	2	3	1	2	1	1	2	1	2	1	4
13-Sep	2	2	1	2	1	3	3	3	2	2	3	4	4	3	2	1	1	1	2	2	2	4	4	3	4
14-Sep	3	2	2	2	2	3	3	4	4	4	4	4	4	4	4	3	2	2	1	1	1	1	2	2	4
15-Sep	2	1	1	2	2	2	3	2	2	3	3	4	3	4	5	4	3	3	3	3	4	4	3	4	5
16-Sep	5	3	3	3	3	2	6	6	6	4	4	6	6	6	5	5	4	3	3	3	2	2	1	2	6
17-Sep	1	1	1	2	3	1	2	3	2	1	2	2	2	2	2	2	3	1	2	4	2	3	1	2	4
18-Sep	2	4	3	1	1	1	2	3	2	2	3	6	4	5	5	4	3	2	3	3	3	3	3	3	6
19-Sep	2	2	2	2	2	2	1	2	4	3	3	3	3	4	3	3	2	2	2	2	1	1	2	1	4
20-Sep	1	2	1	2	2	4	3	3	3	3	4	3	3	3	3	3	2	2	2	1	2	1	2	2	4
21-Sep	2	3	3	3	2	2	2	2	3	3	3	3	5	5	5	5	5	3	3	2	2	2	2	3	5
22-Sep	2	3	3	2	2	2	2	2	2	2	3	2	3	3	2	3	4	4	3	3	4	3	4	2	4
23-Sep	3	4	4	4	4	5	3	4	4	4	4	6	6	6	6	6	7	3	3	3	2	2	3	4	7
24-Sep	2	2	2	2	2	2	3	2	3	2	3	3	3	3	3	3	2	1	1	2	1	2	1	3	3
25-Sep	2	3	3	4	3	3	2	3	3	3	3	2	1	1	2	1	2	4	3	4	3	3	4	4	4
26-Sep	3	5	5	5	5	3	4	3	4	2	4	4	4	2	3	2	2	2	1	3	3	1	2	5	5
27-Sep	3	1	2	2	2	3	2	3	3	3	2	3	2	2	2	2	2	2	2	3	2	2	3	3	3
28-Sep	3	3	3	3	3	3	3	2	3	3	2	2	2	2	3	3	4	3	3	2	3	3	3	4	4
29-Sep	3	3	2	2	2	2	3	4	4	4	4	3	3	3	3	3	3	2	1	1	1	1	1	1	4
30-Sep	1	1	2	1	1	2	1	1	1	2	1	1	1	2	1	1	2	2	3	1	1	2	2	2	3
Diurnal Maximum																								5	





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	69	9.58	9.58
6 - 11	302	41.94	51.53
12 - 19	222	30.83	82.36
20 - 28	91	12.64	95.00
29 - 38	33	4.58	99.58
> 38	3	0.42	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Fort Chipewyan - September 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	0	3	5	6	3	2	3	2	5	2	7	5	13	5	7	69
6 - 11	13	0	0	19	21	13	8	10	16	14	26	24	35	34	31	38	302
12 - 19	0	0	1	13	24	18	9	17	12	19	19	24	22	17	16	11	222
20 - 28	0	0	0	2	5	7	7	28	23	2	1	6	6	2	2	0	91
29 - 38	0	0	0	5	4	1	0	12	9	2	0	0	0	0	0	0	33
> 38	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	3
Totals	14	0	4	44	60	42	26	70	65	42	48	61	68	66	54	56	720

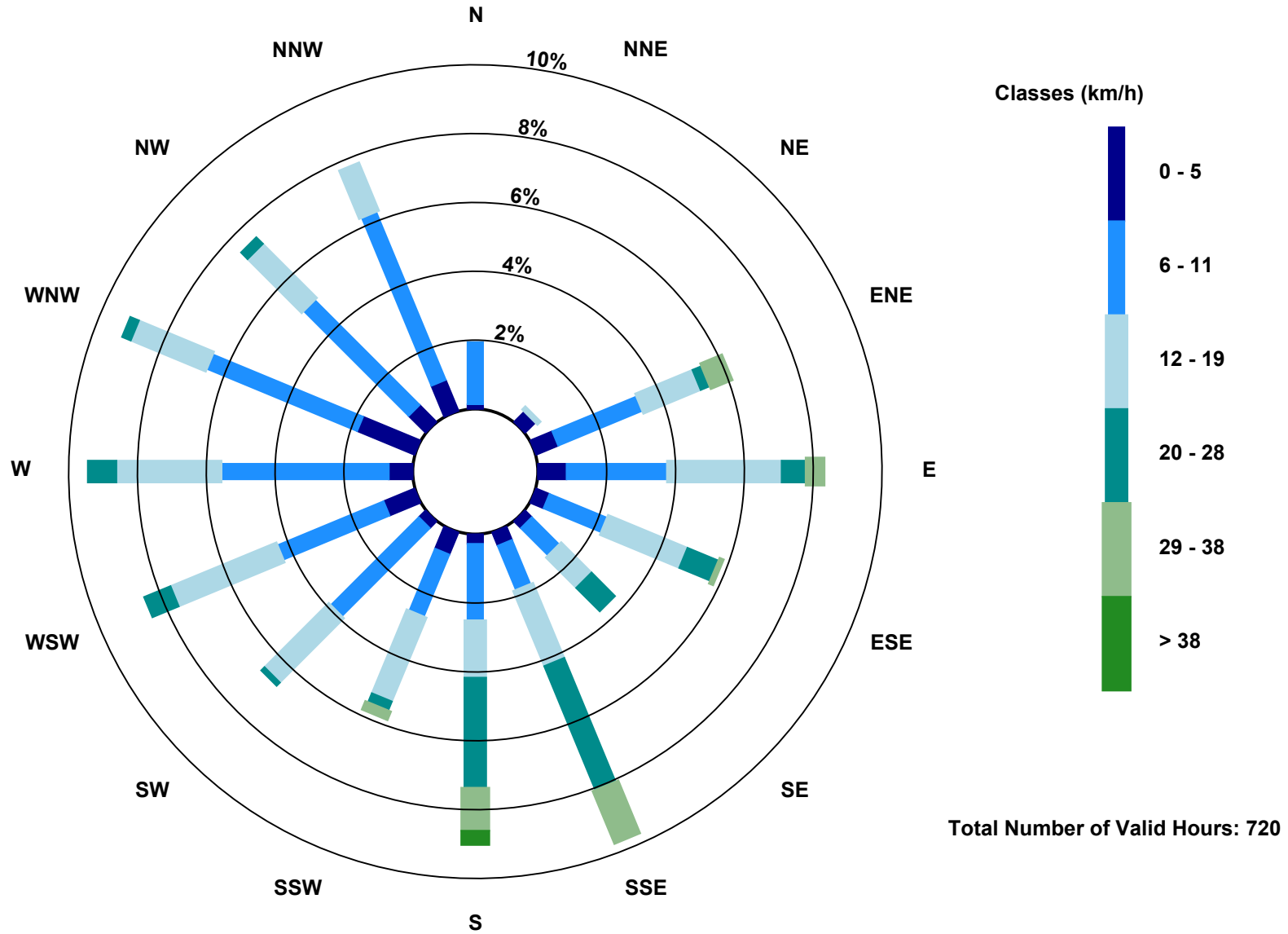
Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

Wind Speed (WS) - km/h
Fort Chipewyan





Wood Buffalo Environmental Association
Summary of Hour Averages

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

Direction of Maximum Speed: 185 deg on Sep 11 14:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 174.9 deg on Sep 11	Hours of Data: 720
Direction of Minimum Speed: 209 deg on Sep 17 00:00	Hours of Missing Data: 0
Direction of Minimum Daily Speed Average: 2.7 deg on Sep 12	Percent Operational Time: 100.0
Monthly Average Direction: 190.7 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-Sep	294	306	308	294	293	222	249	257	253	244	239	241	242	234	209	219	236	249	259	249	252	259	268	268	250.2
2-Sep	286	311	305	282	274	285	286	287	291	282	281	273	261	260	274	294	280	268	265	259	262	262	275	262	277.5
3-Sep	252	270	282	270	250	262	259	281	277	260	247	289	288	270	272	260	249	247	290	328	284	305	312	311	274.9
4-Sep	329	323	327	321	314	307	311	311	307	314	312	315	289	298	279	256	254	257	271	274	246	256	275	262	296.1
5-Sep	237	262	78	196	206	196	220	192	169	146	187	201	214	204	183	186	119	81	140	148	149	148	150	169	169.2
6-Sep	162	154	159	158	153	211	252	161	147	139	116	127	108	96	122	116	109	105	137	189	272	302	302	283	133.4
7-Sep	296	297	290	286	289	287	288	285	288	289	290	277	256	261	238	260	217	220	246	114	93	118	145	150	266.1
8-Sep	149	156	117	107	115	109	104	98	97	91	89	83	81	74	72	74	60	73	59	56	62	73	75	74	89.5
9-Sep	73	68	72	76	82	105	105	114	93	83	82	87	91	98	96	86	85	88	86	64	61	67	71	73	84.4
10-Sep	85	82	79	100	101	96	112	112	110	107	83	86	87	85	83	80	75	79	83	97	128	134	147	155	101.7
11-Sep	169	166	165	168	169	165	171	173	176	172	167	166	169	185	191	190	183	175	176	177	174	184	182	182	174.9
12-Sep	199	209	222	229	226	212	206	203	196	178	114	87	90	89	91	90	82	93	62	75	70	57	301	290	171.2
13-Sep	313	251	159	220	222	243	217	223	226	255	264	257	265	282	334	302	340	340	101	280	266	277	274	262	256.9
14-Sep	262	256	284	285	284	290	284	286	285	292	291	297	300	312	309	323	335	353	3	36	72	141	153	161	295.3
15-Sep	137	134	131	121	165	180	172	169	173	168	170	168	170	165	161	160	160	162	162	149	153	163	168	178	163.2
16-Sep	181	187	209	214	220	229	250	265	264	253	249	247	258	255	246	236	239	247	255	254	237	212	171	209	238.3
17-Sep	71	88	73	97	118	105	115	107	112	102	84	86	79	79	78	75	72	66	68	257	277	291	292	243	85.4
18-Sep	224	209	199	119	131	155	183	183	217	216	246	272	277	268	268	269	273	241	210	191	215	220	226	240	233.9
19-Sep	189	187	202	222	226	217	224	218	233	231	226	229	233	242	233	232	229	244	245	229	244	257	267	278	230.4
20-Sep	288	273	307	337	62	323	317	334	335	333	336	327	306	276	253	263	260	248	246	237	228	229	221	217	285.7
21-Sep	213	196	201	202	216	191	190	178	184	181	182	180	187	185	194	193	197	203	194	206	212	212	214	204	194.7
22-Sep	205	200	207	205	199	177	169	172	169	155	173	174	175	158	160	146	161	162	169	168	159	170	176	175	172.1
23-Sep	168	170	166	165	163	169	168	167	169	166	164	167	159	164	168	171	170	164	162	135	144	136	147	147	162.5
24-Sep	134	120	97	127	138	141	140	145	163	175	171	180	185	200	223	278	302	284	280	257	265	278	274	294	169.1
25-Sep	324	339	343	345	342	336	336	319	313	322	324	269	127	110	94	86	69	68	77	82	86	83	82	80	55.1
26-Sep	79	77	75	78	77	75	75	81	85	87	169	200	216	238	283	298	309	318	315	305	241	293	289	308	80.9
27-Sep	289	299	306	320	335	265	286	318	315	314	322	335	322	318	331	350	350	351	349	346	349	345	359	353	326.0
28-Sep	357	353	351	339	343	346	335	334	329	333	328	320	307	314	324	333	337	338	327	329	328	332	328	334	334.5
29-Sep	323	314	296	312	317	318	329	331	329	326	331	339	339	341	344	336	355	353	283	281	297	278	296	303	323.0
30-Sep	310	328	347	343	337	302	319	336	333	55	47	152	149	118	111	115	120	129	118	115	117	116	116	131	110.1

196.3	182.3	171.4	176.9	180.0	188.3	199.8	203.8	205.3	193.9	195.3	200.4	201.5	200.1	200.6	190.8	186.9	175.5	183.2	167.7	170.9	179.9	182.9	191.2
Diurnal Average																							

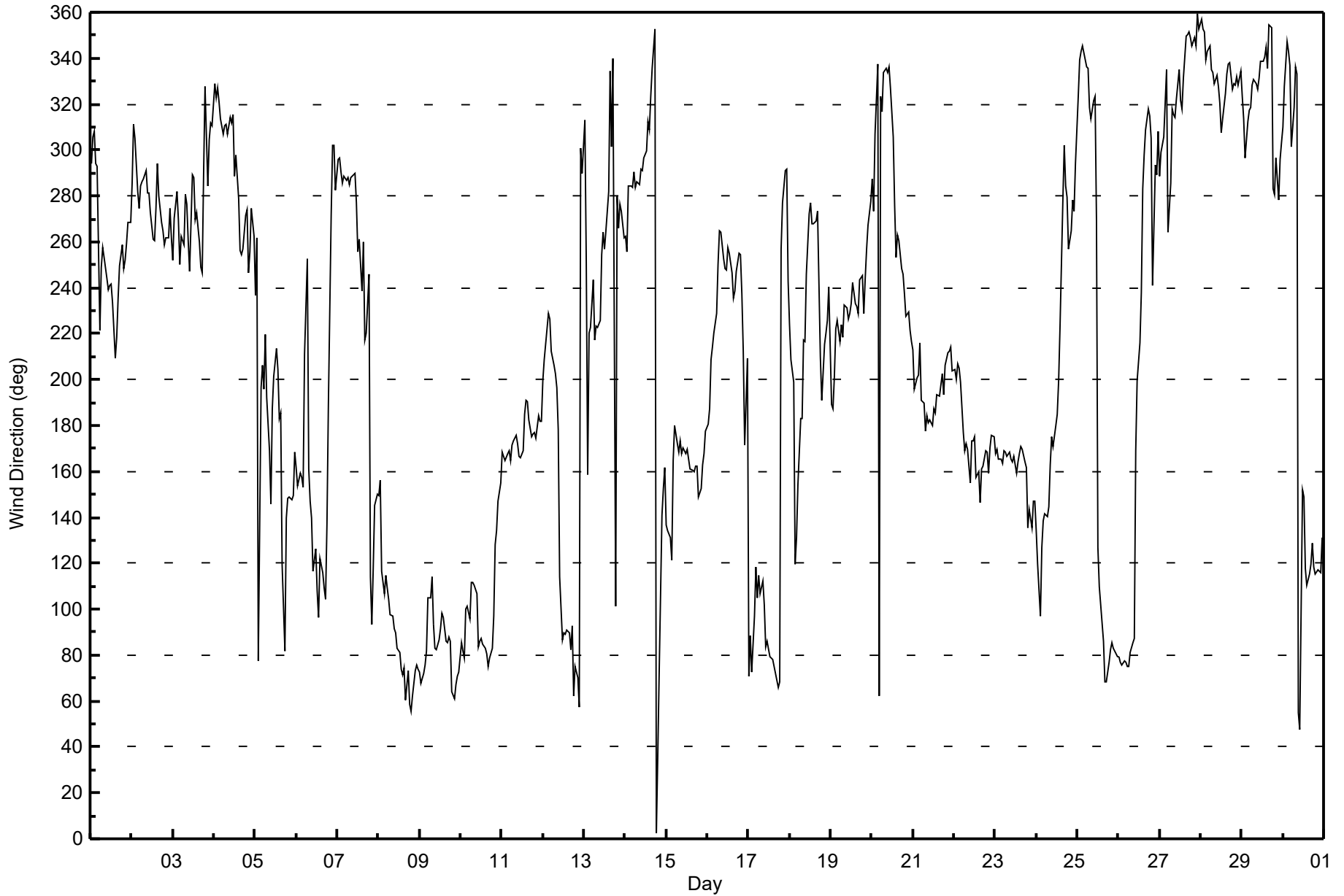
All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 90 deg on Sep 25 12:00 Minimum Value: 4 deg on Sep 10 12:00 Percentiles: P ₁ = 5 P ₁₀ = 7 Q ₁ = 9 Median = 15 Q ₃ = 20 P ₉₀ = 28 P ₉₉ = 76											Hours in Service: 720 Hours of Data: 720 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-Sep	23	20	19	20	59	40	14	13	17	16	16	16	17	11	9	17	15	16	14	16	13	16	15	59	
2-Sep	14	18	15	17	15	14	15	15	16	16	17	17	17	18	20	30	16	16	19	15	15	15	12	21	30
3-Sep	15	17	18	12	19	16	17	14	20	19	25	21	19	17	17	18	18	16	21	21	21	20	19	23	25
4-Sep	23	23	24	21	19	17	18	18	19	21	21	22	22	24	25	19	18	16	16	14	24	17	9	19	25
5-Sep	27	81	50	63	20	36	48	21	26	12	21	16	16	35	48	28	33	6	27	7	5	5	6	12	81
6-Sep	10	6	7	26	19	31	20	41	14	10	7	8	11	8	15	11	7	8	20	42	10	28	15	11	42
7-Sep	15	16	16	14	14	16	17	14	17	21	19	27	28	25	46	42	30	18	10	75	14	24	9	14	75
8-Sep	9	11	12	7	5	7	7	6	6	5	7	6	6	8	9	12	13	9	11	10	11	9	8	8	13
9-Sep	10	8	8	9	15	5	5	13	7	7	7	8	6	7	11	7	7	5	6	12	6	9	15	18	18
10-Sep	10	13	9	12	11	10	9	5	7	5	6	4	5	5	5	6	6	6	6	12	7	7	8	11	13
11-Sep	7	8	9	8	8	9	7	7	7	8	8	10	10	11	10	10	8	6	7	6	5	7	8	8	11
12-Sep	17	17	13	14	13	12	17	18	21	26	33	15	12	12	6	7	36	18	13	12	33	38	11	52	52
13-Sep	31	77	53	10	8	38	12	8	10	16	20	17	23	21	28	20	66	30	60	10	15	16	16	16	77
14-Sep	21	19	12	15	13	15	14	15	16	17	15	19	18	24	22	26	31	22	14	44	11	49	21	18	49
15-Sep	15	13	31	17	22	19	8	9	9	9	10	8	10	9	10	11	9	8	8	7	13	9	9	8	31
16-Sep	8	9	13	9	13	25	24	17	17	16	16	16	17	18	16	13	15	15	14	15	31	12	77	83	83
17-Sep	10	11	12	13	12	7	8	14	14	8	5	5	7	8	8	9	15	10	17	80	11	12	12	21	80
18-Sep	8	20	46	22	37	43	17	27	12	10	21	17	17	17	17	17	19	26	12	9	18	17	30	27	46
19-Sep	16	13	15	15	16	8	8	10	15	13	12	14	16	16	15	13	11	15	15	10	16	11	14	10	16
20-Sep	9	18	20	43	58	34	32	16	17	25	26	30	33	31	21	18	17	16	14	13	11	8	11	12	58
21-Sep	9	14	14	13	12	14	12	11	9	8	8	10	10	8	9	8	10	8	8	9	9	9	9	13	14
22-Sep	13	10	13	12	15	13	15	24	15	24	10	12	16	14	11	10	11	9	7	6	10	6	7	7	24
23-Sep	9	7	8	7	8	7	7	7	7	9	8	9	11	11	10	8	12	8	9	12	8	8	8	8	12
24-Sep	6	9	7	11	7	7	8	9	12	7	7	12	12	12	15	20	15	14	13	9	15	9	17	19	20
25-Sep	14	17	16	17	17	22	22	22	26	24	28	90	17	13	10	7	10	11	7	7	5	6	7	7	90
26-Sep	8	10	11	8	10	10	11	8	5	7	40	11	15	31	23	32	44	21	10	76	78	18	38	27	78
27-Sep	20	10	10	13	16	44	13	13	13	20	29	26	31	40	34	28	20	18	17	18	19	26	21	23	44
28-Sep	20	21	27	20	17	19	19	18	22	24	24	26	36	36	24	25	24	22	22	26	22	24	23	21	36
29-Sep	20	16	21	15	18	19	21	26	23	22	23	23	22	26	28	25	26	30	17	11	15	12	15	11	30
30-Sep	14	14	21	22	25	52	18	21	68	50	46	35	17	19	9	12	10	17	13	7	5	5	5	10	68
											Diurnal Maximum														
											31 81 53 63 59 52 48 41 68 50 46 90 36 40 48 42 66 30 60 80 78 49 77 83														





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS09 BARGE LANDING SEPTEMBER 2023

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

October 30, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BARGE LANDING (AMS09)
 SEPTEMBER 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	33	35	99.72	17.8	0	3.2	0
TRS(ppb) Average	685	35	35	100	5.2	0	1.2	0
THC(ppm) Average	685	33	35	99.72	2.8	-	2.4	-
NMHC(ppm) Average	685	33	35	99.72	0.322	-	0.134	-
CH4(ppm) Average	685	33	35	99.72	2.6	-	2.2	-
NO2 (ppb) Average	683	35	37	99.72	31.3	0	12.4	-
NO (ppb) Average	683	35	37	99.72	152.6	-	21	-
NOX (ppb) Average	683	35	37	99.72	164.1	-	29.2	-
PM2.5(ug/m3) Average	717	1	3	99.72	432.7	163	293.2	20
Temperature (C) Average	720	0	0	100	27.5	-	20.6	-
Relative Humidity (%) Average	720	0	0	100	98.8	-	92	-
Barometric Pressure (inHg) Average	720	0	0	100	29.3	-	29.3	-
Wind Speed 20 m (km/h) Average	720	0	0	100	28	-	18	-
Wind Direction 20 m (deg) Average	720	0	0	100	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BARGE LANDING (AMS09)
 SEPTEMBER 2023

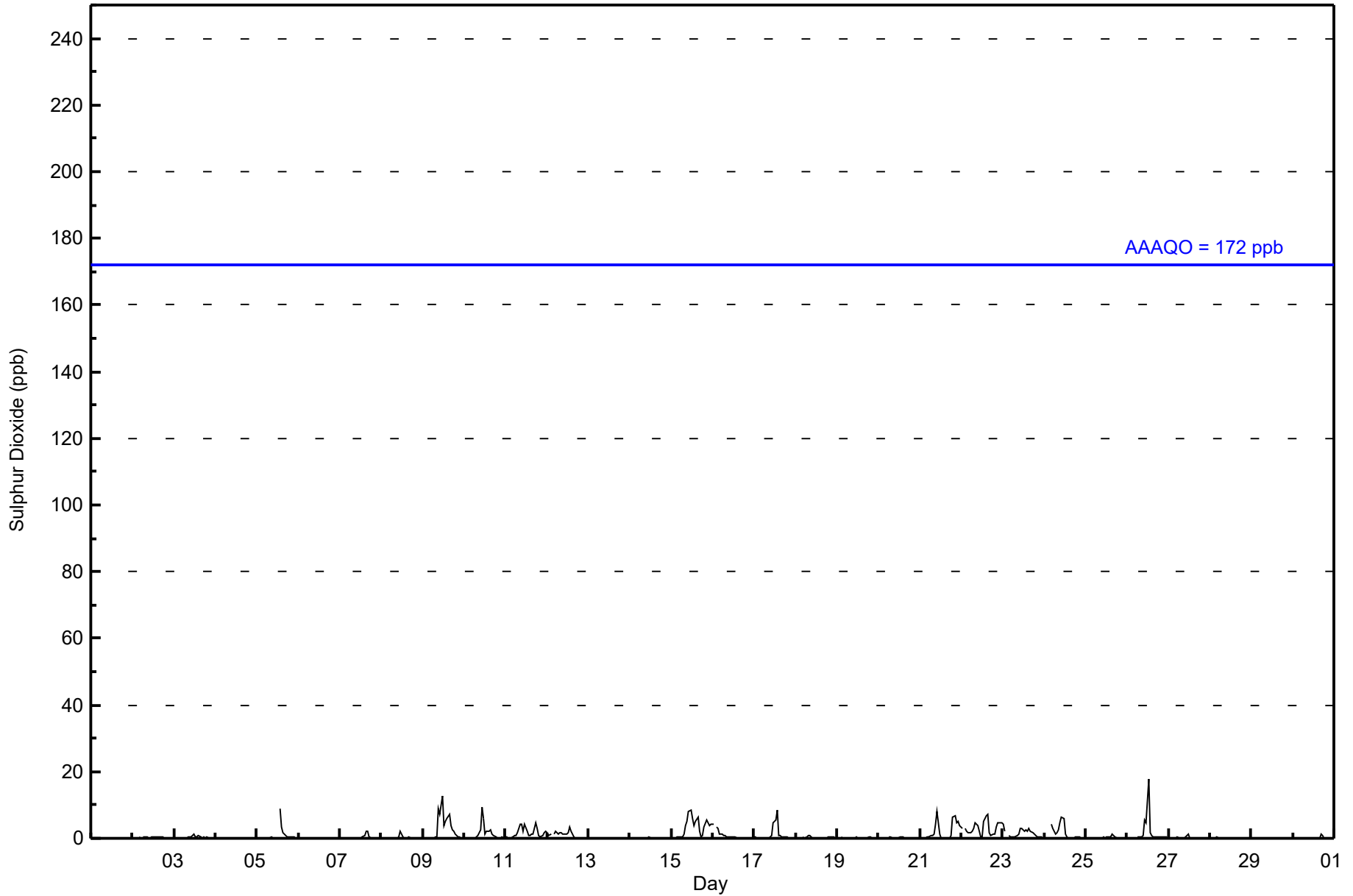
MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	685	0.82	1.7	-	0	0	0	0.1	0.6	2.5	17.8
TRS(ppb) Average	685	0.61	0.5	-	0.1	0.2	0.3	0.4	0.8	1.1	5.2
THC(ppm) Average	685	2.11	0.2	-	1.9	1.9	2	2.1	2.2	2.4	2.8
NMHC(ppm) Average	685	0.042	0.06	-	0	0	0	0	0.1	0.1	0.322
CH4(ppm) Average	685	2.07	0.1	-	1.9	1.9	2	2	2.1	2.3	2.6
NO2 (ppb) Average	683	7.02	5.8	-	0	0.6	2.7	5.8	9.7	14.8	31.3
NO (ppb) Average	683	5.27	12.2	-	0	0	0.1	0.8	5.1	15.9	152.6
NOX (ppb) Average	683	12.28	15.3	-	0	0.7	3.1	7.2	16.6	28.1	164.1
PM2.5(ug/m3) Average	717	65.11	79.5	-	3.8	11.9	17	31.4	72.4	171.5	432.7
Temperature (C) Average	720	13.74	5.9	-	1.4	6.3	9.1	13.3	18.3	21.8	27.5
Relative Humidity (%) Average	720	67.75	20.4	-	23.7	38.1	51.1	69.4	85	95.2	98.8
Barometric Pressure (inHg) Average	720	28.84	0.2	-	28.4	28.6	28.7	28.8	29	29.1	29.3
Wind Speed 20 m (km/h) Average	720	10.1	5	-	0	4	7	9	12	17	28
Wind Direction 20 m (deg) Average	720	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BARGE LANDING (AMS09)
SEPTEMBER 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
NO2,THC,SO2	07 Sep 2023 10:00	07 Sep 2023 11:00	2	Maintenance - sample manifold cleaned
PM2.5	29 Sep 2023 10:00	29 Sep 2023 11:00	2	Maintenance - to repalced the instrument





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Barge Landing - September 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	683	99.71	99.71
11 - 20	2	0.29	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: 720



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Barge Landing - September 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	19	10	3	5	14	41	157	99	66	83	54	20	20	35	36	683
11 - 20	0	0	0	0	0	0	0	0	1	1	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	21	19	10	3	5	14	41	157	100	67	83	54	20	20	35	36	685

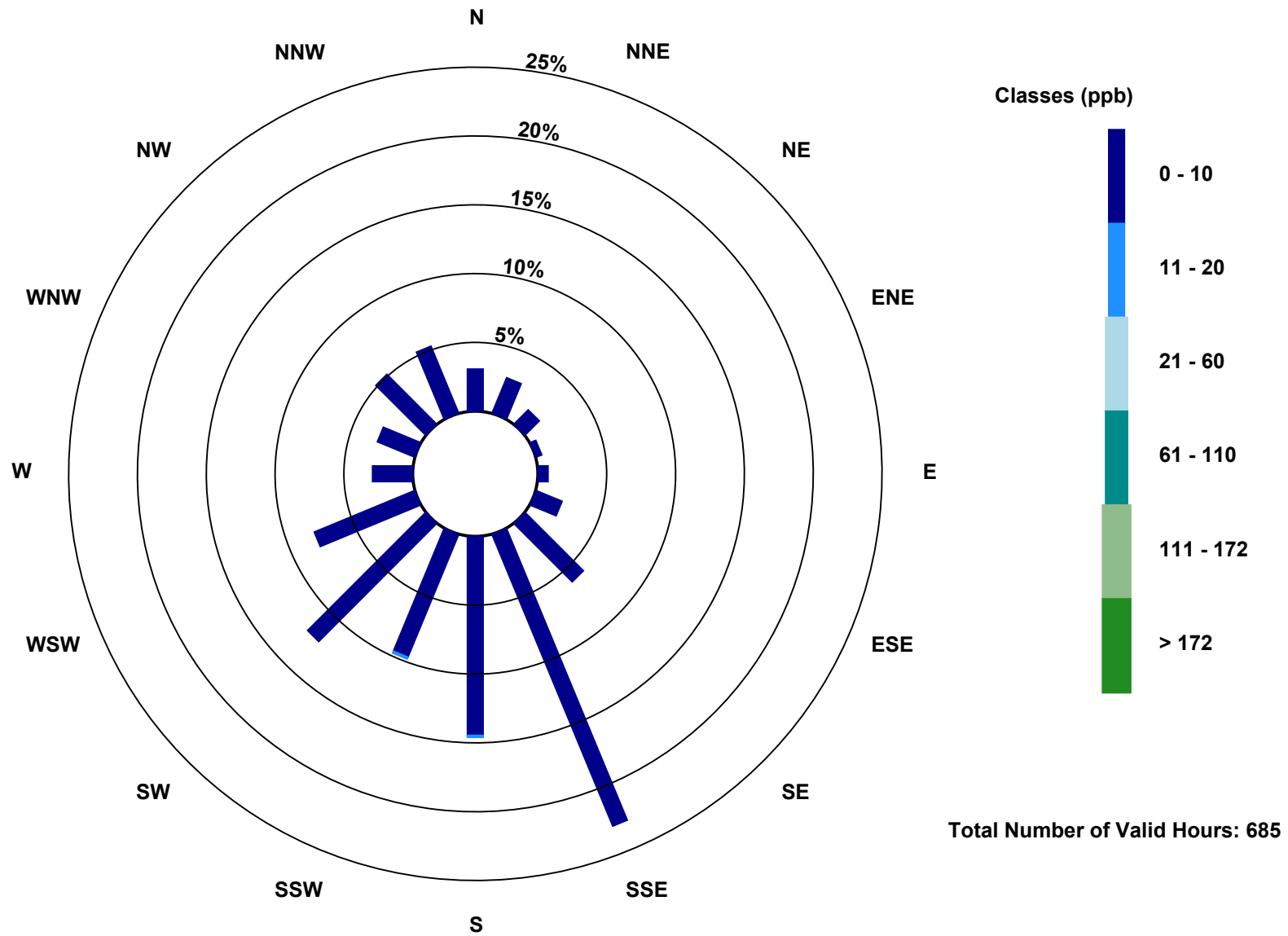
Total Number of Valid Hours: 685

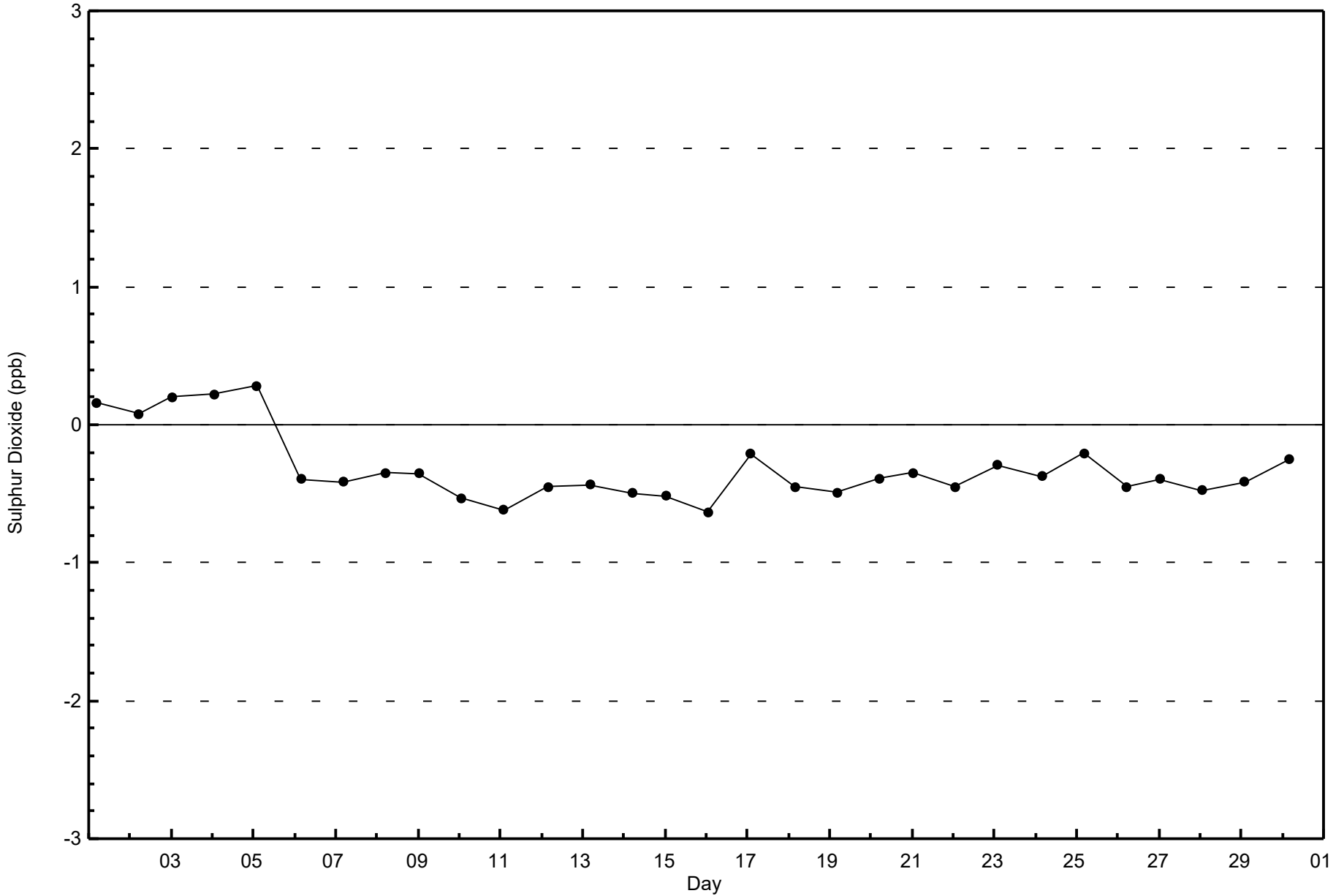
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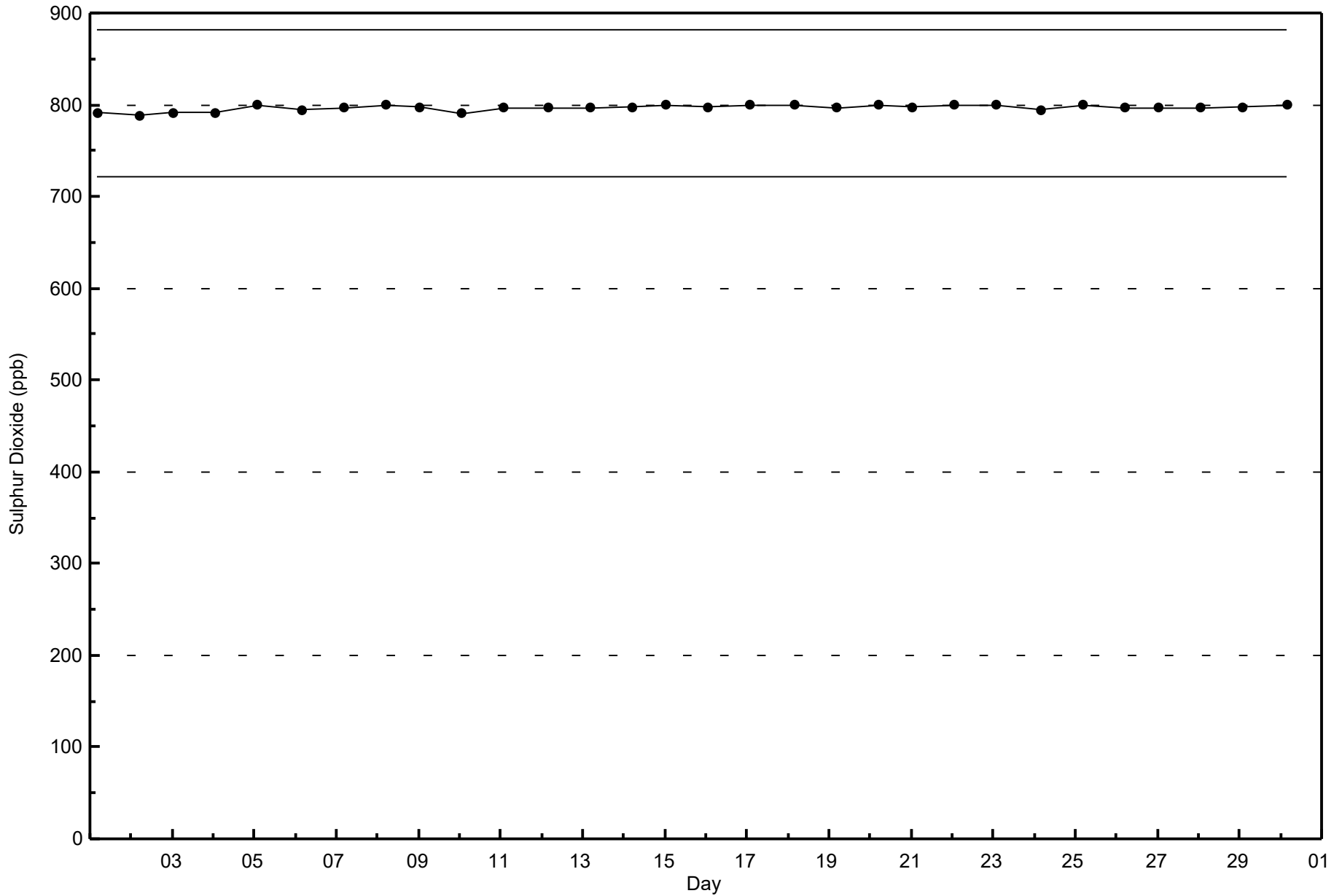


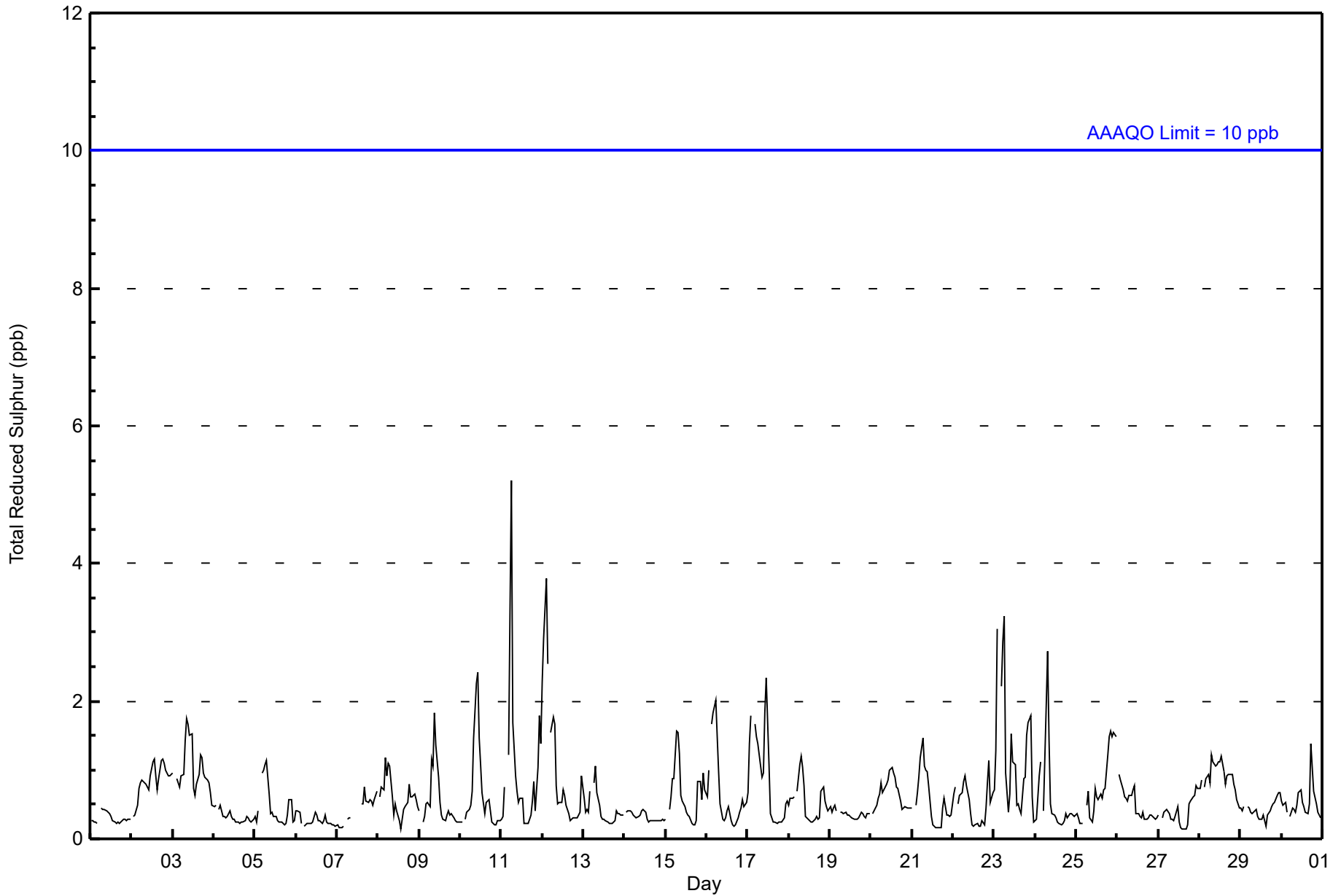
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Sulphur Dioxide (SO₂) - ppb
Barge Landing











Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Reduced Sulphur (TRS) - ppb
Barge Landing - September 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	676	98.69	98.69
3 - 4	8	1.17	99.85
5 - 7	1	0.15	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Barge Landing - September 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	22	19	10	3	5	15	38	150	101	67	83	51	21	21	35	35	676
3 - 4	0	0	0	0	0	0	1	6	1	0	0	0	0	0	0	0	8
5 - 7	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	22	19	10	3	5	15	39	157	102	67	83	51	21	21	35	35	685

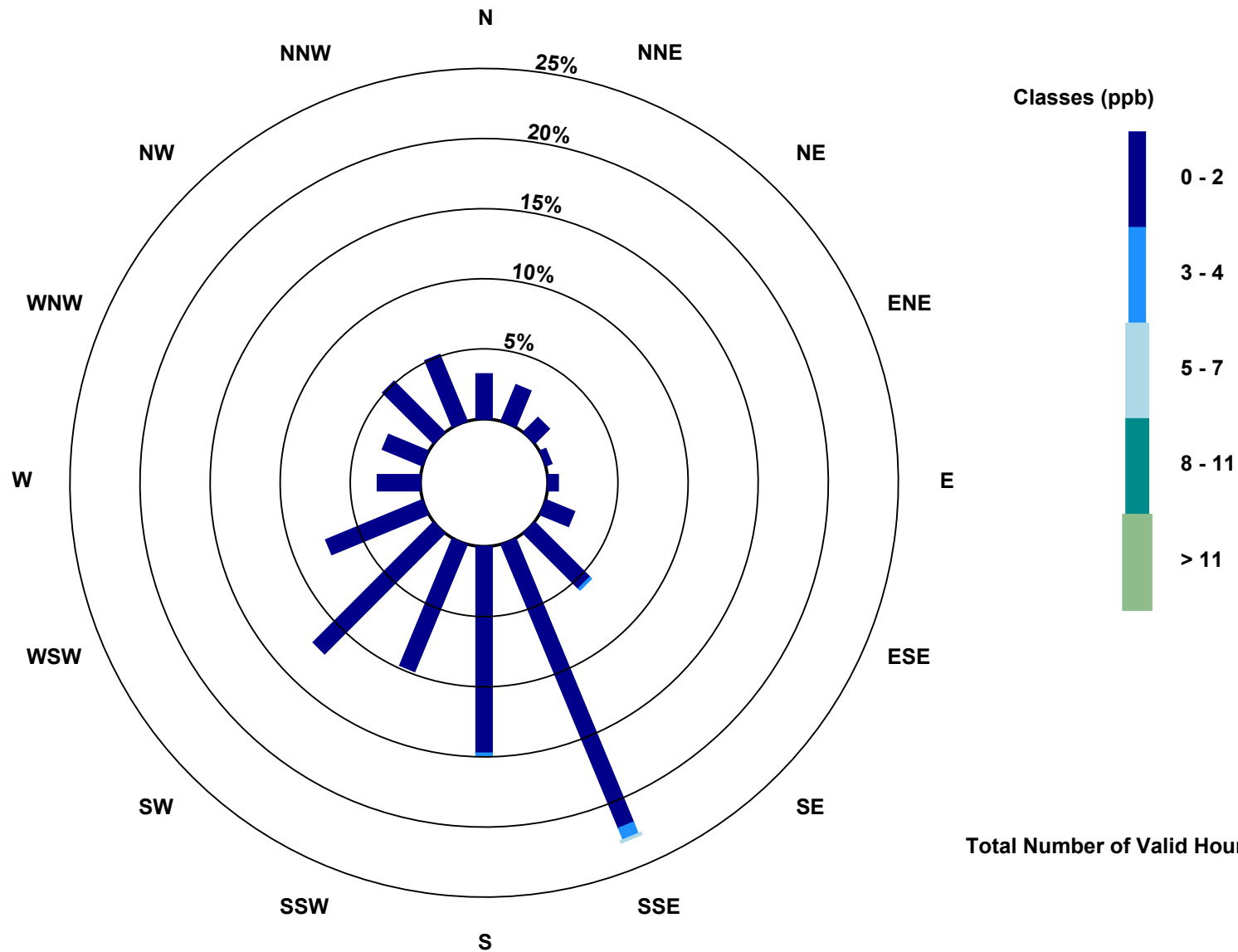
Total Number of Valid Hours: 685

Total Number of Hours: 720

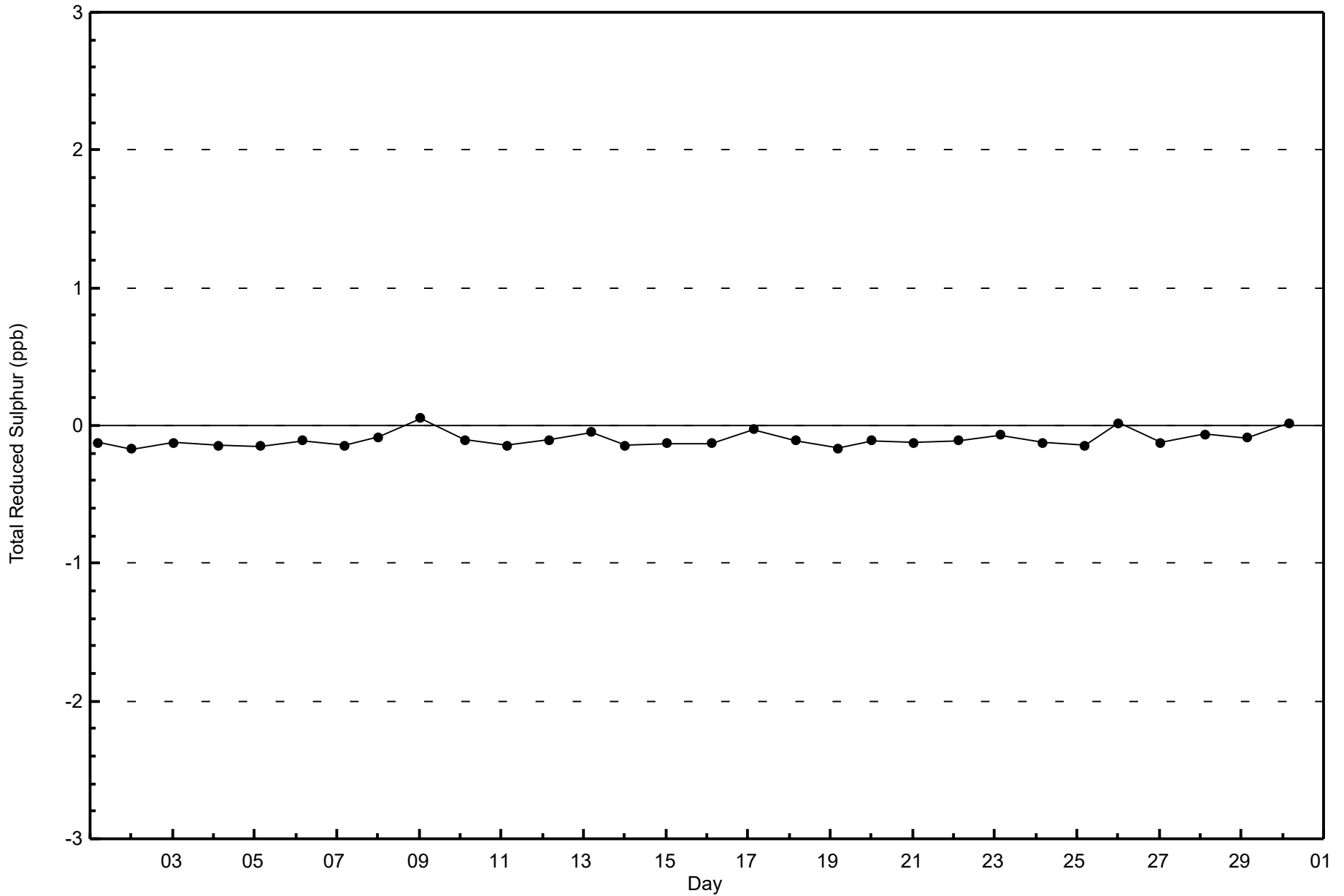


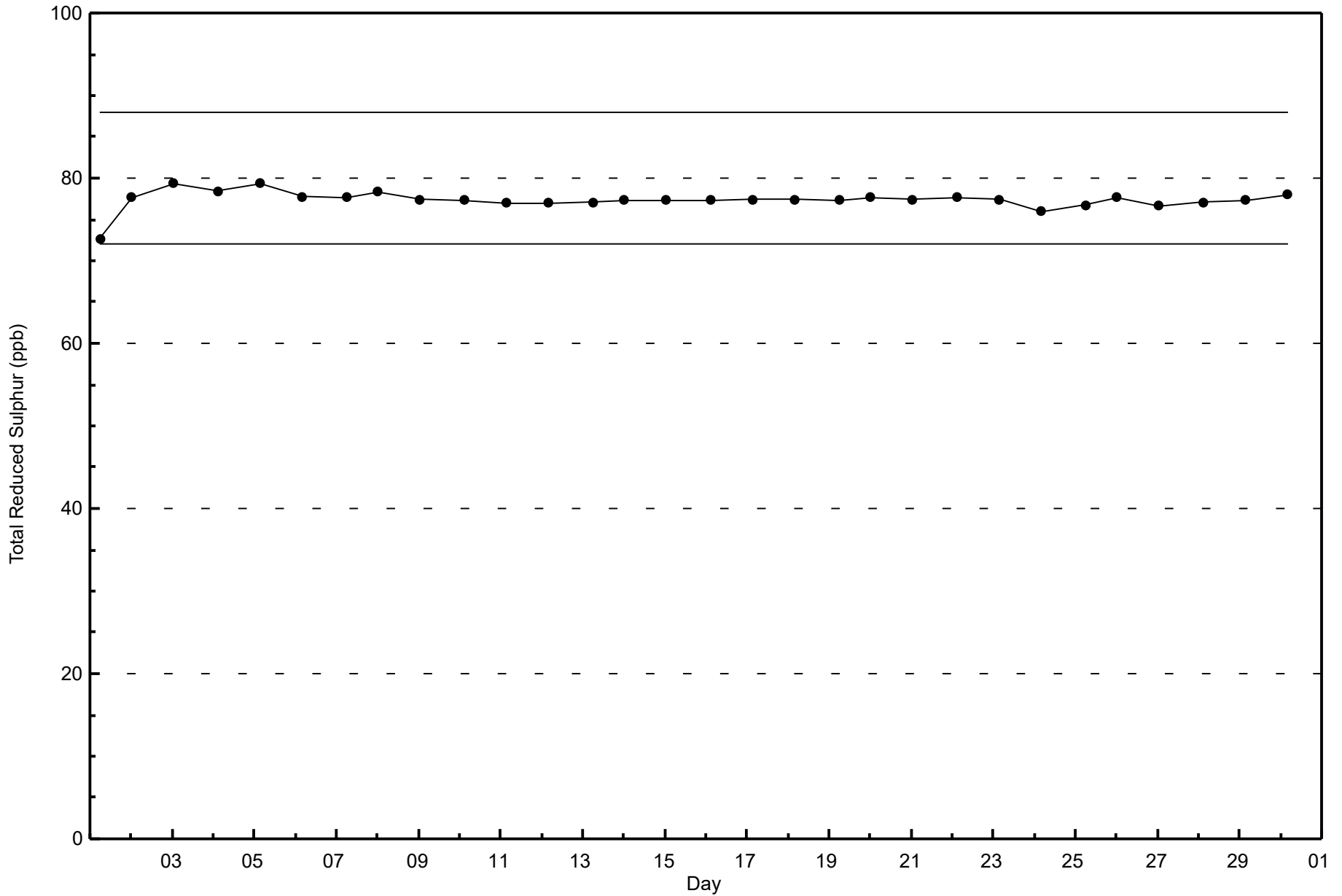
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Total Reduced Sulphur (TRS) - ppb
Barge Landing



Total Number of Valid Hours: 685

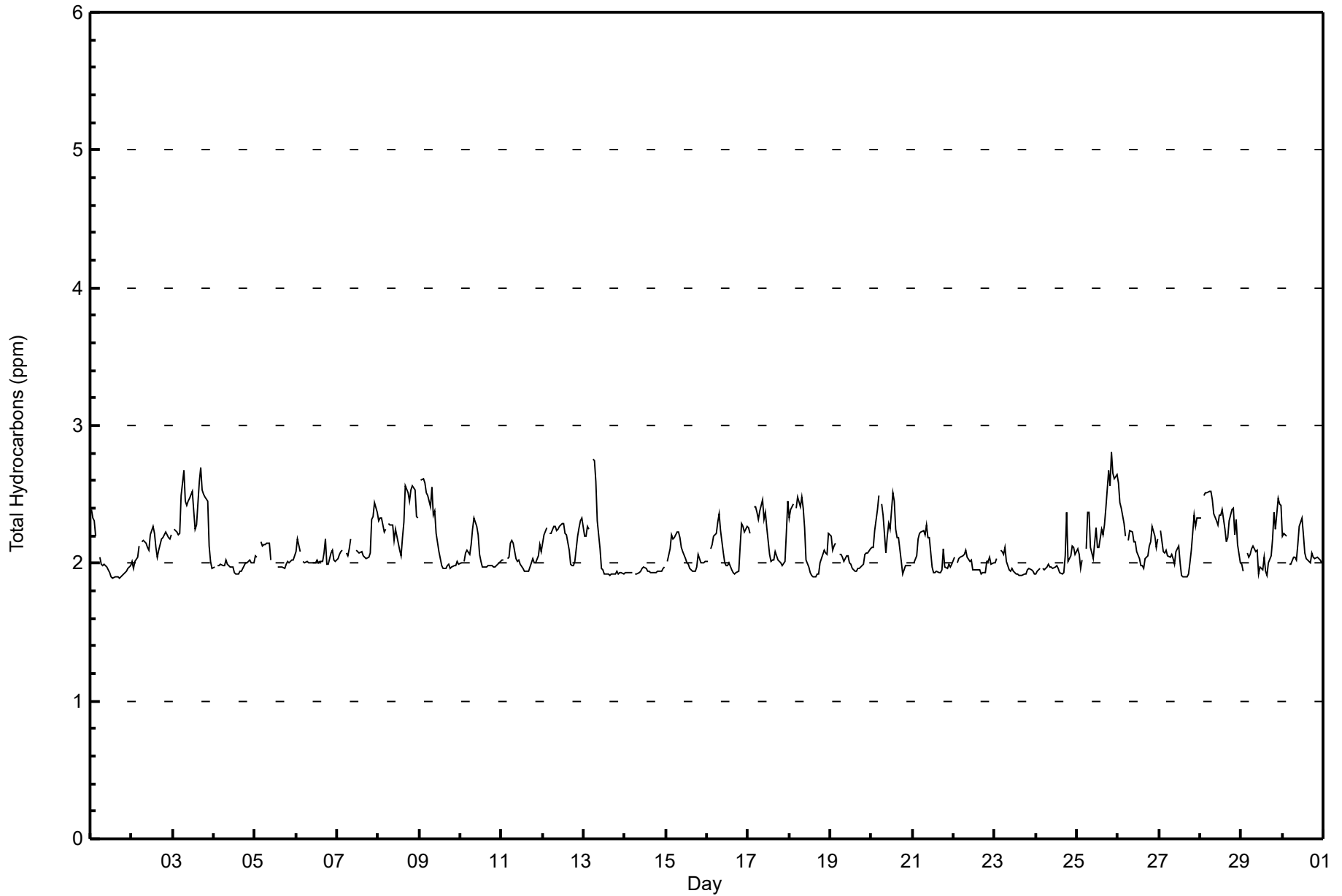






Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Barge Landing - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Barge Landing - September 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	337	49.20	49.20
2.1 - 3.0	348	50.80	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Barge Landing - September 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	4	2	0	0	4	10	31	81	32	37	50	36	11	11	19	9	337
2.1 - 3.0	17	17	10	3	1	4	10	76	68	30	33	18	9	9	16	27	348
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	21	19	10	3	5	14	41	157	100	67	83	54	20	20	35	36	685

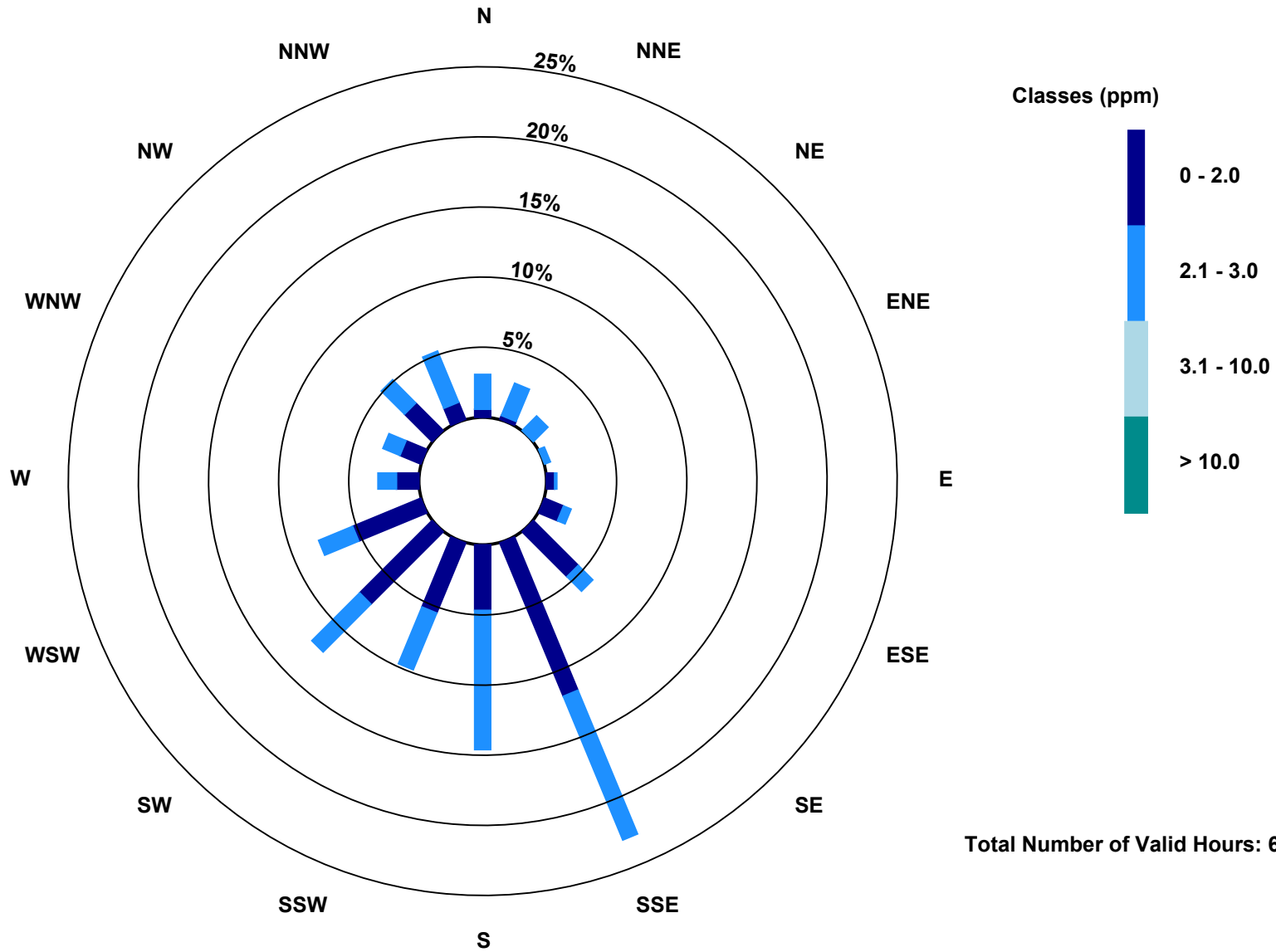
Total Number of Valid Hours: 685

Total Number of Hours: 720

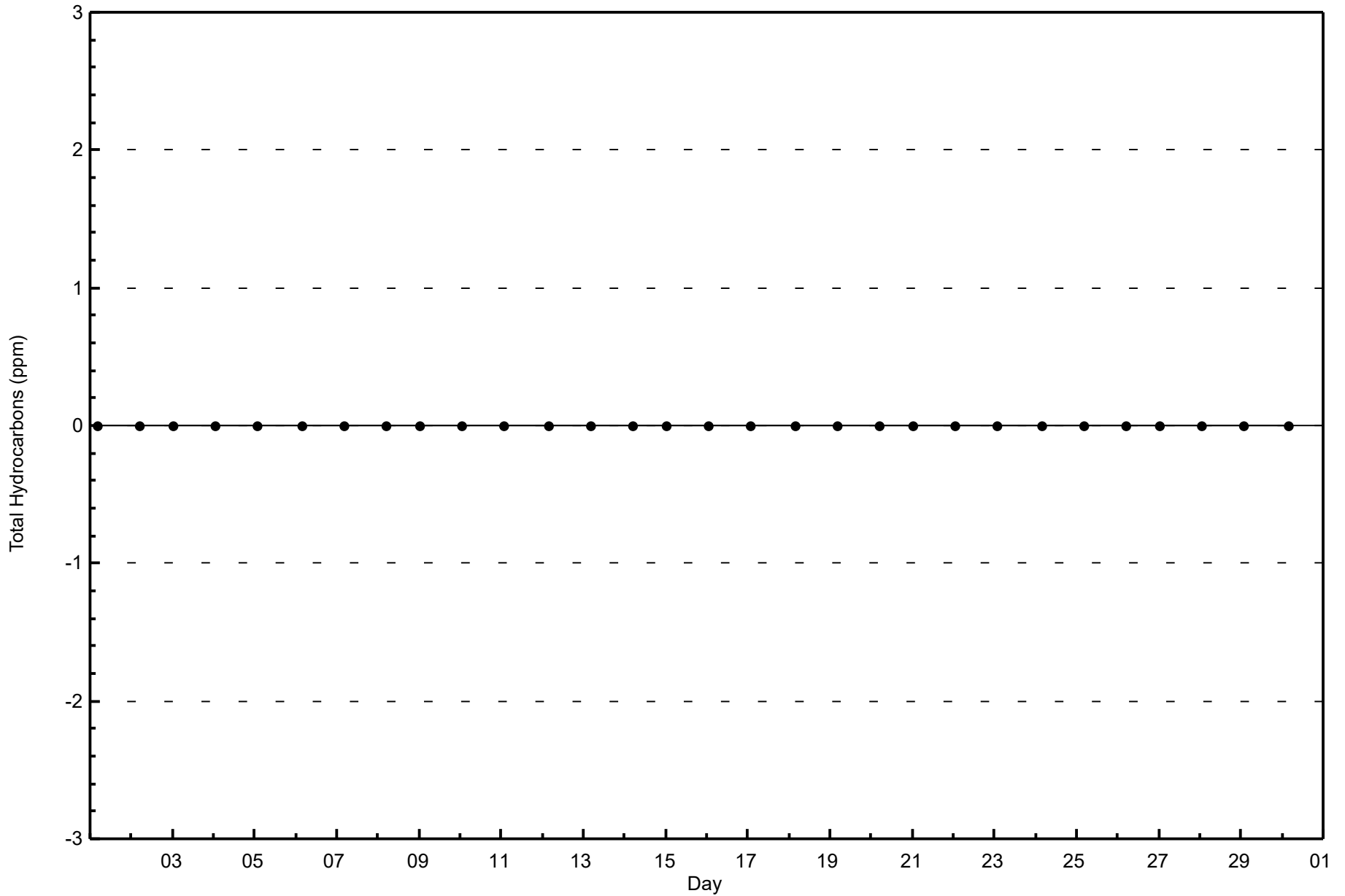


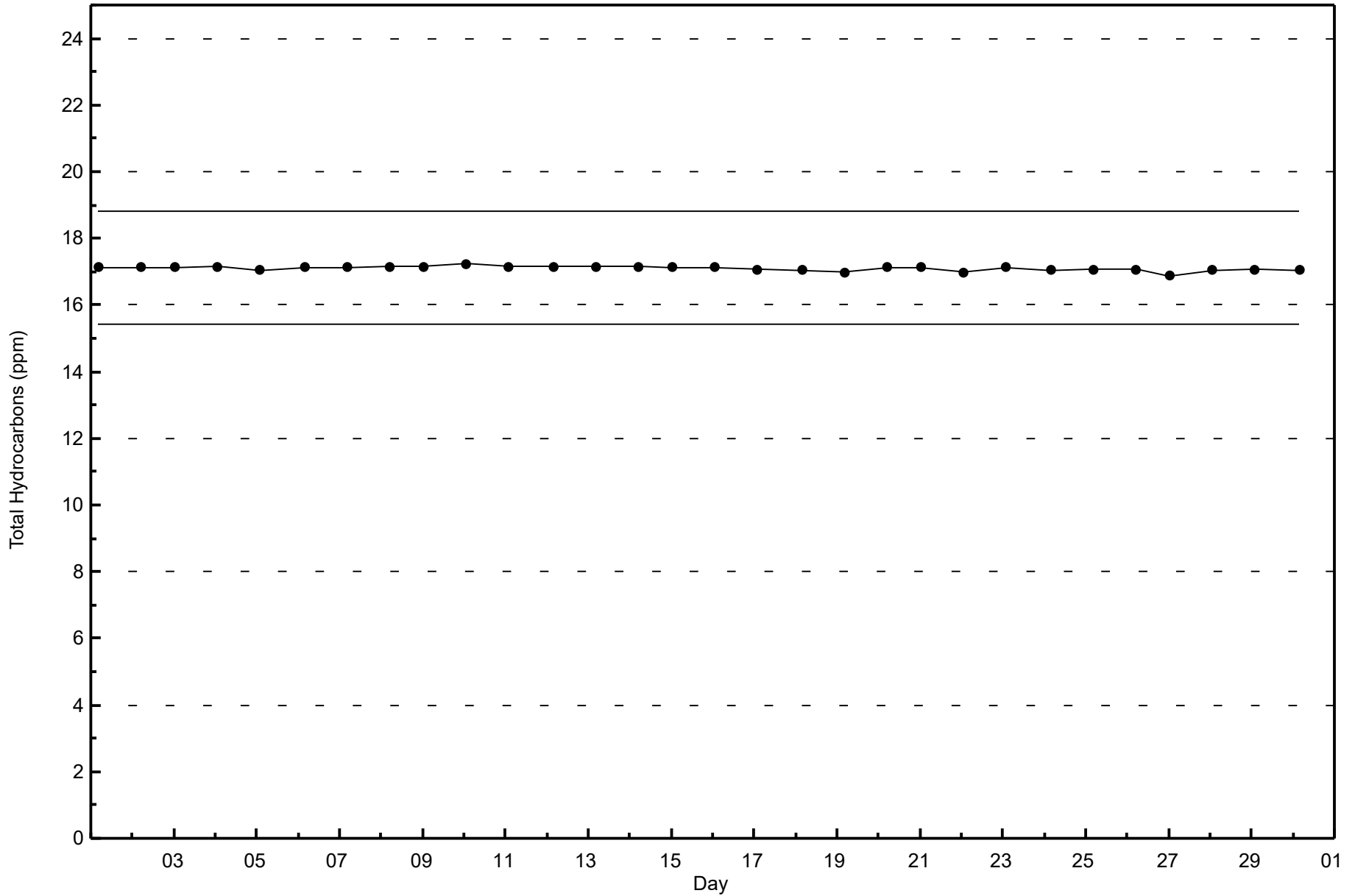
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Total Hydrocarbons (THC) - ppm
Barge Landing



Total Number of Valid Hours: 685



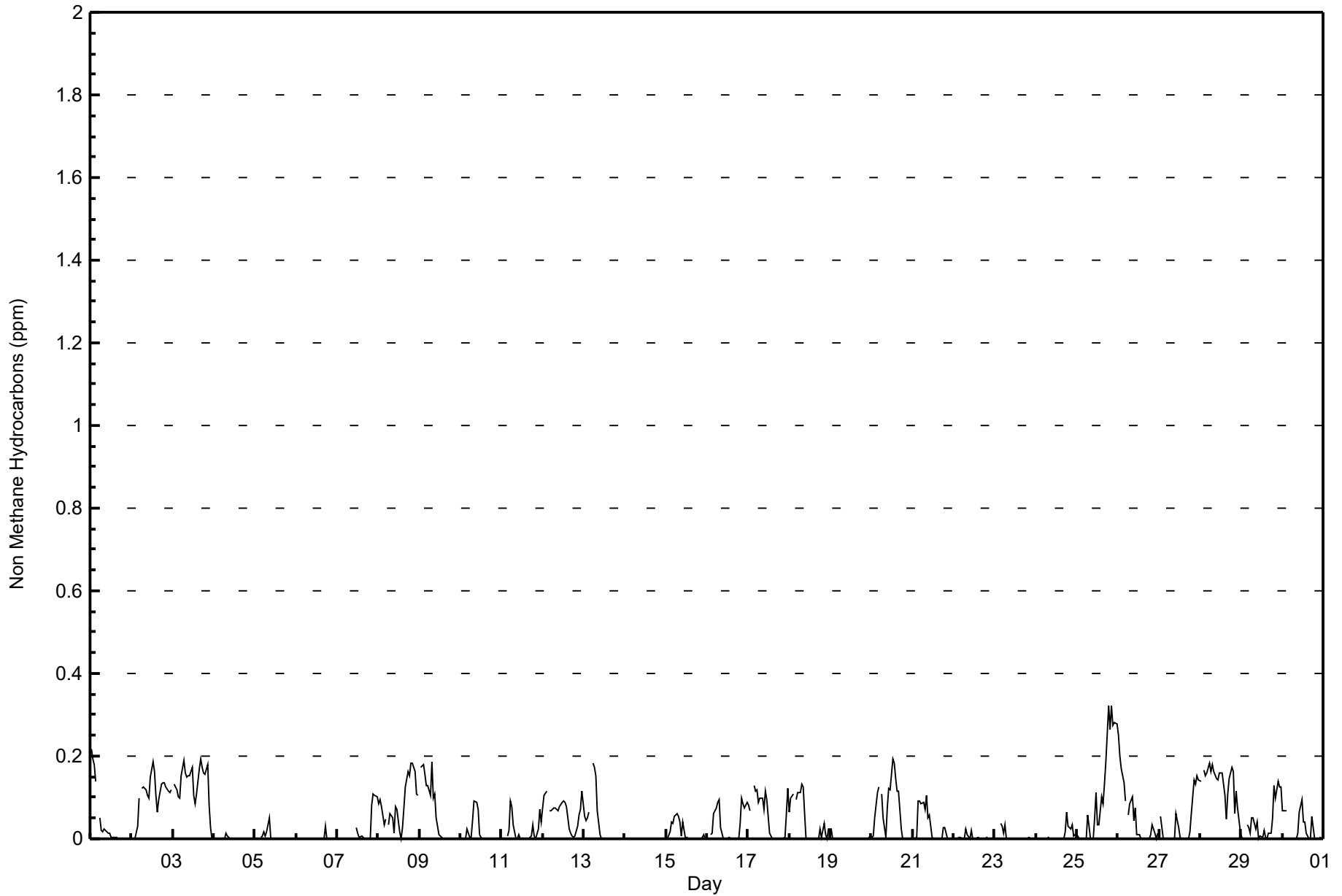




Summary of Hour Averages

Barge Landing - September 2023

Maximum Value: 0.322 ppm on Sep 25 21:00		Maximum Daily Average: 0.134 ppm on Sep 28		Hours in Service:	720																																											
Minimum Value: 0.000 ppm on Sep 1 18:00		Minimum Daily Average: 0.000 ppm on Sep 14		Hours of Data:	685																																											
Maximum Diurnal Average: 0.058 ppm at hour 8		Minimum Diurnal Average: 0.020 ppm at hour 16		Hours of Missing Data:	35																																											
Monthly Average: 0.042 ppm		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.1 P ₉₀ = 0.1 P ₉₉ = 0.2		Hours of Calibration:	33																																											
				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-Sep	0.216	0.194	0.180	0.138	Z	0.051	0.021	0.019	0.023	0.018	0.013	0.015	0.004	0.002	0.004	0.004	0.001	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.039	0.216																						
2-Sep	0.000	0.000	0.002	0.032	0.099	Z	0.120	0.125	0.120	0.104	0.098	0.150	0.185	0.163	0.106	0.066	0.096	0.134	0.135	0.135	0.126	0.115	0.112	0.119	0.102	0.185																						
3-Sep	Z	0.133	0.119	0.102	0.097	0.153	0.190	0.160	0.149	0.153	0.152	0.172	0.106	0.084	0.110	0.168	0.193	0.173	0.159	0.156	0.179	0.083	0.027	0.000	0.131	0.193																						
4-Sep	0.001	Z	0.000	0.000	0.000	0.000	0.000	0.013	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.013																						
5-Sep	0.000	0.000	Z	0.005	0.008	0.018	0.008	0.015	0.050	0.001	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	0.005	0.050																						
6-Sep	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	0.030	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.030																						
7-Sep	0.000	0.000	0.001	0.000	Z	0.000	0.000	0.001	0.000	0.000	M	M	0.027	0.013	0.003	0.005	0.003	0.001	0.001	0.000	0.083	0.107	0.107	0.102	0.022	0.107																						
8-Sep	0.086	0.095	0.077	0.034	0.048	Z	0.033	0.061	0.050	0.013	0.077	0.070	0.016	0.000	0.028	0.076	0.125	0.161	0.153	0.183	0.184	0.164	0.108	0.106	0.085	0.184																						
9-Sep	Z	0.174	0.180	0.156	0.130	0.128	0.104	0.185	0.100	0.107	0.050	0.010	0.008	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.058	0.185																						
10-Sep	0.000	Z	0.000	0.000	0.022	0.004	0.005	0.045	0.093	0.089	0.072	0.010	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.015	0.093																						
11-Sep	0.000	0.000	Z	0.006	0.020	0.090	0.079	0.032	0.000	0.000	0.010	0.001	0.000	0.000	0.000	0.000	0.000	0.006	0.033	0.005	0.000	0.023	0.073	0.042	0.018	0.090																						
12-Sep	0.075	0.105	0.116	Z	0.067	0.068	0.074	0.075	0.071	0.067	0.078	0.087	0.092	0.088	0.078	0.023	0.013	0.006	0.004	0.008	0.029	0.057	0.071	0.117	0.064	0.117																						
13-Sep	0.053	0.046	0.052	0.065	Z	0.184	0.173	0.151	0.069	0.011	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	0.035	0.184																						
14-Sep	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-Sep	Z	0.001	0.016	0.040	0.039	0.055	0.059	0.054	0.042	0.007	0.041	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.003	0.010	0.000	0.016	0.059																						
16-Sep	0.000	Z	0.009	0.014	0.060	0.074	0.089	0.093	0.026	0.000	0.000	0.000	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.036	0.098	0.085	0.075	0.089	0.033	0.098																						
17-Sep	0.081	0.069	Z	0.127	0.115	0.119	0.088	0.098	0.098	0.071	0.115	0.096	0.013	0.008	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.003	0.062	0.122	0.056	0.127																						
18-Sep	0.064	0.098	0.108	Z	0.096	0.113	0.112	0.131	0.125	0.062	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.022	0.003	0.036	0.011	0.001	0.024	0.044	0.131																						
19-Sep	0.023	0.000	0.000	0.001	Z	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.008	0.001	0.023																						
20-Sep	0.003	0.006	0.052	0.111	0.124	Z	0.107	0.051	0.002	0.075	0.121	0.119	0.194	0.184	0.146	0.115	0.115	0.022	0.000	0.000	0.000	0.000	0.000	0.000	0.067	0.194																						
21-Sep	Z	0.000	0.005	0.091	0.092	0.084	0.089	0.070	0.104	0.051	0.058	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.028	0.026	0.000	0.000	0.000	0.000	0.030	0.104																						
22-Sep	0.001	Z	0.000	0.005	0.004	0.001	0.000	0.024	0.011	0.001	0.019	0.000	0.000	0.001	0.002	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.003	0.024																						
23-Sep	0.000	0.001	Z	0.037	0.030	0.014	0.035	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.002	0.000	0.000	0.000	0.005	0.037																						
24-Sep	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.003	0.001	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.016	0.063	0.029	0.024	0.033	0.006	0.010	0.008	0.063																							
25-Sep	0.006	0.000	0.000	0.000	Z	0.000	0.056	0.031	0.000	0.000	0.050	0.111	0.033	0.033	0.103	0.084	0.133	0.188	0.321	0.264	0.322	0.276	0.280	0.279	0.112	0.322																						
26-Sep	0.252	0.199	0.171	0.136	0.090	Z	0.058	0.085	0.103	0.045	0.075	0.011	0.009	0.000	0.000	0.000	0.000	0.000	0.001	0.012	0.033	0.013	0.002	0.013	0.057	0.252																						
27-Sep	Z	0.054	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.062	0.026	0.002	0.000	0.000	0.000	0.000	0.000	0.016	0.060	0.142	0.132	0.153	0.142	0.034	0.153																						
28-Sep	0.138	Z	0.165	0.152	0.159	0.182	0.162	0.179	0.164	0.147	0.143	0.160	0.161	0.161	0.103	0.049	0.108	0.147	0.174	0.164	0.062	0.114	0.075	0.015	0.134	0.182																						
29-Sep	0.002	0.000	Z	0.033	0.027	0.015	0.050	0.052	0.025	0.041	0.000	0.008	0.003	0.022	0.004	0.000	0.013	0.013	0.051	0.129	0.097	0.141	0.125	0.124	0.042	0.141																						
30-Sep	0.069	0.068	0.069	Z	0.001	0.000	0.000	0.000	0.000	0.012	0.064	0.094	0.042	0.039	0.013	0.000	0.001	0.054	0.028	0.001	0.001	0.000	0.003	0.000	0.024	0.094																						
																								0.043	0.050	0.053	0.051	0.053	0.054	0.057	0.058	0.048	0.037	0.046	0.040	0.031	0.027	0.023	0.020	0.027	0.032	0.040	0.040	0.047	0.045	0.043	0.044	Diurnal Average
																								0.252	0.199	0.180	0.156	0.159	0.184	0.190	0.185	0.164	0.153	0.152	0.172	0.194	0.184	0.146	0.168	0.193	0.188	0.321	0.264	0.322	0.276	0.280	0.279	Diurnal Maximum
Z - zerspan		C - Calibration				M - Maintenance																																										





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Barge Landing - September 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	352	51.39	51.39
0.006 - 0.05	125	18.25	69.64
0.06 - 0.1	154	22.48	92.12
> 0.1	54	7.88	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Barge Landing - September 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	2	1	0	2	5	10	33	80	37	41	56	37	12	10	16	10	352
0.006 - 0.05	4	5	0	0	0	2	3	32	27	12	16	7	3	3	5	6	125
0.06 - 0.1	9	6	7	1	0	0	5	40	30	13	9	8	4	5	8	9	154
> 0.1	6	7	3	0	0	2	0	5	6	1	2	2	1	2	6	11	54
Totals	21	19	10	3	5	14	41	157	100	67	83	54	20	20	35	36	685

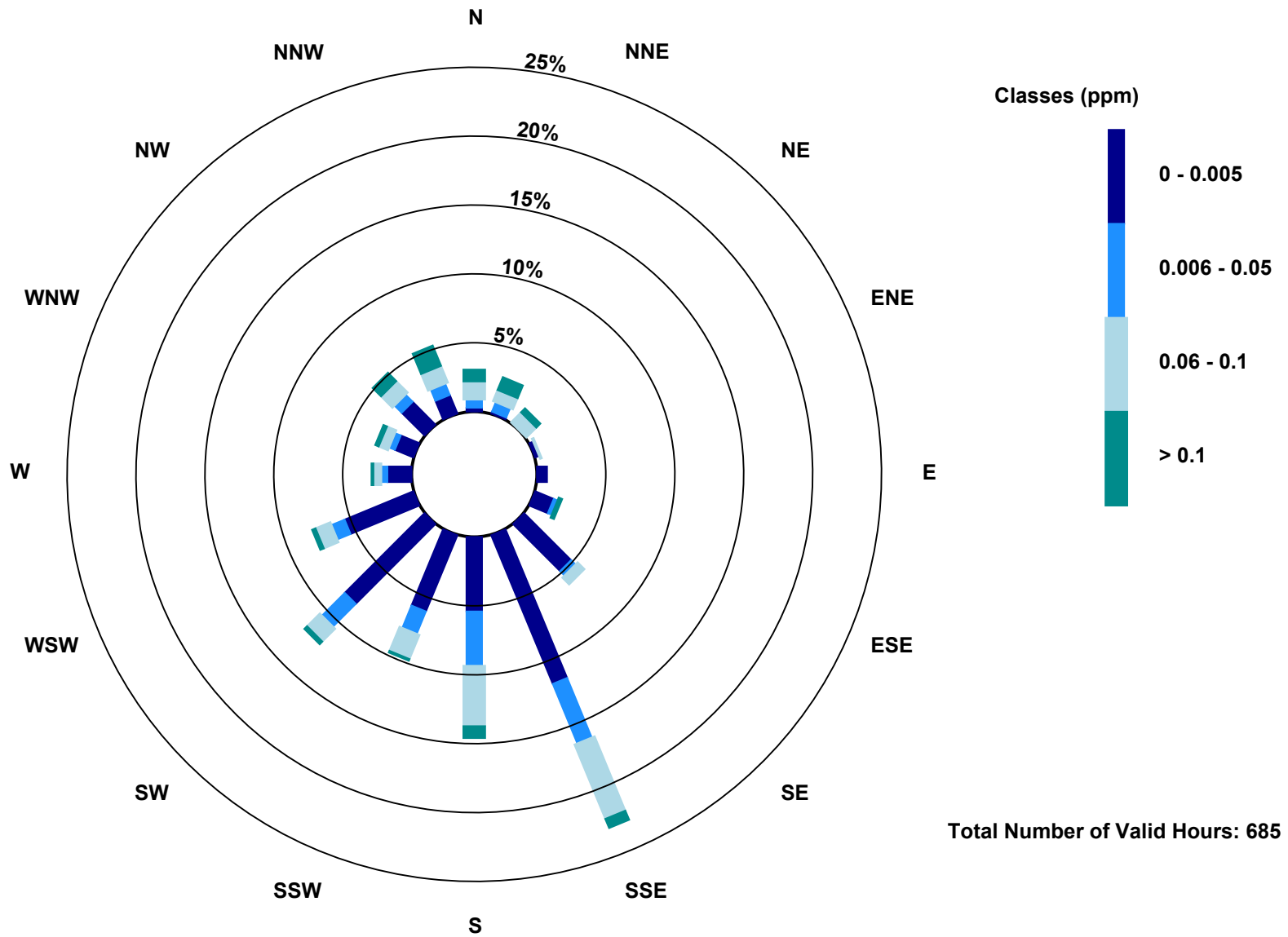
Total Number of Valid Hours: 685

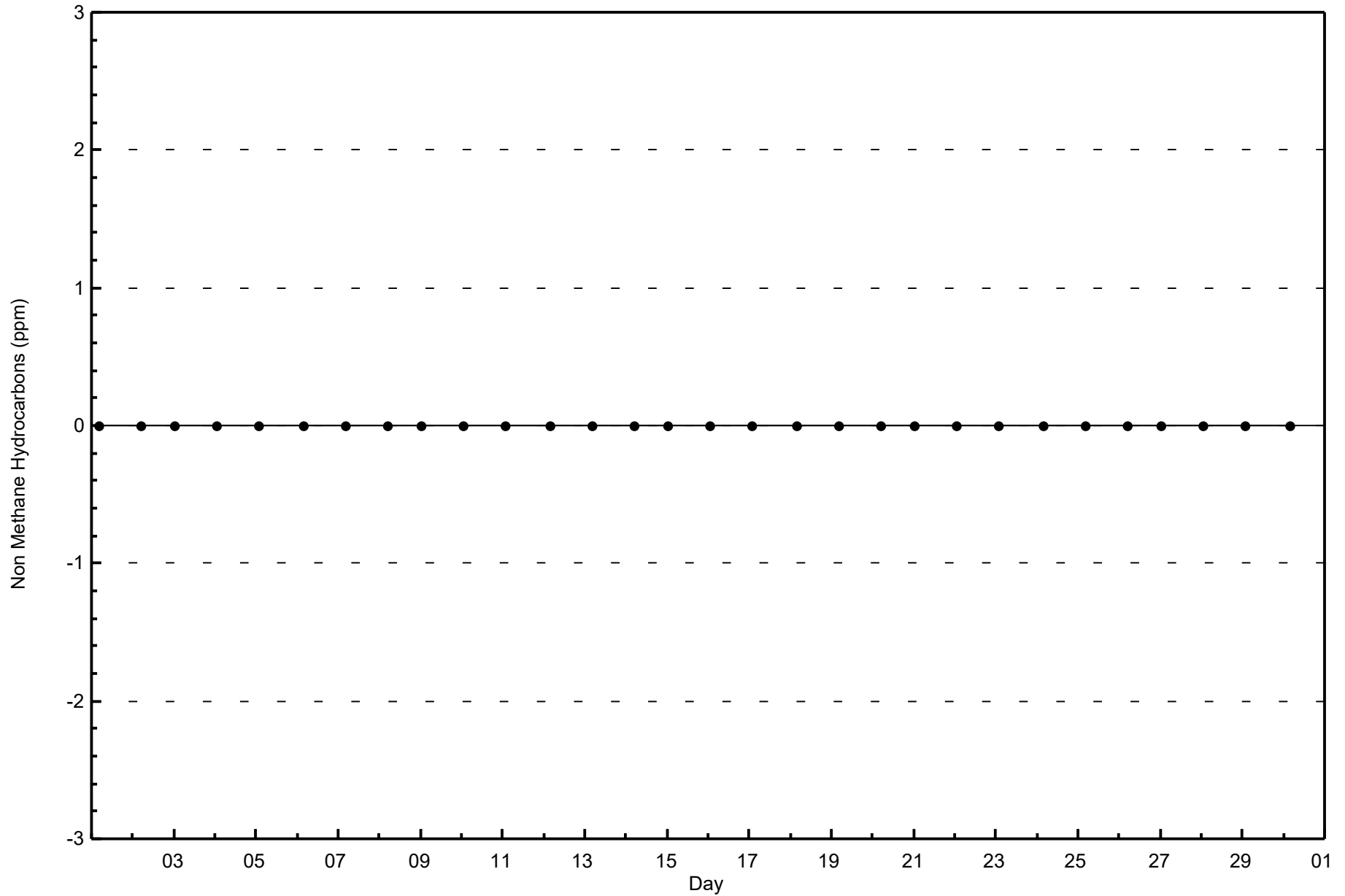
Total Number of Hours: 720

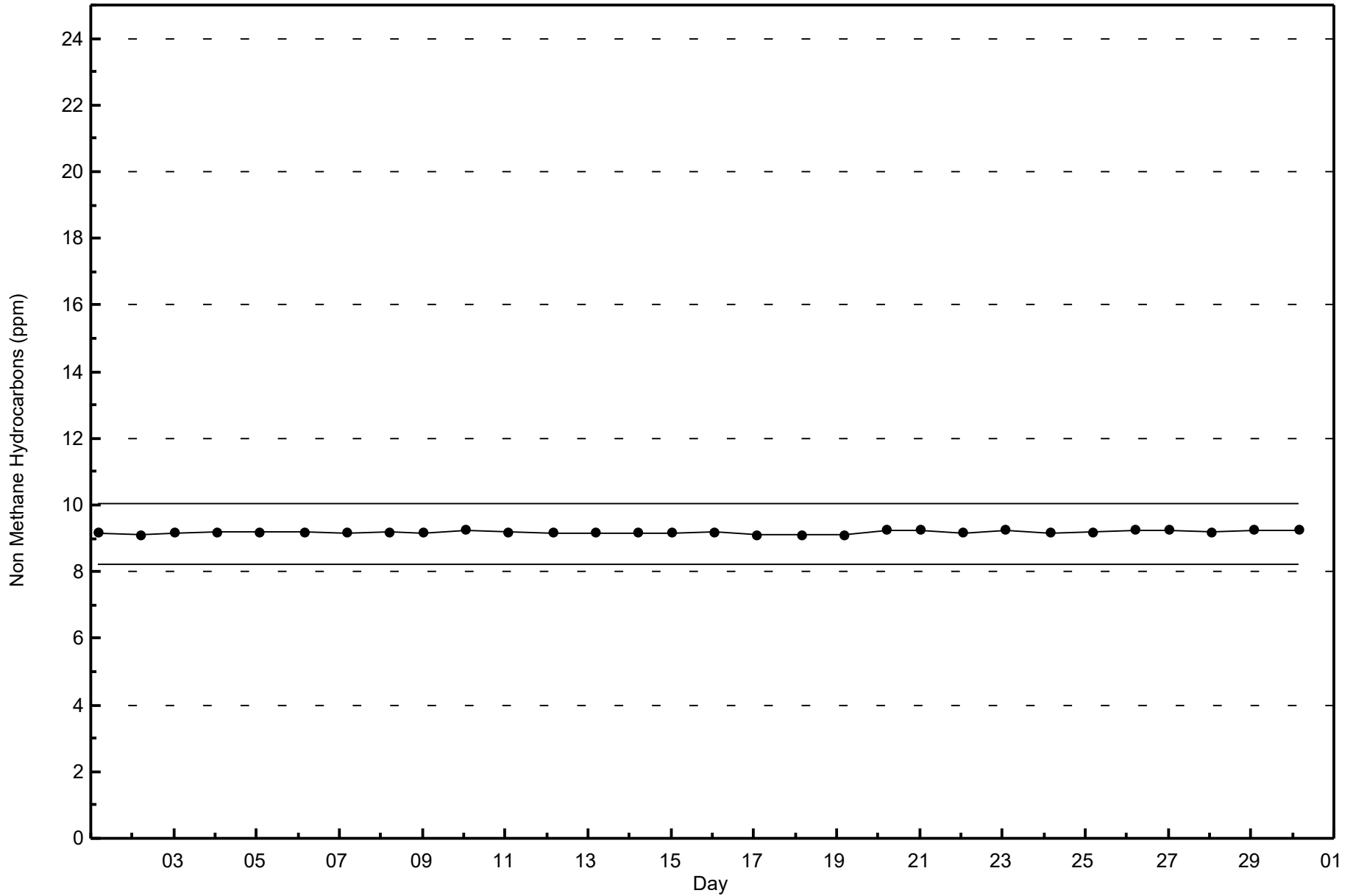


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Non Methane Hydrocarbons (NMHC) - ppm
Barge Landing







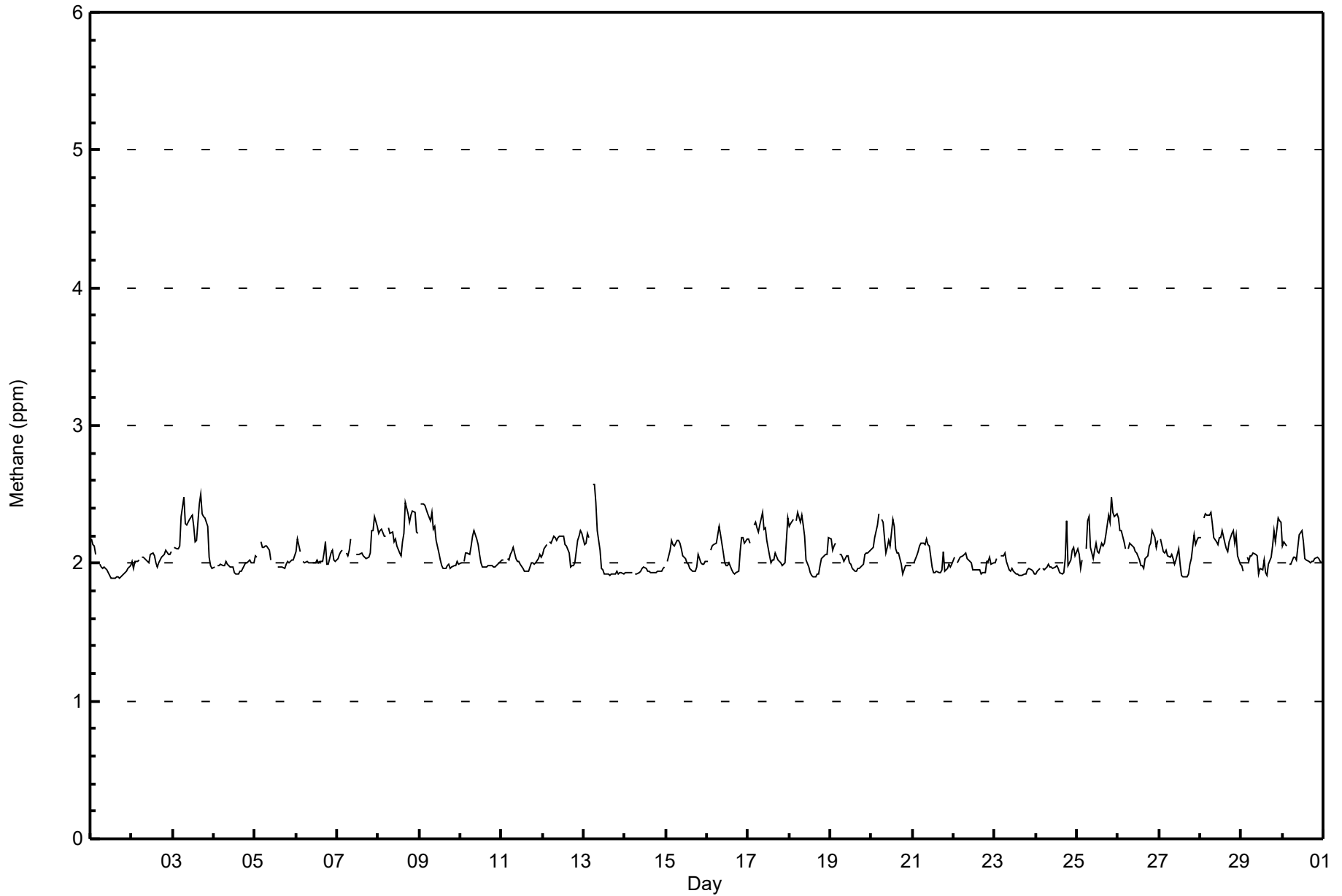


Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 2.6 ppm on Sep 13 06:00	Maximum Daily Average: 2.2 ppm on Sep 3		Hours of Data:	685
Minimum Value: 1.9 ppm on Sep 1 14:00	Minimum Daily Average: 1.9 ppm on Sep 14		Hours of Missing Data:	35
Maximum Diurnal Average: 2.2 ppm at hour 7	Minimum Diurnal Average: 2.0 ppm at hour 15		Hours of Calibration:	33
Monthly Average: 2.07 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 = 2.4		Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Sep	2.2	2.1	2.1	2.1	Z	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	2.0	2.0	2.0	2.0	
2-Sep	2.0	2.0	2.0	2.0	2.0	Z	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	2.1	2.1	2.1	2.1	2.1	2.1	2.1
3-Sep	Z	2.1	2.1	2.1	2.1	2.3	2.5	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.4	2.5	2.4	2.3	2.3	2.3	2.0	2.0	2.0	2.0	2.0	
4-Sep	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	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
5-Sep	2.1	2.0	Z	2.2	2.1	2.1	2.1	2.1	2.1	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	2.1	2.0	
6-Sep	2.1	2.2	2.1	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	
7-Sep	2.0	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.2	M	M	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.2	2.2	2.3	2.3	2.1	
8-Sep	2.2	2.2	2.3	2.2	2.2	Z	2.3	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.2	2.2	2.4	2.4	2.3	2.4	2.4	2.4	2.2	2.2	2.2	
9-Sep	Z	2.4	2.4	2.4	2.4	2.4	2.3	2.4	2.2	2.3	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
10-Sep	2.0	Z	2.0	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
11-Sep	2.0	2.0	Z	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	
12-Sep	2.1	2.1	2.1	Z	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.2	2.2	2.2	2.2	2.2	2.1	
13-Sep	2.1	2.2	2.2	2.2	Z	2.6	2.6	2.4	2.2	2.1	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.1	
14-Sep	1.9	1.9	1.9	1.9	1.9	Z	1.9	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	2.0	2.0	2.0	1.9	
15-Sep	Z	2.0	2.1	2.2	2.1	2.1	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	2.0	2.1	2.0	2.0	2.0	2.0	
16-Sep	2.0	Z	2.1	2.1	2.1	2.1	2.2	2.3	2.2	2.1	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	2.1	2.2	2.2	2.1	2.2	2.1	
17-Sep	2.2	2.1	Z	2.3	2.3	2.3	2.2	2.3	2.4	2.2	2.3	2.2	2.1	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.2	2.3	2.1	
18-Sep	2.3	2.3	2.3	Z	2.3	2.4	2.3	2.4	2.3	2.2	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.1	2.1	2.1	2.2	2.1	
19-Sep	2.2	2.1	2.1	2.1	Z	2.1	2.1	2.0	2.0	2.0	2.1	2.0	2.0	2.0	1.9	1.9	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.0	
20-Sep	2.1	2.1	2.2	2.3	2.4	Z	2.3	2.3	2.1	2.1	2.2	2.1	2.3	2.3	2.1	2.1	2.1	2.0	1.9	1.9	2.0	2.0	2.0	2.0	2.1	
21-Sep	Z	2.0	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.1	2.1	2.0	1.9	1.9	1.9	1.9	1.9	1.9	2.1	1.9	2.0	2.0	2.0	2.0	2.0	
22-Sep	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	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	
23-Sep	2.0	2.0	Z	2.1	2.1	2.1	2.1	2.0	2.0	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	1.9	1.9	2.0	2.1	
24-Sep	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	1.9	1.9	1.9	2.0	2.3	2.0	2.0	2.1	2.1	2.1	2.0	
25-Sep	2.1	2.1	2.0	2.0	Z	2.1	2.3	2.3	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.4	2.3	2.5	2.4	2.3	2.4	2.2	
26-Sep	2.3	2.2	2.2	2.2	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.2	2.1	2.2	2.1	
27-Sep	Z	2.2	2.1	2.1	2.1	2.1	2.0	2.1	2.0	2.0	2.0	2.1	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.2	2.1	2.2	2.2	2.0	
28-Sep	2.2	Z	2.3	2.4	2.4	2.3	2.4	2.3	2.2	2.2	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.2	2.1	2.0	2.2	
29-Sep	2.0	1.9	Z	2.0	2.0	2.0	2.1	2.1	2.1	2.1	1.9	2.0	2.0	2.0	1.9	1.9	2.0	2.0	2.1	2.2	2.2	2.3	2.3	2.3	2.1	
30-Sep	2.1	2.2	2.1	Z	2.0	2.0	2.0	2.0	2.0	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	2.0	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	Diurnal Average
2.3	2.4	2.4	2.4	2.4	2.6	2.6	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.4	2.5	2.4	2.4	2.4	2.5	2.4	2.3	2.4	2.4	Diurnal Maximum

Z - zerospan C - Calibration M - Maintenance





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Barge Landing - September 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	360	52.55	52.55
2.1 - 3.0	325	47.45	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Methane (CH₄) - ppm
Barge Landing - September 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	4	3	0	0	4	10	32	85	35	37	51	36	15	14	23	11	360
2.1 - 3.0	17	16	10	3	1	4	9	72	65	30	32	18	5	6	12	25	325
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	21	19	10	3	5	14	41	157	100	67	83	54	20	20	35	36	685

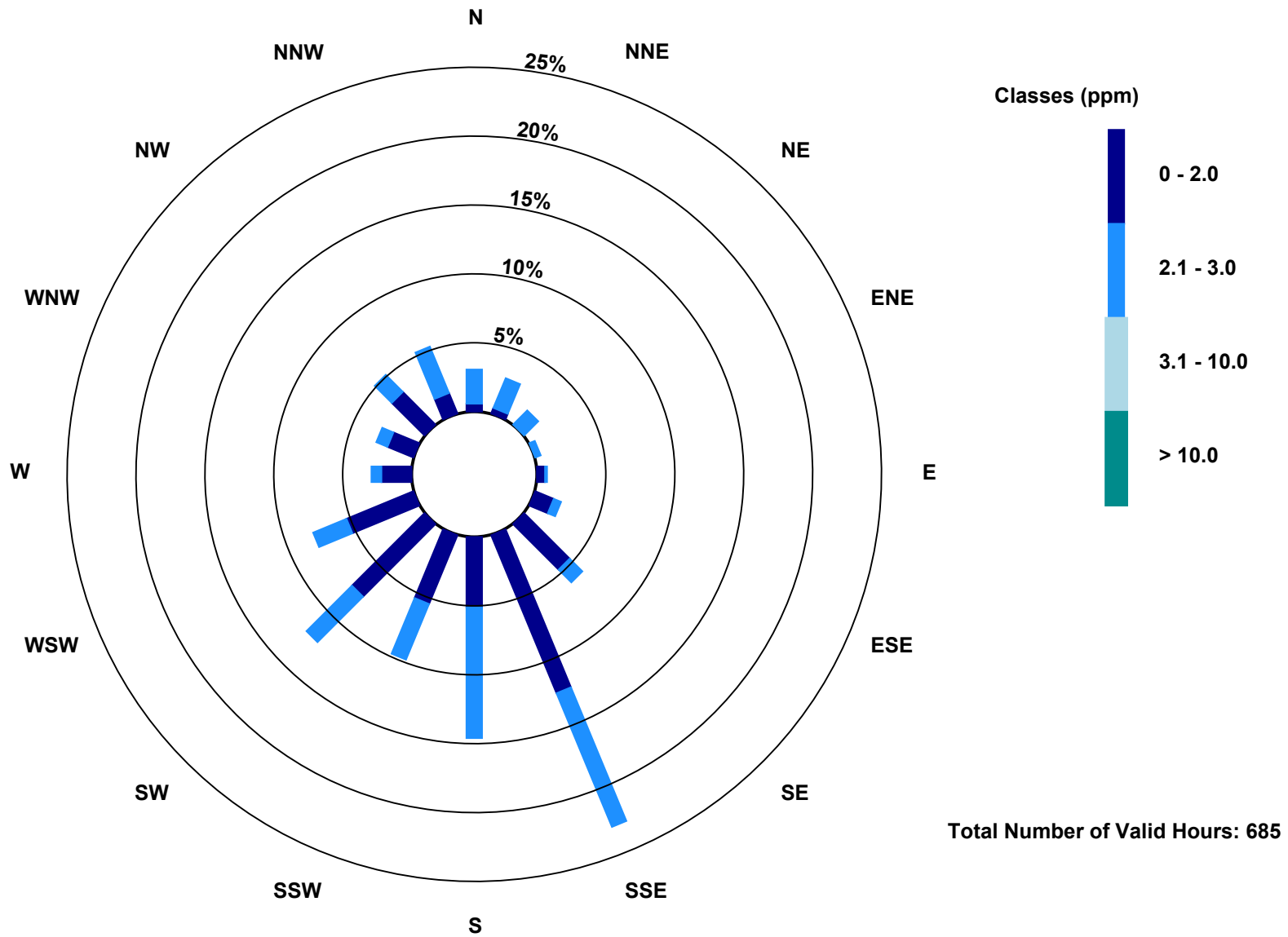
Total Number of Valid Hours: 685

Total Number of Hours: 720

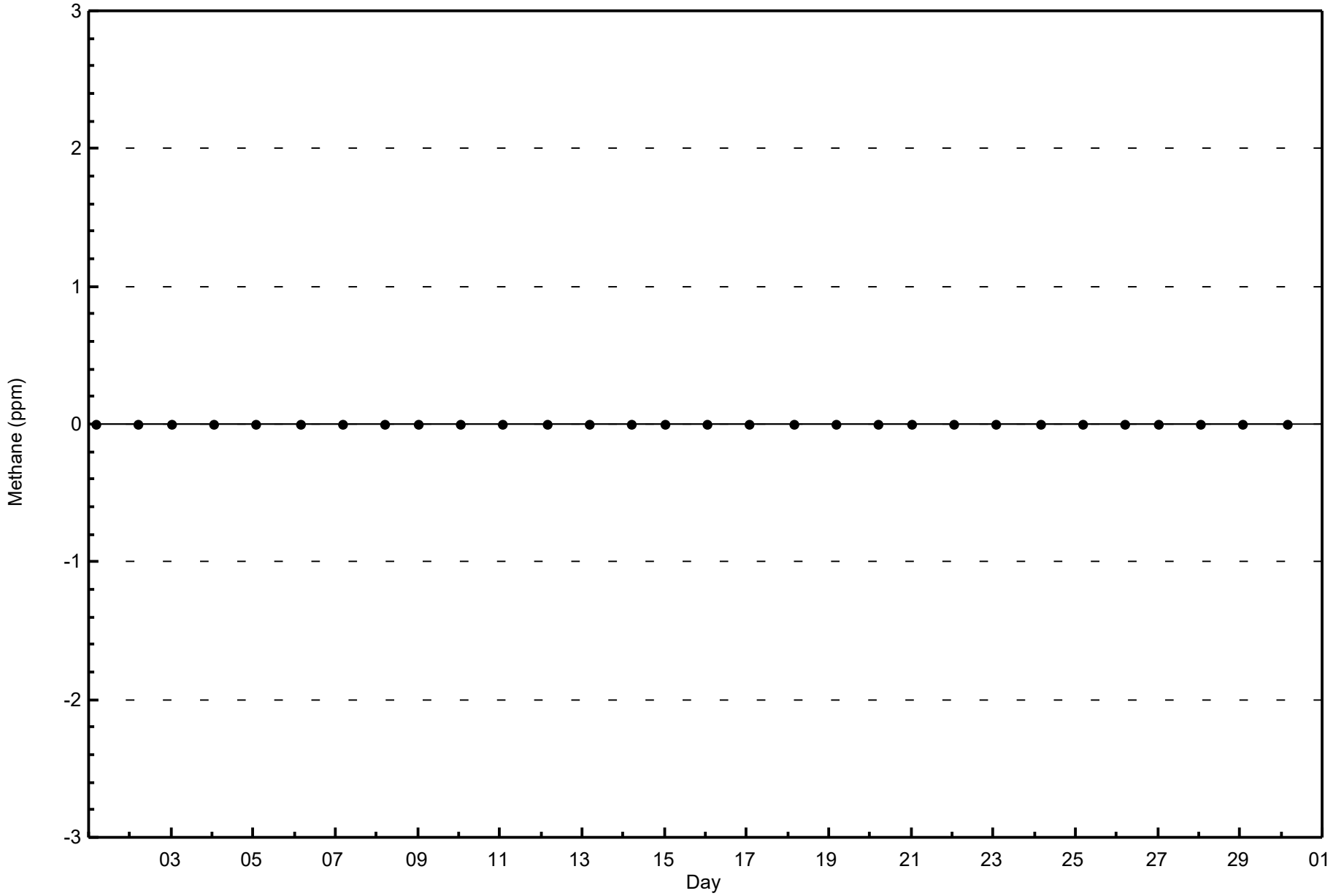


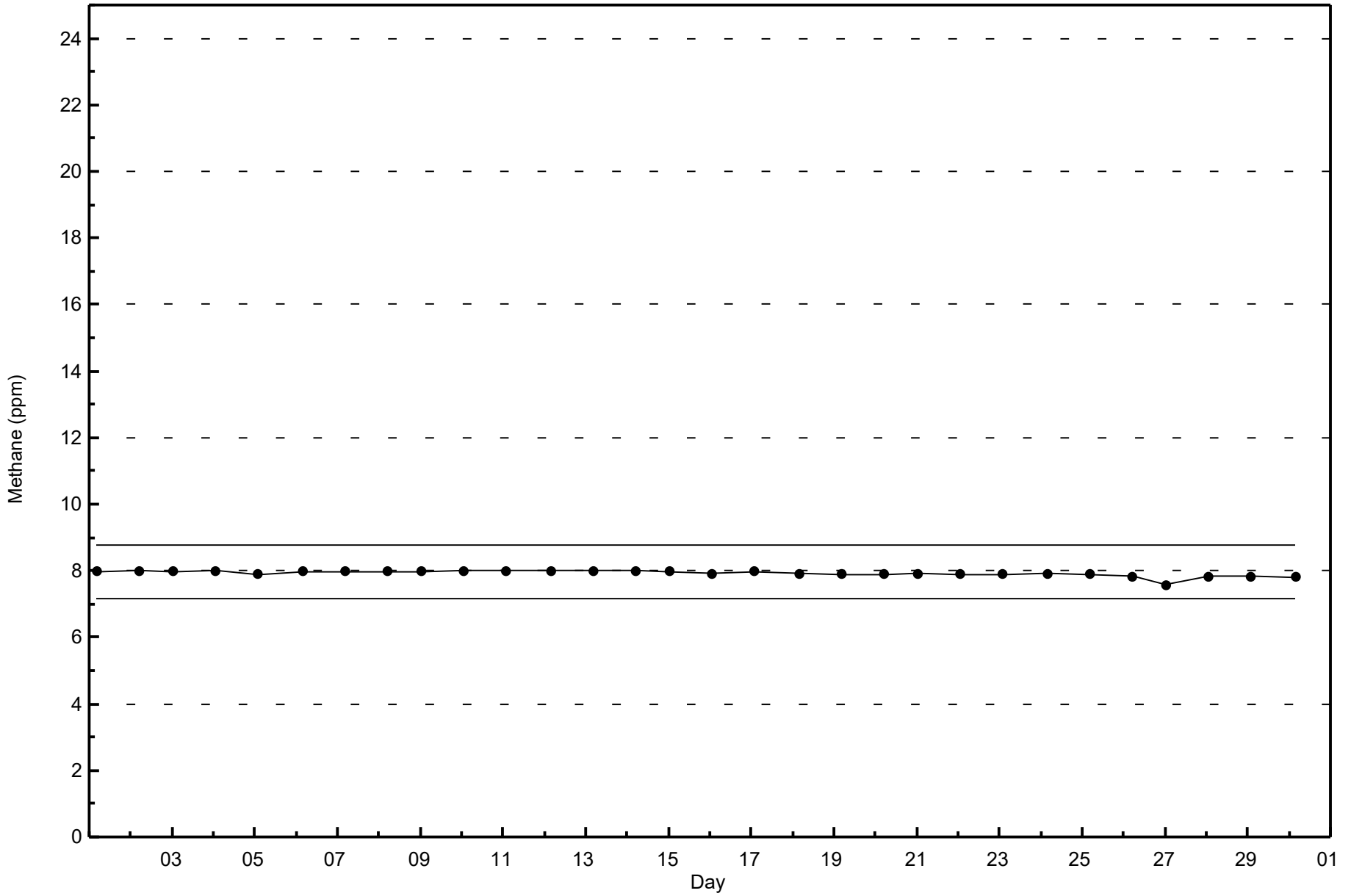
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Methane (CH₄) - ppm
Barge Landing



Total Number of Valid Hours: 685







Wood Buffalo Environmental Association
Summary of Hour Averages

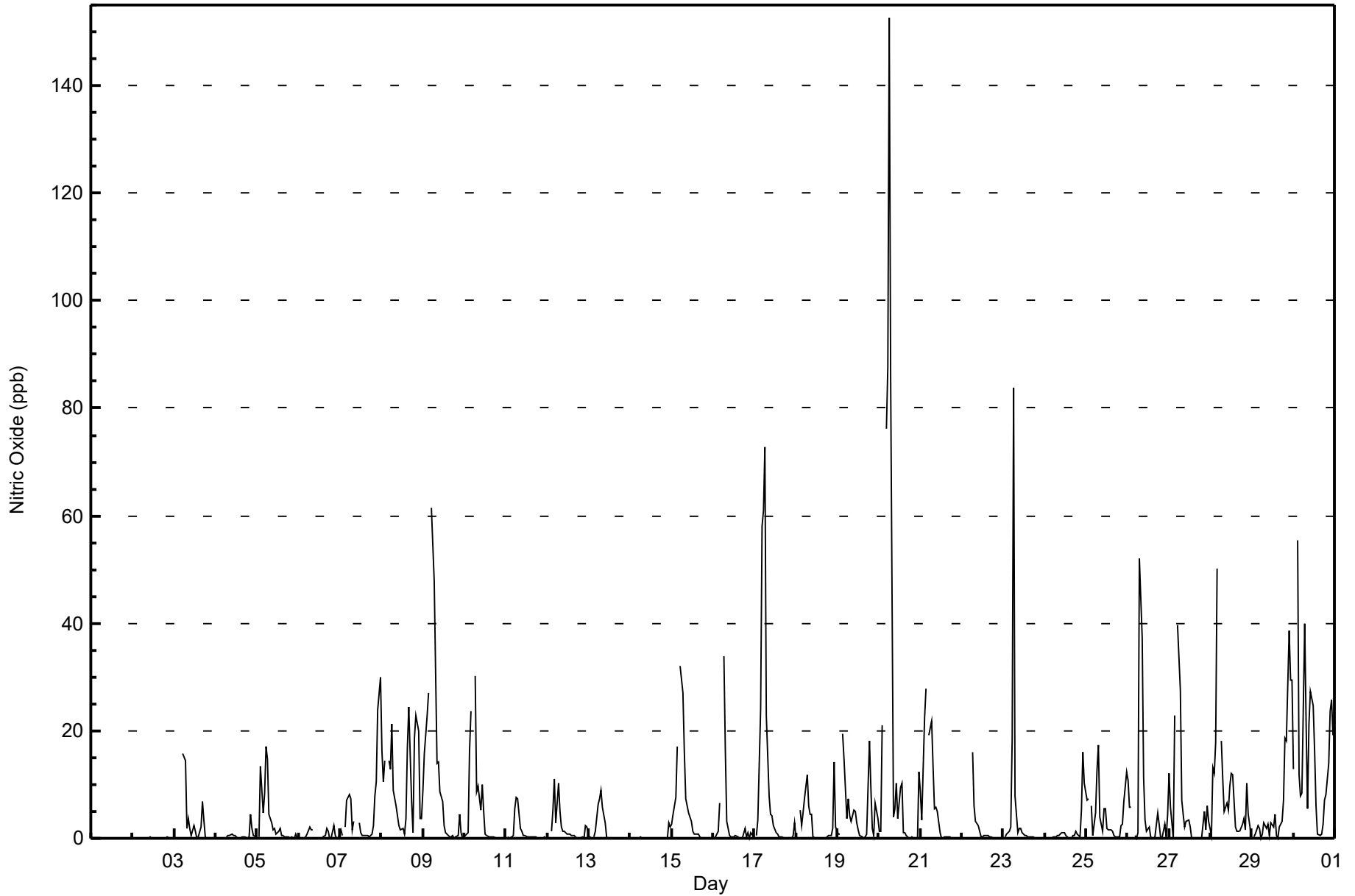
Nitric Oxide (NO) - ppb
Barge Landing - September 2023

Maximum Value: 152.6 ppb on Sep 20 07:00		Maximum Daily Average: 21.0 ppb on Sep 20		Hours in Service: 720																											
Minimum Value: 0.0 ppb on Sep 1 01:00		Minimum Daily Average: 0.0 ppb on Sep 1		Hours of Data: 683																											
Maximum Diurnal Average: 23.1 ppb at hour 7		Minimum Diurnal Average: 0.5 ppb at hour 15		Hours of Missing Data: 37																											
Monthly Average: 5.27 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.8 Q ₃ = 5.1 P ₉₀ = 15.9 P ₉₉ = 60.9		Hours of Calibration: 35																											
				Percent Operational Time: 99.7																											
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24							
1-Sep	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	0.1	0.1	0.0	0.1						
2-Sep	0.0	0.0	0.0	Z	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	0.2	0.0	0.0	0.0	0.0	0.0	0.2					
3-Sep	0.0	0.0	0.0	0.0	Z	15.8	14.5	1.8	3.7	1.7	0.6	2.4	1.2	0.1	0.3	2.0	6.7	3.3	0.3	0.0	0.0	0.0	0.0	0.0	15.8						
4-Sep	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.4	0.5	0.7	0.5	0.5	0.2	0.0	0.0	0.2	0.3	0.2	0.1	0.1	4.5	1.9	0.5	0.2	4.5						
5-Sep	Z	0.2	13.4	4.7	8.4	17.1	14.8	4.4	2.9	1.6	1.9	0.9	1.4	1.9	0.6	0.5	0.2	0.2	0.4	0.1	0.3	0.1	0.7	0.0	3.3	17.1					
6-Sep	0.0	Z	0.1	0.1	0.1	0.8	2.2	1.7	1.5	C	C	C	C	C	0.2	0.4	1.9	1.4	0.0	0.0	2.4	0.4	0.0	0.0	0.7	2.4					
7-Sep	1.5	0.4	Z	2.2	7.1	8.0	7.4	1.5	3.1	M	M	3.0	1.0	0.6	0.5	0.5	0.6	0.3	0.8	2.3	7.8	10.5	23.8	29.8	5.4	29.8					
8-Sep	16.2	10.5	14.3	Z	14.3	12.8	21.3	9.0	6.0	4.1	2.3	1.6	1.8	0.7	3.7	16.8	24.4	6.8	1.0	18.7	22.8	19.9	3.7	3.7	10.3	24.4					
9-Sep	8.9	15.9	22.7	27.1	Z	61.4	47.9	30.7	13.9	14.1	8.7	6.8	2.3	0.9	0.7	0.4	0.3	0.4	0.1	0.3	0.6	4.4	1.0	0.0	11.7	61.4					
10-Sep	0.4	0.7	1.0	16.2	23.5	Z	30.3	8.8	9.7	5.1	9.9	5.1	0.9	0.6	0.4	0.4	0.4	0.2	0.0	0.1	0.1	0.0	0.1	0.1	5.0	30.3					
11-Sep	Z	0.2	0.1	0.2	0.5	5.5	7.7	7.4	1.8	1.3	0.5	0.7	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.1	1.2	7.7					
12-Sep	0.1	Z	1.3	5.3	11.0	2.9	10.1	5.1	2.1	1.3	1.4	0.9	0.9	0.9	0.5	0.4	0.2	0.0	0.0	0.0	0.3	0.1	2.4	2.2	2.1	11.0					
13-Sep	0.0	0.3	Z	0.2	1.4	6.3	7.3	9.0	5.8	3.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	9.0					
14-Sep	0.0	0.0	0.0	Z	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	2.9	2.1	0.2	2.9					
15-Sep	2.7	4.5	7.6	17.2	Z	32.0	27.1	15.9	7.2	6.0	4.8	3.2	1.3	0.8	0.8	0.8	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	5.8	32.0					
16-Sep	0.0	0.3	0.9	1.3	6.4	Z	33.9	16.7	3.1	0.6	0.2	0.2	0.3	0.5	0.3	0.1	0.0	0.1	1.7	0.2	1.1	0.1	1.0	0.3	3.0	33.9					
17-Sep	Z	0.5	3.4	24.1	58.1	60.9	72.9	22.7	7.8	4.4	4.3	2.4	1.1	0.8	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.5	2.8	11.6	72.9					
18-Sep	0.1	Z	5.2	2.3	4.8	7.3	11.8	6.0	4.6	4.4	0.2	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.4	0.6	0.5	1.7	14.1	2.1	2.9	14.1					
19-Sep	0.8	0.9	Z	19.5	14.6	3.6	7.3	4.1	3.1	5.3	5.0	2.9	1.6	0.4	0.2	0.1	0.2	0.8	18.1	9.5	2.0	0.4	6.6	3.8	4.8	19.5					
20-Sep	1.3	1.2	21.0	Z	76.3	87.8	152.6	85.3	4.1	5.5	10.2	3.7	9.4	10.4	1.2	1.0	0.5	0.1	0.0	0.2	0.0	0.0	0.0	12.4	21.0	152.6					
21-Sep	8.8	3.3	22.4	27.9	Z	19.3	21.8	13.5	5.5	5.8	5.0	1.0	0.1	0.1	0.1	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	5.9	27.9					
22-Sep	0.1	0.1	0.1	0.1	0.1	Z	16.0	6.0	3.0	2.3	1.4	0.3	0.2	0.5	0.5	0.4	0.2	0.2	0.0	0.0	0.1	0.1	0.1	0.0	1.4	16.0					
23-Sep	Z	0.3	0.7	1.3	2.1	18.7	83.9	7.8	1.1	1.8	1.9	1.0	0.6	0.6	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	5.4	83.9					
24-Sep	0.0	Z	0.1	0.0	0.0	0.2	0.4	0.4	0.6	0.8	1.1	1.1	0.5	0.2	0.0	0.0	0.4	0.6	1.2	0.9	0.3	5.3	16.0	10.3	1.8	16.0					
25-Sep	7.0	7.3	Z	6.0	0.4	4.6	12.6	17.4	4.0	1.3	5.6	5.5	1.8	1.5	1.5	1.3	0.6	0.2	0.2	0.1	2.3	2.7	6.9	12.2	4.5	17.4					
26-Sep	10.7	5.7	5.7	Z	0.4	0.0	1.0	52.1	37.3	11.2	3.4	1.4	2.0	0.4	0.1	0.1	0.4	4.8	2.6	0.2	0.1	2.6	0.4	4.3	6.4	52.1					
27-Sep	12.0	5.7	0.0	23.0	Z	39.6	27.6	7.1	4.6	2.2	3.3	3.4	2.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	5.0	1.5	6.0	3.1	6.4	39.6					
28-Sep	0.5	13.1	12.1	17.8	50.3	Z	18.2	10.9	5.1	6.7	5.3	9.6	12.0	11.8	2.1	1.4	1.3	1.3	2.7	3.8	1.6	10.2	4.5	0.8	8.8	50.3					
29-Sep	Z	0.2	0.7	2.3	1.9	0.1	0.8	2.9	1.7	2.5	0.5	2.8	2.2	4.4	0.7	0.1	2.1	3.2	7.2	18.7	18.2	38.7	29.4	29.3	7.4	38.7					
30-Sep	12.9	Z	55.3	11.9	7.8	8.5	39.9	21.4	5.4	21.3	27.3	24.6	16.2	5.9	0.8	0.6	0.9	2.6	7.0	8.1	13.9	23.7	25.9	19.1	15.7	55.3					
		3.4	2.9	7.5	8.4	11.6	16.5	23.1	12.3	5.0	4.1	3.8	2.9	2.1	1.5	0.5	1.0	1.4	0.9	1.5	2.1	2.8	4.2	4.9	4.6	Diurnal Average					
		16.2	15.9	55.3	27.9	76.3	87.8	152.6	85.3	37.3	21.3	27.3	24.6	16.2	11.8	3.7	16.8	24.4	6.8	18.1	18.7	22.8	38.7	29.4	29.8	Diurnal Maximum					
Z - zerspan		C - Calibration			M - Maintenance																										



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Barge Landing - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Barge Landing - September 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	637	93.27	93.27
21 - 40	33	4.83	98.10
41 - 80	9	1.32	99.41
81 - 159	4	0.59	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 683

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Barge Landing - September 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	17	10	2	6	12	34	144	95	61	76	53	19	19	34	36	637
21 - 40	3	1	0	0	0	1	3	11	5	3	3	1	0	1	1	0	33
11 - 80	0	0	0	0	0	1	0	3	2	2	1	0	0	0	0	0	9
81 - 159	0	0	0	0	0	0	0	1	0	0	2	1	0	0	0	0	4
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	22	18	10	2	6	14	37	159	102	66	82	55	19	20	35	36	683

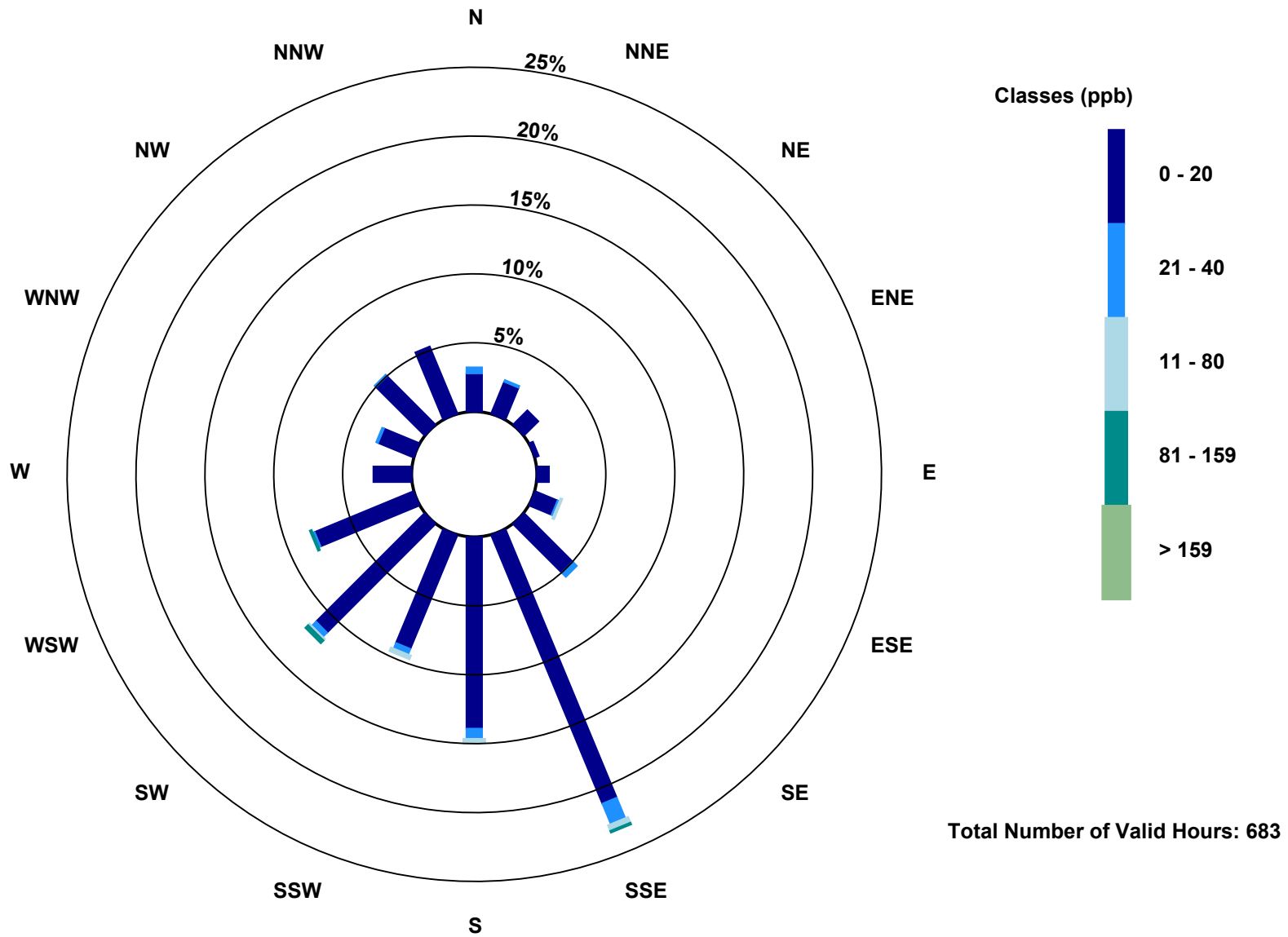
Total Number of Valid Hours: 683

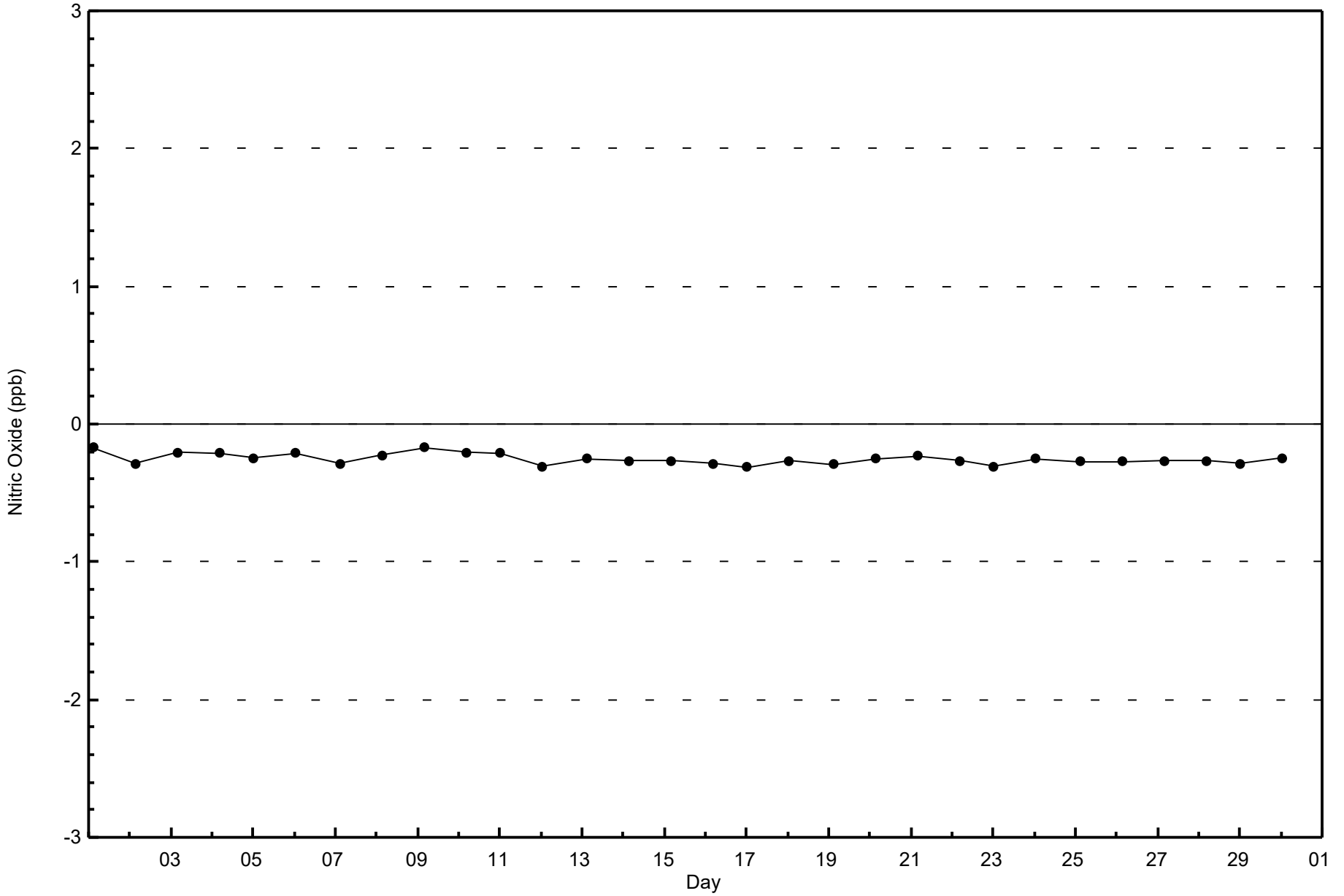
Total Number of Hours: 720

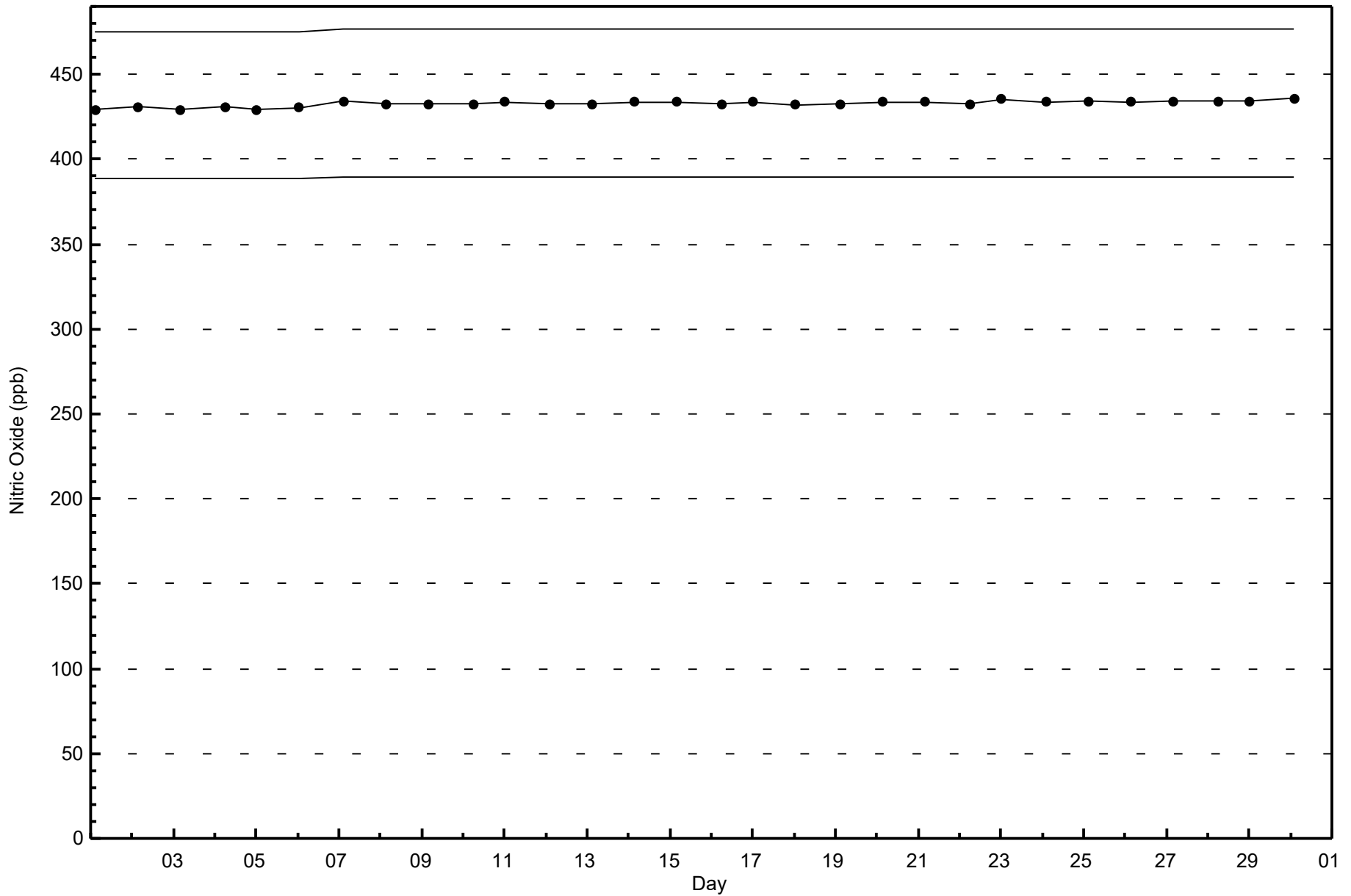


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitric Oxide (NO) - ppb
Barge Landing









Wood Buffalo Environmental Association
Summary of Hour Averages

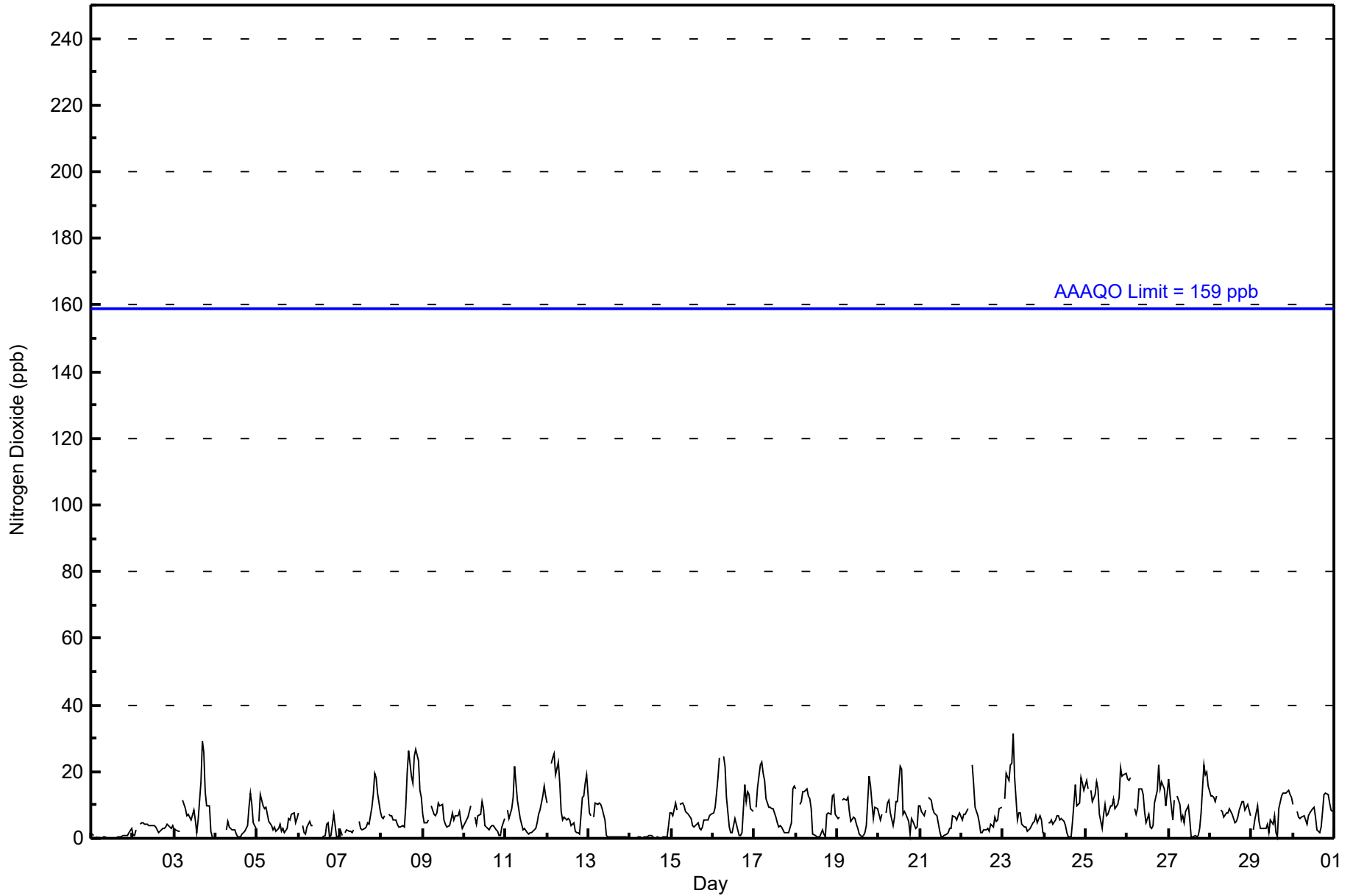
Nitrogen Dioxide (NO₂) - ppb
Barge Landing - September 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 31.3 ppb on Sep 23 07:00	Maximum Daily Average: 12.4 ppb on Sep 25		Hours of Data:	683
Minimum Value: 0.0 ppb on Sep 4 03:00	Minimum Daily Average: 0.6 ppb on Sep 1		Hours of Missing Data:	37
Maximum Diurnal Average: 10.6 ppb at hour 7	Minimum Diurnal Average: 2.7 ppb at hour 15		Hours of Calibration:	35
Monthly Average: 7.02 ppb	Percentiles: P ₁ = 0.1 P ₁₀ = 0.6 Q ₁ = 2.7 Median = 5.8 Q ₃ = 9.7 P ₉₀ = 14.8 P ₉₉ = 24.7		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-Sep	1.4	1.0	Z	0.5	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.3	0.5	0.3	0.9	1.0	0.9	0.8	1.8	2.9	0.6	2.9
2-Sep	1.0	0.9	2.5	Z	4.2	4.7	4.5	4.4	4.4	3.8	4.0	3.8	3.8	3.3	2.4	1.7	2.3	3.0	2.9	3.2	4.3	3.3	2.9	3.7	3.3	4.7
3-Sep	2.5	2.5	2.1	2.1	Z	11.6	9.0	6.9	7.1	6.4	5.5	8.4	5.5	1.8	5.6	16.9	29.2	25.8	14.1	9.7	9.6	2.2	0.6	0.1	8.1	29.2
4-Sep	0.1	0.1	0.0	0.0	0.0	Z	2.7	5.0	3.3	2.7	2.6	2.4	1.1	0.5	0.4	1.1	1.7	2.2	3.9	9.4	13.5	10.3	4.8	2.8	3.1	13.5
5-Sep	Z	5.1	13.1	9.7	9.0	9.4	7.3	4.9	4.0	2.7	3.5	2.2	3.1	4.1	2.3	2.8	1.7	3.0	6.1	5.7	7.4	7.8	4.8	5.9	5.5	13.1
6-Sep	7.6	Z	3.9	1.9	1.4	3.5	5.1	3.8	3.8	C	C	C	C	C	0.6	0.9	4.1	4.5	0.5	0.7	7.1	3.7	0.5	0.3	3.0	7.6
7-Sep	2.1	0.9	Z	1.6	2.5	2.0	2.0	1.5	2.7	M	M	4.9	3.0	2.7	2.9	3.6	4.8	4.1	9.5	13.1	19.4	18.4	13.7	7.9	5.9	19.4
8-Sep	6.5	6.1	6.6	Z	7.0	6.7	6.8	5.7	5.5	4.4	3.4	3.2	3.8	3.6	9.9	20.1	26.1	18.5	16.4	24.7	26.7	23.4	14.3	12.1	11.4	26.7
9-Sep	7.3	4.8	4.5	5.7	Z	9.6	7.4	6.7	7.8	10.7	9.6	10.1	5.6	4.2	3.6	4.0	5.5	7.6	5.6	6.9	6.6	7.9	5.1	3.1	6.5	10.7
10-Sep	4.8	5.7	6.4	7.9	9.7	Z	6.3	4.3	6.9	7.2	11.1	8.8	3.9	3.3	2.5	3.3	3.7	4.0	2.6	2.0	0.9	0.9	3.5	6.0	5.0	11.1
11-Sep	Z	8.3	6.0	8.8	12.2	21.4	16.4	11.4	6.1	4.4	2.6	3.1	1.9	1.4	1.5	1.8	2.1	3.0	4.6	7.2	8.3	12.5	15.7	12.7	7.5	21.4
12-Sep	10.8	Z	22.5	24.1	25.6	18.9	23.0	16.5	7.9	5.3	6.2	5.4	6.0	5.5	4.0	4.5	2.3	1.9	1.7	1.4	12.2	12.9	16.7	19.0	11.1	25.6
13-Sep	7.7	6.9	Z	6.4	10.5	10.1	10.8	10.2	8.7	5.4	0.9	0.5	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.5	0.4	0.4	0.3	0.2	3.6	10.8
14-Sep	0.2	0.2	0.2	Z	0.5	0.4	0.6	0.2	0.3	0.4	0.5	0.8	0.7	0.3	0.2	0.2	0.4	0.2	0.2	0.4	0.5	0.5	3.9	7.7	0.8	7.7
15-Sep	7.7	6.9	10.5	8.4	Z	10.3	10.6	9.8	8.2	7.6	7.3	5.9	3.8	3.3	4.0	4.8	2.9	2.7	3.4	5.6	5.5	5.7	6.9	7.1	6.5	10.6
16-Sep	7.5	9.3	13.7	18.4	24.0	Z	24.7	21.8	12.3	3.4	1.6	1.7	3.8	5.9	2.6	1.0	0.7	1.7	16.2	11.0	13.8	13.0	8.9	8.1	9.8	24.7
17-Sep	Z	9.4	15.1	21.9	23.0	19.6	17.5	11.7	9.5	9.3	9.0	8.8	6.3	4.7	3.2	3.7	3.4	1.9	1.8	1.8	1.6	4.8	14.8	15.7	9.5	23.0
18-Sep	14.9	Z	10.3	11.0	13.8	14.0	14.8	12.7	11.9	8.8	1.4	0.7	0.5	0.5	0.4	2.6	1.1	0.4	7.4	7.6	7.2	12.5	13.0	7.1	7.6	14.9
19-Sep	5.9	6.4	Z	11.4	11.7	11.6	12.2	8.0	5.1	6.2	6.1	4.3	2.9	1.1	0.5	0.7	1.6	3.9	18.6	15.7	10.7	6.1	9.4	8.9	7.3	18.6
20-Sep	7.4	5.4	7.1	Z	7.7	10.4	11.5	7.8	4.0	6.4	10.9	11.1	21.6	20.7	7.1	8.1	7.3	4.9	1.4	5.8	5.0	3.0	3.2	9.8	8.2	21.6
21-Sep	9.9	8.2	6.7	8.4	Z	12.2	11.4	9.0	7.7	7.0	6.9	2.2	0.6	0.6	0.9	1.4	1.7	3.1	3.1	6.7	6.5	5.6	6.8	7.8	5.8	12.2
22-Sep	5.5	7.0	7.2	8.1	9.1	Z	22.1	16.3	9.5	6.6	4.5	1.8	1.6	2.6	2.7	3.1	2.1	4.2	3.6	6.4	5.2	5.7	8.8	9.4	6.7	22.1
23-Sep	Z	11.8	19.3	17.3	22.0	22.4	31.3	18.1	5.6	7.5	7.8	4.4	3.4	3.2	2.3	2.4	2.8	4.8	5.0	6.6	4.7	6.9	5.6	1.9	9.4	31.3
24-Sep	1.5	Z	4.6	4.5	5.3	4.4	5.5	6.7	6.6	5.5	5.9	5.1	3.8	1.9	0.5	0.5	4.9	10.5	16.2	9.8	10.5	18.3	16.6	14.5	7.1	18.3
25-Sep	17.5	14.7	Z	14.5	11.0	13.3	17.1	14.8	7.4	2.9	7.1	10.0	6.6	7.3	9.7	9.8	11.7	8.9	10.0	12.1	21.2	18.8	19.1	19.3	12.4	21.2
26-Sep	17.7	17.3	18.4	Z	8.9	7.2	9.1	14.8	14.7	13.3	8.0	4.6	7.2	3.4	2.8	4.0	10.6	14.6	22.2	14.8	16.8	15.0	9.6	13.6	11.7	22.2
27-Sep	17.6	13.1	5.7	11.6	Z	12.6	10.2	5.5	6.8	4.6	8.2	9.6	5.7	0.6	0.5	0.7	0.5	0.8	2.9	7.8	22.2	19.1	20.0	15.7	8.8	22.2
28-Sep	12.5	12.9	12.3	10.9	12.7	Z	8.4	8.2	6.3	7.7	7.5	8.7	8.2	7.2	4.5	5.2	6.4	8.4	11.0	10.9	8.3	9.3	10.2	6.6	8.9	12.9
29-Sep	Z	2.4	5.4	9.6	5.0	3.1	3.1	3.0	3.1	4.4	1.5	5.4	4.1	6.9	1.8	0.3	9.1	12.7	13.5	13.6	13.4	14.2	13.3	12.3	7.0	14.2
30-Sep	10.3	Z	8.1	6.4	5.8	6.2	6.8	5.6	4.1	6.7	7.5	8.7	9.3	6.4	2.4	1.9	3.3	7.9	13.2	13.5	13.1	10.7	8.6	8.1	7.6	13.5

7.5	6.7	8.5	9.2	9.7	9.8	10.6	8.5	6.4	5.8	5.4	5.1	4.4	3.7	2.7	3.7	5.2	5.7	7.3	7.9	9.5	9.1	8.8	8.3	Diurnal Average	
17.7	17.3	22.5	24.1	25.6	22.4	31.3	21.8	14.7	13.3	11.1	11.1	21.6	20.7	9.9	20.1	29.2	25.8	22.2	24.7	26.7	23.4	20.0	19.3	Diurnal Maximum	

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
Barge Landing - September 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	658	96.34	96.34
21 - 40	25	3.66	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: 683

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Barge Landing - September 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	16	9	2	6	13	36	148	99	65	82	55	19	20	35	33	658
21 - 40	2	2	1	0	0	1	1	11	3	1	0	0	0	0	0	3	25
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	18	10	2	6	14	37	159	102	66	82	55	19	20	35	36	683

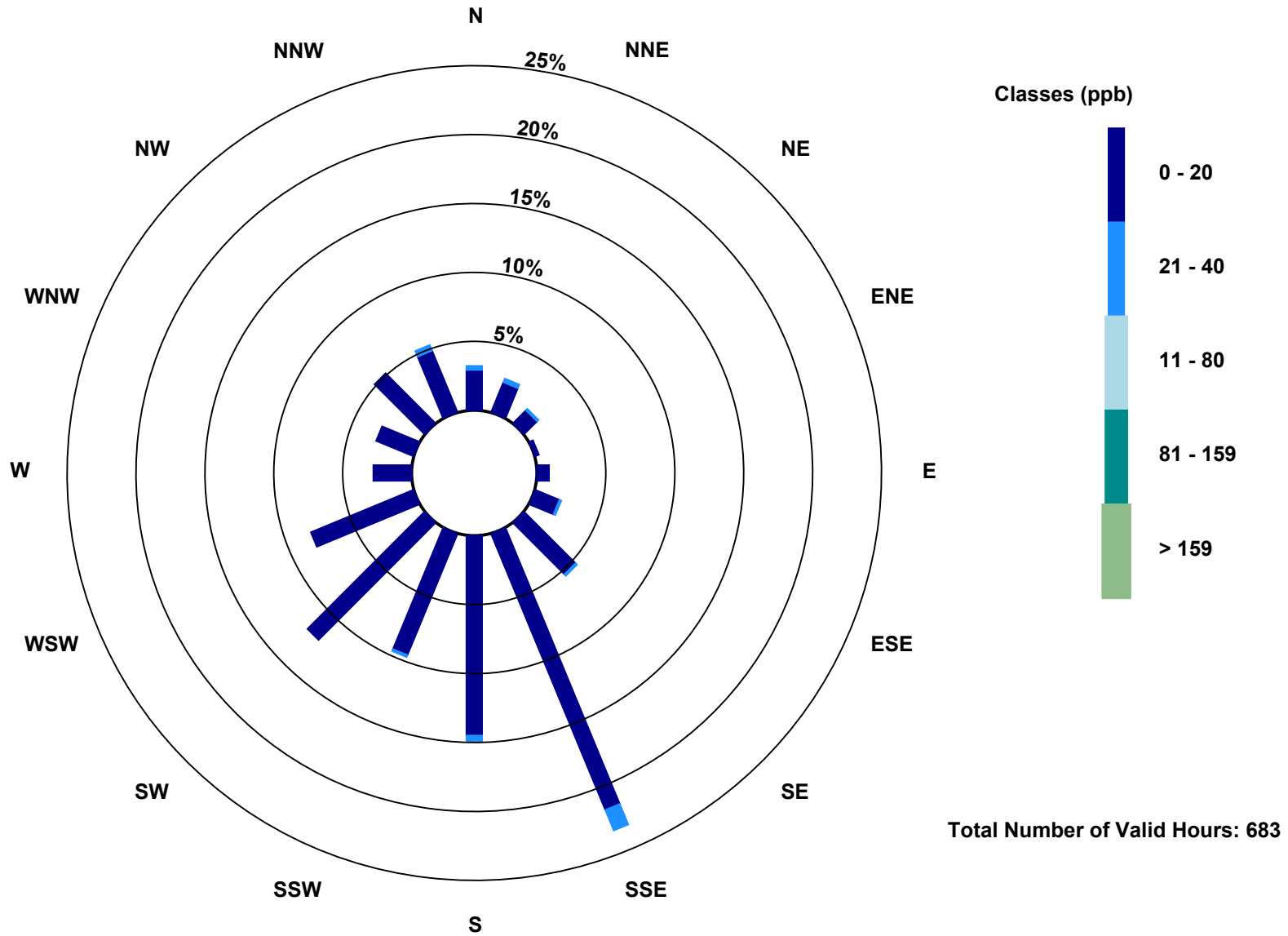
Total Number of Valid Hours: 683

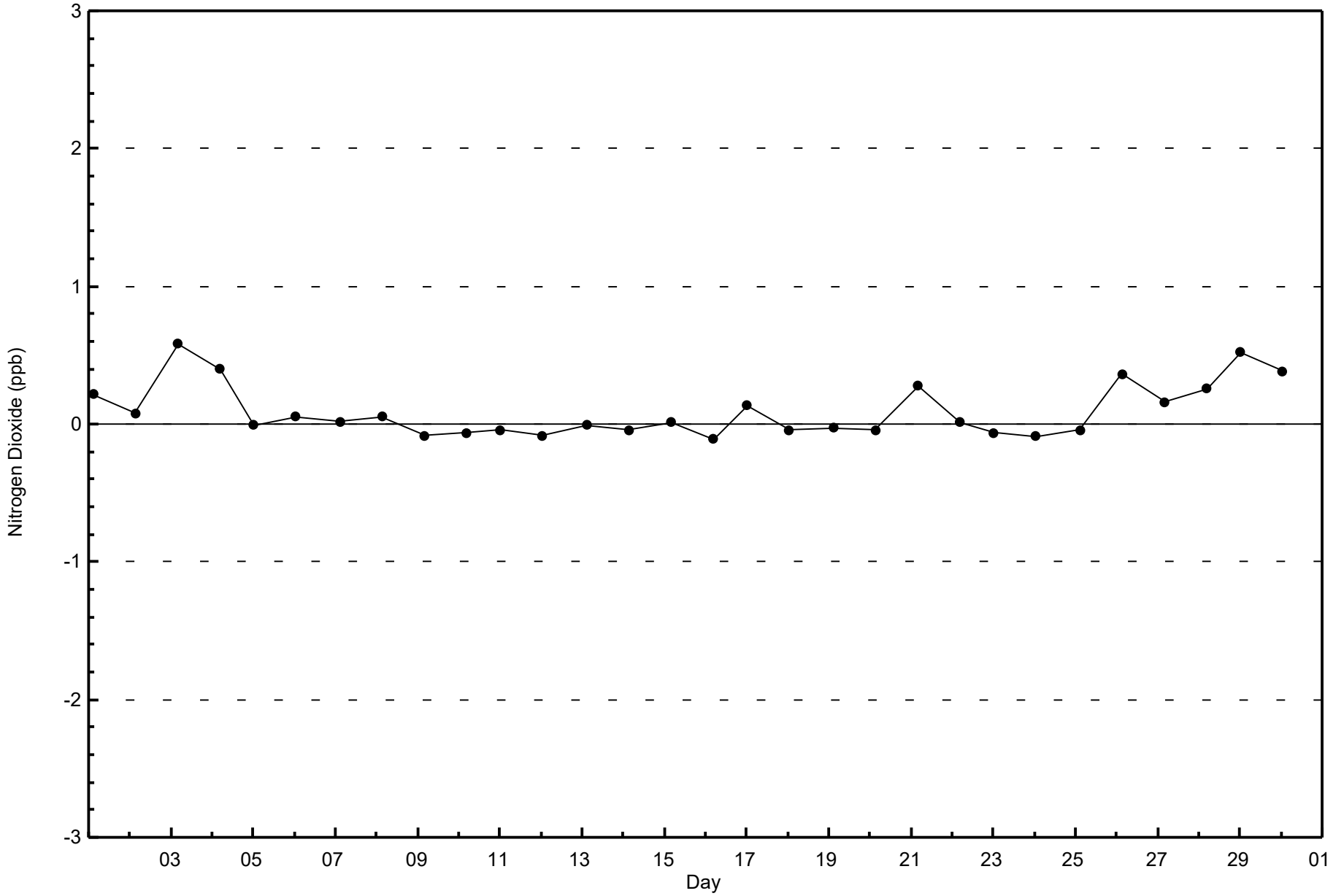
Total Number of Hours: 720

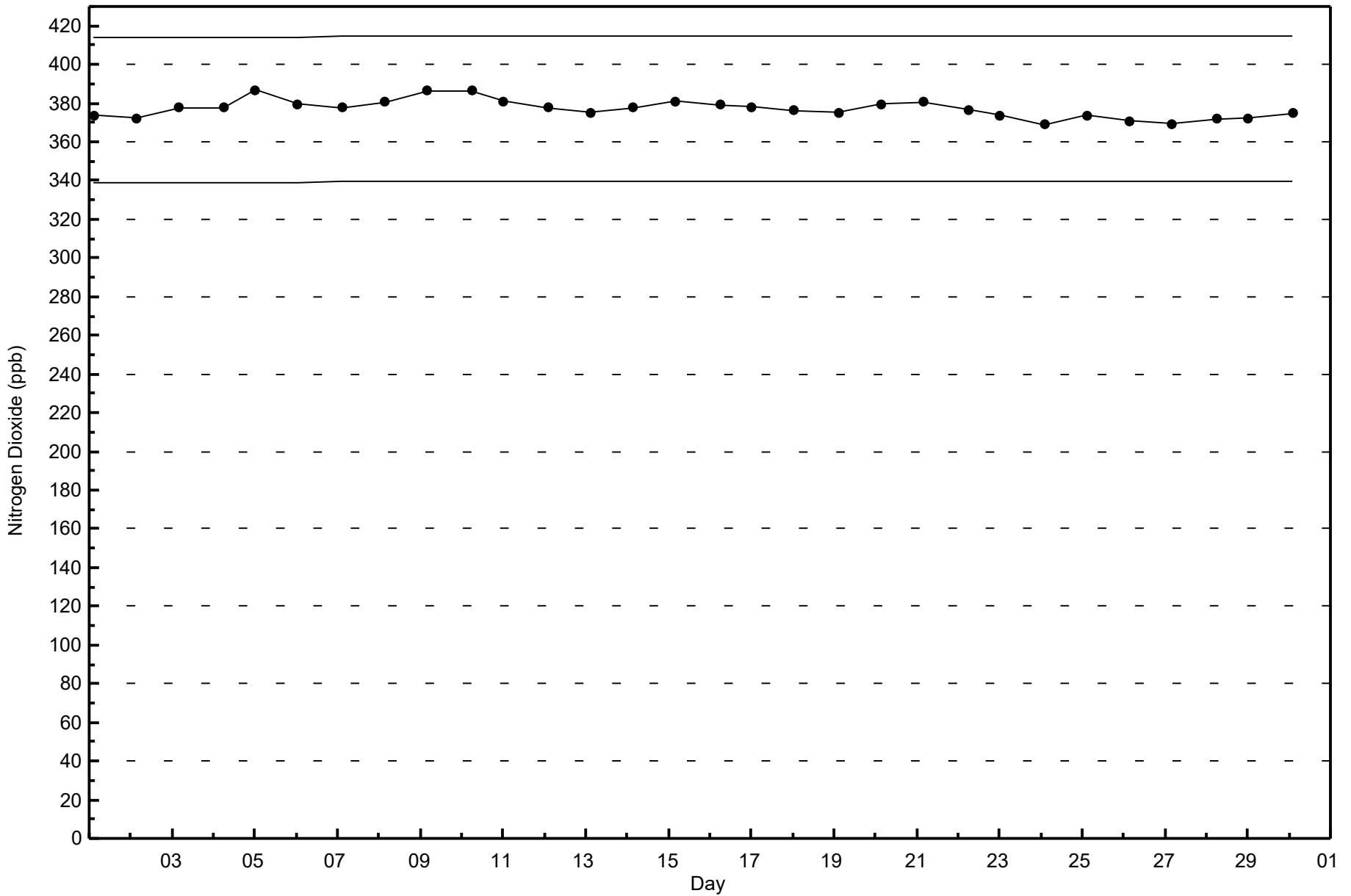


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitrogen Dioxide (NO₂) - ppb
Barge Landing





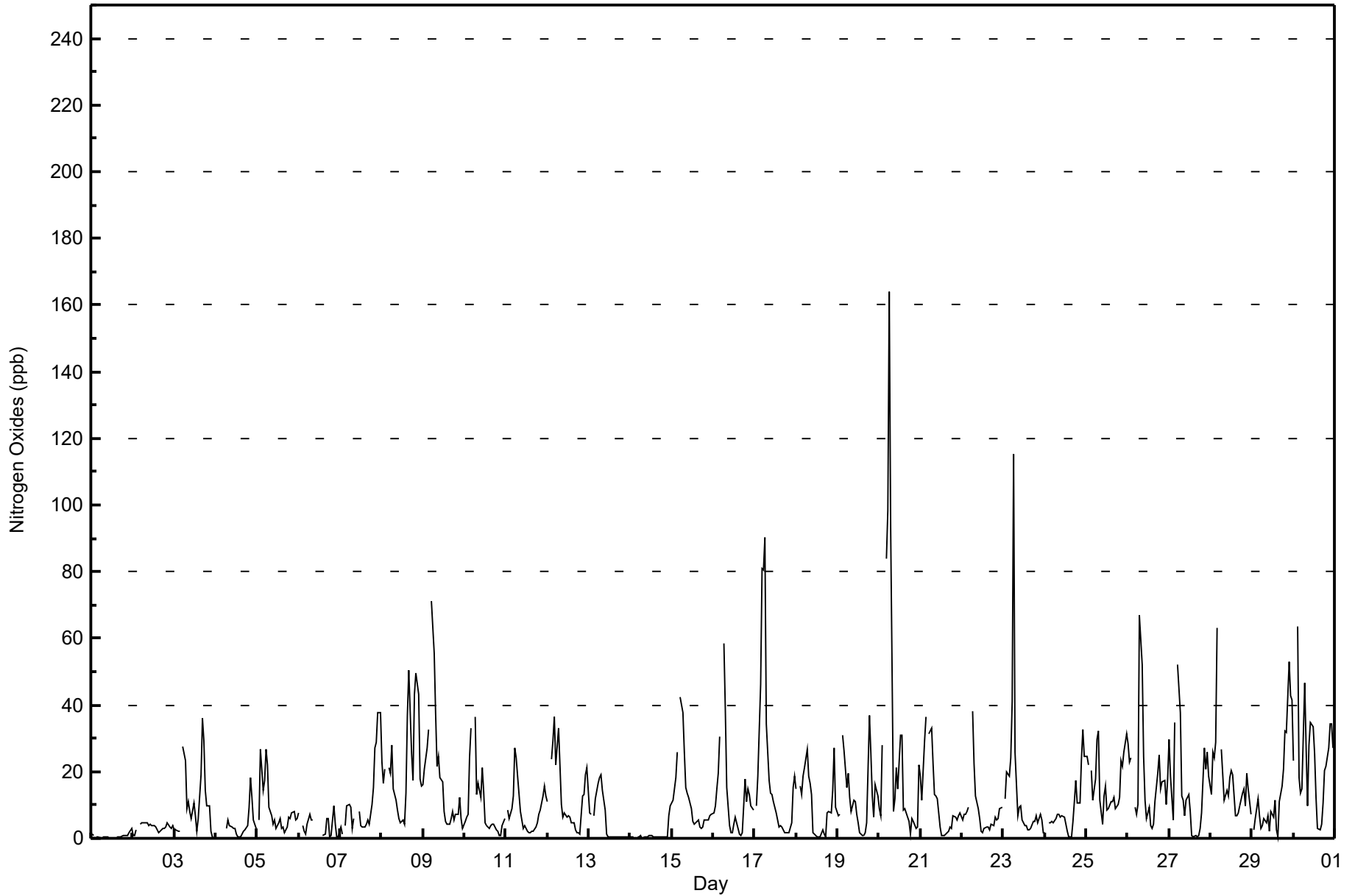




Wood Buffalo Environmental Association
Summary of Hour Averages

Nitrogen Oxides (NO_x) - ppb
Barge Landing - September 2023

Maximum Value: 164.1 ppb on Sep 20 07:00																						Maximum Daily Average: 29.2 ppb on Sep 20																						Hours in Service: 720					
Minimum Value: 0.0 ppb on Sep 4 04:00																						Minimum Daily Average: 0.6 ppb on Sep 1																						Hours of Data: 683					
Maximum Diurnal Average: 33.7 ppb at hour 7																						Minimum Diurnal Average: 3.3 ppb at hour 15																						Hours of Missing Data: 37					
Monthly Average: 12.28 ppb																						Percentiles: P ₁ = 0.1 P ₁₀ = 0.7 Q ₁ = 3.1 Median = 7.2 Q ₃ = 16.6 P ₉₀ = 28.1 P ₉₉ = 80.6																						Hours of Calibration: 35					
																																												Percent Operational Time: 99.7					
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Sep	1.4	1.0	Z	0.5	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.3	0.5	0.3	0.9	1.0	0.9	0.8	1.9	3.0	0.6	3.0																							
2-Sep	1.0	0.9	Z	2.5	Z	4.2	4.7	4.6	4.5	4.5	3.9	4.1	3.9	3.9	3.3	2.4	1.7	2.3	3.0	2.9	3.3	4.5	3.3	2.9	3.7	3.3	4.7																						
3-Sep	2.5	2.5	2.1	2.1	Z	27.4	23.5	8.7	10.8	8.1	6.1	10.8	6.7	1.9	5.9	18.9	35.9	29.1	14.4	9.7	9.6	2.2	0.6	0.1	10.4	35.9																							
4-Sep	0.1	0.1	0.0	0.0	0.0	Z	2.8	5.4	3.8	3.4	3.1	2.9	1.3	0.5	0.4	1.3	2.0	2.4	4.0	9.5	18.0	12.2	5.3	3.0	3.6	18.0																							
5-Sep	Z	5.3	26.5	14.4	17.4	Z	26.5	22.1	9.3	6.9	4.3	5.4	3.1	4.5	6.0	2.9	3.3	1.9	3.2	6.5	5.8	7.7	7.9	5.5	5.9	8.8	26.5																						
6-Sep	7.6	Z	4.0	2.0	1.5	4.3	7.3	5.5	5.3	C	C	C	C	C	0.8	1.3	6.0	5.9	0.5	0.7	9.5	4.1	0.5	0.3	3.7	9.5																							
7-Sep	3.6	1.3	Z	3.8	9.6	10.0	9.4	3.0	5.8	M	M	7.9	4.0	3.3	3.4	4.1	5.4	4.4	10.3	15.4	27.2	28.9	37.5	37.7	11.2	37.7																							
8-Sep	22.7	16.6	20.9	Z	21.3	19.5	28.1	14.7	11.5	8.5	5.7	4.8	5.6	4.3	13.6	36.9	50.5	25.3	17.4	43.4	49.5	43.3	18.0	15.8	21.6	50.5																							
9-Sep	16.2	20.7	27.2	32.8	Z	71.0	55.3	37.4	21.7	24.8	18.3	16.9	7.9	5.1	4.3	4.4	5.8	8.0	5.7	7.2	7.2	12.3	6.1	3.1	18.2	71.0																							
10-Sep	5.2	6.4	7.4	24.1	33.2	Z	36.6	13.1	16.6	12.3	21.0	13.9	4.8	3.9	2.9	3.7	4.1	4.2	2.6	2.1	1.0	0.9	3.6	6.1	10.0	36.6																							
11-Sep	Z	8.5	6.1	9.0	12.7	26.9	24.1	18.8	7.9	5.7	3.1	3.8	2.2	1.6	1.7	2.0	2.3	3.2	4.7	7.3	8.4	12.6	15.9	12.8	8.8	26.9																							
12-Sep	10.9	Z	23.8	29.4	36.6	21.8	33.1	21.6	10.0	6.6	7.6	6.3	6.9	6.4	4.5	4.9	2.5	1.9	1.7	1.4	12.5	13.0	19.1	21.2	13.2	36.6																							
13-Sep	7.7	7.2	Z	6.6	11.9	16.4	18.1	19.2	14.5	8.4	1.2	0.5	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.5	0.4	0.4	0.3	0.2	5.0	19.2																							
14-Sep	0.2	0.2	0.2	Z	0.5	0.4	0.8	0.2	0.3	0.4	0.5	0.8	0.7	0.3	0.2	0.2	0.4	0.2	0.2	0.4	0.5	0.5	6.8	9.8	1.1	9.8																							
15-Sep	10.4	11.4	18.1	25.6	Z	42.3	37.7	25.7	15.4	13.6	12.1	9.1	5.1	4.1	4.8	5.6	3.2	2.8	3.4	5.6	5.5	5.7	6.9	7.1	12.2	42.3																							
16-Sep	7.5	9.6	14.6	19.7	30.4	Z	58.6	38.5	15.4	4.0	1.8	1.9	4.1	6.4	2.9	1.1	0.7	1.8	17.9	11.2	14.9	13.1	9.9	8.4	12.8	58.6																							
17-Sep	Z	9.9	18.5	46.0	81.1	80.5	90.4	34.4	17.3	13.7	13.3	11.2	7.4	5.5	3.4	3.9	3.5	1.9	1.8	1.8	1.6	4.8	15.3	18.5	21.1	90.4																							
18-Sep	15.0	Z	15.5	13.3	18.6	21.3	26.6	18.7	16.5	13.2	1.6	0.7	0.5	0.5	0.4	2.7	1.1	0.4	7.8	8.2	7.7	14.2	27.1	9.2	10.5	27.1																							
19-Sep	6.7	7.3	Z	30.9	26.3	15.2	19.5	12.1	8.2	11.5	11.1	7.2	4.5	1.5	0.7	0.8	1.8	4.7	36.7	25.2	12.7	6.5	16.0	12.7	12.2	36.7																							
20-Sep	8.7	6.6	28.1	Z	84.0	98.2	164.1	93.1	8.1	11.9	21.1	14.8	31.0	31.1	8.3	9.1	7.8	5.0	1.4	6.0	5.0	3.0	3.2	22.2	29.2	164.1																							
21-Sep	18.7	11.5	29.1	36.3	Z	31.5	33.2	22.5	13.2	12.8	11.9	3.2	0.7	0.7	1.0	1.6	1.9	3.3	3.1	6.7	6.5	5.6	6.8	7.8	11.7	36.3																							
22-Sep	5.6	7.1	7.3	8.2	9.2	Z	38.1	22.3	12.5	8.9	5.9	2.1	1.8	3.1	3.2	3.5	2.3	4.4	3.6	6.4	5.3	5.8	8.9	9.4	8.0	38.1																							
23-Sep	Z	12.1	20.0	18.6	24.1	41.1	115.2	25.9	6.7	9.3	9.7	5.4	4.0	3.8	2.6	3.0	5.0	5.1	6.7	4.8	7.0	5.6	1.9		14.8	115.2																							
24-Sep	1.5	Z	4.7	4.5	5.3	4.6	5.9	7.1	7.2	6.3	7.0	6.2	4.3	2.1	0.5	0.5	5.3	11.1	17.4	10.7	10.8	23.6	32.6	24.8	8.9	32.6																							
25-Sep	24.5	22.0	Z	20.5	11.4	17.9	29.7	32.2	11.4	4.2	12.7	15.5	8.4	8.8	11.2	11.1	12.3	9.1	10.2	12.2	23.5	21.5	26.0	31.5	16.9	32.2																							
26-Sep	28.4	23.0	24.1	Z	9.3	7.2	10.1	66.9	52.0	24.5	11.4	6.0	9.2	3.8	2.9	4.1	11.0	19.4	24.8	15.0	16.9	17.6	10.0	17.9	18.1	66.9																							
27-Sep	29.6	18.8	5.7	34.6	Z	52.2	37.8	12.6	11.4	6.8	11.5	13.0	7.8	0.7	0.6	0.8	0.5	0.8	2.9	7.8	27.2	20.6	26.0	18.8	15.2	52.2																							
28-Sep	13.0	26.0	24.4	28.7	63.0	Z	26.6	19.1	11.4	14.4	12.8	18.3	20.2	19.0	6.6	6.6	7.7	9.7	13.7	14.7	9.9	19.5	14.7	7.4	17.7	63.0																							
29-Sep	Z	2.6	6.1	11.9	6.9	3.2	3.9	5.9	4.8	6.9	2.0	8.2	6.3	11.3	2.5	0.4	11.2	15.9	20.7	32.3	31.6	52.9	42.7	41.6	14.4	52.9																							
30-Sep	23.2	Z	63.4	18.3	13.6	14.7	46.7	27.0	9.5	28.0	34.8	33.3	25.5	12.3	3.2	2.5	4.2	10.5	20.2	21.6	27.0	34.4	34.5	27.2	23.3	63.4																							
																								10.9	9.5	16.0	17.7	21.3	26.4	33.7	20.9	11.4	9.9	9.2	8.0	6.6	5.2	3.3	4.7	6.6	6.6	8.8	10.0	12.3	13.3	13.7	13.0	Diurnal Average	
																								29.6	26.0	63.4	46.0	84.0	98.2	164.1	93.1	52.0	28.0	34.8	33.3	31.0	31.1	13.6	36.9	50.5	29.1	36.7	43.4	49.5	52.9	42.7	41.6	Diurnal Maximum	
Z - zerspan																								C - Calibration				M - Maintenance																					





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Barge Landing - September 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	552	80.82	80.82
21 - 40	104	15.23	96.05
41 - 80	20	2.93	98.98
81 - 159	5	0.73	99.71
> 159	1	0.15	99.85

Total Number of Valid Hours: 683

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Barge Landing - September 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	15	6	2	6	11	29	119	81	52	72	51	19	19	32	25	552
21 - 40	5	2	4	0	0	2	7	32	18	11	6	3	0	1	3	10	104
11 - 80	4	1	0	0	0	1	1	5	3	3	1	0	0	0	0	1	20
81 - 159	0	0	0	0	0	0	0	2	0	0	2	1	0	0	0	0	5
> 159	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Totals	22	18	10	2	6	14	37	158	102	66	82	55	19	20	35	36	682

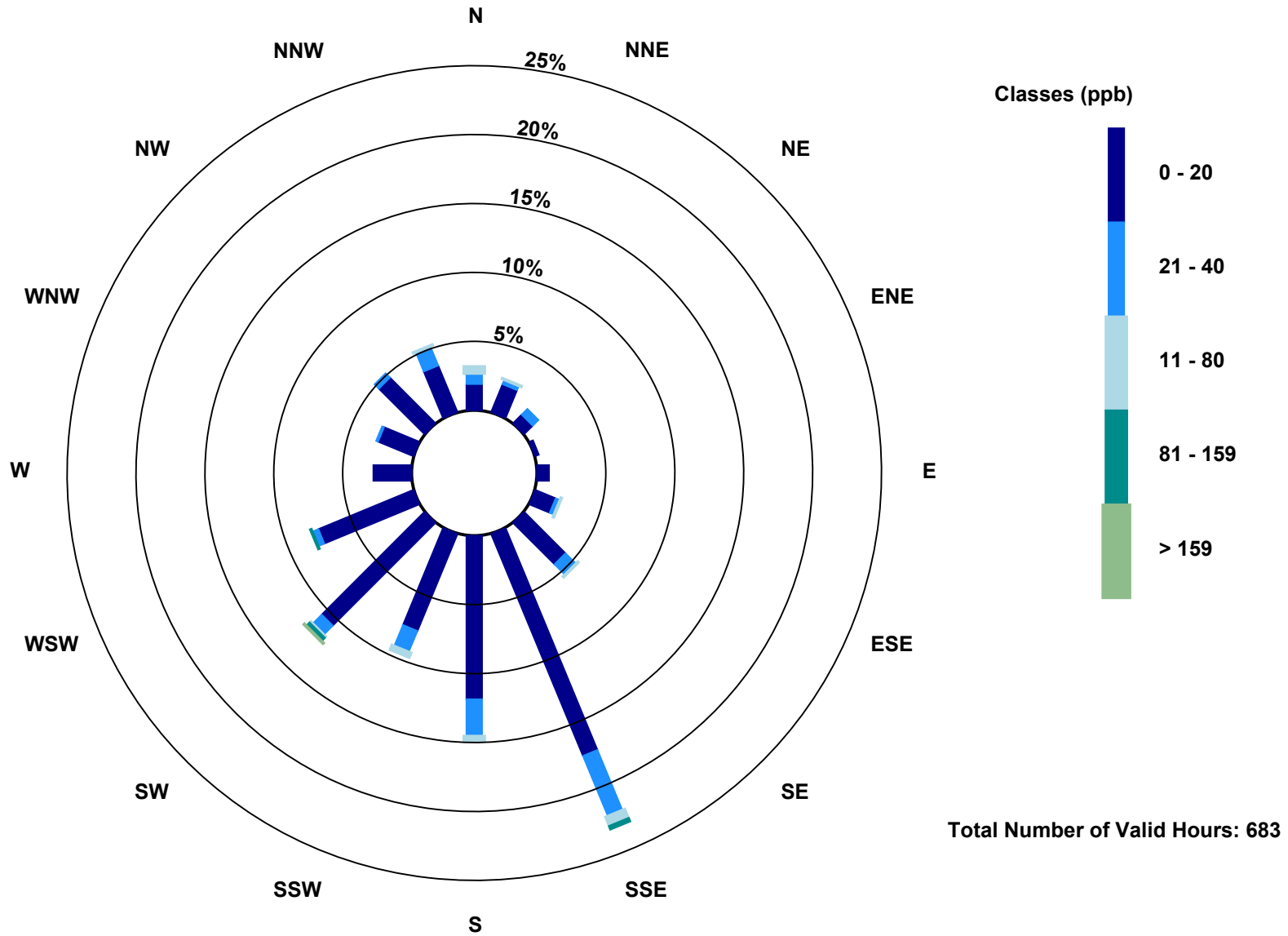
Total Number of Valid Hours: 683

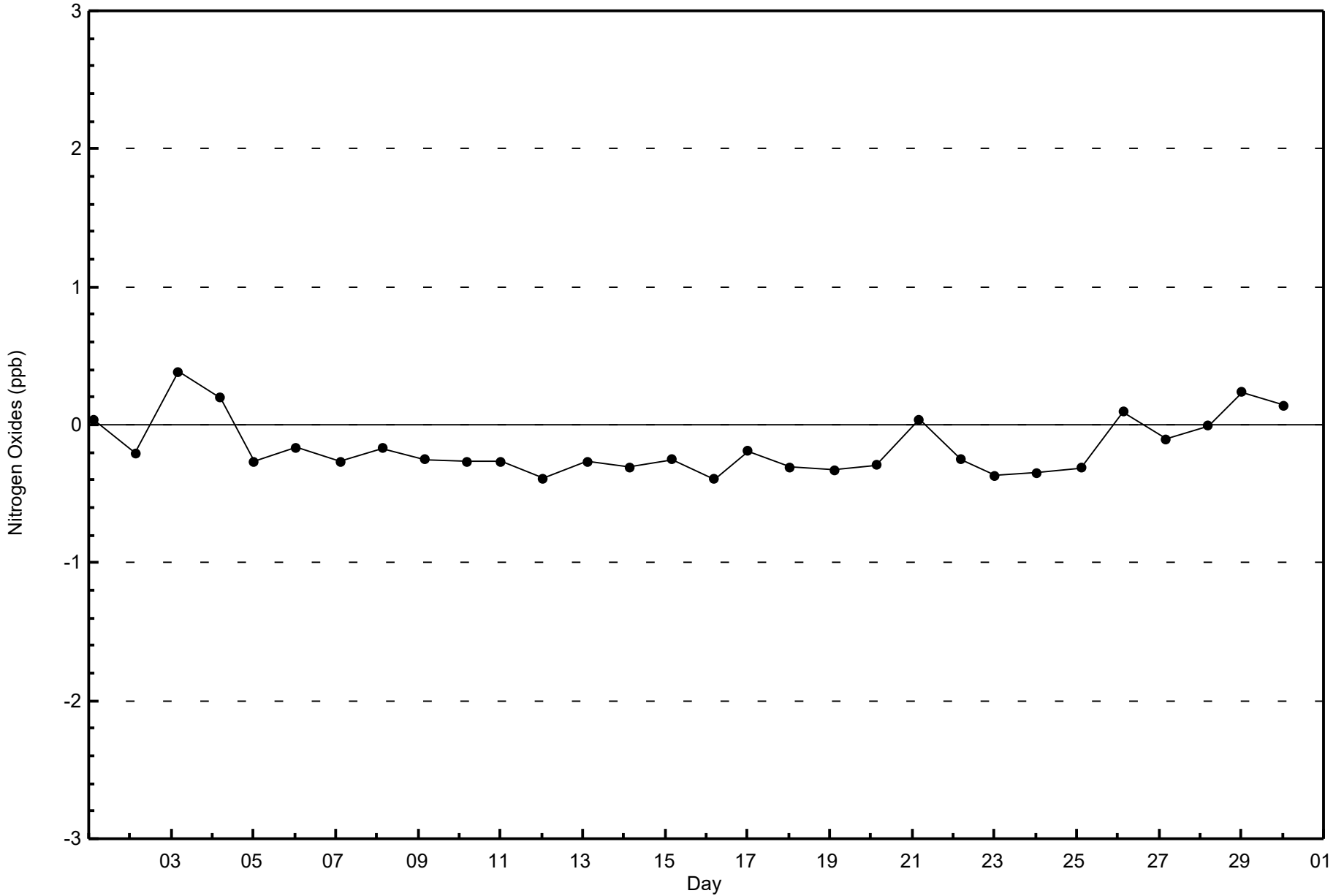
Total Number of Hours: 720

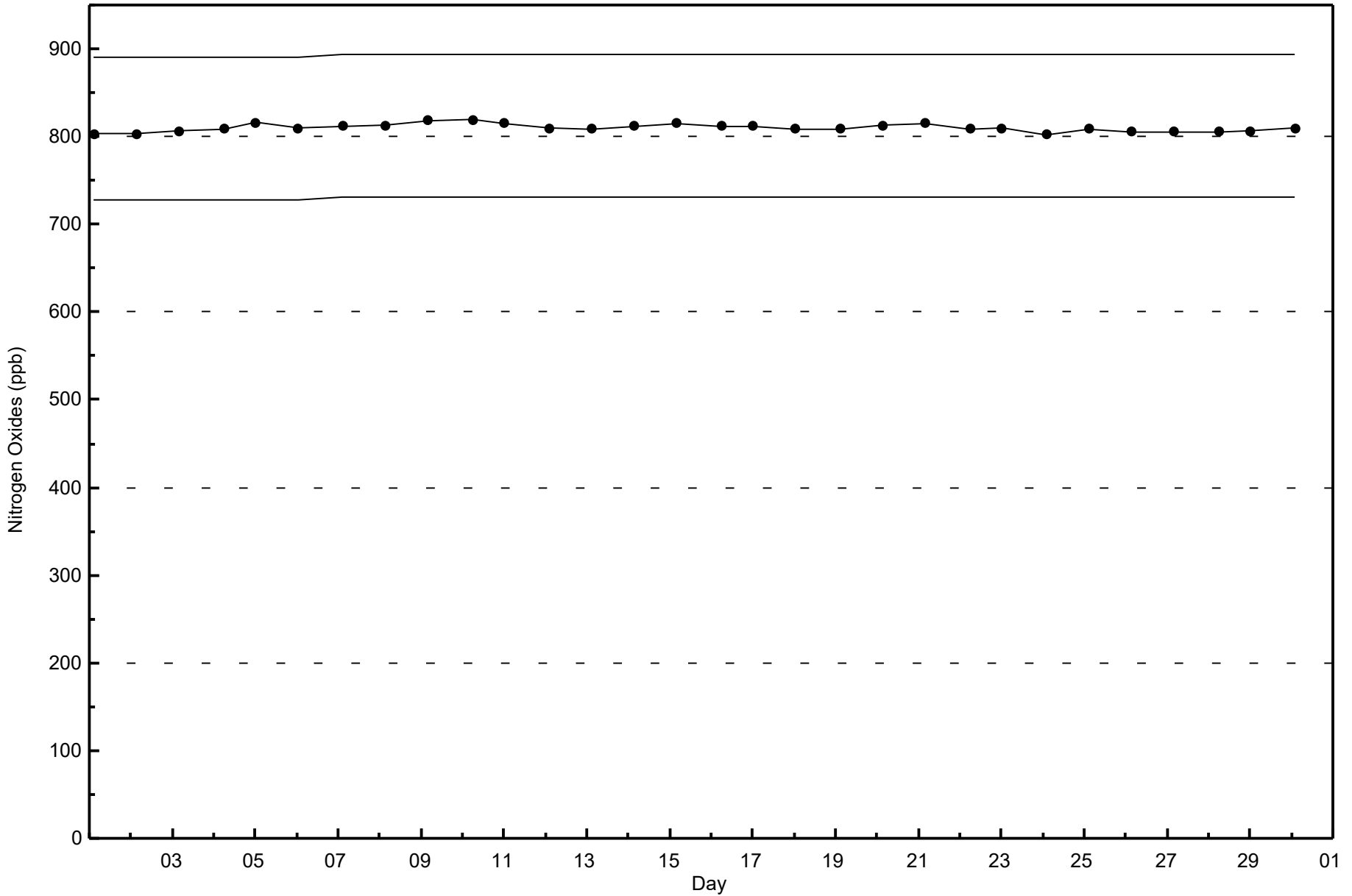


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitrogen Oxides (NO_x) - ppb
Barge Landing









Wood Buffalo Environmental Association

Summary of Hour Averages

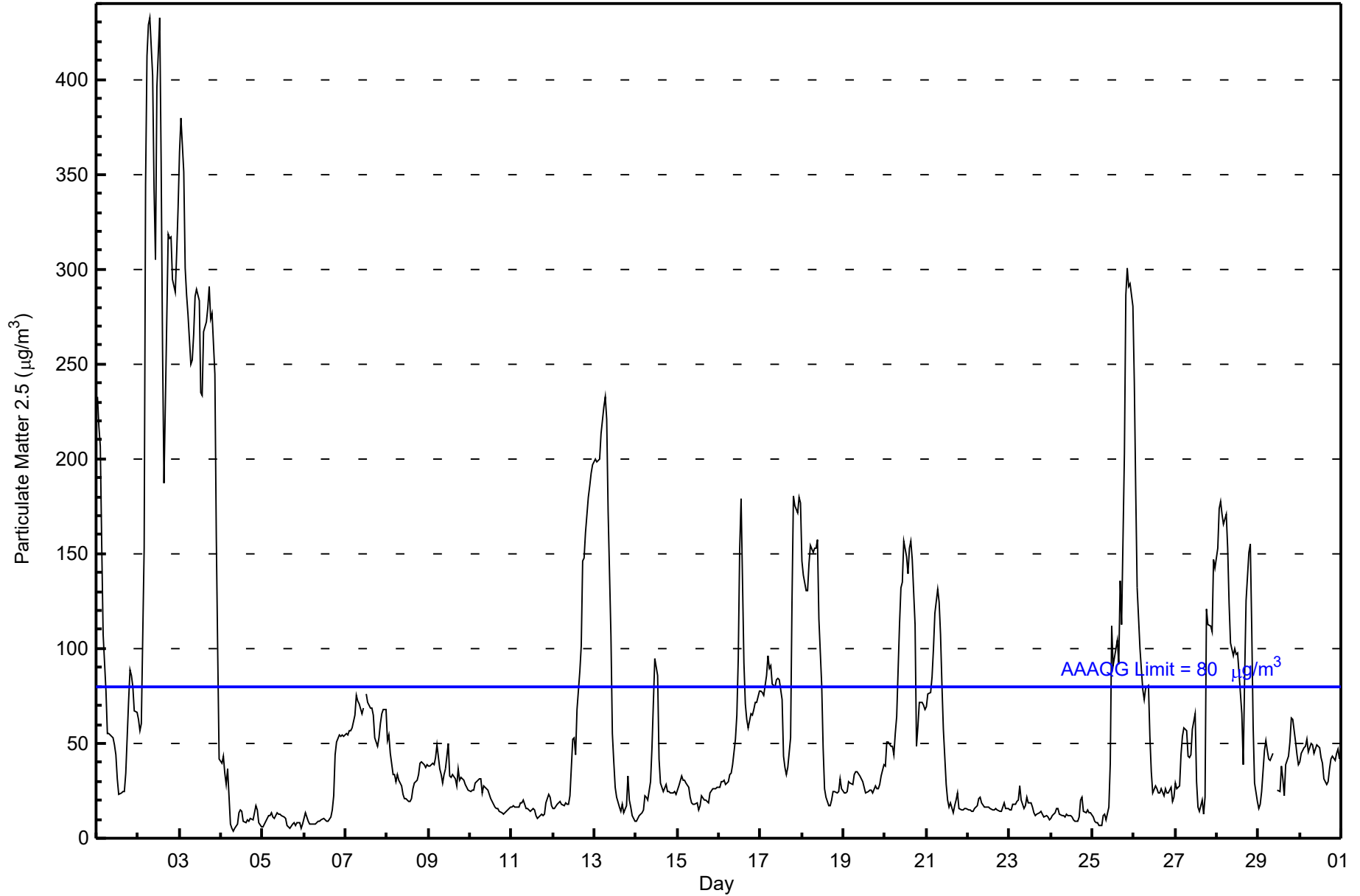
Particulate Matter 2.5 (PM_{2.5}) - µg/m³

Barge Landing - September 2023

Number of Exceedences (AAAQO):	1-hr: 163	24-hr: 20	Hours in Service:	720
Maximum Value: 432.7 µg/m ³ on Sep 2 08:00	Maximum Daily Average: 293.2 µg/m ³ on Sep 2		Hours of Data:	717
Minimum Value: 3.8 µg/m ³ on Sep 4 08:00	Minimum Daily Average: 9.3 µg/m ³ on Sep 5		Hours of Missing Data:	3
Maximum Diurnal Average: 74.7 µg/m ³ at hour 20	Minimum Diurnal Average: 46.4 µg/m ³ at hour 16		Hours of Calibration:	1
Monthly Average: 65.11 µg/m ³	Percentiles: P ₁ = 6.3 P ₁₀ = 11.9 Q ₁ = 17.0 Median = 31.4 Q ₃ = 72.4 P ₉₀ = 171.5 P ₉₉ = 361.2		Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Sep	232.6	216.9	206.4	154.1	107.3	77.6	54.9	54.9	54.6	53.1	49.4	43.9	31.4	23.3	24.0	24.6	24.9	34.5	72.4	88.4	86.1	79.6	67.3	66.2	80.3	232.6	
2-Sep	62.8	57.0	60.5	152.9	344.7	412.6	429.1	432.7	401.8	342.4	305.2	396.1	432.6	356.7	257.8	187.5	229.4	318.3	316.5	316.9	294.9	287.9	309.0	332.6	293.2	432.7	
3-Sep	362.0	379.2	351.1	300.2	286.3	275.9	250.0	252.2	265.7	285.8	289.4	283.3	235.0	233.7	266.7	272.1	279.9	291.2	273.9	276.6	244.3	159.0	97.8	41.5	260.5	379.2	
4-Sep	39.8	43.0	34.1	28.7	36.9	7.6	5.5	3.8	5.1	7.7	13.7	14.8	14.3	9.3	8.4	9.7	8.7	10.7	10.0	13.5	17.0	15.1	8.1	6.2	15.5	43.0	
5-Sep	6.3	7.4	9.2	12.1	11.6	13.4	11.3	10.2	13.4	12.4	12.8	12.4	11.7	11.1	10.2	6.6	5.6	5.3	7.7	8.0	6.9	8.0	8.3	5.2	7.7	9.3	13.4
6-Sep	10.5	13.4	9.3	7.5	7.7	7.7	7.7	8.4	9.3	9.3	9.5	10.6	9.9	8.9	9.1	11.5	14.6	22.1	44.1	51.0	54.7	54.0	54.1	53.8	20.8	54.7	
7-Sep	55.1	54.2	56.6	56.6	58.0	64.6	75.2	72.7	70.6	65.7	68.7	C	75.9	71.5	68.6	68.3	65.0	52.6	48.7	52.6	60.7	65.7	67.9	67.8	63.6	75.9	
8-Sep	51.6	54.7	45.0	33.9	33.2	29.7	33.2	30.5	27.2	23.0	21.1	20.7	19.1	19.1	21.0	26.2	28.8	30.3	33.9	39.8	40.3	38.6	37.0	39.1	32.4	54.7	
9-Sep	38.1	37.7	39.5	39.1	42.4	49.2	36.4	33.4	28.8	33.9	36.4	49.8	33.0	32.4	33.9	31.7	27.5	36.4	30.5	32.2	30.3	28.4	27.1	25.3	34.7	49.8	
10-Sep	24.7	25.5	25.4	29.2	30.1	31.5	31.1	24.1	27.4	26.1	25.2	23.0	20.8	19.1	16.5	15.9	15.8	14.5	13.7	12.6	13.7	14.3	14.6	16.1	21.3	31.5	
11-Sep	16.3	16.9	16.4	16.2	16.5	18.5	18.7	19.8	15.8	15.6	15.3	14.5	15.4	15.2	11.9	10.8	11.4	12.5	12.3	12.4	18.8	22.8	21.3	16.8	15.9	22.8	
12-Sep	15.6	15.5	17.7	18.6	19.1	17.6	17.4	18.9	17.8	18.0	22.4	52.6	52.8	44.1	67.5	88.2	101.2	146.5	147.9	161.1	179.9	185.5	192.2	196.7	75.6	196.7	
13-Sep	199.8	198.3	199.1	199.9	213.4	227.3	232.5	220.6	172.0	106.5	55.1	40.0	27.0	21.6	16.3	14.5	17.8	13.7	16.8	32.5	20.4	16.3	11.8	9.1	95.1	232.5	
14-Sep	9.1	10.1	11.9	13.6	15.0	22.6	21.7	19.9	29.7	47.9	71.4	94.5	85.8	41.9	28.9	26.6	24.4	28.0	24.7	24.6	23.9	24.0	24.3	23.1	31.2	94.5	
15-Sep	25.7	27.8	33.2	30.7	30.3	29.3	26.8	21.9	18.3	17.7	17.6	18.7	15.2	17.4	22.7	20.2	20.1	19.5	18.8	24.2	26.3	26.2	26.1	27.1	23.4	33.2	
16-Sep	26.8	29.5	29.7	30.7	28.4	29.8	33.4	34.7	39.0	51.9	65.1	94.6	151.8	179.0	92.6	70.9	63.0	58.3	65.3	64.8	68.2	71.6	72.0	77.2	63.7	179.0	
17-Sep	77.6	76.5	75.4	85.8	96.0	89.4	91.2	81.1	79.6	83.6	84.0	83.7	73.1	43.4	37.1	33.7	37.0	52.8	125.3	180.4	175.4	171.2	179.4	176.5	95.4	180.4	
18-Sep	146.0	138.7	130.7	130.5	144.7	154.3	150.5	153.0	152.9	157.5	115.4	80.3	47.8	26.0	21.5	17.5	17.3	19.8	24.9	24.3	23.9	24.5	31.0	26.3	81.6	157.5	
19-Sep	23.7	24.0	24.3	29.6	28.9	28.4	33.5	35.0	35.1	33.0	31.6	29.9	27.0	23.7	24.6	25.5	25.6	23.9	27.5	26.3	26.0	28.1	32.7	39.0	28.6	39.0	
20-Sep	38.4	51.0	50.3	48.3	48.5	43.9	55.3	64.2	112.3	131.7	135.0	156.3	148.6	139.3	152.6	156.9	147.1	112.4	48.7	59.0	71.7	71.7	69.8	68.1	90.9	156.9	
21-Sep	69.5	76.2	76.6	84.8	99.6	118.5	131.1	124.6	107.1	80.6	57.2	28.0	20.3	16.7	18.8	13.4	17.0	19.8	23.7	15.5	15.0	14.8	15.8	15.7	52.5	131.1	
22-Sep	14.8	14.8	13.8	14.0	15.4	16.8	20.9	21.5	18.9	16.4	16.5	16.7	16.4	15.4	15.1	14.6	15.9	15.1	14.0	14.3	16.5	18.4	15.5	16.0	16.2	21.5	
23-Sep	15.1	15.3	17.8	18.1	19.6	20.2	27.8	20.0	15.6	17.4	21.3	18.7	18.9	16.8	13.5	12.1	12.5	13.6	14.1	13.0	11.0	12.1	11.2	9.4	16.0	27.8	
24-Sep	10.5	12.1	13.5	15.6	16.0	12.9	12.1	11.8	11.5	12.6	11.9	12.2	11.0	9.8	8.8	8.8	11.3	19.9	21.7	14.1	13.4	14.9	13.1	13.1	13.0	21.7	
25-Sep	10.9	9.0	8.4	8.1	6.5	7.0	12.2	12.9	9.9	16.8	39.8	111.8	91.0	95.5	104.3	91.9	135.8	112.6	203.1	286.3	300.4	290.7	292.0	280.1	105.7	300.4	
26-Sep	240.2	182.7	132.1	99.7	88.4	78.1	73.0	78.9	80.2	53.4	35.2	23.7	27.4	25.8	24.0	23.6	26.5	22.6	26.2	23.9	24.1	26.9	19.5	21.5	60.7	240.2	
27-Sep	29.2	26.4	27.5	44.0	53.5	57.8	56.8	43.5	42.8	43.6	57.4	65.3	29.7	16.5	14.0	20.0	12.8	21.8	120.8	112.8	111.8	109.2	147.0	142.1	58.6	147.0	
28-Sep	152.6	173.5	177.1	170.8	165.6	170.4	153.2	123.8	103.0	96.2	99.8	97.1	97.4	87.1	66.0	39.1	86.0	125.0	150.5	155.3	111.5	58.8	29.0	19.2	112.8	177.1	
29-Sep	15.4	18.0	24.5	45.9	51.8	46.4	41.4	41.4	44.4	M	M	25.6	24.7	38.1	31.4	22.2	38.8	42.9	51.0	63.5	62.3	50.9	43.9	38.9	39.2	63.5	
30-Sep	40.0	44.7	47.5	48.8	52.1	45.5	50.2	49.0	45.0	46.7	49.3	47.7	42.8	39.6	31.0	28.7	29.8	36.5	41.9	43.5	41.4	45.1	47.2	42.1	43.2	52.1	
68.7 68.3 65.5 65.6 72.3 73.5 73.1 70.6 68.5 65.8 63.2 67.8 63.6 56.6 50.5 46.4 51.7 57.9 67.7 74.7 73.1 67.8 66.1 63.8																								Diurnal Average			
362.0 379.2 351.1 300.2 344.7 412.6 429.1 432.7 401.8 342.4 305.2 396.1 432.6 356.7 266.7 272.1 279.9 318.3 316.5 316.9 300.4 290.7 309.0 332.6																								Diurnal Maximum			

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Barge Landing - September 2023**

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	4	0.56	0.56
6 - 15	141	19.67	20.22
16 - 25	145	20.22	40.45
26 - 80	266	37.10	77.55
> 81.0	161	22.45	100.00

Total Number of Valid Hours: 717

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - μg/m³
Barge Landing - September 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	0	0	0	0	0	0	1	1	0	0	0	0	0	0	2	0	4
6 - 15	0	1	0	1	5	5	17	42	21	14	9	11	3	2	8	2	141
16 - 25	3	0	0	0	0	2	5	58	25	12	14	10	5	3	4	4	145
26 - 80	12	6	3	1	1	5	16	44	48	29	45	22	7	7	7	13	266
> 81.0	7	12	7	1	0	3	2	20	13	17	18	14	6	9	15	17	161
Totals	22	19	10	3	6	15	41	165	107	72	86	57	21	21	36	36	717

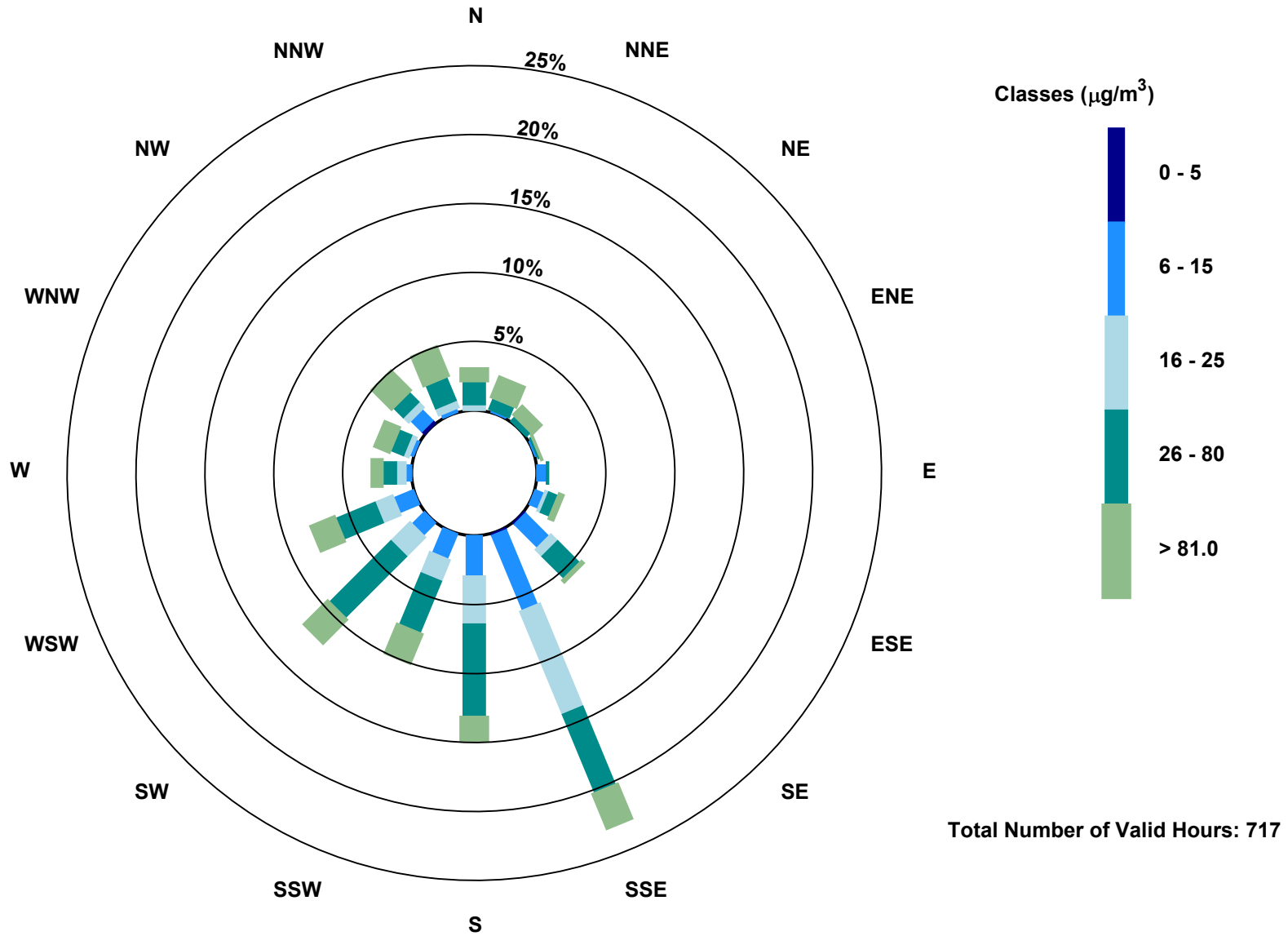
Total Number of Valid Hours: 717

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

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





Wood Buffalo Environmental Association

Summary of Hour Averages

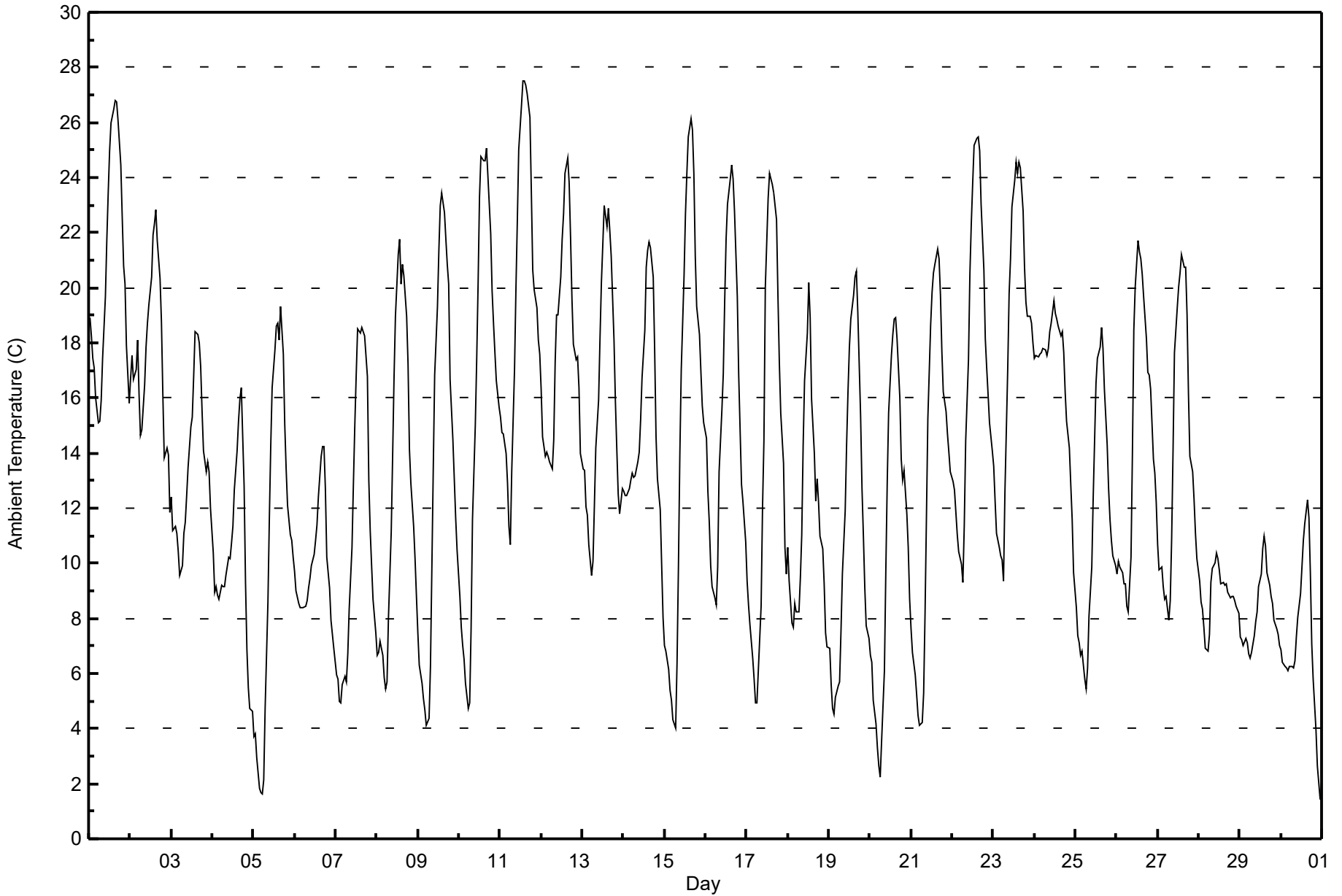
**Ambient Temperature (AT) - C
Barge Landing - September 2023**

Maximum Value: 27.5 C on Sep 11 14:00		Maximum Daily Average: 20.6 C on Sep 1		Hours in Service: 720																																												
Minimum Value: 1.4 C on Oct 1 00:00		Minimum Daily Average: 7.1 C on Sep 30		Hours of Data: 720																																												
Maximum Diurnal Average: 20.3 C at hour 16		Minimum Diurnal Average: 8.1 C at hour 7		Hours of Missing Data: 0																																												
Monthly Average: 13.74 C		Percentiles: P ₁ = 2.6 P ₁₀ = 6.3 Q ₁ = 9.1 Median = 13.3 Q ₃ = 18.3 P ₉₀ = 21.8 P ₉₉ = 26.4		Hours of Calibration: 0																																												
				Percent Operational Time: 100.0																																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Sep	18.9	18.3	17.4	17.1	16.0	15.1	15.2	15.9	17.5	19.7	21.7	23.4	25.0	26.0	26.5	26.8	26.8	26.1	24.5	22.6	20.8	20.2	17.9	15.8	20.6	26.8																						
2-Sep	16.7	17.6	16.7	17.0	18.1	16.2	14.7	14.8	16.5	17.9	18.7	19.4	20.4	21.9	22.3	22.8	21.7	20.3	18.8	16.1	13.8	14.2	13.9	11.9	17.6	22.8																						
3-Sep	12.4	11.2	11.3	11.1	10.4	9.6	9.9	11.1	11.5	12.5	13.5	15.0	15.3	16.8	18.4	18.3	18.0	17.2	15.5	14.1	13.3	13.7	13.3	12.0	13.6	18.4																						
4-Sep	10.4	9.0	9.2	8.8	8.7	9.2	9.1	9.2	9.5	10.2	10.2	10.7	11.3	12.7	14.1	15.2	16.0	16.4	12.8	9.3	6.9	5.5	4.7	4.6	10.2	16.4																						
5-Sep	3.7	3.8	3.0	1.8	1.7	1.6	2.1	4.8	8.6	11.6	14.2	16.4	17.8	18.6	18.7	18.1	19.3	17.6	15.0	13.4	12.1	11.0	10.8	10.2	10.7	19.3																						
6-Sep	9.7	9.0	8.6	8.4	8.4	8.4	8.4	8.6	9.1	9.5	9.9	10.3	10.9	11.4	12.4	13.9	14.2	14.2	12.7	10.2	9.1	7.9	7.4	6.9	10.0	14.2																						
7-Sep	6.0	5.8	5.0	4.9	5.6	5.9	5.7	6.7	8.3	10.6	12.9	15.0	16.8	18.5	18.3	18.6	18.4	18.3	16.8	13.0	11.2	9.9	8.7	7.5	11.2	18.6																						
8-Sep	6.7	6.8	7.2	6.7	5.8	5.4	5.7	8.0	11.2	13.9	16.7	18.9	21.2	21.8	20.1	20.8	20.4	19.0	17.2	14.2	12.9	11.3	10.2	8.8	13.0	21.8																						
9-Sep	7.5	6.3	5.7	5.1	4.7	4.1	4.4	6.2	9.8	13.4	16.8	19.3	21.4	23.0	23.4	22.7	21.7	20.9	20.1	16.7	14.5	13.1	11.6	10.5	13.5	23.4																						
10-Sep	8.8	7.7	7.0	6.5	5.6	4.7	4.9	7.6	11.6	15.0	17.4	20.1	23.3	24.8	24.6	24.6	25.1	24.0	22.0	19.9	18.7	17.6	16.6	15.7	15.6	25.1																						
11-Sep	15.3	14.8	14.7	14.0	12.9	11.4	10.7	13.3	17.1	19.9	22.4	25.0	26.6	27.5	27.5	27.3	27.1	26.2	23.5	20.7	19.9	19.3	18.1	17.6	19.7	27.5																						
12-Sep	16.3	14.6	13.9	14.0	13.9	13.7	13.4	14.5	17.3	19.0	19.0	20.4	21.8	22.7	24.2	24.7	23.8	21.8	19.6	18.0	17.4	17.5	16.4	14.0	18.0	24.7																						
13-Sep	13.4	13.4	12.0	11.8	10.7	9.6	10.1	12.1	14.2	15.9	18.1	20.2	21.6	23.0	22.2	22.9	22.1	21.1	18.1	15.9	14.1	12.5	11.8	12.7	15.8	23.0																						
14-Sep	12.6	12.5	12.5	12.7	13.0	13.3	13.1	13.2	13.7	14.0	15.2	16.7	18.5	20.7	21.4	21.7	21.5	20.4	17.8	14.6	13.1	12.0	10.0	8.0	15.1	21.7																						
15-Sep	7.0	6.8	6.2	5.4	5.0	4.3	4.0	6.4	9.9	14.0	17.0	20.4	22.7	24.1	25.5	26.1	25.7	24.1	21.2	19.3	18.3	17.0	15.7	15.1	15.1	26.1																						
16-Sep	14.6	12.6	11.5	9.9	9.2	8.7	8.5	9.9	13.3	15.5	16.9	19.5	21.7	23.0	23.9	24.5	24.0	22.8	19.7	16.8	14.9	12.9	12.2	10.8	15.7	24.5																						
17-Sep	9.4	8.5	7.8	6.6	5.8	4.9	5.0	6.1	8.5	12.0	14.4	20.0	23.2	24.1	23.9	23.7	23.4	22.5	19.7	17.3	15.5	13.6	10.6	9.6	14.0	24.1																						
18-Sep	10.6	9.4	7.8	7.7	8.5	8.2	8.2	9.5	11.0	14.3	16.6	18.4	20.2	18.9	16.0	14.0	12.3	13.1	12.2	11.0	10.5	9.3	7.5	7.0	11.8	20.2																						
19-Sep	6.9	5.6	4.7	4.5	5.1	5.6	5.7	7.5	9.6	11.9	14.3	16.2	17.8	18.9	19.7	20.4	20.6	19.1	15.3	12.7	11.0	9.1	7.7	7.3	11.6	20.6																						
20-Sep	6.6	6.4	5.1	4.2	3.3	2.7	2.3	3.6	6.1	9.7	12.9	15.4	17.5	18.3	18.9	18.9	18.1	16.0	13.8	13.0	13.4	11.8	10.6	8.7	10.7	18.9																						
21-Sep	7.6	6.7	6.0	5.2	4.5	4.1	4.2	5.3	8.2	11.7	15.3	18.7	19.8	20.5	20.8	21.4	21.0	19.7	17.7	16.2	15.5	14.7	14.0	13.3	13.0	21.4																						
22-Sep	13.0	12.6	11.9	11.0	10.4	9.9	9.3	11.4	14.4	17.4	20.5	22.3	23.8	25.2	25.4	25.5	25.0	23.0	20.7	18.2	17.1	16.1	15.1	14.1	17.2	25.5																						
23-Sep	13.6	12.3	11.1	10.6	10.3	10.1	9.4	12.6	17.0	19.8	21.1	22.9	23.9	24.6	24.2	24.5	24.3	22.8	20.7	19.5	19.0	19.0	18.7	18.0	17.9	24.6																						
24-Sep	17.4	17.6	17.5	17.6	17.6	17.8	17.8	17.5	17.8	18.4	18.7	19.5	19.1	18.9	18.6	18.2	18.4	17.7	16.2	15.2	14.2	12.9	11.6	9.7	16.9	19.5																						
25-Sep	8.4	7.3	7.1	6.6	6.8	5.8	5.4	6.2	8.1	9.9	12.4	14.5	16.5	17.4	17.8	18.6	17.8	16.3	14.3	12.7	11.6	10.8	10.3	9.9	11.4	18.6																						
26-Sep	9.6	10.0	9.9	9.6	9.2	9.3	8.4	8.3	10.2	14.0	18.5	20.0	21.7	21.3	21.0	20.5	19.7	18.2	16.9	16.8	16.3	13.8	13.3	12.2	14.5	21.7																						
27-Sep	10.7	9.8	9.9	9.1	8.7	8.8	7.9	8.6	10.9	14.1	17.7	19.3	20.0	20.5	21.2	20.7	20.7	19.0	16.2	13.9	13.3	12.3	11.1	10.1	13.9	21.2																						
28-Sep	9.3	8.6	8.3	7.7	6.9	6.8	7.4	9.3	9.8	10.0	10.4	10.2	9.8	9.2	9.3	9.2	9.3	8.9	8.8	8.8	8.8	8.6	8.4	8.2	8.8	10.4																						
29-Sep	7.3	7.2	7.0	7.3	7.1	6.7	6.5	6.8	7.4	7.9	8.2	9.2	9.6	10.5	11.0	10.6	9.7	9.2	8.8	8.5	7.9	7.6	7.4	7.0	8.2	11.0																						
30-Sep	6.9	6.4	6.2	6.2	6.1	6.2	6.3	6.2	6.4	7.3	8.0	8.9	9.8	10.8	11.4	12.3	11.6	9.7	7.1	5.8	4.0	2.6	2.0	1.4	7.1	12.3																						
																								10.6	9.9	9.4	9.0	8.7	8.3	8.1	9.4	11.5	13.7	15.7	17.5	19.0	19.9	20.1	20.3	19.9	18.8	16.8	14.8	13.6	12.6	11.6	10.6	Diurnal Average
																								18.9	18.3	17.5	17.6	18.1	17.8	17.8	17.5	17.8	19.9	22.4	25.0	26.6	27.5	27.5	27.3	27.1	26.2	24.5	22.6	20.8	20.2	18.7	18.0	Diurnal Maximum



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Barge Landing - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Barge Landing - September 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	238	33.06	33.06
10 - 20	359	49.86	82.92
> 20	123	17.08	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



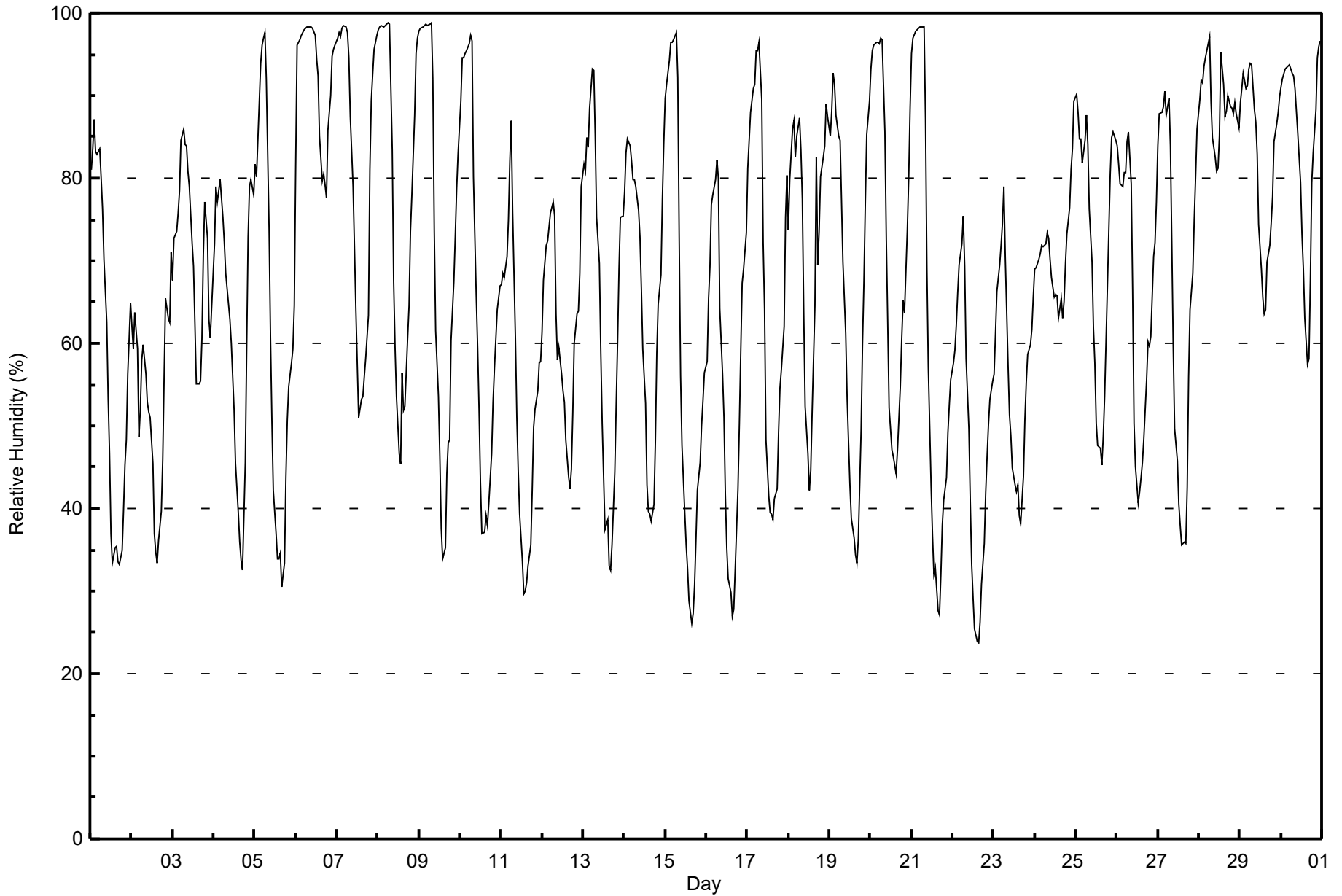
Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Barge Landing - September 2023

Maximum Value: 98.8 % on Sep 9 08:00 Maximum Daily Average: 92.0 % on Sep 6																						Hours in Service:	720																								
Minimum Value: 23.7 % on Sep 22 16:00 Minimum Daily Average: 48.1 % on Sep 22																						Hours of Data:	720																								
Maximum Diurnal Average: 87.9 % at hour 7 Minimum Diurnal Average: 44.3 % at hour 16																						Hours of Missing Data:	0																								
Monthly Average: 67.75 % Percentiles: P₁ = 27.4 P₁₀ = 38.1 Q₁ = 51.1 Median = 69.4 Q₃ = 85.0 P₉₀ = 95.2 P₉₉ = 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-Sep	81.1	83.5	87.2	83.3	83.0	83.5	80.0	76.3	70.2	62.6	53.4	46.6	37.0	33.4	35.2	35.3	33.6	33.2	34.9	39.8	45.3	48.4	56.2	64.9	57.8	87.2																					
2-Sep	62.1	59.3	63.7	59.3	48.7	52.1	58.0	59.7	56.3	52.9	51.7	51.1	45.4	37.0	34.7	33.3	36.1	39.7	45.9	56.2	65.4	63.1	62.6	70.9	52.7	70.9																					
3-Sep	67.6	72.7	73.6	75.7	78.5	84.6	85.9	84.1	83.9	80.9	78.9	72.1	69.3	62.3	55.0	55.2	55.4	60.5	70.8	77.2	72.7	62.8	60.6	64.5	71.0	85.9																					
4-Sep	72.0	79.0	77.1	78.5	79.8	75.2	72.3	68.4	66.7	62.8	60.0	56.0	51.8	45.5	39.5	35.9	33.7	32.5	45.6	59.8	72.8	79.0	79.8	78.0	62.6	79.8																					
5-Sep	81.7	80.2	84.7	93.9	96.1	97.0	97.6	92.0	73.7	60.7	50.6	42.2	36.9	33.9	33.9	34.7	30.6	33.4	43.8	50.6	54.8	57.6	59.3	64.7	61.8	97.6																					
6-Sep	81.5	96.1	96.8	97.3	97.6	98.0	98.2	98.3	98.4	98.3	98.1	97.3	94.5	92.3	85.0	79.6	80.5	79.1	77.7	85.8	90.0	94.7	95.6	96.1	92.0	98.4																					
7-Sep	97.0	97.7	97.2	98.1	98.4	98.3	97.7	94.5	87.5	79.1	71.5	64.0	57.4	51.0	53.3	53.5	55.9	58.1	63.5	81.1	89.4	92.6	95.6	97.3	80.4	98.4																					
8-Sep	97.9	98.3	98.5	98.3	98.4	98.6	98.8	98.6	83.3	67.5	59.6	53.5	46.5	45.4	56.5	51.9	52.4	60.8	64.5	73.6	78.0	87.6	95.0	97.0	77.5	98.8																					
9-Sep	97.7	98.1	98.3	98.5	98.6	98.5	98.6	98.8	91.9	73.7	61.5	53.5	46.3	37.7	34.0	35.3	44.3	48.0	48.3	60.3	67.4	72.8	78.7	82.9	71.8	98.8																					
10-Sep	89.3	94.5	94.6	95.0	95.5	96.3	97.3	96.5	80.2	65.8	59.4	52.0	43.1	37.0	37.0	39.1	38.0	40.8	46.5	52.8	56.9	60.6	64.1	67.0	66.6	97.3																					
11-Sep	67.2	68.5	68.0	70.5	74.9	82.1	86.9	76.0	60.5	51.0	44.6	39.4	33.5	29.7	30.1	31.0	33.1	35.6	42.2	49.8	52.0	54.3	57.7	57.8	54.0	86.9																					
12-Sep	61.4	67.7	71.8	72.4	74.1	75.7	77.2	75.4	63.5	58.0	59.5	56.2	54.2	52.9	48.2	43.8	42.3	44.8	51.5	60.0	63.5	63.8	68.4	79.0	61.9	79.0																					
13-Sep	81.6	80.9	85.0	83.8	88.4	93.2	93.0	85.2	75.3	69.7	59.0	50.3	43.8	37.5	38.7	33.0	32.6	35.6	44.4	52.6	60.2	68.9	75.2	75.4	64.3	93.2																					
14-Sep	78.4	83.1	84.7	83.9	82.0	79.8	79.8	78.9	76.1	73.0	66.6	59.4	52.7	43.0	39.6	39.4	38.5	40.5	48.1	58.8	64.8	68.3	77.4	84.2	65.9	84.7																					
15-Sep	89.7	91.3	94.2	96.4	96.4	96.8	97.6	92.2	72.9	56.1	47.6	39.5	35.5	32.7	28.8	26.1	27.3	30.7	36.3	42.1	45.5	50.1	53.0	56.4	59.8	97.6																					
16-Sep	57.9	65.5	69.4	76.8	78.0	79.8	82.3	80.0	64.2	56.3	51.1	41.8	35.2	31.6	29.8	27.0	27.8	32.6	42.3	50.2	59.0	67.3	69.0	73.3	56.2	82.3																					
17-Sep	81.2	84.6	87.9	90.8	91.4	95.4	95.5	96.4	89.4	72.2	64.1	48.4	41.6	39.6	39.3	38.7	41.3	42.3	49.2	54.6	56.9	62.0	75.3	80.3	67.4	96.4																					
18-Sep	73.6	79.9	86.0	86.9	82.6	85.0	87.2	83.4	77.4	63.8	52.4	46.7	42.3	44.6	51.7	64.5	82.6	69.5	73.6	80.1	82.5	83.9	89.1	87.5	73.2	89.1																					
19-Sep	85.0	88.2	92.7	91.4	87.7	85.2	84.6	77.3	69.9	61.2	53.4	48.1	42.9	38.8	36.4	34.4	33.3	36.3	49.5	60.1	67.4	77.0	85.3	89.3	65.6	92.7																					
20-Sep	93.2	95.4	96.1	96.5	96.5	96.3	96.9	96.7	85.7	72.6	62.5	52.2	47.2	46.2	45.2	44.3	47.2	54.8	60.5	65.3	63.7	73.8	80.0	88.4	73.2	96.9																					
21-Sep	95.2	97.0	97.7	98.0	98.1	98.3	98.2	98.3	87.2	68.9	57.1	42.7	36.8	32.1	32.9	27.7	27.2	32.1	37.9	41.0	43.7	49.1	52.5	55.5	62.7	98.3																					
22-Sep	57.6	59.1	62.3	66.1	69.5	72.1	75.5	69.4	58.2	49.6	40.8	33.2	29.2	25.4	23.9	23.7	26.2	30.8	35.7	41.9	46.3	50.2	53.2	55.4	48.1	75.5																					
23-Sep	56.3	61.1	66.3	69.4	71.9	74.5	78.9	70.5	57.3	51.4	48.8	44.9	43.0	42.1	42.8	39.1	38.1	44.0	50.7	55.3	58.6	59.8	61.7	65.6	56.3	78.9																					
24-Sep	69.0	69.1	70.2	70.9	71.9	71.8	72.0	73.3	72.7	70.1	67.9	65.5	66.0	65.7	63.1	65.4	63.1	65.0	69.7	73.2	76.4	81.1	83.5	89.3	71.1	89.3																					
25-Sep	90.2	87.9	84.8	84.7	81.8	84.6	87.7	84.1	76.3	69.9	61.9	57.6	50.3	47.6	47.4	45.2	48.7	53.6	66.9	73.7	80.5	84.9	85.5	84.5	71.7	90.2																					
26-Sep	83.9	81.8	79.3	78.9	80.6	80.7	84.4	85.6	79.3	66.4	50.3	45.0	40.8	42.0	43.8	45.5	48.5	55.5	60.2	59.7	60.8	70.6	72.3	77.0	65.5	85.6																					
27-Sep	83.8	87.8	88.0	88.6	90.5	87.7	89.7	84.0	72.1	59.6	49.6	45.8	40.6	37.9	35.6	35.9	35.8	42.5	55.9	64.1	68.5	74.9	80.1	86.0	66.0	90.5																					
28-Sep	89.6	91.9	91.6	93.6	94.5	96.3	97.1	89.4	84.9	82.5	80.8	81.2	85.1	95.2	91.4	87.5	88.1	90.0	88.6	88.4	87.8	89.1	87.8	86.2	89.1	97.1																					
29-Sep	89.2	90.8	92.7	90.9	91.2	93.3	94.0	93.8	88.4	86.7	82.9	74.3	69.1	65.6	63.6	64.1	69.9	71.8	74.6	77.7	84.5	86.6	87.9	89.9	82.2	94.0																					
30-Sep	91.0	92.1	93.2	93.4	93.6	93.7	92.7	92.4	90.8	88.1	85.4	79.6	73.3	69.0	63.1	57.5	58.2	67.6	79.4	83.1	88.4	94.6	95.9	96.7	83.9	96.7																					
																						80.1	82.8	84.4	85.4	85.7	86.8	87.9	85.0	76.5	67.7	61.0	54.7	49.7	46.5	45.3	44.3	45.7	48.7	55.3	62.3	66.8	71.0	74.6	78.0	Diurnal Average	
																						97.9	98.3	98.5	98.5	98.6	98.6	98.8	98.8	98.4	98.3	98.1	97.3	94.5	95.2	91.4	87.5	88.1	90.0	88.6	88.4	90.0	94.7	95.9	97.3	Diurnal Maximum	





Wood Buffalo Environmental Association
Summary of Hour Averages

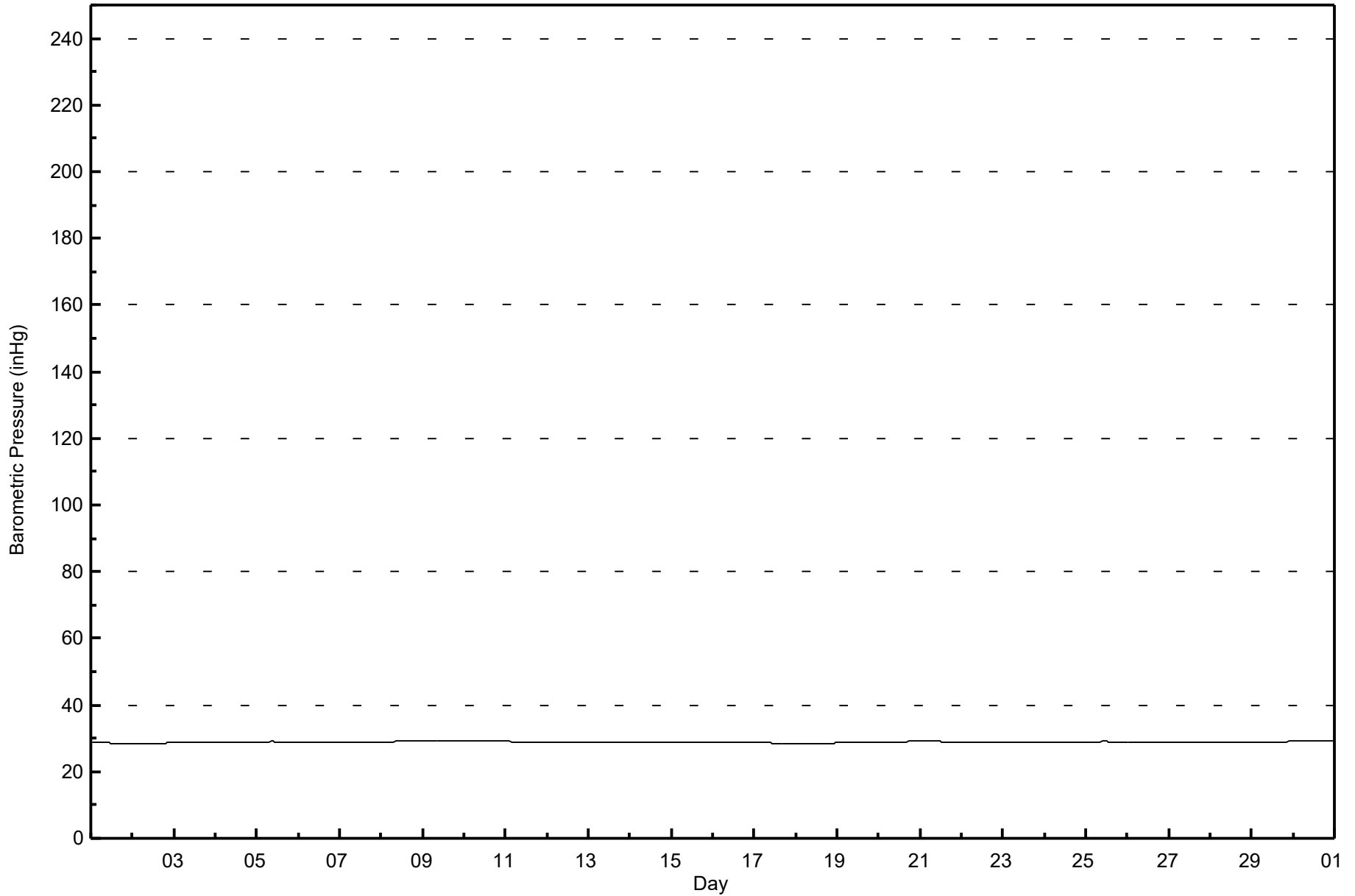
Barometric Pressure (BP) - inHg
Barge Landing - September 2023

Maximum Value: 29.3 inHg on Sep 9 10:00 Maximum Daily Average: 29.3 inHg on Sep 9																						Hours in Service: 720 Hours of Data: 720					
Minimum Value: 28.4 inHg on Sep 2 00:00 Minimum Daily Average: 28.5 inHg on Sep 2 Maximum Diurnal Average: 28.9 inHg at hour 9 Minimum Diurnal Average: 28.8 inHg at hour 17 Monthly Average: 28.84 inHg Percentiles: P ₁ = 28.4 P ₁₀ = 28.6 Q ₁ = 28.7 Median = 28.8 Q ₃ = 29.0 P ₉₀ = 29.1 P ₉₉ = 29.3																						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-Sep	28.7	28.7	28.6	28.6	28.7	28.7	28.7	28.7	28.7	28.6	28.6	28.6	28.6	28.5	28.5	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.5	28.7
2-Sep	28.4	28.4	28.4	28.4	28.4	28.4	28.5	28.5	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	28.6	28.6	28.6	28.6	28.5	28.6
3-Sep	28.7	28.7	28.7	28.7	28.7	28.7	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.7	28.7	28.7	28.7	28.6	28.7
4-Sep	28.7	28.7	28.7	28.7	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	29.0
5-Sep	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0	29.0
6-Sep	28.9	28.9	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.9
7-Sep	28.8	28.8	28.8	28.8	28.8	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.8	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
8-Sep	28.9	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.2	29.2	29.2	29.2	29.2	29.1	29.2
9-Sep	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	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.3	29.3
10-Sep	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	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.2	29.3
11-Sep	29.1	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.9	29.1
12-Sep	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8
13-Sep	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.6	28.6	28.6	28.6	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7
14-Sep	28.7	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	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	28.9	29.0
15-Sep	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.8	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
16-Sep	28.7	28.7	28.7	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8
17-Sep	28.8	28.8	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.6	28.6	28.6	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.6	28.8
18-Sep	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	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.5	28.6
19-Sep	28.6	28.6	28.6	28.6	28.6	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8
20-Sep	28.8	28.8	28.8	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	29.1	29.1	29.1	29.1	29.1	29.1	29.0	29.1
21-Sep	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	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.1
22-Sep	29.0	29.0	29.0	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	28.9	28.9	28.9	28.9	28.9	28.9	29.0
23-Sep	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	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8	28.9
24-Sep	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.9
25-Sep	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	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.8	29.0
26-Sep	28.8	28.8	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.7	28.7	28.7	28.6	28.6	28.6	28.7	28.7	28.8
27-Sep	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7
28-Sep	28.7	28.7	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.9
29-Sep	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	28.9	29.1
30-Sep	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	29.2	29.2
																								Diurnal Average			
																								Diurnal Maximum			



Wood Buffalo Environmental Association
Hourly Averages

Barometric Pressure (BP) - inHg
Barge Landing - September 2023





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Speed 20 m (WS20m) - km/h
Barge Landing - September 2023

Maximum Speed: 28 km/h on Sep 23 14:00	Maximum Daily Speed Average: 17.5 km/h on Sep 23	Hours in Service: 720
Minimum Speed Value: 0 km/h on Sep 20 10:00	Minimum Daily Speed Average: 1.5 km/h on Sep 20	Hours of Data: 720
Maximum Diurnal Speed Average: 8.1 km/h at hour 13	Minimum Diurnal Speed Average: 3.2 km/h at hour 22	Hours of Missing Data: 0
Monthly Average Velocity: 5.2 km/h 191.4 deg	Percentiles: P ₁ = 2 P ₁₀ = 4 Q ₁ = 7 Median = 9 Q ₃ = 12 P ₉₀ = 17 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-Sep	NW6	WNW6	WSW8	WSW7	WSW8	WSW8	WSW10	WSW10	SW9	SW11	SW16	SW17	SW21	SW20	SW24	SW25	SW28	SW26	SW21	WSW15	WSW13	SW11	SW5	SW3	SW13.2	SW28
2-Sep	WSW4	SW7	S4	W9	W13	NW8	NW7	NW7	NW4	NW3	SW3	SW9	W11	WNW14	WNW15	WNW13	W17	W17	W11	WSW9	WSW8	WSW10	WSW6	SSW4	W7.8	W17
3-Sep	WSW10	SW7	SW10	SW7	SSW8	SSE8	SSE10	SSE8	SE9	S3	S5	S6	WSW8	WNW6	N5	NW5	ESE5	SSW5	SW6	NW7	NW9	WNW12	WNW12	WNW12	SW3.8	WNW12
4-Sep	W10	WSW11	WSW15	WSW10	WSW11	NW17	NW14	NW14	NW17	NW18	NW13	NW13	NW13	WNW12	NW11	NW9	NNE5	N2	E6	ESE9	SSE7	SSE4	WSW7	SW7	WNW7.1	NW18
5-Sep	SSW8	SSW8	SSW6	SSE9	SSE11	SE10	SSE11	SSE10	S12	SSW10	S12	S13	S12	SSE12	SSE13	SSE11	SSE11	SSE11	SSE10	SSE11	SE9	SE10	SE8	SE7	SSE9.5	S13
6-Sep	WSW6	ENE7	E10	E9	E8	ESE8	E8	ESE8	ESE7	ESE7	SSE6	SSW3	WSW4	WNW6	SW2	S5	S8	SSW8	SW9	SSW8	SSW7	WSW7	WSW7	WSW5	SSE2.8	E10
7-Sep	SW6	WSW7	SW4	WSW4	SW6	SW7	SW7	SW6	SW6	SSW6	SW8	SW9	WSW7	SSW10	S8	SE8	SE8	SSE2	SE5	ENE5	NE4	NE2	SSE1	SSE5	SSW4.0	SSW10
8-Sep	S6	S5	S9	S8	SSE10	SSE9	SSE10	SSE9	S11	S12	S12	S11	SW6	NW4	N6	NE7	NNE7	NE7	N7	N5	N7	NNW7	WNW3	NNW6	SSE2.4	S12
9-Sep	W4	WSW3	SW3	S3	SSW4	SSW4	S7	SSE6	S8	S10	S9	S8	S11	SSE10	S7	SW5	SSE4	ESE7	E8	ESE11	ESE9	SE8	SE9	SSE5	SSE5.5	S11
10-Sep	ESE4	ESE7	SE6	SE5	ESE7	SE5	S4	S4	S4	S10	SSW7	SW5	S9	SSE15	SSE15	SE14	SE15	SE14	SE14	SE16	SE18	SE17	SE15	SE16	SSE9.5	SE18
11-Sep	SE17	SSE15	SSE17	SSE16	SSE10	SSE7	SSE5	SSE9	SSE16	SSE16	SSE21	SSE21	SSE26	S26	S26	SSE25	SSE22	S17	SSE15	SE13	SSE16	SSE16	SSE16	SSE16	SSE16.6	SSE26
12-Sep	SSE12	SE8	SSE9	S8	SSE10	SSE10	SSE10	SSE11	S10	S9	SSE10	S10	SSE12	SSE11	S9	SSW8	SW9	SW8	SW7	SW9	SSW8	SW8	SSW6	S4	S8.0	SSE12
13-Sep	SW9	SW11	SSW10	SSW10	S9	S11	SSE9	S8	SSW12	SSW10	SW18	SW17	SW18	WSW24	WSW21	WSW25	WSW24	WSW20	WSW19	WSW20	WSW18	SW10	SW9	WSW12	SW13.5	WSW25
14-Sep	WSW11	W9	W9	W8	W10	WNW11	W9	W10	WNW12	WNW11	W11	WNW12	WNW12	WNW18	NW20	NW17	NW15	NW14	WNW8	NW5	NW7	NNW7	W5	SW6	WNW10.0	NW20
15-Sep	SSW7	S8	S7	S8	SSE10	SSE10	SSE9	SSE8	SW8	SSW7	S10	SSE14	SSE17	SSE18	SSE17	S16	S17	S15	SSE15	SSE16	SSE18	SSE16	SSE13	SSE16	SSE12.5	SSE18
16-Sep	S9	S11	SSE11	SE12	SSE11	SSE10	SSE9	S7	SW8	SW7	SW7	SSW6	SSW11	SSW9	SSW9	SW13	SW12	SSW6	SSE8	S11	S9	SE7	SSE10	SSE7	S8.1	SW13
17-Sep	SSE9	SSE10	SSE8	SE8	SSE6	SSE7	SSE5	NW2	NW5	SSE1	WSW5	SSW6	SSW10	S15	SW11	SSW10	S12	SW12	SW11	SW10	SW8	S5	S6	SSW6.5	SSW15	
18-Sep	S7	S7	SSE9	SSE8	SSE9	SSE10	SSE11	SSE9	S11	SSW11	WSW17	WSW16	SW17	WSW20	WSW20	SSW9	SW10	SW9	S11	SSE14	S12	S5	SSE7	SSE12	SSW9.2	WSW20
19-Sep	SSE11	SSE6	SSE8	S7	S12	S13	S11	S9	S11	SSW10	S13	SSW12	SSW13	SW11	SW9	SSW7	SSW8	S7	SSE9	S7	W6	NNW11	NNW8	NNW6	SSW6.9	S13
20-Sep	NNW7	NNW5	WNW1	S2	SW4	SW4	SW5	WSW6	SW4	SSW0	WSW2	NNW1	NNE3	NE9	NE7	NE8	NNE6	NNW10	NNW6	WSW4	ESE5	NW6	SW5	SSW5	NW1.5	NNW10
21-Sep	SSW6	SSW4	SSW5	S6	SSE8	SSE11	SSE11	SSE10	SSE11	SSE14	S11	SSW20	SSW24	SSW26	SSW22	SSW22	SSW23	SSW16	S17	SSE17	SSE18	SSE18	SSE15	SSE13	S14.1	SSW26
22-Sep	SSE15	SSE15	SSE12	SSE13	S12	S12	S11	SSE7	SSE12	SSE14	S14	SSW20	SSW19	S18	S20	S20	S19	SSE16	SSE16	SSE15	SSE17	SSE16	SSE13	SSE10	S14.5	S20
23-Sep	S11	S13	SSE13	SSE13	SSE12	SSE9	SSE8	SSE12	SE14	SSE19	SSE22	SSE22	SSE27	SSE28	SSE25	SSE26	SSE24	SSE18	SSE16	SE16	SE17	SSE19	SE20	SE19	SSE17.5	SSE28
24-Sep	SE20	SE24	SSE22	SSE16	SSE15	SSE18	SSE18	SSE14	SSE16	S15	S12	SSE13	SW12	WSW12	NW10	SSW7	S7	S8	S8	S9	S9	SW6	SW4	SSW7	S11.2	SE24
25-Sep	SSW6	SW7	SW8	SSW6	SSW9	SSW10	S9	SSW7	SSW6	W3	NNE7	ENE7	ESE4	NNE3	NNE10	NE10	NE12	NE13	NE16	NNE10	NNW10	NNW10	NNW11	NNW14	NNE2.1	NE16
26-Sep	NNW12	NNW12	NNW11	NNW14	NNW14	NNW13	NNW8	SSW2	SSE7	S8	S11	S14	SSW11	SSW10	SSW6	SW7	SW7	SW4	SSE8	SW4	WSW7	WSW4	WNW6	S2	WSW3.1	NNW14
27-Sep	SW6	SSW6	W5	SW5	SW6	SW5	WSW8	SW4	S5	S3	SE5	S8	SW11	WSW17	WSW15	WSW15	WSW14	W11	NW6	NNW8	NNW9	NNW8	NNW6	NW6	WSW5.3	WSW17
28-Sep	NW6	N3	NW4	NW4	ESE2	NNE4	N5	NNE12	NE12	NNE11	NNE12	NNE13	N12	NNW11	N13	NNE13	NNE13	N10	NNW11	N10	N13	N11	NNW14	NNW13	N9.0	NNW14
29-Sep	NNW11	NNW8	NNW7	NNW8	NW6	WNW4	W4	W5	NW5	NNW7	NNW11	N11	N12	N12	NNW11	N9	NNE12	NNE9	N9	N10	N9	N6	N5	S2	NNW7.1	N12
30-Sep	SSW4	SW3	S4	SSE5	S4	SSW5	SSW4	SSW4	SSW4	S4	SSE6	SSE6	SSE7	SSE7	SSE8	SSE12	SSE11	SSE8	SE10	SE11	SE9	SE8	SE9	SE9	SSE6.2	SSE12
SSW4.5 S4.5 S5.0 S4.8 S5.5 S4.9 S5.0 S4.5 S5.4 S5.7 SSW6.5 SSW7.4 SSW8.1 SSW7.9 SSW6.5 SSW6.1 SSW6.2 SSW4.9 S4.5 S4.7 S4.1 S3.2 S3.4 S4.0																								Diurnal Average		
SE20 SE24 SSE22 SSE16 SSE15 SSE18 SSE18 SSE14 NW17 SSE19 SSE22 SSE22 SSE27 SSE28 S26 SSE26 SW28 SW26 SW21 WSW20 SE18 SSE19 SE20 SE19																								Diurnal Maximum		

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

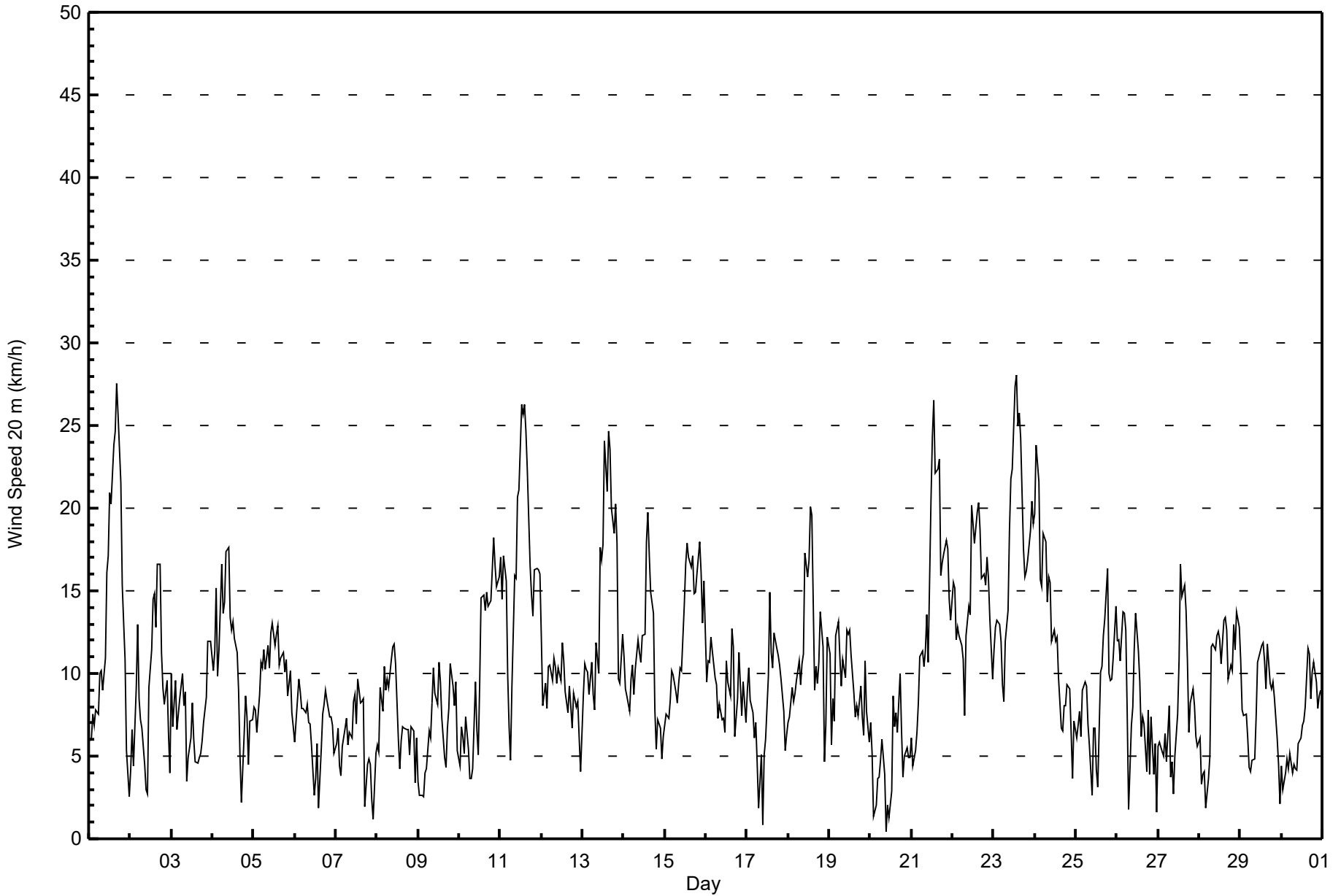
Wind Speed 20 m (WS20m) - km/h
Barge Landing - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 8 km/h on Sep 1 17:00 Minimum Value: 1 km/h on Sep 10 02:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 2 Q ₃ = 3 P ₉₀ = 5 P ₉₉ = 7																	Hours in Service: 720 Hours of Data: 720 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-Sep	1	1	1	2	2	2	3	2	3	3	4	5	7	6	8	7	8	8	6	4	2	2	2	2	8
2-Sep	2	2	3	5	3	3	2	2	2	2	2	3	3	5	5	5	6	5	2	2	2	3	3	2	6
3-Sep	4	3	3	2	2	2	1	3	3	3	4	3	3	2	2	2	1	1	3	2	4	3	4	4	
4-Sep	2	3	4	2	3	5	4	5	5	5	4	3	4	4	4	3	2	1	2	1	1	1	2	5	
5-Sep	2	2	2	1	1	1	2	2	3	3	4	4	4	5	4	3	3	3	2	1	1	1	2	5	
6-Sep	2	2	2	2	1	2	1	2	1	1	2	1	1	2	2	2	2	3	3	1	2	1	1	3	
7-Sep	1	2	2	2	1	2	2	2	2	2	2	3	2	3	3	2	2	1	1	1	1	2	1	3	
8-Sep	1	1	1	1	1	3	1	2	3	3	3	3	3	2	1	2	2	2	1	2	1	2	1	3	
9-Sep	1	1	2	1	1	1	1	1	3	3	2	2	3	3	3	3	1	1	2	1	1	1	1	3	
10-Sep	1	1	1	1	1	1	1	1	2	3	3	2	3	5	4	3	4	4	3	2	3	3	2	5	
11-Sep	3	3	3	3	2	2	1	4	4	5	6	5	7	7	7	6	5	5	3	2	3	3	3	7	
12-Sep	2	2	1	2	2	2	2	2	3	2	2	3	3	3	3	2	3	2	1	1	2	2	1	3	
13-Sep	3	3	2	3	2	2	2	2	4	4	5	5	7	7	7	7	6	6	5	5	4	3	3	7	
14-Sep	3	3	3	2	2	3	3	3	4	3	4	4	4	4	7	6	5	4	3	2	2	2	2	7	
15-Sep	1	1	2	1	1	1	1	2	3	2	3	4	4	4	5	5	4	3	3	3	3	3	3	5	
16-Sep	2	4	3	2	3	2	2	2	2	2	2	2	3	3	4	4	4	1	1	2	1	1	1	4	
17-Sep	1	2	1	2	2	1	2	1	2	2	1	3	4	4	3	3	3	3	2	2	2	3	1	4	
18-Sep	2	1	2	2	2	2	2	2	2	3	4	4	5	6	7	2	4	3	2	2	2	2	2	7	
19-Sep	1	4	2	2	2	2	2	2	3	3	4	4	4	3	2	3	2	1	1	1	2	2	2	4	
20-Sep	1	2	1	1	1	1	1	1	1	1	1	2	2	3	3	2	2	5	4	3	3	2	1	5	
21-Sep	1	1	1	1	2	1	2	2	2	3	3	7	7	8	7	7	7	5	4	3	3	3	3	8	
22-Sep	2	2	2	2	2	1	1	2	3	3	5	6	6	5	6	5	5	3	4	2	3	3	3	6	
23-Sep	2	2	1	2	2	1	3	2	4	4	5	6	7	7	6	6	6	6	5	3	4	5	4	7	
24-Sep	4	6	5	5	4	5	4	4	4	4	3	4	3	3	2	2	1	2	1	1	1	2	1	6	
25-Sep	1	1	2	2	2	3	2	2	2	1	3	3	2	2	3	3	3	3	3	4	2	1	2	4	
26-Sep	3	2	2	2	3	3	2	1	2	2	3	3	4	3	2	2	2	2	3	4	2	3	2	4	
27-Sep	1	2	2	1	2	2	2	2	2	1	2	2	3	4	5	4	4	4	1	2	1	1	2	5	
28-Sep	1	1	1	1	1	2	3	3	4	3	3	3	4	3	3	4	4	2	2	2	3	3	3	4	
29-Sep	2	2	1	2	1	1	1	1	1	3	3	4	4	4	3	3	3	3	2	3	3	1	2	4	
30-Sep	1	1	1	1	1	1	1	2	3	2	1	1	2	2	2	2	3	2	1	1	1	1	1	3	
Diurnal Maximum																									



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed 20 m (WS20m) - km/h
Barge Landing - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed 20 m (WS20m) - km/h
Barge Landing - September 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	117	16.25	16.25
6 - 11	380	52.78	69.03
12 - 19	180	25.00	94.03
20 - 28	43	5.97	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed 20 m (WS20m) - km/h
Barge Landing - September 2023**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	5	4	2	1	0	5	4	10	20	15	20	9	6	3	10	3	117
6 - 11	12	8	5	2	6	10	19	78	59	44	50	27	12	7	14	27	380
12 - 19	5	7	3	0	0	0	15	64	24	6	10	13	3	11	11	8	180
20 - 28	0	0	0	0	0	0	3	13	4	7	7	8	0	0	1	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	22	19	10	3	6	15	41	165	107	72	87	57	21	21	36	38	720

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction 20 m (WD20m) - deg
Barge Landing - September 2023

Direction of Maximum Speed: 153 deg on Sep 23 14:00		Hours in Service:	720
Direction of Maximum Daily Speed Average: 153.8 deg on Sep 23		Hours of Data:	720
Direction of Minimum Speed: 201 deg on Sep 20 10:00		Hours of Missing Data:	0
Direction of Minimum Daily Speed Average: 1.5 deg on Sep 20		Percent Operational Time:	100.0
Monthly Average Direction: 191.4 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-Sep	304	303	246	247	243	243	250	239	230	221	227	230	232	234	227	225	224	231	233	238	237	234	231	224	234.2
2-Sep	255	228	179	273	280	308	314	311	318	307	227	221	262	291	282	289	279	275	260	240	239	247	255	192	269.7
3-Sep	249	226	223	214	192	156	159	157	136	181	189	185	241	288	1	318	117	200	234	311	317	299	296	287	234.1
4-Sep	264	249	254	242	256	320	314	313	315	309	317	313	312	298	306	323	16	349	89	107	147	168	245	220	294.4
5-Sep	210	206	198	159	154	145	150	154	177	196	190	183	181	162	147	151	154	168	153	153	133	133	139	148	163.6
6-Sep	255	68	79	94	99	103	100	111	117	118	152	211	246	295	232	191	169	201	235	208	209	241	254	253	164.2
7-Sep	214	238	233	244	222	218	227	230	214	210	218	223	238	197	180	130	139	166	127	75	37	52	151	147	199.0
8-Sep	181	177	169	173	155	165	163	161	171	187	177	188	218	308	10	36	30	34	354	9	357	341	286	333	168.7
9-Sep	281	253	216	174	192	205	169	159	173	175	177	181	171	165	185	214	148	109	99	108	122	128	137	153	159.5
10-Sep	113	119	136	133	118	137	182	180	176	176	210	221	179	168	158	144	146	143	134	131	132	139	141	142	147.7
11-Sep	139	147	151	152	153	162	159	152	162	168	167	157	160	170	172	168	168	180	168	145	153	152	154	153	159.9
12-Sep	149	144	164	178	160	153	147	165	171	174	168	179	161	164	171	205	230	234	221	228	207	224	202	191	179.0
13-Sep	222	217	202	209	179	170	166	185	209	212	228	231	236	237	247	244	239	255	258	247	252	220	225	242	230.2
14-Sep	245	259	278	277	277	288	278	278	287	282	276	289	293	299	306	310	310	305	298	306	320	328	273	232	289.8
15-Sep	199	187	190	173	154	151	151	149	173	158	170	160	155	155	164	177	171	169	158	160	160	158	156	159	163.3
16-Sep	176	181	149	143	150	161	168	169	223	214	224	204	201	207	206	234	234	197	167	176	172	146	164	163	183.6
17-Sep	154	148	150	136	162	148	160	323	317	167	257	199	201	191	216	200	186	221	221	233	229	220	171	177	194.1
18-Sep	191	172	162	163	168	161	153	155	181	208	238	243	234	241	246	199	214	215	173	163	170	190	149	156	196.7
19-Sep	160	166	153	177	171	177	174	183	191	202	188	201	209	231	236	208	196	178	166	174	271	329	336	327	194.8
20-Sep	329	327	287	190	215	214	220	243	234	201	254	346	24	40	46	38	18	342	337	246	113	311	232	197	322.5
21-Sep	197	209	195	169	168	159	158	157	162	165	173	193	196	196	196	199	199	197	180	166	167	166	168	167	181.2
22-Sep	159	159	158	164	170	176	172	158	157	157	179	192	192	185	183	182	173	164	167	162	155	154	159	166	169.8
23-Sep	178	173	159	158	159	167	168	154	146	157	161	157	151	153	153	151	154	153	153	145	142	149	143	139	153.8
24-Sep	144	146	149	166	162	156	151	154	165	170	176	167	215	240	232	212	190	182	170	176	182	230	224	193	171.4
25-Sep	198	230	225	202	209	194	184	199	200	277	16	67	105	28	27	35	41	41	42	31	344	332	335	334	11.8
26-Sep	337	336	332	334	333	333	336	201	148	182	182	188	201	208	203	215	215	218	147	226	247	255	295	176	255.8
27-Sep	221	200	280	235	230	227	242	216	177	171	135	183	222	238	249	241	258	276	313	345	336	332	332	326	252.9
28-Sep	315	8	320	313	102	21	355	26	34	22	24	15	6	341	3	20	23	357	347	353	0	352	346	343	3.5
29-Sep	338	328	335	340	319	283	276	281	317	343	348	351	1	359	338	356	25	23	356	351	356	352	352	189	346.3
30-Sep	210	216	175	150	175	201	200	192	200	187	158	167	167	166	159	163	158	149	141	131	131	135	133	128	158.3

198.4 189.6 183.5 182.3 182.1 178.4 179.4 178.7 183.3 188.6 196.4 197.6 203.5 211.4 211.2 202.3 193.2 204.6 183.2 174.7 178.1 189.1 185.6 179.5

Diurnal Average

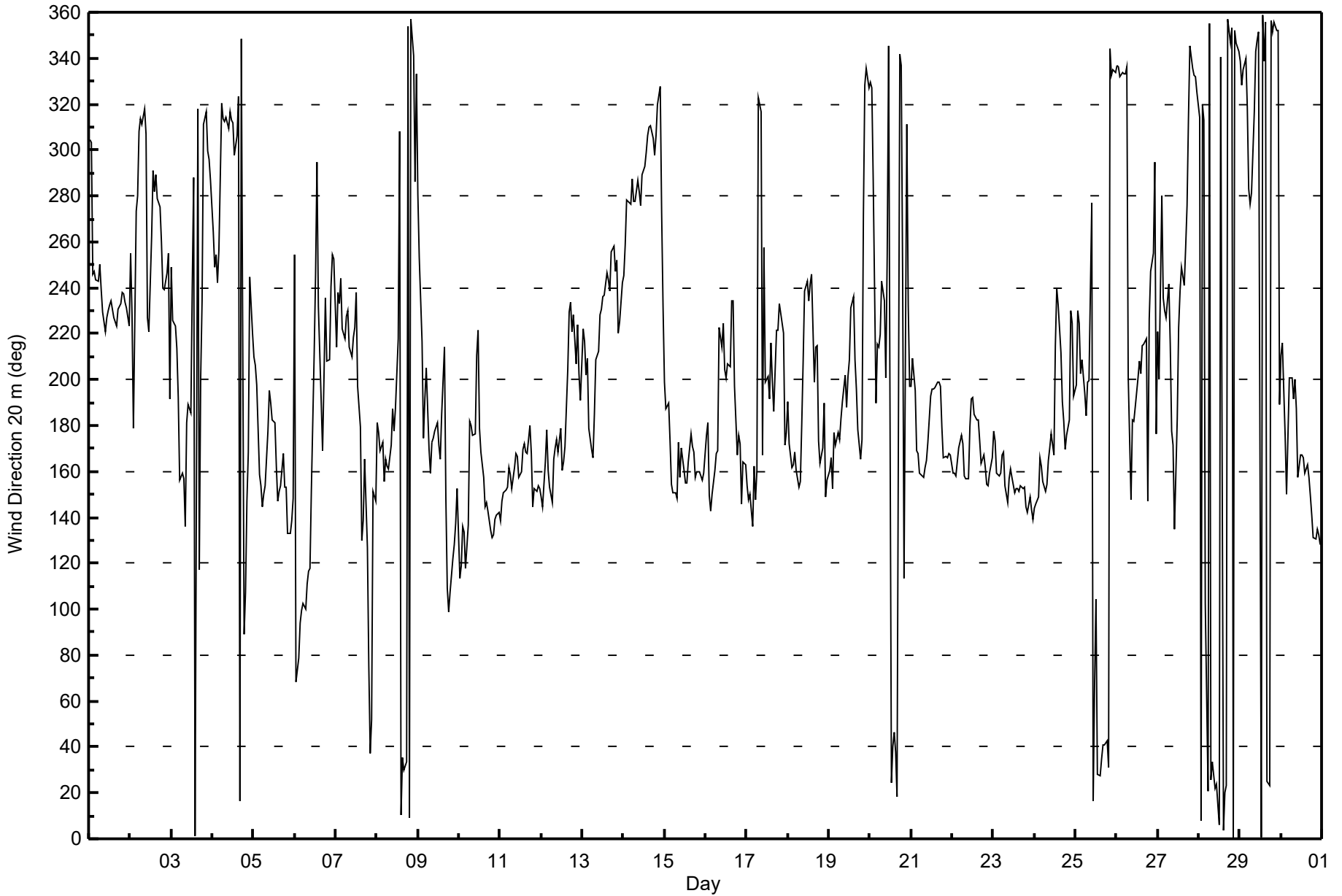
All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction 20 m (WD20m) - deg
Barge Landing - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 101 deg on Sep 20 10:00 Minimum Value: 3 deg on Sep 30 20:00 Percentiles: P ₁ = 5 P ₁₀ = 9 Q ₁ = 13 Median = 18 Q ₃ = 24 P ₉₀ = 36 P ₉₉ = 76																			Hours in Service: 720 Hours of Data: 720 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-Sep	24	17	12	12	13	16	18	15	21	20	17	18	18	21	18	18	17	18	16	13	12	13	39	58	58
2-Sep	69	32	54	33	18	18	15	26	47	72	68	19	27	21	23	24	20	16	13	10	14	18	50	45	72
3-Sep	41	28	15	26	19	13	10	22	18	69	59	39	35	33	46	29	34	30	6	33	12	16	17	15	69
4-Sep	17	13	15	17	16	20	17	17	18	19	20	20	21	25	30	39	49	58	11	14	10	38	17	25	58
5-Sep	15	14	30	11	6	8	8	15	18	26	25	28	32	34	25	24	21	13	9	7	13	7	22	22	34
6-Sep	39	35	10	12	13	11	12	9	11	13	21	37	27	29	72	38	17	29	17	13	15	16	14	31	72
7-Sep	12	21	34	46	17	14	21	20	24	31	23	29	36	24	22	16	25	53	11	27	26	49	75	16	75
8-Sep	14	23	10	11	6	14	8	13	13	21	21	24	54	55	31	19	23	19	23	29	23	10	34	8	55
9-Sep	42	23	48	17	12	16	16	14	18	18	21	26	24	25	39	36	25	12	14	5	15	11	5	6	48
10-Sep	17	7	6	6	4	16	21	30	40	22	43	48	33	23	18	17	19	14	9	8	9	10	8	8	48
11-Sep	8	10	10	10	9	9	27	20	14	18	16	16	16	17	17	16	16	17	14	9	10	9	8	8	27
12-Sep	7	18	8	11	11	14	14	13	22	23	20	20	14	18	22	29	18	18	12	9	22	13	20	41	41
13-Sep	14	16	13	15	15	11	10	18	23	22	18	18	22	19	20	16	17	23	18	16	14	19	16	15	23
14-Sep	15	18	23	16	15	17	18	15	18	20	25	23	24	23	19	20	19	15	14	18	21	16	30	25	30
15-Sep	14	20	20	14	7	7	9	17	19	17	22	16	17	16	19	19	17	13	11	10	10	10	10	11	22
16-Sep	17	43	7	5	10	12	12	16	22	21	22	34	21	29	34	26	20	19	5	16	7	15	9	16	43
17-Sep	7	7	17	24	23	24	33	80	26	99	28	50	30	23	25	26	19	20	12	14	11	24	24	24	99
18-Sep	21	18	11	25	20	14	10	13	17	22	16	18	18	18	18	24	17	24	10	8	12	38	20	16	38
19-Sep	11	40	14	16	10	10	11	16	17	27	22	25	25	25	29	37	25	14	11	12	36	10	18	53	53
20-Sep	11	14	58	60	25	22	13	9	25	101	65	88	76	29	28	21	22	32	59	66	66	24	20	22	101
21-Sep	13	20	22	11	9	7	8	11	15	16	25	23	20	18	19	20	18	17	15	11	11	10	11	10	25
22-Sep	8	8	7	7	8	8	9	14	12	13	25	19	21	22	18	19	17	14	11	9	9	8	9	8	25
23-Sep	8	8	6	4	6	10	25	10	15	15	15	15	14	15	13	13	13	13	11	11	11	13	11	11	25
24-Sep	13	12	12	24	13	12	12	13	13	17	19	19	26	17	18	21	17	11	9	9	13	21	30	14	30
25-Sep	27	13	12	26	14	13	17	20	27	62	39	41	64	84	24	18	9	8	8	25	16	10	10	9	84
26-Sep	11	11	11	9	11	9	24	62	16	21	24	21	27	20	20	20	22	62	33	69	12	65	29	88	88
27-Sep	11	37	26	19	18	17	11	41	44	61	33	37	25	18	22	16	17	34	15	8	9	9	13	30	61
28-Sep	27	48	27	18	64	43	30	11	18	30	27	29	32	25	25	21	17	23	19	21	22	22	19	15	64
29-Sep	14	17	15	18	19	13	17	10	19	26	23	31	30	23	21	30	24	26	24	17	16	14	17	87	87
30-Sep	12	8	17	15	19	16	12	19	59	33	12	18	22	24	19	16	14	10	6	3	4	4	5	5	59
																			69 48 58 60 64 43 33 80 59 101 68 88 76 84 72 39 49 62 59 69 66 65 75 88						
Diurnal Maximum																									





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS11 LOWER CAMP SEPTEMBER 2023

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

October 30, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP (AMS11)
 SEPTEMBER 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	686	34	34	100	218.4	1	18.2	0
H2S (ppb) Average	686	34	34	100	24.6	1	1.9	0
THC (ppm) Average	687	33	33	100	3.7	-	2.3	-
CH4(ppm) Average	687	33	33	100	3.6	-	2.3	-
NMHC(ppm) Average	687	33	33	100	0.21	-	0.116	-
Temperature (C) Average	720	0	0	100	27.3	-	21.5	-
Relative Humidity (%) Average	703	0	17	97.64	100	-	92.6	-
Barometric Pressure (inHg) Average	720	0	0	100	29.5	-	29.4	-
Wind Speed 10 m (km/h) Average	720	0	0	100	26	-	14	-
Wind Direction 10 m (deg) Average	720	0	0	100	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP (AMS11)
 SEPTEMBER 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	686	4.58	13.4	-	0	0.1	0.2	0.7	3.2	11.5	218.4
H2S (ppb) Average	686	0.85	1.4	-	0	0	0.2	0.5	1	1.7	24.6
THC (ppm) Average	687	2.18	0.2	-	1.9	2	2	2.1	2.3	2.4	3.7
CH4(ppm) Average	687	2.16	0.2	-	1.9	2	2	2.1	2.2	2.4	3.6
NMHC(ppm) Average	687	0.02	0.036	-	0	0	0	0	0	0.1	0.21
Temperature 2 m (C) Average	720	14.24	5.4	-	3.2	7.5	9.7	13.6	18.3	21.9	27.3
Relative Humidity (%) Average	703	69.83	20.3	-	23.6	40.5	54.2	71.5	87.4	95.7	100
Barometric Pressure (inHg) Average	720	29.02	0.2	-	28.6	28.8	28.9	29	29.2	29.3	29.5
Wind Speed 10 m (km/h) Average	720	7.4	5	-	0	2	4	7	10	14	26
Wind Direction 10 m (deg) Average	720	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP (AMS11)
SEPTEMBER 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
Relative Humidity	08 Sep 2023 00:00	28 Sep 2023 09:00	17	Sensor operated out of range



Number of Exceedences (AAAQO): 1-hr: 1 24-hr: 0	Hours in Service: 720
Maximum Value: 218.4 ppb on Sep 19 19:00	Maximum Daily Average: 18.2 ppb on Sep 21
Minimum Value: 0.0 ppb on Sep 4 11:00	Hours of Data: 686
Maximum Diurnal Average: 11.1 ppb at hour 19	Hours of Missing Data: 34
Monthly Average: 4.58 ppb	Hours of Calibration: 34
Minimum Daily Average: 0.0 ppb on Sep 29	Percent Operational Time: 100.0
Minimum Diurnal Average: 1.4 ppb at hour 6	
Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.2 Median = 0.7 Q ₃ = 3.2 P ₉₀ = 11.5 P ₉₉ = 67.6	

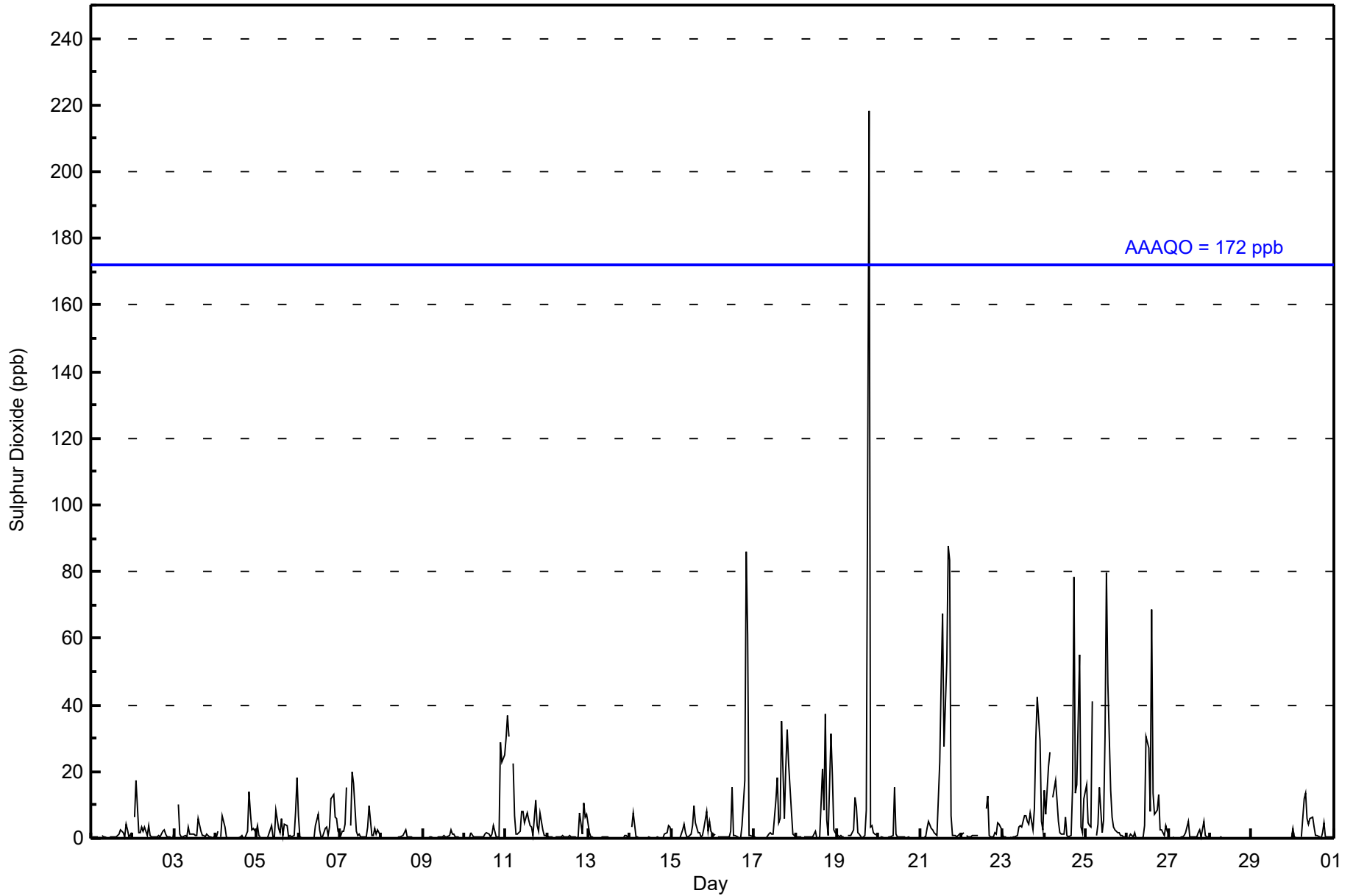
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Sep	0.4	0.3	0.3	0.2	0.5	Z	1.0	0.3	0.3	0.1	0.1	0.3	0.3	0.5	0.6	0.7	1.5	2.4	1.9	0.4	4.2	2.6	0.4	1.5	0.9	4.2	
2-Sep	Z	6.5	17.5	1.7	1.8	3.2	2.0	3.4	0.7	4.0	0.7	0.4	0.6	0.6	0.5	0.7	0.4	2.0	2.7	1.3	0.5	0.3	0.2	0.0	2.2	17.5	
3-Sep	2.0	Z	10.2	1.1	0.6	0.3	1.0	0.6	3.4	1.1	1.3	1.1	0.7	1.0	6.1	2.2	0.7	0.6	0.5	1.1	0.4	0.3	0.1	0.2	1.6	10.2	
4-Sep	0.3	2.1	Z	0.3	6.6	3.3	0.4	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.3	0.7	0.0	0.1	2.3	13.9	7.5	2.3	3.0	1.8	2.0	13.9	
5-Sep	3.8	0.8	0.2	Z	0.0	0.0	0.1	1.2	3.7	0.4	0.3	8.3	2.9	1.9	6.1	0.7	4.2	4.0	0.5	0.6	0.4	1.0	8.2	18.3	2.9	18.3	
6-Sep	6.6	0.4	0.1	0.0	Z	0.0	0.0	0.0	0.1	0.0	4.0	7.2	2.5	0.5	0.4	2.9	3.2	0.7	3.3	11.7	13.1	6.3	6.0	2.1	3.1	13.1	
7-Sep	0.7	2.2	2.0	4.0	15.4	Z	3.9	19.9	16.7	2.3	0.8	1.4	0.6	0.5	0.6	0.5	3.3	9.6	0.8	0.8	2.9	1.3	2.5	0.9	4.1	19.9	
8-Sep	Z	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.1	0.2	0.3	0.6	1.5	2.5	0.4	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.0	0.4	2.5	
9-Sep	0.3	Z	0.2	0.2	0.3	0.2	0.0	0.1	0.1	0.5	0.4	0.5	1.0	0.4	0.3	1.0	2.4	1.1	1.4	0.6	0.3	0.1	0.0	0.0	0.5	2.4	
10-Sep	0.0	0.1	Z	0.2	1.7	0.5	0.2	0.4	0.3	0.2	0.5	0.5	1.4	1.5	1.2	0.5	1.3	4.0	0.5	0.2	0.1	28.9	22.9	24.9	4.0	28.9	
11-Sep	29.9	36.9	30.5	Z	22.6	6.8	1.4	1.2	2.3	8.2	8.1	4.5	7.5	5.5	3.7	3.2	0.7	11.6	4.0	2.3	7.8	2.6	0.8	0.7	8.8	36.9	
12-Sep	0.7	0.6	0.5	0.4	Z	0.2	0.3	0.3	0.4	0.7	0.3	0.3	0.2	0.7	0.5	0.4	0.4	0.2	0.2	7.6	1.3	10.7	6.4	7.3	1.8	10.7	
13-Sep	1.5	0.5	0.3	0.2	0.2	Z	0.2	0.2	0.3	0.3	0.2	0.3	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.8	0.7	0.0	0.3	1.5	
14-Sep	Z	3.3	7.5	0.6	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.2	0.0	0.0	0.2	0.2	0.0	0.0	0.2	1.1	1.7	3.8	3.3	1.0	7.5	1.0	
15-Sep	1.2	Z	0.2	0.1	0.0	0.1	2.4	4.3	1.9	0.6	0.6	1.1	3.8	9.6	4.5	1.8	1.7	0.5	0.8	3.2	8.2	2.3	5.1	2.3	2.4	9.6	
16-Sep	0.7	1.2	Z	0.6	0.3	0.3	0.3	0.4	0.3	0.6	2.2	15.1	0.7	0.8	0.3	0.2	0.1	3.8	17.5	85.9	61.0	0.9	0.8	0.4	8.5	85.9	
17-Sep	0.3	0.1	0.1	Z	0.1	0.0	0.0	0.0	1.2	1.5	1.1	1.2	11.4	18.3	4.5	5.8	35.0	6.1	21.1	32.5	22.6	7.8	1.3	0.7	7.5	35.0	
18-Sep	0.5	0.4	0.2	0.2	Z	0.4	0.3	0.3	0.3	0.6	0.4	1.9	0.2	0.1	0.2	20.6	8.3	37.4	5.4	0.9	31.3	18.5	2.5	1.7	5.8	37.4	
19-Sep	1.0	0.6	0.7	0.5	0.4	Z	0.7	0.9	0.7	2.4	12.3	9.2	1.5	1.1	0.2	0.3	0.6	8.4	218.4	3.4	4.0	1.5	1.3	0.7	11.8	218.4	
20-Sep	Z	0.4	0.3	0.2	0.2	0.2	0.3	0.3	0.8	15.2	1.5	0.6	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.0	1.0	15.2	
21-Sep	0.1	Z	0.2	0.3	3.0	5.0	3.1	2.3	1.7	1.4	0.9	22.8	47.2	67.4	27.7	53.0	87.7	83.4	6.9	0.9	0.7	0.6	0.7	1.1	18.2	87.7	
22-Sep	1.4	1.6	Z	0.9	0.6	0.5	0.9	1.0	0.8	0.7	C	C	C	C	8.8	12.5	0.7	0.3	0.2	1.6	1.4	4.5	4.4	2.3	2.4	12.5	
23-Sep	0.4	0.3	0.3	Z	0.2	0.2	0.2	0.5	0.7	3.4	4.0	3.3	6.7	6.8	5.2	4.2	7.8	2.5	8.7	29.9	42.4	29.1	5.3	2.7	7.2	42.4	
24-Sep	14.5	7.2	21.7	25.6	Z	12.2	17.2	11.6	4.9	1.7	1.1	1.1	6.6	1.0	0.3	0.7	14.7	78.3	13.5	15.9	55.1	3.6	1.7	11.7	14.0	78.3	
25-Sep	16.1	4.6	3.8	3.5	41.3	Z	0.9	4.4	15.3	1.8	5.7	30.3	79.5	46.5	14.3	6.6	3.3	2.4	1.6	1.9	1.0	0.7	0.5	0.4	12.4	79.5	
26-Sep	Z	0.4	1.3	0.6	1.7	0.1	0.1	0.1	0.1	0.5	3.8	30.6	26.9	7.9	68.7	13.4	7.1	8.6	13.0	2.4	2.4	0.8	4.0	2.2	8.5	68.7	
27-Sep	1.2	Z	0.4	0.2	0.2	0.2	0.2	0.3	0.3	0.7	1.5	4.9	0.4	0.2	0.3	0.2	0.4	1.8	2.4	0.5	4.9	0.6	0.6	0.3	1.0	4.9	
28-Sep	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	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.2
29-Sep	0.1	0.1	0.1	Z	0.1	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	0.0	0.0	0.0	0.0	0.0	0.0	0.1
30-Sep	3.0	0.3	0.1	0.0	Z	0.4	11.8	13.4	5.9	4.4	5.7	6.5	3.2	0.7	0.8	0.3	0.2	1.9	4.7	0.4	0.5	0.6	0.4	0.4	2.9	13.4	
																								Diurnal Average			
																								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 - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Lower Camp - September 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	615	89.65	89.65
11 - 20	33	4.81	94.46
21 - 60	29	4.23	98.69
61 - 110	8	1.17	99.85
111 - 172	0	0.00	99.85
> 172	1	0.15	100.00

Total Number of Valid Hours: 686

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Lower Camp - September 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	6	6	10	30	173	101	17	10	15	50	51	41	44	19	31	615
11 - 20	0	0	0	0	1	2	5	8	6	7	1	1	0	0	0	2	33
21 - 60	0	0	0	1	0	2	10	3	5	7	0	0	0	0	0	1	29
61 - 110	0	1	0	0	0	1	0	0	6	0	0	0	0	0	0	0	8
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	1	0	0	0	0	0	0	0	1
Totals	11	7	6	11	31	178	116	28	28	29	51	52	41	44	19	34	686

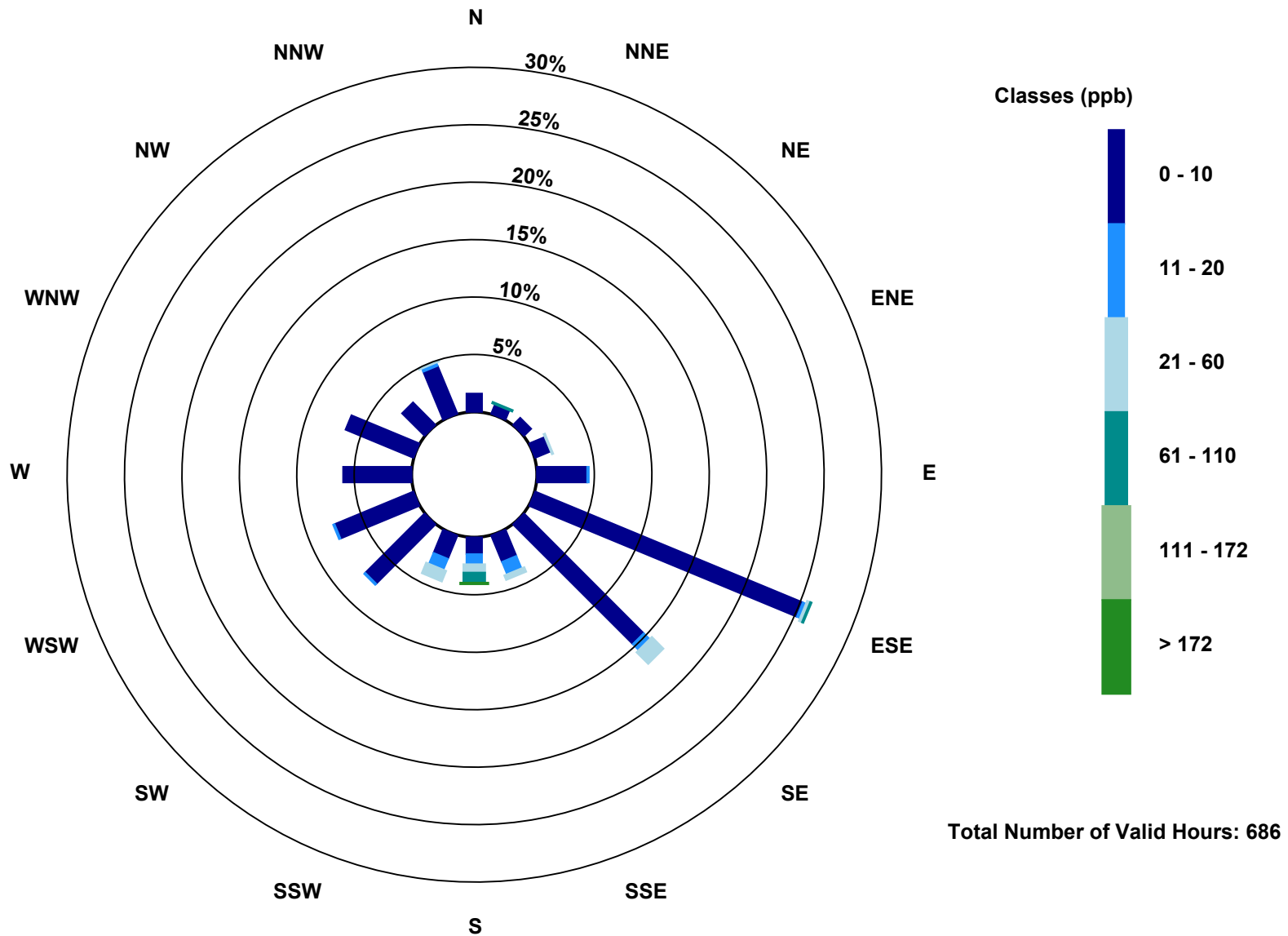
Total Number of Valid Hours: 686

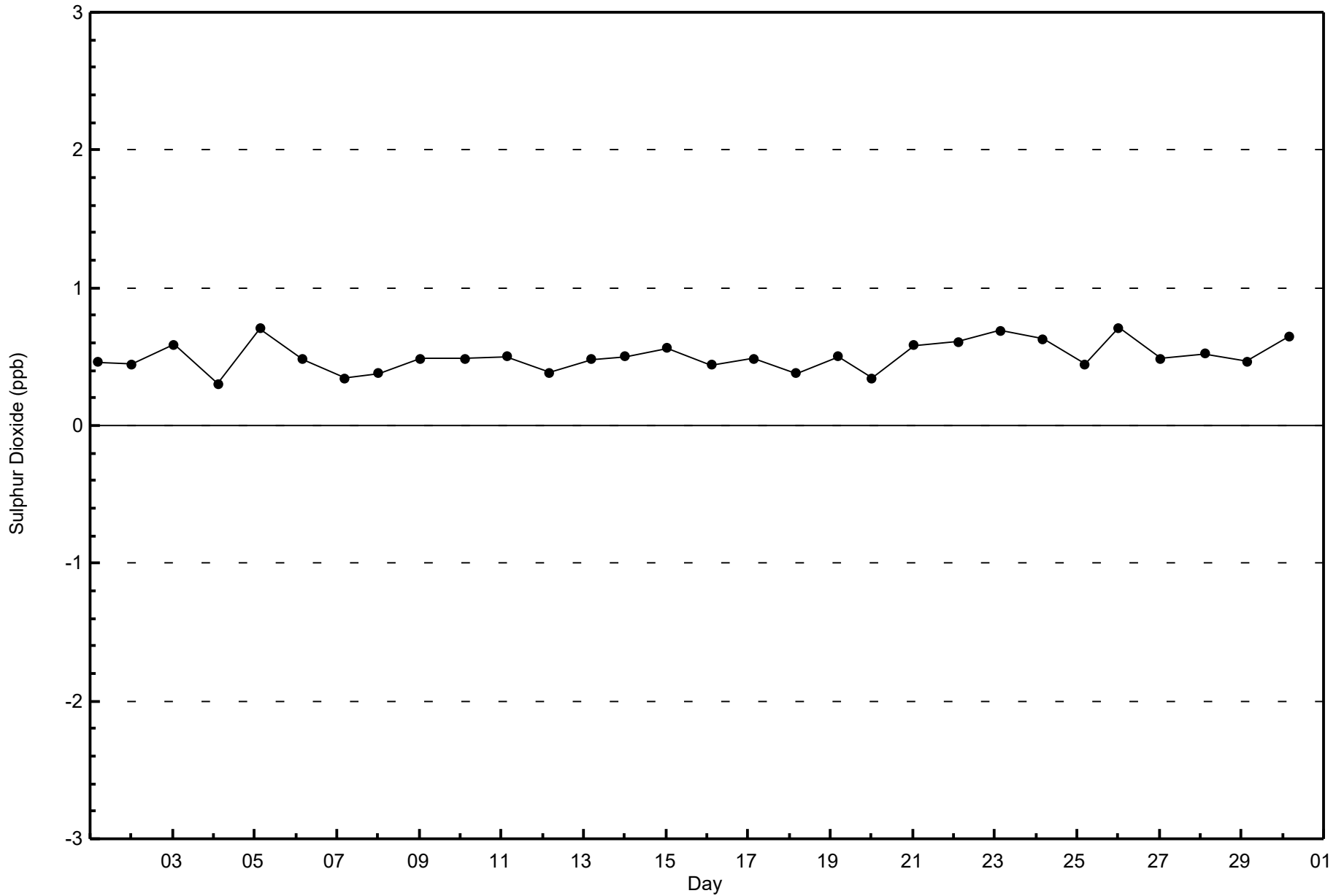
Total Number of Hours: 720

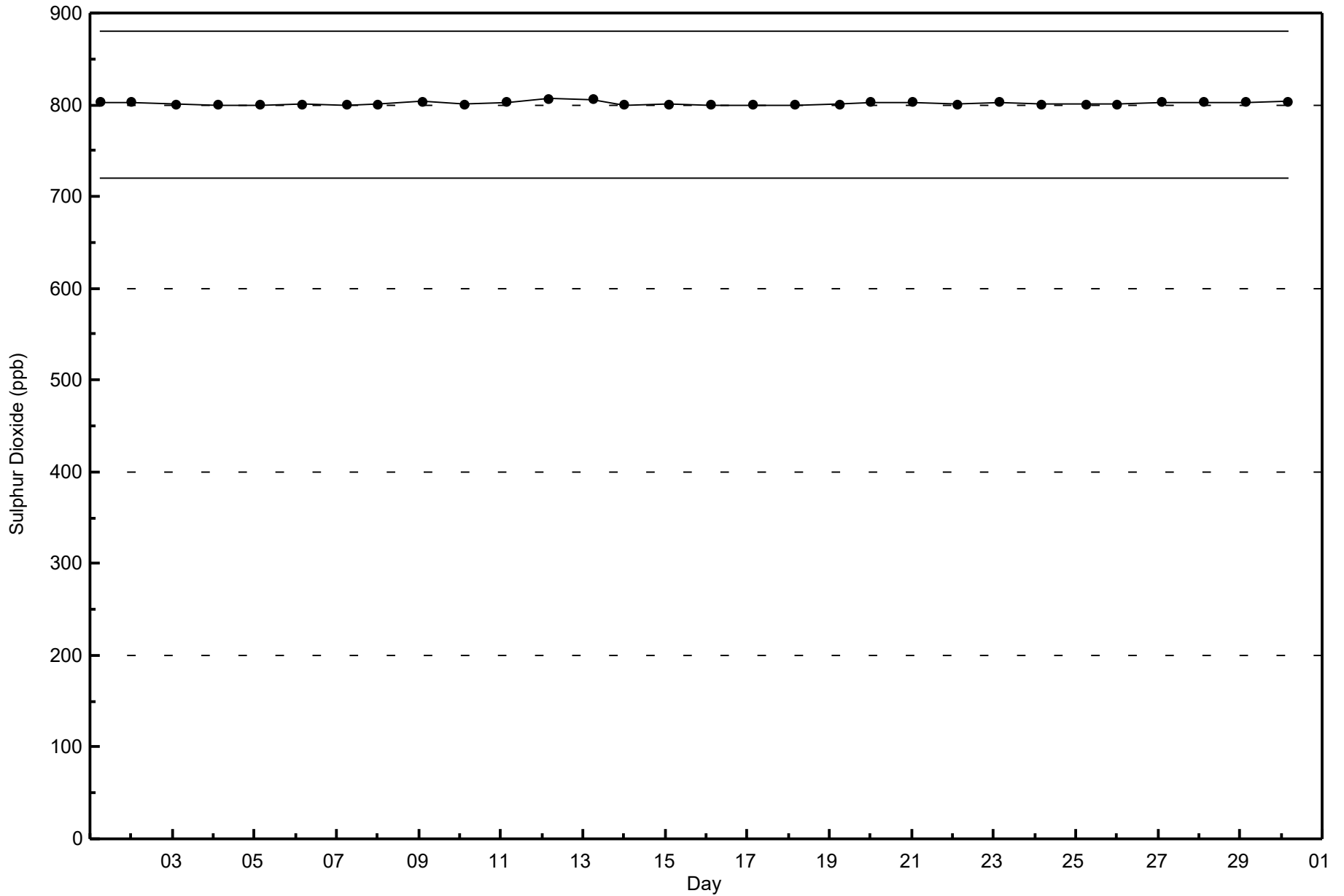


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Sulphur Dioxide (SO₂) - ppb
Lower Camp









Wood Buffalo Environmental Association
Summary of Hour Averages

Hydrogen Sulphide (H₂S) - ppb
Lower Camp - September 2023

Number of Exceedences (AAAQO):	1-hr: 1	24-hr: 0	Hours in Service:	720
Maximum Value: 24.6 ppb on Sep 19 19:00	Maximum Daily Average: 1.9 ppb on Sep 21		Hours of Data:	686
Minimum Value: 0.0 ppb on Sep 1 14:00	Minimum Daily Average: 0.1 ppb on Sep 1		Hours of Missing Data:	34
Maximum Diurnal Average: 1.5 ppb at hour 20	Minimum Diurnal Average: 0.6 ppb at hour 15		Hours of Calibration:	34
Monthly Average: 0.85 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.2 Median = 0.5 Q ₃ = 1.0 P ₉₀ = 1.7 P ₉₉ = 6.2		Percent Operational Time:	100.0

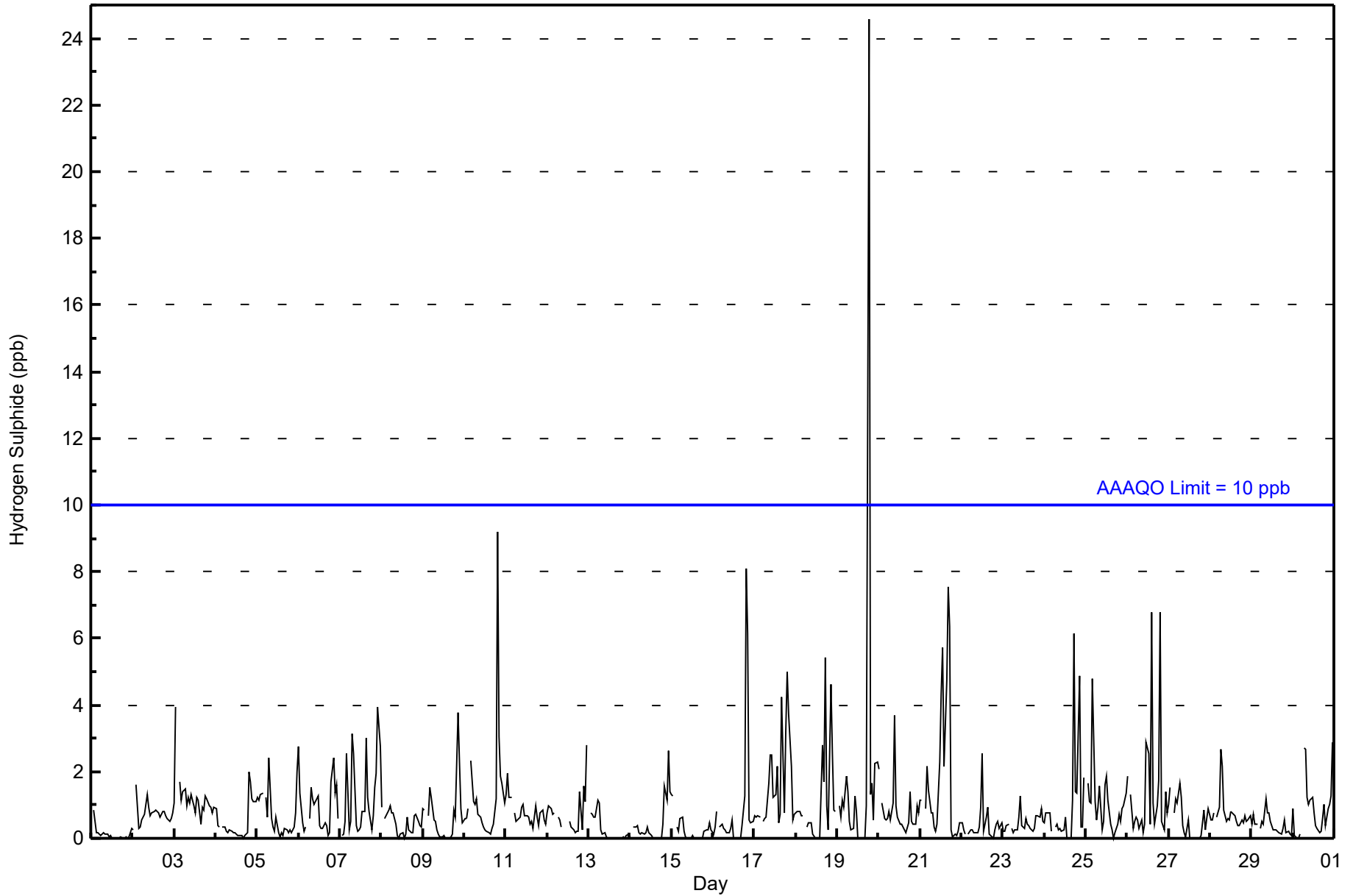
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Sep	Z	0.9	0.5	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.9	
2-Sep	0.3	Z	1.6	0.3	0.4	0.5	0.6	0.7	1.3	0.9	0.7	0.8	0.8	0.9	0.8	0.7	0.6	0.8	0.8	0.7	0.6	0.5	0.6	0.8	0.7	1.6	
3-Sep	1.1	4.0	Z	1.7	1.1	1.4	1.5	1.0	1.2	1.1	1.3	1.0	0.8	1.2	1.1	0.4	0.9	0.9	1.3	1.2	1.0	0.9	0.8	0.9	1.2	4.0	
4-Sep	0.9	0.4	0.4	Z	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	0.0	0.1	0.2	2.0	1.7	1.2	1.1	1.1	0.5	2.0
5-Sep	1.2	1.1	1.3	1.3	Z	1.2	0.6	2.4	0.6	0.3	0.2	0.7	0.2	0.0	0.2	0.1	0.3	0.3	0.2	0.2	0.2	0.3	0.8	2.0	0.7	2.4	
6-Sep	2.7	1.4	0.5	0.2	0.3	Z	0.6	1.5	1.2	1.0	1.1	1.3	0.4	0.3	0.3	0.5	0.4	0.1	0.2	1.7	2.4	1.4	1.6	0.6	0.9	2.7	
7-Sep	Z	0.1	0.1	0.5	2.6	0.3	0.5	3.1	2.6	0.4	0.2	0.2	0.4	0.8	0.8	3.0	1.2	0.8	0.2	0.7	1.5	2.0	3.9	2.8	1.2	3.9	
8-Sep	0.9	Z	0.6	0.8	0.8	1.0	0.8	0.7	0.4	0.1	0.0	0.1	0.2	0.0	0.1	0.6	0.2	0.2	0.2	0.7	0.7	0.5	0.4	0.3	0.5	1.0	
9-Sep	0.9	0.8	Z	0.7	1.5	1.2	0.6	0.5	0.3	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.8	0.6	3.8	2.3	0.9	0.5	0.7	3.8	
10-Sep	0.6	0.6	0.9	Z	2.3	1.1	1.0	1.2	0.7	0.6	0.5	0.4	0.3	0.2	0.2	0.1	0.3	0.4	1.2	9.2	3.0	1.9	1.6	1.1	1.3	9.2	
11-Sep	1.3	1.9	1.2	1.2	Z	0.8	0.5	0.5	0.6	0.9	1.0	0.7	0.7	0.7	0.4	0.5	0.3	1.0	0.6	0.4	0.8	0.8	0.5	0.4	0.8	1.9	
12-Sep	0.8	1.0	0.9	0.7	0.8	Z	0.6	0.6	0.3	C	C	C	C	0.5	0.3	0.3	0.2	0.2	0.2	1.4	0.3	1.6	1.1	2.8	0.8	2.8	
13-Sep	Z	0.8	0.7	0.6	0.6	1.1	1.0	0.2	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3	1.1		
14-Sep	0.0	Z	0.3	0.3	0.4	0.2	0.1	0.2	0.1	0.2	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.5	1.1	2.6	1.4	0.4	2.6	
15-Sep	1.3	1.3	Z	0.4	0.2	0.6	0.6	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.5	0.3	0.3	0.3	1.3	
16-Sep	0.1	0.3	0.8	Z	0.4	0.4	0.3	0.2	0.2	0.2	0.3	0.5	0.0	0.0	0.0	0.0	0.0	0.4	1.3	8.1	6.2	0.5	0.5	0.5	0.9	8.1	
17-Sep	0.7	0.6	0.7	0.6	Z	0.5	0.6	0.6	1.7	2.5	2.5	1.2	1.3	2.2	0.5	0.7	4.2	0.7	3.2	5.0	3.7	2.2	0.6	0.7	1.6	5.0	
18-Sep	0.8	0.8	0.8	0.7	0.7	Z	0.4	0.4	0.5	0.5	0.1	0.0	0.0	0.0	0.0	2.8	1.7	5.4	1.0	0.3	4.6	2.5	0.9	0.8	1.1	5.4	
19-Sep	Z	1.0	0.6	1.2	1.0	1.9	1.4	0.5	0.2	0.3	1.3	0.8	0.0	0.0	0.0	0.0	0.0	1.0	24.6	1.3	1.7	0.6	2.2	2.3	1.9	24.6	
20-Sep	2.1	Z	1.1	0.6	0.6	0.6	0.8	0.5	1.1	3.7	1.0	0.6	0.4	0.4	0.3	0.3	0.2	0.5	1.4	0.5	0.4	0.4	1.0	0.8	0.8	3.7	
21-Sep	1.2	1.2	Z	0.9	2.2	1.4	0.8	0.8	0.3	0.2	0.4	2.3	4.3	5.7	2.2	4.7	7.6	6.4	0.3	0.0	0.1	0.1	0.2	0.4	1.9	7.6	
22-Sep	0.5	0.3	0.1	Z	0.1	0.3	0.3	0.2	0.2	0.2	0.3	0.9	2.5	0.2	0.6	0.9	0.1	0.1	0.0	0.3	0.4	0.5	0.3	0.5	0.4	2.5	
23-Sep	0.2	0.2	0.4	0.4	Z	0.3	0.2	0.2	0.3	0.6	1.3	0.4	0.3	0.6	0.4	0.4	0.3	0.2	0.3	0.7	0.7	0.6	0.9	0.5	0.4	1.3	
24-Sep	0.5	0.8	0.8	0.8	0.2	Z	0.4	0.4	0.3	0.3	0.2	0.2	0.6	0.0	0.0	0.0	1.1	6.1	1.4	1.4	4.9	0.3	0.3	1.8	1.0	6.1	
25-Sep	Z	1.6	1.1	1.1	4.8	1.1	0.5	0.9	1.6	0.3	0.5	1.6	1.9	1.1	0.4	0.2	0.0	0.2	0.4	0.7	0.5	0.9	1.0	1.3	1.0	4.8	
26-Sep	1.8	Z	1.3	0.3	0.5	0.6	0.6	0.3	0.6	0.2	0.4	2.9	2.5	0.4	6.8	1.1	0.4	1.0	1.7	6.8	0.5	0.3	1.4	0.7	1.4	6.8	
27-Sep	1.0	1.5	Z	0.8	1.2	1.1	1.6	1.2	0.4	0.2	0.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.9	0.3	0.6	0.9	0.5	1.6	
28-Sep	0.6	0.6	0.8	Z	0.6	0.9	2.7	2.2	0.8	0.5	0.6	0.5	0.8	0.8	0.7	0.5	0.4	0.4	0.5	0.5	0.7	0.5	0.6	0.7	0.8	2.7	
29-Sep	0.4	0.7	0.4	0.4	Z	0.3	0.5	0.4	1.2	0.8	0.8	0.5	0.3	0.2	0.3	0.2	0.2	0.1	0.3	0.5	0.2	0.2	0.1	0.1	0.4	1.2	
30-Sep	0.9	0.1	0.0	0.0	0.1	Z	2.7	2.7	1.2	1.0	1.1	1.2	0.8	0.4	0.3	0.2	0.2	0.6	1.0	0.4	0.9	1.0	1.3	2.9	0.9	2.9	
																								Diurnal Average			
																								Diurnal Maximum			
																								0.9 1.0 0.7 0.7 1.0 0.8 0.8 0.8 0.7 0.6 0.6 0.7 0.7 0.6 0.6 0.6 0.7 0.9 1.4 1.5 1.5 0.9 0.9 1.0			
																								2.7 4.0 1.6 1.7 4.8 1.9 2.7 3.1 2.6 3.7 2.5 2.9 4.3 5.7 6.8 4.7 7.6 6.4 24.6 9.2 6.2 2.5 3.9 2.9			

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



Wood Buffalo Environmental Association
Hourly Averages

Hydrogen Sulphide (H₂S) - ppb
Lower Camp - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Lower Camp - September 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	643	93.73	93.73
3 - 4	27	3.94	97.67
5 - 7	12	1.75	99.42
8 - 11	3	0.44	99.85
> 11	1	0.15	100.00

Total Number of Valid Hours: 686

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Lower Camp - September 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	7	10	29	168	113	28	15	23	50	52	36	45	19	31	643
3 - 4	0	0	0	1	2	5	2	3	5	6	0	0	1	0	0	2	27
5 - 7	0	0	0	0	0	1	1	1	6	3	0	0	0	0	0	0	12
8 - 11	0	0	0	0	0	1	0	0	2	0	0	0	0	0	0	0	3
> 11	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Totals	11	6	7	11	31	175	116	32	29	32	50	52	37	45	19	33	686

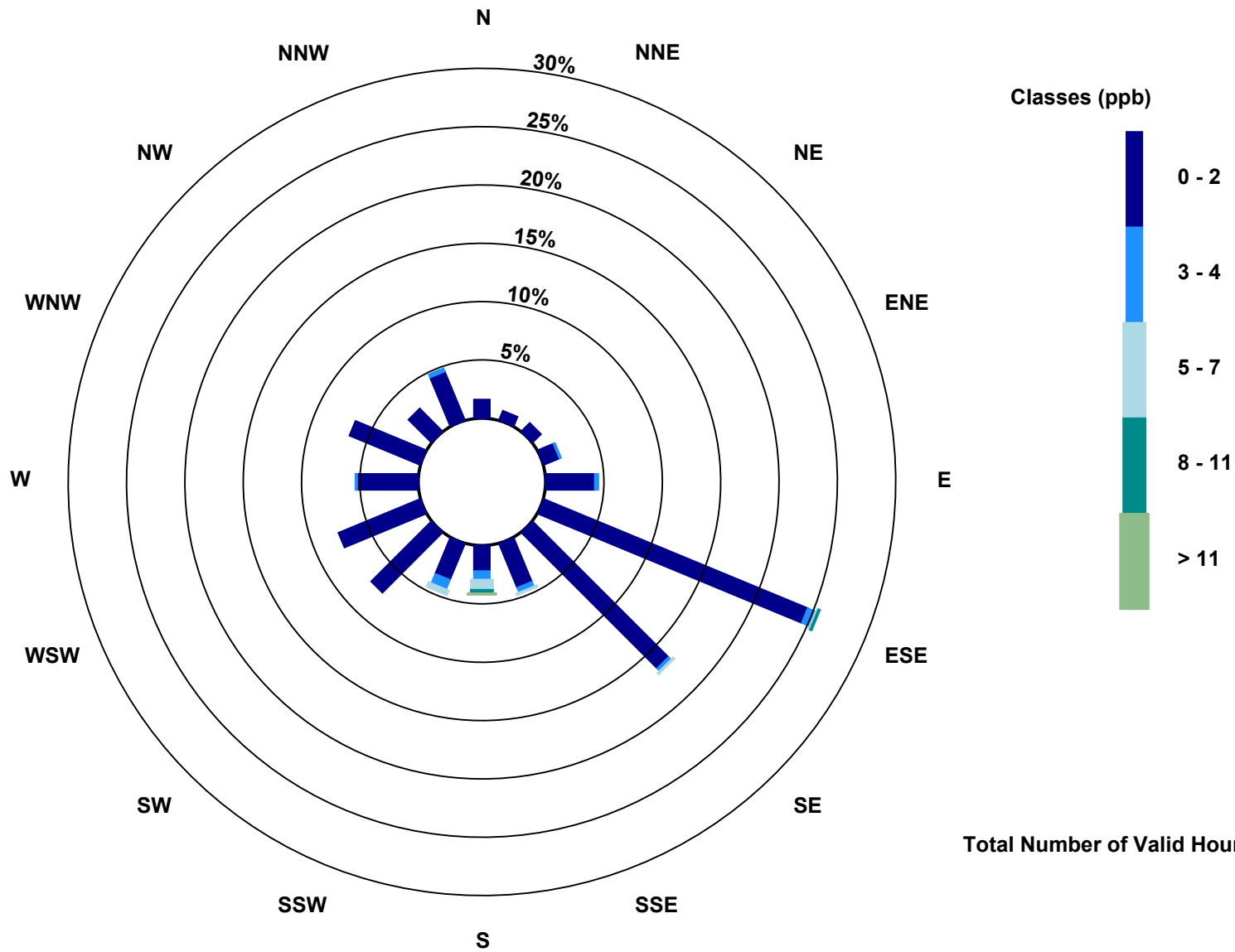
Total Number of Valid Hours: 686

Total Number of Hours: 720

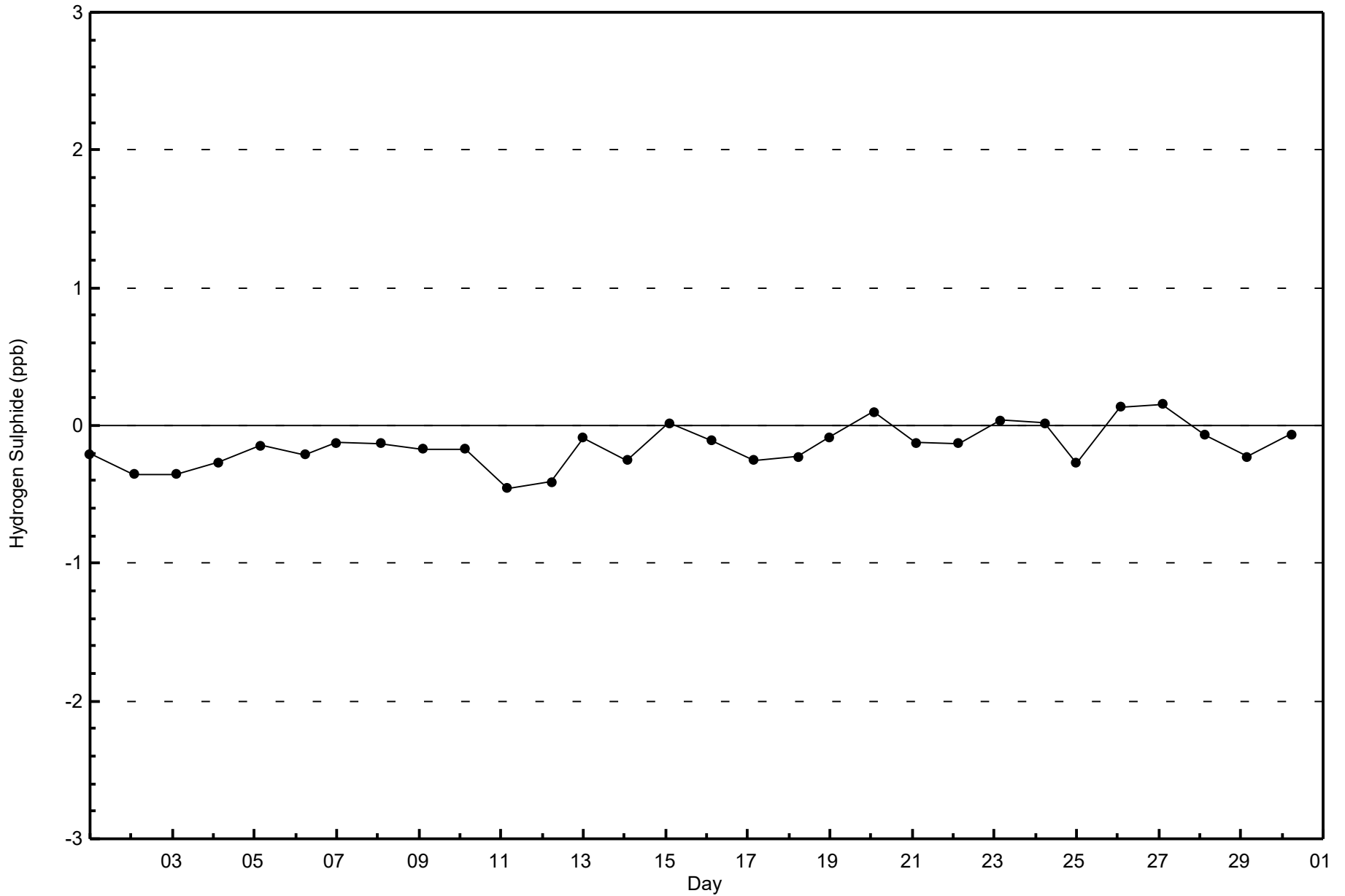


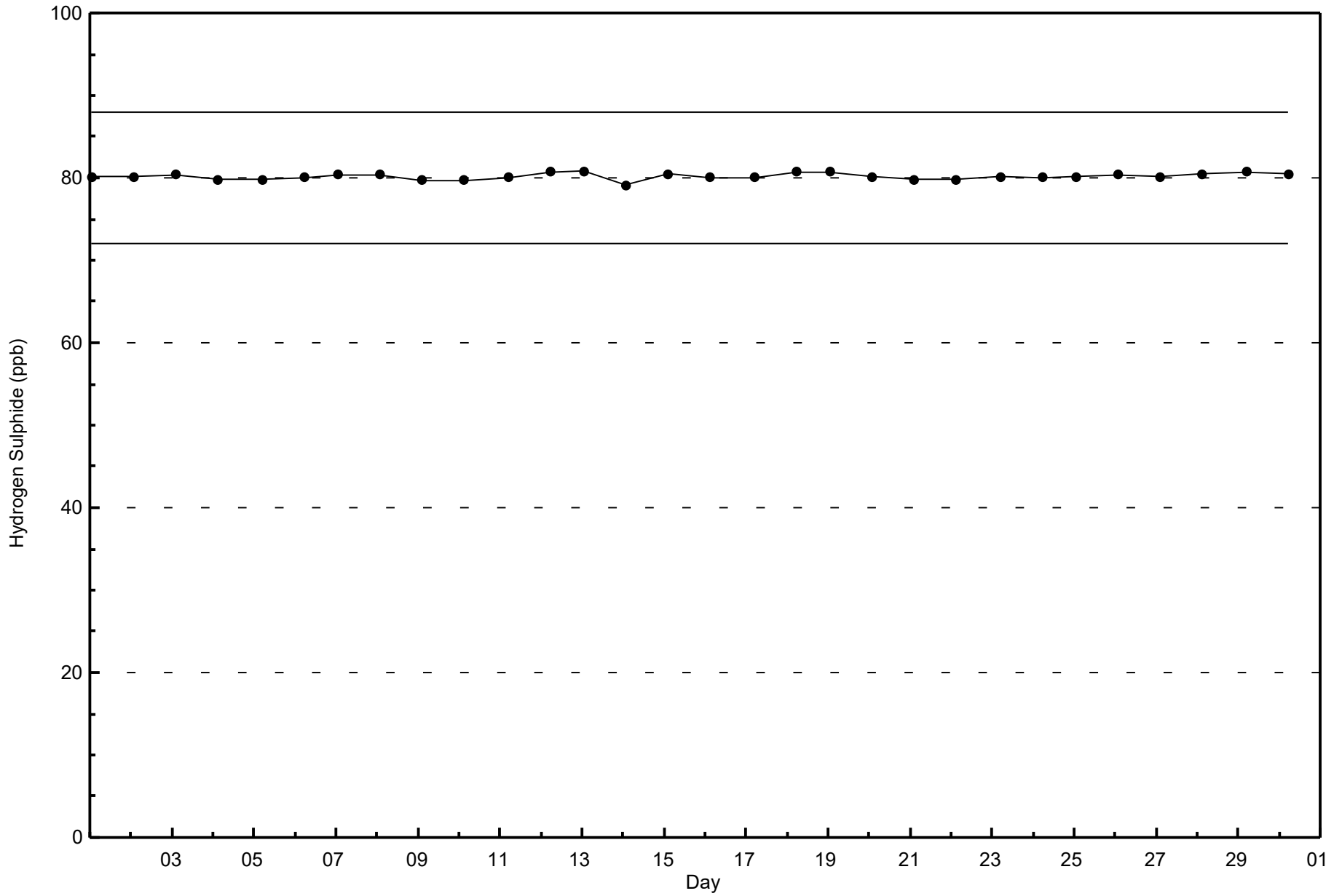
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Hydrogen Sulphide (H₂S) - ppb
Lower Camp



Total Number of Valid Hours: 686

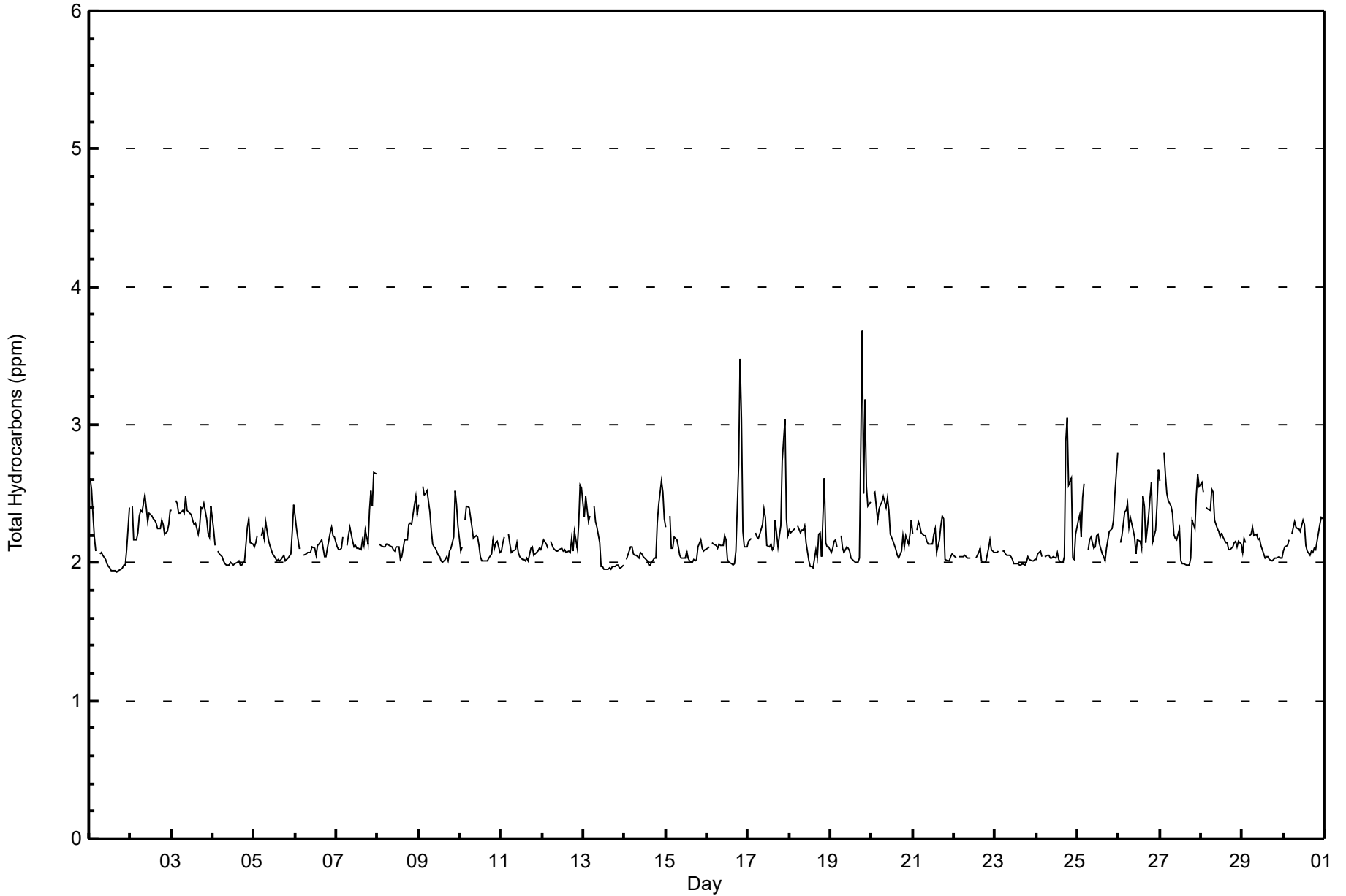






Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Lower Camp - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Lower Camp - September 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	175	25.47	25.47
2.1 - 3.0	508	73.94	99.42
3.1 - 10.0	4	0.58	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 687

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Lower Camp - September 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	3	1	0	0	0	33	35	7	0	5	28	26	4	17	4	12	175
2.1 - 3.0	8	6	6	11	31	144	81	21	26	24	23	26	37	27	15	22	508
3.1 - 10.0	0	0	0	0	0	1	0	1	2	0	0	0	0	0	0	0	4
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	11	7	6	11	31	178	116	29	28	29	51	52	41	44	19	34	687

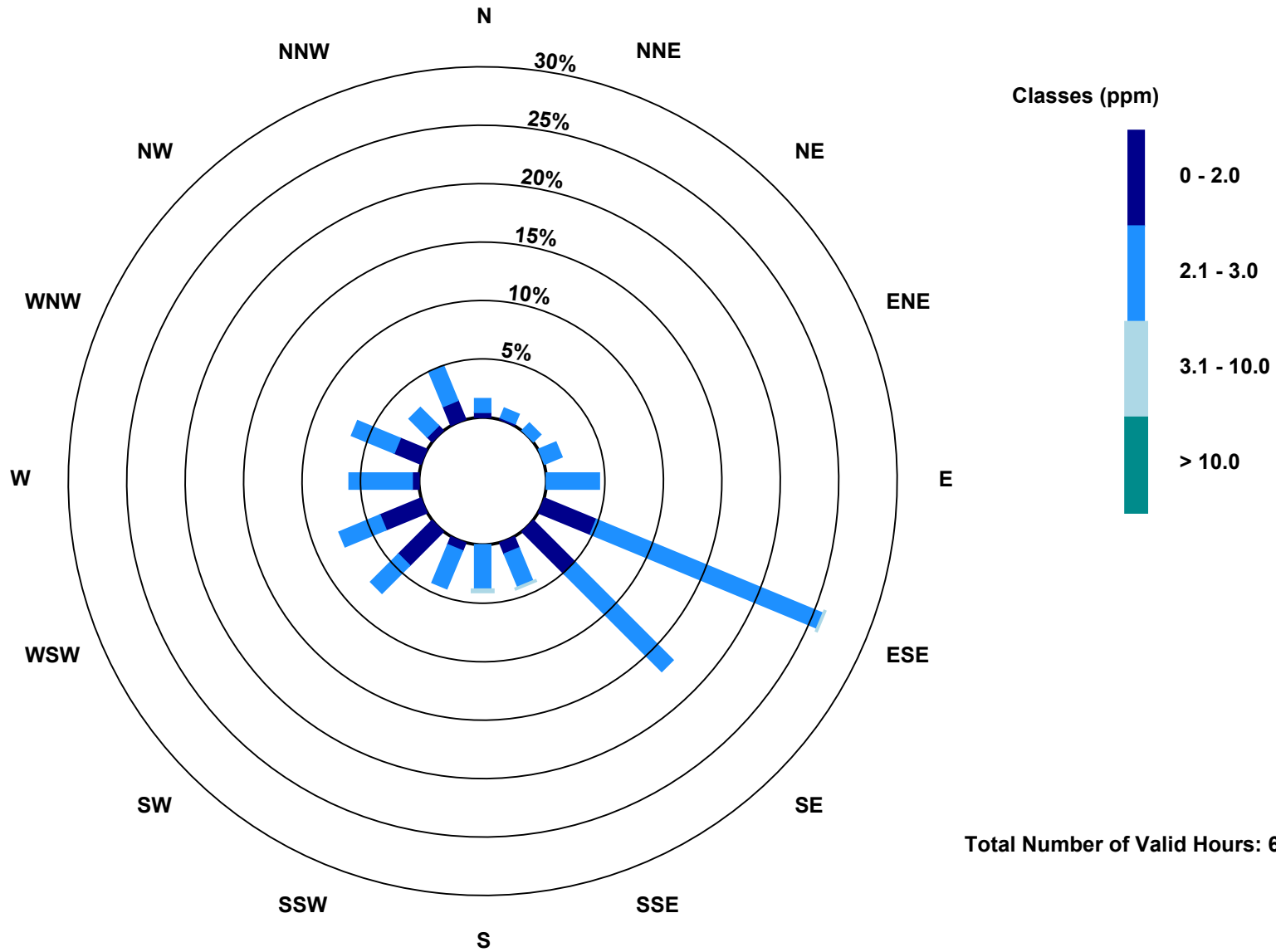
Total Number of Valid Hours: 687

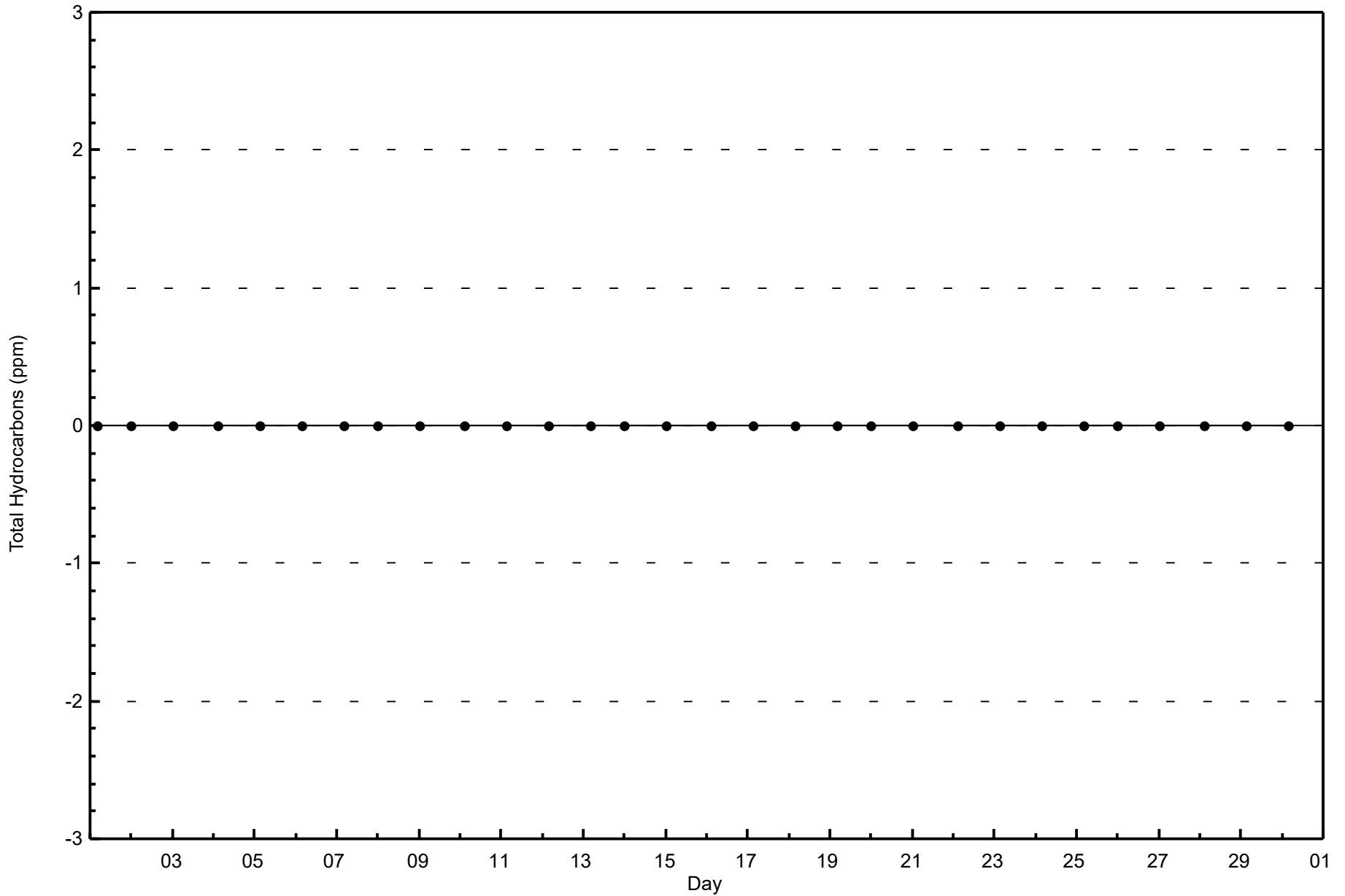
Total Number of Hours: 720

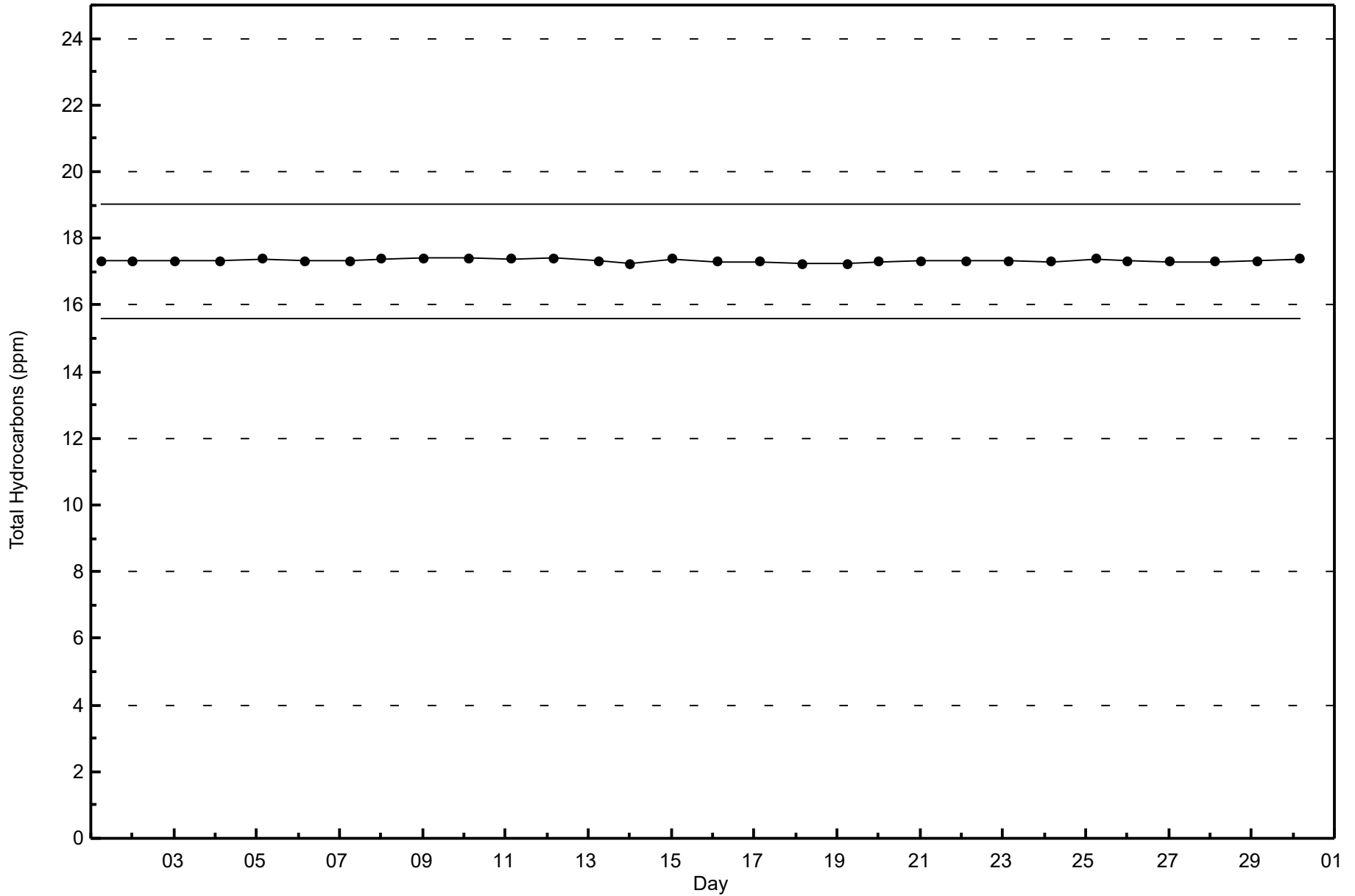


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Total Hydrocarbons (THC) - ppm
Lower Camp









Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH₄) - ppm

Lower Camp - September 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 3.6 ppm on Sep 19 19:00	Maximum Daily Average: 2.3 ppm on Sep 26		Hours of Data:	687
Minimum Value: 1.9 ppm on Sep 1 17:00	Minimum Daily Average: 2.0 ppm on Sep 23		Hours of Missing Data:	33
Maximum Diurnal Average: 2.3 ppm at hour 24	Minimum Diurnal Average: 2.1 ppm at hour 14		Hours of Calibration:	33
Monthly Average: 2.16 ppm	Percentiles: P ₁ = 2.0 P ₁₀ = 2.0 Q ₁ = 2.0 Median = 2.1 Q ₃ = 2.2 P ₉₀ = 2.4 P ₉₉ = 2.8		Percent Operational Time:	100.0

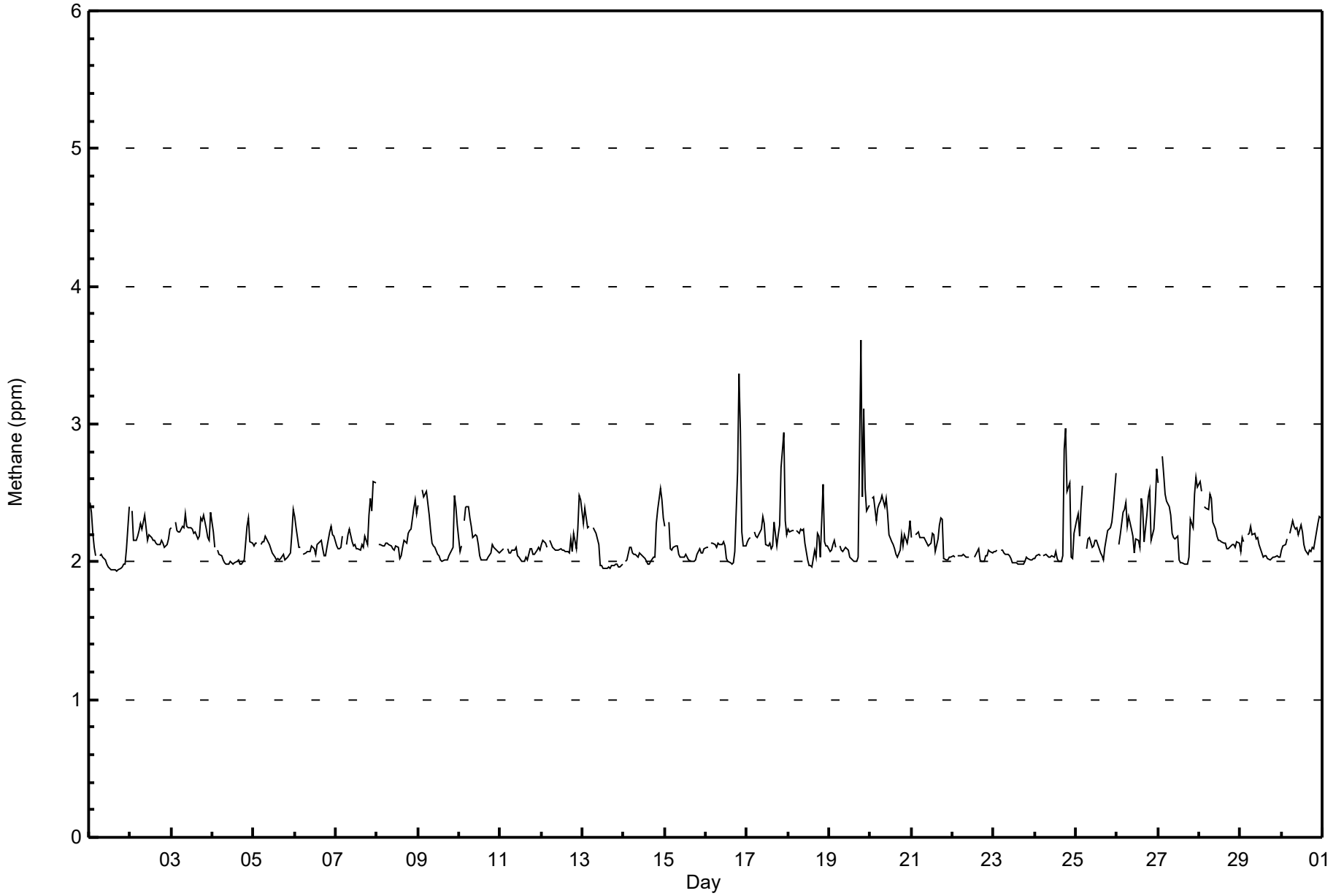
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Sep	2.4	2.4	2.2	2.1	2.0	Z	2.0	2.1	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.1	2.4	2.1	2.4																							
2-Sep	Z	2.4	2.2	2.2	2.2	2.2	2.3	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2																						
3-Sep	2.2	Z	2.3	2.2	2.2	2.2	2.3	2.2	2.4	2.3	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	2.4	2.2	2.4																							
4-Sep	2.2	2.1	Z	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.3	2.3	2.1	2.1	2.1	2.3																							
5-Sep	2.1	2.1	2.1	Z	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	2.0	2.1	2.0	2.0	2.1	2.2	2.4	2.1	2.4																							
6-Sep	2.3	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	2.2	2.1	2.0	2.0	2.1	2.2	2.3	2.2	2.2	2.1	2.3																							
7-Sep	2.1	2.1	2.1	2.1	2.2	Z	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.3	2.5	2.4	2.6	2.6	2.2	2.6																							
8-Sep	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	2.2	2.1	2.2	2.2	2.2	2.4	2.5	2.3	2.2	2.5																							
9-Sep	2.4	Z	2.5	2.5	2.5	2.5	2.3	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.5	2.4	2.3	2.2	2.5																							
10-Sep	2.1	2.1	Z	2.3	2.4	2.4	2.3	2.3	2.2	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4																							
11-Sep	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1																							
12-Sep	2.1	2.2	2.1	2.1	Z	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.1	2.2	2.5	2.5	2.1	2.5																							
13-Sep	2.3	2.4	2.3	2.2	2.3	Z	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	2.0	2.0	2.0	2.0	2.1	2.4																							
14-Sep	Z	2.0	2.0	2.1	2.1	2.1	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	2.3	2.4	2.5	2.4	2.3	2.1	2.5																						
15-Sep	2.3	Z	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3																						
16-Sep	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.7	3.4	2.9	2.2	2.1	2.1	2.2	3.4																							
17-Sep	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.1	2.1	2.1	2.1	2.1	2.3	2.1	2.2	2.3	2.7	2.9	2.3	2.2	2.2	2.9																							
18-Sep	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.2	2.2	2.0	2.6	2.1	2.1	2.1	2.2	2.6																							
19-Sep	2.1	2.1	2.1	2.2	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	3.6	2.5	3.1	2.5	2.4	2.4	2.2	3.6																							
20-Sep	Z	2.5	2.5	2.3	2.4	2.4	2.4	2.5	2.4	2.5	2.4	2.2	2.1	2.1	2.1	2.0	2.0	2.1	2.2	2.1	2.2	2.1	2.2	2.3	2.3	2.5																							
21-Sep	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.2	2.2	2.1	2.2	2.3	2.3	2.3	2.0	2.0	2.0	2.0	2.0	2.2	2.3																							
22-Sep	2.0	2.0	Z	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	C	C	C	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.1																							
23-Sep	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	2.0	2.0	2.1																							
24-Sep	2.0	2.0	2.1	2.0	Z	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.8	3.0	2.5	2.6	2.0	2.0	2.2	2.2	3.0																							
25-Sep	2.3	2.4	2.2	2.4	2.5	Z	2.1	2.2	2.2	2.1	2.1	2.2	2.2	2.1	2.1	2.0	2.0	2.1	2.2	2.2	2.2	2.3	2.4	2.6	2.2	2.6																							
26-Sep	Z	2.1	2.2	2.4	2.4	2.4	2.3	2.3	2.2	2.2	2.1	2.2	2.2	2.1	2.5	2.4	2.1	2.3	2.5	2.5	2.2	2.2	2.4	2.7	2.3	2.7																							
27-Sep	2.6	Z	2.8	2.6	2.5	2.4	2.4	2.3	2.2	2.2	2.2	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3	2.2	2.5	2.6	2.5	2.3	2.8																							
28-Sep	2.6	2.5	Z	2.4	2.4	2.4	2.5	2.5	2.3	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.6																							
29-Sep	2.1	2.2	2.1	Z	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.3																							
30-Sep	2.1	2.1	2.1	2.2	Z	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.3	2.2	2.3																							
																								2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.2	2.2	2.3	Diurnal Average		
																								2.6	2.5	2.8	2.6	2.5	2.5	2.5	2.5	2.4	2.5	2.4	2.3	2.2	2.2	2.5	2.4	2.3	2.8	3.6	3.4	3.1	2.9	2.6	2.7	Diurnal Maximum	

Z - zerospan C - Calibration



Wood Buffalo Environmental Association
Hourly Averages

Methane (CH₄) - ppm
Lower Camp - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Lower Camp - September 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	185	26.93	26.93
2.1 - 3.0	499	72.63	99.56
3.1 - 10.0	3	0.44	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 687

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Methane (CH₄) - ppm
Lower Camp - September 2023

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	3	1	0	0	0	35	39	7	0	5	31	26	5	17	4	12	185
2.1 - 3.0	8	6	6	11	31	142	77	22	26	24	20	26	36	27	15	22	499
3.1 - 10.0	0	0	0	0	0	1	0	0	2	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	11	7	6	11	31	178	116	29	28	29	51	52	41	44	19	34	687

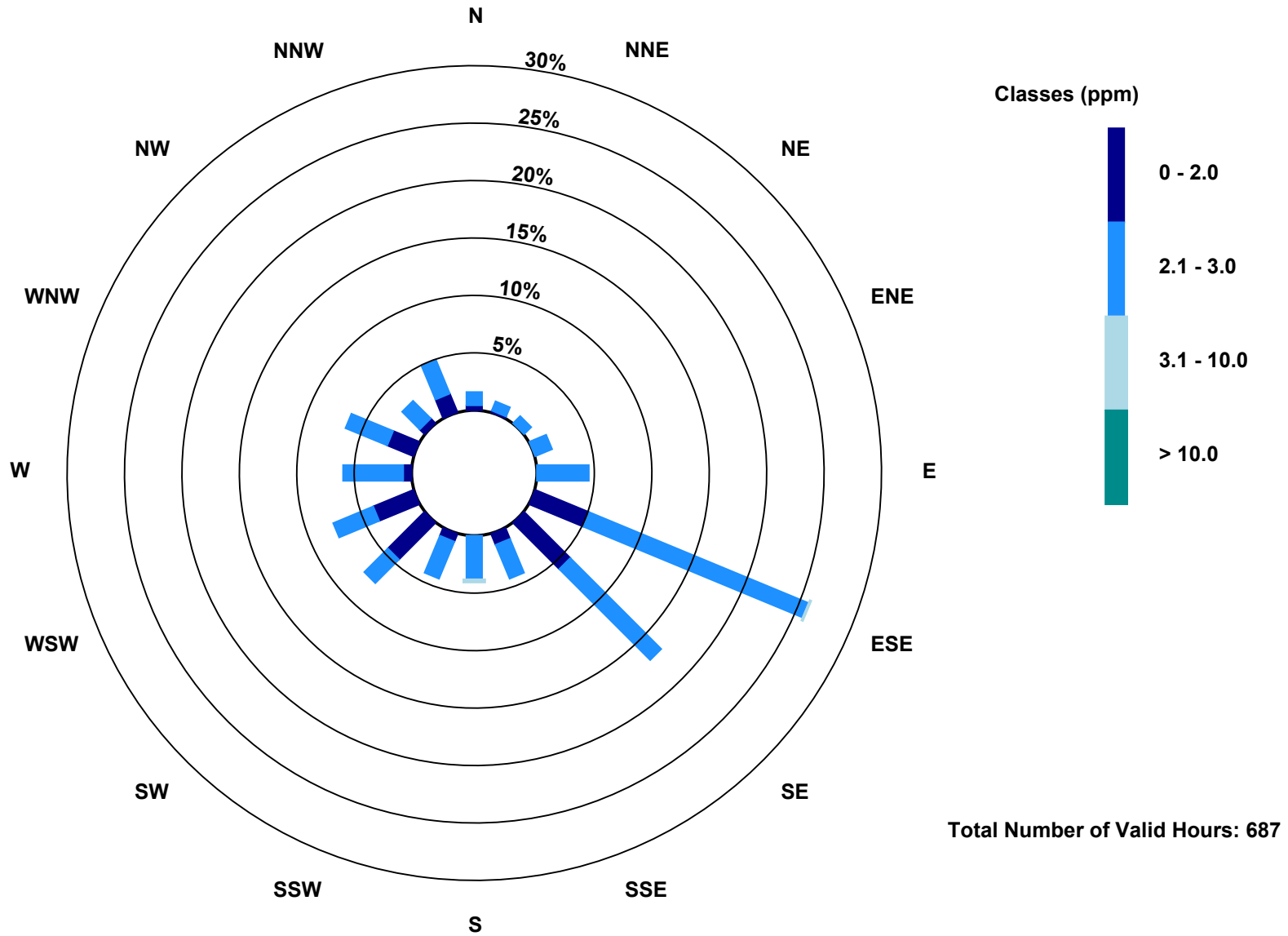
Total Number of Valid Hours: 687

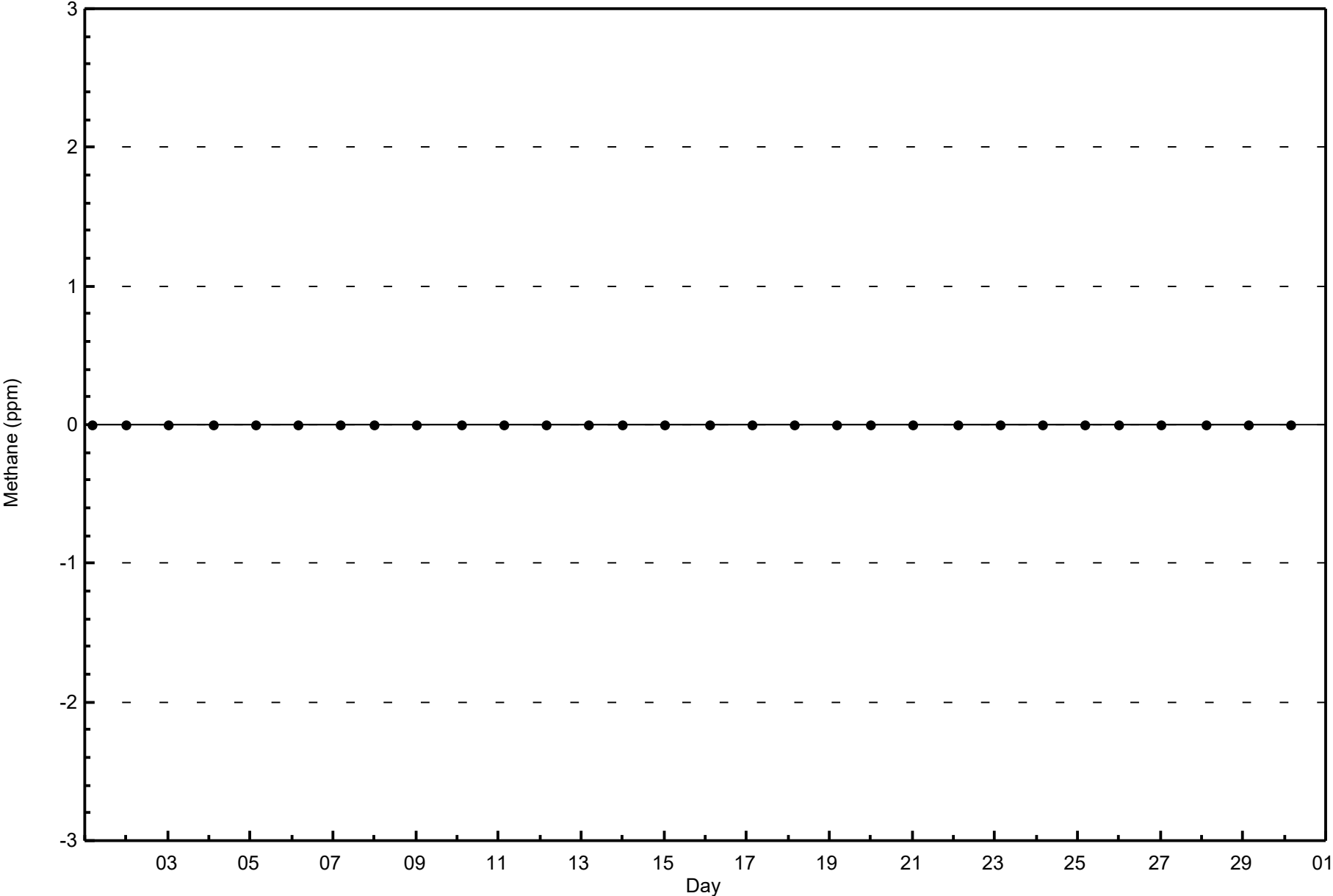
Total Number of Hours: 720

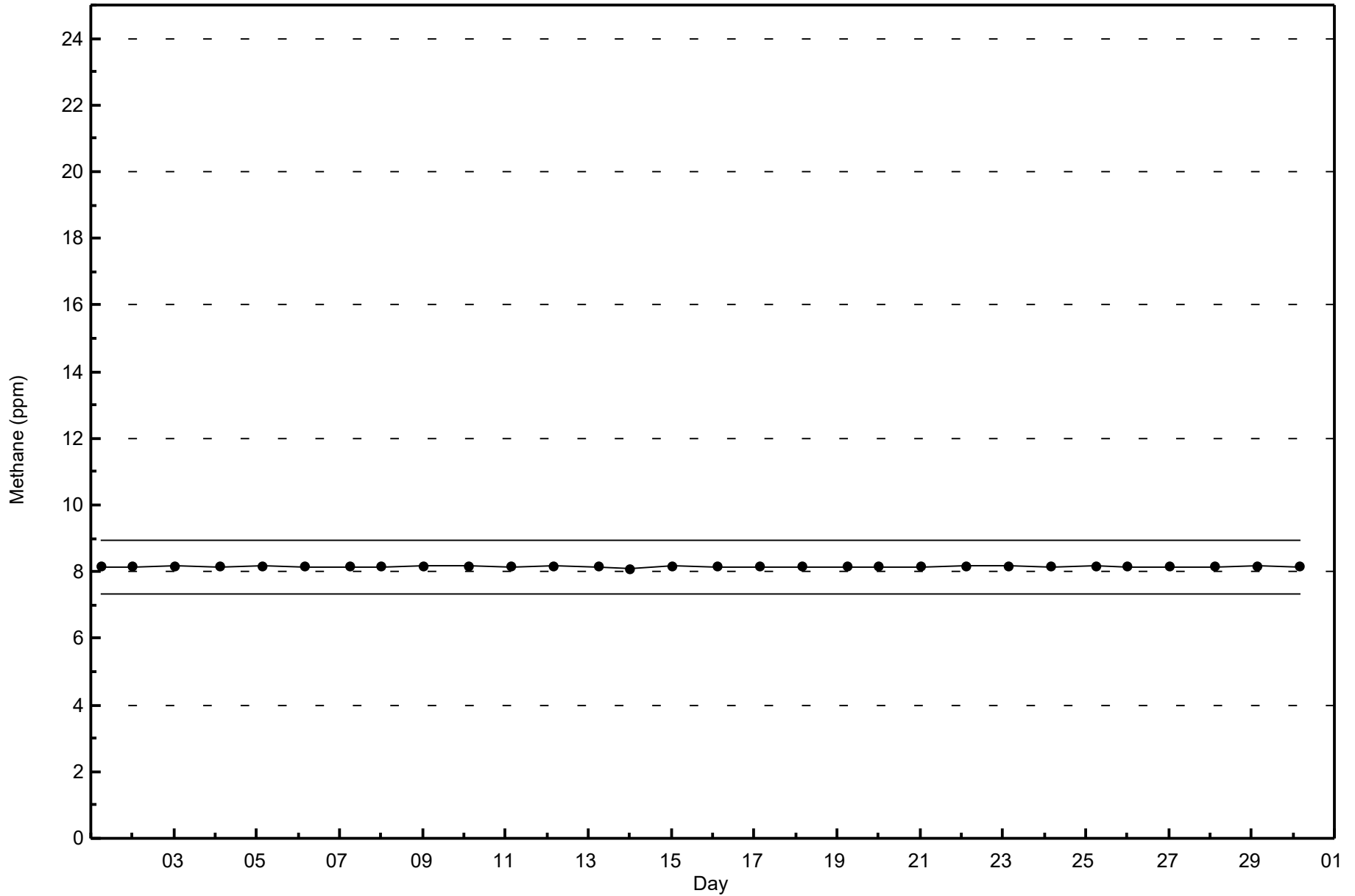


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Methane (CH₄) - ppm
Lower Camp







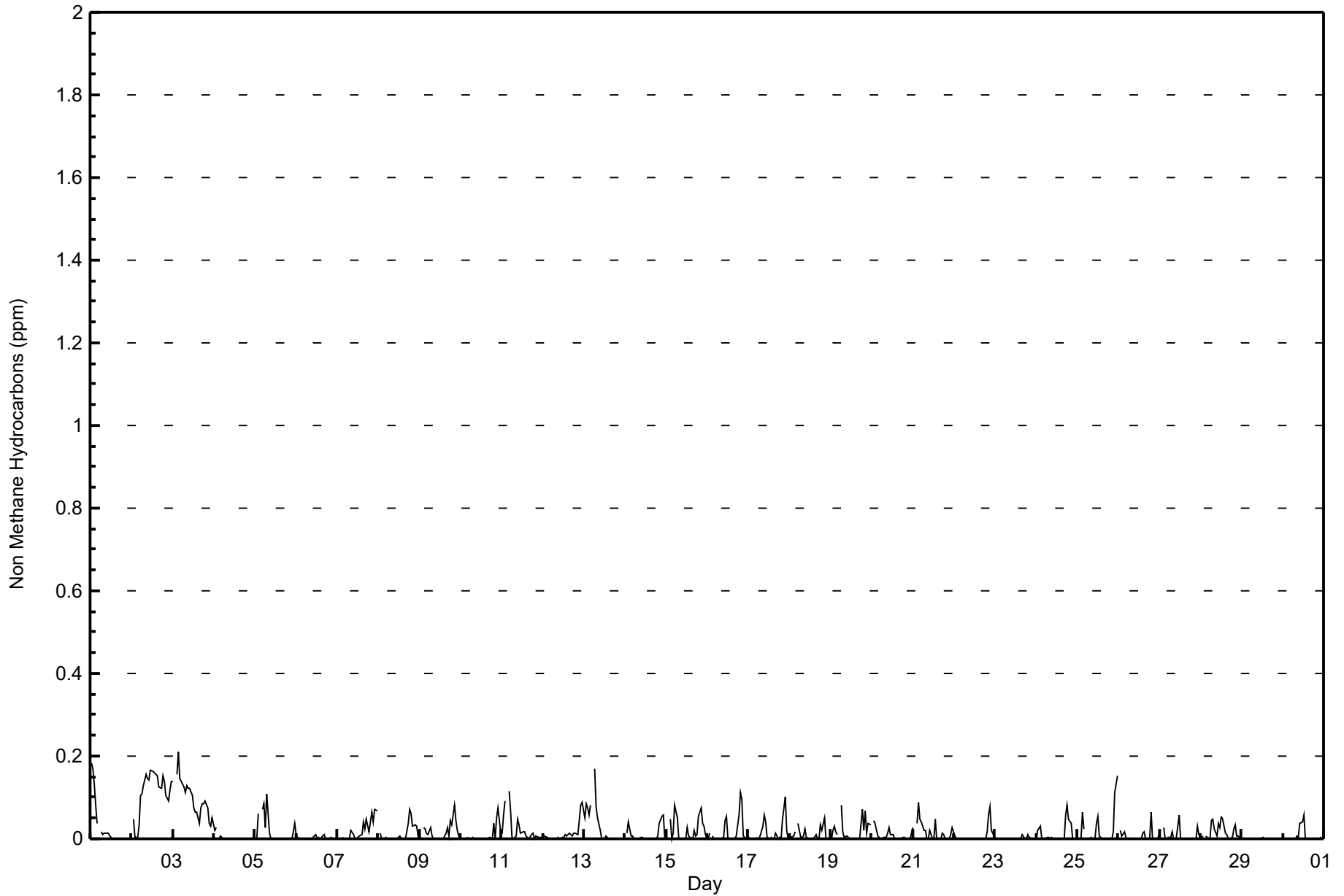


Maximum Value: 0.210 ppm on Sep 3 04:00	Maximum Daily Average: 0.116 ppm on Sep 2	Hours in Service: 720
Minimum Value: 0.000 ppm on Sep 1 16:00	Minimum Daily Average: 0.000 ppm on Sep 29	Hours of Data: 687
Maximum Diurnal Average: 0.033 ppm at hour 3	Minimum Diurnal Average: 0.009 ppm at hour 15	Hours of Missing Data: 33
Monthly Average: 0.020 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: 33
		Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Sep	0.184	0.169	0.134	0.081	0.038	Z	0.018	0.011	0.015	0.014	0.014	0.008	0.002	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.030	0.184
2-Sep	Z	0.049	0.005	0.003	0.035	0.104	0.109	0.130	0.157	0.145	0.143	0.166	0.164	0.160	0.156	0.152	0.127	0.123	0.153	0.140	0.105	0.093	0.118	0.140	0.116	0.166
3-Sep	0.140	Z	0.157	0.210	0.145	0.138	0.126	0.111	0.130	0.123	0.122	0.104	0.073	0.065	0.065	0.038	0.073	0.085	0.086	0.091	0.076	0.038	0.031	0.051	0.099	0.210
4-Sep	0.021	0.026	Z	0.001	0.008	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	0.002	0.003	0.026
5-Sep	0.000	0.003	0.061	Z	0.070	0.085	0.026	0.108	0.014	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.000	0.001	0.000	0.001	0.017	0.036	0.018	0.108
6-Sep	0.010	0.002	0.000	0.000	Z	0.001	0.000	0.000	0.001	0.002	0.005	0.011	0.000	0.002	0.002	0.007	0.010	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.002	0.011
7-Sep	0.001	0.000	0.000	0.000	0.002	Z	0.000	0.000	0.020	0.011	0.001	0.000	0.003	0.005	0.011	0.042	0.025	0.046	0.015	0.042	0.065	0.040	0.071	0.068	0.020	0.071
8-Sep	Z	0.014	0.000	0.000	0.003	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.000	0.000	0.000	0.001	0.039	0.071	0.060	0.032	0.034	0.030	0.007	0.013	0.071
9-Sep	0.010	Z	0.029	0.024	0.014	0.010	0.026	0.006	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.015	0.028	0.005	0.044	0.034	0.082	0.043	0.021	0.007	0.017	0.082
10-Sep	0.001	0.001	Z	0.002	0.004	0.002	0.001	0.002	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.002	0.000	0.037	0.001	0.052	0.074	0.014	0.008	0.074
11-Sep	0.014	0.057	0.091	Z	0.115	0.067	0.002	0.001	0.005	0.047	0.033	0.014	0.018	0.018	0.008	0.003	0.001	0.010	0.012	0.001	0.007	0.004	0.004	0.003	0.023	0.115
12-Sep	0.004	0.006	0.002	0.004	Z	0.001	0.001	0.000	0.000	0.004	0.002	0.002	0.003	0.011	0.008	0.012	0.011	0.007	0.012	0.013	0.010	0.045	0.080	0.089	0.014	0.089
13-Sep	0.050	0.084	0.076	0.058	0.082	Z	0.171	0.078	0.052	0.021	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	0.029	0.171
14-Sep	Z	0.014	0.041	0.005	0.007	0.001	0.000	0.001	0.000	0.003	0.003	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.001	0.006	0.038	0.055	0.059	0.001	0.010	0.059
15-Sep	0.000	Z	0.046	0.002	0.015	0.080	0.050	0.001	0.000	0.000	0.000	0.001	0.026	0.006	0.002	0.001	0.021	0.005	0.011	0.055	0.075	0.038	0.030	0.010	0.021	0.080
16-Sep	0.001	0.013	Z	0.008	0.000	0.001	0.000	0.000	0.000	0.005	0.044	0.053	0.003	0.000	0.000	0.000	0.000	0.008	0.059	0.111	0.095	0.007	0.002	0.001	0.018	0.111
17-Sep	0.003	0.000	0.000	Z	0.004	0.001	0.001	0.006	0.032	0.056	0.041	0.003	0.000	0.003	0.000	0.000	0.012	0.001	0.002	0.000	0.047	0.102	0.021	0.001	0.015	0.102
18-Sep	0.001	0.002	0.006	0.016	Z	0.038	0.004	0.004	0.007	0.023	0.004	0.000	0.000	0.000	0.000	0.010	0.000	0.001	0.035	0.019	0.053	0.002	0.001	0.001	0.010	0.053
19-Sep	0.000	0.020	0.029	0.017	0.010	Z	0.080	0.018	0.003	0.008	0.004	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.070	0.021	0.067	0.014	0.037	0.034	0.019	0.080
20-Sep	Z	0.045	0.036	0.005	0.003	0.001	0.001	0.004	0.003	0.014	0.027	0.011	0.010	0.001	0.001	0.000	0.000	0.000	0.003	0.004	0.001	0.001	0.001	0.013	0.008	0.045
21-Sep	0.028	Z	0.036	0.088	0.049	0.041	0.019	0.021	0.001	0.000	0.021	0.001	0.000	0.047	0.000	0.001	0.001	0.012	0.011	0.000	0.000	0.001	0.012	0.028	0.018	0.088
22-Sep	0.007	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	C	C	C	0.000	0.000	0.001	0.000	0.000	0.000	0.018	0.058	0.078	0.019	0.006	0.009	0.078
23-Sep	0.000	0.000	0.001	Z	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.009	0.000	0.001	0.011	0.005	0.000	0.000	0.000	0.001	0.011
24-Sep	0.000	0.021	0.030	0.001	Z	0.002	0.002	0.002	0.001	0.003	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.059	0.080	0.049	0.038	0.000	0.000	0.000	0.012	0.080
25-Sep	0.000	0.000	0.002	0.065	0.023	Z	0.000	0.001	0.002	0.000	0.003	0.039	0.053	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.018	0.112	0.152	0.021	0.152
26-Sep	Z	0.021	0.007	0.016	0.003	0.001	0.001	0.000	0.000	0.000	0.001	0.001	0.000	0.015	0.018	0.000	0.000	0.005	0.064	0.000	0.000	0.000	0.002	0.007	0.007	0.064
27-Sep	0.012	Z	0.027	0.000	0.002	0.004	0.004	0.016	0.000	0.000	0.003	0.058	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.030	0.011	0.007	0.007	0.058
28-Sep	0.003	0.007	Z	0.006	0.005	0.001	0.045	0.049	0.023	0.006	0.037	0.028	0.054	0.047	0.014	0.011	0.000	0.001	0.004	0.023	0.033	0.006	0.008	0.000	0.018	0.054
29-Sep	0.001	0.000	0.000	Z	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	0.001	0.000	0.000	0.000	0.003
30-Sep	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.006	0.003	0.039	0.040	0.059	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.006	0.059

0.020	0.022	0.033	0.024	0.025	0.023	0.023	0.019	0.016	0.016	0.019	0.019	0.017	0.013	0.009	0.010	0.011	0.013	0.022	0.027	0.030	0.022	0.026	0.023	Diurnal Average	
0.184	0.169	0.157	0.210	0.145	0.138	0.171	0.130	0.157	0.145	0.143	0.166	0.164	0.160	0.156	0.152	0.127	0.123	0.153	0.140	0.105	0.102	0.118	0.152	Diurnal Maximum	

Z - zerospan C - Calibration





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Lower Camp - September 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	410	59.68	59.68
0.006 - 0.05	188	27.37	87.05
0.06 - 0.1	76	11.06	98.11
> 0.1	13	1.89	100.00

Total Number of Valid Hours: 687

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm
Lower Camp - September 2023

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	5	5	4	5	17	109	61	17	15	18	34	33	20	30	15	22	410
0.006 - 0.05	4	2	2	6	13	50	32	8	9	10	11	6	10	10	3	12	188
0.06 - 0.1	2	0	0	0	1	19	20	4	4	1	2	11	8	3	1	0	76
> 0.1	0	0	0	0	0	0	3	0	0	0	4	2	3	1	0	0	13
Totals	11	7	6	11	31	178	116	29	28	29	51	52	41	44	19	34	687

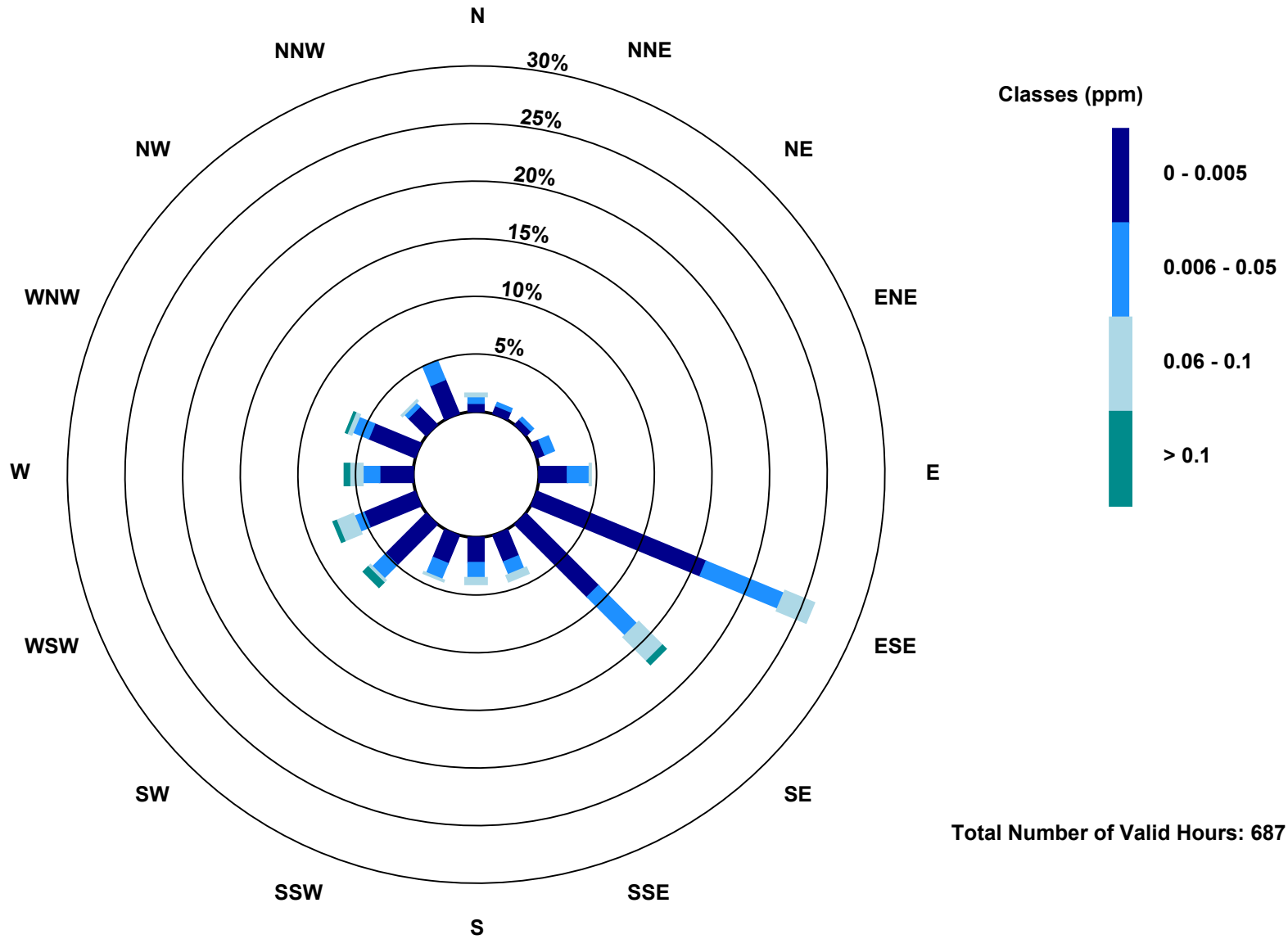
Total Number of Valid Hours: 687

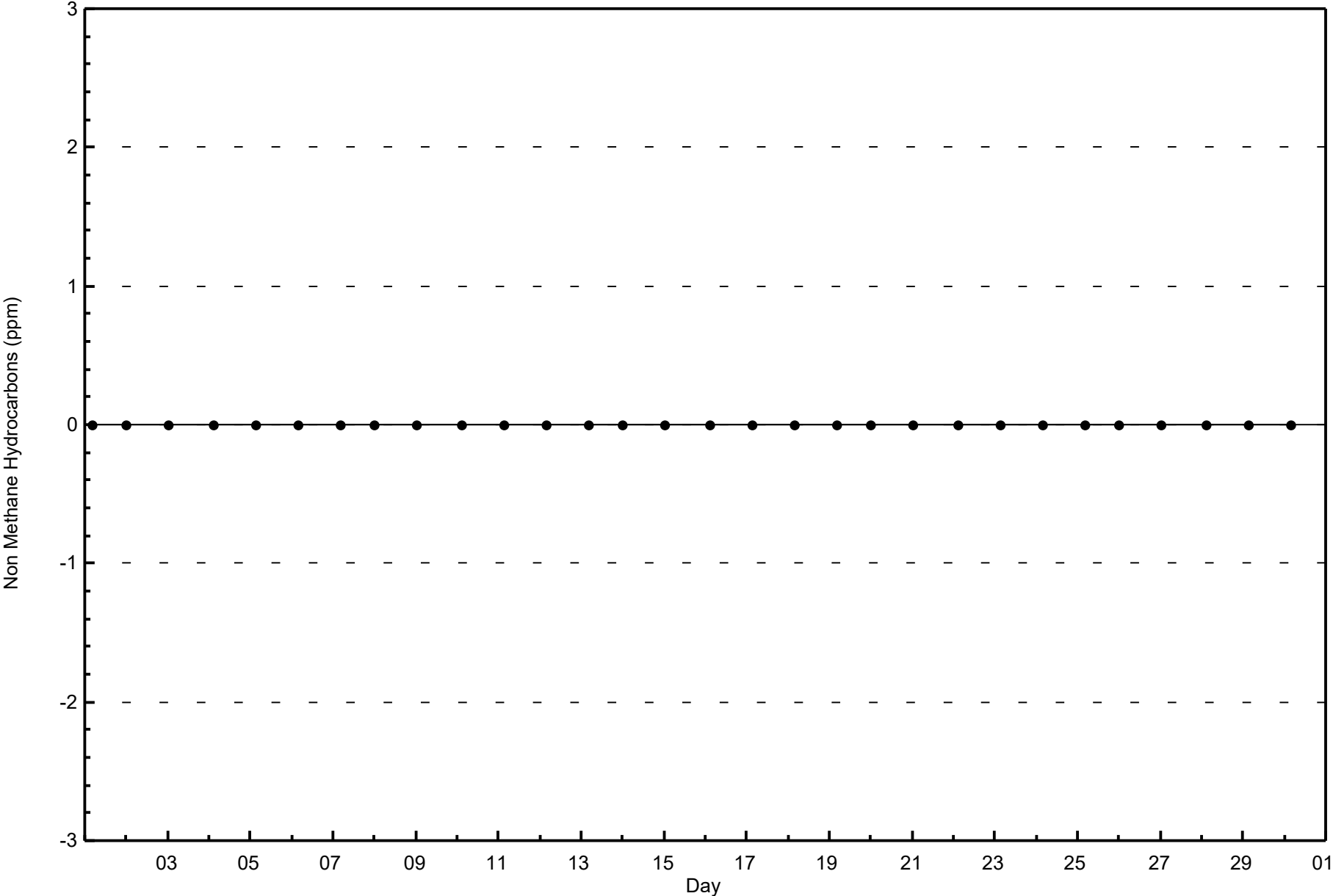
Total Number of Hours: 720

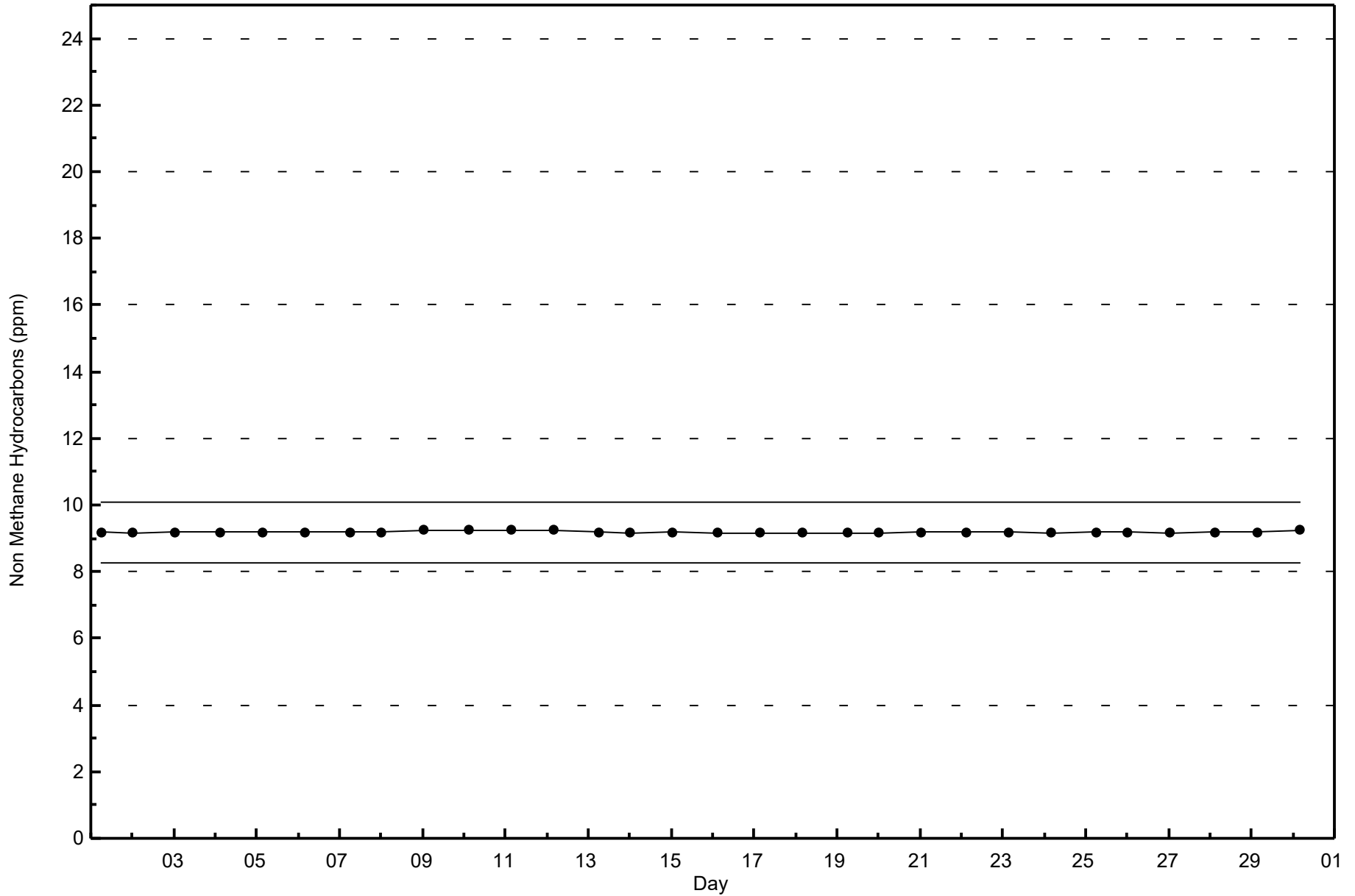


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Non Methane Hydrocarbons (NMHC) - ppm
Lower Camp









Wood Buffalo Environmental Association
Summary of Hour Averages

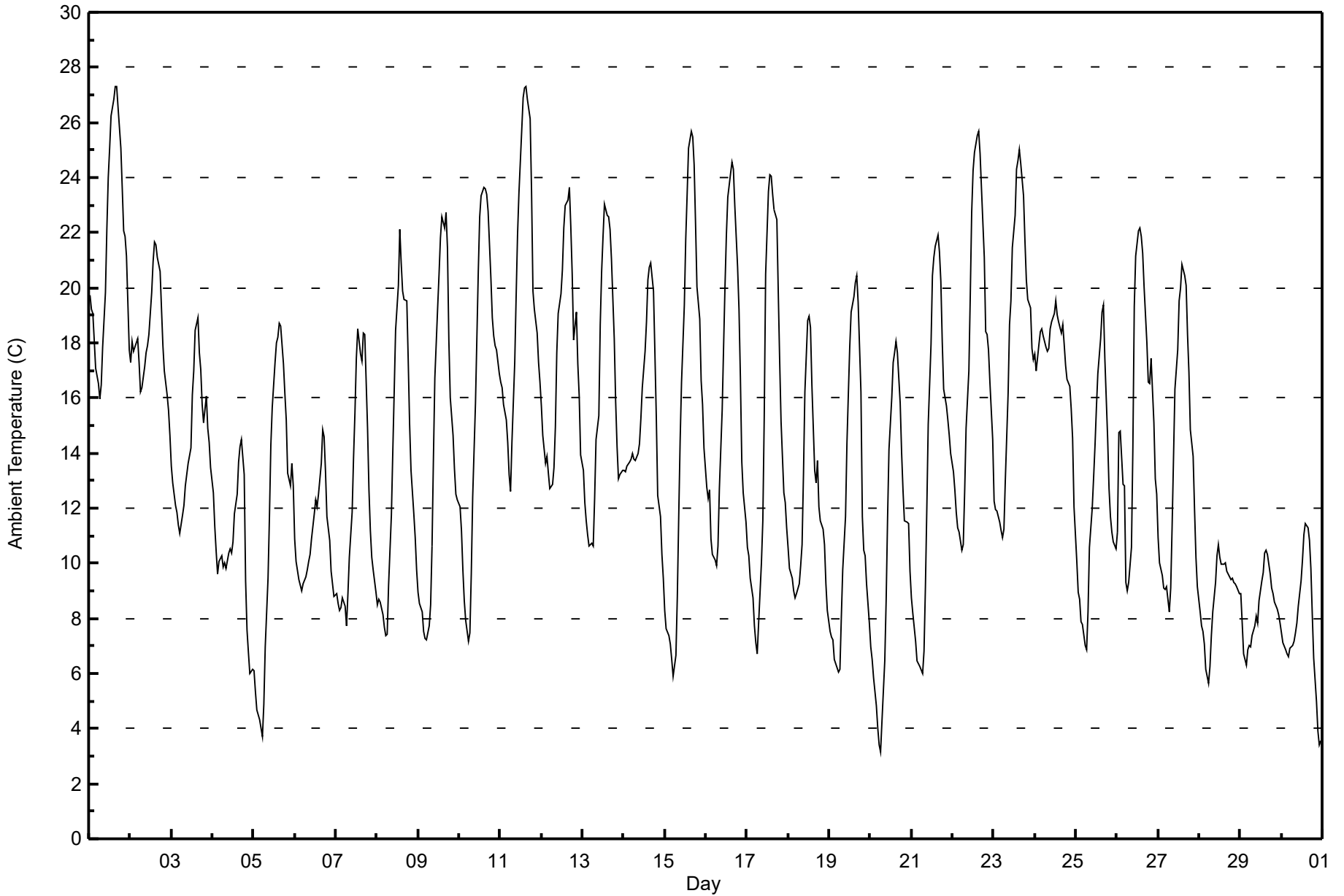
Ambient Temperature (AT) - C
Lower Camp - September 2023

Maximum Value: 27.3 C on Sep 11 16:00		Maximum Daily Average: 21.5 C on Sep 1		Hours in Service: 720																																													
Minimum Value: 3.2 C on Sep 20 07:00		Minimum Daily Average: 7.7 C on Sep 30		Hours of Data: 720																																													
Maximum Diurnal Average: 20.0 C at hour 16		Minimum Diurnal Average: 9.3 C at hour 7		Hours of Missing Data: 0																																													
Monthly Average: 14.24 C		Percentiles: P ₁ = 4.1 P ₁₀ = 7.5 Q ₁ = 9.7 Median = 13.6 Q ₃ = 18.3 P ₉₀ = 21.9 P ₉₉ = 26.5		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-Sep	19.7	19.2	19.1	18.1	17.1	16.5	16.0	16.5	17.9	19.8	22.1	24.0	25.1	26.2	26.8	27.3	27.3	26.6	25.1	23.6	22.1	21.8	21.2	17.8	21.5	27.3																							
2-Sep	17.3	18.0	17.7	18.0	18.1	17.3	16.2	16.4	17.1	17.7	17.9	18.3	19.8	21.0	21.7	21.6	21.1	20.6	19.2	17.9	17.0	16.1	15.5	14.6	18.2	21.7																							
3-Sep	13.5	12.9	12.1	11.9	11.4	11.1	11.7	12.1	12.8	13.2	13.6	14.2	16.1	17.0	18.4	18.9	17.6	17.0	15.8	15.1	16.1	14.9	14.4	13.5	14.4	18.9																							
4-Sep	12.6	11.3	10.4	9.6	10.1	10.3	9.9	10.0	9.8	10.4	10.5	10.4	10.8	11.8	12.5	13.7	14.2	14.5	13.2	9.4	7.6	6.8	6.0	6.1	10.5	14.5																							
5-Sep	6.1	5.3	4.7	4.3	4.0	3.7	4.9	6.9	9.5	11.7	14.3	15.6	17.3	18.0	18.2	18.7	18.6	17.3	16.2	15.2	13.3	12.8	13.6	12.8	11.8	18.7																							
6-Sep	10.9	10.0	9.4	9.2	9.0	9.3	9.5	9.7	10.0	10.3	10.9	11.8	12.3	12.0	12.5	13.6	14.9	14.6	13.3	11.7	10.8	9.7	9.2	8.8	11.0	14.9																							
7-Sep	8.9	8.5	8.3	8.4	8.8	8.4	7.7	8.9	10.2	11.8	13.8	15.5	17.5	18.5	17.6	17.3	18.4	18.3	14.9	12.6	11.2	10.2	9.8	8.9	12.3	18.5																							
8-Sep	8.5	8.7	8.6	8.1	7.7	7.4	7.4	9.2	11.8	14.0	16.2	18.4	20.1	22.1	20.9	19.9	19.6	19.5	17.4	15.1	13.4	11.8	10.9	9.7	13.6	22.1																							
9-Sep	8.9	8.5	8.2	7.5	7.3	7.2	7.7	8.5	10.6	13.8	16.7	19.3	20.5	21.8	22.6	22.1	22.7	21.5	18.1	16.0	14.6	13.4	12.5	12.3	14.3	22.7																							
10-Sep	12.0	11.2	9.8	8.7	8.0	7.2	7.5	9.6	12.4	15.8	18.2	20.6	22.6	23.4	23.7	23.6	23.4	22.8	20.3	18.9	18.3	17.9	17.8	16.9	16.3	23.7																							
11-Sep	16.6	16.4	15.8	15.2	14.4	13.2	12.6	14.4	17.3	19.7	21.9	23.4	25.7	26.9	27.3	27.3	26.8	26.1	23.5	19.9	19.2	18.3	17.3	16.6	19.8	27.3																							
12-Sep	15.7	14.6	13.6	13.9	13.3	12.7	12.9	13.5	15.0	17.6	19.1	19.8	20.7	22.2	23.0	23.2	23.6	22.2	20.5	18.1	19.1	17.2	16.1	13.9	17.6	23.6																							
13-Sep	13.4	12.2	11.5	11.1	10.6	10.7	10.6	12.4	14.5	15.4	18.6	20.6	21.9	23.0	22.6	22.6	22.1	21.1	18.1	15.9	14.2	13.1	13.2	13.4	16.0	23.0																							
14-Sep	13.4	13.3	13.5	13.7	13.8	14.0	13.8	13.7	14.0	14.4	15.2	16.4	17.7	18.8	20.3	20.8	20.9	19.9	17.7	15.3	12.5	11.7	10.3	9.4	15.2	20.9																							
15-Sep	8.3	7.6	7.4	7.1	6.5	5.9	6.6	8.8	11.7	14.4	16.6	19.4	21.7	23.4	25.0	25.7	25.5	24.4	22.3	20.0	18.9	16.7	15.8	14.2	15.6	25.7																							
16-Sep	12.8	12.3	12.7	10.9	10.3	10.1	9.9	10.6	12.7	15.6	17.9	20.1	21.9	23.3	24.2	24.5	24.3	23.0	20.7	19.2	16.7	13.7	12.6	11.5	16.3	24.5																							
17-Sep	10.6	10.3	9.5	8.7	7.7	7.1	6.7	7.8	10.0	11.5	15.3	20.5	23.5	24.1	24.0	23.4	22.8	22.5	19.9	17.4	15.2	12.6	12.2	11.3	14.8	24.1																							
18-Sep	10.6	9.8	9.5	9.0	8.7	8.9	9.3	9.9	10.7	13.2	16.2	18.8	19.0	18.6	16.5	13.4	12.9	13.7	12.0	11.6	11.2	10.7	9.3	8.3	12.2	19.0																							
19-Sep	7.5	7.3	7.2	6.5	6.4	6.0	6.2	8.0	9.7	11.7	14.4	16.1	17.8	19.1	19.7	20.2	20.4	19.5	16.2	11.7	10.5	10.3	9.3	7.8	12.1	20.4																							
20-Sep	6.9	6.5	5.9	4.8	4.0	3.4	3.2	4.3	6.5	8.7	11.6	14.1	16.0	17.3	17.7	18.0	17.6	15.8	14.1	12.7	11.5	11.5	11.4	9.7	10.5	18.0																							
21-Sep	8.7	8.2	7.2	6.5	6.3	6.2	6.0	6.8	9.2	12.0	15.0	18.0	20.4	21.1	21.5	21.9	21.3	20.2	18.1	16.3	15.7	15.2	14.6	14.0	13.8	21.9																							
22-Sep	13.3	12.6	11.8	11.3	11.2	10.5	10.7	12.6	14.9	17.0	19.8	22.7	24.3	24.9	25.5	25.7	24.9	23.6	21.1	18.4	18.3	17.8	16.6	14.5	17.7	25.7																							
23-Sep	12.3	11.9	11.9	11.5	11.2	11.0	11.2	13.0	16.1	18.7	19.5	21.5	22.6	24.3	24.6	25.0	24.5	23.3	21.7	20.3	19.6	19.3	17.8	17.4	17.9	25.0																							
24-Sep	17.6	17.0	17.9	18.4	18.5	18.3	17.8	17.7	17.8	18.5	18.8	19.1	19.5	19.0	18.8	18.4	18.7	18.0	17.2	16.7	16.4	15.6	14.6	12.0	17.6	19.5																							
25-Sep	10.0	8.9	8.7	7.9	7.8	7.0	6.8	8.3	10.6	12.0	13.1	14.3	15.7	16.9	18.1	19.1	19.4	17.5	14.6	12.7	11.7	11.2	10.8	10.5	12.2	19.4																							
26-Sep	11.2	14.8	14.8	12.9	12.8	9.3	9.0	9.3	10.6	14.2	19.3	21.2	22.1	22.2	21.9	21.2	20.1	18.0	16.6	16.5	17.5	15.1	13.1	12.5	15.7	22.2																							
27-Sep	11.0	10.0	9.5	9.1	9.1	9.2	8.2	9.1	11.4	13.8	16.3	17.7	19.5	20.0	20.9	20.5	20.1	18.3	16.9	14.9	13.9	12.0	10.2	9.2	13.8	20.9																							
28-Sep	8.3	7.7	7.5	7.1	6.2	5.6	6.2	7.4	8.2	9.3	10.3	10.7	10.2	10.0	10.0	10.0	9.7	9.6	9.4	9.4	9.3	9.2	9.2	8.9	8.7	10.7																							
29-Sep	8.9	7.8	6.7	6.3	6.9	7.0	7.0	7.4	7.7	8.1	7.8	8.6	9.4	9.7	10.4	10.5	10.3	9.6	9.1	8.9	8.6	8.3	8.1	7.9	8.4	10.5																							
30-Sep	7.5	7.1	6.9	6.7	6.6	6.9	7.0	7.2	7.5	7.8	8.5	9.4	10.1	11.0	11.5	11.3	10.9	9.8	8.1	6.6	5.0	3.9	3.4	3.5	7.7	11.5																							
																								11.4	11.0	10.6	10.1	9.8	9.4	9.3	10.3	11.9	13.7	15.7	17.3	18.7	19.6	19.9	20.0	19.8	19.0	17.0	15.3	14.3	13.3	12.6	11.6	Diurnal Average	
																								19.7	19.2	19.1	18.4	18.5	18.3	17.8	17.7	17.9	19.8	22.1	24.0	25.7	26.9	27.3	27.3	27.3	27.3	26.6	25.1	23.6	22.1	21.8	21.2	17.8	Diurnal Maximum



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Lower Camp - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Lower Camp - September 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	192	26.67	26.67
10 - 20	410	56.94	83.61
> 20	118	16.39	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

Relative Humidity (RH) - %
Lower Camp - September 2023

Maximum Value: 100.0 % on Sep 7 23:00	Maximum Daily Average: 92.6 % on Sep 28	Hours in Service: 720
Minimum Value: 23.6 % on Sep 22 15:00	Minimum Daily Average: 49.8 % on Sep 22	Hours of Data: 703
Maximum Diurnal Average: 88.5 % at hour 6	Minimum Diurnal Average: 47.1 % at hour 17	Hours of Missing Data: 17
Monthly Average: 69.83 %	Percentiles: P ₁ = 27.5 P ₁₀ = 40.5 Q ₁ = 54.2 Median = 71.5 Q ₃ = 87.4 P ₉₀ = 95.7 P ₉₉ = 100.0	Hours of Calibration: 0
		Percent Operational Time: 97.6

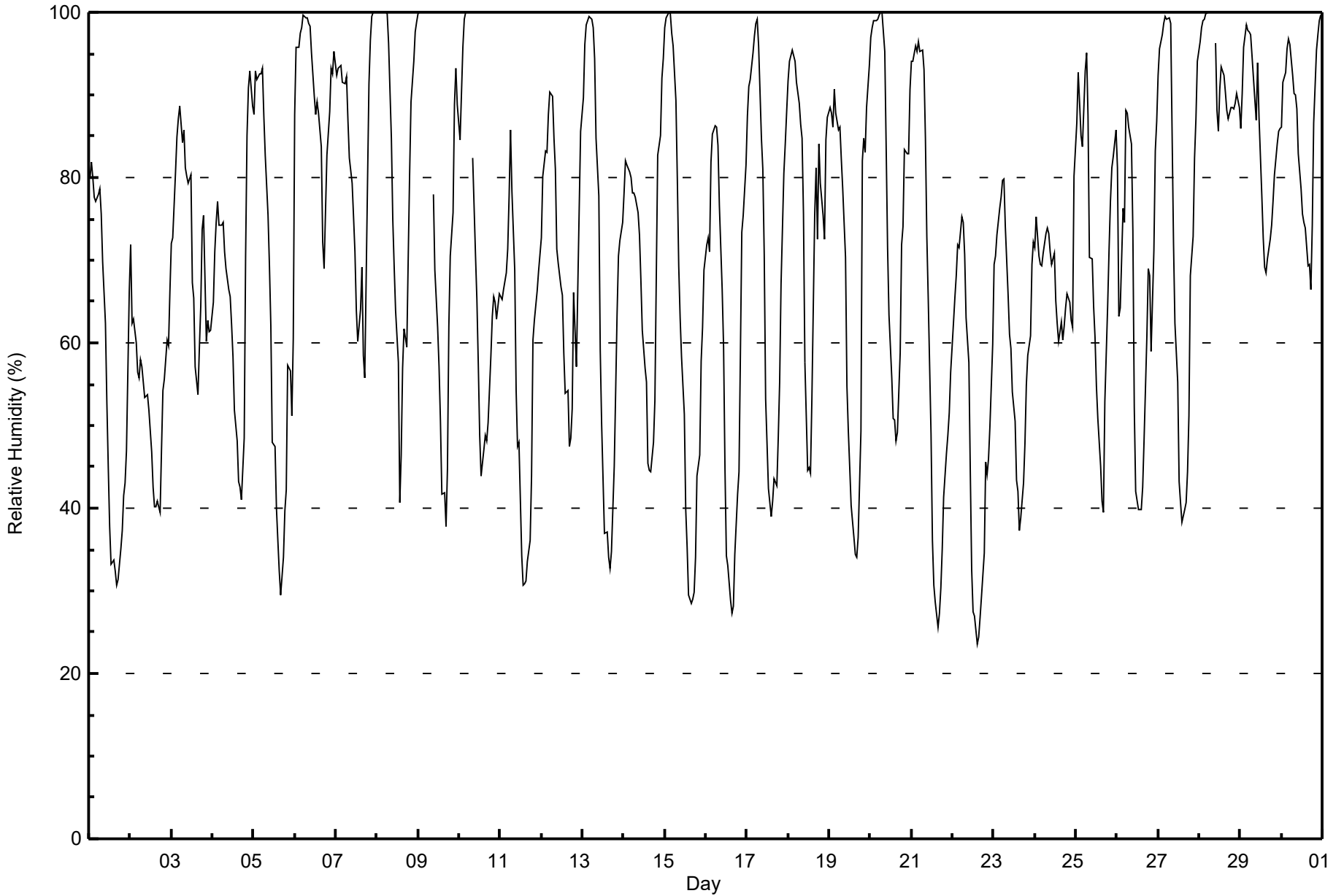
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Sep	80.1	81.9	80.1	77.7	77.1	78.0	78.6	75.6	69.9	62.4	52.9	45.1	37.9	33.2	33.7	32.3	30.7	31.4	35.1	37.2	41.5	43.1	46.9	66.3	55.4	81.9																						
2-Sep	71.9	62.3	62.9	60.0	56.5	55.8	58.0	57.1	53.5	53.6	53.7	51.9	46.8	42.5	40.1	40.2	40.9	39.6	47.1	54.2	55.6	60.4	59.7	66.3	53.8	71.9																						
3-Sep	72.0	72.6	80.7	85.0	87.2	88.6	84.3	85.8	81.2	80.1	79.3	80.4	67.3	65.4	57.2	53.7	59.3	64.4	73.7	75.5	60.2	62.7	61.3	61.5	72.5	88.6																						
4-Sep	65.0	71.0	74.6	77.1	74.3	74.2	74.5	70.9	68.9	66.4	65.5	62.2	58.4	51.9	48.1	43.2	42.5	41.0	48.5	70.6	85.1	90.8	92.8	88.6	66.9	92.8																						
5-Sep	87.7	92.8	91.8	92.6	92.5	93.2	87.4	82.8	75.5	69.4	62.1	48.0	47.4	40.0	36.2	32.4	29.5	34.0	39.6	42.1	57.2	56.6	51.1	60.6	62.6	93.2																						
6-Sep	87.6	95.7	95.7	97.5	98.2	99.7	99.3	99.3	98.7	98.3	95.2	89.9	87.6	89.1	87.8	83.7	72.2	69.0	76.0	82.7	87.9	93.2	92.5	95.2	90.5	99.7																						
7-Sep	92.4	93.3	93.4	93.6	91.5	91.3	92.3	86.9	82.3	79.3	75.3	71.1	63.8	60.1	64.0	69.2	58.5	55.7	79.6	91.4	96.7	99.5	100.0	OR	81.8	100.0																						
8-Sep	OR	OR	OR	OR	100.0	100.0	99.8	96.2	84.8	74.9	69.2	63.9	57.6	40.6	46.4	56.9	61.7	59.6	70.2	80.4	89.1	94.1	97.7	98.8	77.1	100.0																						
9-Sep	99.8	100.0	OR	OR	OR	OR	OR	OR	OR	78.0	68.9	61.9	57.0	50.6	41.8	41.8	37.8	44.7	62.0	70.4	75.7	88.9	93.2	88.9	--	100.0																						
10-Sep	84.5	90.1	95.7	99.1	100.0	OR	OR	OR	82.3	70.6	65.2	57.5	48.8	44.0	47.1	48.8	48.2	50.3	58.5	63.3	65.7	65.0	62.8	65.9	67.3	100.0																						
11-Sep	65.7	65.2	66.5	68.5	71.4	77.7	85.8	78.3	68.7	54.2	47.5	48.0	34.3	30.8	30.8	31.1	33.6	36.1	43.8	60.4	62.6	66.3	68.6	70.8	56.9	85.8																						
12-Sep	72.7	80.2	83.3	83.1	87.7	90.3	89.8	84.7	81.0	71.4	69.7	66.8	65.7	58.9	53.9	54.2	47.4	48.5	52.0	66.1	57.2	66.8	76.3	85.5	70.5	90.3																						
13-Sep	89.6	96.0	98.6	99.0	99.5	99.2	98.2	94.4	84.8	77.8	59.1	50.2	43.5	36.9	37.0	34.1	32.7	34.8	45.1	54.1	63.4	70.4	72.3	74.6	68.6	99.5																						
14-Sep	78.1	82.0	81.5	80.7	80.1	78.1	78.1	77.5	75.8	73.1	67.5	61.5	56.9	55.2	45.4	44.6	44.4	47.9	53.0	68.1	82.8	85.1	92.0	94.4	70.2	94.4																						
15-Sep	98.1	99.3	100.0	99.9	97.5	96.0	89.4	79.8	69.4	63.0	58.3	51.4	39.8	35.3	29.5	28.5	28.9	29.9	34.1	43.9	46.5	57.9	61.9	68.8	62.8	100.0																						
16-Sep	71.8	72.7	71.0	81.8	85.3	86.3	86.1	83.9	76.6	66.5	59.6	44.8	34.2	33.1	28.8	27.4	28.1	34.3	41.7	44.4	58.6	73.4	75.5	81.5	60.3	86.3																						
17-Sep	87.5	91.0	91.8	95.1	97.2	98.7	99.1	95.9	84.8	81.1	70.6	53.3	42.4	40.6	38.9	40.8	43.5	42.8	48.4	55.3	67.1	80.5	84.0	87.9	71.6	99.1																						
18-Sep	91.7	94.1	95.5	94.8	94.1	91.5	89.0	86.4	84.8	75.6	57.7	44.5	45.0	44.2	53.3	75.5	81.2	72.5	84.1	79.4	75.5	72.5	84.6	87.3	77.3	95.5																						
19-Sep	88.4	87.8	86.1	90.7	87.8	85.8	86.0	82.3	78.6	70.4	54.7	49.3	44.9	40.4	36.5	34.4	34.1	36.5	49.3	82.1	84.7	83.0	88.4	93.5	69.0	93.5																						
20-Sep	96.9	98.1	99.0	99.1	99.1	99.7	100.0	100.0	95.2	83.5	71.5	63.4	55.8	50.9	50.7	48.2	49.2	58.8	71.9	74.0	83.5	82.9	82.9	90.8	79.4	100.0																						
21-Sep	94.1	94.1	95.9	95.3	96.4	95.3	95.4	93.1	84.7	73.0	65.4	49.0	36.0	30.6	28.6	25.6	27.3	30.4	35.2	41.4	46.6	48.9	51.6	56.5	62.1	96.4																						
22-Sep	62.3	65.4	68.1	71.9	71.5	75.3	74.6	70.6	63.0	57.6	44.6	32.6	27.5	27.0	23.6	24.4	26.7	29.3	34.6	45.7	44.1	45.9	49.9	59.9	49.8	75.3																						
23-Sep	69.5	70.5	73.1	76.3	77.7	79.7	79.9	74.1	65.8	60.9	59.3	54.1	50.5	43.3	42.0	37.2	38.8	43.0	47.7	54.9	58.5	60.8	69.6	72.3	60.8	79.9																						
24-Sep	71.6	75.2	70.6	69.5	69.3	70.9	73.3	73.9	73.3	71.0	69.5	70.9	65.0	62.3	60.1	62.5	60.3	62.1	64.2	66.0	65.0	62.8	61.8	80.2	68.0	80.2																						
25-Sep	86.7	92.6	89.0	85.1	83.7	92.9	95.1	87.4	70.4	70.2	64.4	60.7	54.7	50.8	45.2	40.9	39.6	52.9	64.4	71.2	77.1	81.2	82.5	85.8	71.8	95.1																						
26-Sep	81.2	63.3	64.3	76.3	74.6	88.1	87.8	86.1	84.1	73.6	52.2	42.0	39.8	39.8	39.9	42.5	48.4	60.8	69.0	68.1	59.0	71.2	83.2	86.8	65.9	88.1																						
27-Sep	92.4	95.5	97.3	98.6	99.5	99.2	99.3	98.6	85.3	72.0	62.4	55.2	43.2	40.7	38.3	39.8	40.6	44.4	51.2	68.2	72.8	82.3	87.0	94.1	73.3	99.5																						
28-Sep	96.4	98.1	99.0	99.2	99.8	100.0	100.0	OR	OR	96.4	88.2	85.6	90.6	93.4	92.3	90.4	88.1	87.1	88.5	88.5	88.3	89.0	90.1	88.5	92.6	100.0																						
29-Sep	85.9	90.1	95.8	98.5	97.9	97.7	97.2	94.8	89.6	86.9	93.9	87.3	77.7	72.8	69.2	68.5	70.2	72.6	74.2	77.2	80.3	84.1	85.7	86.0	84.7	98.5																						
30-Sep	86.0	91.6	92.8	95.7	96.8	96.1	92.4	90.2	90.0	88.3	82.9	78.7	75.7	74.5	73.9	69.3	69.5	66.4	74.2	86.7	95.4	97.3	98.9	99.7	86.0	99.7																						
																								83.0	84.9	85.5	87.2	87.7	88.5	88.2	84.7	78.7	73.3	66.2	59.4	53.2	49.3	47.3	47.4	47.1	49.4	57.2	65.4	69.5	73.9	76.8	80.6	Diurnal Average
																								99.8	100.0	100.0	99.9	100.0	100.0	100.0	100.0	98.7	98.3	95.2	89.9	90.6	93.4	92.3	90.4	88.1	87.1	88.5	91.4	96.7	99.5	100.0	99.7	Diurnal Maximum

OR - Out of Range



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Lower Camp - September 2023





Wood Buffalo Environmental Association

Summary of Hour Averages

Barometric Pressure (BP) - inHg

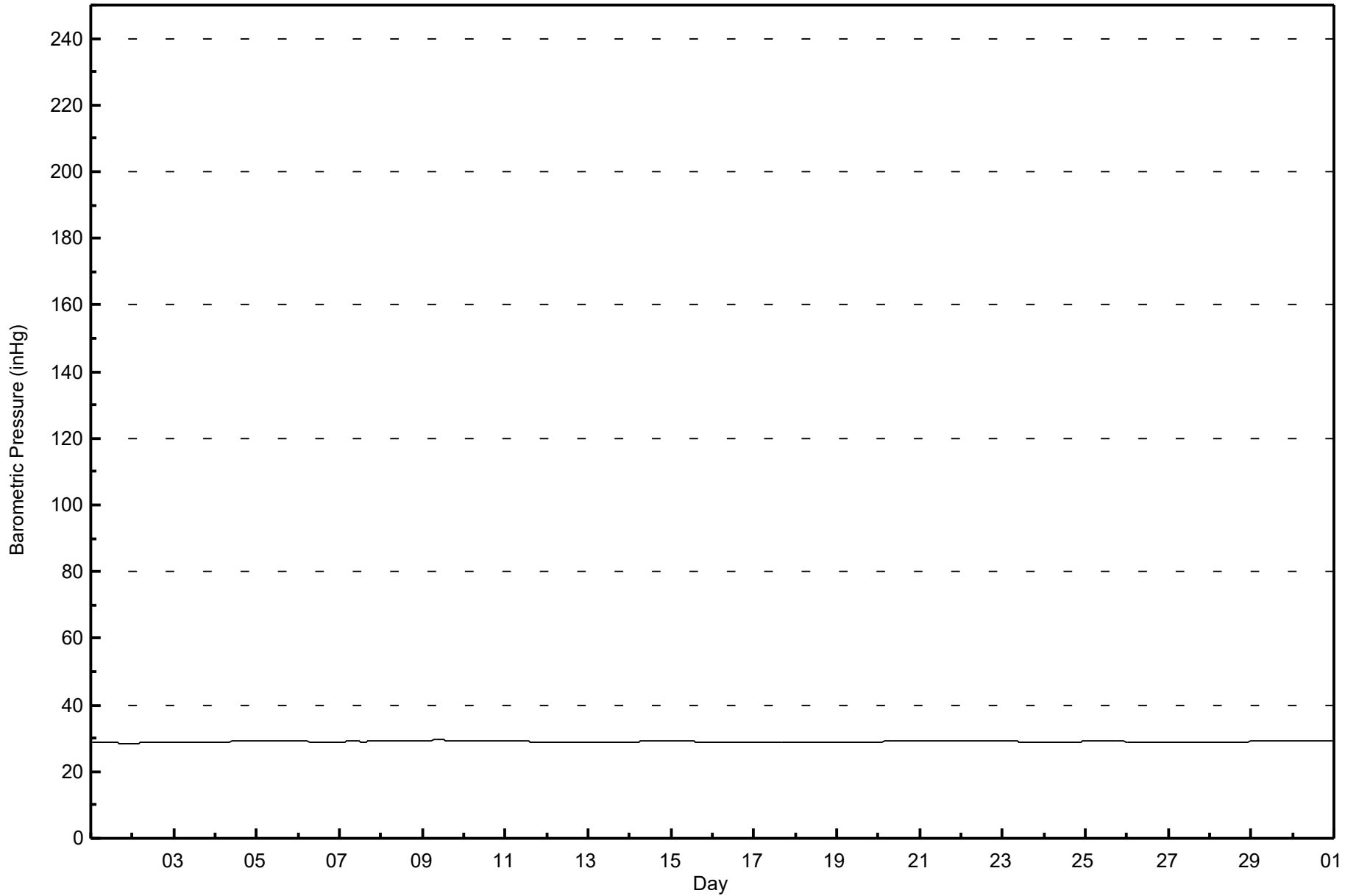
Lower Camp - September 2023

Maximum Value: 29.5 inHg on Sep 9 09:00																				Maximum Daily Average: 29.4 inHg on Sep 9					Hours in Service:	720	
Minimum Value: 28.6 inHg on Sep 2 00:00																				Minimum Daily Average: 28.7 inHg on Sep 2					Hours of Data:	720	
Maximum Diurnal Average: 29.0 inHg at hour 9																				Minimum Diurnal Average: 29.0 inHg at hour 17					Hours of Missing Data:	0	
Monthly Average: 29.02 inHg																				Percentiles: P ₁ = 28.6 P ₁₀ = 28.8 Q ₁ = 28.9 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-Sep	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.7	28.7	28.7	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.7	28.8
2-Sep	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.7	28.8
3-Sep	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.9	28.9	28.8	28.8	28.9
4-Sep	28.9	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.0	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.0	29.1
5-Sep	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.2	29.2
6-Sep	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	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.1
7-Sep	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.1	29.1	29.1	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.1	29.0	29.1
8-Sep	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	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.4	29.4	29.2	29.4
9-Sep	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	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.5
10-Sep	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	29.2	29.2	29.2	29.3	29.2	29.4	29.4	
11-Sep	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	29.0	29.0	29.1	29.2
12-Sep	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0
13-Sep	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9
14-Sep	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	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
15-Sep	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	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	29.1	29.2
16-Sep	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0
17-Sep	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8	28.9
18-Sep	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.7	28.8
19-Sep	28.8	28.8	28.8	28.8	28.8	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0	29.0	28.9	29.0
20-Sep	29.0	29.0	29.0	29.0	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	29.3	29.3	29.3	29.3	29.2	29.3	29.3
21-Sep	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	29.1	29.1	29.1	29.2	29.2	29.1	29.1	29.1	29.1	29.1	29.2	29.3
22-Sep	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	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	29.1	29.1	29.2
23-Sep	29.1	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0	29.1
24-Sep	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.1	28.9	29.1
25-Sep	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	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.0	29.0	29.1	29.2
26-Sep	29.0	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	29.0
27-Sep	28.8	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9
28-Sep	28.9	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0
29-Sep	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.1	29.2
30-Sep	29.2	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4
																								Diurnal Average			
																								Diurnal Maximum			



Wood Buffalo Environmental Association
Hourly Averages

Barometric Pressure (BP) - inHg
Lower Camp - September 2023





Maximum Speed: 26 km/h on Sep 1 16:00	Maximum Daily Speed Average: 14.2 km/h on Sep 1	Hours in Service: 720
Minimum Speed Value: 0 km/h on Sep 27 01:00	Minimum Daily Speed Average: 0.5 km/h on Sep 25	Hours of Data: 720
Maximum Diurnal Speed Average: 4.9 km/h at hour 15	Minimum Diurnal Speed Average: 1.5 km/h at hour 24	Hours of Missing Data: 0
Monthly Average Velocity: 2.7 km/h 176.3 deg	Percentiles: P ₁ = 0 P ₁₀ = 2 Q ₁ = 4 Median = 7 Q ₃ = 10 P ₉₀ = 14 P ₉₉ = 23	Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Sep	W5	W4	WSW11	WSW12	SW12	SW12	SW7	SW14	SW11	SW15	WSW15	SW18	SW22	SW20	SW23	SW26	SW25	SW22	SW19	SW15	SW13	WSW12	WSW11	W1	SW14.2	SW26
2-Sep	S1	SW2	SSE3	WSW9	WSW11	WSW9	W6	WSW7	WNW10	W8	SW13	WSW14	SW16	SW16	WSW19	SW19	WSW20	W16	SW12	SW14	WSW14	WSW13	WSW16	WSW13	WSW11.3	WSW20
3-Sep	SSW6	SSE5	SE5	SE5	ESE5	ESE7	ESE7	ESE8	SE6	SE8	ESE9	ESE8	SW5	SSE4	S6	WSW7	NW8	W3	WNW2	W4	WNW10	WNW7	WNW9	WNW13	S1.7	WNW13
4-Sep	W15	WSW13	WSW16	WSW15	WSW14	W19	WNW16	WNW17	NW18	WNW17	WNW18	NW13	WNW14	WNW13	WNW9	WNW9	N4	NW4	SSW1	ESE3	NE1	E4	SE3	SE4	WNW8.9	WNW19
5-Sep	SE6	SE5	ESE6	ESE6	SE7	ESE7	ESE8	ESE7	ESE9	ESE9	ESE10	SE8	ESE10	ESE9	SE9	SE8	SSE7	SSE8	SSE10	SSE7	ESE5	SE4	SSE6	S2	SE6.9	ESE10
6-Sep	E1	S1	ESE3	E8	E8	E10	E9	E6	E5	ESE5	SSE6	SSW6	SW5	NNW6	NE4	NE4	SSW7	SW11	SSW7	SSW4	WSW2	S1	WSW2	WNW1	SE2.0	SW11
7-Sep	W3	SW4	SW2	SW4	SSW2	SSW4	SSW3	SSW3	SSW4	ESE6	ESE9	ESE8	ESE7	ESE8	ESE6	ESE5	NNE2	SE2	ESE5	ENE1	WSW2	ENE0	W1	ESE1	SE2.4	ESE9
8-Sep	ESE4	ESE5	SE5	SE6	ESE6	SE8	ESE6	ESE7	ESE8	ESE8	ESE9	ESE8	E3	WSW10	NW6	WNW3	NW4	W4	W4	WNW2	WNW2	W3	WNW3	ENE1	SE2.0	WSW10
9-Sep	W2	W2	W2	SW1	SSW1	SSE1	E4	E6	ESE7	ESE7	ESE7	ESE7	ESE7	ESE8	ESE7	ESE6	ESE4	SE4	ESE1	S2	ESE3	NNW1	NNW1	SE2	ESE3.1	ESE8
10-Sep	SE5	E5	SE1	W1	WSW1	ESE0	WNW1	E4	SE4	ESE5	ESE5	ESE6	ESE9	SE9	ESE10	ESE12	ESE9	ESE9	ESE7	ESE8	ESE9	SE9	SE10	ESE11	ESE6.0	ESE12
11-Sep	ESE13	SE13	SE12	SE11	SE9	SE7	SE6	SE6	SE7	SE12	SE14	ESE13	SE16	SE14	SE13	SSE13	SSE12	SSE9	SE7	ESE6	ESE7	SE7	ESE7	SE6	SE9.9	SE16
12-Sep	ESE5	SE1	SE4	ESE8	ESE9	ESE9	ESE8	SE9	ESE7	ESE7	ESE7	ESE6	ESE7	ESE8	ESE8	ESE5	SW6	WSW11	SW10	S2	SW7	SSE4	N1	SE3	SE4.3	WSW11
13-Sep	SE3	ESE4	SE4	SE4	ESE5	ESE7	SE6	ESE7	ESE7	SSE4	SW14	SW14	SW19	SW24	WSW21	WSW25	WSW23	WSW24	WSW24	WSW24	SW16	SW17	SW16	WSW18	SW11.0	WSW25
14-Sep	WSW18	W14	W15	W13	W14	W16	W15	W14	WNW18	WNW16	W16	WNW19	WNW14	NNW9	WNW15	WNW15	WNW14	WNW10	W7	WNW2	ESE2	E1	ESE4	E4	W10.7	WNW19
15-Sep	E3	ESE3	ESE3	ESE5	SE5	ESE6	ESE8	E13	ESE13	ESE13	ESE10	ESE11	SE11	SE11	SE10	SE8	SE8	SE8	SE9	SE10	SE8	SE7	ESE6	ESE7.9	E13	
16-Sep	SE5	SE6	SE7	ESE6	ESE7	SE6	SE5	ESE7	ESE7	ESE7	ESE6	SSW2	W8	WSW6	WSW12	WSW12	WSW9	SSW3	SSE7	S7	ESE2	E4	ESE5	SE4	SSE3.4	WSW12
17-Sep	SE5	ESE7	ESE5	SE5	ESE4	ESE5	SE4	E2	E3	N4	E3	E5	SSE9	SSW9	SSW11	SSW7	SSW6	SW11	SSW6	SSW5	SSE2	SE3	SE5	SE5	SSE3.8	SW11
18-Sep	ESE5	ESE5	ESE7	ESE8	ESE6	SE4	ESE7	SE7	ESE5	ESE7	SW14	WSW18	SW23	WSW18	WSW20	SSW6	SSW7	S5	ESE6	SE7	SSW2	S3	ESE5	SE4	S4.9	SW23
19-Sep	SE6	ESE8	ESE4	ESE8	SE8	ESE8	SE8	ESE8	ESE7	SE6	S7	SSW8	SW8	WSW8	WSW11	SW8	SW6	SSW5	S3	N1	ESE2	ENE1	ESE4	N1	SSE3.5	WSW11
20-Sep	NE0	NNW1	E1	NNE1	ENE1	NE1	NW0	NE2	ENE3	NNW3	WNW4	WNW6	WNW7	NW8	NNW7	N6	N7	WNW4	WNW5	SW1	ESE2	ESE2	NW3	ESE3	NNW2.0	NW8
21-Sep	ESE4	SE3	ESE6	ESE7	ESE7	ESE9	ESE9	ESE9	ESE12	ESE13	ESE10	SSE11	S14	S16	SSW18	S15	S14	S11	SE7	SE8	SE9	SE10	SE10	SE7	SE8.5	SSW18
22-Sep	ESE7	ESE8	E8	ESE8	ESE8	ESE7	ESE7	ESE9	ESE10	ESE11	SE9	SSE9	SSE11	SSE10	SSE12	SSE10	SE10	SE9	SSE7	SE7	SE7	SE10	SE9	ESE6	SE8.2	SSE12
23-Sep	ESE6	SE7	ESE8	ESE7	ESE7	ESE8	ESE7	ESE6	ESE9	ESE11	ESE12	ESE15	ESE17	SE15	SE15	SE15	SE13	SE10	SE11	SE10	SE10	SE12	ESE10	ESE11	SE10.4	ESE17
24-Sep	ESE13	ESE12	SE13	SE11	SE12	SE12	SE10	SE10	SE11	SE8	SE8	ESE7	S6	WSW14	WSW11	SW8	SSW5	S5	SSE5	SSE5	SSW7	WSW9	WSW8	E3	SSE6.3	WSW14
25-Sep	SW1	E3	SE4	SE4	SSE4	SE5	SE6	SE3	S4	ESE7	ENE4	ENE3	NNE2	NNW4	NNW6	NNW5	N8	NNW7	W5	WNW4	W5	W5	W6	W6	NNW0.5	NNE8
26-Sep	WNW3	E6	ESE6	ESE4	S1	W7	WNW3	W4	ENE1	ESE6	SE6	S9	S8	SSE7	S6	S4	W3	S1	SE2	SE8	WSW6	W6	ESE3	WNW1	S2.3	S9
27-Sep	E0	NW1	NW3	ENE2	ESE5	ESE3	ESE3	ESE6	ESE6	ESE6	ESE5	ESE1	SW14	WSW12	WSW13	SW13	SW16	SW11	WSW7	W4	W2	WNW3	W3	WNW3	SW3.3	SW16
28-Sep	NNE1	E0	ESE1	ESE2	NNE1	E1	ENE1	E3	NE2	NW3	NNW9	NNW9	NNW9	NNW9	N9	N12	N12	NNW10	NNW8	NNW8	NNW9	NNW10	NW8	NW8	NNW5.3	N12
29-Sep	NNW9	NW5	NNW2	SSW2	WSW3	W3	WNW1	WNW4	NW5	NW8	NW8	NW8	NNW11	NNW10	NNW7	NNW9	NNW10	NNW9	NNW7	NW6	NNW7	NNW6	N5	NNW2	NNW5.6	NNW11
30-Sep	SSW2	SW1	N1	W0	SSW1	NNE1	S1	SE3	S2	SE4	S2	SE3	SSE4	ESE5	ESE7	E8	ESE8	SSE5	SE4	ESE2	E1	WNW1	NW1	NNW0	SE2.1	E8

SSE2.0 SE2.5 SE2.8 SE3.2 SSE3.3 SE2.9 SE2.9 SE3.2 SE3.2 SE3.5 SSE3.2 S3.3SSW4.6SSW4.3 SW4.9SSW4.2 SW4.0 SW4.4SSW3.6 S2.7SSW2.2SSW1.9 S1.9 SSE1.5	Diurnal Average
WSW18 W14 WSW16WSW15WSW14WNW19WNW16WNW17WNW18WNW17WNW18WNW19 SW23 SW24 SW23 SW26 SW25WSW24WSW24WSW24 SW16 SW17 SW16WSW18	Diurnal Maximum

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

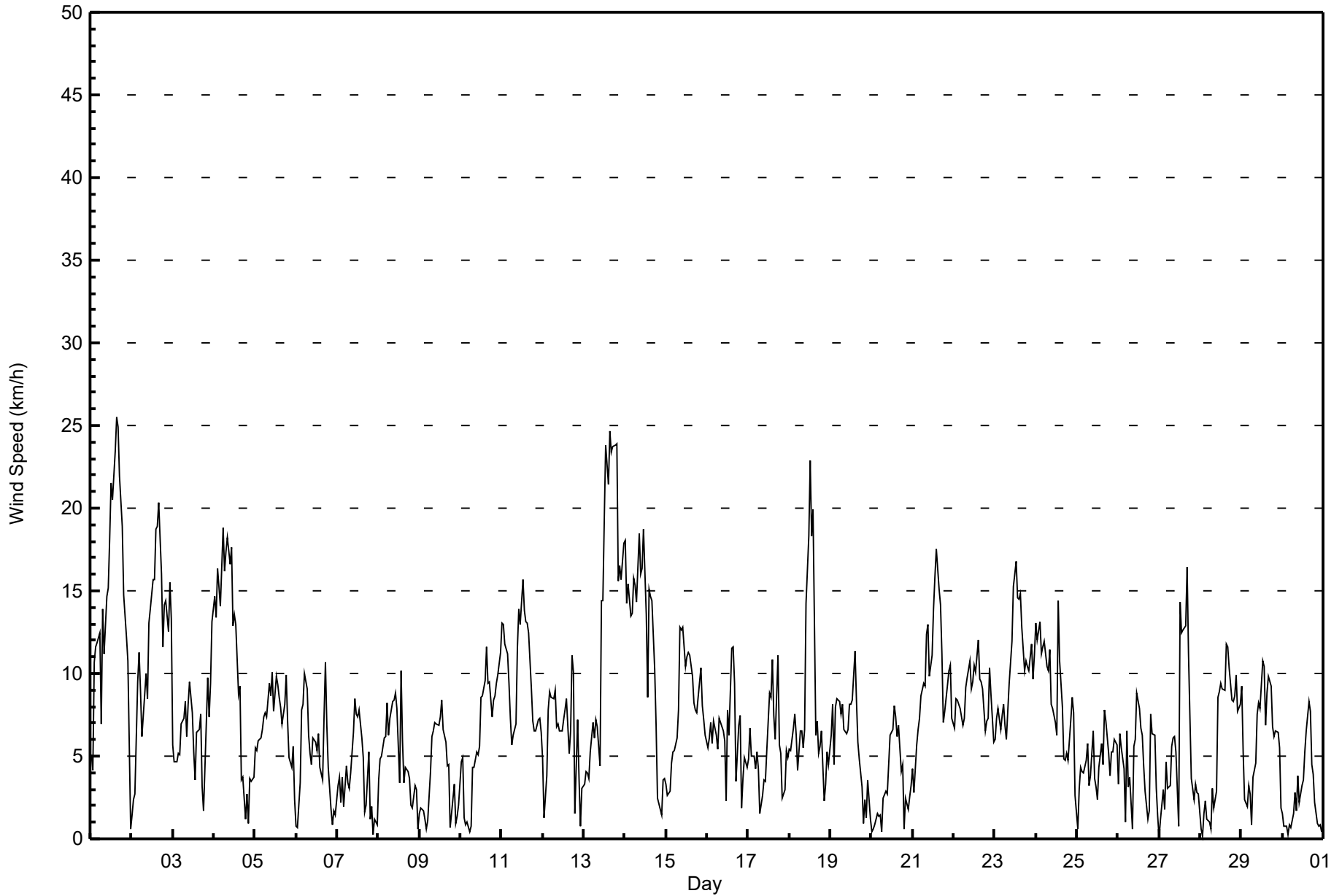
Wind Speed (WS) - km/h
Lower Camp - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Sep 18 15:00																	Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0								
Minimum Value: 1 km/h on Sep 20 10:00																									
Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 2 Q ₃ = 3 P ₉₀ = 4 P ₉₉ = 6																									
Day	Hourly Period Ending At (MST)																							Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23		24
1-Sep	2	1	3	5	3	3	7	4	3	3	5	5	5	6	6	6	7	6	5	3	2	3	3	2	7
2-Sep	2	2	2	4	2	2	2	3	3	2	3	3	3	4	4	4	4	4	2	3	3	3	3	3	4
3-Sep	3	1	2	2	1	2	3	3	3	3	4	3	4	2	3	3	2	1	1	6	3	3	3	4	6
4-Sep	3	3	3	3	3	4	3	4	4	4	4	3	4	4	3	3	2	2	1	1	1	1	1	1	4
5-Sep	2	2	2	2	2	2	2	2	3	2	3	4	4	4	3	3	3	3	3	3	2	2	2	2	4
6-Sep	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	4	2	2	3	2	1	2	1	4
7-Sep	1	2	1	2	1	3	2	1	2	2	2	2	2	2	2	3	1	1	2	1	1	1	1	1	3
8-Sep	1	2	2	2	2	3	2	2	3	3	3	2	3	3	2	2	1	1	1	2	1	2	1	2	3
9-Sep	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	2	2
10-Sep	1	1	1	1	1	1	1	2	2	1	2	1	3	3	3	4	3	3	3	3	3	4	3	3	4
11-Sep	4	4	4	3	3	2	2	2	3	4	5	4	6	5	5	5	5	4	2	2	2	2	2	1	6
12-Sep	1	1	3	2	2	2	2	2	2	2	2	2	2	2	2	2	4	3	2	2	3	1	1	1	4
13-Sep	1	1	1	1	1	2	2	2	2	3	4	4	5	7	6	6	5	6	6	6	4	3	4	4	7
14-Sep	4	3	4	3	3	3	4	3	4	3	4	4	4	3	4	4	4	4	1	3	1	1	1	1	4
15-Sep	1	1	1	1	2	2	3	3	3	3	3	3	3	4	4	4	3	3	2	3	3	3	3	2	4
16-Sep	2	2	2	2	3	2	2	2	2	2	2	2	2	3	3	3	3	2	2	2	2	1	2	1	3
17-Sep	2	2	2	2	2	2	2	1	1	2	2	4	3	4	3	3	4	2	2	1	1	1	1	2	4
18-Sep	1	1	2	2	2	2	3	2	2	2	5	4	5	5	7	2	3	2	2	2	2	2	2	2	7
19-Sep	1	2	2	2	2	2	2	2	2	2	3	4	3	3	3	3	2	2	1	1	1	2	1	1	4
20-Sep	1	1	1	1	1	1	1	2	1	1	1	1	2	2	2	2	2	1	2	1	1	1	2	1	2
21-Sep	1	2	2	3	3	2	2	2	4	4	3	5	6	6	6	6	6	5	2	2	3	3	3	3	6
22-Sep	3	3	2	2	2	2	2	3	2	3	4	4	4	4	5	4	4	3	2	2	3	3	3	2	5
23-Sep	2	2	2	2	2	2	2	2	3	3	3	4	5	5	5	5	4	4	4	4	3	4	3	3	5
24-Sep	4	4	4	4	4	4	3	4	4	3	3	2	3	3	2	2	2	2	2	2	3	2	3	1	4
25-Sep	1	1	2	1	1	2	2	2	2	2	1	1	1	1	2	2	3	3	2	1	2	1	2	2	3
26-Sep	3	4	3	3	3	2	2	1	1	2	2	4	3	3	2	2	2	1	2	5	5	2	1	1	5
27-Sep	1	1	2	1	1	2	2	1	1	1	1	2	3	3	4	4	4	3	2	2	2	2	1	1	4
28-Sep	1	2	1	1	1	2	2	1	2	3	2	2	3	2	2	3	3	3	2	2	2	3	2	2	3
29-Sep	3	2	1	1	1	1	2	1	1	3	2	2	3	2	2	2	3	2	2	2	2	2	1	2	3
30-Sep	1	1	1	1	1	1	1	1	1	2	1	1	1	1	2	1	2	1	1	1	1	1	1	1	2
																	Diurnal Maximum								



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Lower Camp - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Lower Camp - September 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	272	37.78	37.78
6 - 11	321	44.58	82.36
12 - 19	111	15.42	97.78
20 - 28	16	2.22	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Lower Camp - September 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	6	7	11	23	53	40	13	17	18	9	5	24	20	10	10	272
6 - 11	3	1	0	0	9	123	68	16	8	13	12	18	8	9	9	24	321
12 - 19	2	0	0	0	1	12	15	3	4	1	23	23	10	16	1	0	111
20 - 28	0	0	0	0	0	0	0	0	0	0	8	8	0	0	0	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	11	7	7	11	33	188	123	32	29	32	52	54	42	45	20	34	720

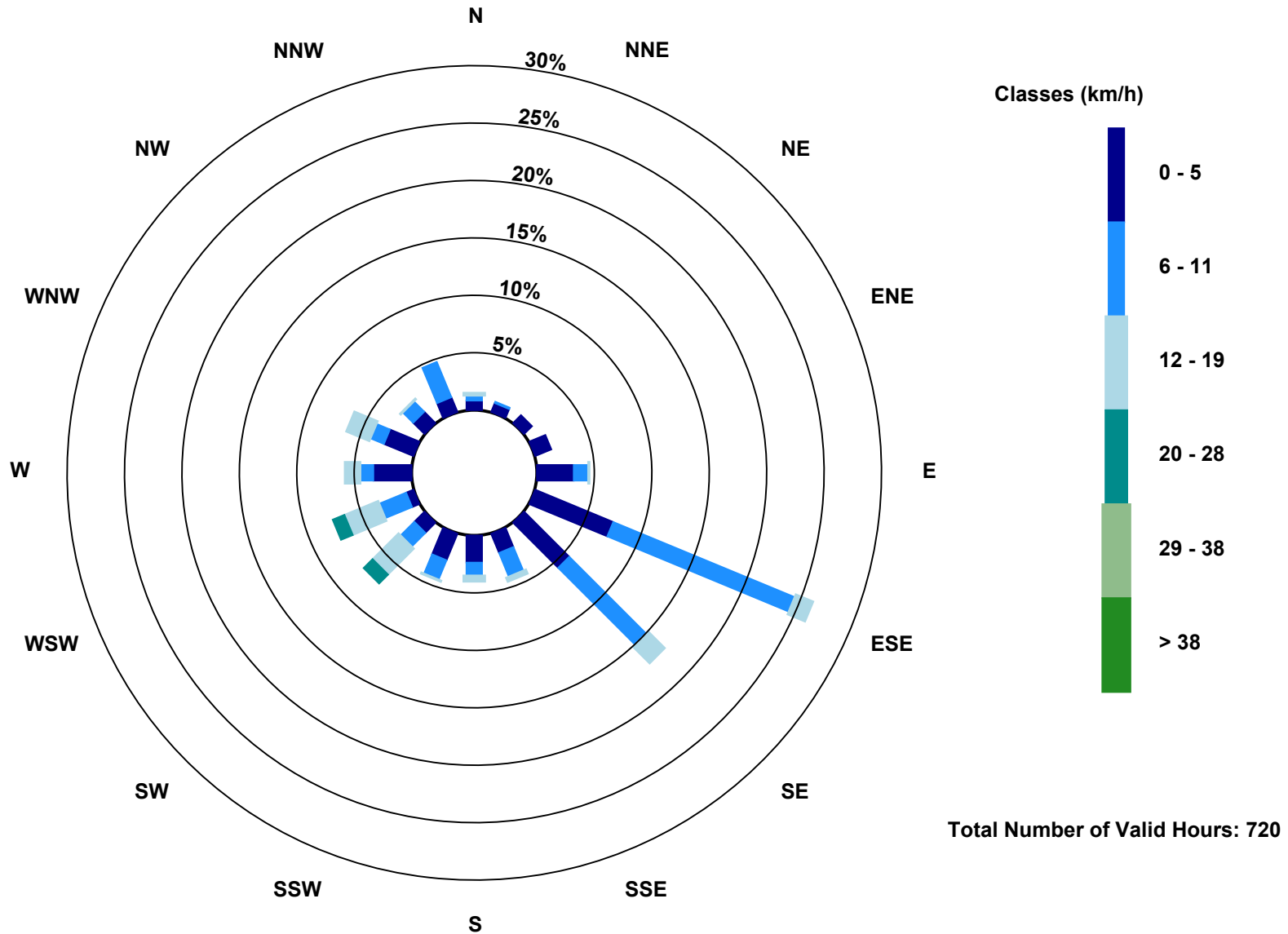
Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

Wind Speed (WS) - km/h
Lower Camp





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Lower Camp - September 2023

Direction of Maximum Speed: 225 deg on Sep 1 16:00 Direction of Maximum Daily Speed Average: 230.4 deg on Sep 1	Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0
Direction of Minimum Speed: 80 deg on Sep 27 01:00 Direction of Minimum Daily Speed Average: 0.5 deg on Sep 25	Percent Operational Time: 100.0
Monthly Average Direction: 176.3 deg	

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Sep	264	263	239	239	226	233	230	235	228	236	239	228	232	226	227	225	217	218	225	232	230	238	249	269	230.4
2-Sep	175	217	160	248	253	251	260	245	297	276	236	238	234	234	241	233	241	263	226	235	238	243	242	245	243.1
3-Sep	202	157	140	125	122	119	118	109	125	127	120	117	217	159	191	249	308	276	294	267	297	300	293	282	183.6
4-Sep	274	251	248	249	258	281	296	296	304	297	290	305	291	293	302	282	349	326	213	118	54	92	128	129	283.0
5-Sep	145	132	123	123	126	123	123	121	111	114	109	144	117	118	133	142	157	156	157	151	122	141	150	173	131.7
6-Sep	81	176	112	99	95	88	86	95	93	122	160	200	216	346	38	49	205	227	209	208	238	182	252	283	135.8
7-Sep	272	227	233	217	196	213	194	195	194	119	111	110	110	111	113	112	24	131	121	67	245	68	276	108	141.0
8-Sep	114	118	130	124	123	124	114	116	114	113	112	111	95	250	308	294	313	269	261	287	292	265	282	67	130.0
9-Sep	271	277	272	216	196	156	91	94	114	114	112	111	113	114	109	106	104	124	115	183	109	346	342	129	112.9
10-Sep	128	86	130	262	246	116	291	96	127	122	121	122	119	132	119	113	118	120	115	114	115	126	126	123	119.6
11-Sep	123	126	127	128	133	129	130	128	127	131	129	122	135	144	145	151	147	155	134	121	123	127	123	129	132.8
12-Sep	122	133	134	120	122	121	113	126	117	112	116	114	111	116	118	111	227	243	234	176	235	154	1	135	137.4
13-Sep	126	120	126	136	121	122	127	117	122	165	232	232	233	234	241	241	237	239	247	242	234	225	231	243	226.8
14-Sep	245	261	268	274	273	277	278	280	282	284	280	283	294	328	287	296	287	288	273	286	102	98	114	93	279.4
15-Sep	99	109	106	123	125	126	109	119	99	108	108	115	121	125	137	139	139	142	143	134	129	125	127	113	122.2
16-Sep	124	130	125	118	119	124	125	118	117	120	118	194	272	249	255	244	242	203	161	169	123	83	115	127	158.0
17-Sep	127	117	122	127	123	113	138	87	84	354	93	97	168	195	208	203	194	219	201	203	153	132	131	127	159.3
18-Sep	122	120	121	120	123	131	120	125	122	119	230	245	233	244	243	200	194	179	123	131	193	191	114	128	187.6
19-Sep	127	122	113	121	126	123	125	121	122	138	184	197	234	253	253	232	228	206	182	2	109	62	105	8	162.8
20-Sep	55	333	81	17	63	54	305	43	66	332	298	291	293	317	329	349	353	291	295	234	117	121	308	114	330.0
21-Sep	115	124	118	110	106	112	119	118	108	107	114	164	173	180	195	187	174	180	143	131	131	132	130	128	144.0
22-Sep	120	111	99	110	117	111	111	113	116	111	143	158	168	148	159	154	141	145	148	130	136	129	134	122	131.8
23-Sep	120	125	122	117	117	120	119	118	111	115	116	117	119	134	127	133	135	137	136	132	131	128	117	117	124.1
24-Sep	121	119	131	132	141	134	130	133	131	137	143	122	174	245	238	221	201	178	161	159	202	249	238	99	157.9
25-Sep	229	96	137	140	158	134	127	146	169	109	66	59	30	332	337	341	11	337	280	297	280	280	265	281	341.4
26-Sep	282	87	106	121	172	260	283	277	77	122	133	177	181	158	179	176	260	191	126	124	250	260	108	297	173.7
27-Sep	80	319	314	57	118	103	112	110	114	118	116	115	233	243	243	235	234	226	239	276	266	283	277	284	224.8
28-Sep	33	95	111	105	15	82	62	96	53	314	334	341	327	346	356	353	352	341	340	335	330	329	312	306	341.1
29-Sep	335	318	333	200	255	278	282	291	305	308	308	319	345	342	330	342	347	348	332	323	346	339	349	333	328.8
30-Sep	201	214	358	272	199	20	180	129	179	129	179	138	154	115	111	92	109	157	136	115	90	303	321	340	127.1

154.6 139.3 145.2 145.8 148.1 146.0 132.0 131.7 123.8 127.7 159.6 180.2 201.4 210.7 215.8 209.7 215.0 216.0 200.4 187.1 195.8 191.5 183.9 167.8

Diurnal Average

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



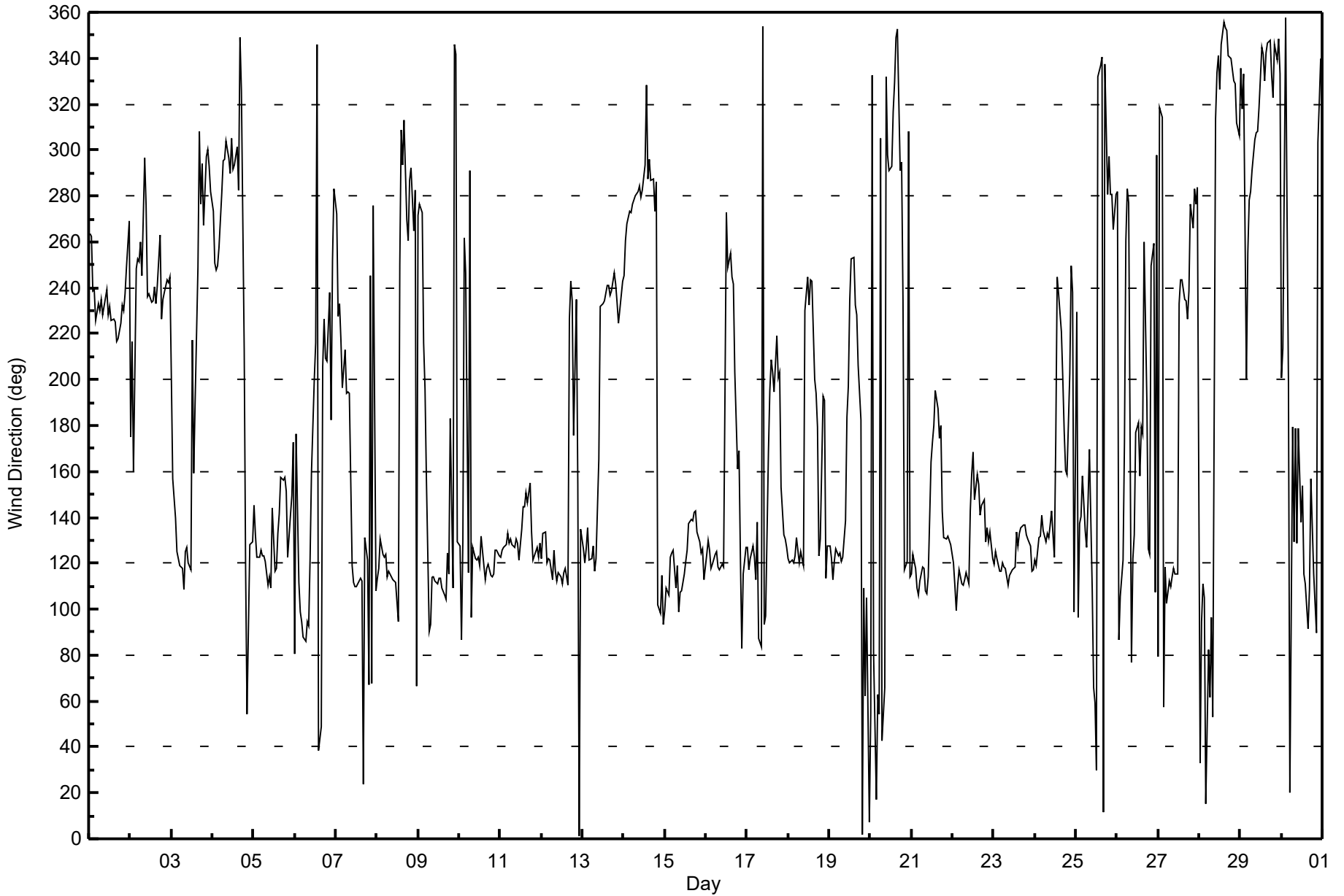
Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Lower Camp - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 109 deg on Sep 6 01:00	Hours of Data: 720
Minimum Value: 11 deg on Sep 14 04:00	Hours of Missing Data: 0
Percentiles: P ₁ = 12 P ₁₀ = 16 Q ₁ = 22 Median = 32 Q ₃ = 48 P ₉₀ = 75 P ₉₉ = 102	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-Sep	20	29	15	23	16	15	73	15	18	17	18	19	18	21	17	18	19	17	15	14	14	16	22	103	103
2-Sep	90	85	75	26	16	13	25	31	24	26	15	16	16	16	15	14	13	16	20	12	13	15	14	15	90
3-Sep	45	30	37	37	31	21	35	43	58	46	31	30	67	64	43	47	12	16	40	86	17	14	16	12	86
4-Sep	14	13	14	14	15	17	12	14	15	16	16	17	18	22	24	28	62	38	75	49	104	37	48	50	104
5-Sep	37	58	28	28	23	24	31	35	25	27	24	49	39	33	39	42	40	32	34	34	36	35	35	93	93
6-Sep	109	95	76	23	20	14	18	41	54	60	36	33	31	21	24	52	48	15	18	34	90	99	78	83	109
7-Sep	52	57	57	40	73	60	49	40	40	39	23	26	26	22	31	48	81	69	33	96	68	95	68	100	100
8-Sep	42	46	45	45	45	35	37	35	30	30	28	25	80	23	31	28	22	16	16	48	59	31	45	84	84
9-Sep	28	72	57	80	95	76	41	25	33	29	29	27	22	18	24	34	23	23	99	63	51	73	68	102	102
10-Sep	42	33	74	35	66	104	68	60	53	43	41	28	28	35	28	24	31	34	41	36	32	34	31	29	104
11-Sep	27	27	29	28	31	37	53	56	51	32	29	28	32	37	37	35	35	35	30	40	34	27	23	21	56
12-Sep	24	90	61	21	19	19	20	23	27	23	30	30	19	21	17	64	60	13	13	84	50	36	90	45	90
13-Sep	47	35	41	48	31	22	31	30	36	63	18	22	21	18	15	14	14	13	15	14	18	15	15	14	63
14-Sep	14	15	15	11	12	13	14	15	13	13	14	13	17	32	18	18	19	13	12	86	75	82	58	35	86
15-Sep	39	52	62	43	40	45	47	42	15	18	17	25	25	27	30	35	31	29	31	33	30	33	42	43	62
16-Sep	37	31	29	37	31	46	44	29	30	28	30	87	24	58	19	21	17	47	27	26	77	49	38	48	87
17-Sep	47	32	40	52	52	46	54	93	78	37	58	39	42	45	30	36	36	25	20	22	59	66	25	33	93
18-Sep	25	36	38	31	48	70	49	37	52	36	46	17	15	16	18	31	27	34	22	23	83	59	55	42	83
19-Sep	23	21	58	23	22	17	26	30	45	44	50	41	39	45	21	21	34	27	80	86	80	95	35	82	95
20-Sep	102	86	101	69	83	92	93	70	57	42	24	19	24	23	24	24	18	25	21	94	64	83	48	39	102
21-Sep	33	79	46	36	32	24	23	21	21	19	23	43	37	34	28	32	33	34	25	22	22	23	24	37	79
22-Sep	44	29	27	22	17	18	20	26	26	22	38	41	42	40	36	39	33	32	32	28	32	29	32	36	44
23-Sep	26	19	22	40	28	23	30	44	25	23	22	21	22	32	29	29	32	31	34	34	30	30	27	24	44
24-Sep	25	24	27	33	34	29	31	31	29	36	33	33	41	14	15	20	32	33	34	47	35	21	25	64	64
25-Sep	91	54	35	37	39	37	33	69	50	26	45	46	50	32	15	27	28	35	28	35	25	23	20	29	91
26-Sep	78	72	70	83	89	19	33	16	104	21	48	45	45	45	32	43	69	84	93	45	56	24	62	53	104
27-Sep	92	79	49	71	30	75	63	27	27	30	30	81	15	15	17	19	15	12	25	40	65	35	26	36	92
28-Sep	98	90	82	51	68	92	89	53	84	64	22	24	21	20	20	20	19	19	19	19	18	18	22	17	98
29-Sep	24	19	54	54	26	23	84	19	13	15	15	23	21	22	22	27	18	19	24	22	23	23	22	65	84
30-Sep	67	80	74	76	79	97	45	48	69	50	60	57	53	31	22	17	30	22	23	77	103	40	56	69	103

	109	95	101	83	95	104	93	93	104	64	60	87	80	64	43	64	81	84	99	96	104	99	90	103	
	Diurnal Maximum																								





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS13 FORT MCKAY SOUTH SEPTEMBER 2023

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

October 30, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT MCKAY SOUTH (AMS13)
 SEPTEMBER 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	684	36	36	100	25.2	0	5.7	0
TRS(ppb) Average	686	34	34	100	7.3	0	1.3	0
THC(ppm) Average	685	35	35	100	3.3	-	2.4	-
NMHC(ppm) Average	685	35	35	100	0.388	-	0.051	-
CH4(ppm) Average	685	35	35	100	3.3	-	2.4	-
O3(ppb) Average	686	34	34	100	46.4	0	34.7	-
NO2(ppb) Average	685	35	35	100	26.2	0	11.1	-
NO(ppb) Average	685	35	35	100	64.7	-	14	-
NOX(ppb) Average	685	35	35	100	67.7	-	17.8	-
PM2.5(ug/m3) Average	718	1	2	99.86	466.4	172	313.3	20
ET(C) Average	720	0	0	100	27.4	-	21	-
RH(%) Average	720	0	0	100	98.6	-	92.1	-
WS(km/h) Average	715	2	5	99.58	27	-	15	-
WD(deg) Average	715	2	5	99.58	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT MCKAY SOUTH (AMS13)
 SEPTEMBER 2023

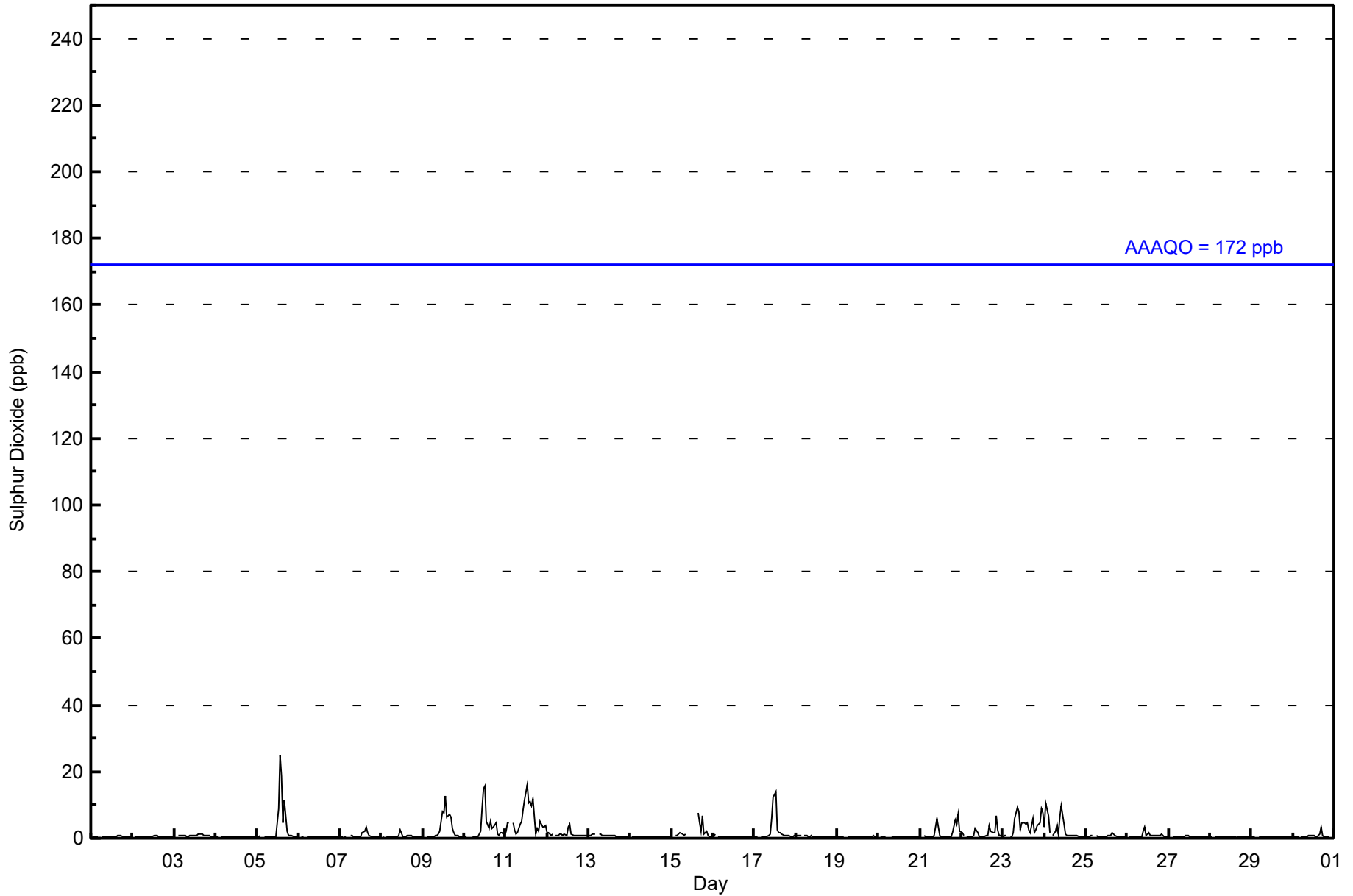
MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2(ppb) Average	684	1.33	2.5	-	0.1	0.3	0.4	0.5	0.9	3.4	25.2
TRS(ppb) Average	686	0.71	0.5	-	0.2	0.4	0.4	0.6	0.8	1.2	7.3
THC(ppm) Average	685	2.2	0.2	-	2	2	2.1	2.1	2.3	2.5	3.3
NMHC(ppm) Average	685	0.008	0.036	-	0	0	0	0	0	0	0.388
CH4(ppm) Average	685	2.19	0.2	-	2	2	2.1	2.1	2.3	2.4	3.3
O3(ppb) Average	686	17.74	12.5	-	2	3	5.5	16.3	27.7	36.6	46.4
NO2(ppb) Average	685	4.64	4.7	-	0	0.4	1.3	3.2	6.4	10.7	26.2
NO(ppb) Average	685	3.42	8.5	-	0	0	0	0.2	2.2	9.3	64.7
NOX(ppb) Average	685	8.06	10.5	-	0	0.4	1.6	4	10.3	20.6	67.7
PM2.5(ug/m3) Average	718	65.69	81.7	-	3.5	11.8	18.2	30.9	76.3	171.7	466.4
Temperature 2 m (C) Average	720	12.91	6.6	-	-2.6	4.5	8	12.7	18	21.8	27.4
Relative Humidity (%) Average	720	68.86	21	-	23.9	38.4	52.2	70.3	88.9	95.8	98.6
Wind Speed 10 m (km/h) Average	715	7	5	-	0	2	3	6	10	13	27
Wind Direction 10 m (deg) Average	715	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT MCKAY SOUTH (AMS13)
SEPTEMBER 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
PM2.5	29 Sep 2023 12:00	29 Sep 2023 12:00	1	Maintenance - analyzer replaced
Wind Speed, Wind Direction	09 Sep 2023 04:00	30 Sep 2023 01:00	3	Flat line in sensor output signal





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Fort McKay South - September 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	671	98.10	98.10
11 - 20	12	1.75	99.85
21 - 60	1	0.15	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Fort McKay South - September 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	8	4	4	1	9	17	65	130	79	103	90	36	30	25	34	668
11 - 20	0	0	0	0	0	1	2	5	4	0	0	0	0	0	0	0	12
21 - 60	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	33	8	4	4	1	10	19	70	135	79	103	90	36	30	25	34	681

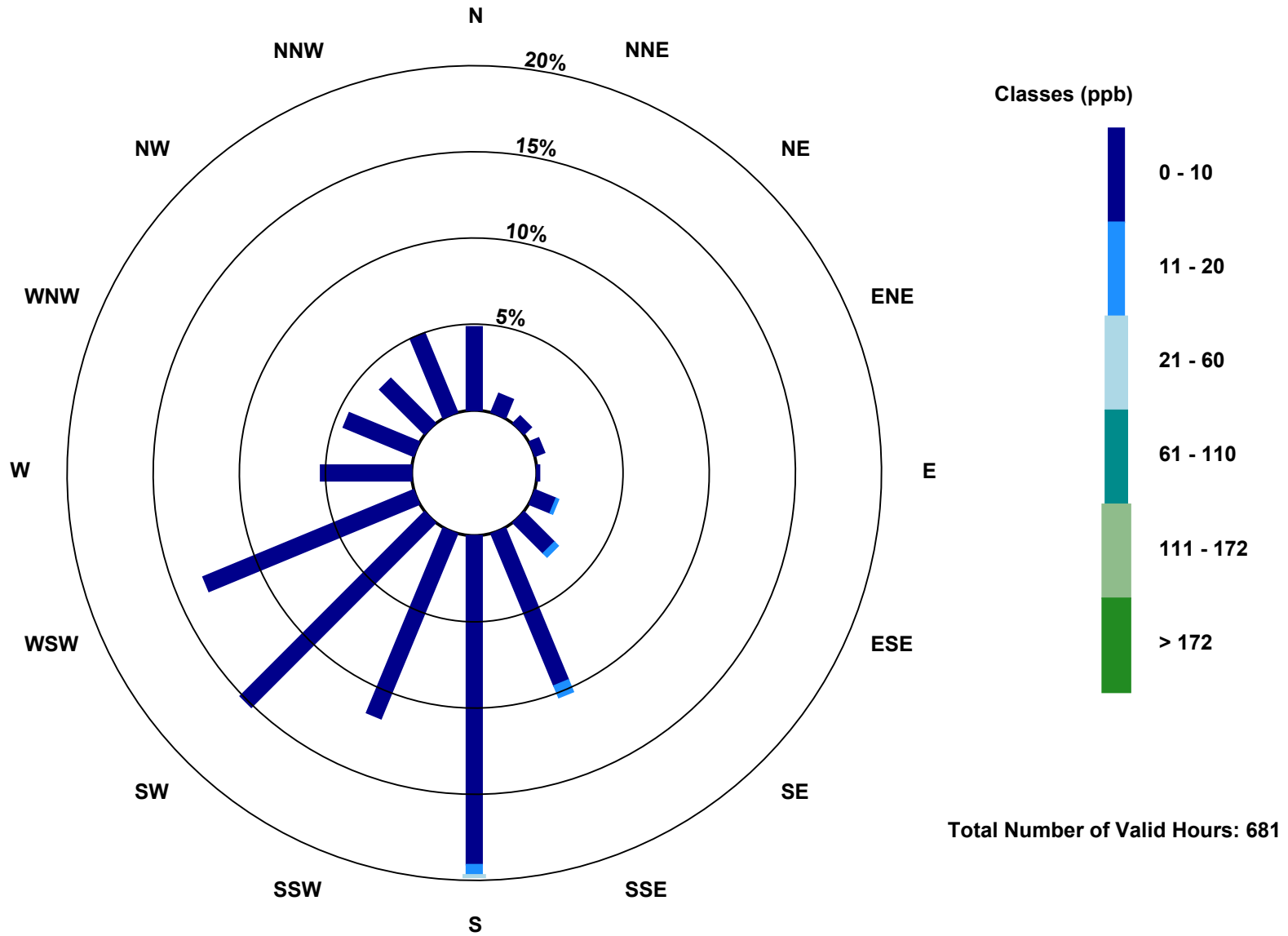
Total Number of Valid Hours: 681

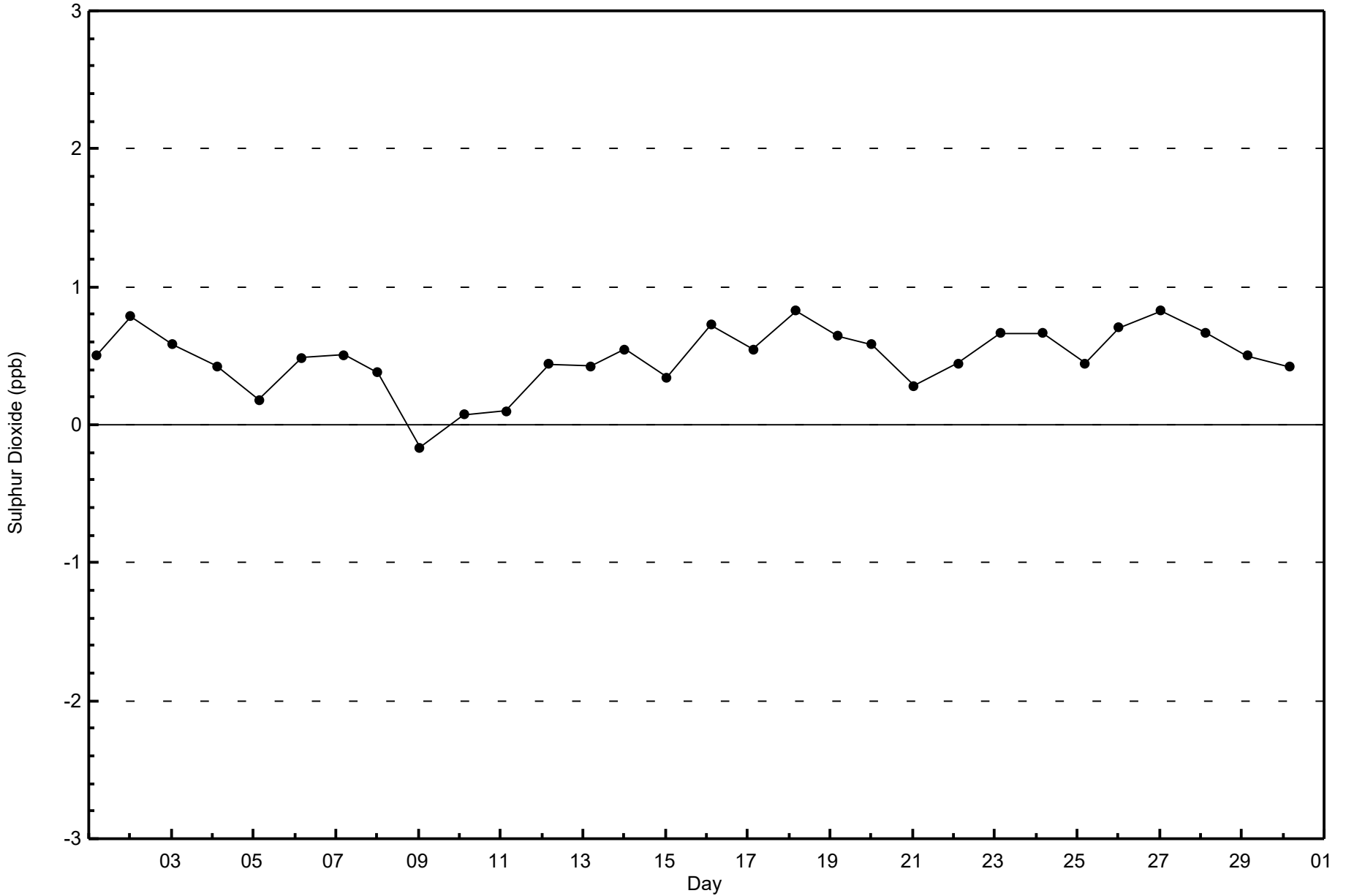
Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

Sulphur Dioxide (SO₂) - ppb
Fort McKay South

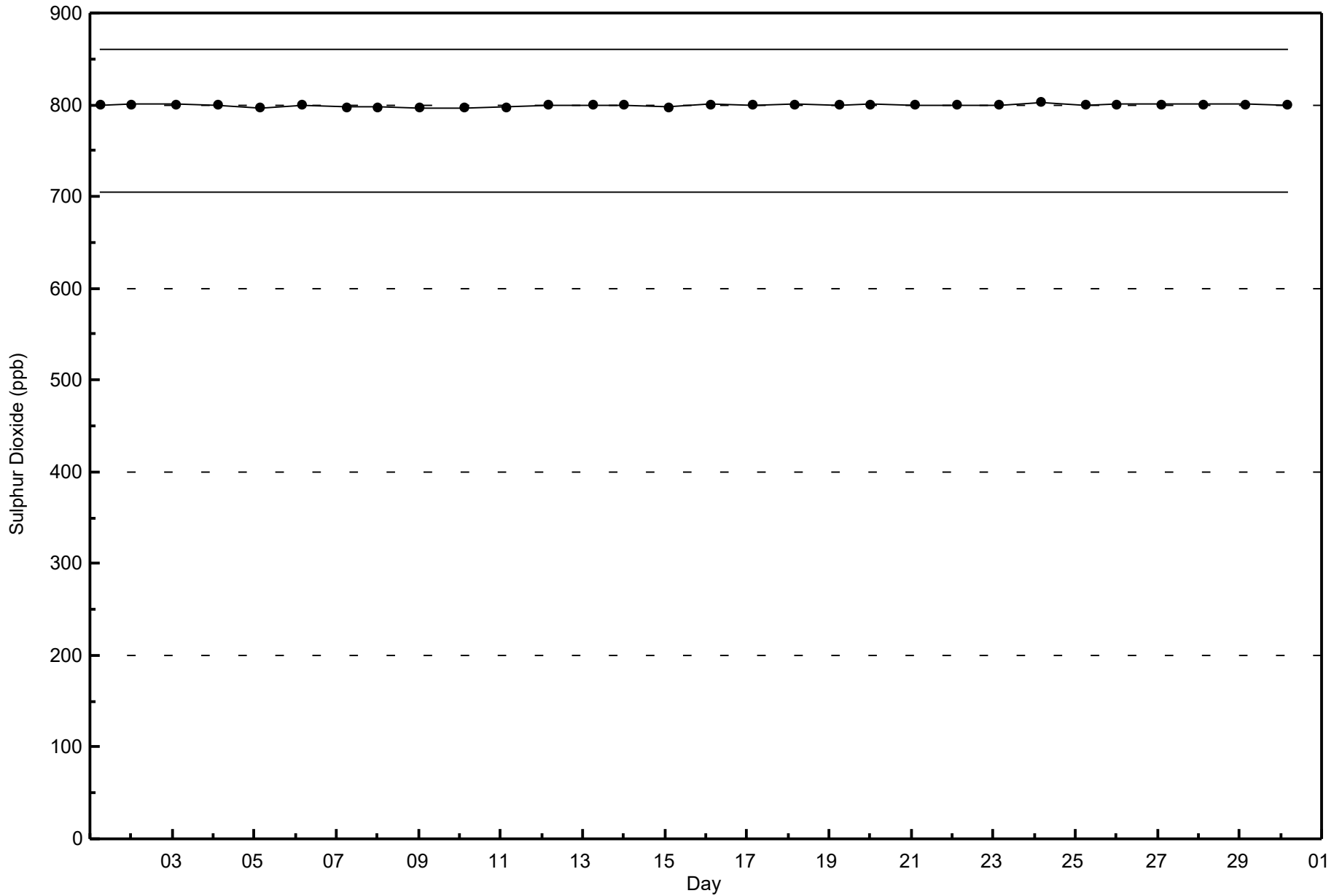






Wood Buffalo Environmental Association
Span Responses

Sulphur Dioxide (SO₂) - ppb
Fort McKay South - September 2023





Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

Fort McKay South - September 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 7.3 ppb on Sep 10 22:00	Maximum Daily Average: 1.3 ppb on Sep 10		Hours of Data:	686
Minimum Value: 0.2 ppb on Sep 9 05:00	Minimum Daily Average: 0.4 ppb on Sep 4		Hours of Missing Data:	34
Maximum Diurnal Average: 0.9 ppb at hour 11	Minimum Diurnal Average: 0.6 ppb at hour 16		Hours of Calibration:	34
Monthly Average: 0.71 ppb	Percentiles: P ₁ = 0.3 P ₁₀ = 0.4 Q ₁ = 0.4 Median = 0.6 Q ₃ = 0.8 P ₉₀ = 1.2 P ₉₉ = 2.2		Percent Operational Time:	100.0

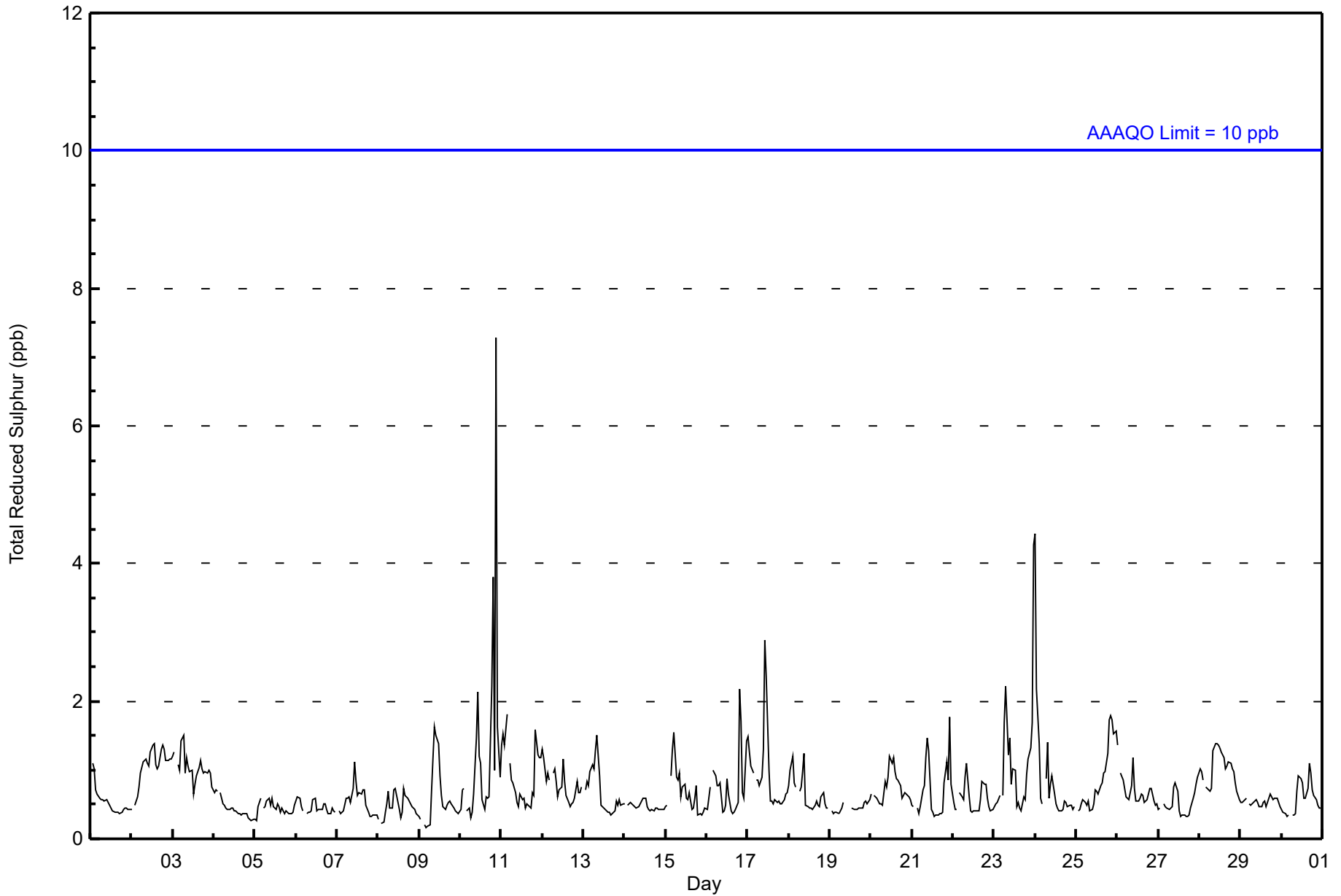
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Sep	Z	1.1	1.0	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.5	1.1																							
2-Sep	0.4	Z	0.5	0.6	0.8	1.0	1.0	1.1	1.2	1.1	1.1	1.3	1.4	1.4	1.1	1.0	1.1	1.3	1.4	1.3	1.1	1.1	1.2	1.2	1.1	1.4																							
3-Sep	1.2	1.3	Z	1.1	1.0	1.4	1.5	1.0	1.2	1.1	1.0	1.0	0.7	0.8	0.9	1.0	1.1	1.0	0.9	1.0	1.0	1.0	1.0	0.8	1.0	1.5																							
4-Sep	0.7	0.7	0.7	Z	0.7	0.5	0.5	0.5	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.7																							
5-Sep	0.3	0.3	0.5	0.6	Z	0.5	0.5	0.5	0.5	0.6	0.5	0.4	0.5	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.6																							
6-Sep	0.5	0.6	0.6	0.5	0.4	Z	0.4	0.4	0.4	0.4	0.6	0.6	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.6																							
7-Sep	Z	0.4	0.4	0.4	0.4	0.6	0.6	0.6	0.5	0.7	1.1	0.8	0.6	0.7	0.7	0.7	0.7	0.5	0.4	0.3	0.3	0.4	0.4	0.3	0.5	1.1																							
8-Sep	0.3	Z	0.2	0.2	0.4	0.5	0.7	0.4	0.4	0.7	0.7	0.6	0.4	0.3	0.4	0.7	0.6	0.6	0.6	0.5	0.5	0.4	0.4	0.4	0.5	0.7																							
9-Sep	0.3	0.3	Z	0.2	0.2	0.2	0.2	0.7	1.2	1.6	1.5	1.4	0.9	0.6	0.5	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.6	1.6																							
10-Sep	0.4	0.7	0.7	Z	0.4	0.5	0.3	0.4	0.7	1.5	2.1	1.2	1.1	0.6	0.4	0.6	0.6	0.6	2.2	3.8	1.0	7.3	1.6	0.9	1.3	7.3																							
11-Sep	1.4	1.5	1.4	1.8	Z	1.1	0.9	0.8	0.7	0.5	0.5	0.7	0.6	0.6	0.4	0.5	0.5	0.5	0.7	0.6	1.6	1.2	1.2	1.2	0.9	1.8																							
12-Sep	1.3	1.2	0.8	1.0	0.8	Z	1.0	1.0	0.8	0.6	0.7	0.8	1.2	0.8	0.6	0.5	0.5	0.5	0.5	0.6	0.8	0.7	0.7	0.8	0.8	1.3																							
13-Sep	Z	0.7	0.8	0.8	1.0	1.1	1.0	1.3	1.5	0.9	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.5	0.5	0.7	1.5																							
14-Sep	0.5	Z	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.6																							
15-Sep	0.5	0.5	Z	0.9	1.3	1.6	0.9	0.9	1.0	0.6	0.7	0.8	0.6	0.6	0.7	0.4	0.5	0.6	0.8	0.3	0.4	0.4	0.4	0.5	0.7	1.6																							
16-Sep	0.4	0.6	0.7	Z	1.0	0.9	0.8	0.8	0.8	0.4	0.4	0.5	0.9	0.6	0.4	0.4	0.4	0.4	0.5	2.2	1.7	0.7	0.6	1.4	0.8	2.2																							
17-Sep	1.5	1.3	1.1	1.0	Z	0.8	0.8	0.8	0.9	1.3	2.9	2.4	1.0	0.6	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.6	0.7	0.7	0.9	2.9																							
18-Sep	0.8	1.0	1.2	0.8	0.8	Z	0.7	0.8	1.0	1.2	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.6	0.7	0.5	0.5	0.4	0.7	1.2																							
19-Sep	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	C	C	C	C	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.5	0.6	0.5	0.6	0.4	0.6																							
20-Sep	0.6	Z	0.6	0.6	0.5	0.5	0.5	0.5	0.8	0.8	0.9	1.2	1.1	1.2	1.0	0.9	0.8	0.8	0.6	0.6	0.7	0.6	0.6	0.6	0.7	1.2																							
21-Sep	0.5	0.5	Z	0.5	0.4	0.5	0.7	0.8	1.2	1.5	1.3	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.8	1.1	0.8	1.8	0.8	0.7	1.8																							
22-Sep	0.5	0.4	0.4	Z	0.7	0.6	0.6	0.9	1.1	0.6	0.4	0.4	0.4	0.4	0.4	0.4	0.6	0.8	0.8	0.8	0.6	0.5	0.4	0.4	0.6	1.1																							
23-Sep	0.5	0.5	0.5	0.6	Z	0.6	1.7	2.2	1.2	1.5	0.8	1.0	1.0	0.5	0.5	0.4	0.4	0.6	0.6	0.9	1.2	1.3	1.7	4.3	1.1	4.3																							
24-Sep	4.4	2.2	1.4	0.6	0.5	Z	0.9	1.4	0.6	0.8	0.9	0.7	0.5	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.9	4.4																							
25-Sep	Z	0.4	0.4	0.5	0.6	0.5	0.5	0.5	0.4	0.4	0.5	0.7	0.7	0.6	0.8	0.8	0.9	1.0	1.2	1.7	1.8	1.7	1.5	1.6	0.9	1.8																							
26-Sep	1.4	Z	1.0	0.8	0.7	0.6	0.6	0.6	0.8	1.2	0.7	0.5	0.5	0.6	0.7	0.6	0.5	0.6	0.6	0.7	0.7	0.6	0.5	0.5	0.7	1.4																							
27-Sep	0.4	0.4	Z	0.5	0.5	0.4	0.4	0.5	0.5	0.7	0.8	0.7	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.6	0.7	0.8	0.9	0.5	0.9																							
28-Sep	1.0	1.0	0.9	Z	0.8	0.7	0.7	0.7	1.3	1.4	1.4	1.4	1.3	1.3	1.2	1.0	1.1	1.1	1.1	1.0	1.0	0.8	0.7	0.6	1.0	1.4																							
29-Sep	0.5	0.5	0.5	0.6	Z	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.6																							
30-Sep	0.4	0.4	0.4	0.3	0.3	Z	0.4	0.3	0.4	0.7	0.9	0.9	0.8	0.6	0.6	0.7	1.1	1.0	0.7	0.6	0.6	0.5	0.4	0.4	0.6	1.1																							
																								0.8	0.8	0.7	0.7	0.6	0.7	0.7	0.7	0.8	0.9	0.9	0.8	0.7	0.6	0.6	0.6	0.6	0.6	0.7	0.8	0.7	0.9	0.7	0.8	Diurnal Average	
																								4.4	2.2	1.4	1.8	1.3	1.6	1.7	2.2	1.5	1.6	2.9	2.4	1.4	1.4	1.2	1.0	1.1	1.3	2.2	3.8	1.8	7.3	1.8	4.3	Diurnal Maximum	

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



Wood Buffalo Environmental Association
Hourly Averages

Total Reduced Sulphur (TRS) - ppb
Fort McKay South - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Fort McKay South - September 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	681	99.27	99.27
3 - 4	4	0.58	99.85
5 - 7	1	0.15	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 686

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Fort McKay South - September 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	7	4	4	1	10	20	67	135	77	101	94	35	29	26	33	676
3 - 4	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	4
5 - 7	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	33	7	4	4	1	10	20	72	135	77	101	94	35	29	26	33	681

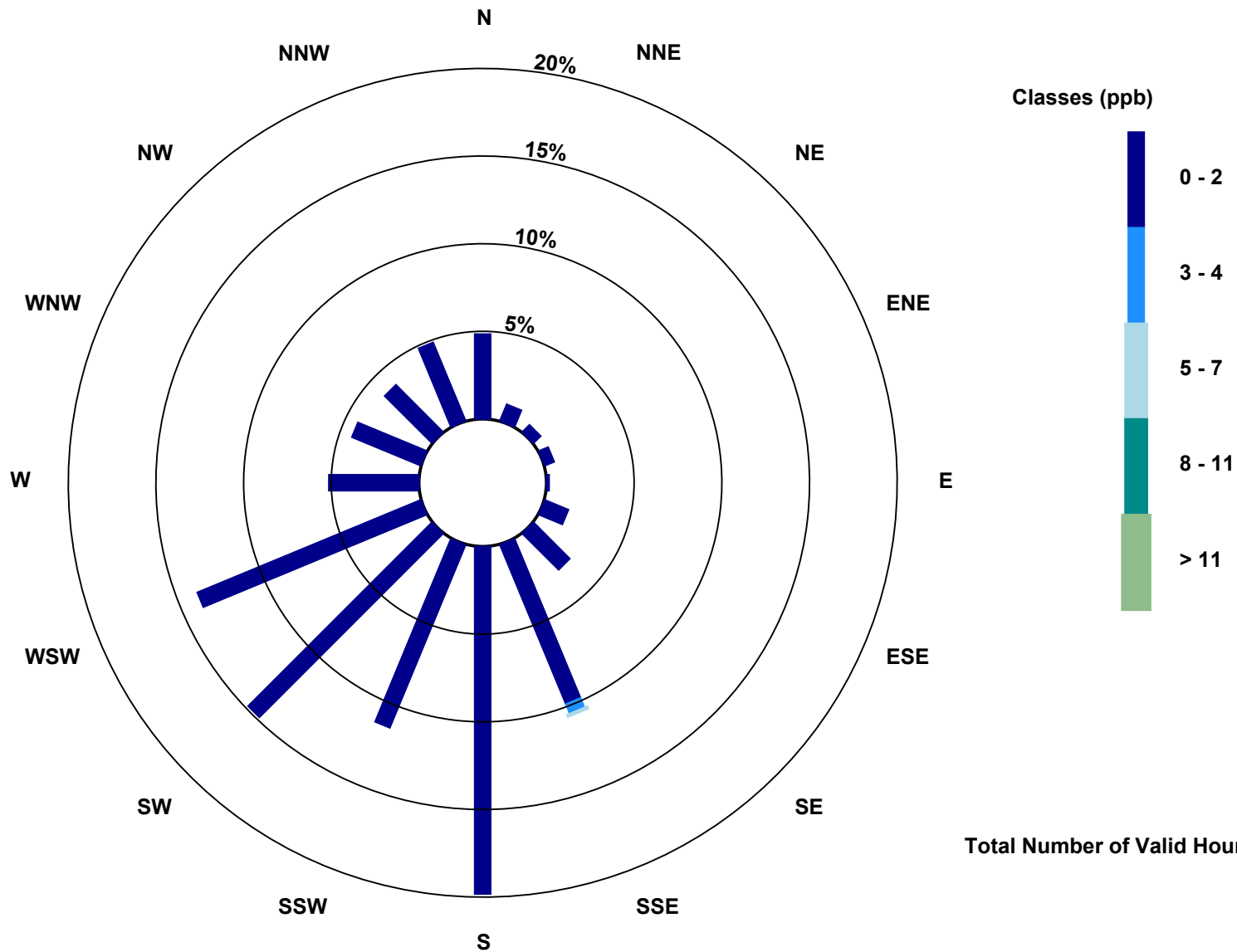
Total Number of Valid Hours: 681

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

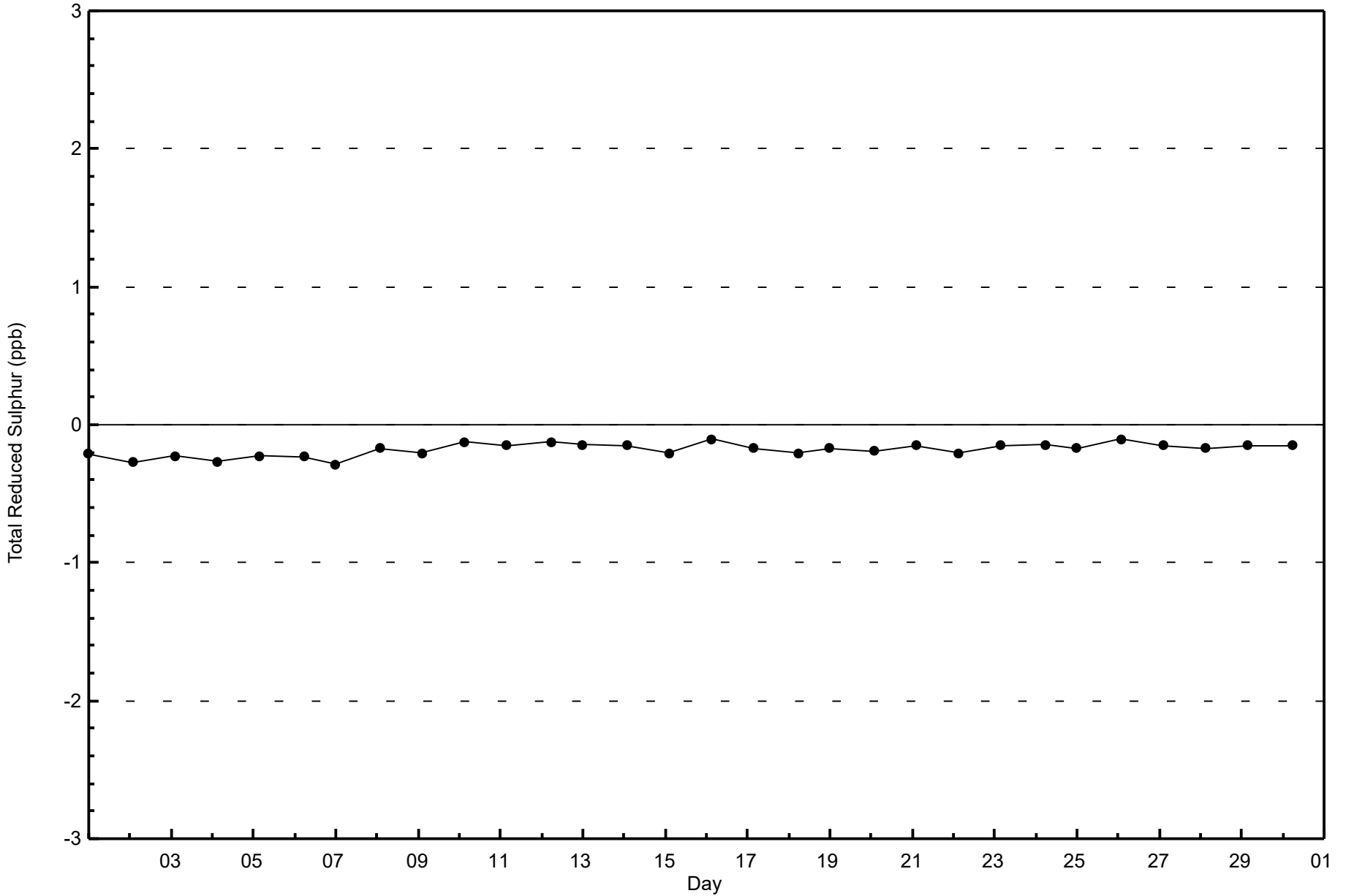
Total Reduced Sulphur (TRS) - ppb
Fort McKay South

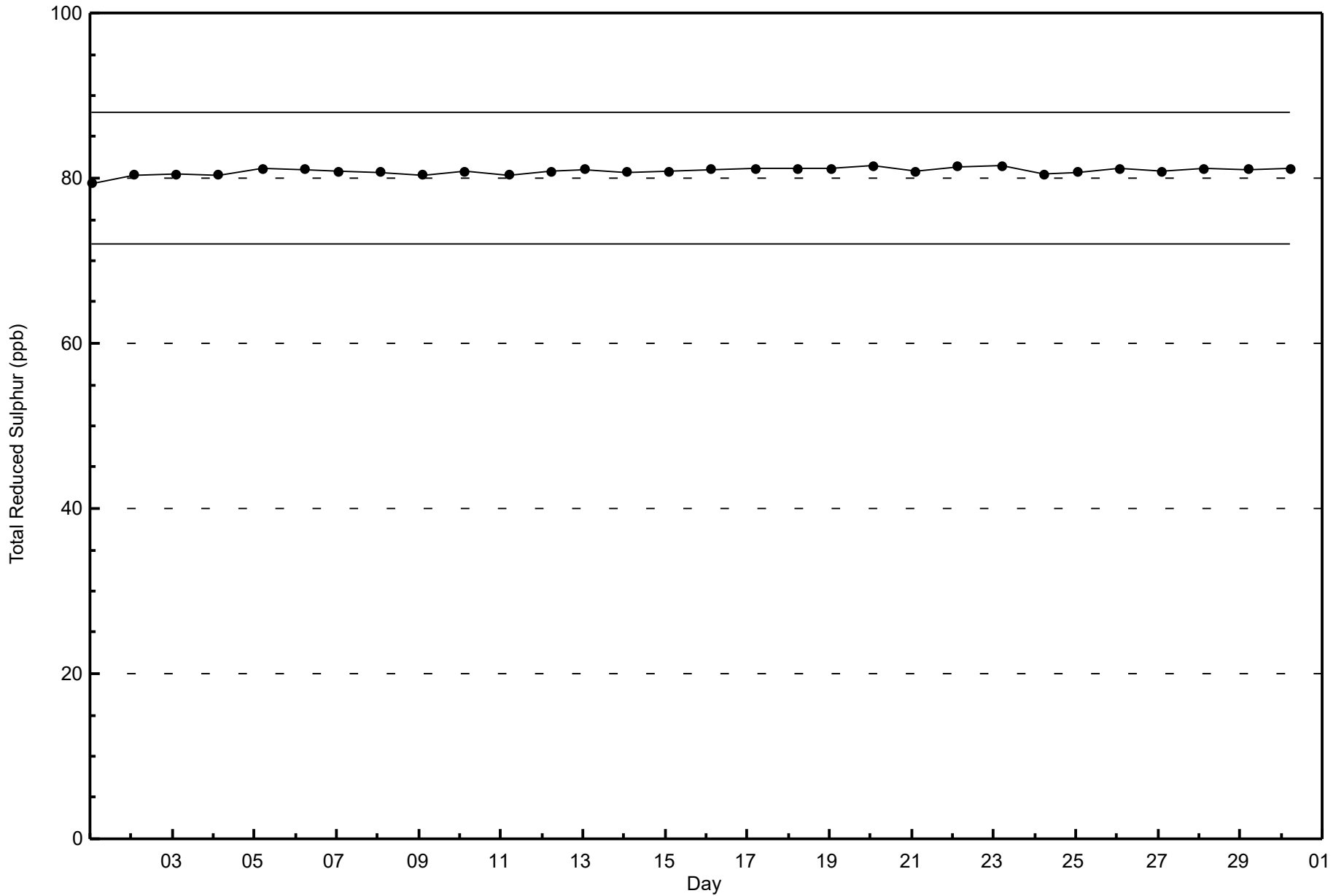




Wood Buffalo Environmental Association
Zero Responses

Total Reduced Sulphur (TRS) - ppb
Fort McKay South - September 2023







Wood Buffalo Environmental Association
Summary of Hour Averages

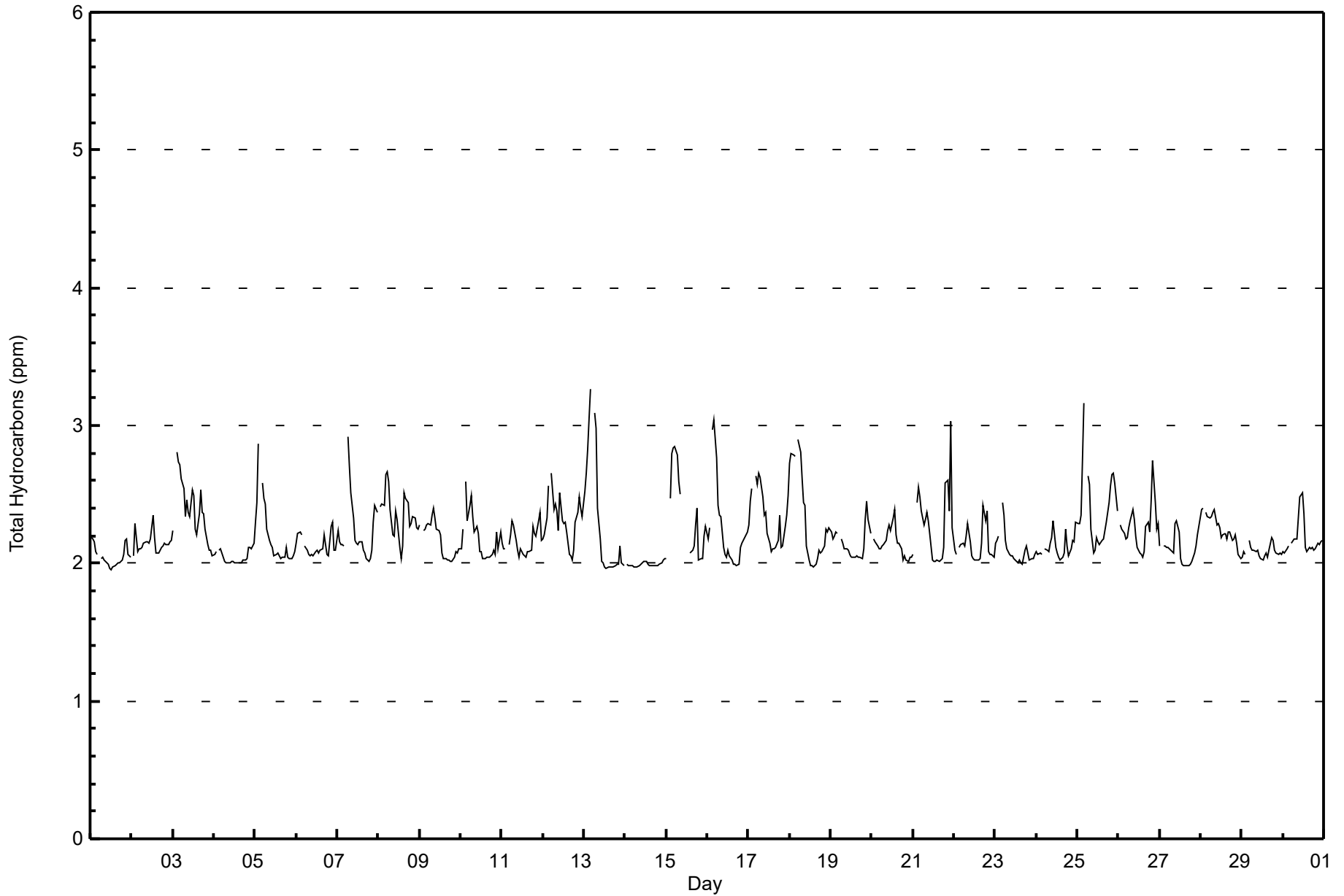
Total Hydrocarbons (THC) - ppm
Fort McKay South - September 2023

Maximum Value: 3.3 ppm on Sep 13 05:00		Maximum Daily Average: 2.4 ppm on Sep 25		Hours in Service: 720																							
Minimum Value: 2.0 ppm on Sep 1 13:00		Minimum Daily Average: 2.0 ppm on Sep 14		Hours of Data: 685																							
Maximum Diurnal Average: 2.4 ppm at hour 5		Minimum Diurnal Average: 2.1 ppm at hour 15		Hours of Missing Data: 35																							
Monthly Average: 2.20 ppm		Percentiles: P ₁ = 2.0 P ₁₀ = 2.0 Q ₁ = 2.1 Median = 2.1 Q ₃ = 2.3 P ₉₀ = 2.5 P ₉₉ = 3.0		Hours of Calibration: 35																							
				Percent Operational Time: 100.0																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Sep	2.2	2.2	2.2	2.1	2.1	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.1	2.0	2.1	2.2		
2-Sep	Z	2.1	2.3	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.2	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.3	
3-Sep	2.2	Z	2.8	2.7	2.7	2.6	2.5	2.3	2.5	2.4	2.3	2.5	2.5	2.2	2.2	2.4	2.5	2.4	2.4	2.2	2.1	2.1	2.1	2.1	2.4	2.8	
4-Sep	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	2.1	2.1	2.1	2.1	2.0	2.1	
5-Sep	2.3	2.4	2.9	Z	2.6	2.5	2.4	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.1	2.1	2.2	2.9	
6-Sep	2.1	2.2	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	2.2	2.1	2.1	2.1	2.3	2.3	2.1	2.1	2.1	2.3	
7-Sep	2.2	2.2	2.1	2.1	2.1	Z	2.9	2.7	2.5	2.3	2.2	2.1	2.1	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.1	2.3	2.4	2.4	2.2	2.9	
8-Sep	Z	2.4	2.4	2.4	2.6	2.7	2.6	2.4	2.2	2.2	2.4	2.3	2.1	2.0	2.1	2.5	2.5	2.4	2.3	2.3	2.3	2.3	2.3	2.2	2.4	2.7	
9-Sep	2.3	Z	2.2	2.2	2.3	2.3	2.3	2.4	2.4	2.3	2.2	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.4	
10-Sep	2.1	2.2	Z	2.6	2.3	2.4	2.5	2.3	2.2	2.3	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.1	2.2	2.2	2.6	
11-Sep	2.1	2.1	2.1	Z	2.1	2.2	2.3	2.3	2.2	2.1	2.0	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.3	2.2	2.2	2.3	2.4	2.2	2.2	2.4	
12-Sep	2.2	2.2	2.3	2.6	Z	2.7	2.4	2.4	2.4	2.2	2.5	2.3	2.3	2.3	2.2	2.1	2.1	2.0	2.1	2.3	2.4	2.5	2.4	2.3	2.3	2.7	
13-Sep	2.5	2.6	2.8	3.0	3.3	Z	3.1	3.0	2.4	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.3	3.3	
14-Sep	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-Sep	2.0	Z	2.5	2.8	2.8	2.8	2.8	2.6	2.5	C	C	C	C	C	2.1	2.1	2.1	2.3	2.4	2.0	2.0	2.0	2.2	2.3	2.4	2.8	
16-Sep	2.2	2.3	Z	3.0	3.0	2.8	2.4	2.4	2.3	2.1	2.1	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.2	2.2	2.2	2.2	3.0	
17-Sep	2.3	2.5	2.5	Z	2.6	2.6	2.7	2.6	2.5	2.4	2.4	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.1	2.1	2.3	2.3	2.5	2.3	2.7	
18-Sep	2.7	2.8	2.8	2.8	Z	2.9	2.8	2.6	2.4	2.4	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.3	2.2	2.3	2.3	2.9	
19-Sep	2.2	2.2	2.2	2.2	2.2	Z	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.1	2.3	2.5	2.3	2.2	2.5	
20-Sep	Z	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.2	2.3	2.4	2.2	2.1	2.1	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.1	2.4	
21-Sep	2.1	Z	2.4	2.6	2.5	2.4	2.3	2.3	2.4	2.3	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.6	2.6	2.4	3.0	2.3	2.3	3.0	
22-Sep	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.2	2.3	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.4	2.3	2.4	2.1	2.1	2.1	2.0	2.1	2.4	
23-Sep	2.1	2.2	2.2	Z	2.4	2.3	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.4	
24-Sep	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.2	2.3	2.1	2.1	2.0	2.0	2.0	2.1	2.3	2.1	2.1	2.1	2.2	2.2	2.3	2.1	2.3	
25-Sep	2.3	2.3	2.3	2.8	3.2	Z	2.6	2.6	2.2	2.1	2.1	2.2	2.2	2.1	2.2	2.2	2.2	2.3	2.4	2.6	2.6	2.7	2.6	2.4	2.4	3.2	
26-Sep	Z	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.4	2.3	2.2	2.1	2.1	2.1	2.0	2.1	2.3	2.3	2.2	2.4	2.7	2.4	2.2	2.3	2.3	2.7	
27-Sep	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.3	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.3	2.1	2.3	
28-Sep	2.4	2.4	Z	2.4	2.3	2.3	2.3	2.4	2.4	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.0	2.3	2.4	
29-Sep	2.0	2.1	2.1	Z	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.0	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	
30-Sep	2.1	2.1	2.1	2.1	Z	2.1	2.2	2.2	2.2	2.3	2.5	2.5	2.4	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.5	
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerospan C - Calibration																											



Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Fort McKay South - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Fort McKay South - September 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	157	22.92	22.92
2.1 - 3.0	525	76.64	99.56
3.1 - 10.0	3	0.44	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Fort McKay South - September 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	5	16	18	15	23	26	16	9	16	10	157
2.1 - 3.0	31	8	4	4	1	9	14	54	117	63	79	64	20	21	9	24	522
3.1 - 10.0	0	0	0	0	0	0	0	0	1	1	1	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	33	8	4	4	1	10	19	70	136	79	103	90	36	30	25	34	682

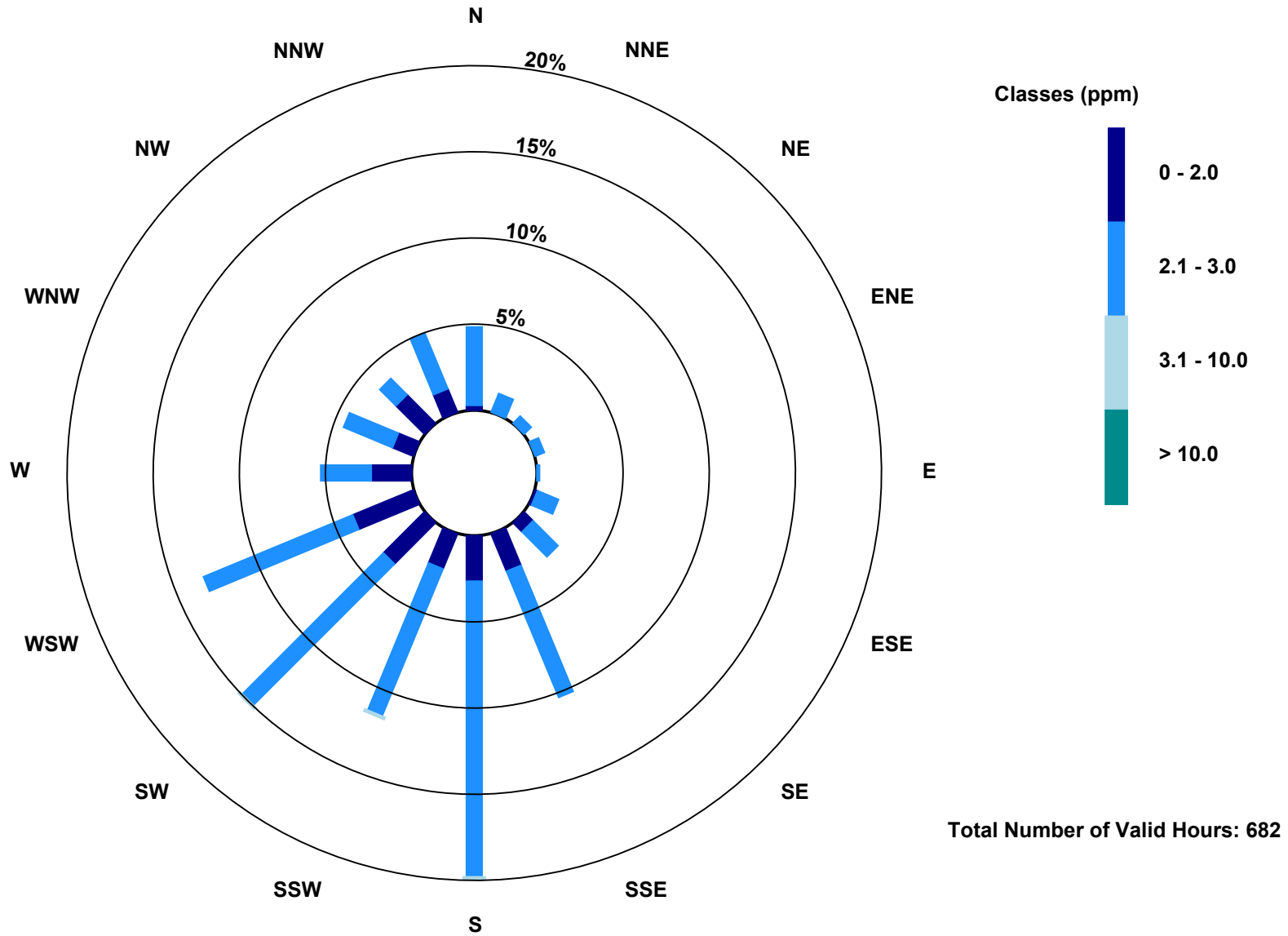
Total Number of Valid Hours: 682

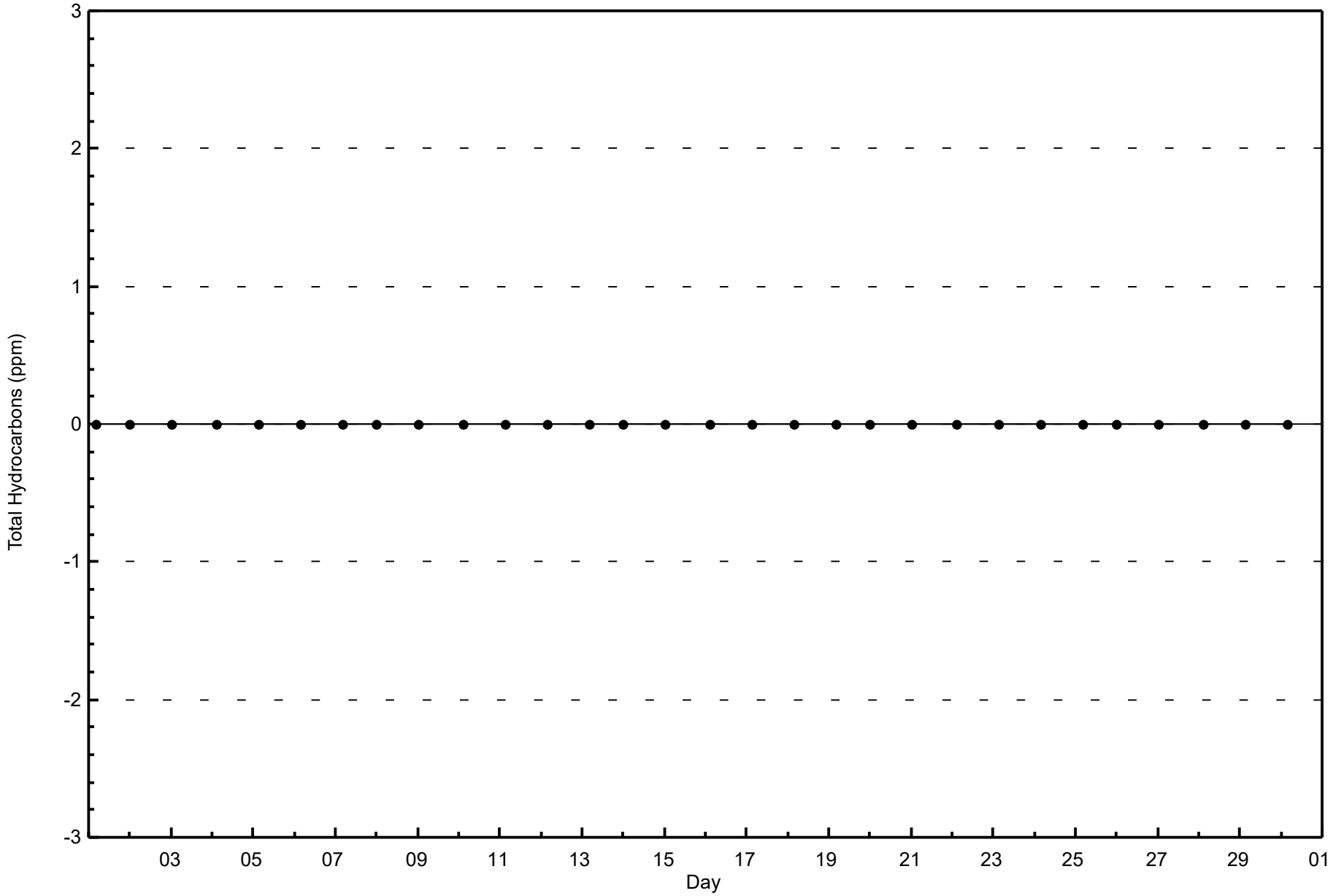
Total Number of Hours: 720

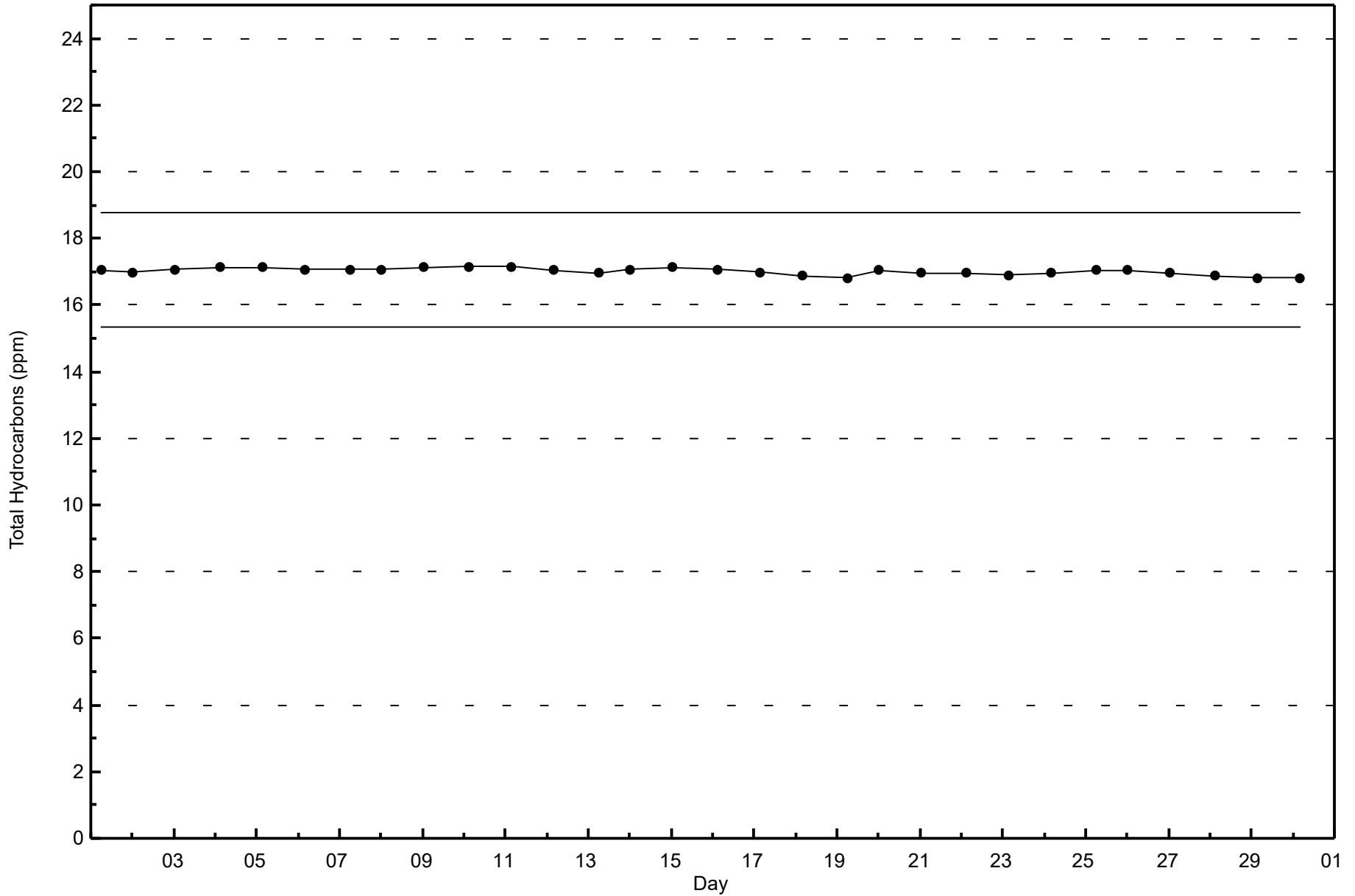


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Total Hydrocarbons (THC) - ppm
Fort McKay South







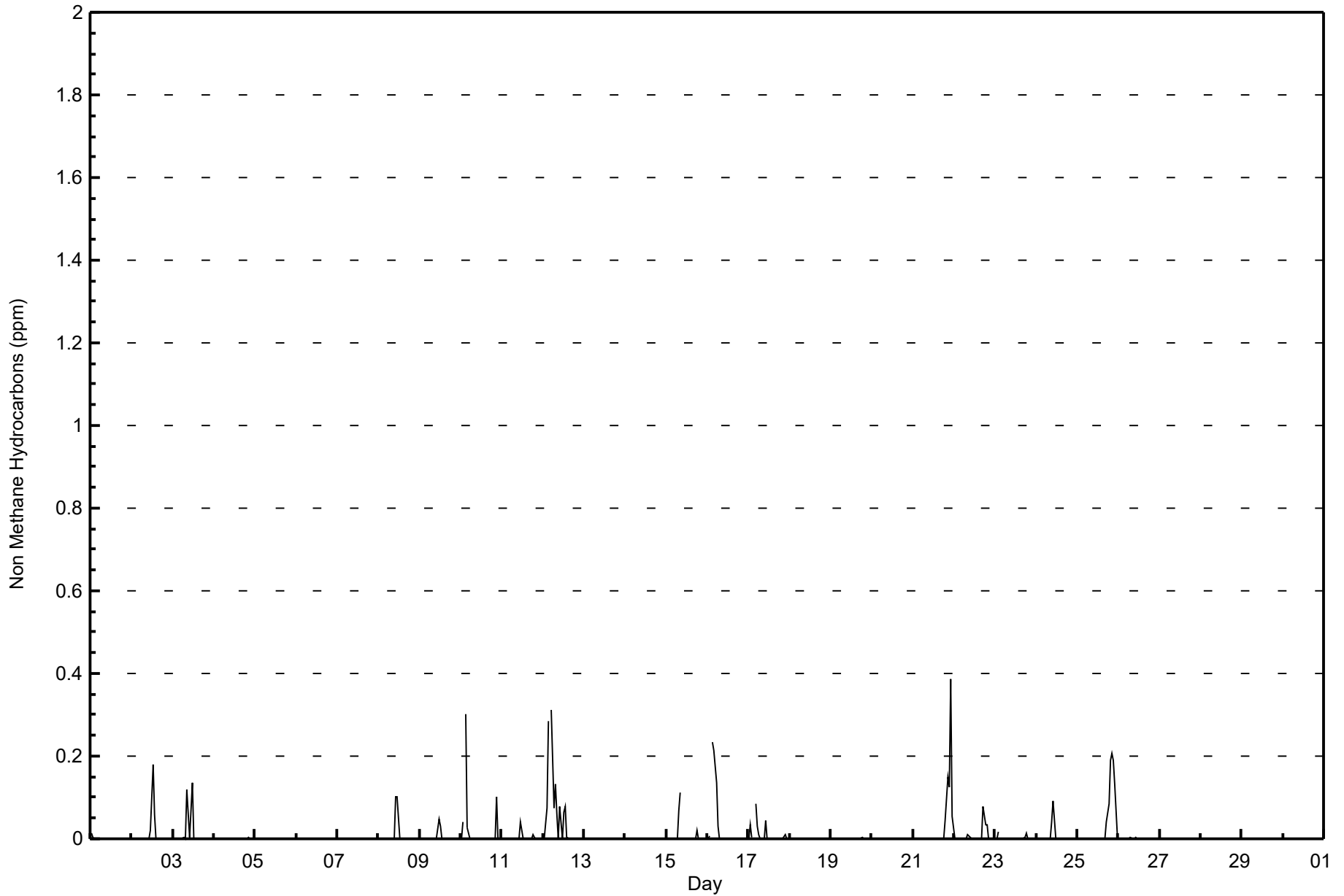


Maximum Value: 0.388 ppm on Sep 21 23:00		Maximum Daily Average: 0.051 ppm on Sep 12		Hours in Service:	720																						
Minimum Value: 0.000 ppm on Sep 1 03:00		Minimum Daily Average: 0.000 ppm on Sep 5		Hours of Data:	685																						
Maximum Diurnal Average: 0.033 ppm at hour 4		Minimum Diurnal Average: 0.000 ppm at hour 16		Hours of Missing Data:	35																						
Monthly Average: 0.008 ppm		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.0 P ₉₉ = 0.2		Hours of Calibration:	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-Sep	0.013	0.003	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.013	
2-Sep	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.020	0.180	0.059	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.011	0.180	
3-Sep	0.000	Z	0.000	0.000	0.000	0.000	0.005	0.000	0.117	0.061	0.004	0.137	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.014	0.137		
4-Sep	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	0.005	0.005
5-Sep	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
6-Sep	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
7-Sep	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
8-Sep	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.100	0.101	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.009	0.101	
9-Sep	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.046	0.029	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.046	
10-Sep	0.000	0.040	Z	0.303	0.026	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.102	0.000	0.020	0.303	
11-Sep	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.039	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.012	0.002	0.000	0.000	0.000	0.002	0.039	
12-Sep	0.000	0.000	0.075	0.286	Z	0.313	0.075	0.132	0.061	0.000	0.077	0.000	0.063	0.079	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.051	0.313	
13-Sep	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-Sep	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-Sep	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.068	0.110	C	C	C	C	C	0.000	0.000	0.000	0.000	0.021	0.000	0.000	0.000	0.000	0.011	0.110		
16-Sep	0.000	0.008	Z	0.232	0.215	0.135	0.029	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.027	0.232		
17-Sep	0.000	0.035	0.003	Z	0.083	0.030	0.011	0.000	0.000	0.000	0.043	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.010	0.000	0.009	0.083		
18-Sep	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	
19-Sep	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	0.003	0.000	0.000	0.000	0.000	0.000	0.003	
20-Sep	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	
21-Sep	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	0.043	0.148	0.126	0.388	0.054	0.033	0.388	
22-Sep	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.010	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.078	0.034	0.033	0.000	0.000	0.000	0.007	0.078		
23-Sep	0.000	0.000	0.016	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	0.004	0.015	0.000	0.000	0.000	0.000	0.001	0.016		
24-Sep	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.041	0.093	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.093		
25-Sep	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	0.042	0.085	0.191	0.206	0.190	0.134	0.000	0.037	0.206	
26-Sep	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.004	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	0.004	
27-Sep	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-Sep	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-Sep	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-Sep	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	
		0.001	0.003	0.004	0.033	0.013	0.019	0.004	0.007	0.010	0.004	0.011	0.012	0.009	0.005	0.000	0.000	0.000	0.004	0.006	0.009	0.012	0.014	0.017	0.002	Diurnal Average	
		0.013	0.040	0.075	0.303	0.215	0.313	0.075	0.132	0.117	0.061	0.100	0.137	0.180	0.079	0.003	0.000	0.000	0.078	0.085	0.191	0.206	0.190	0.388	0.054	Diurnal Maximum	
Z - zerospan		C - Calibration																									



Wood Buffalo Environmental Association
Hourly Averages

Non Methane Hydrocarbons (NMHC) - ppm
Fort McKay South - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Fort McKay South - September 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	626	91.39	91.39
0.006 - 0.05	25	3.65	95.04
0.06 - 0.1	24	3.50	98.54
> 0.1	10	1.46	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Fort McKay South - September 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	29	8	4	4	1	10	15	60	113	74	99	85	36	28	24	33	623
0.006 - 0.05	1	0	0	0	0	0	2	4	7	4	3	3	0	1	0	0	25
0.06 - 0.1	0	0	0	0	0	0	2	6	11	1	1	0	0	1	1	1	24
> 0.1	3	0	0	0	0	0	0	0	5	0	0	2	0	0	0	0	10
Totals	33	8	4	4	1	10	19	70	136	79	103	90	36	30	25	34	682

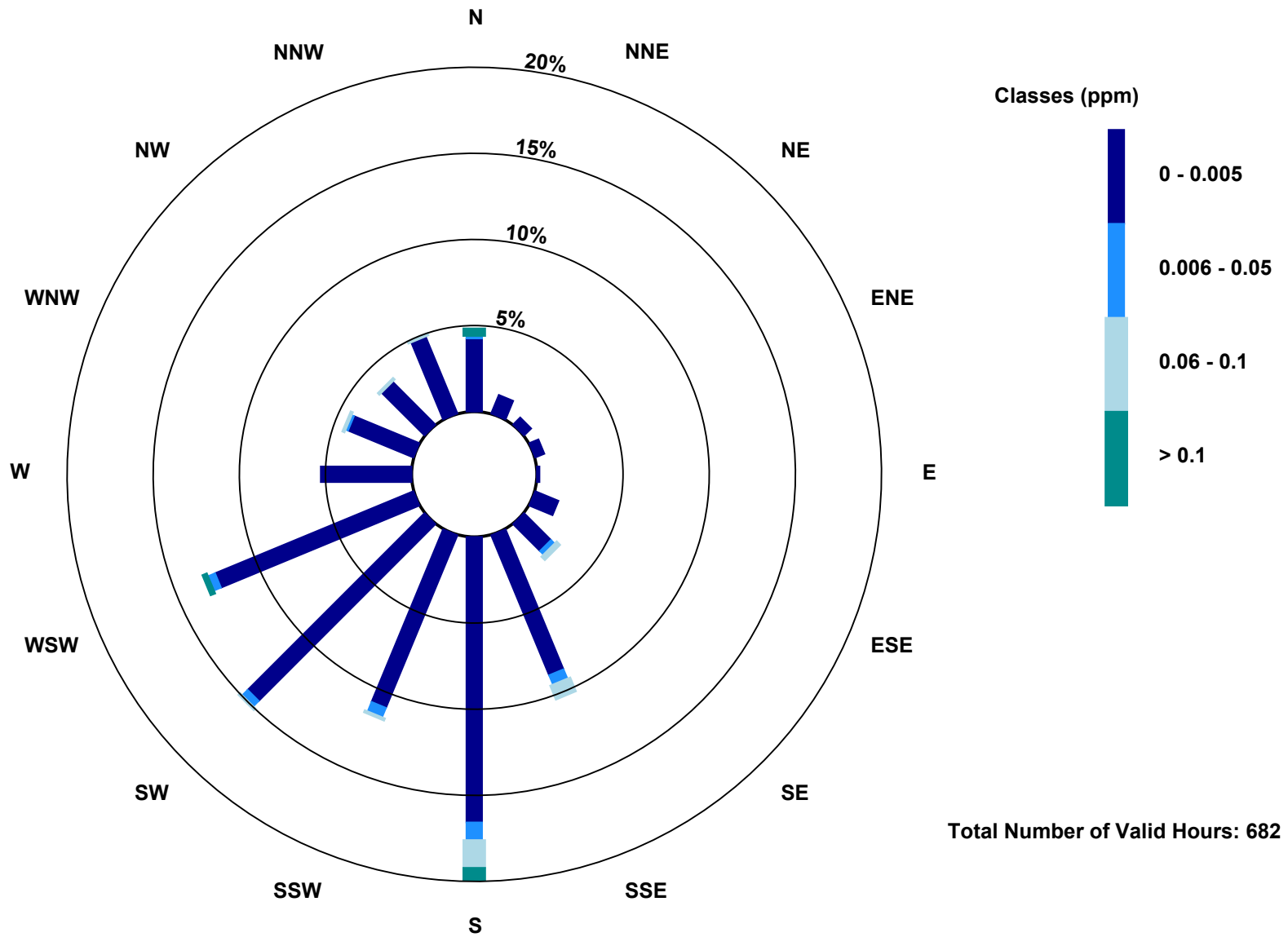
Total Number of Valid Hours: 682

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

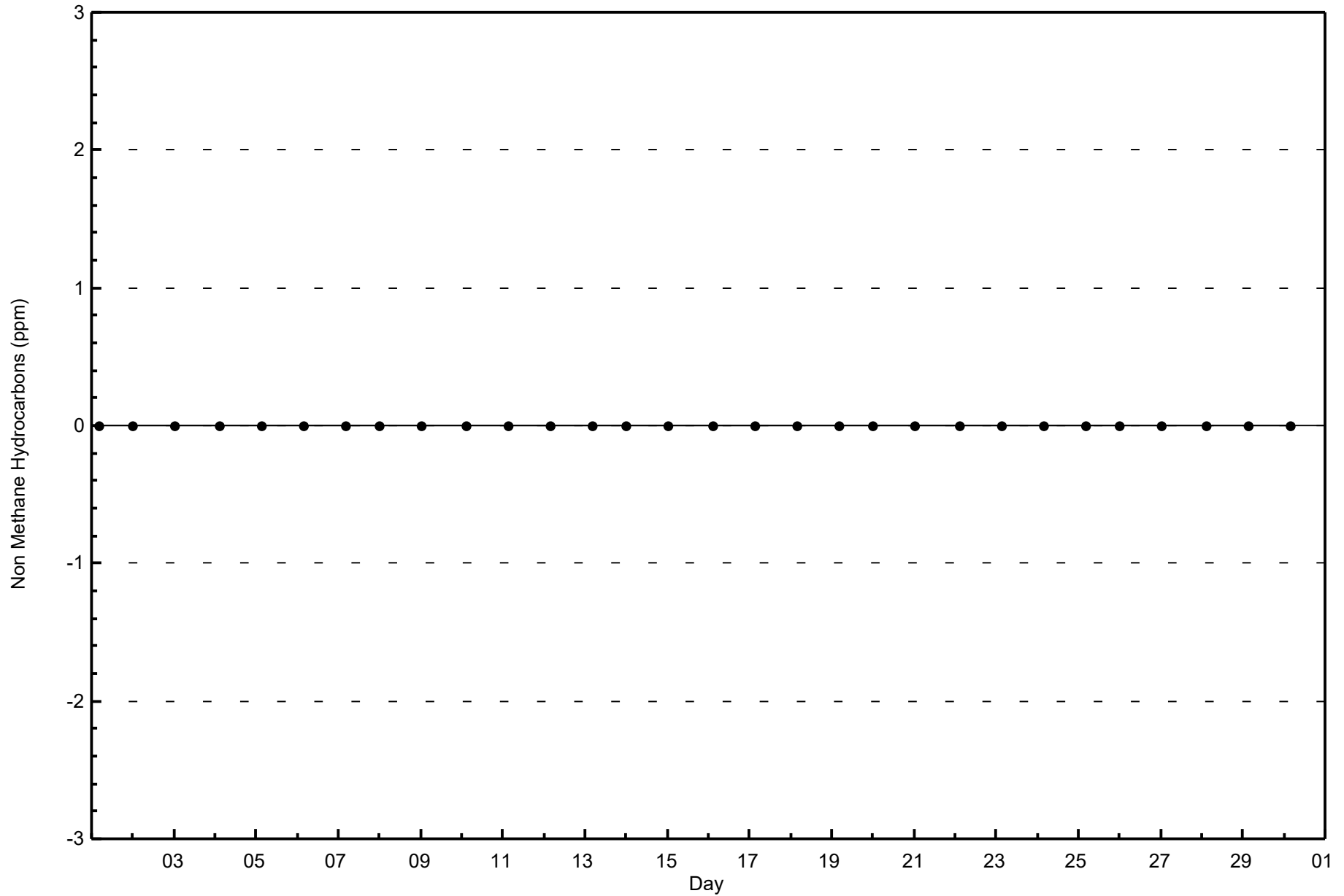
Non Methane Hydrocarbons (NMHC) - ppm
Fort McKay South

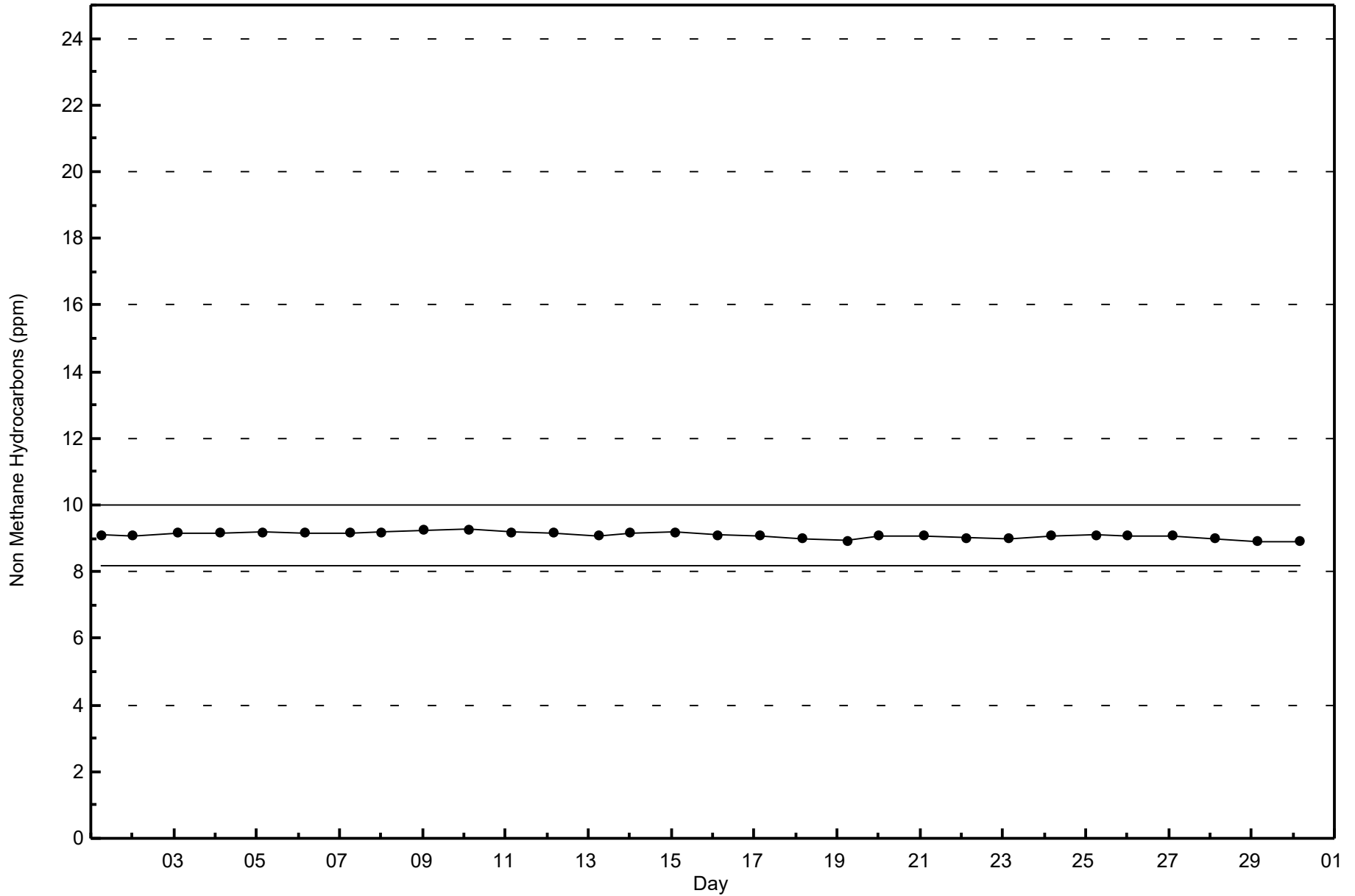




Wood Buffalo Environmental Association
Zero Responses

Non Methane Hydrocarbons (NMHC) - ppm
Fort McKay South - September 2023







Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 3.3 ppm on Sep 13 05:00	Maximum Daily Average: 2.4 ppm on Sep 3		Hours of Data:	685
Minimum Value: 2.0 ppm on Sep 1 13:00	Minimum Daily Average: 2.0 ppm on Sep 14		Hours of Missing Data:	35
Maximum Diurnal Average: 2.4 ppm at hour 5	Minimum Diurnal Average: 2.1 ppm at hour 15		Hours of Calibration:	35
Monthly Average: 2.19 ppm	Percentiles: P ₁ = 2.0 P ₁₀ = 2.0 Q ₁ = 2.1 Median = 2.1 Q ₃ = 2.3 P ₉₀ = 2.4 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-Sep	2.2	2.2	2.2	2.1	2.1	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.1	2.0	2.1	2.2		
2-Sep	Z	2.1	2.3	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.3	
3-Sep	2.2	Z	2.8	2.7	2.7	2.6	2.5	2.3	2.3	2.3	2.3	2.4	2.5	2.2	2.2	2.4	2.5	2.4	2.4	2.2	2.1	2.1	2.1	2.1	2.4	2.8	
4-Sep	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	2.1	2.1	2.1	2.1	2.0	2.1	
5-Sep	2.3	2.4	2.9	Z	2.6	2.5	2.4	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.1	2.1	2.2	2.9	
6-Sep	2.1	2.2	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	2.2	2.1	2.1	2.1	2.3	2.3	2.1	2.1	2.1	2.3	
7-Sep	2.2	2.2	2.1	2.1	2.1	Z	2.9	2.7	2.5	2.3	2.2	2.1	2.1	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.1	2.3	2.4	2.4	2.2	2.9	
8-Sep	Z	2.4	2.4	2.4	2.6	2.7	2.6	2.4	2.2	2.2	2.3	2.2	2.1	2.0	2.1	2.5	2.5	2.4	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.7	
9-Sep	2.3	Z	2.2	2.2	2.3	2.3	2.3	2.4	2.4	2.3	2.2	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.4	
10-Sep	2.1	2.2	Z	2.3	2.3	2.4	2.5	2.3	2.2	2.3	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.5	
11-Sep	2.1	2.1	2.1	Z	2.1	2.2	2.3	2.3	2.2	2.1	2.0	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.3	2.2	2.2	2.3	2.4	2.2	2.2	2.4	
12-Sep	2.2	2.2	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.2	2.4	2.3	2.2	2.2	2.2	2.1	2.1	2.0	2.1	2.3	2.4	2.5	2.4	2.3	2.3	2.5	
13-Sep	2.5	2.6	2.8	3.0	3.3	Z	3.1	3.0	2.4	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.3	3.3	
14-Sep	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-Sep	2.0	Z	2.5	2.8	2.8	2.8	2.8	2.5	2.4	C	C	C	C	C	2.1	2.1	2.1	2.3	2.4	2.0	2.0	2.0	2.2	2.3	2.3	2.8	
16-Sep	2.2	2.2	Z	2.7	2.8	2.6	2.4	2.4	2.3	2.1	2.1	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.2	2.2	2.2	2.8	
17-Sep	2.3	2.4	2.5	Z	2.6	2.5	2.6	2.6	2.5	2.4	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.1	2.1	2.3	2.3	2.5	2.3	2.6	
18-Sep	2.7	2.8	2.8	2.8	Z	2.9	2.8	2.6	2.4	2.4	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.3	2.2	2.3	2.3	2.9	
19-Sep	2.2	2.2	2.2	2.2	2.2	Z	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.1	2.3	2.5	2.3	2.2	2.5	
20-Sep	Z	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.2	2.3	2.4	2.2	2.1	2.1	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.1	2.4	
21-Sep	2.1	Z	2.4	2.6	2.5	2.4	2.3	2.3	2.4	2.3	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.5	2.5	2.3	2.6	2.2	2.3	2.6	
22-Sep	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.2	2.3	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.3	2.3	2.3	2.1	2.1	2.1	2.0	2.1	2.3	
23-Sep	2.1	2.2	2.2	Z	2.4	2.3	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.4	
24-Sep	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.0	2.0	2.1	2.3	2.1	2.1	2.1	2.2	2.2	2.3	2.1	2.3	
25-Sep	2.3	2.3	2.3	2.8	3.2	Z	2.6	2.6	2.2	2.1	2.1	2.2	2.2	2.1	2.2	2.2	2.2	2.3	2.4	2.4	2.4	2.4	2.5	2.4	2.4	3.2	
26-Sep	Z	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.4	2.3	2.2	2.1	2.1	2.1	2.0	2.1	2.3	2.3	2.2	2.4	2.7	2.4	2.2	2.3	2.3	2.7	
27-Sep	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.3	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.3	2.1	2.3	
28-Sep	2.4	2.4	Z	2.4	2.3	2.3	2.3	2.4	2.4	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.0	2.3	2.4
29-Sep	2.0	2.1	2.1	Z	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.0	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	
30-Sep	2.1	2.1	2.1	2.1	Z	2.1	2.2	2.2	2.2	2.3	2.5	2.5	2.4	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.5	

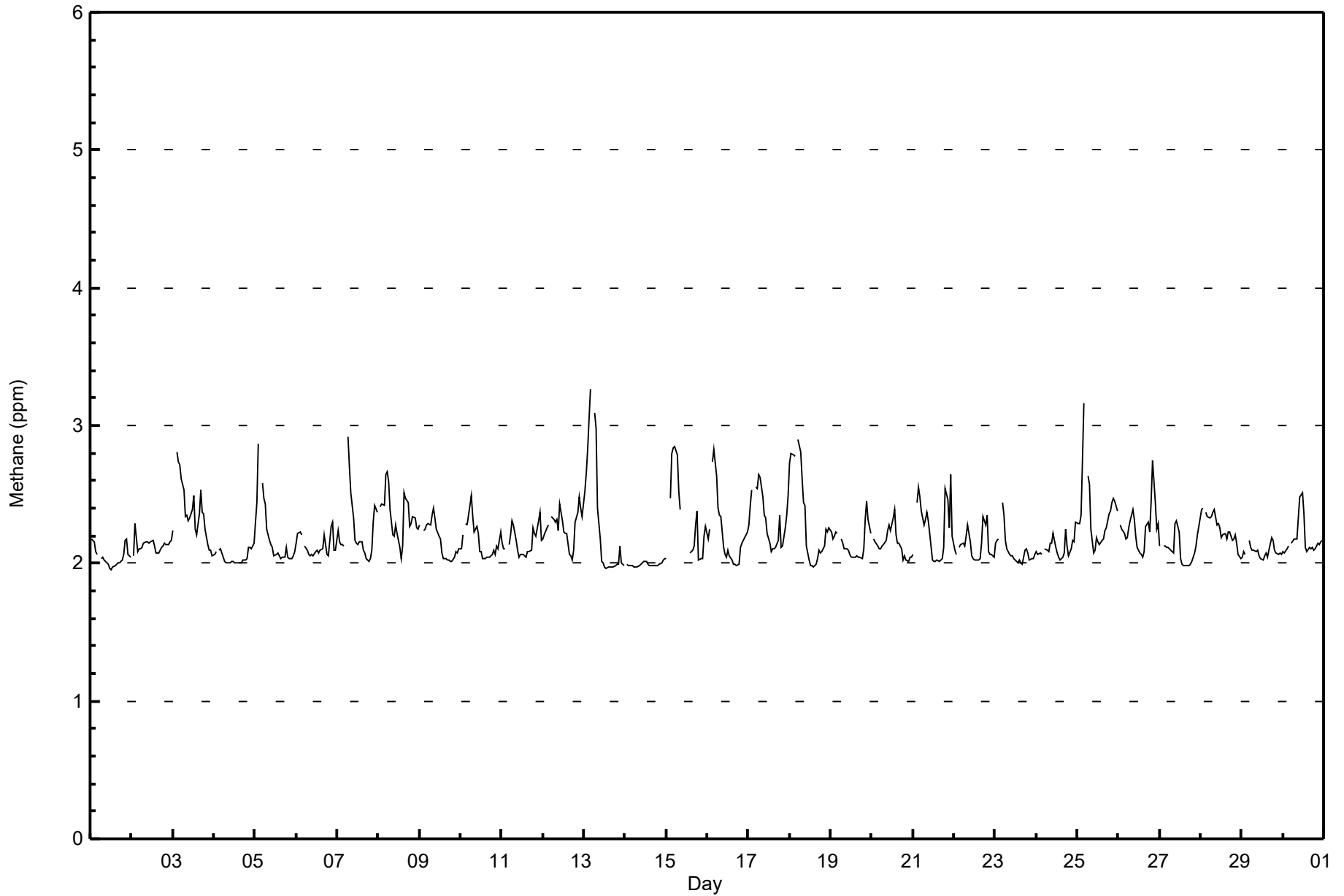
2.2	2.2	2.3	2.3	2.4	2.3	2.3	2.3	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	Diurnal Average
2.7	2.8	2.9	3.0	3.3	2.9	3.1	3.0	2.5	2.4	2.5	2.5	2.5	2.5	2.4	2.2	2.5	2.5	2.4	2.4	2.5	2.7	2.5	2.6	2.5	2.5	2.5	Diurnal Maximum

Z - zerospan C - Calibration



Wood Buffalo Environmental Association
Hourly Averages

Methane (CH₄) - ppm
Fort McKay South - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Fort McKay South - September 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	157	22.92	22.92
2.1 - 3.0	525	76.64	99.56
3.1 - 10.0	3	0.44	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Methane (CH₄) - ppm
Fort McKay South - September 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	5	16	18	15	23	26	16	9	16	10	157
2.1 - 3.0	31	8	4	4	1	9	14	54	117	63	79	64	20	21	9	24	522
3.1 - 10.0	0	0	0	0	0	0	0	0	1	1	1	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	33	8	4	4	1	10	19	70	136	79	103	90	36	30	25	34	682

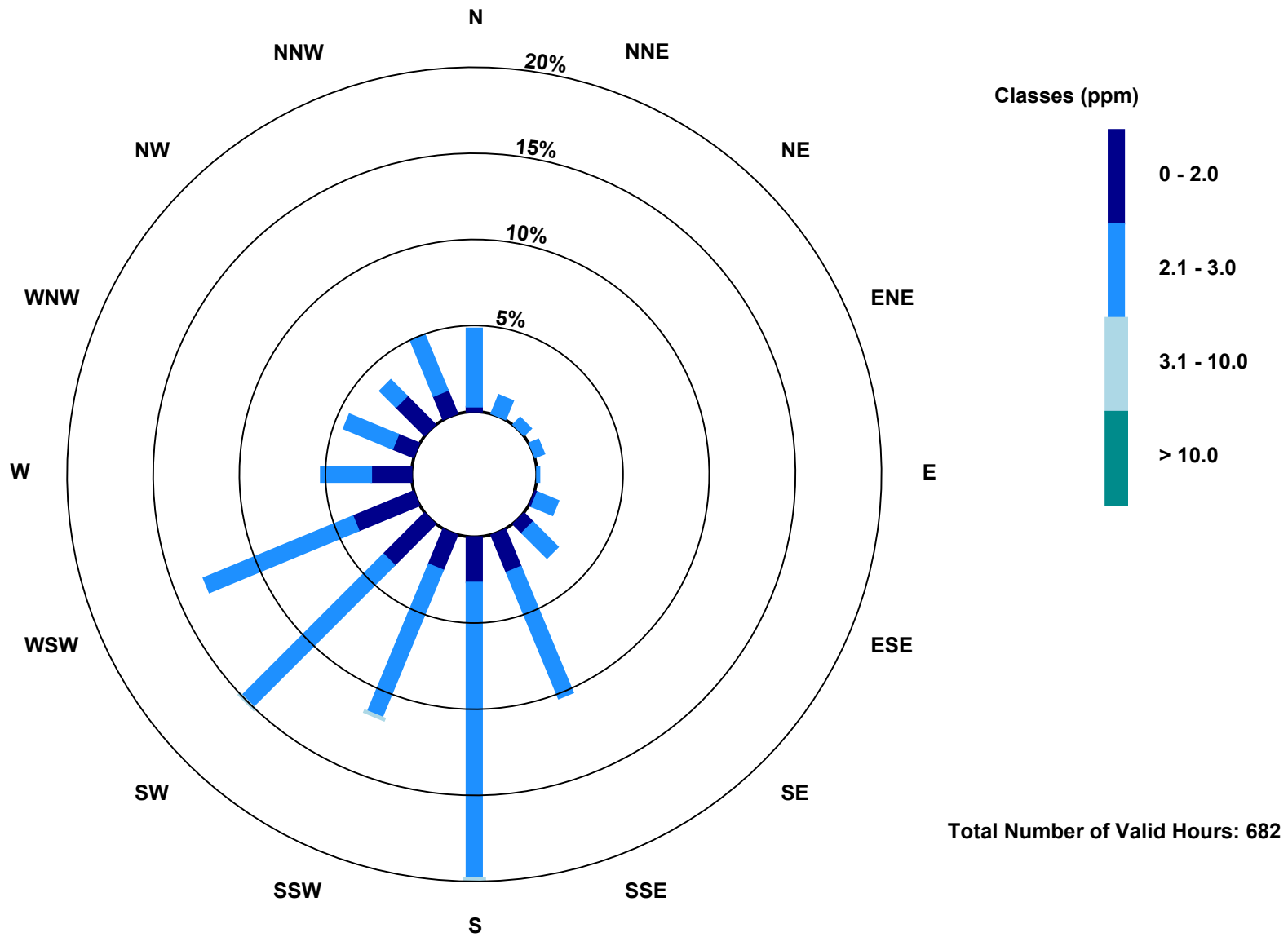
Total Number of Valid Hours: 682

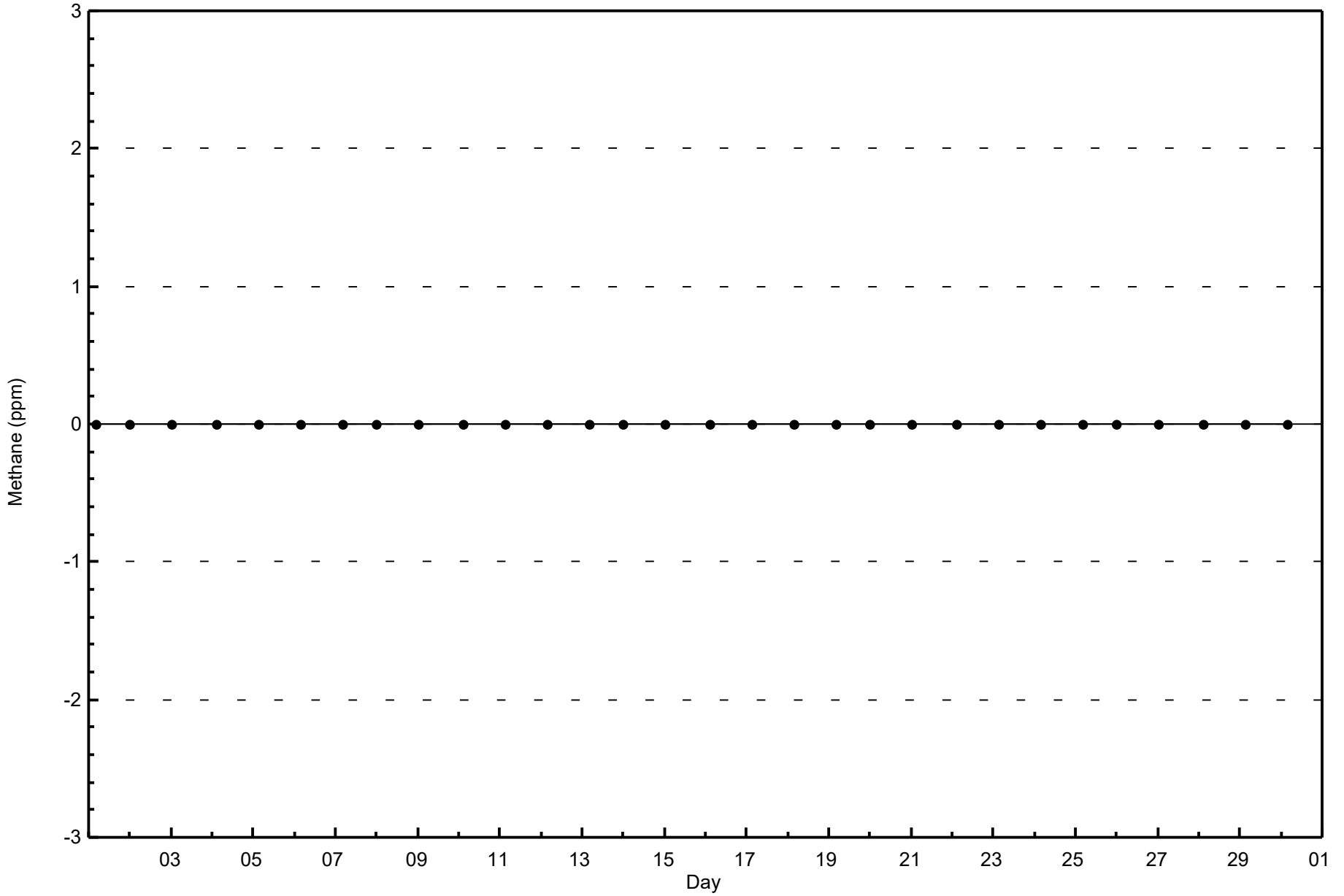
Total Number of Hours: 720

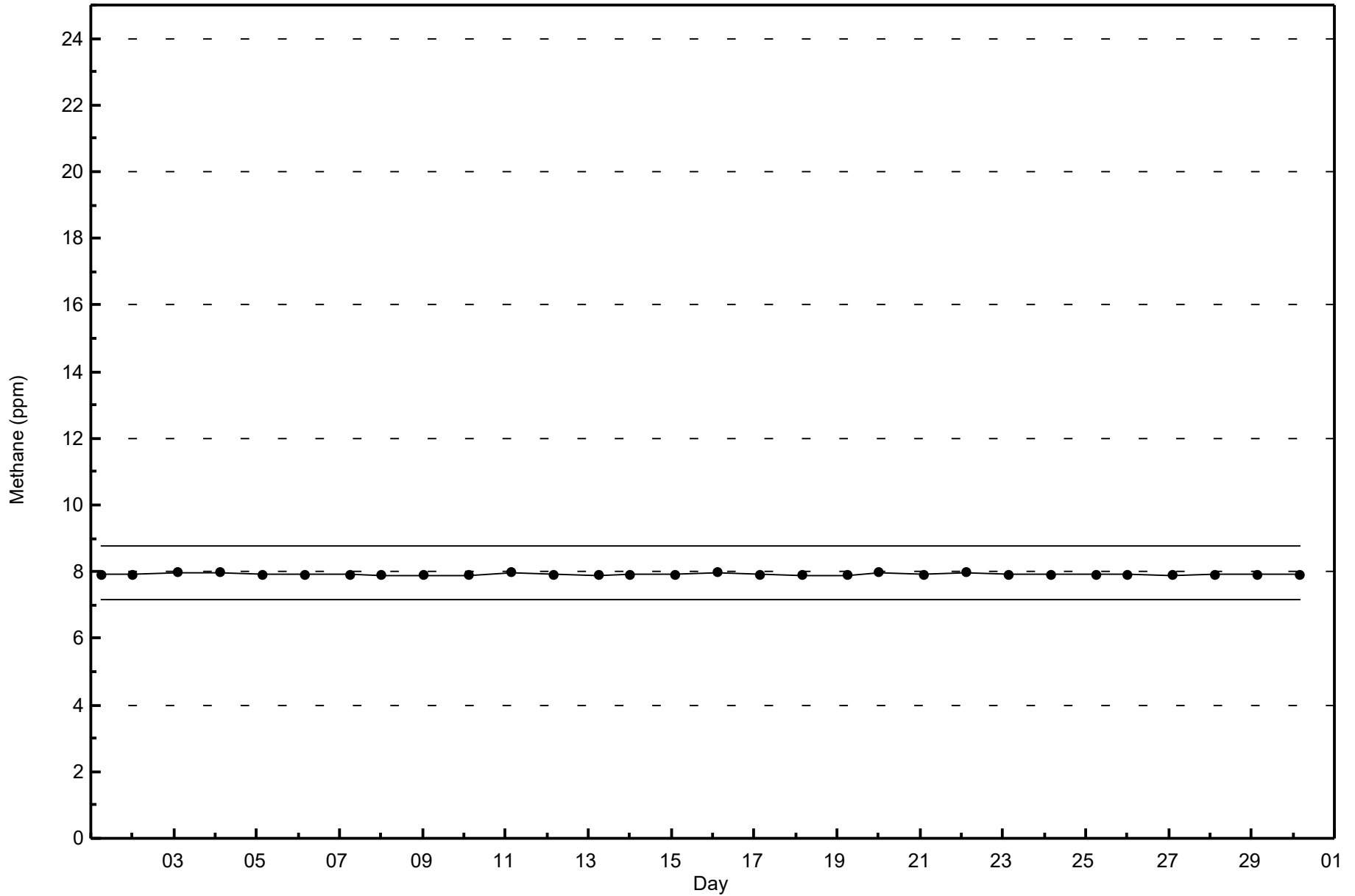


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Methane (CH₄) - ppm
Fort McKay South









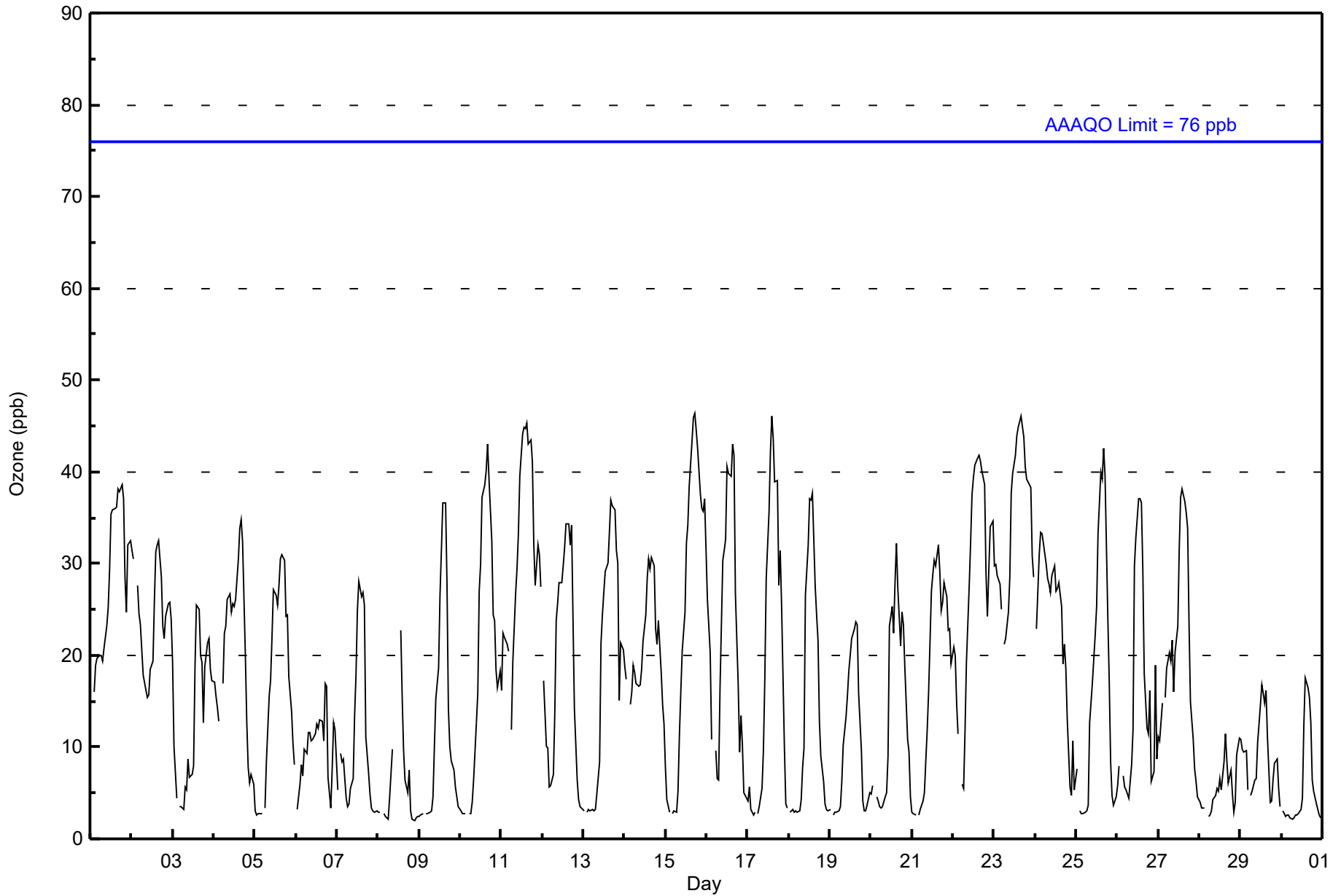
Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O₃) - ppb

Fort McKay South - September 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 720																																											
Maximum Value: 46.4 ppb on Sep 15 18:00		Maximum Daily Average: 34.7 ppb on Sep 23		Hours of Data: 686																																													
Minimum Value: 2.0 ppb on Sep 8 22:00		Minimum Daily Average: 5.5 ppb on Sep 28		Hours of Missing Data: 34																																													
Maximum Diurnal Average: 31.1 ppb at hour 16		Minimum Diurnal Average: 8.3 ppb at hour 6		Hours of Calibration: 34																																													
Monthly Average: 17.74 ppb		Percentiles: P ₁ = 2.4 P ₁₀ = 3.0 Q ₁ = 5.5 Median = 16.3 Q ₃ = 27.7 P ₉₀ = 36.6 P ₉₉ = 44.9		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-Sep	17.6	Z	16.1	18.9	19.7	20.0	20.0	19.4	20.8	23.2	25.1	29.3	35.4	35.8	36.0	36.1	38.1	37.8	38.6	37.0	28.6	24.7	32.0	32.5	28.0	38.6																							
2-Sep	31.5	30.6	Z	27.7	24.6	23.3	20.6	17.9	16.1	15.4	15.7	18.4	19.4	25.9	31.2	32.0	32.5	28.6	23.2	21.7	24.3	25.6	25.8	23.9	24.2	32.5																							
3-Sep	19.2	10.0	4.4	Z	3.5	3.5	3.2	5.6	5.3	8.6	6.7	7.0	7.9	18.6	25.5	25.0	20.0	19.2	12.7	18.7	21.4	21.8	18.5	17.3	13.2	25.5																							
4-Sep	17.1	15.6	14.3	12.7	Z	16.9	22.5	23.3	26.1	26.6	24.7	25.6	25.4	26.0	30.5	33.8	34.8	32.3	19.8	12.7	7.8	6.1	7.0	5.9	20.3	34.8																							
5-Sep	3.1	2.7	2.7	2.8	2.7	Z	3.4	8.4	15.5	17.2	21.9	27.2	26.6	25.4	27.6	30.4	30.9	30.3	24.3	24.4	17.8	13.9	10.3	8.1	16.4	30.9																							
6-Sep	Z	3.2	6.0	8.1	6.9	9.8	11.5	11.6	10.7	10.8	11.4	12.6	12.0	12.9	12.8	10.8	16.9	16.7	6.7	3.4	7.6	12.6	11.8	10.3	16.9																								
7-Sep	5.4	Z	9.2	8.4	8.8	4.4	3.6	3.9	5.4	6.6	13.4	17.8	24.8	28.1	26.4	26.9	25.4	11.2	7.2	4.8	3.4	3.1	2.9	3.1	11.1	28.1																							
8-Sep	2.9	2.9	Z	2.7	2.4	2.3	2.1	4.4	9.7	C	C	C	C	22.7	15.4	9.6	6.4	5.1	7.4	3.0	2.1	2.0	2.3	2.4	5.7	22.7																							
9-Sep	2.5	2.7	2.7	Z	2.7	2.7	2.9	3.1	4.6	10.0	15.3	18.6	26.6	31.4	36.7	36.5	27.7	14.2	10.1	8.5	7.4	5.7	4.6	3.5	12.2	36.7																							
10-Sep	3.0	2.8	2.7	2.7	Z	2.8	2.8	3.9	6.5	12.7	15.9	27.0	29.9	37.2	38.6	40.2	43.0	39.2	32.5	24.4	23.7	18.4	16.4	18.3	19.3	43.0																							
11-Sep	16.2	22.5	22.0	21.3	20.4	Z	11.9	19.2	26.6	29.5	33.3	39.5	44.0	44.9	44.7	45.3	43.0	43.5	41.1	32.1	27.7	32.0	31.0	27.5	31.3	45.3																							
12-Sep	Z	17.2	10.1	10.0	5.7	5.8	7.1	13.7	23.8	25.6	28.0	28.0	29.8	31.8	34.3	34.3	32.1	34.2	24.0	14.1	6.4	4.2	3.5	3.3	18.6	34.3																							
13-Sep	3.1	Z	3.0	3.1	3.0	3.2	3.0	3.3	4.9	8.4	21.4	24.4	26.8	29.2	30.1	33.4	36.9	36.3	35.9	31.5	30.0	15.1	21.3	20.6	18.6	36.9																							
14-Sep	18.8	17.4	Z	14.6	15.9	18.8	18.1	17.0	16.6	16.7	18.5	21.5	24.5	28.3	30.5	29.5	30.6	29.7	22.9	21.2	23.7	18.1	14.6	12.6	20.9	30.6																							
15-Sep	7.7	4.2	2.9	Z	2.8	3.0	3.0	5.1	11.3	16.0	20.5	24.8	32.2	34.2	38.5	43.3	46.0	46.4	44.6	42.5	37.6	36.0	35.8	37.1	25.0	46.4																							
16-Sep	26.1	23.3	20.2	10.9	Z	9.6	6.5	6.5	16.3	30.3	31.4	32.7	40.5	39.8	39.4	43.0	41.8	26.7	16.7	9.5	13.4	10.3	5.1	4.4	21.9	43.0																							
17-Sep	4.2	5.6	3.2	2.6	2.9	Z	2.7	3.5	5.6	9.6	17.4	28.4	35.5	42.2	46.1	43.7	39.0	39.1	27.7	31.5	25.3	9.8	3.9	3.3	18.8	46.1																							
18-Sep	Z	3.0	3.2	3.0	3.0	3.0	3.0	4.3	7.8	9.9	26.6	32.0	37.0	36.9	37.7	27.4	24.4	21.6	12.8	9.1	6.3	3.9	3.2	3.1	14.0	37.7																							
19-Sep	3.2	Z	2.6	2.9	3.0	3.1	3.6	6.3	10.2	13.3	15.5	18.3	20.1	21.8	22.9	23.6	23.3	15.9	9.6	4.2	3.0	3.0	3.6	5.0	10.3	23.6																							
20-Sep	4.9	5.8	Z	4.6	4.1	3.5	3.3	3.4	4.6	5.0	9.0	23.2	25.4	22.4	28.0	32.3	27.2	21.1	24.7	23.4	18.7	10.8	9.5	4.5	13.9	32.3																							
21-Sep	2.9	2.7	2.6	Z	2.6	3.2	4.1	5.0	8.5	11.9	16.1	27.0	28.8	30.3	29.8	32.0	29.1	24.8	25.8	27.9	26.5	22.8	22.8	19.1	17.7	32.0																							
22-Sep	20.8	20.0	14.8	11.4	Z	6.0	5.5	11.7	19.2	27.6	32.3	37.6	39.4	40.8	41.6	41.7	41.2	40.1	38.6	28.9	24.2	29.2	34.1	34.6	27.9	41.7																							
23-Sep	29.7	30.0	28.7	27.7	25.0	Z	21.2	21.8	24.7	28.6	37.6	39.8	41.8	43.9	44.9	45.5	46.0	43.8	40.5	39.2	38.9	38.3	30.9	28.5	34.7	46.0																							
24-Sep	Z	22.9	30.9	33.4	33.3	32.2	29.9	28.4	27.8	26.8	28.7	29.8	27.0	27.3	28.0	25.3	19.1	21.2	18.6	13.1	5.6	4.7	10.7	5.3	23.0	33.4																							
25-Sep	7.6	Z	3.1	2.7	2.8	2.9	3.0	3.7	12.7	17.1	19.6	22.3	25.4	33.2	40.0	39.2	42.6	39.6	24.2	17.2	8.4	4.7	3.7	4.6	16.5	42.6																							
26-Sep	5.8	8.0	Z	6.8	5.7	5.4	4.9	4.4	8.1	12.0	29.8	32.8	37.1	37.1	36.6	29.3	18.1	12.1	11.5	16.2	6.3	7.3	19.0	8.7	15.8	37.1																							
27-Sep	11.2	10.6	14.7	Z	15.4	18.7	20.2	19.4	21.6	16.1	20.3	23.2	31.6	37.2	38.2	36.7	35.5	33.8	23.4	14.9	10.8	7.7	6.3	4.6	20.5	38.2																							
28-Sep	3.9	3.4	3.3	3.3	Z	2.5	2.5	3.1	4.3	4.7	5.5	5.1	6.5	5.3	8.4	11.5	8.5	6.1	7.5	4.8	2.9	3.9	9.2	10.9	5.5	11.5																							
29-Sep	10.8	9.8	9.4	9.5	5.4	Z	4.7	5.3	6.4	6.6	10.5	12.5	16.7	15.8	14.9	16.1	11.2	4.0	4.2	6.4	8.2	8.7	5.5	3.5	9.0	16.7																							
30-Sep	Z	3.1	2.5	2.6	2.6	2.3	2.2	2.4	2.6	2.6	2.7	3.2	4.5	12.3	17.6	16.5	15.4	12.7	6.3	5.2	3.9	3.2	2.5	2.4	5.7	17.6																							
																								11.2	11.2	9.4	10.2	9.0	8.3	8.4	9.6	12.8	15.5	19.8	23.7	27.0	29.3	31.1	31.1	29.4	26.2	21.8	18.5	15.6	13.4	13.6	12.4	Diurnal Average	
																								31.5	30.6	30.9	33.4	33.3	32.2	29.9	28.4	27.8	30.3	37.6	39.8	44.0	44.9	46.1	45.5	46.0	46.4	44.6	42.5	38.9	38.3	35.8	37.1	Diurnal Maximum	
Z - zerospan C - Calibration																																																	
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 76 ppb																																																	





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ozone (O₃) - ppb
Fort McKay South - September 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	407	59.33	59.33
21 - 50	279	40.67	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 686

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Ozone (O₃) - ppb
Fort McKay South - September 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	24	5	2	4	1	8	9	24	64	51	71	60	25	22	11	26	407
21 - 50	10	3	2	0	0	2	11	48	72	25	30	35	10	7	15	7	277
51 - 82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	34	8	4	4	1	10	20	72	136	76	101	95	35	29	26	33	684

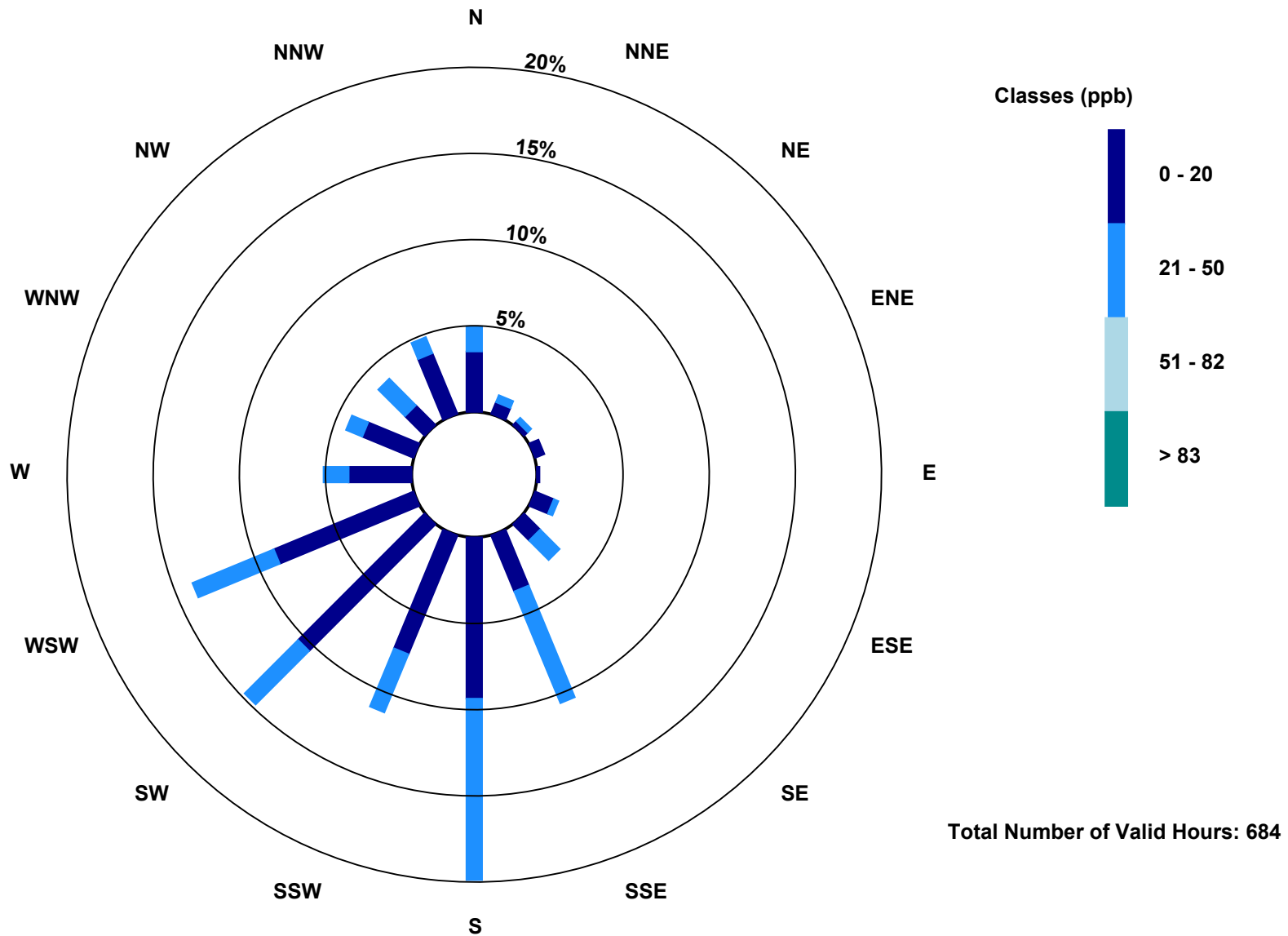
Total Number of Valid Hours: 684

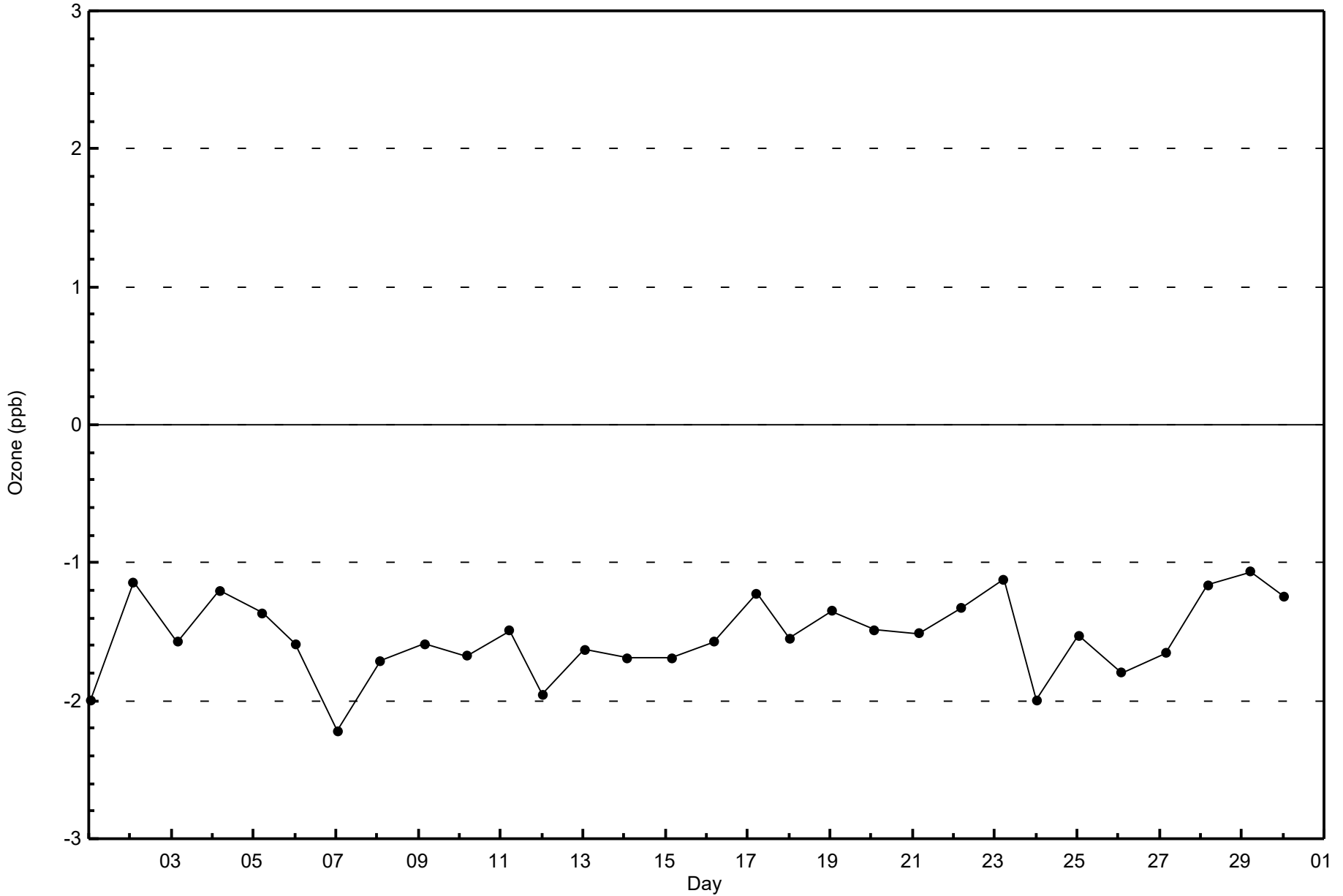
Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

Ozone (O₃) - ppb
Fort McKay South

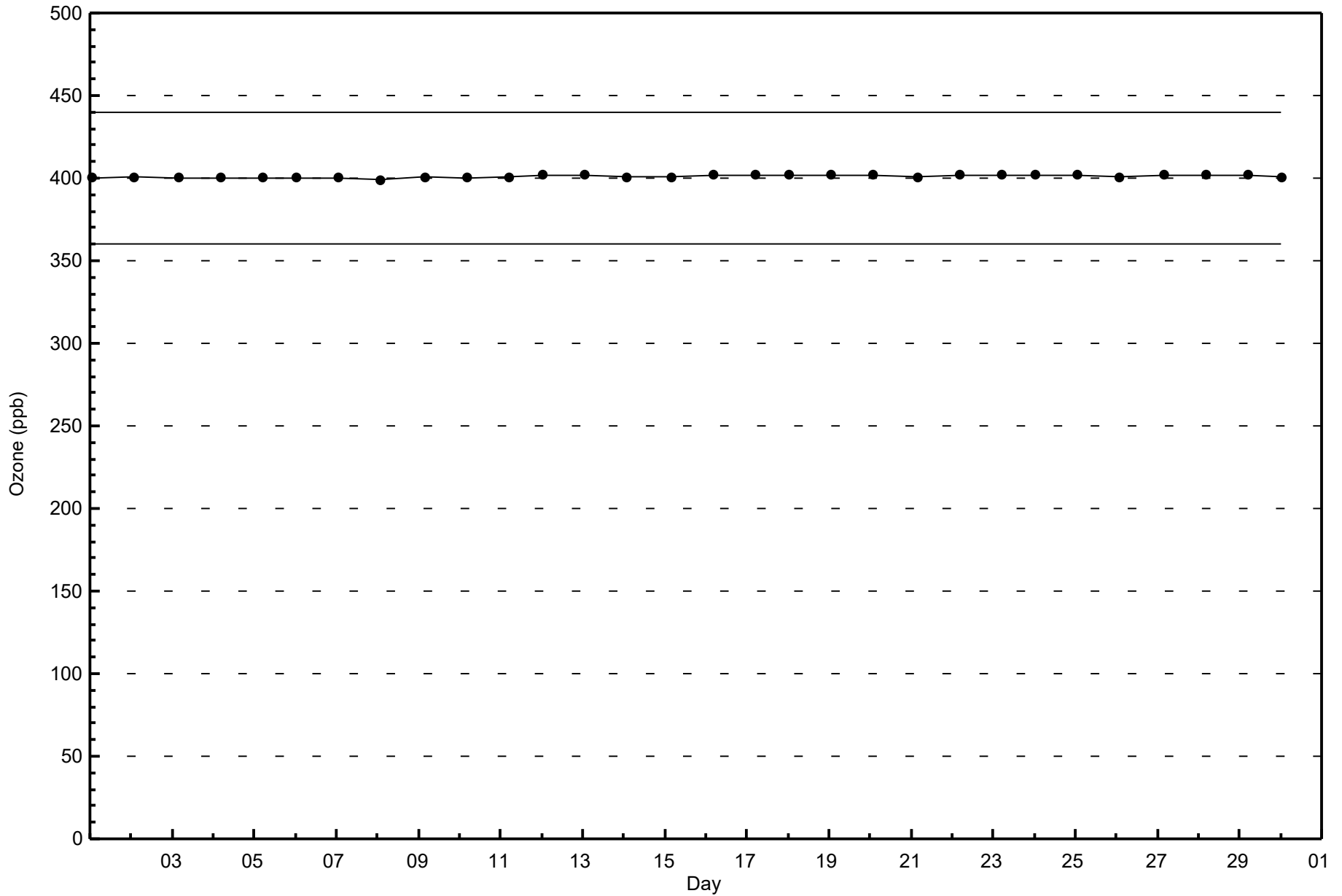






Wood Buffalo Environmental Association
Span Responses

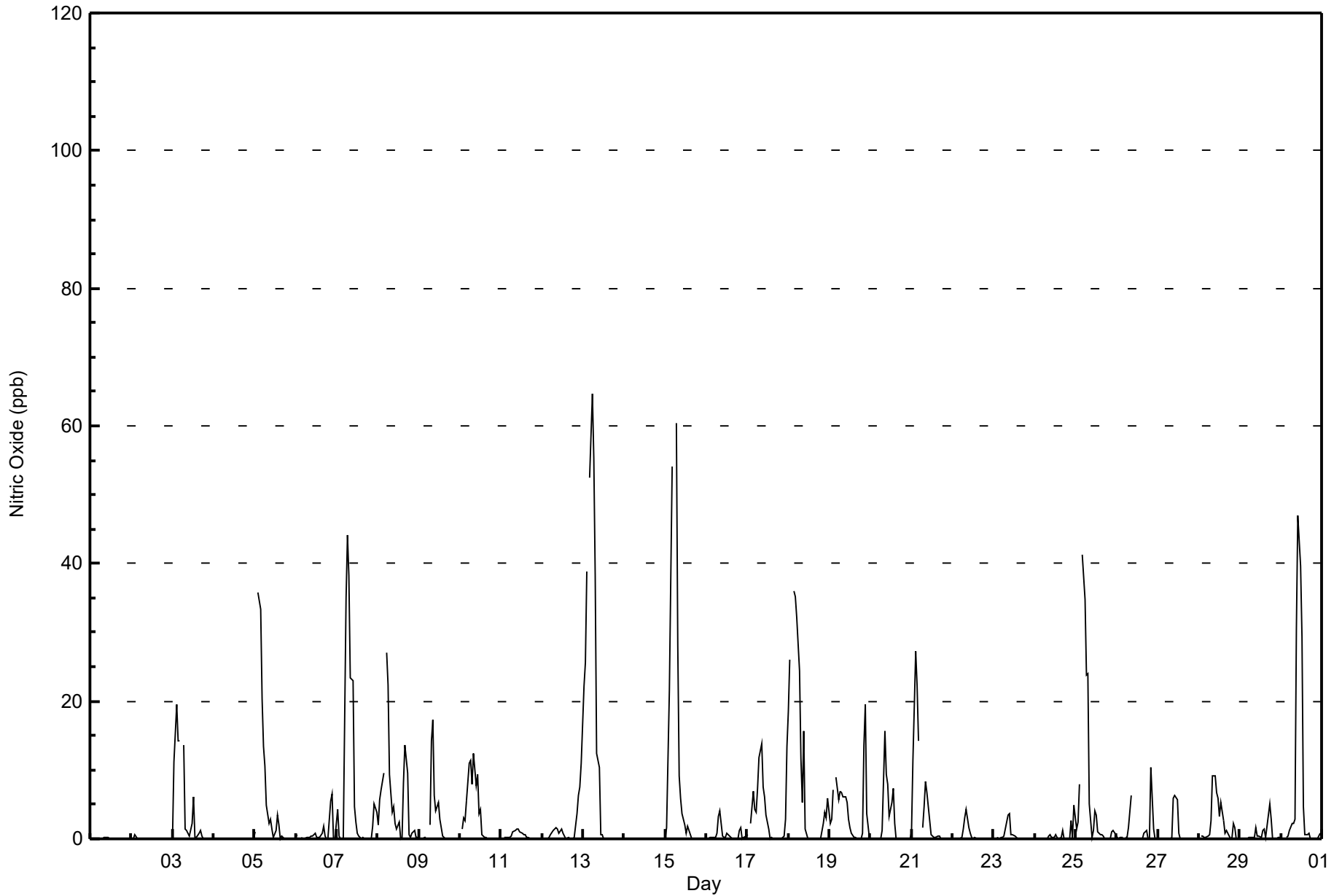
Ozone (O₃) - ppb
Fort McKay South - September 2023





Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Fort McKay South - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb
Fort McKay South - September 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	649	94.74	94.74
21 - 40	28	4.09	98.83
41 - 80	8	1.17	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Nitric Oxide (NO) - ppb
Fort McKay South - September 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	34	7	4	3	1	10	19	67	133	68	82	93	34	30	27	32	644
21 - 40	0	0	0	0	0	0	1	2	4	6	12	3	0	0	0	0	28
11 - 80	0	0	0	1	0	0	0	0	2	1	4	0	0	0	0	0	8
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	34	7	4	4	1	10	20	69	139	75	98	96	34	30	27	32	680

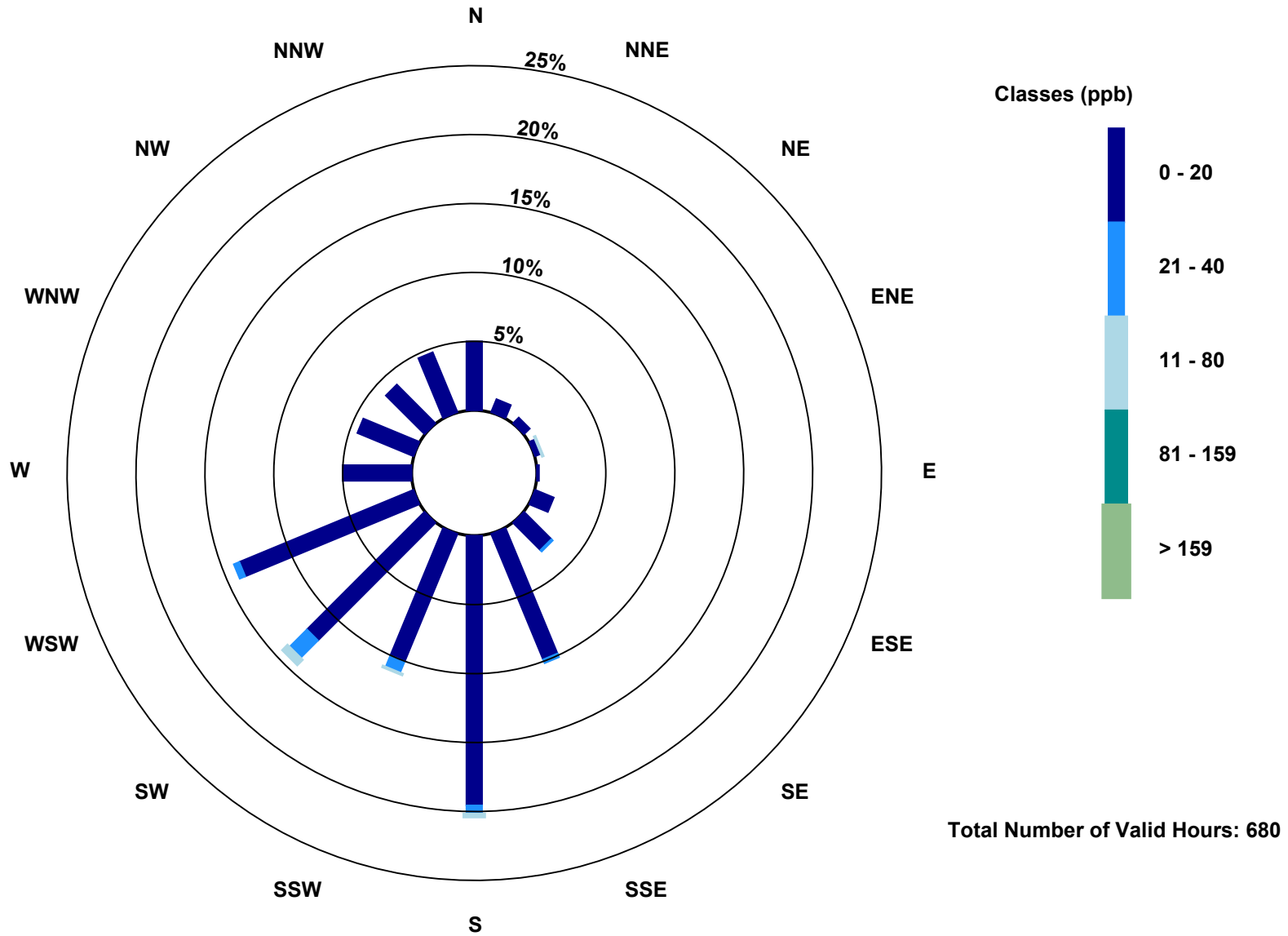
Total Number of Valid Hours: 680

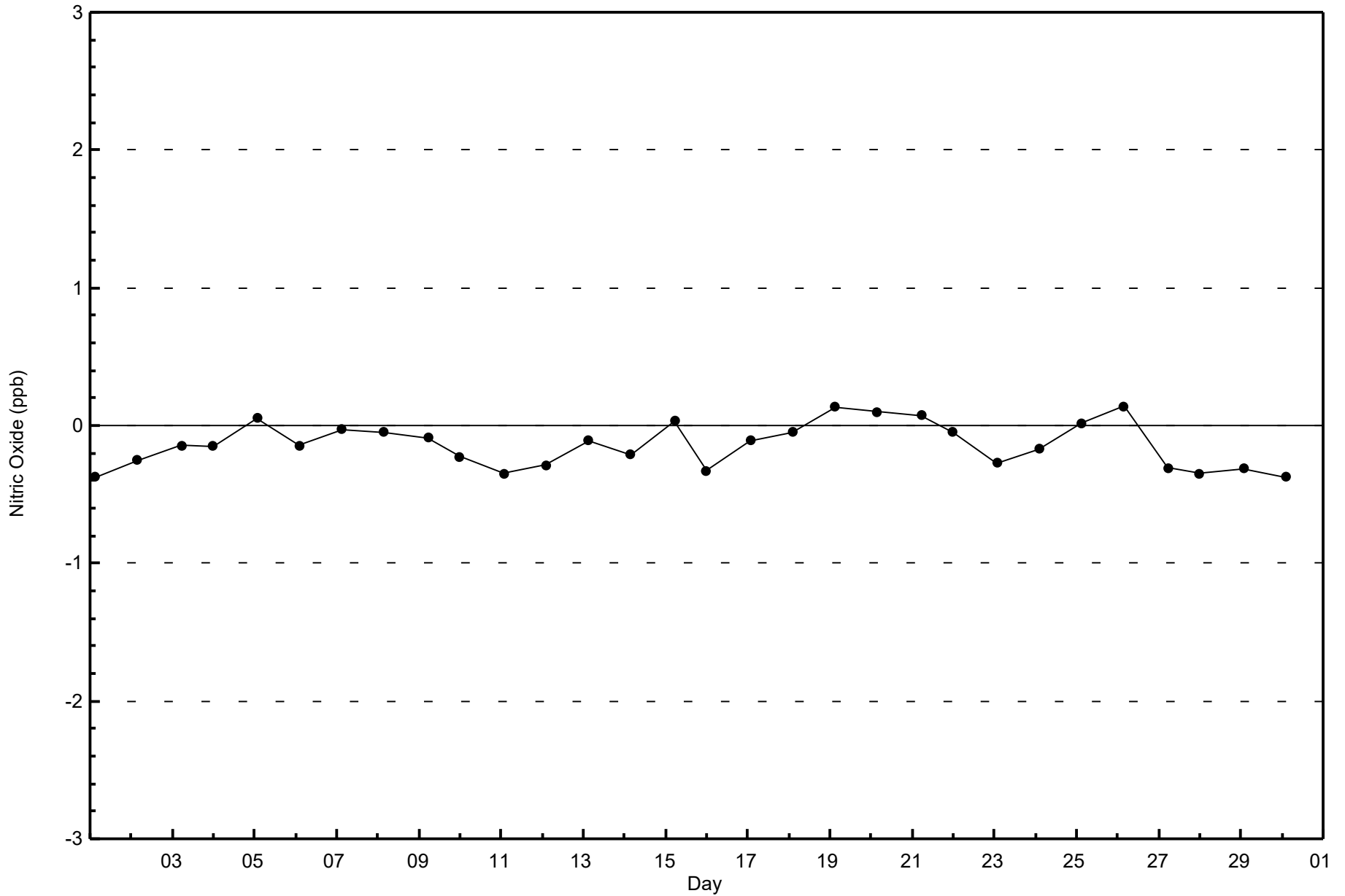
Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitric Oxide (NO) - ppb
Fort McKay South

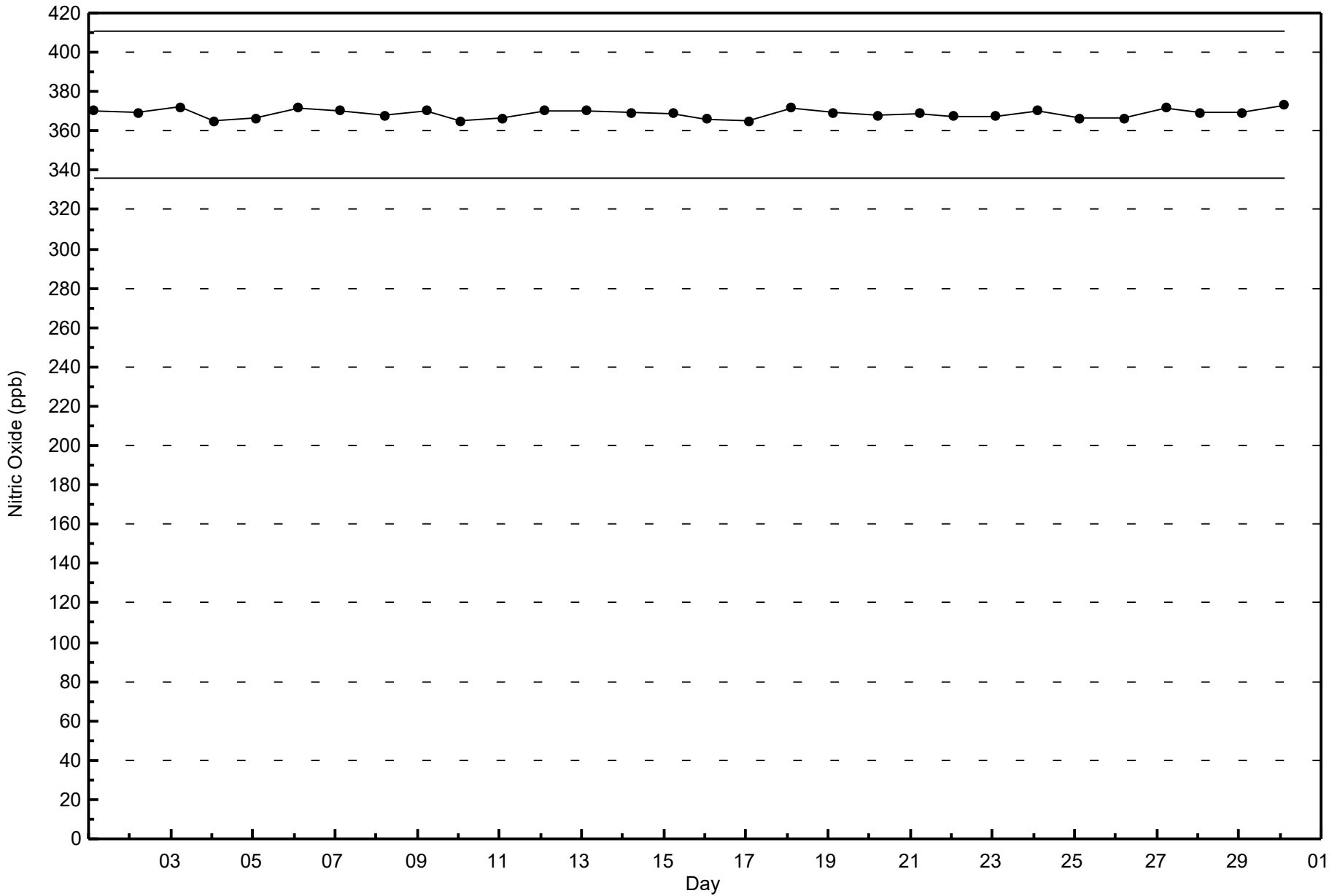






Wood Buffalo Environmental Association
Span Responses

Nitric Oxide (NO) - ppb
Fort McKay South - September 2023





Wood Buffalo Environmental Association
Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb
Fort McKay South - September 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 26.2 ppb on Sep 26 21:00	Maximum Daily Average: 11.1 ppb on Sep 25		Hours of Data:	685
Minimum Value: 0.0 ppb on Sep 4 07:00	Minimum Daily Average: 0.2 ppb on Sep 4		Hours of Missing Data:	35
Maximum Diurnal Average: 7.3 ppb at hour 22	Minimum Diurnal Average: 2.8 ppb at hour 15		Hours of Calibration:	35
Monthly Average: 4.64 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.4 Q ₁ = 1.3 Median = 3.2 Q ₃ = 6.4 P ₉₀ = 10.7 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-Sep	0.9	0.9	0.7	Z	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.3	0.1	0.7	0.8	1.7	1.8	1.4	2.1	3.3	10.2	13.0	3.8	0.8	2.0	13.0	
2-Sep	0.7	0.6	11.6	2.2	Z	4.4	4.6	4.6	4.7	4.1	4.0	4.0	3.8	3.3	2.2	1.9	1.9	2.6	2.4	2.5	2.0	2.3	2.6	2.8	3.3	11.6	
3-Sep	6.3	15.8	20.1	16.9	11.4	Z	6.3	5.5	6.5	4.9	4.8	7.5	9.7	2.0	3.3	11.2	17.7	10.4	6.8	5.3	1.6	0.9	0.6	0.3	7.6	20.1	
4-Sep	Z	0.3	0.2	0.2	0.1	1.1	0.0	0.0	0.0	0.0	0.5	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.0	0.2	1.6	0.2	1.6		
5-Sep	5.6	Z	4.9	3.7	3.0	3.4	2.9	3.9	3.3	4.2	2.9	1.0	2.5	6.2	5.1	1.6	2.9	0.3	1.9	2.6	2.2	1.9	2.1	3.2	3.1	6.2	
6-Sep	5.5	4.4	Z	1.2	0.5	0.9	1.2	1.1	1.4	1.8	1.6	2.5	0.9	0.4	0.6	1.7	4.1	2.6	0.3	0.1	5.1	8.2	0.3	0.2	2.0	8.2	
7-Sep	5.9	2.4	0.3	Z	0.3	5.3	5.6	5.9	7.0	8.4	4.7	4.0	2.5	2.5	2.7	3.5	2.3	0.4	0.0	0.0	0.9	3.1	3.0	3.3	3.2	8.4	
8-Sep	1.8	1.0	0.8	0.7	Z	0.3	0.6	3.0	3.8	4.3	2.8	2.7	4.4	0.3	3.2	15.7	21.2	21.1	11.6	9.7	9.1	6.6	3.4	2.5	5.7	21.2	
9-Sep	2.0	1.2	0.5	0.3	0.2	Z	0.5	2.5	4.3	5.2	5.2	8.2	6.9	5.8	3.7	3.5	4.7	3.7	3.6	2.8	1.8	1.1	0.9	1.0	3.0	8.2	
10-Sep	Z	3.4	2.9	2.2	1.4	1.3	0.6	2.3	5.3	7.2	10.5	8.2	10.5	2.9	2.0	2.7	2.1	2.8	6.7	7.1	2.7	6.8	5.8	2.4	4.3	10.5	
11-Sep	2.5	Z	3.1	3.3	3.0	3.8	3.2	3.7	3.6	3.8	4.1	3.9	3.7	3.1	3.7	2.7	3.7	1.0	1.5	2.7	4.8	3.3	4.5	4.3	3.3	4.8	
12-Sep	5.7	4.3	Z	7.2	7.6	11.1	7.9	7.0	6.2	5.5	4.1	6.8	5.0	3.4	2.9	4.6	4.7	1.3	8.0	17.6	22.9	22.9	17.3	15.0	8.7	22.9	
13-Sep	12.7	8.7	6.9	Z	3.3	3.0	2.2	4.2	9.8	10.5	1.6	1.6	0.6	0.3	0.1	0.0	0.0	0.0	0.0	0.2	0.2	11.1	1.4	0.4	3.4	12.7	
14-Sep	0.4	0.4	0.4	0.4	Z	0.5	0.3	0.3	0.4	0.4	0.5	0.7	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	0.3	0.7
15-Sep	0.0	2.7	5.2	4.1	3.6	Z	1.2	6.2	8.6	6.9	5.1	3.7	2.7	5.7	5.3	1.9	1.2	1.2	2.3	3.3	5.4	4.1	2.4	2.8	3.7	8.6	
16-Sep	Z	5.5	8.2	6.4	5.8	4.9	6.1	8.2	11.3	1.7	0.9	1.3	8.1	5.0	2.7	0.8	0.4	0.4	2.2	23.6	22.9	15.4	16.8	19.1	7.7	23.6	
17-Sep	16.5	Z	11.6	11.1	7.7	6.4	5.1	6.0	10.7	9.8	12.3	10.2	6.7	1.6	3.9	3.6	5.6	5.5	12.6	3.8	5.5	10.6	16.4	15.8	8.7	16.5	
18-Sep	14.1	12.8	Z	8.9	6.9	6.3	6.3	7.3	8.6	17.6	3.0	0.8	0.5	0.3	0.2	3.9	3.0	5.3	6.6	5.8	9.3	18.1	10.9	8.9	7.2	18.1	
19-Sep	8.5	7.3	5.0	Z	4.5	4.4	4.6	6.2	7.1	6.7	6.0	3.8	3.0	2.2	1.6	2.1	2.3	2.2	2.7	6.7	8.7	10.3	6.4	3.8	5.0	10.3	
20-Sep	3.1	2.7	1.2	0.4	Z	0.2	0.1	0.6	5.7	4.7	7.1	9.8	15.8	21.0	10.7	5.9	7.1	5.3	1.5	2.6	1.3	0.7	0.7	0.5	4.7	21.0	
21-Sep	1.0	1.8	2.5	1.6	1.1	Z	5.4	5.0	7.0	6.7	5.8	1.8	1.4	1.0	1.4	2.4	3.8	5.7	2.2	0.7	2.0	3.5	2.6	4.4	3.1	7.0	
22-Sep	Z	3.2	2.5	2.5	1.9	3.7	6.3	6.9	9.7	4.4	2.6	1.5	1.1	1.4	1.0	0.6	1.3	1.1	0.9	5.7	11.4	7.0	3.2	2.9	3.6	11.4	
23-Sep	3.3	Z	4.0	3.8	3.3	3.6	5.7	8.9	12.0	10.1	2.5	2.9	2.8	2.1	1.7	1.5	3.6	3.5	2.6	2.2	2.3	8.6	8.6	4.4	12.0		
24-Sep	10.3	14.4	Z	2.0	1.9	2.2	3.0	3.5	3.1	4.6	3.0	2.7	4.2	2.0	0.4	3.4	10.7	5.1	2.8	2.3	7.9	15.0	7.6	15.5	5.5	15.5	
25-Sep	21.5	23.3	20.6	Z	13.4	11.9	7.7	8.8	5.9	0.8	2.8	8.4	8.0	5.6	6.6	7.9	11.3	12.1	9.8	12.2	14.5	17.0	12.4	11.8	11.1	23.3	
26-Sep	7.6	6.6	4.9	4.6	Z	2.3	2.7	1.9	5.9	C	C	C	C	C	3.0	9.4	18.5	21.6	20.8	14.8	26.2	17.1	6.8	10.6	10.3	26.2	
27-Sep	1.3	0.5	1.1	0.9	0.8	Z	0.6	0.5	0.6	7.9	10.7	12.3	3.1	0.2	0.1	0.0	0.0	0.0	0.3	0.8	4.7	6.0	8.2	7.8	3.0	12.3	
28-Sep	Z	7.1	3.8	2.3	2.2	1.9	1.7	2.2	7.6	9.1	8.8	9.0	5.6	6.7	5.9	4.6	6.4	6.8	5.1	6.4	9.2	7.2	1.1	1.1	5.3	9.2	
29-Sep	0.9	Z	1.8	1.4	4.5	2.5	1.3	1.2	0.9	2.9	1.2	1.3	0.8	3.2	5.3	1.8	7.1	15.2	12.4	7.0	4.4	2.7	3.8	2.8	3.8	15.2	
30-Sep	2.2	1.1	Z	1.0	1.6	1.2	1.3	1.0	1.1	5.4	7.8	9.3	11.2	5.5	2.4	2.4	3.7	3.4	2.5	1.4	1.2	1.5	1.4	1.7	3.1	11.2	

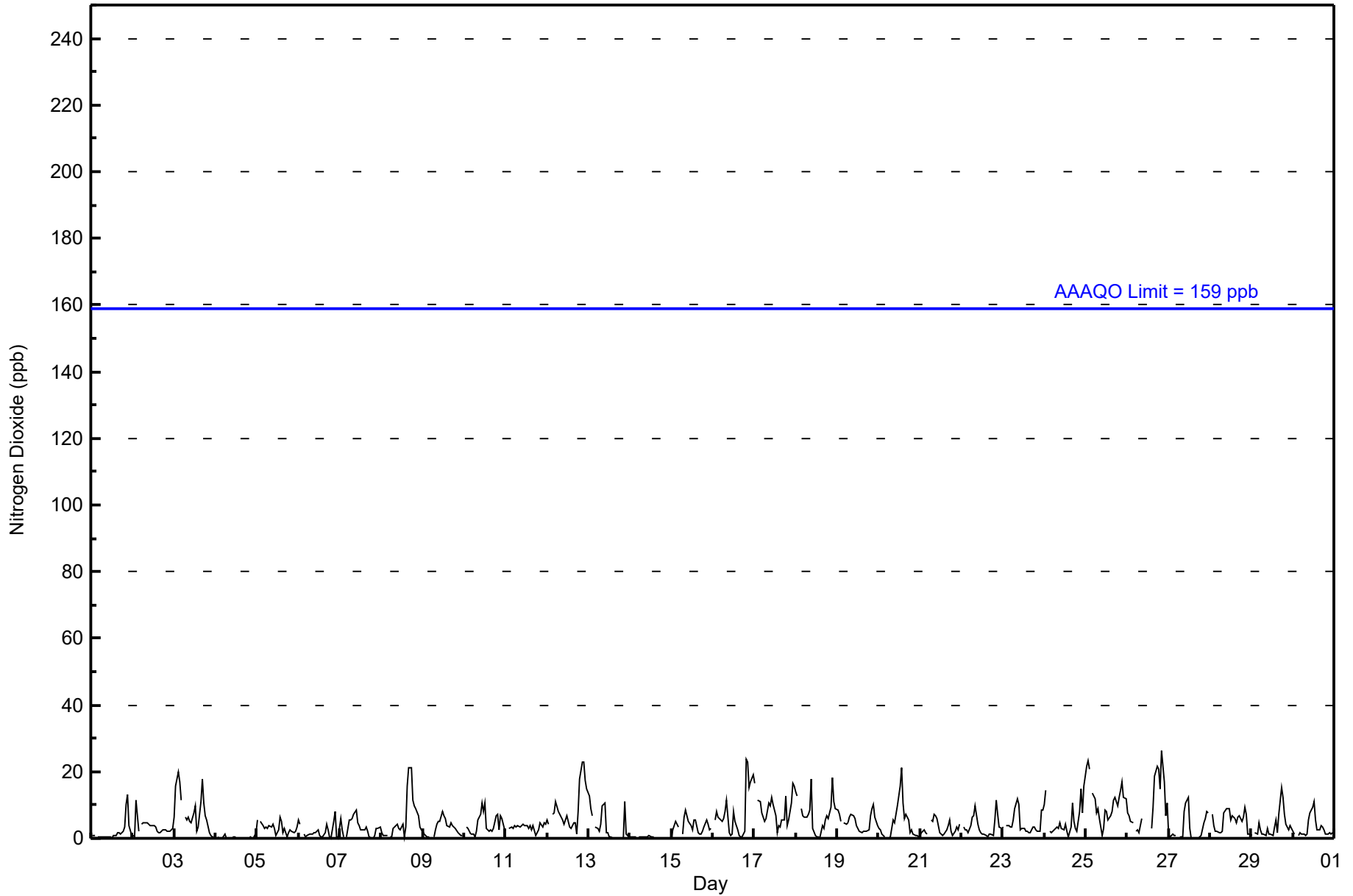
5.6	5.3	5.0	3.6	3.6	3.5	3.2	4.0	5.4	5.5	4.4	4.5	4.4	3.3	2.8	3.4	5.0	4.7	4.4	5.1	6.7	7.3	5.2	5.2	Diurnal Average	
21.5	23.3	20.6	16.9	13.4	11.9	7.9	8.9	12.0	17.6	12.3	12.3	15.8	21.0	10.7	15.7	21.2	21.6	20.8	23.6	26.2	22.9	17.3	19.1	Diurnal Maximum	

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



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Fort McKay South - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Dioxide (NO₂) - ppb
Fort McKay South - September 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	672	98.10	98.10
21 - 40	13	1.90	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: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Fort McKay South - September 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	7	4	4	1	10	20	68	138	72	96	93	34	30	27	32	667
21 - 40	3	0	0	0	0	0	0	1	1	3	2	3	0	0	0	0	13
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	34	7	4	4	1	10	20	69	139	75	98	96	34	30	27	32	680

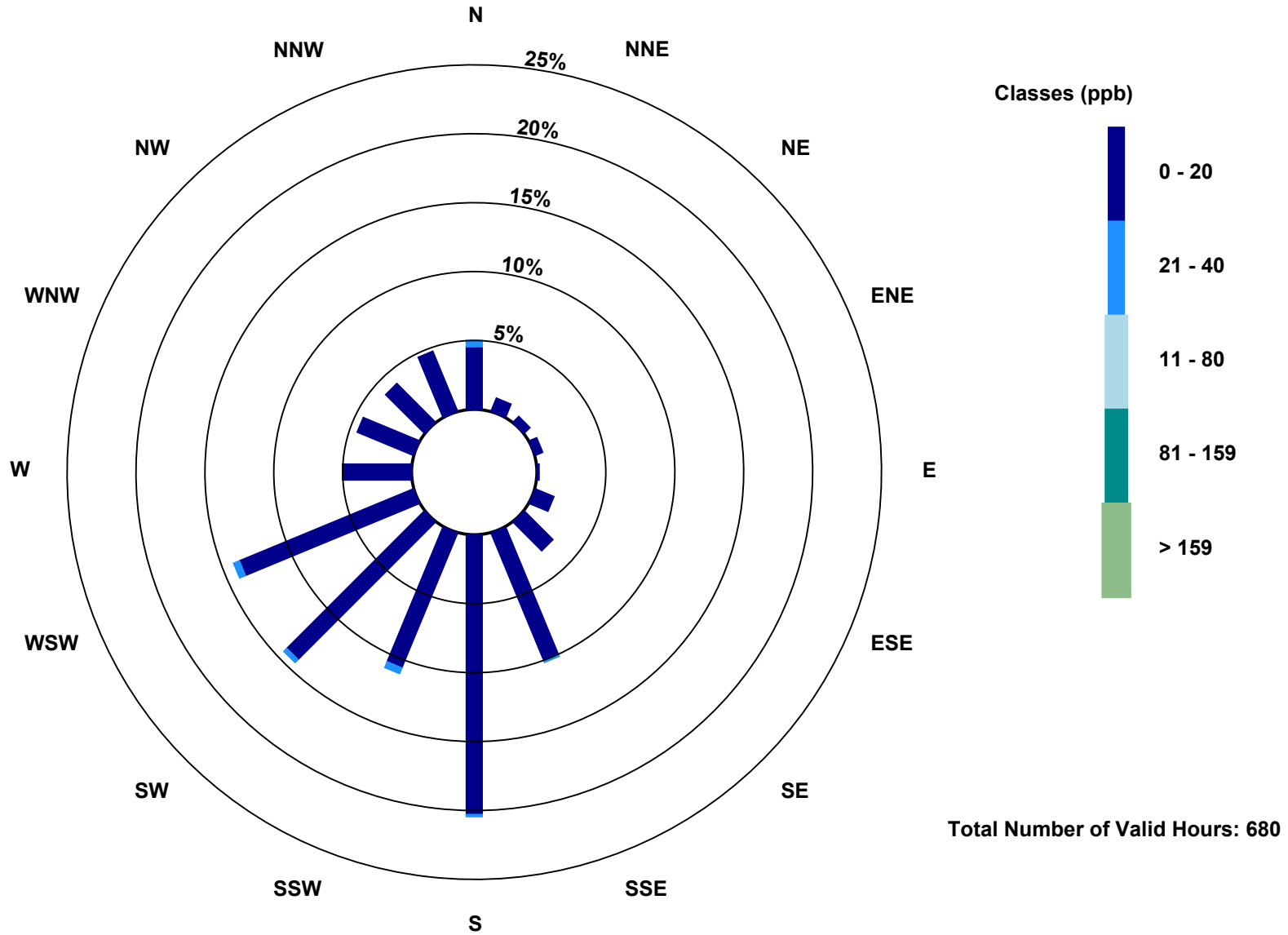
Total Number of Valid Hours: 680

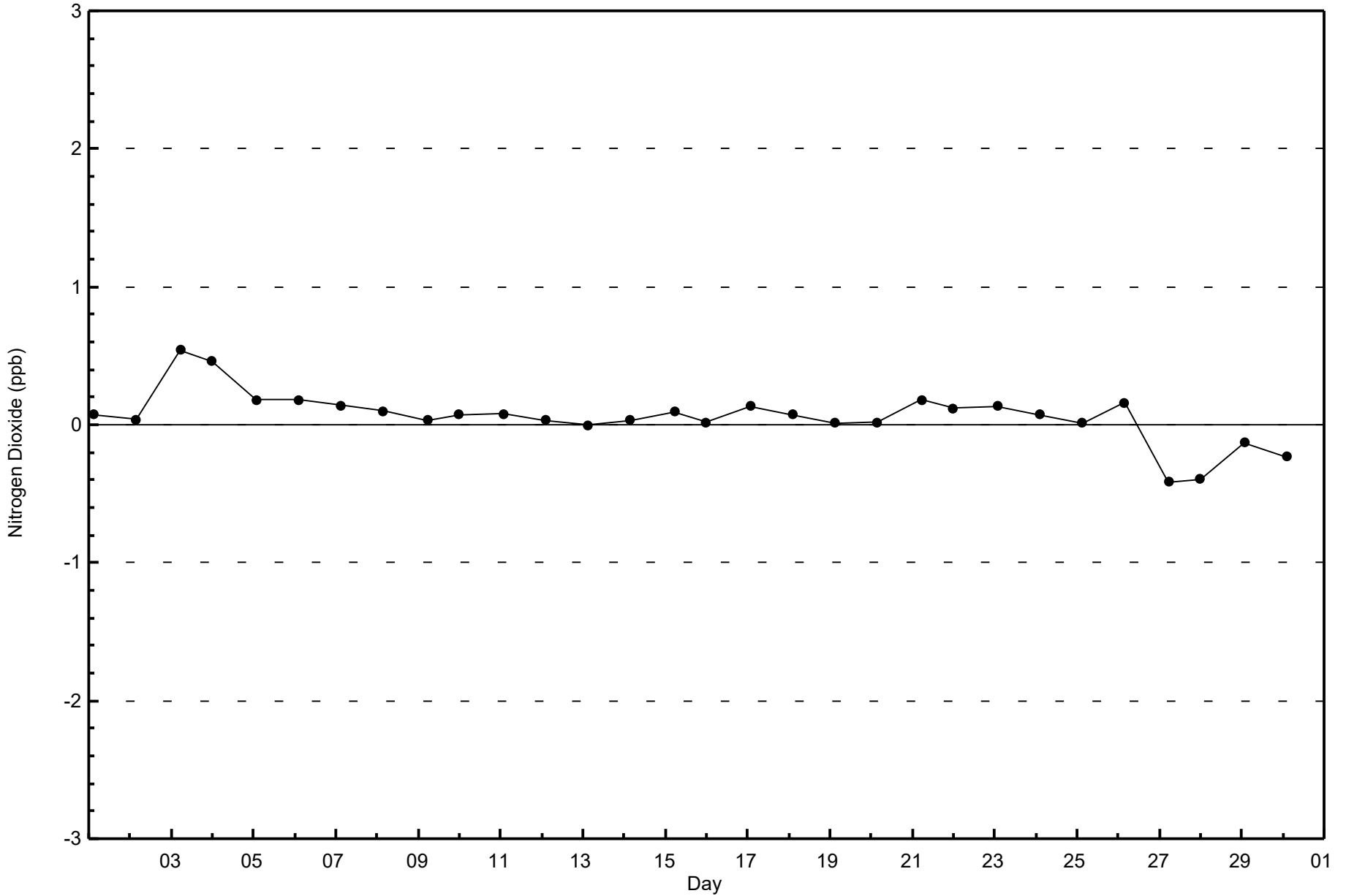
Total Number of Hours: 720

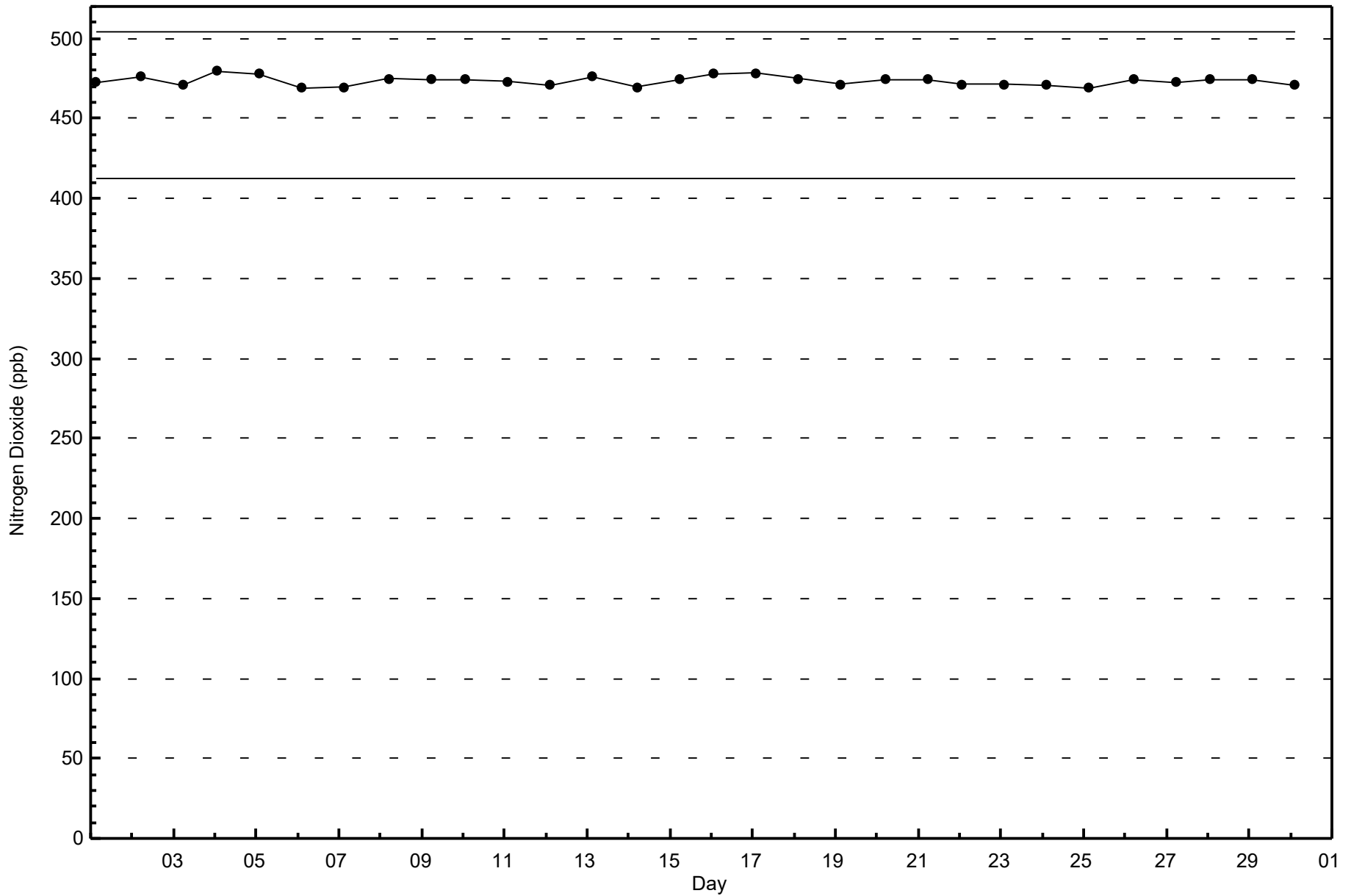


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitrogen Dioxide (NO₂) - ppb
Fort McKay South









Wood Buffalo Environmental Association
Summary of Hour Averages

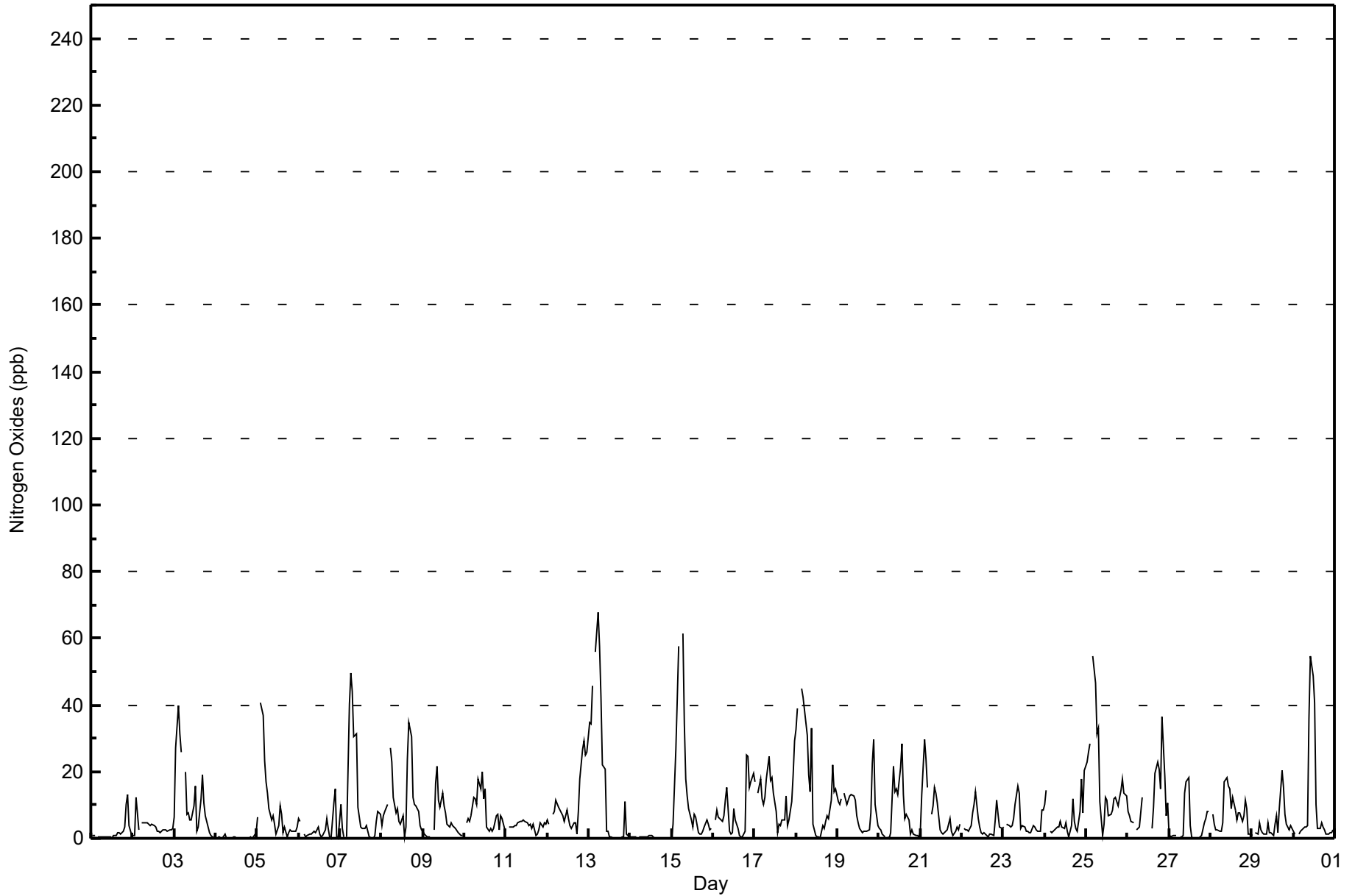
Nitrogen Oxides (NO_x) - ppb
Fort McKay South - September 2023

Maximum Value: 67.7 ppb on Sep 13 06:00																					Maximum Daily Average: 17.8 ppb on Sep 25					Hours in Service: 720																							
Minimum Value: 0.0 ppb on Sep 4 08:00																					Minimum Daily Average: 0.2 ppb on Sep 4					Hours of Data: 685																							
Maximum Diurnal Average: 13.7 ppb at hour 5																					Minimum Diurnal Average: 3.2 ppb at hour 15					Hours of Missing Data: 35																							
Monthly Average: 8.06 ppb																					Percentiles: P ₁ = 0.0 P ₁₀ = 0.4 Q ₁ = 1.6 Median = 4.0 Q ₃ = 10.3 P ₉₀ = 20.6 P ₉₉ = 50.4					Hours of Calibration: 35																							
																										Percent Operational Time: 100.0																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Sep	0.9	0.9	0.7	Z	0.5	0.4	0.4	0.4	0.5	0.6	0.5	0.3	0.1	0.7	0.8	1.7	1.8	1.4	2.1	3.3	10.2	13.0	3.8	0.8	2.0	13.0																							
2-Sep	0.7	0.7	12.2	2.3	Z	4.5	4.6	4.6	4.7	4.1	4.0	4.1	3.8	3.3	2.2	1.9	1.9	2.6	2.4	2.5	2.0	2.3	2.6	2.8	3.3	12.2																							
3-Sep	6.5	27.1	39.7	31.2	25.7	Z	19.9	7.0	7.7	5.7	5.3	9.7	15.7	2.1	3.5	12.0	19.0	10.7	6.8	5.3	1.6	0.9	0.6	0.3	11.5	39.7																							
4-Sep	Z	0.3	0.2	0.2	0.1	1.1	0.0	0.0	0.0	0.0	0.5	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.0	0.2	1.6	0.2	1.6																							
5-Sep	6.6	Z	40.6	37.0	23.2	16.9	13.5	8.7	5.5	7.0	4.4	1.3	3.7	9.6	7.2	1.6	3.2	0.3	1.9	2.6	2.2	1.9	2.1	3.2	8.9	40.6																							
6-Sep	5.8	5.1	Z	1.3	0.6	1.0	1.3	1.2	1.6	2.2	1.9	3.4	1.1	0.5	0.8	2.5	6.0	3.0	0.3	0.1	10.6	14.8	0.3	0.2	2.8	14.8																							
7-Sep	10.1	2.8	0.3	Z	0.3	40.3	49.6	44.2	30.4	31.3	9.4	6.5	3.3	3.0	2.8	3.7	2.3	0.4	0.0	0.0	0.9	5.0	8.2	7.3	11.4	49.6																							
8-Sep	3.8	6.7	7.8	10.2	Z	27.3	22.9	12.3	7.7	8.9	5.0	4.1	6.8	0.3	3.3	23.9	34.9	30.7	12.3	10.0	9.8	7.8	3.7	2.7	11.4	34.9																							
9-Sep	2.1	1.2	0.6	0.4	0.4	Z	2.5	16.7	21.6	11.6	9.3	13.6	9.8	7.5	4.2	3.5	4.7	3.7	3.6	2.8	1.8	1.1	0.9	1.0	5.4	21.6																							
10-Sep	Z	4.8	6.0	4.9	6.8	12.2	11.9	10.3	17.6	14.8	19.8	11.9	14.7	3.5	2.1	2.9	2.1	2.8	6.7	7.1	2.7	6.8	5.8	2.4	7.8	19.8																							
11-Sep	2.5	Z	3.2	3.4	3.2	4.0	3.7	4.7	4.9	5.2	5.6	4.9	4.5	3.7	4.4	2.9	4.0	1.0	1.5	2.7	4.8	3.3	4.5	4.3	3.8	5.6																							
12-Sep	5.7	4.3	Z	7.3	7.8	11.6	9.2	8.5	7.8	7.0	4.9	8.3	5.8	3.8	3.0	4.8	4.7	1.3	8.0	17.8	26.6	29.3	24.9	25.9	10.4	29.3																							
13-Sep	34.9	34.3	45.7	Z	55.8	67.7	57.6	42.5	22.2	20.9	2.1	2.2	0.6	0.3	0.1	0.0	0.0	0.0	0.0	0.2	0.2	11.1	1.4	0.4	17.4	67.7																							
14-Sep	0.4	0.5	0.4	0.4	Z	0.5	0.3	0.3	0.4	0.4	0.5	0.7	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	0.3	0.7																						
15-Sep	0.0	4.2	26.8	42.0	57.6	Z	61.6	34.2	17.8	12.8	8.7	5.6	3.5	7.4	6.5	1.9	1.2	1.2	2.3	3.3	5.4	4.1	2.4	2.8	13.6	61.6																							
16-Sep	Z	5.6	8.3	6.6	6.1	5.2	7.0	11.5	15.5	2.1	1.1	1.5	9.0	5.6	2.8	0.8	0.4	0.4	2.2	24.8	24.6	15.4	16.9	19.5	8.4	24.8																							
17-Sep	17.1	Z	13.8	18.0	11.9	10.3	12.4	17.7	24.6	17.4	18.4	13.6	8.2	1.6	4.1	3.6	5.6	5.5	12.6	3.8	5.5	10.9	19.2	29.1	12.4	29.1																							
18-Sep	32.6	38.8	Z	45.0	42.2	38.4	30.8	18.9	14.0	33.2	4.3	0.8	0.5	0.3	0.2	3.9	3.0	5.3	6.6	5.8	11.6	21.9	14.0	14.8	16.8	45.0																							
19-Sep	10.8	10.1	12.1	Z	13.4	10.1	11.6	12.8	13.2	12.9	11.3	6.6	4.6	3.0	1.7	2.2	2.3	2.2	2.7	7.5	22.3	29.8	10.0	3.8	9.4	29.8																							
20-Sep	3.1	2.7	1.2	0.4	Z	0.3	0.2	1.7	21.4	14.0	14.9	13.1	21.1	28.4	13.0	5.9	7.1	5.3	1.5	2.6	1.3	0.7	0.7	0.5	7.0	28.4																							
21-Sep	1.9	13.3	29.8	23.7	15.3	Z	7.1	9.7	15.3	13.5	10.5	2.5	1.7	1.2	1.6	2.7	4.1	5.8	2.2	0.7	2.0	3.5	2.6	4.4	7.6	29.8																							
22-Sep	Z	3.2	2.5	2.5	2.0	3.9	7.7	10.0	14.0	6.0	3.4	1.8	1.2	1.5	1.0	0.6	1.3	1.1	0.9	5.7	11.4	7.0	3.2	2.9	4.1	14.0																							
23-Sep	3.3	Z	4.1	3.9	3.4	3.7	6.0	10.3	15.6	13.7	3.1	3.6	3.3	2.3	2.1	1.7	1.5	3.6	3.5	2.6	2.2	2.3	8.6	8.7	4.9	15.6																							
24-Sep	10.3	14.5	Z	2.1	1.9	2.3	3.1	3.5	3.4	5.1	3.3	3.0	4.7	2.2	0.4	3.6	11.9	5.2	2.8	2.3	8.0	17.7	7.8	20.4	6.1	20.4																							
25-Sep	23.0	25.8	28.6	Z	54.7	46.6	31.5	32.8	11.0	1.0	4.1	12.5	11.5	6.6	7.2	8.6	11.7	12.1	9.8	12.2	14.5	18.0	13.7	12.5	17.8	54.7																							
26-Sep	7.9	6.7	5.0	4.7	Z	2.4	3.0	3.5	12.2	C	C	C	C	C	3.0	9.5	19.3	22.9	20.8	14.8	36.6	18.4	6.8	10.6	11.6	36.6																							
27-Sep	1.3	0.5	1.1	0.9	0.8	Z	0.6	0.5	0.7	13.8	16.9	18.1	3.9	0.2	0.1	0.0	0.0	0.0	0.3	0.8	4.7	6.0	8.2	7.9	3.8	18.1																							
28-Sep	Z	7.4	4.2	2.6	2.5	2.3	2.3	4.8	16.8	18.2	15.6	14.8	8.9	12.1	8.5	5.5	7.5	7.5	5.1	6.6	11.5	8.8	1.1	1.1	7.6	18.2																							
29-Sep	0.9	Z	1.8	1.4	4.6	2.6	1.5	1.3	1.2	4.5	1.6	1.7	0.9	4.4	6.7	1.9	8.9	20.3	15.2	7.1	4.4	2.7	4.0	2.9	4.4	20.3																							
30-Sep	2.3	1.2	Z	1.3	2.0	2.4	3.5	3.2	3.9	35.9	54.7	48.9	40.5	10.2	2.9	3.0	4.5	3.4	2.5	1.4	1.2	1.6	1.8	2.5	10.2	54.7																							
																								7.8	8.9	11.9	10.1	13.7	12.7	12.9	11.3	11.1	11.1	8.5	7.6	6.7	4.3	3.2	3.9	5.8	5.3	4.6	5.2	8.0	8.9	6.0	6.6	Diurnal Average	
																								34.9	38.8	45.7	45.0	57.6	67.7	61.6	44.2	30.4	35.9	54.7	48.9	40.5	28.4	13.0	23.9	34.9	30.7	20.8	24.8	36.6	29.8	24.9	29.1	Diurnal Maximum	
Z - zerospan																								C - Calibration																									



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Fort McKay South - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Fort McKay South - September 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	616	89.93	89.93
21 - 40	52	7.59	97.52
41 - 80	17	2.48	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Fort McKay South - September 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	28	7	4	3	0	9	19	65	127	63	77	88	34	28	27	32	611
21 - 40	6	0	0	0	1	1	1	3	8	10	15	5	0	2	0	0	52
41 - 80	0	0	0	1	0	0	0	1	4	2	6	3	0	0	0	0	17
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	34	7	4	4	1	10	20	69	139	75	98	96	34	30	27	32	680

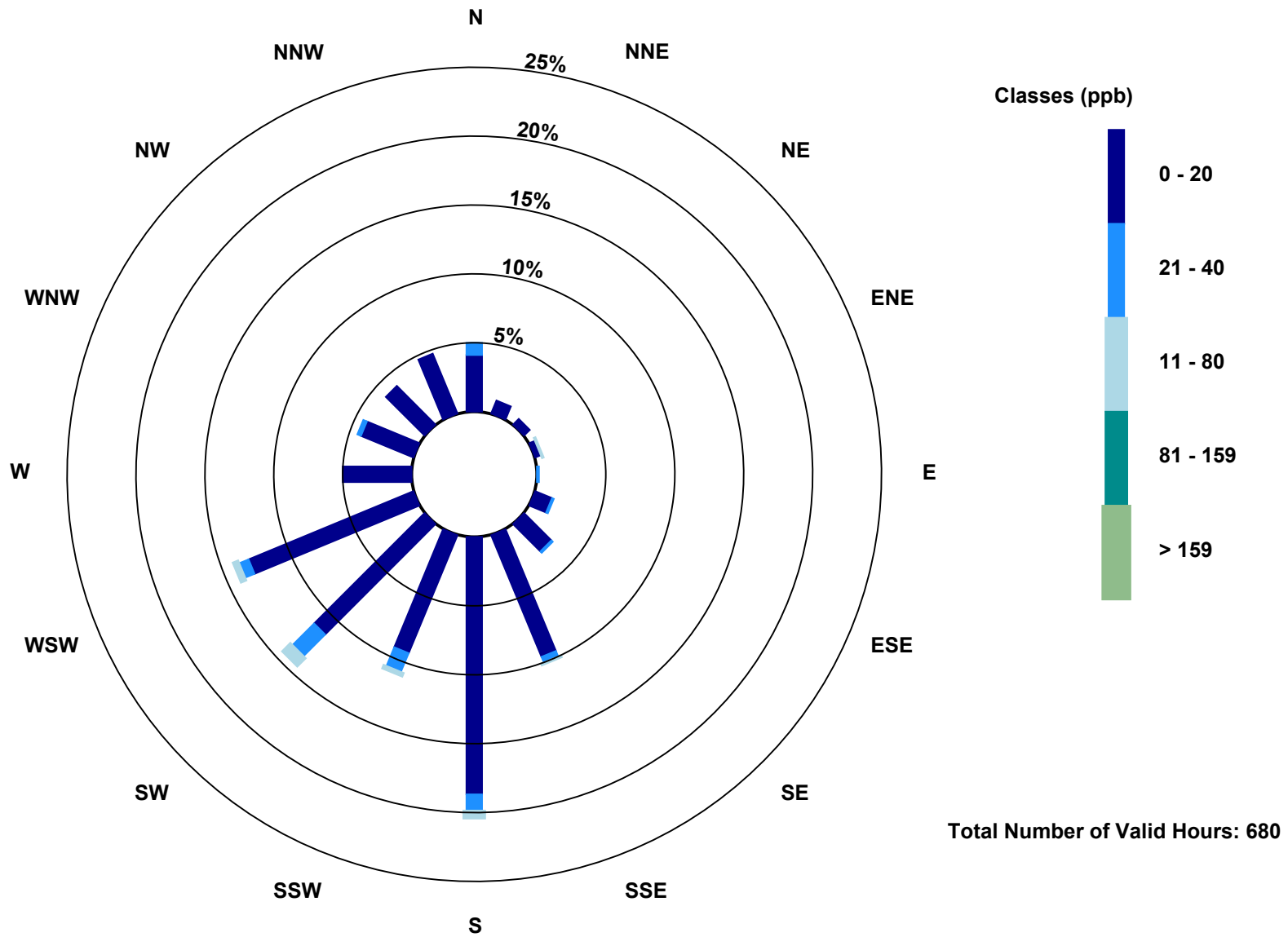
Total Number of Valid Hours: 680

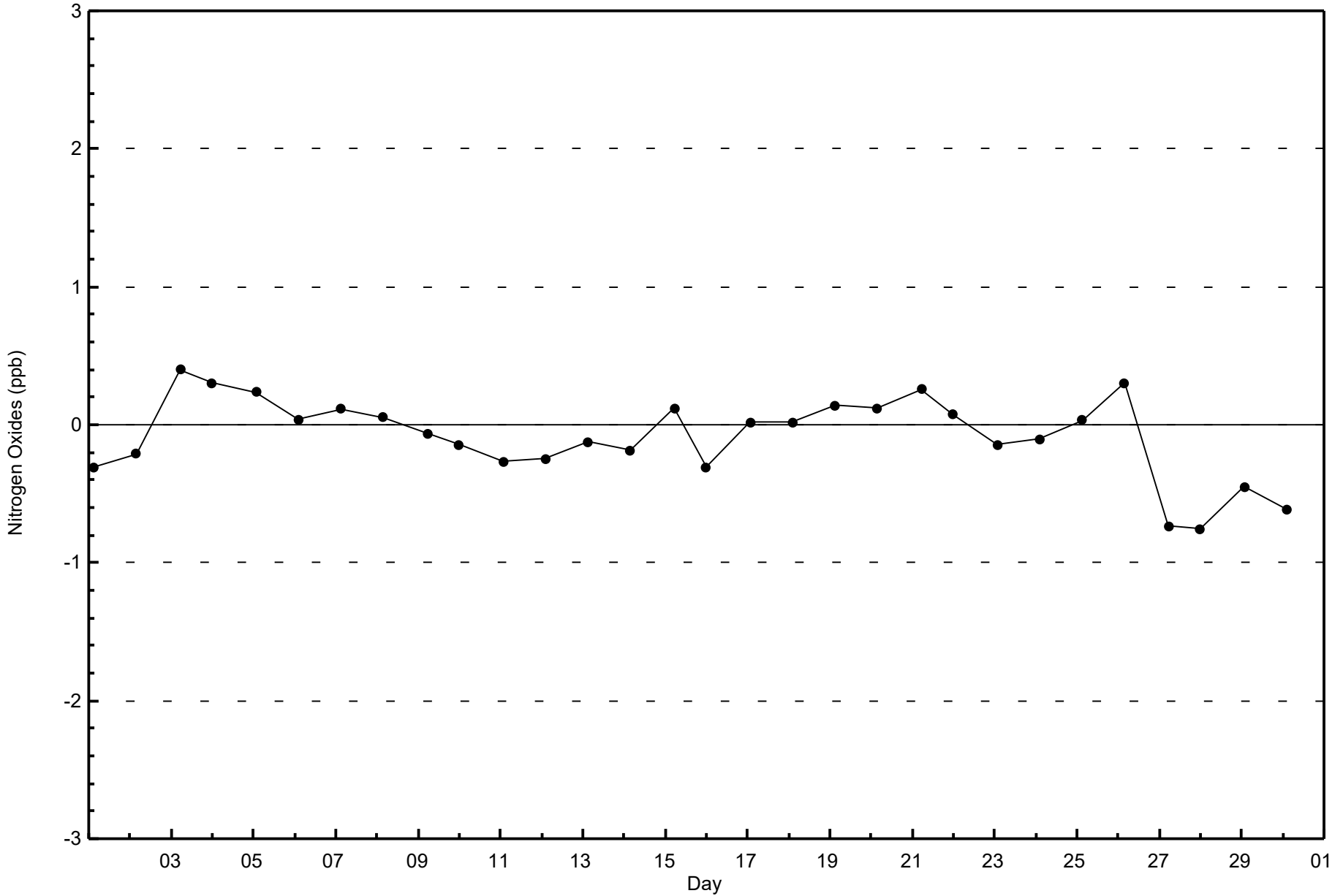
Total Number of Hours: 720

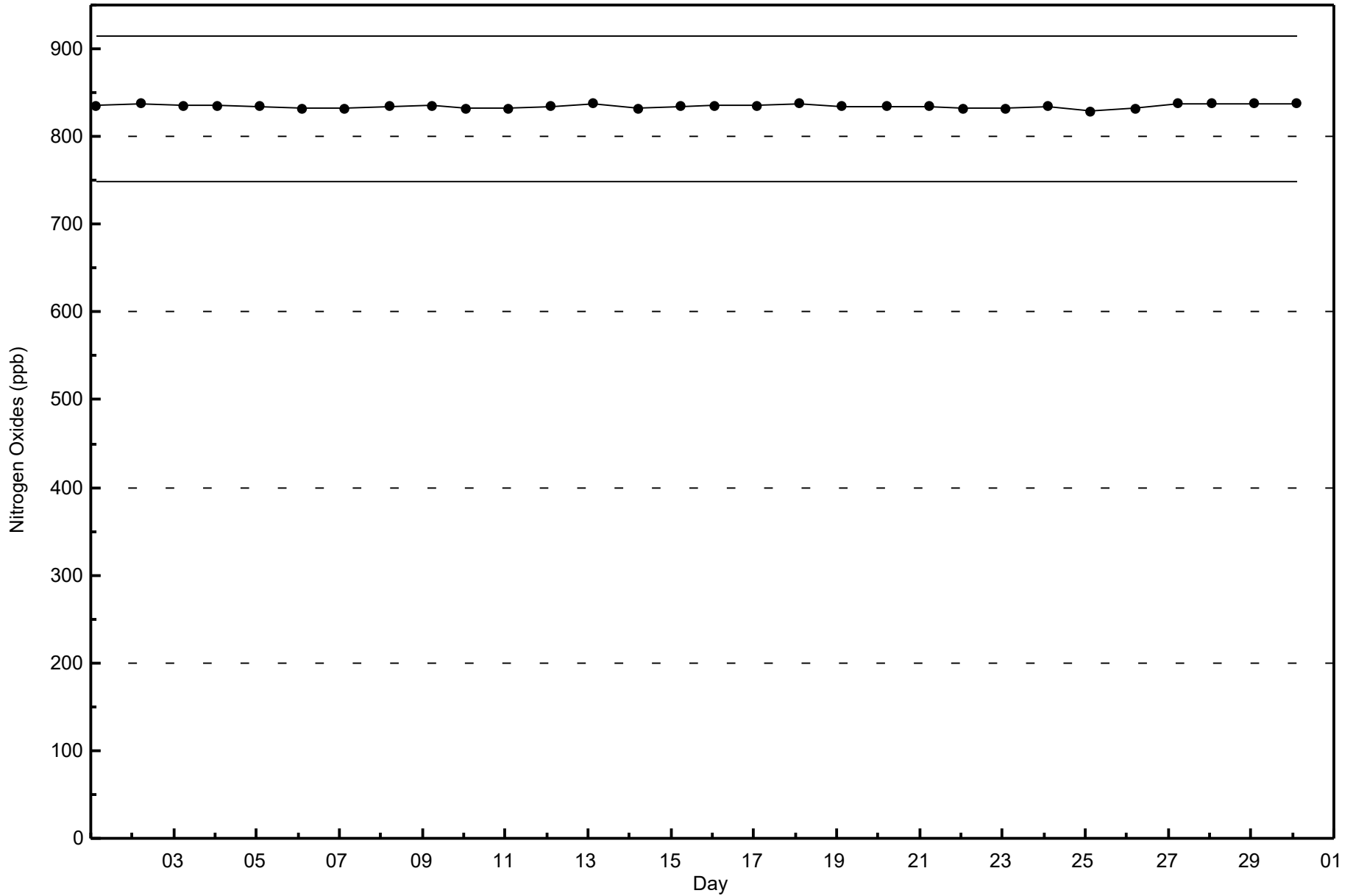


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitrogen Oxides (NO_x) - ppb
Fort McKay South









Wood Buffalo Environmental Association

Summary of Hour Averages

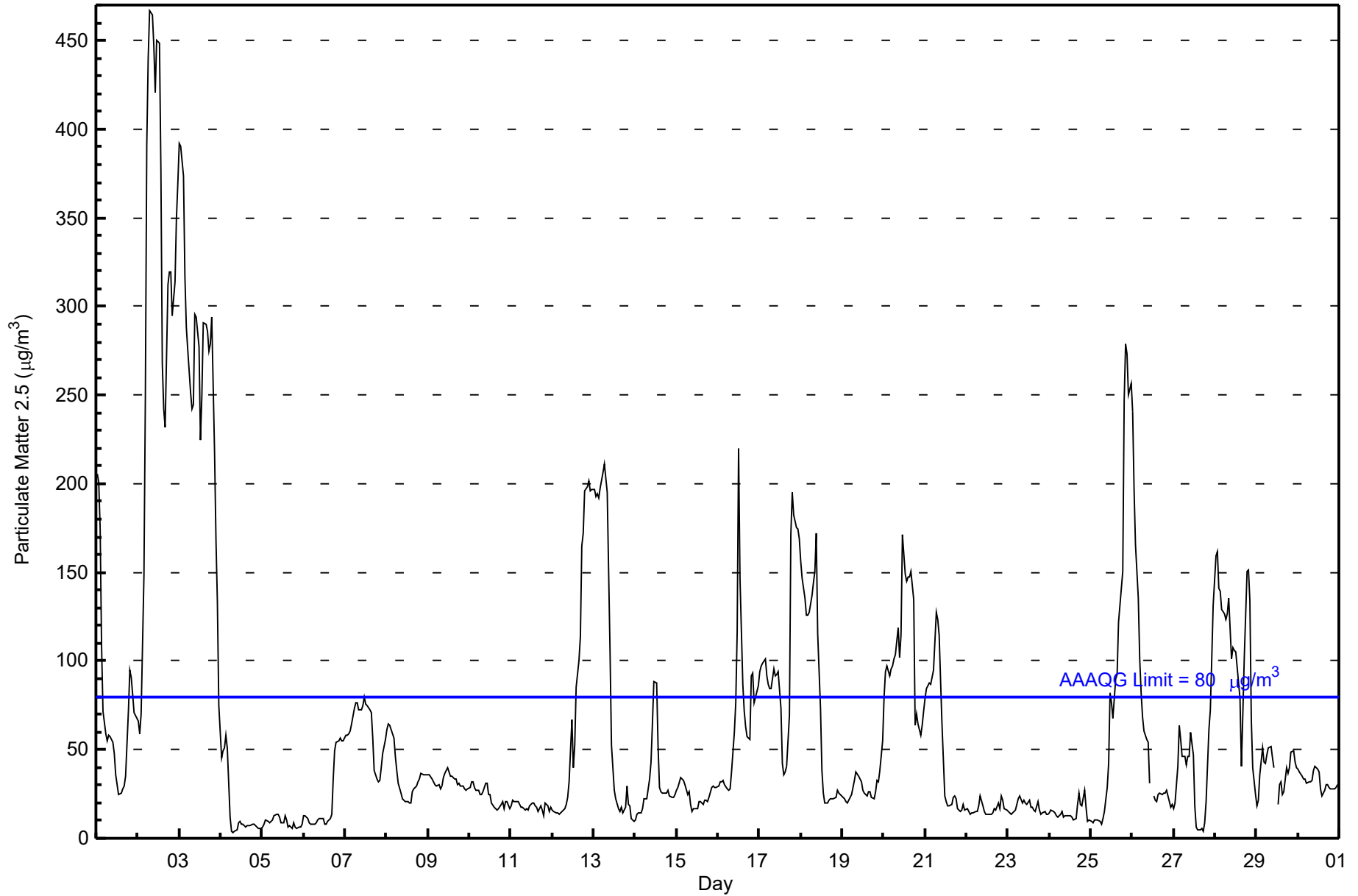
Particulate Matter 2.5 (PM_{2.5}) - µg/m³

Fort McKay South - September 2023

Number of Exceedences (AAAQO):	1-hr: 172	24-hr: 20	Hours in Service:	720
Maximum Value: 466.4 µg/m ³ on Sep 2 08:00	Maximum Daily Average: 313.3 µg/m ³ on Sep 2		Hours of Data:	718
Minimum Value: 3.5 µg/m ³ on Sep 4 08:00	Minimum Daily Average: 9.0 µg/m ³ on Sep 5		Hours of Missing Data:	2
Maximum Diurnal Average: 72.7 µg/m ³ at hour 9	Minimum Diurnal Average: 49.7 µg/m ³ at hour 16		Hours of Calibration:	1
Monthly Average: 65.69 µg/m ³	Percentiles: P ₁ = 5.3 P ₁₀ = 11.8 Q ₁ = 18.2 Median = 30.9 Q ₃ = 76.3 P ₉₀ = 171.7 P ₉₉ = 391.6		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-Sep	205.2	200.7	174.5	108.5	71.8	58.9	55.2	57.8	57.3	53.9	47.7	35.8	29.9	24.8	25.5	28.2	29.2	34.8	71.7	94.9	90.9	81.3	71.1	67.4	74.0	205.2
2-Sep	66.3	59.3	70.2	147.9	248.4	391.1	439.7	466.4	464.3	446.7	420.9	450.0	448.4	377.0	267.8	242.1	231.8	312.0	319.7	319.2	294.9	314.0	350.1	369.9	313.3	466.4
3-Sep	391.8	390.5	373.4	316.9	288.7	275.3	251.4	242.0	244.9	295.2	293.8	277.2	224.6	249.7	290.6	290.1	285.8	275.1	278.7	294.0	217.7	168.1	133.4	75.1	267.7	391.8
4-Sep	45.2	49.6	50.7	57.8	51.3	12.0	3.9	3.5	3.8	4.9	9.2	9.5	7.7	7.7	6.3	7.1	6.9	7.3	7.9	7.9	7.3	6.7	5.9	5.4	16.1	57.8
5-Sep	6.4	7.8	10.3	9.7	8.7	9.6	10.1	12.7	13.9	13.6	12.1	8.8	8.4	12.4	10.5	6.4	7.4	5.5	8.4	6.2	5.9	6.0	6.6	8.2	9.0	13.9
6-Sep	12.7	13.0	11.3	9.0	8.1	7.8	7.7	8.4	10.3	11.1	11.1	10.9	7.9	7.8	9.7	11.2	13.4	33.6	49.2	54.1	54.6	56.7	54.6	54.6	22.0	56.7
7-Sep	57.9	57.9	58.9	60.3	64.8	73.2	76.6	76.2	72.2	72.8	74.6	79.7	75.6	74.9	72.6	70.7	56.8	38.6	33.6	31.8	32.5	39.9	47.9	55.6	60.6	79.7
8-Sep	61.1	64.1	63.4	59.1	56.2	46.4	38.0	30.8	25.5	22.7	21.7	20.4	20.9	19.9	19.9	26.2	28.1	29.3	32.1	33.7	37.0	35.7	35.5	36.1	36.0	64.1
9-Sep	35.9	35.9	33.5	31.9	30.1	29.6	30.0	28.3	29.7	34.2	36.3	39.5	37.1	34.7	35.4	33.2	33.1	30.5	31.0	29.5	29.1	28.2	27.3	27.7	32.2	39.5
10-Sep	28.6	31.9	31.7	28.6	27.3	26.9	24.7	24.7	26.1	30.8	31.4	25.0	25.0	20.0	17.7	16.9	15.6	17.1	19.0	20.6	16.8	20.7	20.6	16.4	23.5	31.9
11-Sep	18.2	21.1	20.9	21.0	20.5	19.2	17.6	17.2	16.2	16.7	16.1	18.2	19.6	19.6	18.7	17.9	14.9	18.7	15.6	12.4	19.7	18.1	15.3	17.5	18.0	21.1
12-Sep	16.1	15.5	14.1	14.2	13.3	14.3	15.8	16.7	19.0	22.9	31.6	67.0	40.1	52.8	85.4	100.4	114.3	164.8	172.0	196.2	198.3	201.3	196.2	196.8	82.5	201.3
13-Sep	196.7	192.5	194.6	191.8	197.4	206.6	210.7	203.0	195.4	105.4	52.2	40.2	27.3	22.1	16.8	15.5	17.7	14.4	17.4	29.4	19.4	18.0	10.8	9.7	91.9	210.7
14-Sep	10.5	13.8	14.5	14.6	16.4	22.0	22.0	22.5	33.8	42.9	64.1	88.1	87.5	51.8	28.4	26.5	25.7	25.1	25.3	26.8	24.0	23.0	22.8	24.5	31.5	88.1
15-Sep	27.0	28.5	34.0	33.3	32.6	30.0	24.9	26.0	19.1	14.9	16.5	16.6	16.8	20.8	20.8	19.0	21.3	21.2	20.8	23.3	28.6	29.2	28.7	28.9	24.3	34.0
16-Sep	29.2	32.0	31.7	32.5	30.3	28.2	26.7	28.0	37.2	59.4	76.3	116.5	219.5	146.8	86.7	71.9	63.2	57.1	55.6	91.9	92.8	76.7	79.8	86.0	69.0	219.5
17-Sep	94.3	96.8	98.8	101.0	91.9	87.1	84.6	84.2	95.9	91.2	92.7	93.8	73.4	42.4	35.8	37.1	40.2	69.4	171.7	195.4	182.3	175.6	174.6	168.8	103.3	195.4
18-Sep	156.4	146.6	135.3	126.0	126.2	127.1	137.2	144.6	150.8	171.9	115.2	73.4	38.6	25.1	20.2	19.6	21.5	22.5	22.6	22.1	23.2	26.8	25.5	24.8	79.3	171.9
19-Sep	23.0	22.2	20.6	19.8	21.9	24.7	28.7	32.6	37.8	35.2	33.8	31.5	27.0	25.4	24.2	26.3	26.5	23.3	22.0	26.4	33.1	31.5	37.9	55.2	28.8	55.2
20-Sep	79.4	93.7	97.4	91.9	95.5	97.3	101.6	103.7	119.0	101.7	114.4	171.1	148.7	145.1	147.0	147.7	150.8	134.8	64.0	70.1	64.3	57.9	63.7	71.5	105.5	171.1
21-Sep	78.6	84.6	87.6	87.1	90.5	94.5	127.7	123.6	114.5	89.2	64.7	24.1	21.0	18.2	18.1	18.9	23.1	23.9	22.2	16.5	14.8	16.1	18.9	15.8	53.9	127.7
22-Sep	17.0	14.9	13.6	14.5	14.5	14.8	15.0	18.0	23.9	18.3	14.8	13.6	13.4	13.6	13.4	14.6	16.4	16.3	19.8	16.5	24.2	21.2	17.0	15.9	16.5	24.2
23-Sep	15.4	14.7	13.7	15.0	16.3	18.8	22.2	23.9	20.2	21.4	19.8	19.0	21.7	17.2	17.5	16.1	15.0	20.4	15.6	13.5	14.7	15.1	13.8	13.7	17.3	23.9
24-Sep	14.7	16.3	15.5	14.2	13.1	12.2	13.5	15.4	12.2	12.9	12.9	12.8	12.4	11.9	10.7	11.3	18.9	25.6	19.3	18.4	27.5	17.6	9.9	10.0	15.0	27.5
25-Sep	9.2	8.8	10.1	10.5	10.0	9.6	8.3	11.1	14.8	28.3	42.6	81.7	76.2	67.8	90.2	92.8	121.5	131.1	150.7	246.8	278.5	273.0	250.4	256.4	95.0	278.5
26-Sep	240.3	196.9	165.6	135.5	101.3	81.7	68.9	60.8	55.7	54.5	31.1	C	24.1	21.2	20.9	24.7	25.6	24.3	25.3	25.9	27.4	20.3	17.2	19.2	63.8	240.3
27-Sep	17.0	20.3	41.0	63.5	55.8	45.8	46.1	41.4	46.2	45.9	59.8	47.1	18.3	6.3	4.5	4.6	5.3	4.0	8.6	20.4	61.0	72.5	101.2	131.2	40.3	131.2
28-Sep	159.3	162.0	141.2	139.7	128.9	126.3	123.3	126.8	135.4	101.1	107.2	106.1	105.1	96.0	79.0	40.6	70.0	101.5	150.7	151.6	134.2	67.2	39.7	24.6	109.1	162.0
29-Sep	18.0	21.5	36.0	51.0	42.9	42.5	46.9	51.2	51.9	45.1	39.8	M	18.9	30.4	31.9	24.6	26.1	40.0	36.4	40.0	48.3	49.5	43.4	40.1	38.1	51.9
30-Sep	38.8	37.4	35.3	33.5	33.7	31.3	31.9	31.9	33.1	38.1	40.7	39.1	37.8	27.6	23.5	27.4	30.3	30.3	28.7	28.3	27.7	28.0	28.9	30.4	32.2	40.7
72.3 71.7 70.0 68.0 66.9 68.8 70.4 71.1 72.7 70.1 66.8 72.0 64.4 56.4 51.7 49.7 51.9 58.4 63.9 72.1 71.0 66.5 65.0 65.2																								Diurnal Average		
391.8 390.5 373.4 316.9 288.7 391.1 439.7 466.4 464.3 446.7 420.9 450.0 448.4 377.0 290.6 290.1 285.8 312.0 319.7 319.2 294.9 314.0 350.1 369.9																								Diurnal Maximum		

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	10	1.39	1.39
6 - 15	121	16.85	18.25
16 - 25	161	22.42	40.67
26 - 80	254	35.38	76.04
> 81.0	172	23.96	100.00

Total Number of Valid Hours: 718

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Fort McKay South - September 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	0	0	0	0	0	0	0	0	1	0	0	3	2	0	4	0	10
6 - 15	2	2	1	1	0	2	3	18	38	10	16	9	4	6	5	4	121
16 - 25	2	0	0	0	0	0	7	32	58	23	12	10	6	3	2	4	159
26 - 80	13	3	0	1	0	7	9	17	33	29	51	45	14	10	9	11	252
> 81.0	17	3	3	2	1	1	1	6	12	21	28	33	11	11	7	14	171
Totals	34	8	4	4	1	10	20	73	142	83	107	100	37	30	27	33	713

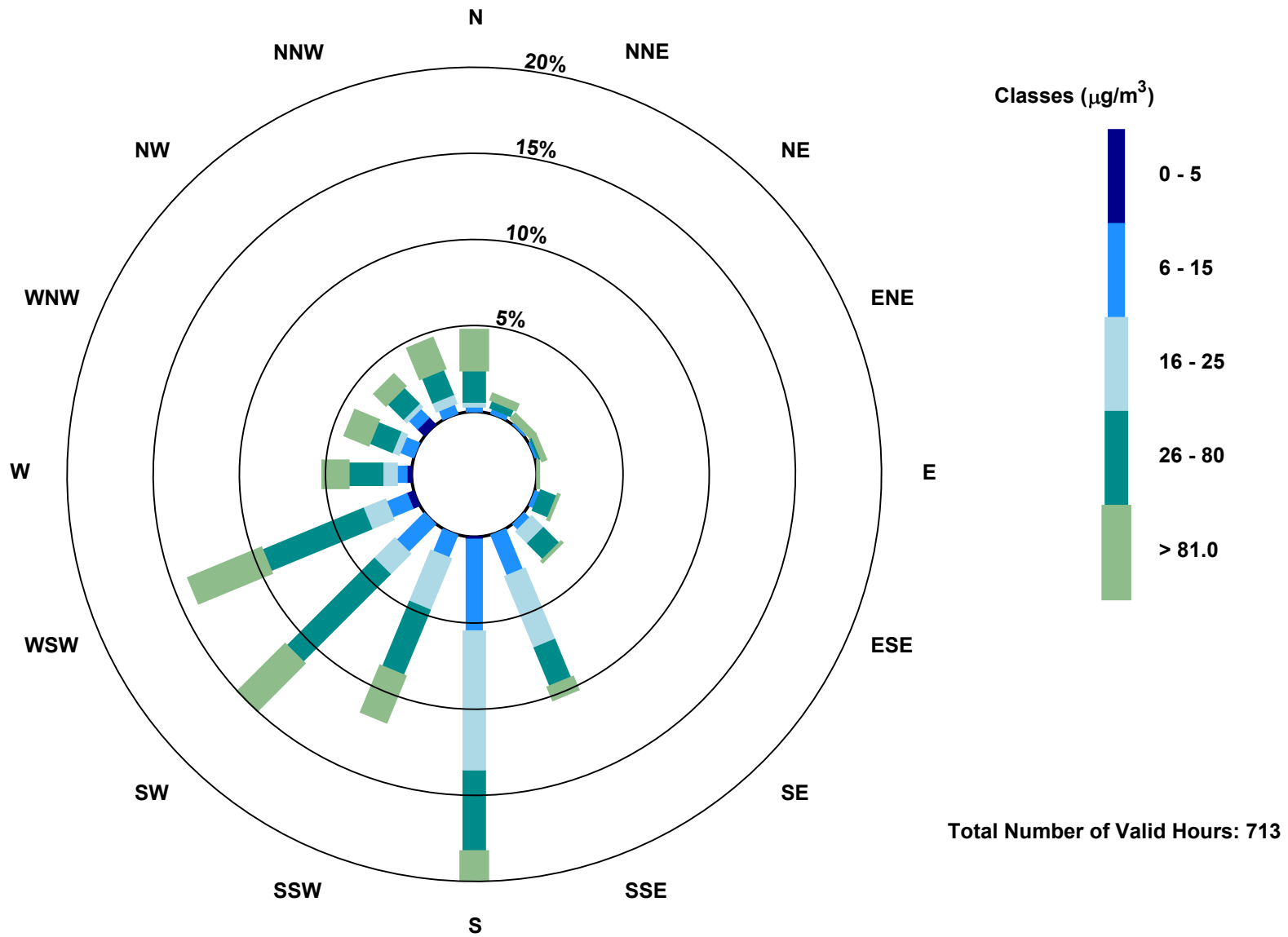
Total Number of Valid Hours: 713

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 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

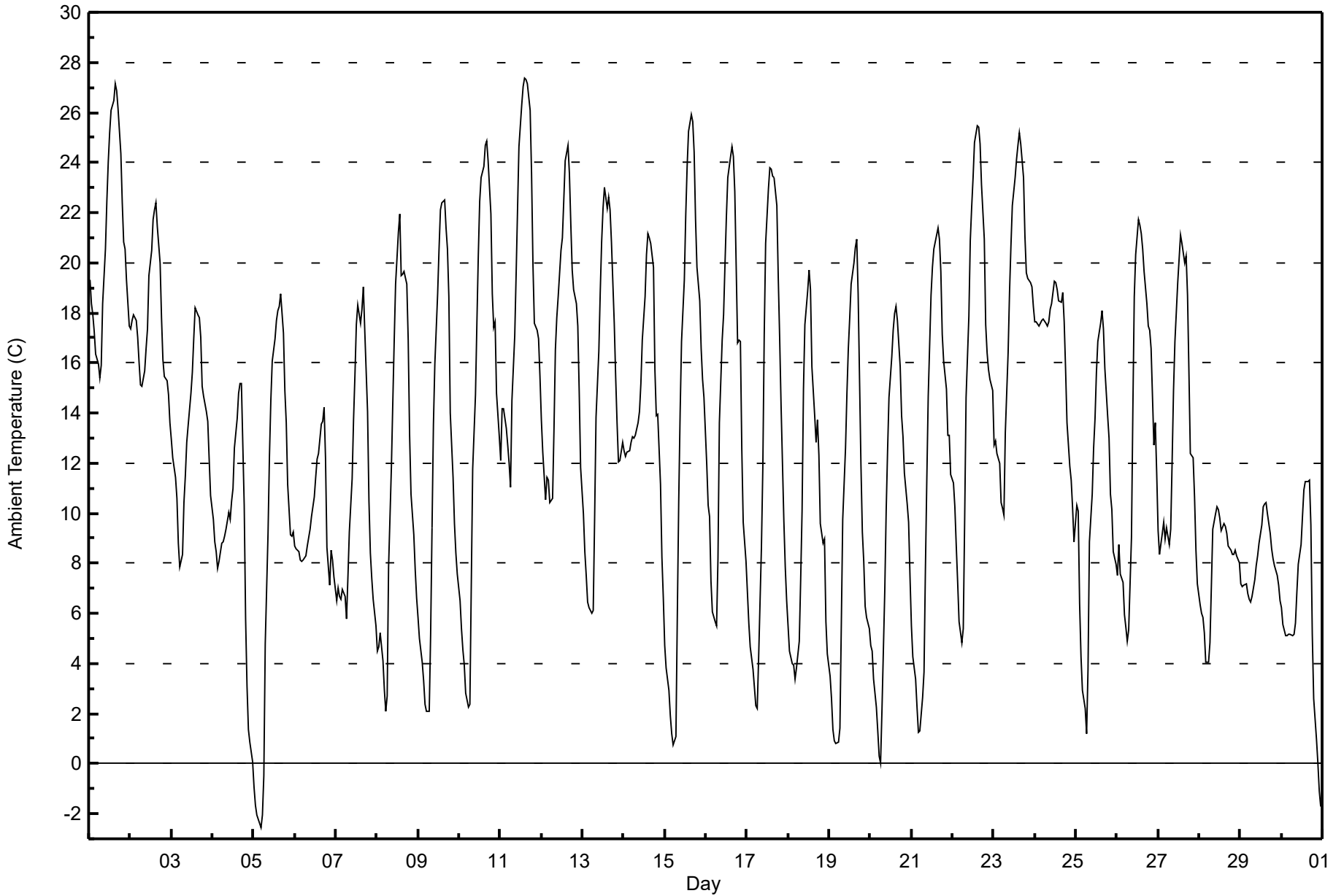
Fort McKay South - September 2023

Maximum Value: 27.4 C on Sep 11 15:00		Maximum Daily Average: 21.0 C on Sep 1		Hours in Service: 720																																												
Minimum Value: -2.6 C on Sep 5 05:00		Minimum Daily Average: 5.9 C on Sep 30		Hours of Data: 720																																												
Maximum Diurnal Average: 20.0 C at hour 16		Minimum Diurnal Average: 6.3 C at hour 6		Hours of Missing Data: 0																																												
Monthly Average: 12.91 C		Percentiles: P ₁ = -0.9 P ₁₀ = 4.5 Q ₁ = 8.0 Median = 12.7 Q ₃ = 18.0 P ₉₀ = 21.8 P ₉₉ = 26.3		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-Sep	19.3	18.4	17.9	17.3	16.3	15.9	15.4	15.9	18.4	20.5	22.4	24.0	25.2	26.1	26.5	27.2	26.8	26.1	24.4	22.4	20.8	20.5	19.3	17.5	21.0	27.2																						
2-Sep	17.4	17.7	17.9	17.7	17.0	16.0	15.1	15.1	15.7	16.6	17.3	19.5	20.5	21.7	22.1	22.4	21.4	20.0	17.8	16.1	15.5	15.3	14.7	13.6	17.7	22.4																						
3-Sep	13.0	12.2	11.4	10.6	8.8	7.8	8.4	10.4	11.5	12.8	13.5	14.8	15.6	17.0	18.2	17.9	17.8	17.0	15.1	14.7	14.1	13.7	12.2	10.7	13.3	18.2																						
4-Sep	9.8	8.8	8.4	7.8	8.1	8.8	8.9	9.1	9.3	10.0	9.7	10.5	11.0	12.6	13.8	14.8	15.2	15.2	10.3	5.8	3.1	1.4	0.9	0.1	8.9	15.2																						
5-Sep	-0.9	-1.6	-2.1	-2.4	-2.6	-2.1	-0.5	4.8	9.2	12.2	14.5	16.1	17.0	17.7	18.1	18.2	18.7	17.2	14.9	13.6	11.2	9.1	9.1	9.2	9.1	18.7																						
6-Sep	8.7	8.6	8.5	8.1	8.1	8.1	8.3	8.7	9.0	9.4	9.9	10.6	11.5	12.2	12.4	13.5	13.7	14.2	12.2	8.6	7.1	8.5	8.1	7.4	9.8	14.2																						
7-Sep	6.5	7.0	6.7	6.6	6.9	6.7	5.8	7.5	9.2	11.4	13.7	15.5	17.5	18.3	17.6	18.1	19.1	17.3	14.1	10.5	8.4	7.4	6.6	5.5	11.0	19.1																						
8-Sep	4.5	4.7	5.2	4.1	2.9	2.1	2.7	7.9	11.8	14.4	16.9	19.1	21.2	22.0	19.5	19.5	19.7	19.1	16.9	13.1	10.8	9.1	7.7	6.6	11.7	22.0																						
9-Sep	5.8	5.0	4.0	3.3	2.4	2.1	2.1	5.2	9.4	13.6	16.0	18.7	20.5	22.1	22.4	22.5	21.4	20.6	18.6	14.0	11.4	9.6	8.4	7.6	11.9	22.5																						
10-Sep	6.5	5.4	4.6	3.9	2.8	2.2	2.3	7.1	11.8	14.8	17.6	20.3	22.5	23.4	23.9	24.7	24.9	24.1	22.0	18.8	17.4	17.6	14.8	13.0	14.4	24.9																						
11-Sep	12.1	14.2	14.2	13.4	12.7	12.0	11.0	14.5	17.1	19.5	22.1	24.7	26.3	27.0	27.4	27.3	27.1	26.1	23.6	19.9	17.6	17.3	16.9	15.5	19.1	27.4																						
12-Sep	13.7	12.4	10.5	11.4	11.3	10.4	10.6	13.4	16.5	17.8	18.6	20.5	21.0	22.5	24.1	24.7	23.6	21.6	19.7	18.9	18.4	17.5	14.9	11.8	16.9	24.7																						
13-Sep	10.0	8.5	7.5	6.5	6.2	6.0	6.1	9.8	13.8	16.5	18.8	20.8	22.2	23.0	22.2	22.6	22.1	20.8	17.6	15.4	13.6	12.0	12.1	12.8	14.5	23.0																						
14-Sep	12.5	12.2	12.4	12.5	12.8	13.1	13.0	13.1	13.6	14.0	15.2	16.9	18.7	20.3	21.2	21.0	20.8	19.8	15.7	13.9	13.9	11.2	8.2	6.6	14.7	21.2																						
15-Sep	4.7	3.8	2.9	1.9	1.2	0.8	1.1	6.0	10.5	14.0	16.9	19.3	21.9	23.8	25.2	25.9	25.6	24.4	21.7	19.8	18.5	16.6	15.4	14.6	14.0	25.9																						
16-Sep	11.9	10.3	9.9	7.3	6.1	5.7	5.5	8.2	13.6	16.9	17.9	20.0	21.8	23.4	24.2	24.6	24.3	22.8	16.8	16.9	16.9	12.6	9.6	8.1	14.8	24.6																						
17-Sep	6.9	5.6	4.7	3.8	3.0	2.3	2.2	4.2	8.6	11.8	17.1	20.8	23.0	23.8	23.7	23.4	23.4	22.3	19.5	17.0	14.3	9.7	7.9	6.5	12.7	23.8																						
18-Sep	5.5	4.5	4.0	3.9	3.4	3.8	4.9	7.3	10.1	15.0	17.5	18.9	19.7	18.9	15.9	13.9	12.8	13.7	12.3	9.6	8.8	9.0	5.6	4.4	10.2	19.7																						
19-Sep	3.5	2.6	1.4	0.9	0.8	0.8	1.4	5.6	9.8	12.6	14.8	16.6	17.8	19.2	20.0	20.6	20.9	18.8	11.9	9.3	8.1	6.3	5.9	5.4	9.8	20.9																						
20-Sep	4.7	4.5	3.4	2.3	1.3	0.3	0.0	2.1	6.9	10.1	12.5	14.6	16.2	17.3	18.0	18.3	17.7	15.8	13.9	13.1	11.6	10.4	9.6	7.4	9.7	18.3																						
21-Sep	5.5	4.3	3.4	2.2	1.3	1.3	2.7	3.7	7.8	11.4	14.7	18.7	19.8	20.6	20.8	21.4	21.0	19.6	17.1	16.1	15.0	13.1	13.1	11.5	11.9	21.4																						
22-Sep	11.2	10.3	8.7	7.2	5.7	4.8	5.4	9.8	14.6	17.8	20.9	22.2	23.4	24.8	25.4	25.4	24.8	23.1	20.9	17.5	16.4	15.7	15.3	14.9	16.1	25.4																						
23-Sep	12.7	12.9	12.4	12.0	10.4	10.2	9.9	13.2	16.4	18.8	20.7	22.3	23.4	24.2	24.7	25.2	24.7	23.4	21.0	19.6	19.4	19.2	19.1	18.3	18.1	25.2																						
24-Sep	17.6	17.7	17.5	17.6	17.7	17.8	17.6	17.5	17.7	18.2	18.4	19.2	19.2	19.0	18.5	18.4	18.8	17.6	15.7	13.6	11.9	11.3	10.2	8.9	16.6	19.2																						
25-Sep	10.3	10.1	6.4	4.3	2.9	2.2	1.2	3.8	8.9	10.8	12.6	13.8	15.7	16.8	17.6	18.1	17.4	15.8	13.9	13.0	10.8	10.1	8.5	8.0	10.5	18.1																						
26-Sep	7.5	8.7	7.6	7.2	6.0	5.4	4.9	5.4	9.0	14.2	18.7	20.3	21.7	21.5	21.2	20.6	19.6	18.4	17.4	17.3	16.6	12.7	13.6	11.6	13.6	21.7																						
27-Sep	9.3	8.4	9.2	9.6	8.9	9.4	8.7	9.3	12.1	14.9	16.9	19.2	20.2	21.1	20.8	20.0	20.2	18.7	15.6	12.4	12.2	10.6	8.5	7.2	13.5	21.1																						
28-Sep	6.3	6.0	5.8	5.2	4.1	4.0	4.8	7.1	9.3	10.0	10.2	10.2	9.8	9.3	9.6	9.4	9.2	8.7	8.5	8.3	8.4	8.5	8.3	8.0	7.9	10.2																						
29-Sep	7.2	7.0	7.1	7.2	6.8	6.6	6.4	6.7	7.4	7.9	8.3	8.8	9.5	10.2	10.3	10.4	10.0	9.2	8.6	8.2	7.9	7.5	7.1	6.5	8.0	10.4																						
30-Sep	6.2	5.5	5.1	5.1	5.2	5.1	5.1	5.2	5.6	6.8	7.9	8.8	9.9	11.0	11.3	11.3	11.3	9.5	5.2	2.6	1.0	0.0	-1.1	-1.7	5.9	11.3																						
																								9.0	8.5	7.9	7.3	6.6	6.3	6.4	8.6	11.5	13.8	15.7	17.5	18.8	19.7	19.9	20.0	19.8	18.7	16.1	14.0	12.7	11.5	10.4	9.3	Diurnal Average
																								19.3	18.4	17.9	17.7	17.7	17.8	17.6	17.5	18.4	20.5	22.4	24.7	26.3	27.0	27.4	27.3	27.1	26.1	24.4	22.4	20.8	20.5	19.3	18.3	Diurnal Maximum



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Fort McKay South - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Fort McKay South - September 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	9	1.25	1.25
0 - 10	265	36.81	38.06
10 - 20	331	45.97	84.03
> 20	115	15.97	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



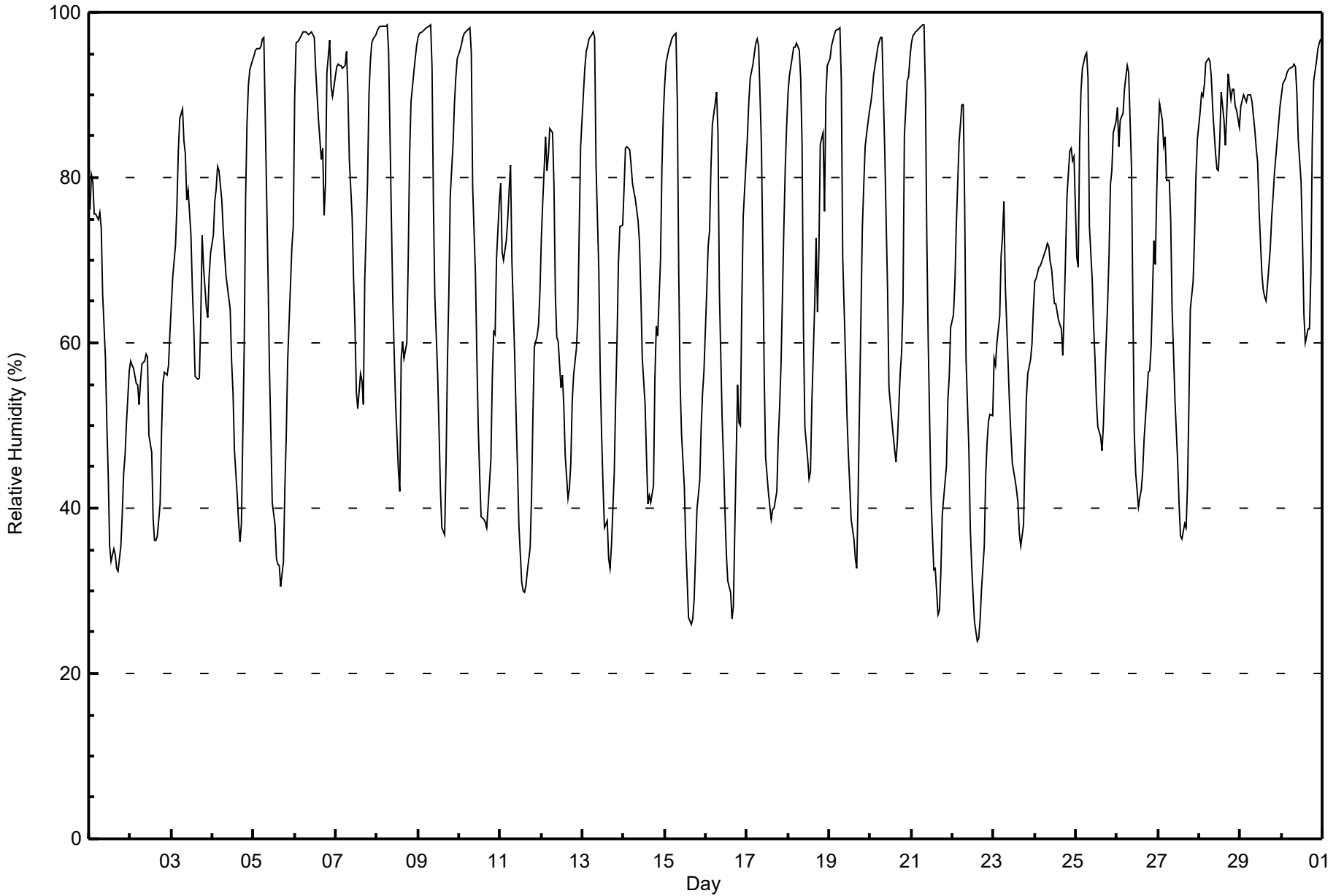
Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Fort McKay South - September 2023

Maximum Value: 98.6 % on Sep 8 07:00 Maximum Daily Average: 92.1 % on Sep 6																						Hours in Service: 720 Hours of Data: 720																											
Minimum Value: 23.9 % on Sep 22 15:00 Minimum Daily Average: 51.6 % on Sep 22 Maximum Diurnal Average: 89.3 % at hour 7 Minimum Diurnal Average: 44.8 % at hour 16 Monthly Average: 68.86 % Percentiles: P₁ = 26.8 P₁₀ = 38.4 Q₁ = 52.2 Median = 70.3 Q₃ = 88.9 P₉₀ = 95.8 P₉₉ = 98.2																						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-Sep	76.1	80.3	79.5	75.6	75.6	74.9	75.7	73.9	65.9	58.1	50.2	43.8	35.5	33.6	35.2	34.4	32.6	32.4	35.4	39.4	44.3	46.4	50.4	56.5	54.4	80.3																							
2-Sep	57.9	57.4	56.9	55.2	54.9	52.6	55.2	57.5	57.8	58.6	58.4	48.7	46.8	38.9	36.1	36.1	36.6	40.6	49.0	55.1	56.5	56.1	57.2	61.2	51.7	61.2																							
3-Sep	64.6	67.9	71.9	76.6	83.2	87.1	88.3	84.4	82.9	77.2	78.5	73.1	66.7	61.9	55.9	55.6	55.8	62.7	73.1	69.1	64.2	63.0	68.1	70.9	70.9	88.3																							
4-Sep	73.1	77.1	78.6	81.3	80.9	77.3	73.7	70.9	68.1	65.4	64.1	57.8	54.0	47.1	41.5	38.2	35.9	38.1	59.5	77.4	86.7	91.1	93.1	94.2	67.7	94.2																							
5-Sep	94.7	95.4	95.6	95.7	96.0	96.7	97.0	87.4	68.1	56.9	49.1	40.7	38.0	34.0	33.2	33.1	30.5	33.5	42.4	48.8	57.9	66.9	71.6	74.1	64.0	97.0																							
6-Sep	89.7	96.3	96.6	96.9	97.4	97.7	97.6	97.5	97.3	97.5	97.6	96.9	93.0	90.0	86.9	82.2	83.5	75.4	79.2	92.7	96.6	91.0	89.8	91.1	92.1	97.7																							
7-Sep	93.3	93.8	93.6	93.6	93.2	93.5	95.3	90.2	82.2	75.2	67.9	62.2	54.1	52.0	56.3	55.5	52.5	67.6	79.5	90.0	94.1	96.2	96.8	97.4	80.2	97.4																							
8-Sep	97.8	98.1	98.2	98.2	98.2	98.4	98.6	95.5	75.1	65.2	58.8	52.7	44.7	42.0	58.2	60.2	58.2	60.0	69.9	82.7	89.2	92.6	94.4	95.9	78.4	98.6																							
9-Sep	96.9	97.4	97.6	97.9	98.0	98.2	98.4	98.5	93.4	76.7	65.7	56.3	49.5	42.2	37.6	36.7	45.4	57.6	66.1	77.9	84.1	89.0	92.2	94.5	77.0	98.5																							
10-Sep	95.4	96.1	97.0	97.5	97.7	97.9	98.1	95.2	78.8	68.1	58.2	49.6	43.8	38.9	38.7	38.3	37.5	40.2	45.9	55.8	61.3	61.0	70.2	77.2	68.3	98.1																							
11-Sep	79.3	71.0	69.9	72.4	75.0	78.4	81.6	69.8	58.4	51.1	44.7	37.9	31.1	29.9	29.8	30.7	32.4	35.3	41.3	51.5	59.5	60.9	62.2	66.3	55.0	81.6																							
12-Sep	72.7	77.1	84.9	80.8	82.7	86.0	85.5	78.9	65.7	60.7	60.2	54.6	56.1	52.3	46.5	41.1	42.4	45.4	52.8	56.1	59.3	62.8	73.6	83.7	65.1	86.0																							
13-Sep	90.2	93.3	95.2	96.0	96.8	97.3	97.6	96.9	81.5	68.7	56.3	48.7	42.7	37.6	38.4	33.8	32.7	35.5	44.2	53.0	60.5	69.7	74.1	74.2	67.3	97.6																							
14-Sep	78.7	83.6	83.7	83.5	81.6	79.3	78.4	77.5	74.8	72.2	65.8	58.2	52.6	46.2	40.6	41.6	40.7	42.8	55.8	62.0	60.8	70.1	81.0	87.6	66.6	87.6																							
15-Sep	91.4	93.9	95.6	96.1	96.8	97.1	97.5	89.2	68.7	55.0	49.0	42.6	35.8	31.3	26.8	25.9	26.6	29.0	34.3	39.8	43.4	49.6	53.9	56.6	59.4	97.5																							
16-Sep	66.2	71.7	73.5	81.3	86.5	89.0	90.3	85.5	66.4	50.7	45.8	39.5	34.4	31.1	29.8	26.6	28.1	37.3	54.8	50.3	50.0	64.7	75.2	81.8	58.8	90.3																							
17-Sep	85.0	89.2	92.0	93.8	95.1	96.3	96.8	96.0	84.0	70.9	56.0	46.1	41.8	40.1	38.6	39.8	40.0	42.0	48.3	52.4	57.5	73.9	81.2	86.2	68.5	96.8																							
18-Sep	90.4	92.4	94.7	95.8	95.8	96.2	95.5	92.0	83.9	61.7	49.8	45.9	43.6	44.4	52.8	64.6	72.7	63.7	71.1	84.1	85.4	76.0	89.9	93.5	76.5	96.2																							
19-Sep	94.3	95.9	96.6	97.4	97.8	98.0	98.2	91.6	70.4	58.1	51.3	46.6	42.8	38.6	36.3	34.0	32.7	41.7	63.2	73.8	79.0	83.8	85.3	87.9	70.6	98.2																							
20-Sep	88.9	90.4	92.4	94.7	95.7	96.4	96.9	96.9	83.0	74.6	66.5	54.5	50.7	48.9	47.0	45.7	48.1	56.4	58.8	64.9	85.2	91.7	92.2	94.6	75.6	96.9																							
21-Sep	96.3	97.1	97.6	97.8	98.0	98.2	98.4	98.4	90.5	72.5	60.0	41.4	36.6	32.6	32.8	27.1	27.5	32.3	39.2	41.2	45.1	53.1	55.9	61.9	63.8	98.4																							
22-Sep	63.4	67.2	74.1	79.2	84.2	88.8	88.8	76.8	58.0	47.1	37.7	33.0	29.6	26.3	23.9	24.2	26.4	30.2	35.4	43.8	47.9	50.5	51.4	51.1	51.6	88.8																							
23-Sep	58.2	57.3	60.0	63.2	70.4	72.9	77.1	67.0	57.4	52.5	48.8	45.5	43.4	42.2	40.7	36.9	35.5	38.0	46.2	53.2	56.3	57.9	59.8	64.1	54.4	77.1																							
24-Sep	67.5	67.9	69.1	69.3	69.8	70.3	71.3	72.1	71.7	69.8	68.9	64.8	64.7	63.7	62.6	61.7	58.5	63.8	70.8	77.7	83.2	83.6	82.0	82.6	70.3	83.6																							
25-Sep	70.3	69.1	84.1	90.5	93.2	94.7	95.2	92.1	74.0	67.6	62.0	58.0	52.8	49.8	48.6	46.9	50.2	55.8	64.8	70.7	79.2	80.8	85.4	86.8	71.8	95.2																							
26-Sep	88.5	83.8	87.0	87.8	90.7	92.3	93.6	92.7	81.4	65.0	49.1	44.3	40.3	41.4	42.1	44.4	48.3	53.5	56.4	56.7	59.5	72.4	69.5	78.0	67.4	93.6																							
27-Sep	84.9	88.9	86.9	83.9	85.0	79.7	79.7	74.8	64.1	58.8	53.2	45.4	40.3	36.6	36.2	38.2	37.5	42.8	52.8	64.0	67.5	72.9	80.3	84.6	64.1	88.9																							
28-Sep	88.0	90.1	89.8	91.1	93.8	94.5	94.1	92.0	88.2	82.9	81.0	80.9	84.5	90.4	86.9	83.9	88.1	92.5	89.5	90.6	90.7	88.7	88.1	86.1	88.6	94.5																							
29-Sep	88.6	89.4	90.0	89.2	90.0	90.1	90.0	89.2	85.8	83.6	81.8	76.3	68.4	66.4	65.5	65.0	67.0	71.4	75.2	77.6	80.5	84.6	86.5	88.6	80.9	90.1																							
30-Sep	89.9	91.3	92.1	92.7	93.1	93.2	93.4	93.7	93.4	90.2	84.6	79.6	72.6	63.6	60.0	61.6	61.7	68.5	84.3	91.7	94.0	95.6	96.3	96.8	84.7	96.8																							
																								82.4	84.0	85.8	86.8	88.2	88.8	89.3	85.8	75.7	67.1	60.7	54.2	49.7	46.5	45.5	44.8	45.5	49.5	58.0	64.8	69.3	73.2	76.9	80.2	Diurnal Average	
																								97.8	98.1	98.2	98.2	98.2	98.4	98.6	98.5	97.3	97.5	97.6	96.9	93.0	90.4	86.9	83.9	88.1	92.5	89.5	92.7	96.6	96.2	96.8	97.4	Diurnal Maximum	





Maximum Speed: 27 km/h on Sep 11 13:00	Maximum Daily Speed Average: 14.5 km/h on Sep 23	Hours in Service: 720
Minimum Speed Value: 0 km/h on Sep 9 18:00	Minimum Daily Speed Average: 1.4 km/h on Sep 6	Hours of Data: 715
Maximum Diurnal Speed Average: 6.3 km/h at hour 13	Minimum Diurnal Speed Average: 2.9 km/h at hour 7	Hours of Missing Data: 5
Monthly Average Velocity: 3.9 km/h 204.5 deg	Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 3 Median = 6 Q ₃ = 10 P ₉₀ = 13 P ₉₉ = 23	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-Sep	WNW5	W1	WSW6	WSW9	WSW10	WSW12	WSW13	WSW10	WSW7	SW10	SW12	WSW13	SW16	SW16	SW18	SSW17	SW20	SW16	SW13	SW9	SW8	SW9	SW7	WSW6	SW10.5	SW20
2-Sep	WSW7	WSW8	WSW8	WSW8	W7	W6	W7	W7	W8	WSW6	WNW2	WSW8	WSW7	WNW9	WNW10	W8	WNW11	WNW8	WSW4	WSW7	WSW8	WSW9	WSW10	WSW10	W7.2	WNW11
3-Sep	WSW11	WSW8	SSW4	S4	SSW2	S4	SSW3	S4	SSE4	SSE6	NNW1	S4	W5	WNW5	NE4	NNE6	SE2	SSW3	WSW5	W7	NW9	NW9	WNW6	WNW7	WSW2.6	WSW11
4-Sep	W6	WSW8	WSW7	W5	WSW7	NW9	NW9	NW10	NW12	NW10	NNW9	NNW10	NNW10	NW9	WNW7	NNW8	NW7	NW3	W2	W3	SW3	S3	SW1	WSW2	WNW5.5	NW12
5-Sep	SSW3	SW3	SW2	SSW3	S3	SSW4	S4	SSE8	S11	S11	S12	S12	S12	SSE11	S10	S10	S9	S7	S7	S3	SW2	WSW1	SW2	S6.5	S12	
6-Sep	NW1	N1	NNE1	NE1	N1	NNE3	ESE2	ESE3	SE4	SE3	S2	WNW1	WNW3	NNW5	ENE3	SE4	SSE6	SW6	SW5	SW4	SW5	WSW8	WSW8	WSW9	SW1.4	WSW9
7-Sep	WSW6	WSW9	WSW9	SW4	WSW6	SW5	S4	S3	SSW5	S5	S8	SSW8	SSW6	S7	SSE6	SE6	S5	SW2	W3	W2	W2	SW2	SW1	S2	SSW3.9	WSW9
8-Sep	S3	S3	SW1	WSW3	SW2	SW3	SSW4	SSE5	S10	S12	S12	S11	S6	W3	N5	N6	N6	N5	NNW4	WSW3	W1	SW2	SW2	W1	SSW2.1	S12
9-Sep	SW1	WSW1	WSW1	UO	SW2	SSE4	SSW2	S5	ESE4	SE6	ESE7	SE7	SE7	SE8	ESE9	SE5	SE3	N0	NW1	WSW3	W3	WSW3	WSW2	WSW2	SSE2.4	ESE9
10-Sep	WSW1	WSW3	WSW3	WSW2	SW2	SW3	WSW3	SSE1	ESE4	SE7	SSE8	SE12	SSE13	SSE15	SE12	SE14	SE13	SSE12	SSE10	SSE7	SSE9	SSE11	S5	S5	SSE6.4	SSE15
11-Sep	S7	S14	S11	S11	S11	SSW8	SW4	SSE7	SSE16	SSE17	SSE20	SSE22	S27	S26	S25	S23	S20	S16	S12	S6	S8	S11	S10	SSW5	S13.8	S27
12-Sep	SSW4	SW5	SSW3	S3	S3	S3	S4	S6	SSE10	SSE10	S9	S9	SE10	SSE10	SSE9	SSW6	SW6	WSW5	WSW7	WSW8	SW8	SSW4	S1	WNW2	S5.0	SSE10
13-Sep	SW1	SW3	WSW4	SSW3	SW2	SW3	SSW2	SW1	SSE3	S8	SW13	SW11	WSW14	WSW17	WSW15	WSW15	WSW15	WSW15	WSW11	WSW11	SW8	SSW6	SW7	WSW8	SW7.8	WSW17
14-Sep	WSW9	W8	W8	WNW5	W5	WNW7	NW7	WNW6	WNW8	WNW9	NW11	NNW9	NNW11	NW14	NW13	NW11	NW8	W5	W6	W7	W4	S2	S2	WNW6.8	NW14	
15-Sep	SW3	SSW3	SSW3	SSW3	SW3	SW3	SW3	S6	SE8	SSE9	SE8	C	C	SSE16	S20	S19	S18	S13	S13	SSE13	SSE11	SSE14	S11	SSE13	S9.1	S20
16-Sep	SW5	SSW7	S6	S4	S4	S3	SSW3	SSW2	S3	SW6	WSW6	SSW4	SSW8	SSW8	SW9	SW9	WSW6	SSW3	SSW3	SSW9	SSW7	SW1	W1	WSW1	SSW4.7	SW9
17-Sep	SW2	SSW4	SW3	SW1	SW2	SW2	WSW1	NNW1	N4	ENE2	SSE6	ESE7	SSE8	S14	SSW11	S11	S12	SW8	SW6	SW7	SW3	SW4	WSW2	WSW1	SSW3.8	S14
18-Sep	SW2	SW3	SW3	WSW2	WSW3	SW2	SSW3	S4	S4	S7	WSW12	WSW11	WSW15	WSW13	WSW11	SSW6	SW10	SSW8	S5	S5	S5	SW4	S2	S5	SW5.5	WSW15
19-Sep	S3	WSW3	SW3	SW2	SSW5	S5	S5	SSE7	S9	SSW11	S11	SSW12	SSW10	SW8	SSW6	SSW5	SSW5	SSW4	SW3	S3	WNW1	SW3	WNW2	W2	SSW4.9	SSW12
20-Sep	W1	SW1	UO	WSW2	WSW2	WSW2	SW2	S1	E1	ENE3	NE3	NE4	N9	N7	N7	N7	N6	NNW7	NNW3	WSW5	WSW3	SSW2	SW2	SSW2	NNW1.9	N9
21-Sep	SSW2	WSW2	SW3	SW3	SSW4	SSW6	SSW4	S6	S11	SSE11	SSE7	S23	S23	S24	S22	SSW21	SSW19	S14	S12	S13	S12	S10	S10	SSW5	S10.7	S24
22-Sep	SSW6	SSW8	SSW5	SW3	SSW4	SSW5	SSW4	SSW3	SSE9	S14	S16	S20	S21	S18	S17	S19	S19	S13	S13	S9	S11	S11	S11	SSE14	S11.2	S21
23-Sep	S9	S8	S10	S8	S7	S5	SSW6	SSE9	SSE16	SSE18	SSE20	SSE20	SSE23	SSE22	SSE21	SSE22	SSE22	S18	S13	SSE13	SSE15	SSE17	SSE19	SSE15	SSE14.5	SSE23
24-Sep	SSE16	SSE18	SSE16	S14	SSE14	SSE16	SSE13	SSE12	SSE14	S16	S13	S12	SW9	SW9	WSW8	SSW4	S6	S6	S4	SSW3	SW3	WSW4	WSW5	SW7	S9.1	SSE18
25-Sep	WSW7	WSW6	SW4	SW2	S4	S4	SW3	SSE2	SW4	WNW3	N7	NNE6	N4	NNE5	N10	N12	N11	N8	NNW10	N9	N6	N5	NNW5	NNW5	NNW3.3	N12
26-Sep	NW5	NNW5	NNW4	NNW4	NNW4	WNW3	SW2	SSW3	S5	SSE5	S11	S13	SSW10	SSW8	SSW7	SSW6	SW4	S2	SSE4	SW7	WSW6	SW3	WNW3	SSW2	SW3.2	S13
27-Sep	SSW3	SSW2	N2	SSW2	S2	SW2	W5	SW2	SSW2	ESE4	ESE5	S6	SW9	WSW11	WSW10	WSW7	W6	W6	WNW4	W2	NW5	WNW3	WNW3	W2	WSW2.8	WSW11
28-Sep	WSW2	SSW1	WSW2	WSW2	SSW2	W2	SSW1	NW1	NNE6	N11	N12	N11	N11	NNW10	N13	N12	N9	NNW7	NNW8	NNW5	NNW8	NNW11	NNW11	NNW9	N6.1	N13
29-Sep	NNW6	NNW5	NNW5	NW7	NW5	WNW4	W3	WNW4	NW5	NNW6	NNW8	NNW10	N12	N10	N7	NNW8	N10	N8	NNW6	NNW6	N5	NNW4	NW2	SW2	NNW5.6	N12
30-Sep	UO	S2	SSW2	SW2	SW2	SSW1	S2	SW2	SSW1	SW1	ENE1	SSE4	SE5	SSE7	SE8	SSE10	SSE9	S7	SW2	WSW3	WSW3	WSW2	WSW2	SW2	S2.8	SSE10

SW3.3	SW3.5	SW3.3	SW2.9	SW3.2	SW3.0	SW2.9	SSW3.0	S4.0	S4.7	S4.6	S5.7	SSW6.3	SSW6.0	SSW5.0	SSW4.6	SSW5.1	SSW4.4	SSW3.6	SW4.2	SW3.5	SSW3.5	SW3.1	SW3.1	Diurnal Average	
SSE16	SSE18	SSE16	S14	SSE14	SSE16	SSE13	SSE12	SSE16	SSE18	SSE20	S23	S27	S26	S25	S23	SSE22	S18	SW13	SSE13	SSE15	SSE17	SSE19	SSE15	Diurnal Maximum	

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Fort McKay South - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 7 km/h on Sep 1 17:00	Hours of Data: 715
Minimum Value: 0 km/h on Sep 10 07:00	Hours of Missing Data: 5
Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 3 P ₉₀ = 4 P ₉₉ = 6	Hours of Calibration: 2
	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-Sep	2	1	2	2	3	3	3	3	3	3	4	5	5	5	6	6	7	6	5	3	3	3	2	2	7
2-Sep	3	3	3	2	2	2	2	2	3	2	2	4	3	4	4	3	4	3	1	2	2	2	3	2	4
3-Sep	3	3	2	1	1	1	2	2	3	3	2	2	2	2	2	2	1	1	1	2	2	2	2	2	3
4-Sep	2	2	2	2	2	3	3	3	4	4	3	3	3	4	4	4	3	2	1	1	1	1	1	1	4
5-Sep	1	1	1	1	1	1	1	2	3	3	4	3	4	3	4	4	3	3	1	2	1	1	1	2	4
6-Sep	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	2	3	2	1	1	1	2	2	3
7-Sep	3	2	3	3	2	3	1	1	2	2	2	2	3	3	2	2	2	1	1	2	1	1	1	1	3
8-Sep	1	1	1	1	1	1	1	1	2	2	3	3	3	2	2	2	1	1	1	1	1	1	1	1	3
9-Sep	1	1	1	UO	0	1	1	1	1	2	2	2	2	3	2	3	1	1	1	1	1	1	1	1	3
10-Sep	1	1	1	1	1	1	0	1	2	2	3	3	3	3	3	3	3	3	2	1	2	3	2	1	3
11-Sep	2	3	2	2	2	1	2	3	4	3	4	5	5	6	6	5	5	5	3	1	1	2	1	3	6
12-Sep	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	3	2	2	2	2	2	2	1	1	3
13-Sep	1	1	1	1	1	1	1	1	2	2	4	4	6	6	6	6	6	6	5	5	3	2	3	3	6
14-Sep	3	3	2	2	2	2	3	3	3	3	4	4	4	4	5	4	4	3	1	1	1	2	1	1	5
15-Sep	1	1	1	1	1	1	1	2	2	2	2	C	C	4	4	4	4	2	2	2	3	3	2	2	4
16-Sep	1	2	4	1	1	2	1	2	2	2	2	2	3	3	3	3	3	1	1	2	2	1	1	1	4
17-Sep	1	1	1	1	1	1	1	1	2	1	3	2	4	4	3	3	3	3	1	2	2	1	1	1	4
18-Sep	1	1	1	1	1	1	1	1	2	2	5	5	5	5	5	2	3	2	1	1	2	1	2	2	5
19-Sep	1	1	1	1	2	1	1	2	2	3	3	4	3	3	3	3	3	2	1	1	1	1	2	1	4
20-Sep	1	1	UO	1	1	1	1	2	1	1	1	2	2	2	2	2	2	4	3	4	2	2	1	1	4
21-Sep	1	1	1	1	1	1	2	2	2	3	3	6	7	6	6	5	5	3	2	2	2	1	2	1	7
22-Sep	2	1	1	1	1	1	2	3	2	4	5	4	5	4	5	5	4	3	4	2	1	2	2	2	5
23-Sep	3	2	1	2	2	1	1	4	5	4	5	4	6	5	5	5	5	5	2	3	3	3	4	3	6
24-Sep	3	4	4	4	3	3	3	3	3	3	3	3	3	3	2	1	1	1	1	1	1	1	2	1	4
25-Sep	2	2	1	1	1	2	1	1	2	2	2	2	2	2	2	2	3	2	2	2	3	1	1	1	3
26-Sep	1	1	1	2	2	1	1	1	1	1	3	4	4	2	2	2	2	2	2	3	2	1	2	1	4
27-Sep	1	1	1	1	2	1	3	1	1	1	1	2	3	4	4	3	3	2	2	1	1	1	1	1	4
28-Sep	1	1	1	1	1	1	1	1	3	3	3	3	4	3	3	3	3	2	2	1	3	3	2	2	4
29-Sep	2	1	1	2	1	1	1	1	1	2	2	2	3	3	2	2	3	2	1	1	2	1	1	1	3
30-Sep	UO	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	1	0	1	1	1	1	2
	3	4	4	4	3	3	3	4	5	4	5	6	7	6	6	6	7	6	5	5	3	3	4	3	

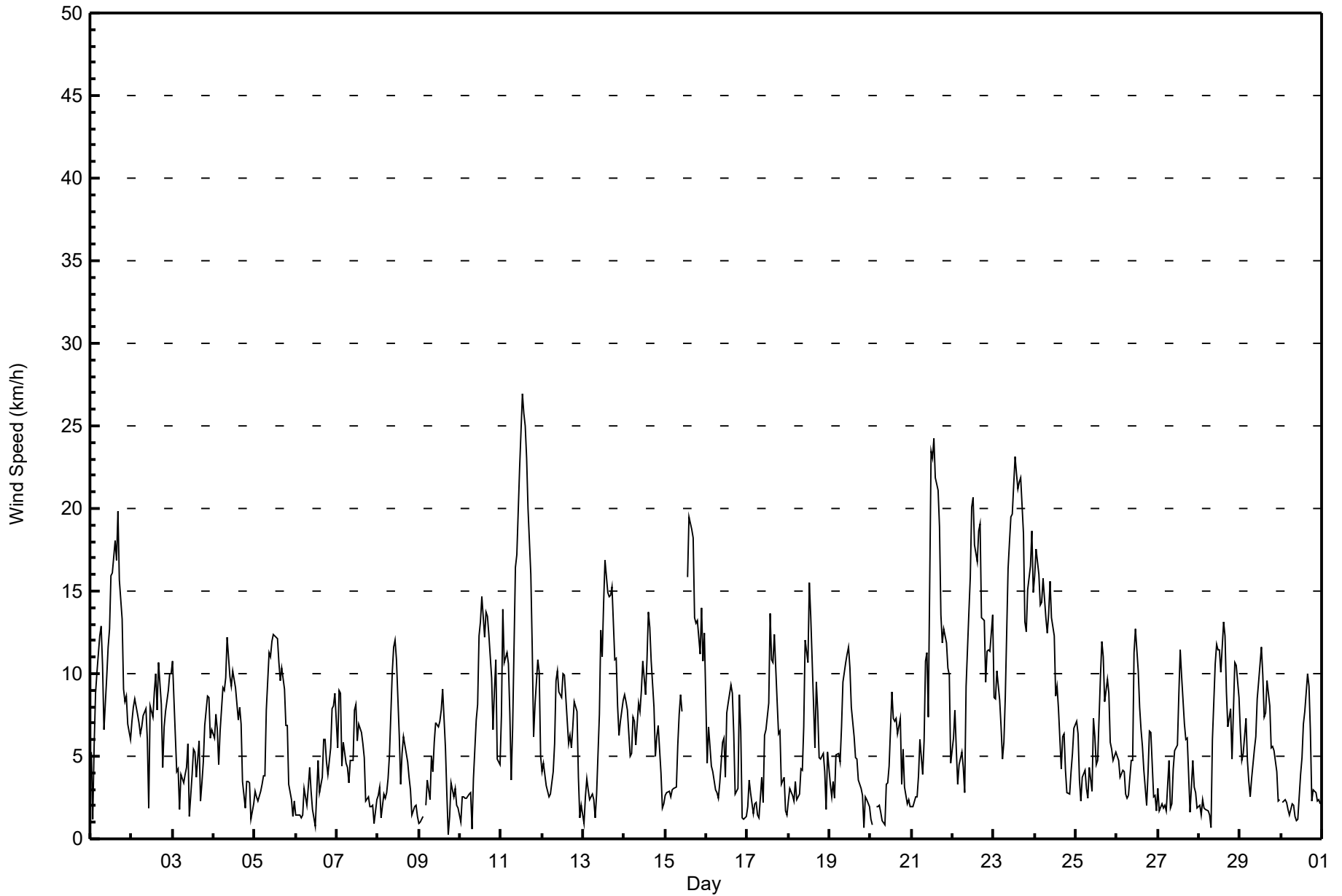
Diurnal Maximum

C - Calibration UO - Unstable Operation



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Fort McKay South - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Fort McKay South - September 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	330	46.15	46.15
6 - 11	269	37.62	83.78
12 - 19	93	13.01	96.78
20 - 28	23	3.22	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 715

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Fort McKay South - September 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	3	4	4	1	6	7	9	51	55	75	41	23	17	10	14	330
6 - 11	19	5	0	0	0	4	9	28	48	24	24	47	14	13	14	20	269
12 - 19	5	0	0	0	0	0	4	27	32	3	7	12	0	0	3	0	93
20 - 28	0	0	0	0	0	0	0	9	12	1	1	0	0	0	0	0	23
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	34	8	4	4	1	10	20	73	143	83	107	100	37	30	27	34	715

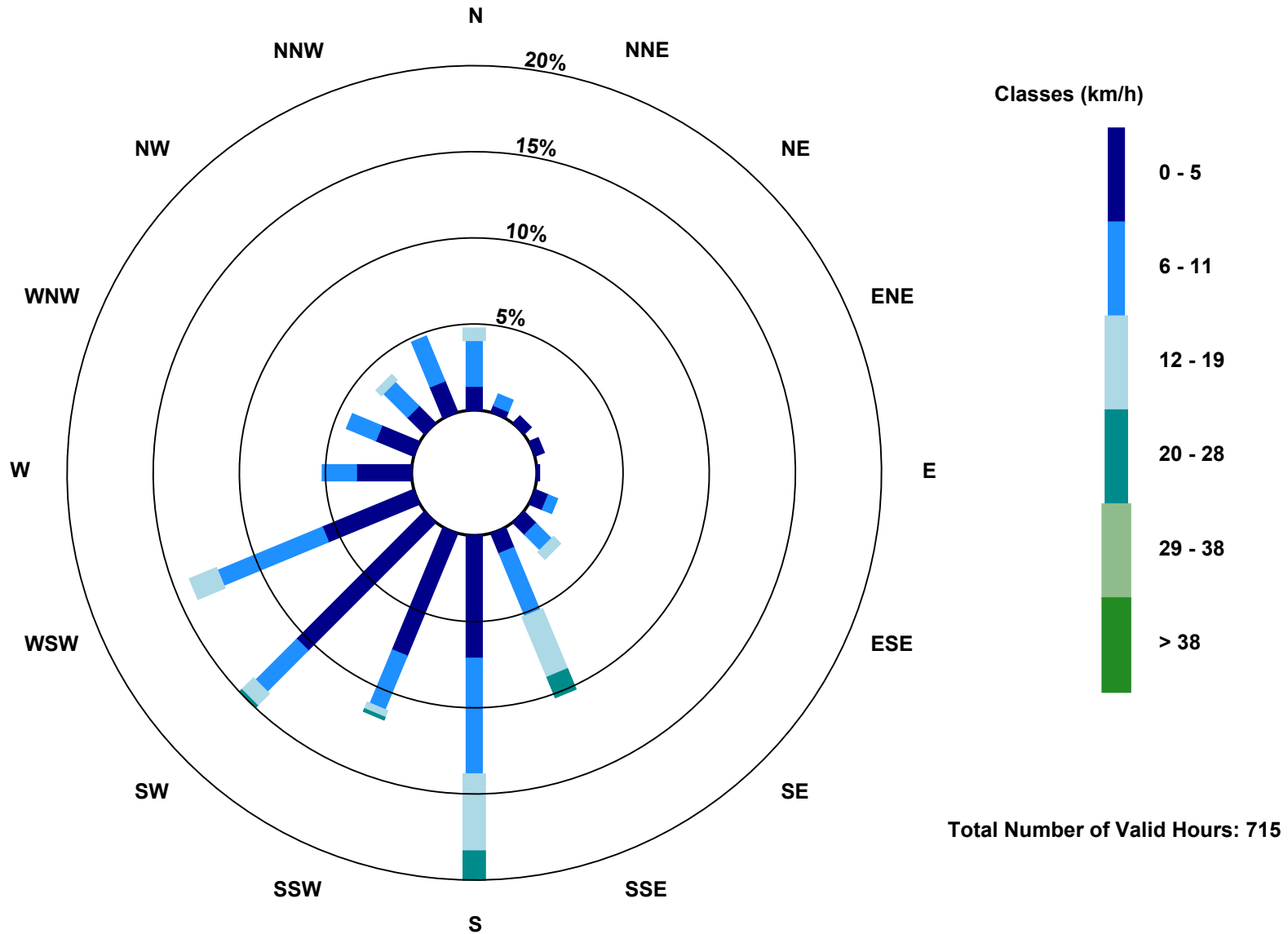
Total Number of Valid Hours: 715

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

Wind Speed (WS) - km/h
Fort McKay South





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Fort McKay South - September 2023

Direction of Maximum Speed: 173 deg on Sep 11 13:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 163.3 deg on Sep 23	Hours of Data: 715
Direction of Minimum Speed: 352 deg on Sep 9 18:00	Hours of Missing Data: 5
Direction of Minimum Daily Speed Average: 1.4 deg on Sep 6	Percent Operational Time: 99.6
Monthly Average Direction: 204.5 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-Sep	288	280	258	255	257	254	255	246	251	235	232	237	226	228	224	211	217	226	223	221	222	221	230	252	233.9
2-Sep	253	252	248	258	271	280	281	266	259	257	287	241	247	289	303	278	290	294	242	239	241	243	249	243	262.8
3-Sep	251	245	209	176	195	183	197	186	165	165	328	182	260	302	48	18	130	213	256	278	312	310	300	298	254.3
4-Sep	269	250	253	263	245	318	320	323	321	314	327	333	295	323	301	333	318	312	271	261	221	169	236	244	301.1
5-Sep	213	226	232	205	184	197	186	167	179	191	190	189	186	180	161	170	179	179	174	181	170	219	247	232	184.2
6-Sep	309	358	18	37	1	18	118	121	134	124	173	302	282	332	60	140	148	219	229	226	234	248	258	254	228.3
7-Sep	243	252	256	230	242	223	185	176	207	173	189	197	201	174	163	135	176	233	275	261	263	218	217	184	208.2
8-Sep	183	179	224	237	224	225	200	166	170	175	170	170	185	274	5	358	360	351	330	254	261	224	233	267	196.9
9-Sep	219	253	238	UO	229	168	193	170	123	124	114	136	126	125	111	125	142	352	324	245	264	243	248	247	147.3
10-Sep	257	246	241	244	234	230	243	160	116	137	150	144	153	152	145	141	145	147	153	159	161	162	182	188	156.9
11-Sep	183	169	185	177	176	196	215	157	156	156	159	164	173	176	174	175	171	180	177	182	183	172	179	195	172.7
12-Sep	207	214	212	182	191	172	187	172	163	163	169	175	140	153	164	212	230	238	239	239	225	203	181	287	189.1
13-Sep	229	222	240	205	220	228	213	226	154	190	228	236	240	237	238	244	237	244	249	247	231	207	231	241	233.9
14-Sep	252	264	279	284	280	296	305	302	301	296	285	308	308	327	325	321	313	320	274	271	274	269	183	175	296.4
15-Sep	235	199	210	196	230	225	216	173	144	154	129	C	C	163	171	173	175	179	172	166	164	163	175	160	170.5
16-Sep	222	199	186	182	190	187	199	197	187	229	249	198	209	207	215	232	238	200	211	203	213	219	264	238	211.2
17-Sep	236	199	227	221	223	227	255	333	7	61	147	108	159	183	204	182	185	224	215	226	218	232	240	238	195.3
18-Sep	228	234	222	252	240	215	198	190	180	186	248	253	237	249	245	205	220	212	178	188	189	225	186	183	222.7
19-Sep	182	238	232	224	193	187	175	159	190	202	189	193	210	223	203	208	210	204	231	185	301	221	296	269	202.0
20-Sep	267	223	UO	258	249	258	230	171	99	68	36	42	359	4	8	358	359	331	347	249	254	209	225	210	340.3
21-Sep	203	258	220	214	194	195	197	177	176	149	147	190	189	188	190	194	192	187	180	176	171	169	173	193	184.3
22-Sep	195	196	201	216	208	211	204	207	151	179	190	187	184	186	182	183	177	179	178	176	171	174	182	162	182.5
23-Sep	177	189	180	179	185	182	193	161	151	149	162	152	164	162	161	162	170	169	165	165	165	159	152	152	163.3
24-Sep	155	155	161	174	165	163	164	166	167	176	170	176	215	233	237	200	190	180	196	225	243	247	234	178.7	
25-Sep	239	247	214	221	182	183	216	162	214	293	11	14	2	17	3	356	3	357	346	4	354	351	317	328	340.3
26-Sep	322	337	335	343	330	302	229	201	180	165	188	190	203	203	198	202	219	187	150	232	249	235	283	206	216.6
27-Sep	204	197	8	207	189	218	271	216	207	106	119	176	225	253	253	244	274	262	301	269	326	300	284	262	245.3
28-Sep	244	211	247	248	209	273	200	311	12	3	3	358	353	346	4	4	6	342	342	336	347	344	342	335	349.0
29-Sep	328	330	340	321	305	287	277	290	307	348	346	348	3	11	350	338	354	357	329	335	355	330	315	224	338.5
30-Sep	UO	188	207	223	222	203	175	224	198	230	75	149	141	168	143	147	153	179	226	247	246	243	240	223	177.6

226.8	218.4	222.3	220.0	218.0	220.8	220.2	192.3	177.3	175.6	184.1	189.1	200.0	203.2	197.6	194.9	198.2	211.6	211.5	216.2	216.0	209.0	218.6	217.0
Diurnal Average																							

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Fort McKay South - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 93 deg on Sep 19 21:00	Hours of Data: 715
Minimum Value: 8 deg on Sep 21 20:00	Hours of Missing Data: 5
Percentiles: P ₁ = 8 P ₁₀ = 13 Q ₁ = 17 Median = 25 Q ₃ = 35 P ₉₀ = 54 P ₉₉ = 86	Hours of Calibration: 2
	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-Sep	26	78	34	18	20	19	19	21	36	25	29	31	30	29	28	27	25	26	26	24	23	22	21	25	78
2-Sep	32	23	24	26	28	24	25	25	27	33	86	48	37	37	31	41	31	27	30	15	19	18	20	17	86
3-Sep	21	19	42	32	82	22	23	42	57	61	89	51	47	50	61	21	61	35	8	31	16	18	18	21	89
4-Sep	25	21	32	36	29	24	22	21	22	30	28	24	29	40	51	43	38	64	18	42	28	15	61	40	64
5-Sep	29	44	25	31	24	39	31	14	18	25	29	28	27	24	29	33	24	14	15	14	16	30	61	51	61
6-Sep	63	59	55	57	48	33	42	31	24	41	52	91	46	35	61	44	26	32	25	13	11	14	16	18	91
7-Sep	31	17	23	42	34	53	31	34	37	42	29	33	42	47	27	24	36	18	45	48	47	41	78	63	78
8-Sep	36	23	47	14	26	19	18	12	14	18	16	23	47	71	18	18	14	15	17	17	23	47	54	37	71
9-Sep	26	53	40	UO	17	20	22	11	30	24	25	37	35	37	24	49	33	93	13	15	40	15	11	34	93
10-Sep	42	17	15	15	14	19	10	66	34	24	26	21	18	16	22	18	17	14	11	8	10	11	15	12	66
11-Sep	11	10	13	9	10	15	54	29	13	14	14	18	14	14	15	16	14	13	10	10	11	11	10	21	54
12-Sep	14	14	44	24	28	26	12	12	14	16	19	19	17	18	23	40	27	19	16	15	23	28	37	40	44
13-Sep	72	28	27	21	17	26	28	38	34	26	29	34	32	29	30	31	30	28	32	32	30	20	27	23	72
14-Sep	28	30	28	26	28	30	29	38	29	31	35	31	37	40	25	27	23	21	20	15	17	71	60	53	71
15-Sep	29	25	29	22	17	13	24	15	18	24	25	C	C	21	15	14	13	11	11	10	9	8	11	10	29
16-Sep	32	34	28	25	34	34	32	42	52	32	31	68	52	38	34	35	32	24	28	12	17	88	53	59	88
17-Sep	40	28	31	59	29	33	54	78	72	62	30	33	37	27	26	18	15	26	19	19	51	18	56	54	78
18-Sep	39	16	16	22	18	29	26	20	23	25	29	35	26	28	31	25	26	25	14	18	18	49	81	17	81
19-Sep	21	41	28	34	14	12	19	11	18	24	23	26	30	41	47	54	33	24	26	34	93	37	22	36	93
20-Sep	61	71	UO	34	24	46	49	87	66	27	38	43	23	31	29	25	17	15	77	59	70	55	37	27	87
21-Sep	23	38	31	20	15	13	26	20	12	14	40	17	18	17	18	18	17	13	9	8	9	8	9	20	40
22-Sep	18	10	14	22	15	15	27	88	17	21	19	17	17	18	18	16	13	11	10	8	8	9	11	8	88
23-Sep	15	16	9	11	12	20	12	25	14	14	17	15	17	17	15	15	14	13	10	10	11	13	12	13	25
24-Sep	12	12	13	22	13	11	11	12	14	15	14	22	31	26	27	29	14	14	13	22	31	15	17	12	31
25-Sep	14	22	35	60	29	40	28	65	45	68	27	44	55	49	22	18	17	15	15	14	39	22	19	22	68
26-Sep	31	19	48	33	30	51	47	32	14	21	24	26	29	23	21	30	58	86	65	53	23	57	78	55	86
27-Sep	26	47	59	81	71	77	71	84	67	33	35	50	34	33	31	29	39	22	29	33	15	17	32	59	84
28-Sep	43	60	37	40	44	37	60	66	20	18	17	19	26	22	17	18	18	19	15	17	15	15	15	15	66
29-Sep	15	18	13	16	20	22	46	21	20	21	19	19	19	20	22	17	19	15	14	15	19	21	40	32	46
30-Sep	UO	14	21	38	52	63	26	33	35	68	64	28	25	27	23	16	15	15	16	8	11	16	32	24	68
	72	78	59	81	82	77	71	88	72	68	89	91	55	71	61	54	61	93	77	59	93	88	81	63	

Diurnal Maximum

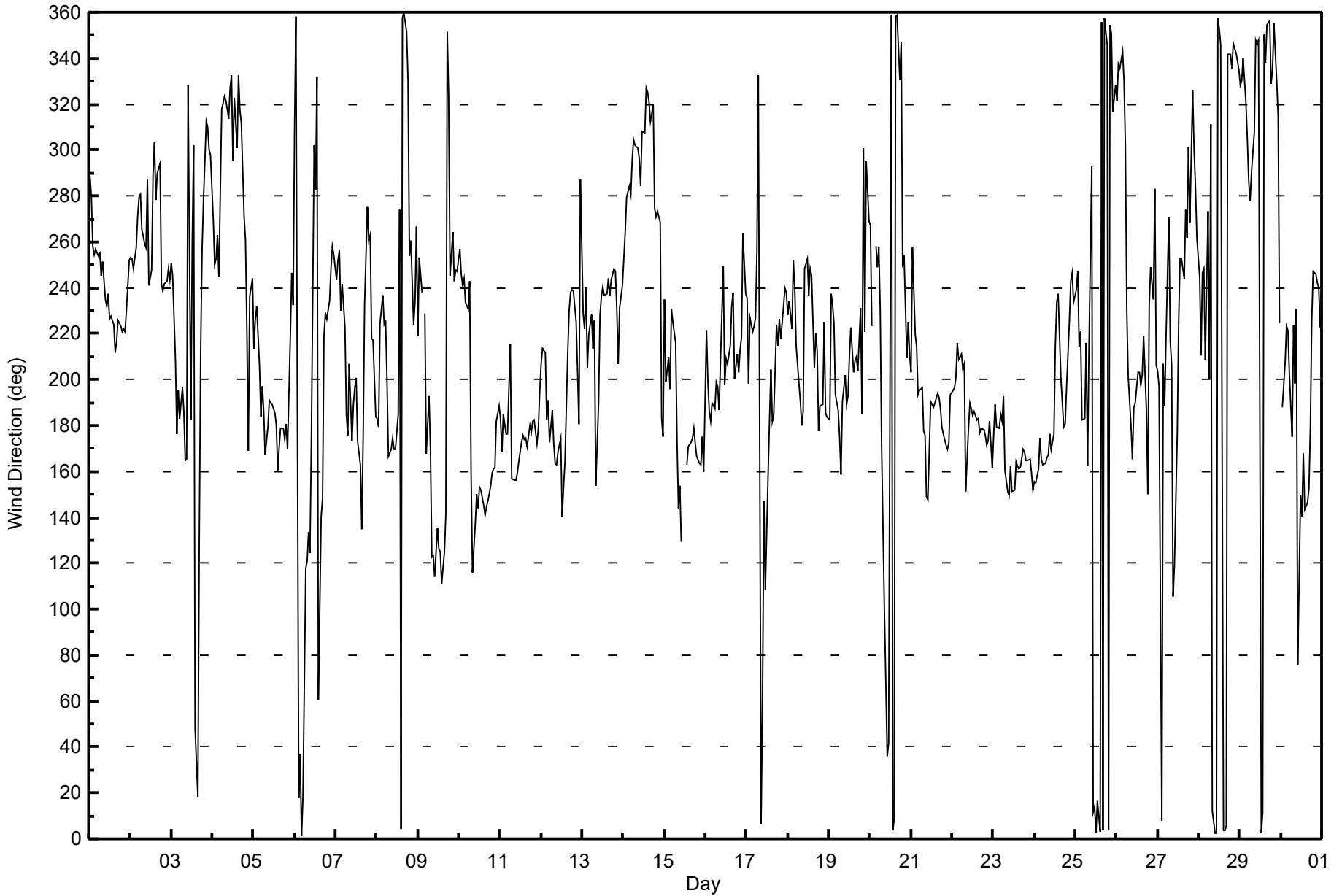
C - Calibration

UO - Unstable Operation



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Fort McKay South - September 2023





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

**AMS14
ANZAC
SEPTEMBER 2023**

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

October 30, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ANZAC (AMS14)
 SEPTEMBER 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	685	34	35	99.86	8.1	0	1.3	0
TRS(ppb) Average	684	35	36	99.86	1.6	0	0.8	0
THC(ppm) Average	683	34	37	99.58	3.3	-	2.3	-
NMHC(ppm) Average	683	34	37	99.58	0.302	-	0.08	-
CH4(ppm) Average	683	34	37	99.58	3.3	-	2.2	-
NO2(ppb) Average	683	36	37	99.86	9.4	0	4.2	-
NO(ppb) Average	683	36	37	99.86	14.3	-	1.3	-
NOX(ppb) Average	683	36	37	99.86	18.7	-	4.4	-
O3(ppb) Average	591	30	129	86.25	50.7	0	37.6	-
PM2.5(ug/m3) Average	718	2	2	100	482.8	111	326.3	13
AT 2m(C) Average	720	0	0	100	25.2	-	20.1	-
RH(%) Average	716	0	4	99.44	100	-	93.8	-
WS(km/h) Average	720	0	0	100	28	-	18	-
WD(deg) Average	720	0	0	100	-	-	-	-
Leaf Wetness (% of range) Average	720	0	0	100	56.5	-	17.5	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ANZAC (AMS14)
 SEPTEMBER 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	0.47	0.6	-	0	0.1	0.2	0.3	0.5	0.9	8.1
TRS(ppb) Average	684	0.24	0.2	-	0.1	0.1	0.1	0.2	0.2	0.4	1.6
THC(ppm) Average	683	2.1	0.1	-	2	2	2	2.1	2.1	2.2	3.3
NMHC (ppm) Average	683	0.006	0.03	-	0	0	0	0	0	0	0.302
CH4(ppm) Average	683	2.1	0.1	-	2	2	2	2.1	2.1	2.2	3.3
NO2(ppb) Average	683	1.86	1.4	-	0.2	0.5	0.8	1.4	2.4	3.9	9.4
NO(ppb) Average	683	0.45	1.1	-	0	0	0	0.1	0.3	1.3	14.3
NOX(ppb) Average	683	2.31	2.1	-	0.3	0.6	0.9	1.6	2.9	4.7	18.7
O3(ppb) Average	591	23.91	11.5	-	0	8.1	14.2	24.2	33.1	38.4	50.7
PM2.5(ug/m3) Average	718	47.72	76.7	-	2.3	6.3	10.8	18.5	50.4	131	482.8
Temperature 2 m (C) Average	720	13.08	5.4	-	1.6	5.9	8.5	13.3	17.2	20.5	25.2
Relative Humidity (%) Average	716	66.82	19.5	-	26.9	40	51.6	66.3	83.3	94.1	100
Wind Speed 20 m (km/h) Average	720	10.9	5	-	1	5	7	11	14	17	28
Wind Direction 20 m (deg) Average	720	193.8	-	-	-	-	-	-	-	-	-
Leaf Wetness (% of range) Average	720	2.86	8.6	-	0	0	0	0	0	9.5	56.5

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ANZAC (AMS14)
SEPTEMBER 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2	20 Sep 2023 08:00	20 Sep 2023 08:00	1	Maintenance - reinitiated daily QA check
TRS	20 Sep 2023 09:00	20 Sep 2023 09:00	1	Maintenance - reinitiated daily QA check
THC/NMHC/CH4	20 Sep 2023 08:00	20 Sep 2023 08:00	1	Maintenance - reinitiated daily QA check
THC/NMHC/CH4	25 Sep 2023 12:00	25 Sep 2023 13:00	2	Maintenance - replaced support gas cylinder
NO2	20 Sep 2023 09:00	20 Sep 2023 09:00	1	Maintenance - reinitiated daily QA check
O3	01 Sep 2023 14:00	05 Sep 2023 15:00	98	Unstable Operation - disconnected sample line
O3	20 Sep 2023 10:00	20 Sep 2023 10:00	1	Maintenance - reinitiated daily QA check
Relative Humidity	06 Sep 2023 08:00	07 Sep 2023 02:00	4	Sensor operated out of range



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb

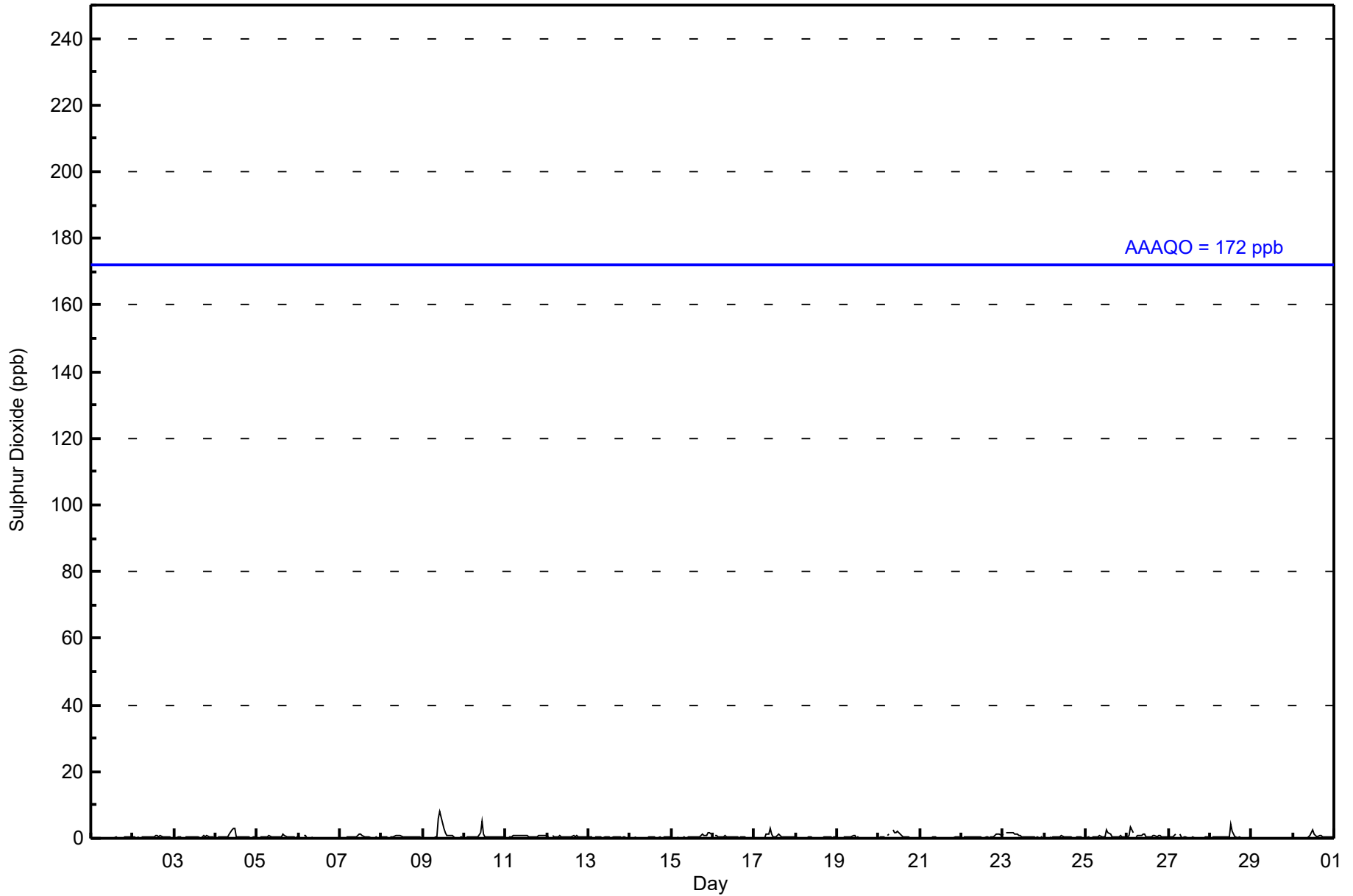
Anzac - September 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:														720							
Maximum Value: 8.1 ppb on Sep 9 11:00		Maximum Daily Average: 1.3 ppb on Sep 9														Hours of Data:		685									
Minimum Value: 0.0 ppb on Sep 6 14:00		Minimum Daily Average: 0.0 ppb on Sep 29														Hours of Missing Data:		35									
Maximum Diurnal Average: 1.1 ppb at hour 11		Minimum Diurnal Average: 0.3 ppb at hour 1														Hours of Calibration:		34									
Monthly Average: 0.47 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.2 Median = 0.3 Q ₃ = 0.5 P ₉₀ = 0.9 P ₉₉ = 3.0														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-Sep	0.2	0.2	0.1	Z	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.1	0.1	0.0	0.1	0.2	0.2	0.3	0.3	0.5	0.2	0.5	
2-Sep	0.5	0.4	0.2	0.2	Z	0.5	0.5	0.6	0.5	0.4	0.6	0.5	0.5	0.6	0.7	0.6	0.7	0.5	0.4	0.4	0.2	0.3	0.1	0.2	0.4	0.7	
3-Sep	0.2	0.2	0.4	0.4	0.5	Z	0.6	0.4	0.3	0.5	0.5	0.4	0.5	0.3	0.3	0.2	0.3	0.7	0.5	0.7	0.4	0.3	0.4	0.4	0.4	0.7	
4-Sep	Z	0.3	0.4	0.3	0.2	0.2	0.3	0.4	1.2	2.7	2.8	2.8	0.3	0.3	0.3	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.3	0.4	0.6	2.8	
5-Sep	0.3	Z	0.3	0.4	0.4	0.3	0.5	0.7	0.6	0.3	0.3	0.3	0.3	0.6	0.6	1.1	1.0	0.5	0.5	0.4	0.6	0.3	0.2	0.3	0.5	1.1	
6-Sep	0.2	0.4	Z	1.0	0.8	0.1	0.2	0.2	0.2	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.2	0.2	1.0	
7-Sep	0.1	0.2	0.2	Z	0.3	0.2	0.2	0.2	0.3	0.5	0.9	1.1	1.2	0.8	0.4	0.4	0.4	0.3	0.2	0.2	0.1	0.2	0.1	0.2	0.4	1.2	
8-Sep	0.2	0.4	0.5	0.6	Z	0.5	0.4	0.5	0.8	0.7	0.8	0.7	0.3	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.4	0.3	0.3	0.2	0.4	0.8	
9-Sep	0.2	0.1	0.1	0.1	0.2	Z	0.1	0.3	0.5	5.8	8.1	4.7	2.9	1.5	0.9	0.7	1.0	0.7	0.3	0.1	0.1	0.2	0.5	0.3	1.3	8.1	
10-Sep	Z	0.4	0.5	0.5	0.2	0.2	0.3	0.5	0.5	1.5	5.0	1.2	0.5	0.5	0.4	0.5	0.6	0.4	0.3	0.5	0.3	0.3	0.4	0.4	0.7	5.0	
11-Sep	0.2	Z	0.2	0.3	0.7	0.7	0.9	0.9	1.0	1.1	0.8	0.9	0.8	0.6	0.5	0.4	0.4	0.3	0.4	0.9	0.9	0.7	0.9	0.7	0.7	1.1	
12-Sep	0.7	0.5	Z	0.7	0.4	0.5	0.6	0.7	0.6	0.3	0.3	0.3	0.4	0.5	0.5	0.7	0.5	0.7	0.4	0.3	0.2	0.4	0.3	0.4	0.5	0.7	
13-Sep	0.5	0.4	0.2	Z	0.3	0.4	0.3	0.3	0.1	0.2	0.3	0.4	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.3	0.3	0.1	0.2	0.3	0.5	
14-Sep	0.1	0.1	0.2	0.2	Z	0.1	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	0.3	0.2	0.2	0.3	0.2
15-Sep	0.1	0.1	0.2	0.1	0.3	Z	0.2	0.4	0.2	0.1	0.4	0.6	0.4	0.3	0.3	0.4	0.5	0.7	1.2	0.9	1.0	1.6	1.6	1.1	0.5	1.6	
16-Sep	Z	0.7	0.7	0.6	0.5	0.4	0.3	0.7	0.6	0.4	0.3	0.3	0.4	0.6	0.4	0.2	0.3	0.5	0.3	0.2	0.0	0.0	0.0	0.0	0.4	0.7	
17-Sep	0.0	Z	0.0	0.0	0.0	0.0	0.0	1.1	1.1	3.2	1.1	0.3	0.6	0.8	1.2	0.9	0.4	0.5	0.5	0.4	0.4	0.4	0.5	0.4	0.6	3.2	
18-Sep	0.2	0.3	Z	0.2	0.2	0.1	0.1	0.3	0.4	0.4	0.1	0.1	0.0	0.1	0.0	0.0	0.3	0.5	0.5	0.5	0.2	0.2	0.4	0.5	0.3	0.5	
19-Sep	0.2	0.1	0.1	Z	0.5	0.4	0.4	0.6	0.5	0.9	0.8	0.0	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.2	0.9	
20-Sep	0.1	0.2	0.5	0.5	Z	0.7	1.2	M	2.6	1.6	1.9	1.9	1.2	0.7	0.5	0.5	0.4	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.7	2.6	
21-Sep	0.0	0.0	0.0	0.0	0.1	Z	0.1	0.2	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.2	0.3	0.4	0.5	0.4	0.1	0.5	
22-Sep	Z	0.3	0.5	0.5	0.5	0.4	0.5	0.6	0.5	0.6	0.4	0.4	0.2	0.2	0.2	0.3	0.1	0.3	0.5	0.9	1.2	1.2	1.1	0.9	0.5	1.2	
23-Sep	1.2	Z	1.8	1.9	1.8	1.8	1.6	1.4	1.5	1.0	0.8	0.5	0.4	0.5	0.4	0.3	0.4	0.3	0.3	0.2	0.2	0.1	0.3	0.2	0.8	1.9	
24-Sep	0.2	0.3	Z	0.2	0.1	0.2	0.3	0.3	0.4	0.6	0.7	0.5	0.3	0.4	0.4	0.3	0.1	0.1	0.2	0.3	0.2	0.3	0.2	0.1	0.3	0.7	
25-Sep	0.1	0.3	0.5	Z	0.5	0.4	0.3	0.5	0.8	0.5	0.4	0.3	2.5	1.6	1.3	0.5	0.3	0.4	0.4	0.5	0.8	0.4	0.3	0.4	0.6	2.5	
26-Sep	0.4	0.8	3.3	1.8	Z	0.4	0.8	1.0	1.0	1.3	1.1	0.6	0.5	0.6	0.5	0.7	0.8	0.5	0.7	0.6	0.4	0.3	0.4	0.5	0.8	3.3	
27-Sep	0.4	0.3	0.3	0.9	1.1	Z	1.1	0.5	0.2	0.4	0.6	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.3	0.3	0.4	0.4	1.1	
28-Sep	Z	0.3	0.3	0.4	0.3	0.4	0.5	0.5	0.5	0.6	0.5	0.4	4.1	2.1	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.3	0.6	4.1	
29-Sep	0.1	Z	0.1	0.2	0.1	0.1	0.0	0.1	0.1	0.1	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	0.2	
30-Sep	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.8	2.4	1.2	1.0	0.6	0.9	0.9	0.5	0.3	0.3	0.3	0.3	0.3	0.4	0.5	2.4	
																								Diurnal Average			
																								Diurnal Maximum			
																								0.3 0.3 0.5 0.5 0.4 0.4 0.4 0.5 0.6 0.9 1.1 0.8 0.7 0.5 0.4 0.4 0.4 0.3 0.3 0.3 0.3 0.3 0.4 0.4			
																								1.2 0.8 3.3 1.9 1.8 1.8 1.6 1.4 2.6 5.8 8.1 4.7 4.1 2.1 1.3 1.1 1.0 0.7 1.2 0.9 1.2 1.6 1.6 1.1			
Z - zerospan C - Calibration M - Maintenance																											
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb																											



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Anzac - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Anzac - September 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: 720



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Anzac - September 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	1	1	6	5	21	105	69	51	59	59	72	143	39	40	10	4	685
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	1	1	6	5	21	105	69	51	59	59	72	143	39	40	10	4	685

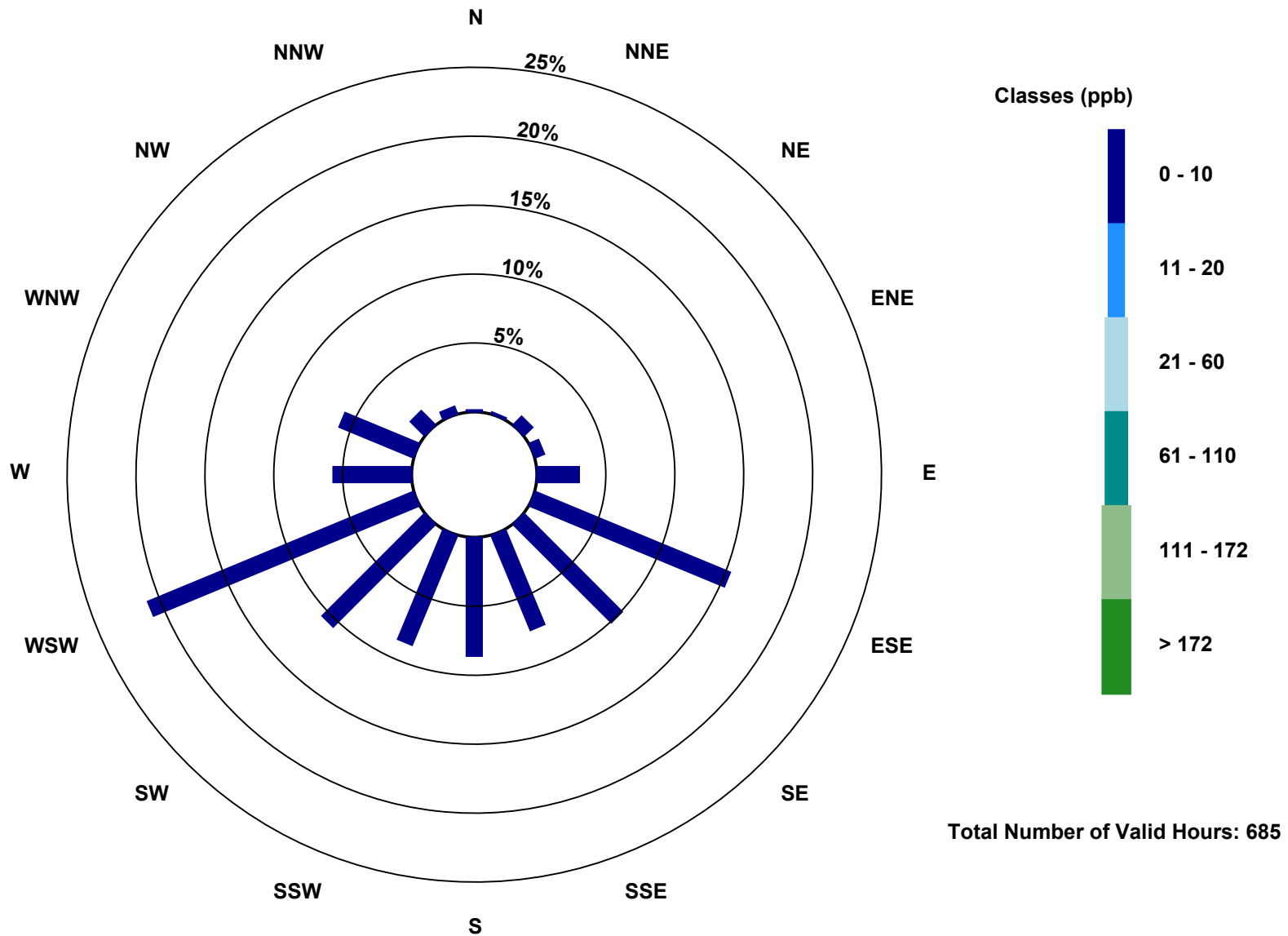
Total Number of Valid Hours: 685

Total Number of Hours: 720

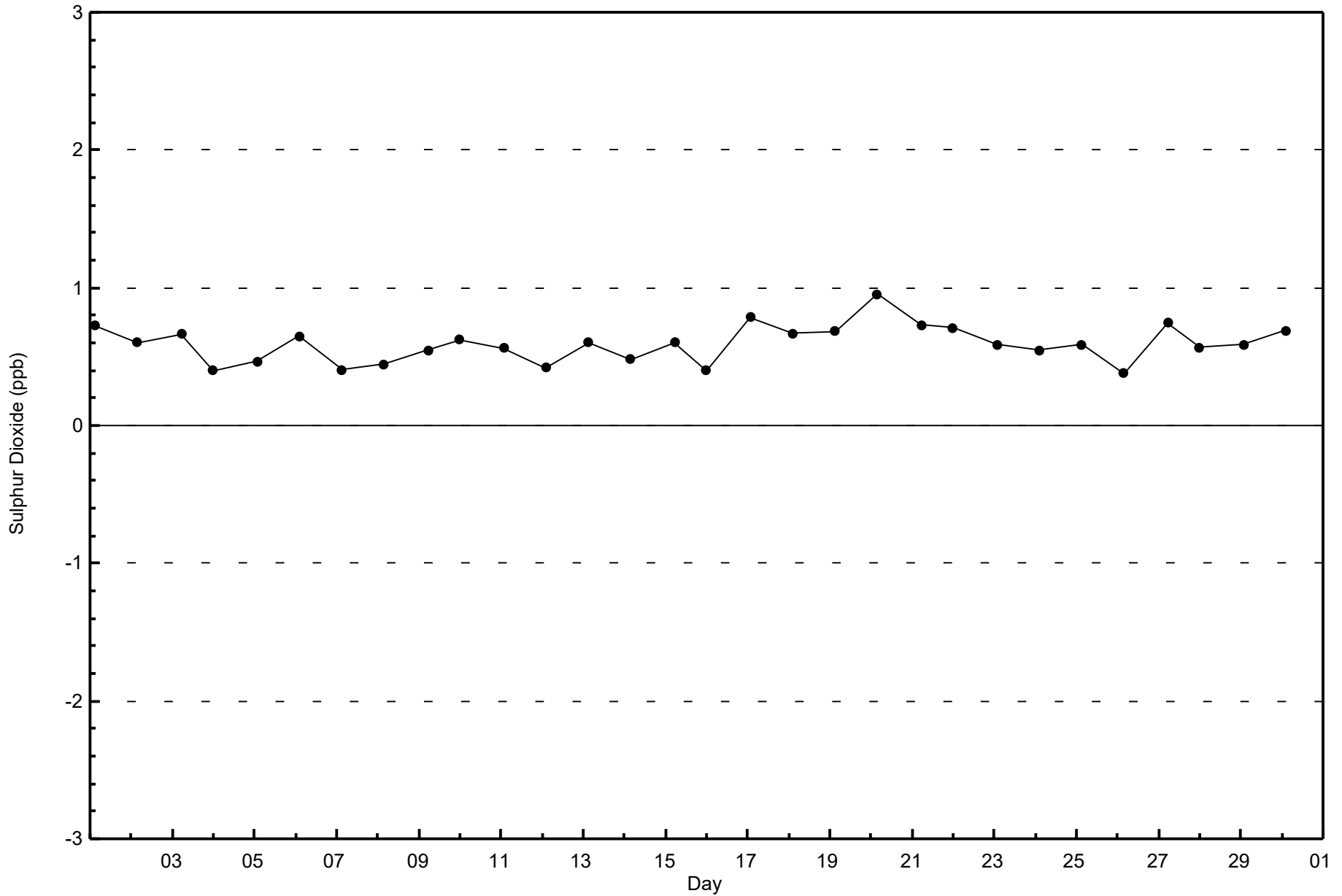


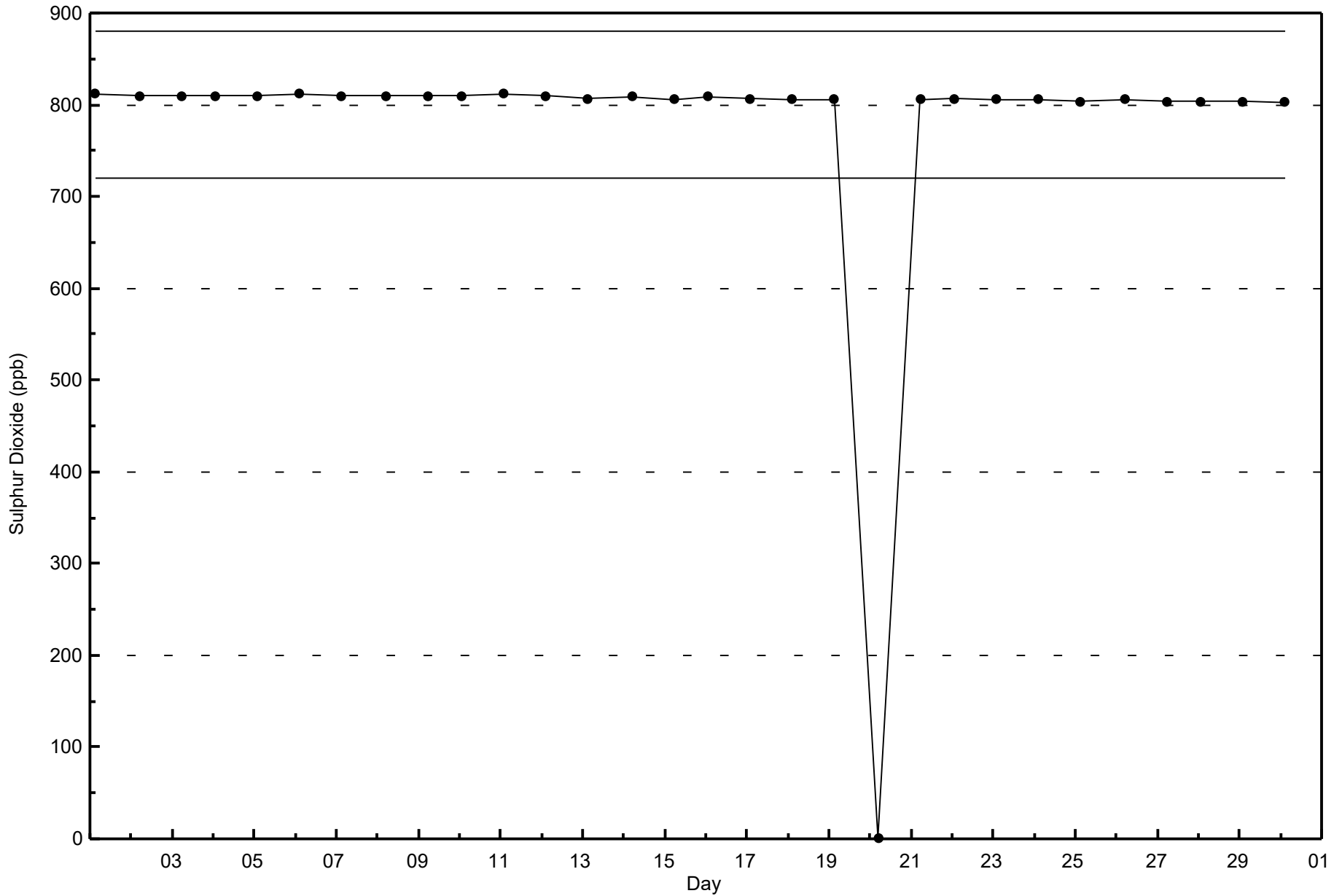
Wood Buffalo Environmental Association
Wind Rose Sep 2023

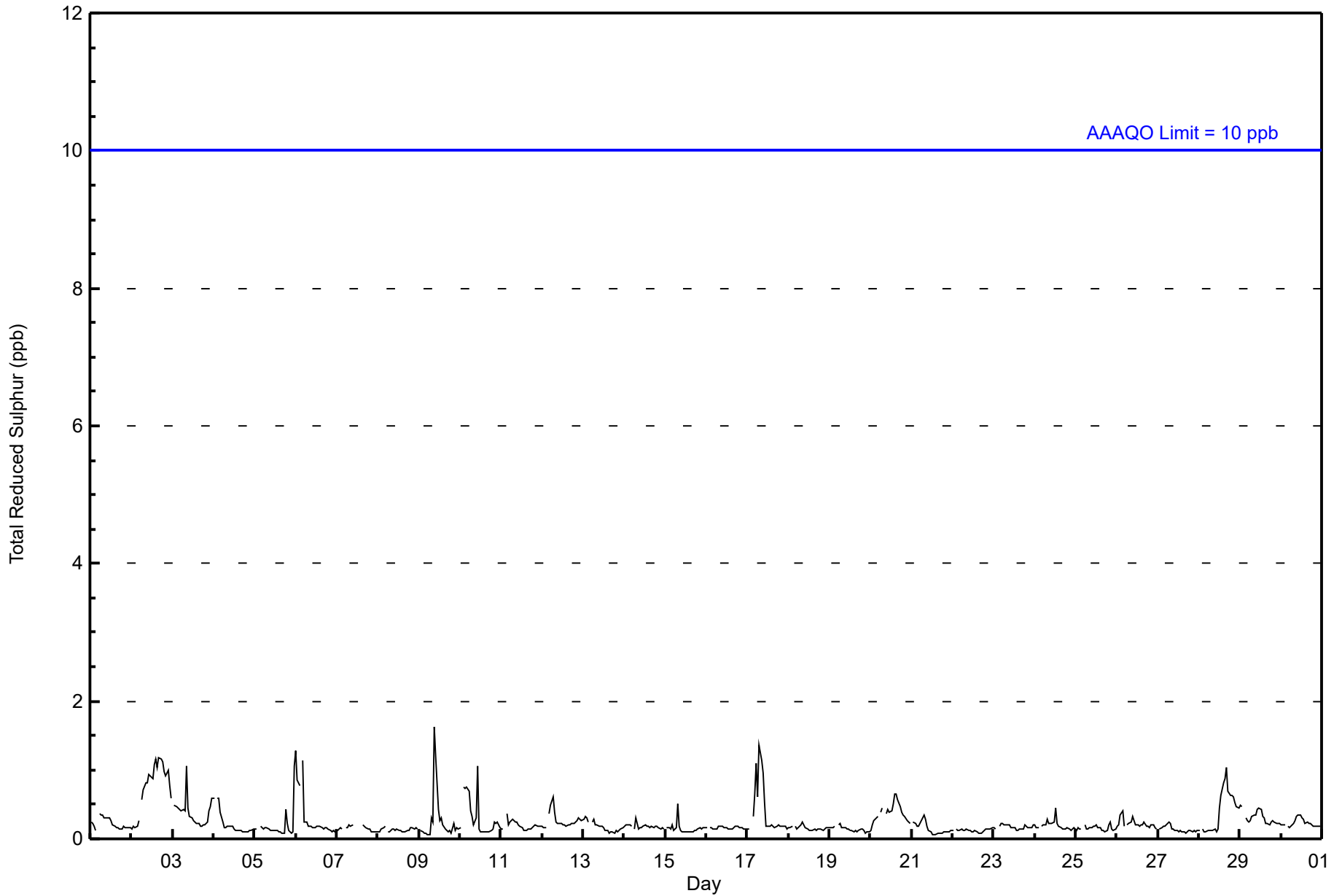
Sulphur Dioxide (SO₂) - ppb
Anzac



Total Number of Valid Hours: 685









Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Reduced Sulphur (TRS) - ppb
Anzac - September 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	684	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: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Anzac - September 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	1	1	6	5	21	107	71	51	60	57	72	141	38	41	8	4	684
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	1	1	6	5	21	107	71	51	60	57	72	141	38	41	8	4	684

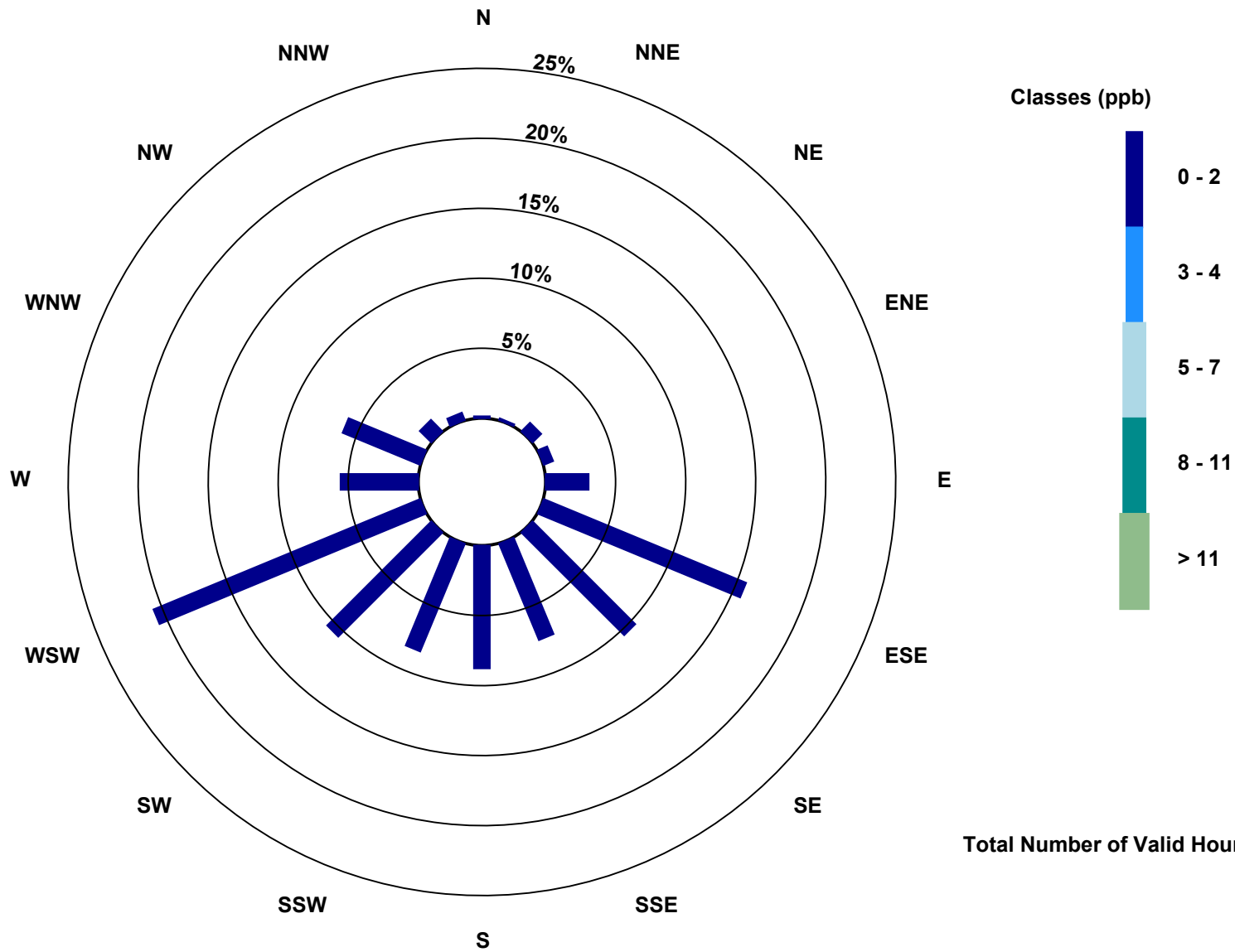
Total Number of Valid Hours: 684

Total Number of Hours: 720

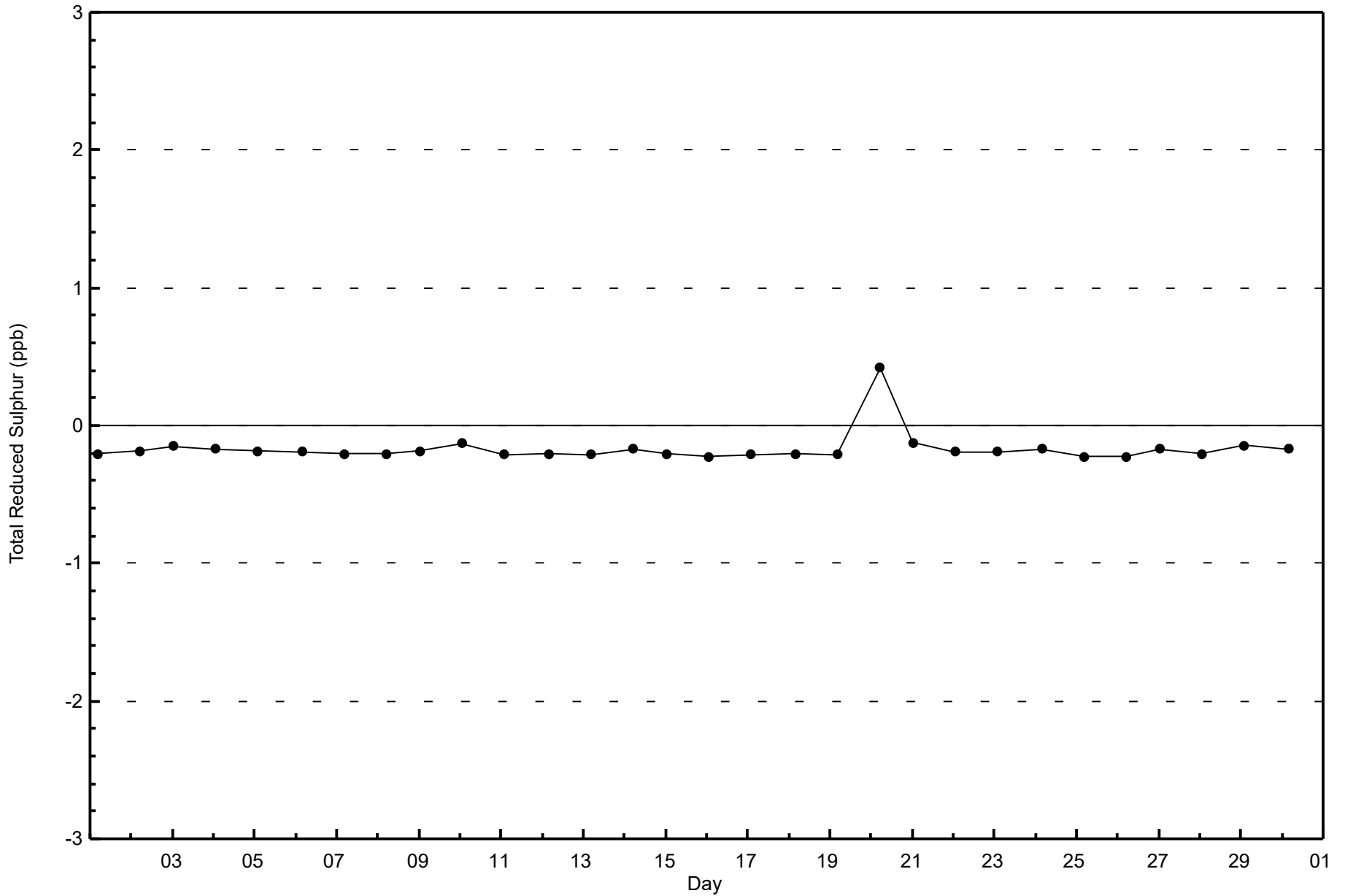


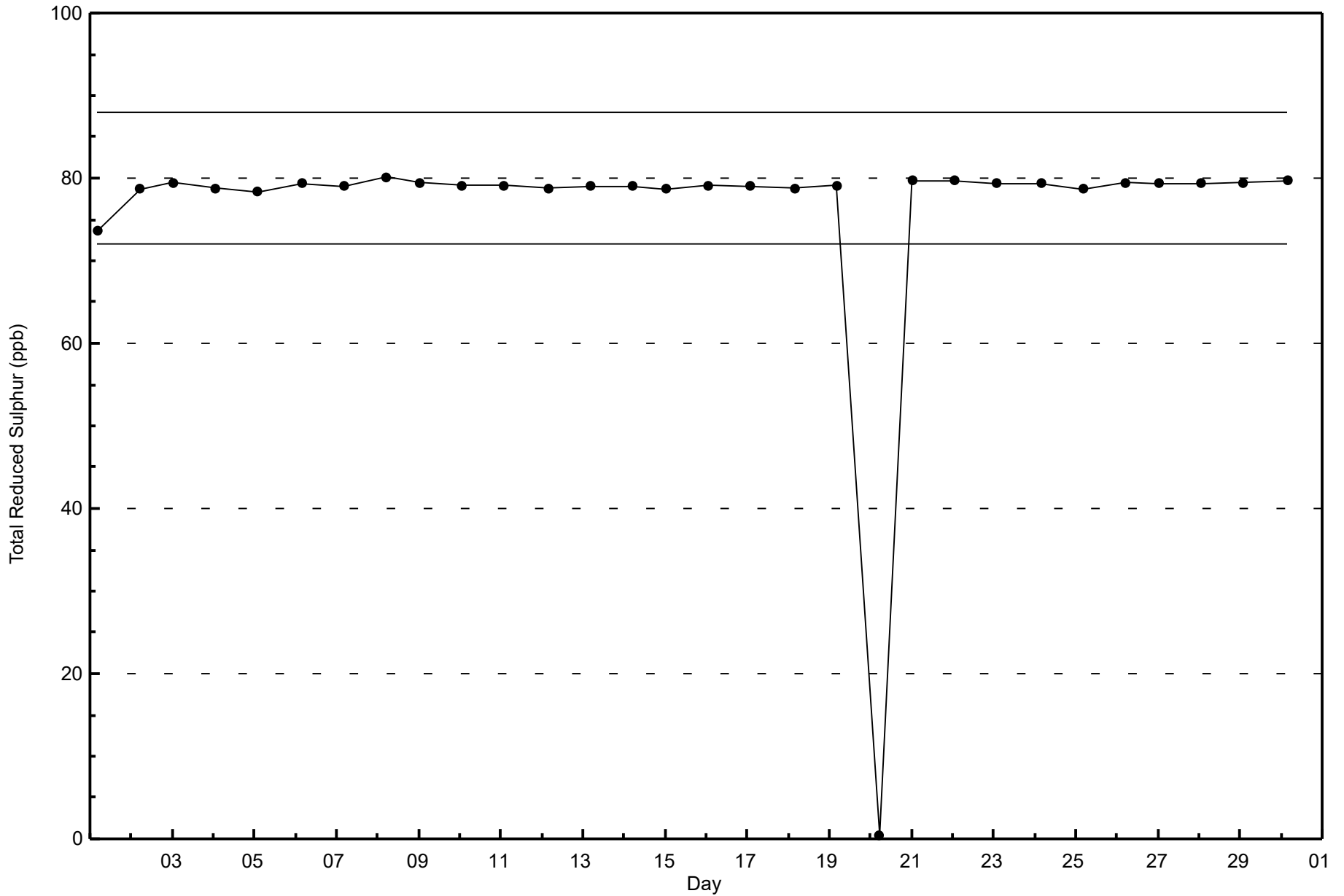
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Total Reduced Sulphur (TRS) - ppb
Anzac



Total Number of Valid Hours: 684

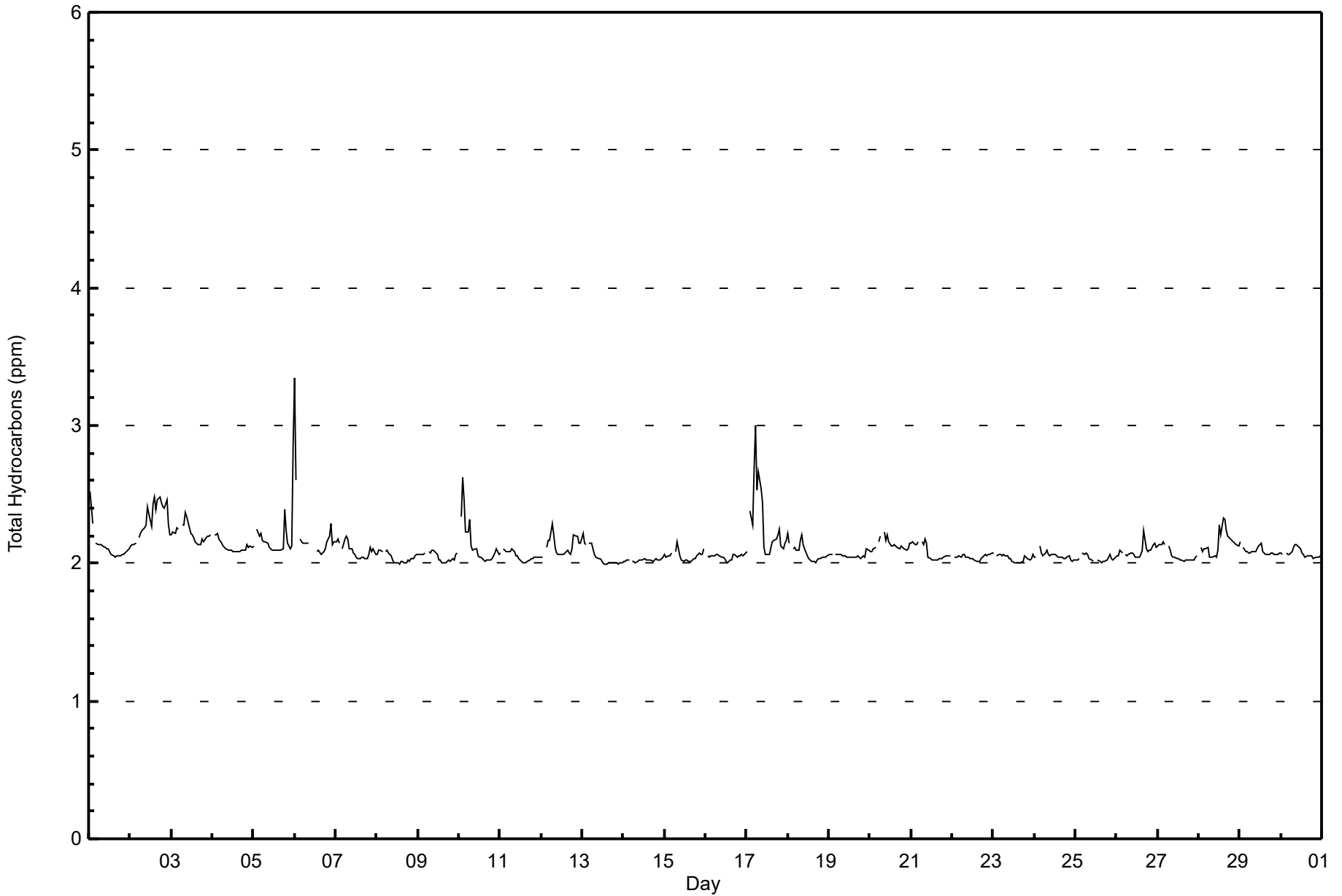






Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Anzac - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Anzac - September 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	228	33.38	33.38
2.1 - 3.0	454	66.47	99.85
3.1 - 10.0	1	0.15	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 683

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Total Hydrocarbons (THC) - ppm
Anzac - September 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	3	3	8	27	29	18	23	23	23	59	7	2	1	2	228
2.1 - 3.0	1	1	3	1	12	77	40	33	36	36	49	84	32	38	9	2	454
3.1 - 10.0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	1	1	6	4	21	104	69	51	59	59	72	143	39	40	10	4	683

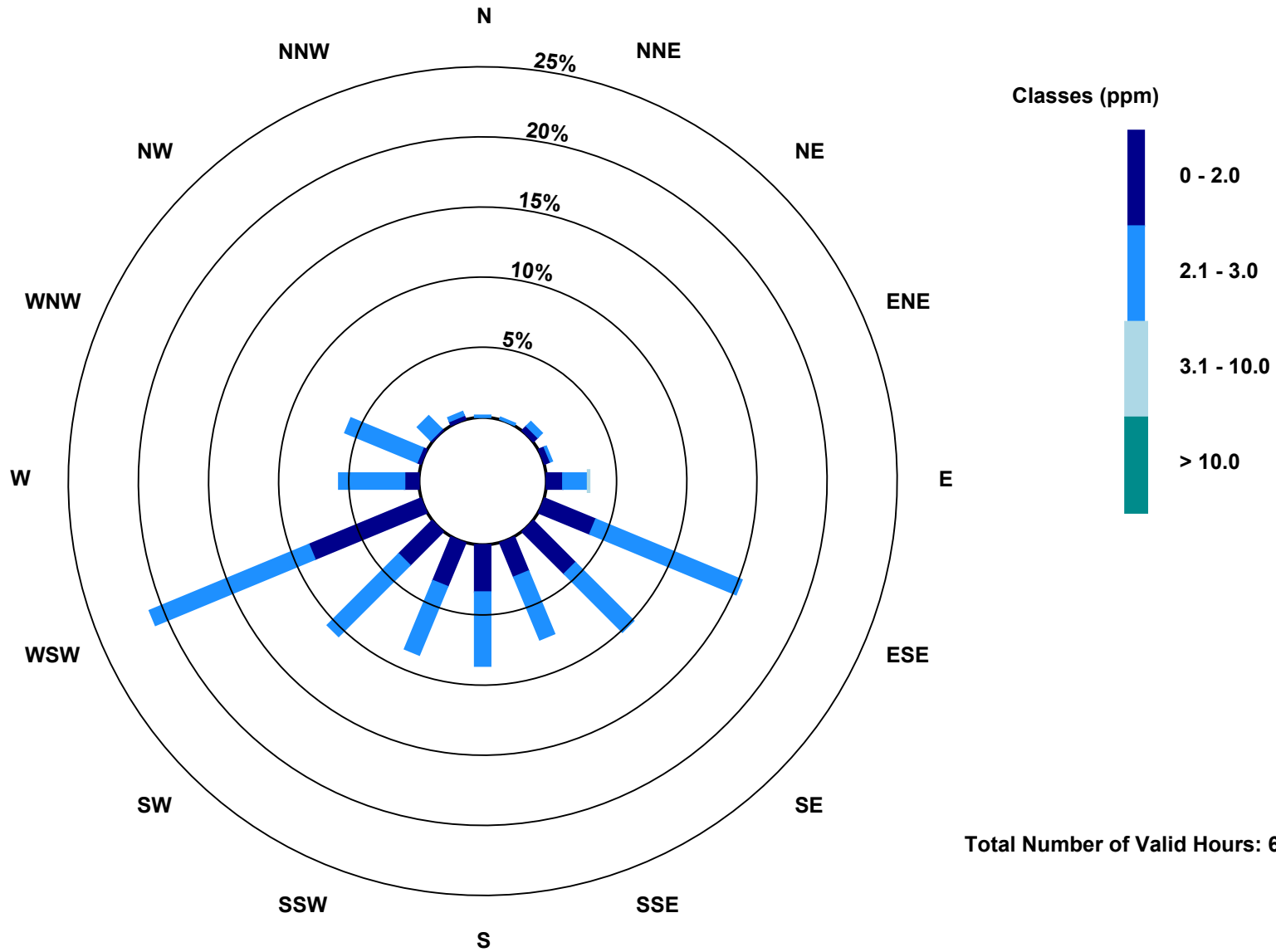
Total Number of Valid Hours: 683

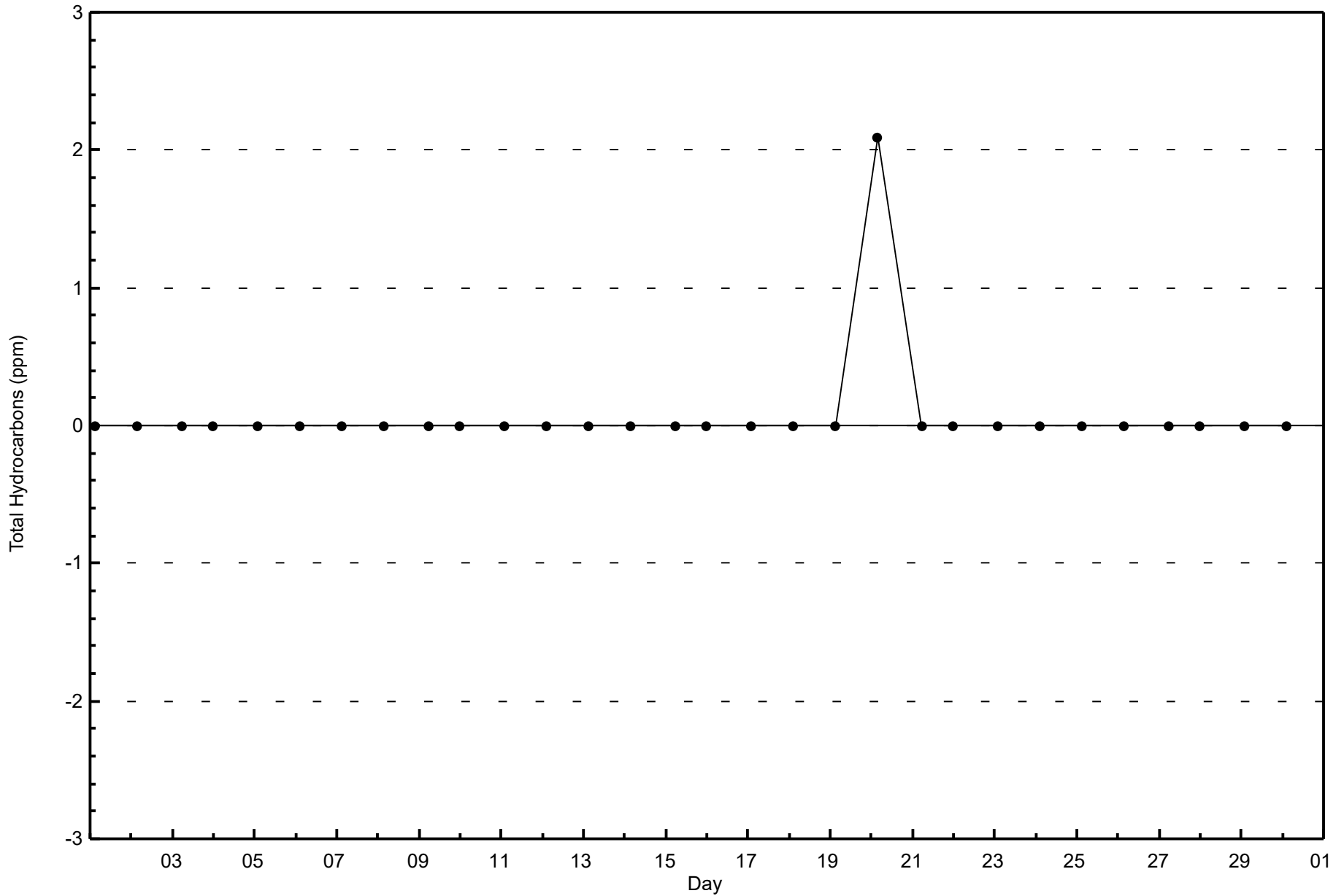
Total Number of Hours: 720

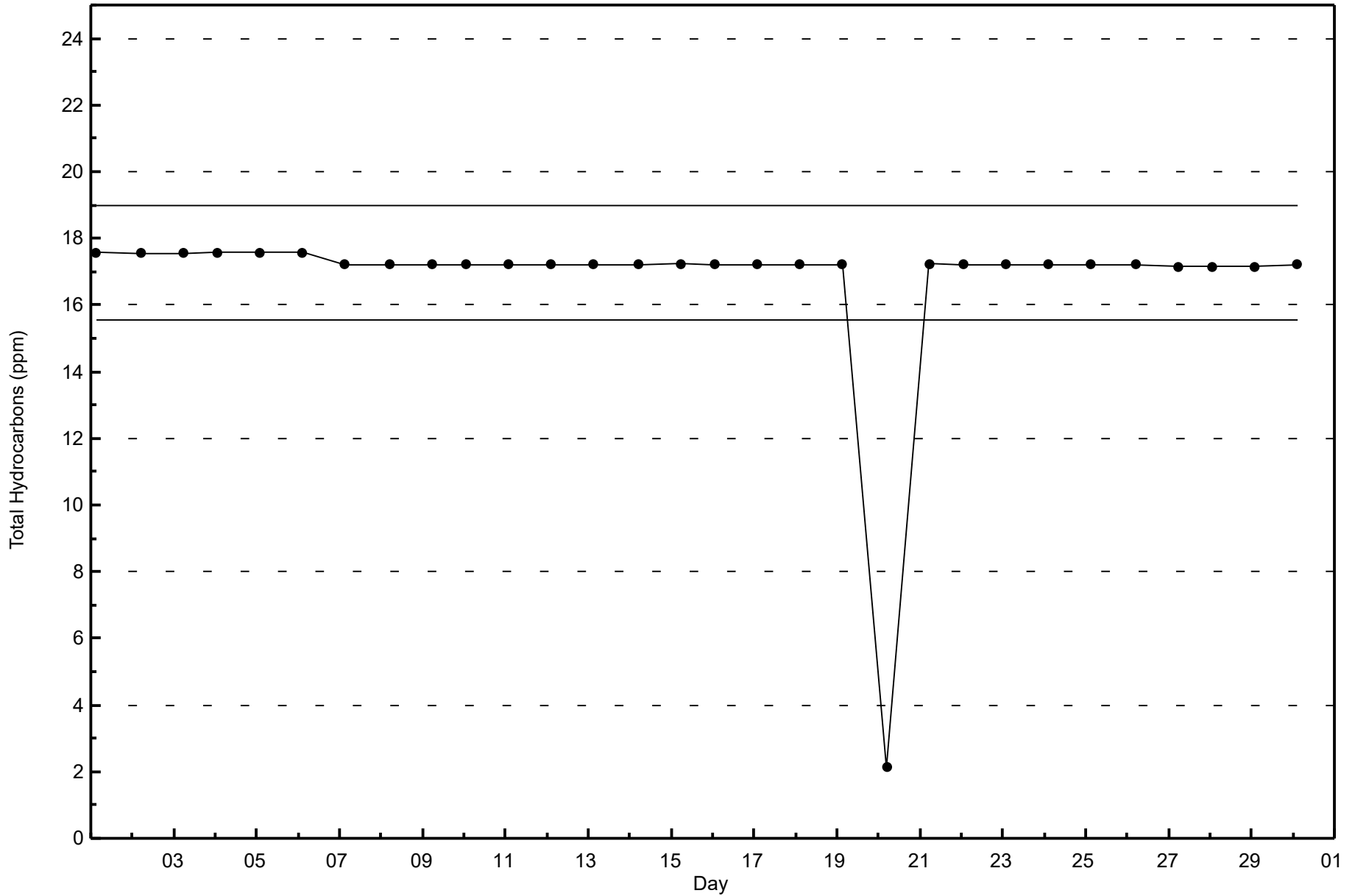


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Total Hydrocarbons (THC) - ppm
Anzac

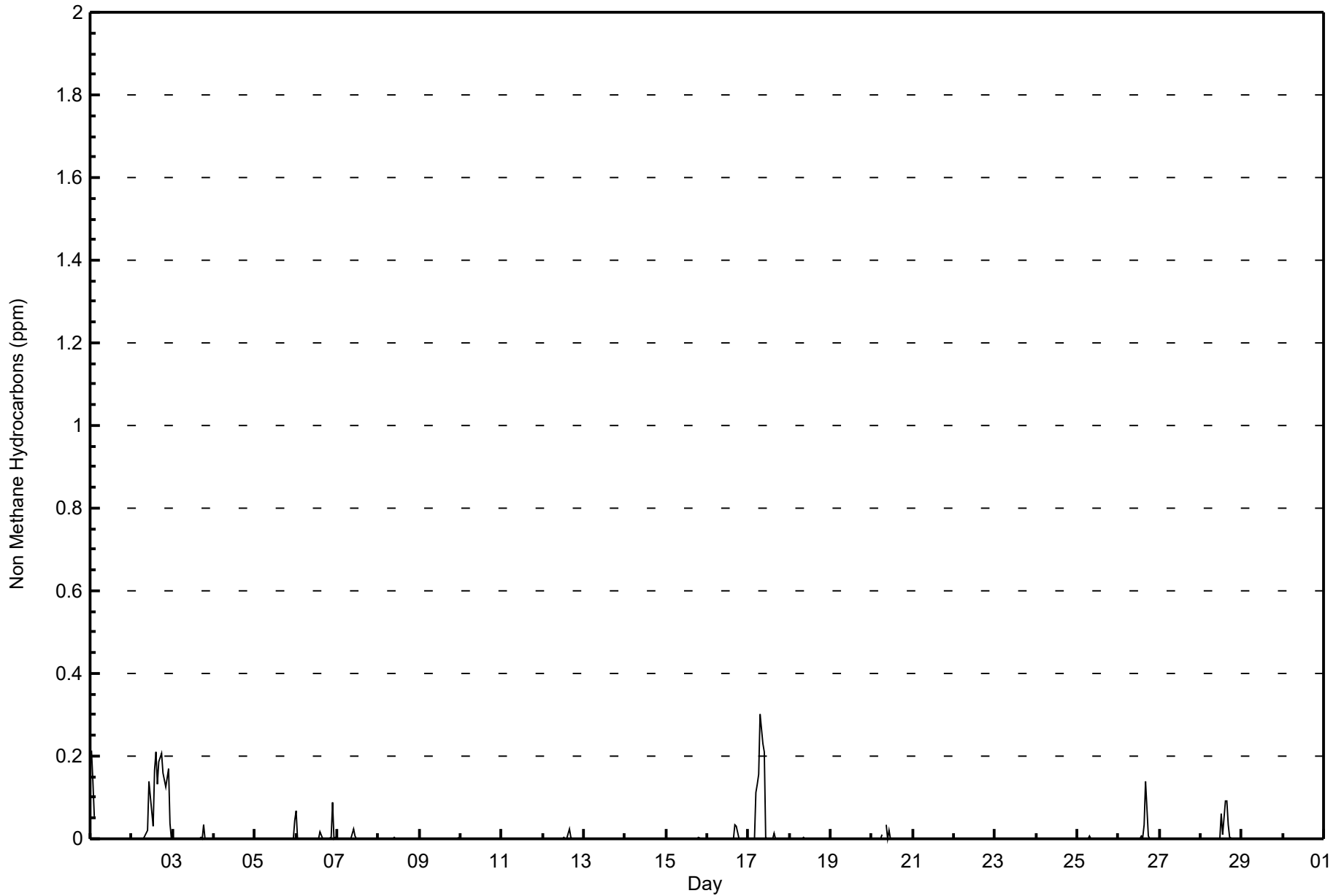








Maximum Value: 0.302 ppm on Sep 17 08:00		Maximum Daily Average: 0.080 ppm on Sep 2		Hours in Service:	720																					
Minimum Value: 0.000 ppm on Sep 1 05:00		Minimum Daily Average: 0.000 ppm on Sep 4		Hours of Data:	683																					
Maximum Diurnal Average: 0.013 ppm at hour 17		Minimum Diurnal Average: 0.000 ppm at hour 4		Hours of Missing Data:	37																					
Monthly Average: 0.006 ppm		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.0 P ₉₉ = 0.2		Hours of Calibration:	34																					
				Percent Operational Time:	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-Sep	0.214	0.140	0.054	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	0.018	0.214
2-Sep	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.012	0.021	0.138	0.103	0.031	0.167	0.210	0.134	0.186	0.206	0.161	0.143	0.126	0.170	0.037	0.000	0.080	0.210
3-Sep	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	0.003	0.000	0.035	0.000	0.000	0.000	0.000	0.002	0.035	
4-Sep	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-Sep	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	0.045	0.002	0.045
6-Sep	0.068	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	C	C	C	C	0.000	0.017	0.000	0.000	0.000	0.000	0.000	0.004	0.089	0.000	0.002	0.009	0.089
7-Sep	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.024	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	0.001	0.024	
8-Sep	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003
9-Sep	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	0.002	0.000	0.002
10-Sep	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-Sep	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-Sep	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.002	0.025	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.025
13-Sep	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
14-Sep	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-Sep	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	0.002	0.000	0.000	0.000	0.000	0.000	0.002
16-Sep	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	0.034	0.031	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.034	
17-Sep	0.000	Z	0.000	0.000	0.111	0.131	0.156	0.302	0.229	0.210	0.005	0.000	0.000	0.000	0.015	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.050	0.302	
18-Sep	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005
19-Sep	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
20-Sep	0.000	0.000	0.000	0.000	Z	0.000	0.010	M	0.035	0.000	0.021	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.003	0.035	
21-Sep	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
22-Sep	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
23-Sep	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
24-Sep	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
25-Sep	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.006	0.000	0.000	0.000	M	M	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006
26-Sep	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.002	0.036	0.137	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.137	
27-Sep	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	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001
28-Sep	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.060	0.009	0.092	0.090	0.034	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.012	0.092	
29-Sep	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001
30-Sep	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
																								Diurnal Average		
																								Diurnal Maximum		
																								Z - zerospan C - Calibration M - Maintenance		





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Anzac - September 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	635	92.97	92.97
0.006 - 0.05	23	3.37	96.34
0.06 - 0.1	14	2.05	98.39
> 0.1	11	1.61	100.00

Total Number of Valid Hours: 683

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm
Anzac - September 2023

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	1	1	6	4	20	97	69	51	57	55	69	123	32	36	10	4	635
0.006 - 0.05	0	0	0	0	0	1	0	0	1	4	2	10	3	2	0	0	23
0.06 - 0.1	0	0	0	0	1	2	0	0	1	0	1	5	2	2	0	0	14
> 0.1	0	0	0	0	0	4	0	0	0	0	0	5	2	0	0	0	11
Totals	1	1	6	4	21	104	69	51	59	59	72	143	39	40	10	4	683

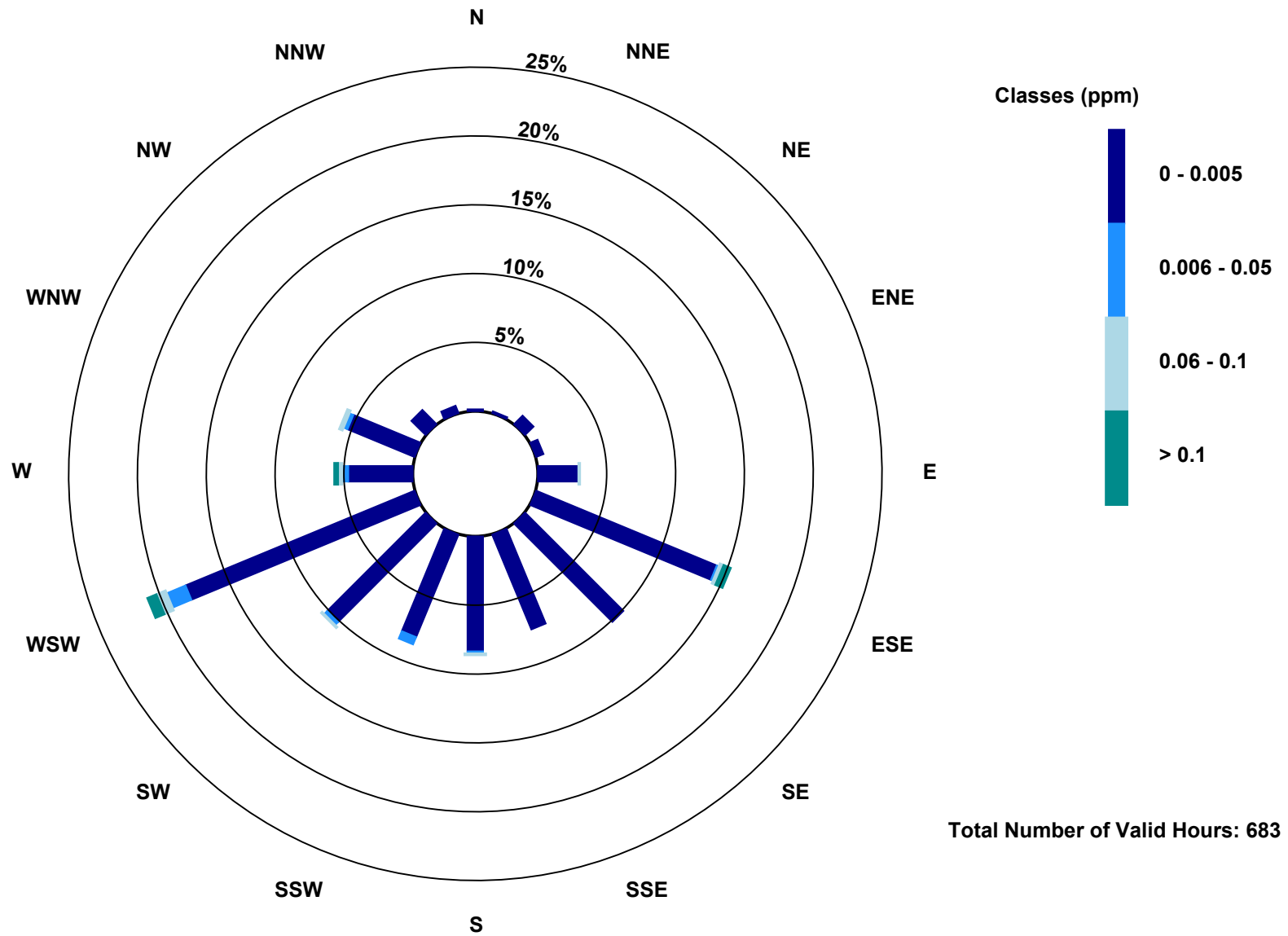
Total Number of Valid Hours: 683

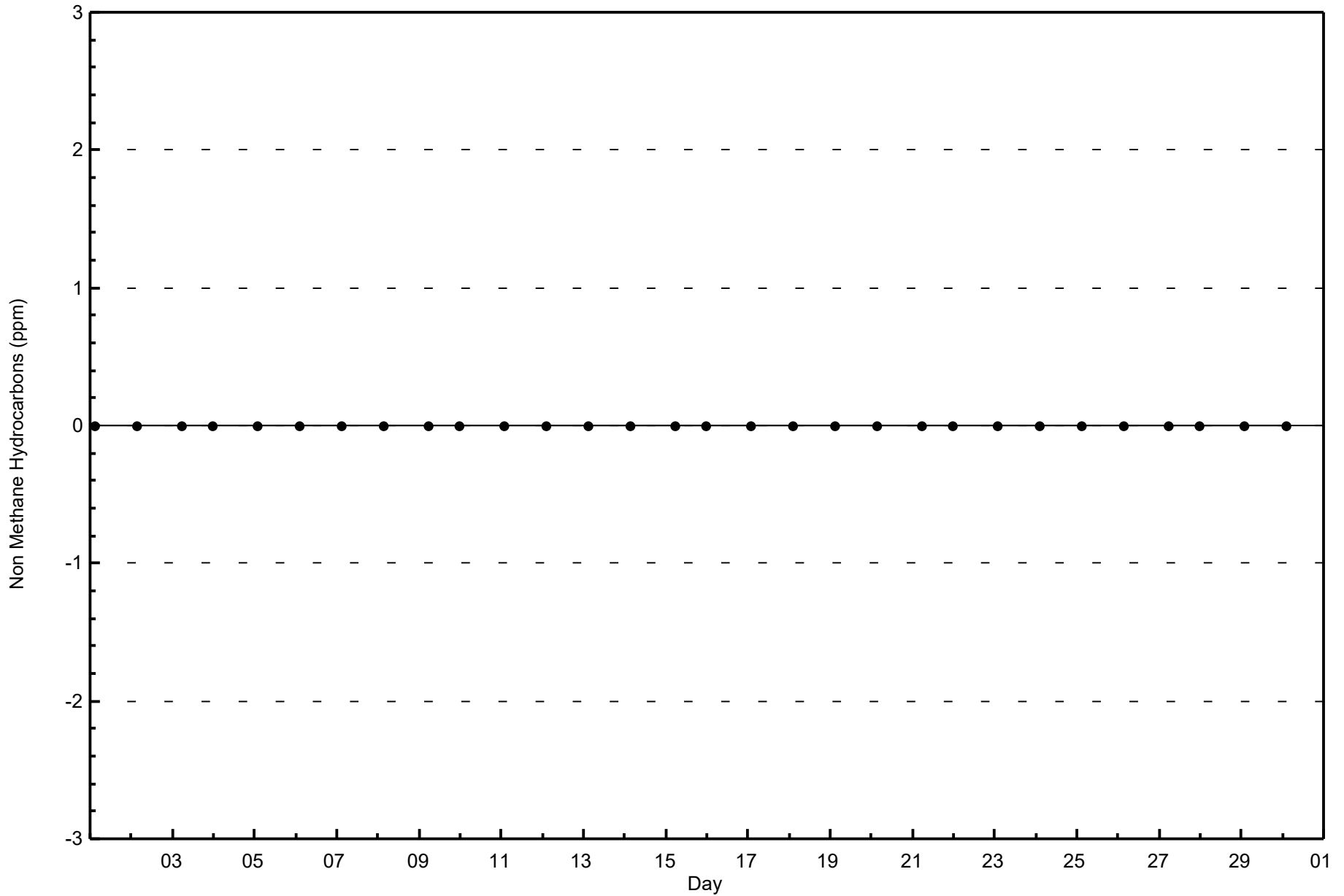
Total Number of Hours: 720

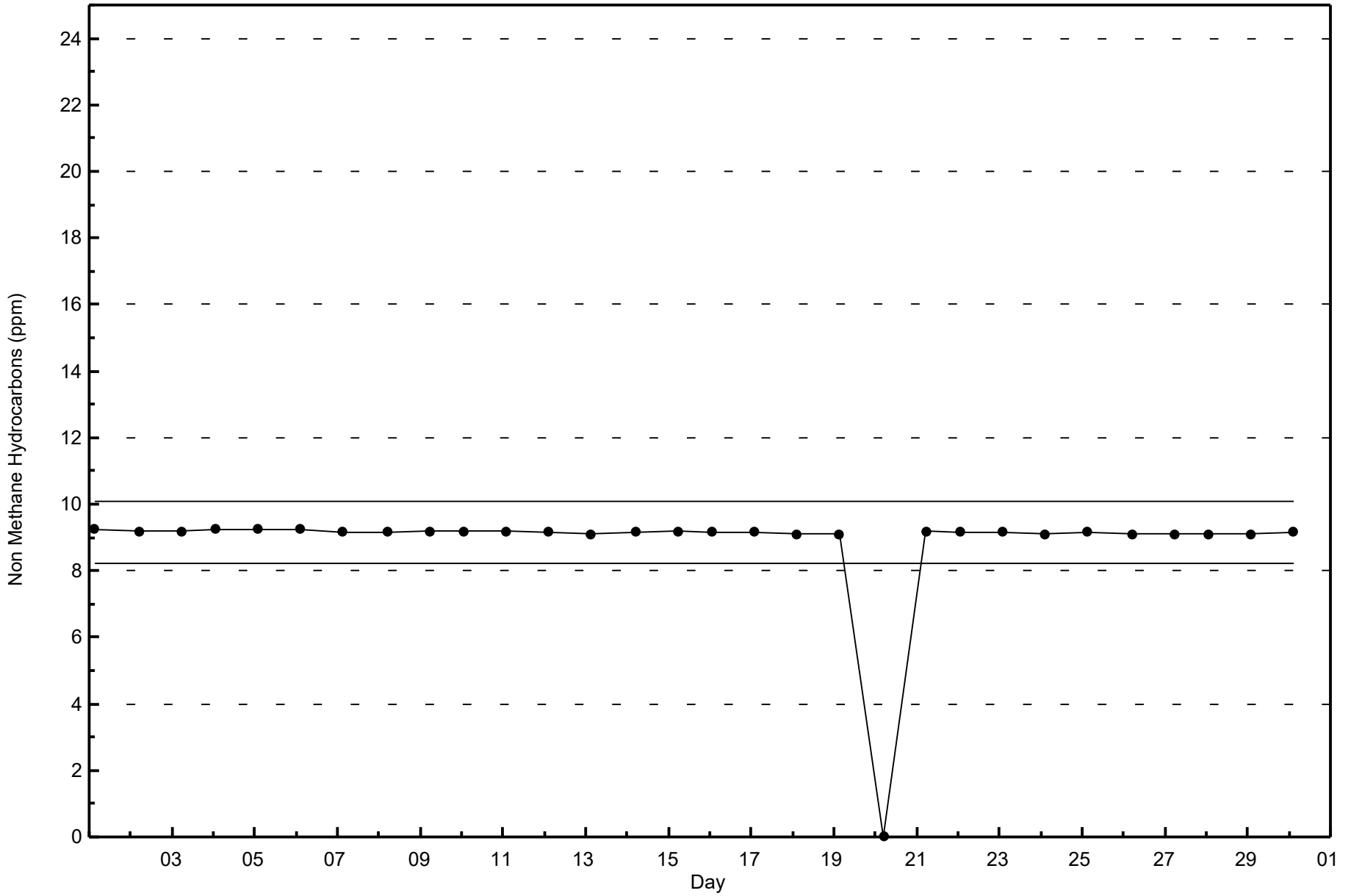


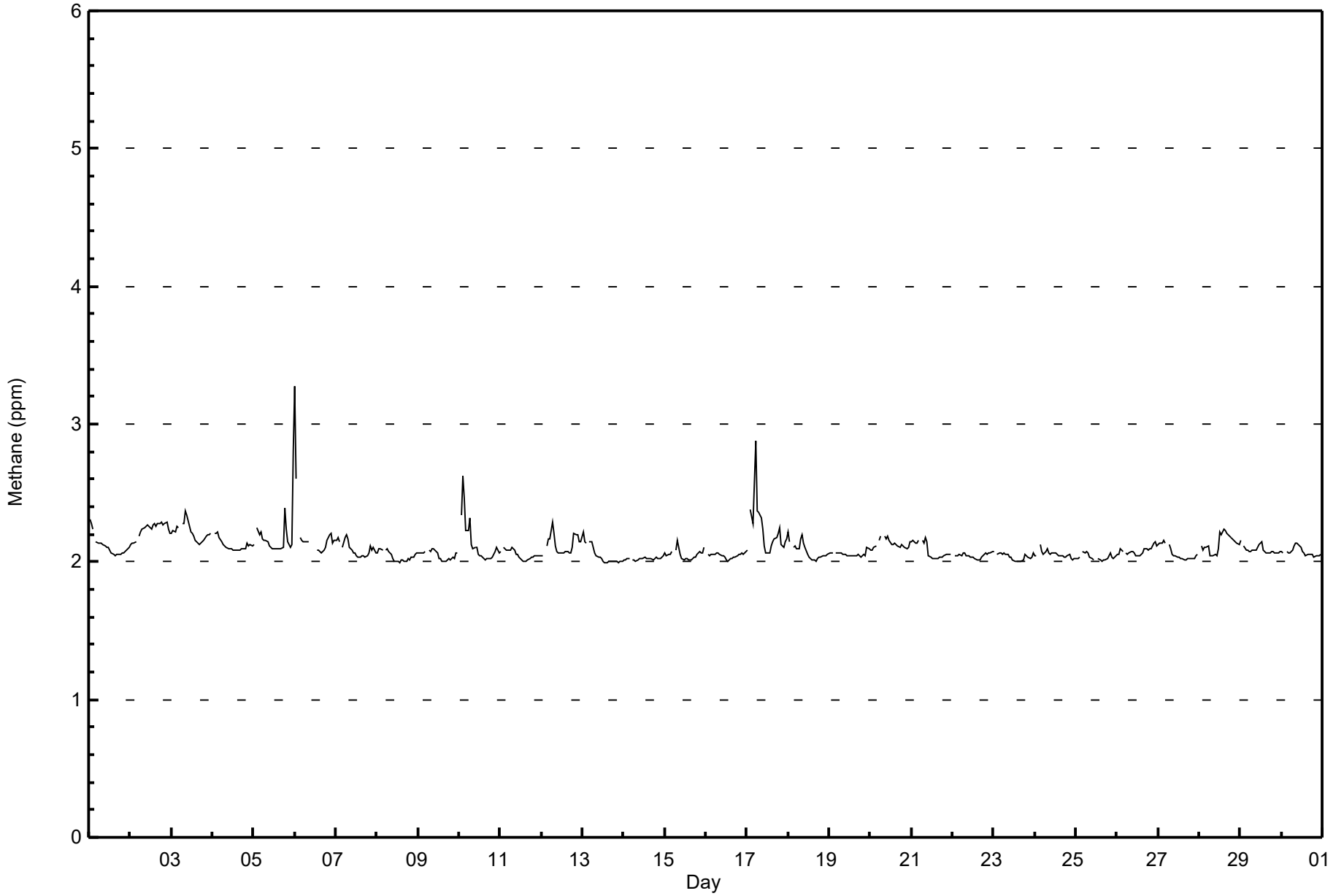
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Non Methane Hydrocarbons (NMHC) - ppm
Anzac











Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Anzac - September 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	230	33.67	33.68
2.1 - 3.0	452	66.18	99.85
3.1 - 10.0	1	0.15	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 683

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Methane (CH₄) - ppm
Anzac - September 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	3	3	8	27	29	18	23	24	24	59	7	2	1	2	230
2.1 - 3.0	1	1	3	1	12	77	40	33	36	35	48	84	32	38	9	2	452
3.1 - 10.0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	1	1	6	4	21	104	69	51	59	59	72	143	39	40	10	4	683

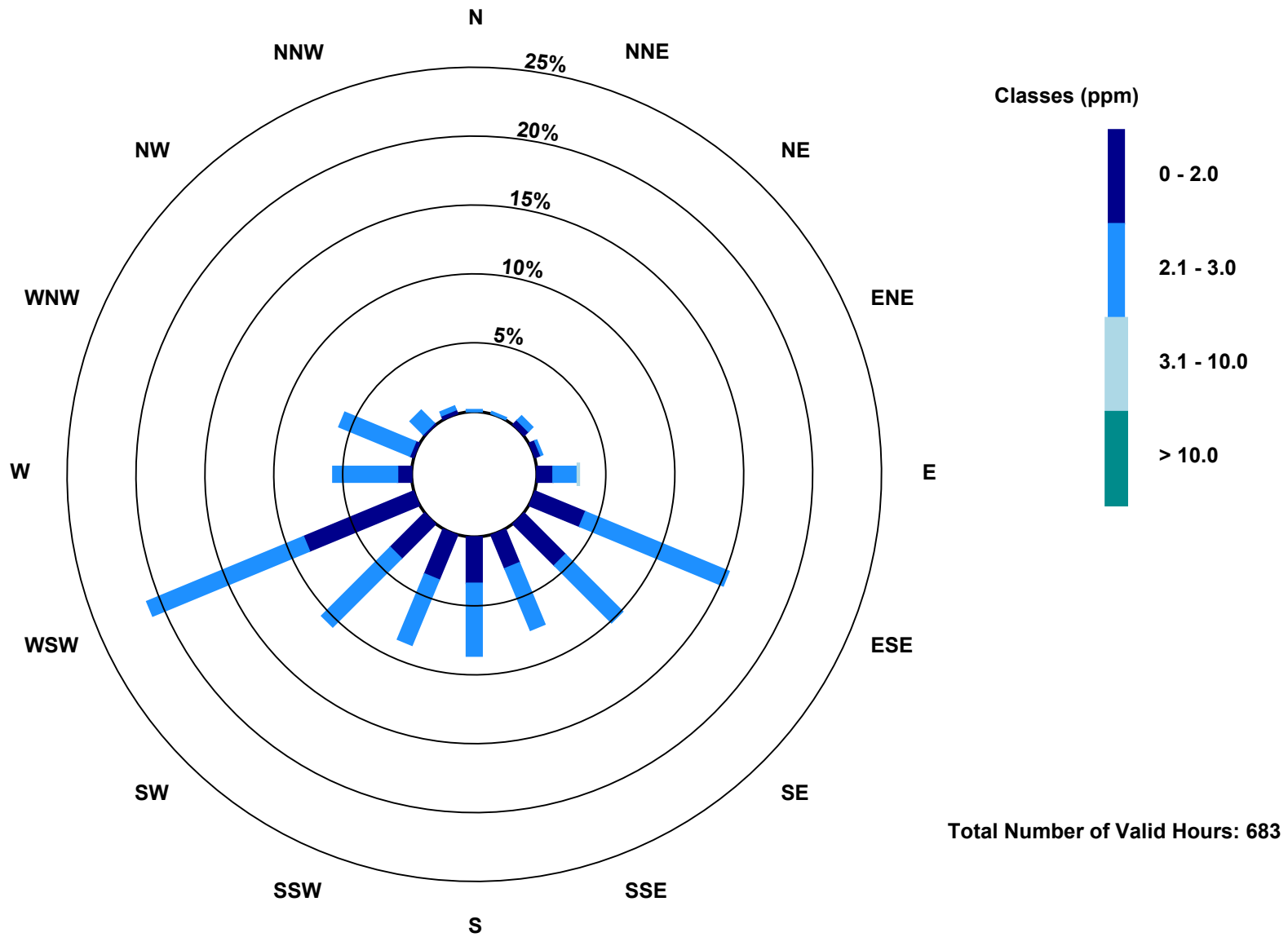
Total Number of Valid Hours: 683

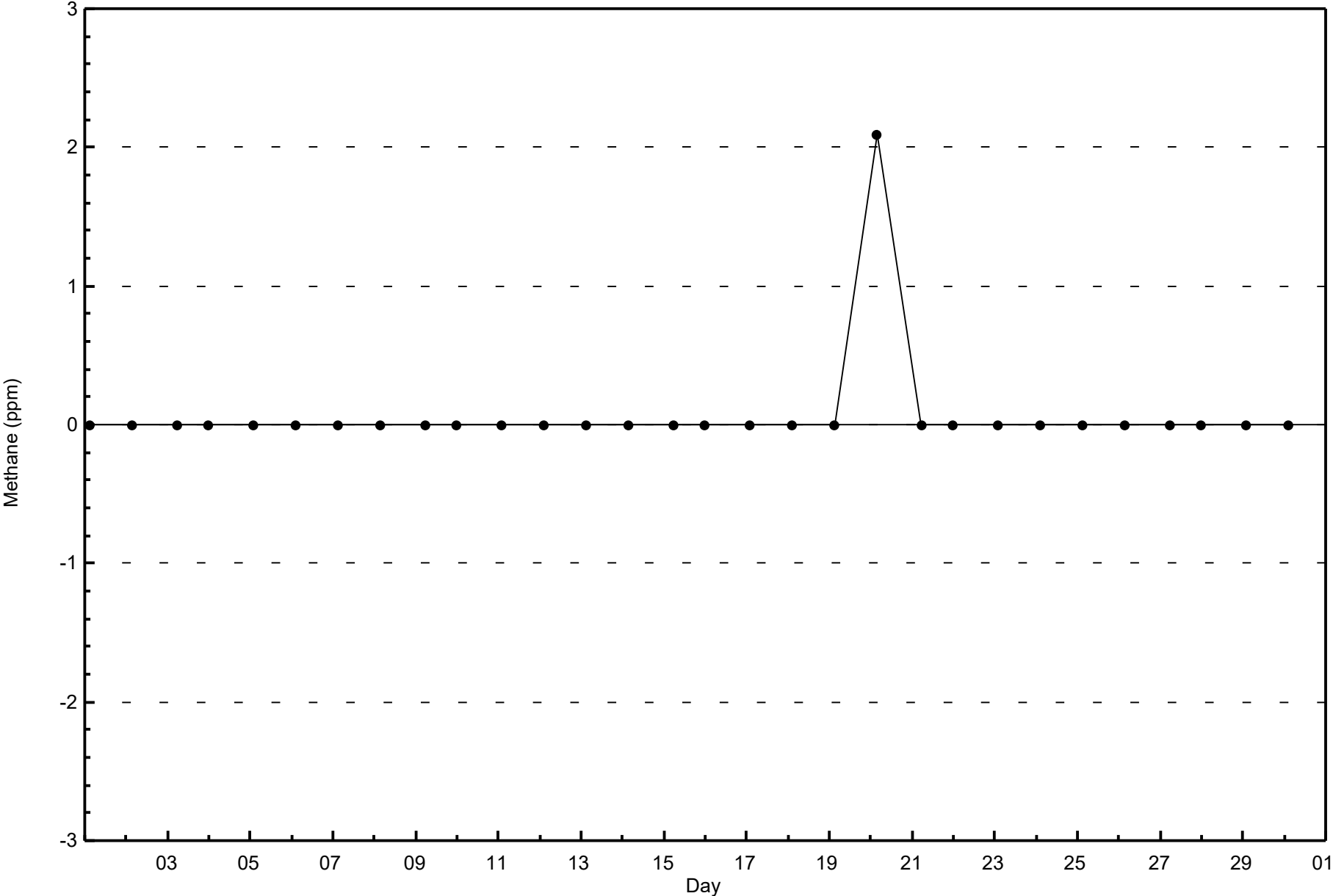
Total Number of Hours: 720

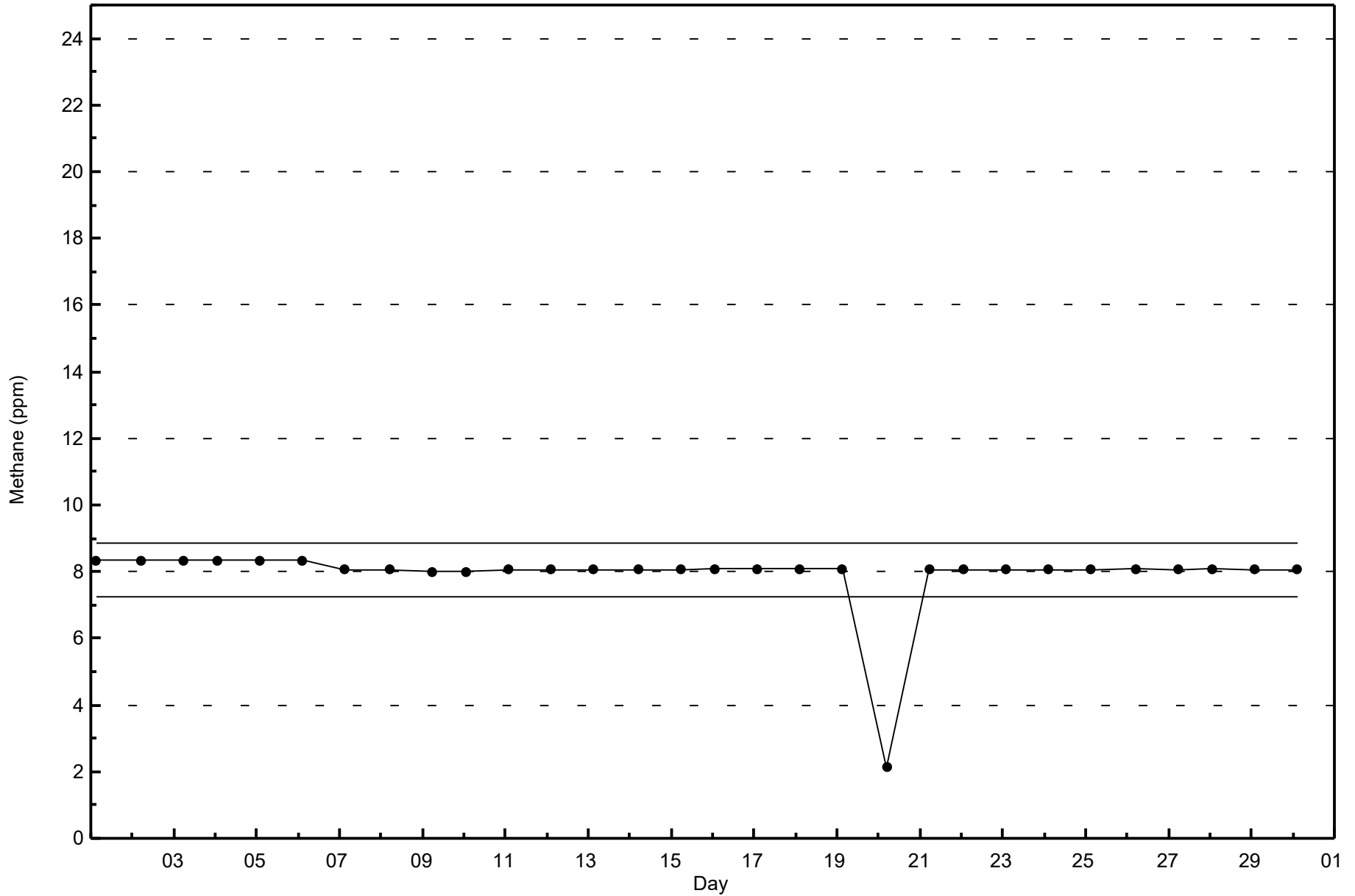


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Methane (CH₄) - ppm
Anzac









Wood Buffalo Environmental Association
Summary of Hour Averages

Nitric Oxide (NO) - ppb
Anzac - September 2023

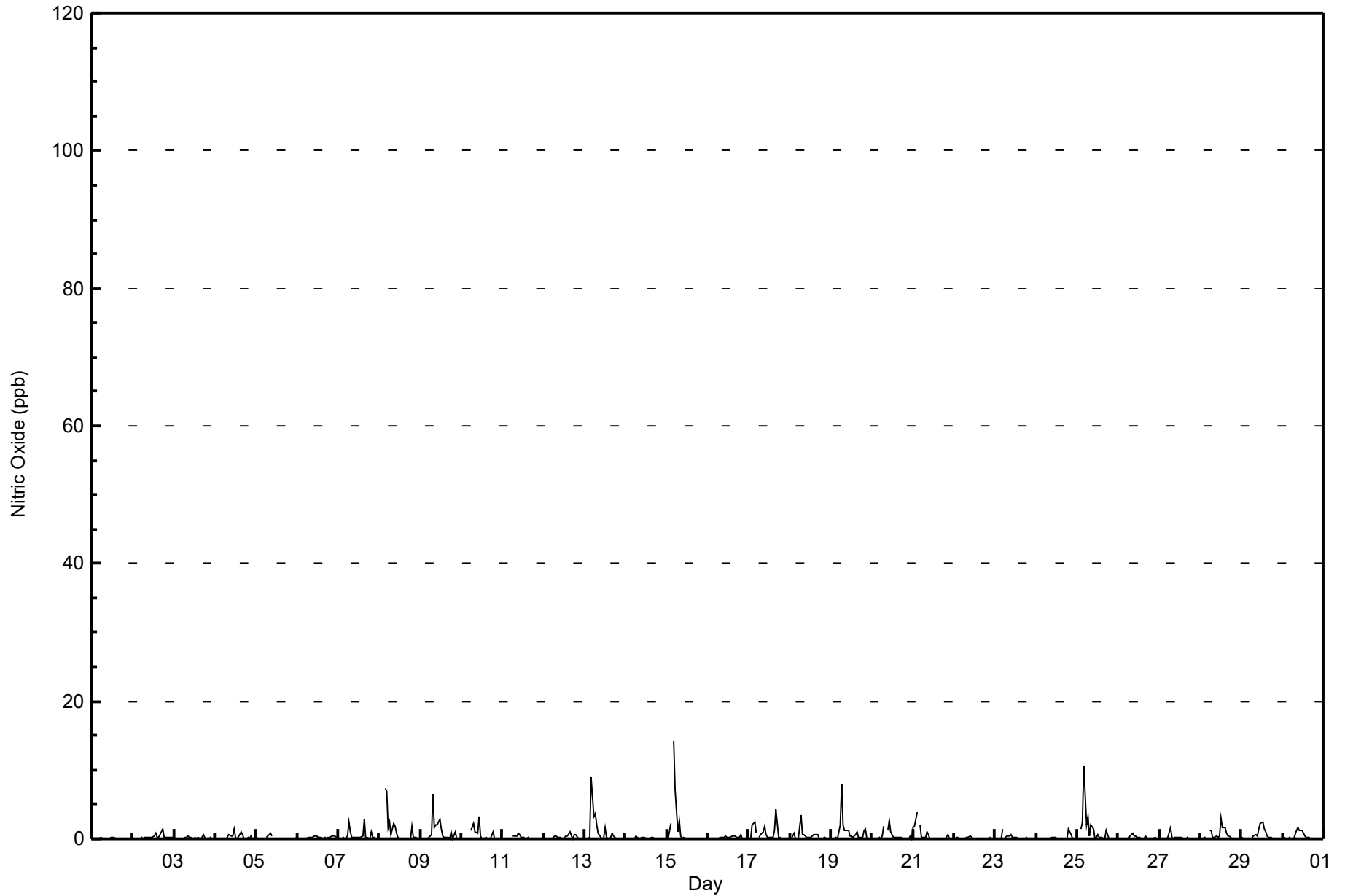
Maximum Value: 14.3 ppb on Sep 15 05:00		Maximum Daily Average: 1.3 ppb on Sep 15		Hours in Service: 720																						
Minimum Value: 0.0 ppb on Sep 2 02:00		Minimum Daily Average: 0.1 ppb on Sep 1		Hours of Data: 683																						
Maximum Diurnal Average: 1.9 ppb at hour 5		Minimum Diurnal Average: 0.1 ppb at hour 24		Hours of Missing Data: 37																						
Monthly Average: 0.45 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.3 P ₉₀ = 1.3 P ₉₉ = 6.6		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-Sep	0.0	Z	0.0	0.0	0.0	0.2	0.0	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3
2-Sep	0.0	0.0	Z	0.0	0.0	0.1	0.1	0.1	0.3	0.2	0.1	0.2	0.4	0.9	0.1	0.1	0.6	1.4	0.1	0.1	0.1	0.1	0.1	0.1	0.2	1.4
3-Sep	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.3	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5
4-Sep	0.1	0.1	0.0	0.1	Z	0.0	0.1	0.1	0.7	0.4	0.4	1.5	0.3	0.0	0.7	0.9	0.5	0.0	0.0	0.1	0.0	0.5	0.0	0.1	0.3	1.5
5-Sep	0.1	0.0	0.0	0.0	0.1	Z	0.3	0.4	0.7	0.4	C	C	C	C	C	C	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.7	
6-Sep	Z	0.1	0.0	0.1	0.0	0.1	0.1	0.2	0.1	0.3	0.3	0.3	0.2	0.2	0.1	0.1	0.2	0.1	0.3	0.3	0.4	0.4	0.5	0.2	0.2	0.5
7-Sep	0.1	Z	0.1	0.2	0.1	0.4	2.4	1.1	0.3	0.3	0.2	0.2	0.1	0.2	0.5	2.8	0.1	0.1	0.1	1.0	0.2	0.2	0.1	0.1	0.5	2.8
8-Sep	0.1	0.1	Z	7.3	6.9	1.6	2.4	0.7	2.2	1.8	0.8	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	1.9	0.3	0.3	0.1	0.1	1.2	7.3
9-Sep	0.1	0.1	0.1	Z	0.1	0.2	0.7	6.5	1.6	2.0	2.0	2.9	1.5	0.4	0.3	0.2	0.1	0.1	1.1	0.1	1.1	0.1	0.0	0.0	0.9	6.5
10-Sep	0.0	0.0	0.0	0.0	Z	1.2	1.7	2.3	1.0	0.8	3.2	0.4	0.1	0.1	0.1	0.1	0.1	0.1	1.1	0.0	0.0	0.0	0.1	0.0	0.5	3.2
11-Sep	0.0	0.0	0.0	0.0	0.0	Z	0.4	0.5	0.5	0.8	0.6	0.2	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.2	0.8
12-Sep	Z	0.0	0.0	0.1	0.0	0.0	0.3	0.4	0.2	0.1	0.1	0.1	0.2	0.5	0.3	1.0	0.3	0.1	0.5	0.5	0.1	0.0	0.1	0.0	0.2	1.0
13-Sep	0.1	Z	0.1	0.1	9.0	3.2	3.7	2.0	0.9	0.1	0.1	0.1	1.7	0.3	0.1	0.2	0.7	0.4	0.0	0.0	0.0	0.0	0.0	0.0	1.0	9.0
14-Sep	0.0	0.0	Z	0.0	0.0	0.0	0.4	0.3	0.0	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	0.1	0.4
15-Sep	0.0	0.0	2.2	Z	14.3	7.2	1.0	2.7	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	0.0	0.1	0.1	1.3	14.3
16-Sep	0.1	0.0	0.1	0.0	Z	0.1	0.1	0.2	0.2	0.2	0.4	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.7	0.1	0.1	0.1	0.1	0.2	0.7
17-Sep	0.1	0.1	2.1	2.5	0.8	Z	0.3	0.6	0.9	1.8	0.5	0.2	0.2	0.1	0.2	1.2	4.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.7	4.3
18-Sep	Z	0.1	0.7	0.1	0.1	0.1	3.4	0.5	0.6	0.5	0.1	0.2	0.1	0.4	0.6	0.6	0.6	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.4	3.4
19-Sep	0.0	Z	0.1	0.2	0.1	2.1	7.9	2.1	1.2	1.3	1.2	0.4	0.4	0.1	0.6	1.0	0.2	0.2	0.2	1.3	1.5	0.0	0.1	0.0	1.0	7.9
20-Sep	0.1	0.0	Z	0.1	0.1	0.1	0.4	1.9	M	1.3	2.6	1.0	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.4	0.0	0.4	2.6
21-Sep	1.7	1.8	3.9	Z	2.0	0.1	0.2	0.2	1.0	0.5	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.6	0.0	0.0	0.0	0.5	3.9
22-Sep	0.0	0.2	0.1	0.0	Z	0.0	0.1	0.2	0.3	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.4
23-Sep	0.0	0.0	0.1	0.1	1.5	Z	0.2	0.3	0.4	0.5	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.2	1.5
24-Sep	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	1.4	0.6	0.0	0.0	0.0	0.1	1.4
25-Sep	0.0	Z	1.5	2.4	10.6	2.1	3.2	0.3	2.0	1.5	0.1	0.1	0.6	0.2	0.2	0.0	0.0	1.3	0.0	0.0	0.1	0.1	0.0	0.0	1.1	10.6
26-Sep	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.4	0.9	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.4	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.9
27-Sep	0.0	0.1	0.1	Z	0.1	0.1	1.7	0.1	0.1	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	0.2	1.7
28-Sep	0.0	0.1	0.2	0.3	Z	1.3	1.3	0.2	0.2	0.3	0.3	0.5	3.1	1.6	1.6	0.9	0.4	0.5	0.1	0.1	0.0	0.0	0.0	0.1	0.6	3.1
29-Sep	0.1	0.0	0.0	0.0	0.1	Z	0.1	0.4	0.6	0.5	1.4	2.2	2.4	1.5	1.0	0.4	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.5	2.4
30-Sep	Z	0.2	0.0	0.0	0.1	0.0	0.0	0.7	1.2	1.6	1.3	1.3	0.7	0.4	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.6
																								Diurnal Average		
																								Diurnal Maximum		
																								0.1 1.7		
																								0.1 1.8		
																								0.5 3.9		
																								0.5 7.3		
																								1.9 14.3		
																								0.8 7.2		
																								1.1 7.9		
																								0.9 6.5		
																								0.7 2.2		
																								0.6 2.0		
																								0.6 3.2		
																								0.5 2.9		
																								0.5 3.1		
																								0.3 1.6		
																								0.3 1.6		
																								0.4 2.8		
																								0.3 4.3		
																								0.2 1.4		
																								0.2 1.1		
																								0.3 1.9		
																								0.2 1.5		
																								0.1 0.5		
																								0.1 0.5		
																								0.1 0.2		

Z - zerspan C - Calibration M - Maintenance



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Anzac - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Anzac - September 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	683	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: 683

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Anzac - September 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	1	1	6	6	20	106	67	50	61	55	76	140	40	40	10	4	683
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	1	1	6	6	20	106	67	50	61	55	76	140	40	40	10	4	683

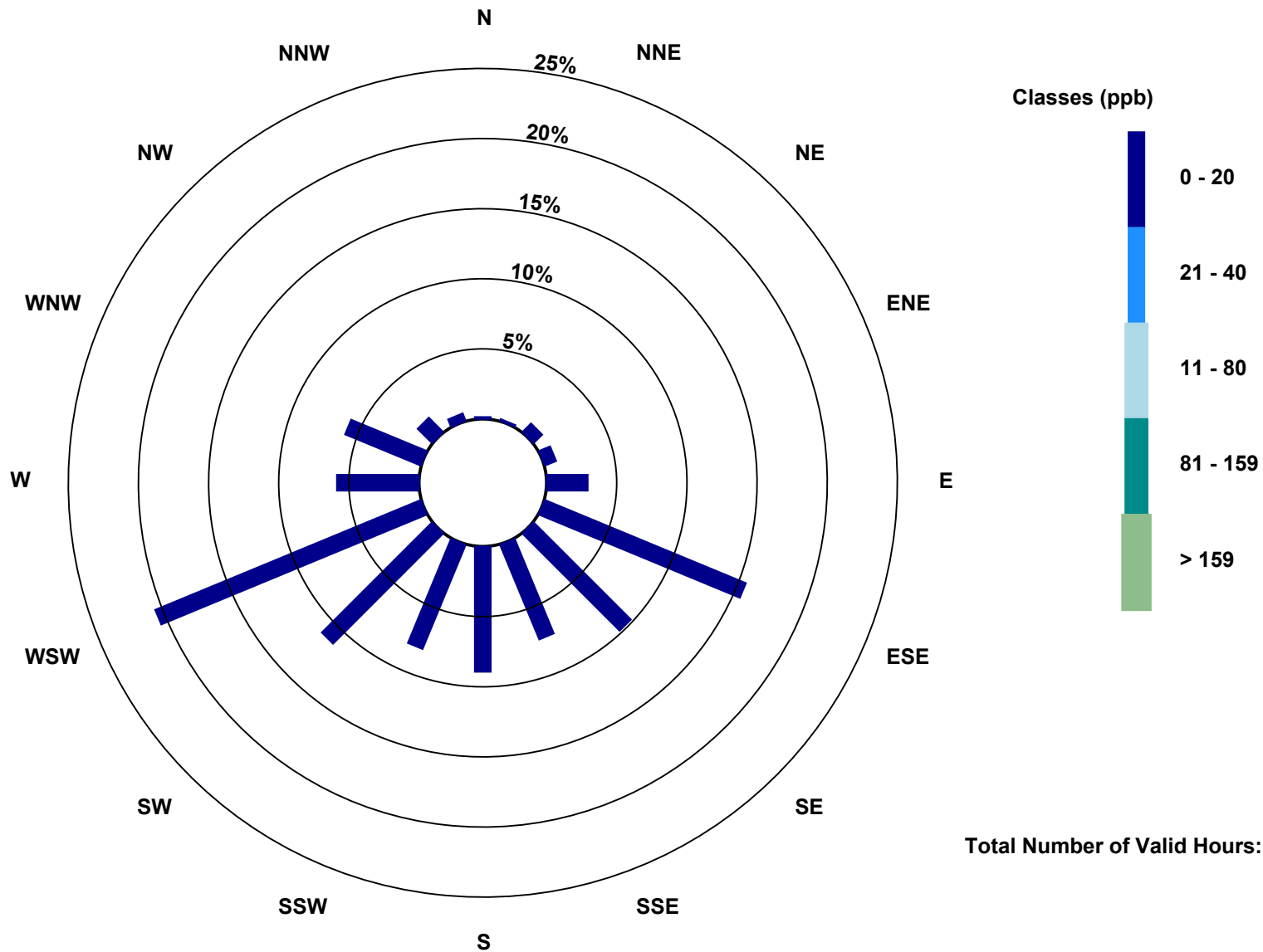
Total Number of Valid Hours: 683

Total Number of Hours: 720

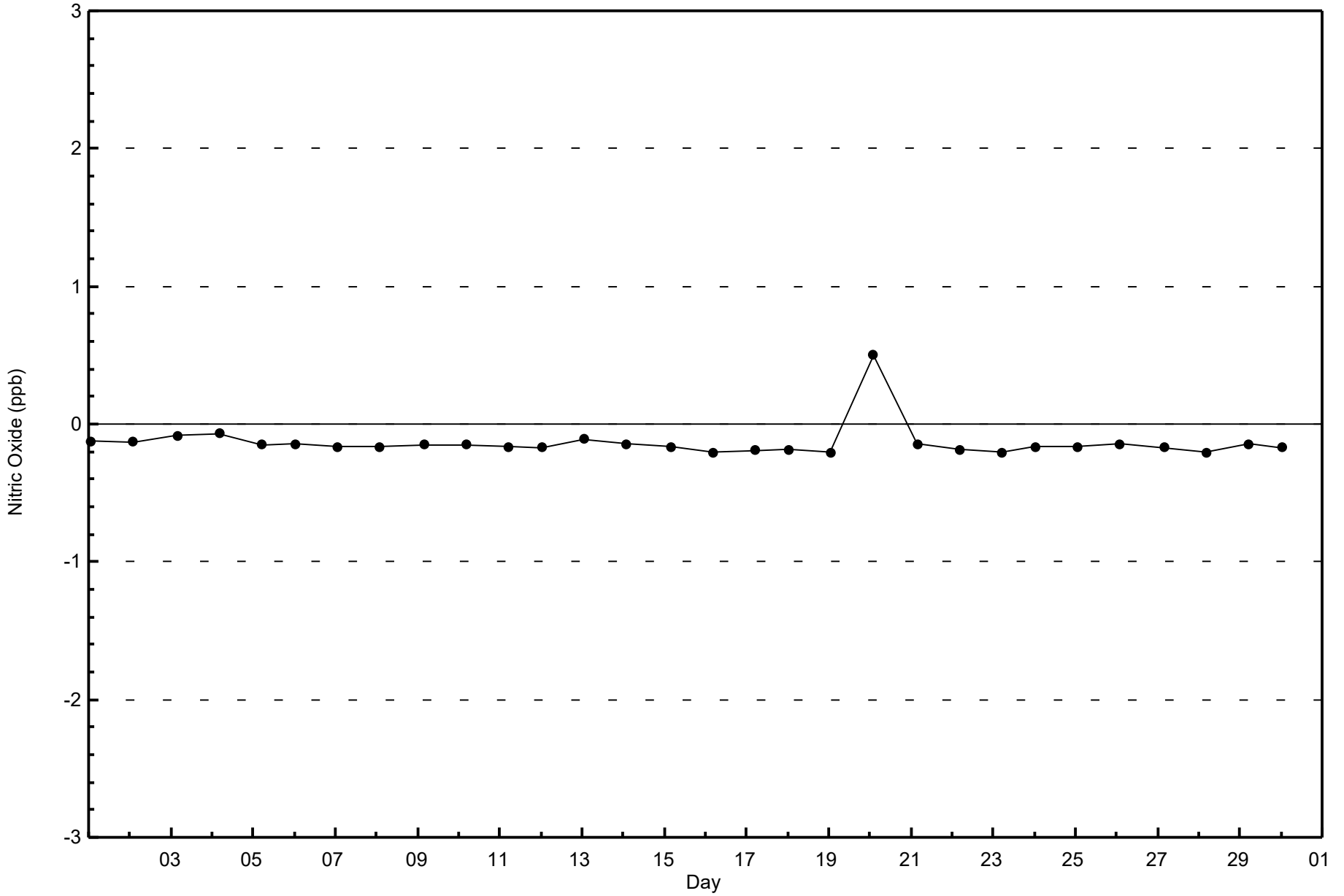


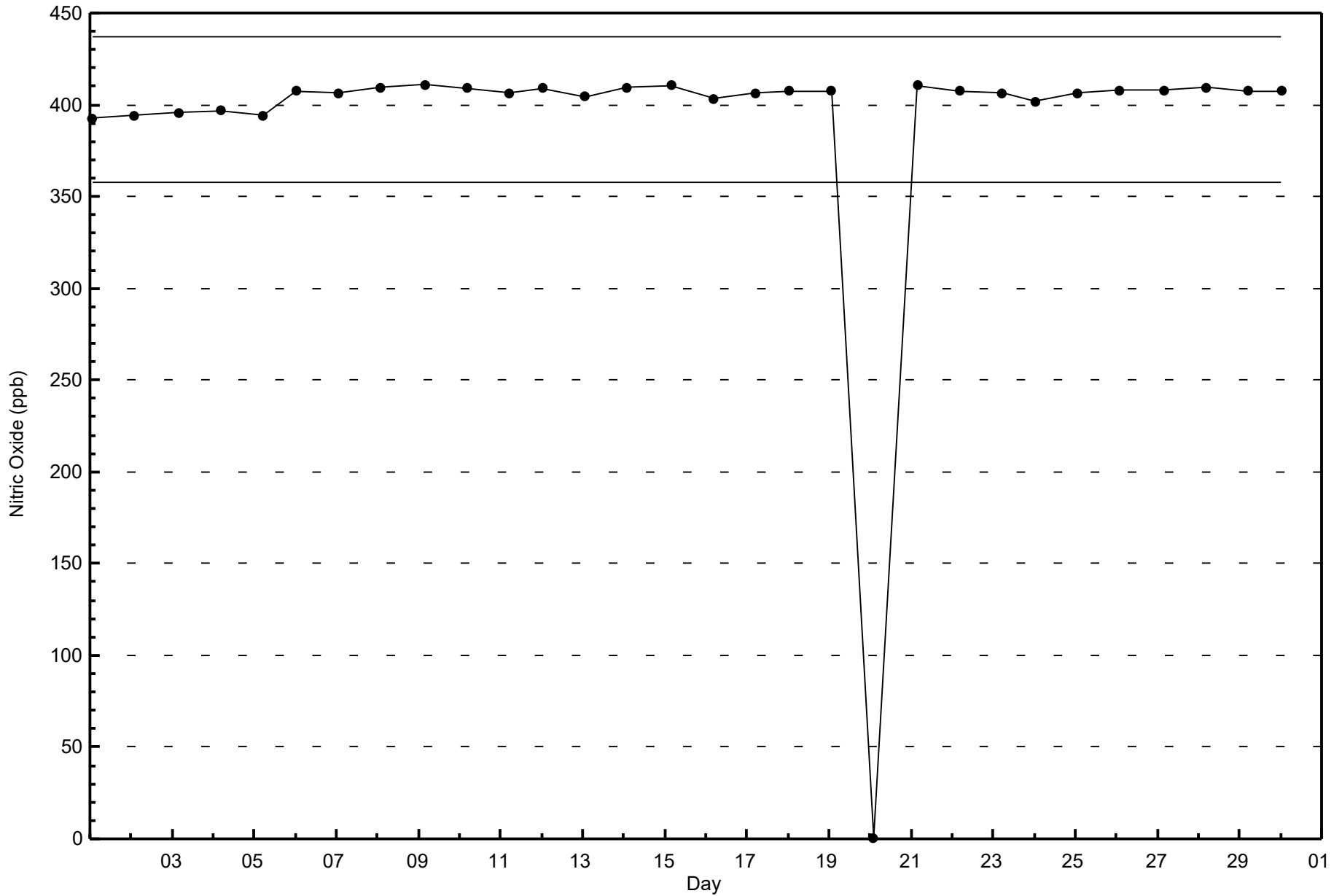
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitric Oxide (NO) - ppb
Anzac



Total Number of Valid Hours: 683







Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

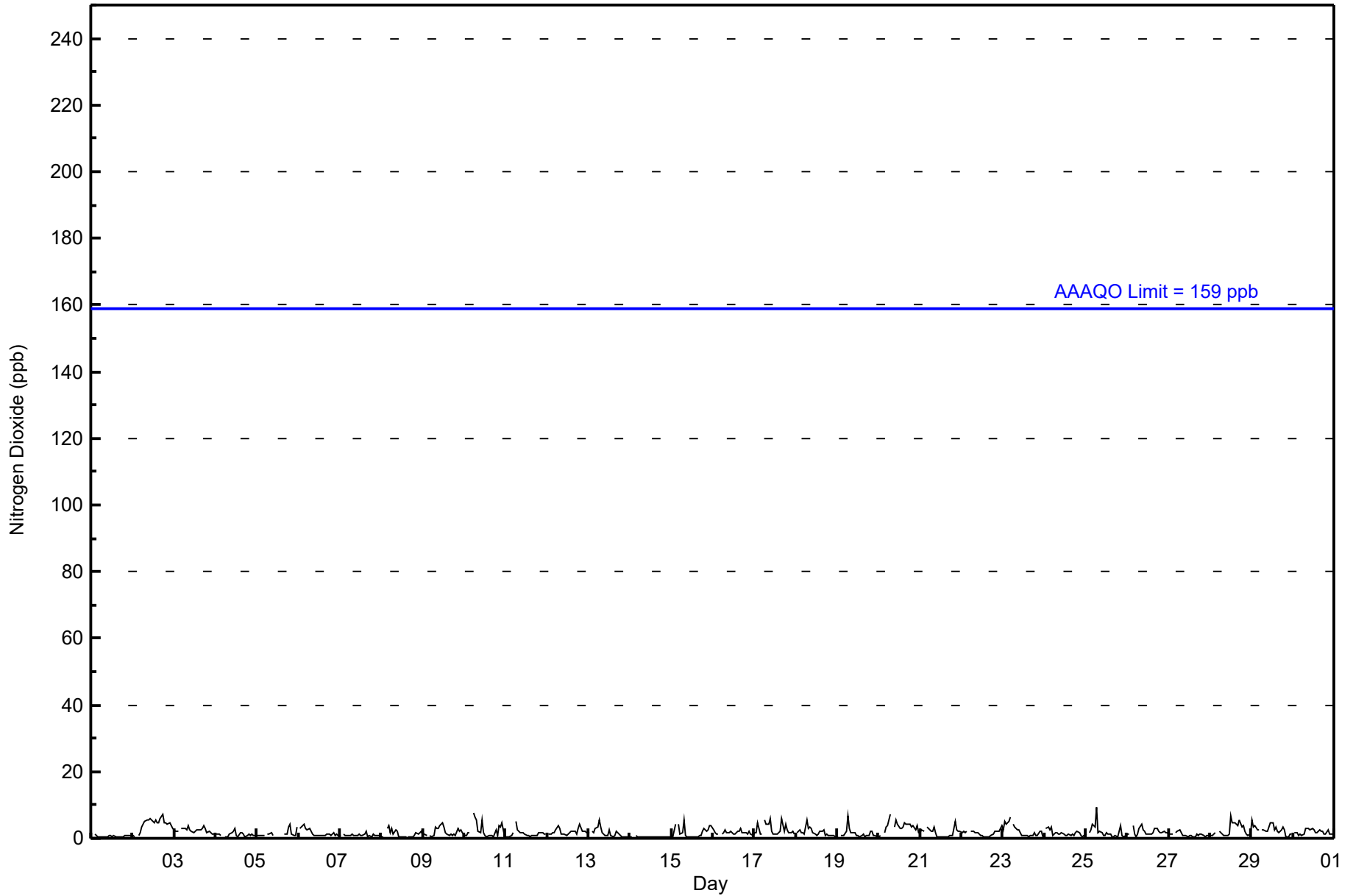
Anzac - September 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 720																	Daily Average		Daily Maximum																										
Maximum Value: 9.4 ppb on Sep 25 07:00		Maximum Daily Average: 4.2 ppb on Sep 2																	Hours of Data: 683		Hours of Missing Data: 37																												
Minimum Value: 0.2 ppb on Sep 8 16:00		Minimum Daily Average: 0.4 ppb on Sep 14																	Hours of Calibration: 36		Percent Operational Time: 99.9																												
Maximum Diurnal Average: 3.1 ppb at hour 7		Minimum Diurnal Average: 1.3 ppb at hour 14																																															
Monthly Average: 1.86 ppb		Percentiles: P ₁ = 0.3 P ₁₀ = 0.5 Q ₁ = 0.8 Median = 1.4 Q ₃ = 2.4 P ₉₀ = 3.9 P ₉₉ = 6.2																																															
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Sep	1.1	Z	1.1	0.7	0.6	0.6	0.5	0.6	0.6	0.6	0.7	0.9	0.6	0.7	0.4	0.4	0.5	0.5	0.6	0.7	1.0	0.8	0.8	0.8	0.7	1.1																							
2-Sep	0.7	0.5	Z	0.9	1.9	3.4	4.2	4.9	5.3	5.3	5.8	5.5	4.8	5.3	4.8	4.7	6.1	7.4	4.8	4.5	4.4	4.7	3.7	2.8	4.2	7.4																							
3-Sep	2.4	2.3	2.2	Z	2.9	2.8	2.8	2.6	3.8	2.7	2.1	1.8	2.1	2.4	2.5	2.5	3.0	3.7	2.9	1.9	2.0	1.7	1.4	1.4	2.4	3.8																							
4-Sep	1.3	1.2	1.2	1.0	Z	0.6	0.4	0.6	1.4	1.5	2.1	3.0	0.7	0.5	1.5	1.6	1.1	0.6	0.8	1.1	0.9	1.2	0.9	0.9	1.1	3.0																							
5-Sep	1.0	0.8	0.9	0.8	0.8	Z	1.3	1.4	1.6	0.8	C	C	C	C	C	C	1.3	1.4	3.6	4.1	1.2	0.8	0.9	3.2	--	4.1																							
6-Sep	Z	2.8	4.0	4.1	2.8	2.7	2.8	2.2	1.1	1.0	0.9	1.0	1.0	0.8	0.9	0.9	1.2	1.1	1.1	1.0	1.6	1.0	1.2	0.8	1.7	4.1																							
7-Sep	0.9	Z	1.2	1.0	0.8	0.8	1.0	1.1	0.9	1.0	1.0	1.1	1.0	0.8	1.1	2.3	0.6	0.8	0.4	1.1	0.8	0.8	0.9	0.9	1.0	2.3																							
8-Sep	0.4	0.5	Z	2.8	3.8	1.5	2.8	1.2	2.5	2.0	0.4	0.6	0.4	0.4	0.3	0.2	0.4	0.4	0.5	1.0	1.8	1.4	1.9	2.0	1.3	3.8																							
9-Sep	1.0	1.1	0.8	Z	0.8	0.6	0.8	3.4	2.8	3.1	3.9	4.8	3.2	1.5	1.3	1.0	1.1	1.0	1.4	1.0	3.1	2.0	2.7	1.6	1.9	4.8																							
10-Sep	0.7	0.9	1.6	1.5	Z	7.8	6.2	5.3	2.1	1.8	5.6	1.7	0.7	0.6	0.7	0.8	0.8	0.6	2.4	0.9	4.0	3.5	4.6	0.5	2.4	7.8																							
11-Sep	0.3	0.4	0.5	0.7	1.6	Z	4.9	2.4	1.7	1.8	1.6	1.1	0.9	0.7	0.6	0.8	0.8	0.7	0.9	1.8	1.9	1.5	1.3	1.1	1.3	4.9																							
12-Sep	Z	1.2	1.1	1.9	1.6	2.4	4.0	2.9	1.4	1.2	1.1	1.0	1.4	1.5	2.0	2.1	2.3	1.4	2.9	4.1	2.1	2.2	2.3	1.9	2.0	4.1																							
13-Sep	1.9	Z	2.1	1.9	2.8	3.6	5.3	3.5	1.9	0.9	0.8	0.7	2.5	0.9	0.5	1.0	2.3	1.5	0.7	0.6	0.4	0.3	0.3	0.4	1.6	5.3																							
14-Sep	0.4	0.4	Z	0.7	0.5	0.4	0.6	0.5	0.4	0.4	0.4	0.5	0.4	0.4	0.5	0.5	0.5	0.3	0.4	0.5	0.5	0.4	0.5	0.3	0.4	0.7	5.3																						
15-Sep	0.3	0.4	4.2	Z	4.4	1.4	1.9	5.7	1.0	0.3	0.5	0.5	0.5	0.4	0.4	0.5	0.7	0.9	2.0	3.0	2.2	2.4	3.9	3.7	1.8	5.7																							
16-Sep	2.7	1.8	1.3	1.3	Z	1.3	1.5	2.4	1.9	1.7	2.2	1.8	1.2	1.2	2.2	2.3	2.8	1.6	1.5	1.8	1.1	2.3	1.3	1.0	1.7	2.8																							
17-Sep	1.5	1.7	4.5	1.3	1.4	Z	5.3	4.3	4.2	5.8	2.2	1.3	1.2	1.3	1.7	2.0	5.8	2.2	4.2	2.7	1.9	1.7	2.0	1.3	2.7	5.8																							
18-Sep	Z	1.6	2.5	1.8	1.8	1.4	5.3	2.8	3.4	3.1	1.6	1.1	0.8	1.4	2.1	2.2	2.5	0.9	1.4	1.0	0.9	0.7	0.8	0.6	1.8	5.3																							
19-Sep	0.5	Z	0.7	0.9	0.8	2.0	6.7	3.0	1.8	1.7	1.5	0.8	0.7	0.5	0.9	1.4	0.6	0.8	1.0	2.1	2.2	0.7	0.7	0.4	1.4	6.7																							
20-Sep	0.4	0.8	Z	1.6	3.2	3.7	5.3	7.0	M	3.3	5.6	4.4	2.9	2.9	3.4	4.7	4.3	4.3	4.1	3.6	3.7	2.6	3.7	1.9	3.5	7.0																							
21-Sep	1.9	2.5	2.1	Z	3.5	2.8	2.1	2.0	3.3	1.6	0.4	0.3	0.3	0.4	0.5	0.5	0.6	0.7	0.9	0.9	5.0	2.4	2.1	2.0	1.7	5.0																							
22-Sep	1.9	2.1	1.8	2.1	Z	2.2	2.2	2.1	1.9	1.6	1.2	0.8	0.7	0.6	0.6	0.5	0.6	1.0	1.4	2.2	2.2	2.3	2.0	4.0	1.7	4.0																							
23-Sep	2.7	5.1	4.3	5.2	6.3	Z	4.1	3.3	2.6	2.4	1.5	0.9	0.9	0.8	0.8	0.6	0.8	0.8	1.7	0.7	0.8	2.0	2.3	0.6	2.2	6.3																							
24-Sep	Z	3.0	3.2	2.4	3.3	1.0	1.8	1.7	1.3	1.4	1.7	1.4	1.0	1.0	1.3	1.0	1.2	1.0	1.7	2.0	1.5	0.7	0.6	1.0	1.6	3.3																							
25-Sep	1.1	Z	1.9	2.6	4.3	3.4	9.4	1.9	2.2	1.9	0.7	0.8	1.8	1.2	1.1	0.4	0.3	0.9	0.3	2.1	3.7	1.0	0.5	1.0	1.9	9.4																							
26-Sep	1.2	1.4	Z	3.8	1.4	0.6	1.4	3.1	4.4	2.5	2.2	1.3	1.3	1.2	1.2	1.7	3.1	3.1	2.3	1.7	1.9	2.0	1.8	1.7	2.0	4.4																							
27-Sep	1.4	1.3	1.3	Z	1.9	2.0	2.5	1.5	0.7	0.8	0.8	0.6	0.7	0.7	0.5	0.6	1.4	0.9	1.3	1.1	0.9	0.6	0.8	0.9	1.1	2.5																							
28-Sep	0.8	0.9	1.3	1.6	Z	2.1	1.7	1.1	0.9	1.0	0.8	1.4	6.6	4.8	4.6	4.4	3.8	5.6	3.3	3.7	2.0	1.2	0.9	1.2	2.4	6.6																							
29-Sep	5.4	3.4	3.9	2.6	2.4	Z	2.6	2.4	2.1	2.0	3.4	4.6	4.6	2.5	3.4	2.2	1.6	2.4	3.6	2.7	0.4	0.3	1.1	1.3	2.6	5.4																							
30-Sep	Z	1.6	1.6	1.0	1.1	0.8	1.3	3.0	3.0	3.1	2.7	3.1	2.6	1.7	1.9	2.4	2.3	2.1	1.4	1.3	2.5	1.4	1.2	1.4	1.9	3.1																							
																								1.4	1.6	2.1	1.8	2.3	2.1	3.1	2.7	2.1	1.9	1.9	1.7	1.6	1.3	1.5	1.6	1.8	1.7	1.9	1.9	2.0	1.6	1.6	1.4	Diurnal Average	
																								5.4	5.1	4.5	5.2	6.3	7.8	9.4	7.0	5.3	5.8	5.8	5.5	6.6	5.3	4.8	4.7	6.1	7.4	4.8	4.5	5.0	4.7	4.6	4.0	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
Anzac - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Dioxide (NO₂) - ppb
Anzac - September 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	683	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: 683

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Anzac - September 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	1	1	6	6	20	106	67	50	61	55	76	140	40	40	10	4	683
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	1	1	6	6	20	106	67	50	61	55	76	140	40	40	10	4	683

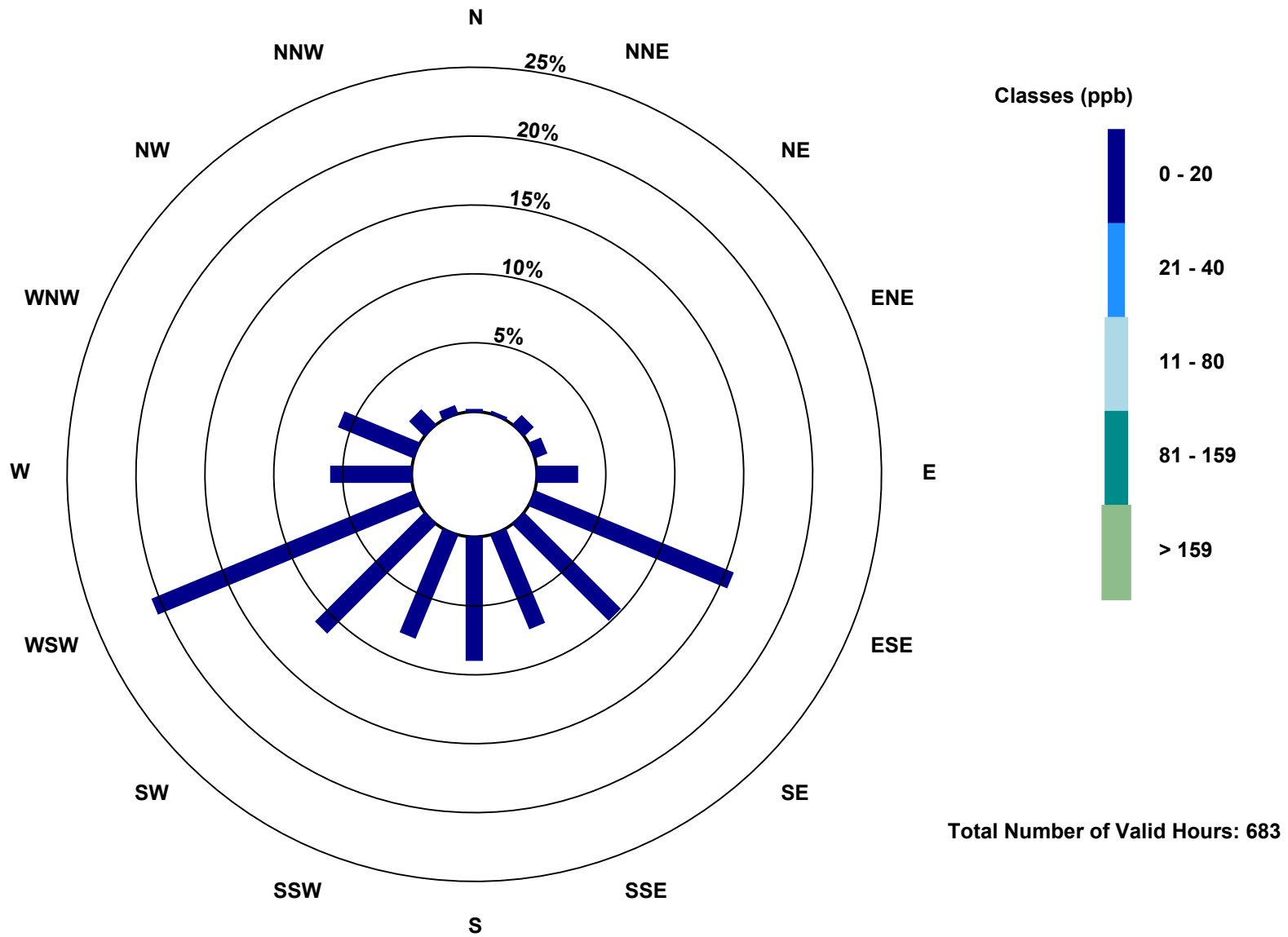
Total Number of Valid Hours: 683

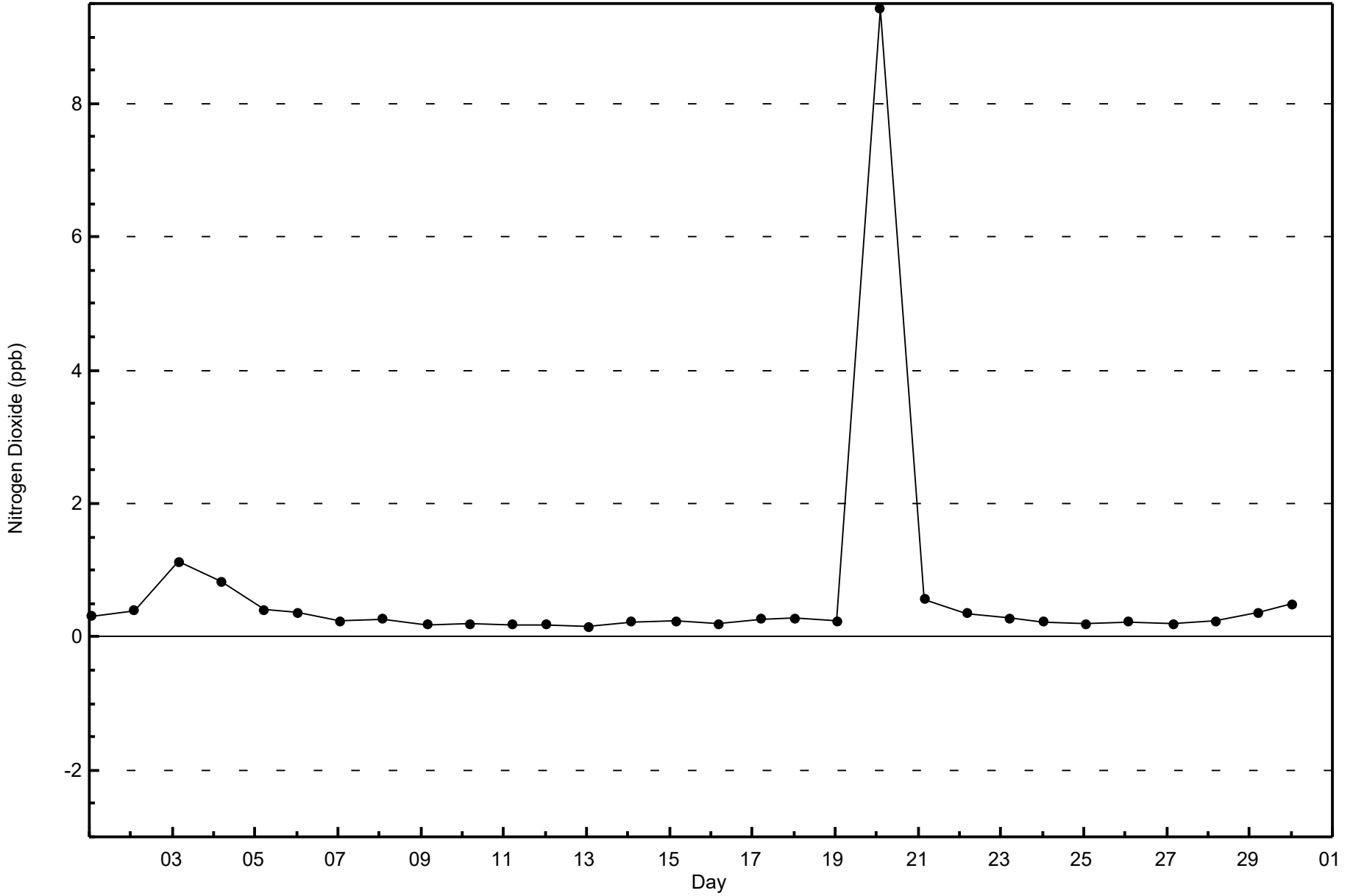
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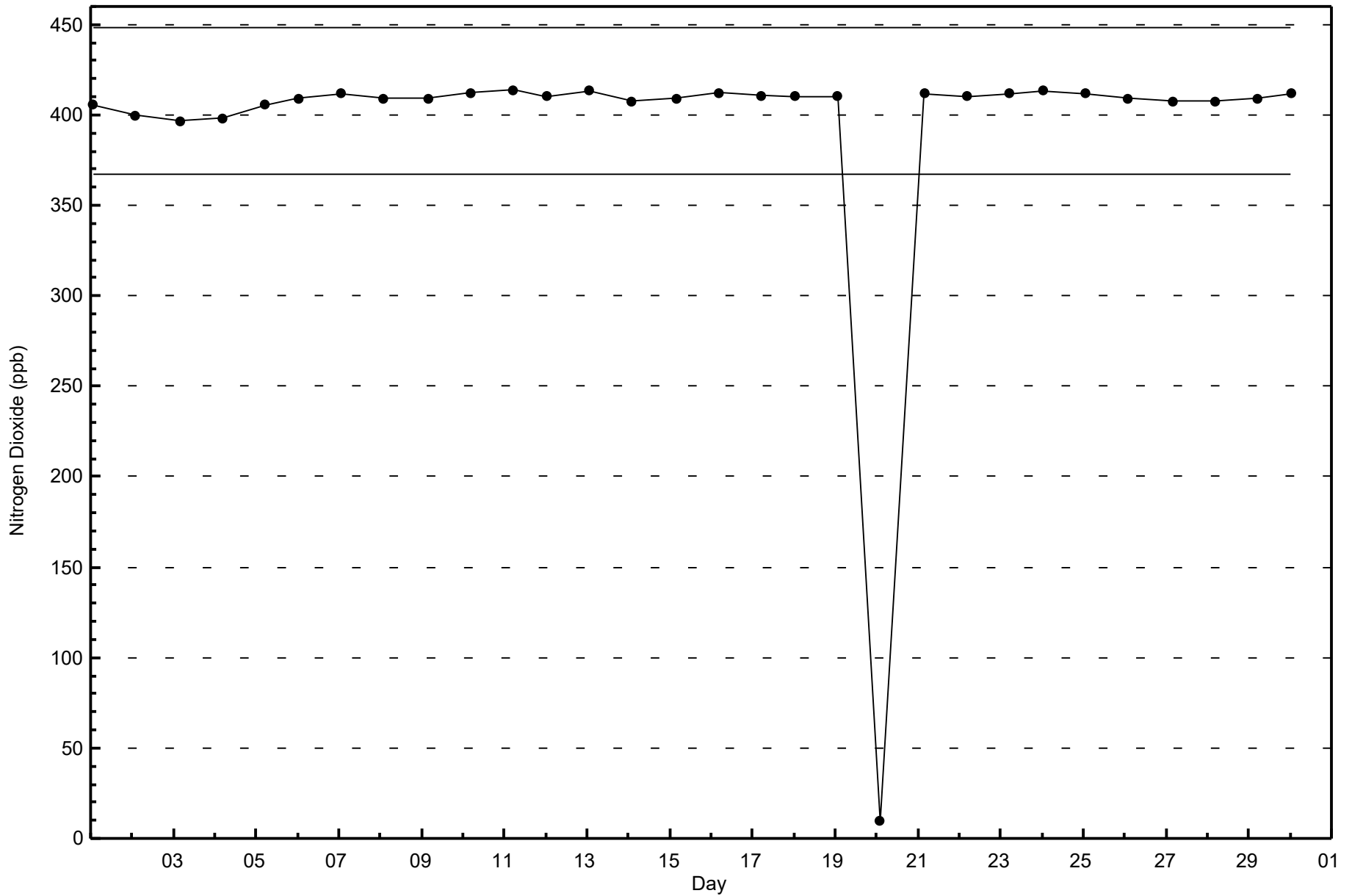


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitrogen Dioxide (NO₂) - ppb
Anzac



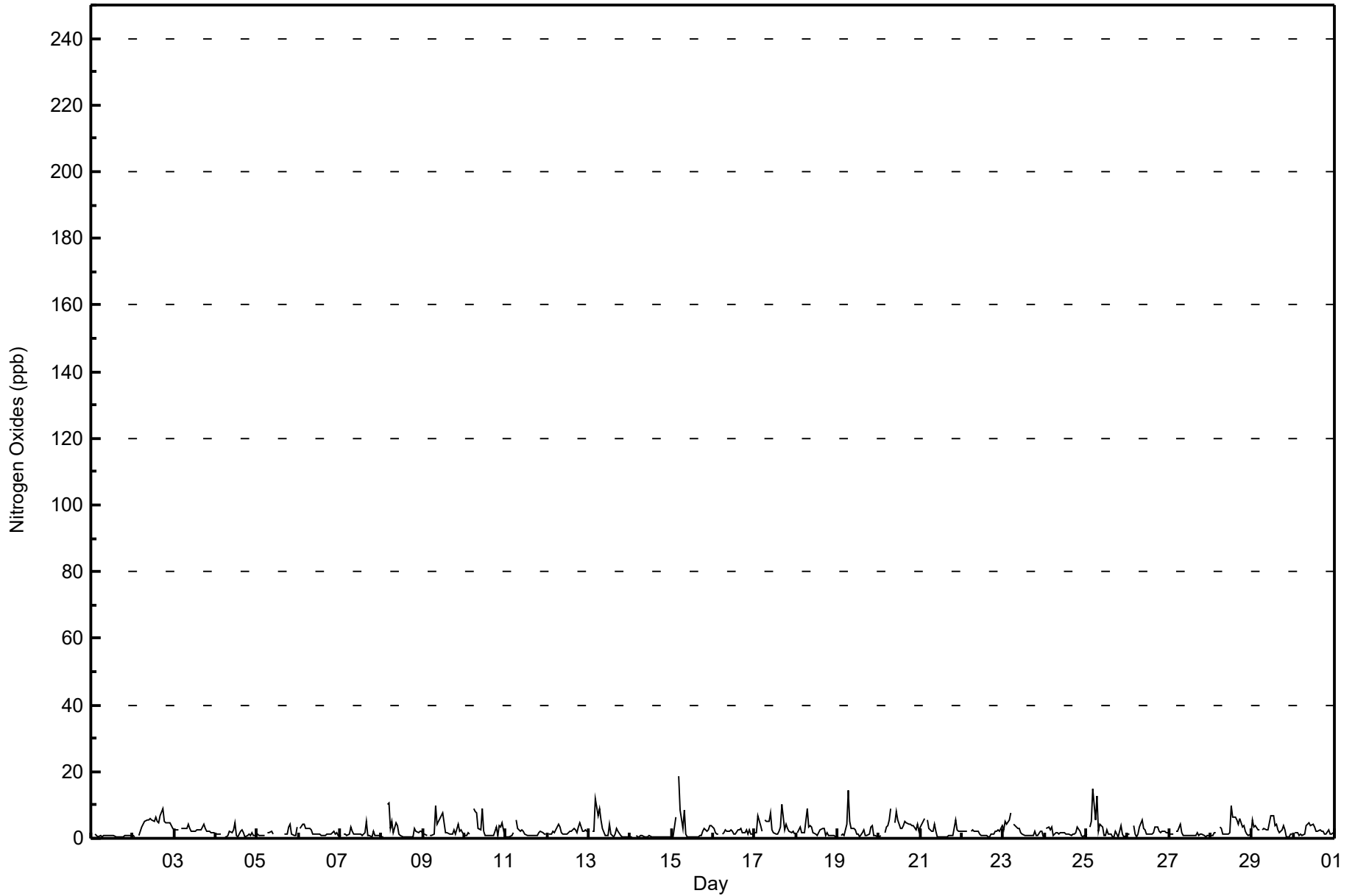






Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Anzac - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Oxides (NO_x) - ppb
Anzac - September 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	683	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: 683

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Anzac - September 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	1	1	6	6	20	106	67	50	61	55	76	140	40	40	10	4	683
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	1	1	6	6	20	106	67	50	61	55	76	140	40	40	10	4	683

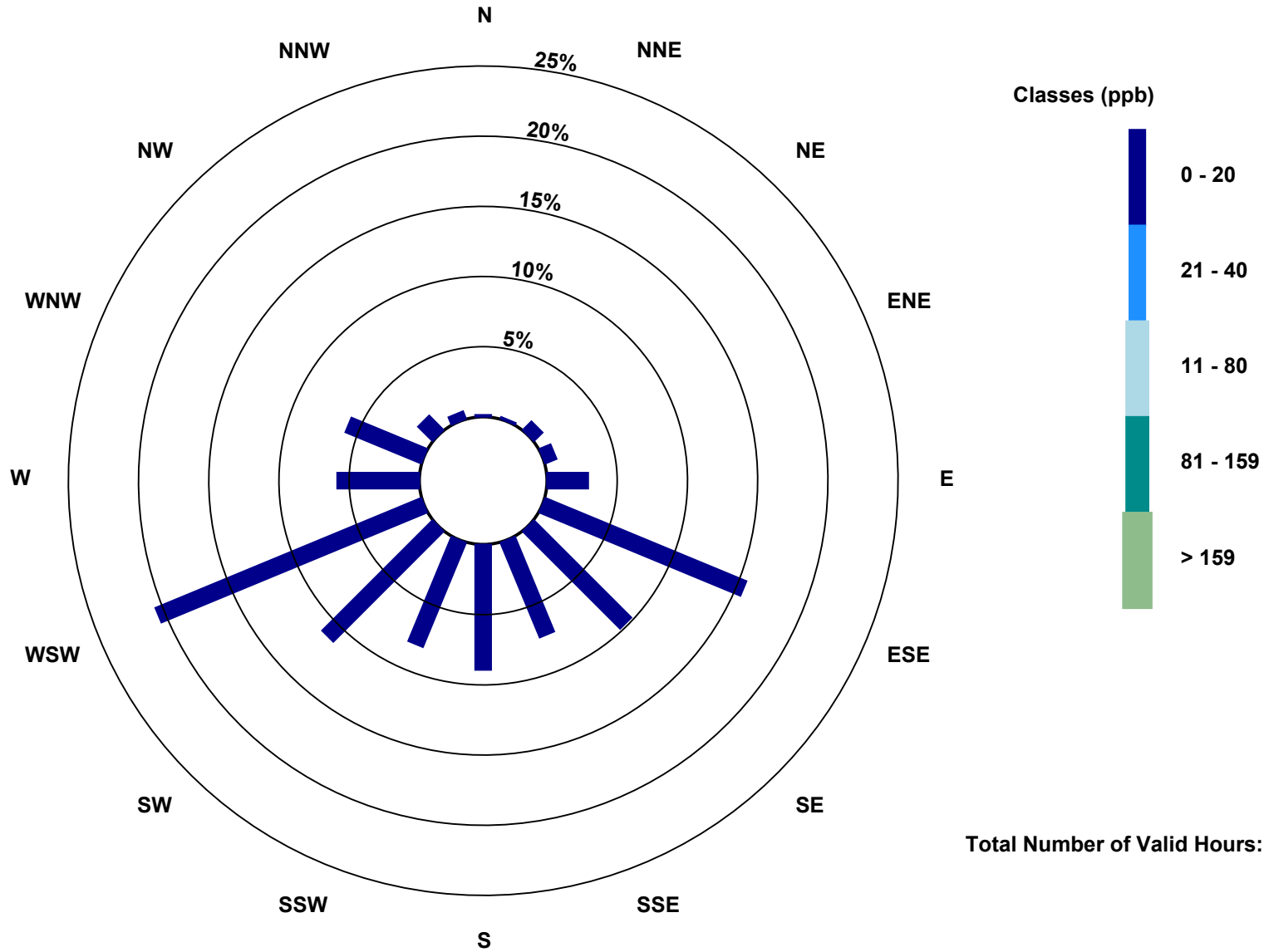
Total Number of Valid Hours: 683

Total Number of Hours: 720

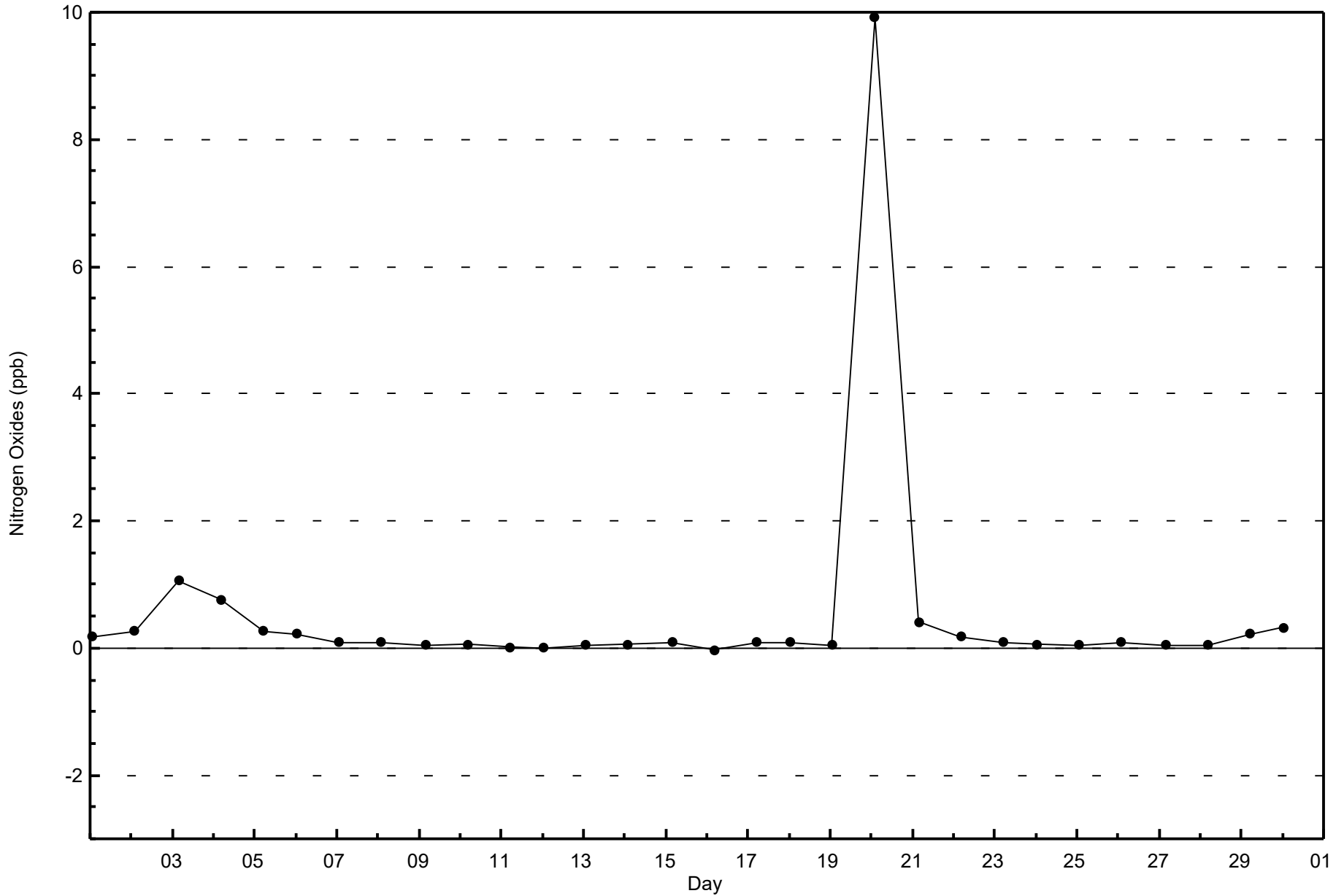


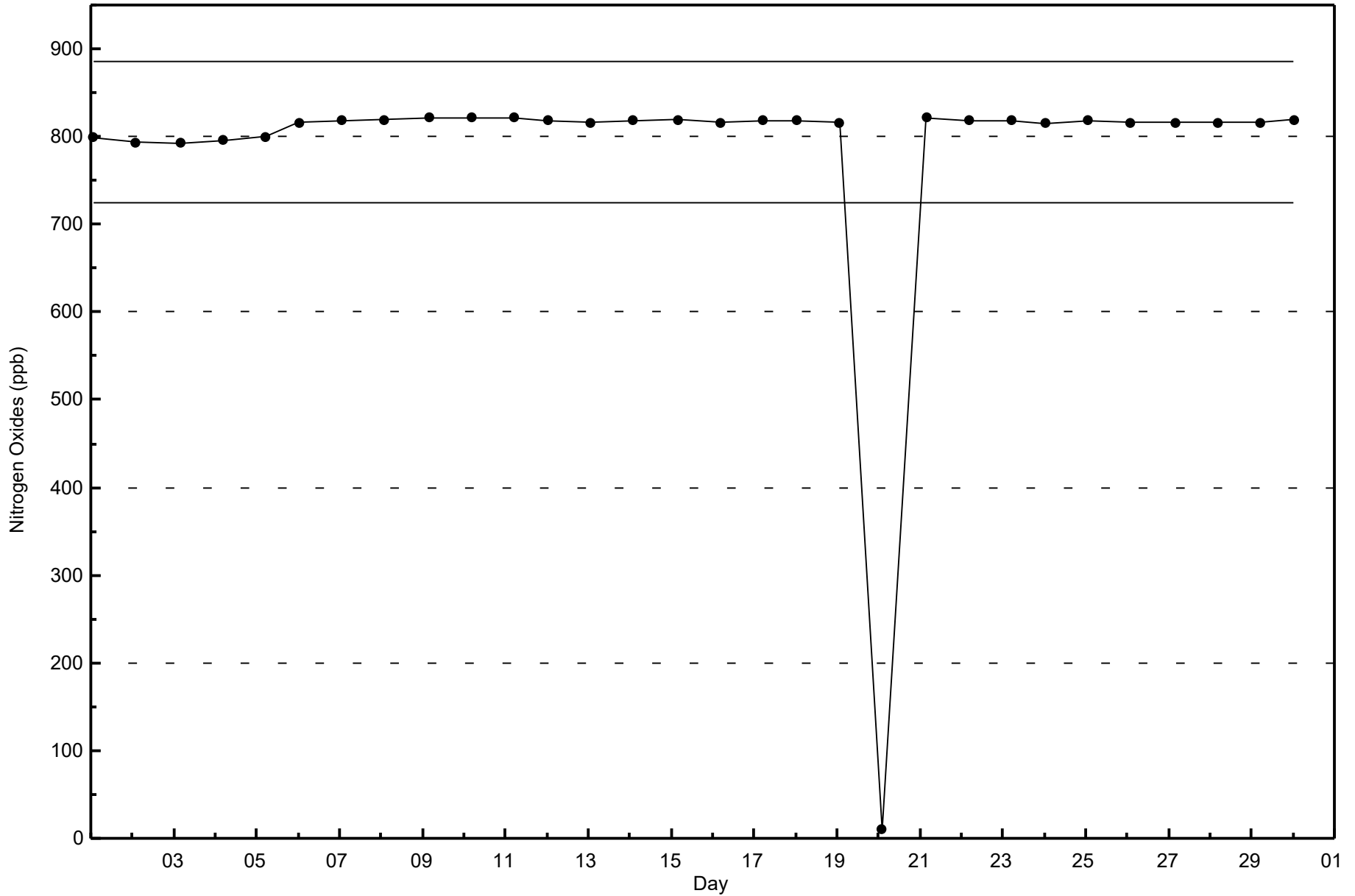
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitrogen Oxides (NO_x) - ppb
Anzac



Total Number of Valid Hours: 683







Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O₃) - ppb

Anzac - September 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 50.7 ppb on Sep 11 15:00	Maximum Daily Average: 37.6 ppb on Sep 23		Hours of Data:	591
Minimum Value: 0.0 ppb on Sep 6 22:00	Minimum Daily Average: 7.3 ppb on Sep 29		Hours of Missing Data:	129
Maximum Diurnal Average: 33.7 ppb at hour 16	Minimum Diurnal Average: 15.7 ppb at hour 7		Hours of Calibration:	30
Monthly Average: 23.91 ppb	Percentiles: P ₁ = 1.0 P ₁₀ = 8.1 Q ₁ = 14.2 Median = 24.2 Q ₃ = 33.1 P ₉₀ = 38.4 P ₉₉ = 46.7		Percent Operational Time:	86.3

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-Sep	17.2	17.7	19.2	21.4	21.9	Z	20.0	20.5	21.8	C	C	C	C	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	21.9
2-Sep	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-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	--
4-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	--
5-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	33.4	31.3	28.3	27.2	22.3	26.6	32.1	18.5	14.8	--	33.4
6-Sep	12.1	13.1	13.2	13.7	Z	12.1	10.2	10.0	11.2	9.9	9.0	11.8	15.5	19.3	21.0	24.7	21.6	16.8	10.8	1.7	1.3	0.0	0.4	0.0	11.3	24.7
7-Sep	0.1	5.5	13.3	12.9	11.0	Z	4.6	6.6	10.8	16.8	23.6	25.3	25.1	25.7	25.8	25.4	25.2	23.0	15.7	9.7	6.1	4.9	6.7	12.3	14.6	25.8
8-Sep	Z	10.0	12.5	10.7	11.7	14.2	10.1	16.7	20.2	23.5	27.7	29.8	31.3	32.6	32.3	31.4	29.8	25.3	18.1	8.6	10.2	6.7	5.2	6.9	18.5	32.6
9-Sep	6.3	Z	3.5	1.7	3.6	0.7	1.0	4.8	15.9	16.9	21.9	23.8	28.6	32.5	34.2	36.4	35.7	32.5	16.6	17.3	11.9	17.2	14.6	16.8	17.1	36.4
10-Sep	19.9	20.4	Z	17.0	11.8	7.1	9.1	11.7	18.3	21.5	23.9	33.3	34.9	36.7	36.2	41.2	41.6	37.7	33.9	32.3	28.5	26.1	22.6	25.4	25.7	41.6
11-Sep	23.5	20.9	20.9	Z	21.4	20.7	19.3	22.1	25.6	28.8	32.3	40.1	46.7	50.6	50.7	49.1	48.2	46.8	46.0	43.2	40.8	40.3	39.6	38.4	35.5	50.7
12-Sep	37.8	38.1	37.0	32.5	Z	18.6	16.8	21.3	25.2	30.3	34.8	35.3	38.1	40.6	37.9	38.9	37.1	35.1	22.1	21.1	28.4	26.8	25.6	22.4	30.5	40.6
13-Sep	21.8	24.2	15.6	7.7	10.2	Z	15.7	17.6	19.7	20.6	21.6	24.0	24.9	29.3	32.0	35.7	34.8	36.9	34.8	32.4	31.5	27.7	25.5	22.6	24.6	36.9
14-Sep	Z	17.1	15.6	14.4	14.2	14.0	14.1	14.3	13.1	12.1	12.3	14.4	18.3	20.8	22.6	24.5	24.3	24.6	23.3	22.0	23.0	23.8	23.4	23.3	18.7	24.6
15-Sep	13.1	Z	5.5	4.5	2.6	1.0	3.9	12.3	20.7	27.0	33.0	36.6	37.8	38.8	40.9	43.1	44.7	40.7	40.4	35.5	37.4	41.3	36.2	33.0	27.4	44.7
16-Sep	37.6	41.2	Z	41.5	40.2	26.5	19.9	33.7	38.2	36.4	35.3	37.2	39.5	41.7	41.5	40.1	38.1	34.3	20.8	19.3	13.9	14.6	13.0	8.1	31.0	41.7
17-Sep	18.1	18.5	10.0	Z	6.4	9.6	17.7	21.6	21.1	24.5	31.5	36.3	39.4	44.3	46.6	45.7	40.7	41.2	34.9	36.1	35.3	31.2	26.7	26.3	28.8	46.6
18-Sep	26.0	30.3	31.7	26.3	Z	12.4	7.2	11.9	21.4	29.4	30.1	34.8	36.8	37.1	35.7	36.9	36.6	29.0	25.9	24.2	22.2	23.2	23.1	22.5	26.7	37.1
19-Sep	21.5	21.0	20.4	19.7	19.1	Z	13.8	16.3	18.4	19.0	20.4	21.9	22.7	23.2	22.8	23.0	23.3	21.2	14.6	8.8	9.5	12.8	16.5	19.9	18.7	23.3
20-Sep	Z	18.7	17.2	16.2	14.3	12.6	11.1	9.7	11.9	M	17.5	27.7	32.1	35.3	38.2	40.3	39.3	43.3	34.8	19.9	16.7	11.0	12.9	10.1	22.3	43.3
21-Sep	6.7	Z	5.2	3.8	6.4	11.6	11.6	12.6	13.3	18.8	26.7	28.1	29.0	30.0	30.4	31.9	32.8	31.9	32.1	31.9	25.1	33.0	34.9	34.5	22.7	34.9
22-Sep	33.9	33.2	Z	33.0	33.1	33.4	31.5	29.8	33.4	34.7	36.9	38.5	38.9	40.3	42.3	42.5	42.6	40.8	39.2	38.4	37.3	36.0	35.9	33.2	36.5	42.6
23-Sep	34.3	31.7	32.6	Z	29.8	31.6	30.6	31.2	33.4	35.1	36.7	40.6	42.6	44.8	46.0	46.1	47.0	44.5	40.8	40.2	39.3	36.4	34.2	35.2	37.6	47.0
24-Sep	32.7	31.5	30.4	29.4	Z	29.5	27.0	25.7	25.4	24.5	23.6	23.3	26.3	28.6	31.1	30.0	30.3	28.9	24.4	20.6	16.9	35.8	36.4	27.2	27.8	36.4
25-Sep	29.6	26.2	23.3	17.7	11.2	Z	11.8	17.7	20.7	21.8	23.5	26.4	30.1	33.3	34.6	36.4	35.8	33.3	32.6	33.9	32.6	31.6	31.8	30.5	27.2	36.4
26-Sep	Z	28.4	25.2	27.8	31.1	32.3	30.3	26.6	28.4	31.3	35.3	36.7	39.1	37.5	35.3	30.1	27.4	27.0	25.4	25.8	22.0	24.0	24.0	29.7	39.1	
27-Sep	26.6	Z	25.1	24.4	25.2	25.1	25.8	28.1	31.0	32.0	31.9	33.3	33.4	34.5	36.8	38.2	36.4	35.2	33.7	31.6	23.7	24.1	23.7	26.5	29.8	38.2
28-Sep	20.2	18.6	Z	17.2	20.0	23.5	26.7	26.3	26.3	25.5	26.4	24.9	23.7	23.0	19.8	15.4	11.4	7.7	8.3	5.0	5.3	6.4	8.1	8.2	17.3	26.7
29-Sep	3.1	4.9	3.9	Z	6.0	6.3	8.6	7.2	7.9	7.2	5.0	4.3	3.4	4.5	8.0	9.4	10.3	10.1	8.2	9.3	11.5	10.7	9.0	8.4	7.3	11.5
30-Sep	8.9	10.1	11.6	10.5	Z	7.0	6.9	3.3	2.5	4.1	6.1	8.8	11.8	16.0	20.7	21.4	19.1	11.6	11.5	10.3	11.2	11.2	10.4	10.6	10.7	21.4

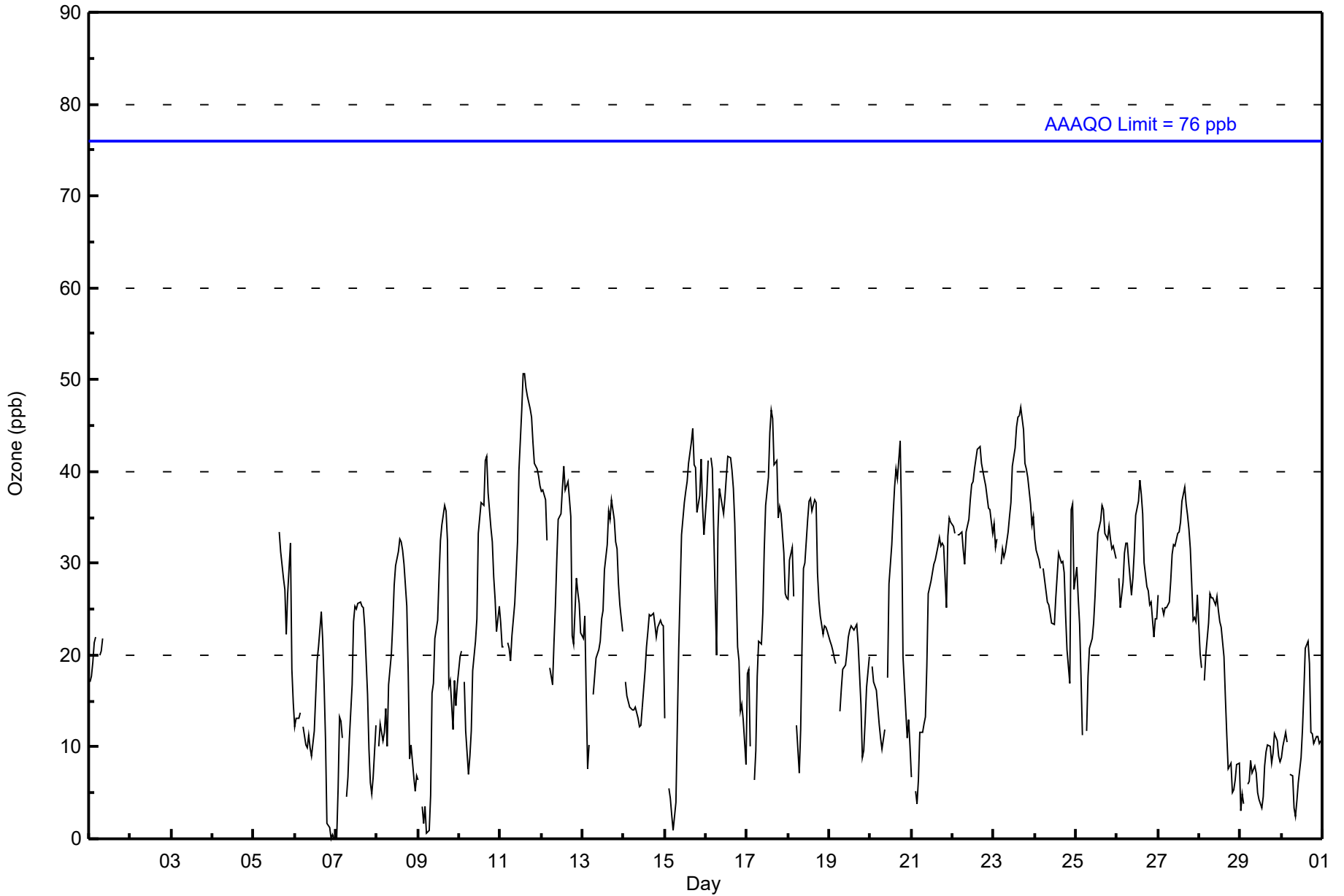
20.5	21.9	17.9	18.4	16.7	16.7	15.7	17.8	20.5	22.9	24.9	27.8	29.9	32.1	33.0	33.7	32.6	30.3	26.1	23.1	22.0	22.6	21.5	20.8	Diurnal Average	
37.8	41.2	37.0	41.5	40.2	33.4	32.1	33.7	38.2	36.4	36.9	40.6	46.7	50.6	50.7	49.1	48.2	46.8	46.0	43.2	40.8	41.3	39.6	38.4	Diurnal Maximum	

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



Wood Buffalo Environmental Association
Hourly Averages

Ozone (O₃) - ppb
Anzac - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ozone (O₃) - ppb
Anzac - September 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	222	37.56	37.56
21 - 50	367	62.10	99.66
51 - 82	2	0.34	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 591

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Ozone (O₃) - ppb
Anzac - September 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	1	0	2	2	7	29	18	16	25	15	22	29	15	28	9	4	222
21 - 50	0	1	4	4	13	77	45	31	25	22	37	86	14	8	0	0	367
51 - 82	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	1	1	6	6	20	106	65	47	50	37	59	115	29	36	9	4	591

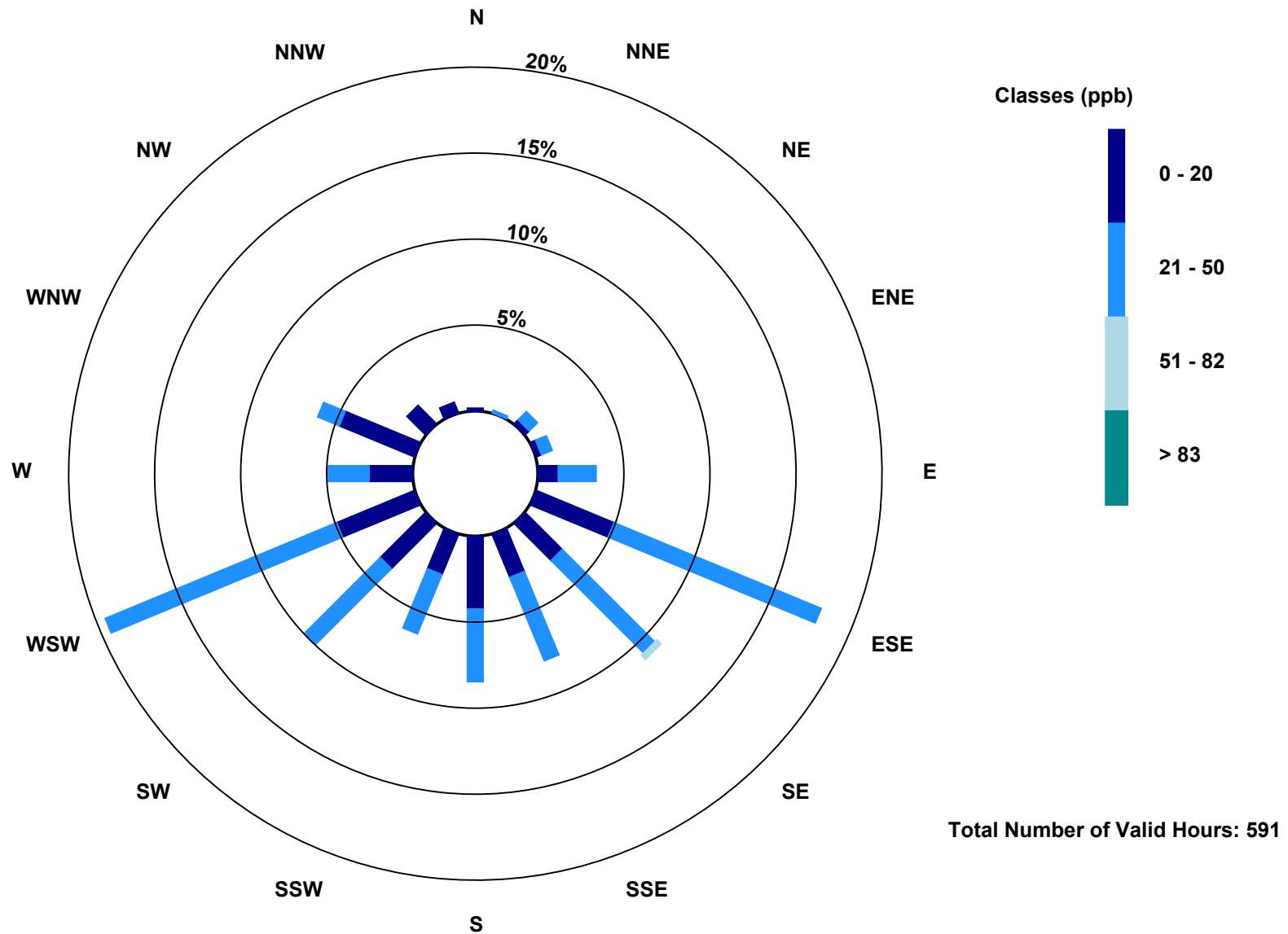
Total Number of Valid Hours: 591

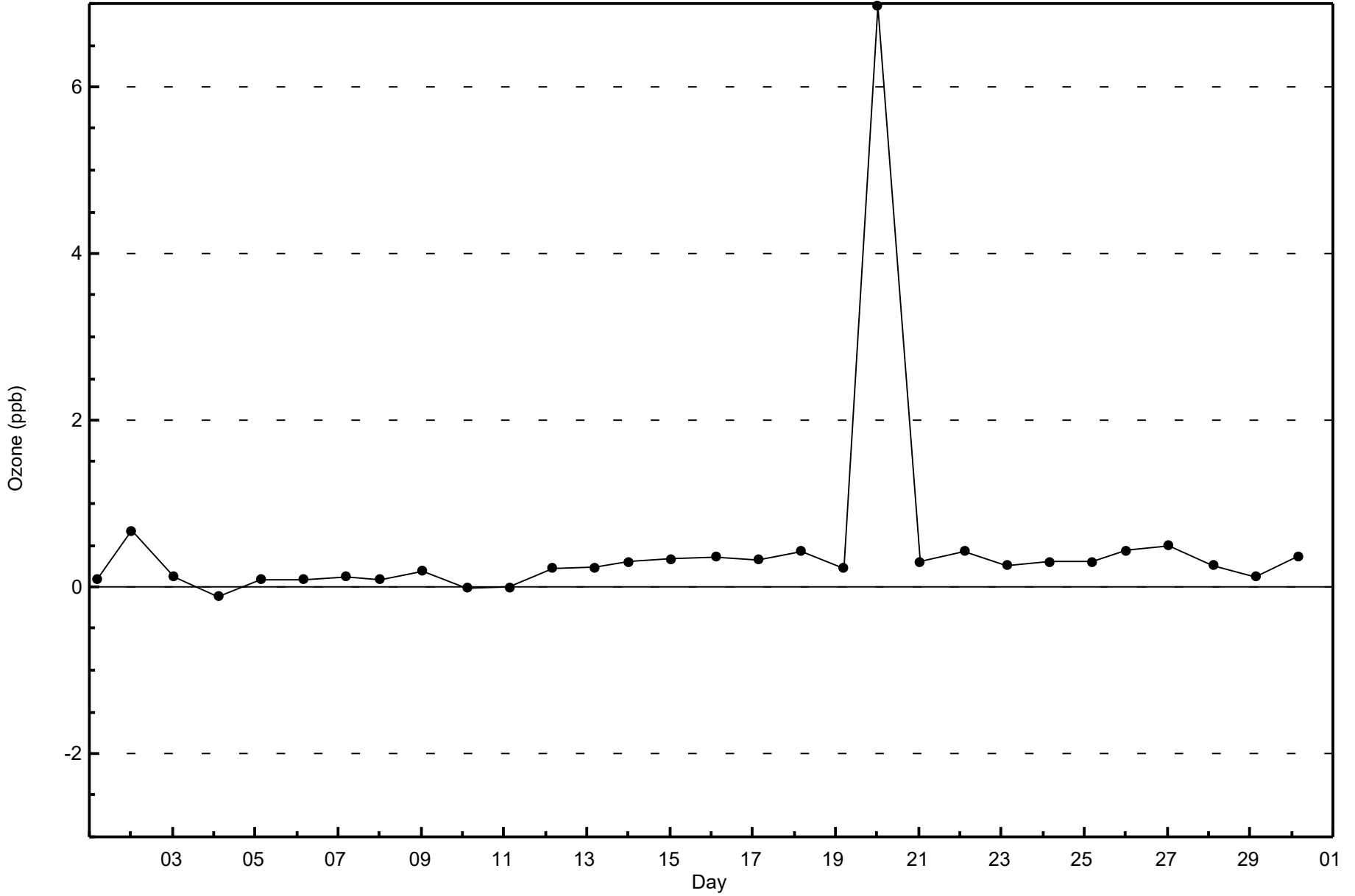
Total Number of Hours: 720

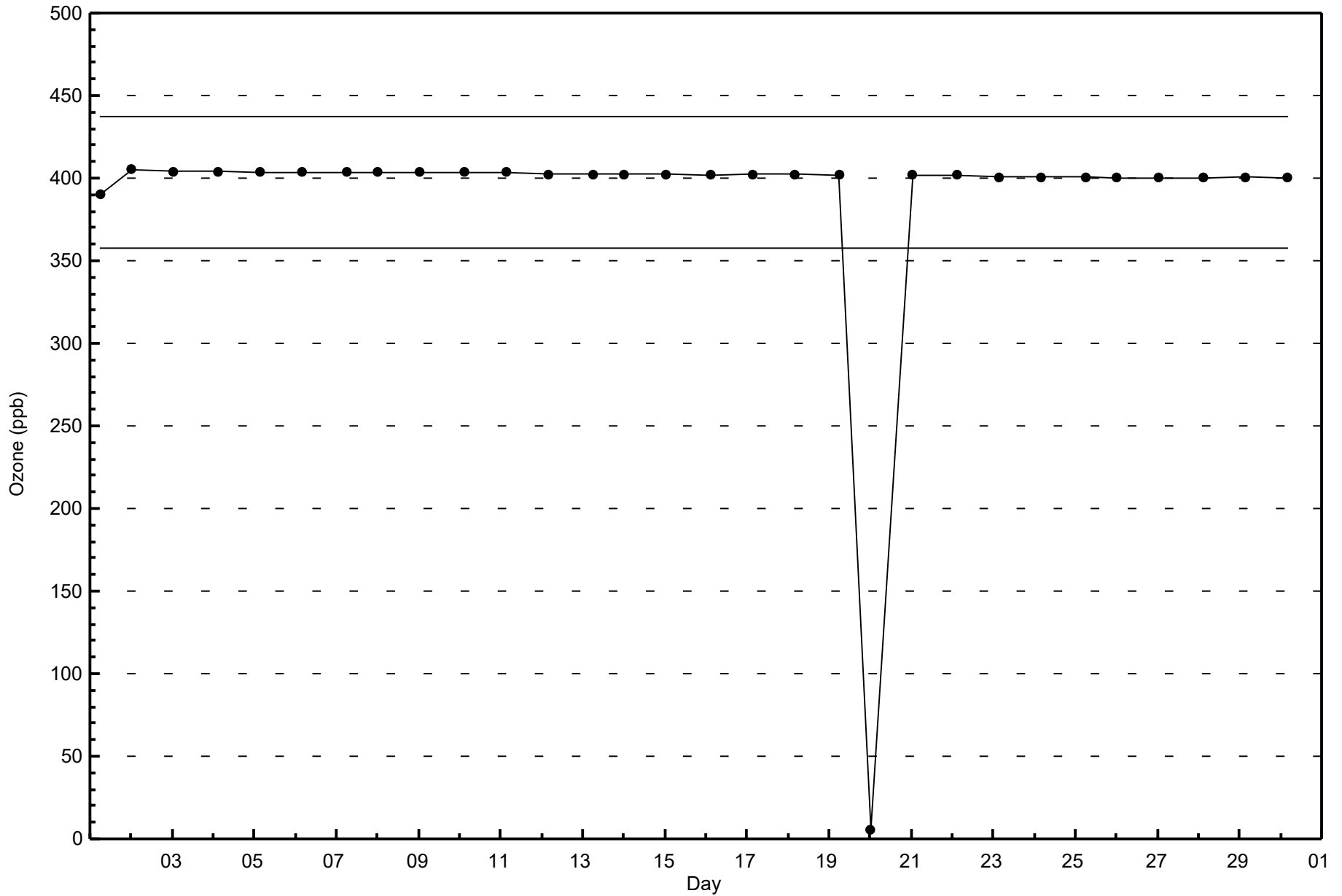


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Ozone (O₃) - ppb
Anzac









Summary of Hour Averages

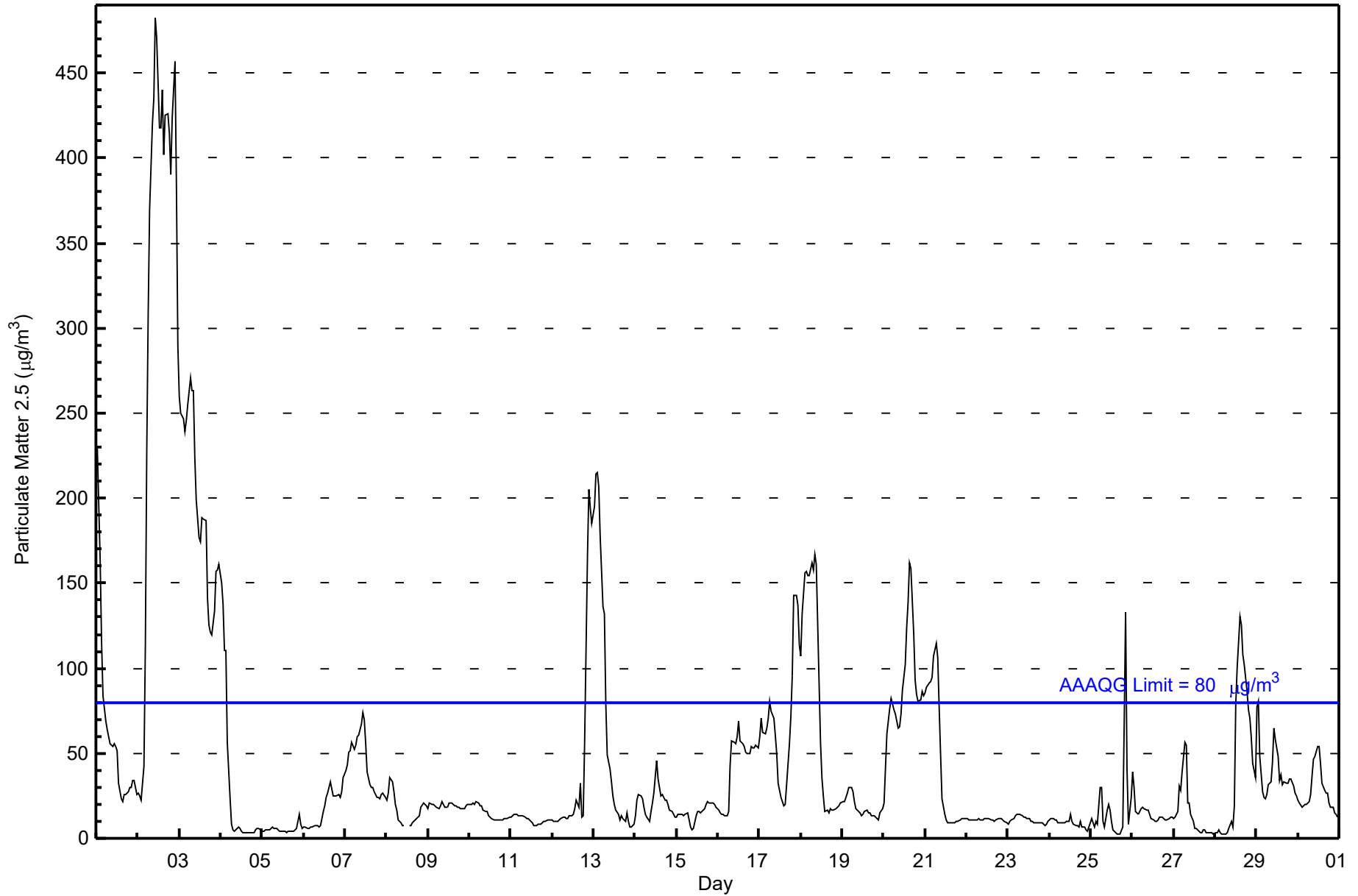
Anzac - September 2023

Number of Exceedences (AAAQO):	1-hr: 111	24-hr: 13	Hours in Service:	720
Maximum Value: 482.8 µg/m ³ on Sep 2 11:00	Maximum Daily Average: 326.3 µg/m ³ on Sep 2		Hours of Data:	718
Minimum Value: 2.3 µg/m ³ on Sep 25 16:00	Minimum Daily Average: 5.3 µg/m ³ on Sep 5		Hours of Missing Data:	2
Maximum Diurnal Average: 54.1 µg/m ³ at hour 7	Minimum Diurnal Average: 39.5 µg/m ³ at hour 19		Hours of Calibration:	2
Monthly Average: 47.72 µg/m ³	Percentiles: P ₁ = 3.0 P ₁₀ = 6.3 Q ₁ = 10.8 Median = 18.5 Q ₃ = 50.4 P ₉₀ = 131.0 P ₉₉ = 422.8		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-Sep	229.1	195.8	163.4	115.2	83.7	68.6	63.6	59.7	55.5	54.1	55.4	53.6	51.3	32.4	23.4	21.9	25.5	26.1	27.4	29.9	29.8	34.4	33.8	25.9	65.0	229.1
2-Sep	26.4	25.0	22.2	42.5	112.8	228.5	308.0	369.8	420.3	435.3	482.8	471.2	417.5	417.9	440.4	402.2	425.6	425.8	414.5	390.4	423.3	457.2	382.7	289.5	326.3	482.8
3-Sep	260.0	250.2	246.3	239.4	246.2	254.6	271.1	263.7	263.0	224.5	198.9	177.3	174.2	188.3	187.6	186.9	140.9	125.4	121.0	120.0	133.5	156.6	157.7	160.7	197.8	271.1
4-Sep	150.6	137.5	110.3	110.8	56.3	23.7	8.1	4.7	4.4	5.7	6.4	6.2	3.9	3.4	3.0	3.0	3.4	3.3	3.1	3.6	4.7	5.5	5.5	5.0	28.0	150.6
5-Sep	4.4	4.5	4.7	4.7	5.0	5.5	6.3	6.1	5.9	5.0	4.3	3.9	3.8	3.9	3.7	3.8	4.0	4.1	4.5	4.7	5.6	13.7	8.4	6.2	5.3	13.7
6-Sep	6.3	6.5	5.4	6.1	6.3	6.7	7.3	7.8	7.6	6.5	7.1	15.4	19.1	24.2	26.3	33.1	29.5	24.9	25.1	24.8	25.5	24.2	27.2	35.6	17.0	35.6
7-Sep	39.7	43.1	50.5	51.5	56.7	52.4	54.5	59.6	60.3	67.0	74.2	69.5	55.7	39.4	31.2	29.9	29.6	27.2	24.1	23.9	23.1	25.9	26.3	24.3	43.3	74.2
8-Sep	22.6	26.9	35.5	33.1	27.3	20.0	16.5	11.1	9.4	7.5	7.1	C	C	7.6	7.8	8.8	10.2	11.9	12.8	13.6	18.0	20.4	20.2	19.2	16.7	35.5
9-Sep	17.5	20.5	19.8	19.6	18.9	18.3	17.8	19.3	21.3	20.2	18.6	18.3	20.4	21.1	20.9	19.1	18.7	18.1	17.9	17.8	17.1	17.8	19.0	20.1	19.1	21.3
10-Sep	20.0	20.1	20.5	20.3	21.7	20.4	19.2	18.8	16.5	16.1	15.9	13.5	12.3	11.5	11.1	10.6	10.8	10.7	11.2	10.9	11.5	11.6	11.9	12.3	15.0	21.7
11-Sep	12.8	13.3	13.9	13.8	13.1	13.5	13.6	13.3	12.3	11.8	11.7	10.5	9.3	7.9	7.3	7.4	7.9	8.2	9.0	9.7	10.1	10.7	10.8	10.8	11.0	13.9
12-Sep	10.9	10.4	10.3	10.4	10.9	11.6	12.4	12.5	11.3	11.8	13.7	13.0	13.8	17.3	22.2	18.6	32.7	12.2	13.0	56.3	165.5	204.8	194.3	185.0	44.8	204.8
13-Sep	195.1	214.3	215.1	206.9	177.6	136.3	131.8	78.6	49.1	40.3	33.1	24.9	19.9	16.6	14.2	10.4	13.1	11.5	10.4	14.6	10.0	6.4	6.4	8.5	68.5	215.1
14-Sep	13.1	22.2	25.5	25.2	22.9	18.6	14.3	12.3	10.3	16.0	20.6	26.4	45.8	34.5	30.2	25.3	25.8	22.6	22.3	20.3	16.9	15.6	14.1	12.4	21.4	45.8
15-Sep	12.4	13.8	13.9	13.8	13.6	14.2	14.8	10.8	6.8	5.0	5.7	12.9	16.1	15.7	15.0	16.8	17.1	19.8	21.7	20.6	20.6	21.1	19.8	17.9	15.0	21.7
16-Sep	16.3	14.7	13.8	13.9	13.6	13.6	15.8	42.9	57.5	56.8	55.5	59.7	68.8	57.4	55.8	53.9	50.9	49.6	50.1	53.8	52.8	52.9	54.7	53.4	42.8	68.8
17-Sep	59.9	70.4	62.0	61.2	65.0	70.6	80.2	74.6	70.4	60.3	49.5	32.5	24.3	21.8	19.1	20.2	31.7	55.5	71.5	95.2	142.9	143.0	136.9	114.0	68.0	143.0
18-Sep	106.9	132.2	156.3	157.1	154.7	154.5	162.3	157.8	167.1	160.8	126.1	56.7	35.9	25.1	16.1	16.4	15.3	17.5	16.6	17.0	17.4	17.9	18.8	20.6	80.3	167.1
19-Sep	21.4	22.0	24.1	27.0	29.7	29.8	27.7	22.0	17.7	16.2	15.3	13.2	14.5	15.6	16.3	14.9	14.7	13.2	13.1	12.5	11.9	11.0	15.3	17.4	18.2	29.8
20-Sep	20.5	41.5	61.3	76.0	82.2	78.5	75.4	73.2	64.4	65.8	73.3	87.1	102.2	123.8	138.7	161.6	158.4	120.3	93.2	84.7	80.9	81.6	86.1	84.1	88.1	161.6
21-Sep	85.8	88.7	91.0	92.2	95.0	106.9	114.7	106.5	76.8	50.1	22.9	13.9	11.1	9.5	9.5	8.9	9.2	9.5	9.6	10.2	10.7	11.2	11.6	11.8	44.5	114.7
22-Sep	11.6	10.9	10.7	11.0	11.1	10.6	11.1	11.8	10.8	11.2	11.6	11.6	11.3	11.7	10.7	10.5	10.0	10.7	11.4	12.0	12.0	11.0	9.6	8.9	11.0	12.0
23-Sep	8.7	9.8	10.8	11.8	13.4	13.8	13.9	13.8	13.0	12.2	12.5	11.8	11.2	10.2	10.0	9.3	8.9	9.1	8.8	9.1	8.9	7.9	8.0	9.9	10.7	13.9
24-Sep	11.1	11.4	11.4	11.1	10.4	9.5	9.1	9.3	9.0	9.3	9.6	9.9	13.9	9.6	8.4	7.1	7.1	6.3	10.1	6.5	6.4	4.8	3.8	6.4	8.8	13.9
25-Sep	11.5	9.3	6.7	10.0	8.4	29.6	30.1	10.0	6.8	16.9	19.8	16.2	10.1	5.1	3.3	2.3	2.8	2.4	6.3	66.4	132.7	40.6	8.3	24.2	20.0	132.7
26-Sep	38.7	29.7	15.6	14.0	16.0	17.7	17.9	17.2	17.0	16.5	14.2	11.4	10.6	10.3	10.2	10.9	12.5	12.2	11.9	10.5	10.9	11.5	12.8	12.7	15.1	38.7
27-Sep	12.0	12.3	16.1	30.4	28.3	38.7	56.5	55.2	20.5	20.6	14.4	9.6	6.1	5.7	4.7	3.6	3.7	4.8	4.8	3.7	3.0	3.0	3.1	2.7	15.1	56.5
28-Sep	3.5	3.1	4.6	3.7	2.9	2.8	2.7	3.1	6.1	9.6	6.6	19.3	78.8	100.8	130.6	125.1	108.0	102.2	86.5	76.0	70.5	59.1	44.2	36.0	45.2	130.6
29-Sep	77.0	80.5	48.1	27.6	24.5	23.0	26.0	31.2	33.2	44.9	64.4	58.3	48.4	33.9	37.6	31.5	33.3	32.4	32.3	35.2	34.7	31.1	26.8	24.9	39.2	80.5
30-Sep	22.5	20.7	18.5	18.7	20.3	20.2	21.3	25.8	36.5	46.7	48.5	53.9	53.8	43.7	32.6	28.6	26.3	26.2	21.1	18.0	17.9	15.0	13.8	12.4	27.6	53.9

50.9	52.0	50.3	49.3	48.3	50.4	54.1	53.4	52.0	50.8	50.0	47.6	47.0	44.2	44.9	43.4	42.9	40.8	39.5	42.4	51.0	50.9	46.4	42.4	Diurnal Average	
260.0	250.2	246.3	239.4	246.2	254.6	308.0	369.8	420.3	435.3	482.8	471.2	417.5	417.9	440.4	402.2	425.6	425.8	414.5	390.4	423.3	457.2	382.7	289.5	Diurnal Maximum	

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Anzac - September 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	58	8.08	8.08
6 - 15	250	34.82	42.90
16 - 25	142	19.78	62.67
26 - 80	158	22.01	84.68
> 81.0	110	15.32	100.00

Total Number of Valid Hours: 718

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - µg/m³
Anzac - September 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	0	0	1	1	4	6	2	4	5	9	9	7	8	2	0	0	58
6 - 15	0	1	0	2	5	69	47	23	23	20	13	35	6	4	0	2	250
16 - 25	1	0	4	0	7	27	14	9	11	9	12	27	7	7	6	1	142
26 - 80	0	0	1	3	5	11	3	12	11	14	24	40	8	22	3	1	158
> 81.0	0	0	0	0	1	0	5	4	13	9	19	37	14	7	1	0	110
Totals	1	1	6	6	22	113	71	52	63	61	77	146	43	42	10	4	718

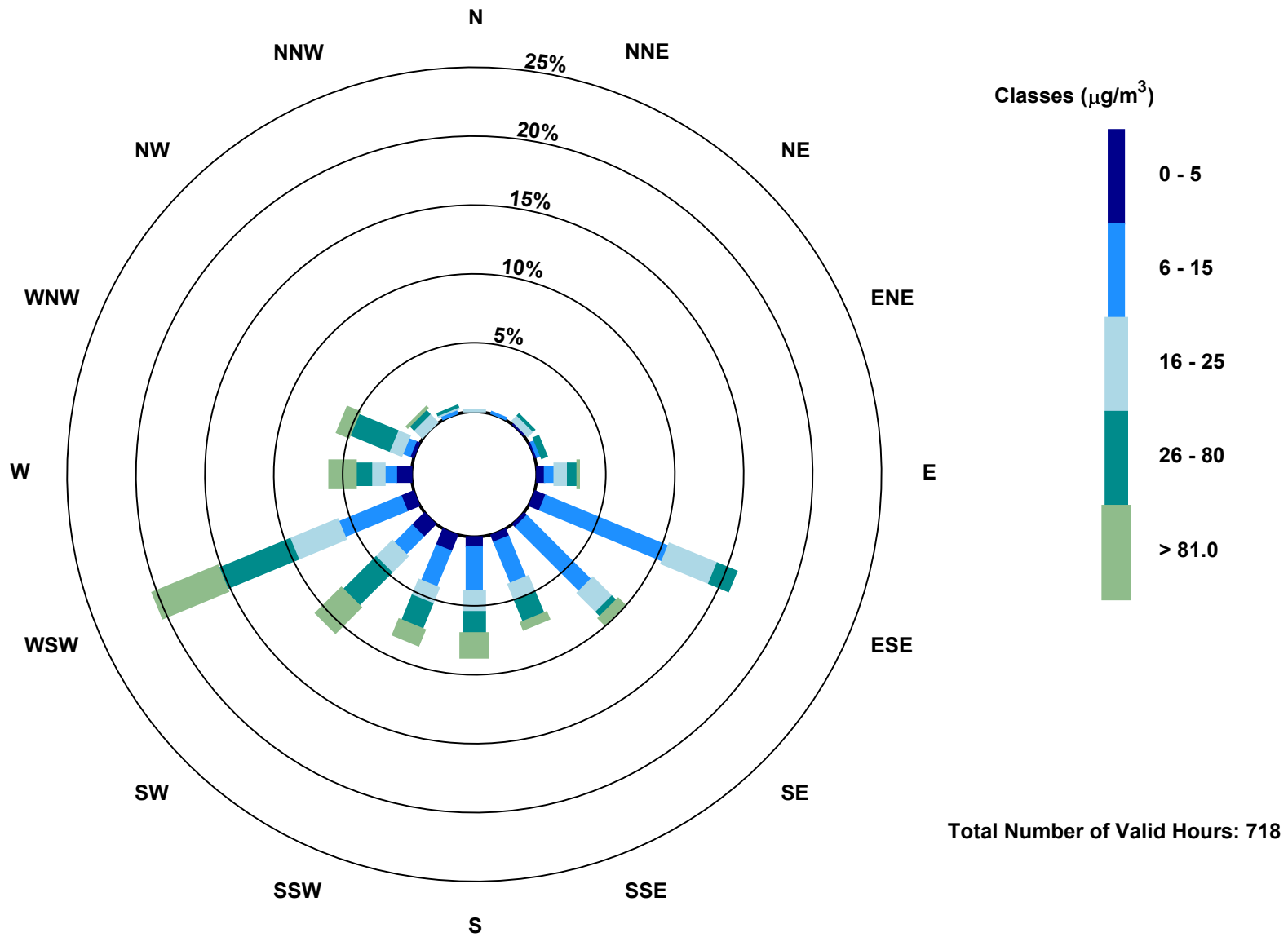
Total Number of Valid Hours: 718

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

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



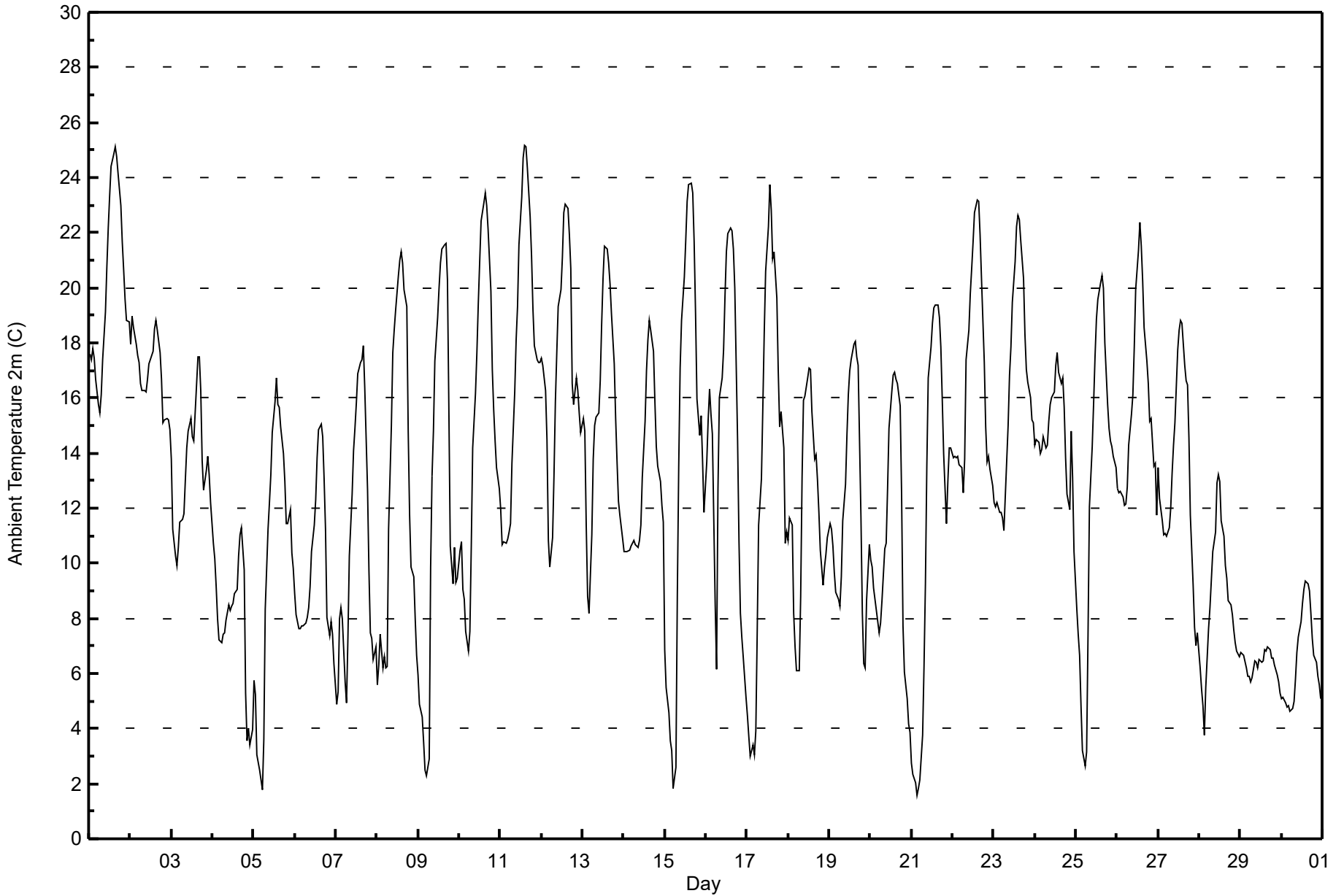


Maximum Value: 25.2 C on Sep 11 15:00		Maximum Daily Average: 20.1 C on Sep 1		Hours in Service: 720																						
Minimum Value: 1.6 C on Sep 21 04:00		Minimum Daily Average: 6.3 C on Sep 29		Hours of Data: 720																						
Maximum Diurnal Average: 18.6 C at hour 15		Minimum Diurnal Average: 8.2 C at hour 6		Hours of Missing Data: 0																						
Monthly Average: 13.08 C		Percentiles: P ₁ = 2.3 P ₁₀ = 5.9 Q ₁ = 8.5 Median = 13.3 Q ₃ = 17.2 P ₉₀ = 20.5 P ₉₉ = 24.3		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-Sep	17.6	17.4	17.8	17.5	16.7	15.8	15.4	16.1	17.4	19.1	20.7	22.2	23.3	24.4	24.9	25.1	24.7	24.2	23.0	21.7	20.6	19.6	18.8	18.7	20.1	25.1
2-Sep	18.0	19.0	18.6	18.0	17.5	17.3	16.5	16.2	16.3	16.2	16.7	17.3	17.5	17.7	18.5	18.8	18.5	17.7	16.7	15.1	15.2	15.2	15.2	14.9	17.0	19.0
3-Sep	13.8	11.2	10.3	9.9	10.6	11.5	11.6	11.8	13.0	14.2	14.8	15.3	14.6	14.4	15.5	17.5	17.5	16.2	13.7	12.7	13.4	13.9	13.2	12.2	13.4	17.5
4-Sep	10.7	10.2	9.2	8.0	7.2	7.1	7.4	7.5	7.9	8.5	8.3	8.4	8.5	8.9	9.0	10.3	11.0	11.3	9.7	5.3	3.6	4.0	3.4	4.0	7.9	11.3
5-Sep	5.7	5.2	3.0	2.5	2.1	1.8	3.6	8.3	11.2	12.2	13.2	14.7	15.9	16.7	15.8	15.6	14.9	14.0	13.0	11.4	11.5	11.9	10.4	9.8	10.2	16.7
6-Sep	8.9	8.1	7.6	7.6	7.7	7.7	7.8	8.1	8.4	9.1	10.4	11.4	12.3	13.8	14.8	15.0	14.6	13.1	11.2	8.0	7.3	7.9	7.4	6.4	9.8	15.0
7-Sep	4.9	5.4	8.0	8.4	8.0	5.7	4.9	7.3	10.3	12.5	14.1	14.9	15.8	16.9	17.3	17.4	17.9	16.4	12.7	9.7	7.5	7.3	6.5	7.0	10.7	17.9
8-Sep	5.6	6.3	7.4	6.2	6.6	6.2	6.3	11.2	15.0	17.6	18.4	19.2	20.4	21.0	21.3	20.9	19.9	19.3	14.8	11.7	9.9	9.5	8.0	6.6	12.9	21.3
9-Sep	5.9	4.9	4.4	3.5	2.5	2.3	2.9	9.9	13.1	14.8	17.3	18.9	20.0	20.9	21.4	21.6	21.6	20.3	15.7	10.6	9.2	10.6	9.3	9.5	12.1	21.6
10-Sep	10.5	10.8	9.1	8.7	7.5	6.8	7.5	10.6	14.2	16.1	17.7	19.4	20.9	22.4	23.1	23.5	23.0	22.1	19.9	17.0	15.6	14.5	13.5	12.7	15.3	23.5
11-Sep	11.9	10.7	10.8	10.7	10.9	11.1	11.4	13.6	16.2	18.1	19.3	21.6	23.3	24.7	25.2	25.1	24.4	22.6	21.2	19.2	17.9	17.4	17.3	17.3	17.6	25.2
12-Sep	17.4	17.2	16.2	14.5	10.8	9.9	10.9	13.2	15.9	17.7	19.3	19.9	21.1	22.7	23.1	22.9	21.9	20.7	16.5	15.8	16.7	16.3	15.5	14.7	17.1	23.1
13-Sep	15.3	14.8	11.4	8.8	8.2	11.0	13.8	15.0	15.3	15.4	16.6	18.7	20.4	21.5	21.4	20.9	20.1	19.1	17.2	15.2	13.7	12.3	11.8	10.9	15.4	21.5
14-Sep	10.4	10.4	10.4	10.5	10.6	10.7	10.8	10.7	10.6	10.8	11.4	13.1	15.1	17.0	18.1	18.8	18.5	17.7	15.8	14.2	13.5	12.9	12.1	11.5	13.2	18.8
15-Sep	6.9	5.5	4.6	3.6	3.2	1.8	2.6	8.8	13.5	17.1	18.8	20.4	21.7	23.1	23.8	23.8	23.4	21.7	19.1	16.0	14.7	15.3	13.7	11.8	14.0	23.8
16-Sep	13.7	15.2	16.3	15.4	14.7	8.6	6.2	12.7	16.0	16.7	17.7	19.7	21.3	22.0	22.2	22.1	21.4	20.0	14.4	10.8	8.2	7.3	6.6	5.1	14.8	22.2
17-Sep	4.5	3.7	3.0	3.4	3.0	3.9	7.5	11.4	13.0	15.7	18.3	20.6	22.2	23.8	22.8	21.0	21.3	19.6	17.0	14.9	15.5	14.2	10.7	11.2	13.4	23.8
18-Sep	10.8	11.6	11.4	8.2	7.0	6.1	6.1	8.8	13.1	15.9	16.0	16.7	17.1	17.0	15.5	13.8	13.9	13.0	11.8	10.5	9.2	9.9	10.3	10.9	11.9	17.1
19-Sep	11.4	11.2	10.6	9.7	9.0	8.7	8.4	9.5	11.5	12.9	14.7	16.1	17.0	17.4	17.9	18.1	17.5	17.2	11.7	8.2	6.4	6.2	8.7	10.7	12.1	18.1
20-Sep	10.1	9.9	9.1	8.3	7.9	7.5	7.8	8.6	10.5	10.7	12.7	14.9	16.2	16.8	16.9	16.7	16.5	15.7	12.5	7.7	6.1	5.1	4.2	3.9	10.7	16.9
21-Sep	2.8	2.3	2.0	1.6	1.8	2.1	3.8	6.2	9.3	13.5	16.7	17.9	18.7	19.3	19.4	19.4	18.9	17.8	16.0	14.0	11.5	13.0	14.2	14.2	11.5	19.4
22-Sep	13.8	13.9	13.8	13.9	13.6	13.5	12.5	13.8	17.4	18.4	19.8	20.7	21.7	22.7	23.2	23.1	21.9	20.3	17.3	14.9	13.7	13.9	13.4	12.8	16.8	23.2
23-Sep	12.2	12.0	12.2	11.9	11.8	11.7	11.2	12.4	15.0	16.8	17.8	19.5	20.9	22.2	22.6	22.5	21.7	20.3	18.3	17.1	16.6	16.0	15.2	15.1	16.4	22.6
24-Sep	14.3	14.5	14.4	14.0	14.1	14.6	14.2	14.3	15.2	15.8	16.0	16.2	17.2	17.7	16.9	16.5	16.7	15.6	13.8	12.5	11.9	14.8	13.1	10.4	14.8	17.7
25-Sep	8.3	7.4	6.6	4.8	3.2	2.6	3.2	7.4	12.0	14.3	15.8	17.5	18.8	19.6	20.2	20.4	20.0	18.0	15.8	14.9	14.4	14.2	13.9	13.5	12.8	20.4
26-Sep	12.7	12.5	12.6	12.4	12.1	12.2	12.8	14.3	15.4	16.1	17.8	19.9	21.4	22.4	21.5	20.2	18.6	17.3	16.5	15.2	15.2	13.5	13.6	11.7	15.8	22.4
27-Sep	13.5	12.4	11.5	11.0	11.1	11.0	11.3	12.0	13.3	14.3	15.1	17.7	18.5	18.8	18.7	17.2	16.7	16.5	14.5	11.8	9.2	7.7	7.0	7.5	13.3	18.8
28-Sep	6.2	5.4	4.8	3.8	5.5	7.6	8.4	9.4	10.4	11.2	12.9	13.2	13.0	11.6	11.0	9.9	9.5	8.6	8.5	8.1	7.6	7.1	6.8	6.6	8.6	13.2
29-Sep	6.7	6.7	6.7	6.2	5.9	5.9	5.7	5.8	6.4	6.4	6.2	6.5	6.4	6.5	6.9	6.8	7.0	6.9	6.6	6.6	6.3	6.0	5.7	5.3	6.3	7.0
30-Sep	5.1	5.2	4.9	4.8	4.8	4.6	4.7	5.0	5.8	6.7	7.3	7.9	8.5	9.1	9.4	9.3	9.0	8.2	7.2	6.6	6.4	5.9	5.6	5.1	6.5	9.4
																								Diurnal Average		
																								Diurnal Maximum		



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature 2m (AT 2m) - C
Anzac - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature 2m (AT 2m) - C
Anzac - September 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	222	30.83	30.83
10 - 20	416	57.78	88.61
> 20	82	11.39	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

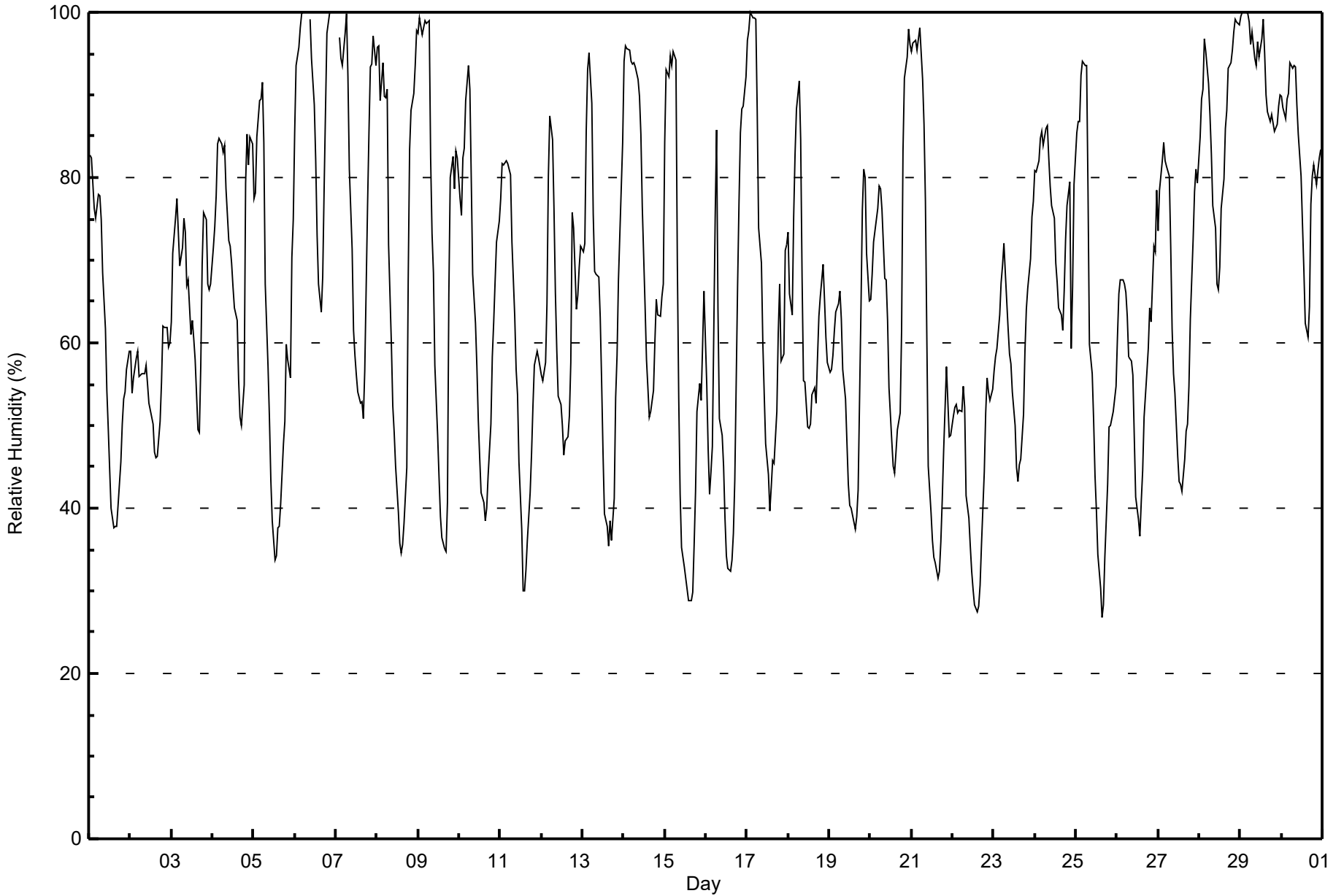
Relative Humidity (RH) - %
Anzac - September 2023

Maximum Value: 100.0 % on Sep 6 06:00 Maximum Daily Average: 93.8 % on Sep 29																						Hours in Service:	720			
Minimum Value: 26.9 % on Sep 25 16:00 Minimum Daily Average: 44.1 % on Sep 22																						Hours of Data:	716			
Maximum Diurnal Average: 84.6 % at hour 6 Minimum Diurnal Average: 46.3 % at hour 16																						Hours of Missing Data:	4			
Monthly Average: 66.82 % Percentiles: P ₁ = 29.9 P ₁₀ = 40.0 Q ₁ = 51.6 Median = 66.3 Q ₃ = 83.3 P ₉₀ = 94.1 P ₉₉ = 100.0																						Hours of Calibration:	0			
																						Percent Operational Time:	99.4			
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-Sep	82.7	82.3	79.2	76.3	75.1	77.9	77.8	75.0	68.5	61.6	54.3	49.6	44.8	39.9	37.7	37.8	37.8	40.3	45.5	50.2	53.3	54.0	56.8	59.0	59.1	82.7
2-Sep	59.0	53.8	55.7	58.2	59.0	55.8	56.1	56.3	56.3	57.3	55.0	52.8	51.1	50.1	46.8	46.1	46.2	50.5	55.2	62.1	61.8	61.8	59.5	59.9	55.3	62.1
3-Sep	62.5	70.9	75.1	77.4	73.4	69.2	71.6	75.0	73.3	66.9	67.6	61.0	62.8	60.5	57.9	49.5	49.2	57.1	69.5	75.7	74.9	67.1	66.5	67.2	66.8	77.4
4-Sep	71.6	74.1	77.9	84.1	84.8	84.1	83.1	83.8	78.7	72.3	71.7	69.7	66.8	64.3	62.7	55.7	51.0	49.9	55.0	79.4	85.3	81.5	84.8	84.1	73.2	85.3
5-Sep	77.4	78.1	84.9	89.3	89.5	91.6	84.2	67.0	57.1	50.9	43.4	38.4	33.8	34.2	37.7	37.8	40.5	47.7	50.6	59.8	58.0	55.8	70.4	74.9	60.5	91.6
6-Sep	85.5	93.5	95.7	98.2	99.8	100.0	100.0	OR	OR	99.1	94.4	88.8	82.2	73.0	67.2	63.8	68.0	78.5	88.1	97.4	100.0	OR	100.0	100.0	89.2	100.0
7-Sep	100.0	OR	96.9	94.4	93.5	97.5	99.8	92.2	80.9	71.3	61.5	58.4	56.1	54.0	52.7	52.9	50.9	56.7	76.6	85.4	93.4	93.7	97.1	93.6	78.7	100.0
8-Sep	95.7	95.9	89.4	93.9	89.8	89.6	90.8	71.9	59.8	52.4	49.2	45.2	39.5	35.7	34.5	35.5	38.1	45.0	67.6	83.4	88.2	90.2	93.6	97.7	69.7	97.7
9-Sep	97.5	99.4	97.2	98.2	99.0	98.7	98.9	82.4	73.2	68.5	57.4	48.8	43.6	39.0	36.5	35.0	34.7	40.6	65.8	80.0	82.5	78.6	83.2	82.4	71.7	99.4
10-Sep	77.4	75.4	82.4	83.6	89.4	93.6	90.8	79.6	68.4	62.3	57.0	50.7	46.1	41.8	40.7	38.4	40.1	43.9	50.1	58.3	62.6	67.5	72.1	74.8	64.5	93.6
11-Sep	77.5	81.7	81.5	82.0	81.7	81.0	80.3	72.2	63.3	56.8	53.8	45.6	37.5	30.0	30.0	32.5	36.1	41.9	46.7	52.4	57.3	59.1	58.1	57.0	58.2	82.0
12-Sep	56.1	55.5	57.7	64.7	80.2	87.5	84.6	76.2	66.2	59.2	53.6	52.6	50.1	46.5	48.1	48.6	51.2	57.6	75.8	73.8	64.1	65.7	69.1	71.7	63.2	87.5
13-Sep	71.1	72.0	85.6	93.1	95.1	88.9	75.6	68.7	68.3	68.0	63.0	55.2	46.6	39.4	37.9	35.4	38.4	36.1	41.2	53.4	58.4	67.6	73.3	84.2	63.2	95.1
14-Sep	94.1	95.9	95.6	95.4	94.1	93.7	93.8	93.4	91.8	89.8	85.3	76.4	64.4	57.9	54.6	51.0	51.7	54.2	60.2	65.3	63.4	63.3	65.6	67.1	75.7	95.9
15-Sep	84.2	93.0	92.2	94.8	93.6	95.3	94.2	69.9	53.4	41.7	35.2	32.9	31.5	30.2	28.8	28.9	29.9	35.6	42.0	51.7	55.1	53.1	59.5	66.3	58.0	95.3
16-Sep	54.9	47.2	41.7	44.4	47.5	75.1	85.7	64.0	50.8	48.7	45.1	38.9	34.3	32.7	32.3	33.8	37.0	43.5	66.9	76.9	85.4	88.3	88.6	92.3	56.5	92.3
17-Sep	96.6	97.9	100.0	99.3	99.3	99.2	87.9	73.9	69.7	60.0	53.7	47.8	44.1	39.6	42.5	45.8	45.5	51.7	61.2	67.2	57.7	58.7	71.1	71.9	68.4	100.0
18-Sep	73.5	66.0	63.3	75.3	82.9	88.3	91.7	84.5	68.0	55.5	55.3	49.8	49.6	50.1	53.8	54.7	52.8	58.2	63.3	65.6	69.5	65.3	60.6	57.6	64.8	91.7
19-Sep	56.4	56.8	58.4	61.3	63.8	64.8	66.2	62.9	56.7	53.2	48.0	42.9	40.3	40.0	38.3	37.4	38.9	42.2	63.9	76.2	81.1	80.0	70.9	65.1	56.9	81.1
20-Sep	65.3	68.4	72.2	74.9	76.2	79.0	78.6	76.1	67.8	67.6	62.7	54.6	48.1	45.1	44.2	46.7	49.5	51.5	61.6	83.2	92.0	94.5	97.9	96.0	68.9	97.9
21-Sep	95.2	96.3	96.6	95.4	96.7	98.1	91.8	86.5	77.2	60.6	45.0	39.5	36.0	34.0	33.3	31.6	32.4	35.9	41.1	47.0	57.1	52.9	48.7	48.9	61.6	98.1
22-Sep	51.2	52.2	52.6	51.5	51.9	51.6	54.8	52.2	41.4	38.9	35.4	32.4	30.1	28.3	27.5	28.1	30.8	35.6	44.4	51.5	55.8	54.0	53.0	54.4	44.1	55.8
23-Sep	56.6	58.3	59.3	63.5	67.3	69.3	72.1	68.6	61.7	58.6	57.4	54.0	50.1	45.0	43.2	45.2	45.9	51.3	58.9	64.0	66.7	70.2	75.2	77.1	60.0	77.1
24-Sep	80.8	80.7	82.0	84.8	85.7	83.8	85.9	86.3	82.3	78.9	76.6	75.1	69.7	67.3	64.3	63.5	61.6	66.4	72.6	76.7	79.5	59.2	66.8	79.1	75.4	86.3
25-Sep	85.4	86.7	86.7	92.4	94.1	93.6	93.6	78.3	59.8	56.3	50.7	43.8	39.7	34.4	30.3	26.9	28.4	34.0	42.9	49.9	49.9	50.9	51.8	54.7	59.0	94.1
26-Sep	60.7	66.0	67.6	67.6	67.2	66.1	63.2	58.3	57.7	56.0	48.6	41.3	38.7	36.6	40.8	44.6	51.0	56.5	59.4	64.2	62.5	71.6	71.0	78.5	58.1	78.5
27-Sep	73.6	78.5	82.0	84.2	82.0	81.3	80.2	71.7	61.8	56.3	53.9	46.3	43.2	42.9	42.0	45.9	49.3	50.2	54.8	62.9	72.5	78.4	81.0	79.4	64.8	84.2
28-Sep	84.9	89.5	90.8	96.9	95.3	91.4	87.6	82.9	76.6	74.0	67.2	66.4	69.2	76.3	79.9	86.0	88.2	93.2	93.9	95.5	97.6	99.2	98.8	98.5	86.7	99.2
29-Sep	99.6	100.0	100.0	100.0	99.9	98.9	96.1	97.7	94.4	93.5	96.5	94.5	96.7	99.1	95.1	90.0	88.0	86.8	87.6	86.7	85.6	86.4	88.6	90.1	93.8	100.0
30-Sep	89.9	88.4	87.1	89.5	90.2	93.9	93.3	93.6	93.3	88.8	85.2	80.1	74.4	68.9	62.3	60.6	64.5	76.9	80.1	81.6	79.2	80.9	82.3	83.4	82.0	93.9
																								Diurnal Average		
																								Diurnal Maximum		
																								OR - Out of Range		



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Anzac - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Anzac - September 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	71	9.92	9.92
40 - 60	224	31.28	41.20
60 - 80	205	28.63	69.83
80 - 100	207	28.91	98.74

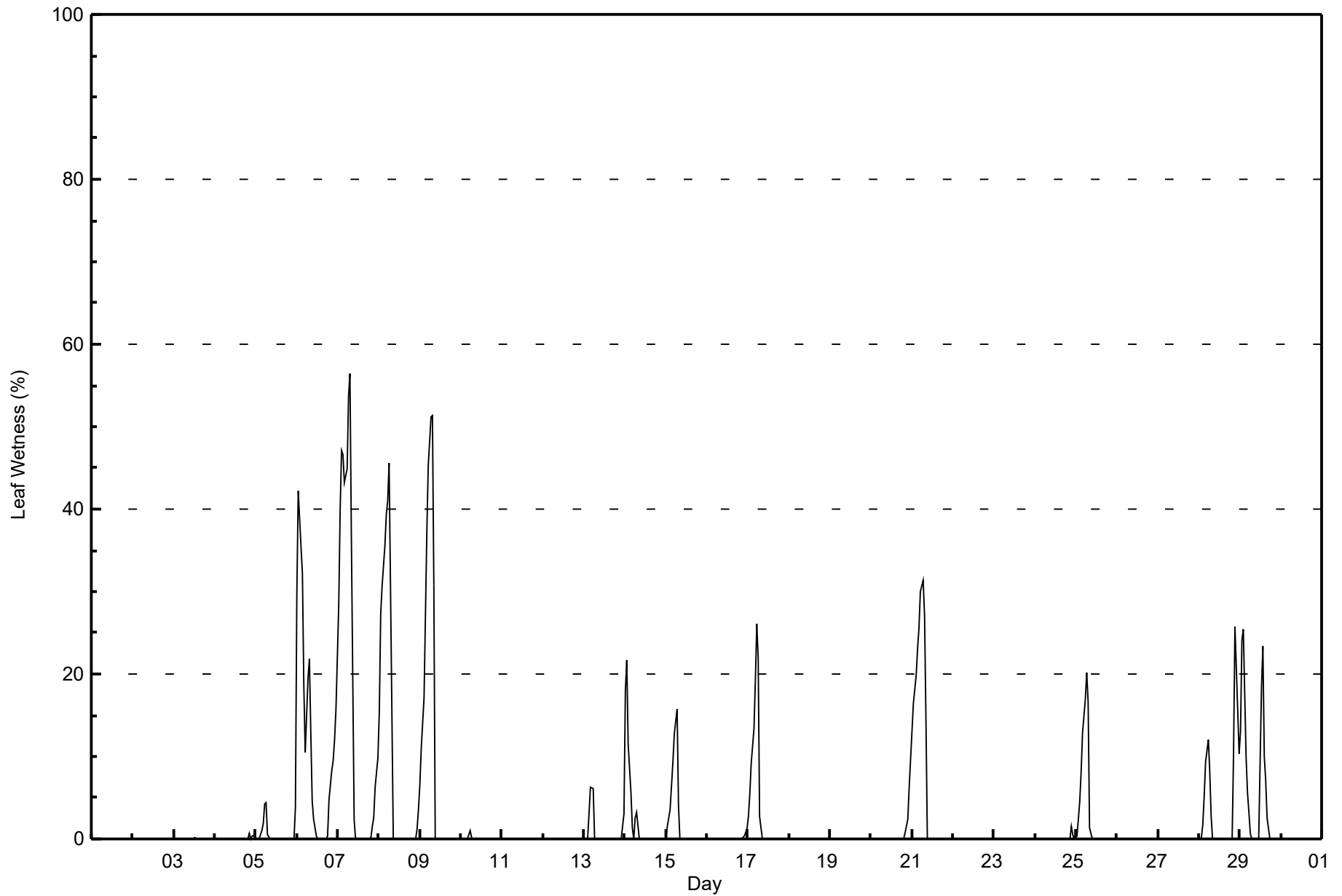
Total Number of Valid Hours: 716

Total Number of Hours: 720



Wood Buffalo Environmental Association
Hourly Averages

Leaf Wetness (LW) - %
Anzac - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Leaf Wetness (LW) - %
Anzac - September 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 0.3	586	81.39	81.39
0.4 - 0.5	7	0.97	82.36
0.6 - 0.7	3	0.42	82.78
0.8 - 1.4	6	0.83	83.61
1.5 - 10	49	6.81	90.42
> 10	69	9.58	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Speed (WS) - km/h
Anzac - September 2023

Maximum Speed: 28 km/h on Sep 11 13:00	Maximum Daily Speed Average: 17.8 km/h on Sep 23	Hours in Service: 720
Minimum Speed Value: 1 km/h on Sep 9 07:00	Minimum Daily Speed Average: 1.8 km/h on Sep 30	Hours of Data: 720
Maximum Diurnal Speed Average: 7.7 km/h at hour 15	Minimum Diurnal Speed Average: 3.6 km/h at hour 19	Hours of Missing Data: 0
Monthly Average Velocity: 5.3 km/h 197.7 deg	Percentiles: P ₁ = 2 P ₁₀ = 5 Q ₁ = 7 Median = 11 Q ₃ = 14 P ₉₀ = 17 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-Sep	W14	WSW13	WSW14	WSW15	WSW16	WSW13	WSW16	WSW17	WSW18	WSW16	WSW20	SW19	SW18	SW19	SW22	SSW21	SSW25	SSW20	SSW17	SSW16	SSW15	SSW12	S9	SSW14	SW15.4	SSW25	
2-Sep	SW10	SW15	WSW18	WSW14	WSW13	WSW16	WSW15	WSW15	WSW15	WSW13	WSW14	WSW14	WSW14	WSW15	WSW16	WSW17	WSW16	W11	WSW9	SW9	WSW13	WSW15	SW13	WSW14	WSW13.7	WSW18	
3-Sep	SW10	S7	SSW7	SSW7	S8	S9	S6	SE7	SE6	S7	SSW3	WSW12	SSW8	S12	SSE9	SSW10	SW10	SW8	SSW7	SSW5	WSW9	WSW13	WSW13	W13	SSW7.1	W13	
4-Sep	W12	W15	W16	WSW19	WSW17	WSW17	W18	W17	WNW18	WNW20	WNW17	WNW17	WNW17	W17	W15	W14	W12	W12	W8	SSW3	S6	SSW7	SW9	SW10	W12.8	WNW20	
5-Sep	SW10	SW10	SSW9	SSW9	SSW9	SSW8	S6	SE4	SE5	SE5	SE11	SE11	SE8	SE12	ESE14	ESE15	SE15	ESE11	ESE7	ESE8	SE10	SE10	ESE5	ESE6	SSW7.3	ESE15	
6-Sep	E7	E9	E10	E11	ESE10	ESE9	ESE8	ESE8	ESE8	ESE7	SSE6	SSW7	WSW7	WSW10	WSW8	WSW12	WNW9	NNW5	N3	NW2	NE1	S2	SW4	SW4	SE2.0	WSW12	
7-Sep	SW4	WSW8	WSW9	WSW9	SW7	SSE7	SSE7	S6	S5	WSW6	WSW9	WSW8	S7	W9	WSW12	WSW11	SW9	SSW7	NE5	SE6	S6	SSW6	S7	SSW7	SW5.7	WSW12	
8-Sep	S7	S8	SSW8	SSW8	S8	S7	S7	S6	SSW5	WSW12	WSW13	WSW11	WSW12	WSW11	WSW8	W7	WNW6	NNW6	NNW5	NW4	SSW4	SSW4	SW2	SW5.4	WSW13		
9-Sep	NW4	NW4	SSW3	S3	WNW1	SE2	S1	E1	SE6	ESE5	ESE7	ESE10	ESE8	ESE5	E6	NE2	SSE6	SE6	SE5	E6	ESE8	SE11	ESE9	ESE9	ESE4.1	SE11	
10-Sep	ESE9	ESE10	ESE10	ESE11	ESE12	ESE10	ESE12	ESE10	ESE11	E12	E15	ESE17	ESE18	ESE18	SE16	SE18	ESE17	ESE14	ESE11	ESE11	ESE13	ESE14	ESE14	ESE15	ESE13.2	SE18	
11-Sep	ESE14	ESE13	ESE16	ESE17	SE15	ESE14	ESE14	ESE15	ESE16	ESE18	ESE21	SE24	SE28	SE26	SE27	SSE21	SSE18	SE15	SE16	ESE14	SE15	SE16	SE15	ESE13	SE17.3	SE28	
12-Sep	SE14	SE13	ESE7	ESE5	SE4	E6	ESE7	SE7	SE8	SSE6	SSE5	ESE6	SE7	W2	WSW9	S5	SSE5	SE8	SSE5	SW7	WSW9	WSW9	WSW6	SW6	SSE4.6	SE14	
13-Sep	SW8	WSW9	WSW6	SW6	SW6	SW10	SW12	WSW16	SW16	SW14	SW12	SW18	SW19	SW19	SW21	SW20	WSW19	SW19	SW19	WSW18	WSW19	WSW22	SW19	SW19	SW15.1	WSW22	
14-Sep	WSW18	WSW18	W17	W15	W16	W17	WSW17	WSW17	WSW19	WSW18	WSW19	WSW19	W19	WSW17	WSW18	WSW18	WSW17	WSW15	WSW12	WSW11	WSW11	WSW10	WSW11	WSW10	WSW15.8	WSW19	
15-Sep	WSW9	SSW7	S6	S7	SSE6	SE7	SE9	SE9	SE8	SSE11	SSE14	SSE14	SE15	SE16	SSE15	SSE14	SE14	ESE14	ESE12	SE17	SE19	ESE15	ESE16	SW11.0	SE19		
16-Sep	ESE15	SSE11	S13	S11	SSW10	SSE5	SSE3	WSW10	WSW11	WSW10	SW10	SW8	WSW9	WSW11	SW12	SW10	SW8	SSW6	S5	S6	SSE6	SSW6	SSE5	SSE6	SSW6.5	ESE15	
17-Sep	SSE2	ENE3	ENE7	E6	ESE5	ESE10	ESE13	ESE12	ESE12	ESE14	E18	ESE19	ESE19	SSE11	WSW14	WSW15	WSW9	SSW8	SW8	SW9	SW11	SW10	SW8	WSW8	SSE5.0	ESE19	
18-Sep	SW10	SW10	SW9	SSW7	SSW7	S6	SSE6	SE7	SSE3	WSW10	WSW16	WSW18	WSW17	WSW17	WSW20	WSW17	SW14	SSW13	SSW9	S9	S10	S11	SSW10	SSW14	SW10.0	WSW20	
19-Sep	SW20	SW21	SW15	SW13	SW13	SW13	SW11	SW14	SW14	SW11	SW12	SW14	WSW13	WSW14	WSW11	WSW10	WSW8	SW5	SSW4	S5	SSW6	SSW8	SW10	WSW10	SW11.3	WSW21	
20-Sep	WSW13	WSW15	W12	W12	W12	W12	W12	W11	W10	WSW10	WSW10	W10	W10	W12	WNW10	WNW10	W8	W7	W7	WSW6	WSW6	WSW6	SW5	S6	W9.1	WSW15	
21-Sep	S5	S6	SE8	SE8	S5	S6	S8	SSE8	SSE6	SSE8	SSE14	S17	S20	S21	S20	S22	S20	S15	SSE11	SE10	SE9	SSE10	S11	S13	S11.3	S22	
22-Sep	S12	SSW13	SSW12	SSW11	SSW14	S12	SSE8	SSE7	SE8	SSE10	S14	SSE18	SSE18	SSE17	SSE16	SE18	SE16	SE12	SE12	SE12	SE13	SE17	ESE16	ESE11	SSE11.9	SSE18	
23-Sep	ESE13	ESE15	ESE15	ESE15	ESE14	ESE14	ESE13	ESE14	ESE17	ESE18	ESE22	ESE26	ESE26	SE26	SE26	ESE24	SE25	ESE19	ESE12	ESE14	ESE15	ESE14	ESE14	ESE17	ESE17.8	ESE26	
24-Sep	ESE13	ESE14	ESE13	ESE12	ESE12	ESE13	ESE10	ESE10	ESE14	ESE13	SE12	SE10	SE6	SW4	WSW5	WSW2	WSW6	WSW8	SSW6	S5	S7	SW15	S5	SSW5	SE6.2	SW15	
25-Sep	SSW7	SSW8	SSW8	SSW7	SSW7	S6	SW7	SSW7	WSW6	WNW7	SW5	ESE2	ENE6	ENE8	E11	E14	E14	NE11	ENE12	ENE13	E11	E10	E11	E13	ESE4.0	E14	
26-Sep	E13	E14	E13	ESE13	ESE14	ESE17	SE17	SE10	NE3	NE6	SE11	S14	S10	SSW6	WSW4	WSW6	W3	W5	W5	NNE8	SSE4	WSW6	SW8	WSW8	SE4.4	SE17	
27-Sep	WSW11	WSW10	WSW10	WSW13	WSW14	WSW15	WSW14	WSW15	WSW14	WSW15	WSW12	WSW13	WSW12	WSW14	WSW15	WSW13	WSW10	SW7	SSW7	SSW7	SSW6	S6	S6	S8	WSW10.5	WSW15	
28-Sep	SW8	SW9	SW8	WSW7	WSW9	WSW11	WSW12	W10	W12	WSW10	WSW11	WNW11	WNW14	WNW15	WNW16	W13	WNW13	WNW13	NW13	WNW12	WNW10	NW11	WNW9	WNW9	W9.9	WNW16	
29-Sep	WNW11	WNW13	WNW12	WNW11	WNW10	WNW13	WNW11	WNW10	WNW11	WNW11	WNW11	WNW11	WNW13	WNW13	WNW13	WNW11	WNW10	WNW7	W7	WNW8	WNW9	NW10	NW9	NNW8	NW8	WNW10.2	WNW13
30-Sep	WNW5	W7	WNW6	NW7	W4	SSE1	SSE3	SSE4	S4	SSE3	ESE4	ESE3	SE3	ESE3	SSE2	SE4	ESE4	SE3	SE5	ESE5	SE6	SE5	SE5	SE5	SE1.8	W7	

SSW5.0	SSW5.2	SSW4.9	SSW5.0	SSW5.3	SSW5.0	S4.9	SSW4.7	SSW4.3	SSW4.5	SSW6.1	SSW7.0	SSW6.5	SSW7.2	SSW7.7	SSW7.3	SSW6.5	SSW4.9	S3.6	S3.8	S5.0	S5.7	S5.1	S5.1	Diurnal Average
SW20	WSW21	WSW18	WSW19	WSW17	WSW17	W18	WSW17	WSW19	WNW20	ESE22	ESE26	SE28	SE26	SE27	ESE24	SSW25	SSW20	SW19	WSW18	WSW19	WSW22	SW19	SW19	Diurnal Maximum

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

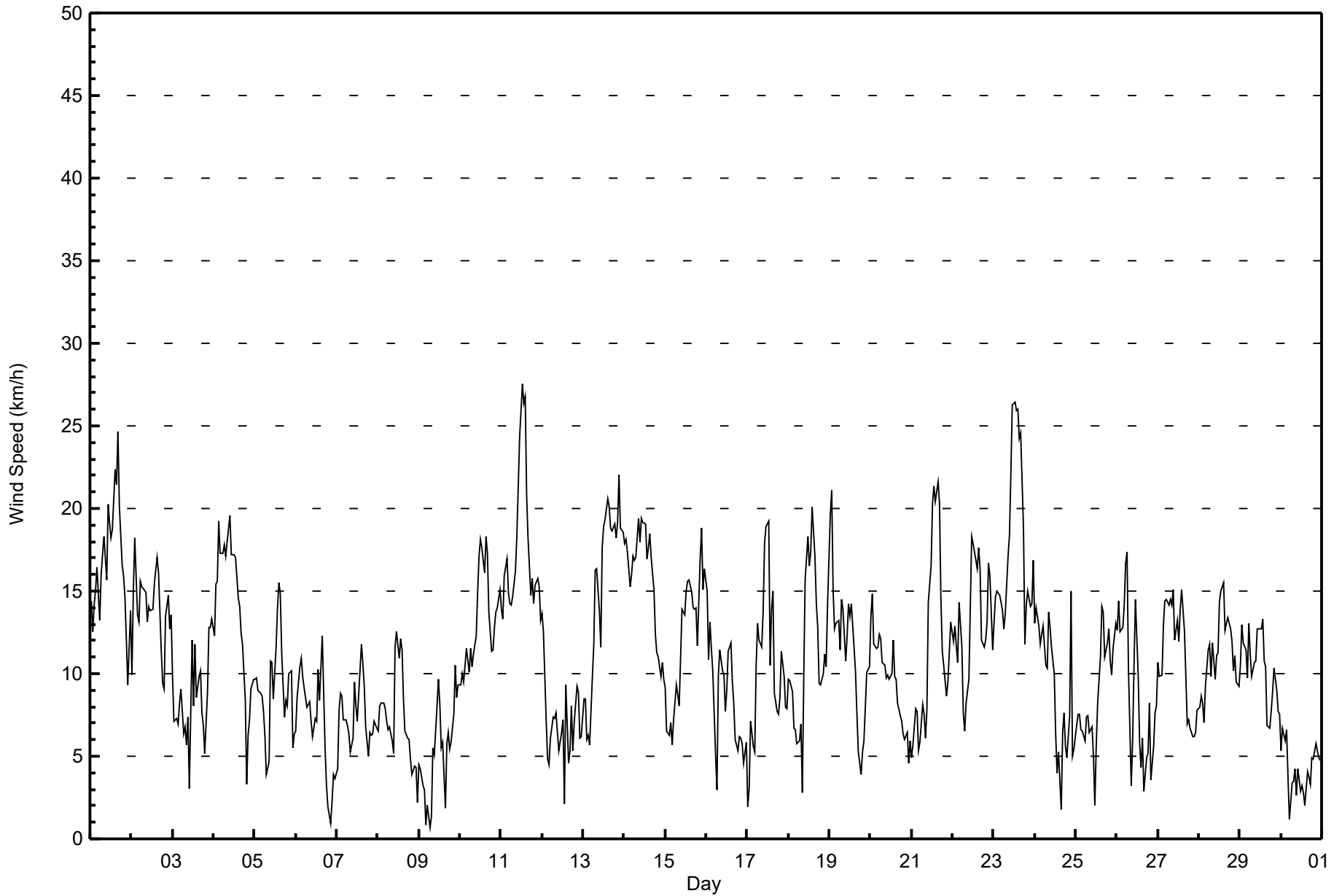
Wind Speed (WS) - km/h
Anzac - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 8 km/h on Sep 11 14:00 Minimum Value: 0 km/h on Sep 9 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: 720 Hours of Data: 720 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-Sep	3	3	4	4	5	4	5	5	5	5	5	5	6	7	7	7	7	6	4	4	3	3	3	7	
2-Sep	3	4	5	4	4	4	4	4	4	4	4	4	6	5	5	6	3	3	2	3	5	4	4	6	
3-Sep	3	1	1	1	1	2	1	1	3	3	4	3	3	3	3	4	2	2	2	3	3	3	4		
4-Sep	3	4	4	5	5	5	5	4	5	5	4	4	5	5	4	4	4	4	3	1	1	1	2	5	
5-Sep	2	2	1	1	1	1	3	1	2	4	4	3	4	5	4	4	3	1	2	1	4	4	2	5	
6-Sep	1	2	2	3	2	2	2	2	2	2	2	2	3	4	3	3	1	1	1	1	1	1	1	4	
7-Sep	1	2	2	3	3	2	1	1	1	2	2	2	2	3	3	3	3	2	1	1	1	1	1	3	
8-Sep	1	1	1	1	1	1	1	1	2	2	4	3	3	4	3	3	2	2	2	1	1	2	1	4	
9-Sep	1	1	1	1	1	0	1	1	2	2	2	3	2	3	2	2	2	1	1	1	2	1	1	3	
10-Sep	1	2	1	2	2	1	2	2	2	3	4	4	5	5	4	4	5	3	2	2	2	2	3	5	
11-Sep	3	2	3	3	2	2	3	3	4	4	5	6	6	8	7	8	7	4	3	3	3	3	3	8	
12-Sep	3	4	3	3	3	1	2	1	2	1	2	2	2	3	3	2	2	2	2	2	2	1	1	4	
13-Sep	2	2	1	1	1	2	3	4	5	4	3	5	5	6	6	6	5	5	6	6	5	6	5	6	
14-Sep	5	5	5	4	4	5	4	5	5	5	5	6	5	5	4	5	5	4	4	3	3	2	2	6	
15-Sep	1	1	1	1	1	1	1	1	2	3	4	4	4	5	4	4	4	3	2	2	4	3	3	5	
16-Sep	4	4	5	4	4	1	1	3	3	3	3	2	3	3	3	2	2	2	1	1	1	1	2	5	
17-Sep	1	1	1	4	2	2	2	3	2	3	5	5	5	3	4	4	2	2	1	2	2	2	1	5	
18-Sep	2	2	2	1	1	1	1	2	2	6	4	5	5	5	6	6	5	4	3	2	2	3	3	6	
19-Sep	6	6	4	3	3	3	3	4	4	3	3	4	3	4	3	3	3	2	1	1	1	1	2	6	
20-Sep	3	3	3	2	2	2	2	2	2	2	2	3	3	3	3	3	2	2	1	1	1	1	1	3	
21-Sep	1	1	1	1	1	3	2	2	1	2	5	5	6	7	7	6	6	5	3	2	2	3	3	7	
22-Sep	4	4	4	4	4	4	3	3	3	3	4	6	5	5	5	5	5	2	2	2	3	3	3	6	
23-Sep	3	2	2	2	3	3	3	3	4	4	5	6	7	7	7	6	6	5	3	4	3	3	5	7	
24-Sep	3	3	2	2	2	3	2	2	3	3	3	2	2	1	2	1	4	2	1	1	3	5	2	5	
25-Sep	1	1	1	1	1	1	1	1	2	2	2	2	3	3	3	4	3	3	3	3	3	3	3	4	
26-Sep	2	3	3	3	3	3	3	4	2	3	3	5	3	2	2	3	2	2	2	3	3	3	2	5	
27-Sep	2	2	2	3	3	3	2	3	3	3	4	3	3	4	4	4	3	2	1	1	1	1	1	4	
28-Sep	1	1	1	2	1	3	2	2	3	2	3	3	3	3	3	3	3	3	3	3	2	2	2	3	
29-Sep	2	3	2	3	2	3	3	2	2	2	3	3	3	3	2	3	2	1	1	2	2	2	2	3	
30-Sep	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	
Diurnal Maximum																									



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Anzac - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Anzac - September 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	89	12.36	12.36
6 - 11	319	44.31	56.67
12 - 19	282	39.17	95.83
20 - 28	30	4.17	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Anzac - September 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	0	4	1	1	11	12	15	11	9	8	3	5	2	4	2	89
6 - 11	0	1	2	3	12	33	27	24	38	39	38	59	14	22	5	2	319
12 - 19	0	0	0	2	9	64	25	12	9	10	27	82	24	17	1	0	282
20 - 28	0	0	0	0	0	5	7	1	5	3	4	4	0	1	0	0	30
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	1	1	6	6	22	113	71	52	63	61	77	148	43	42	10	4	720

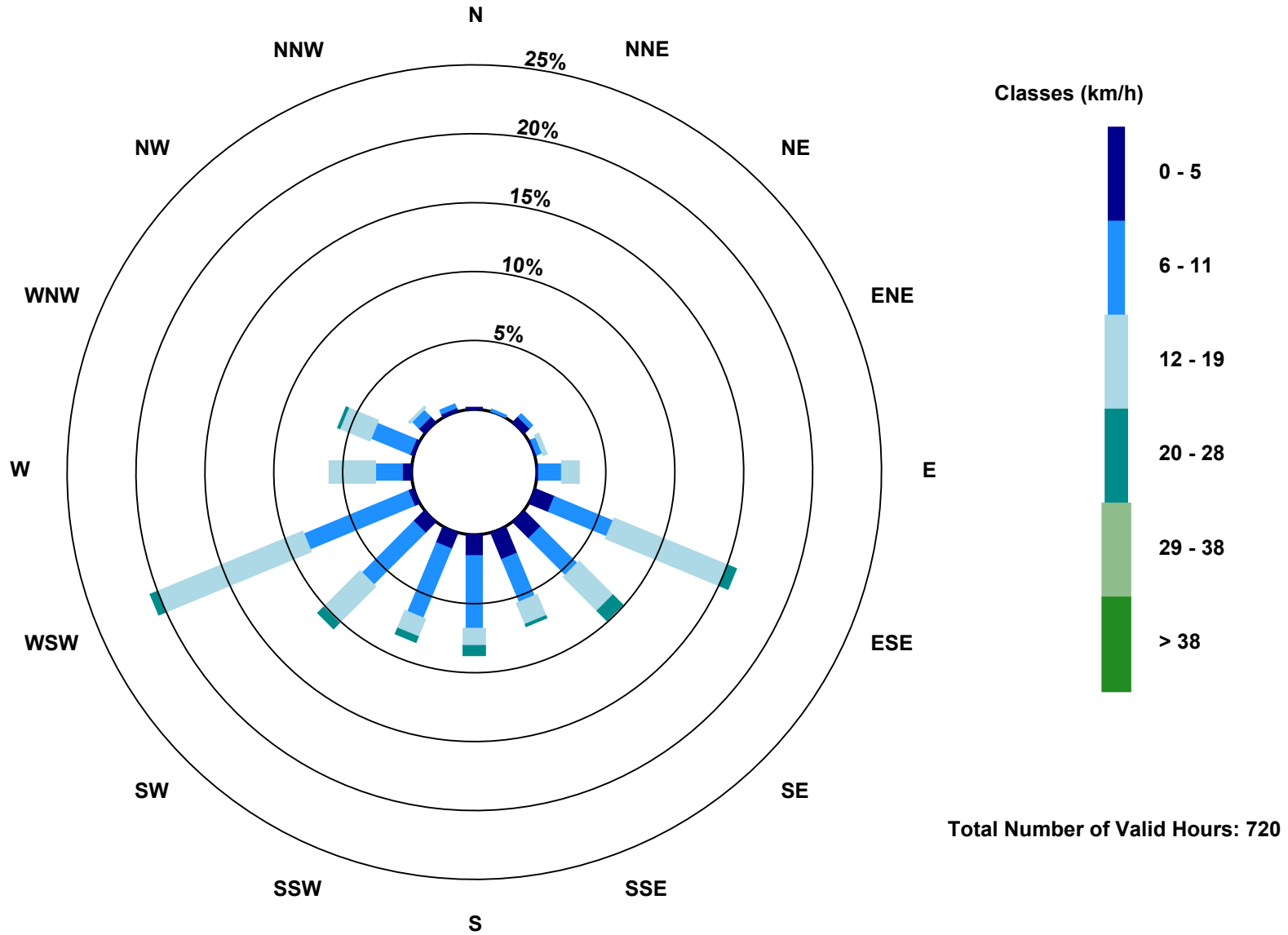
Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

Wind Speed (WS) - km/h
Anzac





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Anzac - September 2023

Direction of Maximum Speed: 129 deg on Sep 11 13:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 117.8 deg on Sep 23	Hours of Data: 720
Direction of Minimum Speed: 170 deg on Sep 9 07:00	Hours of Missing Data: 0
Direction of Minimum Daily Speed Average: 1.8 deg on Sep 30	Percent Operational Time: 100.0
Monthly Average Direction: 197.7 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-Sep	260	256	248	245	245	252	248	248	246	242	239	224	223	222	214	207	200	200	193	198	199	200	191	195	224.2
2-Sep	216	233	251	247	245	247	245	252	255	252	242	245	248	246	239	244	254	271	251	217	237	246	236	237	244.6
3-Sep	224	185	203	207	190	190	177	133	133	172	209	237	199	186	165	198	218	216	210	199	238	257	256	266	209.3
4-Sep	274	270	259	252	247	255	261	275	289	295	285	286	285	275	275	264	274	270	279	208	179	194	215	232	266.5
5-Sep	233	230	209	203	192	193	174	146	143	163	158	156	132	120	122	126	119	105	105	122	141	129	118	107	148.1
6-Sep	100	87	92	100	103	107	106	104	110	115	163	208	237	252	257	248	290	346	358	314	35	187	218	230	140.2
7-Sep	215	252	255	239	219	163	161	182	186	237	251	245	189	263	247	245	218	203	40	128	178	205	191	194	217.5
8-Sep	183	183	195	203	184	183	172	179	185	195	254	255	254	248	248	247	272	284	340	331	320	211	202	233	228.4
9-Sep	310	321	210	187	297	142	170	94	127	123	114	116	106	114	101	46	148	138	124	96	118	132	109	112	119.8
10-Sep	110	110	109	113	119	114	116	115	118	100	100	114	118	121	132	125	120	116	114	122	114	115	115	120	116.1
11-Sep	116	123	122	122	128	116	114	115	115	114	122	127	129	138	137	147	153	141	132	121	128	133	129	119	127.8
12-Sep	134	135	122	111	132	86	110	128	140	149	147	122	133	271	253	170	152	134	161	226	239	240	244	227	157.3
13-Sep	233	238	239	233	214	219	231	238	236	234	229	223	227	226	224	230	239	225	224	238	238	241	233	230	231.2
14-Sep	245	251	260	265	265	262	255	251	253	252	249	252	259	253	252	249	249	245	247	252	252	244	239	247	252.5
15-Sep	242	207	190	180	165	141	136	134	136	158	148	158	143	149	153	153	151	132	122	122	138	133	120	120	145.1
16-Sep	119	147	172	187	209	150	153	240	246	250	235	230	250	248	234	229	219	195	180	169	160	192	154	147	202.3
17-Sep	159	76	58	96	103	111	112	104	102	103	101	109	119	162	250	248	239	212	218	226	219	221	224	240	150.5
18-Sep	231	226	221	200	202	185	149	133	164	243	247	244	247	237	238	242	220	209	198	190	187	191	198	212	219.2
19-Sep	232	236	221	221	225	219	218	227	233	224	220	229	248	250	243	249	254	226	209	188	201	211	233	242	229.8
20-Sep	239	250	263	264	265	264	259	260	273	248	247	271	281	280	282	286	264	262	262	255	240	237	226	173	259.6
21-Sep	175	190	140	138	178	180	173	165	160	150	168	181	180	186	173	174	184	170	166	146	130	165	169	174	170.2
22-Sep	175	201	195	193	193	189	164	149	140	162	182	166	168	161	166	145	143	135	132	133	127	127	121	115	157.3
23-Sep	120	115	110	109	110	111	111	118	118	114	115	118	120	129	128	121	125	120	114	117	112	111	116	120	117.8
24-Sep	108	107	106	107	105	115	107	107	119	122	128	126	140	221	239	243	253	239	197	169	176	235	180	209	137.4
25-Sep	205	213	208	196	195	189	215	203	243	290	219	115	68	72	83	82	83	55	59	70	84	93	97	87	107.7
26-Sep	81	89	91	106	110	117	125	133	41	54	133	175	178	199	245	254	263	278	271	21	157	241	233	258	131.5
27-Sep	246	251	243	245	249	240	245	249	251	251	248	247	243	248	255	256	243	225	212	209	197	182	180	191	240.2
28-Sep	224	221	222	240	257	252	253	264	262	251	254	283	294	297	300	280	300	294	309	301	300	308	300	284	277.2
29-Sep	287	303	302	296	289	295	303	291	300	297	295	293	289	293	285	291	284	279	284	301	320	318	332	314	297.4
30-Sep	297	277	286	315	274	154	152	167	170	154	121	111	134	104	162	140	120	131	125	114	126	127	129	126	146.2

204.5 210.1 204.7 201.7 201.7 192.5 188.7 196.1 202.8 200.6 197.8 198.6 195.7 209.0 211.4 208.2 203.6 196.4 184.3 173.0 177.8 189.2 182.5 187.0

Diurnal Average

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

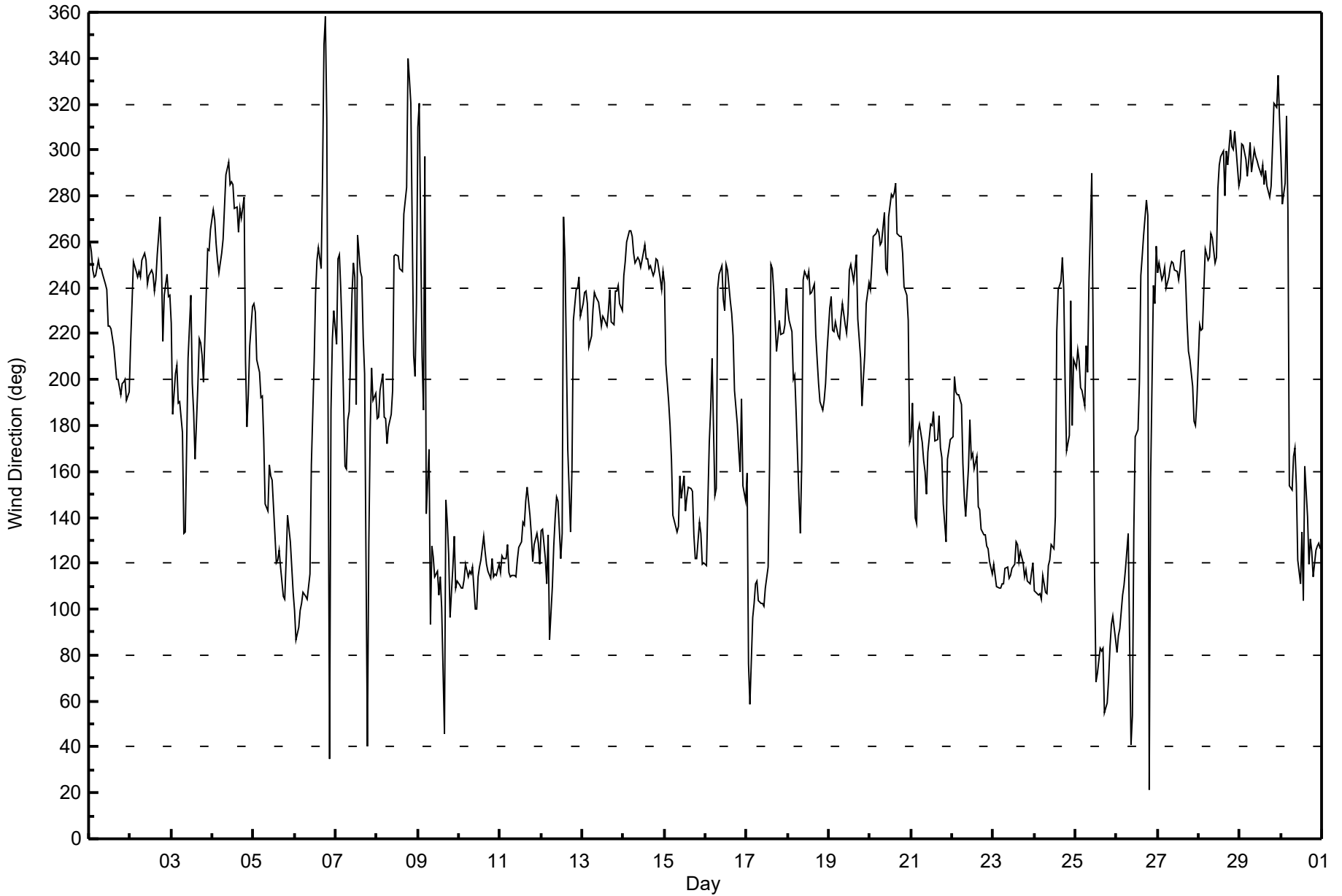
Wind Direction (WD) - deg
Anzac - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 96 deg on Sep 12 14:00 Minimum Value: 7 deg on Sep 15 06:00 Percentiles: P ₁ = 8 P ₁₀ = 10 Q ₁ = 13 Median = 17 Q ₃ = 21 P ₉₀ = 31 P ₉₉ = 72																			Hours in Service: 720 Hours of Data: 720 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-Sep	14	17	16	17	17	17	16	17	18	19	17	18	19	23	20	22	19	19	18	18	18	17	21	19	23		
2-Sep	18	16	19	19	17	18	18	17	19	19	18	18	19	21	19	20	20	17	22	17	18	18	20	17	22		
3-Sep	16	11	10	24	10	14	20	9	45	24	69	17	24	17	21	21	23	17	16	18	20	16	17	16	69		
4-Sep	14	14	18	16	18	19	20	17	15	16	16	15	17	19	20	22	22	12	51	8	9	8	11	51			
5-Sep	12	12	17	8	11	17	39	30	31	23	32	40	36	23	18	16	15	14	12	14	25	17	20	14	40		
6-Sep	14	11	12	14	15	14	14	14	13	16	29	21	31	25	33	20	36	18	32	37	72	71	20	18	72		
7-Sep	32	22	16	19	36	11	12	18	26	36	23	27	33	30	19	18	33	21	59	18	19	8	8	9	59		
8-Sep	9	11	9	9	11	9	11	14	23	41	22	17	20	22	27	26	23	15	14	17	11	34	15	69	69		
9-Sep	17	16	33	21	70	26	84	61	17	33	30	23	33	59	48	94	37	11	13	16	13	10	11	10	94		
10-Sep	9	10	9	10	8	9	9	11	14	16	17	17	19	18	20	17	15	13	13	10	11	10	11	10	20		
11-Sep	12	8	10	11	10	11	13	12	13	14	15	14	14	19	16	22	22	18	13	13	11	11	13	11	22		
12-Sep	16	20	40	60	53	20	15	16	14	31	38	27	30	96	21	50	40	13	33	12	13	13	17	15	96		
13-Sep	14	14	14	12	11	14	16	16	18	17	20	18	20	20	19	19	18	20	18	19	18	20	18	20	20		
14-Sep	19	20	19	19	18	18	17	17	17	18	18	18	19	18	17	18	18	18	16	15	16	17	12	12	20		
15-Sep	8	16	8	11	15	7	7	9	16	23	22	23	24	25	23	21	21	13	14	13	12	13	11	10	25		
16-Sep	18	29	22	22	22	16	42	20	19	21	22	26	21	19	19	22	20	14	9	11	10	11	17	7	42		
17-Sep	49	31	17	22	26	9	11	15	16	15	16	17	15	36	19	15	19	17	13	11	15	10	10	13	49		
18-Sep	10	10	11	10	10	11	11	11	52	40	17	19	19	18	18	20	20	20	18	15	15	19	17	19	52		
19-Sep	19	18	18	16	15	12	14	16	19	22	20	21	21	18	23	22	21	21	24	9	9	11	13	11	24		
20-Sep	10	13	14	12	12	12	13	14	17	19	16	29	26	22	30	19	19	18	12	17	10	10	30	22	30		
21-Sep	18	14	10	7	18	19	15	16	15	23	22	24	22	22	23	21	19	21	19	16	15	21	21	20	24		
22-Sep	21	20	19	25	17	19	44	36	29	30	24	21	24	23	22	20	16	12	8	9	9	10	11	13	44		
23-Sep	11	10	10	11	12	12	12	12	12	14	14	14	17	16	14	15	14	15	14	13	12	13	14	13	17		
24-Sep	13	13	12	12	12	13	14	14	13	15	14	17	25	54	26	32	39	16	20	19	24	23	45	25	54		
25-Sep	11	7	10	12	13	18	22	14	28	31	38	84	62	39	26	22	17	16	14	15	18	17	15	14	84		
26-Sep	11	13	13	14	12	10	12	21	59	38	31	21	26	46	38	37	73	57	50	50	70	34	11	12	73		
27-Sep	12	10	12	12	12	11	9	11	14	13	16	17	18	17	18	17	18	19	14	17	9	13	9	11	19		
28-Sep	10	8	7	14	8	12	12	13	16	21	21	26	18	17	15	23	17	16	15	14	15	15	13	12	26		
29-Sep	12	13	13	12	13	12	13	13	16	16	15	15	14	13	15	13	13	12	9	12	11	9	11	11	16		
30-Sep	16	12	9	9	20	77	15	10	13	30	18	37	59	70	72	23	22	9	8	8	11	11	11	17	77		
	49	31	40	60	70	77	84	61	59	41	69	84	62	96	72	94	73	57	59	51	72	71	45	69			
Diurnal Maximum																											



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Anzac - September 2023





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

**AMS17
WAPASU
SEPTEMBER 2023**

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

October 30, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WAPASU (AMS17)
 SEPTEMBER 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	686	33	34	99.86	24.8	0	3.9	0
H2S (ppb) Average	683	36	37	99.86	1.3	0	0.6	0
THC (ppm) Average	686	33	34	99.86	3.7	-	2.7	-
O3 (ppb) Average	685	34	35	99.86	56.4	0	43.8	-
NO2 (ppb) Average	684	36	36	100	13.7	0	7.9	-
NO (ppb) Average	684	36	36	100	8.2	-	1	-
NOX (ppb) Average	684	36	36	100	18.9	-	8.3	-
PM2.5 (ug/m3) Average	718	2	2	100	554.6	163	284.9	16
Temperature 2 m (C) Average	720	0	0	100	24.9	-	18.7	-
Relative Humidity (%) Average	720	0	0	100	100	-	99.2	-
Wind Speed 10 m (km/h) Average	719	0	1	99.86	24	-	17	-
Wind Direction 10 m (deg) Average	719	0	1	99.86	-	-	-	-
Precipitation (mm) Total	720	0	0	100	2.2	-	5.6	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WAPASU (AMS17)
 SEPTEMBER 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	686	1.38	2.9	-	0	0	0	0.3	1.1	4.6	24.8
H2S (ppb) Average	683	0.25	0.2	-	0	0	0.1	0.2	0.4	0.6	1.3
THC (ppm) Average	686	2.38	0.2	-	2.1	2.2	2.3	2.3	2.4	2.6	3.7
O3 (ppb) Average	685	25.98	12.6	-	2.7	8.8	14.9	26.9	36.1	42.8	56.4
NO2 (ppb) Average	684	2.95	2.6	-	0.1	0.6	1	1.9	4.4	6.8	13.7
NO (ppb) Average	684	0.42	0.8	-	0	0	0.1	0.2	0.3	1	8.2
NOX (ppb) Average	684	3.37	3	-	0.1	0.7	1.1	2.2	4.9	7.6	18.9
PM2.5 (ug/m3) Average	718	60.04	86.8	-	3.5	9.2	12.6	24	65.9	166.4	554.6
Temperature 2 m (C) Average	720	12.67	5.7	-	-0.2	5.5	7.8	12.8	16.8	20.3	24.9
Relative Humidity (%) Average	720	67.92	20.4	-	24	40.9	50.7	67.4	86.2	96.5	100
Wind Speed 10 m (km/h) Average	719	9.2	5	-	1	4	6	8	12	17	24
Wind Direction 10 m (deg) Average	719	-	-	-	-	-	-	-	-	-	-
Precipitation (mm) Total	720	-	-	8.14	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WAPASU (AMS17)
SEPTEMBER 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
H2S, O3, SO2, THC	22 Sep 2023 15:00	22 Sep 2023 15:00	1	Maintenance - sample manifold cleaned
Wind Speed, Wind Direction	04 Sep 2023 19:00	04 Sep 2023 19:00	1	Flat line in sensor output signal



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb

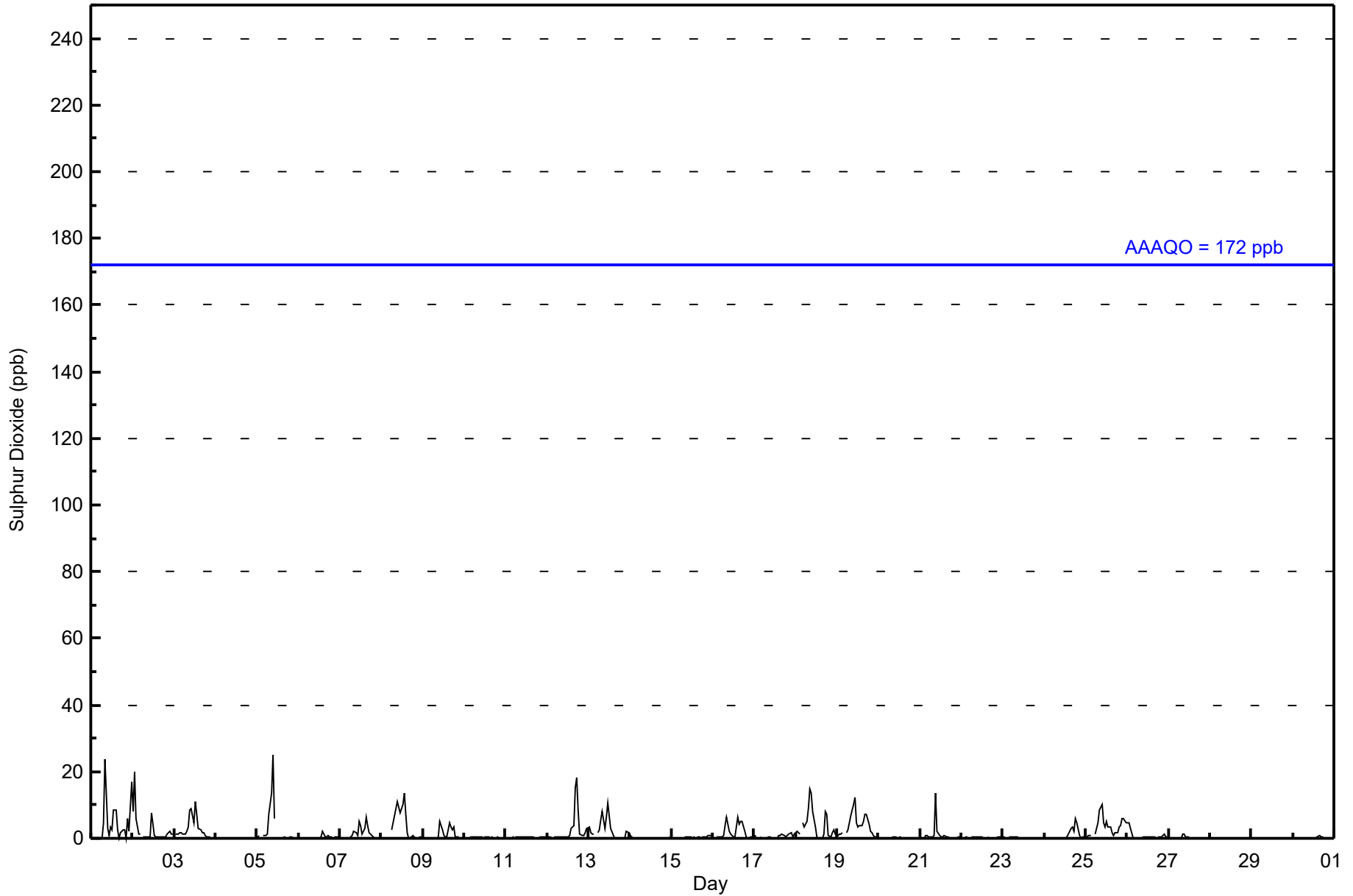
Wapasu - September 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		720																																								
Maximum Value: 24.8 ppb on Sep 5 10:00		Maximum Daily Average: 3.9 ppb on Sep 18		Hours of Data:		686																																										
Minimum Value: 0.0 ppb on Sep 1 01:00		Minimum Daily Average: 0.0 ppb on Sep 28		Hours of Missing Data:		34																																										
Maximum Diurnal Average: 3.5 ppb at hour 10		Minimum Diurnal Average: 0.4 ppb at hour 4		Hours of Calibration:		33																																										
Monthly Average: 1.38 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.3 Q ₃ = 1.1 P ₉₀ = 4.6 P ₉₉ = 13.8		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-Sep	0.0	0.0	0.0	0.0	Z	0.0	0.1	4.7	23.8	3.1	0.7	3.3	2.6	8.5	8.5	2.3	0.1	1.6	2.5	2.4	0.2	6.0	2.0	17.2	3.9	23.8																						
2-Sep	7.9	20.0	5.9	1.3	1.1	Z	0.5	0.4	0.4	0.3	0.3	7.5	1.0	0.4	0.6	0.3	0.5	0.5	0.3	0.3	1.3	2.2	1.2	1.4	2.4	20.0																						
3-Sep	Z	1.1	1.2	1.6	1.5	1.4	1.4	2.0	3.2	8.6	9.0	4.6	11.0	7.0	2.9	2.5	1.5	1.8	0.9	0.5	0.2	0.0	0.0	0.0	2.8	11.0																						
4-Sep	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.2																						
5-Sep	0.1	0.9	Z	0.9	0.9	0.7	1.3	7.3	13.5	24.8	6.0	C	C	C	0.0	0.0	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.1	2.9	24.8																						
6-Sep	0.2	0.1	0.1	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	2.1	0.6	0.4	0.8	0.6	0.4	0.0	0.2	0.4	0.2	0.3	0.3	2.1																						
7-Sep	0.2	0.2	0.2	0.1	Z	0.2	0.2	1.0	2.2	1.5	1.0	5.2	3.8	1.3	3.1	6.4	3.8	1.7	0.7	0.3	0.0	0.0	0.0	0.0	1.4	6.4																						
8-Sep	0.0	0.0	0.0	0.0	0.2	Z	2.7	4.5	8.9	10.8	9.2	7.8	10.3	13.5	7.0	1.7	0.1	0.4	0.8	0.4	0.2	0.0	0.3	0.3	3.4	13.5																						
9-Sep	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	5.1	2.6	1.0	0.5	0.6	4.7	3.3	2.5	3.3	0.6	0.3	0.2	0.1	0.2	1.1	5.1																						
10-Sep	0.2	Z	0.2	0.1	0.3	0.4	0.4	0.5	0.4	0.3	0.3	0.2	0.3	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.3	0.5																						
11-Sep	0.1	0.0	Z	0.2	0.3	0.2	0.2	0.3	0.3	0.4	0.5	0.4	0.3	0.5	0.5	0.5	0.3	0.2	0.1	0.1	0.3	0.3	0.2	0.3	0.3	0.5																						
12-Sep	0.2	0.3	0.3	Z	0.4	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.6	1.0	3.0	3.6	15.4	18.2	8.3	1.5	0.8	1.0	1.7	2.9	2.7	18.2																						
13-Sep	3.2	1.6	1.1	1.2	Z	1.7	2.4	5.6	8.1	3.1	6.4	10.7	6.9	2.8	1.0	0.1	0.1	0.0	0.0	0.1	0.1	0.1	2.0	1.7	2.6	10.7																						
14-Sep	0.8	0.4	0.1	0.1	0.2	Z	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.2	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.2	0.1	0.8																						
15-Sep	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.3	0.5	0.7	0.7	0.7	0.3	0.7																						
16-Sep	0.6	Z	0.5	0.4	0.4	0.5	0.8	3.9	6.4	2.1	1.3	1.0	0.5	0.4	6.5	4.4	5.0	5.3	2.2	0.3	0.1	0.1	0.3	0.4	1.9	6.5																						
17-Sep	0.9	0.6	Z	0.2	0.0	0.0	0.0	0.1	0.6	0.3	0.2	0.0	0.0	0.1	0.7	0.8	1.4	0.7	0.2	0.7	1.3	1.5	0.4	1.1	0.5	1.5																						
18-Sep	1.5	2.1	1.3	Z	4.6	3.2	5.1	8.8	15.0	13.6	8.1	3.4	0.2	0.0	0.0	0.0	1.3	8.1	7.2	0.9	0.4	1.6	2.4	1.2	3.9	15.0																						
19-Sep	1.0	1.1	1.4	1.7	Z	1.5	2.5	4.6	6.7	10.3	12.1	4.8	3.4	4.0	4.0	5.2	7.1	7.3	4.1	2.1	1.5	0.7	0.4	0.3	3.8	12.1																						
20-Sep	0.2	0.1	0.2	0.1	0.1	Z	0.0	0.1	0.3	0.4	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	0.1	0.4																						
21-Sep	Z	0.2	0.1	0.9	0.9	0.4	0.2	0.3	0.7	13.5	2.2	0.7	0.5	0.3	0.9	0.4	0.4	0.0	0.0	0.0	0.0	0.2	0.3	0.3	1.0	13.5																						
22-Sep	0.2	Z	0.4	0.2	0.2	0.2	0.3	0.4	0.4	0.3	0.2	0.4	0.4	0.1	M	0.2	0.0	0.0	0.0	0.1	0.1	0.2	0.5	0.4	0.2	0.5																						
23-Sep	0.4	0.4	Z	0.4	0.4	0.4	0.3	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	0.1	0.4																						
24-Sep	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.5	3.1	3.4	1.9	5.8	4.6	0.7	0.2	0.4	0.5	1.0	5.8																						
25-Sep	0.1	0.7	0.7	0.7	Z	1.3	3.0	4.9	8.4	10.1	4.5	3.3	5.1	3.3	3.2	1.7	1.0	1.5	1.5	3.6	4.0	6.0	5.8	4.6	3.4	10.1																						
26-Sep	4.9	4.7	2.8	0.2	0.2	Z	0.1	0.1	0.0	0.2	0.3	0.3	0.4	0.5	0.4	0.3	0.3	0.2	0.4	0.2	0.2	1.3	0.4	0.3	0.8	4.9																						
27-Sep	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.2	0.5	0.4	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.2																						
28-Sep	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																						
29-Sep	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																						
30-Sep	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	1.0	0.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.0																						
																								0.9	1.4	0.7	0.4	0.5	0.5	0.7	1.7	3.4	3.5	2.3	2.0	1.7	1.6	1.6	1.3	1.6	1.8	1.3	0.7	0.4	0.8	0.7	1.2	Diurnal Average
																								7.9	20.0	5.9	1.7	4.6	3.2	5.1	8.8	23.8	24.8	12.1	10.7	11.0	13.5	8.5	6.4	15.4	18.2	8.3	4.6	4.0	6.0	5.8	17.2	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
Wapasu - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Wapasu - September 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	671	97.81	97.81
11 - 20	13	1.90	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: 686

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Wapasu - September 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	27	6	8	3	7	30	77	170	103	57	76	29	21	13	14	29	670
11 - 20	0	0	0	0	0	0	0	0	3	5	4	0	1	0	0	0	13
21 - 60	0	0	0	0	0	0	0	0	0	0	2	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	27	6	8	3	7	30	77	170	106	62	82	29	22	13	14	29	685

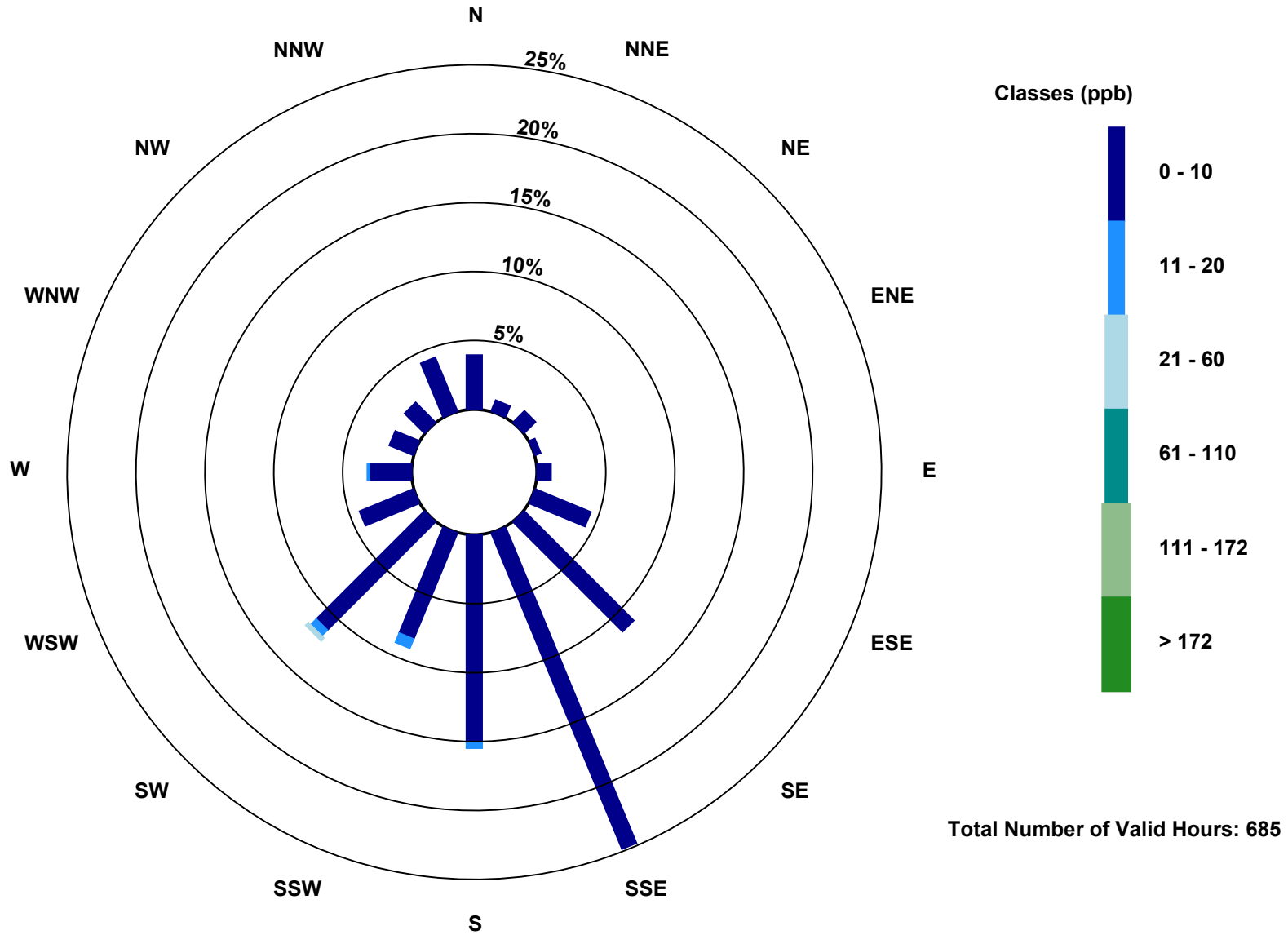
Total Number of Valid Hours: 685

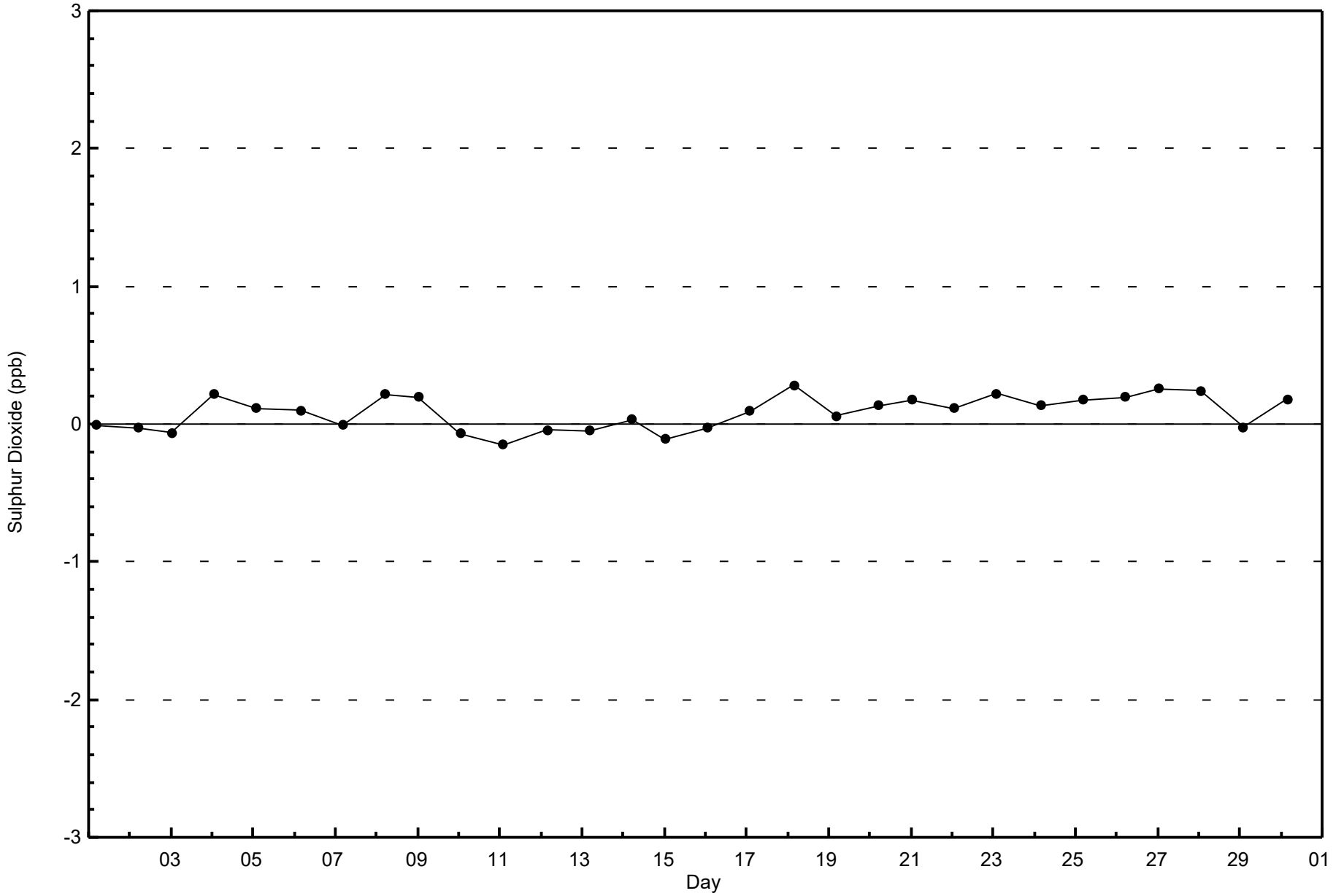
Total Number of Hours: 720

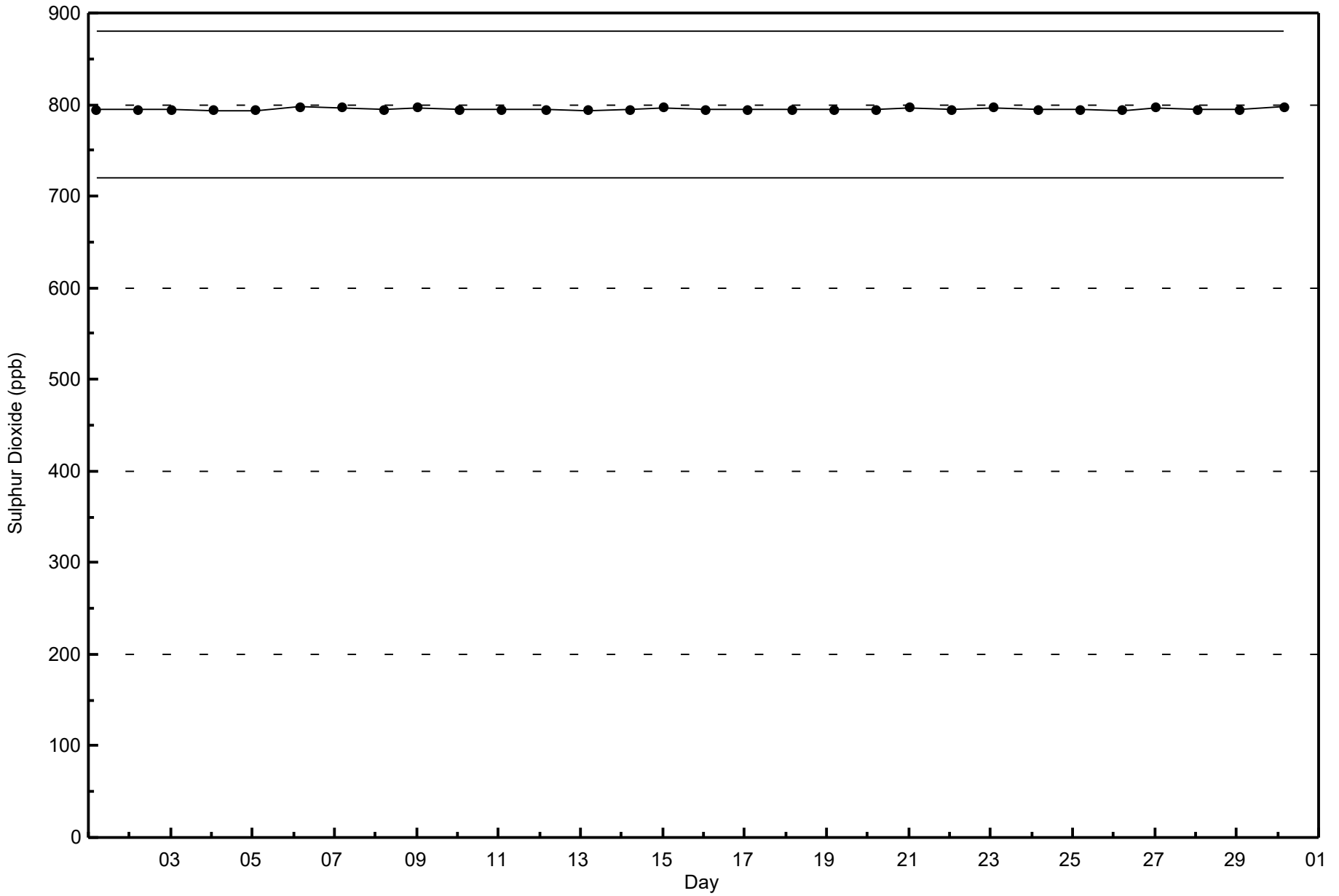


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Sulphur Dioxide (SO₂) - ppb
Wapasu





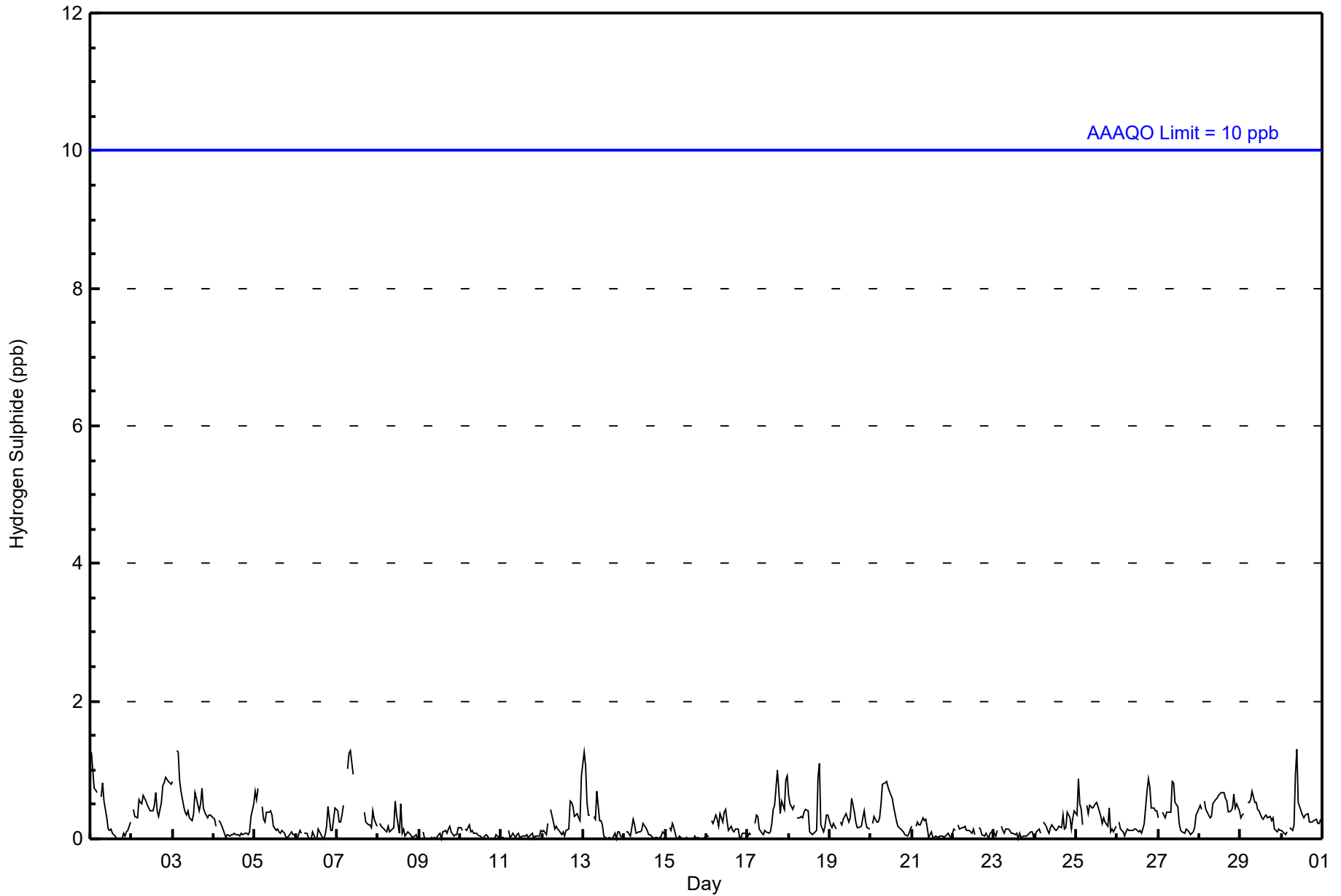




Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 1.3 ppb on Sep 30 10:00	Maximum Daily Average: 0.6 ppb on Sep 2		Hours of Data:	683
Minimum Value: 0.0 ppb on Sep 1 16:00	Minimum Daily Average: 0.0 ppb on Sep 15		Hours of Missing Data:	37
Maximum Diurnal Average: 0.3 ppb at hour 9	Minimum Diurnal Average: 0.2 ppb at hour 16		Hours of Calibration:	36
Monthly Average: 0.25 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.2 Q ₃ = 0.4 P ₉₀ = 0.6 P ₉₉ = 1.1		Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Sep	1.3	1.0	0.7	0.7	0.7	Z	0.6	0.8	0.6	0.3	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.2	0.3	1.3																							
2-Sep	Z	0.4	0.3	0.3	0.6	0.5	0.5	0.6	0.5	0.5	0.5	0.4	0.4	0.5	0.7	0.4	0.3	0.5	0.8	0.8	0.9	0.8	0.8	0.8	0.6	0.9																							
3-Sep	0.8	Z	1.3	1.3	0.9	0.7	0.5	0.4	0.3	0.4	0.3	0.3	0.4	0.7	0.6	0.4	0.5	0.7	0.5	0.4	0.3	0.4	0.4	0.3	0.5	1.3																							
4-Sep	0.3	0.2	Z	0.3	0.3	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.5	0.1	0.5																							
5-Sep	0.7	0.6	0.7	Z	0.5	0.3	0.2	0.4	0.4	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.7																							
6-Sep	0.0	0.0	0.1	0.1	Z	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.2	0.5	0.1	0.1	0.3	0.5	0.1	0.5																							
7-Sep	0.4	0.2	0.2	0.4	0.5	Z	1.0	1.2	1.3	0.9	C	C	C	C	C	C	0.4	0.3	0.2	0.2	0.2	0.4	0.3	0.2	--	1.3																							
8-Sep	Z	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.2	0.5	0.4	0.1	0.5	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.5																						
9-Sep	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.0	0.1	0.1	0.2	0.1	0.2	0.2																						
10-Sep	0.2	0.1	Z	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.2																							
11-Sep	0.0	0.0	0.0	Z	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1																						
12-Sep	0.1	0.1	0.1	0.2	Z	0.4	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.6	0.5	0.5	0.3	0.4	0.3	0.3	0.9	0.3	0.9																							
13-Sep	1.3	1.1	0.5	0.3	0.3	Z	0.3	0.3	0.7	0.3	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.3	1.3																							
14-Sep	Z	0.1	0.1	0.1	0.2	0.3	0.2	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	0.1	0.1	0.1	0.3	0.3																						
15-Sep	0.1	Z	0.2	0.1	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2																						
16-Sep	0.0	0.0	Z	0.3	0.2	0.3	0.3	0.2	0.4	0.3	0.4	0.4	0.3	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.2	0.4																						
17-Sep	0.0	0.1	0.1	Z	0.2	0.4	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.5	1.0	0.7	0.4	0.5	0.4	0.9	0.9	0.3	1.0																							
18-Sep	0.6	0.5	0.4	0.5	Z	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.1	0.1	0.1	0.1	0.1	0.9	1.1	0.2	0.1	0.2	0.3	0.3	0.4	1.1																							
19-Sep	0.2	0.2	0.2	0.2	0.1	Z	0.2	0.2	0.3	0.4	0.3	0.3	0.3	0.6	0.4	0.2	0.2	0.2	0.2	0.3	0.4	0.3	0.2	0.1	0.3	0.6																							
20-Sep	Z	0.2	0.3	0.2	0.2	0.3	0.5	0.8	0.8	0.8	0.8	0.7	0.6	0.5	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.4	0.8																							
21-Sep	0.2	Z	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.3																							
22-Sep	0.1	0.1	Z	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	M	0.2	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.2																							
23-Sep	0.1	0.0	0.1	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.2																							
24-Sep	0.1	0.1	0.1	0.1	Z	0.2	0.2	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.4	0.1	0.2	0.4	0.3	0.2	0.3	0.4	0.2	0.4																							
25-Sep	0.4	0.9	0.5	0.4	0.2	Z	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.3	0.2	0.3	0.2	0.2	0.4	0.1	0.1	0.1	0.2	0.4	0.9																							
26-Sep	Z	0.2	0.1	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	0.2	0.7	0.9	0.7	0.5	0.5	0.4	0.4	0.3	0.9																							
27-Sep	0.3	Z	0.4	0.3	0.3	0.4	0.4	0.4	0.8	0.8	0.5	0.5	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.3	0.8																							
28-Sep	0.5	0.4	Z	0.5	0.4	0.4	0.3	0.3	0.5	0.6	0.6	0.6	0.7	0.7	0.7	0.6	0.5	0.4	0.4	0.5	0.6	0.5	0.5	0.4	0.5	0.7																							
29-Sep	0.3	0.4	0.4	Z	0.5	0.5	0.6	0.7	0.5	0.5	0.4	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.1	0.1	0.1	0.1	0.4	0.7																							
30-Sep	0.1	0.1	0.1	0.1	Z	0.2	0.1	0.2	0.9	1.3	0.5	0.4	0.3	0.3	0.3	0.4	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.3	0.3	1.3																							
																								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	0.3	Diurnal Average		
																								1.3	1.1	1.3	1.3	0.9	0.7	1.0	1.2	1.3	1.3	0.8	0.7	0.7	0.7	0.7	0.6	0.6	1.0	1.1	0.8	0.9	0.8	0.9	0.9	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
Wapasu - September 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: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Wapasu - September 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	27	6	9	3	7	30	77	170	105	64	79	27	22	13	14	29	682
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	27	6	9	3	7	30	77	170	105	64	79	27	22	13	14	29	682

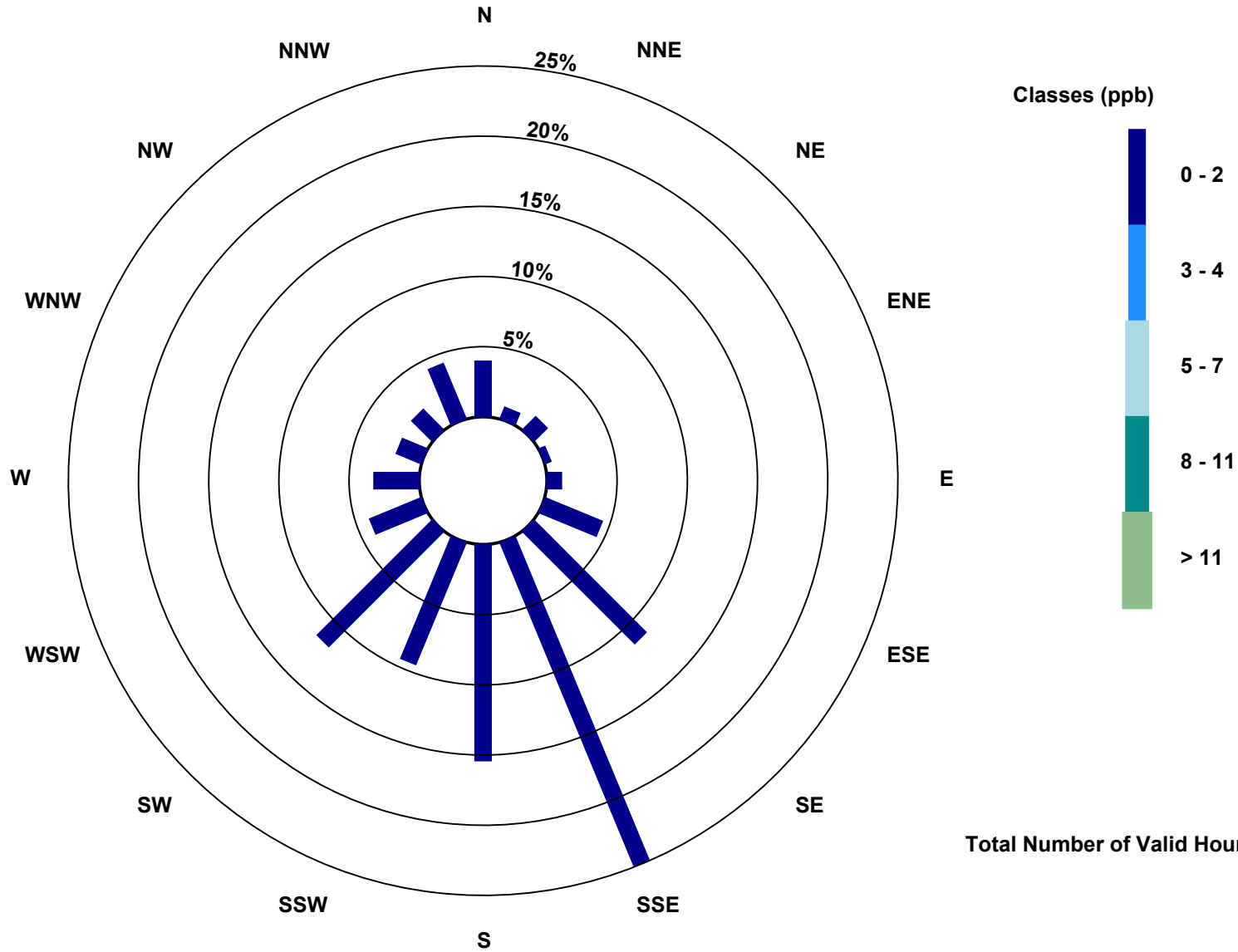
Total Number of Valid Hours: 682

Total Number of Hours: 720

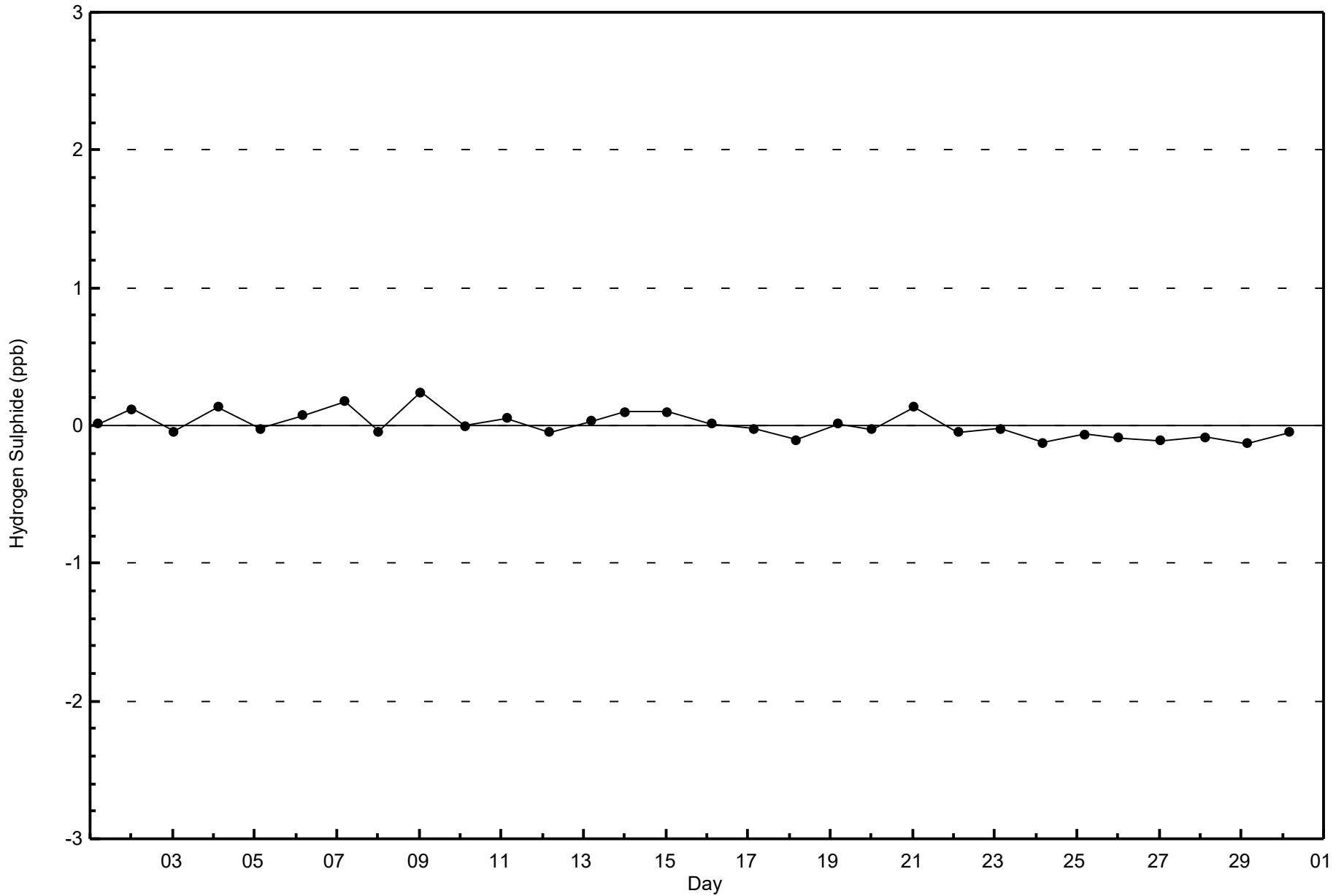


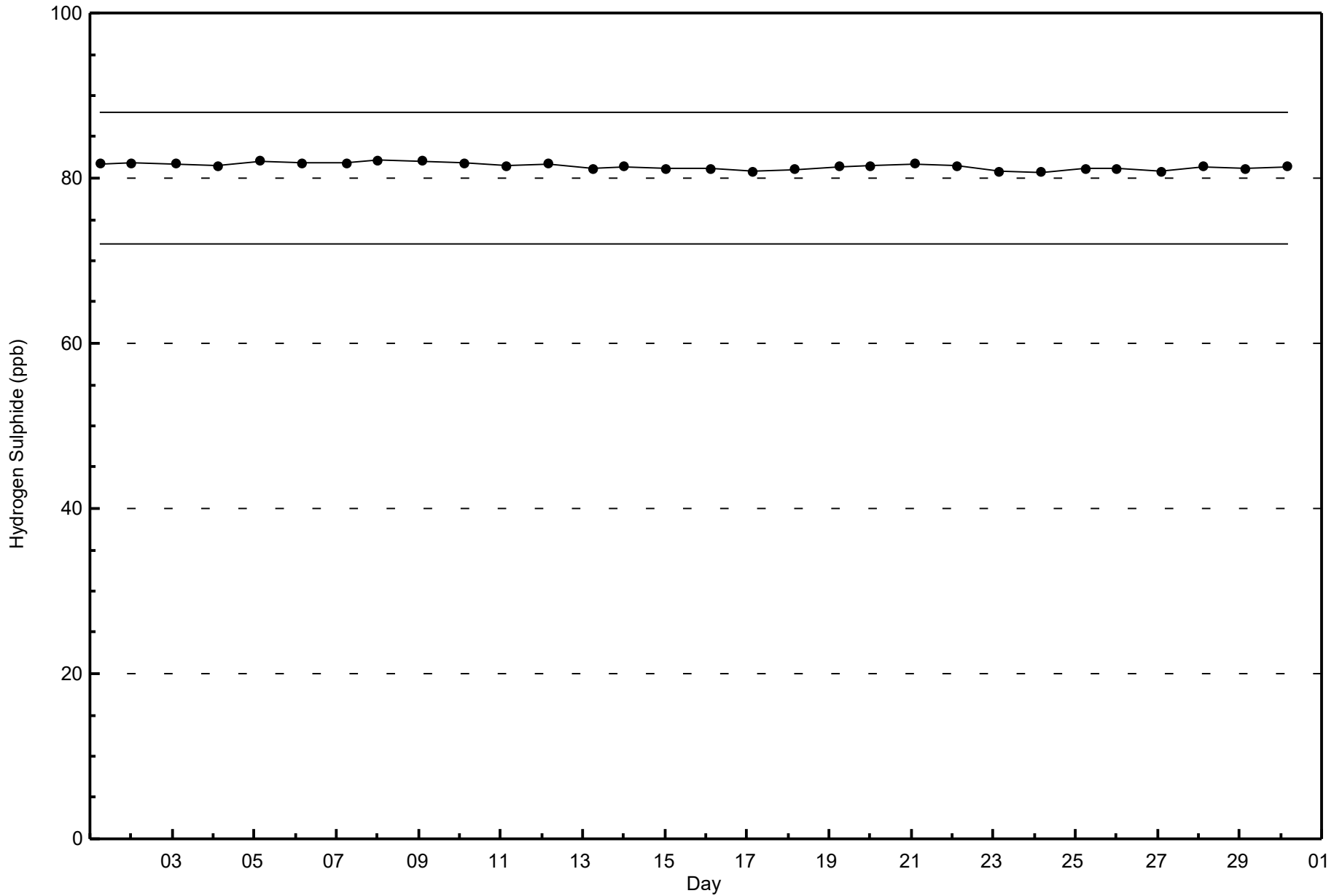
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Hydrogen Sulphide (H₂S) - ppb
Wapasu



Total Number of Valid Hours: 682







Wood Buffalo Environmental Association
Summary of Hour Averages

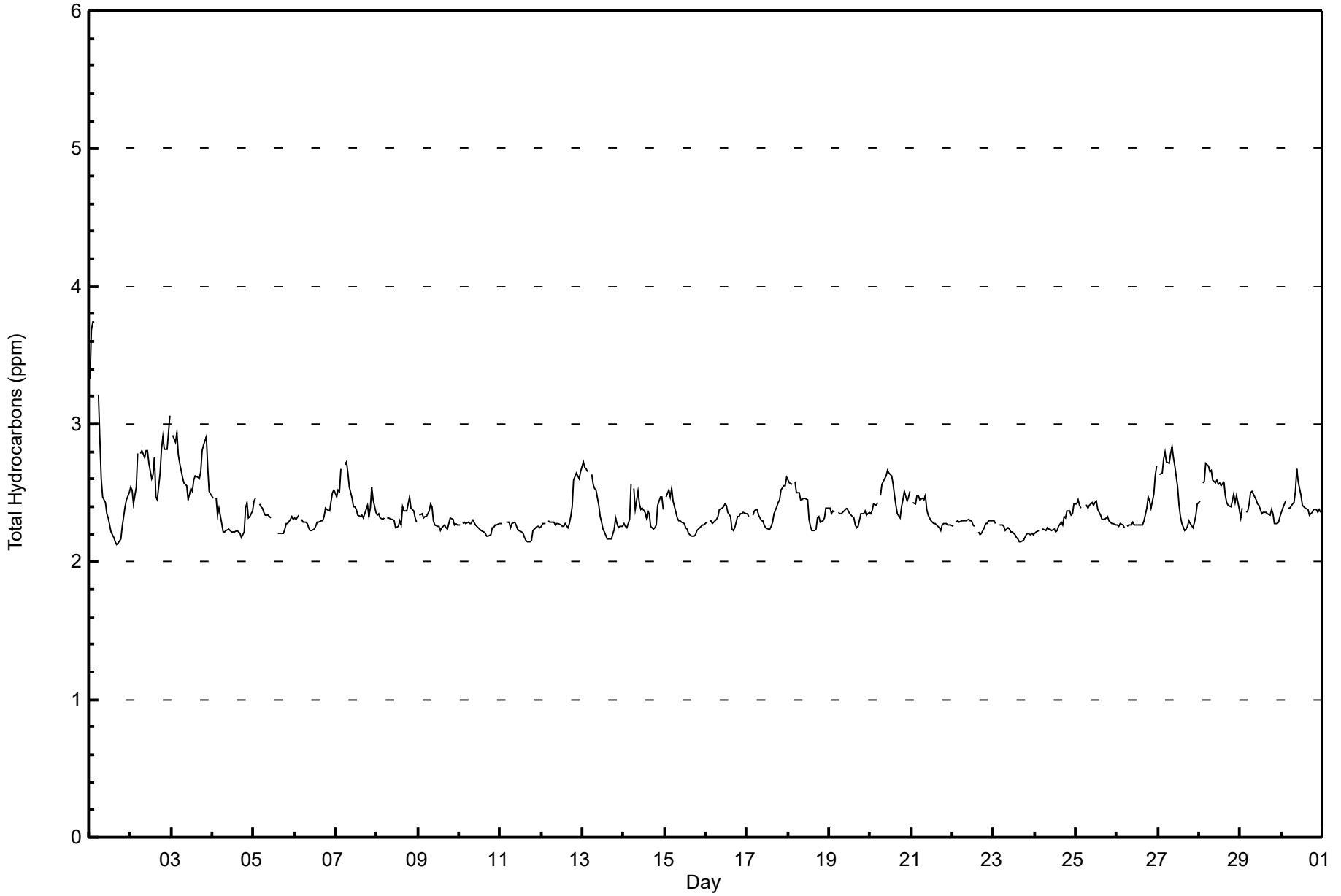
Total Hydrocarbons (THC) - ppm
Wapasu - September 2023

Maximum Value: 3.7 ppm on Sep 1 03:00		Maximum Daily Average: 2.7 ppm on Sep 2		Hours in Service: 720																																													
Minimum Value: 2.1 ppm on Sep 1 17:00		Minimum Daily Average: 2.2 ppm on Sep 23		Hours of Data: 686																																													
Maximum Diurnal Average: 2.5 ppm at hour 4		Minimum Diurnal Average: 2.3 ppm at hour 17		Hours of Missing Data: 34																																													
Monthly Average: 2.38 ppm		Percentiles: P ₁ = 2.2 P ₁₀ = 2.2 Q ₁ = 2.3 Median = 2.3 Q ₃ = 2.4 P ₉₀ = 2.6 P ₉₉ = 2.9		Hours of Calibration: 33																																													
				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-Sep	3.3	3.7	3.7	3.7	Z	3.2	2.9	2.6	2.5	2.4	2.3	2.3	2.2	2.2	2.1	2.1	2.1	2.2	2.3	2.3	2.4	2.5	2.5	2.6	3.7																								
2-Sep	2.5	2.5	2.4	2.5	2.8	Z	2.8	2.8	2.8	2.8	2.8	2.7	2.6	2.6	2.8	2.5	2.4	2.6	2.8	2.9	2.8	2.8	2.9	3.1	3.1																								
3-Sep	Z	2.9	2.9	2.9	2.8	2.7	2.6	2.6	2.6	2.6	2.5	2.5	2.5	2.6	2.6	2.6	2.6	2.7	2.8	2.8	2.9	2.7	2.5	2.5	2.9																								
4-Sep	2.5	Z	2.5	2.3	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4	2.4	2.3	2.3	2.4	2.5																								
5-Sep	2.4	2.5	Z	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	C	C	C	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.5																									
6-Sep	2.3	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.5	2.5	2.5																								
7-Sep	2.5	2.5	2.5	2.7	Z	2.7	2.7	2.6	2.5	2.5	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.4	2.4	2.3	2.4	2.5	2.5	2.4	2.7																								
8-Sep	2.3	2.4	2.3	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.5	2.4	2.4	2.3	2.3	2.5																								
9-Sep	Z	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.4																								
10-Sep	2.3	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	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3																								
11-Sep	2.3	2.3	Z	2.3	2.3	2.3	2.2	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.3																								
12-Sep	2.3	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.6	2.6	2.6	2.6	2.7	2.7																								
13-Sep	2.7	2.7	2.7	2.7	Z	2.6	2.6	2.5	2.5	2.4	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.3	2.3	2.7																								
14-Sep	2.3	2.3	2.2	2.3	2.6	Z	2.5	2.4	2.5	2.4	2.4	2.4	2.3	2.4	2.3	2.3	2.3	2.2	2.2	2.3	2.4	2.5	2.5	2.4	2.6																								
15-Sep	Z	2.5	2.5	2.5	2.5	2.4	2.4	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.5																								
16-Sep	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.2	2.2	2.2	2.3	2.3	2.4	2.3	2.4	2.4	2.4																								
17-Sep	2.3	2.3	Z	2.3	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.3	2.3	2.4	2.4	2.4	2.4	2.5	2.5	2.5	2.6	2.6																								
18-Sep	2.6	2.6	2.6	Z	2.6	2.5	2.5	2.5	2.4	2.5	2.5	2.5	2.3	2.3	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.6																								
19-Sep	2.4	2.3	2.4	2.4	Z	2.4	2.4	2.3	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.2	2.3	2.4	2.4	2.3	2.4	2.3	2.4	2.4																								
20-Sep	2.3	2.4	2.4	2.4	2.4	Z	2.5	2.6	2.6	2.6	2.7	2.6	2.6	2.6	2.5	2.4	2.4	2.3	2.4	2.4	2.5	2.4	2.5	2.5	2.7																								
21-Sep	Z	2.4	2.4	2.5	2.5	2.4	2.5	2.5	2.5	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.5																								
22-Sep	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	M	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3																								
23-Sep	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3																								
24-Sep	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	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.3	2.4	2.4	2.4																								
25-Sep	2.4	2.5	2.4	2.4	Z	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.5																								
26-Sep	2.3	2.3	2.3	2.3	2.2	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.5	2.4	2.4	2.5	2.6	2.7	2.7																								
27-Sep	Z	2.6	2.6	2.7	2.8	2.7	2.7	2.8	2.8	2.8	2.7	2.5	2.4	2.3	2.3	2.2	2.2	2.3	2.3	2.3	2.2	2.3	2.3	2.4	2.8																								
28-Sep	2.4	Z	2.6	2.6	2.7	2.7	2.7	2.7	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.5	2.4	2.4	2.4	2.4	2.5	2.4	2.5	2.4	2.7																								
29-Sep	2.3	2.4	Z	2.4	2.4	2.4	2.5	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.5																								
30-Sep	2.4	2.4	2.4	Z	2.4	2.4	2.4	2.4	2.5	2.7	2.6	2.5	2.4	2.4	2.4	2.4	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.7																								
																								2.4	2.5	2.5	2.5	2.4	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	Diurnal Average		
																								3.3	3.7	3.7	3.7	2.8	3.2	2.9	2.8	2.8	2.8	2.8	2.8	2.7	2.6	2.6	2.8	2.6	2.6	2.7	2.8	2.9	2.9	2.8	2.9	3.1	Diurnal Maximum
Z - zerospan C - Calibration M - Maintenance																																																	



Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Wapasu - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Wapasu - September 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	0	0.00	0.00
2.1 - 3.0	680	99.13	99.13
3.1 - 10.0	6	0.87	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 686

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Wapasu - September 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	25	6	8	3	7	30	77	168	104	62	82	29	22	13	14	29	679
3.1 - 10.0	2	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	6
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	27	6	8	3	7	30	77	170	106	62	82	29	22	13	14	29	685

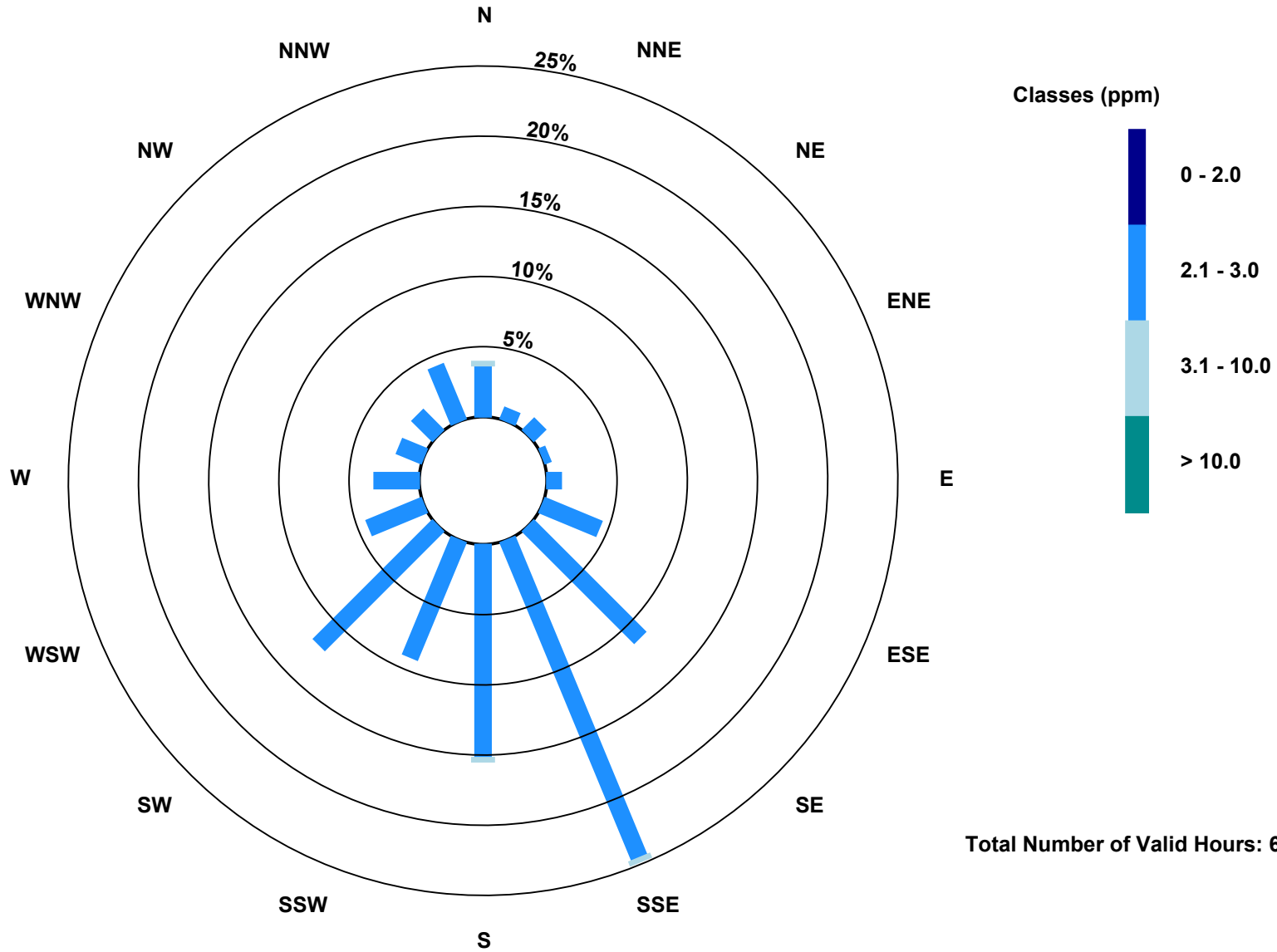
Total Number of Valid Hours: 685

Total Number of Hours: 720

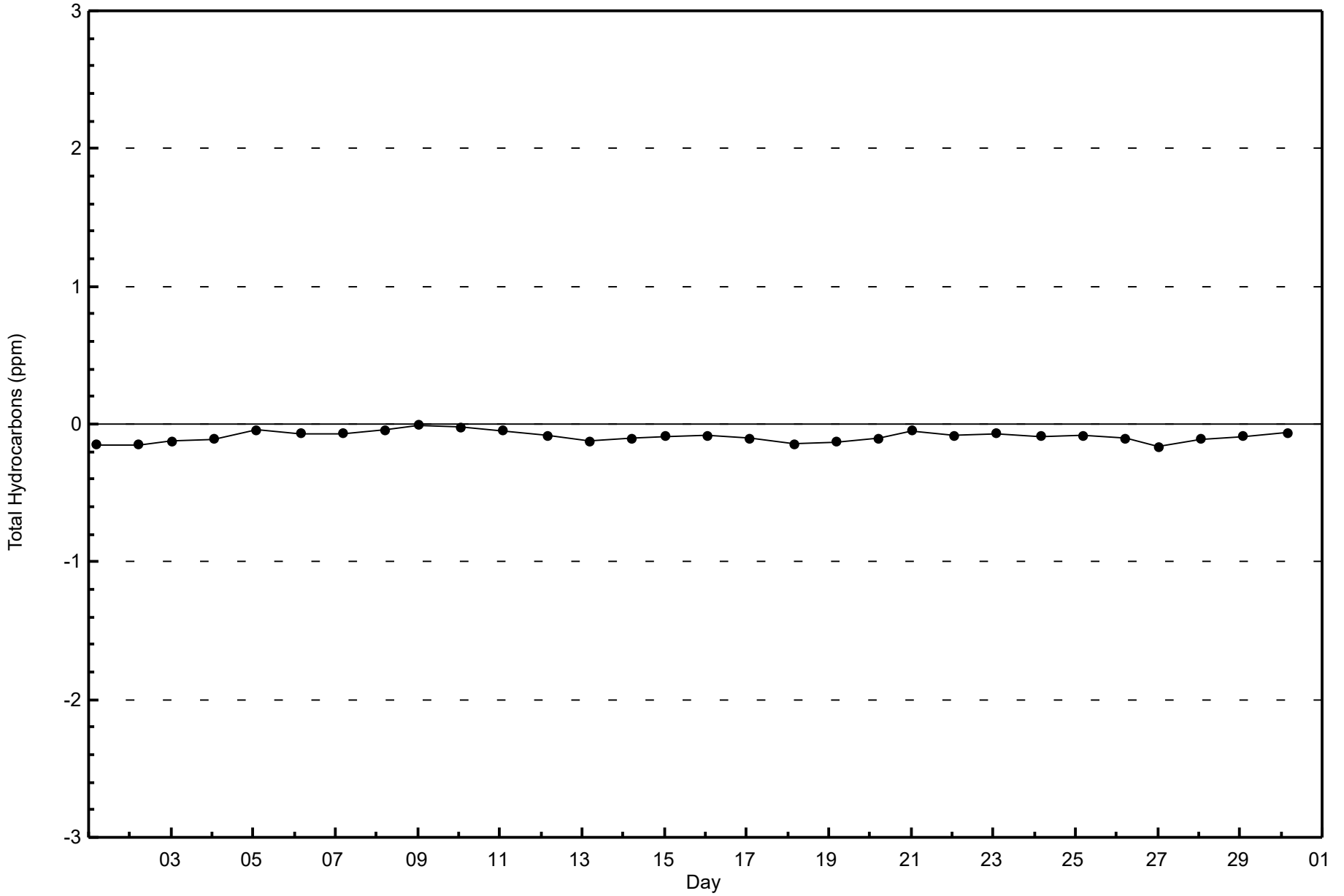


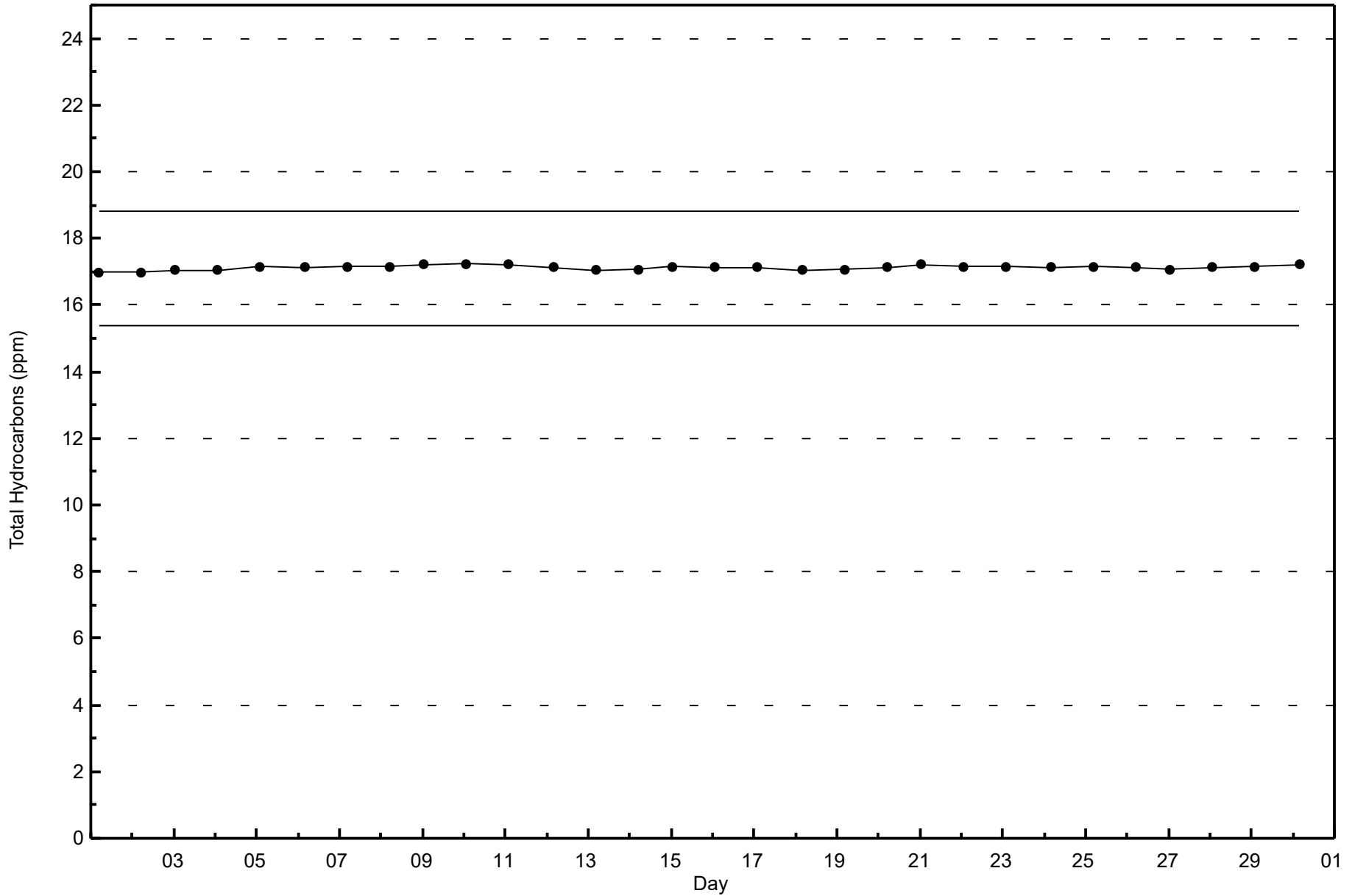
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Total Hydrocarbons (THC) - ppm
Wapasu



Total Number of Valid Hours: 685







Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O₃) - ppb

Wapasu - September 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 56.4 ppb on Sep 16 15:00	Maximum Daily Average: 43.8 ppb on Sep 23		Hours of Data:	685
Minimum Value: 2.7 ppb on Sep 28 07:00	Minimum Daily Average: 7.9 ppb on Sep 28		Hours of Missing Data:	35
Maximum Diurnal Average: 35.7 ppb at hour 16	Minimum Diurnal Average: 17.1 ppb at hour 5		Hours of Calibration:	34
Monthly Average: 25.98 ppb	Percentiles: P ₁ = 4.3 P ₁₀ = 8.8 Q ₁ = 14.9 Median = 26.9 Q ₃ = 36.1 P ₉₀ = 42.8 P ₉₉ = 50.2		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-Sep	Z	10.5	5.4	4.8	4.8	7.8	8.3	13.4	18.9	25.7	31.9	37.9	39.4	42.2	42.2	41.5	41.9	42.3	41.3	40.3	41.0	37.7	36.7	31.4	28.1	42.3
2-Sep	30.4	Z	31.0	26.9	18.3	17.5	19.9	20.4	21.1	20.8	19.2	25.5	37.0	33.8	36.9	39.3	40.0	35.0	25.2	19.6	22.5	15.9	13.2	15.3	25.4	40.0
3-Sep	17.0	15.1	Z	10.1	10.4	11.6	12.9	14.6	15.4	17.9	28.8	21.3	21.5	20.6	23.9	25.8	26.3	20.7	17.9	16.0	12.1	21.3	22.1	14.8	18.2	28.8
4-Sep	16.4	9.7	12.6	Z	9.0	22.3	26.9	28.1	27.1	24.8	25.4	29.7	30.4	28.6	26.6	28.6	30.3	32.1	24.8	12.9	11.2	20.5	23.5	19.4	22.6	32.1
5-Sep	16.1	14.1	13.1	12.7	Z	16.0	16.4	18.8	20.6	22.4	29.1	33.5	35.5	35.2	35.2	34.5	36.9	36.6	31.6	29.2	27.6	27.7	27.1	27.4	26.0	36.9
6-Sep	27.8	23.2	13.6	15.5	17.5	Z	19.1	19.3	20.1	21.2	21.7	19.8	16.4	14.7	15.1	18.6	18.4	17.1	13.1	15.7	16.4	14.6	12.4	11.7	17.5	27.8
7-Sep	Z	10.4	8.8	4.5	5.1	5.3	5.4	8.4	11.4	15.8	21.1	24.7	31.7	36.1	38.9	37.0	37.5	27.3	16.3	11.6	12.1	16.0	15.4	20.2	18.3	38.9
8-Sep	20.0	Z	18.9	18.3	19.1	17.5	14.9	16.4	17.9	21.3	26.0	29.7	29.5	31.0	33.8	31.5	35.0	29.0	18.3	11.2	11.2	11.0	14.9	16.7	21.4	35.0
9-Sep	14.9	10.4	Z	8.8	7.9	6.3	5.1	6.6	15.7	27.7	32.3	36.2	35.9	35.9	37.5	34.0	36.3	34.6	24.1	21.1	24.2	26.1	29.0	29.7	23.5	37.5
10-Sep	29.9	31.1	30.7	Z	28.5	26.0	25.9	25.8	26.9	33.2	35.4	34.4	36.4	39.1	40.0	38.4	40.3	37.6	32.6	29.2	29.6	29.7	31.0	29.8	32.2	40.3
11-Sep	29.0	29.2	29.7	29.3	Z	28.4	28.2	30.6	32.1	37.5	44.3	45.5	47.0	50.2	52.8	54.5	53.2	50.5	47.8	47.3	48.7	47.7	45.0	43.1	41.4	54.5
12-Sep	41.1	40.1	38.3	37.2	35.9	Z	33.7	33.2	33.9	34.2	36.4	40.6	41.7	43.4	47.5	49.5	45.9	42.0	36.9	23.5	26.8	26.5	22.6	20.5	36.2	49.5
13-Sep	Z	18.0	12.7	12.7	12.6	11.1	11.2	13.4	17.1	25.4	21.9	24.5	30.9	32.1	32.6	33.1	37.2	39.4	34.1	33.1	32.0	31.6	25.6	21.4	24.5	39.4
14-Sep	19.5	Z	17.0	12.7	4.0	3.1	4.4	9.1	6.2	9.1	C	C	C	C	33.1	35.9	34.2	31.9	24.6	13.4	7.2	4.8	7.6	10.4	15.2	35.9
15-Sep	11.3	10.9	Z	12.9	9.8	14.0	20.1	25.6	29.0	30.9	34.2	37.8	41.3	42.4	44.2	45.0	43.8	40.7	39.9	40.0	41.6	44.2	47.1	46.7	32.8	47.1
16-Sep	44.8	42.9	40.8	Z	39.2	38.1	35.9	32.0	31.8	36.8	38.7	42.3	46.4	51.3	56.4	50.6	48.3	43.2	37.1	34.8	34.0	35.3	35.4	34.6	40.5	56.4
17-Sep	34.6	34.1	34.7	34.6	Z	31.1	33.2	36.5	36.9	41.4	45.4	45.1	44.4	46.4	46.3	48.4	47.9	45.8	42.2	38.4	35.8	32.6	27.9	23.1	38.6	48.4
18-Sep	19.7	19.1	21.2	19.7	17.3	Z	22.0	23.5	22.1	24.6	29.7	36.1	36.3	37.6	39.5	40.8	37.8	27.8	21.9	22.1	21.1	20.8	17.7	16.5	25.9	40.8
19-Sep	Z	16.9	15.0	15.7	15.7	15.3	13.8	14.2	16.5	17.4	17.2	20.3	23.9	27.9	30.5	29.9	27.8	25.4	16.9	17.4	19.9	17.7	14.8	10.9	19.2	30.5
20-Sep	9.5	Z	6.5	7.5	6.2	5.7	11.9	18.6	23.1	25.6	25.9	27.4	35.2	28.7	29.7	31.2	30.9	28.8	17.5	10.9	8.5	6.2	6.1	9.5	17.9	35.2
21-Sep	16.2	21.2	Z	21.8	27.2	26.0	23.7	21.4	20.7	25.7	29.9	30.9	31.4	32.3	32.7	33.4	32.2	33.7	30.7	31.3	33.8	33.5	34.3	35.3	28.7	35.3
22-Sep	35.0	35.3	35.0	Z	33.4	32.4	31.2	31.9	32.7	34.4	38.0	40.9	43.1	45.6	M	46.3	44.4	44.4	43.1	42.9	43.9	43.9	42.7	42.8	39.2	46.3
23-Sep	43.5	43.1	42.0	41.8	Z	41.0	41.0	40.5	41.0	41.0	43.6	44.6	45.0	46.0	48.6	48.8	47.6	46.8	46.2	44.3	43.1	43.7	42.9	42.0	43.8	48.8
24-Sep	41.6	41.6	40.9	40.2	38.9	Z	36.0	34.7	32.8	32.0	32.2	31.6	33.7	35.0	32.3	30.6	29.9	27.7	22.3	21.8	20.6	20.1	18.6	17.0	31.0	41.6
25-Sep	Z	18.3	17.1	14.3	14.7	14.2	13.0	14.7	15.9	17.2	19.3	22.7	27.6	33.6	37.2	40.5	40.4	38.4	34.5	31.2	33.6	33.6	34.8	34.9	26.2	40.5
26-Sep	34.9	Z	37.0	37.7	37.2	37.1	36.5	35.9	36.2	38.3	38.9	40.6	41.7	43.8	43.9	42.7	39.1	35.9	32.6	31.8	32.3	28.3	17.2	14.8	35.4	43.9
27-Sep	13.6	9.3	Z	5.7	5.1	5.3	4.4	6.5	14.4	25.6	38.2	43.7	41.8	42.8	39.9	39.0	35.9	29.9	25.1	21.3	14.4	13.2	10.6	8.0	21.5	43.7
28-Sep	8.8	5.7	3.7	Z	2.9	2.8	2.7	3.9	8.9	9.2	7.8	8.2	8.3	8.1	7.0	10.9	11.9	12.9	11.3	11.3	11.1	9.6	5.0	9.5	7.9	12.9
29-Sep	11.8	7.0	8.6	10.4	Z	8.4	5.6	5.2	5.3	5.4	7.1	10.6	13.1	13.3	12.1	12.1	12.3	9.8	6.7	9.2	12.2	10.1	10.9	6.0	9.3	13.3
30-Sep	6.3	6.5	5.5	7.6	7.2	Z	6.0	5.8	5.8	5.3	5.3	7.4	10.7	11.8	14.4	18.0	21.4	17.8	10.1	10.3	11.0	11.8	12.6	13.3	10.1	21.4

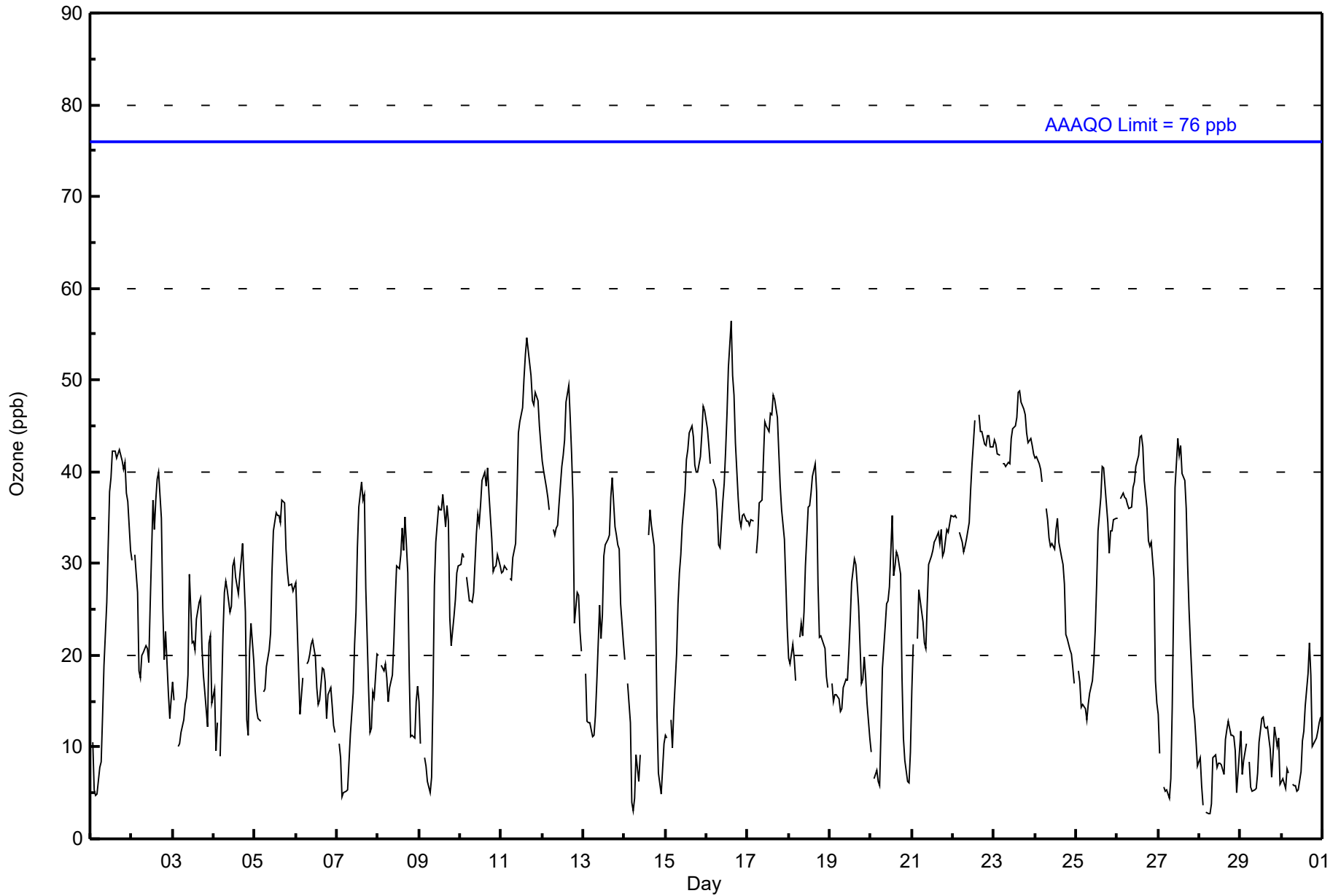
23.8	21.0	21.6	18.5	17.1	17.8	19.0	20.3	21.9	24.9	28.5	30.8	33.0	34.1	34.9	35.7	35.5	32.8	27.6	24.8	24.6	24.5	23.5	22.6	Diurnal Average	
44.8	43.1	42.0	41.8	39.2	41.0	41.0	40.5	41.0	41.4	45.4	45.5	47.0	51.3	56.4	54.5	53.2	50.5	47.8	47.3	48.7	47.7	47.1	46.7	Diurnal Maximum	

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
Wapasu - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ozone (O₃) - ppb
Wapasu - September 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	262	38.25	38.25
21 - 50	416	60.73	98.98
51 - 82	7	1.02	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Ozone (O₃) - ppb
Wapasu - September 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	17	4	6	2	6	16	44	52	42	21	14	5	12	4	0	17	262
21 - 50	9	2	3	1	1	12	35	117	61	43	65	22	13	7	12	12	415
51 - 82	0	0	0	0	0	0	0	0	4	0	3	0	0	0	0	0	7
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	26	6	9	3	7	28	79	169	107	64	82	27	25	11	12	29	684

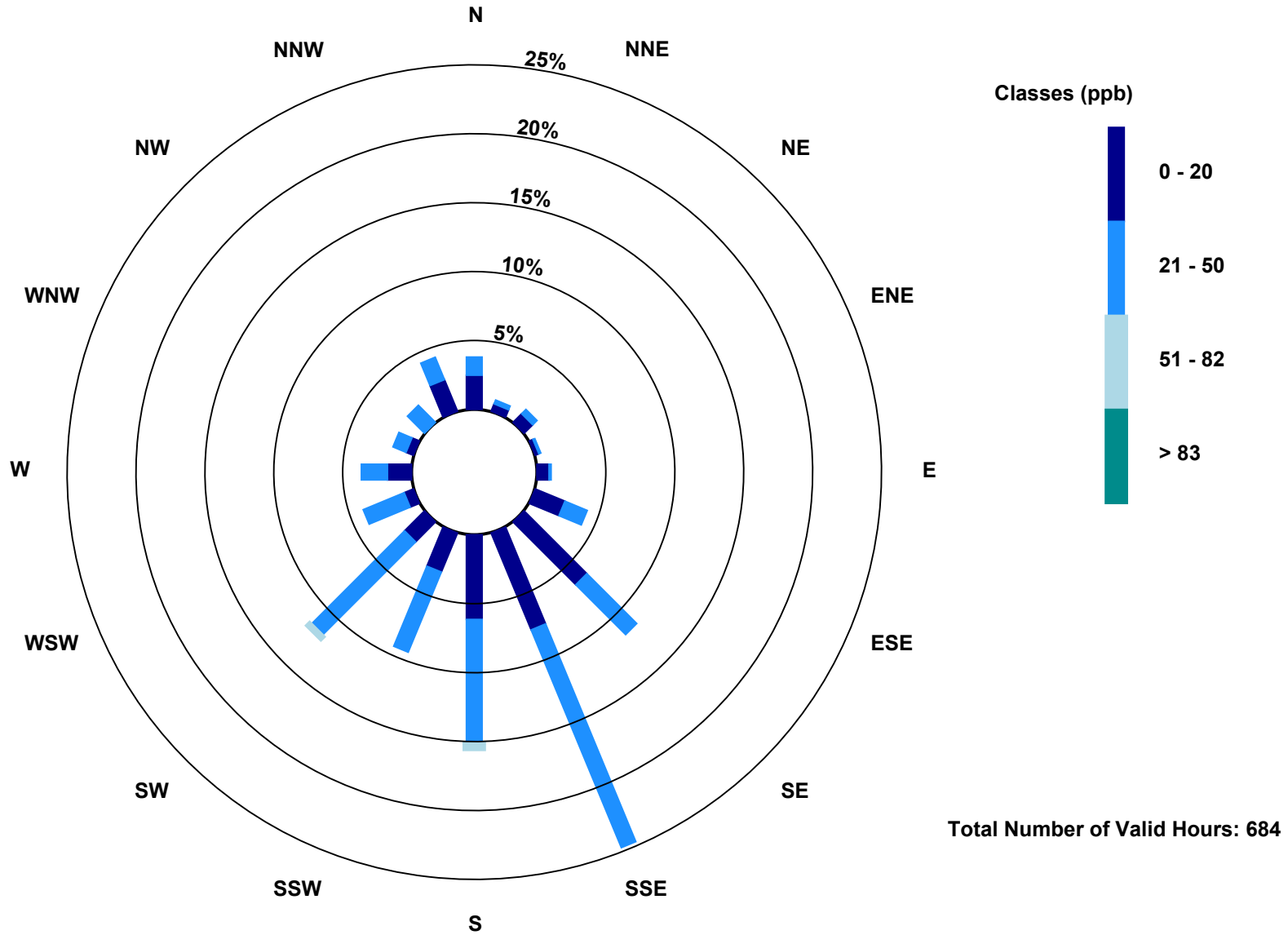
Total Number of Valid Hours: 684

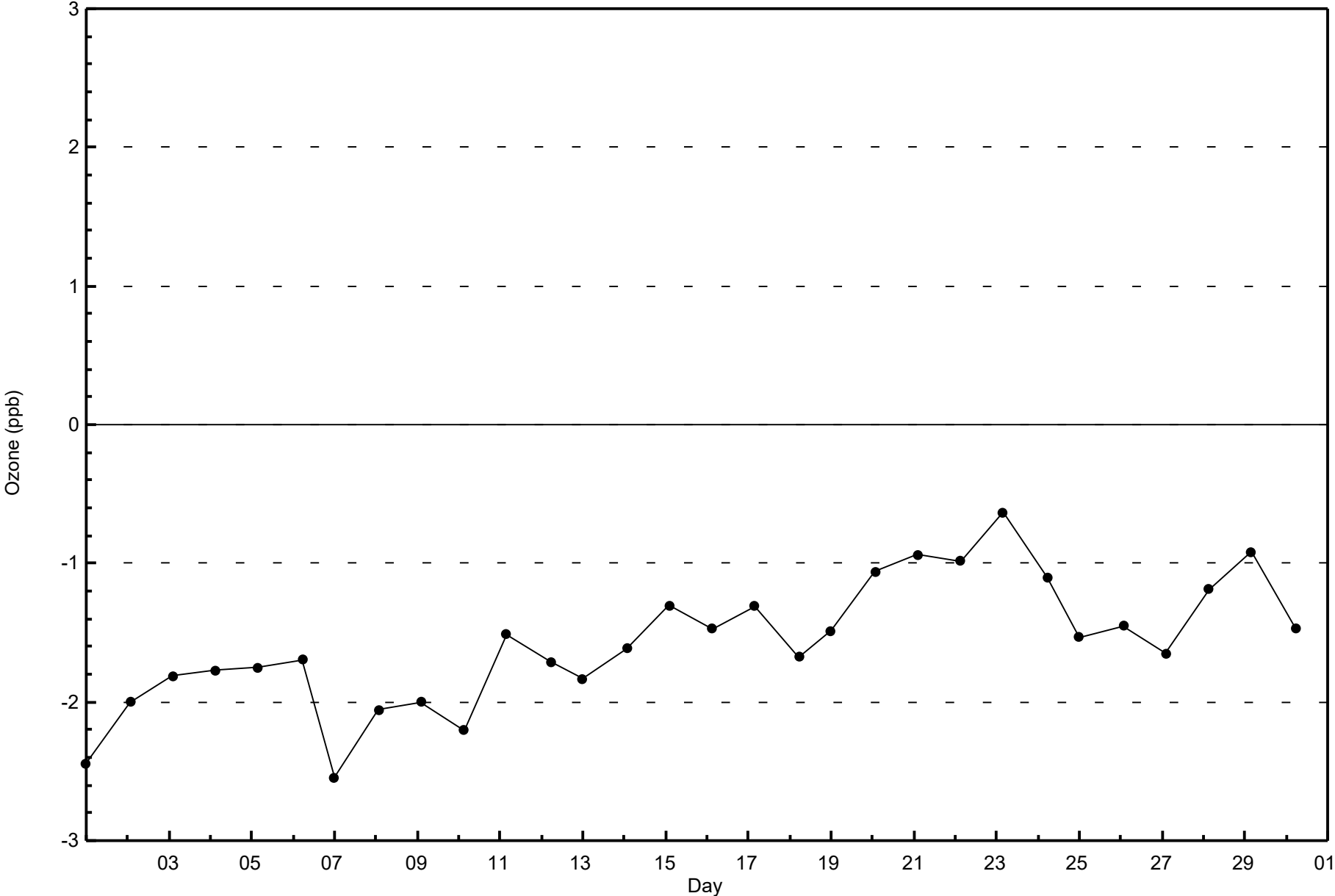
Total Number of Hours: 720

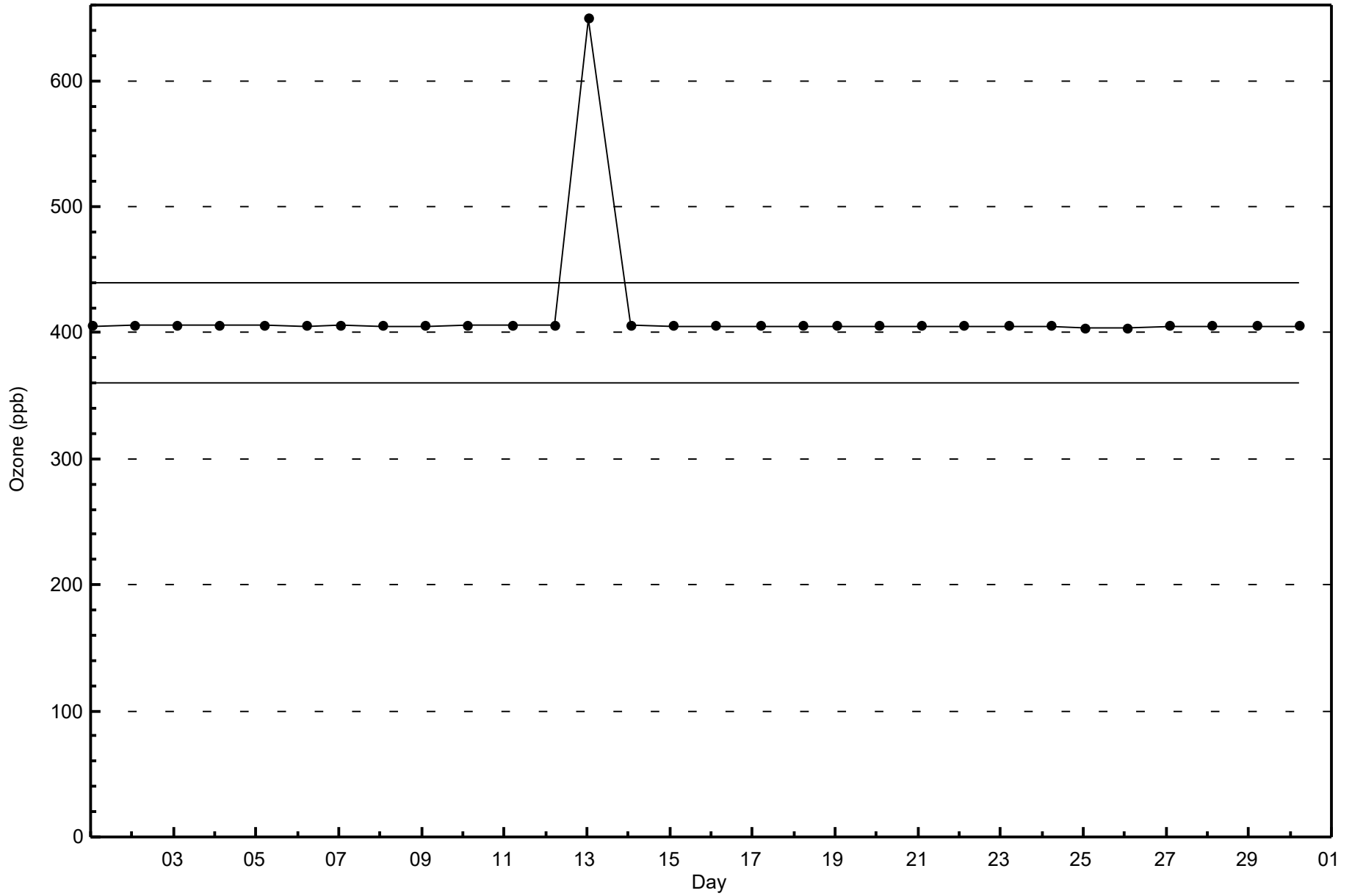


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Ozone (O₃) - ppb
Wapasu









Wood Buffalo Environmental Association
Summary of Hour Averages

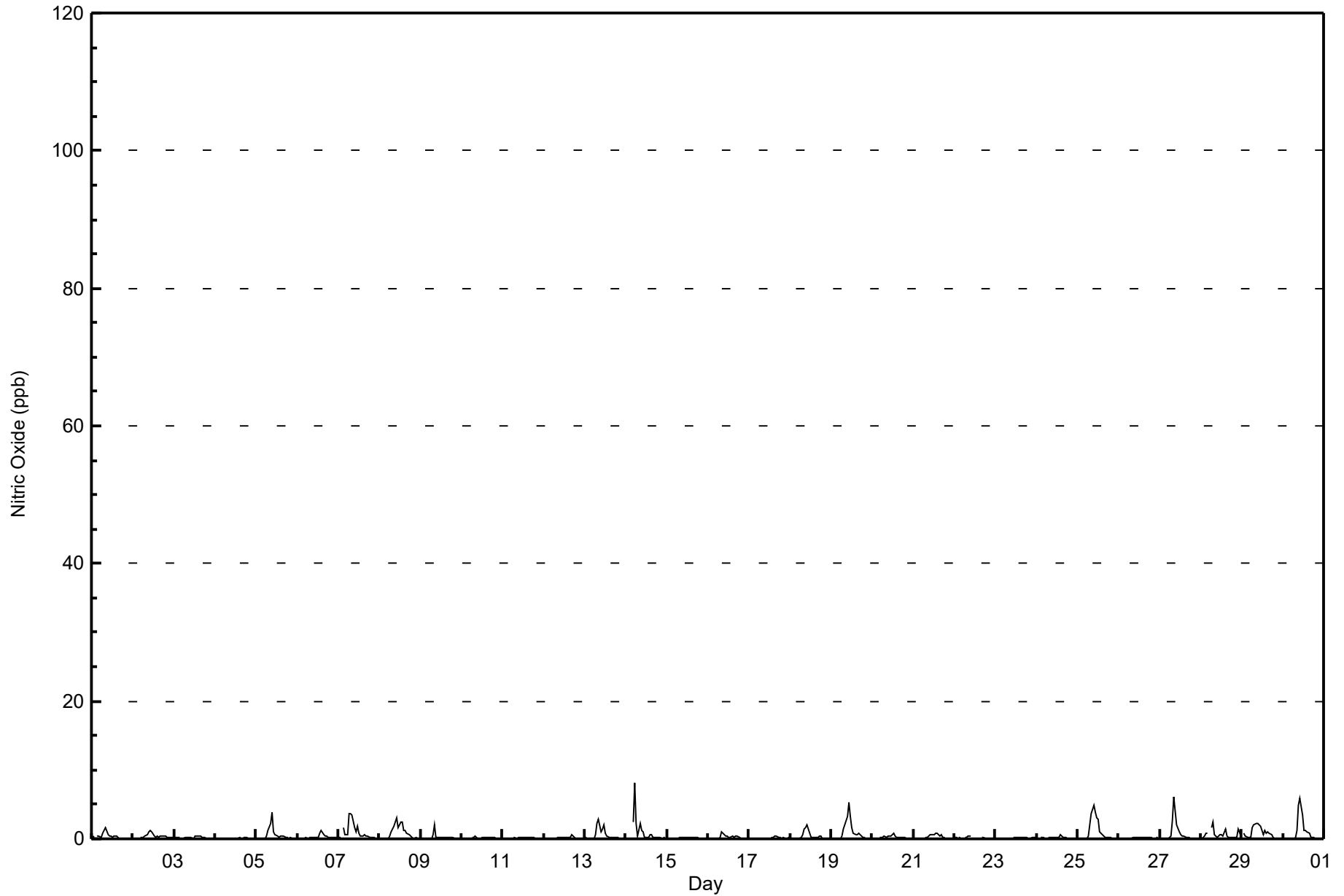
Nitric Oxide (NO) - ppb
Wapasu - September 2023

Maximum Value: 8.2 ppb on Sep 14 06:00		Maximum Daily Average: 1.0 ppb on Sep 25		Hours in Service: 720																						
Minimum Value: 0.0 ppb on Sep 1 18:00		Minimum Daily Average: 0.0 ppb on Sep 4		Hours of Data: 684																						
Maximum Diurnal Average: 1.3 ppb at hour 9		Minimum Diurnal Average: 0.1 ppb at hour 24		Hours of Missing Data: 36																						
Monthly Average: 0.42 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.2 Q ₃ = 0.3 P ₉₀ = 1.0 P ₉₉ = 3.9		Hours of Calibration: 36																						
				Percent Operational Time: 100.0																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Sep	0.3	0.3	Z	0.3	0.3	0.2	0.9	1.3	1.6	0.7	0.4	0.4	0.2	0.3	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.6
2-Sep	0.0	0.0	0.0	Z	0.1	0.3	0.3	0.4	0.5	1.0	1.2	1.1	0.4	0.3	0.5	0.3	0.3	0.4	0.5	0.4	0.2	0.2	0.2	0.1	0.4	1.2
3-Sep	0.2	0.1	0.2	0.2	Z	0.1	0.1	0.2	0.1	0.3	0.2	0.1	0.3	0.4	0.5	0.4	0.3	0.3	0.2	0.1	0.0	0.1	0.1	0.0	0.2	0.5
4-Sep	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	0.1	0.1	0.0	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.2
5-Sep	Z	0.1	0.1	0.1	0.0	0.1	0.4	1.1	2.2	3.8	1.0	0.7	0.4	0.3	0.4	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.5	3.8
6-Sep	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.8	1.2	0.5	0.3	0.4	0.2	0.3	0.1	0.2	0.2	0.2	0.3	1.2
7-Sep	0.2	0.1	Z	1.5	0.7	0.7	3.8	3.7	3.5	1.6	0.9	1.8	0.9	0.3	0.4	0.6	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.0	1.0	3.8
8-Sep	0.0	0.0	0.0	Z	0.1	0.1	0.5	1.0	1.9	2.5	3.0	1.6	2.5	2.5	1.1	1.2	0.9	0.6	0.4	0.2	0.1	0.1	0.1	0.0	0.9	3.0
9-Sep	0.0	0.0	0.0	0.0	Z	0.0	0.1	0.6	2.1	0.1	0.3	0.2	0.2	0.1	0.2	0.3	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.2	2.1
10-Sep	0.1	0.1	0.0	0.0	0.0	Z	0.1	0.2	0.5	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.1	0.5
11-Sep	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.0	0.1	0.0	0.0	0.1	0.2
12-Sep	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.6	0.5	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.6
13-Sep	0.1	0.1	Z	0.1	0.1	0.1	0.7	2.1	2.9	0.9	1.4	1.9	0.8	0.4	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.0	0.1	0.1	0.6	2.9
14-Sep	0.1	0.1	0.1	Z	2.4	8.2	2.3	0.5	2.2	1.3	1.0	0.2	0.3	0.3	0.6	0.5	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.9	8.2
15-Sep	0.1	0.1	0.1	0.1	Z	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	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.2
16-Sep	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.3	0.9	0.6	0.5	0.3	0.2	0.2	0.4	0.3	0.3	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.2	0.9
17-Sep	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.4
18-Sep	0.1	Z	0.1	0.0	0.0	0.0	0.2	0.5	1.3	1.7	2.0	0.9	0.3	0.2	0.1	0.1	0.1	0.4	0.4	0.1	0.0	0.1	0.1	0.0	0.4	2.0
19-Sep	0.0	0.0	Z	0.0	0.0	0.0	0.3	1.4	2.0	3.3	5.2	3.3	1.6	0.9	0.6	0.7	0.8	0.5	0.3	0.2	0.1	0.0	0.1	0.1	0.9	5.2
20-Sep	0.0	0.1	0.1	Z	0.1	0.1	0.2	0.3	0.3	0.3	0.3	0.5	0.7	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.7
21-Sep	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.3	0.4	0.5	0.6	0.6	0.8	0.8	0.4	0.7	0.2	0.2	0.1	0.0	0.1	0.1	0.1	0.3	0.8
22-Sep	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.2	0.3	0.4	C	C	C	C	C	C	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	--	0.4
23-Sep	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2
24-Sep	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.5	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.5
25-Sep	0.0	0.0	Z	0.0	0.0	0.0	0.5	2.0	3.6	4.9	3.9	3.1	2.7	1.0	0.7	0.3	0.2	0.3	0.2	0.1	0.0	0.0	0.1	0.0	1.0	4.9
26-Sep	0.1	0.0	0.0	Z	0.0	0.1	0.1	0.1	0.1	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.3
27-Sep	0.1	0.1	0.1	0.1	Z	0.1	0.3	2.7	6.2	4.0	2.1	1.0	0.7	0.3	0.3	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.8	6.2
28-Sep	0.1	0.1	0.4	0.9	0.8	Z	1.5	2.4	0.6	0.3	0.4	0.6	0.5	0.5	1.4	0.4	0.2	0.2	0.2	0.2	0.2	0.2	1.5	0.4	0.6	2.4
29-Sep	Z	0.7	0.3	0.1	0.1	0.2	1.6	2.0	2.3	2.2	2.0	1.7	0.6	1.2	0.8	0.9	0.8	0.6	0.3	0.1	0.1	0.1	0.1	0.0	0.8	2.3
30-Sep	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.3	1.3	4.8	5.8	3.5	1.1	1.2	1.0	0.7	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.9	5.8
																								Diurnal Average		
																								Diurnal Maximum		
																								0.1 0.1 0.1 0.2 0.2 0.4 0.5 0.8 1.3 1.2 1.2 0.9 0.6 0.5 0.5 0.4 0.3 0.3 0.2 0.1 0.1 0.1 0.1 0.1 0.1 0.1		
																								0.3 0.7 0.4 1.5 2.4 8.2 3.8 3.7 6.2 4.9 5.8 3.5 2.7 2.5 1.4 1.2 0.9 0.6 0.5 0.4 0.2 0.2 1.5 0.4		
Z - zerospan C - Calibration																										



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Wapasu - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Wapasu - September 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	684	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: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Wapasu - September 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	6	9	2	8	32	75	169	107	59	82	27	25	13	14	28	683
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	27	6	9	2	8	32	75	169	107	59	82	27	25	13	14	28	683

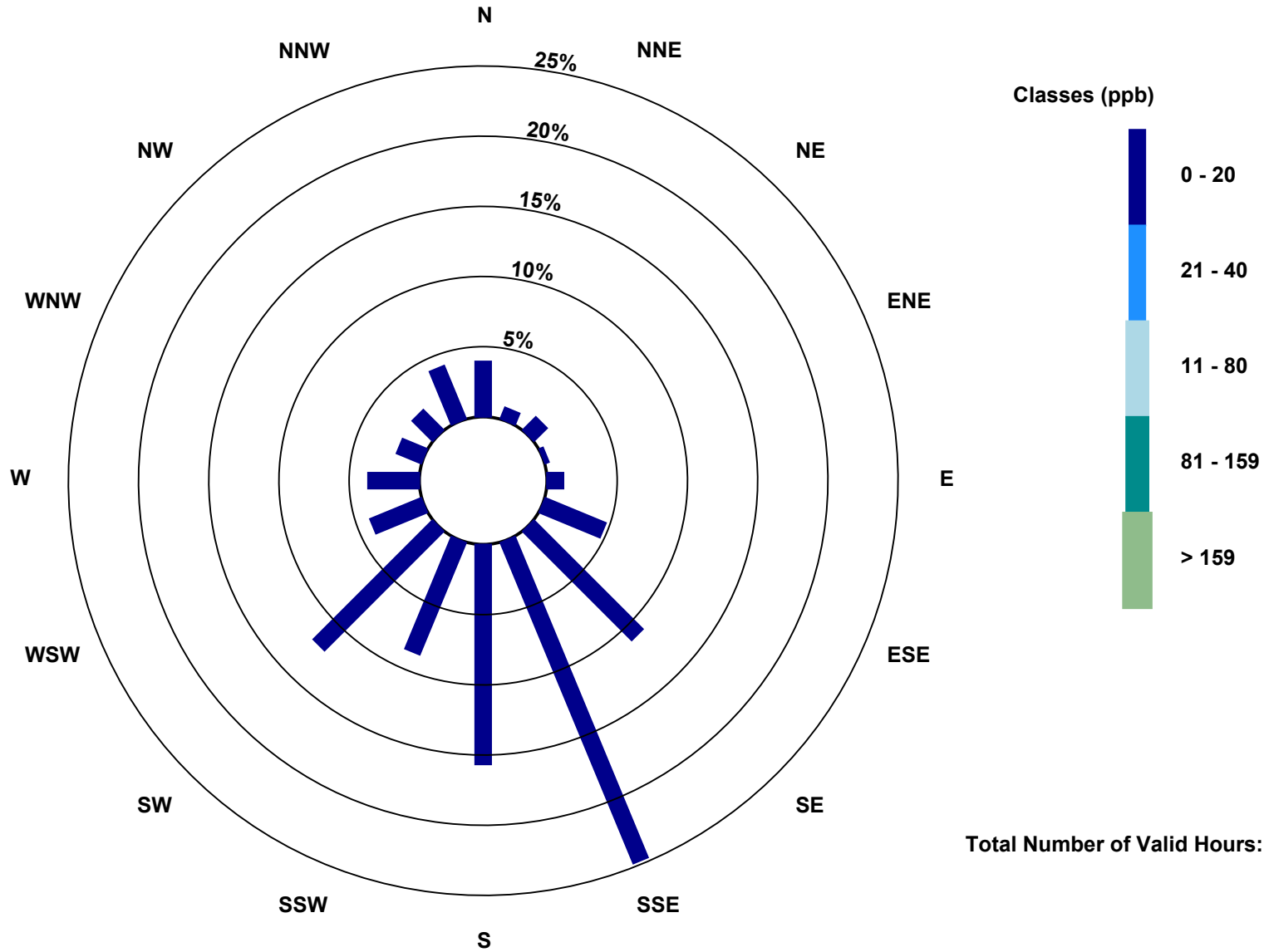
Total Number of Valid Hours: 683

Total Number of Hours: 720

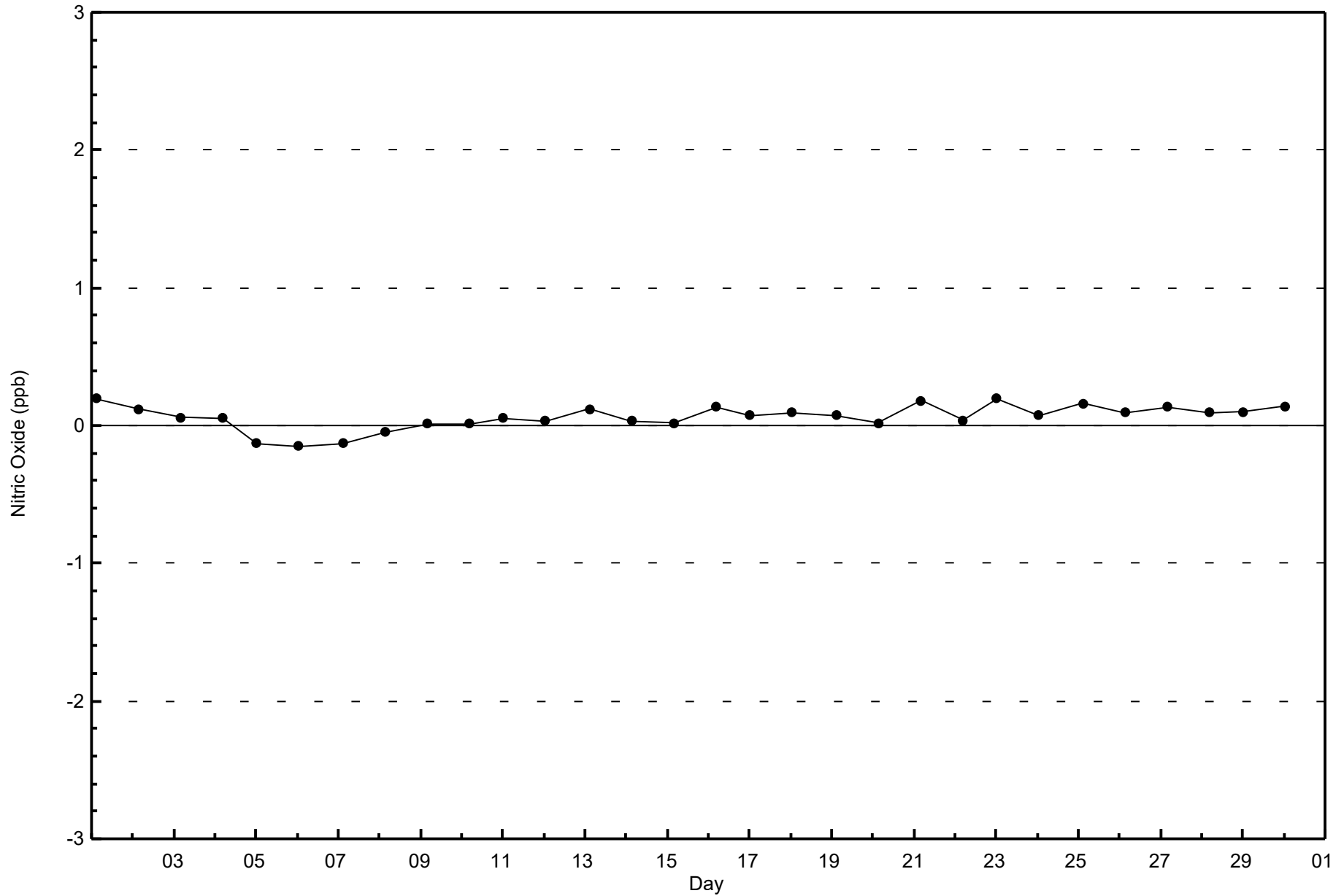


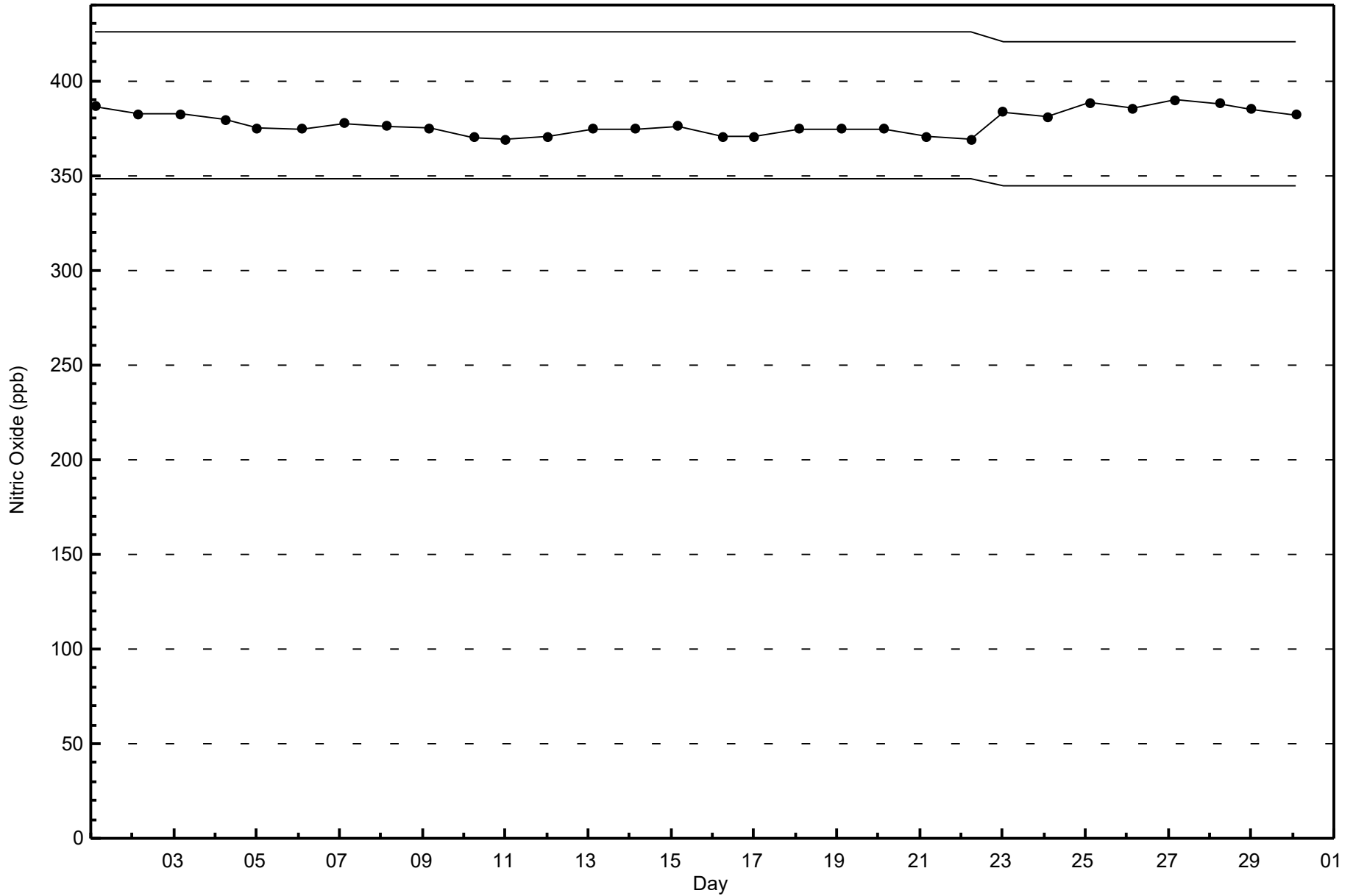
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitric Oxide (NO) - ppb
Wapasu



Total Number of Valid Hours: 683







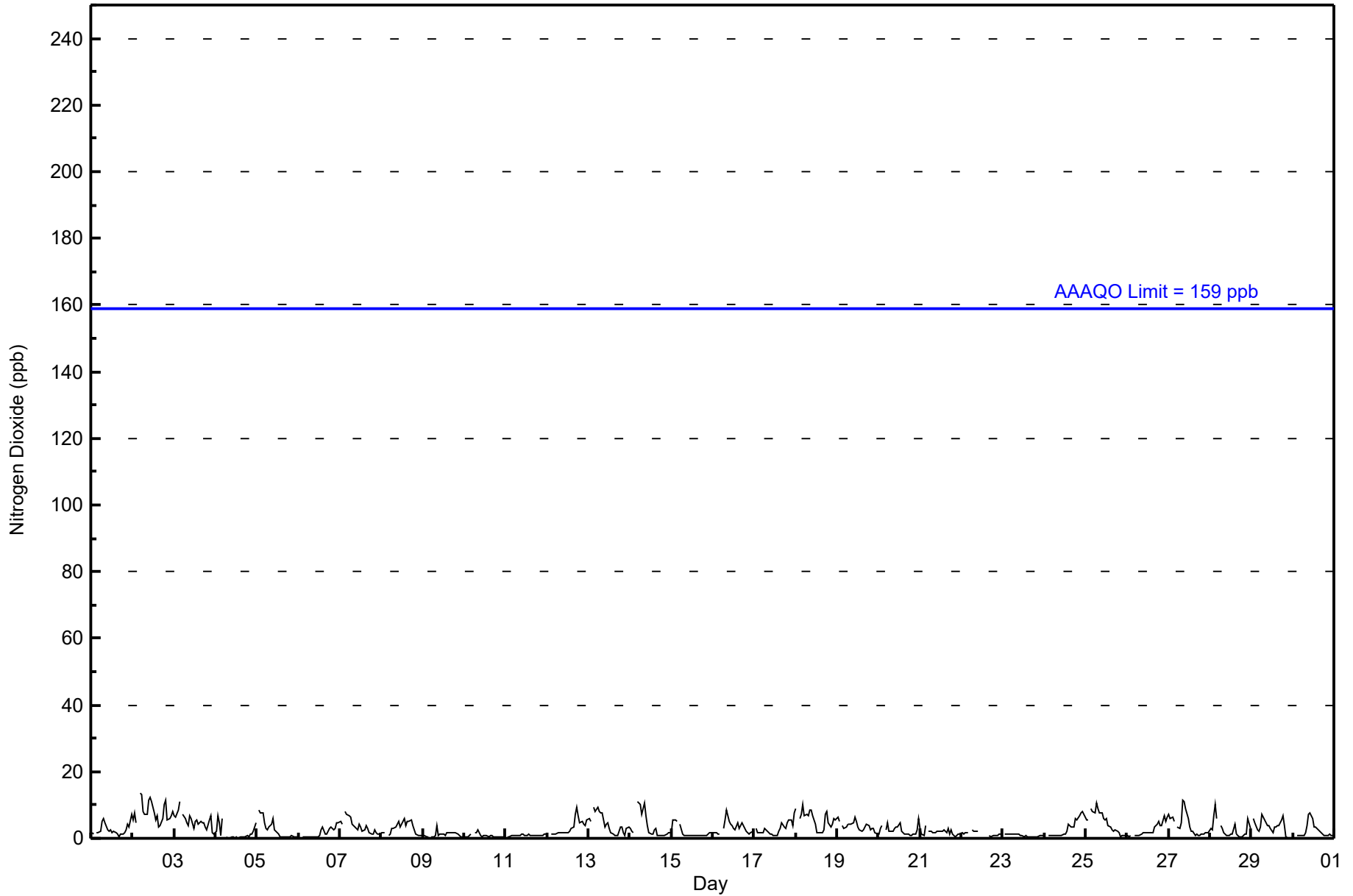
Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

Wapasu - September 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		720																		
Maximum Value: 13.7 ppb on Sep 2 05:00		Maximum Daily Average: 7.9 ppb on Sep 2		Minimum Value: 0.1 ppb on Sep 4 08:00		Minimum Daily Average: 0.8 ppb on Sep 10		Hours of Data: 684																		
Maximum Diurnal Average: 3.9 ppb at hour 9		Minimum Diurnal Average: 2.1 ppb at hour 16		Hours of Missing Data: 36		Hours of Calibration: 36		Percent Operational Time: 100.0																		
Monthly Average: 2.95 ppb		Percentiles: P ₁ = 0.2 P ₁₀ = 0.6 Q ₁ = 1.0 Median = 1.9 Q ₃ = 4.4 P ₉₀ = 6.8 P ₉₉ = 11.1																								
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-Sep	1.9	1.3	Z	1.7	1.7	2.3	5.1	6.0	4.6	2.5	2.2	2.5	1.6	2.2	1.8	1.2	0.6	1.1	1.4	1.8	2.5	4.3	3.4	7.0	2.6	7.0
2-Sep	5.3	7.5	4.8	Z	13.7	13.0	8.0	7.4	7.4	11.5	12.2	10.9	7.5	5.5	6.7	3.2	4.0	5.9	10.3	11.3	5.3	6.0	6.6	8.2	7.9	13.7
3-Sep	6.7	6.2	8.3	11.1	Z	7.4	6.0	4.5	4.0	6.8	6.1	3.1	5.1	5.7	4.1	4.9	4.6	4.5	3.6	2.7	5.4	6.7	1.7	1.4	5.2	11.1
4-Sep	2.2	6.9	4.6	1.0	6.0	Z	0.4	0.1	0.2	0.6	0.6	0.2	0.3	0.2	0.3	0.3	0.4	0.6	0.7	0.5	1.4	1.3	2.3	4.8	1.6	6.9
5-Sep	Z	8.3	7.8	7.7	4.8	3.0	2.5	3.3	4.3	5.9	2.5	2.0	1.3	0.6	0.6	0.4	0.6	0.6	0.5	0.6	0.7	0.5	0.4	0.4	2.6	8.3
6-Sep	0.5	Z	0.6	0.6	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.7	2.4	3.2	1.4	1.2	2.1	2.9	3.5	2.6	3.1	4.6	4.5	1.6	4.6
7-Sep	4.9	4.1	Z	8.2	7.1	6.8	6.5	4.4	4.0	2.8	2.4	4.2	3.2	2.0	2.5	3.9	2.8	1.9	1.4	1.2	2.7	1.8	1.3	1.2	3.5	8.2
8-Sep	1.6	1.8	1.8	Z	0.9	1.4	2.8	2.8	3.4	4.2	5.1	3.3	5.0	5.8	3.7	5.0	5.1	5.5	3.9	2.5	1.4	1.0	0.8	0.8	3.0	5.8
9-Sep	0.9	0.7	0.5	0.4	Z	0.4	0.3	0.9	3.8	1.0	1.3	1.4	1.3	0.8	1.9	1.6	1.6	1.7	1.8	1.5	1.4	0.8	0.6	0.6	1.2	3.8
10-Sep	0.4	0.4	0.5	0.7	1.1	Z	1.8	1.7	2.4	0.9	0.6	0.7	0.7	0.7	0.6	0.7	0.7	0.6	0.5	0.4	0.5	0.5	0.5	0.4	0.8	2.4
11-Sep	Z	0.5	0.6	0.7	0.8	0.9	1.0	1.0	1.0	1.1	1.1	1.0	1.0	1.1	1.0	1.0	0.9	1.0	0.9	0.9	1.0	1.0	1.1	1.2	0.9	1.2
12-Sep	1.2	Z	1.4	1.4	1.3	1.4	1.5	1.8	1.7	1.8	1.7	1.8	1.9	2.3	3.1	3.3	7.1	9.4	6.8	4.5	5.2	4.3	3.9	5.7	3.2	9.4
13-Sep	5.9	5.0	Z	9.4	7.9	9.3	8.2	7.6	7.5	3.5	4.4	4.6	2.8	1.6	1.3	1.0	0.9	0.9	3.2	3.3	1.5	0.9	3.1	3.4	4.2	9.4
14-Sep	3.0	2.0	1.5	Z	10.9	10.7	10.3	7.1	10.5	6.8	3.8	1.6	1.2	1.1	2.7	3.0	0.9	0.7	0.9	0.7	0.8	1.1	1.5	1.6	3.7	10.9
15-Sep	1.7	5.3	5.3	5.0	Z	4.4	1.1	1.0	0.9	1.0	0.9	1.0	0.7	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.9	1.2	1.6	1.8	1.7	5.3
16-Sep	1.7	1.5	1.5	1.4	1.4	Z	2.9	5.4	8.6	4.9	4.3	3.8	3.1	2.6	4.5	2.9	3.7	4.8	2.8	2.0	1.9	1.4	1.9	2.0	3.1	8.6
17-Sep	Z	2.8	1.7	1.5	1.5	1.9	2.8	2.7	1.7	1.2	1.1	0.9	0.7	0.9	2.1	2.9	4.5	3.2	2.9	4.6	5.4	5.5	4.0	7.7	2.8	7.7
18-Sep	9.0	Z	6.1	7.4	10.1	6.6	7.0	6.9	8.6	8.6	6.7	4.4	1.9	1.7	1.6	1.6	2.6	7.4	7.9	4.7	3.3	4.2	5.8	5.4	5.6	10.1
19-Sep	6.2	5.2	Z	3.8	3.0	3.4	4.4	4.4	4.1	4.7	6.2	4.9	3.4	2.5	2.1	2.5	3.3	4.1	4.0	2.7	2.9	2.8	1.9	1.4	3.6	6.2
20-Sep	1.1	2.8	3.9	Z	2.4	4.6	2.0	2.2	2.3	3.0	3.2	3.4	4.7	2.2	1.7	1.4	1.3	1.1	0.9	0.8	1.2	1.2	2.5	5.9	2.4	5.9
21-Sep	3.1	1.1	0.8	3.7	Z	2.0	2.0	1.7	1.9	1.7	2.1	2.0	2.0	2.1	2.6	1.5	2.8	1.4	2.6	1.4	0.6	0.8	1.3	1.2	1.8	3.7
22-Sep	1.5	1.4	1.5	1.5	1.7	Z	2.5	2.3	2.0	2.0	C	C	C	C	C	C	0.7	0.5	0.7	0.7	0.8	1.0	1.4	1.2	--	2.5
23-Sep	Z	1.3	1.3	1.2	1.3	1.3	1.3	1.3	1.2	1.1	0.9	0.7	0.6	0.7	0.6	0.6	0.6	0.5	0.5	0.6	0.6	0.7	0.7	0.7	0.9	1.3
24-Sep	0.7	Z	0.8	0.8	0.8	0.8	0.8	0.8	0.9	1.0	1.0	1.1	1.2	2.3	4.4	3.5	3.2	3.3	5.9	5.6	6.6	7.6	8.0	7.1	3.0	8.0
25-Sep	5.5	5.6	Z	9.1	8.0	7.6	10.5	9.1	7.8	7.8	6.1	5.4	5.9	3.9	3.6	2.4	2.3	2.4	2.3	1.7	0.6	0.8	0.7	0.7	4.8	10.5
26-Sep	0.7	0.6	0.7	Z	0.8	0.7	0.7	0.8	1.2	1.5	1.5	1.5	1.6	1.8	1.7	1.8	3.5	4.3	5.0	3.7	3.8	6.6	5.1	6.4	2.4	6.6
27-Sep	7.4	5.8	6.2	5.0	Z	3.6	2.8	4.5	11.6	11.1	9.1	5.8	3.2	2.0	2.1	0.9	1.4	0.7	1.0	1.2	1.2	1.5	1.9	1.9	4.0	11.6
28-Sep	3.0	2.5	6.9	10.3	5.9	Z	4.0	2.9	1.6	1.0	0.9	1.0	1.3	1.3	4.4	1.4	0.7	0.6	0.5	0.7	1.3	1.4	5.8	3.0	2.7	10.3
29-Sep	Z	6.0	4.5	2.5	2.3	3.5	7.1	6.5	4.7	3.8	3.8	2.9	1.8	3.2	3.6	3.8	4.0	5.5	6.9	3.7	0.3	0.2	0.1	0.1	3.5	7.1
30-Sep	0.2	Z	0.7	0.7	1.0	0.8	1.0	1.7	3.9	7.3	7.5	6.0	3.4	3.3	3.1	2.0	1.5	1.1	0.9	1.0	0.8	1.1	1.0	0.9	2.2	7.5
																								Diurnal Average		
																								Diurnal Maximum		
																								3.1 3.5 3.0 3.9 3.9 3.9 3.6 3.4 3.9 3.7 3.4 2.8 2.4 2.2 2.5 2.1 2.3 2.6 2.8 2.4 2.2 2.4 2.5 3.0		
																								9.0 8.3 8.3 11.1 13.7 13.0 10.5 9.1 11.6 11.5 12.2 10.9 7.5 5.8 6.7 5.0 7.1 9.4 10.3 11.3 6.6 7.6 8.0 8.2		
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
Wapasu - September 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	684	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: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Wapasu - September 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	6	9	2	8	32	75	169	107	59	82	27	25	13	14	28	683
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	27	6	9	2	8	32	75	169	107	59	82	27	25	13	14	28	683

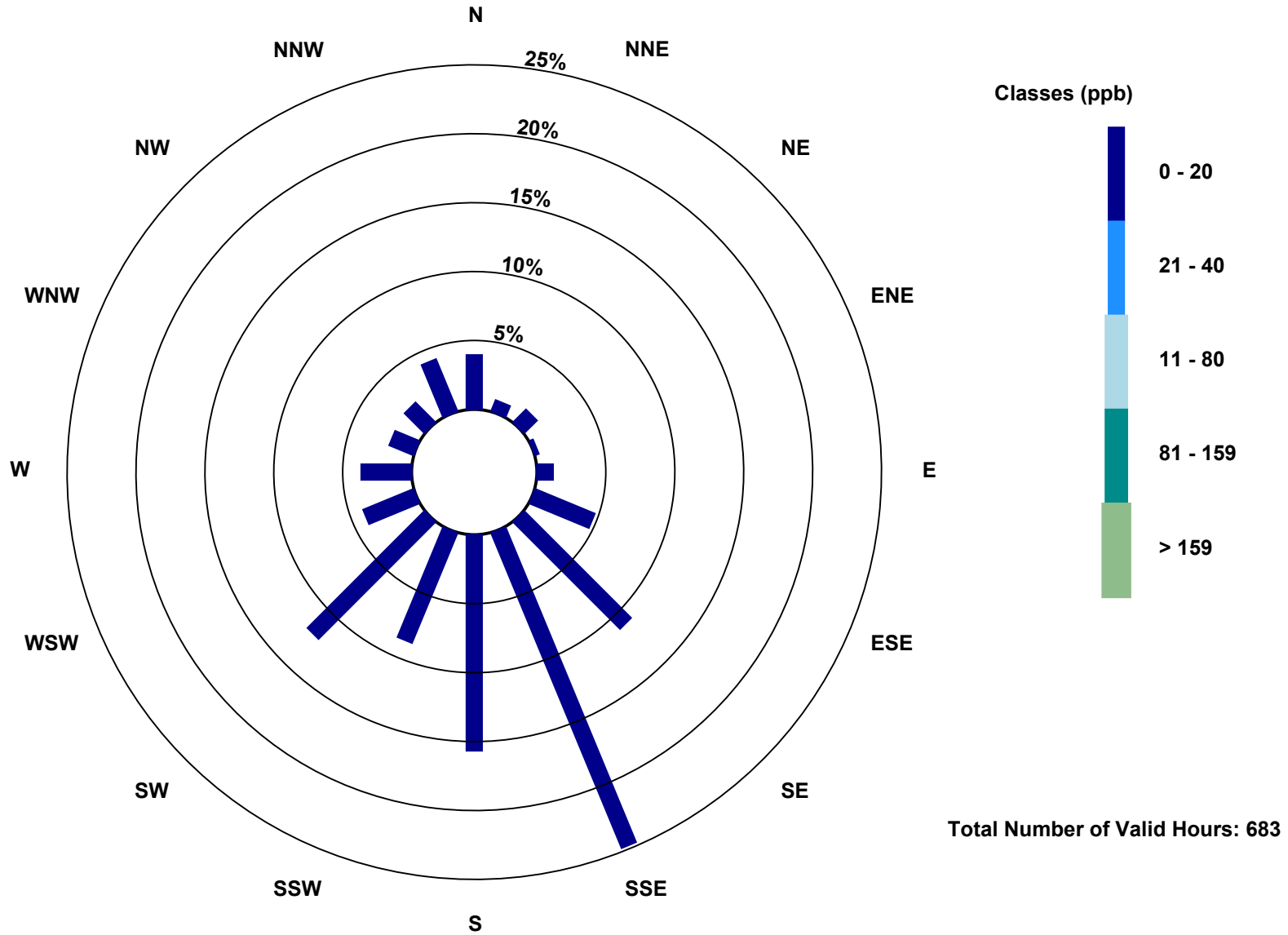
Total Number of Valid Hours: 683

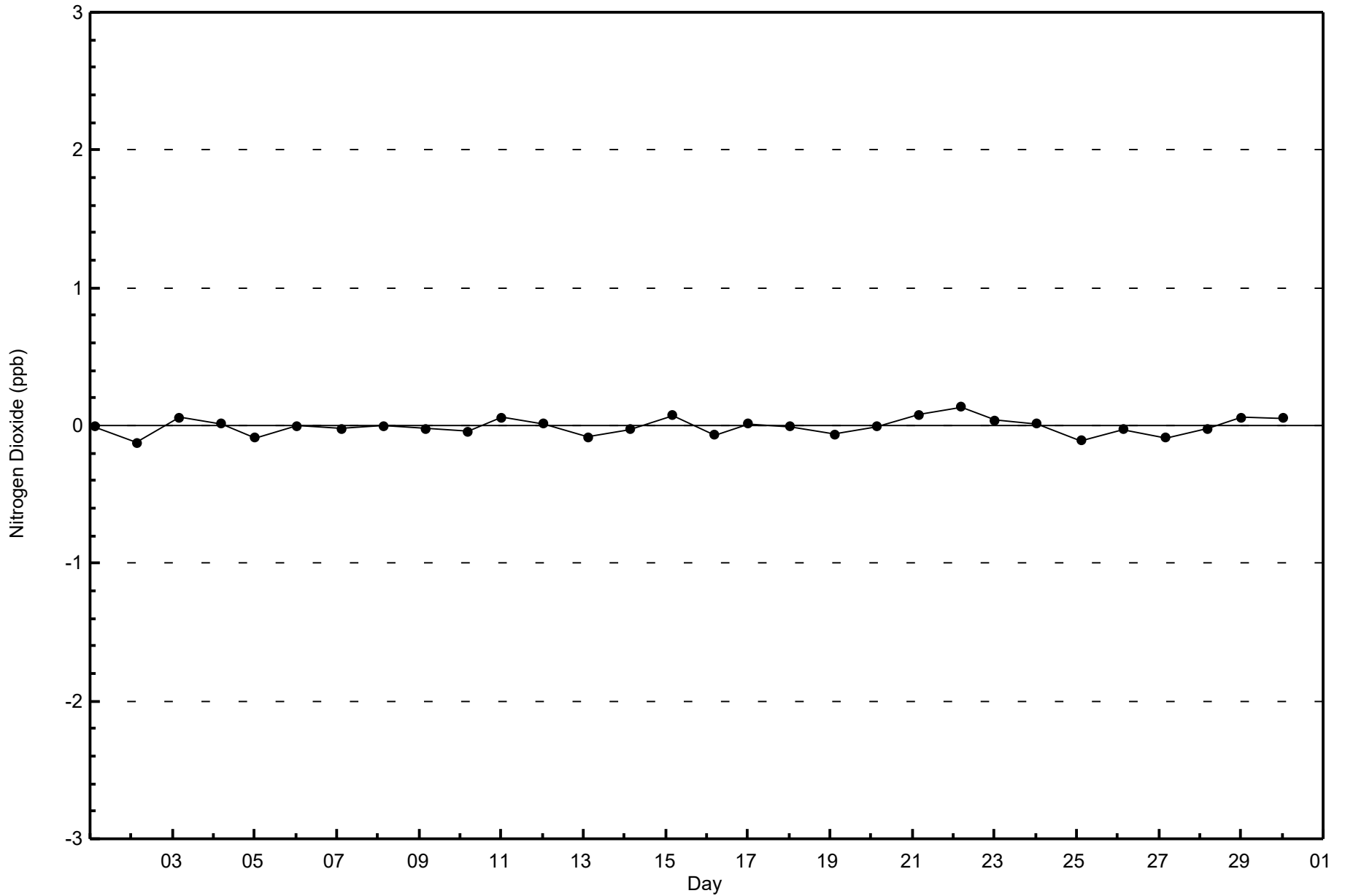
Total Number of Hours: 720

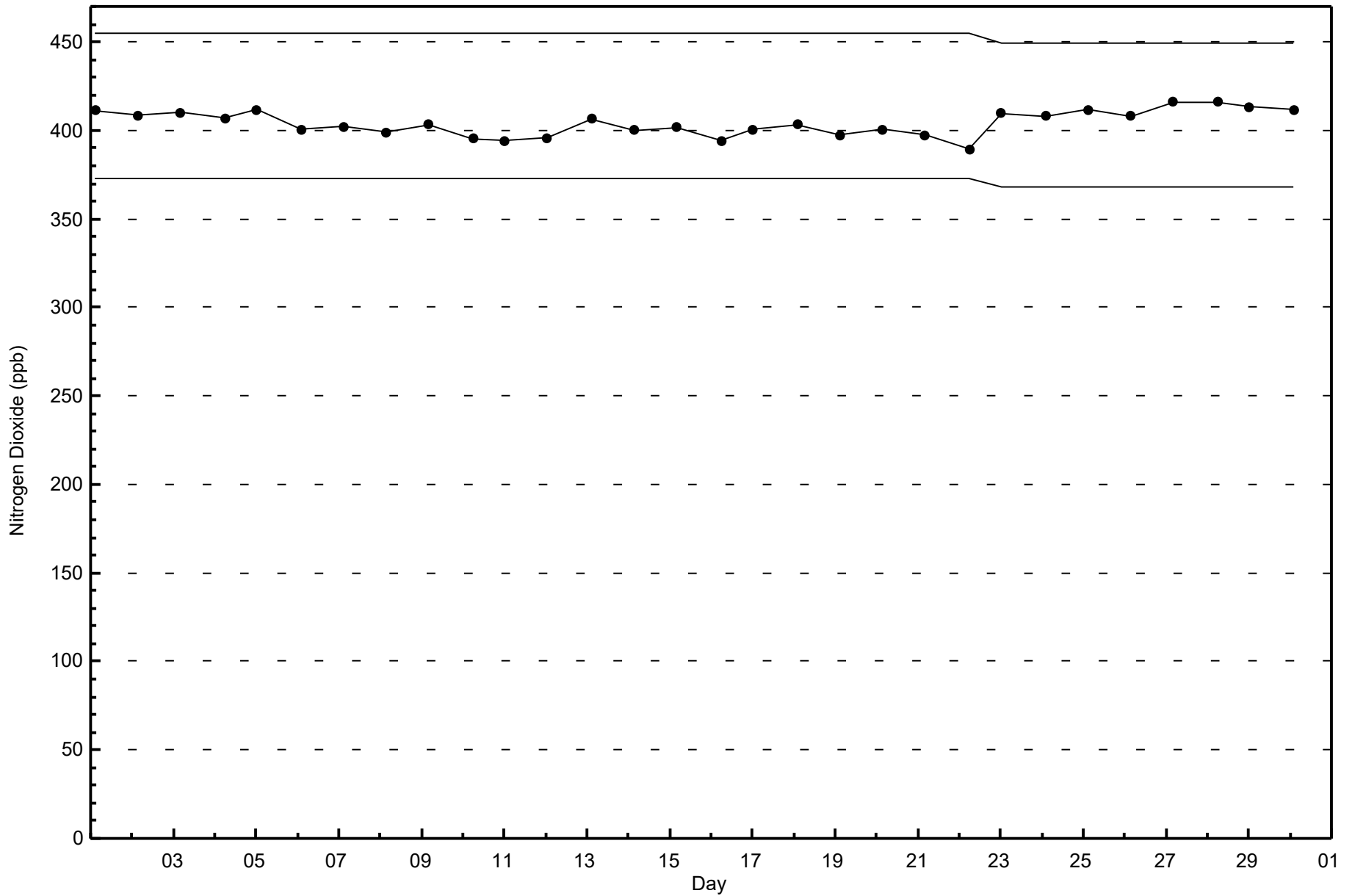


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitrogen Dioxide (NO₂) - ppb
Wapasu









Wood Buffalo Environmental Association
Summary of Hour Averages

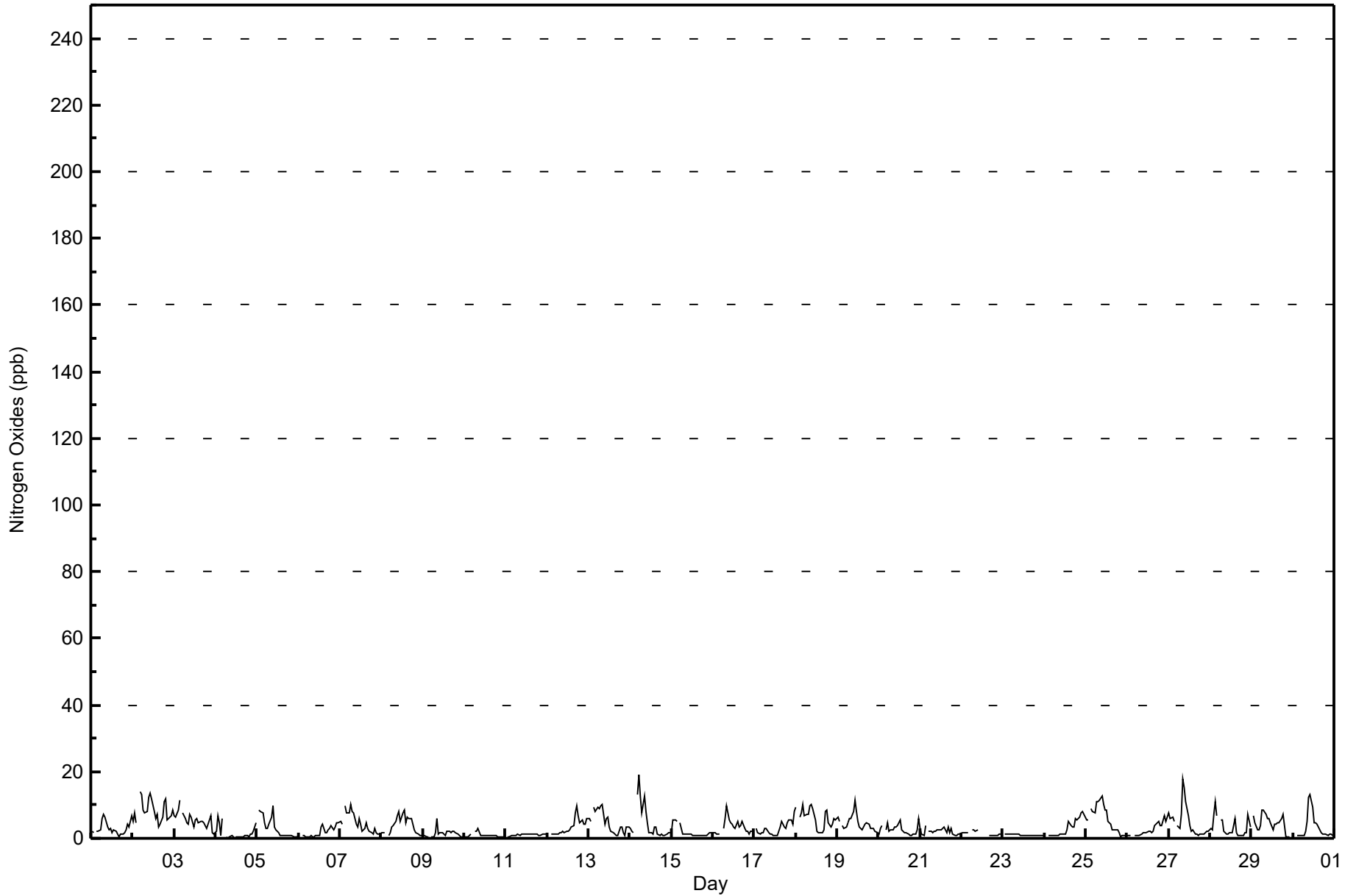
Nitrogen Oxides (NO_x) - ppb
Wapasu - September 2023

Maximum Value: 18.9 ppb on Sep 14 06:00 Maximum Daily Average: 8.3 ppb on Sep 2																						Hours in Service: 720 Hours of Data: 684				
Minimum Value: 0.1 ppb on Sep 30 00:00 Minimum Daily Average: 0.9 ppb on Sep 10 Maximum Diurnal Average: 5.2 ppb at hour 9 Minimum Diurnal Average: 2.2 ppb at hour 21 Monthly Average: 3.37 ppb Percentiles: P ₁ = 0.3 P ₁₀ = 0.7 Q ₁ = 1.1 Median = 2.2 Q ₃ = 4.9 P ₉₀ = 7.6 P ₉₉ = 13.3																						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-Sep	2.2	1.6	Z	2.0	2.0	2.5	6.0	7.3	6.2	3.2	2.6	2.9	1.8	2.5	2.1	1.3	0.6	1.1	1.4	1.8	2.5	4.3	3.4	7.0	3.0	7.3
2-Sep	5.3	7.5	4.8	Z	13.8	13.3	8.3	7.8	7.9	12.5	13.4	12.0	7.9	5.8	7.2	3.5	4.3	6.3	10.8	11.7	5.5	6.2	6.8	8.3	8.3	13.8
3-Sep	6.9	6.3	8.5	11.3	Z	7.5	6.1	4.7	4.1	7.1	6.3	3.2	5.4	6.1	4.6	5.3	4.9	4.8	3.8	2.8	5.4	6.8	1.8	1.4	5.4	11.3
4-Sep	2.2	6.9	4.6	1.0	6.0	Z	0.4	0.1	0.2	0.6	0.6	0.2	0.3	0.3	0.4	0.3	0.5	0.8	0.8	0.6	1.4	1.3	2.3	4.8	1.6	6.9
5-Sep	Z	8.4	7.9	7.8	4.8	3.1	2.9	4.4	6.5	9.7	3.5	2.7	1.7	0.9	1.0	0.7	0.9	0.9	0.7	0.7	0.8	0.6	0.5	0.5	3.1	9.7
6-Sep	0.6	Z	0.7	0.7	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.6	0.9	3.2	4.4	1.9	1.5	2.5	3.1	3.8	2.7	3.3	4.8	4.7	1.9	4.8
7-Sep	5.1	4.2	Z	9.7	7.8	7.5	10.3	8.1	7.5	4.4	3.3	6.0	4.1	2.3	2.9	4.5	3.2	2.2	1.6	1.4	2.8	1.9	1.4	1.2	4.5	10.3
8-Sep	1.6	1.8	1.8	Z	1.0	1.5	3.3	3.8	5.3	6.7	8.1	4.9	7.5	8.3	4.8	6.2	6.0	6.1	4.3	2.7	1.5	1.1	0.9	0.8	3.9	8.3
9-Sep	0.9	0.7	0.5	0.4	Z	0.4	0.4	1.5	5.9	1.1	1.6	1.6	1.5	0.9	2.1	1.9	1.8	1.9	2.0	1.6	1.4	0.8	0.6	0.6	1.4	5.9
10-Sep	0.5	0.5	0.5	0.7	1.1	Z	1.9	1.9	2.9	0.9	0.7	0.8	0.8	0.9	0.8	0.9	0.9	0.8	0.7	0.6	0.5	0.5	0.5	0.4	0.9	2.9
11-Sep	Z	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.1	1.3	1.3	1.2	1.2	1.3	1.2	1.2	1.1	1.2	1.1	1.0	1.0	1.1	1.1	1.2	1.0	1.3
12-Sep	1.2	Z	1.4	1.4	1.3	1.4	1.5	1.9	1.8	2.0	1.9	2.0	2.1	2.5	3.4	3.6	7.7	9.9	7.0	4.6	5.3	4.4	4.0	5.8	3.4	9.9
13-Sep	6.0	5.1	Z	9.5	8.0	9.4	8.9	9.7	10.4	4.4	5.8	6.5	3.6	2.0	1.5	1.2	1.0	1.0	3.4	1.6	0.9	3.2	3.5	4.8	10.4	10.4
14-Sep	3.1	2.1	1.6	Z	13.3	18.9	12.6	7.6	12.7	8.1	4.8	1.8	1.5	1.4	3.3	3.5	1.2	0.9	1.1	0.9	0.9	1.2	1.6	1.7	4.6	18.9
15-Sep	1.8	5.4	5.4	5.1	Z	4.5	1.2	1.2	1.1	1.2	1.1	1.2	0.9	1.0	1.0	1.0	1.0	1.0	0.8	0.8	0.9	1.2	1.6	1.8	1.8	5.4
16-Sep	1.7	1.5	1.5	1.4	1.4	Z	2.9	5.7	9.5	5.5	4.8	4.1	3.3	2.8	4.9	3.2	4.0	5.1	3.0	2.1	1.9	1.4	1.9	2.0	3.3	9.5
17-Sep	Z	2.8	1.7	1.5	1.5	1.9	2.8	2.8	1.7	1.2	1.2	1.0	0.8	1.0	2.3	3.2	4.9	3.4	3.1	4.7	5.5	5.6	4.1	7.8	2.9	7.8
18-Sep	9.1	Z	6.2	7.4	10.1	6.6	7.2	7.4	9.9	10.3	8.7	5.3	2.2	1.9	1.7	1.7	2.7	7.8	8.3	4.8	3.3	4.3	5.9	5.4	6.0	10.3
19-Sep	6.2	5.2	Z	3.8	3.0	3.4	4.7	5.8	6.1	8.0	11.4	8.2	5.0	3.4	2.7	3.2	4.1	4.6	4.3	2.9	3.0	2.8	2.0	1.5	4.6	11.4
20-Sep	1.1	2.9	4.0	Z	2.5	4.7	2.2	2.5	2.6	3.3	3.5	3.9	5.4	2.5	2.0	1.6	1.5	1.3	1.1	0.9	1.3	1.3	2.6	6.0	2.6	6.0
21-Sep	3.1	1.1	0.8	3.7	Z	2.0	2.0	1.8	2.2	2.1	2.6	2.6	2.6	2.9	3.4	1.9	3.5	1.6	2.8	1.5	0.6	0.9	1.4	1.3	2.1	3.7
22-Sep	1.6	1.5	1.6	1.6	1.8	Z	2.6	2.5	2.3	2.4	C	C	C	C	C	C	0.9	0.7	0.8	0.7	0.8	1.0	1.4	1.2	--	2.6
23-Sep	Z	1.3	1.3	1.2	1.3	1.3	1.3	1.4	1.3	1.2	1.0	0.8	0.8	0.9	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.8	0.8	0.8	1.0	1.4
24-Sep	0.8	Z	0.9	0.9	0.9	0.9	0.9	0.9	1.0	1.1	1.2	1.3	1.4	2.5	4.9	3.8	3.4	3.4	6.0	5.7	6.6	7.6	8.1	7.1	3.1	8.1
25-Sep	5.5	5.6	Z	9.1	8.0	7.6	11.0	11.1	11.4	12.7	10.0	8.5	8.6	4.9	4.3	2.7	2.5	2.7	2.5	1.8	0.6	0.8	0.8	0.7	5.8	12.7
26-Sep	0.8	0.6	0.7	Z	0.8	0.8	0.8	0.9	1.3	1.8	1.7	1.7	1.9	2.0	1.9	2.0	3.7	4.5	5.2	3.8	3.9	6.7	5.2	6.5	2.6	6.7
27-Sep	7.5	5.9	6.3	5.1	Z	3.7	3.1	7.2	17.8	15.1	11.2	6.8	3.9	2.3	2.4	1.1	1.5	0.8	1.1	1.2	1.3	1.6	2.0	2.0	4.8	17.8
28-Sep	3.1	2.6	7.3	11.2	6.7	Z	5.5	5.3	2.2	1.3	1.3	1.6	1.8	1.8	5.8	1.8	0.9	0.8	0.7	0.9	1.5	1.6	7.3	3.4	3.3	11.2
29-Sep	Z	6.7	4.8	2.6	2.4	3.7	8.7	8.5	7.0	6.0	5.8	4.6	2.4	4.4	4.4	4.7	4.8	6.1	7.2	3.8	0.4	0.3	0.2	0.1	4.3	8.7
30-Sep	0.2	Z	0.7	0.7	1.0	0.8	1.1	2.0	5.2	12.1	13.3	9.5	4.5	4.5	4.1	2.7	1.8	1.3	1.1	1.1	0.9	1.2	1.1	0.9	3.1	13.3
																								Diurnal Average		
																								Diurnal Maximum		
																								3.1 3.6 3.0 4.0 4.1 4.4 4.1 4.3 5.2 4.9 4.6 3.7 3.0 2.7 3.0 2.5 2.6 2.9 3.0 2.5 2.2 2.4 2.7 3.0		
																								9.1 8.4 8.5 11.3 13.8 18.9 12.6 11.1 17.8 15.1 13.4 12.0 8.6 8.3 7.2 6.2 7.7 9.9 10.8 11.7 6.6 7.6 8.1 8.3		
Z - zerospan C - Calibration																										



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Wapasu - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Wapasu - September 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	684	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: 684

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Nitrogen Oxides (NO_x) - ppb
Wapasu - September 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	6	9	2	8	32	75	169	107	59	82	27	25	13	14	28	683
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	27	6	9	2	8	32	75	169	107	59	82	27	25	13	14	28	683

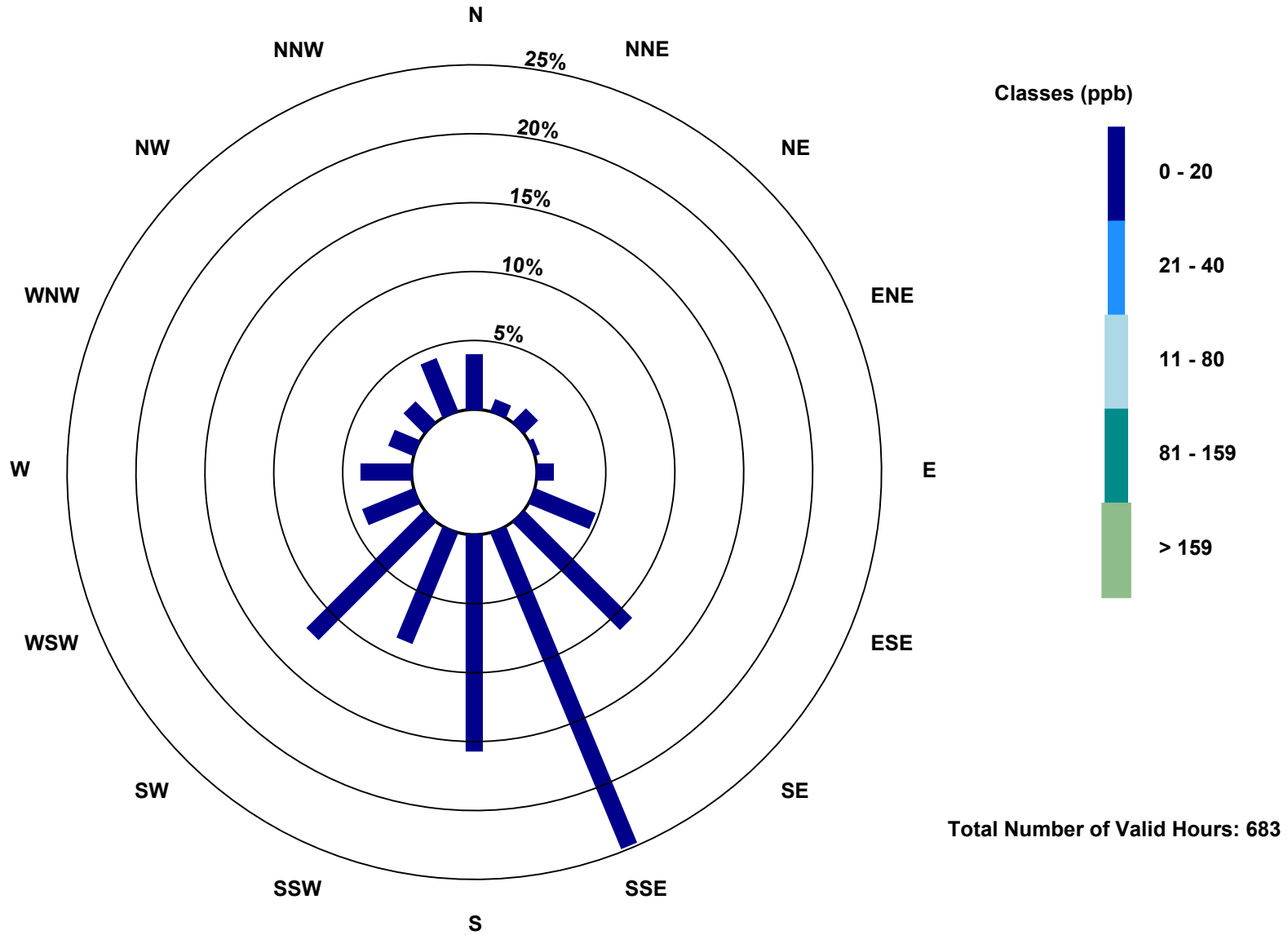
Total Number of Valid Hours: 683

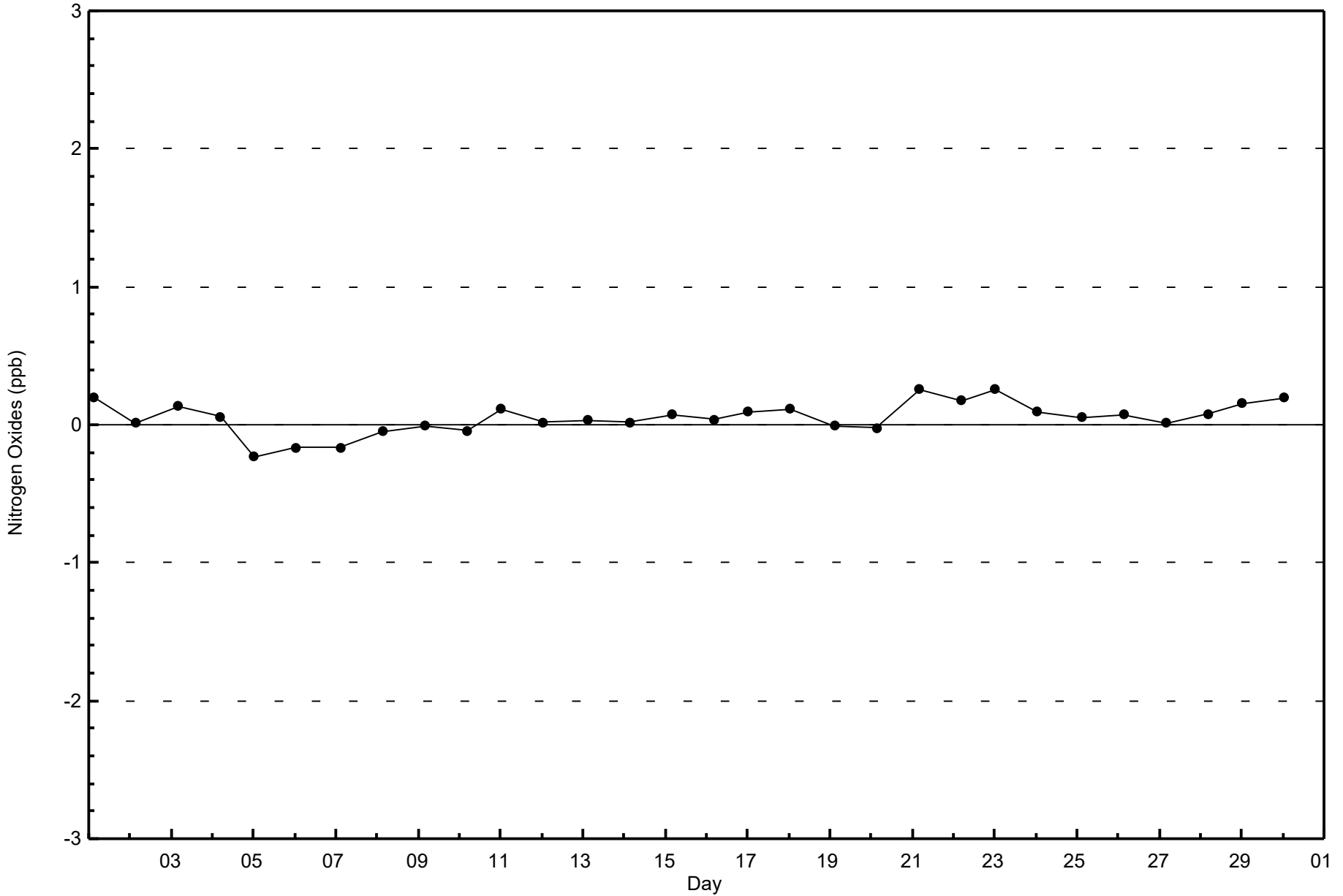
Total Number of Hours: 720

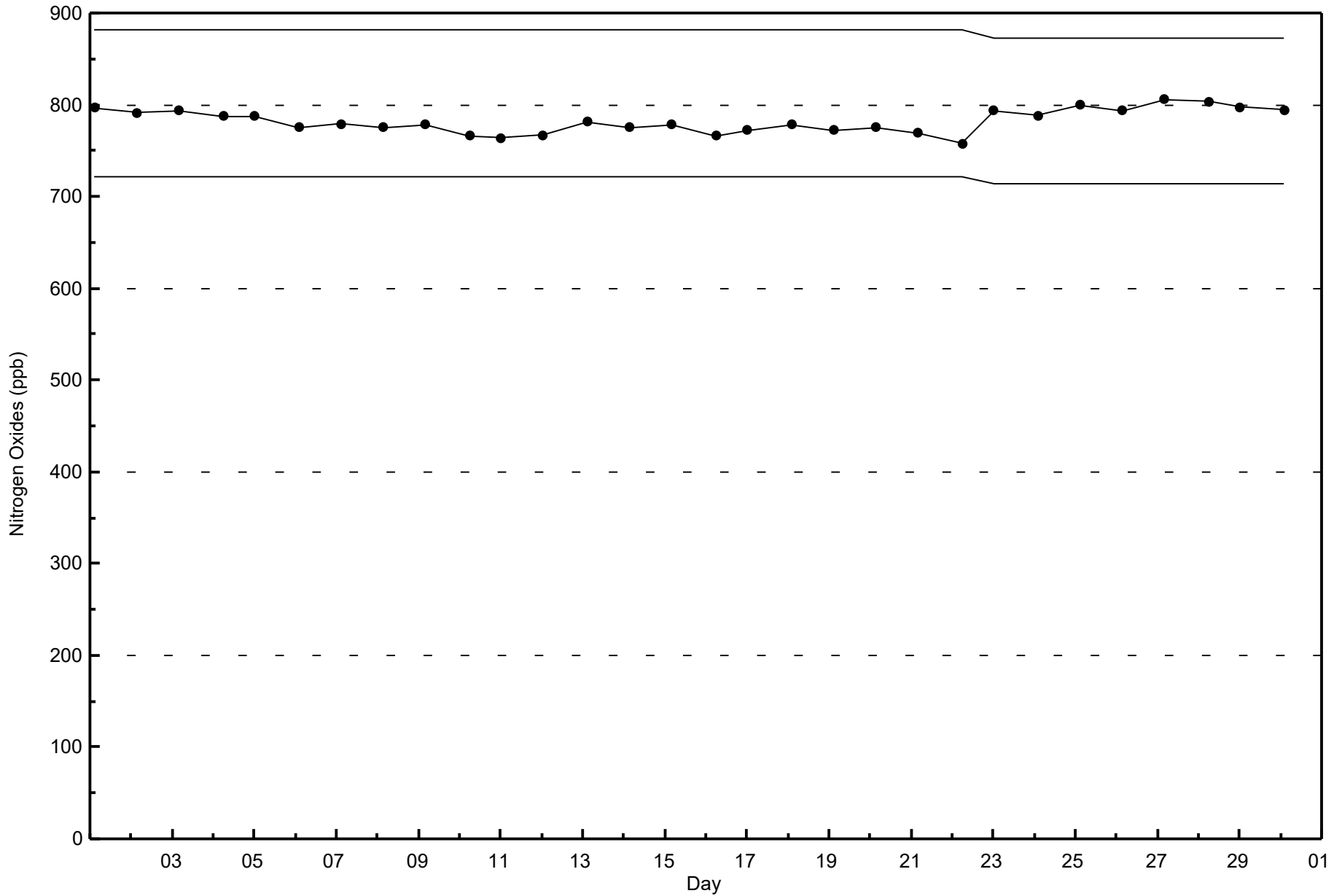


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitrogen Oxides (NO_x) - ppb
Wapasu









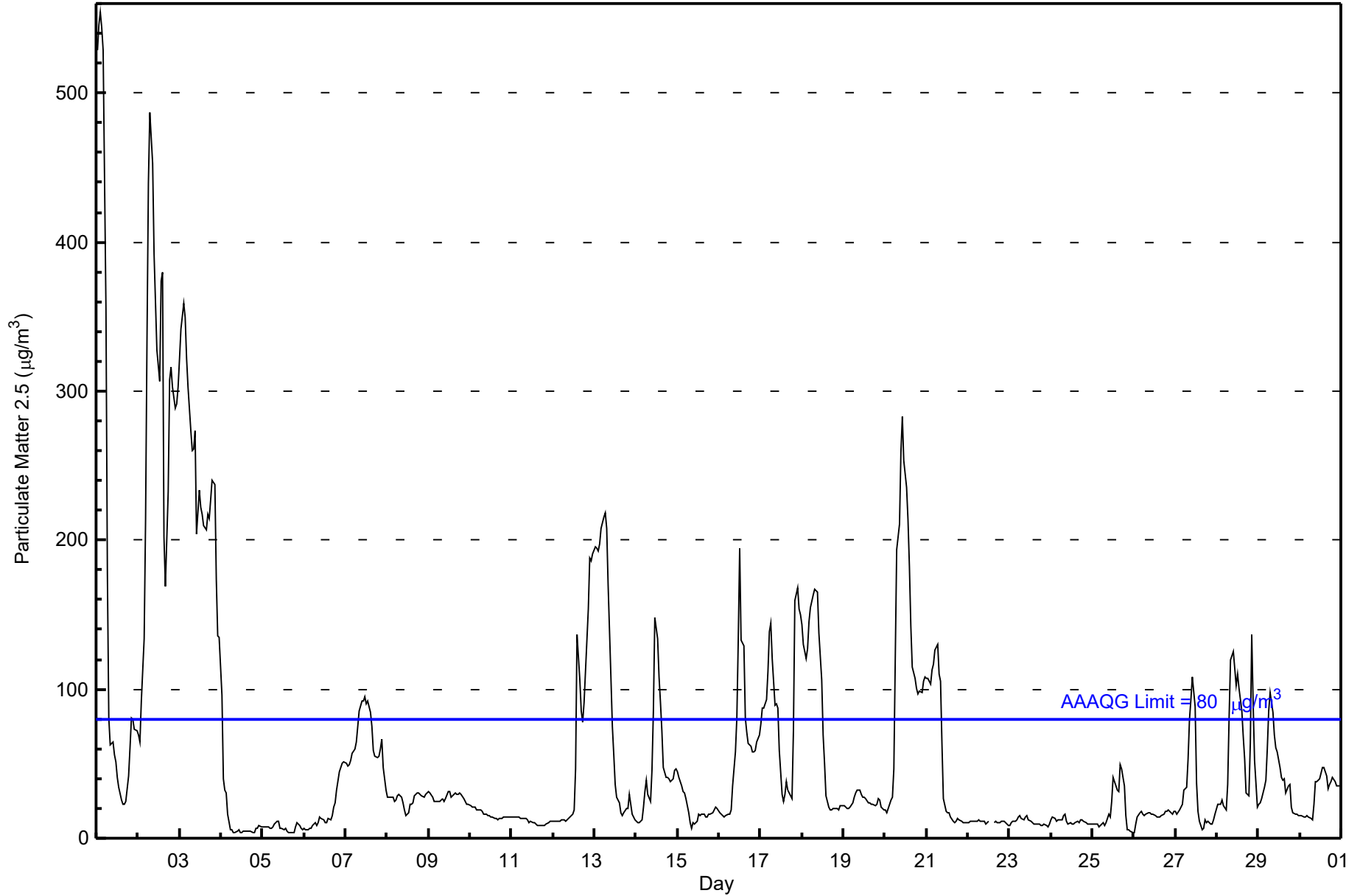
Summary of Hour Averages

Wapasu - September 2023

Number of Exceedences (AAAQO):	1-hr: 163	24-hr: 16	Hours in Service:	720
Maximum Value: 554.6 µg/m ³ on Sep 1 03:00	Maximum Daily Average: 284.9 µg/m ³ on Sep 2		Hours of Data:	718
Minimum Value: 3.5 µg/m ³ on Sep 4 12:00	Minimum Daily Average: 7.0 µg/m ³ on Sep 5		Hours of Missing Data:	2
Maximum Diurnal Average: 73.9 µg/m ³ at hour 8	Minimum Diurnal Average: 40.8 µg/m ³ at hour 17		Hours of Calibration:	2
Monthly Average: 60.04 µg/m ³	Percentiles: P ₁ = 3.9 P ₁₀ = 9.2 Q ₁ = 12.6 Median = 24.0 Q ₃ = 65.9 P ₉₀ = 166.4 P ₉₉ = 431.2		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-Sep	529.1	545.7	554.6	543.6	528.6	355.2	177.8	81.1	62.6	64.8	56.2	51.1	41.2	34.5	25.2	22.8	22.4	25.1	41.3	61.1	81.1	80.1	72.9	71.8	172.1	554.6
2-Sep	69.2	64.7	91.6	133.4	213.6	334.0	439.2	486.6	453.0	391.8	359.8	327.4	306.4	373.7	379.5	202.5	169.3	232.7	307.6	316.2	302.7	288.4	290.9	302.5	284.9	486.6
3-Sep	321.9	341.4	358.8	349.3	321.9	302.4	273.3	259.6	261.5	273.2	204.5	233.8	222.3	217.8	209.7	206.5	217.6	214.8	227.1	239.9	237.5	173.5	136.2	134.3	247.4	358.8
4-Sep	95.8	40.1	32.3	30.2	16.4	6.0	5.3	3.9	4.2	4.8	5.5	3.5	3.8	4.5	4.9	5.1	4.8	4.3	3.9	4.1	7.0	6.9	8.8	7.6	13.1	95.8
5-Sep	7.2	7.2	8.0	7.7	7.1	6.8	7.2	9.3	11.1	11.7	6.9	6.2	5.5	6.7	4.4	4.0	3.9	3.9	3.7	7.3	10.3	8.8	6.6	5.4	7.0	11.7
6-Sep	6.7	5.7	6.1	6.5	6.5	8.2	10.0	8.5	10.0	14.1	12.8	12.2	10.4	10.3	13.3	12.1	15.1	20.9	24.1	32.2	44.2	47.6	50.5	51.3	18.3	51.3
7-Sep	50.0	48.8	49.5	52.6	56.9	59.5	64.5	75.2	85.9	92.1	91.6	94.6	90.4	91.7	84.4	75.0	58.5	55.1	54.0	55.0	59.6	66.2	47.7	32.6	66.3	94.6
8-Sep	27.9	27.6	27.4	27.7	25.1	25.4	28.6	29.4	27.2	24.1	18.9	15.7	17.3	23.0	23.2	24.0	28.4	30.2	30.0	29.5	28.2	27.5	29.6	30.3	26.1	30.3
9-Sep	31.0	30.3	27.6	24.4	24.7	24.9	24.9	25.3	26.8	24.9	26.4	31.6	30.9	27.2	28.2	30.4	29.6	29.3	30.5	29.0	26.8	24.9	22.4	22.4	27.3	31.6
10-Sep	21.4	21.0	20.9	20.7	19.4	19.1	18.6	18.1	16.6	16.2	15.6	15.1	14.5	14.0	13.6	13.6	12.7	13.1	13.6	14.5	14.5	14.2	13.9	13.9	16.2	21.4
11-Sep	14.0	14.2	13.8	14.0	13.9	13.7	13.5	12.9	12.8	11.9	10.9	11.0	10.4	10.2	9.8	8.9	8.6	8.7	9.0	8.9	9.7	10.6	11.2	11.3	11.4	14.2
12-Sep	11.4	11.6	11.6	11.8	11.8	12.0	12.0	11.7	12.1	12.8	14.0	15.9	18.7	47.0	136.9	105.9	85.2	77.9	91.5	112.2	154.2	187.5	186.0	190.4	64.3	190.4
13-Sep	195.8	194.4	193.0	197.5	208.0	215.8	218.6	208.3	170.0	107.2	75.5	55.8	36.5	27.4	23.6	16.9	15.3	17.3	20.3	20.1	29.2	22.4	15.7	12.7	95.7	218.6
14-Sep	11.6	10.4	10.3	12.0	20.7	30.9	38.6	29.5	25.1	45.9	85.2	147.7	133.6	108.0	90.7	72.3	47.2	40.7	40.8	39.6	37.8	40.3	45.7	46.5	50.5	147.7
15-Sep	44.3	40.7	34.8	31.1	30.2	26.7	17.5	10.2	7.0	10.6	9.7	11.9	16.5	15.6	15.8	16.4	14.3	14.6	15.8	16.6	17.5	18.6	21.1	19.9	19.9	44.3
16-Sep	17.5	16.2	15.4	14.7	15.0	15.7	16.1	18.7	35.2	57.8	80.5	133.2	194.1	132.7	129.2	80.9	71.2	63.8	61.2	58.1	58.3	58.8	64.6	69.3	61.6	194.1
17-Sep	77.1	87.8	87.3	92.6	111.8	138.2	144.2	120.3	89.0	89.9	87.7	58.6	29.3	24.4	29.4	37.5	32.3	28.6	26.4	72.5	159.8	168.1	154.0	149.9	87.4	168.1
18-Sep	143.8	130.3	120.1	127.4	145.0	154.9	163.5	167.1	166.1	165.1	137.7	106.3	69.2	50.0	28.7	20.9	18.9	18.8	19.5	19.6	19.5	19.4	21.5	21.9	85.6	167.1
19-Sep	21.5	20.6	20.0	20.1	21.1	23.9	27.6	30.6	32.4	31.8	29.7	27.7	27.6	26.6	24.0	23.6	23.0	23.2	21.9	22.9	27.0	26.0	21.3	19.4	24.7	32.4
20-Sep	18.5	17.0	19.7	25.8	27.8	46.2	120.5	193.6	210.7	259.2	283.2	253.1	235.6	213.6	182.6	142.4	114.8	106.8	100.6	96.9	98.4	97.6	105.1	107.9	128.2	283.2
21-Sep	107.5	107.3	103.9	112.9	116.7	126.6	130.5	109.9	105.3	63.4	26.9	18.1	17.3	16.7	14.3	11.8	10.8	11.2	13.3	12.4	11.2	10.9	10.4	10.5	53.3	130.5
22-Sep	10.3	11.1	11.2	11.2	11.4	11.4	12.0	11.5	11.0	11.2	9.9	10.8	11.4	C	C	10.7	11.6	10.9	10.6	11.0	11.6	11.8	10.7	8.6	11.0	12.0
23-Sep	8.6	10.1	11.0	11.8	12.5	14.3	14.7	13.1	12.6	14.6	15.1	12.5	11.1	10.6	9.6	9.1	9.1	9.0	8.7	8.3	9.4	8.8	7.6	9.7	10.9	15.1
24-Sep	12.2	13.8	13.2	11.8	12.6	12.6	12.7	14.9	15.7	11.1	9.7	10.0	9.6	9.3	10.2	11.0	10.6	12.1	12.1	11.5	10.5	9.2	9.2	9.6	11.5	15.7
25-Sep	9.1	9.9	9.3	9.2	8.0	9.3	10.5	8.8	10.0	15.8	13.9	24.7	40.6	38.4	32.4	31.5	49.4	46.7	35.5	15.5	6.1	5.3	4.4	3.8	18.7	49.4
26-Sep	4.2	9.5	14.2	17.5	17.6	15.8	15.3	16.2	17.4	16.9	16.5	16.0	14.9	14.4	13.8	14.5	15.5	15.9	18.1	17.9	18.5	17.3	16.6	17.7	15.5	18.5
27-Sep	18.4	16.4	18.6	21.1	23.2	32.4	34.3	53.1	79.7	93.0	108.1	88.7	37.0	18.2	11.5	6.0	6.2	12.3	10.9	10.9	9.7	9.9	11.9	16.3	31.2	108.1
28-Sep	22.7	22.3	22.4	25.4	22.2	19.4	36.2	80.5	119.3	125.4	114.2	102.9	110.0	100.6	85.4	68.4	52.9	30.1	28.5	63.5	137.1	90.6	52.0	21.1	64.7	137.1
29-Sep	22.7	23.7	26.4	34.2	38.9	59.4	85.8	97.6	84.6	69.7	60.5	57.5	47.2	40.5	38.5	39.7	30.5	35.2	35.6	20.9	16.7	16.5	16.4	15.6	42.3	97.6
30-Sep	15.5	14.9	14.4	14.5	15.1	14.0	13.2	12.5	22.7	37.8	38.0	39.6	43.7	47.5	47.6	41.4	33.4	36.1	38.0	41.2	37.8	35.3	35.4	35.4	30.2	47.6
64.9 63.8 64.9 67.1 70.1 71.1 72.9 73.9 73.3 72.3 67.5 66.4 61.9 60.5 59.3 45.5 40.8 41.6 45.1 49.0 56.4 53.4 50.0 49.0																								Diurnal Average		
529.1 545.7 554.6 543.6 528.6 355.2 439.2 486.6 453.0 391.8 359.8 327.4 306.4 373.7 379.5 206.5 217.6 232.7 307.6 316.2 302.7 288.4 290.9 302.5																								Diurnal Maximum		

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	25	3.48	3.48
6 - 15	217	30.22	33.70
16 - 25	135	18.80	52.51
26 - 80	180	25.07	77.58
> 81.0	161	22.42	100.00

Total Number of Valid Hours: 718

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - μg/m³
Wapasu - September 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	0	0	0	0	0	4	3	1	2	2	0	0	0	0	6	6	24
6 - 15	0	0	0	0	0	11	20	100	50	14	13	6	1	1	0	1	217
16 - 25	3	2	1	1	3	7	22	30	19	15	16	8	5	1	0	2	135
26 - 80	9	2	4	2	5	9	23	22	19	24	28	6	5	3	4	15	180
> 81.0	16	2	4	0	0	1	14	29	21	9	25	9	14	8	4	5	161
Totals	28	6	9	3	8	32	82	182	111	64	82	29	25	13	14	29	717

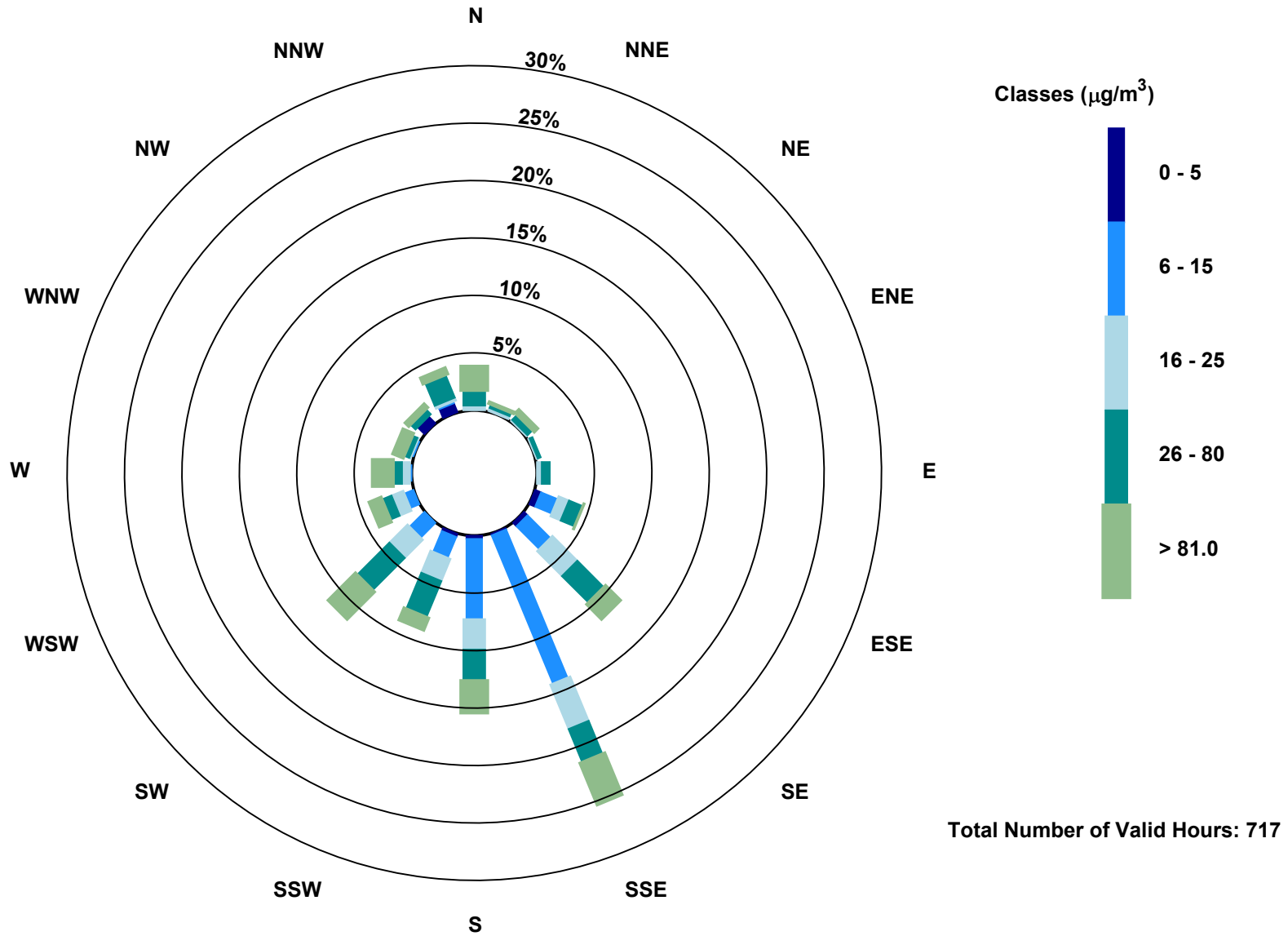
Total Number of Valid Hours: 717

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

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





Wood Buffalo Environmental Association
Summary of Hour Averages

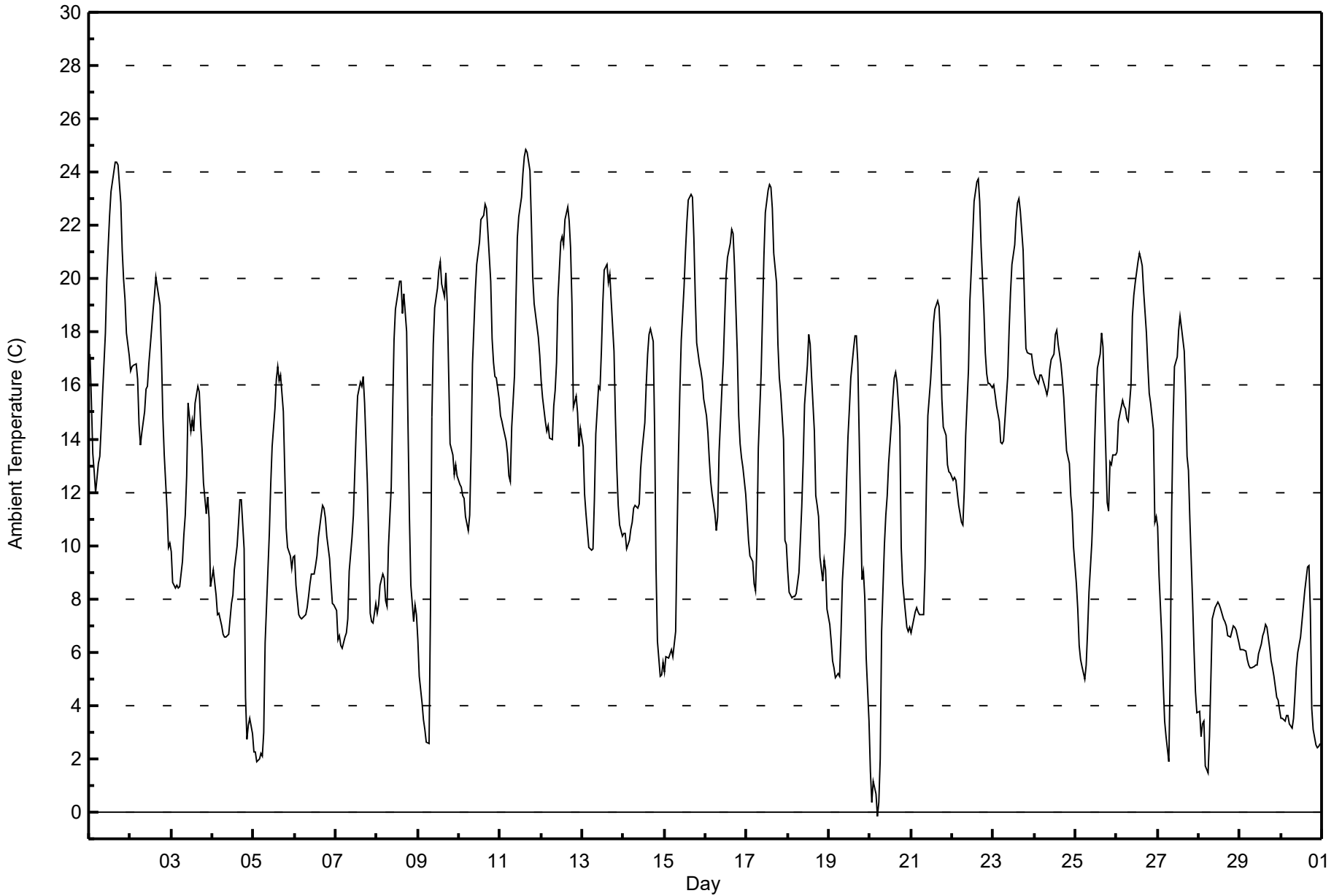
Ambient Temperature (AT) - C
Wapasu - September 2023

Maximum Value: 24.9 C on Sep 11 16:00 Minimum Value: -0.2 C on Sep 20 05:00 Maximum Diurnal Average: 18.0 C at hour 16 Monthly Average: 12.67 C		Maximum Daily Average: 18.7 C on Sep 11 Minimum Daily Average: 4.8 C on Sep 30 Minimum Diurnal Average: 8.3 C at hour 6 Percentiles: P ₁ = 1.7 P ₁₀ = 5.5 Q ₁ = 7.8 Median = 12.8 Q ₃ = 16.8 P ₉₀ = 20.3 P ₉₉ = 24.0		Hours in Service: 720 Hours of Data: 720 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-Sep	17.2	15.4	13.5	12.8	12.0	13.1	13.3	14.4	15.7	18.0	20.0	21.2	22.4	23.3	24.0	24.4	24.4	24.3	22.9	21.1	20.0	19.2	18.0	17.1	18.6	24.4	
2-Sep	16.6	16.7	16.7	16.8	16.2	14.6	13.8	14.3	15.0	15.8	16.0	16.8	18.1	18.8	19.4	20.1	19.7	19.0	17.2	14.8	13.4	11.4	9.9	10.1	15.9	20.1	
3-Sep	9.8	8.6	8.4	8.5	8.4	8.5	9.4	10.4	11.2	12.6	15.3	14.3	14.7	14.3	15.3	16.0	15.8	14.6	13.6	12.3	11.2	11.8	11.0	8.4	11.8	16.0	
4-Sep	9.1	8.6	8.1	7.4	7.4	7.0	6.7	6.6	6.5	6.6	7.3	7.8	8.2	9.1	10.0	10.8	11.7	11.7	9.9	4.3	2.7	3.2	3.5	2.9	7.4	11.7	
5-Sep	2.3	2.3	1.9	2.0	2.2	2.1	3.0	6.3	9.1	10.4	12.3	13.7	15.1	16.3	16.7	16.2	16.4	15.0	12.8	10.6	9.9	9.6	9.1	9.5	9.4	16.7	
6-Sep	9.6	8.5	7.4	7.3	7.3	7.3	7.4	7.7	8.1	8.6	8.9	8.9	9.3	9.6	10.3	11.1	11.5	11.4	11.0	10.4	9.5	8.6	7.8	7.8	9.0	11.5	
7-Sep	7.6	6.4	6.6	6.3	6.2	6.6	6.7	7.2	9.0	10.3	11.2	12.7	14.3	15.6	16.1	16.0	16.3	15.3	12.3	10.0	7.4	7.1	7.1	7.8	10.1	16.3	
8-Sep	7.4	7.8	8.5	8.9	8.8	7.9	7.7	9.9	12.2	15.1	17.7	18.9	19.5	19.9	19.9	18.7	19.4	18.0	14.5	11.0	8.5	7.2	7.8	7.4	12.6	19.9	
9-Sep	6.4	5.1	4.1	3.4	3.1	2.6	2.6	7.6	14.8	17.6	18.9	19.7	20.3	20.6	19.8	19.3	20.2	19.1	16.4	13.8	13.4	12.6	13.0	12.6	12.8	20.6	
10-Sep	12.3	12.2	11.9	11.8	11.1	10.6	11.1	13.5	16.8	19.5	20.5	20.9	21.4	22.2	22.4	22.8	22.6	21.7	19.9	17.8	16.8	16.4	16.3	15.5	17.0	22.8	
11-Sep	14.9	14.6	14.4	13.9	13.5	12.6	12.4	14.4	16.4	19.1	21.6	22.3	23.1	23.9	24.6	24.9	24.8	24.1	22.2	20.1	19.1	18.2	17.8	17.1	18.7	24.9	
12-Sep	16.2	15.6	14.7	14.3	14.5	14.0	14.0	15.2	15.8	16.9	19.3	21.4	21.6	21.3	22.2	22.7	22.2	21.2	19.1	15.2	15.6	14.9	13.7	14.4	17.3	22.7	
13-Sep	13.7	11.9	11.2	10.6	9.9	9.8	9.9	11.7	14.2	16.0	15.9	17.3	19.1	20.4	20.5	19.8	20.2	19.2	17.3	14.8	12.9	11.5	10.8	10.3	14.5	20.5	
14-Sep	10.4	10.5	9.9	10.2	10.6	10.9	11.4	11.5	11.4	11.6	12.9	13.6	14.6	16.0	17.2	17.9	18.1	17.7	14.3	9.1	6.4	5.1	5.1	5.6	11.7	18.1	
15-Sep	5.3	5.8	5.8	5.9	6.1	5.8	6.8	10.3	13.3	15.8	17.7	19.7	21.0	22.1	23.0	23.2	23.1	21.5	19.3	17.6	16.8	16.5	16.2	15.5	14.8	23.2	
16-Sep	14.9	14.2	13.2	12.4	11.9	11.2	10.5	11.1	13.5	15.9	16.9	18.6	20.1	20.8	21.4	21.9	21.7	20.5	17.3	14.9	13.8	13.3	12.9	11.9	15.6	21.9	
17-Sep	11.1	10.2	9.6	9.4	8.6	8.3	10.0	13.7	16.5	18.6	20.9	22.5	23.3	23.5	23.4	22.6	21.0	19.9	17.6	16.3	15.7	14.0	10.2	10.0	15.7	23.5	
18-Sep	9.0	8.2	8.1	8.1	8.1	8.2	9.0	10.2	11.5	13.1	15.3	16.8	17.9	17.6	16.4	14.3	11.9	11.5	11.1	9.6	8.6	9.4	9.1	7.6	11.3	17.9	
19-Sep	7.0	6.4	5.7	5.4	5.0	5.2	5.1	6.7	8.7	10.5	12.5	14.1	15.1	16.3	17.4	17.9	17.9	16.9	11.3	8.7	9.1	8.0	5.8	3.4	10.0	17.9	
20-Sep	1.5	0.4	1.1	0.7	-0.2	0.4	2.0	6.8	10.0	11.1	11.9	13.1	14.6	15.5	16.3	16.5	16.1	14.4	9.9	8.6	8.0	7.0	6.8	7.0	8.3	16.5	
21-Sep	6.7	7.0	7.5	7.7	7.5	7.4	7.4	7.4	9.2	12.4	14.9	16.3	17.2	18.3	18.9	19.2	19.0	17.8	15.5	14.5	14.1	13.0	12.7	12.7	12.7	19.2	
22-Sep	12.5	12.5	12.5	12.0	11.5	10.9	10.8	12.1	14.1	16.6	19.2	20.3	21.6	22.9	23.6	23.7	22.9	21.2	18.8	17.2	16.4	16.1	16.1	15.9	16.7	23.7	
23-Sep	16.0	15.7	15.2	14.7	13.9	13.8	13.9	14.7	16.4	18.1	19.5	20.5	21.3	22.3	22.9	23.0	22.5	21.0	19.1	17.4	17.3	17.2	17.2	16.8	17.9	23.0	
24-Sep	16.4	16.3	16.1	16.4	16.4	16.2	15.9	15.6	15.9	16.6	17.0	17.2	17.9	18.1	17.5	16.8	16.3	15.5	14.5	13.5	13.1	11.9	11.2	9.9	15.5	18.1	
25-Sep	8.6	7.6	6.2	5.7	5.5	5.0	5.5	6.8	8.2	10.1	11.5	13.8	15.5	16.6	17.2	18.0	17.5	15.5	11.6	11.3	13.1	13.0	13.4	13.4	11.3	18.0	
26-Sep	13.5	14.7	14.9	15.5	15.2	15.1	14.7	14.7	16.0	18.6	19.4	19.9	20.7	20.9	20.8	20.5	19.5	18.0	16.8	15.7	15.4	14.3	10.9	11.1	16.5	20.9	
27-Sep	10.7	8.9	6.5	4.8	3.4	2.9	1.9	5.3	11.2	14.6	16.7	17.1	18.1	18.6	18.2	17.3	15.6	13.3	12.8	11.0	7.8	6.0	4.5	3.7	10.5	18.6	
28-Sep	3.8	2.8	3.3	3.4	1.7	1.5	2.8	5.0	7.2	7.6	7.8	7.9	7.8	7.6	7.3	7.1	7.0	6.6	6.6	6.8	7.0	6.9	6.8	6.3	5.8	7.9	
29-Sep	6.1	6.1	6.1	6.0	5.7	5.5	5.4	5.4	5.5	5.5	5.5	5.5	5.9	6.3	6.6	6.8	7.0	6.9	6.2	5.7	5.4	5.1	4.3	4.2	3.9	5.7	7.0
30-Sep	3.5	3.5	3.4	3.6	3.6	3.3	3.1	3.5	4.4	5.4	6.0	6.6	7.1	7.7	8.3	9.2	9.2	7.5	3.9	3.1	2.5	2.4	2.5	2.6	4.8	9.2	
	10.0	9.5	9.1	8.9	8.5	8.3	8.5	10.0	11.9	13.6	15.0	16.0	16.9	17.6	17.9	18.0	17.7	16.7	14.5	12.6	11.7	11.0	10.4	9.9	Diurnal Average		
	17.2	16.7	16.7	16.8	16.4	16.2	15.9	15.6	16.8	19.5	21.6	22.5	23.3	23.9	24.6	24.9	24.8	24.3	22.9	21.1	20.0	19.2	18.0	17.1	Diurnal Maximum		



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Wapasu - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Wapasu - September 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	1	0.14	0.14
0 - 10	254	35.28	35.42
10 - 20	387	53.75	89.17
> 20	78	10.83	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

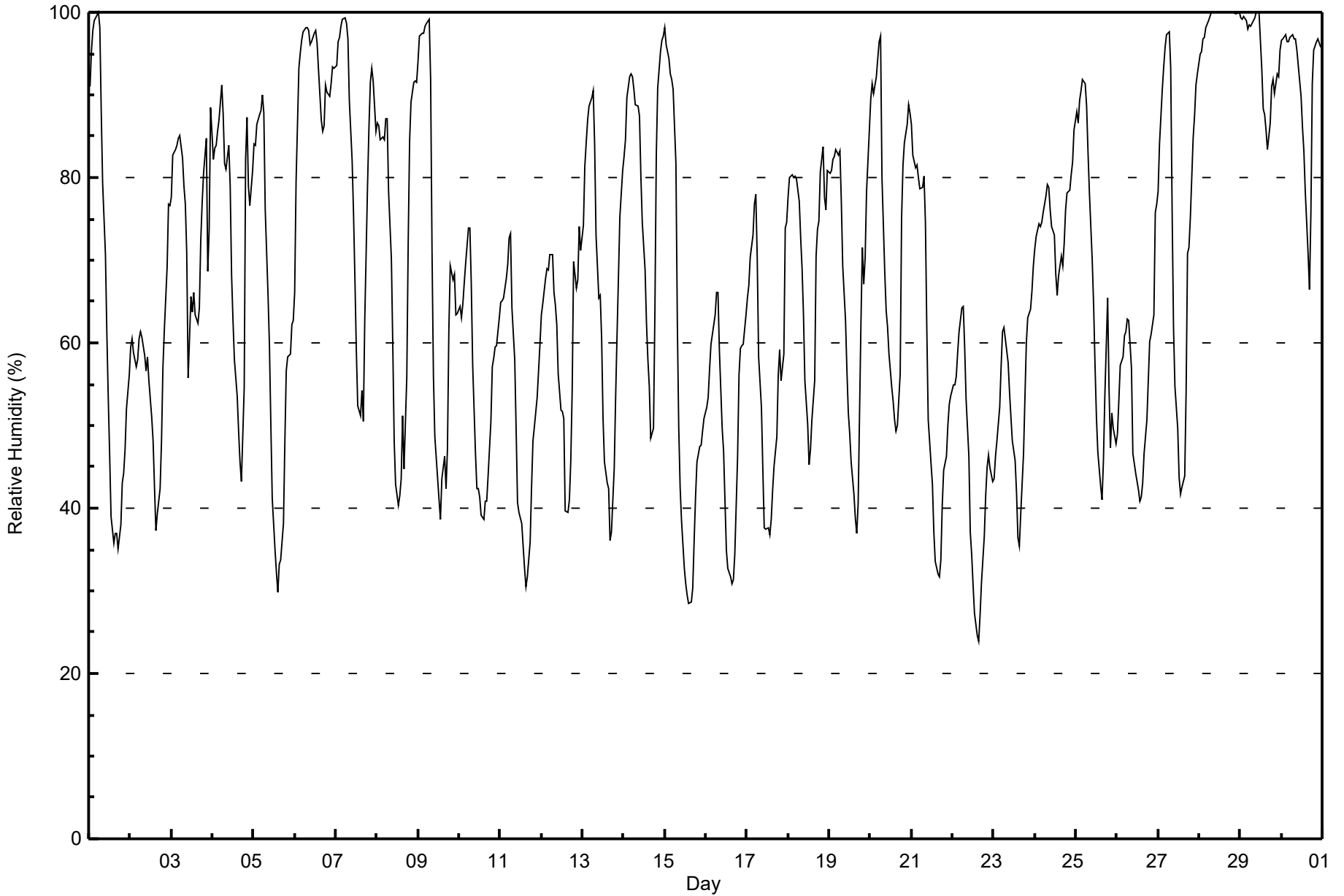
Relative Humidity (RH) - %
Wapasu - September 2023

Maximum Value: 100.0 % on Sep 1 06:00 Maximum Daily Average: 99.2 % on Sep 28																						Hours in Service:	720																								
Minimum Value: 24.0 % on Sep 22 16:00 Minimum Daily Average: 44.5 % on Sep 22																						Hours of Data:	720																								
Maximum Diurnal Average: 84.1 % at hour 6 Minimum Diurnal Average: 48.6 % at hour 16																						Hours of Missing Data:	0																								
Monthly Average: 67.92 % Percentiles: P ₁ = 29.9 P ₁₀ = 40.9 Q ₁ = 50.7 Median = 67.4 Q ₃ = 86.2 P ₉₀ = 96.5 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-Sep	91.1	95.2	97.8	98.9	99.4	100.0	98.1	88.1	79.3	70.7	61.2	53.4	46.5	39.0	35.7	37.0	36.9	35.1	37.9	43.1	44.2	47.1	52.0	56.1	64.3	100.0																					
2-Sep	59.6	60.6	58.8	57.1	58.0	60.5	61.4	60.7	58.5	56.7	58.2	55.4	51.1	48.2	42.6	37.3	39.3	42.3	48.1	57.0	61.5	69.1	76.9	76.6	56.5	76.9																					
3-Sep	77.6	82.7	83.4	83.9	84.7	85.1	82.4	79.0	76.8	70.9	55.8	65.5	63.8	66.1	63.4	62.4	64.3	72.3	77.0	80.5	84.8	68.7	73.8	88.6	74.7	88.6																					
4-Sep	82.2	83.6	84.0	85.6	87.0	91.3	87.7	81.7	81.1	83.9	79.0	68.1	62.7	57.9	53.6	49.4	45.6	43.3	54.6	82.2	87.2	78.9	76.6	80.9	73.7	91.3																					
5-Sep	84.0	83.9	86.4	87.6	88.2	90.0	87.8	76.0	65.8	59.7	50.3	41.1	34.9	32.2	29.8	33.3	33.7	38.1	48.0	56.6	58.3	58.7	62.2	62.8	60.4	90.0																					
6-Sep	66.2	79.5	93.2	95.0	96.6	97.7	98.2	98.2	97.8	96.1	96.4	97.5	97.8	96.2	93.1	87.0	85.6	86.2	91.2	90.3	89.8	91.4	93.4	93.2	92.0	98.2																					
7-Sep	93.6	96.4	97.0	98.3	99.1	99.3	98.7	96.8	89.3	82.1	75.7	67.7	59.0	52.3	51.3	54.2	50.6	62.7	79.2	86.1	91.6	93.2	91.8	85.6	81.3	99.3																					
8-Sep	86.7	86.2	84.5	84.9	84.5	87.1	87.1	78.2	70.2	59.7	48.1	42.8	40.4	41.4	43.6	51.2	44.8	56.0	72.2	84.4	89.1	91.6	91.6	91.5	70.7	91.6																					
9-Sep	94.1	97.2	97.5	97.5	98.4	98.6	99.2	91.9	71.0	56.0	48.7	43.6	41.1	38.6	43.6	46.3	42.4	47.1	61.6	69.4	67.5	68.2	63.3	63.6	68.6	99.2																					
10-Sep	64.5	63.0	64.8	67.4	69.6	73.8	73.9	67.1	57.4	46.7	42.4	42.4	41.4	39.1	38.6	40.8	40.9	43.9	50.5	57.2	58.1	59.4	59.6	63.0	55.2	73.9																					
11-Sep	64.9	65.1	65.4	67.8	69.5	72.7	73.2	64.2	57.9	49.5	40.7	39.5	38.2	35.4	32.7	30.6	31.7	35.9	42.6	48.2	49.8	53.3	56.5	59.8	51.9	73.2																					
12-Sep	63.4	64.8	67.8	69.0	68.8	70.6	70.6	66.2	64.5	62.1	56.2	51.8	51.8	50.8	39.6	39.6	41.0	45.8	54.4	69.9	66.6	67.7	74.0	71.2	60.3	74.0																					
13-Sep	74.2	81.4	84.3	86.9	88.6	89.6	90.4	84.0	73.0	65.5	65.7	60.5	50.8	45.6	43.0	42.4	36.2	37.1	45.0	53.5	61.0	68.0	75.2	80.9	65.9	90.4																					
14-Sep	82.6	84.6	89.6	92.3	92.6	92.2	90.6	88.9	88.6	87.5	80.1	74.5	68.8	62.3	57.9	54.7	48.5	49.6	63.8	82.8	90.8	95.2	96.6	97.1	79.7	97.1																					
15-Sep	98.2	96.1	94.4	92.6	91.8	90.7	81.7	62.6	49.8	42.6	38.4	32.8	30.8	29.6	28.4	28.6	30.3	36.1	41.4	45.5	47.5	47.6	49.3	50.9	55.7	98.2																					
16-Sep	52.2	53.4	56.9	59.8	61.0	63.4	66.1	66.2	59.2	49.6	46.9	40.8	34.9	32.7	31.7	30.9	31.3	34.4	46.3	56.0	59.3	59.7	59.8	63.3	50.7	66.2																					
17-Sep	65.4	67.0	70.4	73.0	76.8	77.9	70.3	58.4	52.3	44.8	37.7	37.4	37.6	36.8	38.7	42.2	45.0	48.7	56.1	59.1	55.4	58.6	73.9	74.6	56.6	77.9																					
18-Sep	77.6	80.0	80.3	80.0	80.2	79.9	77.0	72.6	69.0	63.5	55.5	50.2	45.3	47.1	50.7	55.4	70.5	73.8	74.8	80.7	83.7	77.6	76.1	80.8	70.1	83.7																					
19-Sep	80.6	80.8	82.3	82.6	83.4	82.7	83.1	77.2	69.4	62.7	56.6	51.5	48.9	45.6	41.7	38.9	37.0	40.6	62.4	71.5	67.1	70.3	78.4	85.8	65.9	85.8																					
20-Sep	89.6	91.4	90.3	92.3	94.5	96.4	97.1	79.9	68.5	63.9	61.8	58.6	54.5	52.9	50.7	49.4	50.0	56.2	75.1	81.5	84.2	86.4	88.9	87.8	75.1	97.1																					
21-Sep	86.4	82.8	81.1	81.5	80.0	78.7	78.9	80.2	74.5	61.6	50.7	45.5	42.8	37.2	33.6	32.0	31.7	33.8	40.4	44.6	46.3	50.0	52.5	53.6	57.5	86.4																					
22-Sep	55.0	54.9	55.9	58.9	61.4	64.2	64.5	59.6	53.2	46.4	37.2	34.4	30.6	27.3	24.6	24.0	27.2	31.0	36.6	41.6	44.8	46.4	45.0	43.2	44.5	64.5																					
23-Sep	43.5	46.2	48.2	52.2	57.2	61.3	61.8	60.5	57.6	54.1	51.1	48.2	45.8	41.8	36.5	35.4	39.4	46.6	53.3	59.9	63.0	64.1	66.2	69.4	52.6	69.4																					
24-Sep	71.3	72.8	74.5	74.1	74.7	75.7	77.8	79.1	78.7	76.2	74.1	73.1	68.3	65.7	68.2	70.5	69.4	72.0	76.1	78.2	78.5	80.3	81.9	85.7	74.9	85.7																					
25-Sep	87.9	86.7	89.3	90.4	91.8	91.3	88.6	83.0	78.2	70.0	64.7	57.2	51.1	46.8	42.6	41.0	45.8	53.6	65.4	54.4	47.2	51.5	49.6	47.8	65.7	91.8																					
26-Sep	49.0	53.1	57.3	58.3	60.9	61.3	62.9	62.7	56.9	46.7	45.4	44.3	42.3	40.9	41.3	43.1	46.7	50.7	55.4	60.1	61.0	63.3	75.8	76.8	54.8	76.8																					
27-Sep	78.2	84.0	90.7	93.4	95.7	97.3	97.6	93.2	76.2	61.9	54.8	49.7	43.7	41.7	42.5	43.8	54.3	70.9	71.6	75.1	84.8	87.4	91.2	92.5	73.8	97.6																					
28-Sep	94.9	95.3	96.8	97.0	98.1	99.0	99.5	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.8	99.8	100.0	99.2	100.0																					
29-Sep	99.3	99.2	99.5	98.9	98.0	98.5	98.2	98.6	99.3	100.0	100.0	100.0	93.1	88.3	87.6	85.8	83.3	86.6	91.0	91.9	90.3	92.5	92.1	95.4	94.5	100.0																					
30-Sep	96.6	96.7	97.3	96.5	96.4	96.9	97.3	96.8	96.7	95.4	93.6	89.8	86.1	83.3	78.3	70.9	66.4	75.6	91.3	95.4	96.5	96.7	96.3	95.8	90.9	97.3																					
																						77.0	78.8	80.6	81.8	82.9	84.1	83.4	78.4	72.4	66.2	60.9	57.3	53.5	50.8	48.8	48.6	49.0	53.5	62.1	68.6	70.3	71.4	74.0	75.8	Diurnal Average	
																						99.3	99.2	99.5	98.9	99.4	100.0	99.5	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.8	99.8	100.0	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Wapasu - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Wapasu - September 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	66	9.17	9.17
40 - 60	215	29.86	39.03
60 - 80	192	26.67	65.69
80 - 100	229	31.81	97.50

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association

Summary of Hour Averages

Precipitation (PC) - mm

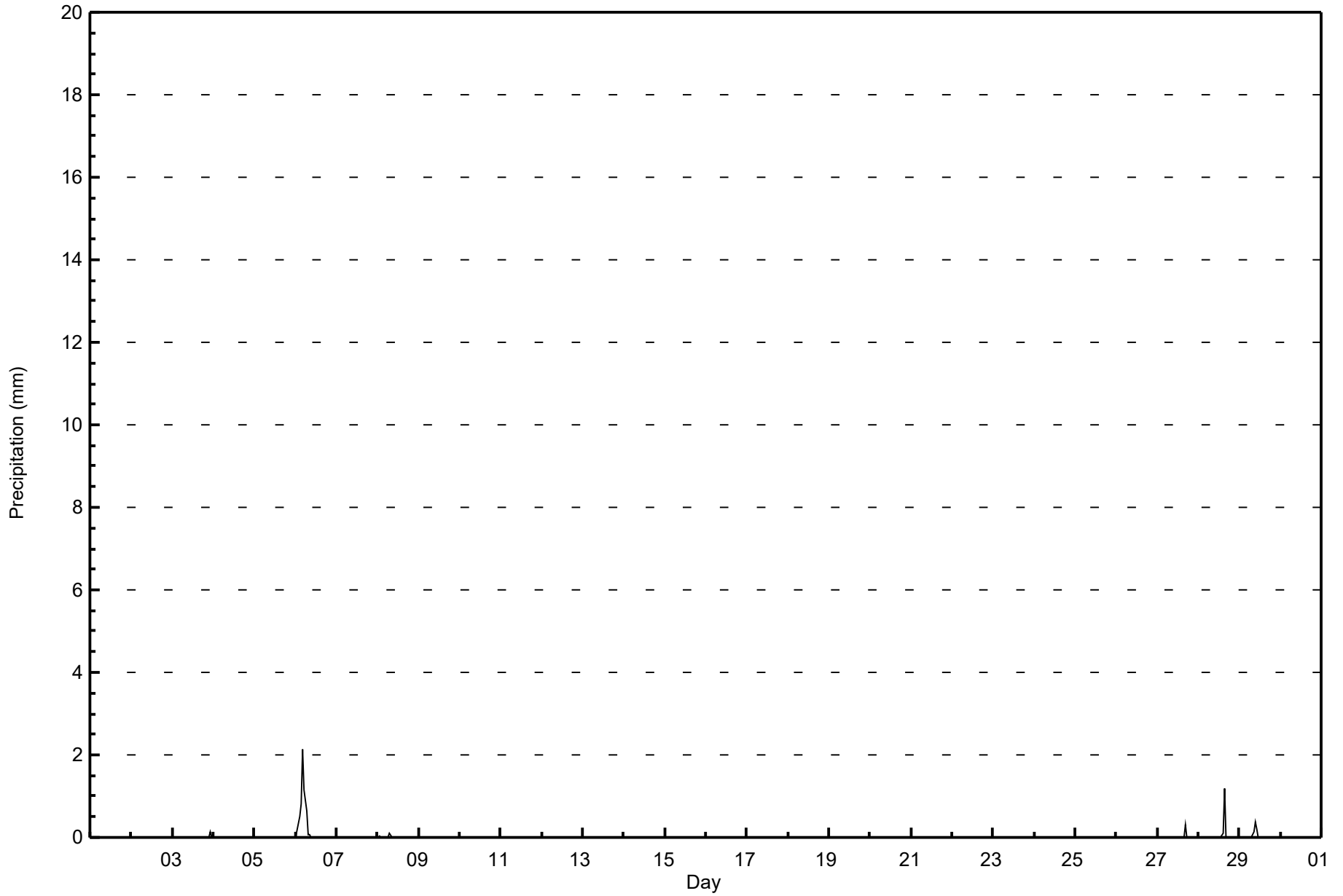
Wapasu - September 2023

Maximum Value: 2.2 mm on Sep 6 05:00 Maximum Daily Total: 5.6 mm on Sep 6		Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0																									
Minimum Value: 0.0 mm on Sep 1 01:00 Maximum Diurnal Total: 2.2 mm at hour 5 Monthly Total: 8.14 mm		Minimum Daily Total: 0.0 mm on Sep 1 Minimum Diurnal Total: 0.0 mm at hour 1 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 = 0.3																									
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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
4-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.2	0.5	0.8	2.2	1.2	0.7	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
7-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.2	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
																								Diurnal Average			
																								Diurnal Maximum			



Wood Buffalo Environmental Association
Hourly Averages

Precipitation (PC) - mm
Wapasu - September 2023





Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Wapasu - September 2023

Maximum Speed: 24 km/h on Sep 1 16:00	Maximum Daily Speed Average: 17.2 km/h on Sep 23	Hours in Service: 720
Minimum Speed Value: 1 km/h on Sep 27 04:00	Minimum Daily Speed Average: 1.8 km/h on Sep 27	Hours of Data: 719
Maximum Diurnal Speed Average: 7.7 km/h at hour 14	Minimum Diurnal Speed Average: 3.9 km/h at hour 19	Hours of Missing Data: 1
Monthly Average Velocity: 5.6 km/h 180.7 deg	Percentiles: P ₁ = 1 P ₁₀ = 4 Q ₁ = 6 Median = 8 Q ₃ = 12 P ₉₀ = 17 P ₉₉ = 20	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-Sep	N5	N1	SSE2	SSE3	SE4	S5	S6	SSW8	SW10	SW12	SW14	SW15	SW19	SW19	SW23	SW24	SW23	SW23	SW19	SW13	SW12	SW11	SW8	SSW7	SW11.1	SW24
2-Sep	SSW6	S6	SW7	WSW8	W6	W5	WNW4	W5	WSW8	W8	WSW4	SW7	WSW8	WSW11	W12	W12	W8	W11	W8	SW5	SSW6	S4	SSW5	S6	WSW6.2	W12
3-Sep	S6	SSE7	SSE7	SSE6	SSE7	SSE7	S8	S8	SSE6	SSE5	SW7	S8	SW9	WSW9	WSW7	W6	WSW4	SW3	SW4	W2	WNW2	NW6	NW5	WNW2	SSW3.9	SW9
4-Sep	W5	W5	WSW8	WSW9	WSW6	NNW13	NNW12	NW10	NW11	NW8	NNW11	NNW13	NW13	NW12	NNW9	NW8	NNW7	NNW6	UO	SE4	SE6	SSE7	SSE7	SSE6	NW5.1	NW13
5-Sep	SSE6	SSE7	SSE8	SSE8	SSE7	SSE8	SSE8	S8	SSW9	SW15	SW15	SSW13	SSW12	SSW11	SSW10	S9	S9	SSE8	SE8	SE7	SE7	SE7	SE9	SE8	\$7.9	SW15
6-Sep	SE9	SE5	ESE3	ESE5	ESE7	ESE9	ESE9	SE10	SE9	SE10	SE11	SSE8	S6	SW8	SW9	SW8	SW8	SSW6	SSW4	SW8	SSW5	SSW5	SSW6	SSW5	SSE5.2	SE11
7-Sep	SSW6	S5	SSW6	S4	S5	S5	S5	SSW7	SSW7	SW10	SW11	SW11	WSW9	W8	W6	W5	NW5	NNE1	E3	E4	ESE4	SE6	SE6	SSE7	SSW4.0	SW11
8-Sep	SSE7	SSE7	SSE7	SSE6	SSE7	SSE8	S7	S8	SSW8	SSW8	SW9	SW11	WSW9	W8	WNW8	W6	NNW8	NNW3	NE3	ESE4	ESE4	ESE5	SE5	SE4	S3.5	SW11
9-Sep	SE4	SE5	SE4	SE5	SE4	ESE4	ESE4	SE4	SE4	SSE4	SSW3	SW5	WSW5	WSW5	NNW6	ESE2	ESE4	ESE4	ESE4	SE7	SE8	SE9	SSE10	SSE10	SSE3.6	SSE10
10-Sep	SSE10	SSE11	SSE10	SSE9	SE8	SE7	SE8	SE9	SE8	SSE12	SSE14	SSE14	SSE15	SSE14	SSE13	SSE12	SSE12	SSE13	SE14	SE16	SE18	SE18	SSE20	SSE19	SSE12.6	SSE20
11-Sep	SSE20	SSE20	SSE20	SSE19	SSE18	SSE16	SSE16	SSE17	SSE19	SSE17	S17	S19	SSE20	SSE20	S20	S19	S15	S12	S11	SSE13	SSE16	SSE15	SSE14	SSE13	SSE16.7	SSE20
12-Sep	SSE12	SSE10	SSE8	SSE9	S8	SSE9	SSE10	SSE11	S10	S10	S9	SSW9	SW9	SW10	SW9	SW8	SW8	SW6	SW5	S4	SSW6	S5	S6	S5	S7.3	SSE12
13-Sep	S5	SSE6	S6	S6	S7	S7	S8	S9	SW12	SW15	SW13	SW18	SW17	SW17	WSW15	WSW14	WSW16	WSW15	W12	WSW12	SW13	SW11	SW11	SW9	SW10.3	SW18
14-Sep	SW7	WSW7	WSW6	WSW6	W5	W6	W6	W7	W7	WNW7	NNW10	NW11	NW12	NNW11	WNW8	WNW9	NW9	NW7	N4	E3	SE4	SE6	SE7	SE7	W4.4	NW12
15-Sep	SE7	SE7	SE7	SSE8	SSE6	SSE7	SSE8	SSE9	S11	S12	SSW14	SSW14	S14	S13	S14	S15	S13	SSE13	SSE13	SSE15	SSE15	SSE16	SSE16	SSE16	SSE11.4	SSE16
16-Sep	SSE16	SSE13	SSE11	SSE10	SSE10	S8	S7	S7	SSW8	SW9	SW7	SW7	SW9	SW12	SW11	SW9	SW9	SSW7	SSE5	SSE7	SSE8	SSE8	SSE7	SSE8	S7.7	SSE16
17-Sep	SSE7	SSE7	SSE7	SE7	SE6	SE7	SE10	SE12	SE14	SE17	SE17	SSE18	SSE17	S15	SSW13	SW12	SSW8	SW9	S5	SSW8	SW9	SSW6	SSE5	S5	SSE8.8	SSE18
18-Sep	SSE6	SSE7	SSE7	S7	SSE8	SSE8	SSE7	SSE7	S8	SSW10	SW10	SW12	WSW12	SW12	WSW17	SW15	SW11	SSW12	SSW9	S7	SSE7	SSW6	S6	S7	SSW7.8	WSW17
19-Sep	S8	S8	S8	SSE9	S9	S9	S9	S10	SSW11	SSW13	SW12	SSW13	SW13	SW11	SW9	SW9	SW7	S4	SSE4	SE7	SE7	SE7	SE4	SE4	S7.5	SSW13
20-Sep	E3	ESE4	ENE3	ENE3	E5	NE6	NE6	NE7	NE7	NNE9	N10	N10	N10	N9	N8	NNW10	N8	N4	ESE1	SE3	SSE4	SE4	SE5	SE5	NNE3.9	N10
21-Sep	SE7	SSE6	SSE8	SSE8	SSE9	SSE10	SSE10	SSE10	S10	S11	SSW14	SSW20	SSW20	SSW20	SSW20	SSW19	SSW18	SSW14	S9	S12	S12	S12	S12	S11	S11.9	SSW20
22-Sep	S10	S12	S12	S11	S11	S10	S11	S12	S14	S14	SSW16	SSW18	SSW18	SSW15	SSW15	SSW15	S12	S11	SSE10	SSE13	SSE13	SSE13	SSE16	SSE17	S12.8	SSW18
23-Sep	SSE17	SSE17	SSE16	SSE17	SSE16	SSE15	SSE17	SSE17	SSE17	SSE17	SSE18	SSE20	SSE21	S19	S21	S19	SSE17	SSE16	SSE13	SSE12	SSE16	SSE18	SSE18	SSE20	SSE17.2	SSE21
24-Sep	SSE19	SE19	SSE19	SSE19	SSE19	SSE17	SSE16	SSE17	SSE14	S11	S11	S10	S10	SW11	SW11	SW9	SW9	SW8	S4	SSE5	S6	S6	S5	SSE6	SSE10.6	SSE19
25-Sep	SSE6	SSE5	SSE6	SSE6	SSE7	SSE7	S7	S6	SSW8	SW7	W5	NNW1	SW5	NW1	N3	NE5	NE8	ENE7	E7	ESE9	ESE15	ESE16	ESE17	ESE19	SE4.8	ESE19
26-Sep	ESE20	SE19	SE19	SE22	SE20	SE17	SSE15	SSE13	SSE13	S13	S12	SSE13	S12	S10	SSE8	S7	SSW5	SSW4	SSW4	SSE6	SE4	WSW3	SSW2	SSW3	SSE9.8	SE22
27-Sep	ESE1	SE3	E3	SW1	SE6	SE5	ESE4	SE6	SSW5	SSW3	WNW5	WNW7	WNW8	WSW10	W10	WSW10	WNW3	SSE3	ESE3	SE3	SE4	ESE4	ESE3	SE4	SSW1.8	WSW10
28-Sep	ESE2	E4	SE5	ESE1	SE4	SE1	SE3	NE2	NNE6	N6	N7	N9	NNW10	N9	N11	N9	N9	N8	NNE6	N7	N8	N8	NNW9	N9	N5.1	N11
29-Sep	N10	NNW8	N8	N9	N9	NNW7	NNW8	NNW9	NNW11	NNW11	NNW12	NNW11	NNW11	NNW11	NNW9	NNW10	NNW12	NNW9	NNW7	N5	NNE4	NNE3	NE2	SSE1	NNW8.1	NNW12
30-Sep	SSE3	SSE2	S2	SSE3	SSE3	SE3	SSE3	SE3	SSE3	S3	S4	S3	SSW5	SSW5	S6	S9	S7	S4	SE5	SE6	SSE6	SSE6	SSE7	SSE7	SSE4.4	S9

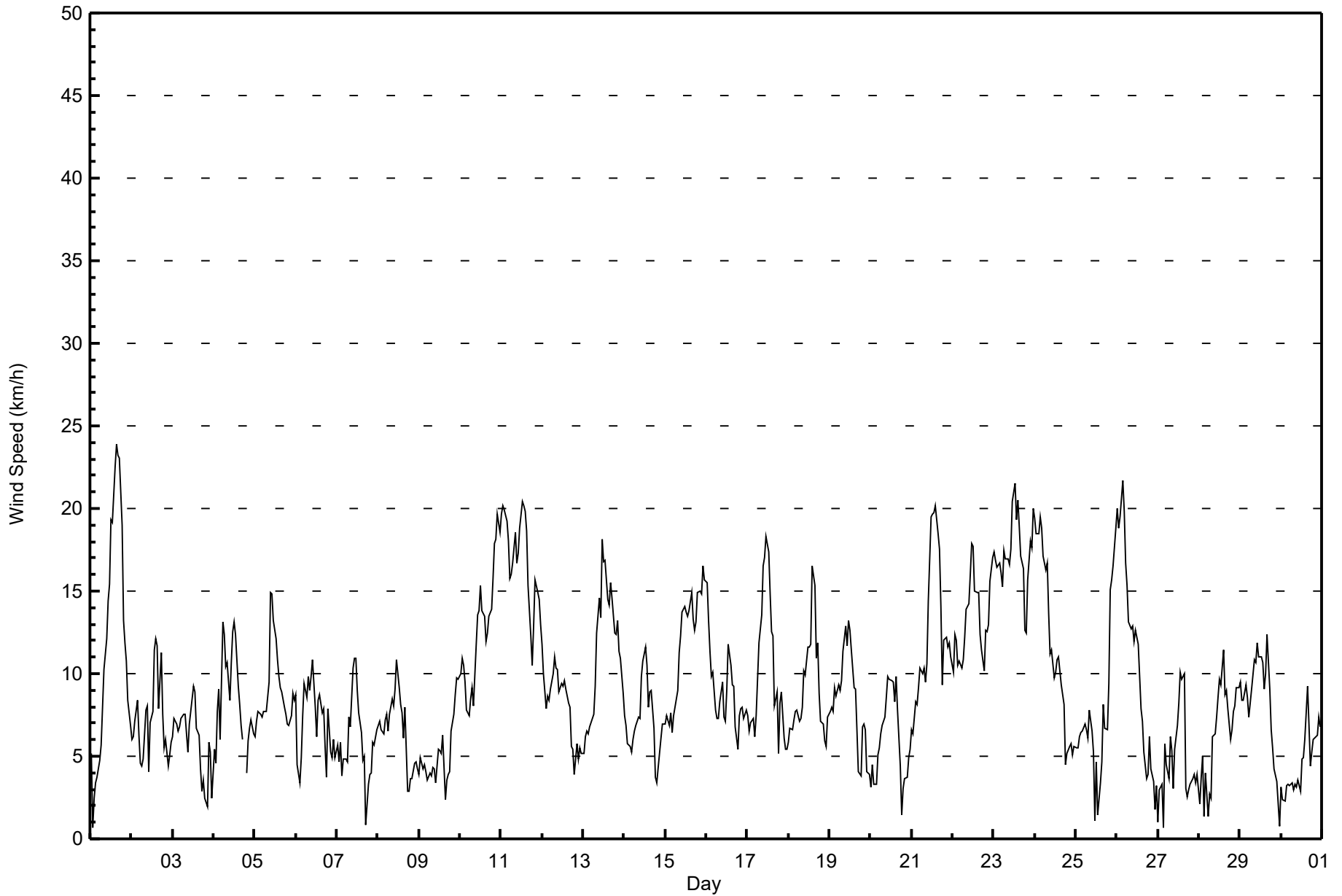
SSE6.4 SSE6.7 SSE6.6 SSE6.5 SSE6.6 SSE5.9 SSE5.9 SSE6.2 S6.3 SSW6.6 SSW6.5 SSW7.1 SSW7.4 SW7.7 SW7.1 SW6.7 SW4.9 SSW4.5 S3.9 SSE5.3 SSE6.1 SSE6.1 SSE6.6 SSE6.9	Diurnal Average
ESE20 SSE20 SSE20 SE22 SE20 SSE17 SSE17 SSE17 SSE19 SSE17 SSE18 SSE20 SSE21 SSE20 SW23 SW24 SW23 SW23 SW19 SE16 SE18 SE18 SSE20 SSE20	Diurnal Maximum

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Wapasu - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Wapasu - September 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	159	22.11	22.11
6 - 11	366	50.90	73.02
12 - 19	172	23.92	96.94
20 - 28	22	3.06	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 719

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Wapasu - September 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	3	4	2	7	22	31	18	20	16	7	5	8	5	3	2	159
6 - 11	22	3	5	1	1	4	38	85	63	28	47	17	14	8	8	22	366
12 - 19	0	0	0	0	0	5	11	70	26	18	24	7	3	0	3	5	172
20 - 28	0	0	0	0	0	1	2	9	2	4	4	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	28	6	9	3	8	32	82	182	111	66	82	29	25	13	14	29	719

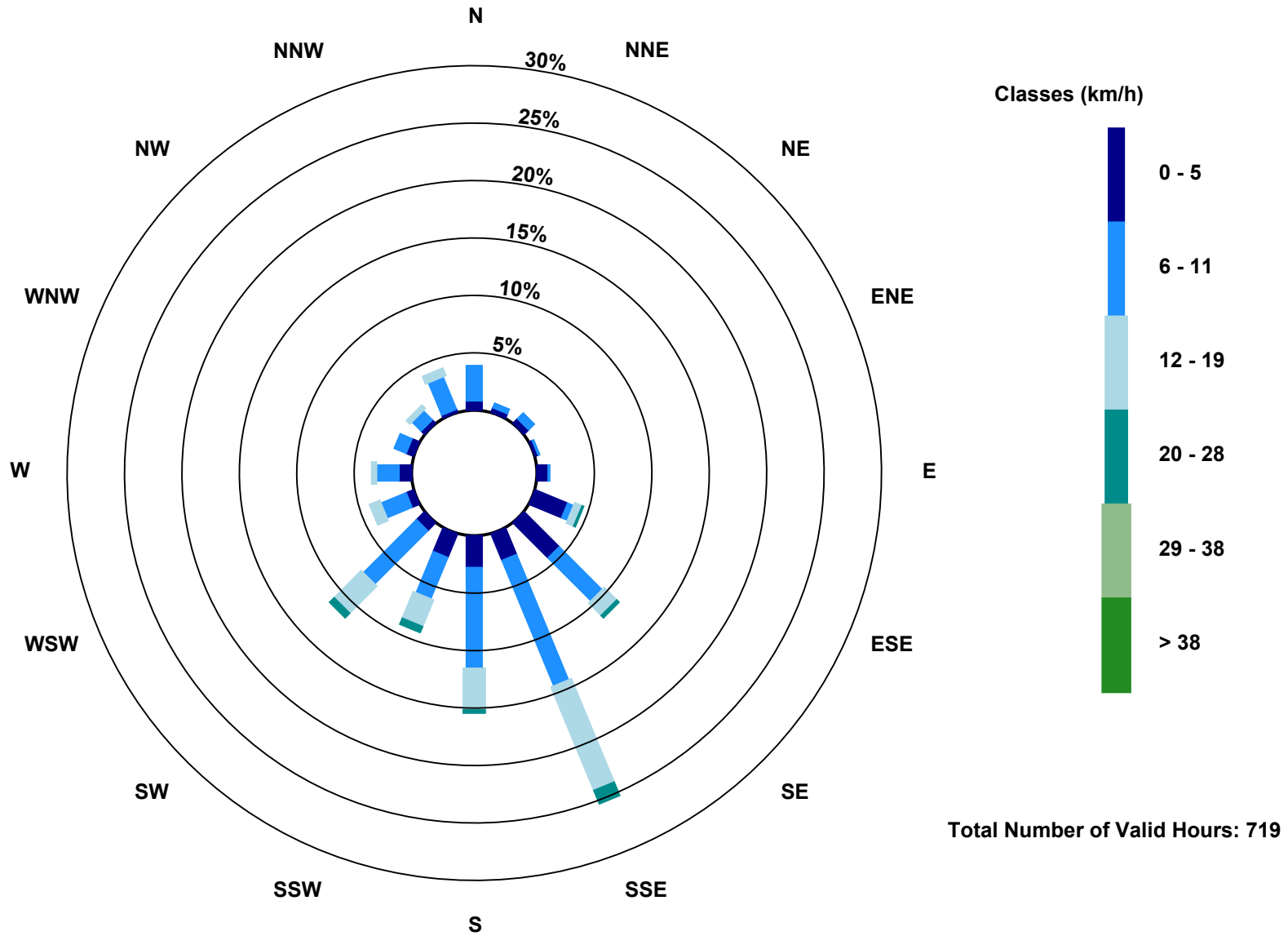
Total Number of Valid Hours: 719

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

Wind Speed (WS) - km/h
Wapasu





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Wapasu - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Sep 23 15:00	Hours in Service: 720 Hours of Data: 719 Hours of Missing Data: 1 Hours of Calibration: 0 Percent Operational Time: 99.9
Minimum Value: 0 km/h on Sep 30 05:00	
Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 4 P ₉₀ = 5 P ₉₉ = 7	

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Sep	2	1	1	1	1	1	2	2	3	3	4	4	6	5	6	6	7	7	6	3	3	3	2	2	7
2-Sep	2	2	2	2	2	2	2	2	2	3	2	2	3	3	4	4	3	5	3	1	1	1	1	1	5
3-Sep	1	1	1	1	1	1	2	2	2	2	3	3	3	3	2	2	2	1	1	1	3	2	3	2	3
4-Sep	2	1	2	3	2	4	3	3	3	3	3	4	3	3	3	3	2	2	UO	2	1	1	1	1	4
5-Sep	1	1	1	1	2	2	2	2	3	4	4	5	4	4	4	3	2	2	1	1	2	2	2	2	5
6-Sep	2	2	2	1	2	3	2	2	2	3	3	3	2	3	2	2	2	3	1	2	1	1	2	2	3
7-Sep	2	1	2	1	1	1	1	3	2	3	3	3	3	3	3	2	2	1	1	1	1	1	1	1	3
8-Sep	1	1	1	1	2	2	2	2	3	2	2	3	3	3	2	2	3	1	1	1	1	1	1	1	3
9-Sep	1	1	1	1	0	1	1	1	1	2	2	2	3	3	2	2	2	1	1	2	1	2	2	2	3
10-Sep	2	2	2	2	1	1	1	2	2	4	4	5	5	5	5	4	5	4	4	4	5	5	5	5	5
11-Sep	5	6	6	6	5	5	4	5	6	5	7	7	7	7	7	6	6	5	4	4	4	4	4	4	7
12-Sep	3	3	2	2	3	3	3	3	3	4	3	3	3	2	2	2	2	2	2	1	1	1	1	1	4
13-Sep	1	1	1	1	1	2	2	3	4	4	4	5	5	5	6	6	5	4	5	4	4	3	3	2	6
14-Sep	2	2	2	1	2	2	2	2	3	2	3	3	3	4	2	3	3	3	1	1	1	1	1	1	4
15-Sep	1	1	1	1	1	1	2	3	4	4	5	5	5	5	5	5	5	4	3	4	4	5	5	5	5
16-Sep	4	4	3	3	3	2	2	2	3	2	2	2	4	3	3	3	3	2	1	1	1	1	1	1	4
17-Sep	1	1	1	1	1	1	2	3	3	5	5	6	6	5	4	4	3	3	2	3	2	1	1	1	6
18-Sep	1	1	1	1	1	1	2	2	3	4	3	3	4	3	5	4	3	4	3	2	2	2	2	2	5
19-Sep	2	2	2	2	3	3	3	3	4	4	3	4	4	3	3	3	3	1	2	1	0	1	1	1	4
20-Sep	2	1	1	1	1	1	1	1	2	3	3	3	3	3	3	3	3	2	1	1	1	1	1	1	3
21-Sep	1	2	2	2	2	3	3	3	3	3	5	6	6	6	7	6	6	6	3	4	4	4	4	3	7
22-Sep	3	4	4	4	3	3	3	4	5	5	5	6	5	5	5	5	4	4	3	3	3	4	5	5	6
23-Sep	5	5	5	4	4	4	5	5	5	5	6	7	7	7	7	7	6	5	3	4	5	5	5	6	7
24-Sep	5	5	5	5	5	5	5	5	5	4	4	3	3	3	4	3	2	2	1	1	1	1	1	1	5
25-Sep	1	1	1	1	1	1	1	2	3	2	2	2	2	2	2	3	2	2	1	2	4	4	4	5	5
26-Sep	6	5	5	6	6	5	4	4	4	4	4	4	4	4	2	3	2	1	2	2	2	2	1	1	6
27-Sep	1	1	1	1	1	1	2	1	2	1	2	2	3	3	3	3	3	1	2	1	1	1	1	2	3
28-Sep	1	1	1	1	1	1	1	2	2	2	2	2	3	3	3	3	3	3	2	3	2	2	3	3	3
29-Sep	3	2	3	3	3	2	2	2	2	3	3	3	3	3	2	3	3	3	2	2	1	1	1	1	3
30-Sep	1	1	1	1	0	0	1	0	1	1	1	1	2	2	2	3	2	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
Wapasu - September 2023

Direction of Maximum Speed: 226 deg on Sep 1 16:00 Direction of Maximum Daily Speed Average: 157.8 deg on Sep 23	Hours in Service: 720 Hours of Data: 719 Hours of Missing Data: 1
Direction of Minimum Speed: 230 deg on Sep 27 04:00 Direction of Minimum Daily Speed Average: 1.8 deg on Sep 27	Percent Operational Time: 99.9
Monthly Average Direction: 180.7 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-Sep	358	3	161	160	136	182	183	212	219	226	231	227	230	225	221	226	226	232	233	232	228	222	222	208	223.5
2-Sep	207	190	214	238	261	279	286	263	253	262	253	227	245	241	268	277	275	271	267	225	205	185	201	189	245.3
3-Sep	179	163	155	167	153	159	173	170	151	159	221	191	217	242	249	271	256	222	223	275	303	312	319	282	202.0
4-Sep	274	260	246	248	256	334	327	320	319	324	328	329	321	322	346	311	328	336	UO	138	145	150	151	157	310.6
5-Sep	158	161	155	155	159	160	158	176	196	222	220	208	201	193	203	181	172	163	144	143	143	132	133	142	175.8
6-Sep	142	129	112	117	122	118	113	126	133	139	145	158	179	215	232	235	234	213	200	221	211	192	206	202	167.3
7-Sep	208	189	206	184	182	181	181	205	205	225	235	234	237	261	270	269	323	16	84	98	110	144	145	148	208.5
8-Sep	148	149	151	152	164	163	170	174	192	201	215	233	248	266	282	271	341	337	44	120	112	119	125	126	189.0
9-Sep	124	146	145	140	139	121	122	136	143	161	200	236	242	251	327	106	118	106	114	129	130	142	147	147	146.6
10-Sep	149	150	149	148	142	142	136	134	133	147	152	160	151	161	165	160	161	149	142	134	142	146	150	148	148.5
11-Sep	148	149	153	154	156	155	150	154	154	165	172	169	166	167	173	169	175	179	178	157	151	156	161	164	161.0
12-Sep	160	168	166	163	170	167	155	167	184	181	180	195	222	234	233	229	231	214	223	191	207	185	178	190	189.1
13-Sep	183	165	174	172	170	172	177	186	216	227	222	226	223	229	245	249	254	242	261	238	235	235	221	224	223.3
14-Sep	232	242	243	247	264	269	280	276	273	283	295	312	317	303	297	294	317	316	4	92	141	143	145	145	280.4
15-Sep	146	144	149	147	155	155	155	168	178	188	194	197	182	184	184	176	176	164	154	154	161	164	157	160	168.5
16-Sep	159	164	162	165	168	176	181	183	210	226	225	229	231	233	232	230	226	212	164	156	163	162	165	158	190.0
17-Sep	155	151	147	141	130	137	133	135	140	143	141	151	160	177	203	216	211	219	188	207	216	198	161	191	165.5
18-Sep	165	161	166	169	163	158	166	166	188	207	216	235	237	230	238	235	226	212	205	177	165	197	180	169	200.9
19-Sep	170	176	171	164	174	182	183	187	196	204	214	210	217	226	225	228	224	190	155	141	143	139	137	141	190.0
20-Sep	91	102	67	69	82	52	49	47	39	21	1	351	357	353	7	344	356	358	104	142	157	129	140	136	31.6
21-Sep	142	160	161	162	161	157	166	164	169	191	202	207	202	202	206	202	204	197	185	177	180	177	181	181	186.6
22-Sep	179	174	179	179	179	173	171	178	180	191	200	203	202	192	197	192	185	169	161	159	158	158	160	158	179.5
23-Sep	160	157	159	152	148	153	152	152	156	154	161	157	160	171	171	169	163	154	155	156	158	156	155	152	157.8
24-Sep	148	146	148	150	151	155	154	151	162	170	175	172	189	215	216	226	222	219	186	164	174	173	186	162	168.1
25-Sep	167	168	153	160	158	167	172	182	193	231	280	328	233	323	8	36	44	69	87	111	120	117	118	115	132.5
26-Sep	119	124	127	135	135	145	147	153	158	180	174	167	175	180	168	183	212	211	197	149	145	254	195	210	152.8
27-Sep	108	131	88	230	145	138	122	142	202	201	288	288	287	255	259	249	298	160	113	124	125	122	117	129	202.3
28-Sep	104	91	132	108	136	131	128	44	22	10	352	357	348	350	350	10	355	5	19	9	357	353	345	351	6.7
29-Sep	352	344	358	351	352	345	343	342	338	342	343	346	346	340	338	337	340	339	341	359	18	22	39	156	346.2
30-Sep	151	165	179	156	148	143	149	141	164	177	169	169	195	199	187	178	186	173	139	140	147	147	147	147	162.5

156.0 156.2 158.0 159.5 156.6 157.7 157.7 165.0 179.6 194.2 204.3 206.8 212.0 219.4 224.4 221.4 222.0 204.0 177.5 162.1 162.2 160.7 159.6 158.7

Diurnal Average

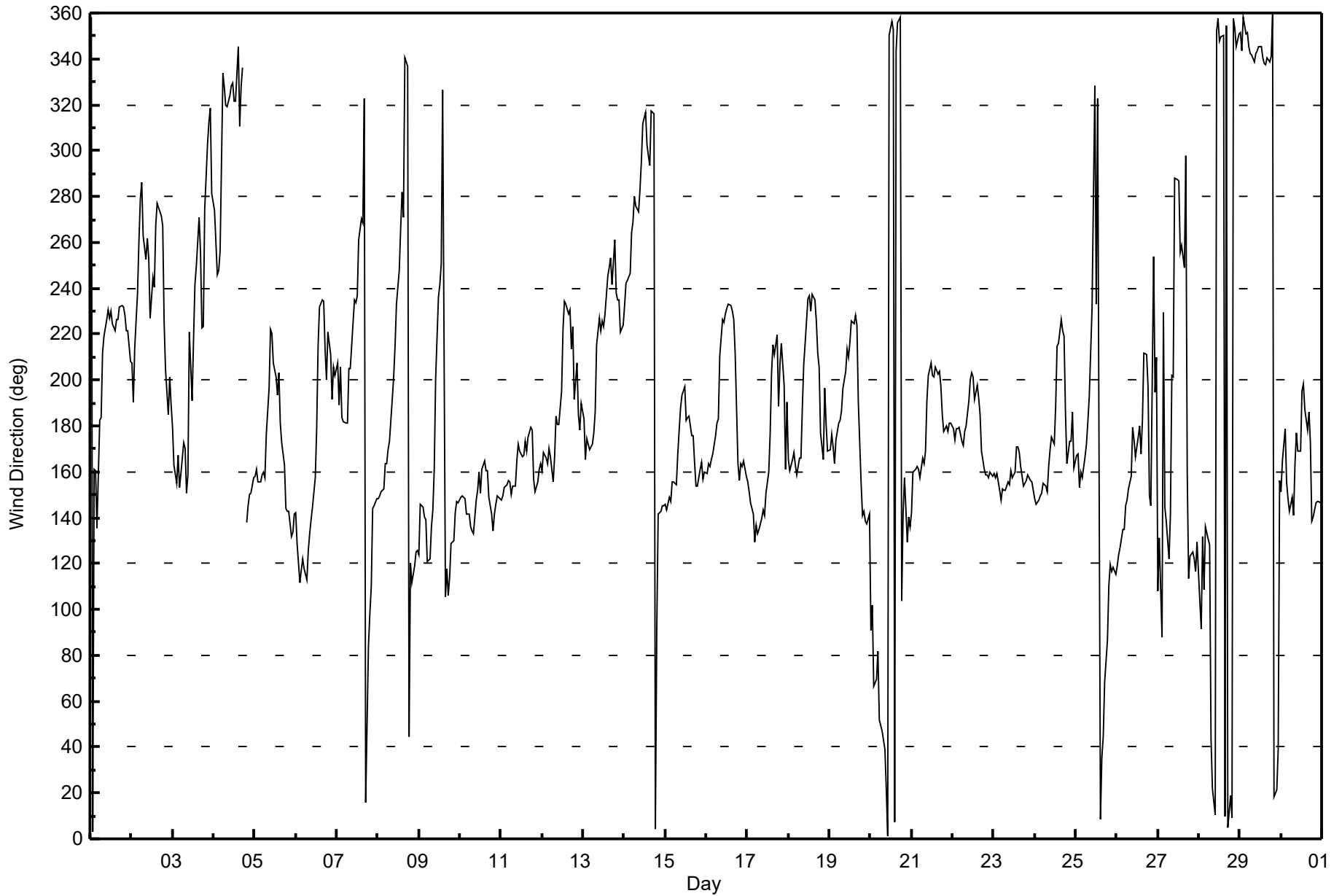
UO - Unstable Operation

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Wapasu - September 2023





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Wapasu - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 100 deg on Sep 25 12:00	Hours of Data: 719
Minimum Value: 4 deg on Sep 14 22:00	Hours of Missing Data: 1
Percentiles: P ₁ = 6 P ₁₀ = 12 Q ₁ = 18 Median = 23 Q ₃ = 28 P ₉₀ = 33 P ₉₉ = 77	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-Sep	27	87	33	21	29	18	24	21	19	19	21	21	22	21	19	20	18	19	19	16	17	17	16	19	87
2-Sep	25	28	24	21	28	33	35	31	25	30	39	28	33	26	29	29	32	28	28	23	17	30	16	16	39
3-Sep	20	17	11	16	12	17	23	29	19	35	36	30	26	24	31	36	38	22	19	48	77	23	31	73	77
4-Sep	30	28	24	26	28	20	19	21	19	22	22	20	23	24	42	39	34	31	UO	14	6	8	9	11	42
5-Sep	10	10	10	11	15	16	18	28	28	19	21	26	27	33	33	33	29	28	14	10	11	13	13	18	33
6-Sep	17	31	43	17	17	19	19	18	18	18	20	26	29	23	21	26	25	31	31	17	21	20	19	23	43
7-Sep	24	20	20	43	22	23	26	26	26	21	24	22	36	40	42	39	41	67	15	18	23	6	11	8	67
8-Sep	7	9	11	16	18	23	21	25	26	25	27	25	33	39	39	33	36	30	34	22	18	11	7	10	39
9-Sep	10	7	7	9	7	13	16	13	23	33	73	46	55	55	28	66	56	22	10	12	11	12	15	15	73
10-Sep	16	17	16	16	13	14	13	14	17	22	24	29	24	31	31	30	28	20	18	18	19	19	20	19	31
11-Sep	20	20	21	22	22	26	20	22	22	27	29	28	27	29	28	28	29	28	27	19	19	20	22	24	29
12-Sep	21	24	21	22	23	22	20	26	27	27	31	30	32	20	25	27	19	20	19	18	21	22	21	21	32
13-Sep	19	13	16	18	16	18	23	26	20	20	21	19	20	20	28	27	28	22	32	22	19	19	16	19	32
14-Sep	18	23	24	25	25	28	28	31	26	30	29	26	23	33	39	27	24	19	27	17	15	4	5	5	39
15-Sep	8	5	10	7	13	12	15	24	28	28	28	28	31	31	31	27	30	24	18	20	22	24	21	23	31
16-Sep	21	25	24	24	24	26	26	25	23	21	23	37	37	24	25	27	22	25	13	12	13	12	13	13	37
17-Sep	10	11	10	11	10	8	11	16	18	20	21	21	26	33	30	24	25	20	22	24	16	24	14	20	33
18-Sep	14	11	13	16	13	14	20	21	26	26	26	24	25	21	22	19	17	22	26	25	19	34	23	21	34
19-Sep	20	24	21	19	26	26	28	28	26	22	26	24	26	24	30	25	31	30	35	6	4	6	17	23	35
20-Sep	40	10	47	26	12	10	9	13	25	34	31	29	30	30	40	29	32	26	52	17	23	9	7	8	52
21-Sep	7	12	18	17	19	20	22	24	27	29	25	23	25	26	24	25	25	26	28	28	30	27	28	28	30
22-Sep	28	28	28	30	27	26	26	29	29	28	25	26	25	30	29	29	31	26	20	20	21	20	24	22	31
23-Sep	22	22	23	19	18	20	18	20	22	23	26	27	26	28	27	28	26	21	20	21	22	22	22	20	28
24-Sep	20	19	21	20	21	22	22	20	25	29	30	31	29	26	24	22	15	20	22	16	17	17	18	16	31
25-Sep	15	18	8	9	11	12	17	29	28	33	52	100	64	99	59	74	22	18	16	15	19	19	20	20	100
26-Sep	19	20	20	18	20	21	20	21	23	30	31	28	29	31	28	29	36	38	38	27	54	42	65	40	65
27-Sep	82	9	23	97	9	26	28	10	32	47	46	35	37	34	27	27	77	61	59	29	24	23	18	31	97
28-Sep	71	37	12	81	22	74	24	53	31	32	29	27	22	24	27	31	26	28	29	32	29	25	21	24	81
29-Sep	21	18	26	24	22	18	19	18	16	19	19	21	22	19	17	17	17	16	16	30	24	19	65	94	94
30-Sep	10	20	15	10	14	9	12	26	17	23	24	28	25	28	28	26	29	20	7	8	11	11	13	12	29

82	87	47	97	29	74	35	53	32	47	73	100	64	99	59	74	77	67	59	48	77	42	65	94	
Diurnal Maximum																								

UO - Unstable Operation



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS18 STONY MOUNTAIN SEPTEMBER 2023

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

October 30, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - STONY MOUNTAIN (AMS18)
 SEPTEMBER 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	674	35	46	98.47	3.7	0	0.7	0
TRS(ppb) Average	673	36	47	98.47	1.3	0	0.8	0
THC(ppm) Average	619	31	101	90.28	2.2	-	2.1	-
NMHC(ppm) Average	619	31	101	90.28	0.072	-	0.009	-
CH4(ppm) Average	619	31	101	90.28	2.2	-	2.1	-
O3 (ppb) Average	665	33	55	96.94	49.8	0	37.6	-
NO2 (ppb) Average	673	36	47	98.47	5.1	0	3.4	-
NO (ppb) Average	673	36	47	98.47	2.6	-	0.4	-
NOX (ppb) Average	673	36	47	98.47	7.6	-	3.7	-
PM2.5 (ug/m3) Average	707	2	13	98.47	524	101	308.2	13
CO(ppm) Average	667	31	53	96.94	2.4	0	1.3	0
CO2(ppm) Average	660	33	60	96.25	449.9	0	429	0
Temperature 2 m (C) Average	720	0	0	100	23.4	-	18	-
Relative Humidity (%) Average	713	0	7	99.03	100	-	87.7	-
Wind Speed 20 m (km/h) Average	229	0	491	31.81	21	-	14	-
Wind Direction 20 m (deg) Average	229	0	491	31.81	-	-	-	-
Precipitation (mm) Total	710	0	10	98.61	3.2	-	6.5	-
Leaf Wetness (% of range) Average	720	0	0	100	34.1	-	13.1	-
Global Solar Radiation (W/m2) Average	720	0	0	100	698.2	-	163.8	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - STONY MOUNTAIN (AMS18)
 SEPTEMBER 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	674	0.26	0.3	-	0	0	0.1	0.1	0.3	0.7	3.7
TRS (ppb) Average	673	0.26	0.2	-	0.1	0.1	0.2	0.2	0.3	0.4	1.3
THC (ppm) Average	619	2.02	0.1	-	1.9	2	2	2	2	2.1	2.2
NMHC(ppm) Average	619	0.001	0.006	-	0	0	0	0	0	0	0.072
CH4(ppm) Average	619	2.02	0.1	-	1.9	2	2	2	2	2.1	2.2
O3 (ppb) Average	665	26.73	8.9	-	5.1	15.4	20.4	27	33.7	37.5	49.8
NO2 (ppb) Average	673	1.09	0.8	-	0.1	0.4	0.5	0.9	1.3	1.9	5.1
NO (ppb) Average	673	0.15	0.2	-	0	0.1	0.1	0.1	0.2	0.3	2.6
NOX (ppb) Average	673	1.24	0.9	-	0.2	0.5	0.7	1	1.5	2.2	7.6
PM2.5 (ug/m3) Average	707	47.03	81	-	2.1	4.5	11.1	17.8	39.1	116.7	524
CO(ppm) Average	667	0.37	0.3	-	0.1	0.2	0.2	0.2	0.4	0.7	2.4
CO2(ppm) Average	660	416.83	9.4	-	398.3	405.4	409.8	416	422.5	428.9	449.9
Temperature 2 m (C) Average	720	12.66	4.7	-	2.7	6.9	8.9	12.5	15.6	19.7	23.4
Relative Humidity (%) Average	713	66.87	16.5	-	30.2	43.1	55.5	67.3	78.8	89.6	100
Wind Speed 10 m (km/h) Average	229	10.1	3	-	1	6	7	10	12	14	21
Wind Direction 10 m (deg) Average	229	-	-	-	-	-	-	-	-	-	-
Precipitation (mm) Total	710	-	-	19.92	-	-	-	-	-	-	-
Surface Wetness (% of range) Average	720	3.1	5	-	0.1	1	1.4	1.6	1.9	6	34.1
Global Solar Radiation (W/m2) Average	720	114.38	173.9	-	0	0	0	10.1	173.9	422.1	698.2

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - STONY MOUNTAIN (AMS18)
 SEPTEMBER 2023

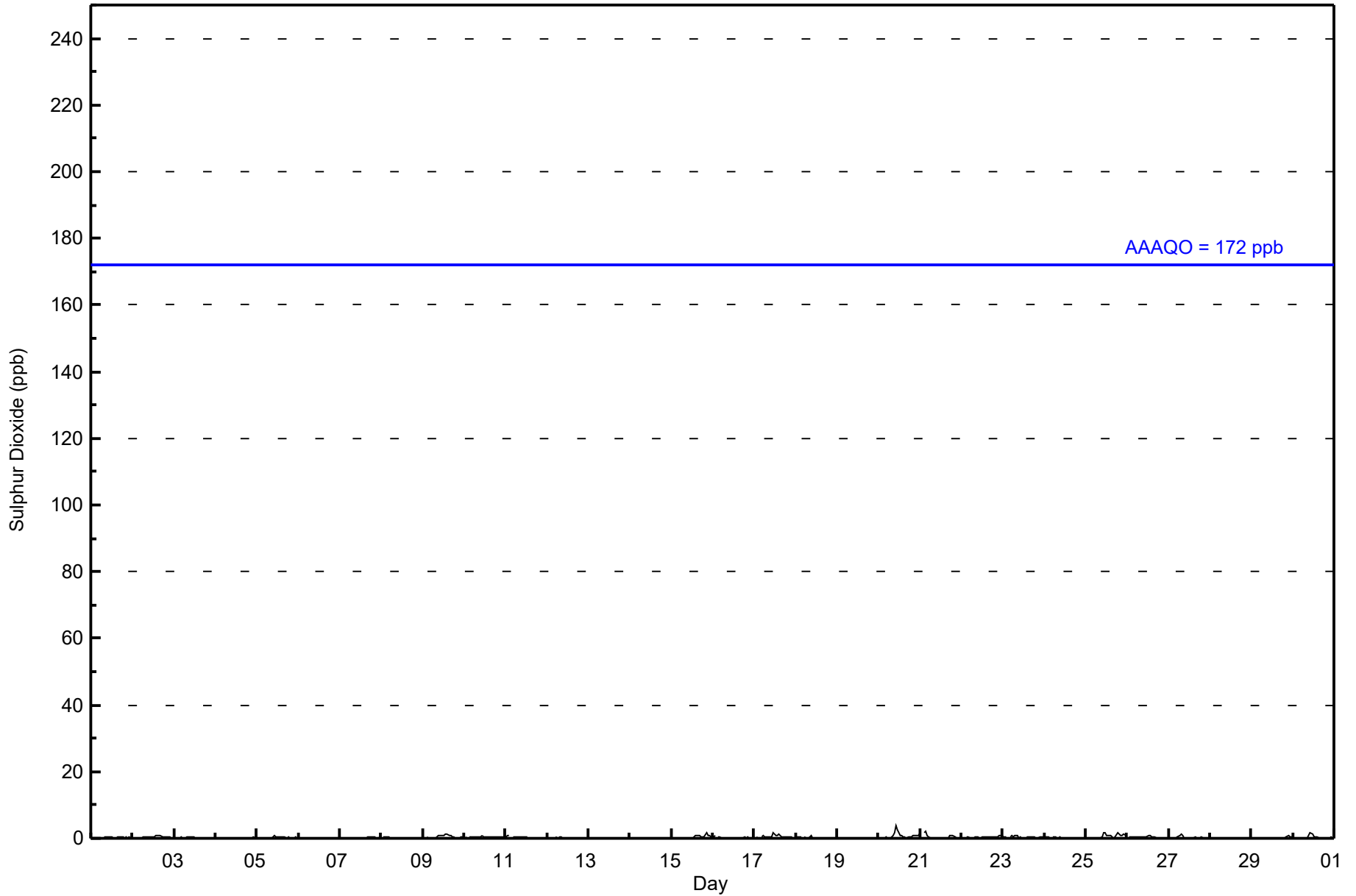
MONTHLY SUMMARY

Parameter	Period Start	Period End	Duration (Hours)	Notes
AIR QUALITY ANALYZERS	11 Sep 2023 14:00	12 Sep 2023 00:00	11	Station power failure
CO2, O3	12 Sep 2023 01:00	12 Sep 2023 11:00	11	Unstable Operations - flatline in analyzer output signal
CO	12 Sep 2023 01:00	12 Sep 2023 10:00	10	Unstable Operations - flatline in analyzer output signal
CO	12 Sep 2023 11:00	12 Sep 2023 11:00	1	Maintenance - analyzer rebooted
CO2	29 Sep 2023 12:00	29 Sep 2023 16:00	5	Maintenance - analyzer replaced due to noisy signal
THC/NMHC/CH4	08 Sep 2023 02:00	08 Sep 2023 11:00	10	Unstable Operations - daily span outside AMD criteria
THC/NMHC/CH4	08 Sep 2023 12:00	08 Sep 2023 13:00	2	Maintenance - analyzer replaced
THC/NMHC/CH4	12 Sep 2023 01:00	12 Sep 2023 10:00	10	Unstable Operations - FID flame out
THC/NMHC/CH4	12 Sep 2023 11:00	12 Sep 2023 11:00	1	Maintenance - FID flame re-ignited
THC/NMHC/CH4	20 Sep 2023 02:00	21 Sep 2023 11:00	34	Unstable Operations - support gases depleted
THC/NMHC/CH4	21 Sep 2023 12:00	21 Sep 2023 13:00	2	Maintenance - replaced support gas cylinder & QA check
Relative Humidity	29 Sep 2023 02:00	29 Sep 2023 08:00	7	Sensor operated out of range
Wind Speed, Wind Direction	03 Sep 2023 03:00	03 Sep 2023 11:00	9	Unstable Operations - inconsistent response
Wind Speed, Wind Direction	08 Sep 2023 13:00	28 Sep 2023 12:00	480	Unstable Operations - inconsistent response
Wind Speed, Wind Direction	28 Sep 2023 13:00	28 Sep 2023 14:00	2	Maintenance - wind direction sensor replaced
Precipitation Collector	11 Sep 2023 14:00	11 Sep 2023 23:00	10	DAS Failure - data not recorded



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Stony Mountain - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Stony Mountain - September 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	674	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: 674

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Stony Mountain - September 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	6	2	5	2	4	8	7	5	11	28	33	39	28	14	17	218
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	6	2	5	2	4	8	7	5	11	28	33	39	28	14	17	218

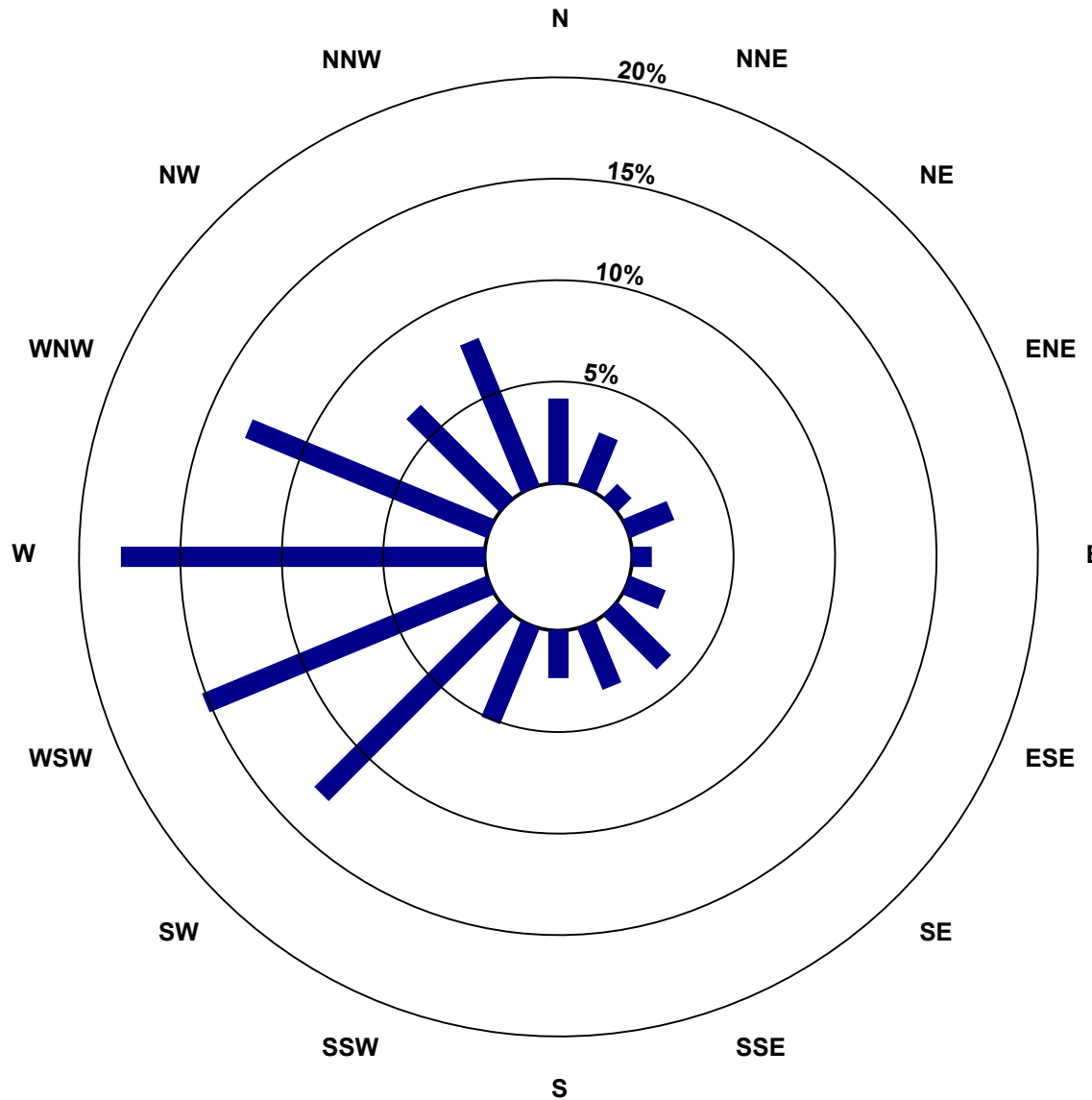
Total Number of Valid Hours: 218

Total Number of Hours: 720

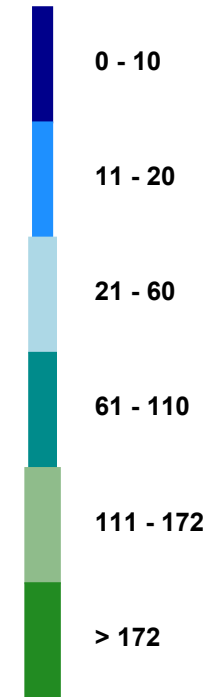


Wood Buffalo Environmental Association
Wind Rose Sep 2023

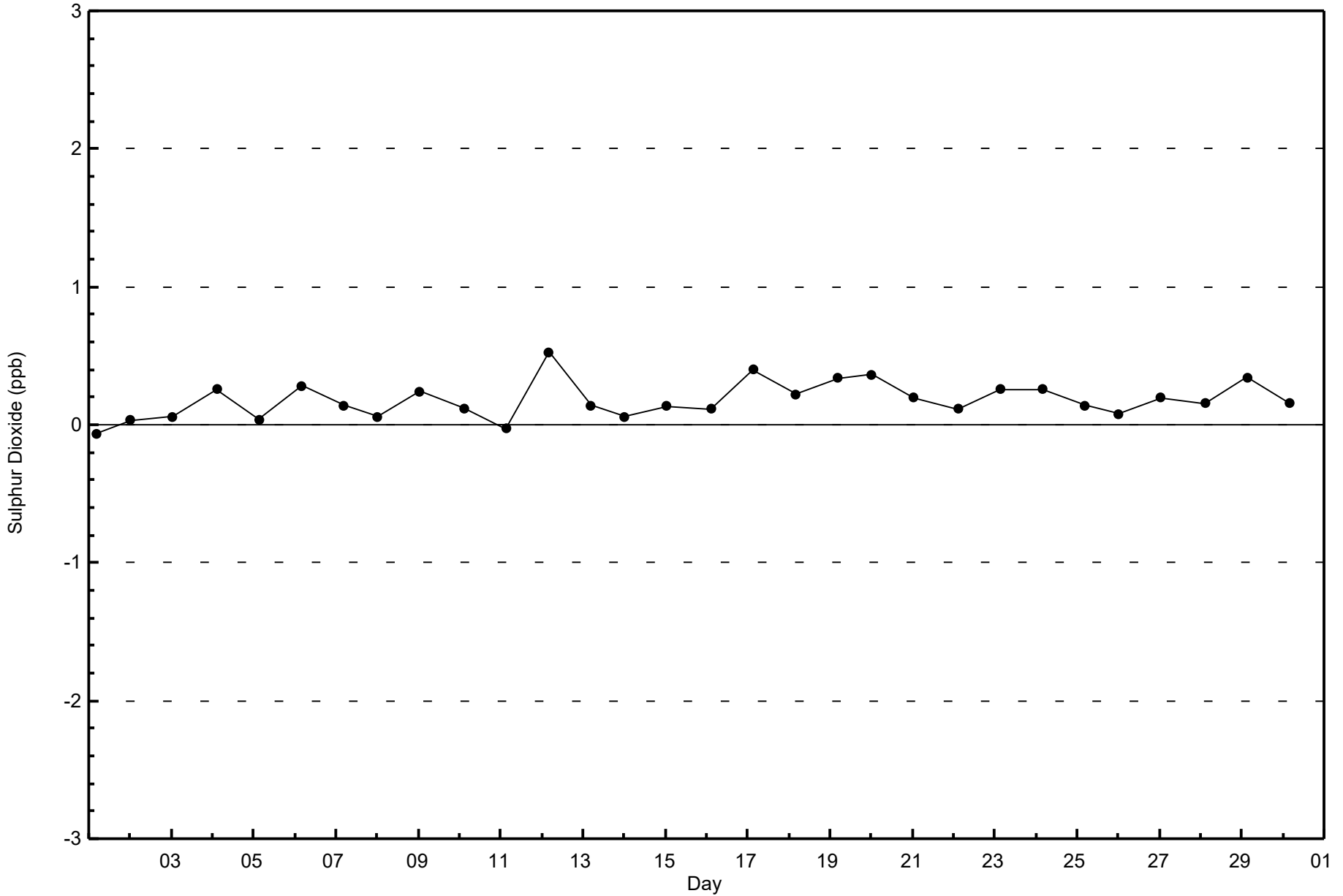
Sulphur Dioxide (SO₂) - ppb
Stony Mountain

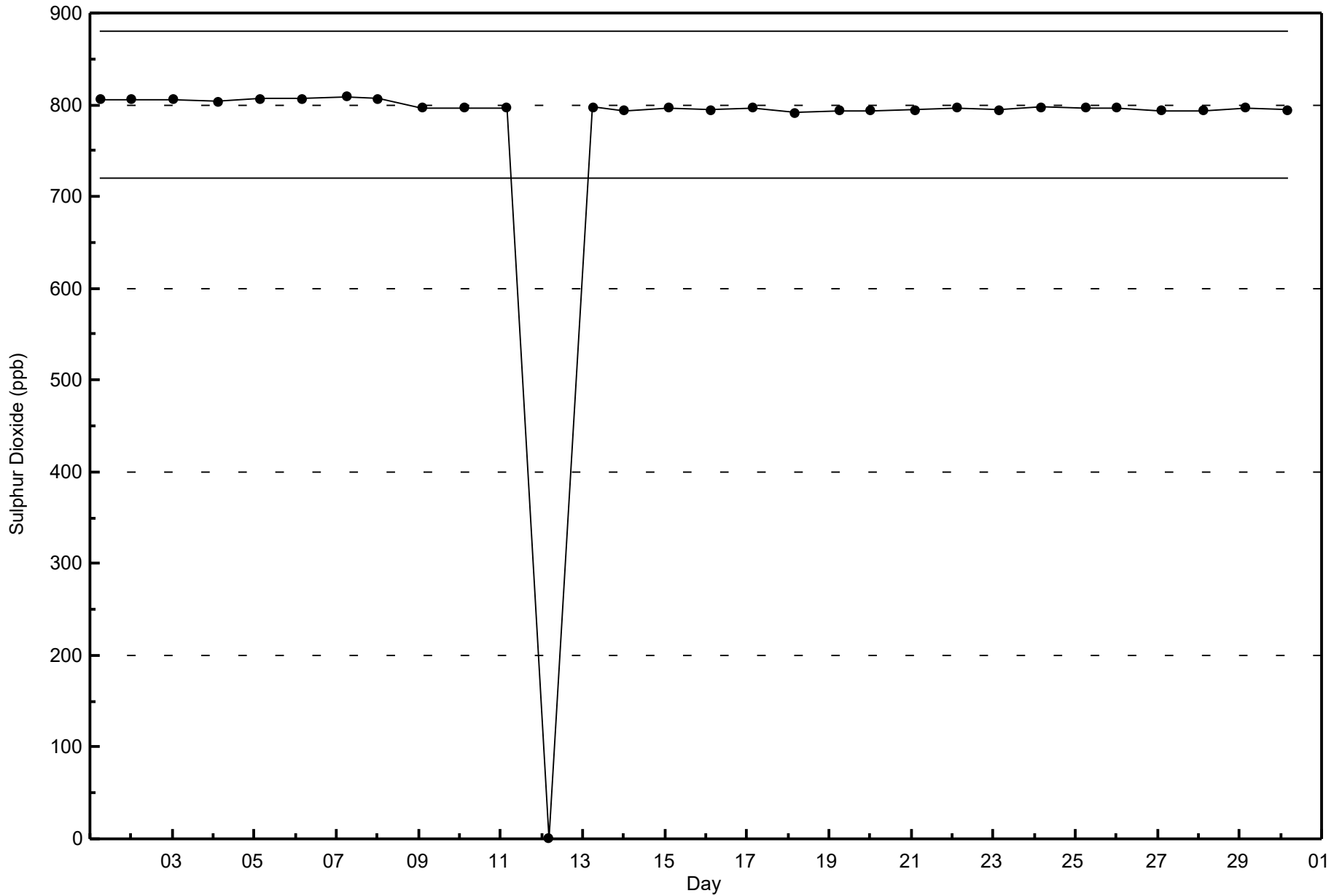


Classes (ppb)



Total Number of Valid Hours: 218







Wood Buffalo Environmental Association
Summary of Hour Averages

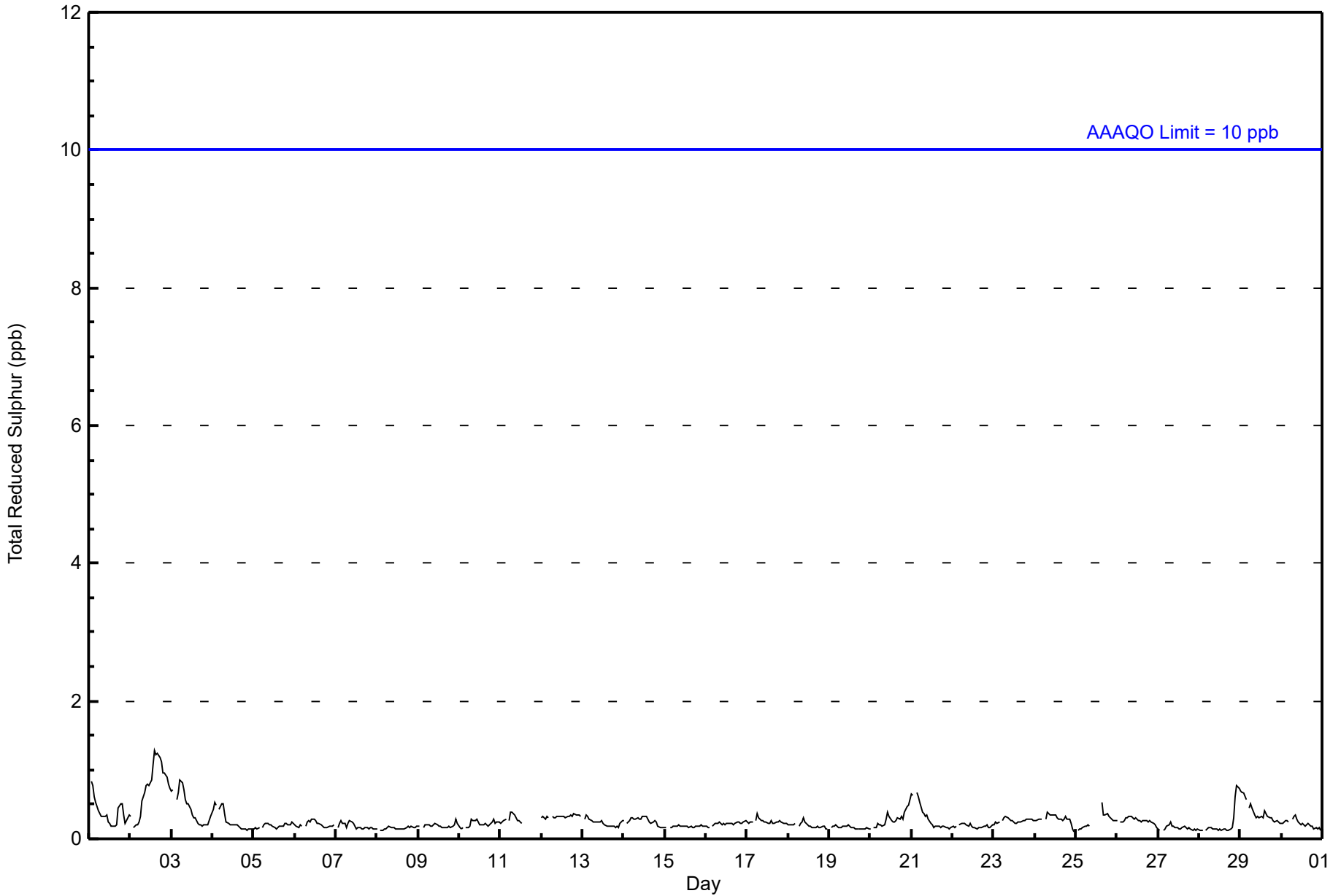
Total Reduced Sulphur (TRS) - ppb
Stony Mountain - September 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	720				
Maximum Value: 1.3 ppb on Sep 2 15:00		Maximum Daily Average: 0.8 ppb on Sep 2																	Hours of Data:	673						
Minimum Value: 0.1 ppb on Sep 25 00:00		Minimum Daily Average: 0.2 ppb on Sep 8																	Hours of Missing Data:	47						
Maximum Diurnal Average: 0.3 ppb at hour 8		Minimum Diurnal Average: 0.2 ppb at hour 14																	Hours of Calibration:	36						
Monthly Average: 0.26 ppb		Percentiles: P ₁ = 0.1 P ₁₀ = 0.1 Q ₁ = 0.2 Median = 0.2 Q ₃ = 0.3 P ₉₀ = 0.4 P ₉₉ = 1.0																	Percent Operational Time:	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-Sep	Z	0.8	0.8	0.6	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.5	0.5	0.3	0.2	0.3	0.4	0.4	0.8
2-Sep	0.3	Z	0.2	0.2	0.2	0.2	0.3	0.5	0.7	0.8	0.8	0.8	0.9	1.1	1.3	1.2	1.2	1.2	1.1	1.0	1.0	0.9	0.8	0.7	0.8	1.3
3-Sep	0.7	0.7	Z	0.6	0.7	0.9	0.8	0.7	0.6	0.5	0.5	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.9
4-Sep	0.4	0.5	0.5	Z	0.4	0.5	0.5	0.4	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	0.3	0.5
5-Sep	0.1	0.2	0.1	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
6-Sep	0.2	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.3	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
7-Sep	Z	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.2	0.3
8-Sep	0.1	Z	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	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
9-Sep	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.3
10-Sep	0.2	0.1	0.2	Z	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	0.2	0.3	0.2	0.2	0.2	0.2	0.3
11-Sep	0.2	0.3	0.3	0.3	Z	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.2	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	0.4
12-Sep	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	0.4	0.3	0.3	0.4	0.3	0.3	0.4
13-Sep	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3
14-Sep	0.3	Z	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.3
15-Sep	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
16-Sep	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.3
17-Sep	0.2	0.2	0.2	0.2	Z	0.3	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.4
18-Sep	0.2	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.3
19-Sep	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2
20-Sep	0.1	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	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.5	0.6	0.3	0.6
21-Sep	0.7	0.6	Z	0.7	0.6	0.5	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.3	0.7
22-Sep	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
23-Sep	0.2	0.2	0.2	0.2	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
24-Sep	0.3	0.3	0.3	0.3	0.3	Z	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.2	0.1	0.1	0.3	0.4
25-Sep	Z	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	C	C	C	C	C	C	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.5
26-Sep	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	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.3
27-Sep	0.1	0.1	Z	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2
28-Sep	0.1	0.1	0.1	Z	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.6	0.8	0.7	0.2	0.8
29-Sep	0.7	0.7	0.7	0.6	Z	0.4	0.5	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.2	0.4	0.7
30-Sep	0.2	0.2	0.3	0.3	0.2	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	0.1	0.2	0.1	0.2	0.1	0.2	0.3
																								Diurnal Average		
																								Diurnal Maximum		
																								Z - zerspan C - Calibration PF - Power Failure		
																								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
Stony Mountain - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Stony Mountain - September 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	673	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: 673

Total Number of Hours: 720



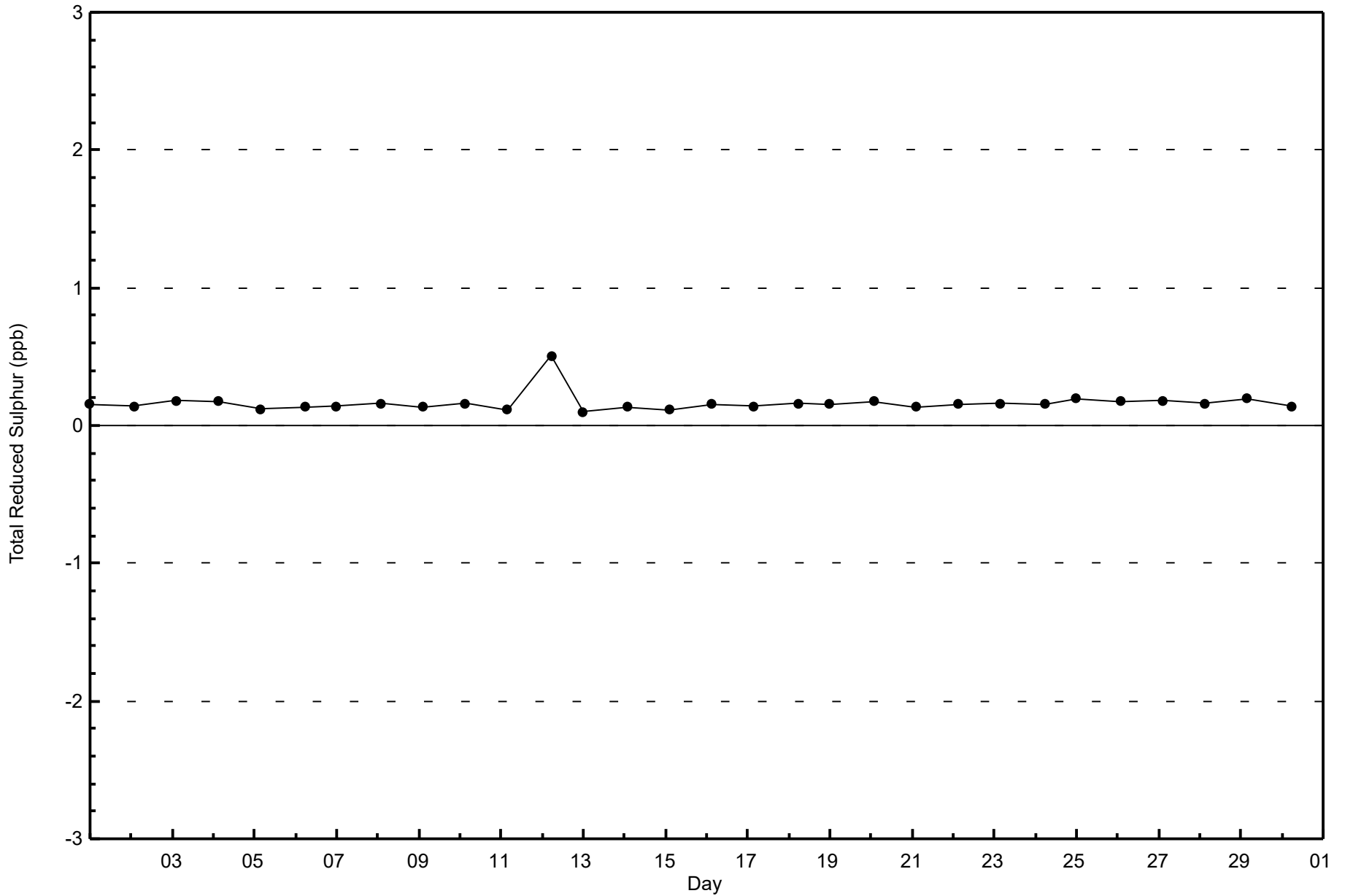
**Wood Buffalo Environmental Association
Frequency Distribution**

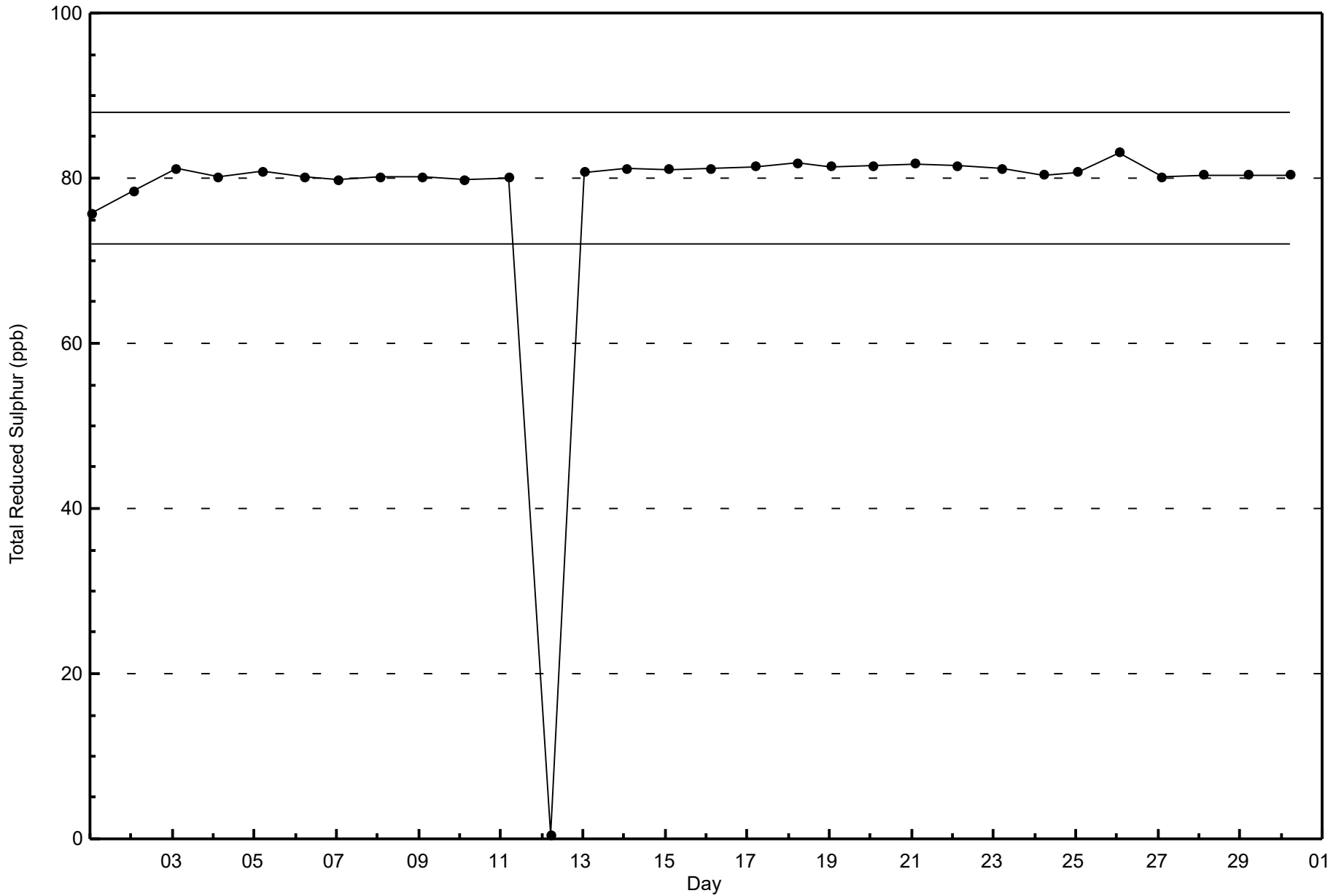
**Total Reduced Sulphur (TRS) - ppb
Stony Mountain - September 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	9	6	2	5	2	4	8	7	5	11	29	33	41	28	13	17	220
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	9	6	2	5	2	4	8	7	5	11	29	33	41	28	13	17	220

Total Number of Valid Hours: 220

Total Number of Hours: 720







Wood Buffalo Environmental Association
Summary of Hour Averages

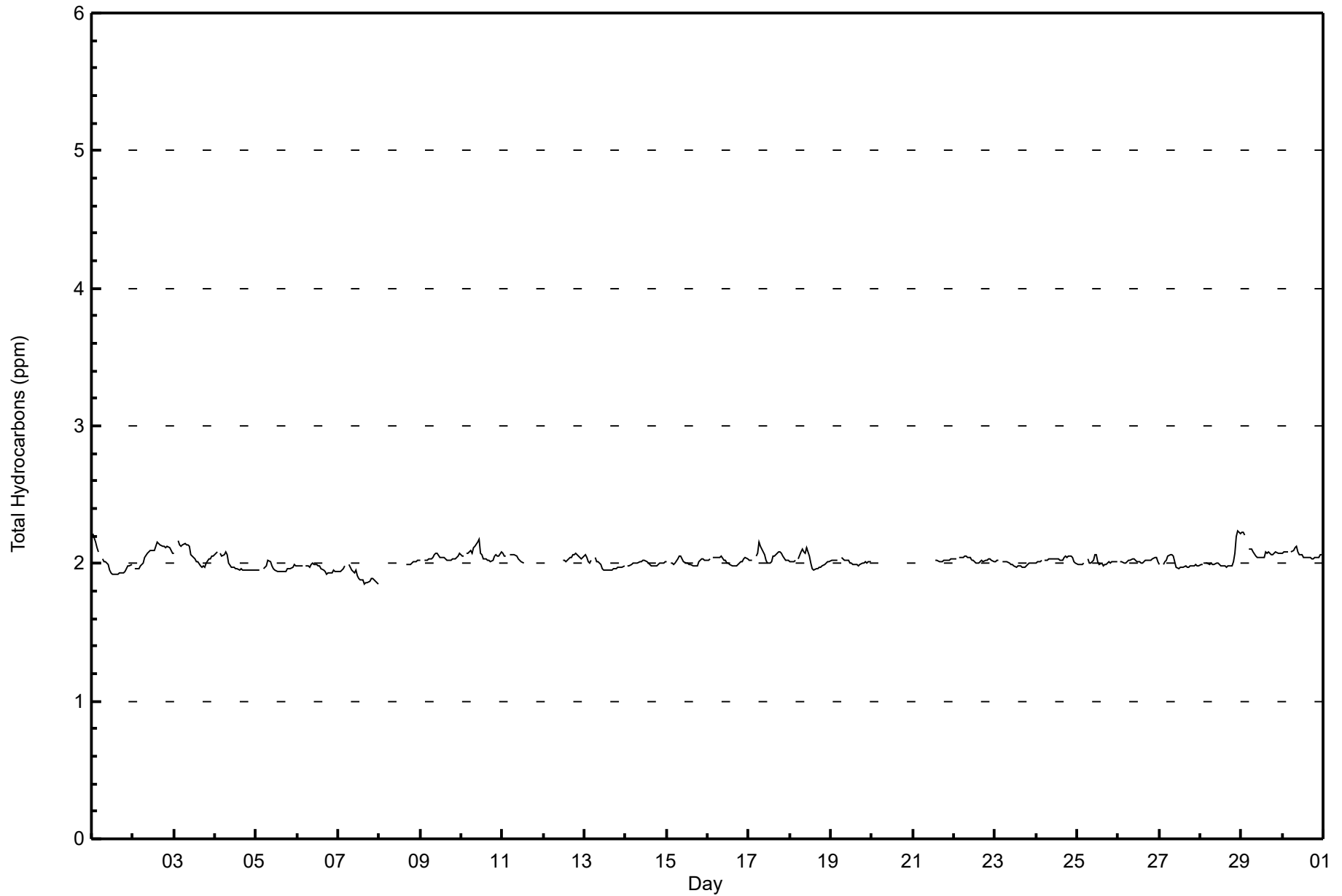
Total Hydrocarbons (THC) - ppm
Stony Mountain - September 2023

Maximum Value: 2.2 ppm on Sep 28 23:00		Maximum Daily Average: 2.1 ppm on Sep 29		Hours in Service: 720																													
Minimum Value: 1.9 ppm on Sep 8 00:00		Minimum Daily Average: 1.9 ppm on Sep 7		Hours of Data: 619																													
Maximum Diurnal Average: 2.0 ppm at hour 7		Minimum Diurnal Average: 2.0 ppm at hour 16		Hours of Missing Data: 101																													
Monthly Average: 2.02 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 = 2.2		Hours of Calibration: 31																													
				Percent Operational Time: 90.3																													
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-Sep	2.2	2.2	2.2	2.1	2.1	Z	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	2.0	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-Sep	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	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2
3-Sep	2.1	Z	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	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	2.2	
4-Sep	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	
5-Sep	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	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	
6-Sep	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	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
7-Sep	1.9	1.9	2.0	2.0	2.0	Z	2.0	2.0	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	1.9	1.9	1.9	1.9	1.9	1.9	2.0	
8-Sep	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	C	C	C	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
9-Sep	2.0	Z	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	2.0	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-Sep	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.0	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	2.2
11-Sep	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	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	2.1
12-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	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	2.1
13-Sep	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	2.0	2.0	2.0	2.0	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-Sep	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	2.0
15-Sep	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
16-Sep	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	2.0	2.0	2.0	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-Sep	2.0	2.0	2.0	Z	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	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	2.2
18-Sep	2.0	2.0	2.0	2.0	Z	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
19-Sep	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	2.0
20-Sep	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	UO	UO	UO	UO
21-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	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	2.0	2.0	2.0	2.0	2.0
22-Sep	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	2.0	2.0	2.1
23-Sep	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	2.0
24-Sep	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	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
25-Sep	2.0	2.0	2.0	2.0	2.0	Z	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
26-Sep	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	2.0
27-Sep	2.0	Z	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
28-Sep	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	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
29-Sep	2.2	2.2	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
30-Sep	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	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		M - Maintenance		UO - Unstable Operation		PF - Power Failure			



Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Stony Mountain - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Stony Mountain - September 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	480	77.54	77.54
2.1 - 3.0	139	22.46	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 619

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Total Hydrocarbons (THC) - ppm
Stony Mountain - September 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	4	2	0	5	2	4	8	5	5	11	24	22	31	7	8	4	142
2.1 - 3.0	5	4	2	0	0	0	0	2	0	0	0	6	7	21	6	13	66
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	6	2	5	2	4	8	7	5	11	24	28	38	28	14	17	208

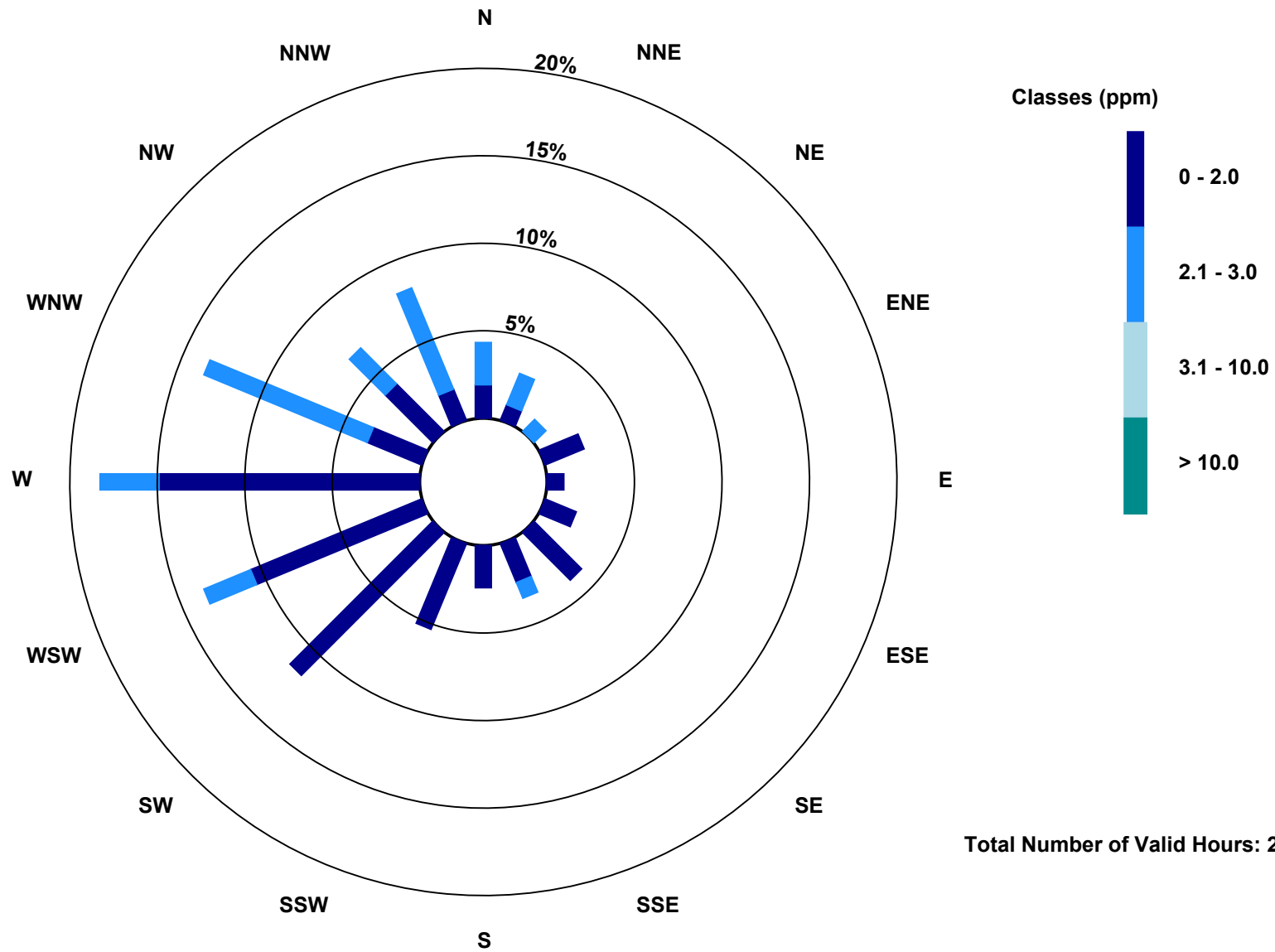
Total Number of Valid Hours: 208

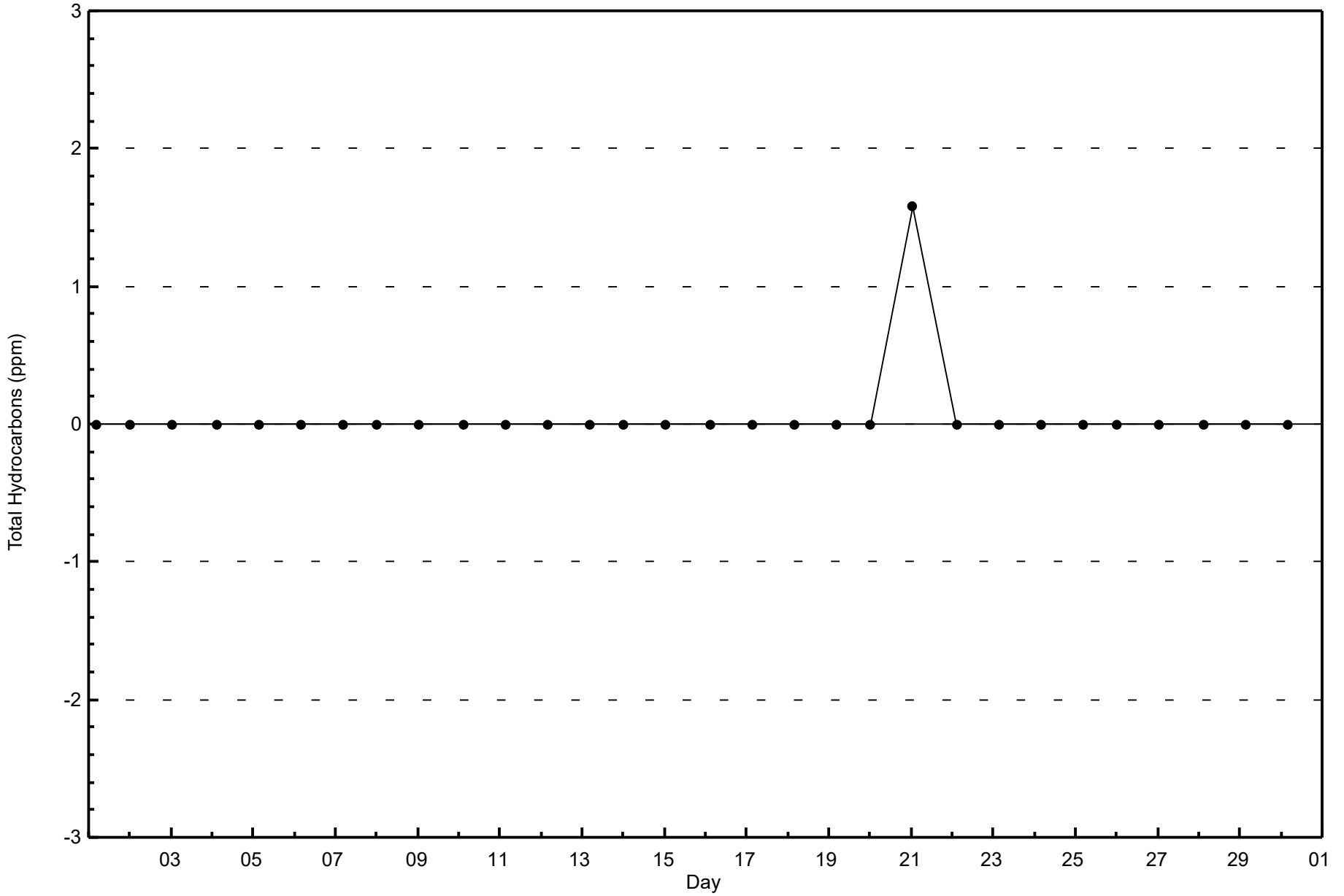
Total Number of Hours: 720

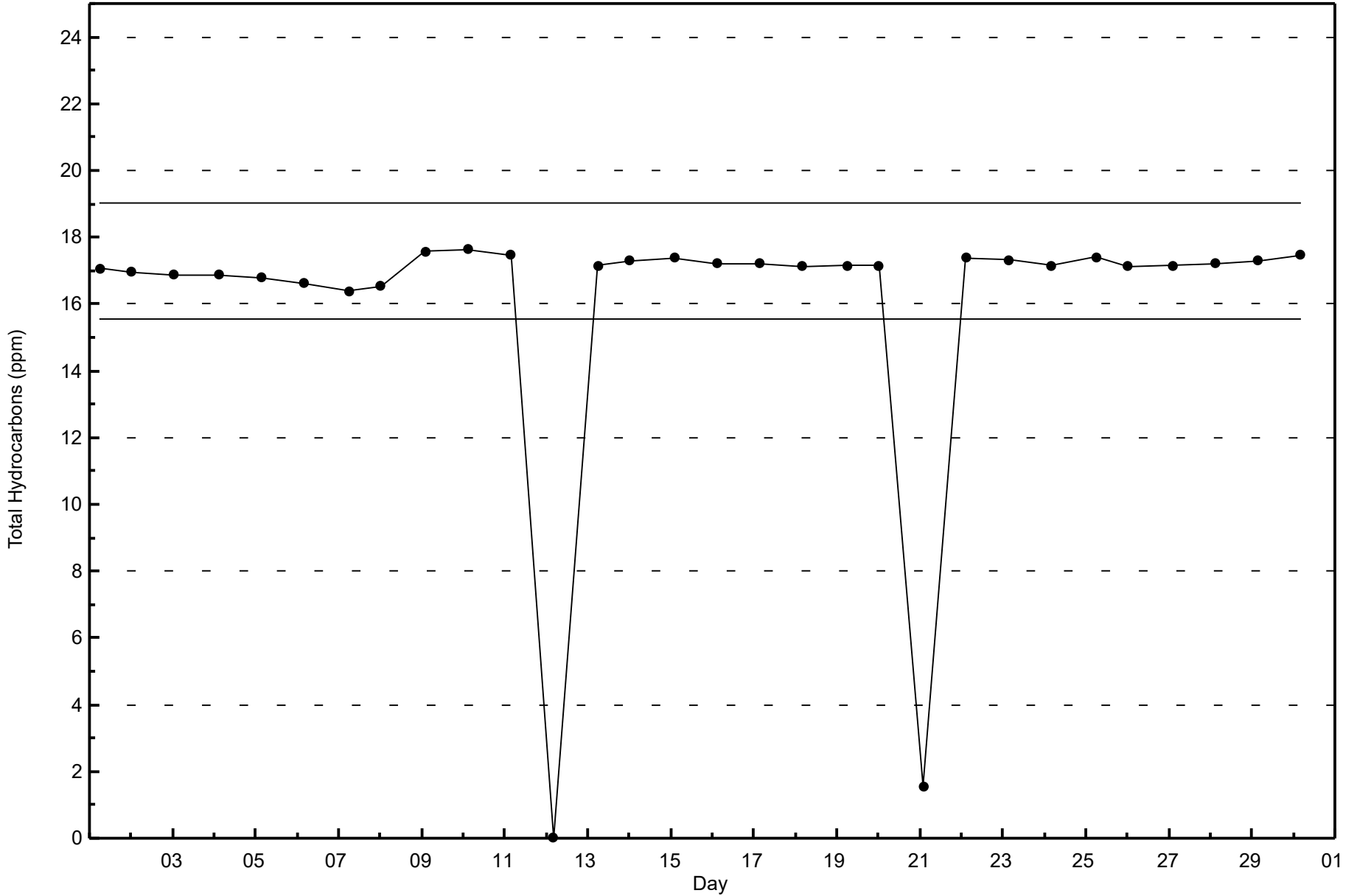


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Total Hydrocarbons (THC) - ppm
Stony Mountain

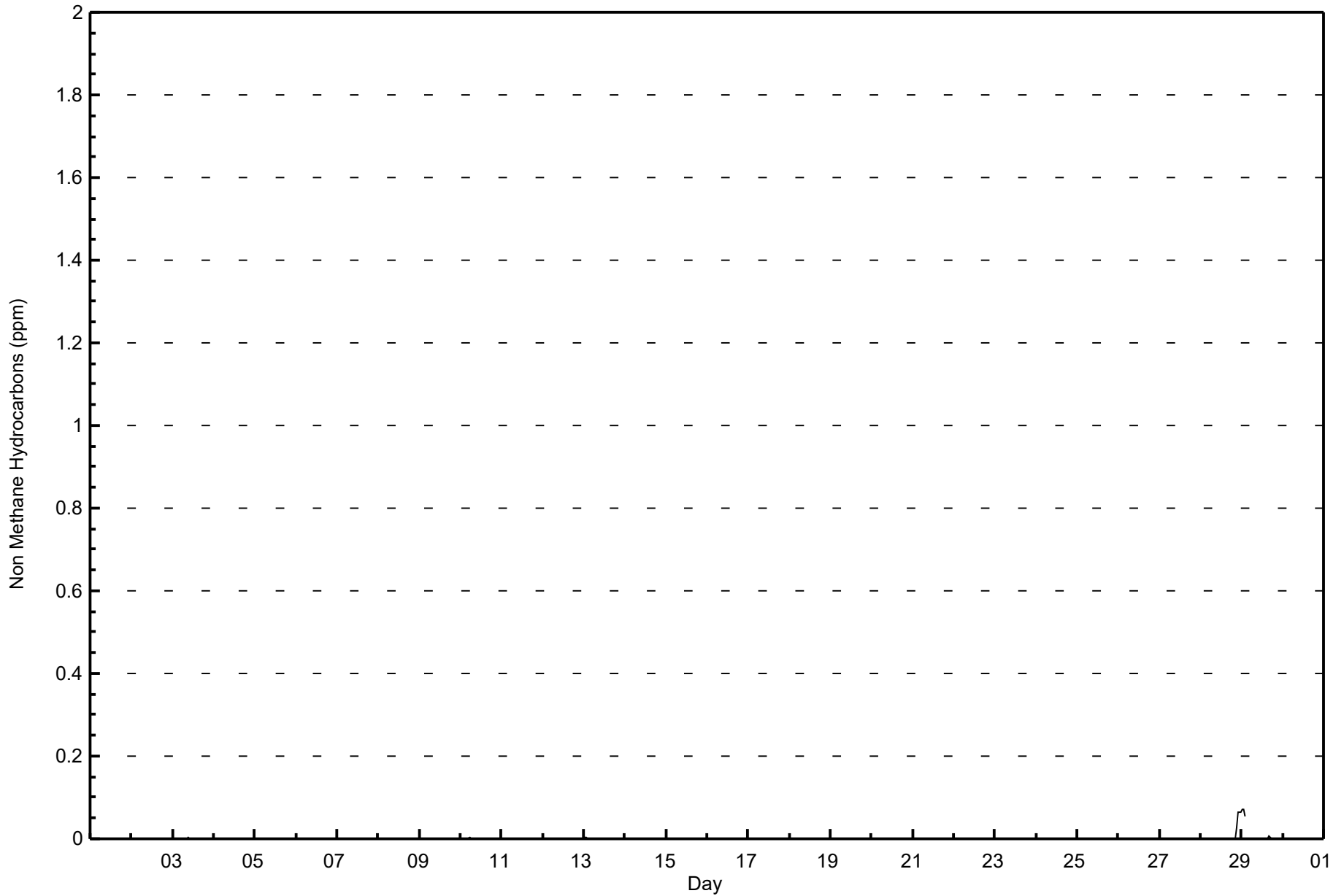








Maximum Value: 0.072 ppm on Sep 29 02:00		Maximum Daily Average: 0.009 ppm on Sep 29		Hours in Service:	720																																												
Minimum Value: 0.000 ppm on Sep 1 01:00		Minimum Daily Average: 0.000 ppm on Sep 2		Hours of Data:	619																																												
Maximum Diurnal Average: 0.003 ppm at hour 2		Minimum Diurnal Average: 0.000 ppm at hour 4		Hours of Missing Data:	101																																												
Monthly Average: 0.001 ppm		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.0 P ₉₉ = 0.0		Hours of Calibration:	31																																												
				Percent Operational Time:	90.3																																												
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-Sep	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	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.001																					
2-Sep	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																				
3-Sep	0.000	Z	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	0.000	0.000	0.000	0.000	0.000	0.000	0.004																				
4-Sep	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																				
5-Sep	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																				
6-Sep	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																				
7-Sep	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																				
8-Sep	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	C	C	C	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	--																				
9-Sep	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000																				
10-Sep	0.000	0.000	Z	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003																				
11-Sep	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	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--																				
12-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	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-Sep	0.003	0.002	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	0.003																				
14-Sep	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000																				
15-Sep	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																				
16-Sep	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																				
17-Sep	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																				
18-Sep	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																				
19-Sep	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																				
20-Sep	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	--																			
21-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	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	0.000	0.000	0.000	--																				
22-Sep	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																				
23-Sep	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																				
24-Sep	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																				
25-Sep	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																				
26-Sep	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000																				
27-Sep	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000																				
28-Sep	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	0.028	0.066	0.063	0.007																				
29-Sep	0.070	0.072	0.053	Z	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.009	0.072																				
30-Sep	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																				
																								0.003	0.003	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	0.001	0.002	0.002	Diurnal Average		
																								0.070	0.072	0.053	0.000	0.001	0.003	0.000	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.000	0.000	0.000	0.001	0.028	0.066	0.063	Diurnal Maximum	
Z - zerospan																								C - Calibration				M - Maintenance				UO - Unstable Operation				PF - Power Failure													





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm
Stony Mountain - September 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	612	98.87	98.87
0.006 - 0.05	3	0.48	99.35
0.06 - 0.1	4	0.65	100.00
> 0.1	0	0.00	100.00

Total Number of Valid Hours: 619

Total Number of Hours: 720



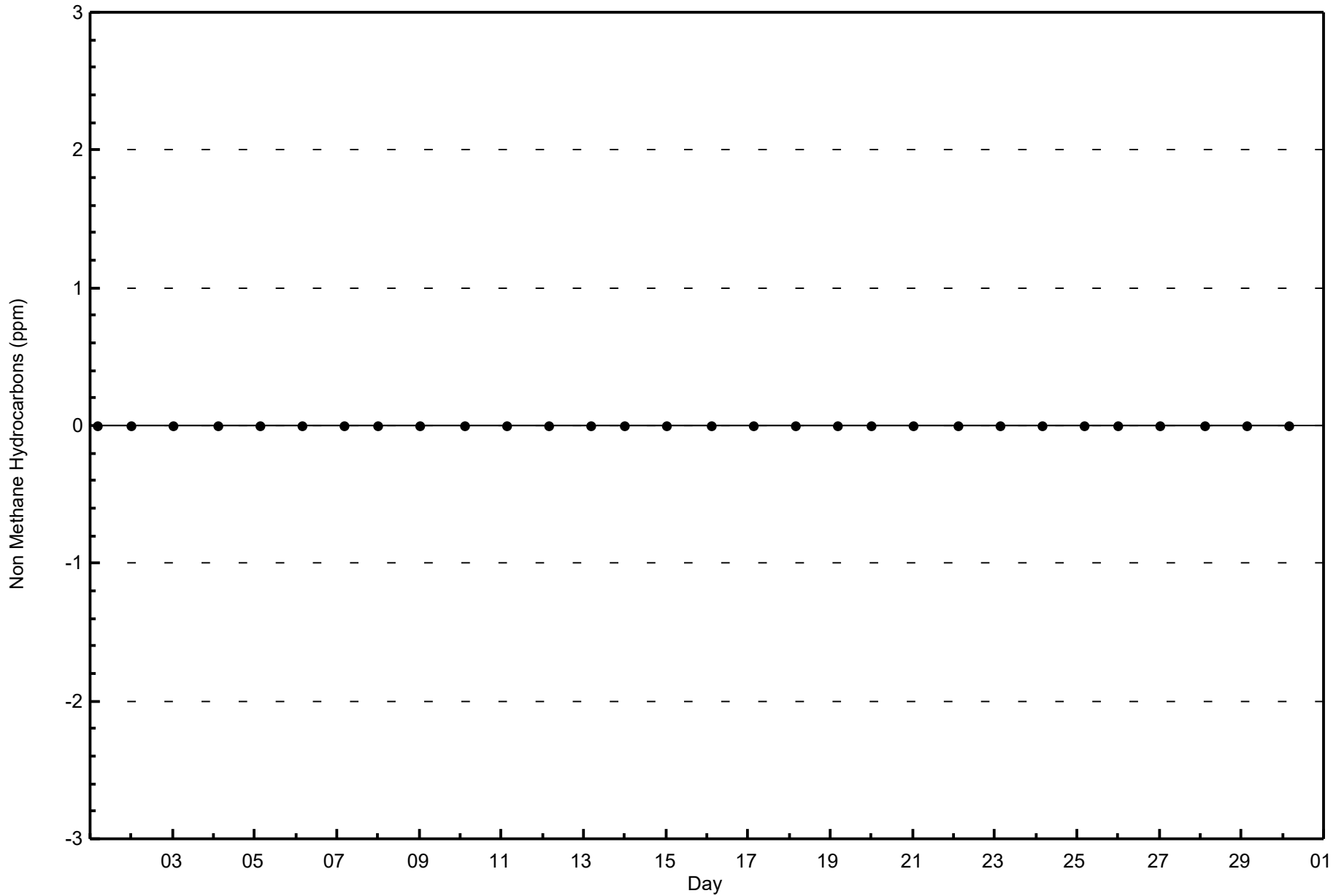
Wood Buffalo Environmental Association
Frequency Distribution

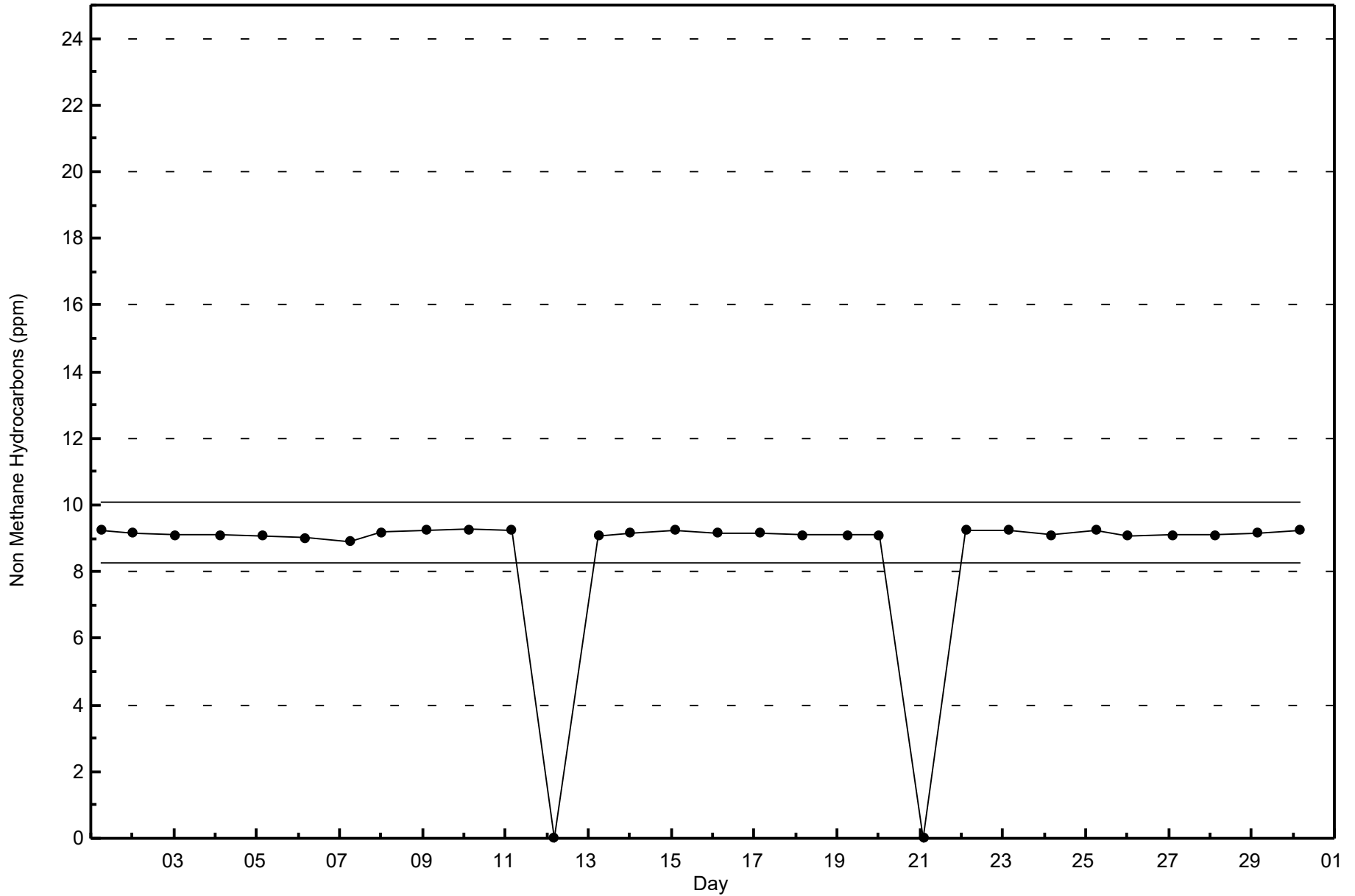
Non Methane Hydrocarbons (NMHC) - ppm
Stony Mountain - September 2023

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	7	4	1	5	2	4	8	7	5	11	24	28	38	28	14	15	201
0.006 - 0.05	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	3
0.06 - 0.1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4
> 0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	9	6	2	5	2	4	8	7	5	11	24	28	38	28	14	17	208

Total Number of Valid Hours: 208

Total Number of Hours: 720







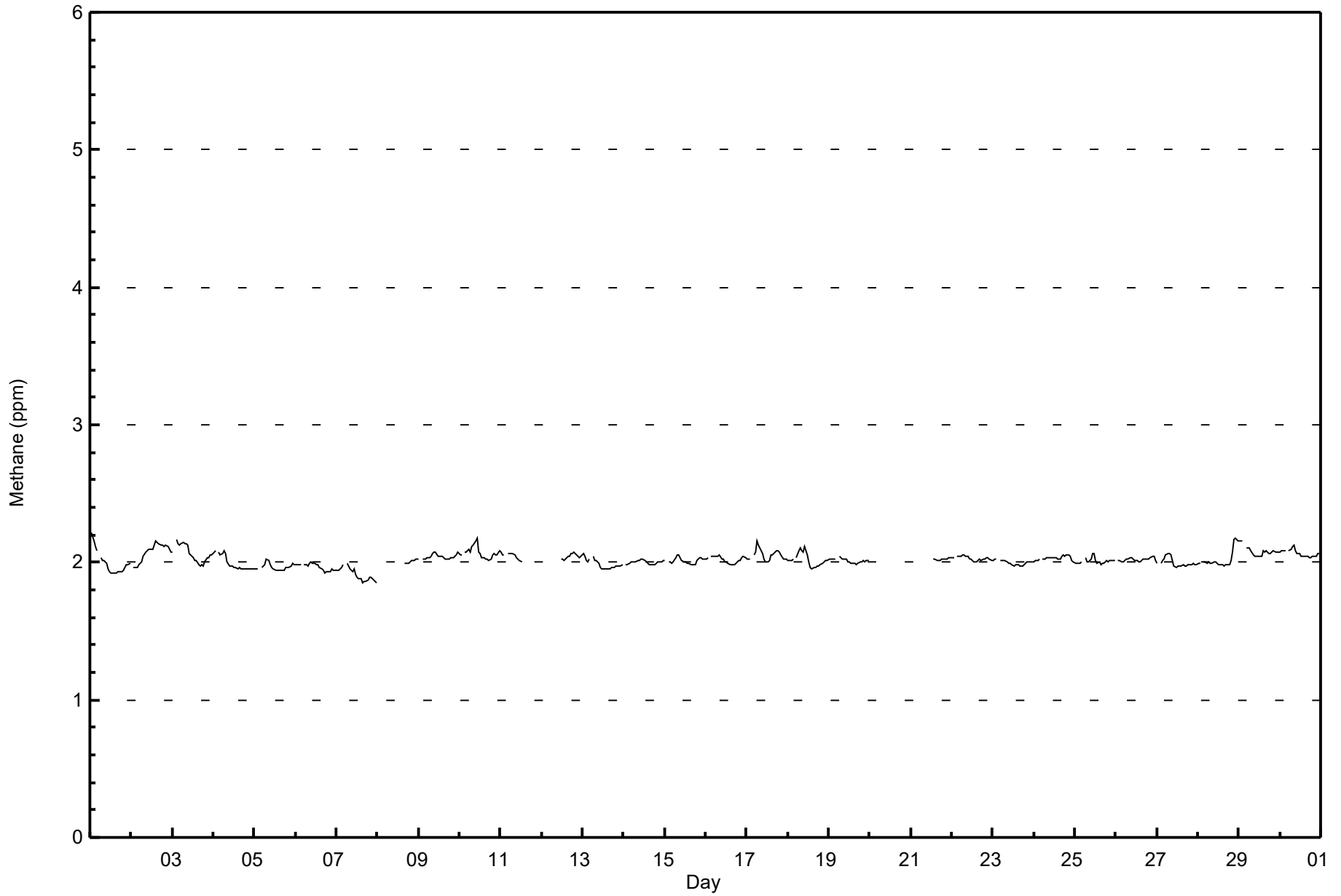
Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH₄) - ppm

Stony Mountain - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 2.2 ppm on Sep 1 01:00 Maximum Daily Average: 2.1 ppm on Sep 29		Hours in Service: 720 Hours of Data: 619 Hours of Missing Data: 101 Hours of Calibration: 31 Percent Operational Time: 90.3																									
Minimum Value: 1.9 ppm on Sep 8 00:00 Maximum Diurnal Average: 2.0 ppm at hour 7 Monthly Average: 2.02 ppm		Minimum Daily Average: 1.9 ppm on Sep 7 Minimum Diurnal Average: 2.0 ppm at hour 16 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 = 2.2																									
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-Sep	2.2	2.2	2.2	2.1	2.1	Z	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	2.0	2.0	2.0	2.0	2.0	2.0	2.2
2-Sep	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	2.2	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
3-Sep	2.1	Z	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2	
4-Sep	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	2.0	1.9	2.0	2.1	
5-Sep	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	
6-Sep	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	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	1.9	2.0	2.0	
7-Sep	1.9	1.9	2.0	2.0	2.0	Z	2.0	2.0	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	
8-Sep	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	C	C	C	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
9-Sep	2.0	Z	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	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	
10-Sep	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.2	
11-Sep	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	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	2.1	
12-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	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	2.0	2.1	
13-Sep	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	
14-Sep	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	
15-Sep	2.0	Z	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	2.0	2.0	2.0	2.0	2.1	
16-Sep	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	2.1	
17-Sep	2.0	2.0	2.0	Z	2.1	2.1	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.2	
18-Sep	2.0	2.0	2.0	2.0	Z	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	
19-Sep	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-Sep	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	--	
21-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	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	
22-Sep	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	2.1	
23-Sep	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	
24-Sep	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.1	
25-Sep	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	
26-Sep	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-Sep	2.0	Z	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	2.0	2.0	2.0	2.0	2.1	
28-Sep	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	2.1	2.2	2.2	2.2	2.2	2.2	
29-Sep	2.2	2.2	2.2	Z	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	2.2	
30-Sep	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerospan C - Calibration M - Maintenance UO - Unstable Operation PF - Power Failure																											





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Stony Mountain - September 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	480	77.54	77.54
2.1 - 3.0	139	22.46	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 619

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Methane (CH₄) - ppm
Stony Mountain - September 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	4	2	0	5	2	4	8	5	5	11	24	22	31	7	8	4	142
2.1 - 3.0	5	4	2	0	0	0	0	2	0	0	0	6	7	21	6	13	66
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	6	2	5	2	4	8	7	5	11	24	28	38	28	14	17	208

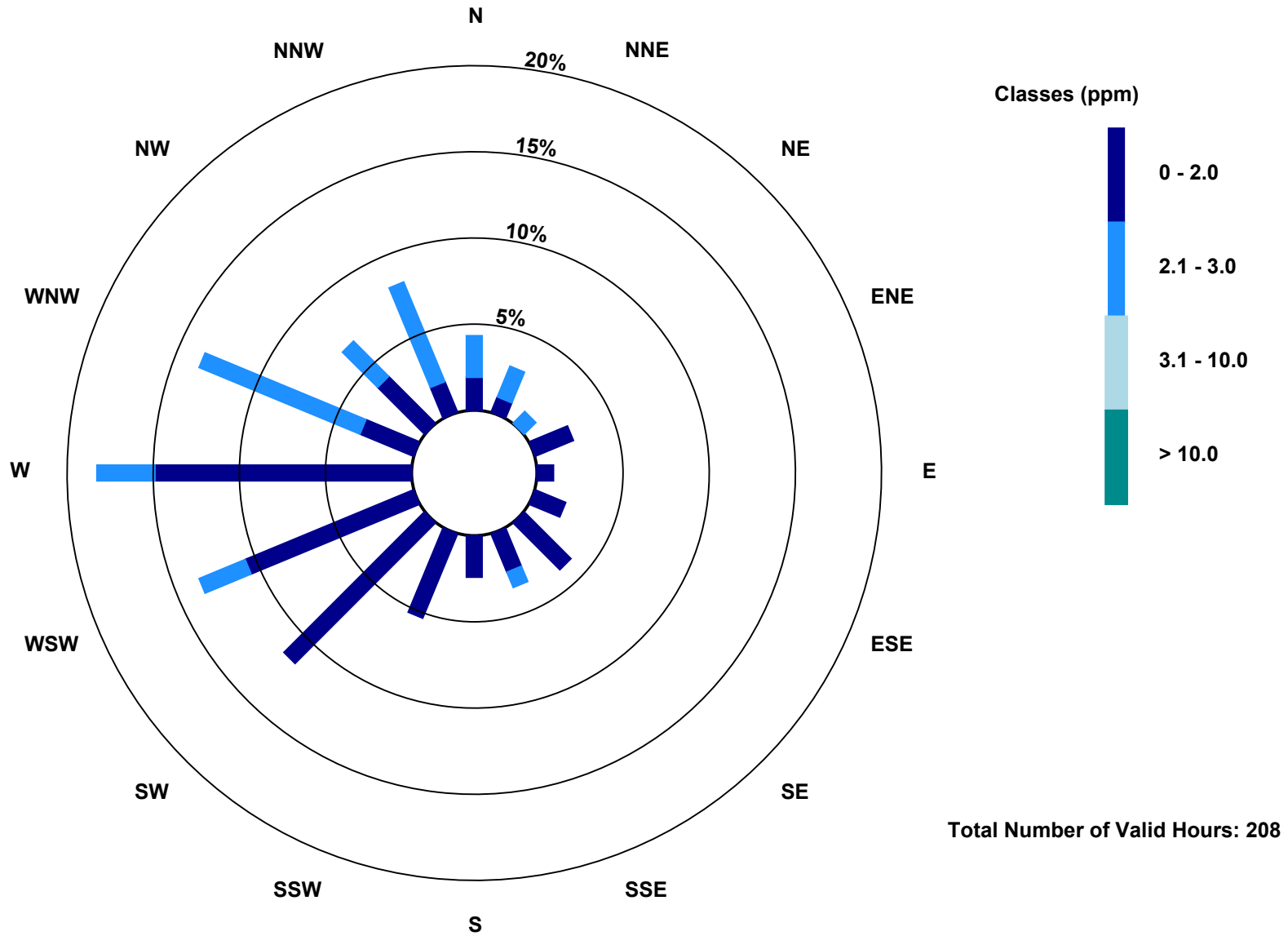
Total Number of Valid Hours: 208

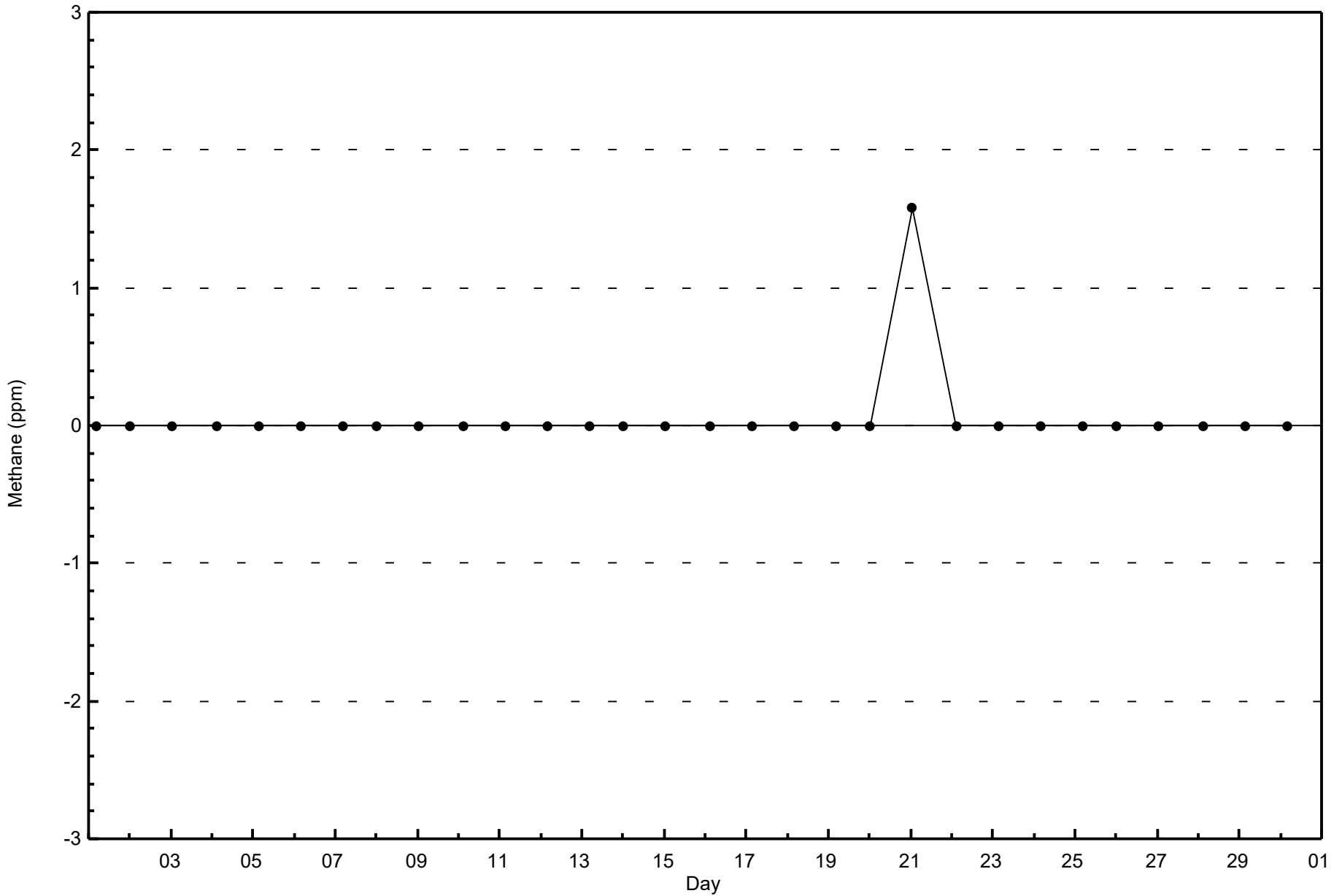
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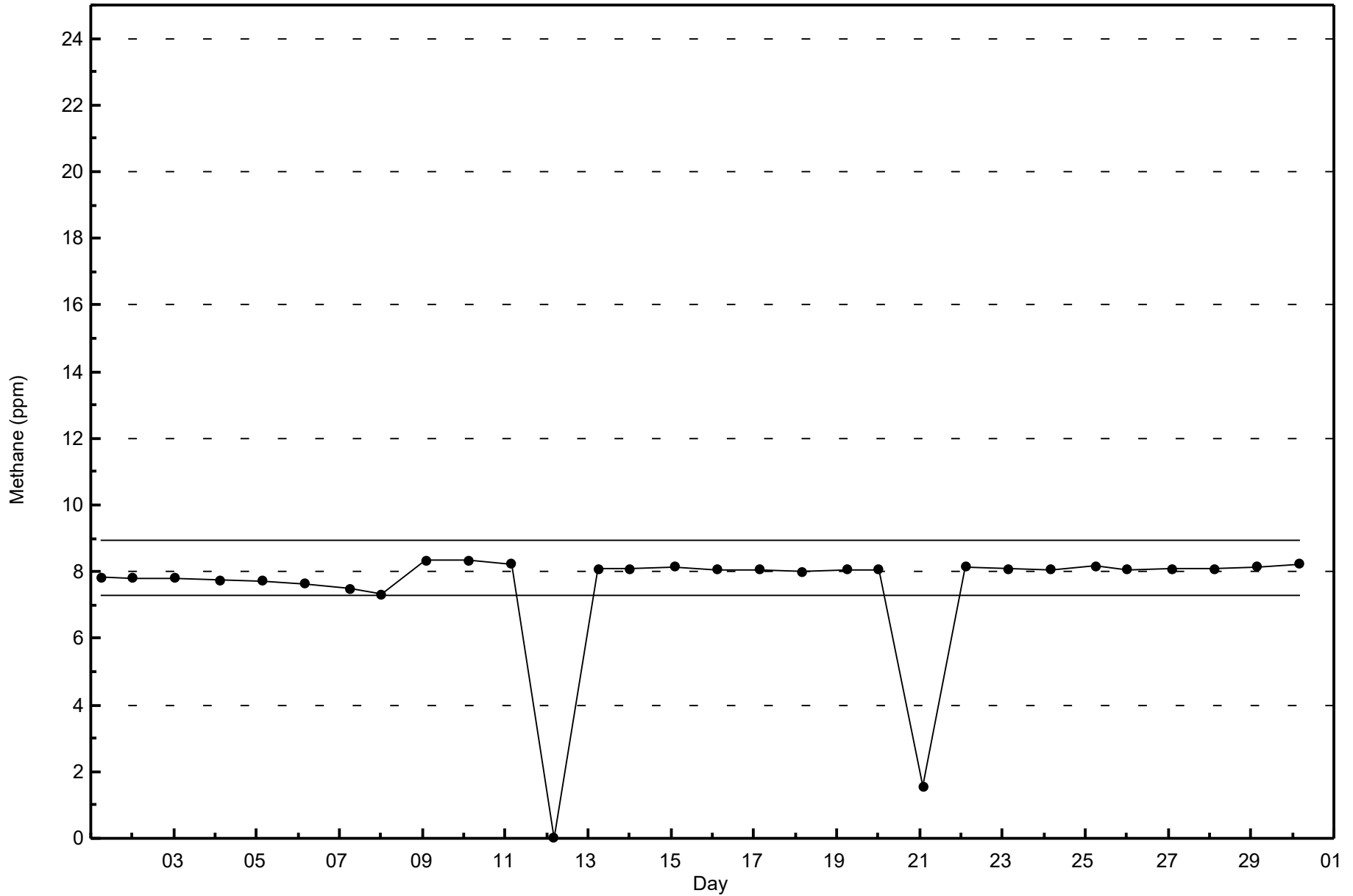


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Methane (CH₄) - ppm
Stony Mountain



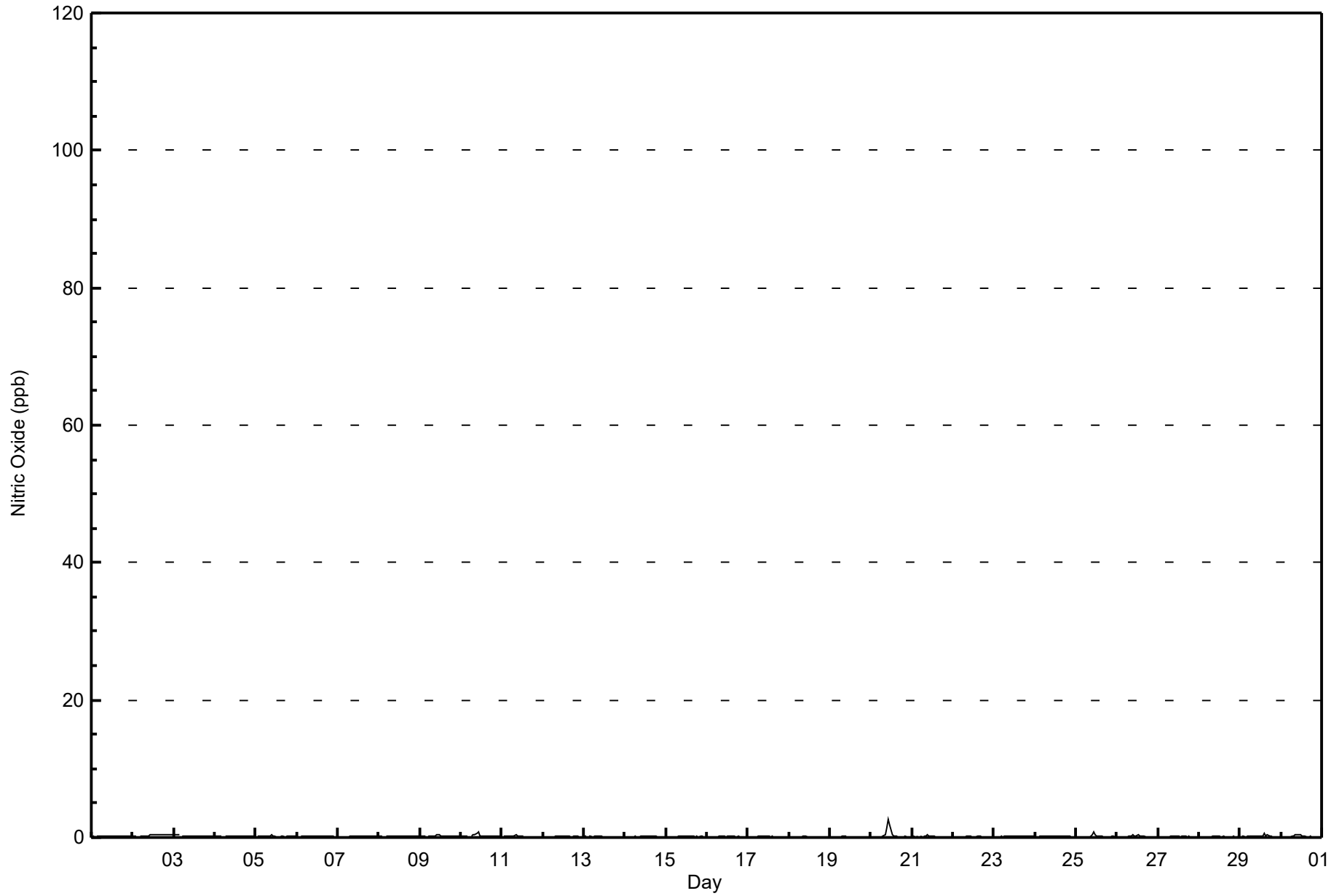






Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Stony Mountain - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb
Stony Mountain - September 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	673	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: 673

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Nitric Oxide (NO) - ppb
Stony Mountain - September 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	5	2	5	2	4	7	8	5	11	29	35	38	30	12	17	220
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	10	5	2	5	2	4	7	8	5	11	29	35	38	30	12	17	220

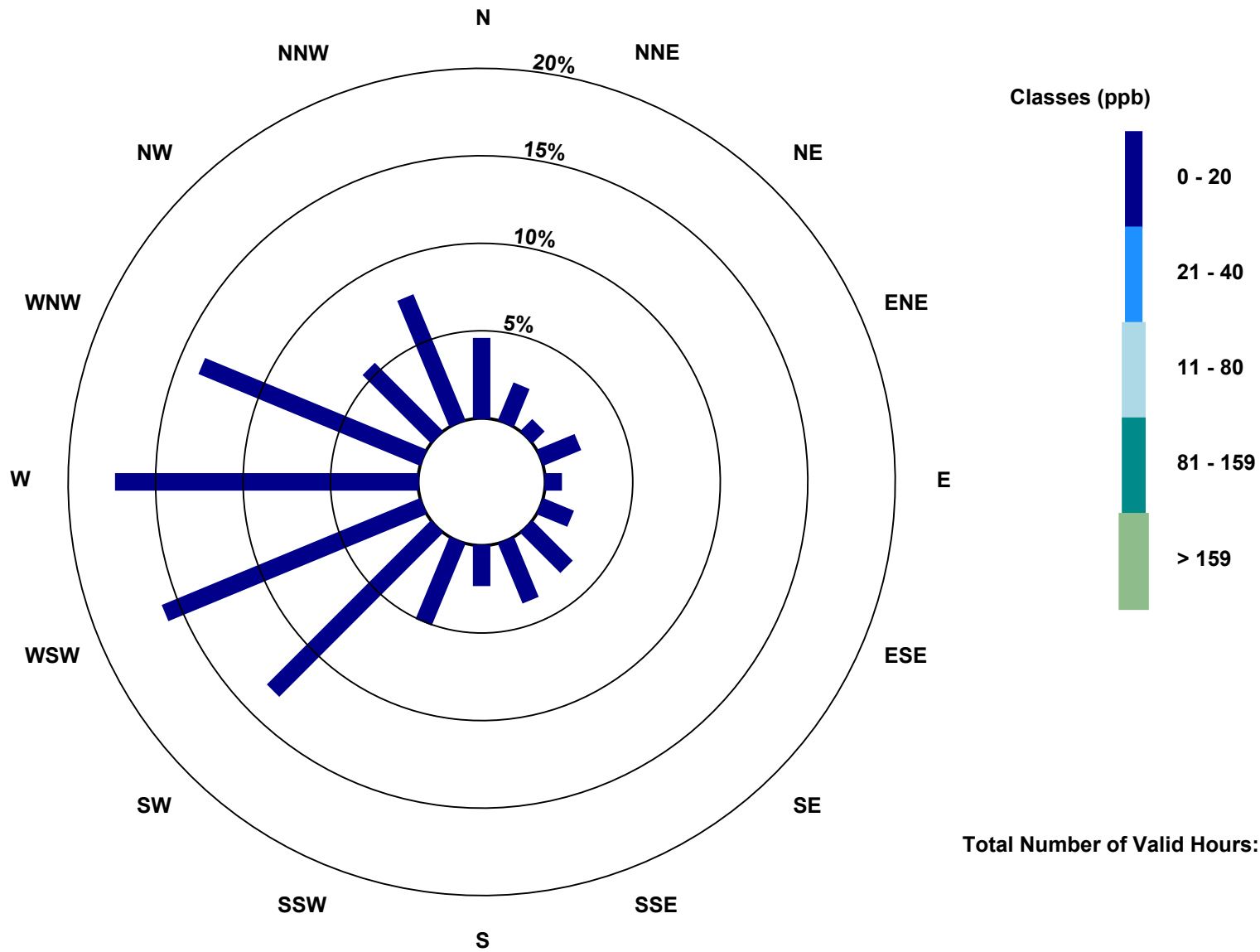
Total Number of Valid Hours: 220

Total Number of Hours: 720

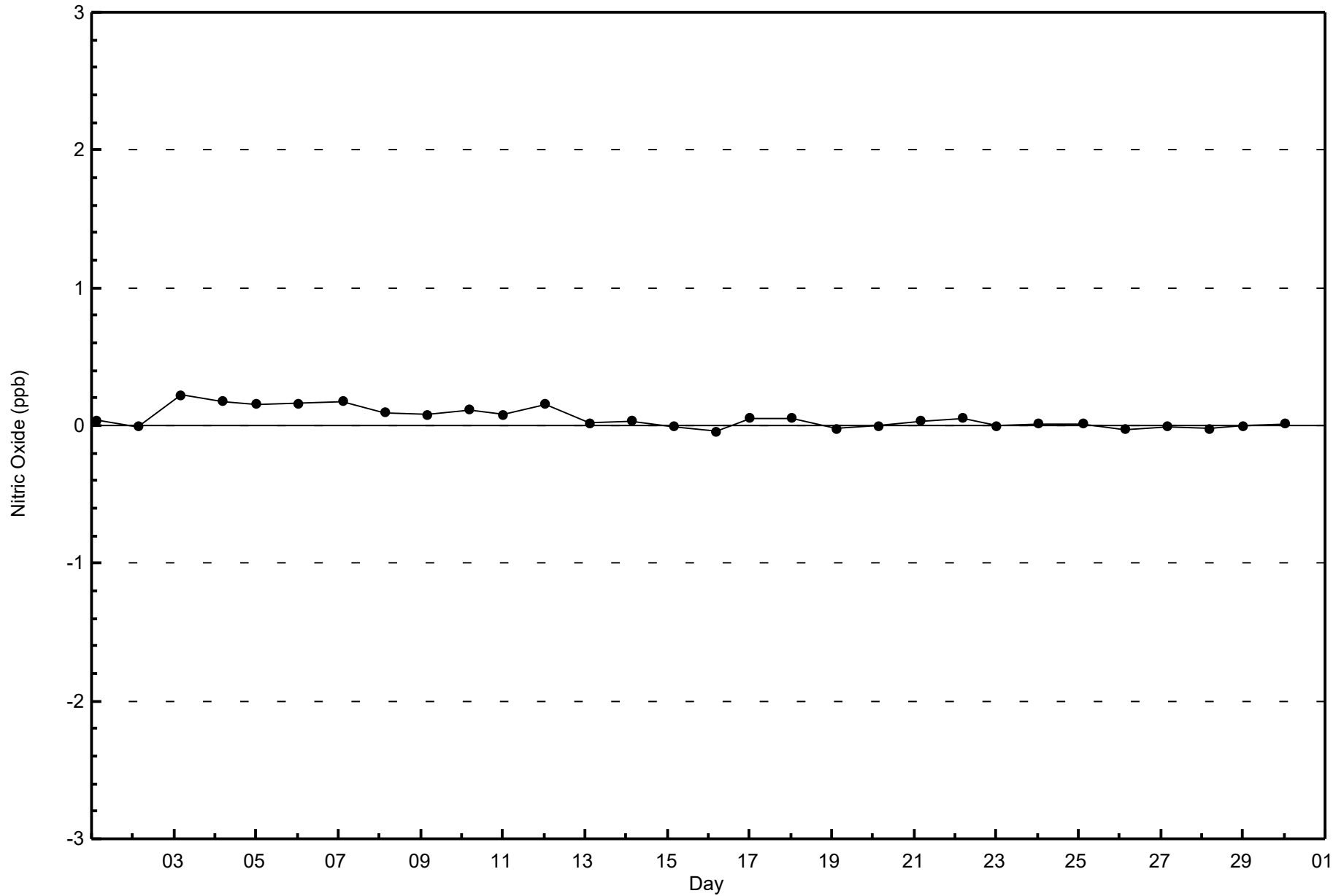


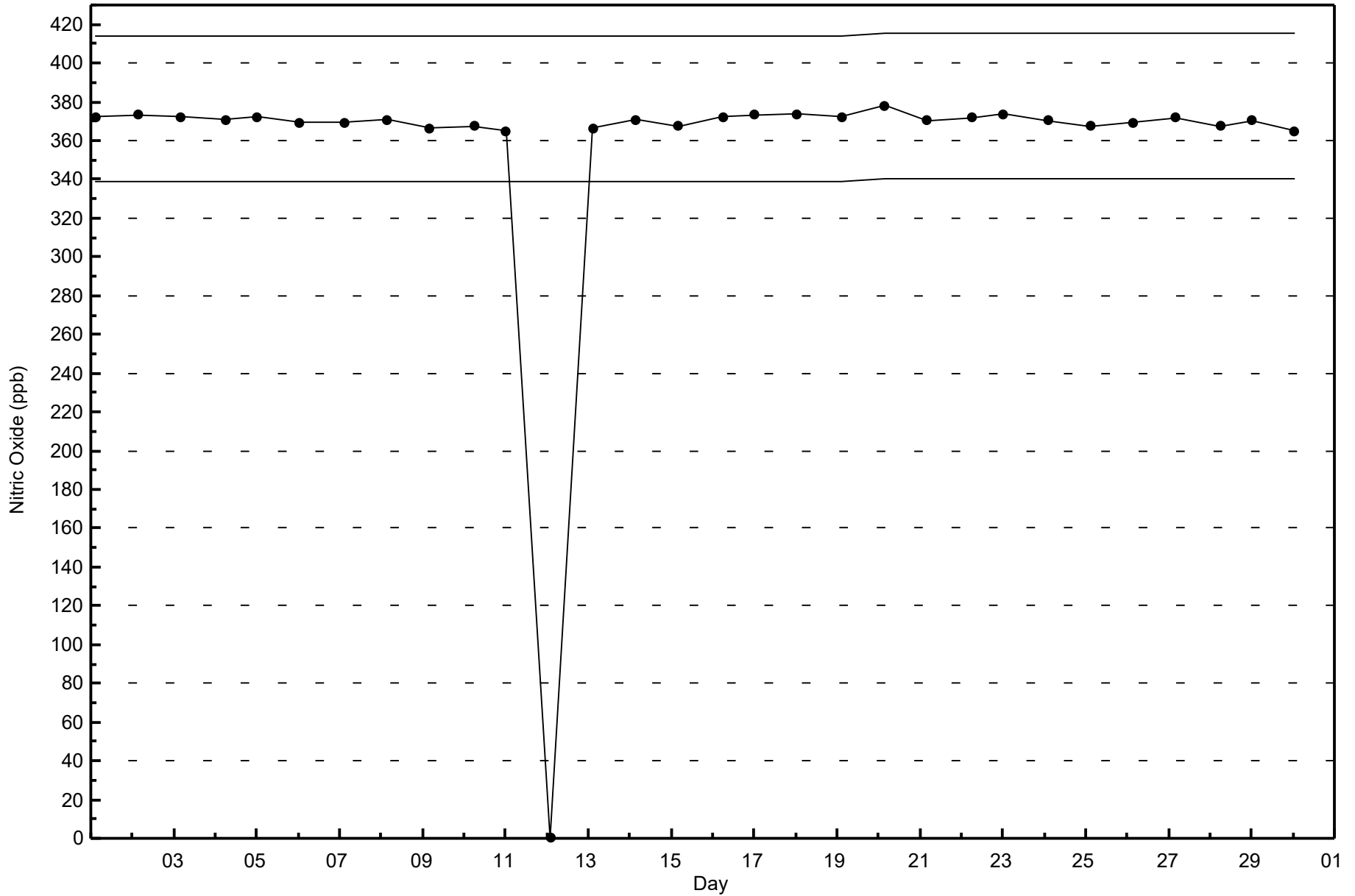
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitric Oxide (NO) - ppb
Stony Mountain



Total Number of Valid Hours: 220







Wood Buffalo Environmental Association
Summary of Hour Averages

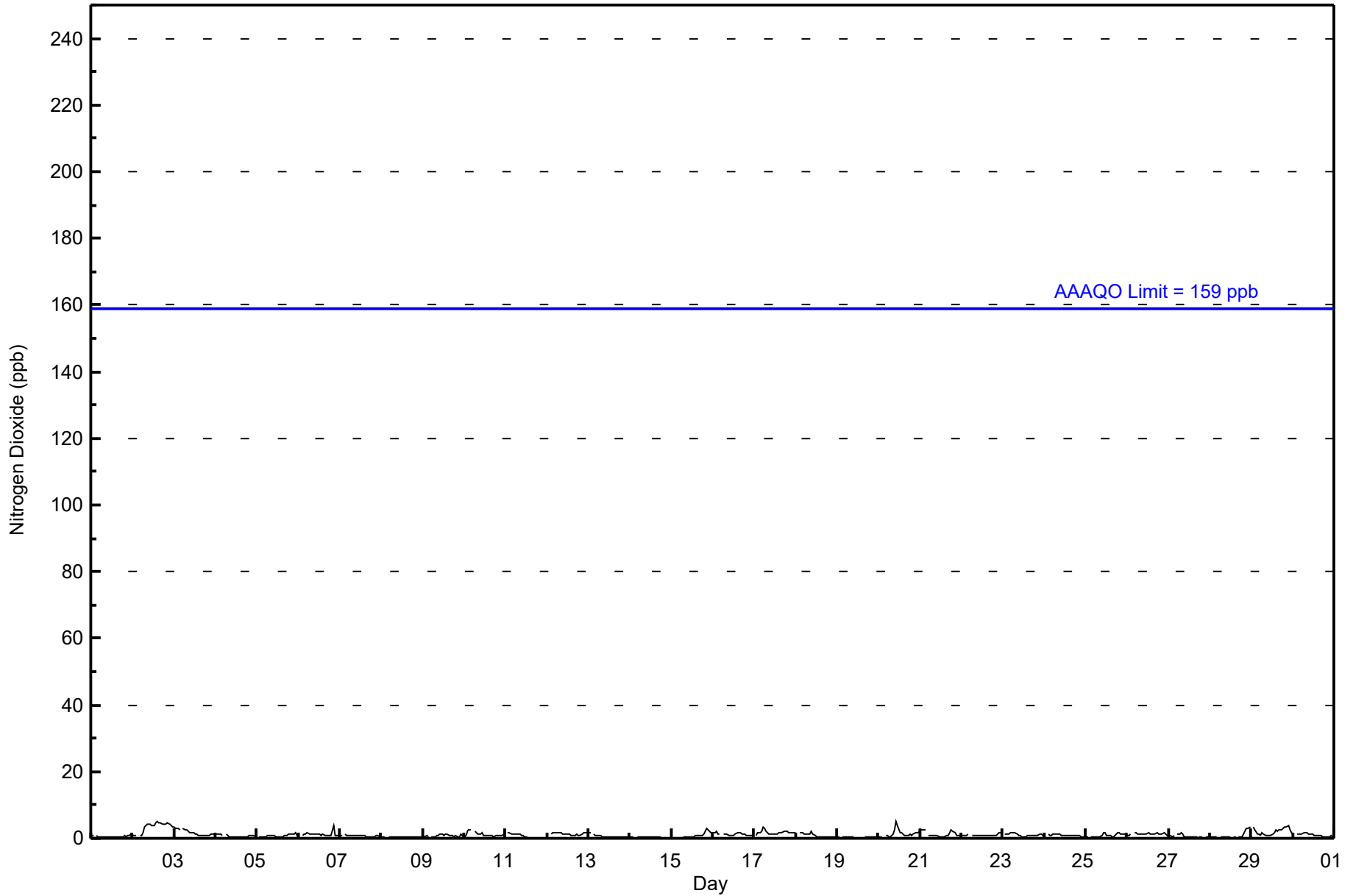
Nitrogen Dioxide (NO₂) - ppb
Stony Mountain - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0										Hours in Service: 720																	
Maximum Value: 5.1 ppb on Sep 2 15:00										Maximum Daily Average: 3.4 ppb on Sep 2										Hours of Data: 673							
Minimum Value: 0.1 ppb on Sep 15 01:00										Minimum Daily Average: 0.4 ppb on Sep 14										Hours of Missing Data: 47							
Maximum Diurnal Average: 1.3 ppb at hour 21										Minimum Diurnal Average: 0.9 ppb at hour 13										Hours of Calibration: 36							
Monthly Average: 1.09 ppb										Percentiles: P ₁ = 0.2 P ₁₀ = 0.4 Q ₁ = 0.5 Median = 0.9 Q ₃ = 1.3 P ₉₀ = 1.9 P ₉₉ = 4.3										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-Sep	0.8	0.7	Z	0.7	0.5	0.3	0.3	0.3	0.3	0.5	0.6	0.4	0.3	0.3	0.4	0.4	0.6	0.6	0.7	0.6	0.8	1.0	1.2	0.5	1.2		
2-Sep	0.9	0.7	0.7	Z	0.8	1.0	1.7	3.3	4.2	4.4	4.3	4.0	3.9	4.5	5.1	4.8	4.6	4.3	4.1	4.1	4.5	4.3	3.8	3.6	3.4	5.1	
3-Sep	3.5	3.1	2.8	2.6	Z	2.9	2.7	2.5	2.2	1.7	1.8	1.8	1.4	1.1	1.0	0.9	0.8	0.7	0.8	0.8	0.9	1.1	1.1	1.2	1.7	3.5	
4-Sep	1.2	1.3	1.2	1.2	1.0	Z	1.1	0.8	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.6	0.6	0.7	0.7	0.8	0.7	0.6	0.6	0.7	1.3	
5-Sep	Z	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.7	0.6	0.5	0.6	0.5	0.6	0.9	0.8	1.2	1.3	1.2	1.3	1.5	1.0	0.8	1.5	
6-Sep	1.4	Z	0.9	1.2	1.2	1.7	1.2	1.4	1.2	1.1	1.2	1.2	1.1	1.0	1.1	1.0	0.9	0.8	0.7	0.7	3.7	0.9	0.8	0.8	1.2	3.7	
7-Sep	0.9	1.0	Z	1.1	1.0	1.0	0.7	0.9	0.9	0.9	0.9	1.0	0.9	0.8	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.6	0.8	1.1	
8-Sep	0.5	0.6	0.6	Z	0.5	0.5	0.5	0.5	0.4	0.5	0.4	0.3	0.4	0.3	0.3	0.4	0.5	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.6	
9-Sep	0.5	0.6	0.7	0.5	Z	0.6	0.5	0.4	0.7	0.8	1.3	1.4	1.0	1.3	1.2	1.0	1.0	0.8	0.6	0.7	0.6	0.6	1.1	0.8	0.8	1.4	
10-Sep	0.6	1.1	2.5	2.4	2.4	Z	2.0	1.7	1.4	1.3	1.7	1.0	0.8	0.8	0.9	0.8	0.8	0.6	0.8	0.9	0.9	1.0	0.9	1.1	1.2	2.5	
11-Sep	Z	1.8	1.5	1.4	1.4	1.3	1.4	1.2	1.2	1.0	0.8	0.6	0.6	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	1.8	
12-Sep	1.2	Z	1.4	1.5	1.6	1.7	1.7	1.7	1.6	1.4	1.3	1.1	1.3	1.2	1.0	1.0	1.0	1.1	1.0	1.0	1.1	1.5	1.6	1.6	1.3	1.7	
13-Sep	1.9	1.6	Z	1.1	1.0	0.9	0.8	0.7	0.6	0.5	0.5	0.4	0.3	0.4	0.4	0.3	0.4	0.5	0.5	0.4	0.3	0.3	0.4	0.5	0.6	1.9	
14-Sep	0.5	0.4	0.4	Z	0.5	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	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.5	
15-Sep	0.1	0.1	0.1	0.1	Z	0.1	0.2	0.3	0.4	0.4	0.3	0.3	0.5	0.6	0.8	0.8	0.8	0.7	1.0	1.4	3.1	2.6	2.0	1.6	0.8	3.1	
16-Sep	1.6	1.6	2.3	1.2	1.2	Z	1.2	1.4	1.3	1.0	1.0	1.0	1.0	1.1	1.6	1.7	1.5	1.4	1.1	1.0	1.0	0.9	1.0	1.0	1.3	2.3	
17-Sep	Z	1.0	1.5	1.7	2.3	3.4	3.1	2.1	1.4	1.2	1.3	1.2	1.2	1.4	1.8	1.6	1.7	2.0	2.2	2.2	1.9	1.6	1.7	1.6	1.8	3.4	
18-Sep	1.6	Z	1.7	1.7	1.6	1.4	1.2	1.2	1.4	2.2	1.4	0.7	0.5	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.9	2.2	
19-Sep	0.5	0.5	Z	0.5	0.5	0.4	0.4	0.4	0.4	0.4	C	C	C	C	C	C	C	0.3	0.3	0.4	0.5	0.5	0.4	0.4	0.4	0.5	
20-Sep	0.4	0.3	0.4	Z	0.7	0.7	0.6	0.6	1.2	2.7	5.0	3.8	1.9	1.6	1.2	0.9	0.9	1.0	1.2	0.9	1.3	1.5	1.5	1.9	1.4	5.0	
21-Sep	2.5	2.7	2.5	2.6	Z	1.0	0.8	0.8	0.7	1.0	0.7	0.6	0.5	0.6	0.6	0.7	0.9	1.9	2.4	2.3	1.7	1.0	0.9	1.0	1.3	2.7	
22-Sep	0.9	1.0	1.0	1.0	1.1	Z	1.0	1.0	0.9	0.9	0.9	0.9	0.7	0.7	0.7	0.8	1.0	0.9	0.8	0.8	1.0	0.8	1.2	1.7	1.8	1.0	1.8
23-Sep	Z	1.3	1.3	1.3	1.5	1.9	1.5	1.9	1.4	0.9	0.9	0.6	0.6	0.6	0.7	0.7	0.9	1.0	1.0	0.8	0.9	1.1	1.1	0.9	1.1	1.9	
24-Sep	1.0	Z	1.2	1.0	1.0	1.3	1.4	1.3	1.3	1.1	1.0	0.9	0.9	0.8	0.7	0.8	0.8	0.8	0.8	0.9	0.9	0.6	0.4	0.4	0.9	1.4	
25-Sep	0.3	0.4	Z	0.3	0.4	0.4	0.4	0.4	0.3	1.0	1.9	1.5	0.9	0.7	0.9	0.6	0.4	0.9	1.9	1.7	1.3	1.3	1.3	1.1	0.9	1.9	
26-Sep	0.8	0.8	1.3	Z	1.5	1.5	1.4	1.4	1.4	1.4	1.2	1.4	1.9	1.3	1.3	1.3	1.4	1.5	1.4	1.3	1.3	1.5	1.4	0.9	1.3	1.9	
27-Sep	0.7	0.7	0.6	0.8	Z	1.1	1.4	1.7	1.1	0.6	0.5	0.5	0.4	0.3	0.3	0.4	0.3	0.2	0.4	0.3	0.2	0.2	0.3	0.3	0.6	1.7	
28-Sep	0.3	0.3	0.4	0.4	0.3	Z	0.4	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.3	0.2	0.2	0.3	0.3	1.2	2.1	3.1	3.0	3.6	0.8	3.6	
29-Sep	Z	3.3	2.6	1.2	1.1	1.0	1.6	1.3	0.9	1.0	1.0	0.9	1.1	1.5	2.5	2.1	2.6	2.4	2.9	3.2	3.5	3.9	2.4	1.6	2.0	3.9	
30-Sep	1.3	Z	1.2	1.1	1.1	1.4	1.6	1.8	1.5	1.2	1.1	1.2	0.9	0.9	0.8	0.7	0.7	0.6	0.5	0.5	0.5	0.6	0.8	0.3	1.0	1.8	
																								Diurnal Average			
																								Diurnal Maximum			
																								3.5 3.3 2.8 2.6 2.4 3.4 3.1 3.3 4.2 4.4 5.0 4.0 3.9 4.5 5.1 4.8 4.6 4.3 4.1 4.1 4.5 4.3 3.8 3.6			
Z - zerspan 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
Stony Mountain - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Stony Mountain - September 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	673	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: 673

Total Number of Hours: 720



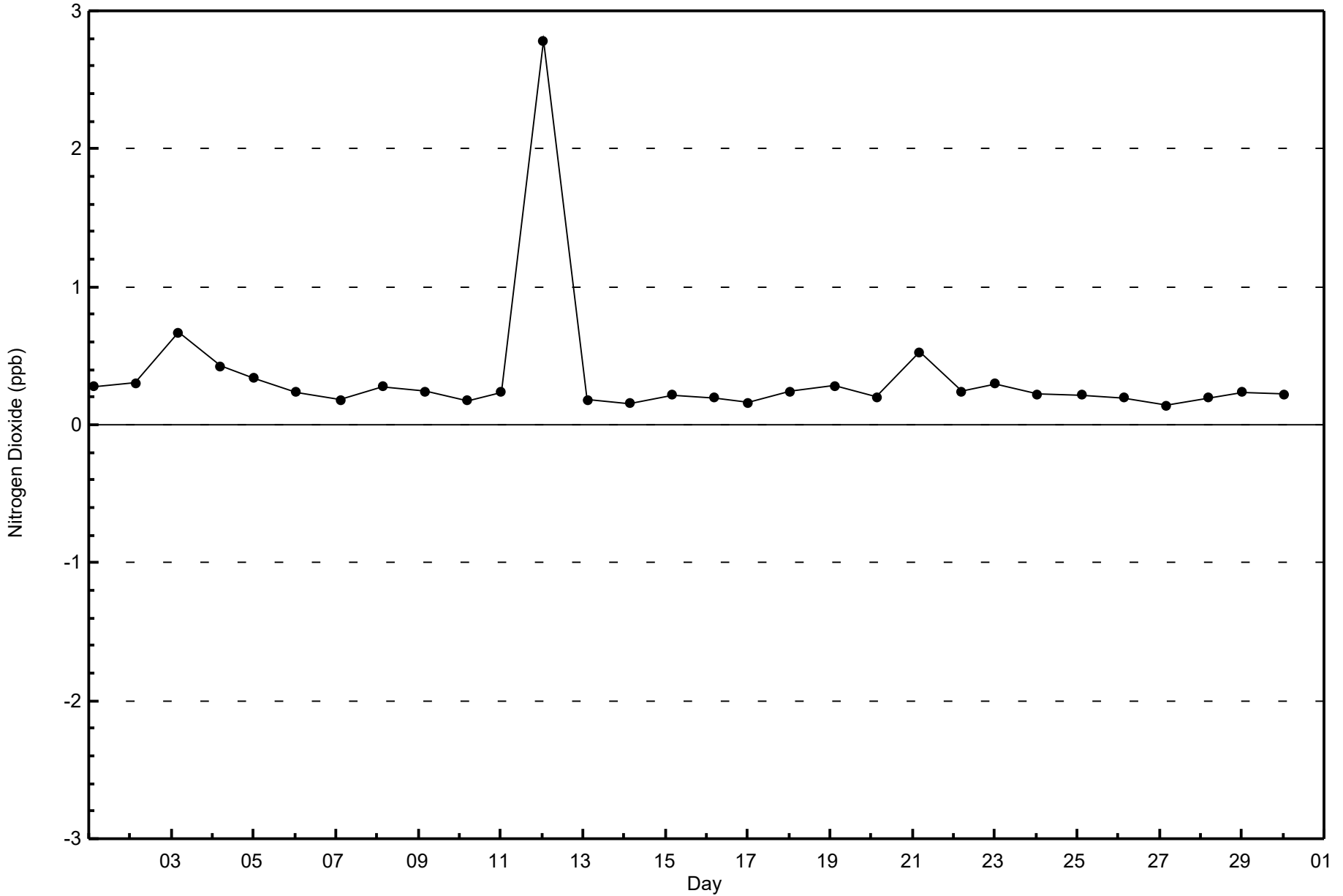
**Wood Buffalo Environmental Association
Frequency Distribution**

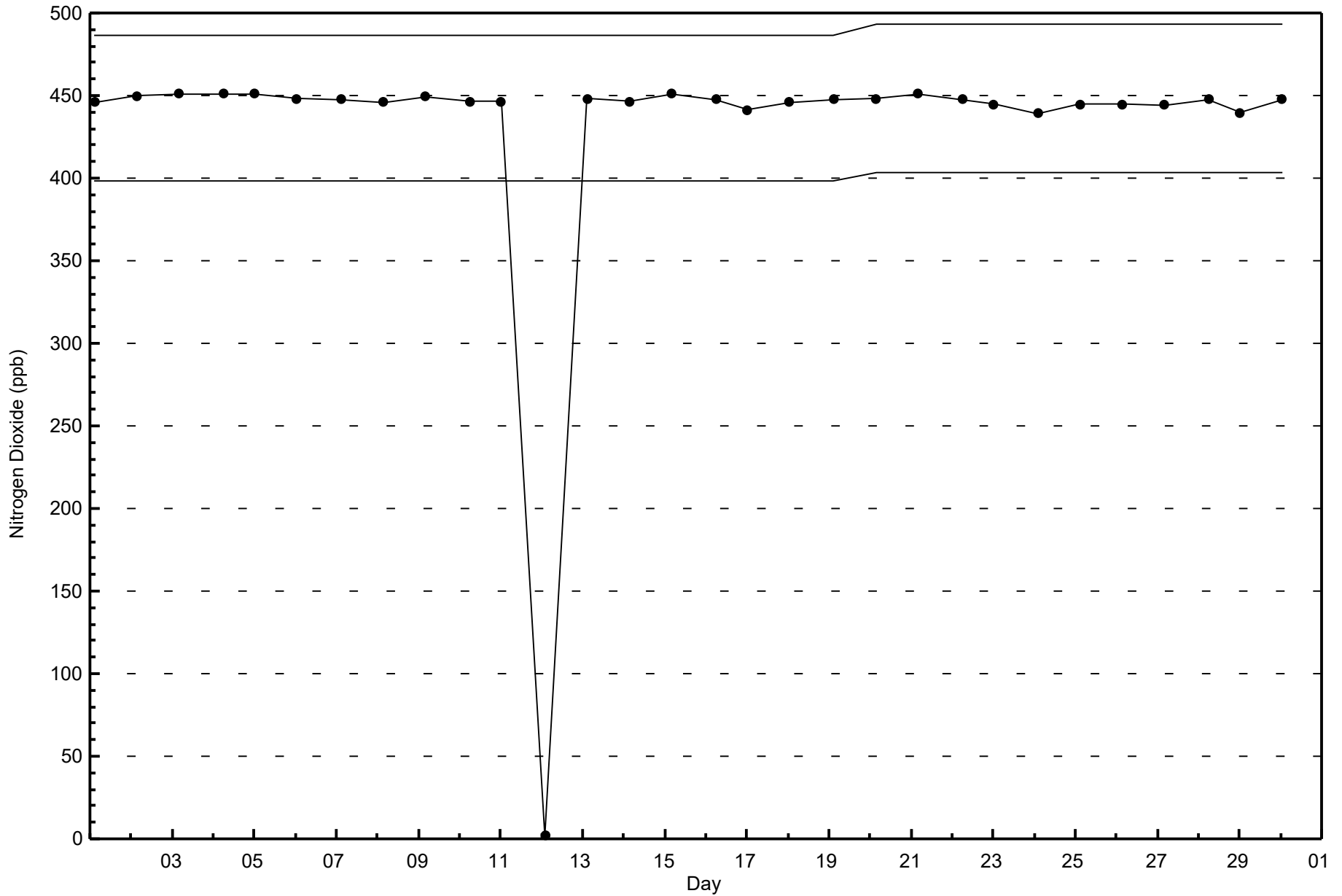
**Nitrogen Dioxide (NO₂) - ppb
Stony Mountain - September 2023**

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	5	2	5	2	4	7	8	5	11	29	35	38	30	12	17	220
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	10	5	2	5	2	4	7	8	5	11	29	35	38	30	12	17	220

Total Number of Valid Hours: 220

Total Number of Hours: 720







Wood Buffalo Environmental Association
Summary of Hour Averages

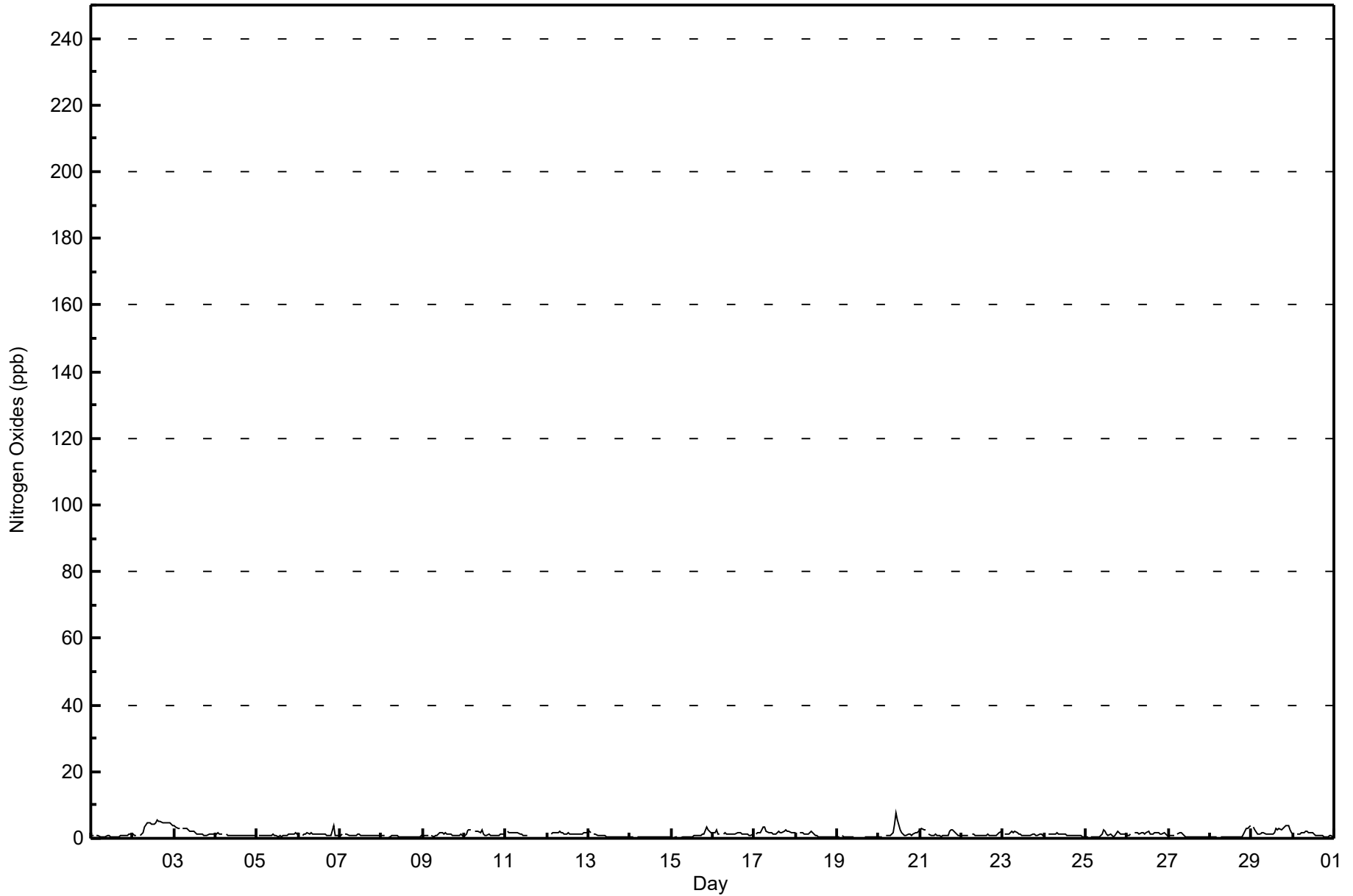
Nitrogen Oxides (NO_x) - ppb
Stony Mountain - September 2023

Maximum Value: 7.6 ppb on Sep 20 11:00																				Maximum Daily Average: 3.7 ppb on Sep 2					Hours in Service: 720				
Minimum Value: 0.2 ppb on Sep 15 06:00																				Minimum Daily Average: 0.4 ppb on Sep 14					Hours of Data: 673				
Maximum Diurnal Average: 1.5 ppb at hour 11																				Minimum Diurnal Average: 1.1 ppb at hour 18					Hours of Missing Data: 47				
Monthly Average: 1.24 ppb																				Percentiles: P ₁ = 0.3 P ₁₀ = 0.5 Q ₁ = 0.7 Median = 1.0 Q ₃ = 1.5 P ₉₀ = 2.2 P ₉₉ = 4.7					Hours of Calibration: 36				
																				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-Sep	1.0	0.9	Z	0.9	0.7	0.5	0.5	0.5	0.5	0.7	0.8	0.5	0.4	0.4	0.4	0.5	0.6	0.7	0.7	0.8	0.8	1.0	1.2	1.4	0.7	1.4			
2-Sep	1.1	0.8	0.8	Z	0.9	1.1	1.8	3.5	4.5	4.7	4.6	4.3	4.2	4.8	5.5	5.2	5.0	4.7	4.5	4.5	4.9	4.7	4.2	3.9	3.7	5.5			
3-Sep	3.8	3.4	3.1	2.9	Z	3.2	3.0	2.8	2.5	2.0	2.1	2.1	1.7	1.4	1.3	1.2	1.1	1.0	1.0	1.0	1.1	1.3	1.3	1.4	2.0	3.8			
4-Sep	1.4	1.5	1.4	1.4	1.2	Z	1.2	1.0	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.7	0.6	0.7	0.7	0.8	0.8	0.9	0.8	0.7	0.9	1.5			
5-Sep	Z	0.7	0.7	0.7	0.7	Z	0.7	0.8	0.9	0.9	1.1	0.9	0.7	0.6	0.7	0.6	0.7	1.0	0.9	1.3	1.4	1.4	1.7	1.1	0.9	1.7			
6-Sep	1.6	Z	1.0	1.3	1.3	1.9	1.4	1.7	1.4	1.3	1.4	1.4	1.3	1.2	1.2	1.1	1.0	0.9	0.8	0.8	3.9	1.0	0.9	0.9	1.3	3.9			
7-Sep	1.0	1.1	Z	1.2	1.1	1.1	0.8	1.0	1.0	1.0	1.1	1.1	1.0	0.9	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.7	0.9	1.2			
8-Sep	0.6	0.7	0.7	Z	0.6	0.6	0.7	0.7	0.7	0.7	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.7			
9-Sep	0.6	0.7	0.8	0.6	Z	0.7	0.6	0.6	0.9	1.1	1.6	1.7	1.2	1.6	1.4	1.2	1.2	1.0	0.7	0.8	0.7	0.7	1.2	0.9	1.0	1.7			
10-Sep	0.7	1.2	2.6	2.5	2.5	Z	2.2	2.1	1.9	1.9	2.5	1.2	1.0	1.0	1.1	1.0	0.9	0.7	0.9	1.0	1.0	1.1	1.1	1.2	1.5	2.6			
11-Sep	Z	2.0	1.7	1.6	1.6	1.5	1.6	1.5	1.5	1.3	1.0	0.8	0.8	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	2.0			
12-Sep	1.3	Z	1.5	1.6	1.6	1.8	1.8	1.9	1.9	1.7	1.5	1.3	1.5	1.3	1.1	1.1	1.1	1.2	1.1	1.1	1.2	1.6	1.7	1.7	1.5	1.9			
13-Sep	2.0	1.7	Z	1.2	1.1	1.0	0.9	0.8	0.7	0.6	0.6	0.5	0.4	0.5	0.5	0.4	0.5	0.5	0.5	0.4	0.3	0.3	0.4	0.6	0.7	2.0			
14-Sep	0.6	0.5	0.5	Z	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.6			
15-Sep	0.2	0.2	0.2	Z	0.2	Z	0.2	0.3	0.4	0.5	0.5	0.4	0.4	0.6	0.7	0.9	0.9	0.9	0.8	1.1	1.5	3.2	2.7	2.1	1.7	0.9	3.2		
16-Sep	1.7	1.7	2.4	1.3	1.3	Z	1.3	1.5	1.4	1.1	1.1	1.1	1.1	1.2	1.7	1.8	1.6	1.5	1.2	1.1	1.1	1.0	1.1	1.1	1.4	2.4			
17-Sep	Z	1.1	1.6	1.8	2.4	3.4	3.2	2.3	1.6	1.5	1.5	1.4	1.3	1.5	1.9	1.7	1.8	2.1	2.3	2.2	1.9	1.6	1.7	1.6	1.9	3.4			
18-Sep	1.6	Z	1.8	1.7	1.7	1.5	1.3	1.3	1.5	2.3	1.5	0.8	0.6	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1.0	2.3			
19-Sep	0.6	0.6	Z	0.6	0.6	0.5	0.5	0.5	0.5	0.5	C	C	C	C	C	C	C	0.3	0.3	0.4	0.5	0.5	0.4	0.4	--	0.6			
20-Sep	0.4	0.4	0.5	Z	0.8	0.8	0.7	0.7	1.6	4.0	7.6	5.6	2.4	1.8	1.3	1.0	1.0	1.1	1.3	1.0	1.4	1.6	1.6	2.0	1.8	7.6			
21-Sep	2.6	2.8	2.6	2.7	Z	1.1	0.9	0.9	0.8	1.3	0.9	0.7	0.6	0.7	0.7	0.8	1.0	2.0	2.5	2.4	1.8	1.1	0.9	1.0	1.4	2.8			
22-Sep	1.0	1.0	1.0	1.0	1.1	Z	1.1	1.1	1.0	1.0	1.0	0.8	0.8	0.8	0.9	1.2	1.0	0.9	0.9	1.0	0.9	1.3	1.8	1.9	1.1	1.9			
23-Sep	Z	1.4	1.4	1.4	1.6	2.0	1.6	2.2	1.7	1.1	1.1	0.8	0.8	0.8	0.9	0.9	1.1	1.1	1.1	0.9	1.0	1.2	1.2	1.0	1.2	2.2			
24-Sep	1.1	Z	1.3	1.1	1.1	1.4	1.5	1.5	1.5	1.4	1.2	1.1	1.1	1.0	0.9	0.9	0.9	0.9	0.9	1.0	1.0	0.7	0.5	0.5	1.1	1.5			
25-Sep	0.4	0.5	Z	0.4	0.4	0.5	0.5	0.5	0.4	1.4	2.6	2.0	1.1	0.9	1.1	0.7	0.5	1.0	2.0	1.8	1.4	1.4	1.4	1.2	1.0	2.6			
26-Sep	0.9	0.9	1.4	Z	1.6	1.6	1.5	1.5	1.6	1.7	1.5	1.6	2.3	1.5	1.4	1.4	1.5	1.6	1.5	1.4	1.4	1.6	1.5	1.0	1.5	2.3			
27-Sep	0.8	0.7	0.7	0.8	Z	1.2	1.5	1.8	1.2	0.7	0.6	0.6	0.5	0.4	0.4	0.5	0.4	0.3	0.5	0.4	0.3	0.3	0.4	0.4	0.7	1.8			
28-Sep	0.4	0.4	0.5	0.5	0.4	Z	0.5	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.4	0.3	0.3	0.4	0.4	1.3	2.2	3.2	3.1	3.7	0.9	3.7			
29-Sep	Z	3.4	2.7	1.3	1.3	1.1	1.7	1.5	1.1	1.2	1.2	1.1	1.3	1.7	3.1	2.4	3.1	2.6	3.0	3.3	3.6	4.0	2.5	1.7	2.2	4.0			
30-Sep	1.4	Z	1.3	1.2	1.2	1.5	1.7	2.0	1.9	1.6	1.5	1.6	1.1	1.0	0.9	0.8	0.8	0.7	0.6	0.6	0.6	0.7	0.9	0.4	1.1	2.0			
																								Diurnal Average					
																								Diurnal Maximum					
Z - zerspan																													
C - Calibration																													
PF - Power Failure																													



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Stony Mountain - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Stony Mountain - September 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	673	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: 673

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Stony Mountain - September 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	5	2	5	2	4	7	8	5	11	29	35	38	30	12	17	220
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	10	5	2	5	2	4	7	8	5	11	29	35	38	30	12	17	220

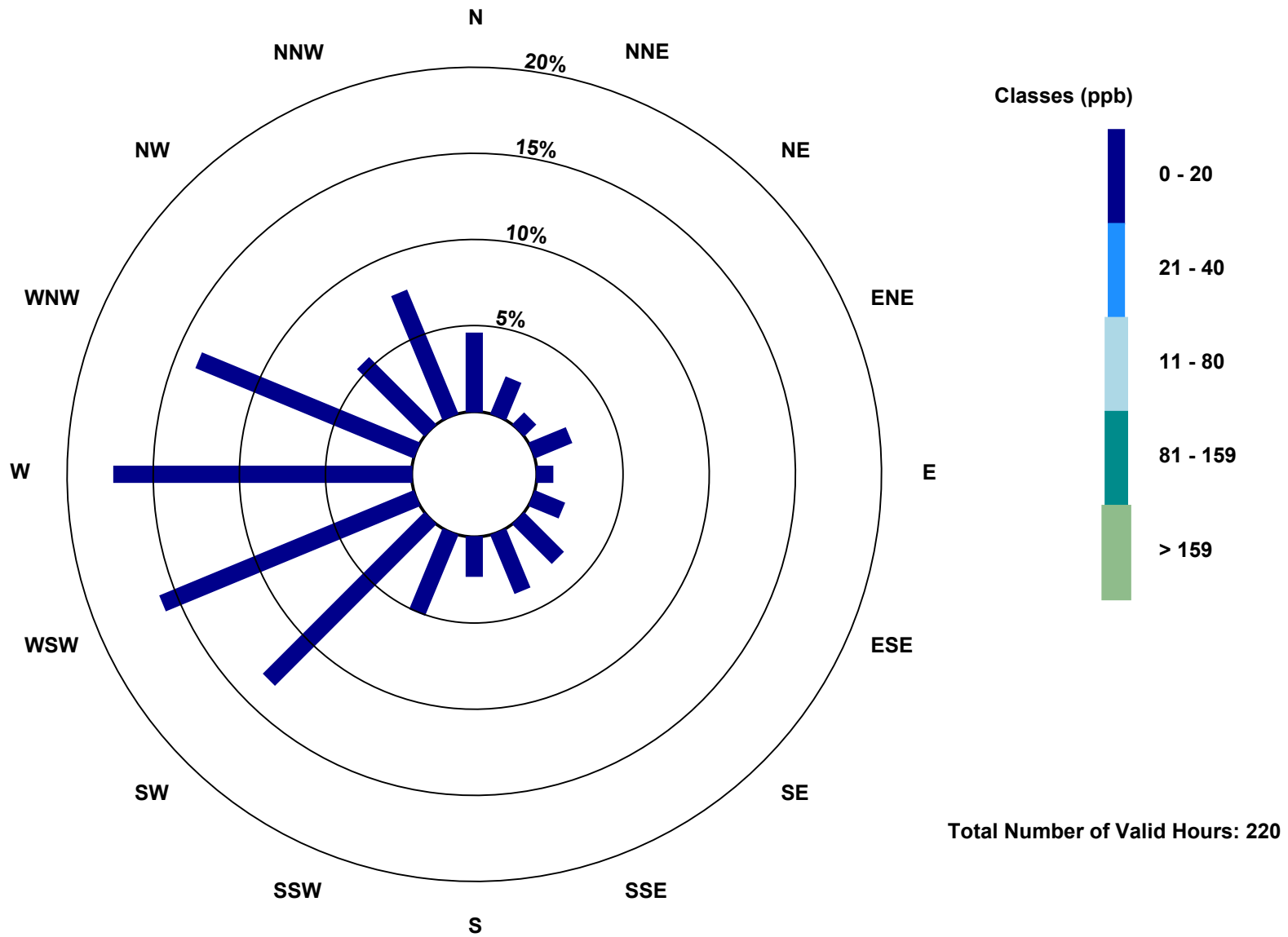
Total Number of Valid Hours: 220

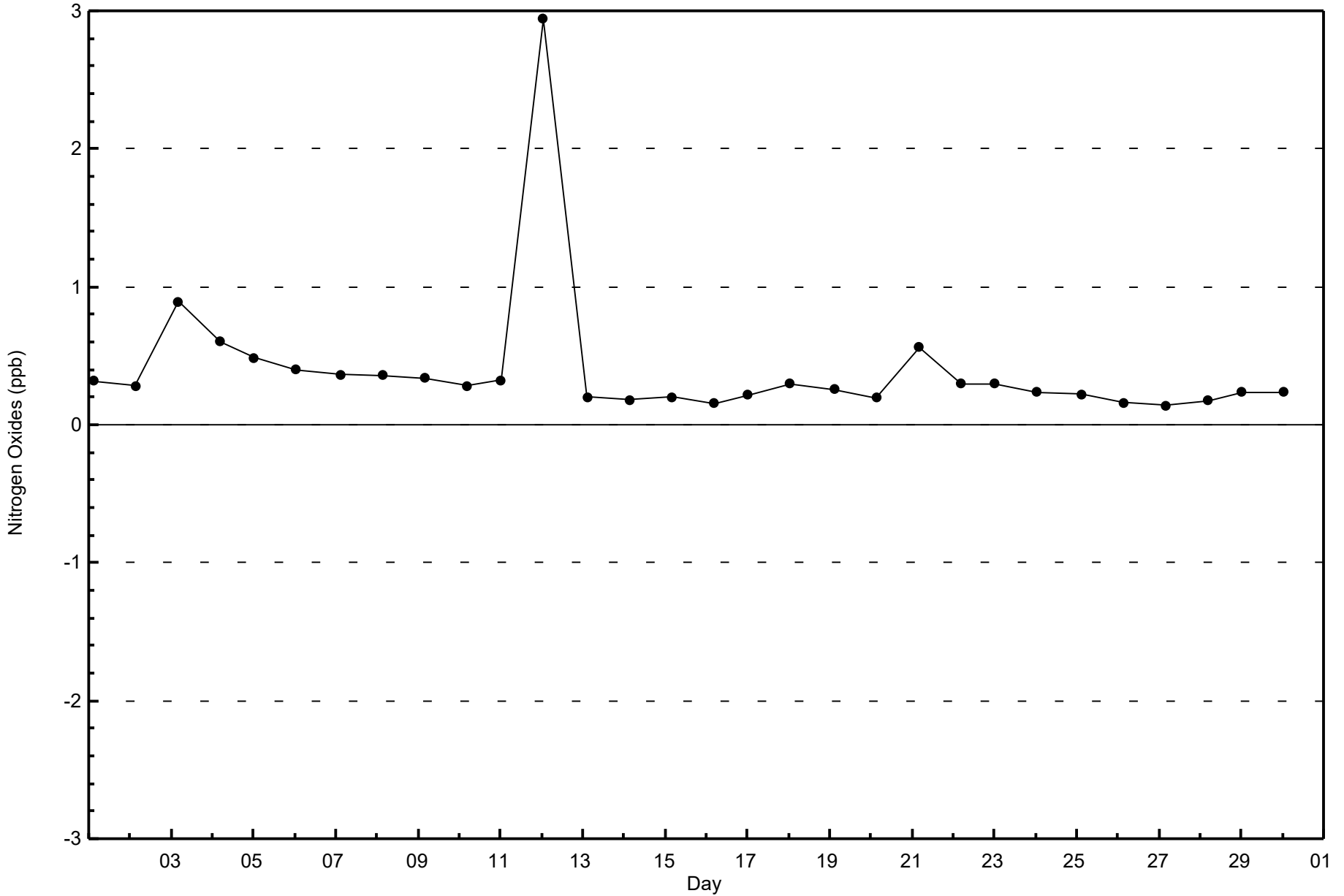
Total Number of Hours: 720

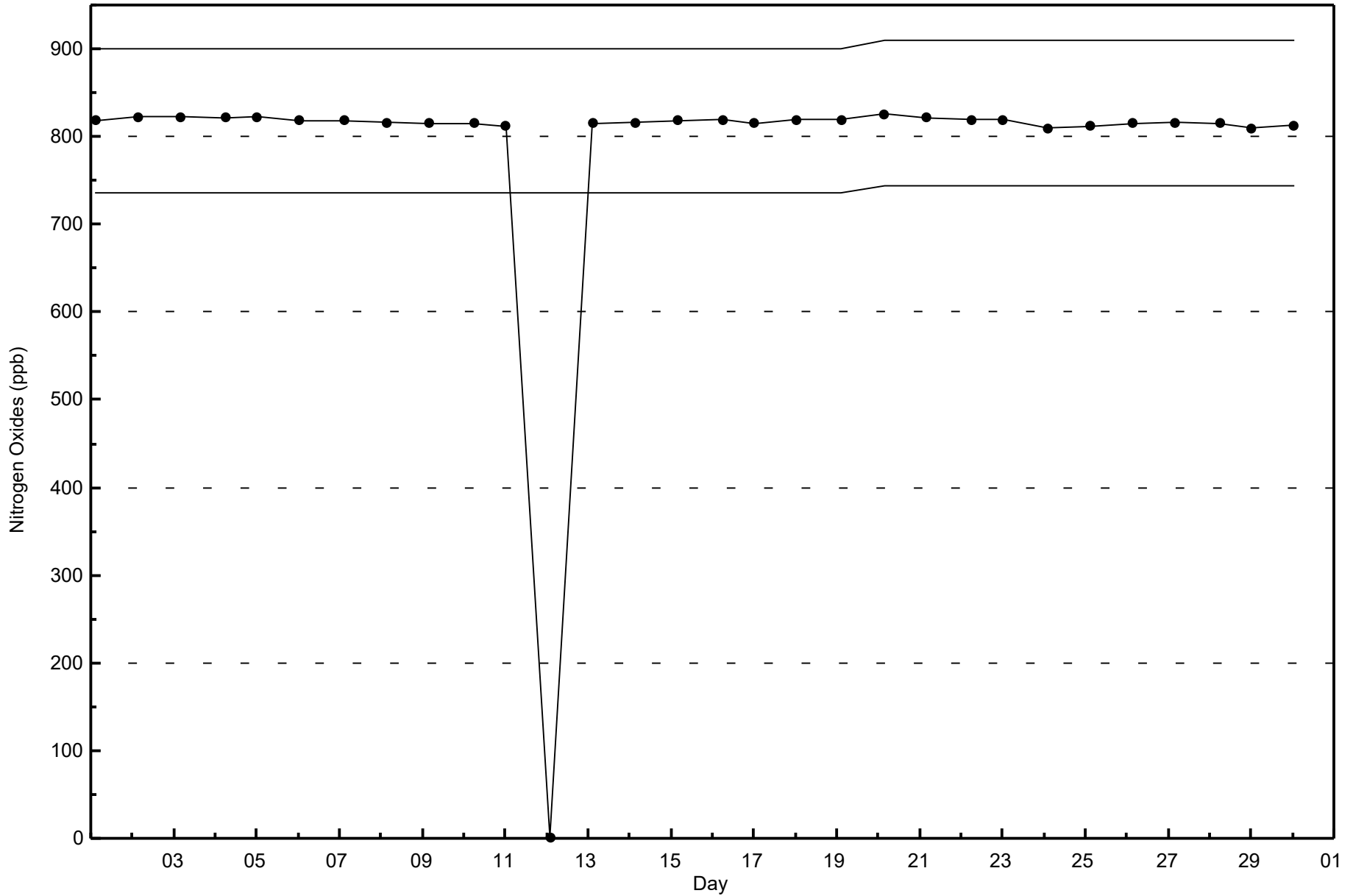


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitrogen Oxides (NO_x) - ppb
Stony Mountain









Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O₃) - ppb

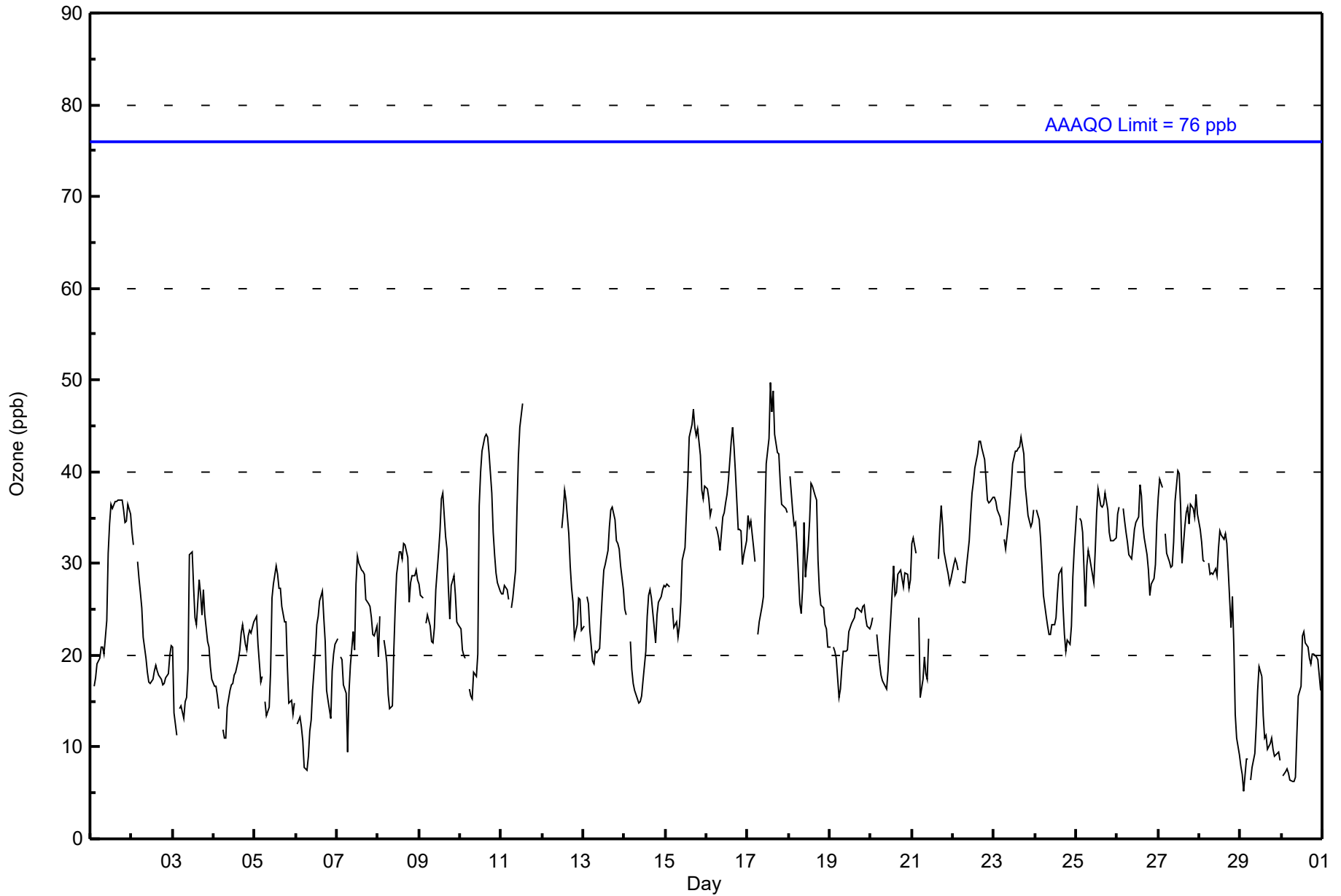
Stony Mountain - September 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		720																			
Maximum Value: 49.8 ppb on Sep 17 14:00		Maximum Daily Average: 37.6 ppb on Sep 23				Hours of Data:		665																			
Minimum Value: 5.1 ppb on Sep 29 03:00		Minimum Daily Average: 10.4 ppb on Sep 29				Hours of Missing Data:		55																			
Maximum Diurnal Average: 32.2 ppb at hour 16		Minimum Diurnal Average: 20.4 ppb at hour 7				Hours of Calibration:		33																			
Monthly Average: 26.73 ppb		Percentiles: P ₁ = 6.9 P ₁₀ = 15.4 Q ₁ = 20.4 Median = 27.0 Q ₃ = 33.7 P ₉₀ = 37.5 P ₉₉ = 44.9				Percent Operational Time:		96.9																			
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Sep	16.5	Z	16.6	17.6	19.0	19.7	20.9	20.9	20.2	23.9	31.1	34.3	36.5	36.0	36.8	36.8	36.9	36.9	37.0	35.8	34.5	34.6	36.5	35.4	29.3	37.0	
2-Sep	33.5	32.1	Z	30.2	28.4	26.9	25.1	22.0	19.7	18.1	17.1	17.0	17.4	18.3	18.8	18.3	17.9	17.4	16.8	17.0	17.5	18.0	20.0	21.0	21.2	33.5	
3-Sep	20.9	13.7	11.2	Z	14.2	14.5	13.1	15.0	15.5	18.4	30.9	31.3	27.4	24.1	23.4	28.2	26.7	24.4	27.2	24.5	21.5	21.0	18.7	17.4	21.0	31.3	
4-Sep	16.7	16.6	15.5	14.2	Z	12.0	10.9	11.0	14.3	16.1	16.8	16.9	17.9	18.1	19.6	20.5	22.5	23.3	21.2	20.7	22.1	22.7	22.4	23.7	18.1	23.7	
5-Sep	23.9	24.3	21.2	17.1	17.6	Z	15.0	13.4	14.4	18.4	26.2	27.7	29.7	28.8	27.3	27.3	25.3	23.6	23.6	18.7	14.8	15.0	13.6	14.7	20.9	29.7	
6-Sep	Z	12.5	13.2	12.3	10.7	7.8	7.5	9.1	11.8	13.0	16.2	20.5	23.3	24.3	25.9	27.0	24.0	21.5	16.2	15.2	13.2	18.2	20.2	21.2	16.7	27.0	
7-Sep	21.8	Z	19.8	19.6	16.8	15.8	9.5	16.1	18.9	22.6	20.6	27.7	30.8	30.1	29.3	29.1	28.8	26.1	25.6	25.3	24.1	22.2	22.1	23.2	22.9	30.8	
8-Sep	19.9	24.2	Z	21.6	20.5	19.3	15.6	14.1	14.5	20.5	25.2	28.8	31.3	31.3	30.6	32.2	32.1	30.6	25.9	28.0	28.7	28.7	29.2	28.2	25.3	32.2	
9-Sep	27.8	26.5	26.3	Z	23.6	24.5	23.2	21.5	21.4	23.0	27.1	31.3	33.5	37.0	37.7	33.0	31.6	27.2	23.9	27.6	28.6	26.5	23.6	23.4	27.4	37.7	
10-Sep	22.8	20.6	19.9	19.7	Z	16.4	15.5	15.3	18.2	17.7	20.2	36.3	39.9	42.3	43.8	44.1	43.8	42.1	37.6	33.3	30.9	29.0	28.0	26.9	28.9	44.1	
11-Sep	26.7	26.7	27.7	27.2	26.1	Z	25.2	26.2	29.2	35.9	41.7	44.9	47.4	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	47.4
12-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	33.9	35.6	38.0	36.9	33.3	29.7	27.3	25.7	22.0	23.3	26.3	26.0	22.7	--	38.0	
13-Sep	23.2	Z	26.4	25.7	22.8	19.4	19.1	20.5	20.3	20.7	23.9	26.8	29.3	29.9	31.5	34.0	35.9	36.2	34.7	32.5	32.1	31.6	29.7	27.2	27.5	36.2	
14-Sep	25.0	24.4	Z	21.5	18.4	17.0	16.1	15.7	14.8	14.9	15.5	17.3	20.4	24.3	26.6	27.1	26.3	23.0	21.4	24.4	25.8	26.4	27.2	27.6	21.8	27.6	
15-Sep	27.4	27.8	27.5	Z	25.2	23.0	23.7	22.0	23.1	25.8	30.3	31.7	35.5	39.1	43.7	45.1	46.8	44.9	43.9	44.8	41.8	38.1	37.1	38.4	34.2	46.8	
16-Sep	38.1	37.1	35.3	36.1	Z	34.0	33.6	32.9	31.5	35.0	35.6	36.6	37.6	39.1	43.4	44.8	42.7	40.0	33.7	33.7	33.5	29.9	31.0	32.5	36.0	44.8	
17-Sep	35.2	34.1	34.7	31.8	30.2	Z	22.2	23.7	25.3	26.4	34.6	41.0	43.7	49.8	46.5	48.8	44.1	42.2	42.0	38.9	36.4	36.1	36.0	35.6	36.5	49.8	
18-Sep	Z	39.6	35.5	34.2	34.5	32.0	25.6	24.6	27.3	34.5	28.5	32.0	34.6	38.7	38.5	37.4	36.9	30.4	27.0	25.5	25.1	23.3	22.8	20.8	30.8	39.6	
19-Sep	20.9	Z	20.9	20.4	19.6	15.5	16.3	18.6	20.4	20.4	20.6	22.6	23.1	23.5	24.2	25.0	25.2	25.1	24.7	25.3	25.5	24.2	23.2	22.9	22.1	25.5	
20-Sep	23.3	24.1	Z	22.2	20.6	19.1	17.9	17.2	16.6	16.3	18.4	21.5	27.0	29.7	26.6	26.8	28.8	29.2	28.3	27.5	28.9	28.8	27.4	28.2	24.1	29.7	
21-Sep	32.3	32.8	31.1	Z	24.1	15.4	17.4	19.9	18.0	17.4	21.8	C	C	C	C	30.5	33.9	36.3	34.2	31.3	29.6	28.9	27.7	28.4	26.9	36.3	
22-Sep	29.9	30.5	30.1	29.4	Z	28.1	27.8	27.9	29.6	32.4	35.3	37.6	39.0	40.4	42.0	43.3	43.3	42.5	41.4	39.2	37.0	36.6	36.8	37.3	35.5	43.3	
23-Sep	37.2	36.7	35.9	35.1	34.1	Z	32.6	31.6	34.4	36.5	38.5	40.9	42.2	42.2	42.5	42.7	43.8	41.9	38.4	37.0	35.2	34.0	34.5	35.8	37.6	43.8	
24-Sep	Z	35.8	34.9	32.6	29.6	26.5	24.2	23.1	22.2	22.3	23.3	23.4	24.1	26.7	28.8	29.5	25.4	22.3	20.4	21.7	21.2	23.2	28.5	31.5	26.1	35.8	
25-Sep	36.3	Z	35.0	34.6	33.4	25.4	29.7	31.4	30.6	28.8	27.9	31.5	35.5	38.1	36.3	36.1	36.5	37.6	35.8	33.4	32.6	32.5	32.5	32.8	33.2	38.1	
26-Sep	35.4	36.2	Z	35.9	34.6	33.4	32.4	31.0	30.6	32.0	33.7	34.5	35.1	38.6	37.3	34.1	32.7	30.9	29.2	26.6	27.8	28.4	29.9	34.5	32.8	38.6	
27-Sep	37.2	39.2	38.3	Z	33.2	31.0	30.2	29.6	29.7	32.4	36.8	40.1	39.8	36.1	30.0	34.0	35.5	36.2	34.3	36.4	36.0	35.1	37.6	35.5	35.0	40.1	
28-Sep	33.8	32.3	30.4	30.2	Z	30.0	28.9	29.0	28.9	29.5	28.7	31.6	33.6	33.0	32.7	33.2	32.2	29.3	23.1	26.4	21.0	13.7	10.9	9.1	27.4	33.8	
29-Sep	8.0	7.0	5.1	8.7	8.7	Z	6.5	7.7	9.3	12.3	16.2	18.7	17.6	13.5	11.0	11.2	9.7	10.3	10.9	9.8	8.9	9.3	9.4	8.6	10.4	18.7	
30-Sep	Z	6.9	7.3	7.6	7.1	6.4	6.2	6.2	6.8	11.2	15.5	16.6	22.1	22.6	21.3	20.9	19.7	19.1	20.1	20.2	19.9	19.6	17.8	16.1	14.7	22.6	
		26.9	26.7	25.0	24.4	23.0	21.4	20.4	20.6	21.3	23.3	26.1	29.5	31.4	31.9	31.9	32.2	31.7	30.3	28.4	27.7	26.8	26.3	26.2	26.2	Diurnal Average	
		38.1	39.6	38.3	36.1	34.6	34.0	33.6	32.9	34.4	36.5	41.7	44.9	47.4	49.8	46.5	48.8	46.8	44.9	43.9	44.8	41.8	38.1	37.6	38.4	Diurnal Maximum	
Z - zerospan		C - Calibration		UO - Unstable Operation		PF - Power Failure																					
Alberta Ambient Air Quality Objectives (AAAQO):		1-hr		76 ppb																							



Wood Buffalo Environmental Association
Hourly Averages

Ozone (O₃) - ppb
Stony Mountain - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ozone (O₃) - ppb
Stony Mountain - September 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	169	25.41	25.41
21 - 50	496	74.59	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 665

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Ozone (O₃) - ppb
Stony Mountain - September 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	4	1	1	2	4	6	4	1	4	11	11	16	24	10	14	122
21 - 50	1	2	1	4	0	0	1	4	4	7	17	24	24	3	4	2	98
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	6	2	5	2	4	7	8	5	11	28	35	40	27	14	16	220

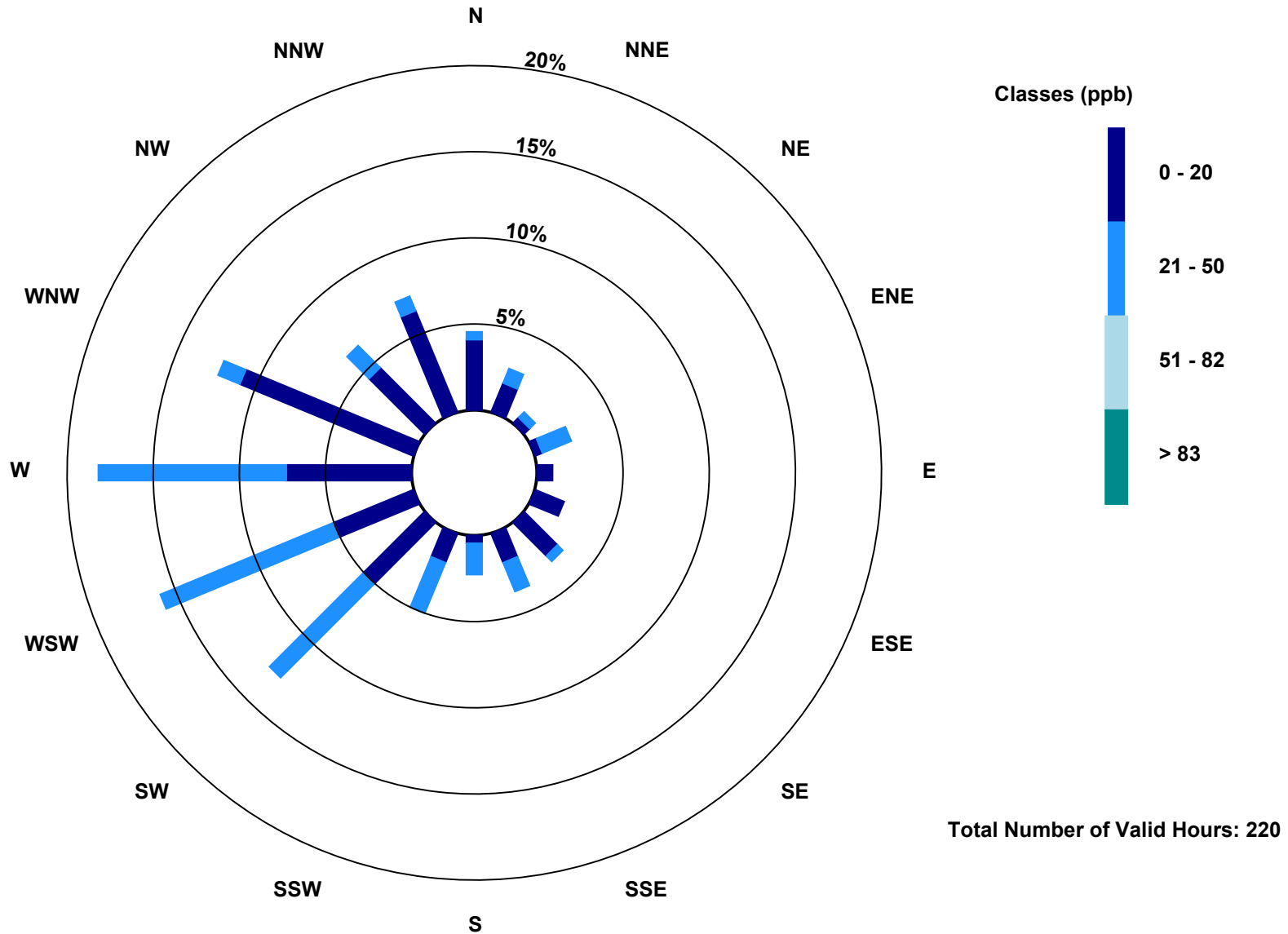
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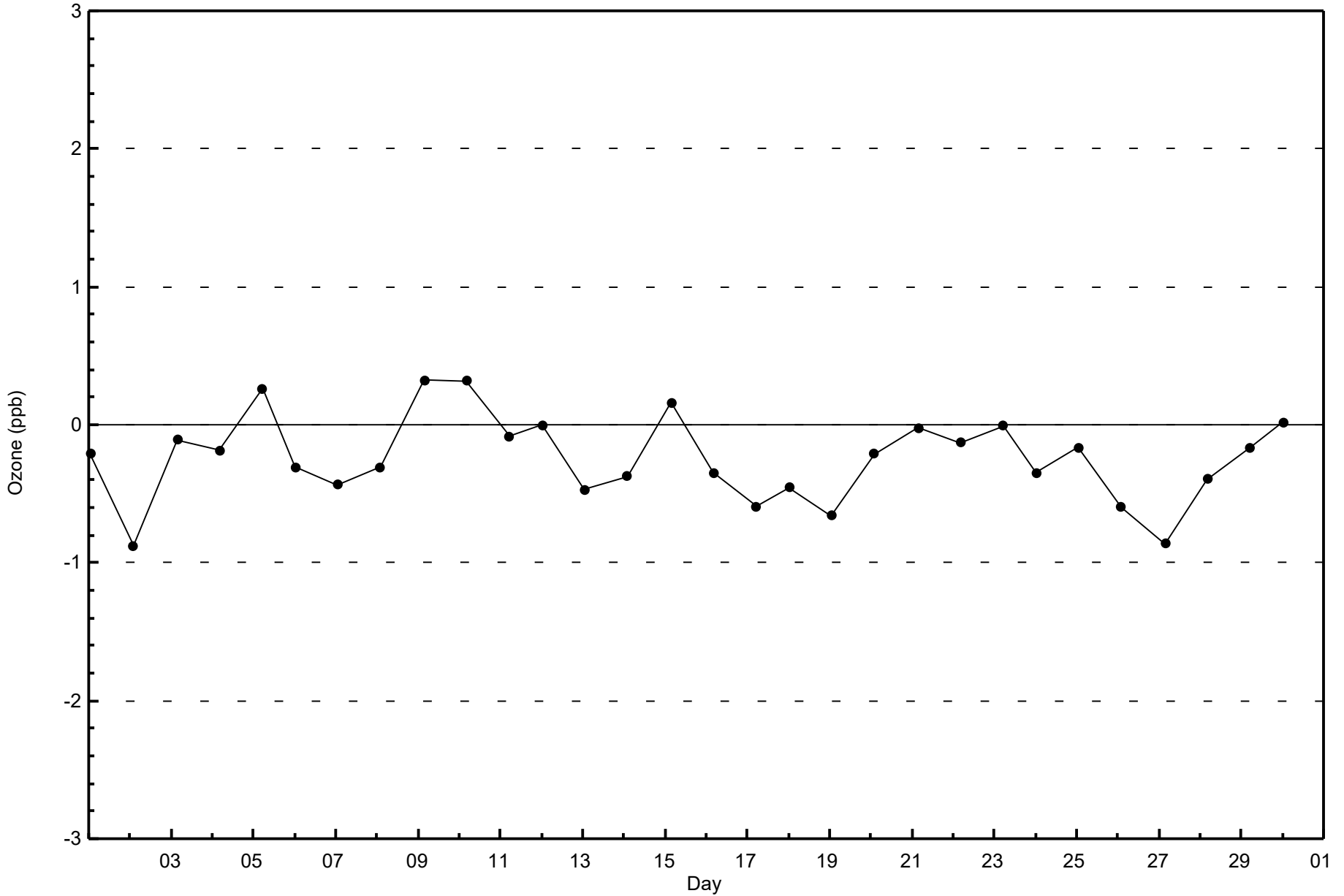
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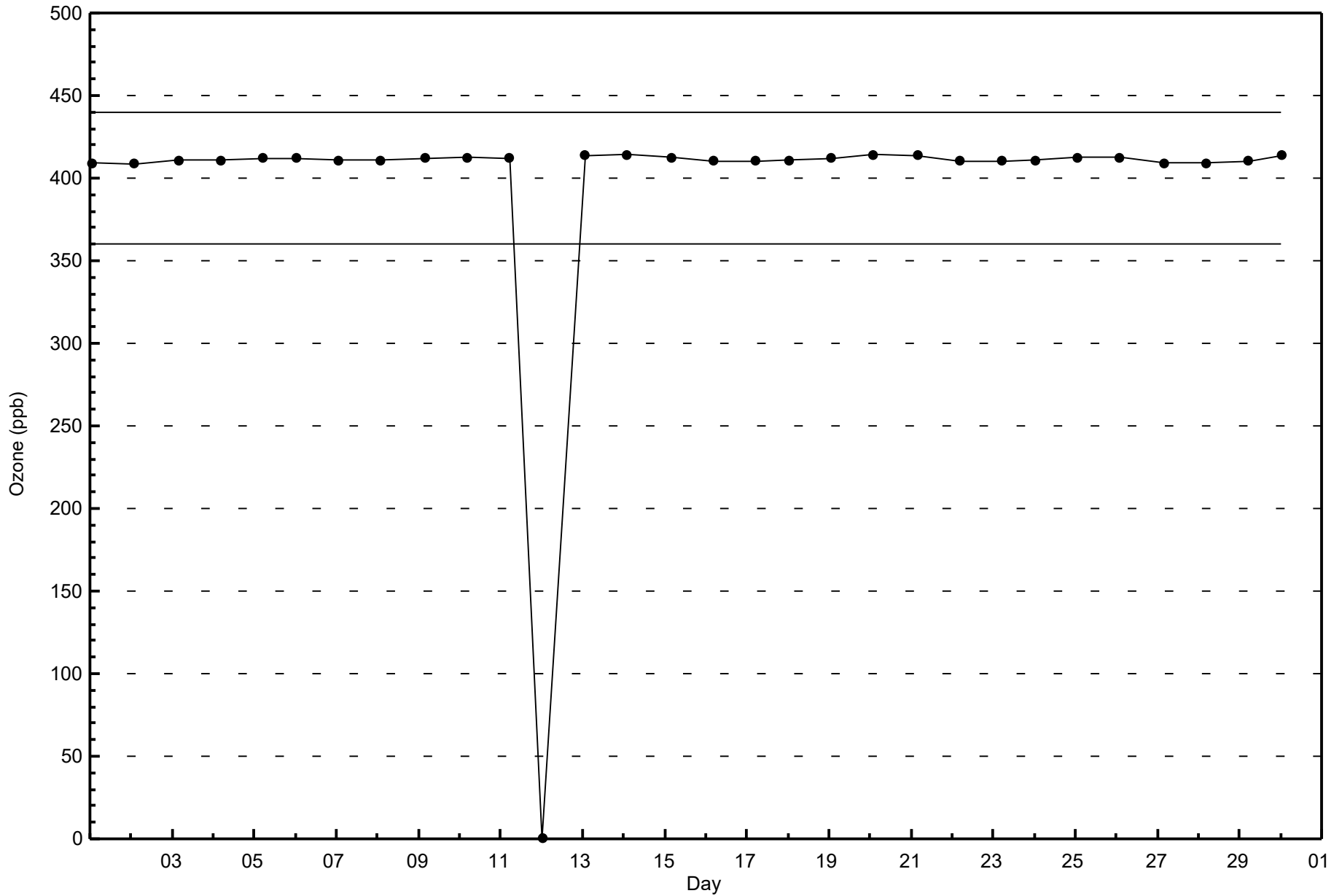


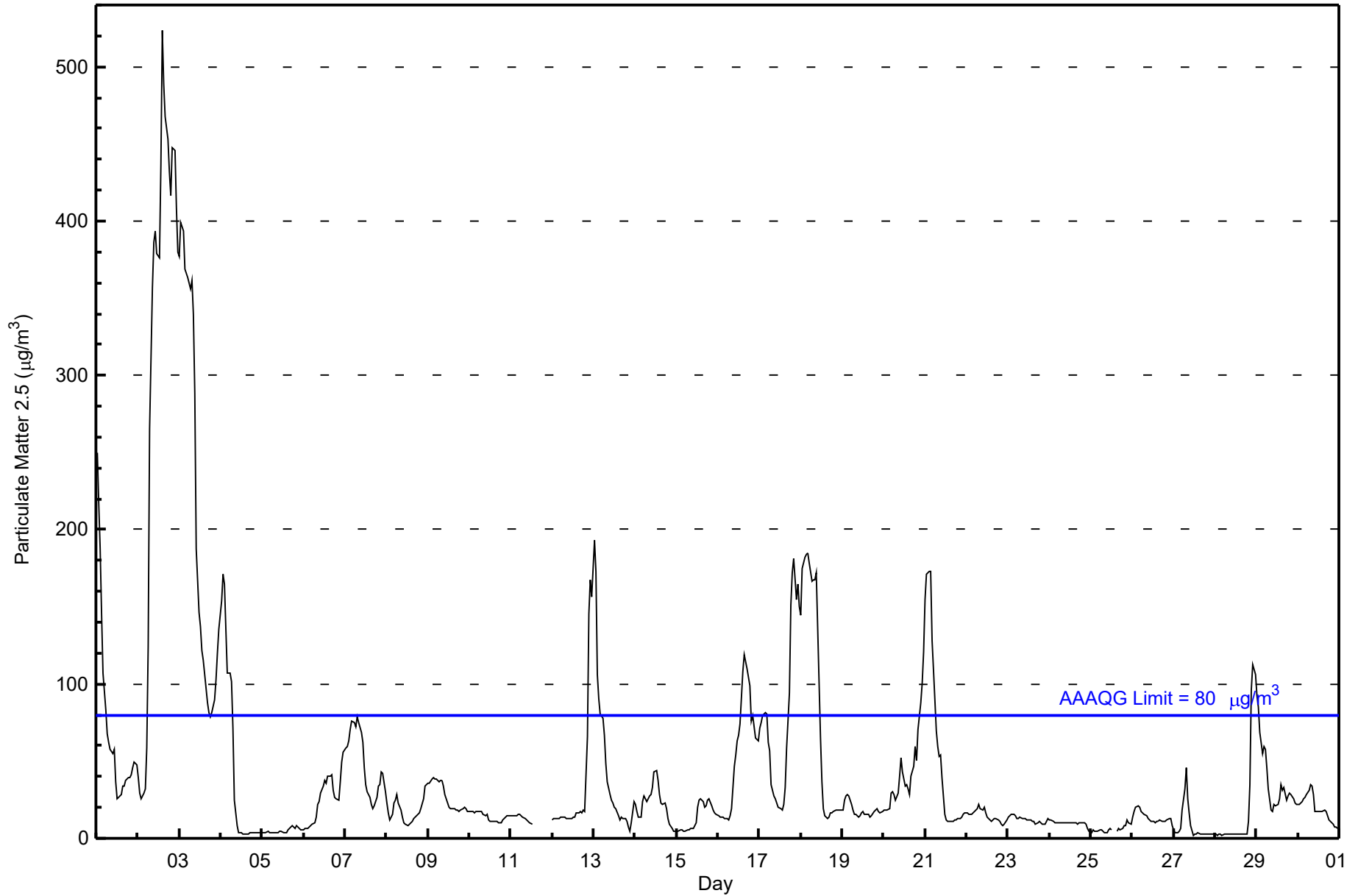
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Ozone (O₃) - ppb
Stony Mountain











**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Stony Mountain - September 2023**

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	89	12.59	12.59
6 - 15	215	30.41	43.00
16 - 25	144	20.37	63.37
26 - 80	159	22.49	85.86
> 81.0	100	14.14	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - μg/m³
Stony Mountain - September 2023

Concentration Ranges (μg/m ³)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	1	1	0	0	0	0	0	2	4	2	3	4	7	2	7	2	35
6 - 15	0	0	0	2	1	4	8	6	1	1	1	3	2	0	1	0	30
16 - 25	5	2	0	3	1	0	0	0	0	1	5	5	2	3	4	3	34
26 - 80	3	1	1	0	0	0	0	0	0	3	15	17	22	7	0	11	80
> 81.0	1	2	1	0	0	0	0	0	0	4	5	7	9	18	2	1	50
Totals	10	6	2	5	2	4	8	8	5	11	29	36	42	30	14	17	229

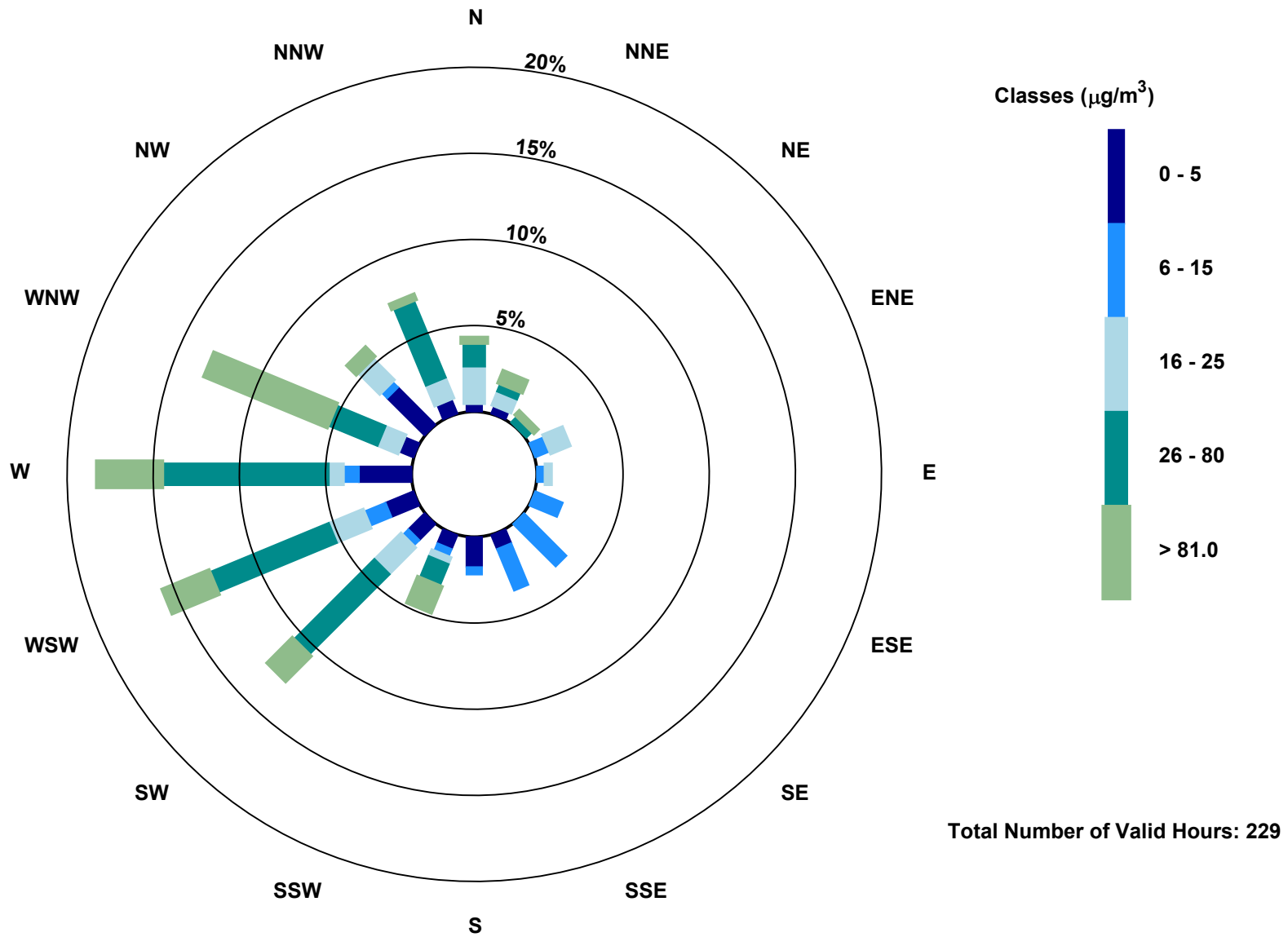
Total Number of Valid Hours: 229

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

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



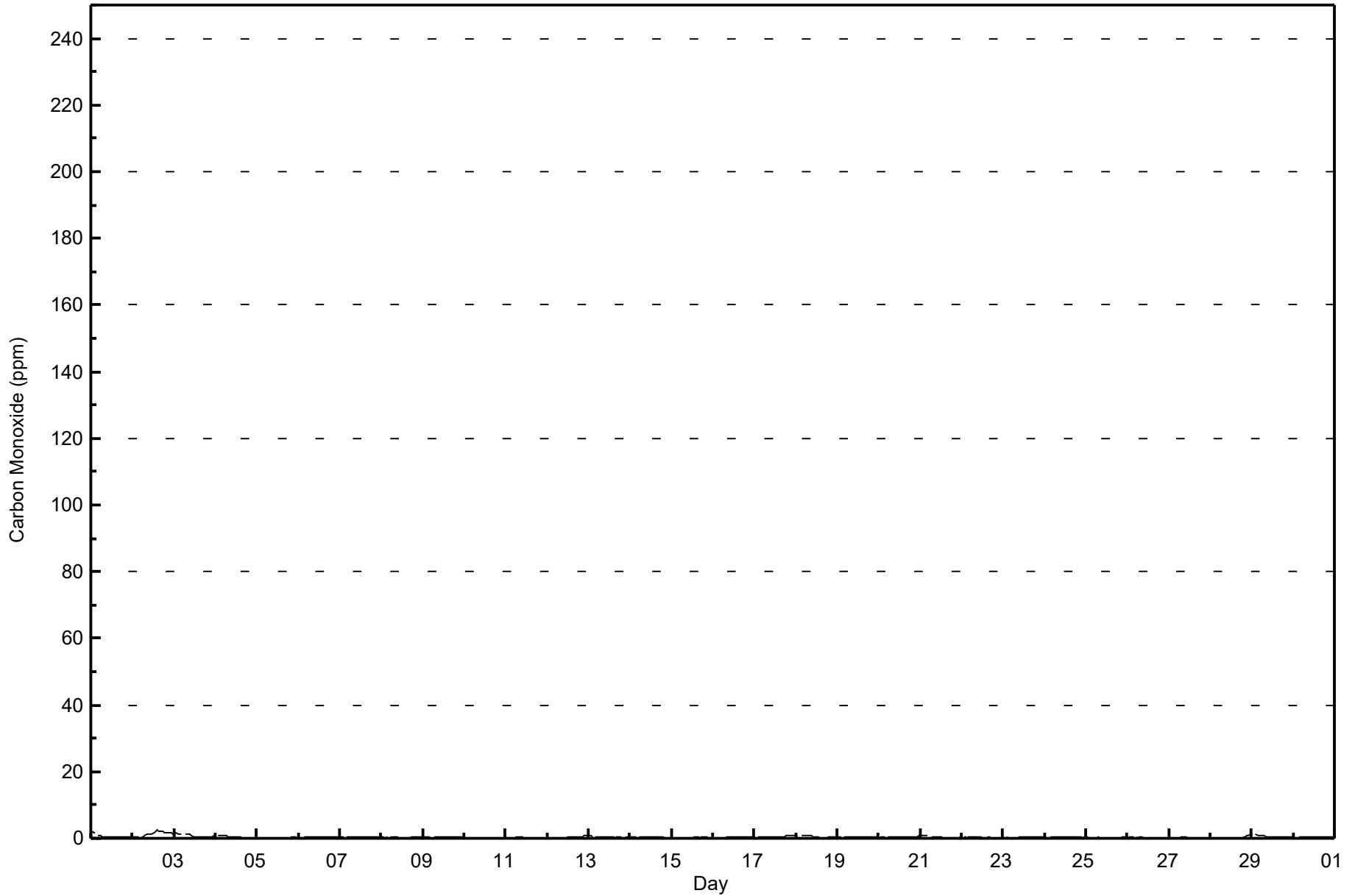


Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 720																	Daily Average		Daily Maximum				
Maximum Value: 2.4 ppm on Sep 2 15:00		Maximum Daily Average: 1.3 ppm on Sep 2																	Hours of Data: 667		Hours of Missing Data: 53						
Minimum Value: 0.1 ppm on Sep 15 05:00		Minimum Daily Average: 0.2 ppm on Sep 15																	Hours of Calibration: 31		Percent Operational Time: 96.9						
Maximum Diurnal Average: 0.5 ppm at hour 1		Minimum Diurnal Average: 0.3 ppm at hour 13																									
Monthly Average: 0.37 ppm		Percentiles: P ₁ = 0.2 P ₁₀ = 0.2 Q ₁ = 0.2 Median = 0.2 Q ₃ = 0.4 P ₉₀ = 0.7 P ₉₉ = 1.8																									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Sep	2.1	1.8	1.5	Z	0.9	0.7	0.6	0.5	0.5	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.6	2.1	
2-Sep	0.4	0.3	0.3	0.3	Z	0.4	0.5	1.0	1.3	1.4	1.4	1.4	1.5	1.9	2.4	2.2	2.2	2.0	1.9	1.7	1.7	1.7	1.5	1.4	1.3	2.4	
3-Sep	1.4	1.5	1.5	1.4	1.4	Z	1.4	1.3	1.3	1.1	0.8	0.6	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.6	0.7	0.9	1.5		
4-Sep	Z	1.0	0.9	0.9	0.8	0.8	0.8	0.6	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	1.0		
5-Sep	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	
6-Sep	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.3	0.5	
7-Sep	0.5	0.5	0.5	Z	0.5	0.5	0.5	0.6	0.6	0.5	0.5	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	0.6	
8-Sep	0.3	0.2	0.2	0.2	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	0.2	0.3	0.3	0.3	0.2	0.3	
9-Sep	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	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	
10-Sep	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	
11-Sep	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	C	C	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	0.2	
12-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.5	0.8	0.8	0.8	--	0.8	
13-Sep	1.0	0.8	0.6	Z	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.3	1.0		
14-Sep	0.3	0.3	0.3	0.2	Z	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.3	0.4	
15-Sep	0.1	0.2	0.2	0.2	0.1	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
16-Sep	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.3	0.4	0.3	0.5	
17-Sep	0.4	Z	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	0.4	0.5	0.7	0.7	0.7	0.7	0.7	0.6	0.4	0.7	
18-Sep	0.6	0.7	Z	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	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	0.4	0.7	
19-Sep	0.2	0.3	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	
20-Sep	0.2	0.2	0.2	0.2	Z	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.3	0.3	0.4	0.3	0.4	0.5	0.6	0.7	0.3	0.7	
21-Sep	0.8	0.8	0.8	0.8	0.7	Z	0.4	0.4	0.4	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	0.8	
22-Sep	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	
23-Sep	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	
24-Sep	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	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	
25-Sep	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	
26-Sep	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	
27-Sep	0.2	0.2	0.2	0.2	0.2	Z	0.3	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4	
28-Sep	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	0.4	0.8	1.0	1.1	0.3	1.1	
29-Sep	1.1	Z	1.1	0.9	0.9	0.9	0.8	0.7	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.6	1.1	
30-Sep	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	
																								Diurnal Average		Diurnal Maximum	
0.5 0.5 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 0.4 0.4 0.4																								Diurnal Average		Diurnal Maximum	
2.1 1.8 1.5 1.4 1.4 0.9 1.4 1.3 1.3 1.4 1.4 1.4 1.5 1.9 2.4 2.2 2.2 2.0 1.9 1.7 1.7 1.7 1.5 1.4																								Diurnal Average		Diurnal Maximum	
Z - zerospan C - Calibration M - Maintenance UO - Unstable Operation PF - Power Failure																											
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 13 ppm																											



Wood Buffalo Environmental Association
Hourly Averages

Carbon Monoxide (CO) - ppm
Stony Mountain - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Carbon Monoxide (CO) - ppm
Stony Mountain - September 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.3	475	71.21	71.21
0.4 - 0.5	107	16.04	87.26
0.6 - 0.7	30	4.50	91.75
0.8 - 1.4	39	5.85	97.60
1.5 - 10	13	1.95	99.55
> 10	0	0.00	99.55

Total Number of Valid Hours: 667

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Carbon Monoxide (CO) - ppm
Stony Mountain - September 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	2	3	0	5	2	4	7	8	5	4	13	22	15	3	8	2	103
0.4 - 0.5	4	1	1	0	0	0	0	0	0	7	14	5	14	8	4	11	69
0.6 - 0.7	0	0	0	0	0	0	0	0	0	0	1	2	3	3	0	1	10
0.8 - 1.4	3	2	1	0	0	0	0	0	0	0	0	2	2	9	1	3	23
1.5 - 10	0	0	0	0	0	0	0	0	0	0	0	4	4	4	1	0	13
> 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	9	6	2	5	2	4	7	8	5	11	28	35	38	27	14	17	218

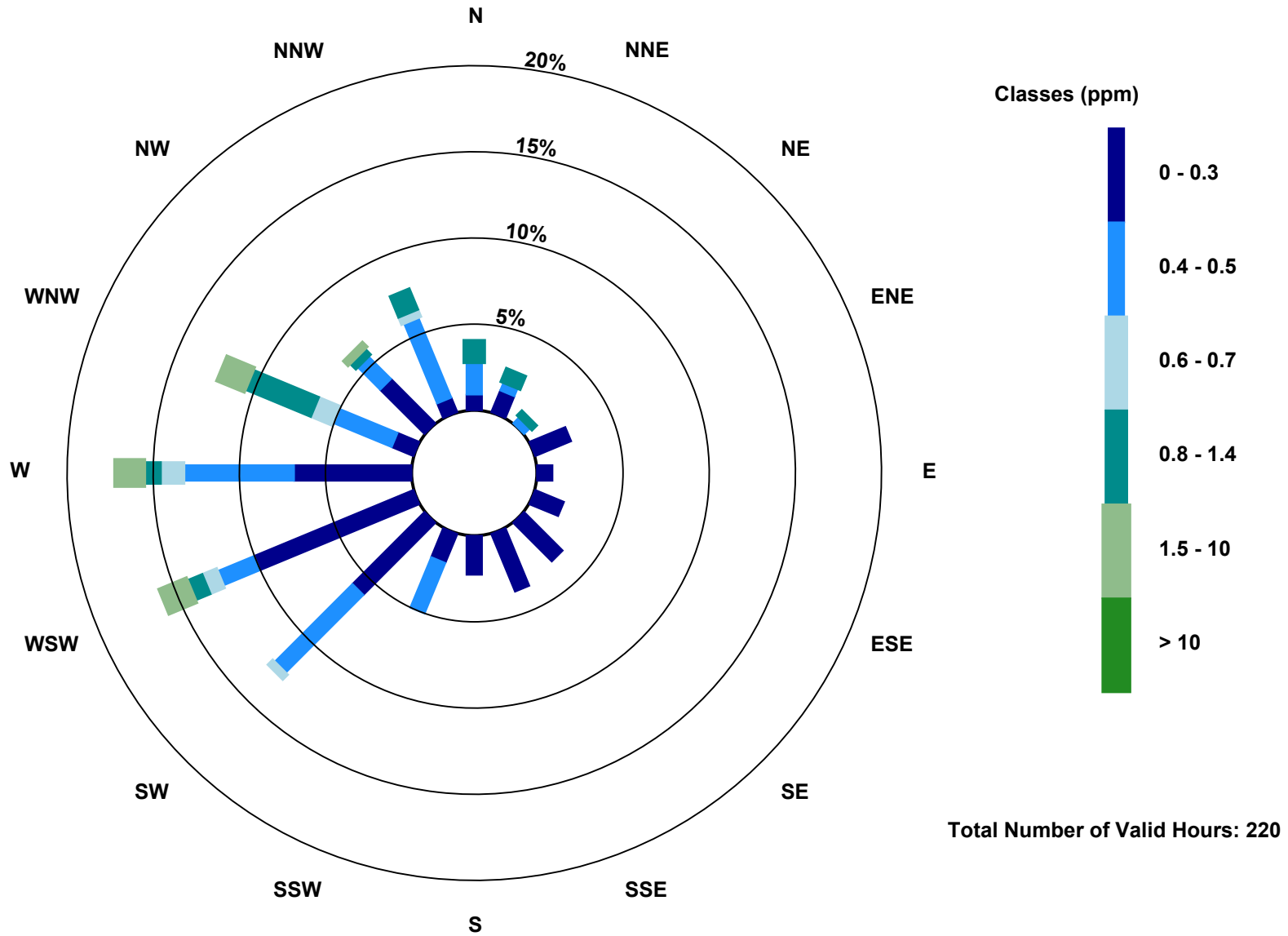
Total Number of Valid Hours: 220

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

Carbon Monoxide (CO) - ppm
Stony Mountain



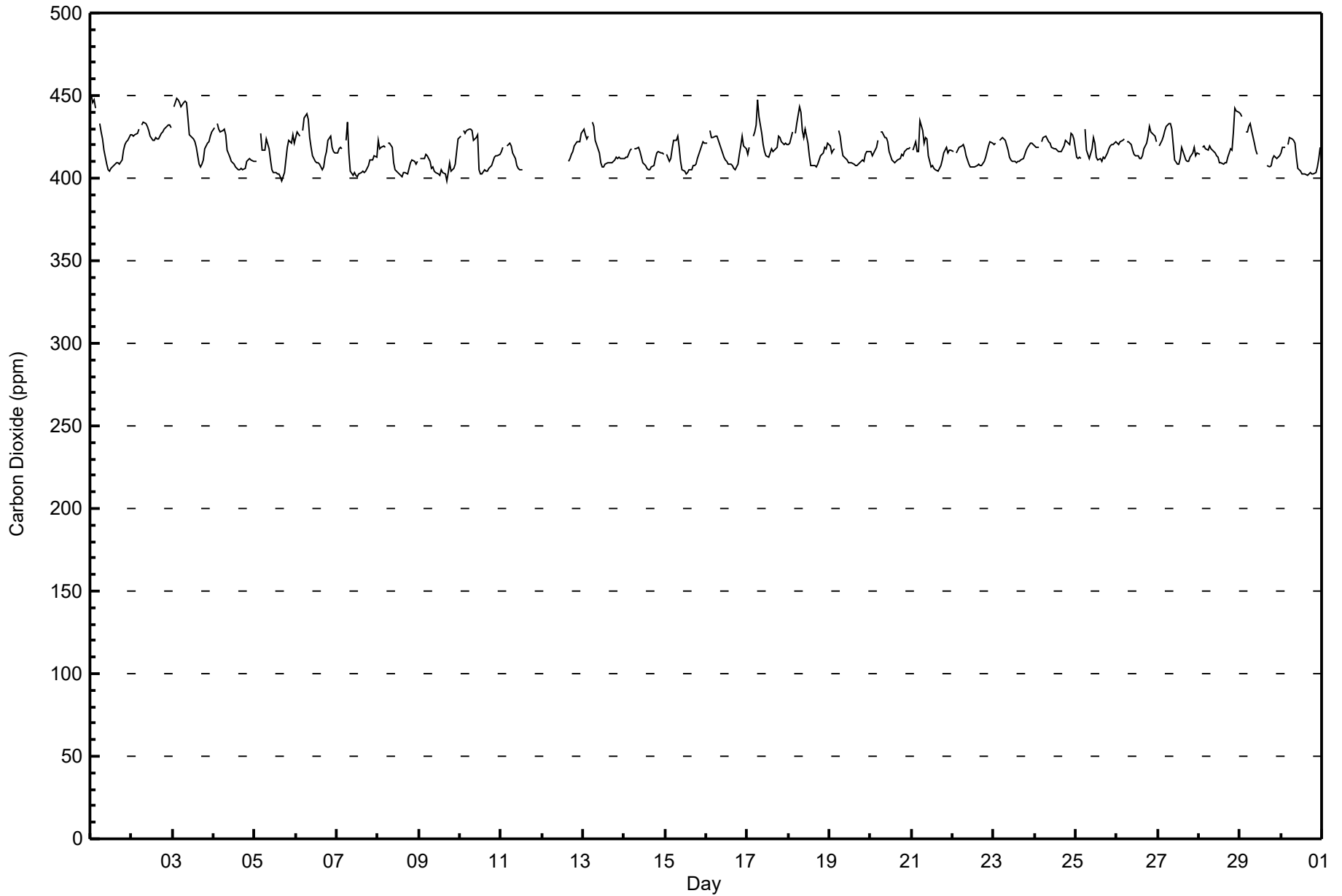


Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service:																	720																										
Maximum Value: 449.9 ppm on Sep 1 01:00		Maximum Daily Average: 429.0 ppm on Sep 3																	Hours of Data:		660																										
Minimum Value: 398.3 ppm on Sep 9 17:00		Minimum Daily Average: 407.8 ppm on Sep 9																	Hours of Missing Data:		60																										
Maximum Diurnal Average: 427.5 ppm at hour 6		Minimum Diurnal Average: 408.3 ppm at hour 16																	Hours of Calibration:		33																										
Monthly Average: 416.83 ppm		Percentiles: P ₁ = 401.8 P ₁₀ = 405.4 Q ₁ = 409.8 Median = 416.0 Q ₃ = 422.5 P ₉₀ = 428.9 P ₉₉ = 446.0																	Percent Operational Time:		96.3																										
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-Sep	449.9	446.1	447.7	442.1	Z	433.1	428.1	423.4	417.3	408.2	405.2	404.5	405.6	406.8	408.6	409.0	408.9	408.8	410.9	417.2	420.1	422.1	423.1	426.0	420.5	449.9																					
2-Sep	426.5	425.7	426.0	426.8	429.9	Z	432.5	434.0	433.4	431.4	429.2	425.4	422.9	423.3	424.9	423.5	424.0	426.8	428.3	429.4	430.7	432.6	431.9	430.5	428.2	434.0																					
3-Sep	Z	443.3	448.2	447.5	445.3	443.4	445.9	446.8	445.5	436.7	426.0	424.3	423.8	421.8	418.7	408.1	407.2	408.2	411.1	417.7	421.4	421.8	425.3	428.0	429.0	448.2																					
4-Sep	430.6	Z	432.8	429.7	428.4	429.1	429.3	426.1	416.6	412.3	410.5	409.4	408.3	406.5	404.8	405.5	405.4	406.3	409.8	411.3	411.4	411.4	411.0	410.6	415.3	432.8																					
5-Sep	410.1	410.0	Z	427.0	417.1	417.0	417.2	423.9	418.2	411.3	405.1	403.4	403.1	402.5	402.3	400.7	398.5	403.8	411.1	418.5	422.6	421.3	426.0	421.4	412.7	427.0																					
6-Sep	424.8	427.8	425.7	Z	429.2	436.6	438.9	435.5	424.9	418.8	413.9	409.8	409.6	409.7	408.6	405.4	406.8	412.7	416.2	422.7	425.5	419.0	415.8	415.0	419.7	438.9																					
7-Sep	415.6	417.4	418.4	418.0	Z	422.5	434.1	415.7	404.1	401.3	403.5	401.7	401.3	402.5	403.7	404.0	403.5	404.3	407.5	411.0	411.0	411.3	413.7	412.7	410.4	434.1																					
8-Sep	422.8	417.6	418.9	419.3	418.8	Z	421.4	421.0	418.3	409.0	405.2	404.1	402.7	401.9	400.6	403.5	403.4	402.3	406.0	409.1	410.7	410.4	408.8	410.1	410.7	422.8																					
9-Sep	Z	412.0	412.0	412.2	414.1	413.7	410.3	405.8	406.4	404.2	403.1	402.3	402.0	405.2	403.8	402.9	398.3	403.4	409.7	404.3	406.1	408.4	415.7	423.6	407.8	423.6																					
10-Sep	425.3	Z	428.7	426.8	429.1	429.7	430.1	428.7	422.8	424.6	426.6	405.3	402.9	402.4	404.8	404.4	404.2	406.3	407.7	410.5	412.5	413.5	413.2	414.1	416.3	430.1																					
11-Sep	416.0	418.8	Z	419.5	420.7	421.1	419.6	415.7	411.9	407.8	406.4	404.9	404.7	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	421.1																					
12-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	C	C	C	C	410.0	412.3	414.3	415.9	419.2	422.0	421.8	422.4	427.0	--	427.0																					
13-Sep	429.3	426.0	424.0	425.3	Z	434.1	431.4	423.2	420.4	415.3	409.3	406.6	407.0	408.1	409.1	409.0	409.6	409.7	411.3	412.9	412.1	413.0	411.7	411.6	416.1	434.1																					
14-Sep	412.2	412.4	412.8	417.2	418.0	Z	418.0	418.1	418.8	416.1	413.1	409.7	407.4	406.3	405.4	405.3	406.7	407.9	411.8	415.4	415.7	415.4	415.1	414.1	412.7	418.8																					
15-Sep	Z	414.2	410.1	411.8	417.8	422.5	422.7	425.6	418.6	410.0	405.0	404.6	403.0	403.6	404.7	405.5	407.8	407.4	408.8	411.9	416.7	419.3	422.0	421.4	412.8	425.6																					
16-Sep	421.6	Z	429.0	424.8	424.6	425.5	425.3	423.1	420.1	415.3	412.4	411.3	410.1	408.6	408.4	408.0	406.0	405.4	408.5	414.6	419.4	425.2	419.6	418.1	416.7	429.0																					
17-Sep	414.0	418.6	Z	425.4	428.2	431.9	447.1	437.6	427.2	420.5	415.7	413.2	412.5	415.6	417.4	416.3	417.1	419.0	425.3	424.4	421.8	420.3	421.3	420.5	422.2	447.1																					
18-Sep	420.6	421.6	427.8	Z	426.9	432.8	443.1	439.7	428.9	424.4	430.1	421.0	413.3	408.0	407.3	407.7	407.0	408.5	411.4	413.8	415.6	419.0	418.2	421.2	420.3	443.1																					
19-Sep	419.3	415.1	416.7	417.5	Z	428.6	425.6	418.7	413.3	411.9	411.0	409.0	409.1	409.5	408.1	407.2	407.3	408.1	410.1	411.0	410.6	414.0	416.2	416.4	413.7	428.6																					
20-Sep	415.7	413.8	415.1	419.0	422.9	Z	428.2	427.6	425.0	424.4	421.8	416.1	411.3	409.9	409.2	409.8	410.7	411.5	414.3	413.4	415.9	417.6	417.9	418.8	417.0	428.2																					
21-Sep	Z	417.3	421.9	416.4	416.0	434.8	429.1	421.3	425.0	423.8	413.5	406.4	407.6	405.9	405.0	404.6	405.6	407.5	411.3	415.6	418.8	415.6	416.8	416.9	415.5	434.8																					
22-Sep	415.9	Z	415.5	416.8	418.5	419.5	420.1	418.0	413.4	408.9	406.7	406.7	406.6	406.7	407.6	408.6	408.0	407.9	410.0	412.4	415.8	419.4	422.1	421.4	413.3	422.1																					
23-Sep	420.8	421.4	Z	422.8	423.5	424.2	423.9	423.1	416.8	413.1	411.1	409.9	409.7	409.7	410.0	410.0	410.8	411.5	414.3	417.2	419.0	421.6	421.1	420.3	416.8	424.2																					
24-Sep	419.3	418.9	418.4	Z	421.7	424.4	425.4	424.0	422.2	421.0	418.7	417.8	417.5	416.9	415.8	415.9	418.0	419.3	423.1	422.1	420.2	427.1	426.0	423.5	420.7	427.1																					
25-Sep	412.5	411.8	412.8	412.1	Z	429.7	417.2	414.5	412.0	418.1	424.7	421.5	413.0	411.4	411.6	410.2	412.6	412.1	415.6	418.2	419.3	420.1	420.6	422.2	416.3	429.7																					
26-Sep	420.8	420.1	421.9	422.9	423.5	Z	422.2	422.4	420.0	416.7	414.2	413.2	413.3	411.7	412.2	413.4	417.6	420.9	425.8	431.1	428.2	426.1	425.8	421.6	420.2	431.1																					
27-Sep	Z	419.8	422.5	425.2	428.9	431.2	432.9	433.1	429.3	420.0	411.1	408.5	408.8	411.7	418.9	413.8	410.7	409.8	410.1	412.9	415.2	418.8	413.6	415.3	418.4	433.1																					
28-Sep	414.5	Z	418.2	419.2	418.1	417.2	419.1	417.8	416.8	414.9	413.9	412.9	409.2	409.6	408.5	408.9	409.7	412.7	417.4	416.7	428.0	442.3	440.4	439.5	418.5	442.3																					
29-Sep	438.6	437.7	Z	427.8	427.8	431.7	433.3	428.9	421.1	416.6	414.6	M	M	M	M	M	407.7	406.6	407.9	412.0	413.3	412.3	412.4	413.5	420.2	438.6																					
30-Sep	415.0	418.5	418.4	Z	420.4	424.6	423.6	422.5	421.2	412.7	406.0	404.5	402.1	402.3	402.4	402.0	402.3	403.1	402.9	402.7	403.2	406.5	412.2	418.7	410.8	424.6																					
																								Diurnal Average		419.8																					
																								Diurnal Maximum		439.5																					
Z - zerspan																								C - Calibration		M - Maintenance		UO - Unstable Operation		PF - Power Failure																	



Wood Buffalo Environmental Association
Hourly Averages

Carbon Dioxide (CO₂) - ppm
Stony Mountain - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Carbon Dioxide (CO₂) - ppm
Stony Mountain - September 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
400 - 420	443	67.12	67.12
420 - 440	200	30.30	97.42
440 - 460	15	2.27	99.70
460 - 480	0	0.00	99.70
480 - 500	0	0.00	99.70
> 500	0	0.00	99.70

Total Number of Valid Hours: 660

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Carbon Dioxide (CO₂) - ppm
Stony Mountain - September 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	4	4	0	5	2	3	0	6	4	9	16	25	24	7	12	7	128
420 - 440	4	2	1	0	0	1	6	2	1	2	11	10	16	16	1	6	79
440 - 460	0	0	1	0	0	0	0	0	0	0	1	0	0	3	1	0	6
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	8	6	2	5	2	4	6	8	5	11	28	35	40	26	14	13	213

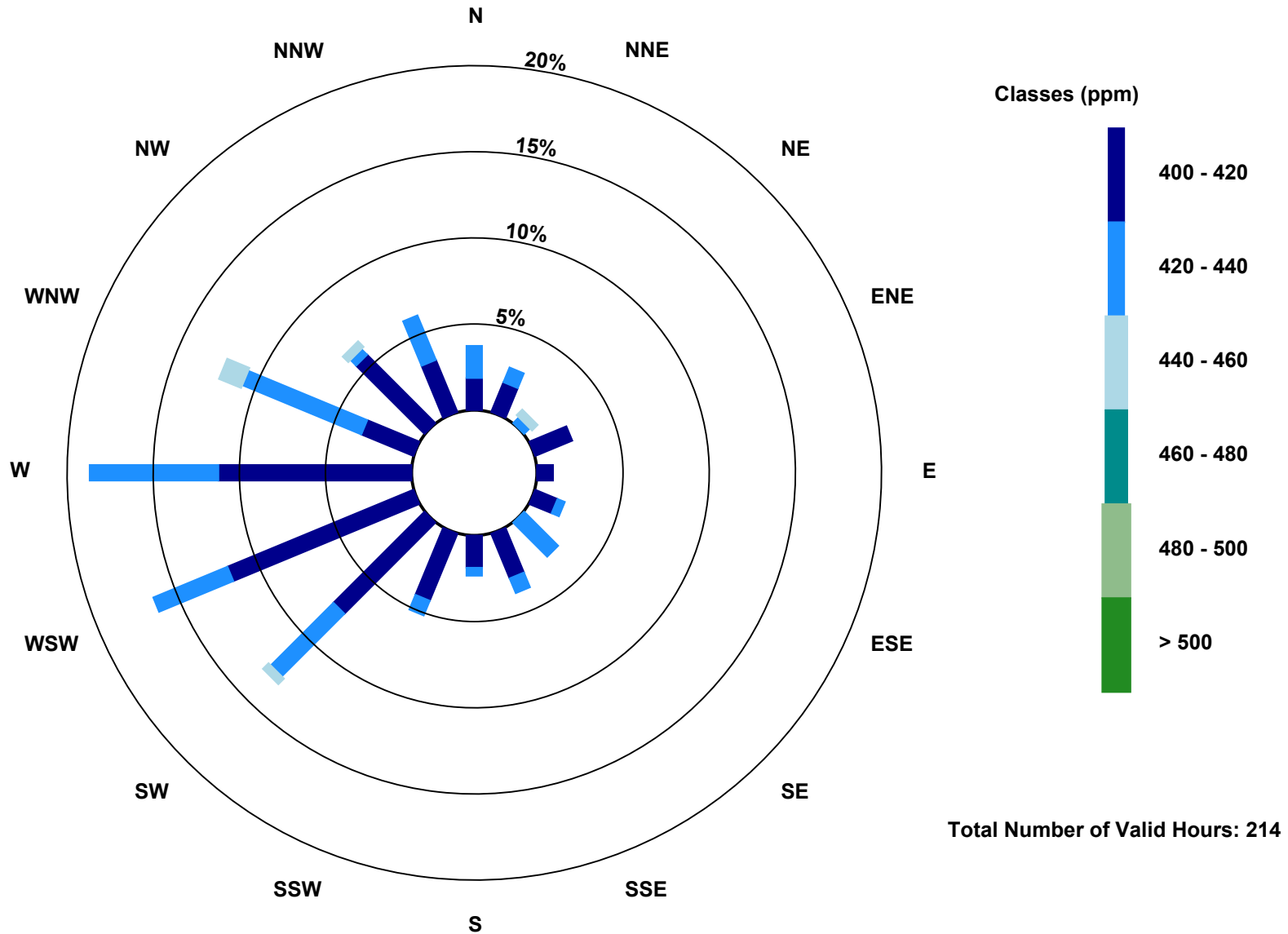
Total Number of Valid Hours: 214

Total Number of Hours: 720



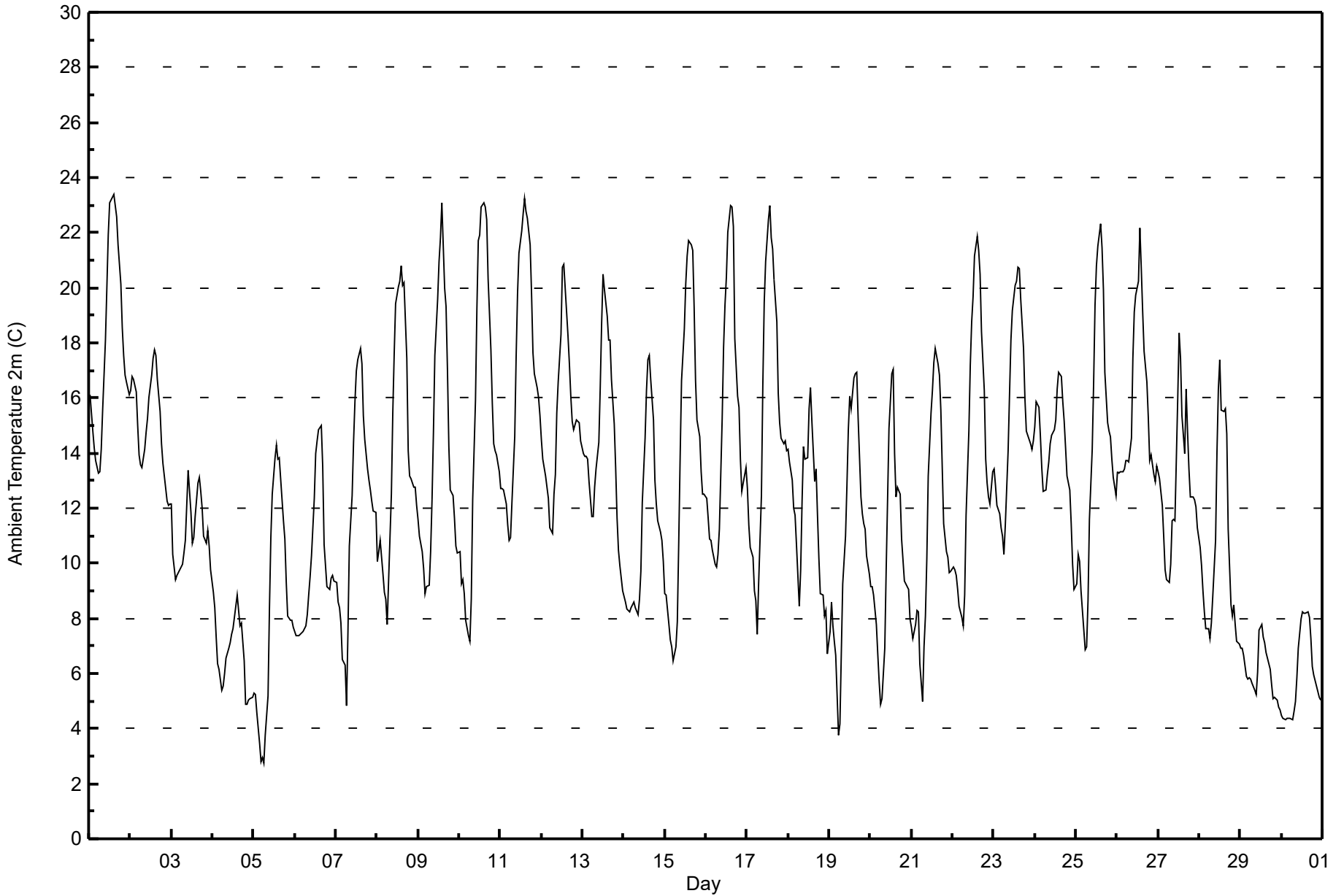
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Carbon Dioxide (CO₂) - ppm
Stony Mountain





Maximum Value: 23.4 C on Sep 1 15:00		Maximum Daily Average: 18.0 C on Sep 1		Hours in Service: 720																																												
Minimum Value: 2.7 C on Sep 5 07:00		Minimum Daily Average: 5.9 C on Sep 30		Hours of Data: 720																																												
Maximum Diurnal Average: 17.8 C at hour 15		Minimum Diurnal Average: 8.3 C at hour 7		Hours of Missing Data: 0																																												
Monthly Average: 12.66 C		Percentiles: P ₁ = 4.3 P ₁₀ = 6.9 Q ₁ = 8.9 Median = 12.5 Q ₃ = 15.6 P ₉₀ = 19.7 P ₉₉ = 23.0		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-Sep	16.1	15.5	14.8	14.2	13.7	13.3	13.3	14.1	15.6	18.1	20.0	21.9	23.1	23.2	23.4	23.0	22.6	21.6	20.2	18.5	17.5	16.8	16.6	16.1	18.0	23.4																						
2-Sep	16.2	16.8	16.7	16.2	15.0	14.0	13.6	13.5	14.1	14.8	15.3	16.0	16.8	17.5	17.8	17.5	16.7	15.5	14.4	13.6	13.2	12.3	12.1	12.1	15.1	17.8																						
3-Sep	12.1	10.3	9.4	9.6	9.7	9.7	9.9	10.4	10.8	12.1	13.4	11.9	10.7	10.9	11.7	12.9	13.1	12.6	12.0	11.0	10.7	11.2	10.6	9.7	11.1	13.4																						
4-Sep	9.0	8.4	7.3	6.3	6.2	5.4	5.6	6.0	6.5	6.9	7.1	7.4	7.6	8.0	8.9	8.3	7.7	7.8	6.5	4.9	4.9	5.0	5.1	5.1	6.7	9.0																						
5-Sep	5.3	5.2	4.6	3.5	2.8	2.9	2.7	3.7	5.2	8.3	10.9	12.5	13.8	14.3	13.8	13.8	13.1	11.5	10.9	9.3	8.1	7.9	7.9	7.7	8.3	14.3																						
6-Sep	7.5	7.4	7.4	7.4	7.5	7.5	7.7	8.2	8.9	9.5	10.2	12.3	14.0	14.4	14.8	15.0	13.5	10.7	9.9	9.2	9.0	9.5	9.6	9.4	10.0	15.0																						
7-Sep	9.3	8.6	8.4	7.8	6.5	6.3	4.8	7.5	10.6	12.4	14.4	15.9	17.0	17.4	17.8	17.3	15.4	14.5	13.4	13.0	12.7	12.3	11.9	11.9	12.0	17.8																						
8-Sep	10.1	10.4	10.8	9.6	8.9	8.7	7.8	9.4	12.5	15.4	17.6	19.4	20.0	20.2	20.8	20.1	20.2	17.4	14.1	13.2	13.1	12.8	12.8	12.1	14.1	20.8																						
9-Sep	11.6	11.0	10.4	9.8	8.9	9.1	9.2	10.4	12.3	14.8	17.6	19.6	21.0	21.8	23.1	20.0	19.3	17.0	14.3	12.6	12.5	11.7	10.6	10.4	14.1	23.1																						
10-Sep	10.4	9.3	9.4	8.9	7.9	7.4	7.2	8.7	12.3	15.9	19.2	21.7	21.9	22.9	23.1	22.9	22.5	20.4	17.7	15.8	14.4	14.1	13.9	13.3	15.1	23.1																						
11-Sep	12.7	12.7	12.6	12.2	11.4	10.8	10.9	12.2	14.6	17.5	19.8	21.3	22.1	22.7	23.2	22.8	22.5	21.6	19.8	17.6	16.9	16.4	16.0	15.4	16.9	23.2																						
12-Sep	14.5	13.8	13.2	12.8	12.4	11.3	11.1	12.5	13.2	15.5	16.6	18.3	20.7	20.9	20.0	18.2	17.2	16.1	15.2	14.8	15.2	15.2	15.1	14.4	15.3	20.9																						
13-Sep	14.0	13.9	13.9	13.8	13.0	11.7	11.7	12.8	13.4	14.4	16.4	18.7	20.5	19.9	19.0	18.1	18.1	16.7	15.0	13.5	11.7	10.5	9.9	9.0	14.6	20.5																						
14-Sep	8.8	8.6	8.3	8.2	8.4	8.5	8.6	8.4	8.1	8.7	9.7	12.2	14.5	16.3	17.4	17.5	16.7	15.2	13.0	12.1	11.5	11.1	10.8	10.1	11.4	17.5																						
15-Sep	8.9	8.8	7.8	7.2	7.0	6.5	7.0	7.9	10.8	13.8	16.6	18.5	20.1	21.2	21.7	21.6	21.4	19.3	16.6	15.2	14.6	13.3	12.5	12.5	13.8	21.7																						
16-Sep	12.4	11.6	10.9	10.9	10.5	10.0	9.9	10.3	11.2	15.2	17.8	19.4	20.4	22.0	23.0	22.9	22.2	18.1	16.0	15.6	13.8	12.6	12.9	13.5	15.1	23.0																						
17-Sep	12.7	11.4	10.6	10.2	9.0	8.6	7.4	9.2	12.5	16.5	19.5	20.9	22.5	23.0	21.8	21.4	20.3	18.8	16.1	15.1	14.5	14.4	14.4	14.1	15.2	23.0																						
18-Sep	14.1	13.7	13.0	12.0	11.7	10.7	8.5	9.7	12.3	14.2	13.8	13.8	15.6	16.4	15.2	12.9	13.4	11.7	10.2	8.9	8.8	8.1	8.3	6.7	11.8	16.4																						
19-Sep	7.5	8.6	7.7	7.2	6.6	3.8	4.2	6.7	9.3	11.0	12.8	14.8	16.1	15.6	16.7	16.9	16.9	15.2	12.4	11.8	11.5	11.2	10.3	9.6	11.0	16.9																						
20-Sep	9.2	9.1	8.8	7.8	6.7	5.7	4.9	5.1	6.9	9.8	12.3	14.9	16.9	17.0	14.0	12.4	12.8	12.5	10.9	10.1	9.4	9.2	9.0	8.0	10.1	17.0																						
21-Sep	7.7	7.3	7.8	8.3	8.2	6.4	5.0	7.0	8.1	10.2	13.2	15.4	16.3	17.3	17.8	17.2	16.8	15.5	13.5	11.5	10.4	10.2	9.7	9.7	11.3	17.8																						
22-Sep	9.9	9.7	9.6	9.0	8.4	8.0	7.7	8.8	11.8	14.8	17.2	18.8	19.7	21.2	21.9	21.4	20.5	18.4	16.2	13.8	12.9	12.4	12.2	13.3	14.1	21.9																						
23-Sep	13.4	12.8	12.1	11.8	11.3	11.0	10.3	11.4	14.1	16.1	18.1	19.2	20.1	20.2	20.8	20.7	19.6	17.8	16.0	14.8	14.6	14.3	14.1	14.5	15.4	20.8																						
24-Sep	14.9	15.8	15.6	14.6	13.5	12.6	12.7	13.2	13.7	14.3	14.7	14.8	15.2	16.3	16.9	16.8	15.9	15.2	14.2	13.1	12.7	11.4	10.0	9.0	14.0	16.9																						
25-Sep	9.2	10.3	10.1	9.0	8.3	6.8	7.0	8.7	11.6	14.1	16.5	19.4	20.8	21.5	22.3	21.4	19.9	17.0	15.1	14.8	14.6	13.8	13.1	12.5	14.1	22.3																						
26-Sep	13.3	13.3	13.3	13.3	13.4	13.7	13.7	13.7	14.5	17.4	19.1	19.7	20.2	22.2	20.7	19.1	17.7	16.6	15.3	13.7	13.9	13.2	13.0	13.5	15.7	22.2																						
27-Sep	13.3	13.1	12.1	11.0	9.8	9.4	9.3	9.9	11.6	11.6	11.5	16.0	18.3	17.4	15.3	14.0	16.3	14.8	13.4	12.4	12.4	12.3	12.1	11.3	12.9	18.3																						
28-Sep	10.6	9.9	9.0	8.2	7.6	7.6	7.3	7.8	8.8	10.8	14.0	16.3	17.4	15.6	15.5	15.6	14.7	11.2	8.5	8.1	8.5	7.8	7.2	7.1	10.6	17.4																						
29-Sep	6.9	6.9	6.7	5.9	5.8	5.8	5.8	5.6	5.4	5.2	6.0	7.6	7.8	7.3	7.1	6.8	6.6	6.1	5.6	5.1	5.1	5.0	4.8	4.7	6.1	7.8																						
30-Sep	4.5	4.3	4.3	4.4	4.4	4.4	4.3	4.6	5.0	5.9	6.9	8.0	8.2	8.2	8.2	8.3	8.0	7.3	6.3	6.0	5.6	5.3	5.2	5.0	5.9	8.3																						
																								10.9	10.6	10.2	9.7	9.1	8.6	8.3	9.3	10.9	12.8	14.6	16.2	17.3	17.8	17.8	17.2	16.7	15.1	13.4	12.3	11.8	11.4	11.1	10.7	Diurnal Average
																								16.2	16.8	16.7	16.2	15.0	14.0	13.7	14.1	15.6	18.1	20.0	21.9	23.1	23.2	23.4	23.0	22.6	21.6	20.2	18.5	17.5	16.8	16.6	16.1	Diurnal Maximum





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature 2m (AT 2m) - C
Stony Mountain - September 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	236	32.78	32.78
10 - 20	420	58.33	91.11
> 20	64	8.89	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

Relative Humidity (RH) - %
Stony Mountain - September 2023

Maximum Value: 100.0 % on Sep 6 05:00	Maximum Daily Average: 87.7 % on Sep 6	Hours in Service: 720
Minimum Value: 30.2 % on Sep 22 15:00	Minimum Daily Average: 52.3 % on Sep 22	Hours of Data: 713
Maximum Diurnal Average: 83.0 % at hour 7	Minimum Diurnal Average: 48.8 % at hour 14	Hours of Missing Data: 7
Monthly Average: 66.87 %	Percentiles: P ₁ = 32.9 P ₁₀ = 43.1 Q ₁ = 55.5 Median = 67.3 Q ₃ = 78.8 P ₉₀ = 89.6 P ₉₉ = 99.8	Hours of Calibration: 0
		Percent Operational Time: 99.0

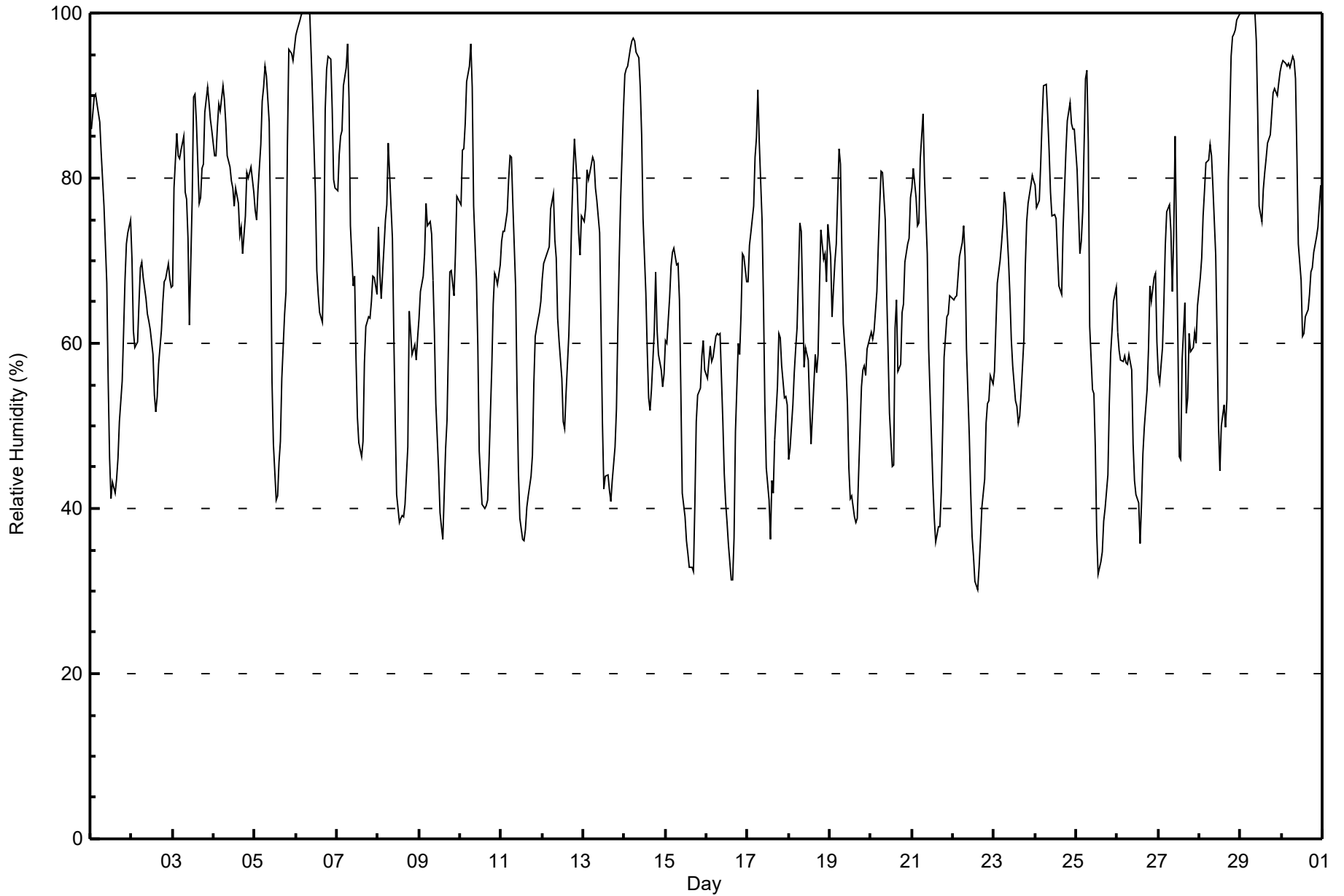
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Sep	86.0	87.8	89.8	90.1	88.9	86.7	83.1	79.9	76.5	67.3	55.4	46.2	41.2	43.2	41.9	43.6	46.1	50.6	55.4	61.4	67.6	72.0	73.4	74.8	67.0	90.1																						
2-Sep	70.2	61.5	59.5	60.2	65.0	69.1	69.9	68.0	65.4	63.5	62.8	61.7	58.7	53.8	51.8	53.6	57.5	61.6	64.9	67.4	67.7	69.6	67.8	66.7	63.2	70.2																						
3-Sep	67.0	78.8	85.5	82.8	82.4	83.4	85.0	78.3	77.4	72.8	62.1	77.5	89.9	90.2	86.9	77.0	77.6	81.2	81.7	88.0	91.1	89.2	87.1	85.7	81.6	91.1																						
4-Sep	82.8	82.8	86.3	88.9	88.1	91.2	89.5	86.7	82.6	81.4	79.7	78.8	76.6	78.7	76.9	73.0	74.1	70.9	75.4	80.7	80.1	80.7	81.3	78.3	81.1	91.2																						
5-Sep	76.0	74.9	78.6	84.0	89.4	91.1	93.6	92.4	86.8	74.1	55.5	47.9	40.9	41.6	45.7	48.2	55.7	63.5	66.2	83.8	95.6	95.1	94.2	95.7	73.8	95.7																						
6-Sep	97.3	98.0	99.2	99.9	100.0	100.0	100.0	100.0	99.8	94.9	89.5	78.2	68.7	66.0	63.8	62.6	70.8	88.3	93.2	94.7	94.4	88.3	79.8	78.8	87.7	100.0																						
7-Sep	78.4	82.8	85.1	85.8	91.3	93.4	96.2	89.6	74.2	66.9	68.2	58.1	51.1	48.0	46.3	48.1	57.6	62.1	63.1	63.1	65.0	68.1	67.9	65.9	69.8	96.2																						
8-Sep	74.1	68.5	65.4	71.7	74.9	76.8	84.2	80.6	72.7	60.9	50.6	41.8	38.3	38.9	39.1	39.0	40.4	47.5	64.0	61.4	58.6	59.8	58.0	60.7	59.5	84.2																						
9-Sep	63.1	66.2	68.1	70.8	76.9	74.2	74.7	73.3	67.6	61.3	52.7	44.6	39.5	37.8	36.2	47.3	50.7	59.7	68.7	68.8	65.8	70.8	77.9	77.4	62.2	77.9																						
10-Sep	76.7	83.4	83.6	86.6	91.7	93.6	96.3	91.0	76.5	67.7	59.7	46.9	43.7	40.5	40.0	40.4	41.1	45.7	57.3	64.7	68.5	68.0	67.1	69.6	66.7	96.3																						
11-Sep	72.4	73.5	73.6	75.9	79.9	82.7	82.5	76.9	66.9	54.4	44.4	38.9	36.3	36.1	37.5	40.2	41.5	43.9	46.5	55.1	60.8	62.9	63.7	65.1	58.8	82.7																						
12-Sep	67.8	69.7	70.6	71.1	71.6	76.3	78.2	72.6	70.4	63.1	60.4	55.8	50.4	49.6	53.9	61.1	67.3	75.0	80.5	84.7	79.2	73.4	70.7	75.5	68.7	84.7																						
13-Sep	74.8	76.4	81.0	79.9	80.7	82.6	82.1	78.8	77.3	73.4	62.0	50.3	42.4	43.8	44.2	42.2	40.9	43.4	47.4	52.0	61.8	70.3	77.4	88.2	64.7	88.2																						
14-Sep	92.5	93.3	93.6	95.8	96.6	96.9	96.6	95.2	94.6	91.0	85.3	75.1	66.2	59.1	53.3	51.9	54.3	61.4	68.6	61.6	58.6	56.8	54.8	56.3	75.4	96.9																						
15-Sep	60.4	60.0	65.5	69.3	71.0	71.5	69.6	69.7	65.3	54.3	41.8	38.9	36.0	34.6	32.9	32.9	32.4	40.5	50.6	53.8	54.6	58.5	60.3	56.8	53.4	71.5																						
16-Sep	55.8	57.8	59.6	57.9	58.3	60.9	61.2	61.1	61.2	50.5	44.2	40.6	38.3	35.5	31.4	31.3	36.5	49.2	60.0	58.7	63.6	70.8	70.6	67.4	53.4	70.8																						
17-Sep	67.5	71.9	73.5	76.5	82.5	84.9	90.7	84.5	74.9	65.3	52.6	45.0	41.0	36.3	43.3	41.8	48.3	54.7	61.2	60.7	57.2	53.4	53.5	52.5	61.4	90.7																						
18-Sep	45.9	47.2	52.6	56.5	59.4	61.8	74.5	73.6	65.4	57.2	59.5	58.0	52.5	47.7	51.3	58.6	56.5	58.7	66.7	73.7	70.1	70.9	67.5	74.3	60.8	74.5																						
19-Sep	70.5	63.3	66.7	69.9	72.0	83.5	81.7	71.2	62.3	57.2	52.6	45.0	41.2	41.5	39.1	38.3	38.9	44.3	54.8	56.7	57.2	56.2	59.4	60.6	57.7	83.5																						
20-Sep	61.4	60.5	61.5	66.3	71.7	76.7	80.9	80.7	74.8	66.2	59.0	51.6	45.1	45.2	61.8	65.2	56.6	57.4	63.7	64.8	69.8	72.1	72.7	77.6	65.1	80.9																						
21-Sep	78.8	81.2	77.6	74.2	74.5	82.3	87.8	80.2	75.4	70.9	59.3	48.4	43.1	38.8	35.9	37.7	37.7	42.1	49.6	58.3	63.3	63.5	65.7	65.6	62.2	87.8																						
22-Sep	65.2	65.6	65.8	68.1	70.5	72.2	74.3	70.5	59.3	48.9	42.0	36.6	34.2	31.2	30.2	32.9	36.3	40.2	43.5	50.4	52.7	53.0	56.1	55.0	52.3	74.3																						
23-Sep	56.7	62.0	67.3	70.0	72.0	74.4	78.3	76.8	70.1	65.9	60.4	57.3	53.1	52.3	50.3	51.2	54.0	60.6	69.4	74.8	76.9	79.1	80.3	79.7	66.4	80.3																						
24-Sep	79.2	76.5	77.3	81.7	87.0	91.1	91.3	87.6	83.4	78.4	75.4	75.7	75.1	70.8	67.0	65.9	73.9	78.5	83.2	86.9	89.2	86.6	85.9	85.9	80.6	91.3																						
25-Sep	81.0	75.9	70.8	72.4	75.9	92.0	93.0	84.4	62.1	54.5	53.8	47.5	37.0	32.0	33.5	34.7	38.5	39.9	44.1	52.8	58.7	61.7	65.0	66.8	59.5	93.0																						
26-Sep	61.3	59.2	57.9	57.8	58.5	57.6	57.4	58.6	56.7	47.8	43.3	41.7	40.6	35.8	40.6	46.6	49.8	54.3	59.3	66.9	65.0	68.0	68.5	60.2	54.7	68.5																						
27-Sep	56.3	55.3	59.4	65.0	71.8	75.9	76.8	73.5	66.3	73.1	85.1	60.2	46.3	46.0	58.0	64.9	51.5	53.4	61.2	59.0	59.5	61.3	59.9	64.6	62.7	85.1																						
28-Sep	68.0	70.4	75.4	78.5	81.9	82.2	84.1	82.7	79.0	70.8	60.6	50.1	44.7	50.0	52.5	49.9	53.3	79.7	94.8	97.1	97.5	97.9	99.1	99.8	75.0	99.8																						
29-Sep	100.0	OR	OR	OR	OR	OR	OR	OR	100.0	96.6	87.8	76.6	74.7	78.7	80.7	82.4	84.2	85.3	87.8	90.3	90.8	90.0	91.6	92.9	--	100.0																						
30-Sep	93.8	94.2	94.0	93.5	94.0	93.4	94.7	94.2	92.1	82.8	72.0	67.7	60.9	61.2	63.2	64.0	66.0	68.6	69.1	71.1	73.0	74.0	76.5	79.1	78.9	94.7																						
																								72.7	72.4	73.9	75.9	78.6	81.3	83.0	79.7	74.6	67.8	61.3	54.8	50.3	48.8	49.6	50.9	53.0	58.7	65.1	68.8	70.5	71.4	71.8	72.6	Diurnal Average
																								100.0	98.0	99.2	99.9	100.0	100.0	100.0	100.0	100.0	96.6	89.5	78.8	89.9	90.2	86.9	82.4	84.2	88.3	94.8	97.1	97.5	97.9	99.1	99.8	Diurnal Maximum

OR - Out of Range



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Stony Mountain - September 2023



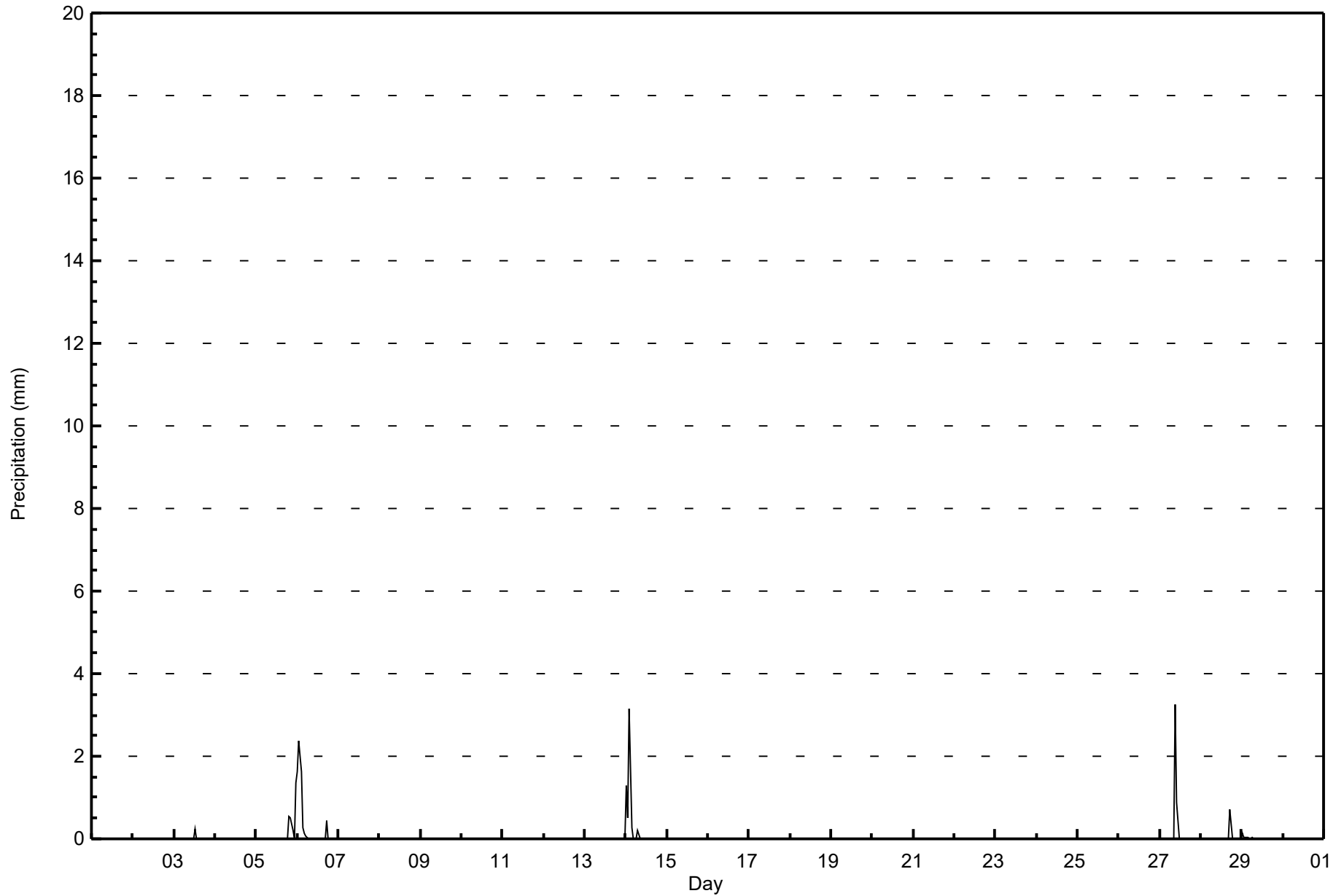


Maximum Value: 3.2 mm on Sep 27 10:00		Maximum Daily Total: 6.5 mm on Sep 6		Hours in Service: 720																															
Minimum Value: 0.0 mm on Sep 1 01:00		Minimum Daily Total: 0.0 mm on Sep 1		Hours of Data: 710																															
Maximum Diurnal Total: 4.8 mm at hour 3		Minimum Diurnal Total: 0.0 mm at hour 9		Hours of Missing Data: 10																															
Monthly Total: 19.92 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 = 0.9		Hours of Calibration: 0																															
				Percent Operational Time: 98.6																															
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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
4-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.2	0.0	1.4	2.6	1.4	0.0	0.0	0.0	0.0	0.0			
6-Sep	1.6	2.4	1.6	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	0.5	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	6.5	2.4	
7-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	0.0	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
12-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	1.3	0.5	3.2	0.3	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.4	3.2
15-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	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	0.0	0.0	0.0	0.0	4.1	3.2
28-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.7
29-Sep	0.2	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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
30-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	2.9	4.8	0.6	0.1	0.1	0.1	0.2	0.0	3.2	0.9	0.0	0.2	0.0	0.0	0.0	1.2	0.0	0.6	0.5	0.2	0.0	1.4	Diurnal Average										
		1.6	2.4	3.2	0.3	0.1	0.1	0.1	0.2	0.0	3.2	0.9	0.0	0.2	0.0	0.0	0.0	0.7	0.0	0.6	0.5	0.2	0.0	1.4	Diurnal Maximum										
DF - DAS Failure																																			



Wood Buffalo Environmental Association
Hourly Averages

Precipitation (PC) - mm
Stony Mountain - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Precipitation (PC) - mm
Stony Mountain - September 2023

Concentration Ranges (mm)	Number of Hours	%	Cumulative %
0 - 0.3	697	98.17	98.17
0.4 - 0.5	3	0.42	98.59
0.6 - 0.7	2	0.28	98.87
0.8 - 1.4	3	0.42	99.30
1.5 - 10	5	0.70	100.00
> 10	0	0.00	100.00

Total Number of Valid Hours: 710

Total Number of Hours: 720



Wood Buffalo Environmental Association

Summary of Hour Averages

Leaf Wetness (LW) - %

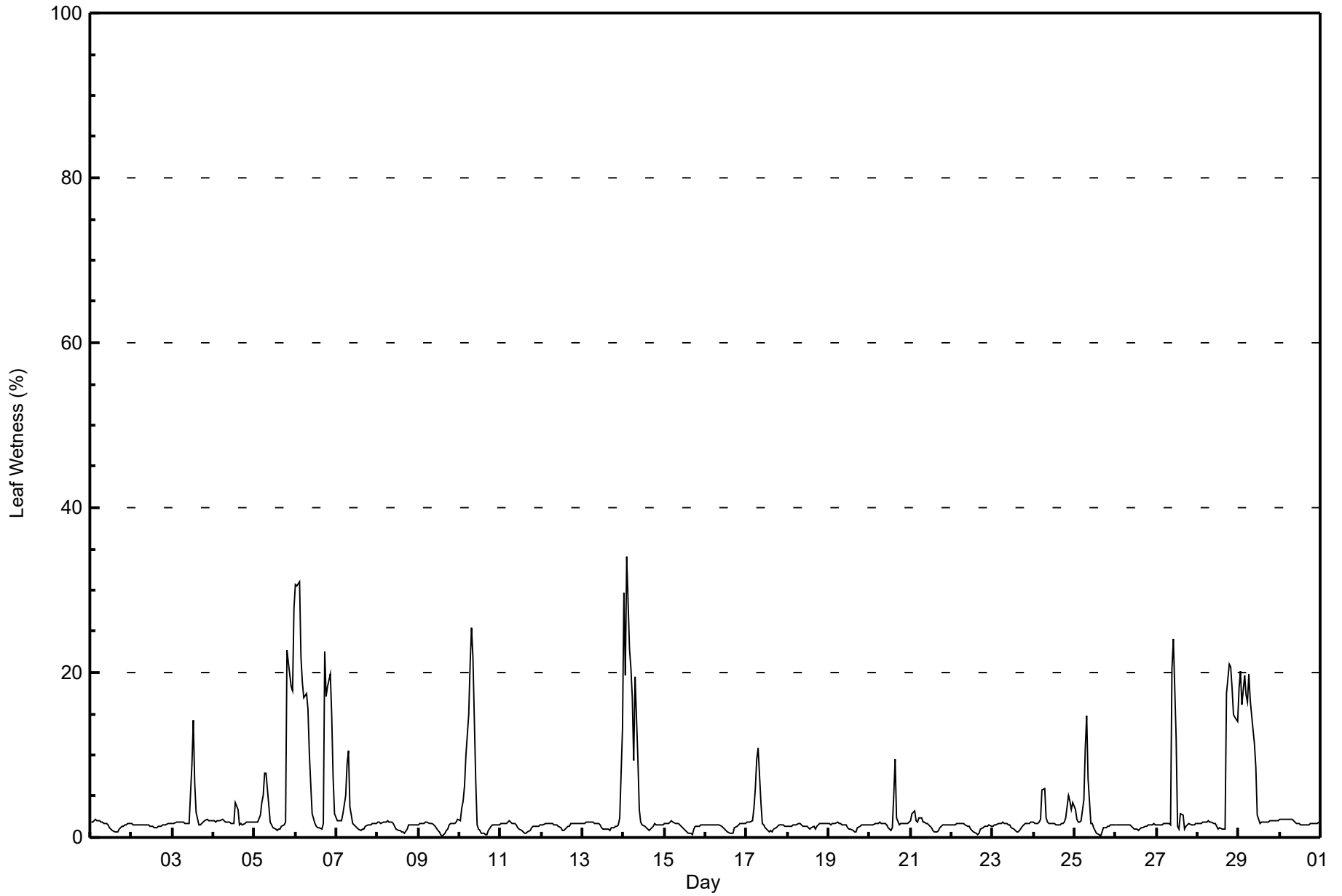
Stony Mountain - September 2023

Maximum Value: 34.1 % on Sep 14 03:00		Maximum Daily Average: 13.1 % on Sep 6		Hours in Service: 720																							
Minimum Value: 0.1 % on Sep 9 15:00		Minimum Daily Average: 1.3 % on Sep 22		Hours of Data: 720																							
Maximum Diurnal Average: 5.3 % at hour 8		Minimum Diurnal Average: 1.1 % at hour 17		Hours of Missing Data: 0																							
Monthly Average: 3.10 %		Percentiles: P₁ = 0.4 P₁₀ = 1.0 Q₁ = 1.4 Median = 1.6 Q₃ = 1.9 P₉₀ = 6.0 P₉₉ = 23.8		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-Sep	1.9	1.9	2.1	2.2	2.1	2.0	1.9	1.8	1.8	1.6	1.5	1.2	1.0	0.9	0.7	0.7	0.7	1.0	1.3	1.4	1.5	1.6	1.6	1.7	1.5	2.2	
2-Sep	1.6	1.6	1.5	1.5	1.5	1.6	1.6	1.6	1.5	1.5	1.5	1.4	1.3	1.2	1.2	1.2	1.3	1.4	1.5	1.6	1.6	1.6	1.6	1.6	1.5	1.6	
3-Sep	1.6	1.7	1.8	1.8	1.8	1.9	1.8	1.8	1.7	1.7	1.7	8.9	14.2	6.7	3.0	1.6	1.6	1.7	1.8	2.0	2.1	2.0	2.0	2.1	2.9	14.2	
4-Sep	2.0	1.9	2.0	2.0	2.0	2.2	2.0	1.9	1.8	1.8	1.8	1.8	1.7	4.2	3.4	1.6	1.6	1.6	1.8	1.9	1.8	1.8	1.9	1.8	2.0	4.2	
5-Sep	1.8	1.8	1.9	2.8	4.2	5.1	7.8	7.8	3.8	1.8	1.5	1.3	1.0	0.9	1.1	1.1	1.3	1.5	1.9	22.6	21.2	18.3	17.8	27.7	6.6	27.7	
6-Sep	30.7	30.5	31.1	21.8	18.8	17.0	17.5	15.6	10.2	6.5	2.8	1.7	1.4	1.3	1.1	1.1	1.7	22.5	17.2	18.3	19.8	14.8	7.3	2.8	13.1	31.1	
7-Sep	2.0	2.1	2.1	2.0	2.9	5.0	9.1	10.6	3.7	1.7	1.6	1.4	1.2	1.0	0.9	1.0	1.0	1.3	1.5	1.6	1.6	1.7	1.7	1.7	2.5	10.6	
8-Sep	1.8	1.8	1.7	1.8	1.8	1.9	2.0	1.9	1.8	1.6	1.4	1.1	0.9	0.8	0.6	0.7	0.5	1.0	1.5	1.5	1.5	1.5	1.5	1.5	1.4	2.0	
9-Sep	1.6	1.6	1.7	1.7	1.9	1.8	1.7	1.7	1.6	1.5	1.3	0.9	0.7	0.4	0.1	0.6	0.8	1.1	1.5	1.6	1.6	1.7	1.9	2.2	1.4	2.2	
10-Sep	2.0	3.5	4.4	6.3	10.1	14.9	21.1	25.4	21.9	7.0	1.5	1.0	0.8	0.6	0.5	0.3	0.3	0.9	1.3	1.5	1.6	1.6	1.5	1.6	5.5	25.4	
11-Sep	1.6	1.7	1.7	1.7	1.8	2.0	1.9	1.8	1.6	1.5	1.2	1.0	0.8	0.6	0.5	0.5	0.6	0.9	1.2	1.3	1.4	1.4	1.4	1.5	1.3	2.0	
12-Sep	1.5	1.6	1.6	1.6	1.6	1.7	1.7	1.6	1.5	1.4	1.3	1.2	0.9	0.8	1.0	1.3	1.4	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.5	1.7	
13-Sep	1.7	1.8	1.8	1.9	1.8	1.9	1.8	1.8	1.7	1.7	1.5	1.3	1.0	1.0	1.1	1.0	0.8	1.2	1.3	1.3	1.4	1.6	2.4	13.2	2.0	13.2	
14-Sep	29.7	19.7	34.1	22.8	20.6	16.9	9.3	19.5	9.4	3.3	1.8	1.6	1.4	1.2	1.0	0.9	1.0	1.4	1.6	1.6	1.6	1.6	1.6	1.6	8.6	34.1	
15-Sep	1.6	1.6	1.7	1.8	2.0	1.9	1.7	1.7	1.7	1.5	1.3	1.1	0.8	0.7	0.5	0.4	0.4	1.1	1.3	1.4	1.4	1.5	1.6	1.6	1.3	2.0	
16-Sep	1.5	1.6	1.6	1.5	1.5	1.5	1.6	1.5	1.5	1.4	1.2	1.0	0.8	0.6	0.5	0.4	0.5	1.2	1.4	1.5	1.6	1.7	1.8	1.8	1.3	1.8	
17-Sep	1.8	1.9	1.9	2.1	3.5	5.9	9.5	10.8	4.2	1.7	1.5	1.1	0.9	0.7	0.8	0.7	0.9	1.2	1.4	1.5	1.5	1.5	1.4	1.4	2.5	10.8	
18-Sep	1.4	1.4	1.4	1.5	1.5	1.6	1.7	1.6	1.5	1.4	1.4	1.4	1.1	1.0	1.2	1.4	1.1	1.4	1.6	1.7	1.7	1.7	1.7	1.7	1.5	1.7	
19-Sep	1.7	1.6	1.6	1.6	1.7	1.8	1.8	1.7	1.6	1.5	1.5	1.1	0.9	1.0	0.8	0.7	0.7	1.2	1.4	1.5	1.5	1.5	1.5	1.6	1.4	1.8	
20-Sep	1.6	1.6	1.6	1.6	1.7	1.7	1.8	1.8	1.7	1.6	1.5	1.2	0.9	1.1	5.1	9.5	2.4	1.5	1.6	1.7	1.7	1.8	1.8	1.9	2.1	9.5	
21-Sep	2.1	2.9	3.3	2.0	1.9	2.3	2.3	1.9	1.8	1.8	1.6	1.3	1.1	0.9	0.7	0.7	0.8	1.2	1.3	1.5	1.5	1.5	1.6	1.6	1.7	3.3	
22-Sep	1.6	1.6	1.6	1.6	1.7	1.7	1.7	1.7	1.5	1.4	1.3	1.0	0.9	0.6	0.4	0.4	0.5	1.1	1.2	1.4	1.4	1.4	1.4	1.4	1.3	1.7	
23-Sep	1.4	1.5	1.6	1.6	1.7	1.7	1.8	1.8	1.6	1.6	1.5	1.3	1.0	0.9	0.7	0.6	0.9	1.3	1.5	1.7	1.7	1.8	1.8	1.8	1.5	1.8	
24-Sep	1.8	1.8	1.8	1.9	2.2	5.8	6.0	2.3	1.9	1.8	1.7	1.7	1.7	1.5	1.5	1.6	1.7	1.8	1.9	2.4	5.1	4.5	3.5	4.3	2.6	6.0	
25-Sep	3.4	2.2	1.9	1.9	2.0	4.6	10.8	14.7	7.1	1.7	1.7	1.2	0.8	0.5	0.3	0.3	0.6	1.1	1.2	1.3	1.4	1.5	1.5	1.6	2.7	14.7	
26-Sep	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.3	1.2	1.1	1.0	0.8	1.0	1.1	1.2	1.3	1.4	1.5	1.5	1.6	1.6	1.5	1.4	1.6	
27-Sep	1.5	1.5	1.5	1.6	1.6	1.7	1.7	1.7	1.6	20.6	24.1	12.1	1.3	1.1	2.8	2.7	1.1	1.4	1.6	1.6	1.6	1.6	1.6	1.6	3.8	24.1	
28-Sep	1.7	1.7	1.8	1.8	1.9	1.9	2.0	1.9	1.8	1.7	1.6	1.3	1.0	1.2	1.0	1.1	1.0	17.4	21.0	20.7	18.1	14.9	14.6	14.1	6.1	21.0	
29-Sep	18.1	20.1	16.1	19.7	17.4	16.5	19.8	16.6	13.1	11.4	8.4	2.7	1.7	1.8	1.8	1.9	1.9	1.9	2.0	2.1	2.1	2.1	2.1	2.1	8.5	20.1	
30-Sep	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.1	1.9	1.8	1.6	1.5	1.5	1.5	1.5	1.5	1.6	1.6	1.7	1.7	1.7	1.7	1.8	1.8	2.3	
		4.2	4.0	4.4	3.9	4.0	4.3	5.0	5.3	3.7	3.0	2.5	1.9	1.5	1.2	1.2	1.3	1.1	2.6	2.7	3.5	3.5	3.2	2.9	3.5	Diurnal Average	
		30.7	30.5	34.1	22.8	20.6	17.0	21.1	25.4	21.9	20.6	24.1	12.1	14.2	6.7	5.1	9.5	2.4	22.5	21.0	22.6	21.2	18.3	17.8	27.7	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Leaf Wetness (LW) - %
Stony Mountain - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Leaf Wetness (LW) - %
Stony Mountain - September 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 0.3	5	0.69	0.69
0.4 - 0.5	15	2.08	2.78
0.6 - 0.7	22	3.06	5.83
0.8 - 1.4	167	23.19	29.03
1.5 - 10	425	59.03	88.06
> 10	57	7.92	95.97

Total Number of Valid Hours: 720

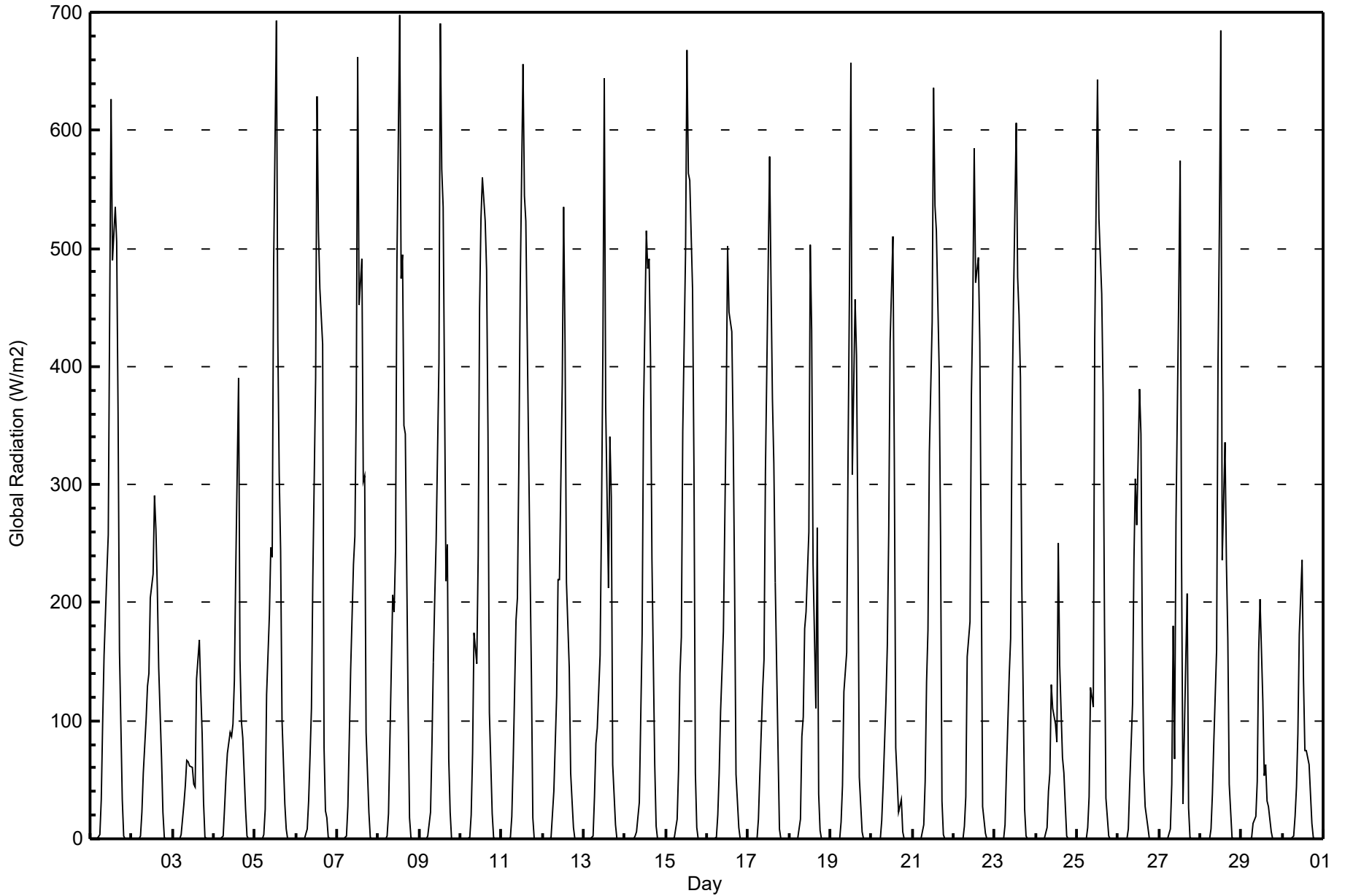
Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

Global Radiation (GR) - W/m2
Stony Mountain - September 2023

Maximum Value: 698.2 W/m2 on Sep 8 13:00 Maximum Daily Average: 163.8 W/m2 on Sep 1																							Hours in Service:	720		
Minimum Value: 0.0 W/m2 on Sep 1 01:00 Minimum Daily Average: 30.9 W/m2 on Sep 29																							Hours of Data:	720		
Maximum Diurnal Average: 504.6 W/m2 at hour 13 Minimum Diurnal Average: 0.0 W/m2 at hour 3																							Hours of Missing Data:	0		
Monthly Average: 114.38 W/m2 Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 10.1 Q ₃ = 173.9 P ₉₀ = 422.1 P ₉₉ = 654.0																							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-Sep	0.0	0.0	0.0	0.0	0.0	4.1	33.0	98.7	154.9	225.2	257.9	444.4	626.5	490.3	535.1	504.9	359.9	159.0	33.2	2.9	0.1	0.1	0.1	0.1	163.8	626.5
2-Sep	0.0	0.0	0.0	0.0	0.0	2.6	22.0	55.6	100.5	128.7	139.6	204.6	224.0	290.9	262.6	211.9	144.8	68.7	22.6	1.6	0.0	0.1	0.0	0.0	78.4	290.9
3-Sep	0.0	0.0	0.0	0.0	0.0	3.3	29.6	44.9	66.5	65.8	62.0	60.8	46.1	43.3	135.1	168.6	126.3	88.8	30.3	1.5	0.1	0.0	0.0	0.0	40.5	168.6
4-Sep	0.0	0.0	0.0	0.0	0.0	2.5	26.6	52.0	71.9	90.4	86.2	97.9	133.5	228.8	390.8	152.4	99.5	85.2	25.0	2.0	0.2	0.1	0.1	0.0	64.4	390.8
5-Sep	0.0	0.0	0.1	0.1	0.1	3.7	24.8	122.3	190.3	247.3	238.9	484.6	692.4	422.6	308.1	244.7	101.3	29.3	8.9	0.1	0.0	0.0	0.0	0.0	130.0	692.4
6-Sep	0.0	0.0	0.0	0.0	0.0	0.3	8.5	32.5	69.5	109.9	221.4	390.0	628.5	515.1	466.1	419.1	76.7	23.5	17.7	0.9	0.0	0.1	0.3	0.1	124.2	628.5
7-Sep	0.1	0.0	0.0	0.0	0.0	2.2	26.7	84.7	144.0	232.2	256.1	371.5	662.4	451.6	490.9	302.4	307.3	90.2	22.7	0.9	0.0	0.0	0.0	0.0	143.6	662.4
8-Sep	0.0	0.0	0.0	0.0	0.0	2.1	21.3	83.5	206.8	192.7	243.5	487.7	698.2	475.0	495.0	350.2	343.2	111.8	18.0	0.8	0.0	0.0	0.0	0.0	155.4	698.2
9-Sep	0.0	0.0	0.0	0.0	0.0	1.8	22.8	79.3	150.0	203.9	252.5	403.3	689.9	567.0	534.7	218.8	248.8	67.8	22.6	0.6	0.0	0.0	0.0	0.0	144.3	689.9
10-Sep	0.0	0.0	0.0	0.0	0.0	1.4	20.1	72.4	174.4	148.2	239.9	449.2	525.1	560.4	522.9	481.2	343.5	107.1	21.0	0.7	0.0	0.0	0.0	0.0	152.8	560.4
11-Sep	0.0	0.0	0.0	0.0	0.0	1.4	18.5	66.2	184.6	203.9	314.8	466.9	656.4	544.9	523.7	426.2	326.5	137.7	17.8	0.3	0.0	0.0	0.0	0.0	162.1	656.4
12-Sep	0.0	0.0	0.0	0.0	0.0	1.5	39.8	81.2	121.2	219.6	219.9	385.4	535.5	417.7	217.5	145.0	56.3	32.4	9.1	0.0	0.0	0.0	0.0	0.0	103.4	535.5
13-Sep	0.0	0.0	0.0	0.0	0.0	2.0	35.0	80.3	93.2	156.0	270.9	413.7	643.9	365.8	212.3	340.5	289.2	62.6	11.8	0.1	0.0	0.0	0.0	0.0	124.1	643.9
14-Sep	0.0	0.0	0.0	0.0	0.0	0.2	2.3	6.3	30.4	102.3	173.7	361.9	514.8	483.1	490.7	406.8	237.4	63.2	10.7	0.1	0.0	0.0	0.0	0.0	120.2	514.8
15-Sep	0.0	0.0	0.0	0.0	0.0	0.8	17.1	58.2	139.9	170.7	345.0	497.6	668.4	563.9	557.9	464.6	312.9	55.4	9.4	0.0	0.0	0.0	0.0	0.0	160.9	668.4
16-Sep	0.0	0.0	0.0	0.0	0.0	0.7	19.7	56.2	108.2	176.1	269.1	363.6	502.0	445.9	429.0	341.8	213.7	54.3	9.3	0.2	0.0	0.1	0.1	0.0	124.6	502.0
17-Sep	0.0	0.0	0.0	0.0	0.0	0.4	16.3	55.1	125.8	151.8	310.5	398.2	577.5	469.1	372.4	318.3	217.1	76.0	8.2	0.0	0.0	0.0	0.0	0.0	129.0	577.5
18-Sep	0.0	0.0	0.0	0.0	0.0	0.5	16.6	86.8	103.0	177.7	192.1	259.9	503.0	430.2	232.0	110.2	263.7	37.9	7.0	0.0	0.0	0.0	0.0	0.0	100.9	503.0
19-Sep	0.0	0.0	0.0	0.0	0.0	0.3	14.6	44.6	124.8	158.1	329.2	469.9	657.6	308.3	456.4	409.3	253.0	52.3	6.4	0.0	0.0	0.0	0.0	0.0	136.9	657.6
20-Sep	0.0	0.0	0.0	0.0	0.0	0.2	14.9	45.2	116.8	164.1	260.4	421.3	510.6	318.7	76.6	50.6	22.3	33.3	6.4	0.0	0.0	0.0	0.0	0.0	85.1	510.6
21-Sep	0.0	0.0	0.0	0.0	0.0	0.1	11.5	48.2	132.5	176.9	328.0	437.2	635.5	535.8	515.2	396.9	253.8	31.5	3.8	0.0	0.0	0.0	0.0	0.0	146.1	635.5
22-Sep	0.0	0.0	0.0	0.0	0.0	0.1	10.4	35.9	154.8	183.8	376.6	451.5	584.4	471.4	492.8	419.5	241.8	26.8	4.6	0.0	0.0	0.0	0.0	0.0	143.9	584.4
23-Sep	0.0	0.0	0.0	0.0	0.0	0.2	11.3	56.9	139.1	169.9	357.3	452.0	605.9	475.8	443.4	390.2	212.3	24.4	2.3	0.0	0.0	0.0	0.0	0.0	139.2	605.9
24-Sep	0.0	0.0	0.0	0.0	0.0	0.0	9.8	40.8	55.8	130.0	110.8	97.4	82.0	249.8	146.6	68.8	56.3	28.4	2.5	0.0	0.0	0.0	0.0	0.0	45.0	249.8
25-Sep	0.0	0.0	0.0	0.0	0.1	0.1	9.7	35.0	127.9	111.9	422.0	538.0	642.7	525.7	462.0	377.4	180.6	34.0	1.8	0.0	0.0	0.0	0.0	0.0	144.5	642.7
26-Sep	0.0	0.0	0.0	0.0	0.0	0.0	8.1	46.2	114.4	236.3	305.2	265.3	380.5	343.3	163.8	58.3	26.8	9.5	0.5	0.0	0.0	0.0	0.0	0.0	81.6	380.5
27-Sep	0.0	0.1	0.0	0.0	0.0	0.0	8.4	46.8	180.0	68.0	268.7	463.9	574.3	233.4	29.9	151.4	207.7	26.7	1.6	0.1	0.0	0.0	0.0	0.0	94.2	574.3
28-Sep	0.0	0.0	0.0	0.0	0.0	0.0	8.5	38.2	81.4	159.8	401.8	519.5	684.6	236.5	335.8	233.6	169.5	45.7	1.4	0.0	0.0	0.0	0.0	0.0	121.5	684.6
29-Sep	0.0	0.0	0.0	0.0	0.0	0.0	1.3	13.4	18.4	48.2	158.3	203.4	116.8	53.2	63.4	31.8	27.3	6.0	0.2	0.0	0.0	0.0	0.0	0.0	30.9	203.4
30-Sep	0.0	0.0	0.0	0.0	0.0	0.0	2.8	19.2	43.6	88.6	173.5	236.3	135.2	74.2	75.3	62.9	37.8	13.4	0.6	0.0	0.0	0.0	0.0	0.0	40.1	236.3
																							Diurnal Average			
																							Diurnal Maximum			





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Global Radiation (GR) - W/m2
Stony Mountain - September 2023

Concentration Ranges (W/m2)	Number of Hours	%	Cumulative %
0 - 20	380	52.78	52.78
21 - 100	106	14.72	67.50
101 - 300	115	15.97	83.47
301 - 600	105	14.58	98.06
601 - 900	14	1.94	100.00
> 900	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Speed 20 m (WS20m) - km/h
Stony Mountain - September 2023

Maximum Speed: 21 km/h on Sep 1 17:00	Maximum Daily Speed Average: 12.5 km/h on Sep 2	Hours in Service: 720
Minimum Speed Value: 1 km/h on Sep 30 11:00	Minimum Daily Speed Average: 1.4 km/h on Sep 30	Hours of Data: 229
Maximum Diurnal Speed Average: 8.0 km/h at hour 5	Minimum Diurnal Speed Average: 5.1 km/h at hour 18	Hours of Missing Data: 491
Monthly Average Velocity: 6.4 km/h 263.1 deg	Percentiles: P ₁ = 3 P ₁₀ = 6 Q ₁ = 7 Median = 10 Q ₃ = 12 P ₉₀ = 14 P ₉₉ = 18	Percent Operational Time: 31.8

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-Sep	WNW13WNW14	NW10WNW10WNW12	W13	W14	W12	W10	W10	W15WNW15	W14WSW15WSW18	SW20	SW21	SW18	SW15	SSW13	SSW15	SW17	SW18	SW16	WSW12.4	SW21							
2-Sep	WSW16WSW16	W17	W18	W17	W15WNW15WNW16WNW15WNW13WNW11	W9	W9	W11WNW12WNW10	W10	W10	W11	W14WSW13WSW11WSW11WSW11	WSW12.5	W18													
3-Sep	WSW12	SW13	UO	UO	UO	UO	UO	UO	UO	UO	UO	WSW17	SW13	SSW8	SSW7	SSW7	SSW8	SW9	SW12	SW13	SW13	W13WNW12WNW11	---	WSW17			
4-Sep	WNW13WNW13	NW14	NW12WNW11	W12WNW11WNW11WNW12	NW11WNW12	NW9WNW12	NW14	NW14	NW12	NW11	NW8	W7	WSW9WSW10	W11	W12	W11	WSW10.8	NW14									
5-Sep	W12	W10	W9	WSW9WSW12	SW11	SW11	SW12	SSW11	SSW11	S12	S10	S13	SSE9	S9	SSE8	SE6	SSE7	SSE7	SSW7	SE6	ESE9	SE9	SE8	SSW7.0	S13		
6-Sep	SE7	SE8	SE9	SE8	SSE7	SSE5	S5	SW6	W7	W8	WSW9WSW10	W11	SW12	SW11	SW11	SW10	WSW6	SW8	SSW8	SW9WSW12	W11	W11	SW6.3	SW12			
7-Sep	W11	W10	W10	W13WNW11	W8	SW7	WSW7	W5	WSW8	SW7WSW11WSW14WSW13WSW12WSW12	SW13WSW11WSW12WSW12WSW12	W10	W10	W12	WSW10.1	WSW14											
8-Sep	WSW10WSW10WSW11WSW12WSW13	SW12	SW11	SW10	SW9	WSW7	W8	W9	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	WSW13	
9-Sep	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-Sep	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-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	---	
12-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	---	
13-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	---	
14-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	---	
15-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	---	
16-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	---	
17-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	---	
18-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	---	
19-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	---	
20-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	---	
21-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	---	
22-Sep	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-Sep	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-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	---	
25-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	---	
26-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	---	
27-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	---	
28-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	NNW8	NW7	N9	NNW5	NNE5	ENE8	NE8	NE8	NNE9	NNW5	---	NNE9
29-Sep	NNE7	N7	N9	N10	N6	NNW6	NNW7	NNW8	N8	N9	N9	N10	NNW11	NNW10	NNW10	NNW10	NNW11	NNW11	NNW7	NNW7	NW7	NW7	NW7	NW6	NNW8.1	NNW11	
30-Sep	WNW6	NW6	WNW6	WNW6	WNW5	WNW6	WNW6	NNW5	NNW3	NNE2	NNE1	N2	NNE5	ENE5	ENE6	ENE6	E5	ENE6	E6	ESE6	ESE6	ESE6	SSE6	SSE7	NNE1.4	SSE7	

W7.7	W7.8	W7.6	W7.3	W8.0	W7.9	W7.5	W7.1	W6.5	W6.4	W6.1	W7.4	W7.3	WSW6.4	W6.1	WSW6.0	WSW5.8	WSW5.1	WSW5.4	SW5.8	SW5.5	WSW5.8	WSW6.1	WSW6.7	Diurnal Average
WSW16	WSW16	W17	W18	W17	W15WNW15WNW16WNW15WNW13	W15WSW17	W14WSW15WSW18	SW20	SW21	SW18	SW15	WSW14	SSW15	SW17	SW18	SW16	Diurnal Maximum							

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

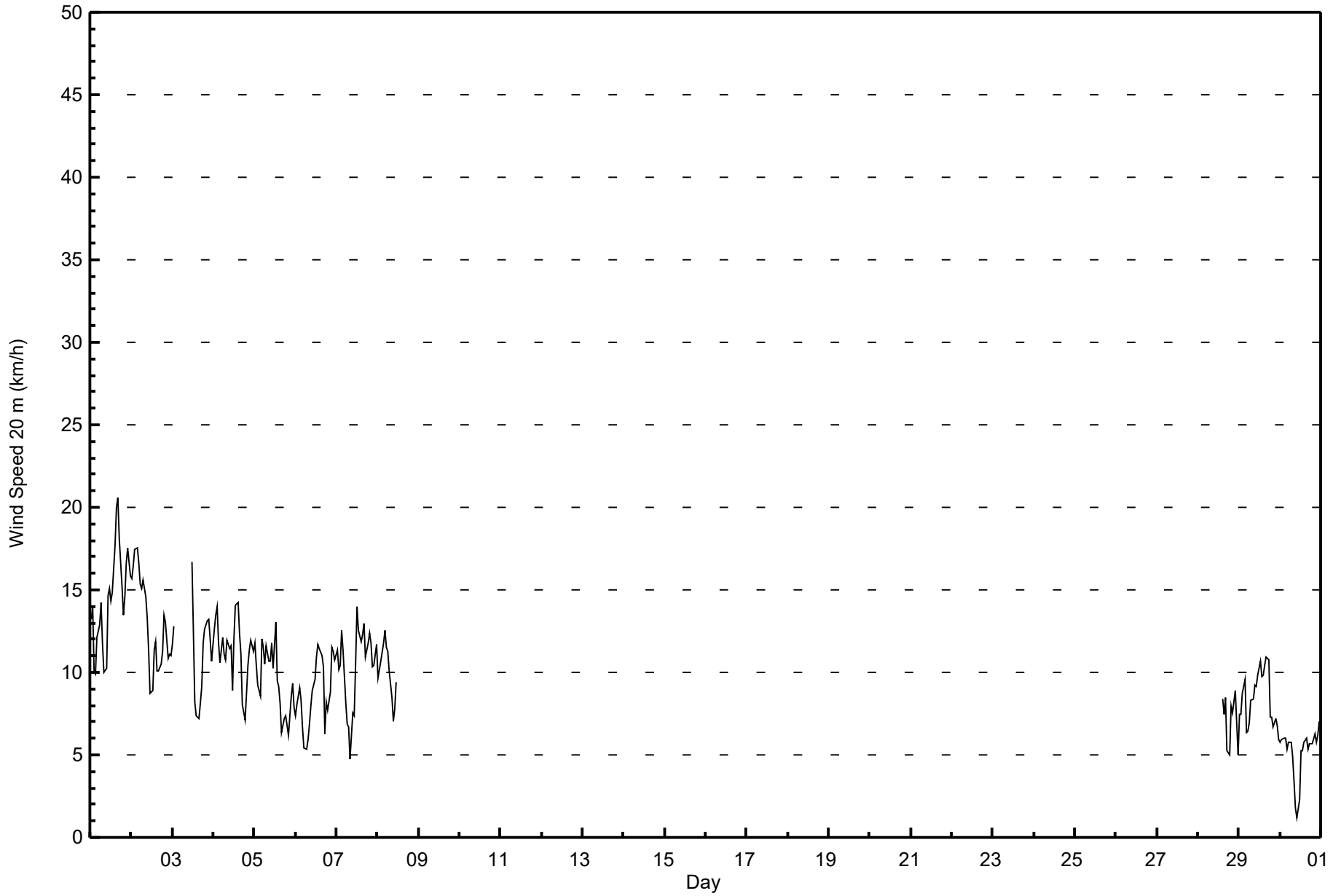
Wind Speed 20 m (WS20m) - km/h
Stony Mountain - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Sep 1 17:00 Minimum Value: 1 km/h on Sep 30 10:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 3 Q ₃ = 4 P ₉₀ = 5 P ₉₉ = 6													Hours in Service: 720 Hours of Data: 229 Hours of Missing Data: 491 Hours of Calibration: 0 Percent Operational Time: 31.8													
Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Sep	3	4	3	2	3	3	4	3	4	3	5	6	5	5	6	7	7	6	4	4	4	4	5	4	7	
2-Sep	4	5	6	5	5	4	5	4	4	4	3	3	3	4	4	3	3	3	4	5	5	3	3	3	6	
3-Sep	3	3	UO	UO	UO	UO	UO	UO	UO	UO	UO	6	4	2	2	2	2	3	3	3	4	3	3	6		
4-Sep	3	4	4	3	3	3	3	3	4	4	4	3	5	5	5	4	4	3	2	2	3	3	3	5		
5-Sep	3	3	2	2	3	2	2	3	3	3	4	4	4	4	3	3	2	2	2	1	1	2	2	4		
6-Sep	2	2	2	2	2	1	1	2	3	3	3	3	4	3	4	4	3	4	2	1	2	3	3	4		
7-Sep	3	3	3	4	3	2	1	2	2	2	3	4	5	5	5	4	5	3	3	3	3	3	3	5		
8-Sep	2	3	3	2	3	2	2	2	2	2	3	3	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	3		
9-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--		
10-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--		
11-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--		
12-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--		
13-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--		
14-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--		
15-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--		
16-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--		
17-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--		
18-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--		
19-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--		
20-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--		
21-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--		
22-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--		
23-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--		
24-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--		
25-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--		
26-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--		
27-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--		
28-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	3	3	3	4	1	2	3	2	2	4		
29-Sep	2	2	3	3	3	2	2	3	3	3	3	3	4	3	3	3	3	4	2	2	2	2	1	4		
30-Sep	1	1	1	2	1	1	1	1	1	1	1	2	2	2	2	2	2	1	1	1	1	1	2	2		
													Diurnal Maximum													
M - Maintenance			UO - Unstable Operation																							



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed 20 m (WS20m) - km/h
Stony Mountain - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed 20 m (WS20m) - km/h
Stony Mountain - September 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	15	6.55	6.55
6 - 11	140	61.14	67.69
12 - 19	72	31.44	99.13
20 - 28	2	0.87	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 229

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed 20 m (WS20m) - km/h
Stony Mountain - September 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	0	1	1	0	0	1	1	0	0	0	1	1	0	4	15
6 - 11	9	2	2	4	1	4	8	7	2	9	13	17	26	13	10	13	140
12 - 19	0	0	0	0	0	0	0	0	2	2	14	19	15	16	4	0	72
20 - 28	0	0	0	0	0	0	0	0	0	0	2	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	10	6	2	5	2	4	8	8	5	11	29	36	42	30	14	17	229

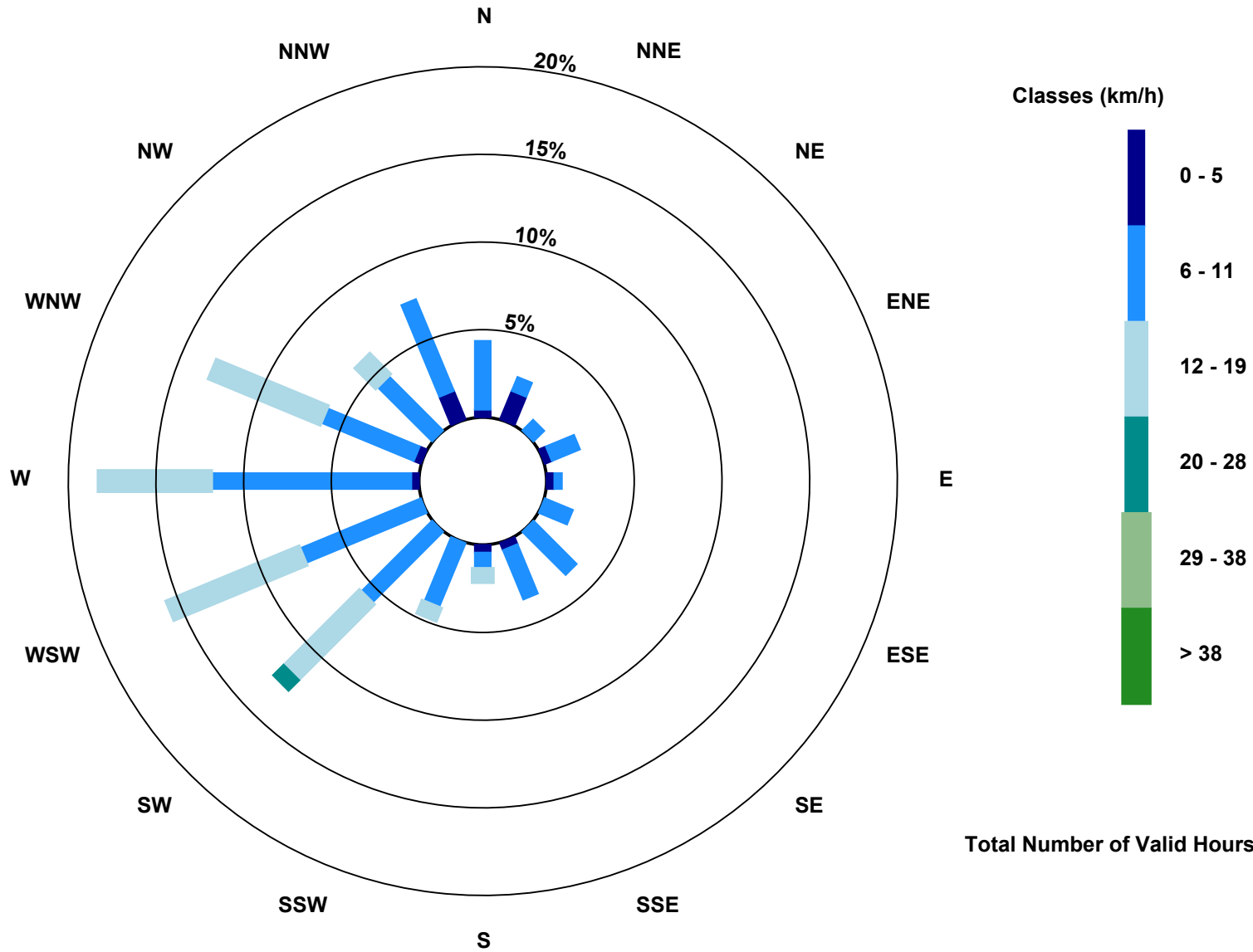
Total Number of Valid Hours: 229

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

Wind Speed 20 m (WS20m) - km/h
Stony Mountain



Total Number of Valid Hours: 229



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction 20 m (WD20m) - deg
Stony Mountain - September 2023

Direction of Maximum Speed: 229 deg on Sep 1 17:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 270.4 deg on Sep 2	Hours of Data: 229
Direction of Minimum Speed: 24 deg on Sep 30 11:00	Hours of Missing Data: 491
Direction of Minimum Daily Speed Average: 1.4 deg on Sep 30	Percent Operational Time: 31.8
Monthly Average Direction: 263.1 deg	

Day	Hourly Period Ending At (MST)																								Daily Average	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Sep	300	303	309	299	285	280	270	263	268	275	279	286	272	242	238	233	229	225	219	213	213	218	222	227	252.4	
2-Sep	242	256	261	266	278	278	285	290	292	290	287	270	279	279	289	282	262	266	260	259	258	252	252	253	270.4	
3-Sep	252	226	UO	UO	UO	UO	UO	UO	UO	UO	UO	243	227	207	202	203	206	221	234	232	235	264	290	295	--	
4-Sep	295	294	304	311	294	280	291	300	299	309	303	307	299	312	313	312	310	305	273	257	255	261	268	268	293.8	
5-Sep	269	267	261	253	239	231	221	215	204	194	181	183	170	168	184	168	145	147	162	204	130	117	139	145	195.3	
6-Sep	126	137	139	136	151	147	183	215	264	273	249	253	259	229	230	235	231	252	220	210	215	251	262	262	223.9	
7-Sep	263	262	268	281	284	274	230	258	265	243	214	255	239	245	247	238	236	247	248	248	250	260	260	271	253.8	
8-Sep	251	257	256	242	242	233	232	224	220	258	265	279	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	
9-Sep	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-Sep	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-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	
12-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	
13-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	
14-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	
15-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	
16-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	
17-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	
18-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	
19-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	
20-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	
21-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	
22-Sep	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-Sep	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-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	
25-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	
26-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	
27-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	
28-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	346	317	351	327	20	72	47	39	28	342	--
29-Sep	20	8	353	4	356	338	343	346	349	349	1	358	344	338	338	334	333	335	335	333	326	310	311	314	343.0	
30-Sep	292	307	298	292	303	295	302	335	342	24	24	6	14	68	59	76	88	71	86	106	105	120	149	168	32.0	

270.7 270.8 279.7 280.3 273.2 267.4 264.1 268.9 274.9 278.6 270.6 269.8 263.3 255.5 266.9 257.8 253.8 256.2 240.8 234.6 235.2 248.7 254.4 256.7

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 - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 92 deg on Sep 30 12:00	Hours of Data: 229
Minimum Value: 12 deg on Sep 6 20:00	Hours of Missing Data: 491
Percentiles: P ₁ = 13 P ₁₀ = 17 Q ₁ = 19 Median = 22 Q ₃ = 26 P ₉₀ = 31 P ₉₉ = 60	Hours of Calibration: 0
	Percent Operational Time: 31.8

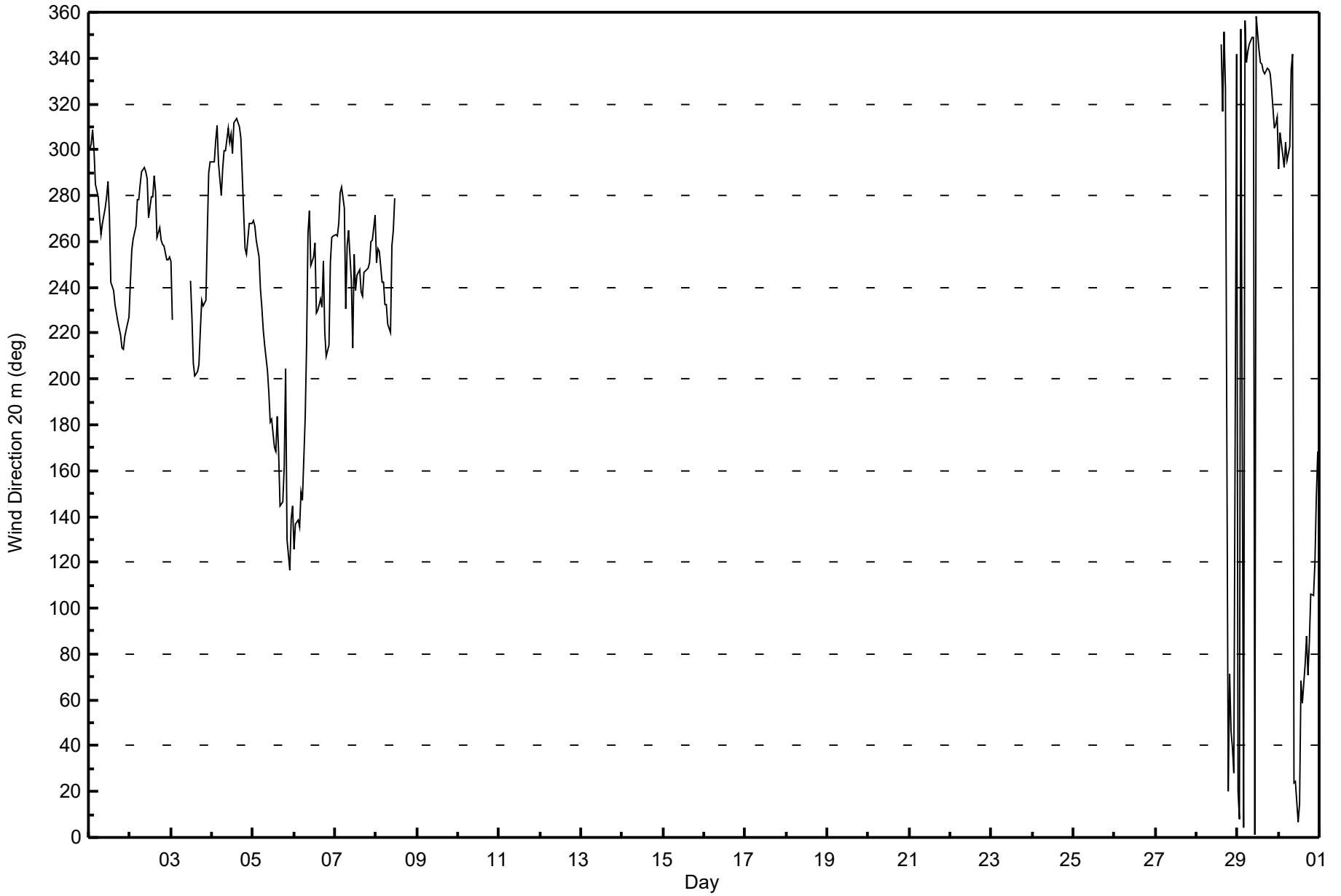
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Sep	19	19	18	18	20	22	23	24	30	27	26	28	29	29	28	25	25	23	20	19	17	18	19	18	30
2-Sep	22	24	25	26	22	22	22	19	19	21	21	26	27	25	25	25	25	23	27	26	21	21	20	27	
3-Sep	21	18	UO	UO	UO	UO	UO	UO	UO	UO	UO	23	21	16	20	20	19	17	17	18	28	20	19	28	
4-Sep	19	19	20	20	19	21	24	22	23	26	25	28	24	24	27	24	25	28	20	18	20	22	21	24	28
5-Sep	21	19	19	21	17	14	15	18	22	28	31	35	31	42	31	28	24	15	28	19	25	18	16	22	42
6-Sep	17	16	16	19	18	16	20	23	32	26	29	31	33	28	27	27	23	45	17	12	12	22	22	21	45
7-Sep	22	21	23	22	19	24	15	23	32	29	33	35	32	31	32	27	23	22	19	19	21	20	20	21	35
8-Sep	21	19	20	18	19	21	14	14	18	28	32	32	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	32
9-Sep	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-Sep	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-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
12-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
13-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
14-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
15-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
16-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
17-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
18-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
19-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
20-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
21-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
22-Sep	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-Sep	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-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
25-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
26-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
27-Sep	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
28-Sep	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-Sep	27	24	24	25	25	20	22	26	26	25	24	28	29	25	26	22	22	22	23	18	18	19	19	18	29
30-Sep	17	17	21	18	15	13	20	19	26	63	85	92	36	30	24	24	23	18	15	13	12	14	15	17	92
Diurnal Maximum																									
27 24 25 26 25 24 24 26 32 63 85 92 36 42 32 28 27 51 28 27 26 28 22 41																									

M - Maintenance UO - Unstable Operation



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction 20 m (WD20m) - deg
Stony Mountain - September 2023





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS19 FIREBAG SEPTEMBER 2023

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

October 30, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FIREBAG (AMS19)
 SEPTEMBER 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	35	99.86	31.6	0	6.8	0
H2S (ppb) Average	684	35	36	99.86	2.4	0	0.6	0
THC (ppm) Average	685	34	35	99.86	3.8	-	2.6	-
NO2 (ppb) Average	685	35	35	100	17.1	0	6.7	-
NO (ppb) Average	685	35	35	100	8	-	1.1	-
NOX (ppb) Average	685	35	35	100	20.9	-	7	-
Temperature 2 m (C) Average	720	0	0	100	23.5	-	18.1	-
Relative Humidity (%) Average	686	0	34	95.28	100	-	91.7	-
Wind Speed 10 m (km/h) Average	720	0	0	100	38	-	27	-
Wind Direction 10 m (deg) Average	720	0	0	100	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FIREBAG (AMS19)
 SEPTEMBER 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	2.64	4.2	-	0	0.1	0.2	1	3.3	6.9	31.6
H2S (ppb) Average	684	0.27	0.3	-	0	0.1	0.1	0.2	0.4	0.6	2.4
THC (ppm) Average	685	2.36	0.2	-	2.1	2.2	2.2	2.3	2.4	2.6	3.8
NO2 (ppb) Average	685	3.33	2.9	-	0.1	0.8	1.2	2.3	4.5	7.5	17.1
NO (ppb) Average	685	0.39	0.8	-	0	0	0.1	0.1	0.3	1	8
NOX (ppb) Average	685	3.72	3.3	-	0.1	0.9	1.3	2.5	4.9	8.4	20.9
Temperature 2 m (C) Average	720	12.45	5	-	3.3	5.8	8.3	12.8	16	19.2	23.5
Relative Humidity (%) Average	686	66.11	18.6	-	25.6	41.2	51.4	65.9	80.3	92.3	100
Wind Speed 10 m (km/h) Average	720	13.4	7	-	0	5	8	12	17	24	38
Wind Direction 10 m (deg) Average	720	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FIREBAG (AMS19)
SEPTEMBER 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
H2S,SO2, THC	29 Sep 2023 13:00	29 Sep 2023 13:00	1	Maintenance - sample manifold cleaned
Relative Humidity	01 Sep 2023 04:00	29 Sep 2023 12:00	34	Sensor operated out of range



Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 31.6 ppb on Sep 21 21:00	Maximum Daily Average: 6.8 ppb on Sep 22		Hours of Data:	685
Minimum Value: 0.0 ppb on Sep 4 15:00	Minimum Daily Average: 0.1 ppb on Sep 29		Hours of Missing Data:	35
Maximum Diurnal Average: 5.6 ppb at hour 10	Minimum Diurnal Average: 1.5 ppb at hour 6		Hours of Calibration:	34
Monthly Average: 2.64 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.2 Median = 1.0 Q ₃ = 3.3 P ₉₀ = 6.9 P ₉₉ = 20.0		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-Sep	0.0	0.1	0.0	0.0	0.0	Z	0.1	0.2	0.2	0.3	0.7	5.5	5.4	3.7	1.7	1.4	0.7	1.2	1.4	2.0	3.6	3.9	4.9	4.3	1.8	5.5	
2-Sep	Z	2.8	0.9	1.0	3.3	0.8	0.6	0.5	0.5	0.5	0.3	0.9	0.9	0.9	0.9	0.6	0.5	0.9	2.3	1.2	0.2	0.2	0.2	0.2	0.9	3.3	
3-Sep	1.1	Z	2.7	2.8	3.0	3.4	3.6	4.7	6.1	10.2	3.1	0.7	3.7	11.3	7.3	6.6	6.7	4.8	2.6	1.2	0.7	0.4	0.2	0.2	3.8	11.3	
4-Sep	0.1	0.1	Z	0.4	1.5	1.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.3	0.2	1.5	
5-Sep	0.3	2.5	2.6	Z	2.0	2.7	3.7	12.9	13.5	12.5	1.7	0.2	0.3	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	2.5	13.5	
6-Sep	0.3	0.2	0.2	0.2	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	0.5	0.1	0.7	1.7	0.3	0.1	0.0	0.1	0.1	0.3	1.8	
7-Sep	0.0	0.0	0.0	0.0	0.1	Z	0.2	0.3	0.4	0.4	0.9	9.3	5.0	2.6	3.3	5.3	4.6	3.5	2.8	1.1	0.5	0.5	0.3	0.2	1.8	9.3	
8-Sep	Z	0.2	0.2	0.2	1.4	4.2	3.2	4.2	11.8	24.4	4.0	3.6	9.2	7.5	10.3	3.1	0.6	0.5	0.6	1.3	1.1	0.8	0.7	0.4	4.1	24.4	
9-Sep	0.3	Z	0.3	0.2	0.2	0.1	0.1	0.2	1.2	19.4	6.5	7.2	2.9	1.6	2.5	0.7	0.9	1.2	0.2	0.2	0.2	0.9	0.1	0.9	2.1	19.4	
10-Sep	0.1	0.0	Z	0.3	1.7	1.7	3.8	8.1	6.8	2.2	2.8	1.4	2.5	2.2	1.8	1.2	2.3	3.1	8.2	3.0	13.9	24.2	11.3	1.2	4.5	24.2	
11-Sep	4.8	14.4	1.8	Z	0.8	2.8	0.7	1.9	2.1	4.5	3.9	2.6	2.2	2.6	3.8	1.4	1.8	3.5	5.1	7.8	0.5	0.7	5.1	5.2	3.5	14.4	
12-Sep	0.6	18.8	28.4	13.0	Z	0.8	1.7	4.4	7.2	6.3	11.5	1.9	2.5	0.7	1.8	3.6	4.4	14.6	8.2	4.5	1.8	1.7	3.3	3.7	6.3	28.4	
13-Sep	5.9	2.1	1.6	1.9	2.4	Z	5.4	7.7	5.7	4.4	6.0	8.2	5.4	6.4	5.0	1.6	1.0	0.8	0.3	1.5	0.4	2.3	3.5	2.9	3.6	8.2	
14-Sep	Z	1.9	0.6	0.4	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	0.1	0.1	0.0	0.0	0.0	0.2	0.2	1.9	
15-Sep	0.4	Z	0.2	0.1	0.2	0.2	0.3	0.5	18.1	10.8	4.9	3.7	1.6	1.6	2.7	1.4	2.9	5.3	1.2	1.0	18.2	1.9	1.1	11.5	3.9	18.2	
16-Sep	12.4	7.1	Z	2.7	14.6	1.0	1.2	5.4	8.7	4.7	2.6	1.2	0.7	0.8	6.8	4.3	3.4	2.9	2.7	3.4	1.9	2.9	2.5	3.4	4.2	14.6	
17-Sep	0.5	0.3	0.3	Z	0.6	0.4	0.3	0.3	3.2	12.2	2.6	3.8	5.8	3.4	3.5	1.0	1.6	1.8	1.2	0.6	1.5	1.7	1.4	2.2	2.2	12.2	
18-Sep	5.3	5.7	3.1	6.1	Z	7.3	11.2	15.6	16.6	9.6	8.3	7.0	2.3	0.6	1.8	0.7	2.8	4.0	1.7	1.2	7.9	0.7	3.2	2.0	5.4	16.6	
19-Sep	0.7	0.9	1.2	6.7	1.3	Z	2.4	3.8	5.1	7.0	5.5	1.0	0.5	1.3	1.2	1.9	3.0	3.8	2.1	1.0	0.7	0.3	0.2	0.2	2.2	7.0	
20-Sep	Z	0.1	0.2	0.3	0.3	0.4	0.2	0.2	0.3	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.4
21-Sep	0.1	Z	0.1	0.5	4.7	0.8	0.5	0.5	16.4	9.8	0.5	1.5	1.3	2.7	0.7	0.2	0.1	0.5	9.7	17.1	31.6	28.2	19.6	0.5	6.4	31.6	
22-Sep	6.3	22.1	Z	13.7	27.1	2.8	0.9	5.3	10.3	11.2	0.9	1.6	3.1	4.3	5.4	2.2	4.4	2.1	1.2	1.6	9.1	13.1	0.8	6.8	6.8	27.1	
23-Sep	13.6	10.5	4.5	Z	1.2	3.7	1.2	1.9	3.8	4.2	1.8	2.3	2.0	1.2	2.2	1.4	0.8	0.8	1.0	0.3	0.2	0.7	1.3	1.1	2.7	13.6	
24-Sep	11.5	9.3	4.7	2.0	Z	2.5	0.9	3.9	1.4	3.6	3.7	2.3	1.9	0.6	0.3	0.3	0.3	3.9	12.6	4.0	0.8	0.5	0.7	1.0	3.2	12.6	
25-Sep	0.8	1.4	2.0	1.3	1.0	Z	4.6	7.0	11.2	6.5	5.5	3.8	2.1	2.2	2.5	4.4	4.2	2.2	0.5	0.6	0.2	0.2	0.2	0.2	2.8	11.2	
26-Sep	Z	0.3	0.2	0.3	0.3	0.2	5.8	1.7	5.8	2.0	1.4	2.5	2.9	3.7	3.5	2.6	1.1	1.7	0.8	1.1	1.1	1.5	2.0	2.3	1.9	5.8	
27-Sep	1.7	Z	0.5	0.5	0.3	0.3	0.2	0.5	0.7	1.1	1.4	2.8	0.7	0.5	0.5	0.3	0.8	0.2	0.5	2.1	0.5	0.6	0.4	0.3	0.8	2.8	
28-Sep	0.2	0.2	Z	0.1	0.1	0.1	0.1	0.0	0.1	0.1	C	C	C	C	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	
29-Sep	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	M	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.1
30-Sep	0.1	0.1	0.0	0.1	Z	0.2	0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.3	1.5	1.8	0.8	0.5	0.3	0.2	0.3	0.7	0.3	0.1	0.4	1.8	

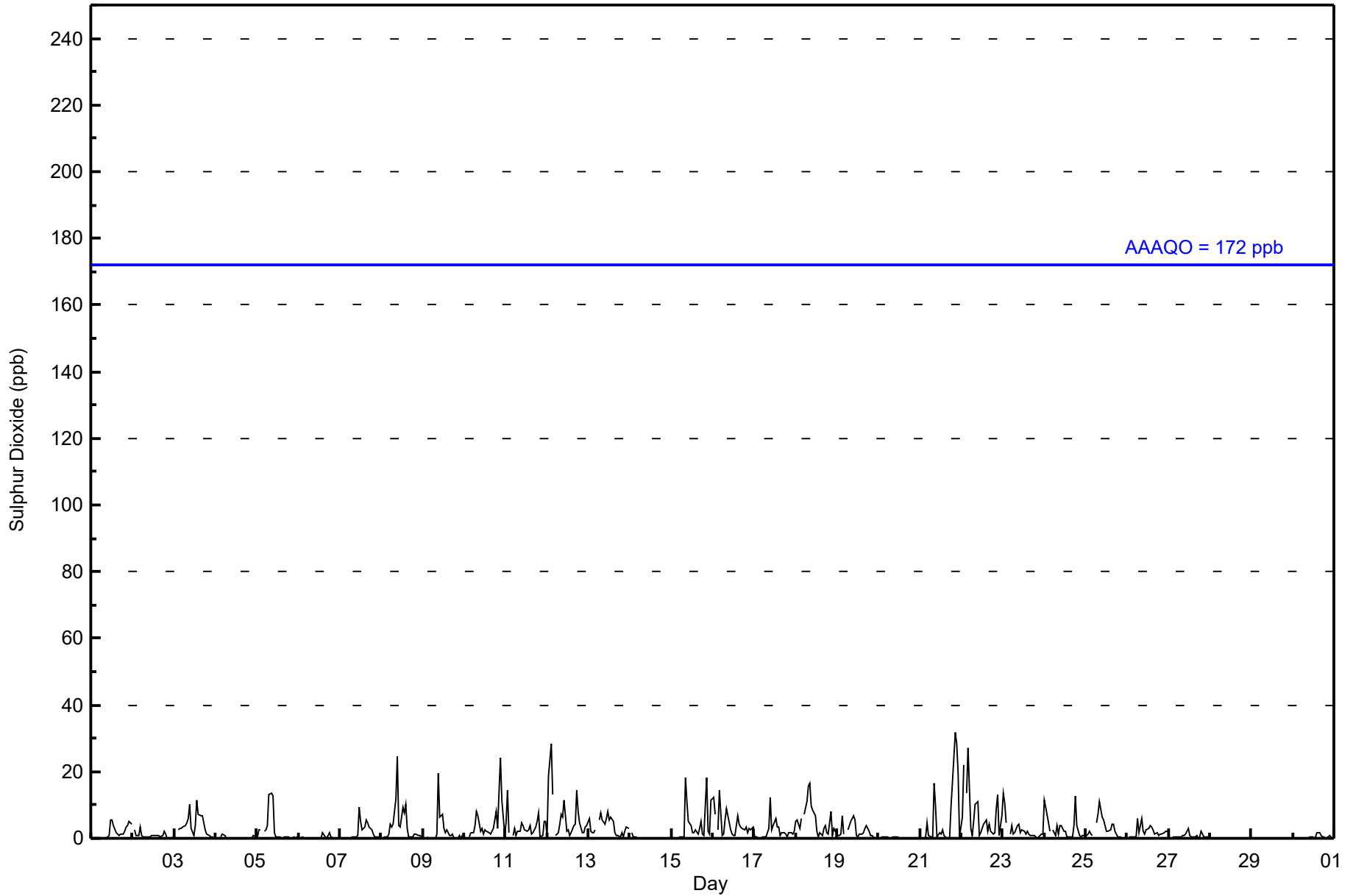
2.7	4.0	2.3	2.2	2.7	1.5	1.8	3.1	5.3	5.6	2.8	2.6	2.3	2.2	2.4	1.6	1.7	2.2	2.3	2.0	3.2	3.0	2.2	1.7	Diurnal Average	
13.6	22.1	28.4	13.7	27.1	7.3	11.2	15.6	18.1	24.4	11.5	9.3	9.2	11.3	10.3	6.6	6.7	14.6	12.6	17.1	31.6	28.2	19.6	11.5	Diurnal Maximum	

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 - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Firebag - September 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	644	94.01	94.01
11 - 20	34	4.96	98.98
21 - 60	7	1.02	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: 720



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Firebag - September 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	35	12	2	4	2	16	37	48	108	87	95	87	37	31	19	24	644
11 - 20	0	0	0	0	0	0	0	6	7	12	6	3	0	0	0	0	34
21 - 60	0	0	0	0	0	0	0	1	0	5	1	0	0	0	0	0	7
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	35	12	2	4	2	16	37	55	115	104	102	90	37	31	19	24	685

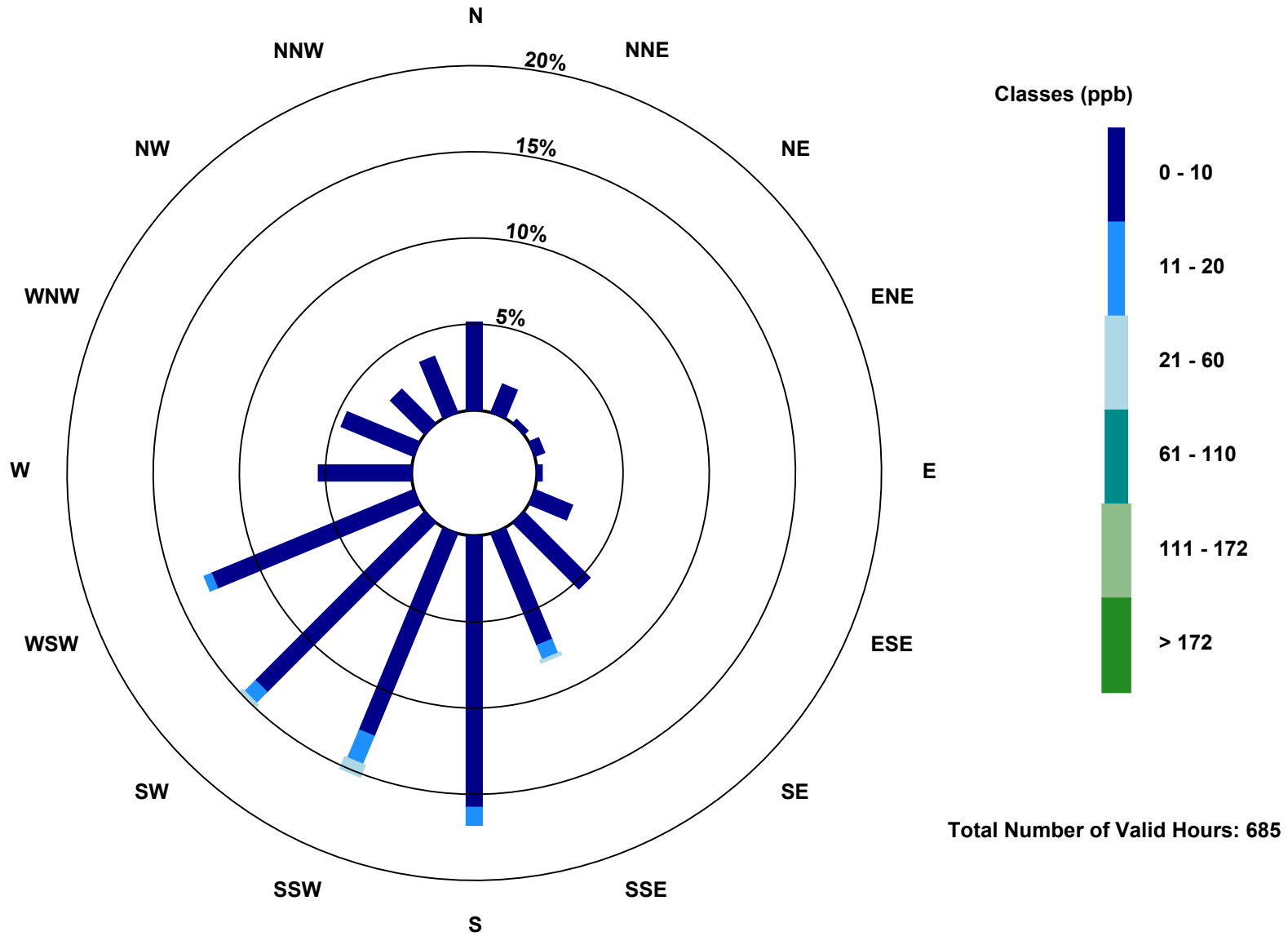
Total Number of Valid Hours: 685

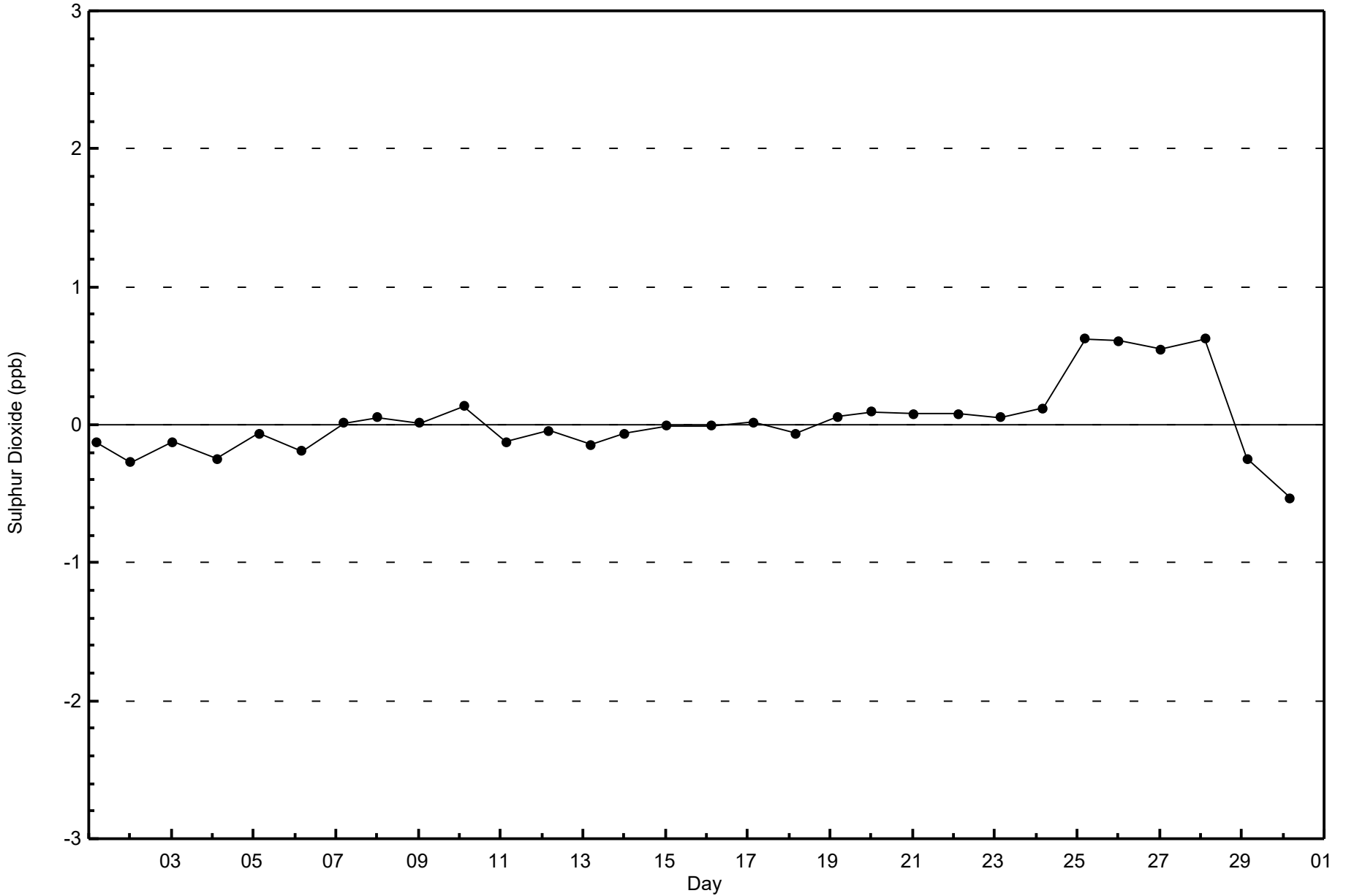
Total Number of Hours: 720

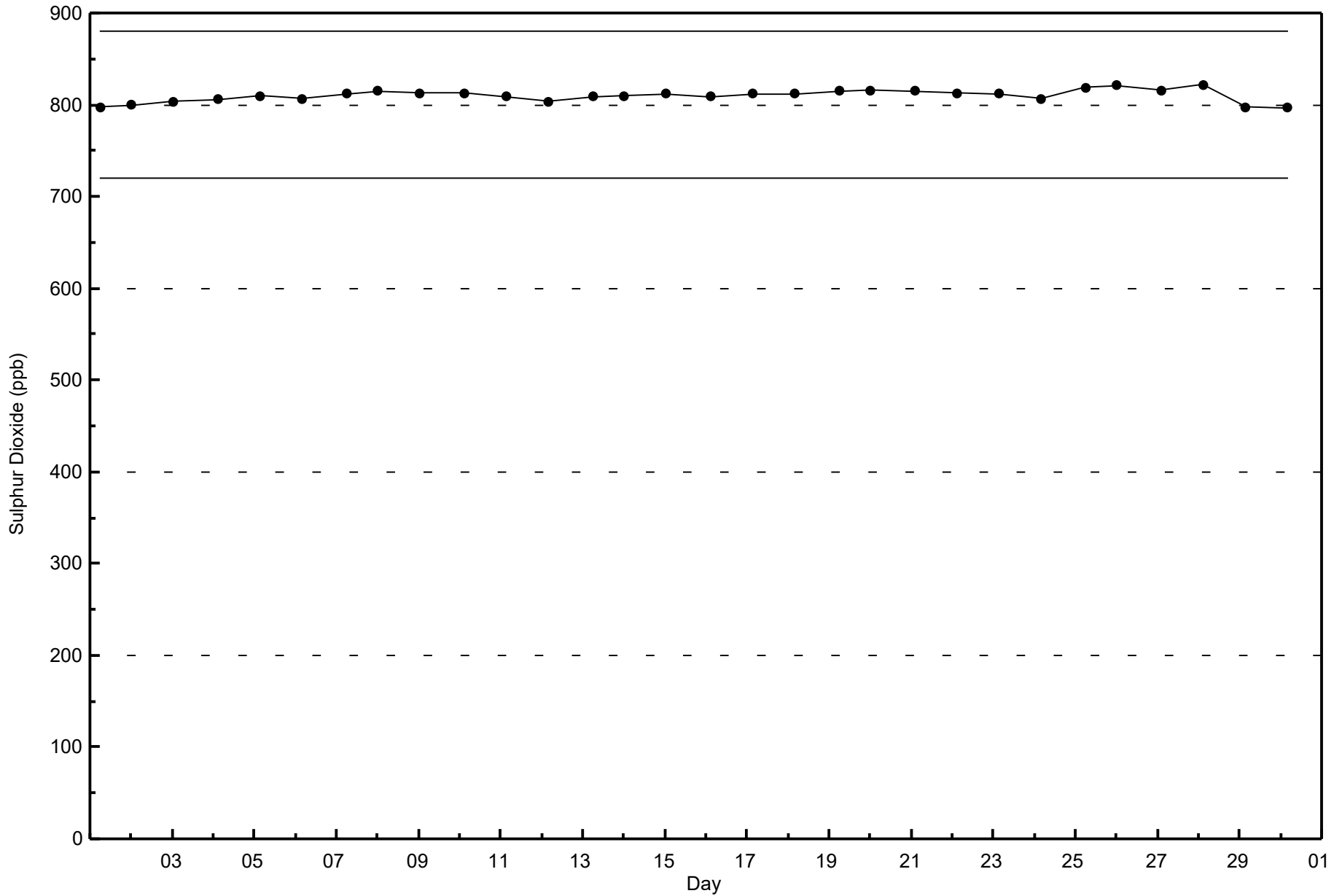


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Sulphur Dioxide (SO₂) - ppb
Firebag

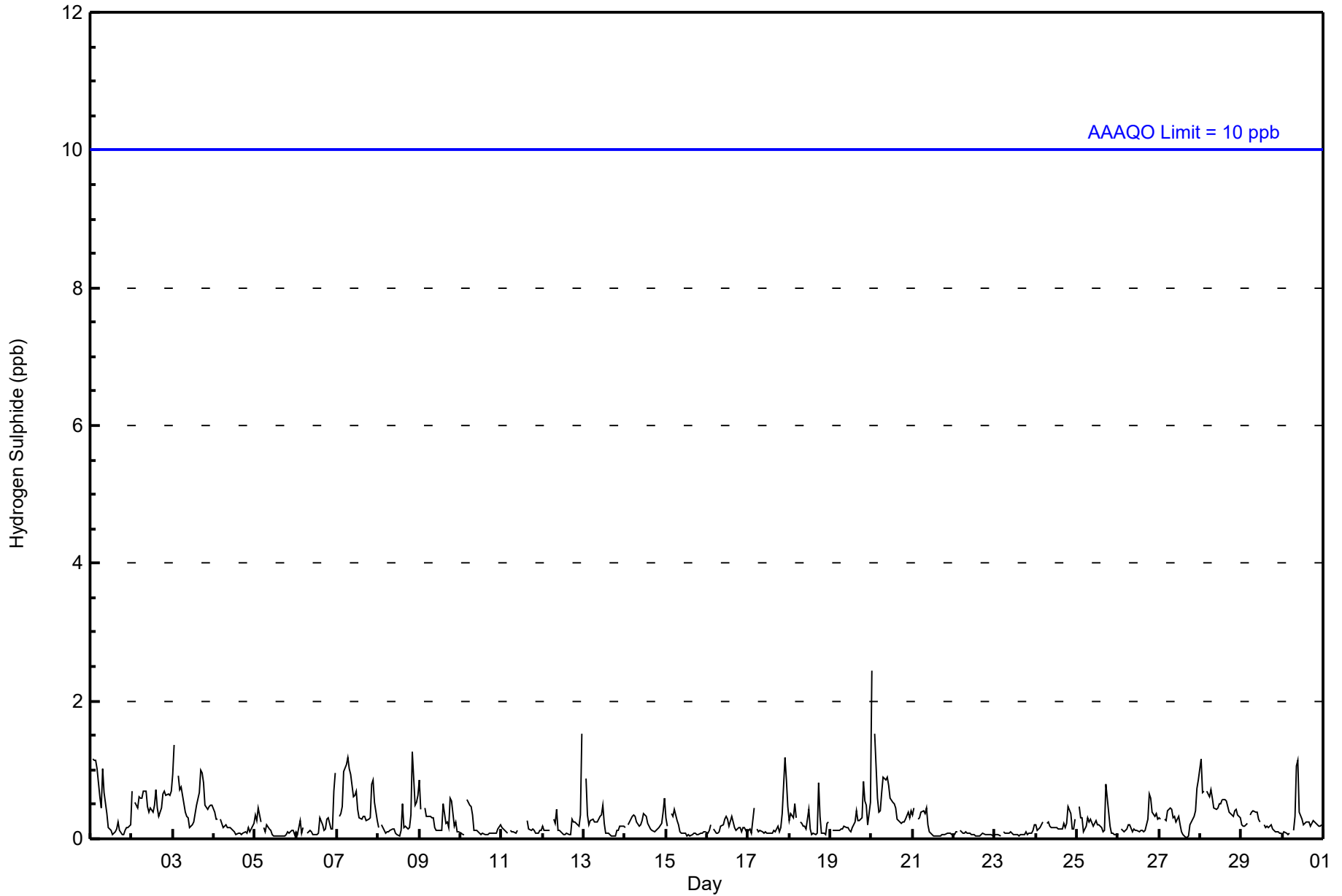








Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:														720							
Maximum Value: 2.4 ppb on Sep 20 01:00		Maximum Daily Average: 0.6 ppb on Sep 20														Hours of Data:		684									
Minimum Value: 0.0 ppb on Sep 27 16:00		Minimum Daily Average: 0.1 ppb on Sep 22														Hours of Missing Data:		36									
Maximum Diurnal Average: 0.4 ppb at hour 1		Minimum Diurnal Average: 0.2 ppb at hour 14														Hours of Calibration:		35									
Monthly Average: 0.27 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.1 Median = 0.2 Q ₃ = 0.4 P ₉₀ = 0.6 P ₉₉ = 1.2														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-Sep	Z	1.2	1.1	1.1	1.0	0.6	0.5	1.0	0.7	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.4	1.2	
2-Sep	0.7	Z	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.5	0.4	0.4	0.4	0.5	0.7	0.4	0.3	0.5	0.7	0.7	0.6	0.6	0.6	0.7	0.6	0.7	
3-Sep	0.9	1.4	Z	0.9	0.7	0.8	0.5	0.4	0.3	0.3	0.2	0.2	0.3	0.4	0.5	0.7	1.0	1.0	0.8	0.5	0.4	0.5	0.5	0.5	0.6	1.4	
4-Sep	0.4	0.3	0.3	Z	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.4	
5-Sep	0.3	0.3	0.4	0.2	Z	0.2	0.1	0.2	0.1	0.2	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	0.4	
6-Sep	0.1	0.1	0.3	0.1	0.2	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.1	0.1	0.3	0.3	0.1	0.1	0.7	1.0	0.2	1.0	
7-Sep	Z	0.3	0.4	0.5	1.0	1.1	1.2	1.0	0.9	0.6	0.6	0.7	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.8	0.9	0.5	0.3	0.6	1.2	
8-Sep	0.2	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.5	0.2	0.2	0.1	0.2	0.3	1.3	0.5	0.5	0.6	0.3	1.3	
9-Sep	0.8	0.4	Z	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.5	0.2	0.2	0.2	0.2	0.6	0.5	0.2	0.3	0.1	0.1	0.3	0.8
10-Sep	0.1	0.1	0.1	Z	0.6	0.5	0.5	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	0.1	0.2	0.2	0.6	
11-Sep	0.2	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	C	C	C	C	C	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.8
12-Sep	0.2	0.1	0.1	0.1	0.1	Z	0.3	0.2	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.2	0.2	0.2	0.4	1.5	0.2	1.5	
13-Sep	Z	0.9	0.4	0.2	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.5	0.2	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.9	
14-Sep	0.2	Z	0.2	0.3	0.3	0.4	0.3	0.2	0.2	0.2	0.3	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.6	0.2	0.6	
15-Sep	0.3	0.2	Z	0.4	0.3	0.4	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	0.1	0.1	0.1	0.1	0.1	0.1	0.4	
16-Sep	0.1	0.1	0.2	Z	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.2	0.3	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.3	0.8
17-Sep	0.1	0.1	0.1	0.5	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.4	1.2	0.9	0.5	0.2	1.2	
18-Sep	0.3	0.4	0.3	0.5	0.3	Z	0.3	0.2	0.2	0.2	0.2	0.4	0.1	0.1	0.1	0.1	0.1	0.8	0.3	0.1	0.1	0.1	0.2	0.2	0.2	0.8	
19-Sep	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.4	0.3	0.3	0.3	0.8	0.6	0.5	0.2	0.5	0.3	0.8	
20-Sep	2.4	Z	1.5	0.6	0.4	0.4	0.7	0.9	0.9	0.9	0.8	0.6	0.5	0.5	0.5	0.3	0.3	0.2	0.2	0.3	0.3	0.4	0.3	0.4	0.6	2.4	
21-Sep	0.4	0.4	Z	0.3	0.3	0.4	0.4	0.4	0.4	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.4	
22-Sep	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	
23-Sep	0.1	0.1	0.1	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	0.1	0.1	0.1	0.1	0.2	0.1	0.2	
24-Sep	0.2	0.1	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.5	0.4	0.1	0.1	0.3	0.2	0.5	
25-Sep	Z	0.5	0.3	0.3	0.1	0.2	0.3	0.2	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.1	0.1	0.8	0.4	0.2	0.1	0.1	0.1	0.1	0.2	0.8	
26-Sep	0.1	Z	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.7	0.6	0.4	0.3	0.4	0.3	0.2	0.7	0.7	
27-Sep	0.3	0.3	Z	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.2	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.2	0.3	0.3	0.4	0.7	0.8	0.3	0.8	
28-Sep	1.2	0.7	0.7	Z	0.7	0.6	0.7	0.6	0.4	0.4	0.4	0.5	0.5	0.6	0.6	0.5	0.5	0.4	0.3	0.3	0.4	0.4	0.4	0.3	0.5	1.2	
29-Sep	0.2	0.2	0.2	0.2	Z	0.3	0.4	0.4	0.4	0.4	0.3	0.2	M	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.4	
30-Sep	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.3	1.1	1.1	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.4	
																								Diurnal Average		0.4	
																								Diurnal Maximum		2.4	
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
Firebag - September 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	684	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: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Firebag - September 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	12	2	3	3	15	38	56	111	102	102	92	36	31	19	23	684
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	39	12	2	3	3	15	38	56	111	102	102	92	36	31	19	23	684

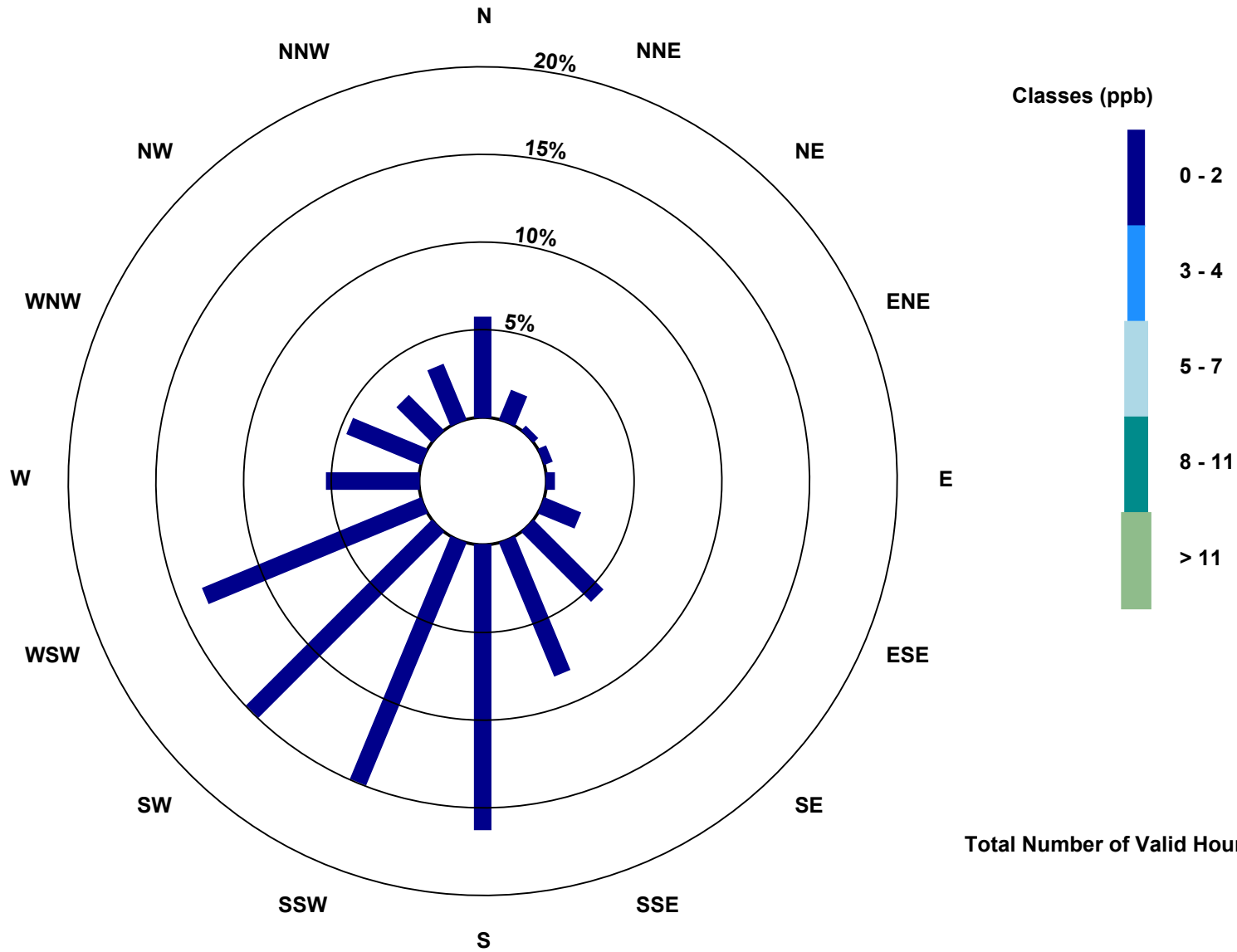
Total Number of Valid Hours: 684

Total Number of Hours: 720

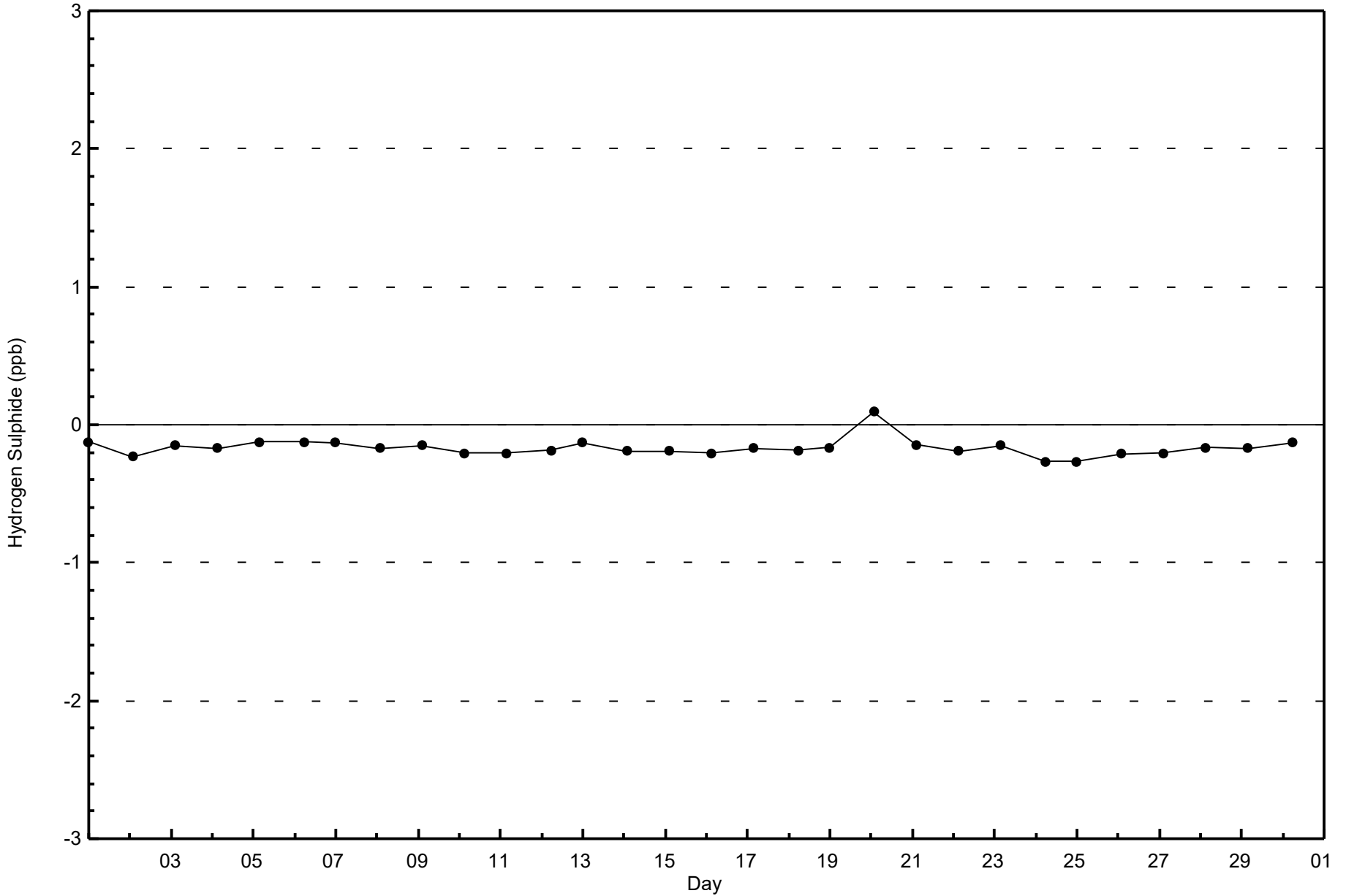


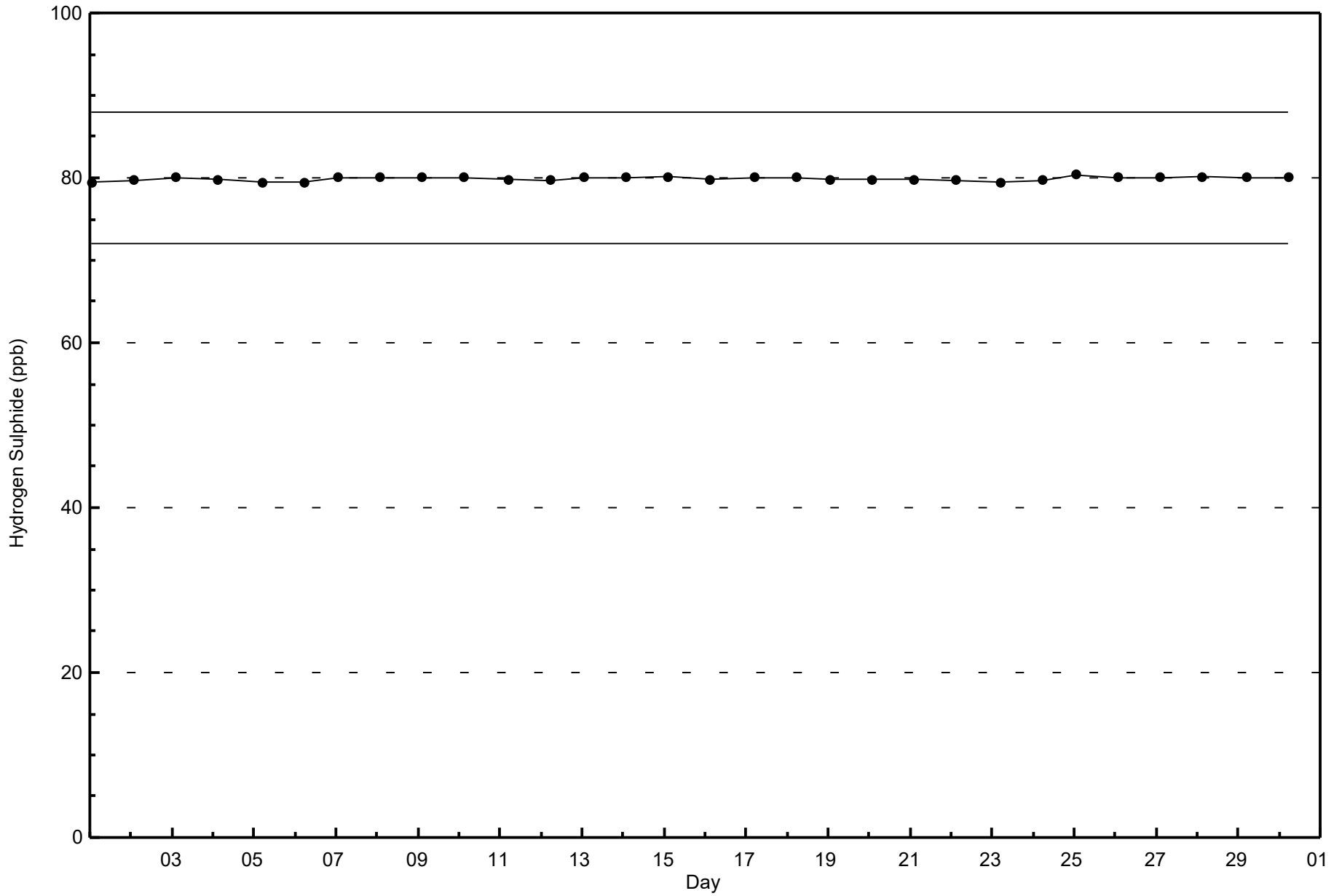
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Hydrogen Sulphide (H₂S) - ppb
Firebag



Total Number of Valid Hours: 684







Wood Buffalo Environmental Association
Summary of Hour Averages

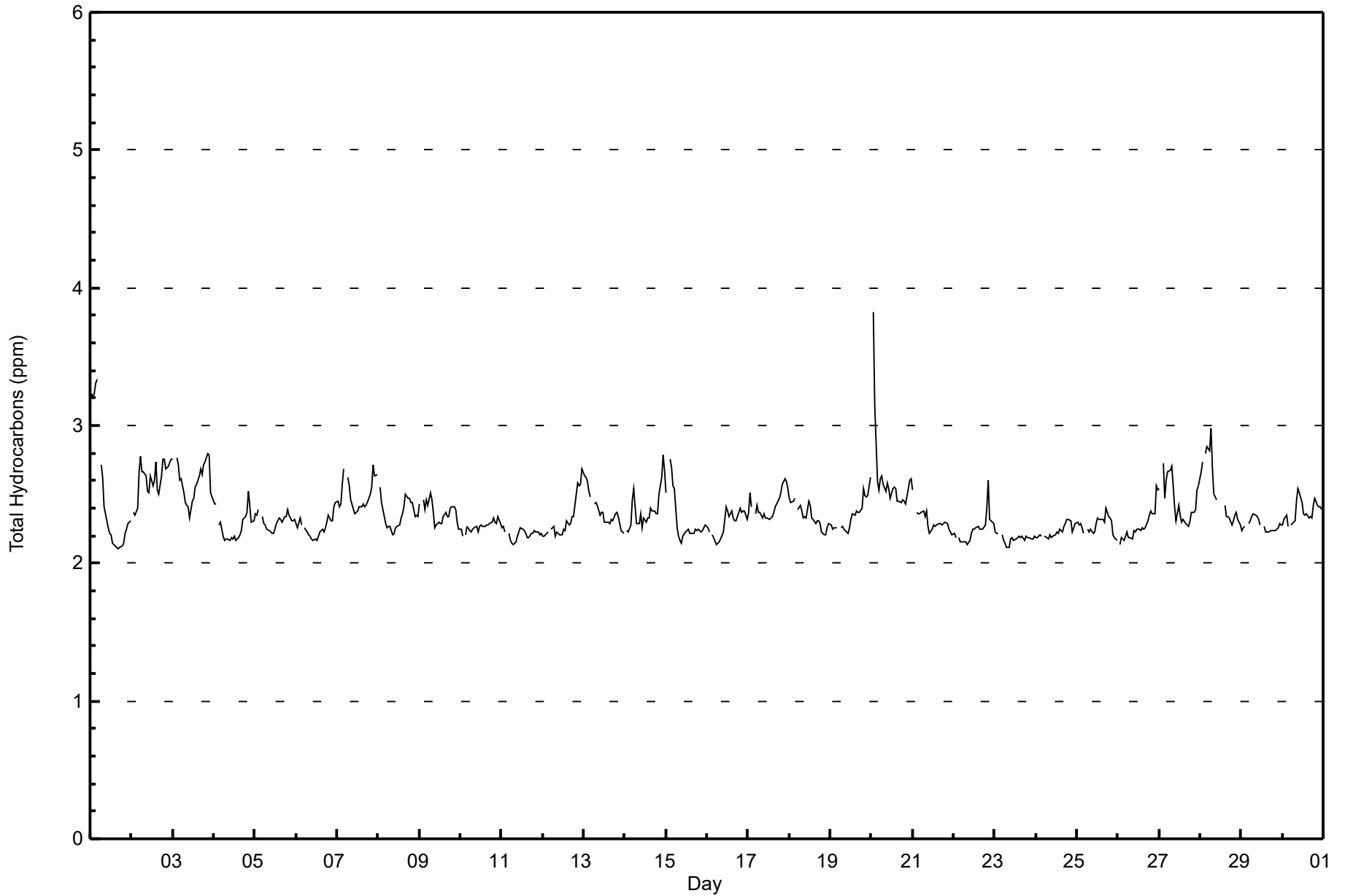
Total Hydrocarbons (THC) - ppm
Firebag - September 2023

Maximum Value: 3.8 ppm on Sep 20 02:00		Maximum Daily Average: 2.6 ppm on Sep 2		Hours in Service: 720																						
Minimum Value: 2.1 ppm on Sep 1 17:00		Minimum Daily Average: 2.2 ppm on Sep 23		Hours of Data: 685																						
Maximum Diurnal Average: 2.5 ppm at hour 3		Minimum Diurnal Average: 2.3 ppm at hour 11		Hours of Missing Data: 35																						
Monthly Average: 2.36 ppm		Percentiles: P ₁ = 2.1 P ₁₀ = 2.2 Q ₁ = 2.2 Median = 2.3 Q ₃ = 2.4 P ₉₀ = 2.6 P ₉₉ = 3.0		Hours of Calibration: 34																						
				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-Sep	3.2	3.2	3.2	3.3	3.3	Z	2.7	2.6	2.4	2.3	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.3	2.5	3.3
2-Sep	Z	2.4	2.3	2.4	2.7	2.8	2.7	2.7	2.6	2.5	2.5	2.6	2.6	2.6	2.7	2.5	2.5	2.6	2.8	2.8	2.7	2.7	2.7	2.8	2.6	2.8
3-Sep	2.8	Z	2.8	2.7	2.6	2.6	2.5	2.4	2.4	2.4	2.3	2.4	2.5	2.6	2.6	2.6	2.7	2.6	2.7	2.7	2.8	2.8	2.5	2.5	2.6	2.8
4-Sep	2.4	2.4	Z	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.4	2.5	2.4	2.3	2.3	2.3	2.5
5-Sep	2.4	2.3	2.4	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	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.4
6-Sep	2.3	2.3	2.3	2.3	Z	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.3	2.4
7-Sep	2.5	2.4	2.4	2.6	2.7	Z	2.6	2.6	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.5	2.5	2.6	2.7	2.6	2.6	2.5	2.7
8-Sep	Z	2.6	2.4	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.3	2.3	2.3	2.4	2.4	2.5	2.5	2.5	2.4	2.4	2.3	2.4	2.3	2.4	2.6
9-Sep	2.4	Z	2.5	2.4	2.5	2.4	2.5	2.5	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.4	2.4	2.4	2.4	2.3	2.2	2.4	2.5
10-Sep	2.2	2.2	Z	2.2	2.3	2.2	2.2	2.2	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
11-Sep	2.3	2.3	2.2	Z	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3
12-Sep	2.2	2.2	2.2	2.2	Z	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.6	2.6	2.6	2.7	2.7
13-Sep	2.6	2.6	2.6	2.5	2.5	Z	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.3	2.3	2.2	2.2	2.4	2.6
14-Sep	Z	2.2	2.2	2.3	2.5	2.5	2.4	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.5	2.6	2.8	2.7	2.4	2.8
15-Sep	2.5	Z	2.8	2.7	2.6	2.5	2.3	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.8
16-Sep	2.3	2.2	Z	2.2	2.2	2.1	2.1	2.2	2.2	2.2	2.3	2.4	2.4	2.3	2.4	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.4
17-Sep	2.4	2.5	2.4	Z	2.4	2.4	2.4	2.4	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.5	2.5	2.5	2.6	2.6	2.6	2.5	2.4	2.6
18-Sep	2.5	2.4	2.4	2.5	Z	2.4	2.4	2.4	2.3	2.3	2.3	2.5	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.3	2.3	2.3	2.5
19-Sep	2.3	2.3	2.3	2.3	2.3	Z	2.3	2.3	2.2	2.2	2.2	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.5	2.5	2.5	2.5	2.6	2.6
20-Sep	Z	3.8	3.2	2.6	2.5	2.6	2.6	2.6	2.5	2.6	2.5	2.5	2.5	2.6	2.5	2.5	2.4	2.4	2.5	2.5	2.4	2.5	2.6	2.6	2.6	3.8
21-Sep	2.5	Z	2.4	2.4	2.4	2.4	2.4	2.3	2.4	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.3	2.5
22-Sep	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.3	2.2	2.3	2.3	2.3	2.2	2.3	2.3	2.4	2.6	2.3	2.3	2.3	2.2	2.6
23-Sep	2.2	2.2	2.2	Z	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	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
24-Sep	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	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.3	2.2	2.3
25-Sep	2.3	2.3	2.3	2.3	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.2	2.2	2.2	2.3	2.4
26-Sep	Z	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.3	2.3	2.4	2.4	2.4	2.4	2.6	2.5	2.3	2.6
27-Sep	2.5	Z	2.7	2.5	2.6	2.7	2.7	2.7	2.6	2.4	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.5	2.6	2.5	2.7
28-Sep	2.7	2.7	Z	2.8	2.8	2.8	3.0	2.7	2.5	2.5	C	C	C	C	2.4	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.3	2.3	2.5	3.0
29-Sep	2.2	2.3	2.3	Z	2.3	2.3	2.3	2.4	2.4	2.3	2.3	2.3	M	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
30-Sep	2.3	2.3	2.4	2.3	Z	2.3	2.3	2.3	2.4	2.5	2.5	2.4	2.4	2.3	2.4	2.3	2.3	2.3	2.4	2.5	2.4	2.4	2.4	2.4	2.4	2.5
																								Diurnal Average		
																								Diurnal Maximum		
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan C - Calibration M - Maintenance																										



Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Firebag - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Firebag - September 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	0	0.00	0.00
2.1 - 3.0	678	98.98	98.98
3.1 - 10.0	7	1.02	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Total Hydrocarbons (THC) - ppm
Firebag - September 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	35	12	1	3	2	16	37	55	115	104	102	89	36	31	18	22	678
3.1 - 10.0	0	0	1	1	0	0	0	0	0	0	0	1	1	0	1	2	7
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	35	12	2	4	2	16	37	55	115	104	102	90	37	31	19	24	685

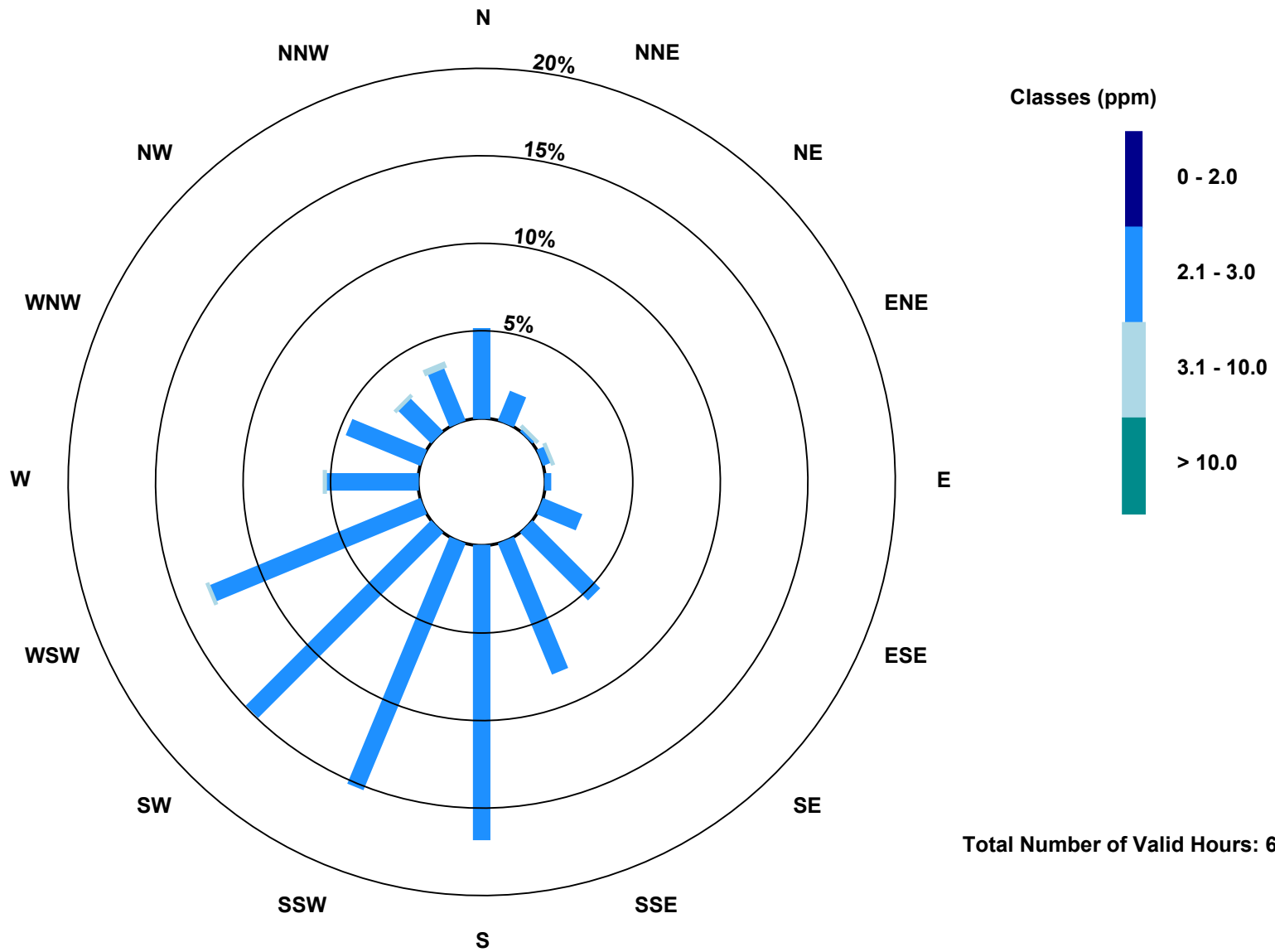
Total Number of Valid Hours: 685

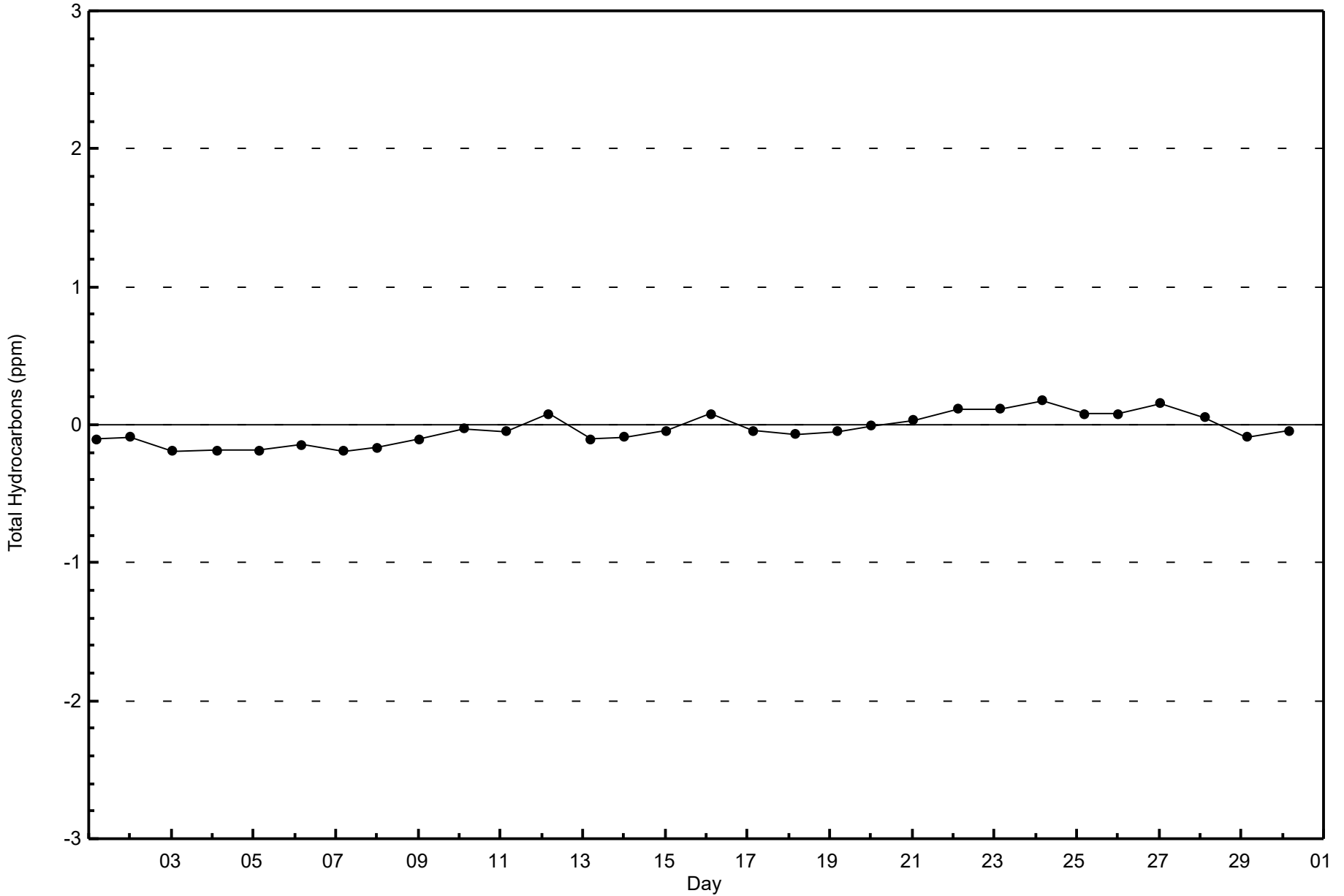
Total Number of Hours: 720

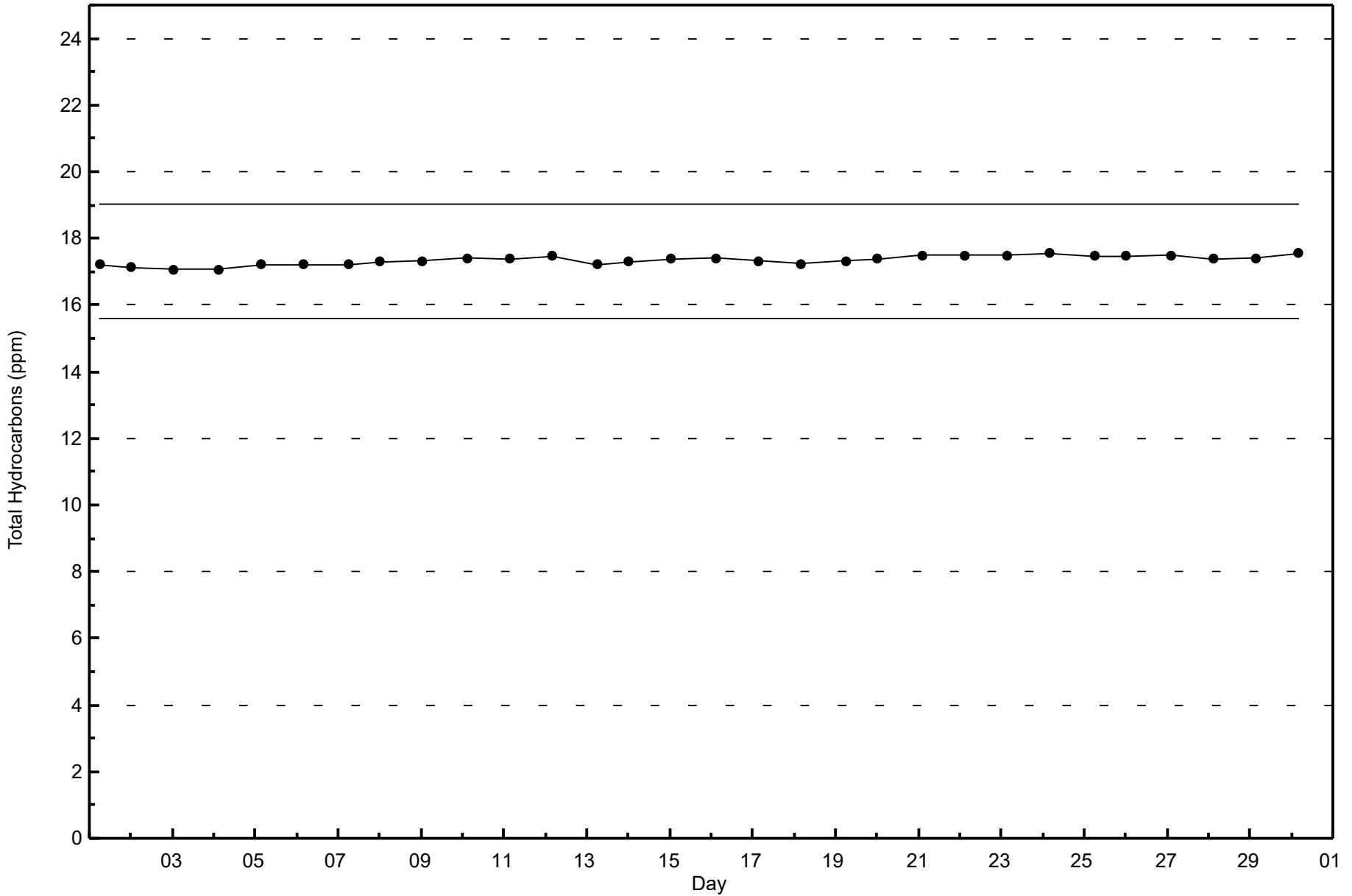


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Total Hydrocarbons (THC) - ppm
Firebag









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

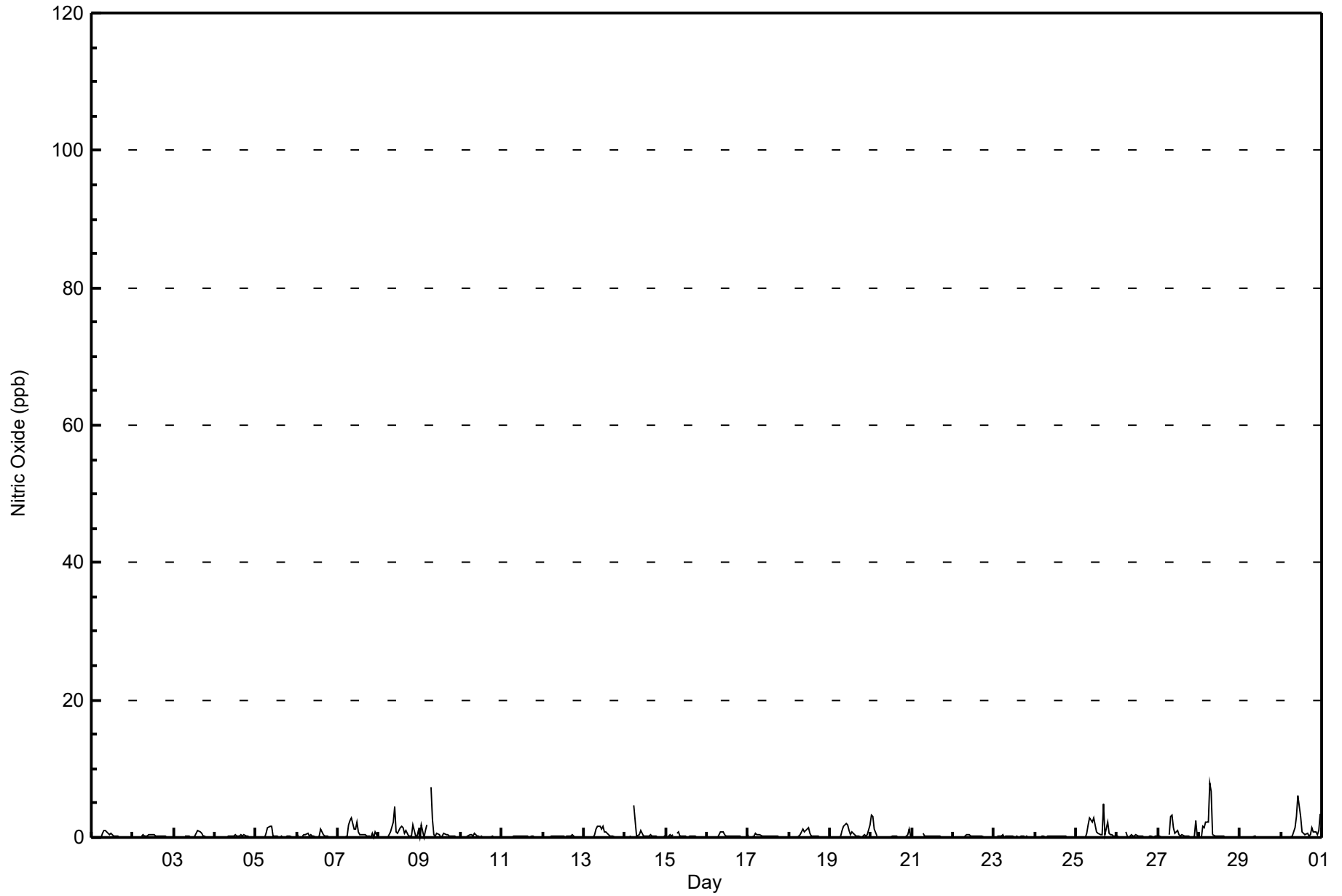
Firebag - September 2023

Maximum Value: 8.0 ppb on Sep 28 07:00																				Maximum Daily Average: 1.1 ppb on Sep 30					Hours in Service: 720	
Minimum Value: 0.0 ppb on Sep 28 20:00																				Minimum Daily Average: 0.0 ppb on Sep 29					Hours of Data: 685	
Maximum Diurnal Average: 1.0 ppb at hour 8																				Minimum Diurnal Average: 0.1 ppb at hour 22					Hours of Missing Data: 35	
Monthly Average: 0.39 ppb																				Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.1 Q ₃ = 0.3 P ₉₀ = 1.0 P ₉₉ = 3.7					Hours of Calibration: 35	
																									Percent Operational Time: 100.0	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Sep	0.1	0.1	0.1	Z	0.1	0.1	0.5	1.1	1.1	0.5	0.4	0.6	0.4	0.3	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.3	1.1
2-Sep	0.0	0.0	0.0	0.1	Z	0.1	0.3	0.3	0.3	0.3	0.4	0.5	0.4	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.5
3-Sep	0.1	0.1	0.1	0.1	0.1	Z	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0.7	1.0	0.9	0.6	0.3	0.1	0.1	0.1	0.1	0.0	0.0	0.2	1.0
4-Sep	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.3	0.4	0.3	0.3	0.3	0.1	0.1	0.0	0.0	0.1	0.1	0.4
5-Sep	0.1	Z	0.0	0.0	0.1	0.1	0.6	1.5	1.7	1.6	0.2	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.3	1.7
6-Sep	0.0	0.5	Z	0.2	0.3	0.5	0.5	0.2	0.3	0.1	0.1	0.1	0.1	0.2	1.1	0.4	0.2	0.3	0.2	0.1	0.0	0.0	0.0	0.1	0.2	1.1
7-Sep	0.0	0.1	0.0	Z	0.1	0.2	1.9	2.4	2.9	1.1	1.1	2.1	0.9	0.3	0.3	0.4	0.4	0.2	0.1	0.1	0.6	0.1	0.8	0.1	0.7	2.9
8-Sep	0.1	0.1	0.1	0.1	Z	0.1	0.3	0.9	2.2	4.6	0.8	0.6	1.3	1.6	1.4	0.6	1.0	0.3	0.1	0.2	1.7	0.1	0.3	1.0	0.8	4.6
9-Sep	0.1	1.7	0.1	1.1	1.7	Z	7.3	2.7	0.4	0.2	0.6	0.4	0.1	0.1	0.6	0.4	0.4	0.2	0.1	0.1	0.2	0.1	0.1	0.0	0.8	7.3
10-Sep	Z	0.0	0.0	0.0	0.2	0.4	0.3	0.2	0.5	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.1	0.5
11-Sep	0.1	Z	0.1	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.0	0.1	0.1	0.0	0.1	0.1	0.2
12-Sep	0.1	0.0	Z	0.1	0.1	0.3	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.3	0.2	0.2	0.4	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.4
13-Sep	0.1	0.1	0.1	Z	0.0	0.1	0.3	1.3	1.6	1.6	1.2	1.7	0.8	0.8	0.5	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	1.7
14-Sep	0.1	0.1	0.1	0.2	Z	4.7	2.5	0.3	0.4	1.0	0.6	0.2	0.2	0.1	0.2	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.5	4.7
15-Sep	0.1	0.1	0.4	0.3	0.3	Z	0.7	0.9	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.9
16-Sep	Z	0.1	0.0	0.0	0.0	0.0	0.3	0.9	0.8	0.4	0.2	0.2	0.1	0.3	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.9
17-Sep	0.5	Z	0.1	0.2	0.5	0.3	0.4	0.5	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.5
18-Sep	0.1	0.1	Z	0.1	0.0	0.0	0.4	0.8	1.3	0.9	1.1	1.4	0.6	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.3	1.4
19-Sep	0.0	0.1	0.0	Z	0.0	0.0	0.2	1.0	1.6	2.0	1.8	1.1	0.5	0.9	0.4	0.2	0.2	0.2	0.1	0.1	0.5	0.2	0.3	1.8	0.6	2.0
20-Sep	3.2	3.1	1.1	0.2	Z	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	1.2	0.1	0.5	3.2
21-Sep	0.1	0.0	0.0	0.0	0.0	Z	0.6	0.3	0.3	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.6
22-Sep	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.4	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.4
23-Sep	0.0	Z	0.3	0.2	0.2	0.3	0.1	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	0.0	0.1	0.1	0.1	0.1	0.3
24-Sep	0.1	0.1	Z	0.1	0.2	0.3	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.3
25-Sep	0.1	0.1	0.1	Z	0.1	0.0	0.5	1.8	2.9	2.2	2.8	1.9	0.7	0.5	0.5	0.3	4.9	0.3	2.2	0.7	0.4	0.4	0.2	0.2	1.0	4.9
26-Sep	0.2	0.1	0.1	0.1	Z	0.8	0.3	0.1	0.3	0.3	0.2	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.8
27-Sep	0.1	0.1	0.1	0.1	0.1	Z	0.5	3.0	3.2	1.4	0.6	1.0	0.4	0.3	0.3	0.1	0.2	0.1	0.1	0.1	0.1	0.1	2.4	0.2	0.6	3.2
28-Sep	Z	0.1	1.6	1.4	2.2	2.3	8.0	6.8	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	8.0
29-Sep	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	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	0.2
30-Sep	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.7	1.4	3.0	6.0	3.0	0.7	0.5	0.4	0.6	0.2	0.4	1.5	0.7	0.7	0.3	1.1	3.5	6.0	
																								Diurnal Average		
																								Diurnal Maximum		
0.2 0.3 0.2 0.2 0.3 0.4 0.9 1.0 0.9 0.8 0.7 0.6 0.3 0.3 0.3 0.2 0.4 0.2 0.2 0.1 0.2 0.1 0.2 0.3																								Diurnal Average		
																								Diurnal Maximum		
3.2 3.1 1.6 1.4 2.2 4.7 8.0 6.8 3.2 4.6 6.0 3.0 1.3 1.6 1.4 0.9 4.9 0.4 2.2 0.7 1.7 0.5 2.4 3.5																								Diurnal Maximum		
Z - zerospan C - Calibration																										



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Firebag - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Firebag - September 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	685	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: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Firebag - September 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	38	11	2	4	3	17	36	56	115	104	102	92	35	29	19	22	685
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	38	11	2	4	3	17	36	56	115	104	102	92	35	29	19	22	685

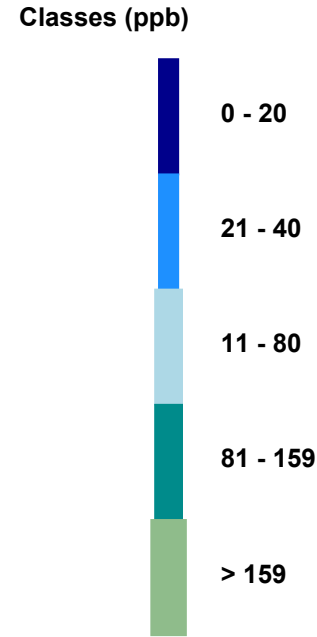
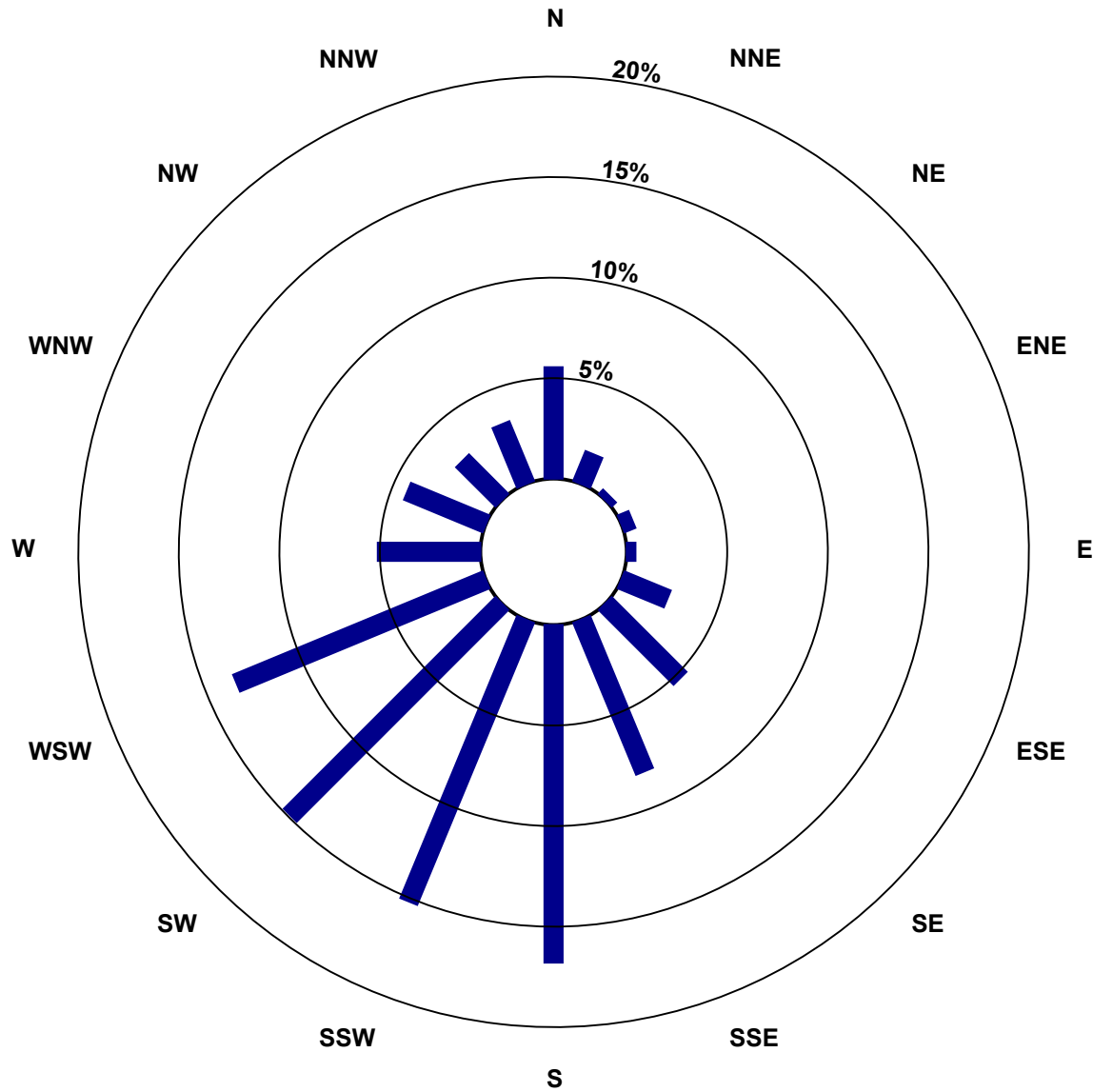
Total Number of Valid Hours: 685

Total Number of Hours: 720

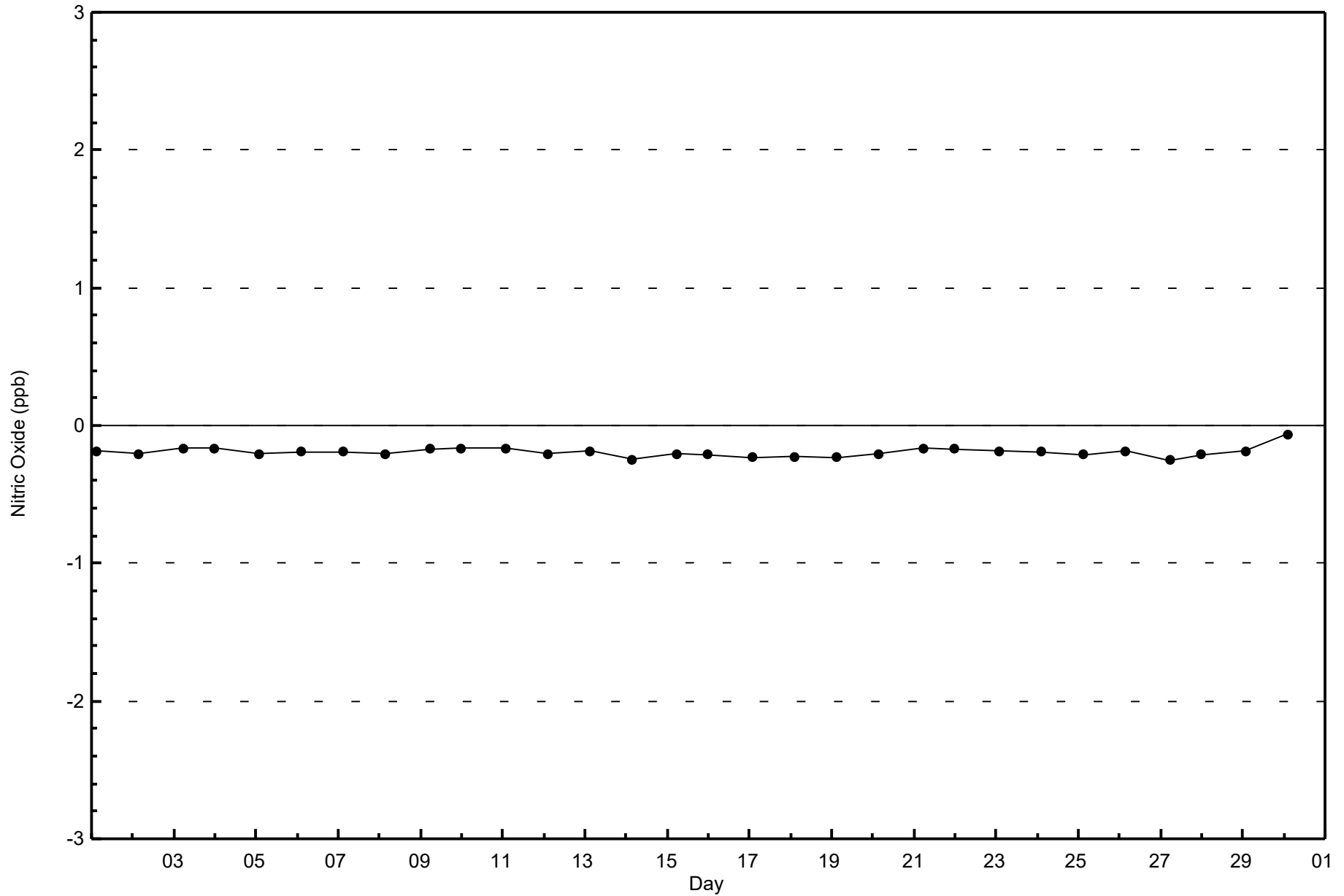


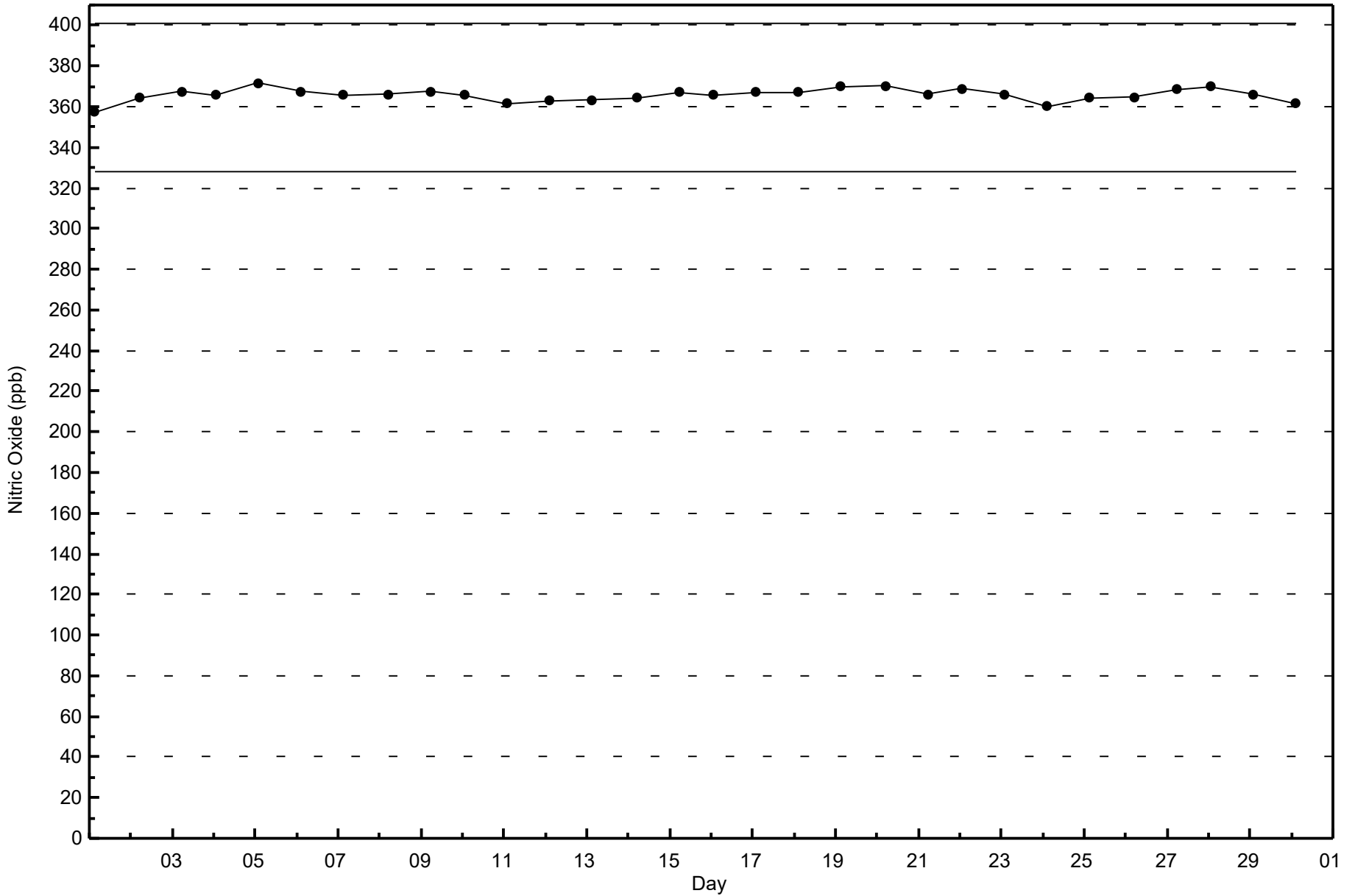
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitric Oxide (NO) - ppb
Firebag



Total Number of Valid Hours: 685







Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 17.1 ppb on Sep 20 01:00	Maximum Daily Average: 6.7 ppb on Sep 3		Hours of Data:	685
Minimum Value: 0.1 ppb on Sep 29 10:00	Minimum Daily Average: 0.3 ppb on Sep 29		Hours of Missing Data:	35
Maximum Diurnal Average: 5.3 ppb at hour 3	Minimum Diurnal Average: 2.0 ppb at hour 14		Hours of Calibration:	35
Monthly Average: 3.33 ppb	Percentiles: P ₁ = 0.2 P ₁₀ = 0.8 Q ₁ = 1.2 Median = 2.3 Q ₃ = 4.5 P ₉₀ = 7.5 P ₉₉ = 13.0		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-Sep	1.3	1.3	4.2	Z	3.7	1.8	4.3	4.8	3.0	1.7	1.6	2.6	1.9	1.3	0.7	0.6	0.4	0.6	0.9	1.4	2.4	3.1	3.9	3.8	2.2	4.8	
2-Sep	4.7	4.4	3.7	5.3	Z	14.0	10.5	7.7	6.9	7.2	7.1	9.0	8.2	6.3	6.4	4.1	4.0	5.4	7.5	5.7	4.0	5.4	7.5	8.6	6.7	14.0	
3-Sep	7.1	8.5	12.2	12.9	10.1	Z	8.6	5.5	4.4	5.8	3.2	2.0	3.1	8.0	6.6	7.9	8.0	5.7	4.3	4.0	8.0	10.6	4.2	4.3	6.7	12.9	
4-Sep	Z	7.0	5.2	1.1	3.3	2.5	1.8	3.2	2.6	1.3	1.3	0.9	1.6	0.7	0.8	1.4	1.3	2.0	3.4	4.4	3.4	1.6	3.7	6.5	2.7	7.0	
5-Sep	8.9	Z	10.6	10.5	6.2	4.0	3.8	4.5	3.7	3.1	1.1	1.3	0.9	0.8	0.6	0.8	0.9	0.9	1.6	2.4	1.7	1.2	1.8	0.8	3.1	10.6	
6-Sep	1.2	2.8	Z	1.9	1.9	1.6	1.4	1.1	1.4	1.0	0.9	0.7	0.7	1.3	3.1	1.7	1.2	2.2	3.7	3.3	2.3	2.3	2.6	5.0	2.0	5.0	
7-Sep	5.3	4.7	5.4	Z	7.8	6.5	6.9	4.3	3.6	2.6	3.1	5.2	3.5	2.6	2.8	3.6	3.4	3.2	3.1	2.2	6.1	3.9	5.3	1.6	4.2	7.8	
8-Sep	2.3	2.2	2.2	1.4	Z	0.8	2.3	2.9	4.0	6.4	2.2	1.8	3.3	4.2	4.6	3.6	6.1	4.4	3.7	3.0	7.7	2.9	4.5	4.5	3.5	7.7	
9-Sep	3.2	5.7	2.9	4.9	9.5	Z	7.3	4.4	1.7	1.4	2.2	2.1	1.2	1.4	4.2	2.7	2.2	2.5	2.4	3.9	3.4	1.1	0.7	0.6	3.1	9.5	
10-Sep	Z	0.6	0.6	1.0	2.0	2.7	2.2	1.0	1.7	1.0	0.9	0.7	0.9	0.8	0.8	0.9	0.9	0.9	1.1	1.0	0.8	0.8	0.8	0.6	1.1	2.7	
11-Sep	0.6	Z	0.7	0.8	1.0	1.0	1.0	1.2	1.1	1.1	1.1	1.2	1.1	1.1	1.2	1.0	1.1	1.6	2.1	1.3	1.0	1.0	1.2	1.1	1.1	2.1	
12-Sep	1.2	1.6	Z	1.6	1.7	2.1	1.8	1.7	1.7	1.6	1.8	1.5	1.5	1.5	2.7	3.6	3.7	7.5	5.5	4.9	3.7	2.8	4.4	4.9	2.8	7.5	
13-Sep	5.9	6.5	12.5	Z	8.3	9.2	7.4	6.4	5.2	4.6	4.3	4.4	2.7	2.6	2.0	1.2	1.1	1.0	2.1	3.3	1.7	1.2	3.5	3.2	4.4	12.5	
14-Sep	3.1	2.8	1.8	4.5	Z	11.0	9.2	5.4	6.8	8.2	2.7	1.7	1.6	1.1	1.2	2.5	2.0	2.2	0.7	0.6	0.9	1.7	3.3	3.9	3.4	11.0	
15-Sep	2.4	4.7	12.0	9.8	9.2	Z	5.3	3.2	1.0	0.8	0.8	0.7	0.7	0.8	0.9	1.0	1.1	1.1	0.9	0.8	1.3	1.3	1.8	2.1	2.8	12.0	
16-Sep	Z	1.9	2.1	1.9	1.8	1.7	2.3	5.4	7.1	5.2	3.9	4.3	2.7	2.3	4.8	3.0	3.0	2.2	2.9	2.4	1.5	1.6	1.8	1.4	2.9	7.1	
17-Sep	6.7	Z	2.3	4.1	7.7	6.5	3.9	3.8	2.5	1.7	1.5	1.2	1.0	0.9	1.1	2.4	3.0	3.2	3.1	4.6	4.9	5.2	6.2	10.6	3.8	10.6	
18-Sep	12.9	10.9	Z	8.9	10.4	8.0	9.6	9.3	8.6	5.5	4.7	5.7	3.7	1.7	2.8	2.0	3.1	3.1	2.9	4.3	1.9	2.1	4.7	5.9	5.8	12.9	
19-Sep	5.2	5.0	4.2	Z	2.7	2.7	3.8	3.6	3.2	3.1	2.9	2.3	1.7	2.5	1.8	1.7	1.9	2.3	3.2	6.7	5.7	4.5	5.6	6.4	3.6	6.7	
20-Sep	17.1	15.2	8.9	4.1	Z	4.1	2.1	2.3	2.9	4.0	3.3	2.6	2.5	2.2	1.9	1.2	1.1	1.2	1.1	2.4	2.1	3.7	8.6	3.8	4.3	17.1	
21-Sep	2.1	1.4	1.2	3.0	2.7	Z	4.1	2.4	2.1	1.4	1.0	1.0	0.8	0.7	0.7	0.9	1.0	0.7	0.9	0.9	1.1	1.5	1.5	1.7	1.5	4.1	
22-Sep	Z	2.0	2.2	2.0	2.2	2.2	2.6	2.5	2.2	2.0	1.7	1.7	1.4	1.2	1.1	0.9	1.2	1.8	1.3	1.0	1.4	1.4	1.4	1.2	1.7	2.6	
23-Sep	1.5	Z	2.0	1.8	2.0	2.4	1.7	1.7	1.5	1.1	1.1	0.8	0.7	0.7	0.7	0.6	0.7	0.8	0.7	0.8	0.6	0.6	0.7	0.7	1.1	2.4	
24-Sep	0.9	0.8	Z	0.9	1.6	1.5	0.9	1.0	0.9	1.1	1.0	1.1	1.0	1.1	1.8	2.7	3.3	3.9	6.3	4.0	8.4	4.8	6.1	6.4	2.7	8.4	
25-Sep	6.2	8.7	10.0	Z	6.6	6.7	10.5	9.2	7.1	4.3	4.9	3.8	2.6	2.5	2.6	2.2	6.5	3.4	9.0	3.0	1.5	1.4	1.0	0.8	5.0	10.5	
26-Sep	0.9	0.9	1.0	1.2	Z	3.3	1.7	1.2	1.9	1.7	1.4	1.9	1.8	1.7	1.6	2.0	2.0	4.2	6.3	5.2	4.6	4.6	11.7	7.7	3.1	11.7	
27-Sep	11.5	13.5	11.0	6.7	6.5	Z	11.1	9.8	9.4	6.3	3.8	6.1	3.0	1.7	2.4	1.1	2.3	1.7	3.5	5.4	2.7	5.6	8.3	7.1	6.1	13.5	
28-Sep	Z	10.3	12.0	16.6	13.8	13.3	12.9	8.2	1.5	0.9	0.9	0.7	0.7	0.8	0.8	0.9	0.8	0.6	0.5	0.5	0.8	0.8	0.4	0.4	4.3	16.6	
29-Sep	0.3	Z	0.4	0.3	0.3	0.3	0.6	0.6	0.3	0.1	Z	C	C	C	C	C	0.5	0.5	0.4	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.6
30-Sep	0.2	0.6	Z	1.0	0.8	1.0	2.2	6.5	6.6	7.4	9.0	6.6	3.0	2.2	2.1	2.0	1.4	2.4	5.5	2.8	2.6	2.2	2.9	5.6	3.3	9.0	

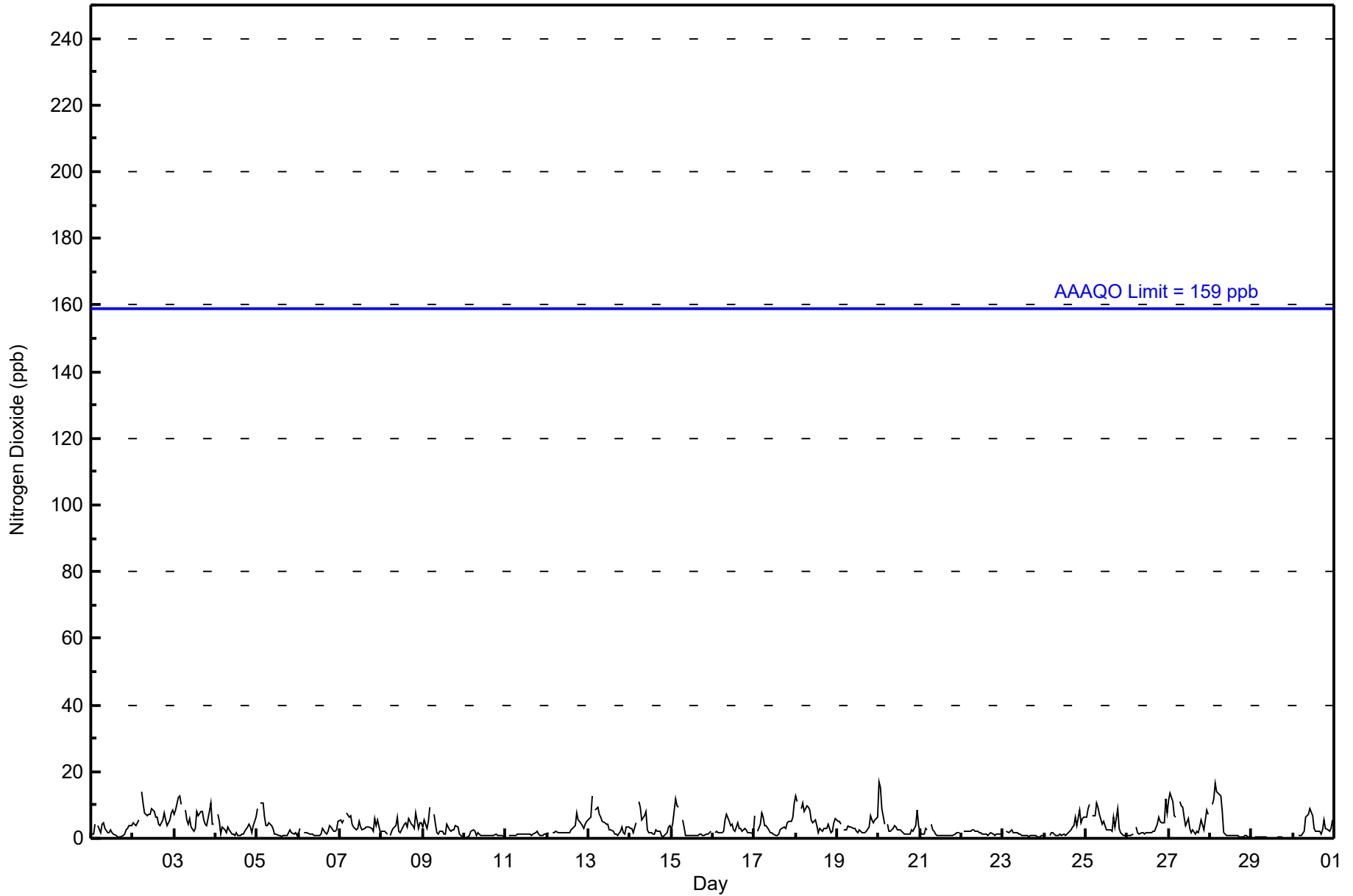
4.5	5.0	5.3	4.3	5.0	4.4	4.8	4.2	3.6	3.1	2.6	2.6	2.1	2.0	2.2	2.0	2.3	2.4	3.0	2.9	2.9	2.7	3.7	3.7	Diurnal Average	
17.1	15.2	12.5	16.6	13.8	14.0	12.9	9.8	9.4	8.2	9.0	9.0	8.2	8.0	6.6	7.9	8.0	7.5	9.0	6.7	8.4	10.6	11.7	10.6	Diurnal Maximum	

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



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Firebag - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Dioxide (NO₂) - ppb
Firebag - September 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	685	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: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Firebag - September 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	38	11	2	4	3	17	36	56	115	104	102	92	35	29	19	22	685
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	38	11	2	4	3	17	36	56	115	104	102	92	35	29	19	22	685

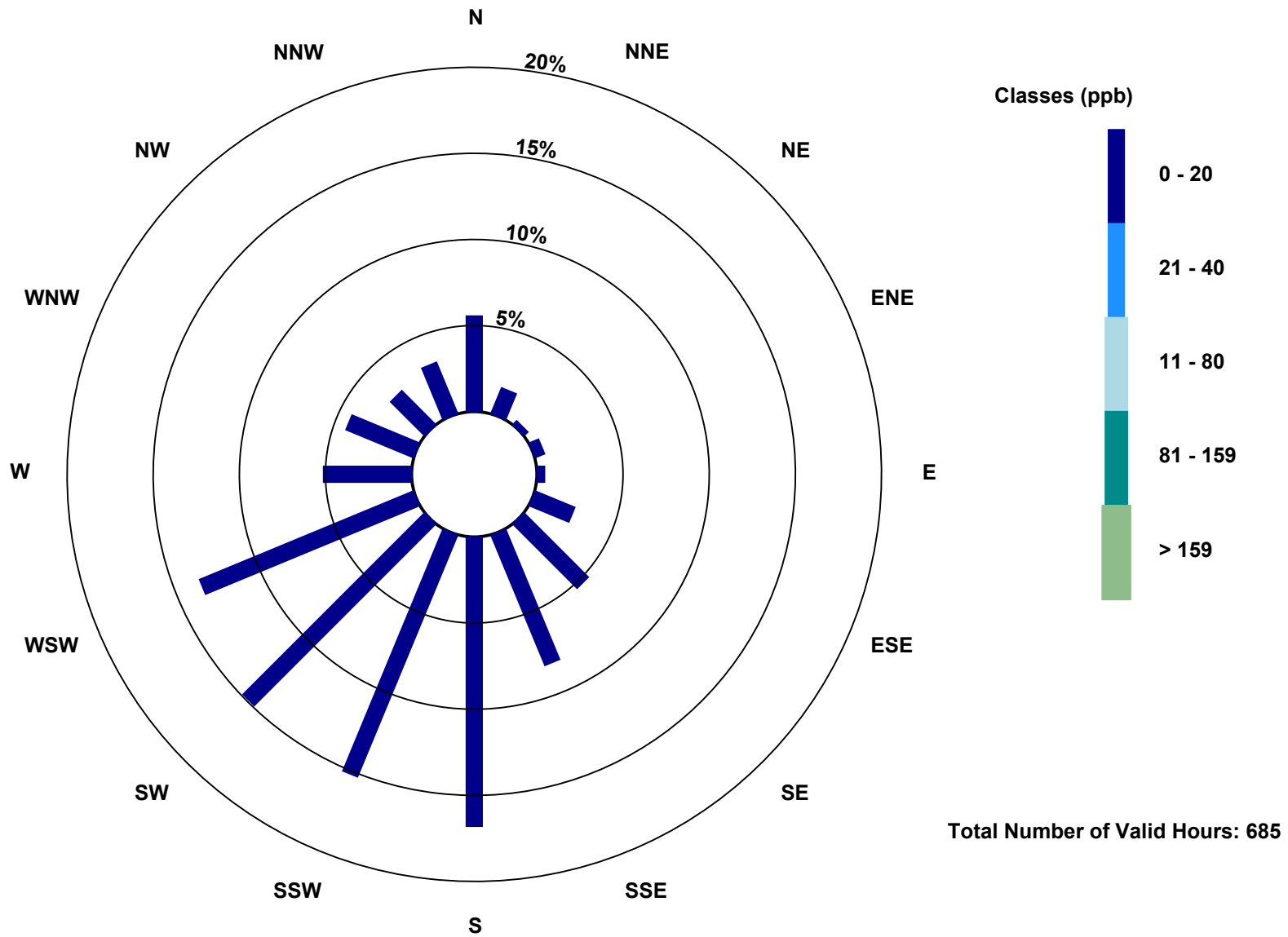
Total Number of Valid Hours: 685

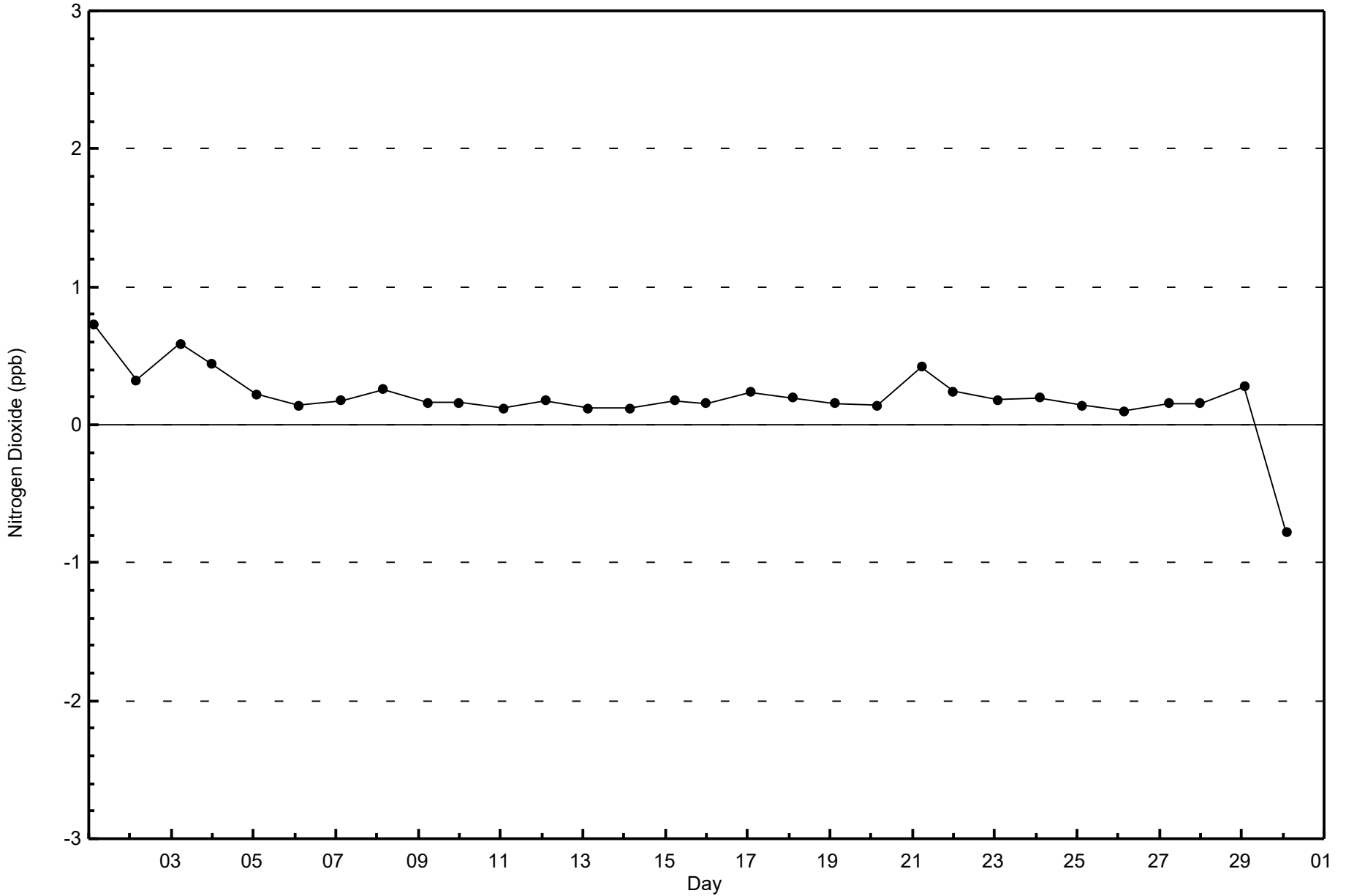
Total Number of Hours: 720

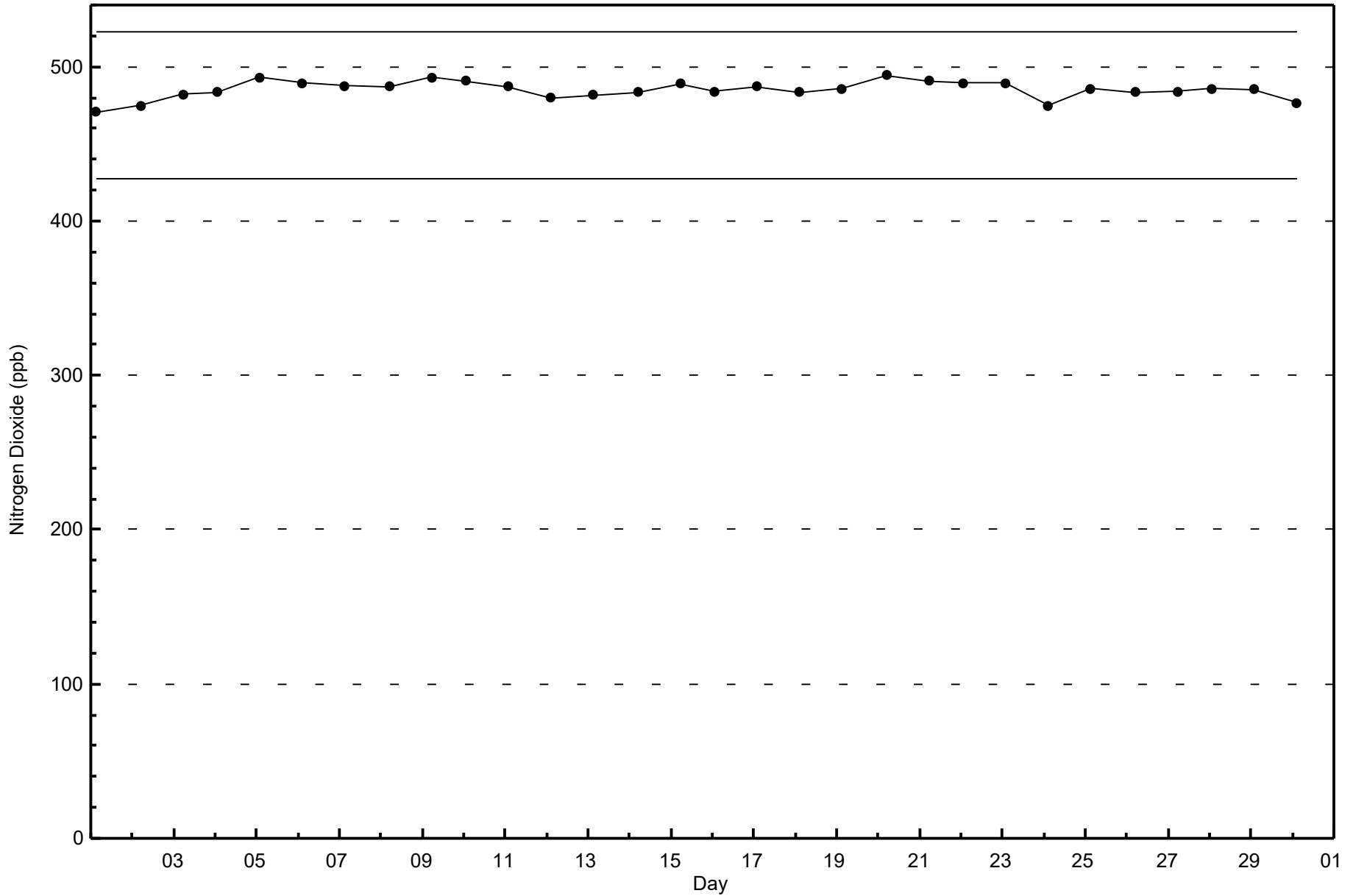


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitrogen Dioxide (NO₂) - ppb
Firebag









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_x) - ppb

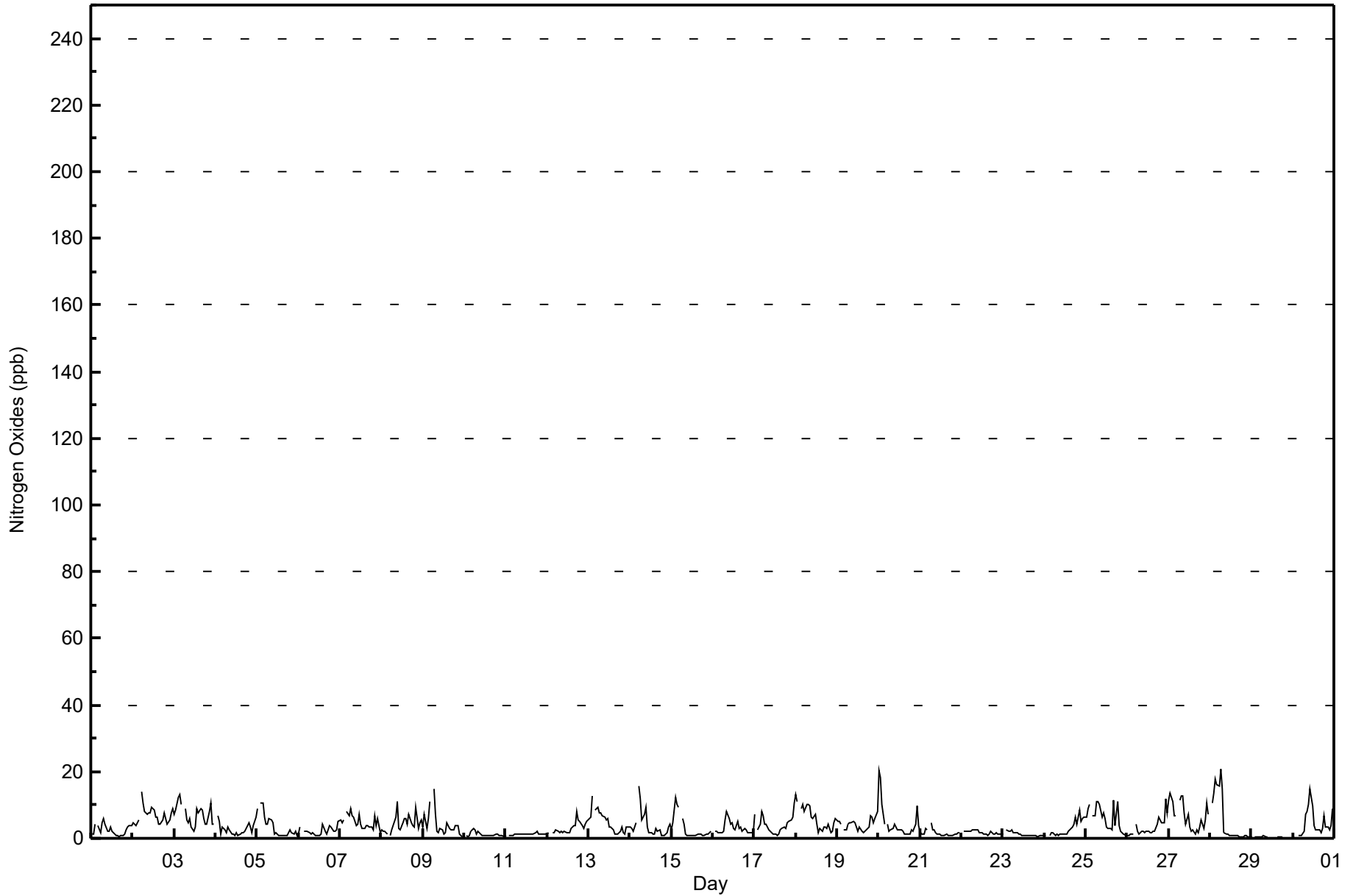
Firebag - September 2023

Maximum Value: 20.9 ppb on Sep 28 07:00																					Maximum Daily Average: 7.0 ppb on Sep 3					Hours in Service: 720	
Minimum Value: 0.1 ppb on Sep 29 20:00																					Minimum Daily Average: 0.3 ppb on Sep 29					Hours of Data: 685	
Maximum Diurnal Average: 5.7 ppb at hour 7																					Minimum Diurnal Average: 2.2 ppb at hour 14					Hours of Missing Data: 35	
Monthly Average: 3.72 ppb																					Percentiles: P ₁ = 0.2 P ₁₀ = 0.9 Q ₁ = 1.3 Median = 2.5 Q ₃ = 4.9 P ₉₀ = 8.4 P ₉₉ = 15.1					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-Sep	1.4	1.4	4.3	Z	3.8	1.9	4.8	5.9	4.1	2.2	2.0	3.2	2.3	1.5	0.8	0.7	0.5	0.7	1.0	1.4	2.4	3.2	3.9	3.8	2.5	5.9	
2-Sep	4.7	4.4	3.7	5.4	Z	14.1	10.8	8.0	7.2	7.5	7.5	9.5	8.6	6.4	6.6	4.3	4.2	5.6	7.7	5.8	4.1	5.5	7.6	8.7	6.9	14.1	
3-Sep	7.2	8.6	12.3	13.0	10.2	Z	8.9	5.7	4.6	6.0	3.3	2.1	3.3	8.7	7.6	8.8	8.6	6.0	4.4	4.1	8.1	10.7	4.2	4.3	7.0	13.0	
4-Sep	Z	7.0	5.2	1.1	3.3	2.5	1.8	3.3	2.7	1.4	1.4	1.0	1.9	0.9	1.1	1.8	1.6	2.3	3.7	4.5	3.5	1.6	3.7	6.6	2.8	7.0	
5-Sep	9.0	Z	10.6	10.5	6.3	4.1	4.4	6.0	5.4	4.7	1.3	1.6	1.0	0.9	0.7	0.9	1.0	1.0	1.8	2.6	1.8	1.3	1.9	0.9	3.5	10.6	
6-Sep	1.2	3.3	Z	2.1	2.2	2.1	1.9	1.3	1.7	1.1	1.0	0.8	0.8	1.5	4.2	2.1	1.4	2.5	3.9	3.4	2.3	2.3	2.6	5.1	2.2	5.1	
7-Sep	5.3	4.8	5.4	Z	7.9	6.7	8.8	6.7	6.5	3.7	4.2	7.3	4.4	2.9	3.1	4.0	3.8	3.4	3.2	2.3	6.7	4.0	6.1	1.7	4.9	8.8	
8-Sep	2.4	2.3	2.3	1.5	Z	0.9	2.6	3.8	6.2	11.0	3.0	2.4	4.6	5.8	6.0	4.2	7.1	4.7	3.8	3.2	9.4	3.0	4.8	5.5	4.4	11.0	
9-Sep	3.3	7.4	3.0	6.0	11.2	Z	14.6	7.1	2.1	1.6	2.8	2.5	1.3	1.5	4.8	3.1	2.6	2.7	2.5	4.0	3.6	1.2	0.8	0.6	3.9	14.6	
10-Sep	Z	0.6	0.6	1.0	2.2	3.1	2.5	1.2	2.2	1.3	1.1	0.8	1.0	0.9	1.0	1.0	1.0	1.0	1.3	1.1	0.9	0.9	0.8	0.6	1.2	3.1	
11-Sep	0.7	Z	0.8	0.8	1.0	1.1	1.1	1.4	1.3	1.3	1.3	1.3	1.2	1.2	1.4	1.1	1.2	1.7	2.3	1.3	1.1	1.1	1.2	1.2	1.2	2.3	
12-Sep	1.3	1.6	Z	1.7	1.8	2.4	1.9	1.9	1.9	1.8	2.0	1.7	1.6	1.6	3.0	3.8	3.9	7.9	5.6	4.9	3.7	2.9	4.4	5.0	3.0	7.9	
13-Sep	6.0	6.6	12.6	Z	8.3	9.3	7.7	7.7	6.8	6.2	5.5	6.1	3.5	3.4	2.5	1.4	1.3	1.1	2.2	3.4	1.8	1.3	3.6	3.3	4.9	12.6	
14-Sep	3.2	2.9	1.9	4.7	Z	15.7	11.7	5.7	7.2	9.2	3.3	1.9	1.8	1.2	1.4	2.8	2.3	2.4	0.8	0.7	1.0	1.8	3.4	4.1	4.0	15.7	
15-Sep	2.5	4.8	12.4	10.1	9.5	Z	6.0	4.1	1.3	1.0	0.9	0.8	0.8	0.9	1.0	1.2	1.2	1.3	1.0	0.9	1.4	1.4	1.9	2.2	3.0	12.4	
16-Sep	Z	2.0	2.1	1.9	1.8	1.7	2.3	5.7	8.0	6.0	4.3	4.5	2.9	2.4	5.1	3.2	3.2	2.3	3.1	2.5	1.6	1.7	1.9	1.5	3.1	8.0	
17-Sep	7.2	Z	2.4	4.3	8.2	6.8	4.3	4.3	2.7	1.9	1.7	1.3	1.2	1.0	1.2	2.6	3.2	3.3	3.2	4.7	5.0	5.3	6.3	10.7	4.0	10.7	
18-Sep	13.0	11.0	Z	9.0	10.4	8.0	10.0	10.1	9.9	6.4	5.8	7.1	4.3	1.9	3.1	2.2	3.3	3.2	3.0	4.4	1.9	2.1	4.7	5.9	6.1	13.0	
19-Sep	5.2	5.1	4.2	Z	2.7	2.7	4.0	4.6	4.8	5.1	4.7	3.4	2.2	3.4	2.2	1.9	2.1	2.5	3.3	6.8	6.2	4.7	5.9	8.2	4.2	8.2	
20-Sep	20.3	18.3	10.0	4.3	Z	4.1	2.1	2.4	3.0	4.1	3.4	2.7	2.6	2.3	2.0	1.3	1.2	1.3	1.2	2.5	2.2	4.2	9.8	3.9	4.7	20.3	
21-Sep	2.2	1.4	1.2	3.0	2.7	Z	4.7	2.7	2.4	1.6	1.1	1.2	1.0	0.9	0.8	1.1	1.1	0.8	0.9	0.9	1.1	1.5	1.5	1.7	1.6	4.7	
22-Sep	Z	2.0	2.2	2.0	2.2	2.2	2.6	2.7	2.6	2.4	1.9	1.9	1.6	1.3	1.2	1.0	1.4	1.9	1.4	1.1	1.5	1.4	1.4	1.2	1.8	2.7	
23-Sep	1.5	Z	2.3	2.0	2.2	2.7	1.8	1.9	1.7	1.3	1.3	0.9	0.8	0.8	0.8	0.7	0.9	0.9	0.8	0.9	0.6	0.7	0.8	0.8	1.3	2.7	
24-Sep	1.0	0.9	Z	1.0	1.8	1.8	1.0	1.1	1.0	1.3	1.2	1.2	1.2	1.2	2.0	2.9	3.5	4.1	6.4	4.1	8.5	4.9	6.1	6.5	2.8	8.5	
25-Sep	6.3	8.8	10.1	Z	6.7	6.7	11.0	11.0	10.0	6.5	7.7	5.7	3.3	3.0	3.1	2.5	11.4	3.7	11.2	3.7	1.9	1.8	1.2	1.0	6.0	11.4	
26-Sep	1.1	1.0	1.1	1.3	Z	4.1	2.0	1.3	2.2	2.0	1.6	2.2	2.1	1.9	1.8	2.1	2.1	4.3	6.4	5.3	4.7	4.7	11.8	7.8	3.3	11.8	
27-Sep	11.6	13.6	11.1	6.8	6.6	Z	11.6	12.8	12.6	7.7	4.4	7.1	3.4	2.0	2.7	1.2	2.5	1.8	3.6	5.5	2.8	5.7	10.7	7.3	6.7	13.6	
28-Sep	Z	10.4	13.6	18.0	16.0	15.6	20.9	15.0	1.9	1.1	1.1	0.9	0.9	1.0	1.0	1.0	0.8	0.6	0.5	0.5	0.8	0.8	0.4	0.4	5.4	20.9	
29-Sep	0.3	Z	0.4	0.3	0.3	0.3	0.6	0.7	0.5	0.3	C	C	C	C	C	0.5	0.5	0.4	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.7	
30-Sep	0.2	0.6	Z	1.0	0.8	1.0	2.3	7.2	8.0	10.4	15.0	9.6	3.7	2.7	2.5	2.6	1.6	2.8	7.0	3.5	3.3	2.5	4.0	9.1	4.4	15.0	
																								Diurnal Average			
																								Diurnal Maximum			
																								Z - zerospan C - Calibration			



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Firebag - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Oxides (NO_x) - ppb
Firebag - September 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	684	99.85	99.85
21 - 40	1	0.15	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: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Firebag - September 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	38	11	2	4	3	17	36	56	115	104	102	92	35	29	18	22	684
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	38	11	2	4	3	17	36	56	115	104	102	92	35	29	19	22	685

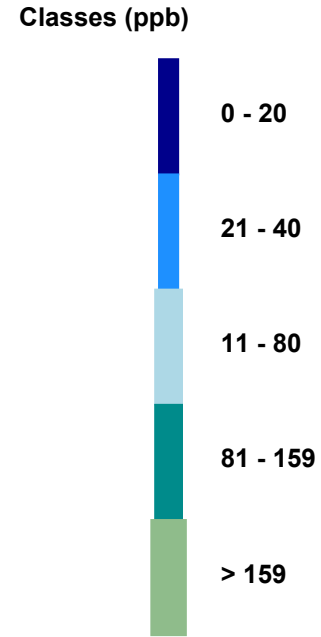
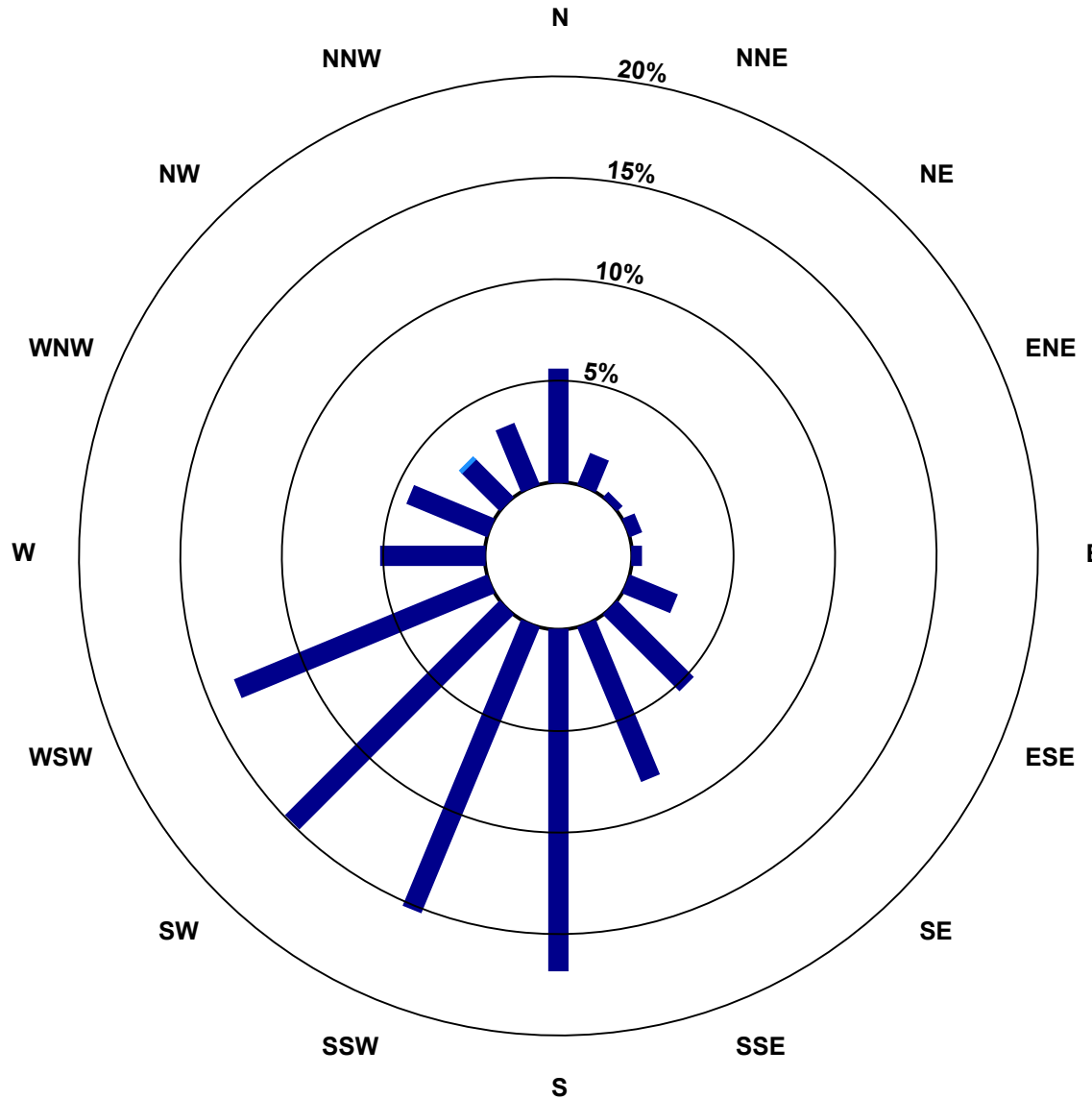
Total Number of Valid Hours: 685

Total Number of Hours: 720

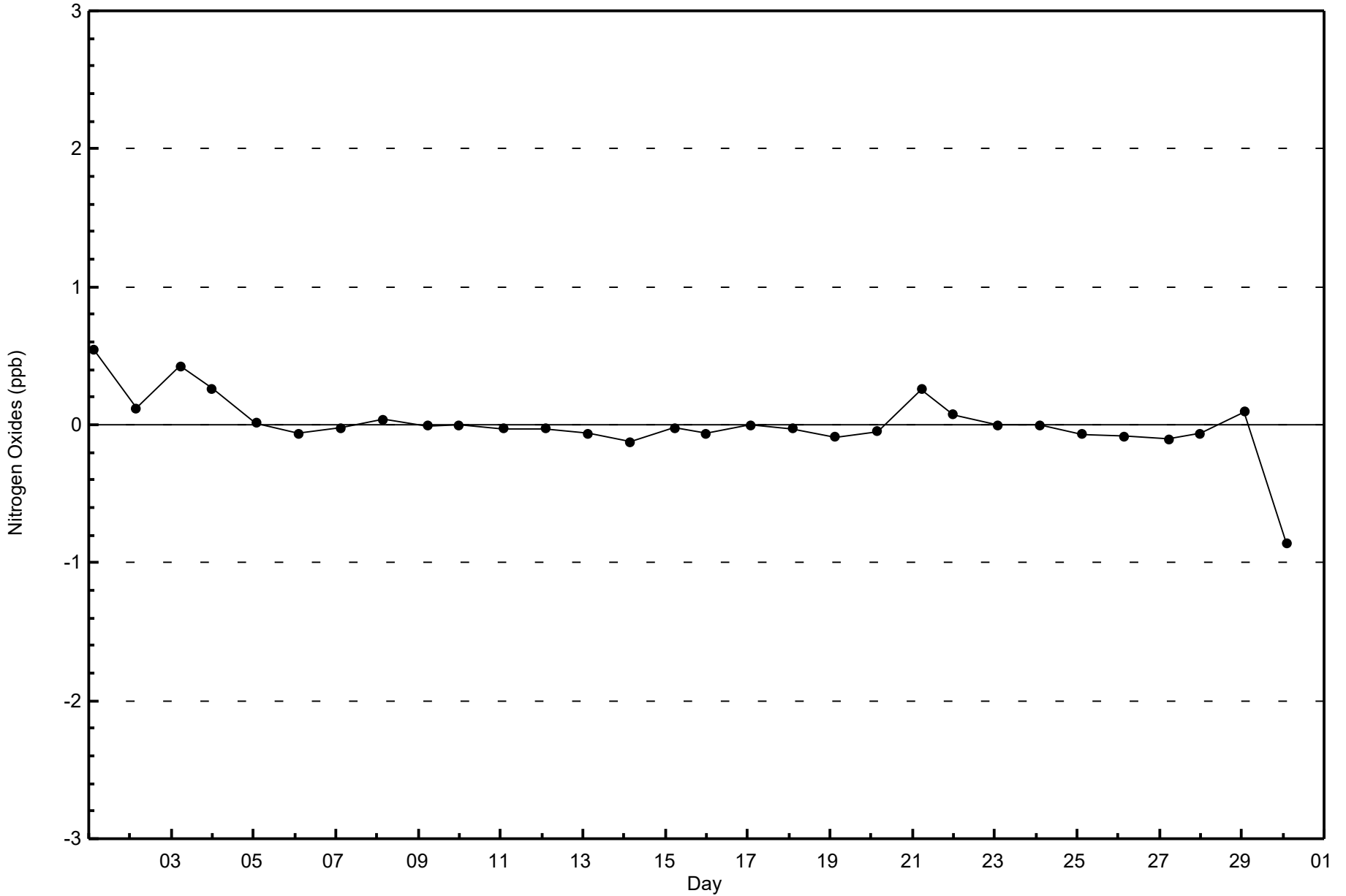


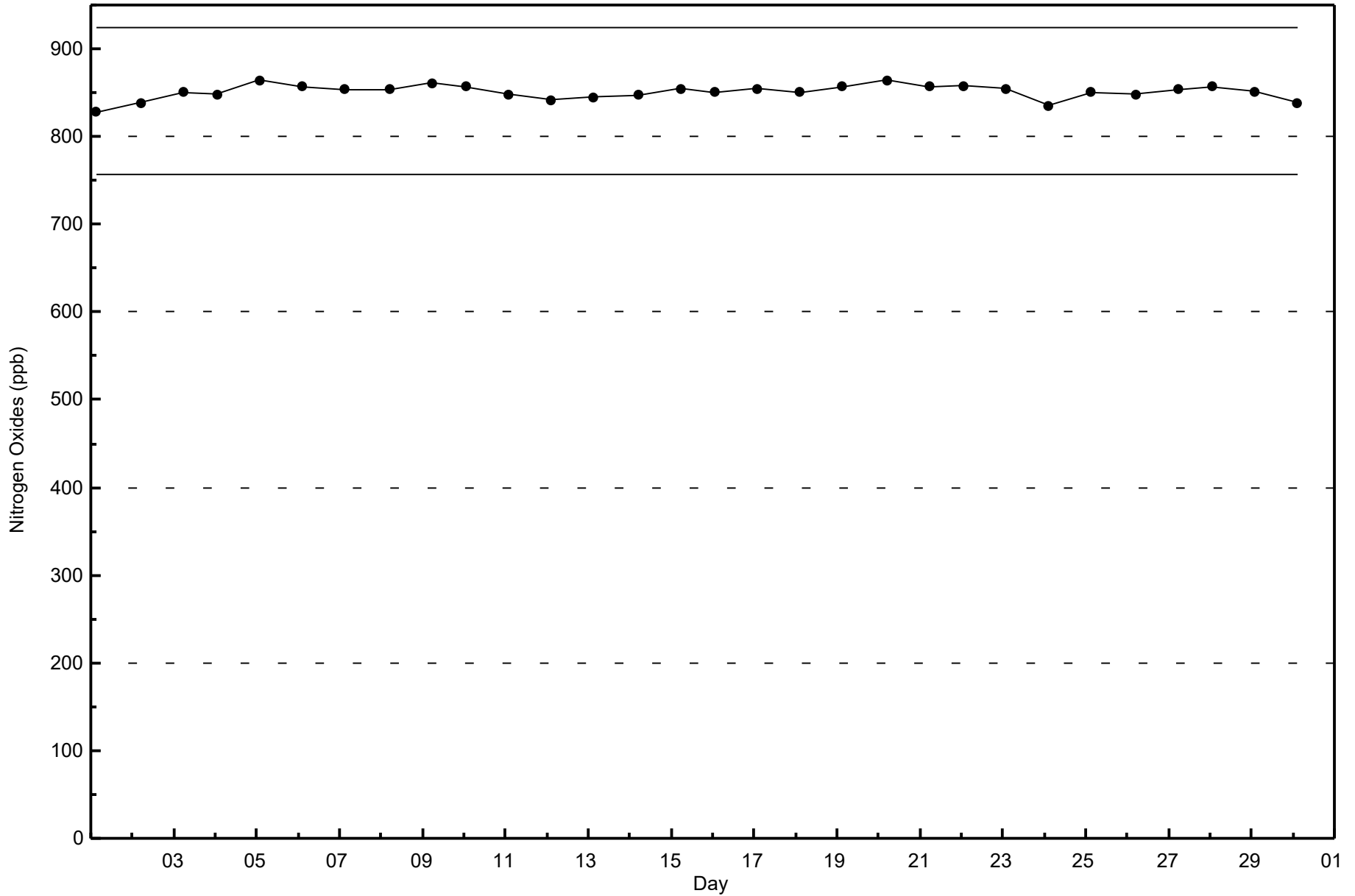
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitrogen Oxides (NO_x) - ppb
Firebag



Total Number of Valid Hours: 685







Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature (AT) - C

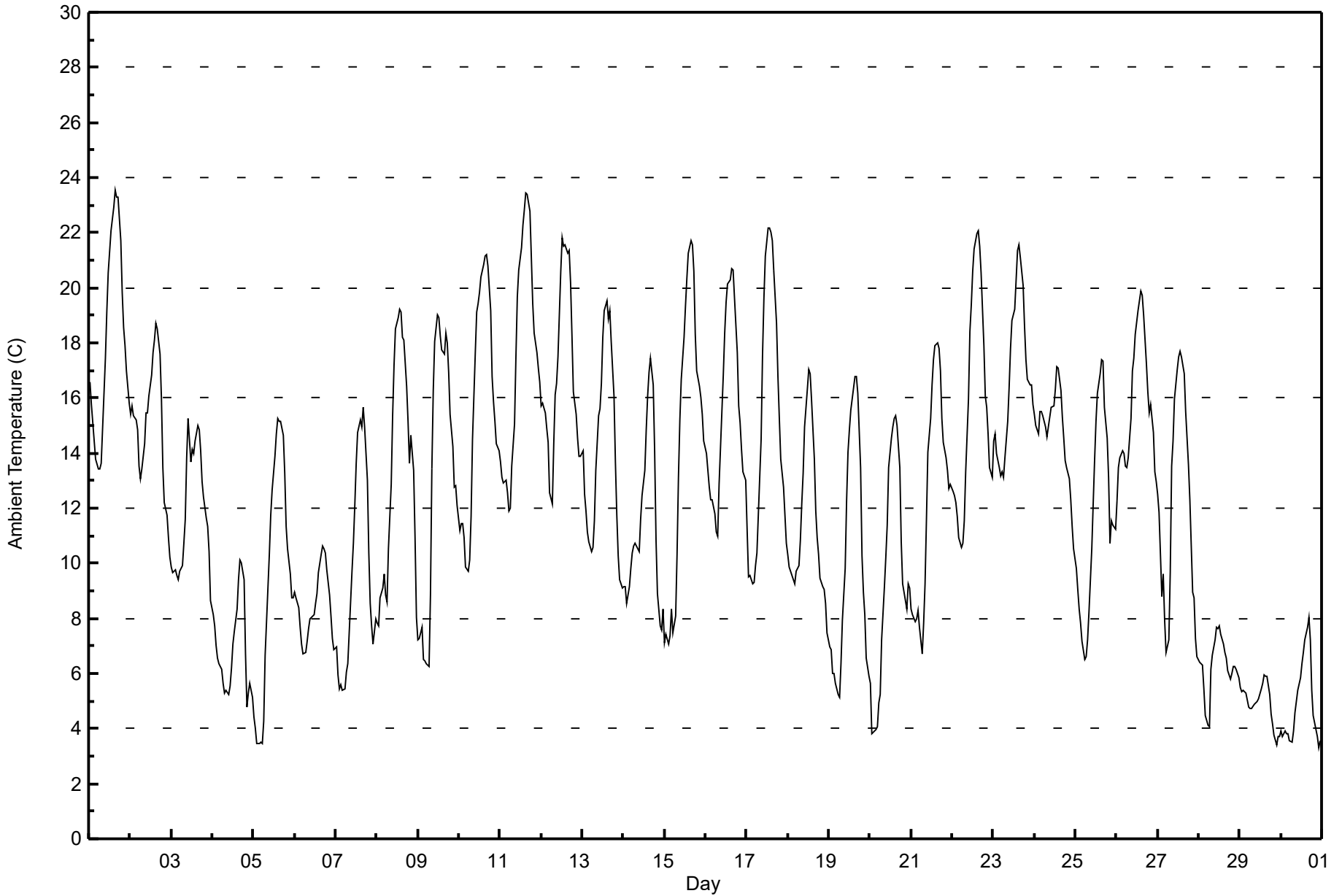
Firebag - September 2023

Maximum Value: 23.5 C on Sep 1 16:00 Maximum Daily Average: 18.1 C on Sep 1																				Hours in Service: 720 Hours of Data: 720						
Minimum Value: 3.3 C on Sep 30 23:00 Minimum Daily Average: 4.9 C on Sep 29 Maximum Diurnal Average: 16.9 C at hour 16 Minimum Diurnal Average: 8.8 C at hour 6 Monthly Average: 12.45 C Percentiles: P ₁ = 3.5 P ₁₀ = 5.8 Q ₁ = 8.3 Median = 12.8 Q ₃ = 16.0 P ₉₀ = 19.2 P ₉₉ = 22.7																				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-Sep	16.6	15.8	15.1	14.5	13.8	13.4	13.4	13.6	14.9	17.4	19.1	20.6	21.3	22.1	22.9	23.5	23.3	23.3	21.7	19.9	18.5	17.9	17.0	15.8	18.1	23.5
2-Sep	15.4	15.7	15.4	15.2	14.8	13.5	13.1	13.4	14.3	15.4	15.4	16.1	16.8	17.6	18.1	18.7	18.5	17.6	16.0	13.5	12.2	11.7	10.9	10.2	15.0	18.7
3-Sep	9.9	9.7	9.8	9.6	9.4	9.7	9.9	10.7	11.6	13.8	15.2	13.7	14.1	14.0	14.4	15.0	14.9	14.1	13.0	12.4	11.6	11.3	10.4	8.7	12.0	15.2
4-Sep	8.1	7.7	7.0	6.5	6.4	6.2	5.6	5.3	5.4	5.2	5.5	6.2	7.0	7.5	8.3	9.4	10.1	10.0	9.4	6.7	4.8	5.3	5.6	5.1	6.9	10.1
5-Sep	4.4	4.0	3.4	3.5	3.5	3.5	4.3	6.6	9.1	10.3	11.8	12.7	13.9	14.7	15.3	15.1	15.2	14.7	13.3	11.3	10.5	9.6	8.7	8.7	9.5	15.3
6-Sep	8.9	8.8	8.4	7.7	7.1	6.7	6.8	7.2	7.6	8.0	8.1	8.2	8.5	8.9	9.7	10.3	10.6	10.5	10.4	9.7	8.9	8.1	7.3	6.8	8.5	10.6
7-Sep	7.0	5.9	5.5	5.6	5.4	5.4	6.1	6.4	7.5	9.7	10.7	12.1	13.6	14.7	15.2	14.9	15.7	14.9	13.0	10.4	8.5	7.7	7.0	8.0	9.6	15.7
8-Sep	7.8	7.7	8.7	9.1	9.6	8.9	8.6	10.5	12.9	15.3	17.2	18.5	18.9	19.2	19.1	18.2	18.1	16.4	15.1	13.6	14.6	13.4	11.0	8.0	13.4	19.2
9-Sep	7.2	7.3	7.7	6.5	6.4	6.3	6.3	8.8	13.4	16.3	18.0	19.0	18.9	18.3	17.7	17.6	18.4	18.0	16.9	15.4	14.2	12.8	12.8	12.1	13.2	19.0
10-Sep	11.2	11.4	11.4	10.9	9.9	9.7	10.1	11.7	14.5	17.7	19.1	19.4	19.9	20.4	20.8	21.1	21.2	20.8	19.2	16.8	15.8	15.1	14.3	14.1	15.7	21.2
11-Sep	13.7	13.1	12.9	13.0	12.6	11.9	12.0	13.5	15.0	17.5	19.7	20.7	21.5	22.3	22.9	23.5	23.4	22.8	21.1	19.4	18.4	17.6	17.1	16.6	17.6	23.5
12-Sep	15.7	15.8	15.5	14.9	14.4	12.6	12.2	14.3	16.1	16.5	17.5	20.6	21.8	21.5	21.5	21.2	21.3	20.2	18.3	16.2	15.4	14.6	13.9	13.9	16.9	21.8
13-Sep	14.1	12.5	11.9	11.1	10.8	10.4	10.6	11.5	13.4	15.4	15.6	16.5	18.2	19.2	19.5	18.9	19.2	18.1	16.1	13.7	11.7	10.2	9.4	9.1	14.0	19.5
14-Sep	9.1	9.2	8.6	9.1	9.8	10.4	10.6	10.7	10.5	10.4	11.6	12.5	13.4	14.8	16.0	16.9	17.4	16.5	14.1	10.8	8.9	7.7	7.6	8.3	11.5	17.4
15-Sep	7.1	7.4	7.1	7.4	8.4	7.5	8.1	10.3	13.1	15.2	16.7	18.2	19.3	20.3	21.2	21.7	21.5	20.6	18.3	17.0	16.4	16.0	15.4	14.5	14.5	21.7
16-Sep	14.0	13.4	12.7	12.3	12.3	11.8	11.1	11.0	12.9	15.5	16.8	18.3	19.5	20.1	20.3	20.7	20.7	19.6	17.7	15.7	15.1	14.2	13.3	13.0	15.5	20.7
17-Sep	11.2	9.5	9.6	9.3	9.3	9.9	10.4	11.7	14.5	17.6	19.6	21.2	22.1	22.2	22.0	21.7	20.6	18.7	16.8	15.3	13.8	12.8	11.7	10.7	15.1	22.2
18-Sep	10.3	9.9	9.6	9.4	9.3	9.7	9.9	10.8	12.1	13.2	15.0	16.3	17.0	16.9	15.9	13.8	11.9	10.9	10.3	9.5	9.1	9.1	8.5	7.5	11.5	17.0
19-Sep	6.9	6.8	6.0	6.0	5.6	5.2	5.2	6.4	7.9	9.8	12.2	14.0	14.9	15.6	16.4	16.8	16.8	16.2	13.5	10.3	9.0	8.2	6.6	5.9	10.1	16.8
20-Sep	5.6	3.8	3.9	4.0	4.1	4.9	5.2	7.2	9.1	10.2	11.4	13.5	14.5	15.0	15.3	15.4	15.0	13.5	10.8	9.2	9.0	8.3	9.3	9.1	9.5	15.4
21-Sep	8.3	8.2	7.9	8.0	8.3	7.7	6.7	7.8	9.2	11.6	14.1	15.3	16.5	17.4	17.9	18.0	17.8	17.0	15.3	14.4	13.8	13.4	12.7	12.9	12.5	18.0
22-Sep	12.6	12.5	12.2	11.7	10.9	10.6	10.7	11.6	13.3	16.0	18.4	19.4	20.6	21.4	21.9	22.1	21.5	20.6	17.9	16.1	15.7	14.7	13.5	13.1	15.8	22.1
23-Sep	14.4	14.7	14.0	13.5	13.2	13.3	13.1	13.9	15.2	16.4	17.8	18.8	19.2	20.3	21.4	21.5	21.1	20.1	18.6	17.4	16.7	16.5	16.5	15.8	16.8	21.5
24-Sep	15.4	15.0	14.7	15.5	15.5	15.3	14.9	14.6	15.0	15.3	15.7	16.3	17.1	17.1	17.1	16.3	15.3	14.5	13.7	13.5	13.0	12.3	11.4	10.5	14.7	17.1
25-Sep	9.8	9.0	8.3	7.9	7.2	6.5	6.6	7.2	8.3	10.5	12.1	13.7	15.1	16.2	16.9	17.4	17.3	15.6	14.5	13.1	10.7	11.6	11.4	11.3	11.6	17.4
26-Sep	12.3	13.5	13.8	14.1	14.0	13.5	13.5	13.8	15.3	17.0	17.4	18.3	19.2	19.5	19.9	19.7	19.0	17.2	16.2	15.4	15.8	14.8	13.3	13.0	15.8	19.9
27-Sep	12.5	11.8	8.8	9.6	7.9	6.8	7.2	9.7	13.5	14.4	16.0	17.0	17.5	17.7	17.5	16.9	15.5	14.5	13.6	12.3	9.0	8.7	7.3	6.6	12.2	17.7
28-Sep	6.4	6.3	6.3	5.4	4.5	4.1	4.1	6.2	6.7	7.2	7.7	7.6	7.7	7.4	7.1	6.8	6.6	6.1	5.8	6.0	6.2	6.3	6.2	5.8	6.3	7.7
29-Sep	5.5	5.4	5.4	5.3	5.0	4.8	4.7	4.7	4.9	4.9	5.0	5.1	5.5	5.6	5.9	5.9	5.9	5.3	4.5	4.2	3.8	3.4	3.7	3.7	4.9	5.9
30-Sep	3.9	3.7	3.9	3.8	3.8	3.5	3.5	3.9	4.6	5.0	5.4	5.9	6.4	6.8	7.2	7.7	8.1	7.2	5.4	4.5	4.0	3.7	3.3	3.5	4.9	8.1
																								Diurnal Average		
																								Diurnal Maximum		



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Firebag - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Firebag - September 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	256	35.56	35.56
10 - 20	410	56.94	92.50
> 20	54	7.50	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

Relative Humidity (RH) - %
Firebag - September 2023

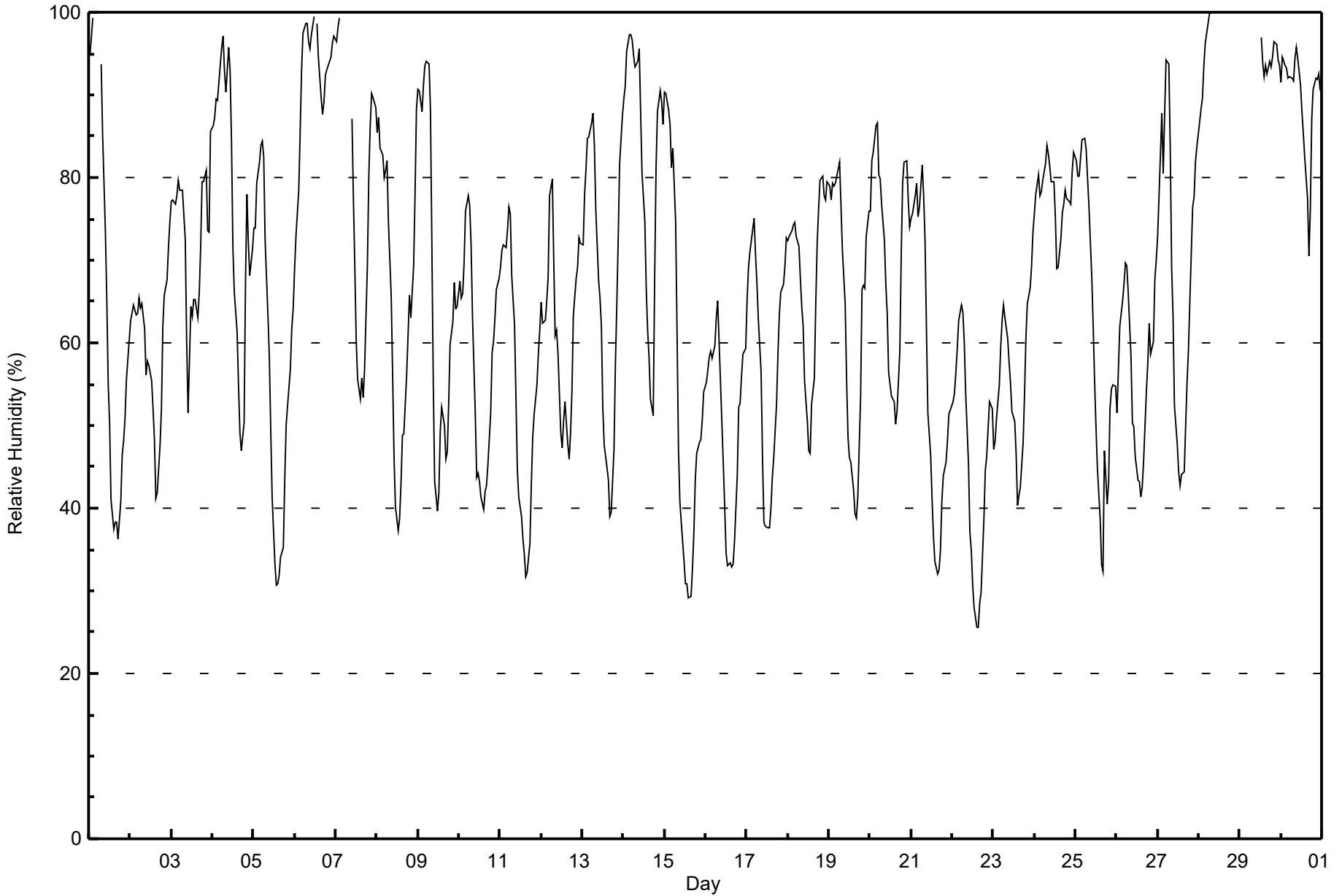
Maximum Value: 100.0 % on Sep 28 08:00																						Maximum Daily Average: 91.7 % on Sep 6																						Hours in Service: 720			
Minimum Value: 25.6 % on Sep 22 15:00																						Minimum Daily Average: 45.7 % on Sep 22																						Hours of Data: 686			
Maximum Diurnal Average: 81.5 % at hour 6																						Minimum Diurnal Average: 48.7 % at hour 16																						Hours of Missing Data: 34			
Monthly Average: 66.11 %																						Percentiles: P ₁ = 30.6 P ₁₀ = 41.2 Q ₁ = 51.4 Median = 65.9 Q ₃ = 80.3 P ₉₀ = 92.3 P ₉₉ = 99.6																						Hours of Calibration: 0			
																																												Percent Operational Time: 95.3			
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-Sep	95.0	97.0	99.3	OR	OR	OR	OR	93.7	85.3	73.3	65.3	55.0	50.3	41.0	37.5	38.4	38.2	36.3	40.8	46.4	48.2	50.9	55.6	60.3	60.4	99.3																					
2-Sep	62.8	63.6	64.5	63.4	63.5	65.4	64.3	64.7	61.7	56.1	57.9	57.3	55.4	52.1	48.4	41.2	41.8	47.6	52.0	62.0	65.8	67.6	71.6	74.6	59.4	74.6																					
3-Sep	77.1	77.3	76.8	77.9	79.6	78.4	78.5	75.4	72.6	60.1	51.5	64.4	63.2	65.3	65.3	63.1	66.1	71.7	79.6	79.6	80.9	73.5	73.4	85.5	72.4	85.5																					
4-Sep	86.3	87.3	89.5	89.4	91.5	95.8	97.1	92.8	90.4	95.8	93.0	84.5	71.6	66.1	61.3	54.8	49.1	47.0	50.4	67.4	77.9	72.2	68.1	71.4	77.1	97.1																					
5-Sep	73.9	73.9	79.4	81.8	83.9	84.5	82.5	72.4	63.4	58.3	49.4	41.4	33.2	30.7	30.8	31.8	34.1	35.3	43.4	50.0	52.3	56.9	61.7	64.1	57.0	84.5																					
6-Sep	68.9	72.9	78.4	85.5	92.8	97.5	98.7	98.6	96.4	95.6	97.3	99.6	OR	98.6	94.5	89.7	87.7	89.2	92.3	93.1	94.1	94.6	96.3	97.1	91.7	99.6																					
7-Sep	96.5	98.2	99.3	OR	OR	OR	OR	OR	OR	87.1	77.4	69.4	60.3	55.6	53.2	55.8	53.3	56.9	69.6	80.1	86.3	90.1	89.7	88.5	76.0	99.3																					
8-Sep	85.5	87.2	83.5	82.7	79.9	80.8	82.0	74.6	65.6	56.1	46.2	40.1	37.4	38.8	43.1	48.9	49.0	56.1	60.8	65.8	63.1	69.3	78.0	88.3	65.1	88.3																					
9-Sep	90.7	90.5	88.0	91.2	93.6	94.1	93.7	88.1	72.0	55.3	43.2	39.7	41.9	49.3	52.2	50.1	45.9	46.8	52.6	59.8	62.5	67.3	64.1	64.3	66.5	94.1																					
10-Sep	67.5	65.5	65.9	69.6	75.9	77.8	76.6	71.8	63.2	51.4	43.7	44.3	43.3	41.4	39.9	42.1	42.7	45.2	51.6	58.8	60.2	62.9	66.4	67.8	58.1	77.8																					
11-Sep	69.2	71.2	71.8	71.6	73.8	76.4	75.6	68.2	62.2	53.6	44.7	41.4	38.9	36.3	34.4	31.7	32.1	35.8	42.9	48.6	51.4	55.0	58.6	61.5	54.4	76.4																					
12-Sep	64.9	62.4	62.7	65.0	68.0	77.8	79.8	69.9	60.8	61.5	58.9	49.2	47.3	50.4	52.9	47.8	46.0	49.2	54.3	63.5	67.9	69.1	72.7	72.1	61.4	79.8																					
13-Sep	71.9	78.0	81.1	84.7	85.0	86.7	87.8	83.9	76.0	67.7	65.5	62.1	52.3	47.6	44.9	43.4	39.0	39.5	47.1	57.5	64.6	72.6	81.7	87.5	67.0	87.8																					
14-Sep	89.5	91.0	95.2	97.2	97.3	96.6	94.8	93.3	94.1	95.6	87.9	80.6	74.8	66.6	61.6	58.2	53.2	51.3	67.7	81.1	87.9	90.5	89.2	86.4	82.6	97.3																					
15-Sep	90.4	90.3	88.1	86.5	81.2	83.6	74.6	61.3	47.3	40.9	38.3	33.6	30.8	30.8	29.1	29.4	32.6	36.9	43.4	46.6	47.9	48.3	50.7	54.0	54.0	90.4																					
16-Sep	55.2	56.8	58.4	59.1	58.2	59.6	63.0	65.1	60.1	50.3	45.4	40.2	34.6	33.1	33.4	33.0	33.3	35.9	44.1	52.2	52.7	55.8	58.7	59.3	49.9	65.1																					
17-Sep	65.2	69.1	70.9	73.7	75.0	70.7	67.2	62.9	56.4	45.8	38.4	37.9	37.6	37.7	40.0	43.7	46.1	52.6	58.7	63.5	66.1	67.1	69.4	72.7	57.9	75.0																					
18-Sep	72.4	72.9	73.5	74.3	74.6	72.9	71.7	67.9	64.4	62.0	55.4	50.5	46.9	46.5	52.6	55.7	64.8	72.1	76.1	79.7	80.2	77.7	77.3	79.6	67.6	80.2																					
19-Sep	79.0	77.3	79.4	78.9	79.4	81.0	81.9	76.6	71.2	64.7	55.7	48.7	46.0	45.6	42.2	39.3	38.8	41.3	53.4	66.4	67.0	66.7	72.9	76.0	63.7	81.9																					
20-Sep	75.9	82.1	83.1	86.3	86.7	80.3	79.8	76.8	72.4	67.1	63.6	56.4	53.5	53.2	52.9	50.1	51.7	58.9	70.6	79.2	81.9	82.0	77.3	74.0	70.7	86.7																					
21-Sep	75.1	75.5	77.9	79.4	75.2	76.5	81.6	77.7	72.3	61.7	51.5	46.4	41.2	36.6	33.6	32.0	32.6	34.9	40.8	43.9	45.6	48.1	51.4	51.8	56.0	81.6																					
22-Sep	52.9	53.9	56.4	59.3	62.8	64.6	63.7	60.0	53.9	45.5	37.1	34.8	30.7	28.0	25.6	25.6	28.4	29.9	38.6	44.6	46.3	49.7	52.8	52.0	45.7	64.6																					
23-Sep	47.2	48.2	50.9	54.9	59.6	62.8	64.5	63.1	60.5	57.7	55.0	51.8	50.5	46.6	40.4	41.6	42.6	47.9	53.8	60.6	64.7	66.7	69.2	73.3	55.6	73.3																					
24-Sep	75.5	78.0	80.4	77.9	78.4	79.6	81.8	83.8	82.8	81.3	79.6	79.5	75.3	69.0	69.2	72.7	75.7	76.8	78.4	77.5	77.1	76.8	80.8	83.0	78.0	83.8																					
25-Sep	82.0	80.2	80.3	82.4	84.6	84.8	83.4	79.8	76.4	67.9	62.0	55.4	49.8	44.8	38.7	33.2	32.4	46.9	40.5	43.0	52.1	54.5	55.0	54.7	61.0	84.8																					
26-Sep	51.6	56.7	62.1	65.0	67.1	69.7	69.3	66.1	58.3	50.3	49.9	46.3	43.4	43.1	41.4	42.6	45.7	54.2	57.6	62.4	58.6	60.2	67.6	70.0	56.6	70.0																					
27-Sep	72.9	77.8	87.9	80.5	87.7	94.2	93.7	83.5	69.2	63.3	52.4	47.8	44.3	42.6	44.1	44.5	50.1	55.2	59.2	65.1	76.5	77.6	81.9	83.8	68.2	94.2																					
28-Sep	86.9	88.3	89.6	93.6	96.3	98.7	99.8	100.0	100.0	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	--	100.0																				
29-Sep	OR	OR	OR	OR	OR	100.0	100.0	OR	OR	OR	OR	OR	OR	96.9	93.8	92.2	93.6	92.6	94.0	93.4	94.6	96.5	96.1	94.3	93.6	--	100.0																				
30-Sep	91.6	94.6	93.6	93.2	92.0	92.3	92.1	91.7	94.4	95.8	94.4	91.2	88.0	85.2	82.3	77.4	70.6	76.3	87.1	90.7	92.0	91.9	92.6	90.5	89.2	95.8																					
																						74.9	76.5	78.2	77.9	79.4	81.5	81.4	77.3	71.6	65.1	59.3	55.3	51.4	50.9	49.6	48.7	48.8	52.5	58.6	65.0	68.9	70.4	71.7	73.7	Diurnal Average	
																						96.5	98.2	99.3	97.2	97.3	100.0	100.0	100.0	100.0	95.8	97.3	99.6	96.9	98.6	94.5	93.6	92.6	94.0	93.4	94.6	100.0	100.0	96.3	97.1	Diurnal Maximum	

OR - Out of Range



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Firebag - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Firebag - September 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	59	8.60	8.60
40 - 60	207	30.17	38.78
60 - 80	243	35.42	74.20
80 - 100	171	24.93	99.13

Total Number of Valid Hours: 686

Total Number of Hours: 720



Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Firebag - September 2023

Maximum Speed: 38 km/h on Sep 11 15:00	Maximum Daily Speed Average: 26.8 km/h on Sep 11	Hours in Service: 720
Minimum Speed Value: 0 km/h on Sep 27 21:00	Minimum Daily Speed Average: 4.1 km/h on Sep 8	Hours of Data: 720
Maximum Diurnal Speed Average: 11.4 km/h at hour 14	Minimum Diurnal Speed Average: 5.4 km/h at hour 19	Hours of Missing Data: 0
Monthly Average Velocity: 8.2 km/h 205.9 deg	Percentiles: P ₁ = 1 P ₁₀ = 5 Q ₁ = 8 Median = 12 Q ₃ = 17 P ₉₀ = 24 P ₉₉ = 33	Percent Operational Time: 100.0

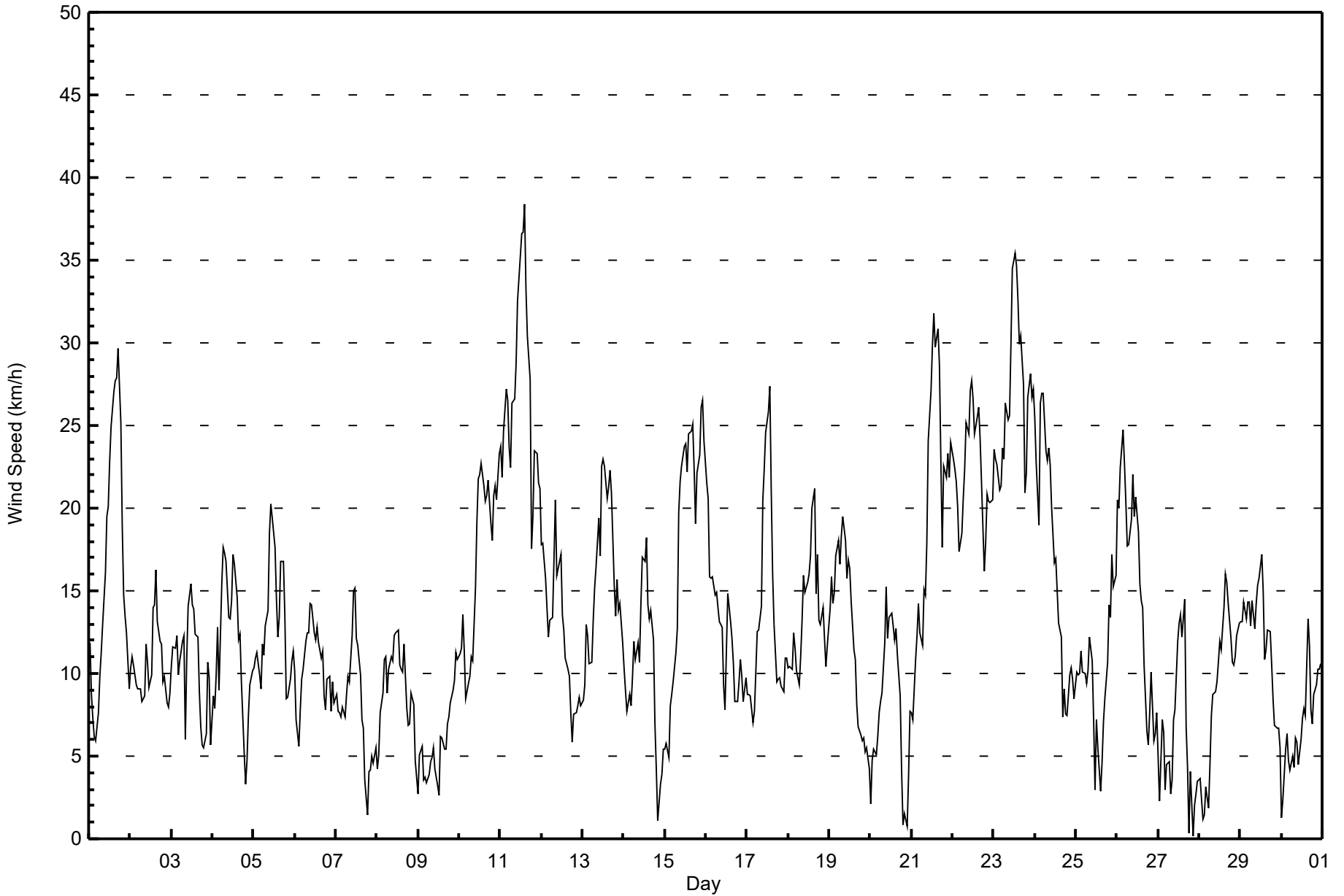
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Sep	NNW12	NNW9	NW7	W6	WSW6	SW8	SW10	WSW11	WSW13	WSW16	WSW19	WSW20	WSW23	WSW25	WSW27	WSW28	SW28	WSW30	WSW25	WSW19	WSW15	WSW13	WSW12	SW9	WSW15.0	WSW30
2-Sep	WSW10	SW11	SW11	W9	W9	WNW9	WNW9	WNW8	WNW9	WNW12	NW11	W9	WSW10	WSW14	W14	WNW16	WNW13	W12	W12	WSW9	WSW10	WSW8	WSW8	SW9	W9.7	WNW16
3-Sep	SW10	SW12	SSW12	SW12	SW10	SSW11	SSW12	SW12	SW6	SW11	SW14	SSW15	SW14	WSW14	SW12	WSW12	W9	WSW7	WSW6	WSW5	WNW6	NW11	NW10	WNW6	SW8.9	SSW15
4-Sep	WNW9	W8	W10	W13	W9	NW15	NNW18	NNW17	NNW17	NNW13	NNW13	NNW14	NW17	NW17	NW15	NW12	NW12	NNW9	NW5	SW3	S5	S7	SSW9	SSW10	NW8.9	NNW18
5-Sep	SW10	SW11	SW11	SSW10	SSW9	SSW12	SSW11	SW13	SW14	WSW18	SW20	SW19	SSW18	SSW14	S12	SSW13	S17	S17	SSE13	SSE8	SE9	SE10	SE11	SSE11	SSW11.4	SW20
6-Sep	SSE10	SSE7	SE6	SE8	SE10	ESE10	ESE12	SE12	SE12	SE14	SE14	SSE12	SSW12	SW13	WSW12	WSW11	WSW11	WSW9	SW8	SW10	WSW10	SW8	SW9	SW8	S6.8	SE14
7-Sep	SW9	SW8	WSW8	SW7	SW8	SW7	SW9	SW10	SW9	WSW12	WSW15	WSW15	W12	W12	WNW10	W7	W7	W4	NW1	ENE4	ESE4	SSE5	SE5	S6	WSW6.5	WSW15
8-Sep	S4	S5	S8	S9	SSW11	SSW11	SSW9	SSW10	SSW11	SW11	WSW12	WSW12	WSW13	W11	WNW10	WNW10	NNW12	N8	NNE7	ENE7	ESE9	ESE8	SE5	SE4	SW4.1	WSW13
9-Sep	SE3	SE5	SSE6	SE4	SE4	SE3	SE4	SE5	SSE5	SSE6	S4	S3	W3	NNE6	E6	SE5	ESE5	SE7	SE7	SE8	SE9	SSE10	S11	S11	SE4.9	S11
10-Sep	S11	S12	S14	S11	SSE9	SSE9	SSE10	SSE11	SE11	SE15	SSE19	SSE22	SSE22	S23	S21	S20	S21	SSE22	SSE19	SE18	SSE21	SSE21	SSE21	SSE23	SSE16.6	SSE23
11-Sep	SSE24	SSE22	SSE25	S27	S26	S24	S22	S26	S27	S29	S33	S34	S37	S37	S38	S33	S30	S28	S18	S20	S23	S23	S22	S21	S26.8	S38
12-Sep	S18	SSW18	SSW16	SSW14	S12	S13	SSE13	S17	SSW20	SSW16	S16	S17	SSW14	SW13	WSW11	WSW10	SW10	WSW8	SW6	SW8	SW8	SW8	SSW9	SW8	SSW11.5	SSW20
13-Sep	SW8	SW9	SW13	SW12	SSW11	SW11	SW13	SW15	SW16	WSW19	WSW17	WSW23	WSW23	WSW23	WSW21	WSW21	WSW22	WSW21	W15	W14	WSW16	WSW14	WSW14	WSW12	WSW15.5	WSW23
14-Sep	WSW10	W9	W8	WNW9	WNW8	WNW10	WNW12	WNW11	WNW12	WNW11	WNW14	NW17	NW17	NW18	WNW14	NW13	NW14	NNW12	N7	NNE4	SSE1	SSW3	SSW4	S5	WNW8.6	NW18
15-Sep	SSW5	SSW6	SSW5	SSW8	SSW9	S10	S11	S13	SSW20	SSW22	SSW23	SSW24	SSW24	SSW24	S25	S25	S22	S19	S22	S23	S26	S27	S24	S17.9	S27	
16-Sep	S22	S21	S16	SSW16	SSW16	SW15	SW13	WSW13	WSW13	W9	WNW8	W11	WSW15	WSW13	WSW12	WSW11	SW8	S8	S10	SSW11	S10	S8	SSW10	SW11.0	S22	
17-Sep	S9	S9	S9	SSE7	SE8	SE10	SE13	SW13	SSE14	SSE21	SE22	SSE25	SSE26	S27	SSW21	SW16	SW13	WSW10	SW10	SSW10	SSW9	SW9	SW11	SW11	S11.5	S27
18-Sep	SW10	SW10	SW10	SW12	SSW12	SSW10	SSW9	SW11	SW13	SW16	WSW15	WSW15	WSW16	WSW17	WSW20	WSW21	WSW15	SW17	SW13	SSW13	SSW14	SW12	SW10	SW12	SW13.1	WSW21
19-Sep	SSW14	SW16	SW14	SSW15	SW17	SW18	SW17	SW18	SW19	SW18	SW16	SW17	SW16	WSW14	WSW11	WSW11	WSW8	SSW7	SSW6	S6	SSE6	SSE5	SE6	ESE4	SW11.6	SW19
20-Sep	E2	ENE5	NE5	NE5	N6	NNE8	NNE8	NNE9	NNE12	NNE15	N12	N13	N14	N13	N12	N13	N11	N9	N4	E1	WSW1	W1	SE4	SSE8	NNE6.7	NNE15
21-Sep	SSE8	S7	S11	SSW12	SSW14	S12	S12	SSW15	SSW15	SSW18	SSW24	SW27	SSW30	SSW32	SW30	SW31	SW29	SSW23	SSW18	SSW23	SSW22	SSW23	SSW22	SSW24	SSW19.6	SSW32
22-Sep	SSW23	SSW22	SSW22	SSW20	SSW17	SSW18	SSW21	SSW22	SSW25	SSW25	SSW27	SSW28	SSW27	SSW24	SSW26	SSW26	S24	S22	SSE16	S18	S21	S20	S20	S20	SSW21.7	SSW28
23-Sep	S24	S23	S23	S21	S21	S24	S23	S26	S25	S26	S30	S35	S35	S35	S33	S30	S30	SSE27	SSE21	S22	S27	SW8	S27	SSE27	S26.7	S35
24-Sep	SSE26	SSE23	SSE19	SSE26	SSE27	SSE27	SSE23	SSE23	S24	S23	S20	S17	S17	SSW15	SW13	SW12	WSW7	WSW9	SW8	SSW7	SW10	SW10	SW9	S15.1	SSE27	
25-Sep	SSW10	SSW10	SSW10	SSW11	SSW10	SSW10	SSW9	SW10	SW12	WSW11	WNW7	WSW3	WSW7	SW5	WSW3	S5	ESE7	ENE8	ESE11	ESE14	ESE13	ESE17	ESE15	ESE16	S5.4	ESE17
26-Sep	ESE20	ESE20	SE22	SE25	SE23	SE20	SSE18	SSE18	S19	S22	S19	S21	SSW19	S15	S14	S14	SSW11	WSW6	SW6	S8	SE10	W6	W6	W8	SSE12.5	SE25
27-Sep	NW5	N2	N7	N6	W3	W4	WNW5	WSW3	WNW4	W7	WNW8	WNW12	WNW13	W14	W12	W14	WSW7	NNW4	ESE0	SSW4	NNW0	SSW2	SSE3	SSE3	WNW4.6	W14
28-Sep	S4	WNW2	SSE1	SW1	W3	W2	NW5	NNW7	N9	NNE9	N9	N11	N12	N11	NNW14	NNE16	NNE15	N14	N12	N11	N10	N11	N12	N13	N8.1	NNE16
29-Sep	N13	N13	N14	N13	N14	N14	N13	NNW14	NNW13	NNW14	N15	N16	NNW17	NNW15	NNW11	NNW11	NNW13	NNW13	NNW11	N9	N7	N7	N7	N6	N12.1	NNW17
30-Sep	N1	WNW2	WSW5	WSW6	WSW5	WSW4	W5	WSW4	SW6	SW6	WSW4	SSW6	SW7	SW8	SSW7	SSW13	SSW12	SSW8	S7	SSE9	S9	S10	S10	S11	SSW5.9	SSW13
S7.4 SSW7.4 SSW7.7 SSW8.3 SSW7.9 SSW7.5 SSW7.3 SSW8.3 SSW8.8 SW9.5 SW9.8 SW10.6 SW11.2 SW11.4 SW10.7 SW10.7 SW8.6 SW7.0 SSW5.4 S6.6 S7.7 S7.9 S7.8 S8.3																								Diurnal Average		
SSE26 S23 SSE25 S27 SSE27 SSE27 SSE23 S26 S27 S29 S33 S35 S37 S37 S38 S33 S30 WSW30 WSW25 SSW23 S27 S28 S27 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 - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Firebag - September 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	78	10.83	10.83
6 - 11	261	36.25	47.08
12 - 19	230	31.94	79.03
20 - 28	130	18.06	97.08
29 - 38	21	2.92	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Firebag - September 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	2	2	2	4	12	7	8	6	3	10	8	4	4	2	78
6 - 11	18	7	0	2	1	5	14	17	25	37	56	32	19	18	4	6	261
12 - 19	20	4	0	0	0	6	8	10	24	34	41	35	11	9	11	17	230
20 - 28	0	0	0	0	0	2	5	24	50	31	3	15	0	0	0	0	130
29 - 38	0	0	0	0	0	0	0	0	15	2	3	1	0	0	0	0	21
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	41	12	2	4	3	17	39	58	122	110	106	93	38	31	19	25	720

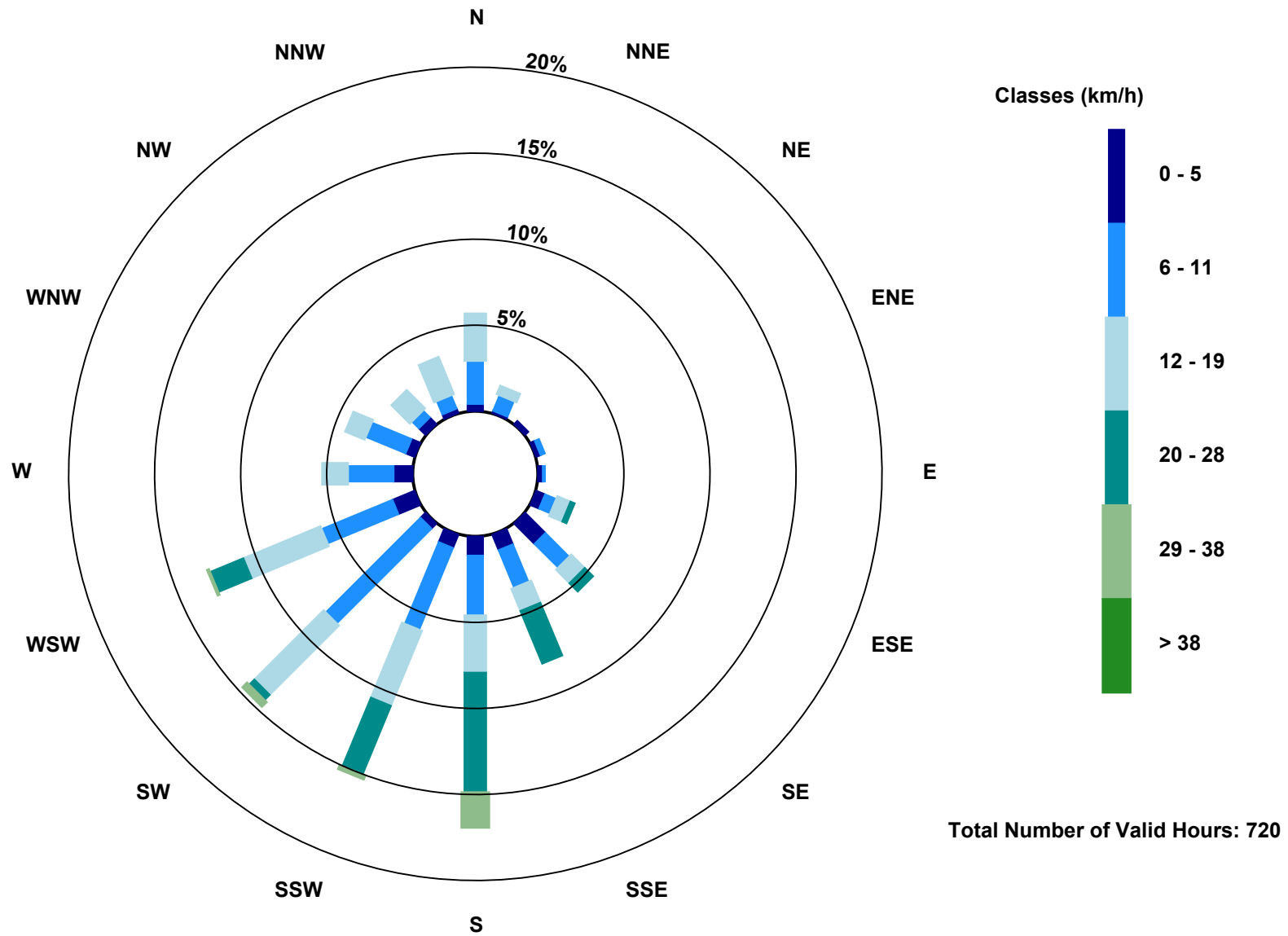
Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

Wind Speed (WS) - km/h
Firebag





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Firebag - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Sep 1 18:00 Minimum Value: 0 km/h on Sep 20 03:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 3 Q ₃ = 3 P ₉₀ = 4 P ₉₉ = 6																	Hours in Service: 720 Hours of Data: 720 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-Sep	2	1	1	1	1	2	1	2	3	3	4	5	5	5	6	6	7	7	6	4	3	2	2	1	7
2-Sep	2	2	2	2	2	2	2	2	3	3	3	2	3	4	4	4	4	6	4	1	1	1	1	1	6
3-Sep	2	2	2	2	2	2	2	3	3	5	3	3	3	3	3	3	2	1	1	1	1	2	2	2	5
4-Sep	3	2	2	3	2	5	4	4	4	3	3	4	5	4	4	3	3	3	1	1	1	1	1	1	5
5-Sep	1	2	2	2	1	2	2	2	3	4	4	4	4	4	4	3	3	3	3	1	1	2	2	2	4
6-Sep	2	3	3	2	2	2	2	3	2	3	3	2	2	2	3	3	3	2	2	1	2	1	2	1	3
7-Sep	1	1	1	1	1	1	2	2	2	3	3	4	3	4	3	2	3	1	1	0	1	1	1	1	4
8-Sep	1	1	1	1	1	1	2	2	2	2	3	3	4	3	4	3	3	2	2	2	2	1	2	1	4
9-Sep	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	1	1	1	1	1	2	1	2	1	2
10-Sep	1	1	2	3	1	1	1	2	2	3	3	4	5	4	4	4	4	4	4	3	4	3	3	3	5
11-Sep	3	4	4	4	4	3	3	4	5	4	5	6	6	6	6	6	5	5	3	3	3	3	3	3	6
12-Sep	3	2	3	2	2	2	2	4	3	3	3	3	3	3	3	3	2	1	1	1	1	1	1	1	4
13-Sep	2	1	2	1	1	2	3	2	4	4	4	5	5	6	5	7	6	5	4	3	3	3	2	3	7
14-Sep	2	2	1	2	2	3	3	3	3	3	4	4	4	4	4	4	4	4	1	1	1	1	1	1	4
15-Sep	1	1	1	1	1	1	1	2	3	4	4	4	4	4	4	4	4	4	2	3	3	4	4	4	4
16-Sep	3	3	3	2	2	2	2	2	2	3	3	3	4	4	4	3	3	2	2	2	2	1	1	1	4
17-Sep	1	1	1	1	2	3	2	2	3	6	4	5	5	5	5	3	3	1	1	2	1	1	1	2	6
18-Sep	1	1	1	2	2	2	2	2	3	4	3	3	4	4	5	6	4	4	3	2	2	2	2	2	6
19-Sep	2	3	2	2	2	2	3	3	3	3	3	4	4	3	3	3	2	1	0	1	0	1	1	2	4
20-Sep	1	1	0	0	1	1	1	2	3	3	3	3	3	4	3	3	3	2	2	1	2	1	1	1	4
21-Sep	1	1	1	1	2	2	1	2	3	3	5	5	6	6	6	6	6	5	3	4	4	4	4	4	6
22-Sep	4	4	3	3	3	3	3	3	4	4	5	5	5	5	5	4	4	4	2	3	3	3	3	3	5
23-Sep	4	3	4	3	3	4	3	4	4	4	5	6	5	6	6	5	5	6	3	4	4	4	5	4	6
24-Sep	4	4	4	4	5	4	4	4	4	4	3	2	2	3	3	3	2	2	1	1	1	1	1	1	5
25-Sep	2	1	2	1	1	1	2	3	3	2	3	3	3	3	2	2	3	1	2	3	2	3	3	3	3
26-Sep	4	4	5	5	4	4	3	3	3	4	4	4	4	3	3	3	2	2	1	3	2	3	1	1	5
27-Sep	1	1	1	1	1	2	2	1	2	2	2	3	4	4	3	3	3	3	3	1	2	2	1	1	4
28-Sep	1	2	1	2	3	1	2	2	2	2	2	2	3	3	3	3	3	3	3	2	2	2	3	3	3
29-Sep	3	3	3	3	3	3	3	3	3	3	3	4	4	3	3	3	3	3	2	2	1	1	1	1	4
30-Sep	1	0	1	1	1	1	1	1	2	2	1	1	2	1	1	3	2	2	1	2	1	1	1	2	3
Diurnal Maximum																									



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Firebag - September 2023

Direction of Maximum Speed: 181 deg on Sep 11 15:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 177.3 deg on Sep 11	Hours of Data: 720
Direction of Minimum Speed: 329 deg on Sep 27 21:00	Hours of Missing Data: 0
Direction of Minimum Daily Speed Average: 4.1 deg on Sep 8	Percent Operational Time: 100.0
Monthly Average Direction: 205.9 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-Sep	348	339	304	264	258	235	229	238	244	249	248	250	244	238	237	239	235	239	245	245	241	238	246	233	245.9
2-Sep	237	229	232	259	278	301	295	295	289	299	305	267	254	255	264	286	287	280	274	246	245	248	250	229	267.5
3-Sep	218	214	212	216	216	213	211	214	219	219	217	207	222	238	225	254	265	242	257	251	294	313	319	291	232.3
4-Sep	289	281	259	268	268	324	331	330	328	331	332	333	323	320	322	311	321	331	307	215	181	188	200	213	307.5
5-Sep	216	218	216	213	208	212	207	214	226	237	232	218	206	194	179	195	176	173	156	149	143	146	138	151	197.0
6-Sep	147	149	141	137	132	118	113	127	133	136	144	158	193	225	240	245	255	238	214	230	242	230	222	227	180.7
7-Sep	235	231	238	233	225	223	230	224	233	245	246	248	264	267	290	272	273	272	320	65	110	162	143	175	241.1
8-Sep	172	169	186	190	198	201	204	209	212	228	245	245	252	264	298	296	329	358	18	69	102	120	133	125	224.5
9-Sep	136	144	150	142	130	142	140	126	162	165	170	169	268	13	99	137	112	138	134	136	139	164	172	178	146.1
10-Sep	174	173	177	172	163	163	159	155	138	146	158	165	166	179	174	181	174	167	149	142	153	158	159	161	163.2
11-Sep	160	159	167	169	173	174	171	173	172	177	179	182	185	182	181	191	187	184	182	179	172	173	179	186	177.3
12-Sep	189	201	209	203	184	170	162	181	204	212	184	189	207	229	254	256	236	253	228	234	222	218	210	228	205.8
13-Sep	223	216	217	219	209	214	217	223	236	244	240	237	244	247	246	250	250	254	264	261	250	252	243	248	240.3
14-Sep	252	264	268	282	288	291	300	294	295	299	302	314	309	310	303	305	314	327	8	27	148	199	207	185	298.5
15-Sep	201	203	192	196	193	188	190	190	199	204	208	201	194	195	197	191	179	175	169	169	180	187	186	178	189.1
16-Sep	180	182	187	197	205	218	221	227	241	254	264	284	264	254	247	241	244	217	191	191	207	190	188	195	217.3
17-Sep	176	174	172	161	144	145	144	144	148	152	145	151	153	186	199	227	227	237	223	213	206	220	230	233	178.7
18-Sep	232	234	230	214	211	205	207	215	221	232	239	245	247	253	247	250	250	233	226	213	207	220	227	214	230.5
19-Sep	213	215	217	212	217	220	218	218	223	223	221	223	226	244	243	238	241	212	196	187	158	147	142	122	217.3
20-Sep	99	61	46	37	11	17	16	18	14	13	8	355	357	1	3	360	4	0	9	91	238	266	139	149	12.8
21-Sep	149	175	189	194	197	187	183	192	201	208	213	214	212	211	217	216	215	212	206	199	202	203	204	213	205.6
22-Sep	209	204	201	200	200	198	194	195	200	207	213	211	211	203	204	194	190	186	168	173	180	177	169	172	195.5
23-Sep	176	173	171	173	172	174	171	172	174	174	173	172	174	170	174	170	170	167	166	172	170	173	169	163	171.4
24-Sep	158	151	151	164	161	165	167	162	172	180	180	180	185	206	227	223	243	241	230	209	215	216	222	215	180.6
25-Sep	211	212	209	211	208	206	202	215	222	246	283	257	237	233	243	173	112	76	103	112	117	111	113	113	173.4
26-Sep	114	122	128	137	136	143	158	165	179	183	178	181	208	191	182	187	200	251	214	171	145	261	271	264	166.8
27-Sep	306	353	351	0	271	280	298	240	290	277	284	290	289	273	265	268	253	338	121	201	329	196	153	166	281.4
28-Sep	181	299	155	231	271	269	315	334	7	20	351	360	3	357	346	12	12	5	8	10	3	1	358	359	358.8
29-Sep	357	358	353	357	356	356	352	345	346	341	351	351	348	346	344	335	336	337	341	355	3	0	357	354	349.3
30-Sep	3	293	246	248	246	249	259	255	236	225	240	211	214	215	210	194	196	192	175	167	172	173	172	175	204.7

191.0 191.9 195.2 196.2 194.3 195.5 197.1 199.8 207.7 214.3 214.9 214.3 220.4 225.4 225.7 228.2 224.0 218.7 201.8 187.4 185.7 190.0 190.2 189.7

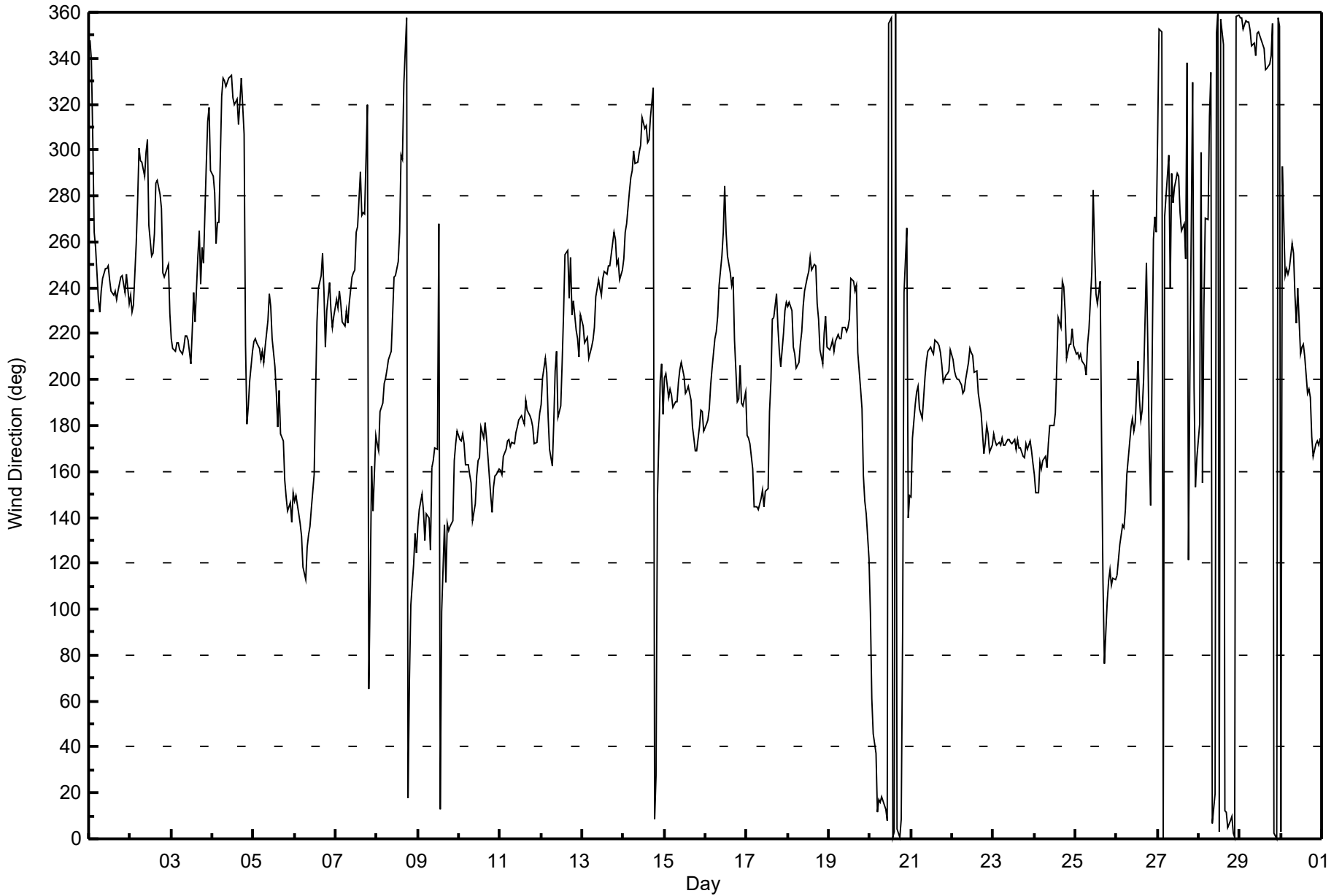
Diurnal Average

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Firebag - September 2023





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Firebag - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 88 deg on Sep 27 19:00	Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0
Minimum Value: 4 deg on Sep 8 05:00	
Percentiles: P ₁ = 6 P ₁₀ = 8 Q ₁ = 9 Median = 12 Q ₃ = 16 P ₉₀ = 23 P ₉₉ = 71	

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-Sep	15	15	11	17	16	9	9	11	13	16	14	16	14	15	15	15	13	13	13	11	11	11	10	10	17
2-Sep	14	11	11	21	18	14	16	18	20	21	17	27	18	21	19	21	20	18	18	10	7	9	10	9	27
3-Sep	10	10	9	9	9	9	9	11	31	20	11	13	22	13	16	22	21	11	9	25	14	10	13	16	31
4-Sep	17	19	17	19	16	25	14	12	13	13	14	13	15	16	23	32	22	17	10	41	14	8	7	9	41
5-Sep	9	8	9	10	9	9	9	10	12	14	14	17	18	25	34	19	16	13	10	12	12	12	13	12	34
6-Sep	15	25	31	14	14	12	12	14	13	14	14	16	13	13	16	16	19	21	10	16	10	9	8	9	31
7-Sep	10	9	12	13	11	11	11	12	13	14	17	16	27	28	23	25	30	29	64	9	13	9	19	7	64
8-Sep	11	8	7	9	4	7	11	9	11	18	18	25	22	29	28	21	25	15	19	18	11	9	42	16	42
9-Sep	30	11	8	14	14	9	12	22	18	24	47	68	73	35	22	22	25	12	10	10	11	10	7	7	73
10-Sep	7	7	7	10	9	8	9	11	12	15	15	14	13	18	15	15	14	11	14	12	11	10	10	9	18
11-Sep	9	11	11	9	9	8	8	9	9	10	11	11	11	10	12	11	9	8	8	8	8	10	8	12	12
12-Sep	8	8	10	11	15	8	9	13	10	13	15	15	20	18	22	19	22	11	11	7	9	10	11	12	22
13-Sep	15	8	8	7	9	9	9	11	13	13	13	14	14	17	20	15	16	14	22	17	12	13	10	12	22
14-Sep	12	18	16	18	20	20	18	19	19	18	17	15	16	17	21	22	19	14	10	6	71	11	13	10	71
15-Sep	14	11	9	9	11	8	7	8	8	11	12	13	11	14	12	11	11	10	8	9	8	8	8	9	14
16-Sep	8	9	7	7	9	11	10	10	12	17	19	32	28	21	23	16	17	10	8	13	9	8	6	7	32
17-Sep	5	6	8	10	10	8	10	12	13	15	14	13	13	17	15	16	14	11	8	10	8	8	6	7	17
18-Sep	9	8	9	9	9	9	10	10	11	14	15	16	16	15	13	14	13	11	11	10	10	11	20	11	20
19-Sep	9	9	8	10	8	8	9	9	11	14	16	16	15	20	29	27	23	10	5	12	6	14	9	21	29
20-Sep	60	14	7	12	10	7	5	11	13	14	18	18	19	22	20	19	16	13	14	47	65	71	10	9	71
21-Sep	11	11	9	6	7	10	9	7	9	12	11	13	13	12	13	12	11	11	10	8	9	9	10	10	13
22-Sep	10	10	8	8	8	8	8	9	10	11	12	12	13	13	12	11	12	9	7	8	8	8	8	8	13
23-Sep	8	9	9	8	8	8	8	9	9	10	11	11	10	11	12	11	10	9	9	9	9	11	9	12	12
24-Sep	10	11	14	10	10	10	9	11	10	10	10	11	13	19	15	18	11	11	9	9	9	8	9	10	19
25-Sep	9	10	8	9	9	9	8	12	11	16	56	83	44	52	72	49	36	18	10	11	12	10	11	11	83
26-Sep	12	12	13	13	12	13	13	11	9	11	20	14	17	17	13	12	22	16	25	31	18	49	32	15	49
27-Sep	28	13	18	21	41	14	20	33	56	22	29	22	23	24	22	20	15	71	88	27	82	71	41	13	88
28-Sep	31	69	84	85	69	56	22	15	17	16	17	17	17	17	15	15	13	15	14	12	15	16	15	14	85
29-Sep	15	16	15	16	16	14	16	12	13	13	15	16	15	15	16	12	13	12	13	14	11	11	12	9	16
30-Sep	60	33	9	9	11	9	16	15	13	14	22	14	12	13	13	10	9	8	6	8	7	6	5	6	60

60	69	84	85	69	56	22	33	56	24	56	83	73	52	72	49	36	71	88	47	82	71	42	21	
Diurnal Maximum																								



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS20 MACKAY RIVER SEPTEMBER 2023

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

October 30, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MACKAY RIVER (AMS20)
 SEPTEMBER 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	686	34	34	100	11	0	1.2	0
H2S (ppb) Average	685	35	35	100	2.1	0	0.6	0
THC (ppm) Average	687	33	33	100	3.1	-	2.6	-
NO2 (ppb) Average	685	35	35	100	13.5	0	4.4	-
NO (ppb) Average	685	35	35	100	10.3	-	1.6	-
NOX (ppb) Average	685	35	35	100	23.8	-	6	-
Temperature 2 m (C) Average	720	0	0	100	25.4	-	18.6	-
Relative Humidity (%) Average	720	0	0	100	99.7	-	91.1	-
Wind Speed 10 m (km/h) Average	719	1	1	100	18	-	11	-
Wind Direction 10 m (deg) Average	719	1	1	100	-	-	-	-
Precipitation (mm) Total	720	0	0	100	1.3	-	2.8	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MACKAY RIVER (AMS20)
 SEPTEMBER 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	686	0.23	0.6	-	0	0	0	0.1	0.2	0.5	11
H2S (ppb) Average	685	0.19	0.2	-	0	0.1	0.1	0.1	0.2	0.4	2.1
THC (ppm) Average	687	2.36	0.2	-	2.1	2.2	2.2	2.3	2.5	2.6	3.1
NO2 (ppb) Average	685	1	1.3	-	0	0.3	0.4	0.6	1	1.9	13.5
NO (ppb) Average	685	0.11	0.6	-	0	0	0	0	0.1	0.1	10.3
NOX (ppb) Average	685	1.11	1.7	-	0	0.3	0.4	0.7	1.1	2	23.8
Temperature 2 m (C) Average	720	12.08	5.9	-	-0.6	4.3	7.4	12.1	16.6	20.2	25.4
Relative Humidity (%) Average	720	67.85	19.6	-	27.3	40.2	50.6	69.7	85.6	92.5	99.7
Wind Speed 10 m (km/h) Average	719	6.5	4	-	0	2	4	6	8	11	18
Wind Direction 10 m (deg) Average	719	-	-	-	-	-	-	-	-	-	-
Precipitation (mm) Total	720	-	-	4.38	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION -MACKAY RIVER (AMS20)
SEPTEMBER 2023

OPERATIONAL NOTES

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



Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 11.0 ppb on Sep 20 11:00	Maximum Daily Average: 1.2 ppb on Sep 4
Minimum Value: 0.0 ppb on Sep 1 01:00	Hours of Data: 686
Maximum Diurnal Average: 0.9 ppb at hour 11	Hours of Missing Data: 34
Monthly Average: 0.23 ppb	Hours of Calibration: 34
Minimum Daily Average: 0.0 ppb on Sep 28	Percent Operational Time: 100.0
Minimum Diurnal Average: 0.1 ppb at hour 6	
Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.2 P ₉₀ = 0.5 P ₉₉ = 3.3	

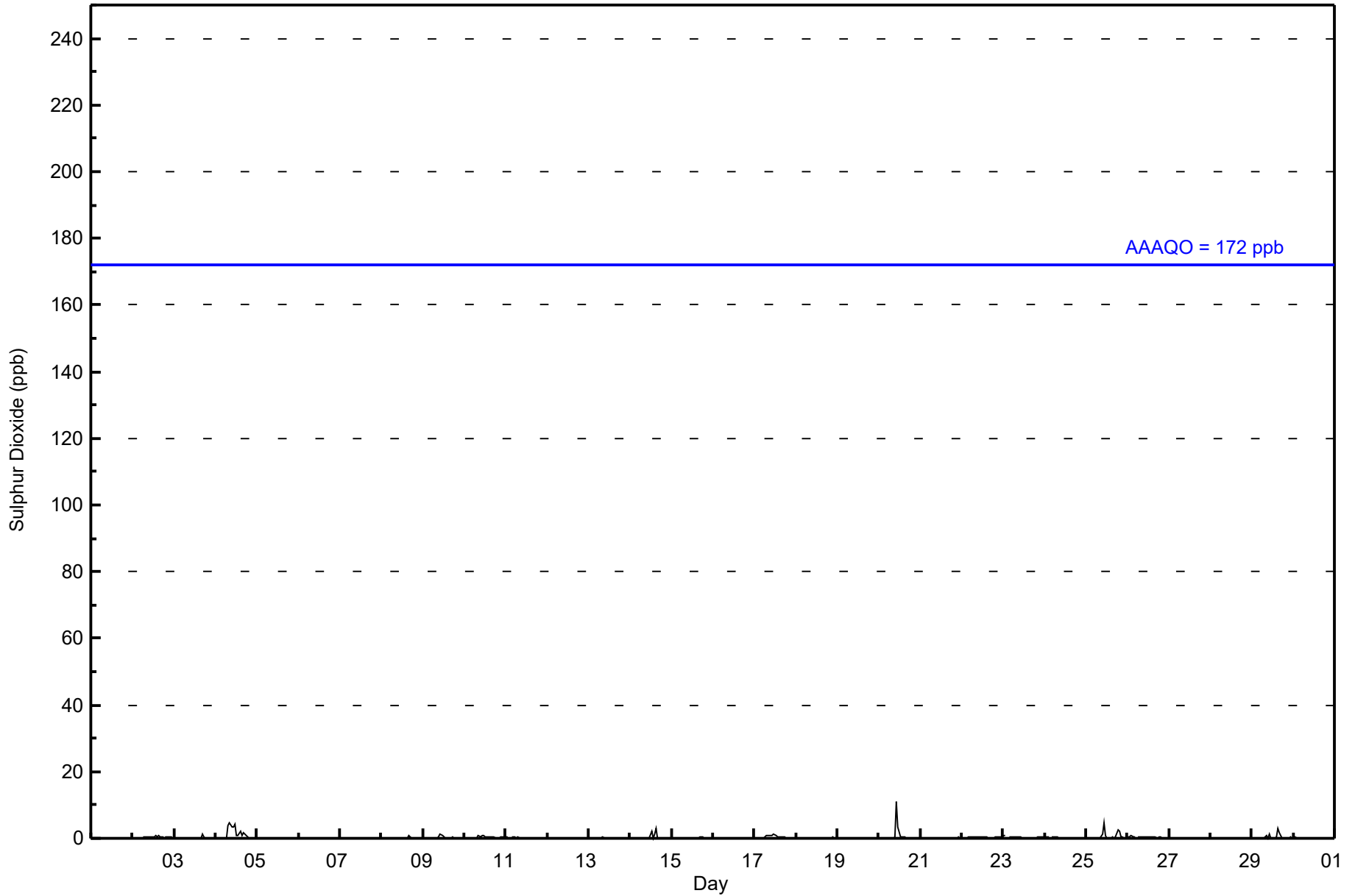
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum										
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24												
1-Sep	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2-Sep	0.0	0.0	0.0	0.1	0.2	Z	0.4	0.4	0.4	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.5	0.3	0.2	0.2	0.3	0.4	0.2	0.2	0.3	0.4	0.2	0.2	0.3	0.4	0.2	0.2	0.3	0.3	0.7	
3-Sep	Z	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	1.4	0.4	0.1	0.1	0.1	0.1	0.0	0.2	0.0	0.2	1.4	0.2	1.4	0.2	1.4	0.2	1.4	0.2	1.4		
4-Sep	0.0	Z	0.0	0.0	0.0	0.0	0.0	3.7	4.6	3.3	3.6	4.1	1.0	0.9	2.2	0.8	1.5	1.4	0.4	0.1	0.1	0.1	0.1	0.1	0.1	1.2	4.6	0.1	1.2	4.6	0.1	1.2	4.6	0.1	1.2	
5-Sep	0.1	0.1	Z	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	
6-Sep	0.1	0.1	0.1	Z	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	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	
7-Sep	0.2	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	
8-Sep	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.7	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	0.1	0.1	0.7	
9-Sep	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	1.1	1.0	0.4	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	1.1	0.2	1.1	0.2	1.1	0.2	1.1	0.2	1.1	
10-Sep	0.0	Z	0.1	0.1	0.2	0.0	0.0	0.1	0.7	0.6	0.7	0.8	0.5	0.6	0.6	0.5	0.3	0.2	0.1	0.1	0.1	0.1	0.2	0.4	0.3	0.3	0.8	0.3	0.8	0.3	0.8	0.3	0.8	0.3	0.8	
11-Sep	0.3	0.4	Z	0.4	0.3	0.3	0.2	0.3	0.2	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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4	
12-Sep	0.0	0.1	0.0	Z	0.0	0.0	0.0	C	C	C	C	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	0.1	0.1	
13-Sep	0.2	0.2	0.2	0.2	Z	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	0.1	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-Sep	0.1	0.1	0.0	0.1	0.1	Z	0.1	0.1	0.2	0.1	0.1	0.2	2.2	0.2	1.4	3.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	3.1	0.4	3.1	0.4	3.1	0.4	3.1	0.4	3.1		
15-Sep	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.5	0.4	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	0.5		
16-Sep	0.1	Z	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
17-Sep	0.0	0.0	Z	0.1	0.0	0.0	0.3	0.9	0.9	0.7	0.9	1.3	0.8	0.5	0.4	0.4	0.4	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.4	1.3	0.4	1.3	0.4	1.3	0.4	1.3	0.4	1.3		
18-Sep	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	0.1	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6		
19-Sep	0.0	0.0	0.0	0.1	Z	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1		
20-Sep	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.5	11.0	3.5	0.6	0.4	0.5	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.7	11.0	0.7	11.0	0.7	11.0	0.7	11.0	0.7	11.0		
21-Sep	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.2	0.2	0.0	0.2	0.0	0.2	0.0	0.2	0.0	0.2	0.0		
22-Sep	0.1	Z	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.5	0.3	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.6	0.6	0.3	0.6	0.3	0.6	0.3	0.6	0.3	0.6	0.3	0.6	
23-Sep	0.7	0.7	Z	0.5	0.5	0.4	0.3	0.5	0.5	0.4	0.3	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.5	0.5	0.4	0.3	0.3	0.7	0.3	0.7	0.3	0.7	0.3	0.7	0.3	0.7		
24-Sep	0.3	0.4	0.5	Z	0.3	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	0.1	0.5	0.1	0.5	0.1	0.5	0.1		
25-Sep	0.0	0.0	0.1	0.0	Z	0.1	0.1	0.0	0.1	1.3	4.7	0.7	0.1	0.1	0.1	0.3	0.2	0.5	2.3	2.0	0.4	0.4	0.1	0.2	0.6	4.7	0.6	4.7	0.6	4.7	0.6	4.7	0.6	4.7		
26-Sep	0.3	0.5	0.7	0.5	0.5	Z	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.4	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.0	0.1	0.3	0.7	0.3	0.7	0.3	0.7	0.3	0.7	0.3	0.7		
27-Sep	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	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		
28-Sep	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	0.0	0.0	0.0	0.0	0.1		
29-Sep	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.0	0.7	0.1	1.1	0.1	0.1	0.1	0.0	0.6	3.0	1.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4	3.0	0.4	3.0	0.4	3.0	0.4	3.0	0.4		
30-Sep	0.1	0.2	0.2	Z	0.2	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.2	0.1	0.2	0.1	0.2	0.1		
	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.3	0.9	0.5	0.3	0.2	0.3	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	Diurnal Average	
	0.7	0.7	0.7	0.5	0.5	0.4	0.4	3.7	4.6	3.3	11.0	4.1	2.2	0.9	2.2	3.1	1.5	1.4	2.3	2.0	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	Diurnal Maximum	

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



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Mackay River - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Mackay River - September 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	685	99.85	99.85
11 - 20	1	0.15	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: 686

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Mackay River - September 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	10	10	6	3	10	34	77	76	141	72	64	66	61	29	20	6	685
11 - 20	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	11	10	6	3	10	34	77	76	141	72	64	66	61	29	20	6	686

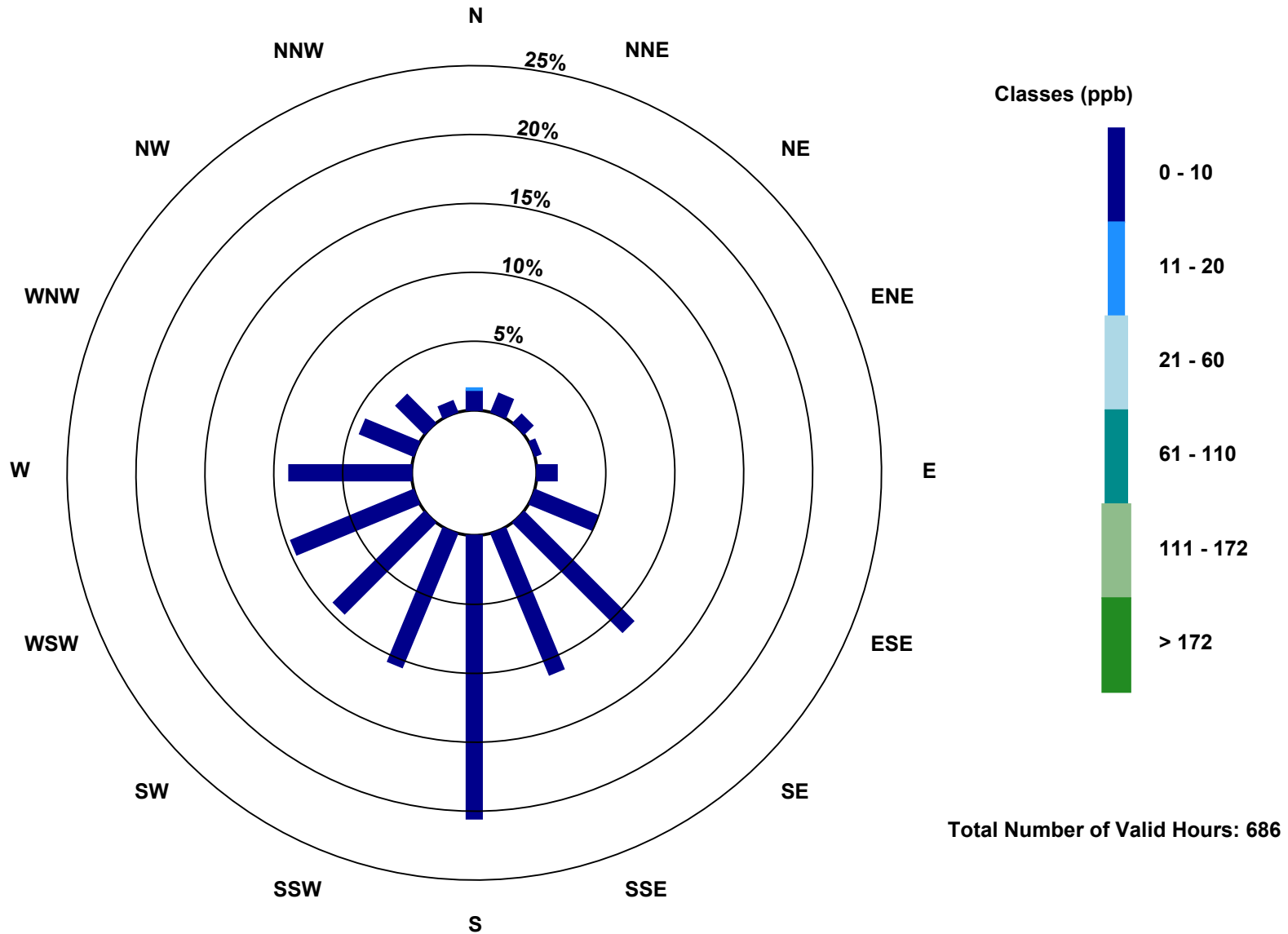
Total Number of Valid Hours: 686

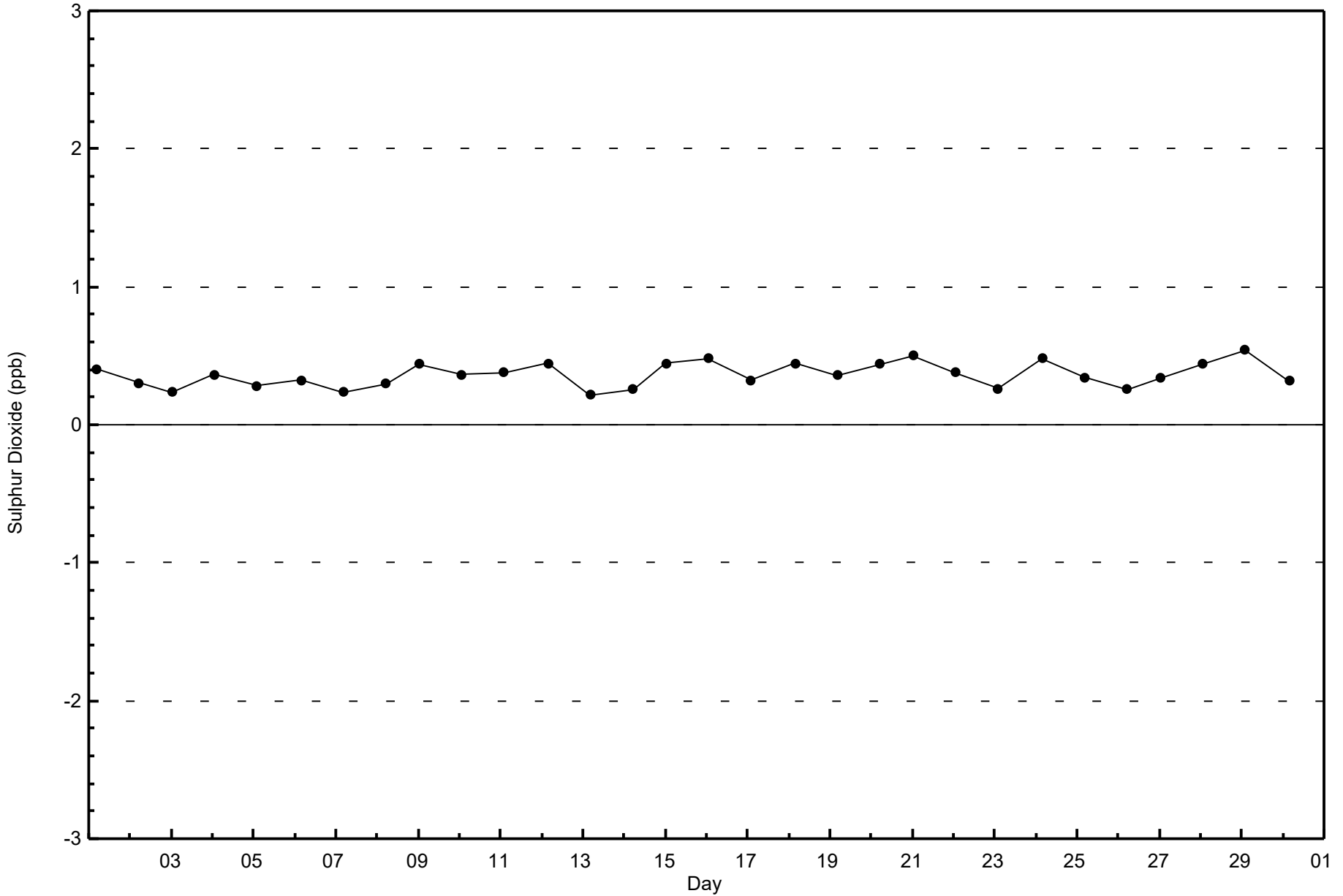
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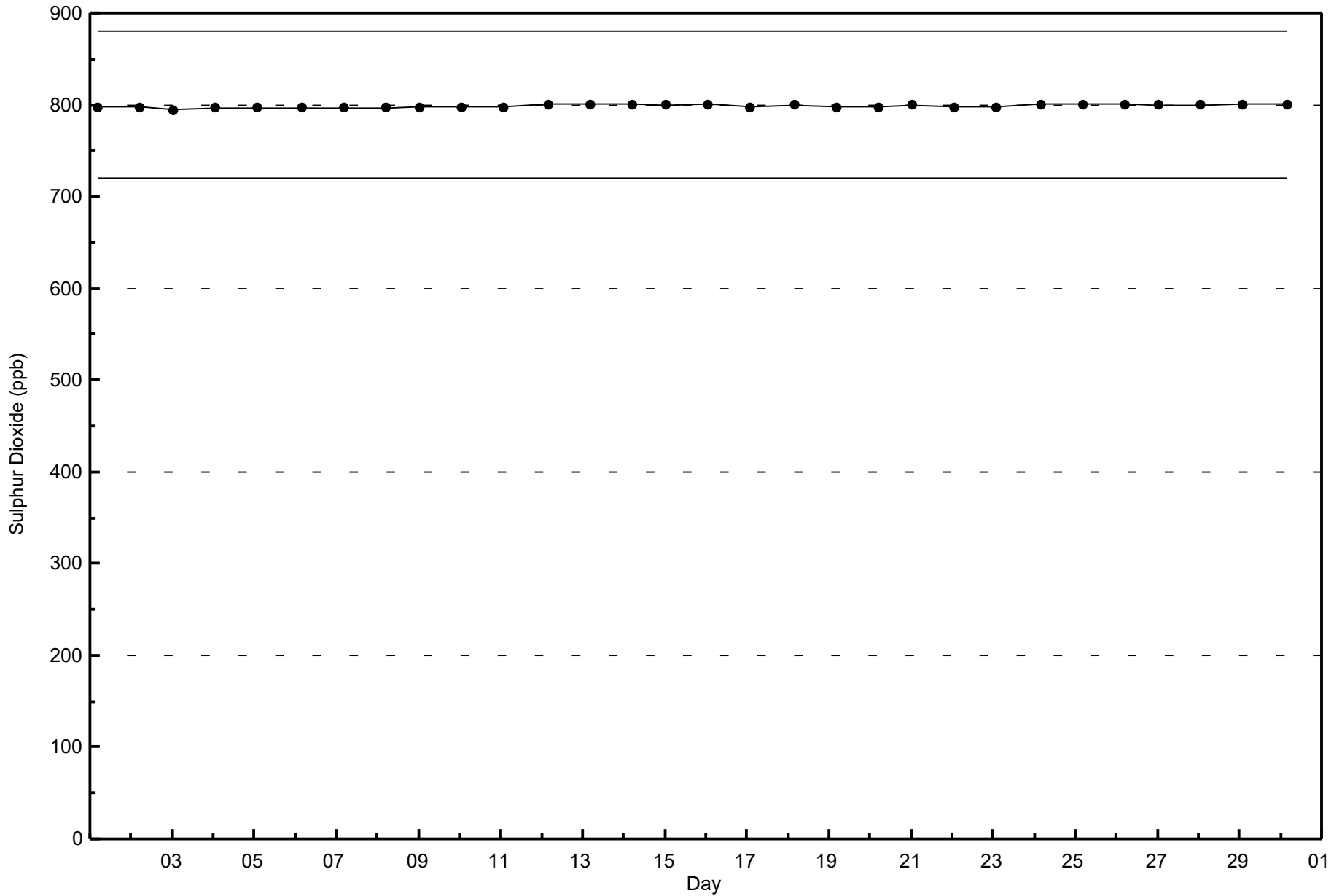


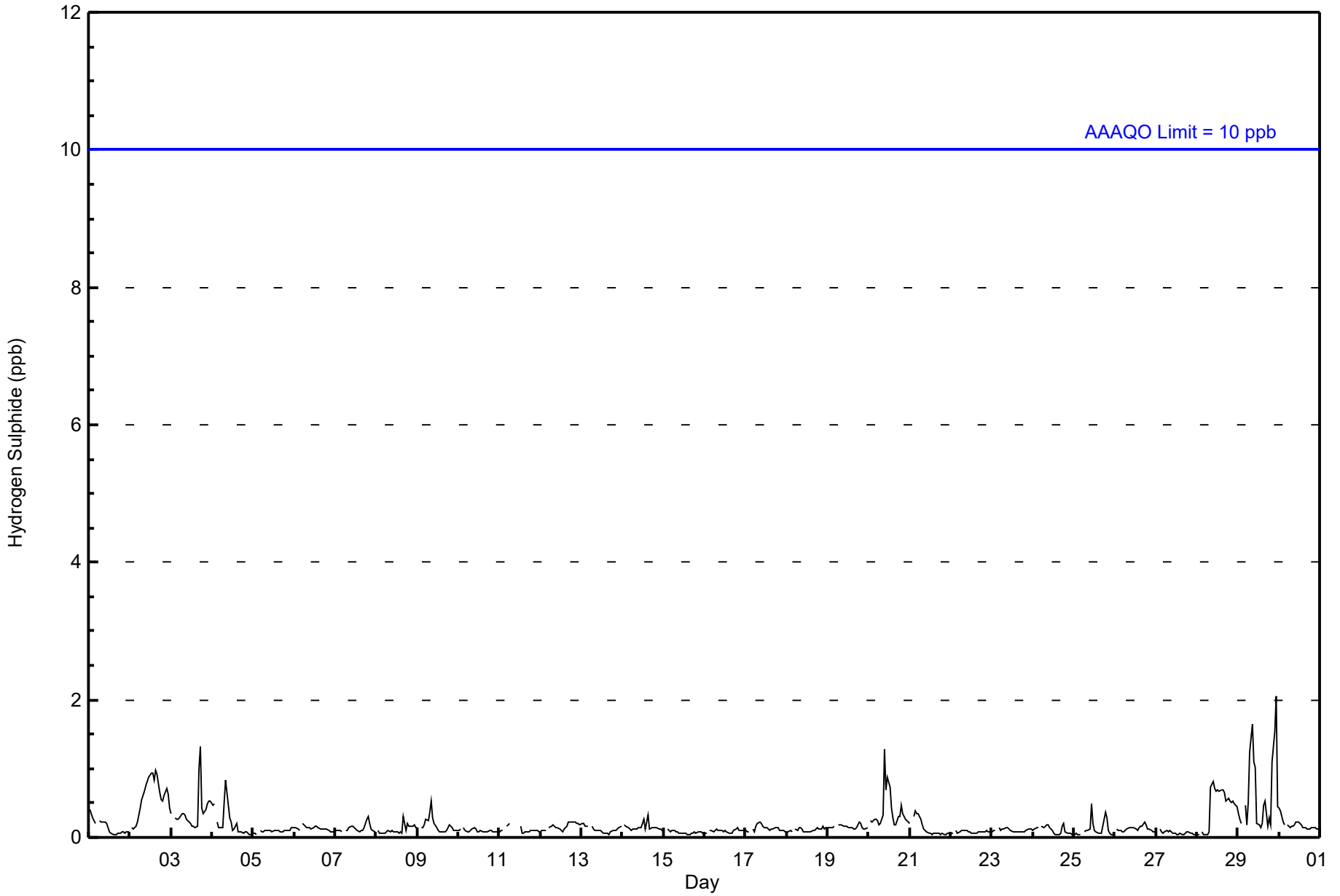
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Sulphur Dioxide (SO₂) - ppb
Mackay River











**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Mackay River - September 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	685	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: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Mackay River - September 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	10	6	3	9	34	76	79	135	71	66	69	59	31	19	6	684
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	11	10	6	3	9	34	76	79	135	71	66	69	59	31	19	6	684

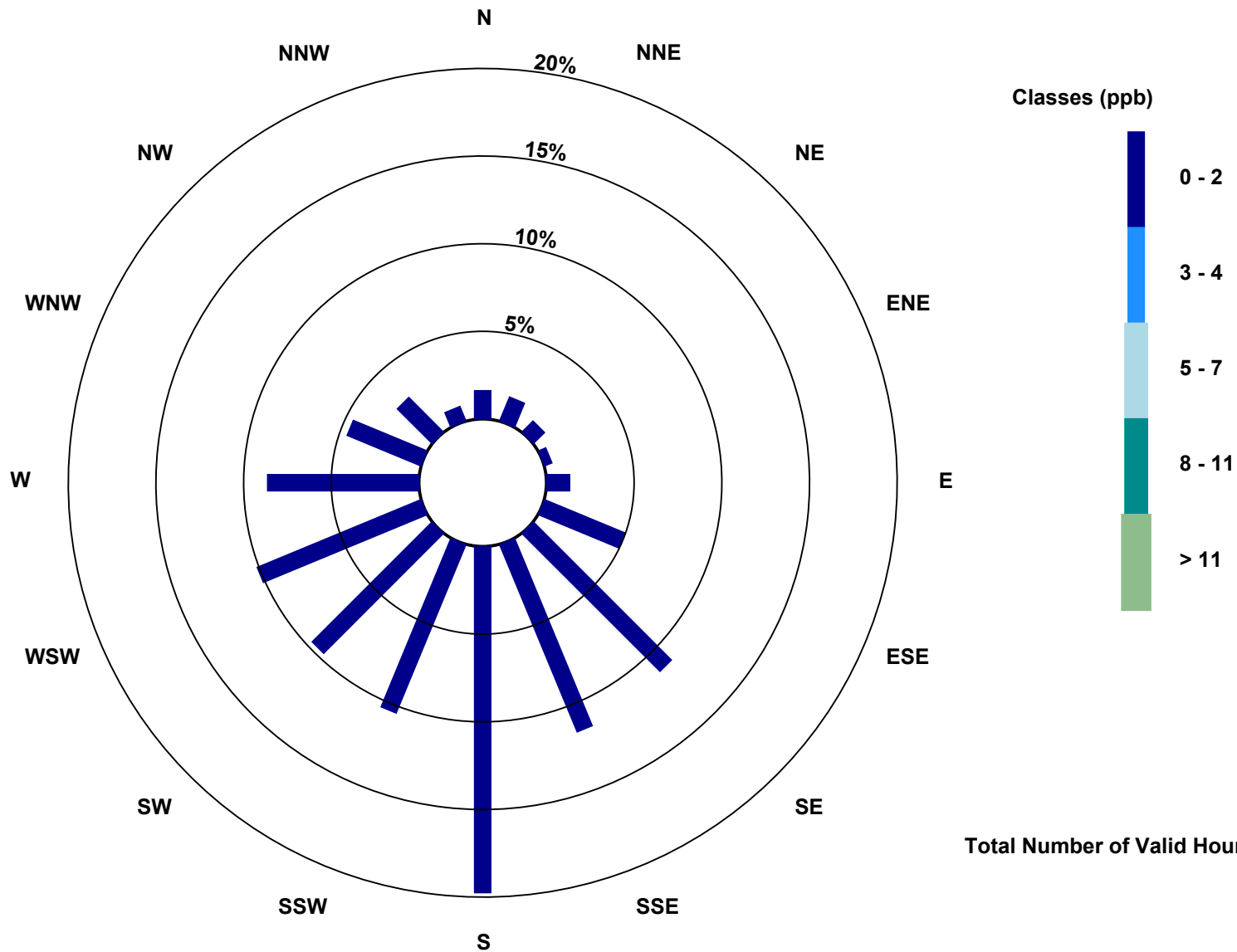
Total Number of Valid Hours: 684

Total Number of Hours: 720

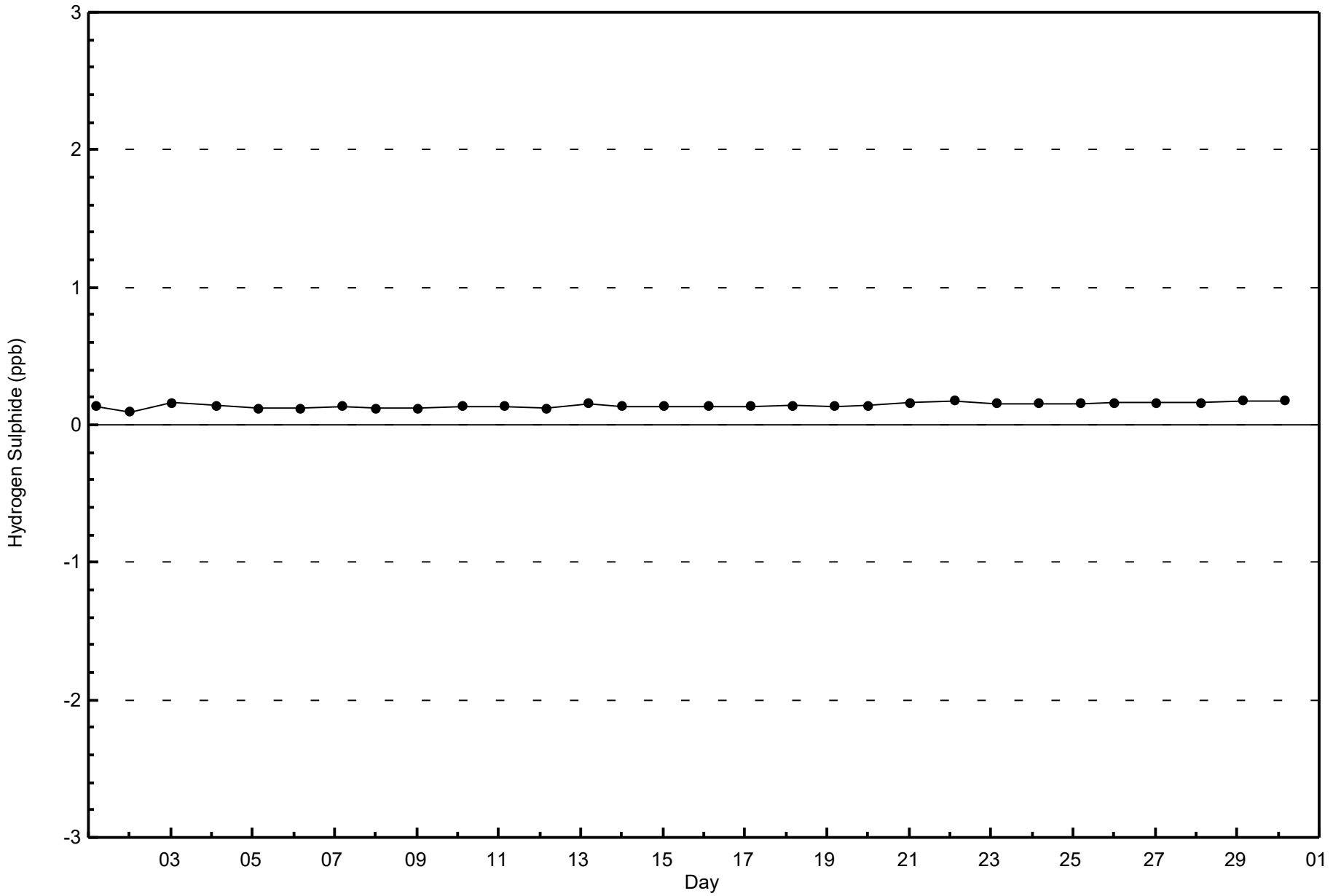


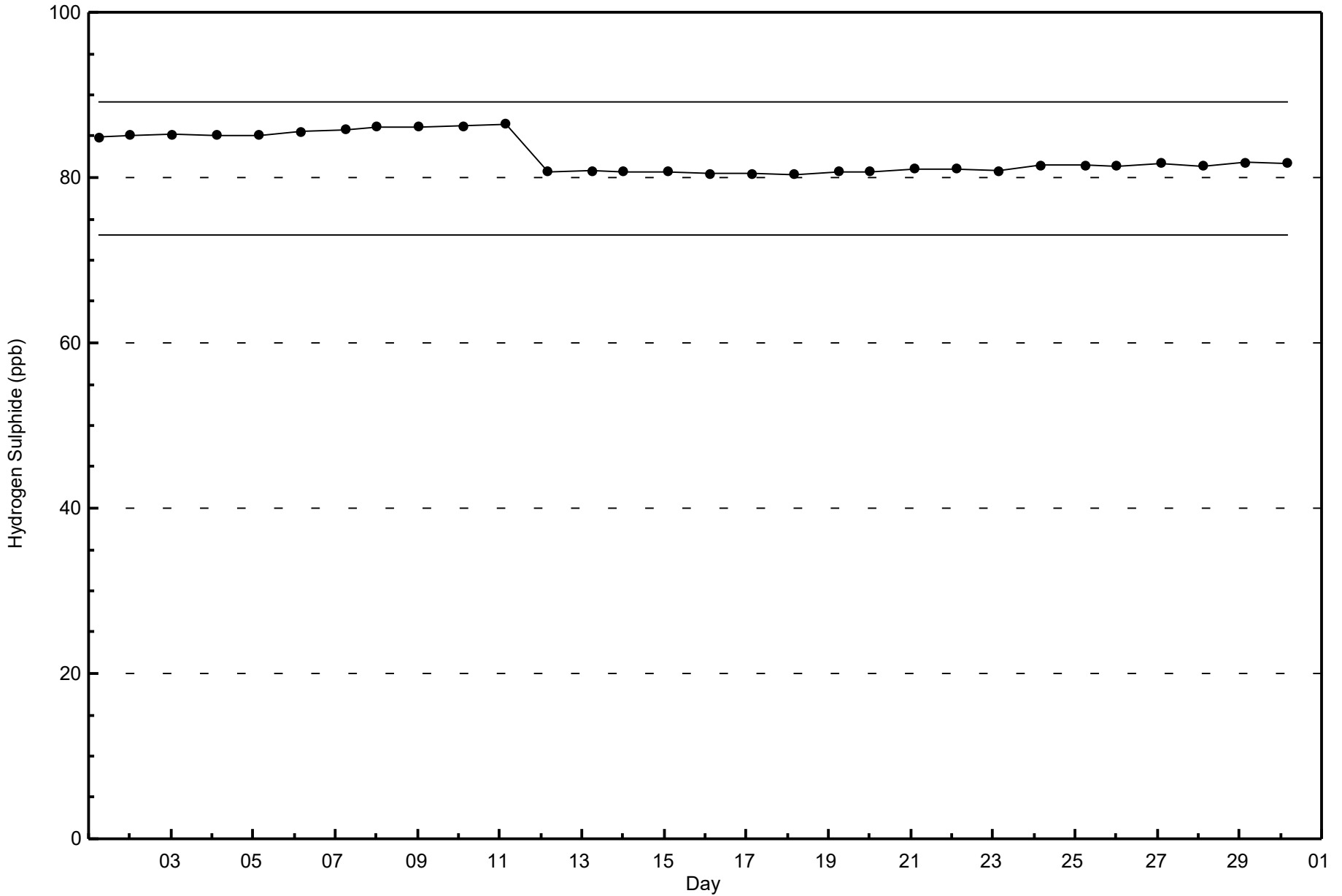
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Hydrogen Sulphide (H₂S) - ppb
Mackay River



Total Number of Valid Hours: 684







Wood Buffalo Environmental Association
Summary of Hour Averages

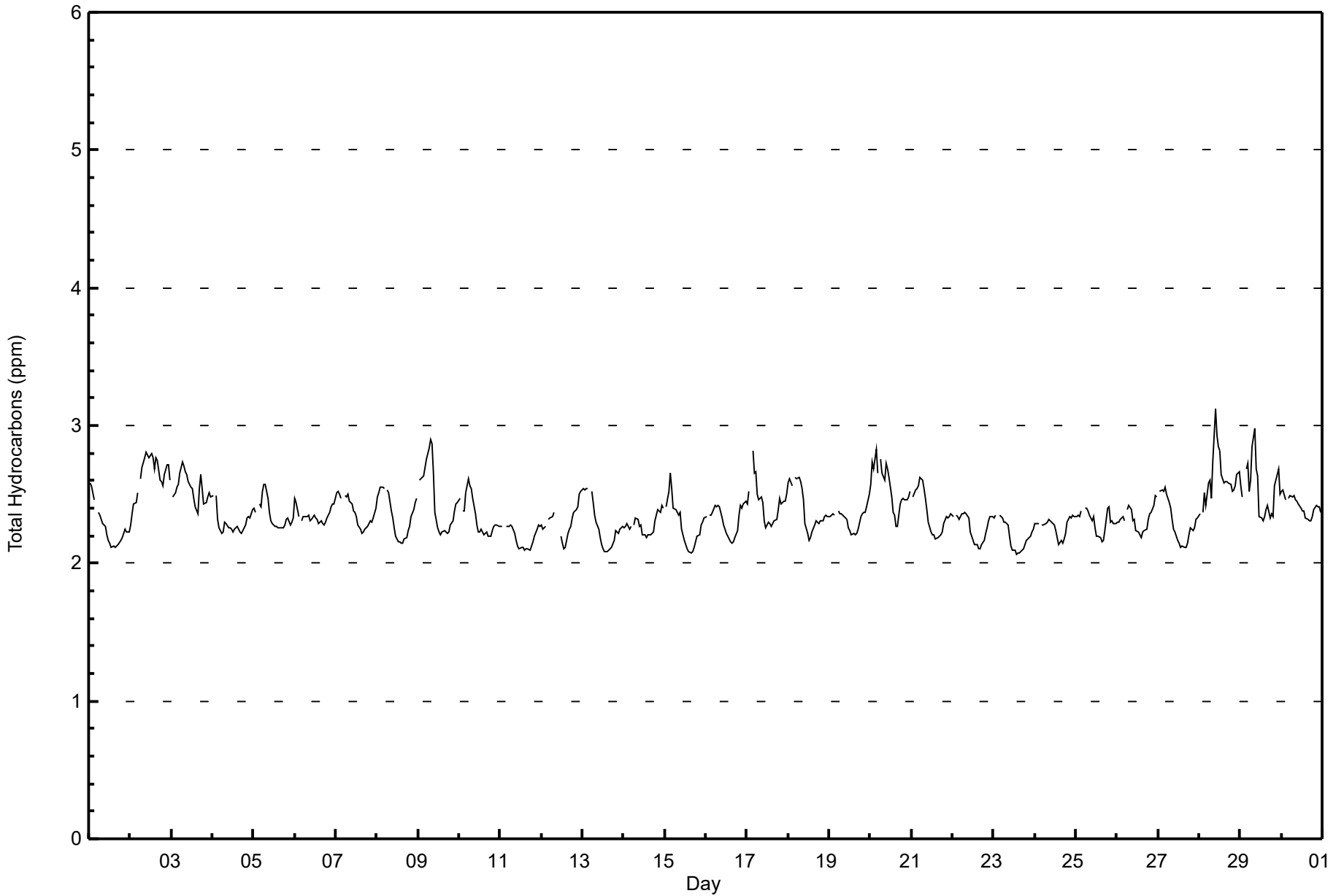
Total Hydrocarbons (THC) - ppm
Mackay River - September 2023

Maximum Value: 3.1 ppm on Sep 28 10:00																				Maximum Daily Average: 2.6 ppm on Sep 2					Hours in Service:	720
Minimum Value: 2.1 ppm on Sep 23 14:00																				Minimum Daily Average: 2.2 ppm on Sep 11					Hours of Data:	687
Maximum Diurnal Average: 2.5 ppm at hour 4																				Minimum Diurnal Average: 2.2 ppm at hour 15					Hours of Missing Data:	33
Monthly Average: 2.36 ppm																				Percentiles: P ₁ = 2.1 P ₁₀ = 2.2 Q ₁ = 2.2 Median = 2.3 Q ₃ = 2.5 P ₉₀ = 2.6 P ₉₉ = 2.8					Hours of Calibration:	33
																									Percent Operational Time:	100.0
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Sep	2.6	2.6	2.5	2.5	Z	2.4	2.3	2.3	2.3	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.6
2-Sep	2.3	2.4	2.4	2.4	2.5	Z	2.6	2.7	2.8	2.8	2.8	2.8	2.8	2.7	2.8	2.8	2.8	2.6	2.6	2.6	2.6	2.7	2.7	2.6	2.6	2.8
3-Sep	Z	2.5	2.5	2.5	2.6	2.7	2.7	2.7	2.7	2.6	2.6	2.5	2.5	2.4	2.4	2.5	2.6	2.5	2.4	2.4	2.4	2.5	2.5	2.5	2.5	2.7
4-Sep	2.5	Z	2.5	2.3	2.3	2.2	2.2	2.3	2.3	2.3	2.3	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.4	2.5	2.5
5-Sep	2.4	2.4	Z	2.4	2.4	2.5	2.6	2.6	2.5	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.6
6-Sep	2.5	2.4	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.3	2.5
7-Sep	2.5	2.5	2.5	2.5	Z	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.5
8-Sep	2.5	2.5	2.6	2.6	2.5	Z	2.5	2.5	2.4	2.3	2.3	2.2	2.2	2.2	2.1	2.1	2.2	2.2	2.2	2.3	2.3	2.4	2.4	2.4	2.5	2.6
9-Sep	Z	2.6	2.6	2.6	2.7	2.8	2.8	2.9	2.9	2.7	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.4	2.4	2.4	2.5	2.9
10-Sep	2.5	Z	2.4	2.4	2.5	2.6	2.6	2.5	2.5	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	2.3	2.6	
11-Sep	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.3	2.3	2.3
12-Sep	2.3	2.3	2.3	Z	2.3	2.3	2.3	2.4	C	C	C	2.2	2.1	2.1	2.1	2.2	2.2	2.3	2.3	2.4	2.4	2.4	2.5	2.5	2.3	2.5
13-Sep	2.5	2.5	2.5	2.5	Z	2.5	2.4	2.4	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.3	2.5	
14-Sep	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	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.4	2.4	2.4	2.4	2.3	2.4
15-Sep	Z	2.4	2.5	2.7	2.5	2.4	2.4	2.4	2.4	2.4	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.7
16-Sep	2.3	Z	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.4	2.4	2.4	2.4	2.4	2.3	2.4
17-Sep	2.4	2.5	Z	2.8	2.7	2.7	2.5	2.5	2.5	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.5	2.4	2.5	2.4	2.5	2.4	2.8
18-Sep	2.6	2.6	2.6	Z	2.6	2.6	2.6	2.6	2.5	2.5	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.6
19-Sep	2.3	2.4	2.4	2.4	Z	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.4	2.4	2.4	2.5	2.3	2.5
20-Sep	2.6	2.7	2.7	2.8	2.7	Z	2.8	2.7	2.6	2.7	2.7	2.6	2.5	2.4	2.4	2.3	2.3	2.4	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.8
21-Sep	Z	2.5	2.5	2.5	2.6	2.6	2.6	2.5	2.5	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.4	2.4	2.6
22-Sep	2.3	Z	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.3	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.4
23-Sep	2.3	2.3	Z	2.4	2.3	2.3	2.3	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.4
24-Sep	2.3	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.1	2.2	2.1	2.2	2.2	2.3	2.3	2.3	2.4	2.3	2.3	2.4
25-Sep	2.3	2.3	2.3	2.4	Z	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.4
26-Sep	2.3	2.3	2.3	2.3	Z	2.4	2.4	2.4	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.4	2.4	2.5	2.5	2.3	2.5
27-Sep	Z	2.5	2.5	2.5	2.6	2.5	2.4	2.4	2.3	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.2	2.3	2.3	2.3	2.3	2.6
28-Sep	2.4	Z	2.4	2.5	2.4	2.6	2.6	2.5	2.7	3.1	2.9	2.8	2.8	2.6	2.6	2.6	2.6	2.6	2.6	2.5	2.5	2.6	2.6	2.7	2.6	3.1
29-Sep	2.6	2.5	Z	2.7	2.7	2.5	2.6	2.8	3.0	2.7	2.6	2.3	2.3	2.3	2.3	2.4	2.4	2.3	2.4	2.3	2.6	2.6	2.7	2.5	2.5	3.0
30-Sep	2.5	2.5	2.5	Z	2.5	2.5	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.5
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan C - Calibration																										



Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Mackay River - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Mackay River - September 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	0	0.00	0.00
2.1 - 3.0	686	99.85	99.85
3.1 - 10.0	1	0.15	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 687

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Mackay River - September 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.1 - 3.0	11	10	5	3	10	34	77	76	141	72	64	66	61	29	20	6	685
3.1 - 10.0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	11	10	6	3	10	34	77	76	141	72	64	66	61	29	20	6	686

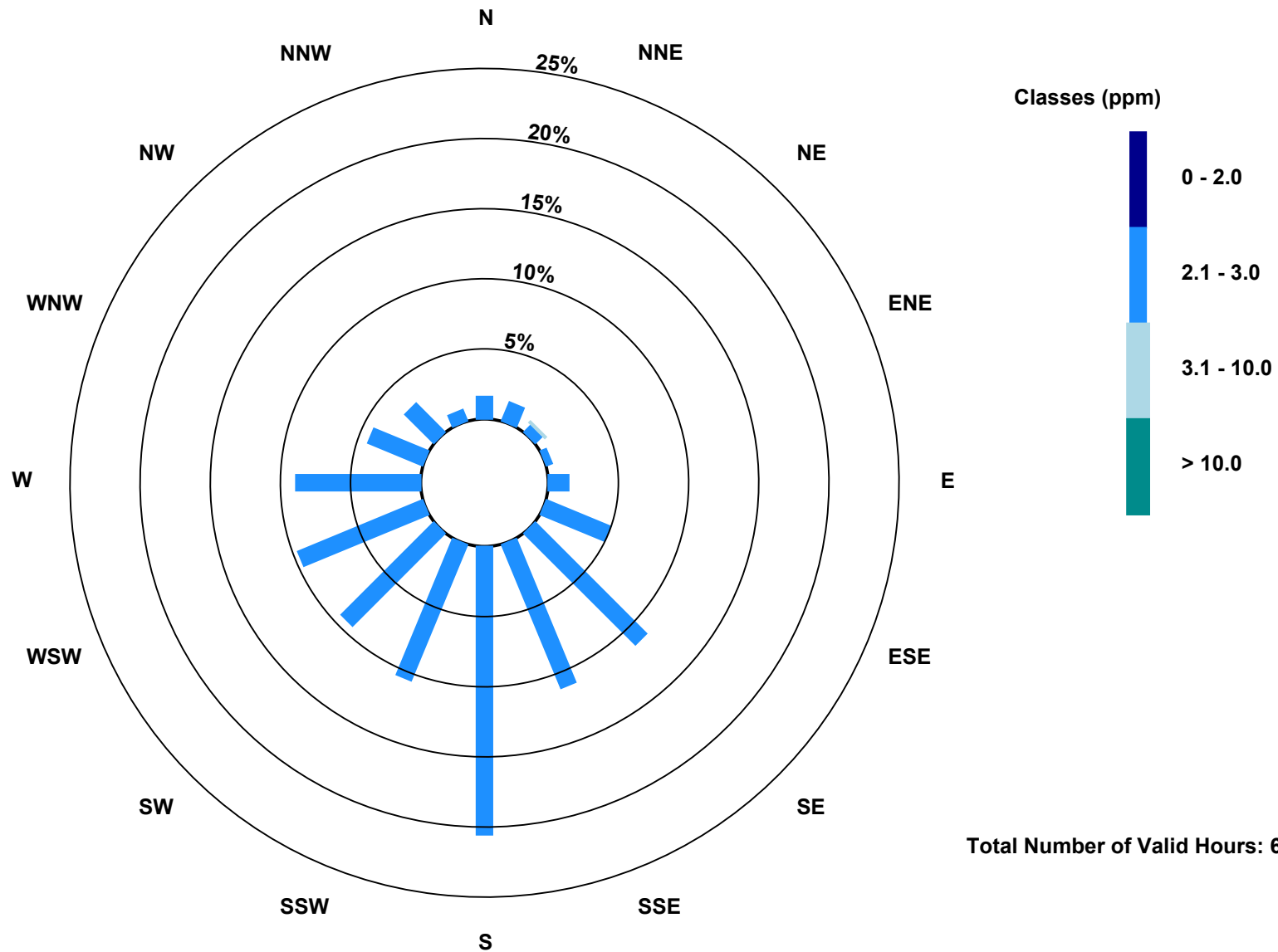
Total Number of Valid Hours: 686

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

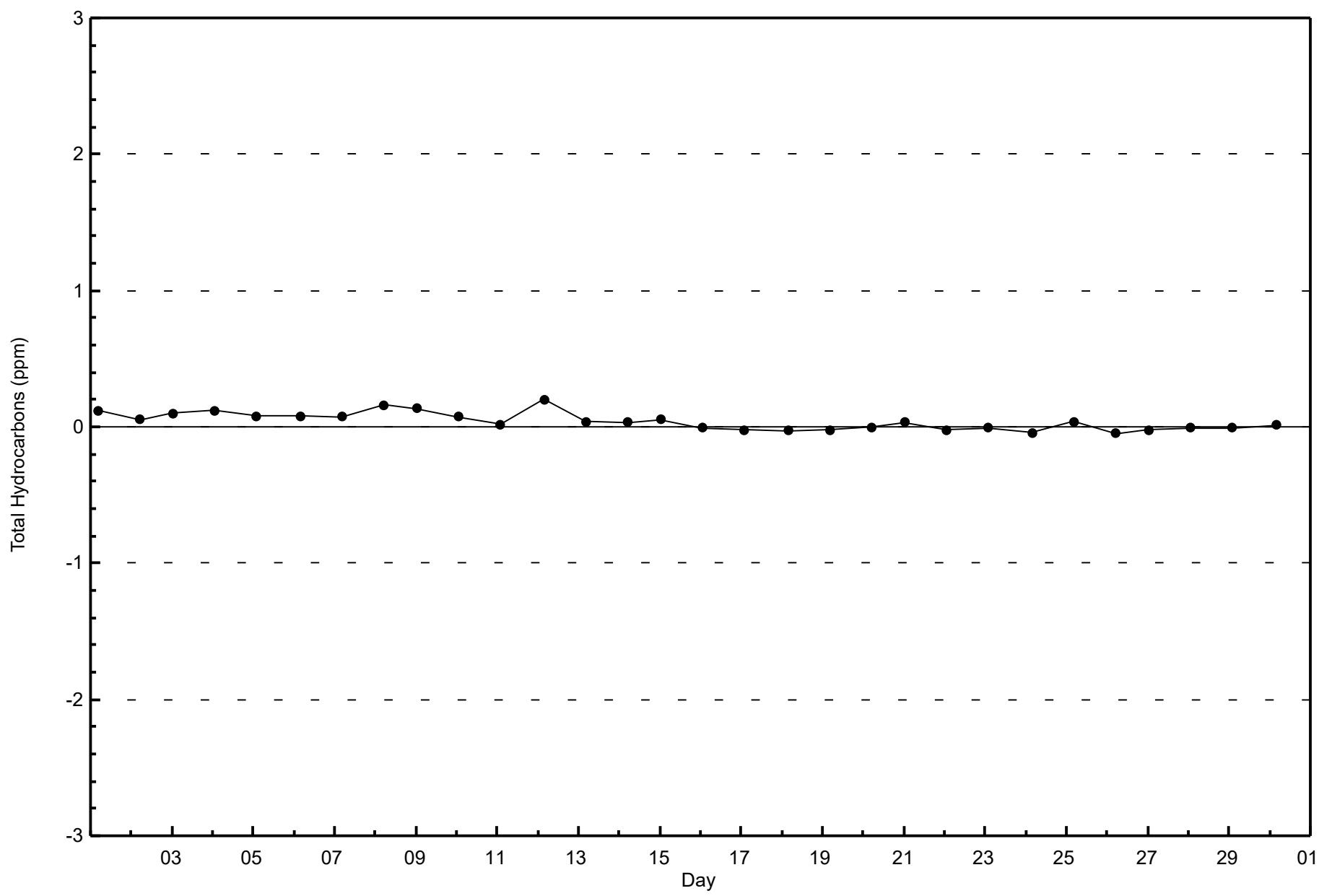
Total Hydrocarbons (THC) - ppm
Mackay River

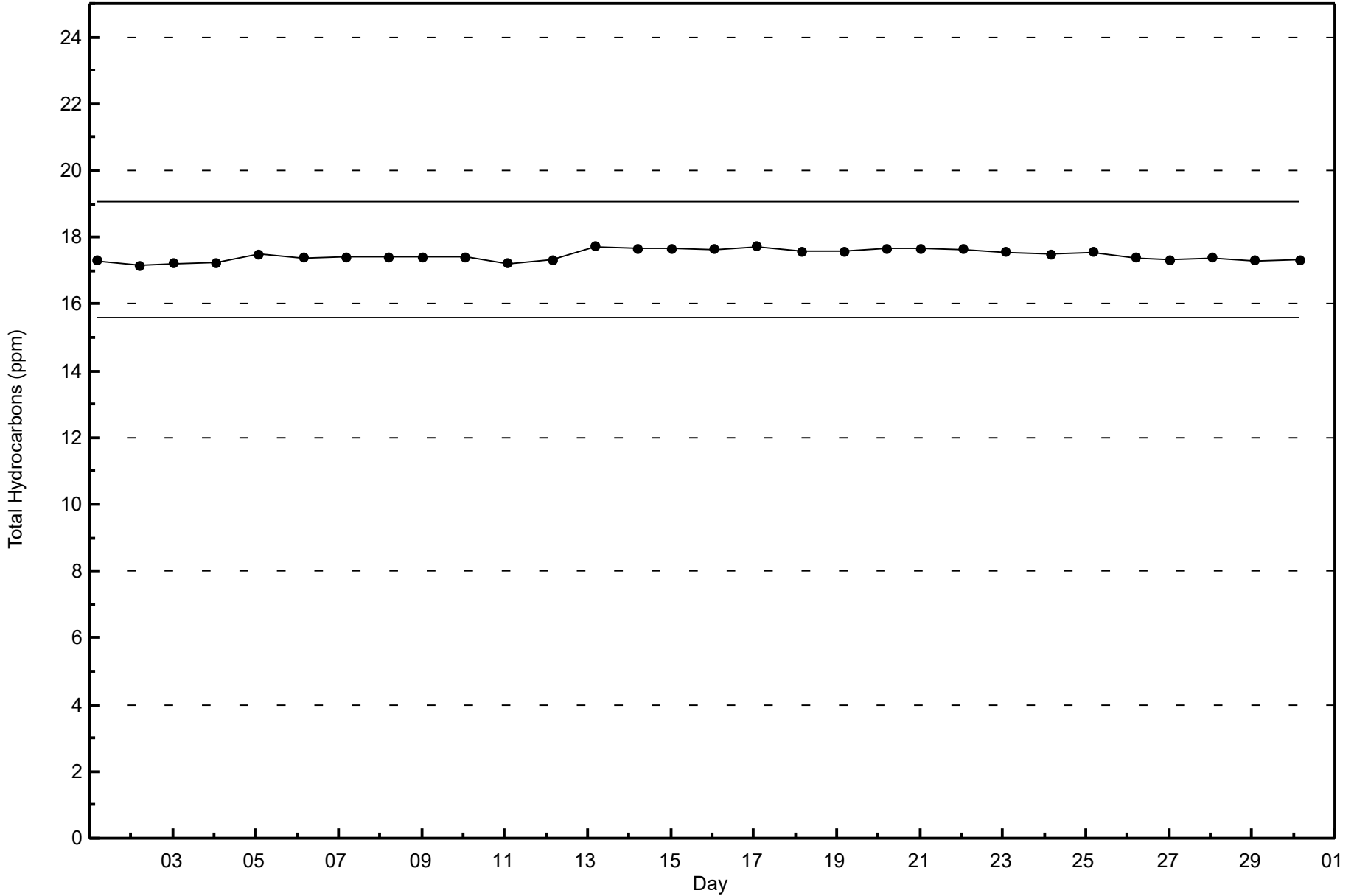




Wood Buffalo Environmental Association
Zero Responses

Total Hydrocarbons (THC) - ppm
Mackay River - September 2023

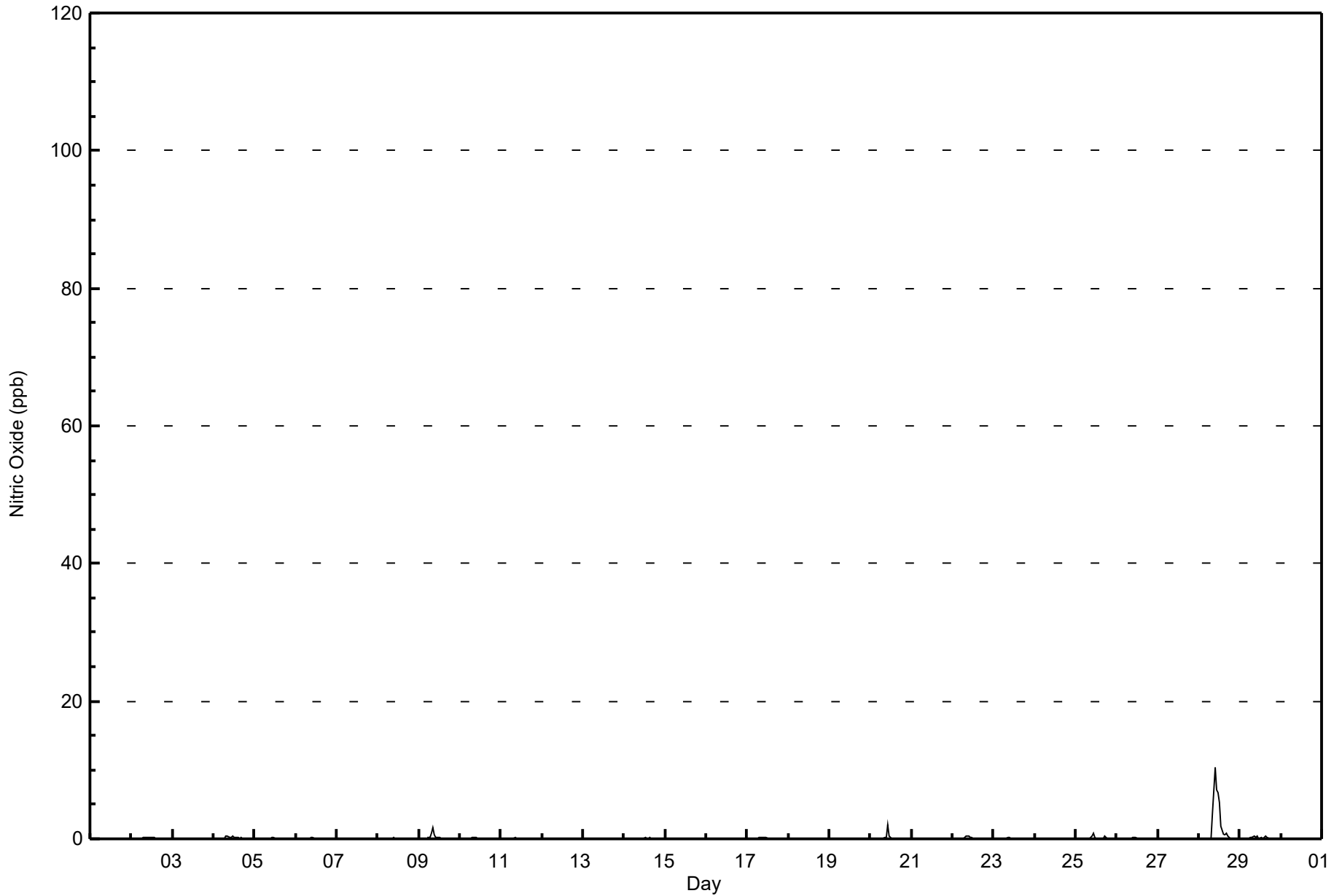






Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Mackay River - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb
Mackay River - September 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	685	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: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Mackay River - September 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	10	6	3	10	33	77	80	140	70	66	68	58	27	20	6	684
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	10	10	6	3	10	33	77	80	140	70	66	68	58	27	20	6	684

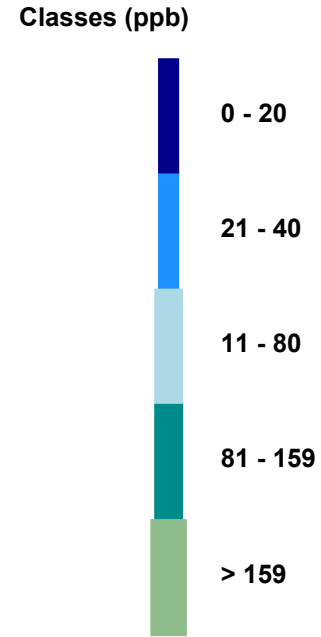
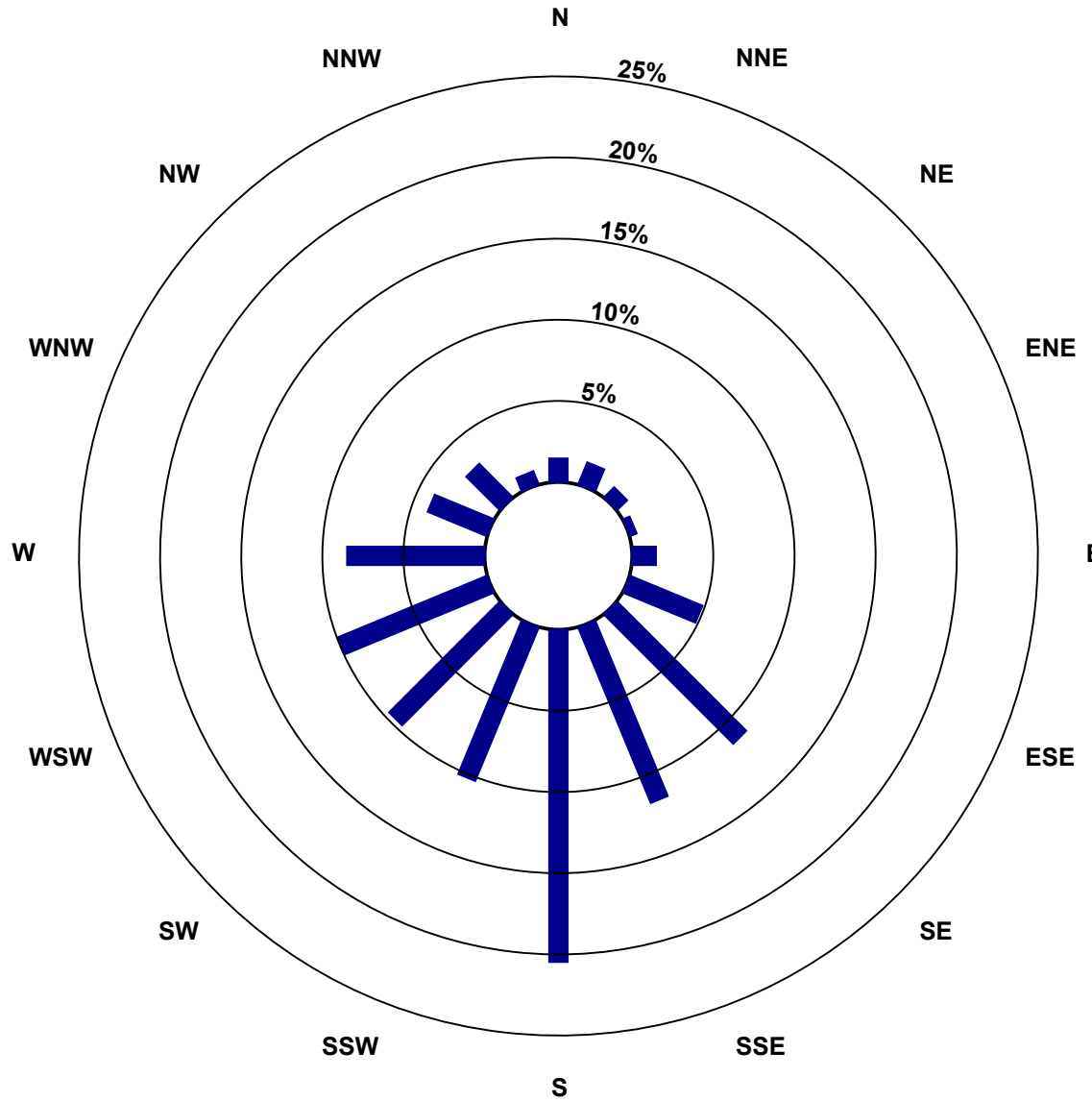
Total Number of Valid Hours: 684

Total Number of Hours: 720

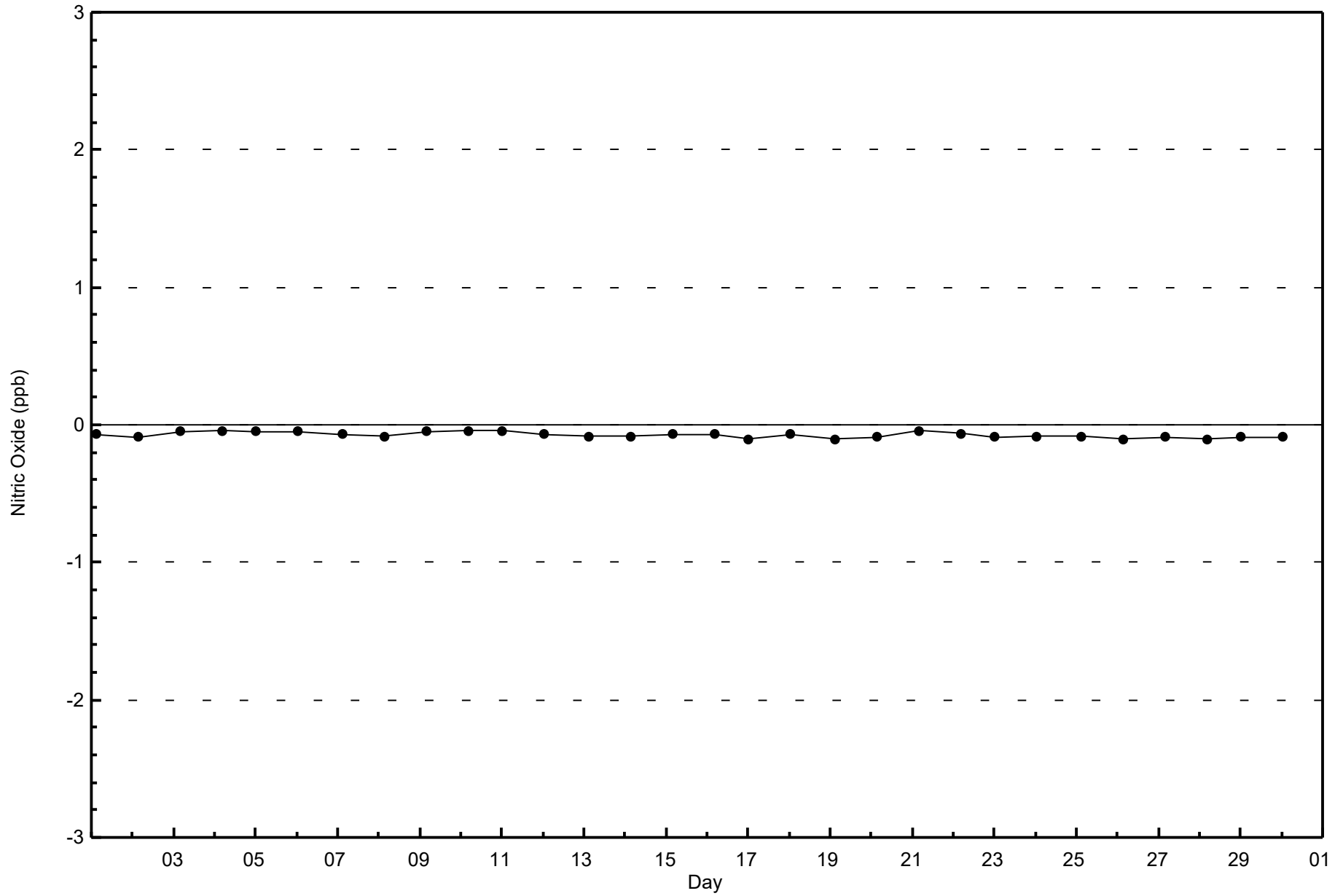


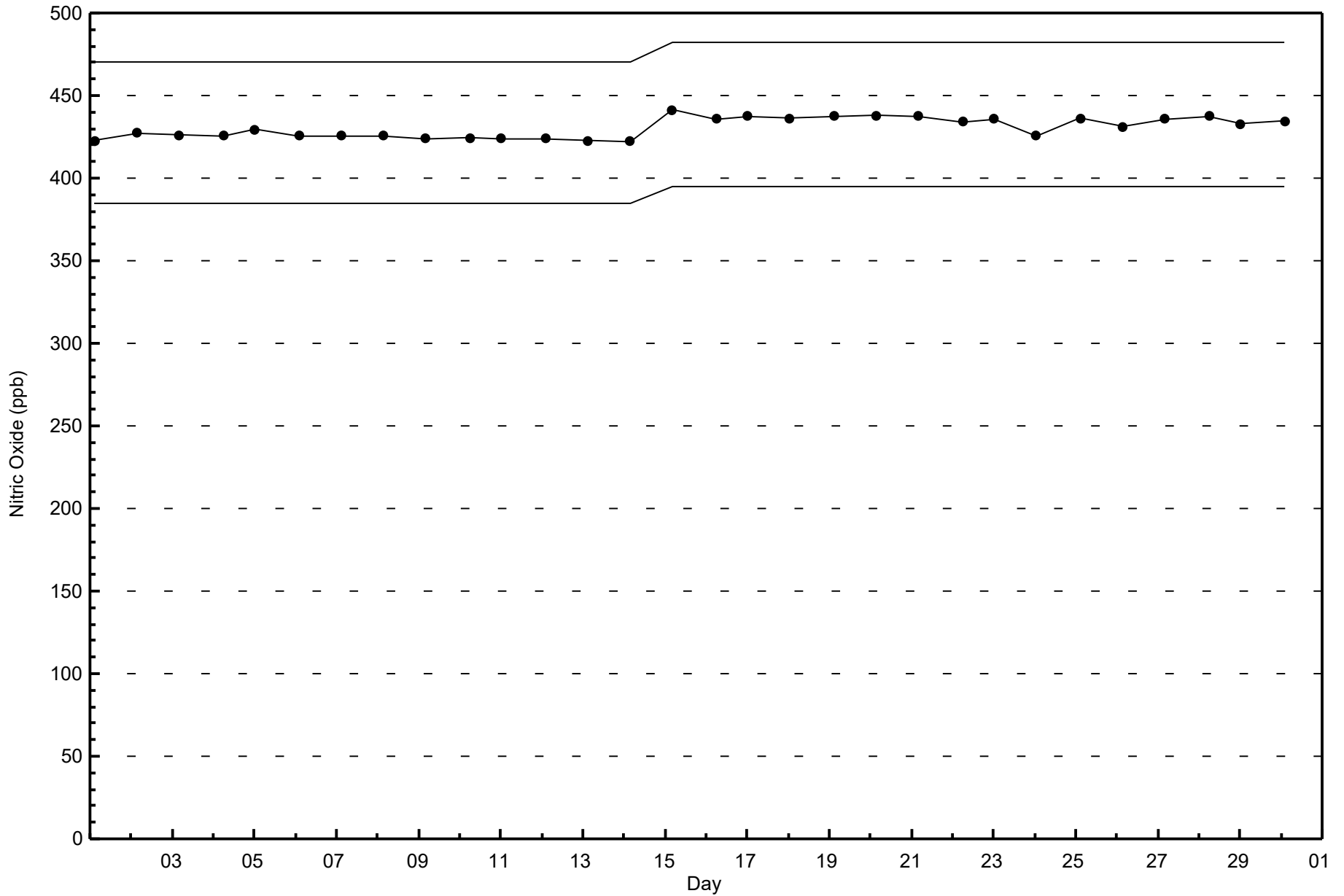
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitric Oxide (NO) - ppb
Mackay River



Total Number of Valid Hours: 684







Wood Buffalo Environmental Association
Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb
Mackay River - September 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 13.5 ppb on Sep 28 10:00	Maximum Daily Average: 4.4 ppb on Sep 28		Hours of Data:	685
Minimum Value: 0.0 ppb on Sep 14 22:00	Minimum Daily Average: 0.2 ppb on Sep 30		Hours of Missing Data:	35
Maximum Diurnal Average: 1.5 ppb at hour 11	Minimum Diurnal Average: 0.7 ppb at hour 4		Hours of Calibration:	35
Monthly Average: 1.00 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.3 Q ₁ = 0.4 Median = 0.6 Q ₃ = 1.0 P ₉₀ = 1.9 P ₉₉ = 5.9		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Sep	0.7	0.6	Z	0.5	0.5	0.4	0.5	0.4	0.6	0.6	0.6	0.5	0.3	0.4	0.4	0.5	0.6	0.8	1.0	1.1	1.0	0.9	0.8	0.8	0.6	1.1
2-Sep	0.8	0.7	0.7	Z	2.0	2.5	3.5	4.3	4.9	5.2	4.8	4.6	4.7	4.9	4.4	4.9	4.7	3.4	2.9	2.9	3.2	4.0	3.5	2.4	3.5	5.2
3-Sep	2.0	1.8	1.6	1.2	Z	1.4	1.5	1.8	1.7	1.6	1.7	1.5	1.7	2.0	2.3	2.3	3.5	3.2	2.3	1.7	1.5	1.6	1.6	1.5	1.9	3.5
4-Sep	1.3	1.2	0.9	0.6	0.5	Z	0.6	1.8	1.8	1.4	1.6	1.7	0.8	0.7	1.0	0.7	0.9	0.9	0.6	0.4	0.4	0.3	0.4	0.3	0.9	1.8
5-Sep	Z	0.5	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.5	0.9	0.8	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.6	0.6	0.5	0.5	0.9
6-Sep	0.5	Z	0.8	0.9	1.0	1.1	1.0	0.8	0.8	0.7	0.7	0.7	0.8	0.9	0.9	0.9	0.9	1.0	0.8	0.5	0.4	0.3	0.3	0.3	0.7	1.1
7-Sep	0.5	0.6	Z	0.5	0.4	0.2	0.2	0.3	0.5	0.7	0.7	0.7	0.6	0.7	0.6	0.6	0.5	0.4	0.4	0.4	0.3	0.2	0.2	0.2	0.5	0.7
8-Sep	0.2	0.1	0.1	Z	0.3	0.2	0.2	0.4	0.5	0.5	0.4	0.4	0.5	0.5	0.4	0.5	0.6	0.4	0.6	1.3	2.5	2.6	1.9	1.7	0.7	2.6
9-Sep	1.5	1.4	1.3	1.2	Z	0.8	0.5	0.6	2.7	2.1	1.5	1.7	1.1	0.8	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.4	0.4	0.4	1.0	2.7
10-Sep	0.4	0.4	0.4	0.5	0.4	Z	0.4	0.4	0.8	0.8	0.7	0.7	0.7	0.8	0.9	0.9	0.8	0.7	0.5	0.5	0.5	0.6	0.8	0.8	0.6	0.9
11-Sep	Z	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.8	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.7	0.7	0.8	1.0
12-Sep	0.8	Z	1.1	1.1	1.0	0.9	1.0	1.0	0.9	1.0	1.2	1.1	0.8	0.8	1.1	1.6	1.7	1.5	1.5	1.6	1.6	1.5	1.4	1.2	1.2	1.7
13-Sep	1.5	1.5	Z	1.1	1.2	1.0	0.9	0.6	0.5	0.5	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.6	1.5	1.5
14-Sep	0.4	0.3	0.3	Z	0.3	0.4	C	C	C	C	C	0.3	0.8	0.2	0.5	1.0	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.3	1.0
15-Sep	0.0	0.0	0.0	0.1	Z	0.3	0.3	0.5	0.4	0.3	0.3	0.5	0.6	0.7	0.8	0.9	0.9	1.0	1.0	0.8	0.8	0.8	0.9	1.1	0.6	1.1
16-Sep	1.1	1.0	0.9	1.0	1.0	Z	0.9	1.0	0.9	0.9	0.9	0.9	1.0	0.8	0.7	0.7	0.7	0.9	0.8	0.7	0.6	0.6	0.6	0.7	0.8	1.1
17-Sep	Z	0.5	0.3	0.3	0.5	0.5	1.4	2.3	2.3	2.1	1.7	1.8	1.5	1.3	1.2	1.8	2.3	1.9	1.7	1.7	1.2	0.9	0.9	0.5	1.3	2.3
18-Sep	0.4	Z	0.8	0.6	0.4	0.5	0.5	0.9	1.4	1.2	0.7	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.6	0.4	0.4	0.6	1.4
19-Sep	0.4	0.4	Z	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.3	0.2	0.2	0.2	0.3	0.3	0.4	0.5
20-Sep	0.4	0.4	0.3	Z	0.9	1.9	0.4	0.4	0.9	1.2	5.9	4.3	2.8	2.9	2.5	2.3	2.3	2.1	1.3	0.9	0.7	0.7	1.1	1.6	1.7	5.9
21-Sep	0.9	0.7	0.6	0.8	Z	0.9	0.8	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.5	0.6	1.0	1.0	0.6	1.0
22-Sep	1.0	1.0	1.1	1.3	1.4	Z	2.2	2.0	1.9	1.7	1.5	1.2	0.8	0.7	0.6	0.5	0.5	0.6	0.6	0.6	0.7	0.9	1.1	1.1	1.1	2.2
23-Sep	Z	1.2	1.1	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.7	0.6	0.6	0.5	0.5	0.5	0.5	0.7	0.7	0.6	0.8	1.0	1.0	1.1	0.8	1.2
24-Sep	1.1	Z	1.1	1.1	1.1	1.2	1.2	1.3	1.0	0.8	0.8	0.7	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.2	0.2	0.7	1.3
25-Sep	0.2	0.2	Z	0.2	0.2	0.2	0.1	0.2	0.3	0.8	1.9	0.9	0.4	0.4	0.4	0.3	0.6	5.8	6.2	3.4	1.2	1.3	0.4	0.4	1.1	6.2
26-Sep	0.6	0.9	1.1	Z	1.0	0.8	0.6	0.6	0.8	1.0	1.0	1.0	1.1	1.2	1.1	1.0	0.9	0.9	0.8	0.9	0.7	0.7	0.5	0.4	0.9	1.2
27-Sep	0.3	0.5	0.5	0.3	Z	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.4	0.6	0.4	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.1	0.3	0.6
28-Sep	0.1	0.2	0.1	0.1	0.1	Z	0.1	0.2	7.7	13.5	10.4	10.1	9.9	5.3	3.1	3.4	5.6	5.9	4.8	2.9	2.9	3.6	5.3	5.2	4.4	13.5
29-Sep	Z	1.4	0.8	0.4	0.3	0.5	0.9	0.9	1.3	0.8	1.1	0.5	0.7	0.3	0.5	1.1	0.7	0.3	0.3	0.2	0.2	0.2	0.4	0.2	0.6	1.4
30-Sep	0.1	Z	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.4	0.4	0.3	0.2	0.4	0.5	0.5	0.4	0.5	0.2	0.5

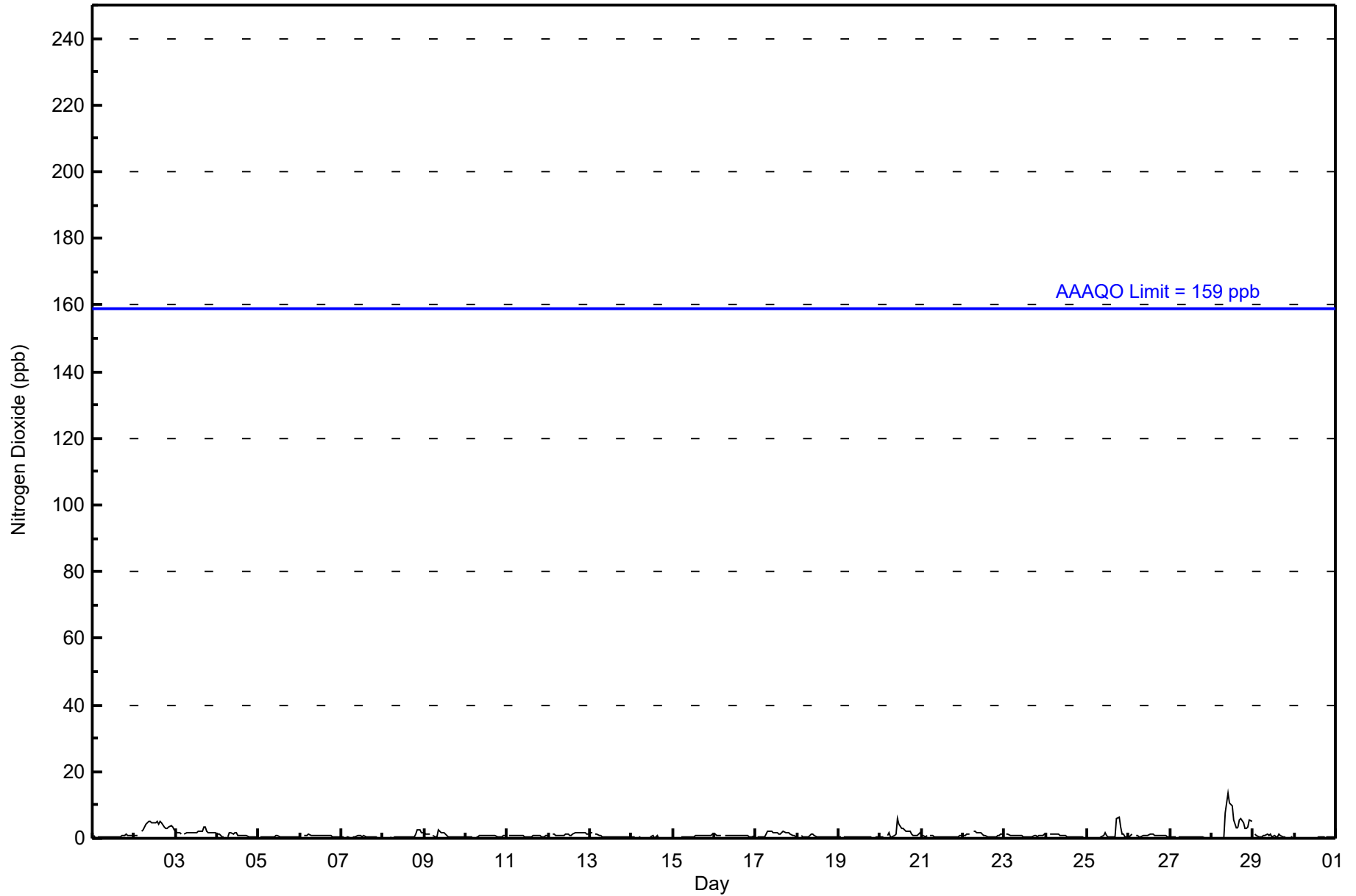
0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.9	1.3	1.5	1.5	1.3	1.2	1.0	1.0	1.0	1.1	1.2	1.1	0.9	0.8	0.9	0.9	0.9	0.9	0.9	Diurnal Average
2.0	1.8	1.6	1.3	2.0	2.5	3.5	4.3	7.7	13.5	10.4	10.1	9.9	5.3	4.4	4.9	5.6	5.9	6.2	3.4	3.2	4.0	5.3	5.2	5.2	5.2	Diurnal Maximum

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



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Mackay River - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Mackay River - September 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	685	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: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Mackay River - September 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	10	6	3	10	33	77	80	140	70	66	68	58	27	20	6	684
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	10	10	6	3	10	33	77	80	140	70	66	68	58	27	20	6	684

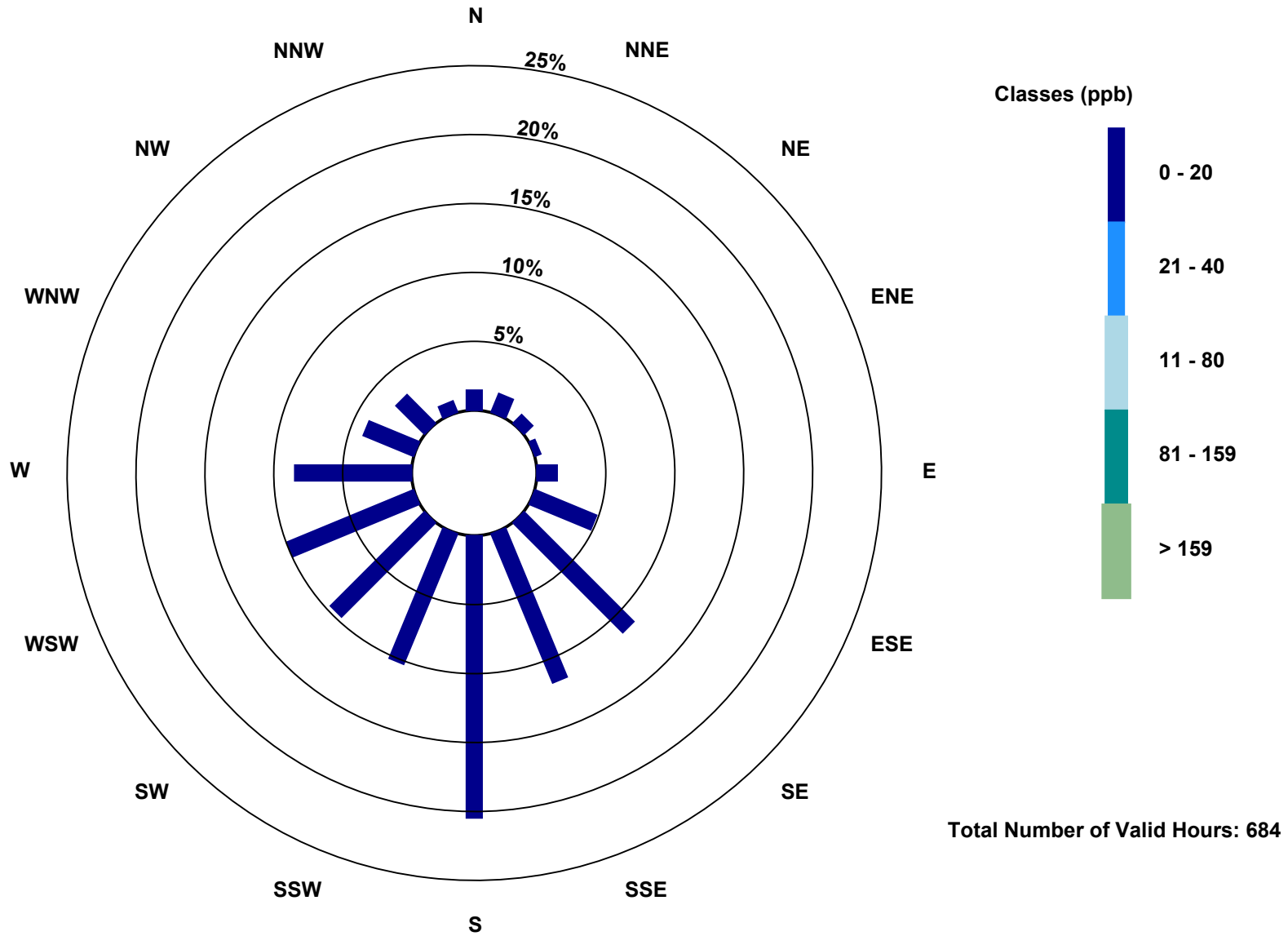
Total Number of Valid Hours: 684

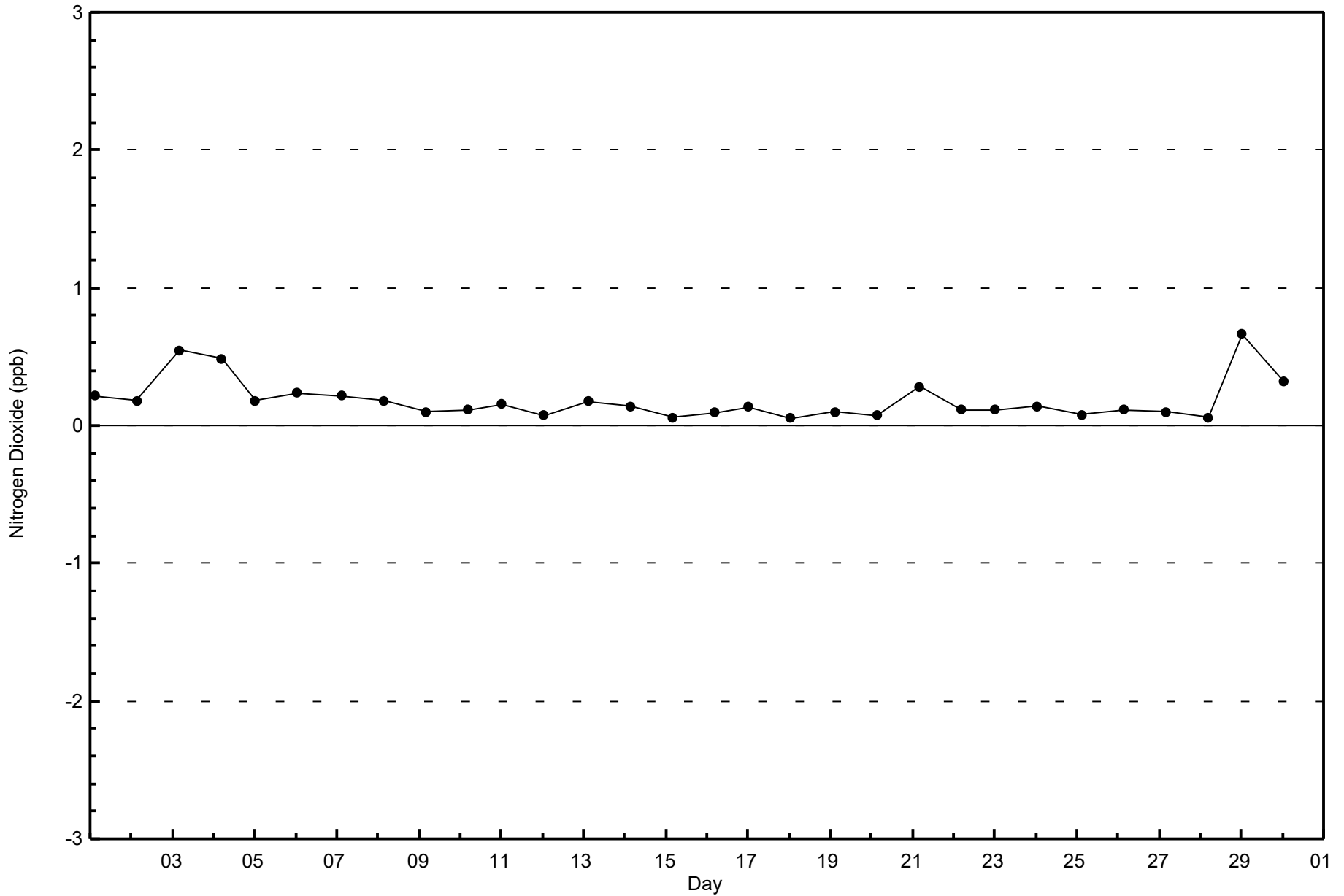
Total Number of Hours: 720

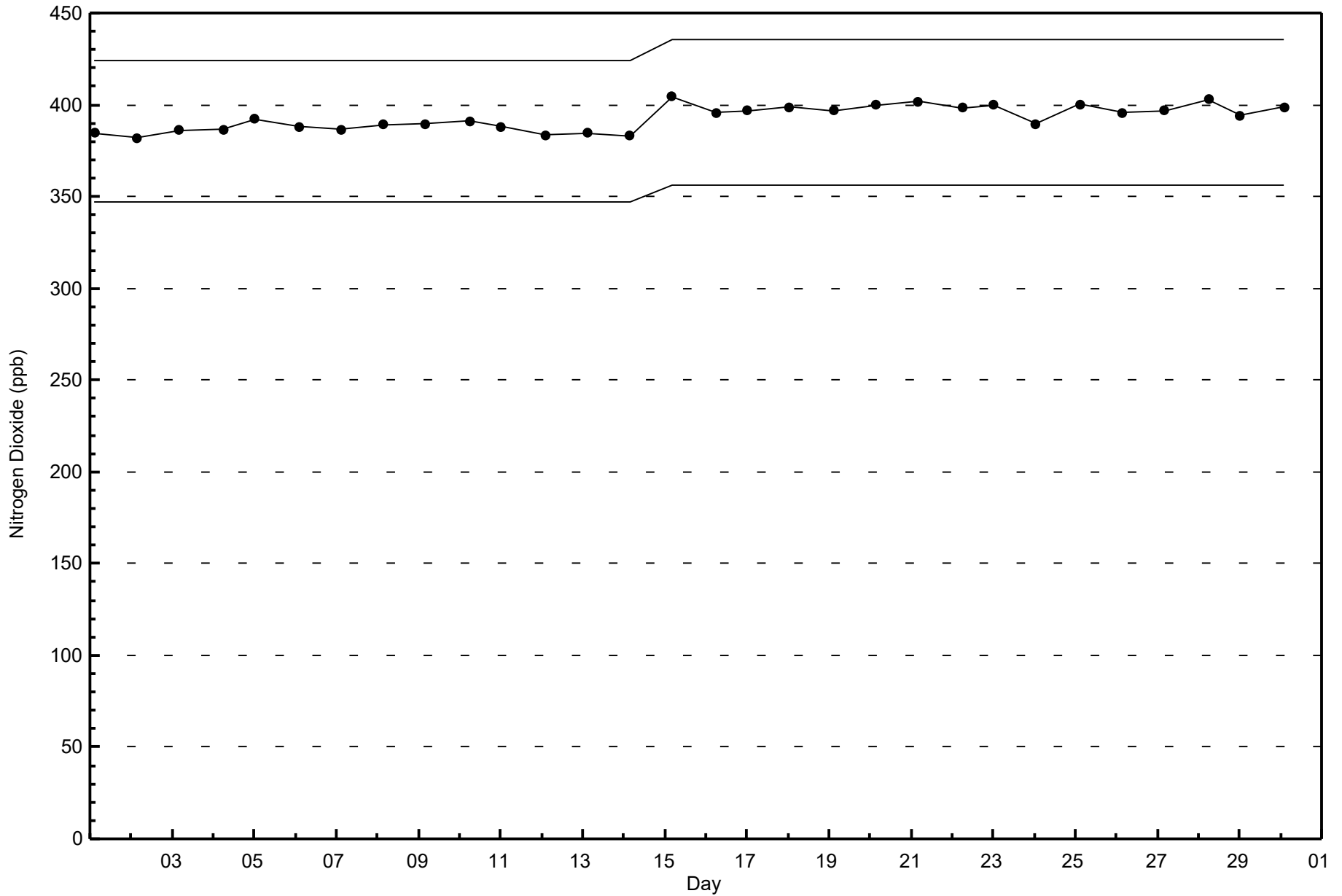


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitrogen Dioxide (NO₂) - ppb
Mackay River









Wood Buffalo Environmental Association
Summary of Hour Averages

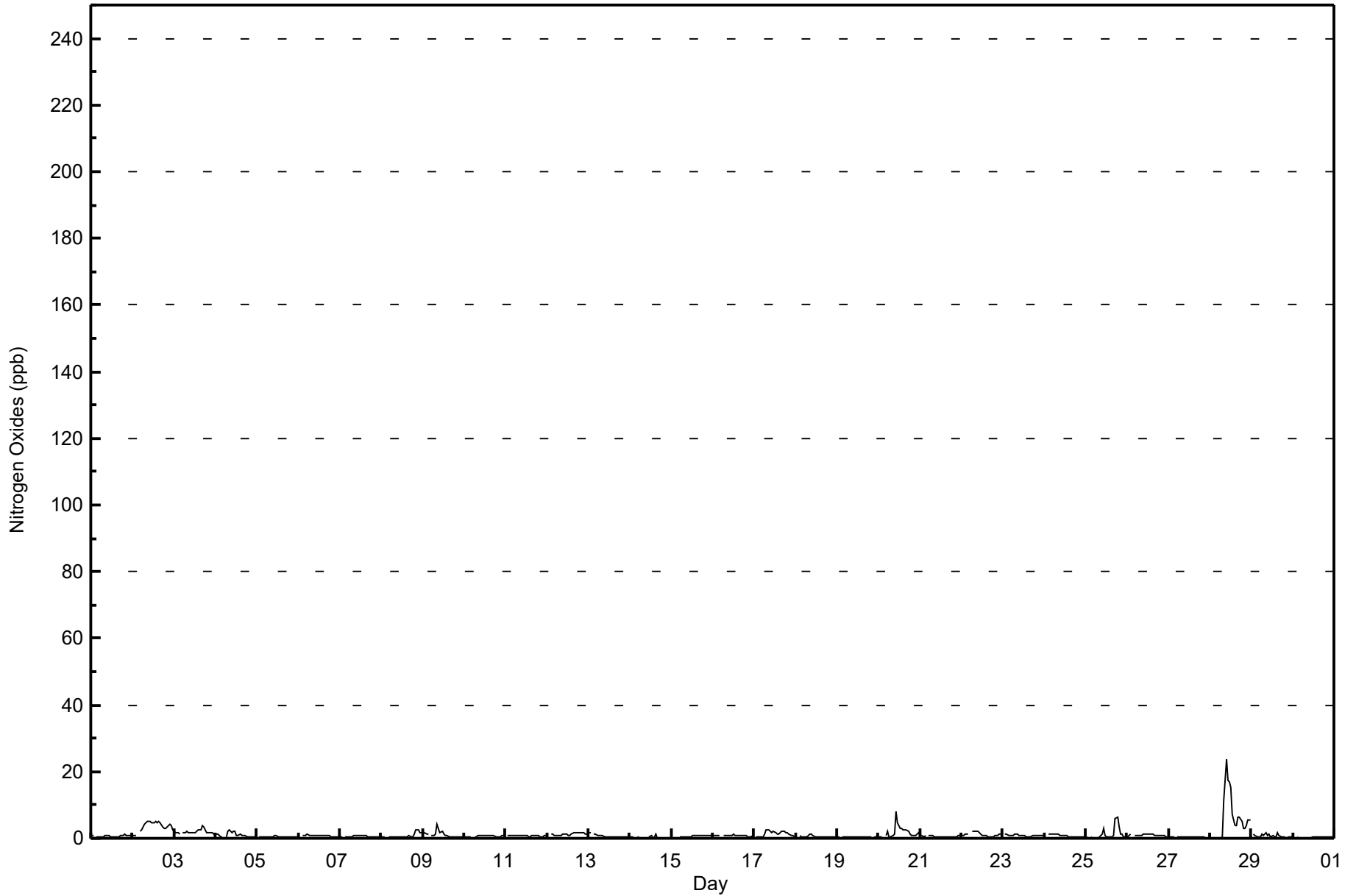
Nitrogen Oxides (NO_x) - ppb
Mackay River - September 2023

Maximum Value: 23.8 ppb on Sep 28 10:00																				Maximum Daily Average: 6.0 ppb on Sep 28					Hours in Service: 720		
Minimum Value: 0.0 ppb on Sep 15 00:00										Minimum Daily Average: 0.2 ppb on Sep 30										Hours of Data: 685							
Maximum Diurnal Average: 2.0 ppb at hour 11										Minimum Diurnal Average: 0.7 ppb at hour 4										Hours of Missing Data: 35							
Monthly Average: 1.11 ppb										Percentiles: P ₁ = 0.0 P ₁₀ = 0.3 Q ₁ = 0.4 Median = 0.7 Q ₃ = 1.1 P ₉₀ = 2.0 P ₉₉ = 6.5										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-Sep	0.8	0.6	Z	0.5	0.5	0.4	0.5	0.5	0.7	0.7	0.7	0.6	0.4	0.4	0.5	0.5	0.6	0.8	1.0	1.1	1.0	0.9	0.8	0.8	0.7	1.1	
2-Sep	0.8	0.7	0.7	Z	2.0	2.6	3.6	4.4	5.0	5.3	4.9	4.7	4.8	5.0	4.5	5.0	4.8	3.5	3.0	3.0	3.3	4.1	3.6	2.5	3.6	5.3	
3-Sep	2.1	1.9	1.7	1.3	Z	1.5	1.6	1.9	1.8	1.7	1.7	1.6	1.8	2.1	2.4	2.4	3.6	3.3	2.4	1.7	1.5	1.6	1.6	1.5	1.9	3.6	
4-Sep	1.3	1.2	0.9	0.6	0.5	Z	0.6	2.2	2.3	1.7	1.9	2.1	0.9	0.8	1.3	0.8	1.0	1.0	0.6	0.4	0.4	0.3	0.4	0.3	1.0	2.3	
5-Sep	Z	0.5	0.3	0.3	0.3	0.3	0.3	0.5	0.5	0.5	1.1	1.0	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.6	0.6	0.5	0.5	1.1	
6-Sep	0.5	Z	0.8	0.9	1.0	1.1	1.0	0.8	0.9	0.8	0.8	0.8	0.9	1.0	1.0	1.0	1.0	1.0	0.8	0.5	0.4	0.3	0.3	0.3	0.8	1.1	
7-Sep	0.5	0.6	Z	0.5	0.4	0.3	0.3	0.4	0.6	0.8	0.8	0.8	0.7	0.8	0.7	0.7	0.6	0.5	0.5	0.4	0.3	0.3	0.3	0.3	0.5	0.8	
8-Sep	0.3	0.2	0.2	Z	0.3	0.3	0.3	0.5	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.7	0.4	0.6	1.3	2.5	2.6	1.9	1.7	0.8	2.6	
9-Sep	1.5	1.5	1.4	1.3	Z	0.9	0.7	1.4	4.4	2.8	1.7	2.0	1.2	0.8	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.4	0.4	0.4	1.2	4.4	
10-Sep	0.4	0.4	0.4	0.5	0.4	Z	0.4	0.5	1.0	0.9	0.8	0.7	0.8	0.9	1.0	0.9	0.8	0.7	0.5	0.5	0.5	0.6	0.8	0.8	0.7	1.0	
11-Sep	Z	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.0	0.9	0.7	0.7	0.7	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.7	0.7	0.8	1.1	
12-Sep	0.8	Z	1.1	1.1	1.0	0.9	1.0	1.0	1.0	1.1	1.3	1.2	0.9	0.9	1.2	1.7	1.8	1.6	1.6	1.7	1.6	1.6	1.4	1.2	1.2	1.8	
13-Sep	1.5	1.5	Z	1.1	1.2	1.0	0.9	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	0.3	0.4	0.4	0.6	1.5	1.5	
14-Sep	0.4	0.3	0.3	Z	0.3	0.4	C	C	C	C	C	0.3	0.9	0.2	0.6	1.2	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.3	1.2	
15-Sep	0.0	0.0	0.0	0.1	Z	0.3	0.3	0.5	0.5	0.3	0.3	0.5	0.6	0.7	0.8	0.9	0.9	1.0	1.0	0.8	0.8	0.8	0.9	1.1	0.6	1.1	
16-Sep	1.1	1.0	0.9	1.0	1.0	Z	0.9	1.0	0.9	0.9	0.9	0.9	1.1	0.9	0.8	0.7	0.7	0.9	0.8	0.7	0.6	0.6	0.6	0.7	0.9	1.1	
17-Sep	Z	0.5	0.3	0.3	0.5	0.5	1.4	2.4	2.5	2.3	1.9	1.9	1.6	1.4	1.3	1.8	2.3	1.9	1.7	1.7	1.2	0.9	0.9	0.5	1.4	2.5	
18-Sep	0.4	Z	0.8	0.6	0.4	0.5	0.5	0.9	1.4	1.2	0.7	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.6	0.4	0.6	1.4	
19-Sep	0.4	0.4	Z	0.5	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.3	0.2	0.2	0.2	0.3	0.3	0.4	0.5	
20-Sep	0.4	0.4	0.3	Z	0.9	2.0	0.5	0.4	1.0	1.4	8.0	4.7	2.9	3.0	2.6	2.4	2.4	2.1	1.3	0.9	0.7	0.7	1.1	1.6	1.8	8.0	
21-Sep	0.9	0.7	0.6	0.8	Z	0.9	0.8	0.7	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.6	1.0	1.0	0.6	1.0
22-Sep	1.0	1.0	1.1	1.3	1.4	Z	2.2	2.2	2.3	2.0	1.8	1.4	0.9	0.8	0.7	0.5	0.5	0.6	0.6	0.6	0.7	0.9	1.1	1.1	1.2	2.3	
23-Sep	Z	1.2	1.1	1.0	1.0	1.0	1.0	1.1	1.1	1.0	0.8	0.7	0.7	0.6	0.6	0.6	0.6	0.7	0.7	0.6	0.8	1.0	1.0	1.1	0.9	1.2	
24-Sep	1.1	Z	1.1	1.1	1.1	1.2	1.2	1.3	1.1	0.9	0.9	0.8	0.7	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.2	0.2	0.7	1.3	
25-Sep	0.2	0.2	Z	0.2	0.2	0.2	0.1	0.2	0.3	1.1	2.8	1.0	0.5	0.4	0.4	0.4	0.7	6.1	6.3	3.4	1.2	1.3	0.4	0.4	1.2	6.3	
26-Sep	0.6	0.9	1.1	Z	1.0	0.8	0.6	0.7	0.9	1.1	1.2	1.2	1.2	1.3	1.2	1.1	1.0	0.9	0.8	0.9	0.7	0.7	0.5	0.4	0.9	1.3	
27-Sep	0.3	0.5	0.5	0.3	Z	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.4	0.6	0.4	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.1	0.3	0.6	
28-Sep	0.1	0.2	0.1	0.1	0.1	Z	0.2	0.3	11.4	23.8	17.5	16.8	15.2	7.1	3.8	3.9	6.4	6.2	4.9	3.0	3.0	3.7	5.4	5.3	6.0	23.8	
29-Sep	Z	1.4	0.8	0.5	0.4	0.6	1.1	1.0	1.7	0.9	1.5	0.6	0.8	0.4	0.6	1.5	0.9	0.3	0.3	0.2	0.2	0.2	0.4	0.2	0.7	1.7	
30-Sep	0.1	Z	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.4	0.4	0.3	0.2	0.4	0.5	0.5	0.4	0.5	0.2	0.5	
																								Diurnal Average			
																								Diurnal Maximum			
																								0.7 0.8 0.7 0.7 0.7 0.8 0.8 1.0 1.6 2.0 2.0 1.7 1.5 1.1 1.0 1.1 1.2 1.3 1.1 0.9 0.8 0.9 0.9 0.9 0.9 0.9			
																								2.1 1.9 1.7 1.3 2.0 2.6 3.6 4.4 11.4 23.8 17.5 16.8 15.2 7.1 4.5 5.0 6.4 6.2 6.3 3.4 3.3 4.1 5.4 5.3			
Z - zerospan C - Calibration																											



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Mackay River - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Mackay River - September 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	684	99.85	99.85
21 - 40	1	0.15	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: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Mackay River - September 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	10	5	3	10	33	77	80	140	70	66	68	58	27	20	6	683
21 - 40	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	10	10	6	3	10	33	77	80	140	70	66	68	58	27	20	6	684

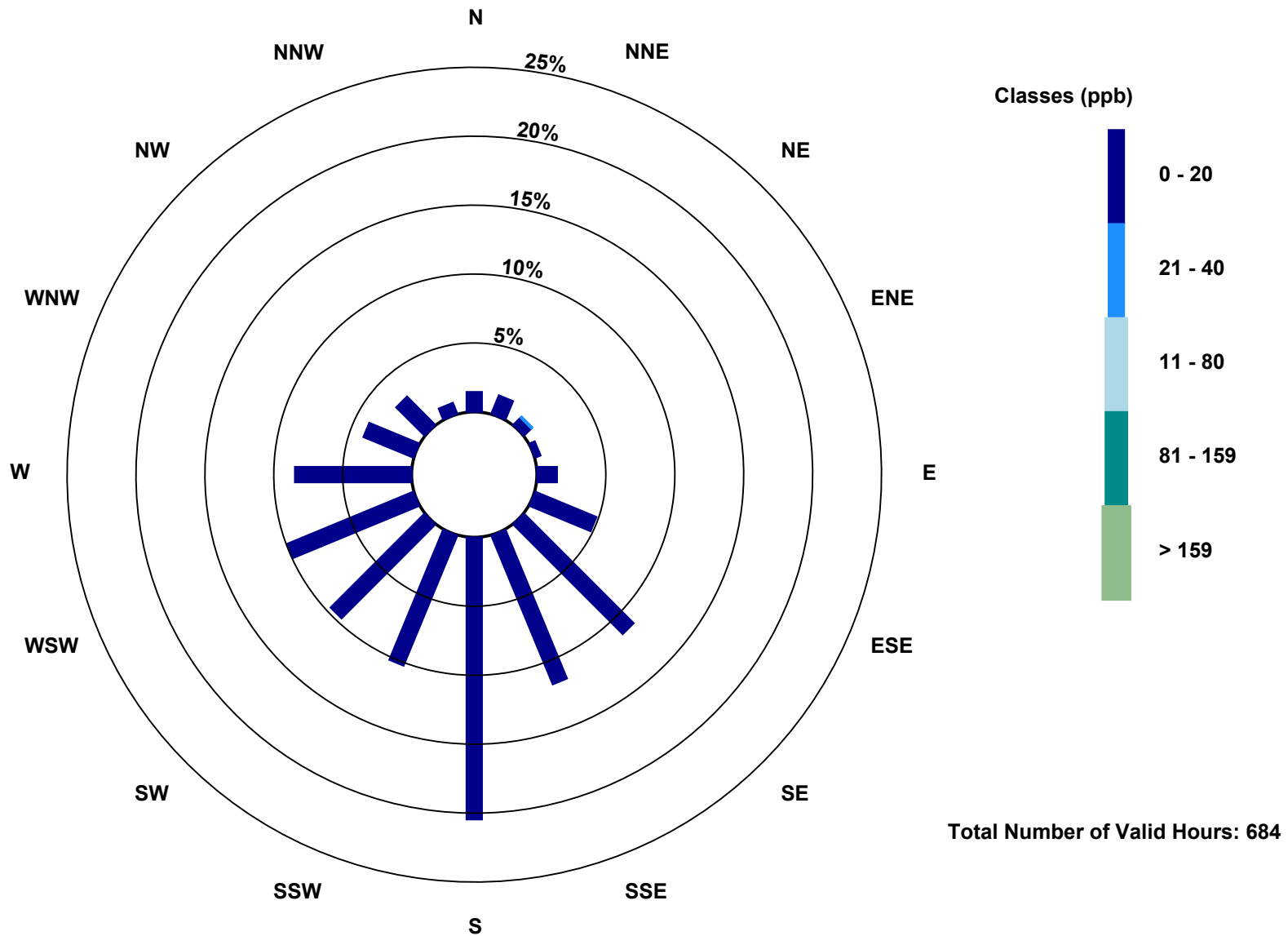
Total Number of Valid Hours: 684

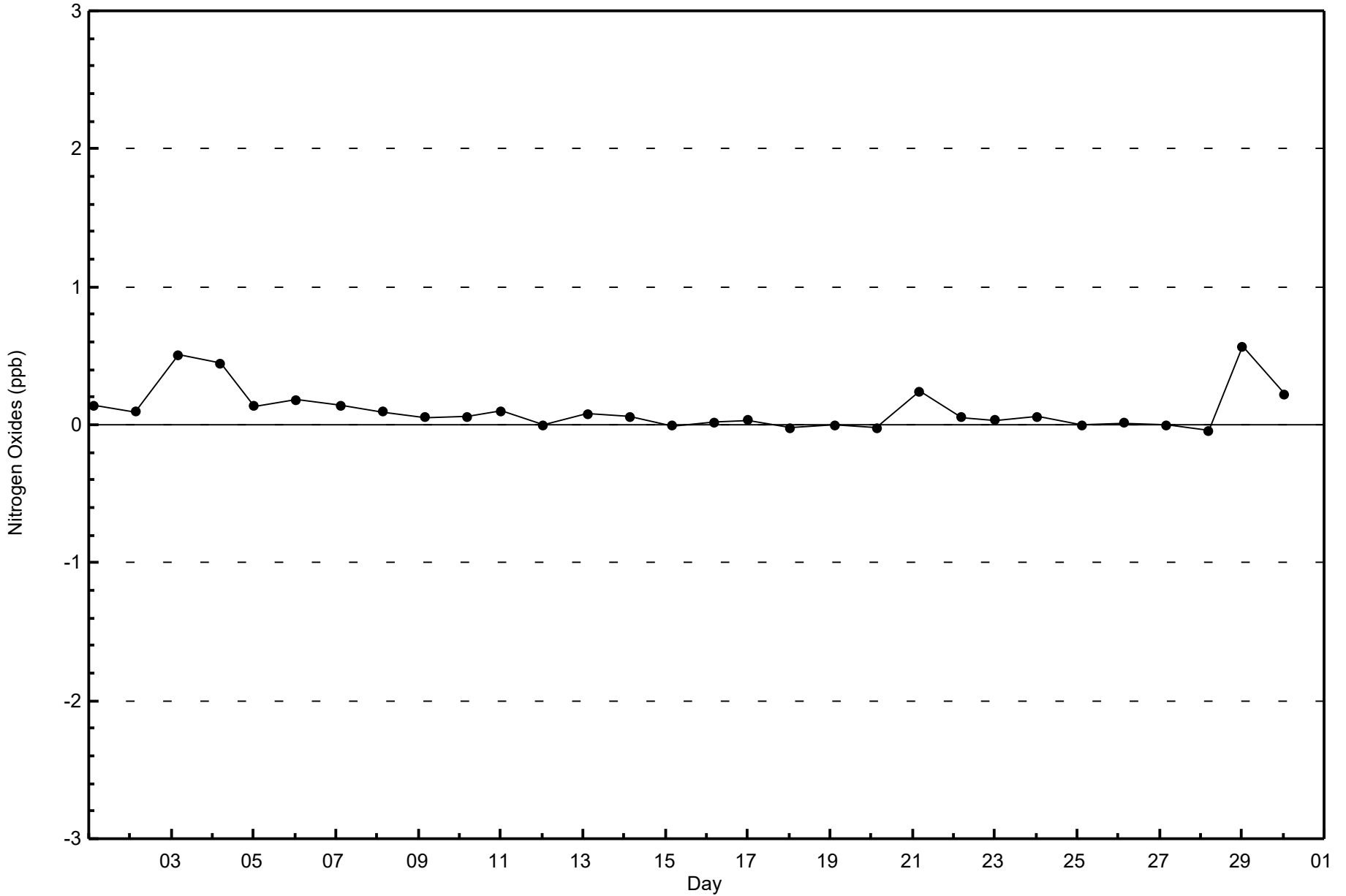
Total Number of Hours: 720

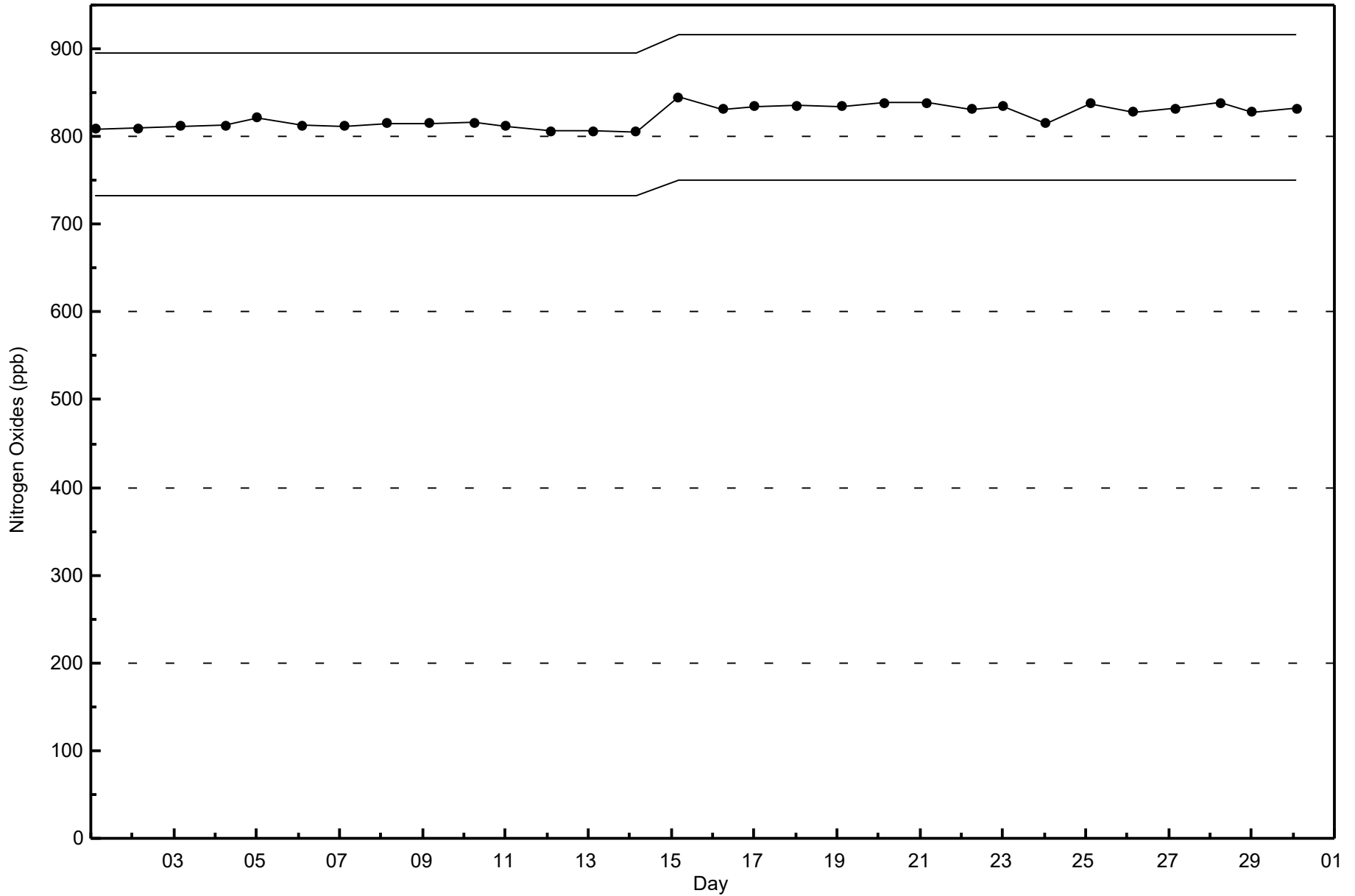


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitrogen Oxides (NO_x) - ppb
Mackay River





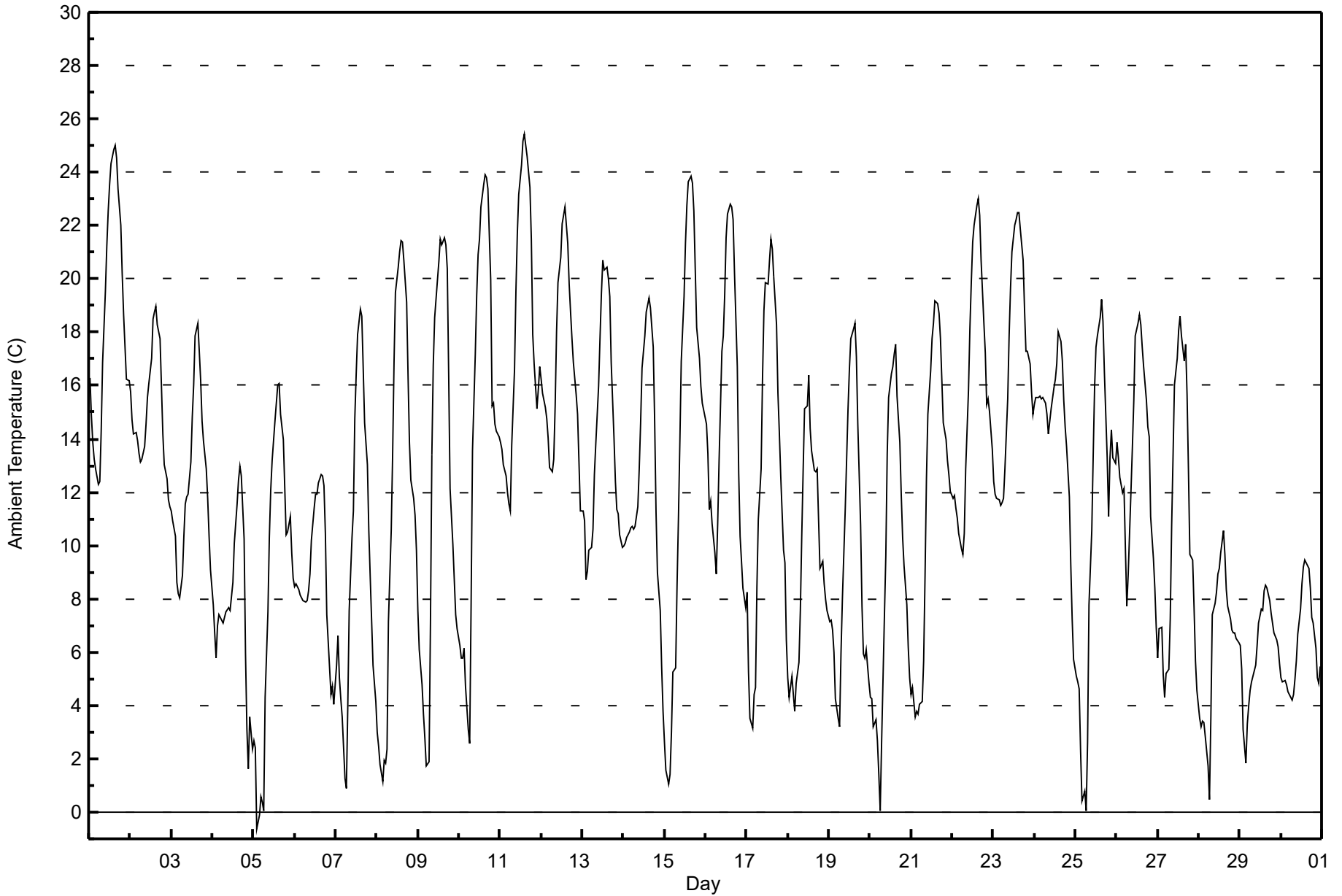




Wood Buffalo Environmental Association
Summary of Hour Averages

Ambient Temperature (AT) - C
Mackay River - September 2023

Maximum Value: 25.4 C on Sep 11 15:00 Maximum Daily Average: 18.6 C on Sep 1																						Hours in Service: 720 Hours of Data: 720				
Minimum Value: -0.6 C on Sep 5 03:00 Minimum Daily Average: 6.1 C on Sep 29 Maximum Diurnal Average: 18.5 C at hour 15 Minimum Diurnal Average: 6.6 C at hour 7 Monthly Average: 12.08 C Percentiles: P ₁ = 0.5 P ₁₀ = 4.3 Q ₁ = 7.4 Median = 12.1 Q ₃ = 16.6 P ₉₀ = 20.2 P ₉₉ = 24.3																						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-Sep	16.3	14.9	13.9	13.2	12.9	12.3	12.4	14.3	16.9	19.5	21.2	22.5	23.5	24.3	24.9	25.0	24.5	23.4	22.0	20.2	18.6	17.5	16.2	16.2	18.6	25.0
2-Sep	15.7	14.7	14.2	14.2	13.9	13.5	13.1	13.2	13.7	14.5	15.6	16.1	17.0	18.5	18.7	19.0	18.3	17.7	16.0	14.2	13.0	12.5	11.7	11.4	15.0	19.0
3-Sep	11.3	10.9	10.3	8.6	8.2	8.0	8.9	10.3	11.6	11.8	11.9	13.1	14.8	16.0	17.8	18.4	17.3	16.2	14.7	13.9	12.9	11.8	10.4	9.1	12.4	18.4
4-Sep	7.8	6.7	5.8	7.0	7.4	7.2	7.1	7.3	7.5	7.7	7.6	8.1	8.6	10.1	11.5	12.5	13.0	12.6	10.3	5.9	3.1	1.7	3.6	2.4	7.6	13.0
5-Sep	2.7	2.4	-0.6	-0.1	0.6	0.4	0.1	4.3	7.5	10.3	12.1	13.2	14.7	15.4	16.0	16.1	14.9	14.0	12.2	10.4	10.5	11.1	9.7	8.8	8.6	16.1
6-Sep	8.5	8.6	8.4	8.1	8.0	7.9	7.9	7.9	8.3	8.9	10.2	11.4	11.9	11.9	12.3	12.7	12.6	12.3	10.5	7.4	5.4	4.4	4.7	4.0	8.9	12.7
7-Sep	5.5	6.6	5.1	4.2	3.5	1.3	0.9	4.0	7.6	10.3	11.3	14.8	16.4	17.9	18.9	18.6	16.6	14.6	13.0	10.6	8.8	7.2	5.5	4.1	9.5	18.9
8-Sep	3.0	2.4	1.8	1.1	1.9	1.8	2.4	7.2	10.5	13.4	16.8	19.5	20.4	21.0	21.4	21.4	20.7	19.1	16.4	13.9	12.4	11.8	11.2	9.8	11.7	21.4
9-Sep	7.6	6.1	4.8	3.7	2.8	1.7	1.9	7.1	13.4	16.8	18.6	20.0	20.6	21.5	21.3	21.5	21.3	20.4	16.4	12.2	10.0	8.7	7.4	6.9	12.2	21.5
10-Sep	6.2	5.8	5.8	6.2	4.7	3.1	2.6	7.7	13.5	17.2	19.4	20.9	21.5	22.7	23.6	23.9	23.8	23.4	20.0	15.2	15.4	14.5	14.3	14.1	14.4	23.9
11-Sep	13.9	13.6	13.0	12.6	12.0	11.5	11.3	13.8	16.6	19.6	21.7	23.2	24.3	25.2	25.4	25.0	24.6	23.4	21.5	17.9	16.8	15.1	15.9	16.7	18.1	25.4
12-Sep	16.2	15.7	15.2	14.7	14.0	12.9	12.8	13.2	15.2	18.0	19.8	20.8	22.1	22.4	22.7	21.4	19.8	18.7	17.7	16.9	15.6	14.9	13.1	11.3	16.9	22.7
13-Sep	11.3	10.9	8.7	9.0	9.8	9.9	10.6	12.7	13.8	16.0	17.7	19.4	20.7	20.3	20.4	20.0	19.3	16.9	14.1	12.4	11.4	11.2	10.4	10.0	14.0	20.7
14-Sep	10.0	10.1	10.3	10.5	10.7	10.7	10.6	10.7	11.4	12.9	14.6	16.6	17.9	18.8	19.0	19.3	18.9	17.4	14.7	11.2	9.0	7.5	5.4	3.8	12.6	19.3
15-Sep	2.6	1.6	1.0	1.4	3.0	5.2	5.4	8.5	11.0	13.9	16.9	19.3	21.4	22.7	23.6	23.9	23.6	22.5	20.3	18.2	17.0	15.9	15.3	15.1	13.7	23.9
16-Sep	14.5	13.4	11.3	11.7	10.8	9.7	8.9	10.8	13.2	17.3	17.9	19.4	21.5	22.4	22.8	22.7	22.2	20.2	16.7	12.7	10.4	9.4	8.4	7.7	14.8	22.8
17-Sep	8.2	5.3	3.5	3.2	4.4	4.7	8.5	11.0	12.9	16.3	18.8	19.8	19.8	20.7	21.5	21.1	20.1	18.3	15.7	14.2	12.6	9.8	9.4	6.5	12.8	21.5
18-Sep	5.1	4.3	5.1	4.4	3.8	4.8	5.6	7.6	10.4	12.8	15.1	15.2	16.4	14.4	13.6	12.8	12.7	12.9	11.0	9.1	9.4	8.6	8.0	7.6	9.6	16.4
19-Sep	7.1	7.2	6.8	6.0	4.3	3.5	3.2	5.9	8.0	11.3	13.2	15.1	16.6	17.8	18.1	18.3	17.1	14.6	10.8	7.7	5.9	5.8	6.1	4.8	9.8	18.3
20-Sep	4.3	4.2	3.2	3.5	2.7	1.4	0.1	2.6	7.4	9.6	13.5	15.6	16.5	16.7	17.2	17.5	15.6	13.9	11.9	10.3	9.3	7.8	6.2	5.0	9.0	17.5
21-Sep	4.4	4.7	3.6	3.8	3.7	4.1	4.1	5.7	8.9	12.5	14.9	16.5	17.8	18.3	19.2	19.1	18.7	17.8	16.2	14.6	14.0	13.2	12.6	12.0	11.7	19.2
22-Sep	11.8	11.9	11.4	11.1	10.4	9.9	9.6	10.5	12.9	15.8	18.1	19.9	21.4	22.0	22.7	23.0	22.4	20.7	18.4	17.2	15.3	15.5	15.0	13.6	15.8	23.0
23-Sep	12.4	11.9	11.7	11.7	11.5	11.6	11.8	12.9	15.5	17.8	19.6	21.0	22.0	22.2	22.5	22.5	21.9	20.7	18.9	17.3	17.3	16.8	15.7	14.9	16.8	22.5
24-Sep	15.3	15.6	15.6	15.6	15.5	15.6	15.4	14.9	14.2	14.7	15.1	15.9	16.2	16.8	18.0	17.7	16.9	15.4	14.5	13.7	11.8	9.3	7.3	5.8	14.4	18.0
25-Sep	5.1	4.9	4.6	2.3	0.4	0.8	0.1	2.6	7.8	10.6	13.4	15.9	17.5	17.8	18.5	19.2	18.4	16.5	13.3	11.1	13.3	14.3	13.3	13.1	10.6	19.2
26-Sep	13.9	13.3	12.6	12.0	12.1	9.9	7.7	9.0	12.1	13.7	15.4	17.9	18.3	18.6	18.3	17.5	16.7	15.5	14.5	14.1	11.1	9.5	8.4	7.0	13.3	18.6
27-Sep	5.8	6.9	6.9	5.1	4.3	5.2	5.4	7.3	10.7	13.4	16.0	17.0	18.0	18.6	17.9	16.9	17.6	15.7	12.8	9.7	9.5	7.7	5.7	4.6	10.8	18.6
28-Sep	3.5	3.2	3.4	3.4	2.8	1.7	0.5	3.5	7.4	7.8	8.2	8.9	9.1	9.7	10.6	9.7	8.4	7.7	7.3	6.8	6.7	6.7	6.5	6.4	6.3	10.6
29-Sep	6.2	5.3	3.1	1.9	3.3	4.0	4.6	4.9	5.3	5.5	6.2	7.1	7.6	7.6	8.3	8.5	8.4	8.0	7.5	7.1	6.7	6.5	6.2	5.6	6.1	8.5
30-Sep	5.0	4.9	4.9	4.8	4.5	4.4	4.2	4.4	5.0	5.7	6.7	7.6	8.5	9.2	9.4	9.3	9.1	8.4	7.3	7.1	6.1	5.1	4.8	5.5	6.3	9.4
																								Diurnal Average		
																								Diurnal Maximum		





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Mackay River - September 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	2	0.28	0.28
0 - 10	275	38.19	38.47
10 - 20	367	50.97	89.44
> 20	76	10.56	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720

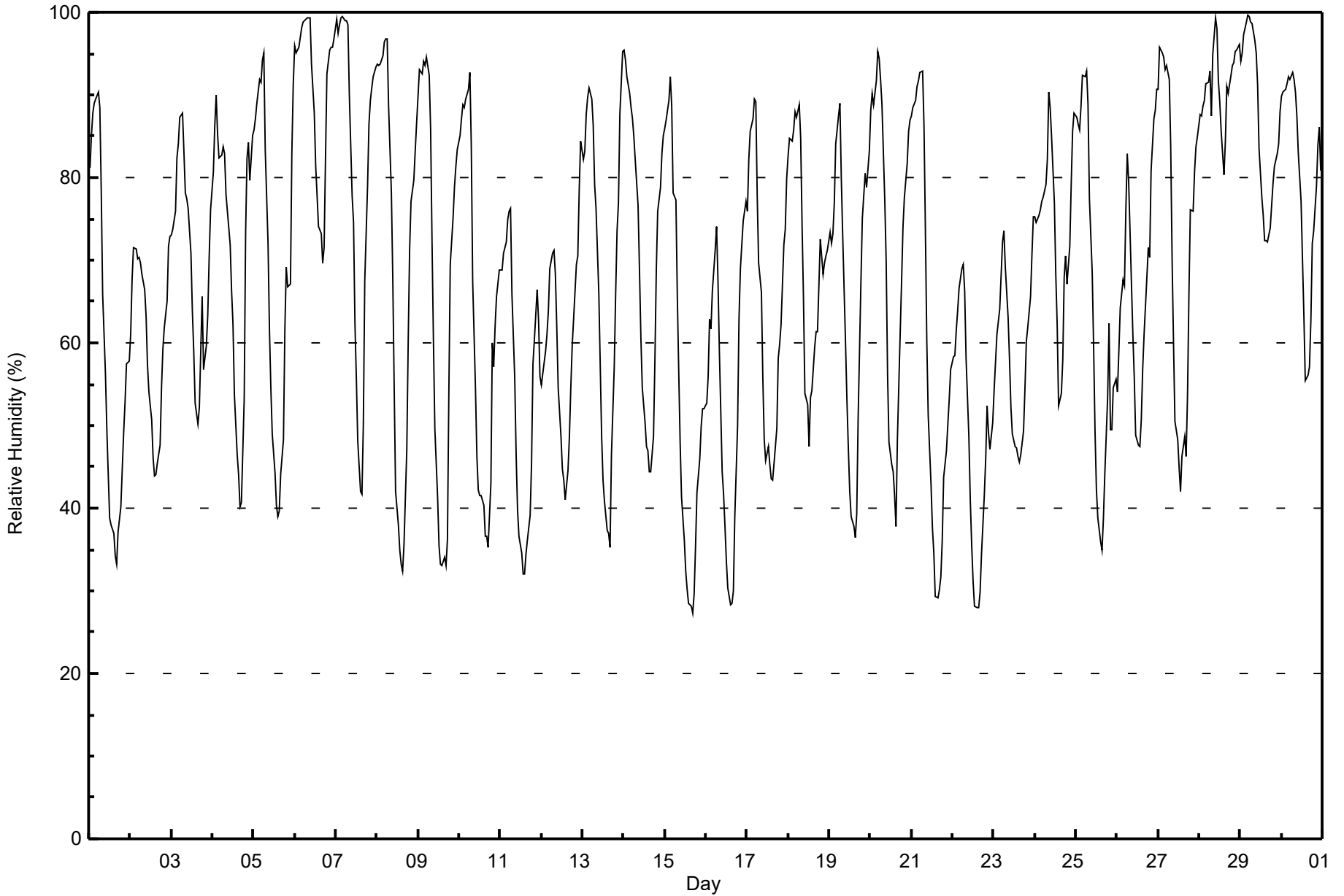


Wood Buffalo Environmental Association

Summary of Hour Averages

**Relative Humidity (RH) - %
Mackay River - September 2023**

Maximum Value: 99.7 % on Sep 29 05:00																								Hours in Service: 720																								
Maximum Daily Average: 91.1 % on Sep 28																								Hours of Data: 720																								
Minimum Value: 27.3 % on Sep 15 17:00																								Hours of Missing Data: 0																								
Minimum Daily Average: 48.4 % on Sep 22																								Hours of Calibration: 0																								
Maximum Diurnal Average: 86.3 % at hour 6																								Percent Operational Time: 100.0																								
Minimum Diurnal Average: 44.3 % at hour 15																																																
Monthly Average: 67.85 %																																																
Percentiles: P ₁ = 28.6 P ₁₀ = 40.2 Q ₁ = 50.6 Median = 69.7 Q ₃ = 85.6 P ₉₀ = 92.5 P ₉₉ = 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-Sep	81.2	85.0	87.7	88.9	89.5	90.3	88.4	78.4	65.9	56.2	49.4	44.1	38.9	37.9	37.0	34.3	33.3	37.0	40.2	44.8	49.2	52.9	57.5	57.7	59.4	90.3																						
2-Sep	61.0	67.6	71.6	71.4	70.2	70.4	69.7	68.3	66.4	63.3	57.3	54.0	50.7	46.0	44.0	44.0	45.5	47.6	54.6	59.3	61.9	65.1	71.7	72.9	60.6	72.9																						
3-Sep	73.0	73.8	75.9	82.4	84.1	87.2	87.8	83.0	78.1	77.5	76.2	70.8	63.9	59.0	52.8	50.2	52.2	59.0	65.6	56.8	59.7	63.3	70.3	76.0	69.9	87.8																						
4-Sep	80.8	86.3	89.9	85.2	82.4	82.8	83.7	82.9	78.0	74.0	71.8	66.3	62.2	53.7	46.4	44.1	40.2	40.6	53.2	73.2	82.4	84.3	79.6	85.1	71.2	89.9																						
5-Sep	85.7	87.2	89.0	91.9	91.5	94.2	95.0	83.4	72.0	61.6	54.6	49.0	44.2	40.3	39.0	39.6	44.2	48.3	61.6	69.2	66.8	67.1	83.1	91.3	68.7	95.0																						
6-Sep	96.0	95.1	95.7	96.9	98.2	98.8	99.1	99.3	99.4	99.4	93.7	87.7	81.4	77.8	74.1	73.2	69.7	71.5	82.3	92.6	95.4	95.8	95.8	96.7	90.2	99.4																						
7-Sep	99.2	97.5	98.5	99.3	99.5	99.0	99.0	98.5	90.0	77.8	74.6	62.4	55.7	48.2	42.0	41.6	50.2	67.4	78.9	86.4	89.4	90.8	92.2	93.4	80.5	99.5																						
8-Sep	93.7	93.5	93.7	94.8	96.5	96.9	96.8	88.6	78.1	67.8	54.6	42.0	38.0	34.9	33.2	32.3	35.6	47.1	60.2	71.1	77.1	79.7	83.2	86.6	69.8	96.9																						
9-Sep	89.8	93.0	92.5	94.1	93.6	94.6	92.4	85.8	72.3	60.3	49.6	41.1	35.4	33.2	33.0	34.0	33.0	36.3	53.9	69.5	75.1	78.8	81.4	83.3	66.9	94.6																						
10-Sep	85.0	87.1	88.9	88.5	89.5	90.7	92.8	84.0	67.5	54.5	46.3	42.2	41.5	41.5	40.3	36.6	36.6	35.3	43.0	59.9	57.1	62.0	65.7	68.8	62.7	92.8																						
11-Sep	68.9	68.8	70.8	72.3	74.8	76.0	76.2	65.9	55.7	46.4	39.8	36.6	34.7	32.0	32.0	34.3	36.1	39.2	45.5	57.4	60.4	66.4	62.7	56.0	54.5	76.2																						
12-Sep	54.9	56.3	58.9	61.1	64.0	68.9	70.8	71.3	68.3	61.9	54.7	48.6	44.7	43.4	41.0	44.5	48.6	54.6	59.6	62.8	69.5	70.5	78.4	84.4	60.1	84.4																						
13-Sep	82.2	83.2	87.6	89.7	90.8	89.5	86.3	79.1	76.3	65.9	57.3	48.7	43.4	40.8	37.3	36.9	35.2	46.4	57.1	65.9	73.6	77.0	87.7	95.2	68.0	95.2																						
14-Sep	95.4	94.2	92.2	90.2	88.5	87.2	84.9	82.1	76.7	68.8	60.7	54.5	50.3	47.4	46.9	44.5	44.5	48.7	57.9	68.9	75.9	78.9	82.9	85.1	71.1	95.4																						
15-Sep	86.0	87.0	89.4	92.2	88.7	78.1	77.3	65.6	56.6	48.0	41.4	36.0	32.4	30.1	28.4	28.2	27.3	29.6	35.5	41.9	45.9	49.9	52.1	52.0	54.1	92.2																						
16-Sep	52.8	55.9	63.0	61.7	66.3	71.2	74.0	67.6	59.0	44.4	41.7	37.8	33.6	30.4	28.3	28.4	30.0	39.0	50.0	62.9	69.0	71.9	74.8	77.2	53.8	77.2																						
17-Sep	76.0	82.2	85.6	87.1	89.5	89.1	77.8	69.6	66.2	55.8	48.2	45.8	47.4	45.2	43.6	43.3	45.5	49.7	58.1	59.9	62.1	71.9	73.7	79.9	64.7	89.5																						
18-Sep	82.5	84.8	84.4	85.7	88.0	87.4	88.7	84.7	74.2	65.4	53.8	52.6	47.4	53.5	54.3	59.5	61.4	61.3	67.0	72.5	68.4	69.6	70.5	71.2	70.4	88.7																						
19-Sep	73.3	72.1	73.2	76.9	84.0	87.5	89.0	79.9	72.9	60.0	53.1	47.3	42.1	38.9	37.8	36.5	39.3	50.9	67.4	75.1	77.9	80.5	78.8	83.2	65.7	89.0																						
20-Sep	88.1	90.2	88.7	91.7	95.2	94.4	91.8	88.8	77.3	69.8	56.1	48.0	45.3	44.4	41.4	37.7	48.3	61.2	67.5	74.0	77.6	81.8	85.6	86.9	72.2	95.2																						
21-Sep	87.4	88.5	89.4	91.0	91.6	92.7	92.9	86.1	73.3	60.1	51.2	42.9	37.7	34.7	29.2	29.2	30.2	31.8	36.2	43.7	46.9	50.1	53.2	56.8	59.4	92.9																						
22-Sep	58.3	58.5	61.5	63.9	66.6	68.9	69.6	66.3	58.2	48.6	41.1	35.5	31.2	28.1	28.0	27.9	29.8	34.3	41.5	46.0	52.4	49.1	47.1	50.3	48.4	69.6																						
23-Sep	54.3	57.6	61.1	64.0	68.2	72.2	73.6	69.2	63.0	58.0	52.2	48.9	47.5	47.3	46.3	45.6	46.4	49.3	54.4	60.2	61.8	65.6	70.6	75.2	58.9	75.2																						
24-Sep	75.3	74.5	75.4	76.2	77.2	77.7	79.2	82.2	90.3	88.5	84.9	77.0	68.2	62.2	52.5	53.9	58.0	68.0	70.5	67.1	71.6	79.1	85.6	87.7	74.3	90.3																						
25-Sep	87.4	86.4	85.8	88.6	92.4	92.2	93.0	88.8	77.5	68.5	59.6	49.2	42.3	38.8	35.9	35.0	38.9	44.2	53.4	62.4	49.6	49.5	54.6	55.7	63.7	93.0																						
26-Sep	54.1	59.1	64.2	67.7	67.0	76.0	82.9	79.5	67.2	61.0	55.7	48.8	47.7	47.5	50.6	56.8	61.1	68.0	71.6	70.4	80.8	87.2	88.1	90.7	66.8	90.7																						
27-Sep	90.7	95.7	95.1	94.6	93.1	93.6	91.9	83.7	70.0	60.1	50.5	48.3	44.9	42.1	46.4	48.7	46.3	53.8	66.0	76.2	76.0	80.7	83.7	85.0	71.5	95.7																						
28-Sep	87.6	87.5	88.6	89.3	91.4	91.6	92.9	87.4	94.9	99.3	98.0	91.6	89.1	85.6	80.3	84.4	91.0	90.1	92.4	93.6	93.9	95.2	95.4	96.1	91.1	99.3																						
29-Sep	94.1	95.0	97.2	98.7	99.7	99.5	98.9	98.6	96.6	95.0	91.2	83.5	77.6	75.5	72.4	72.4	72.1	74.0	76.7	79.3	81.4	82.8	84.1	88.0	86.8	99.7																						
30-Sep	89.9	90.3	90.7	91.4	92.2	91.8	92.7	91.9	90.4	87.5	83.1	77.1	70.2	63.4	55.4	56.2	57.1	62.8	72.1	73.6	78.9	83.8	86.1	80.8	79.6	92.7																						
																								79.5	81.1	82.9	84.2	85.5	86.3	86.3	81.4	74.4	66.8	60.1	54.0	49.6	46.8	44.3	44.5	46.3	51.6	59.8	66.6	69.6	72.7	75.9	78.3	Diurnal Average
																								99.2	97.5	98.5	99.3	99.7	99.5	99.1	99.3	99.4	99.4	98.0	91.6	89.1	85.6	80.3	84.4	91.0	90.1	92.4	93.6	95.4	95.8	95.8	96.7	Diurnal Maximum





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Mackay River - September 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	71	9.86	9.86
40 - 60	192	26.67	36.53
60 - 80	217	30.14	66.67
80 - 100	240	33.33	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720

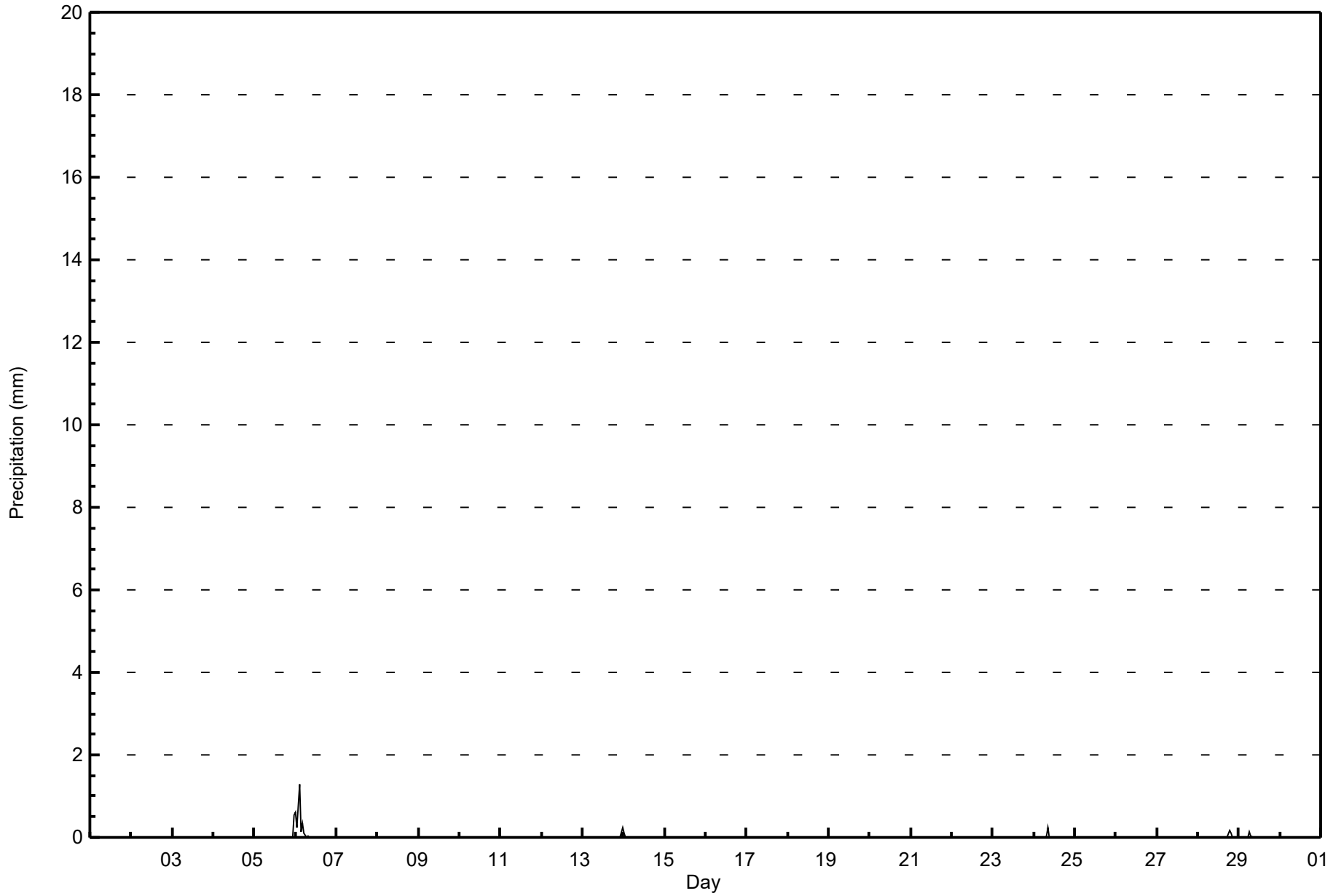


Maximum Value: 1.3 mm on Sep 6 03:00		Maximum Daily Total: 2.8 mm on Sep 6		Hours in Service: 720																													
Minimum Value: 0.0 mm on Sep 1 01:00		Minimum Daily Total: 0.0 mm on Sep 1		Hours of Data: 720																													
Maximum Diurnal Total: 1.3 mm at hour 3		Minimum Diurnal Total: 0.0 mm at hour 10		Hours of Missing Data: 0																													
Monthly Total: 4.38 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 = 0.2		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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.5
6-Sep	0.6	0.3	1.3	0.1	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	1.3	
7-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2
14-Sep	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
15-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3
25-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.2
29-Sep	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	0.2	0.2	0.2
30-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.7	0.3	1.3	0.1	0.3	0.1	0.2	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.8			Diurnal Average					
		0.6	0.3	1.3	0.1	0.3	0.1	0.2	0.1	0.3	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	0.5			Diurnal Maximum						



Wood Buffalo Environmental Association
Hourly Averages

Precipitation (PC) - mm
Mackay River - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Precipitation (PC) - mm
Mackay River - September 2023

Concentration Ranges (mm)	Number of Hours	%	Cumulative %
0 - 0.3	717	99.58	99.58
0.4 - 0.5	1	0.14	99.72
0.6 - 0.7	1	0.14	99.86
0.8 - 1.4	1	0.14	100.00
1.5 - 10	0	0.00	100.00
> 10	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Maximum Speed: 18 km/h on Sep 11 13:00	Maximum Daily Speed Average: 11.0 km/h on Sep 22	Hours in Service: 720
Minimum Speed Value: 0 km/h on Sep 10 07:00	Minimum Daily Speed Average: 1.2 km/h on Sep 20	Hours of Data: 719
Maximum Diurnal Speed Average: 5.7 km/h at hour 14	Minimum Diurnal Speed Average: 2.5 km/h at hour 19	Hours of Missing Data: 1
Monthly Average Velocity: 3.8 km/h 197.2 deg	Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 4 Median = 6 Q ₃ = 8 P ₉₀ = 11 P ₉₉ = 17	Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Sep	W4	WSW5	WSW6	WSW6	WSW6	WSW6	WSW6	WSW7	WSW8	WSW8	WSW11	WSW11	WSW13	SW16	SW16	SW16	SW16	SW14	SW9	SW7	SSW7	SSW6	S7	SSW7	SW8.8	SW16
2-Sep	SW5	W5	WSW5	WSW5	W6	WSW7	WSW6	WSW6	WSW6	W6	W7	WSW8	WSW9	W10	W11	WSW9	W9	W6	WSW4	SW5	SW5	SW6	SW5	WSW5	WSW6.2	W11
3-Sep	SW5	SSW5	SSW4	SSE4	S4	SSE5	SE4	SSW6	SSE5	S7	S9	SSW5	WSW4	SSW9	SW8	W6	NW7	WNW3	W5	WNW7	WNW7	WNW5	WNW5	WNW6	SW3.7	SSW9
4-Sep	W5	WSW5	W6	W6	W9	WNW10	WNW10	WNW9	NW12	WNW11	WNW10	WNW12	WNW12	WNW9	NW10	WNW8	WNW8	WNW8	W3	S2	SSE3	S4	SW5	SSW5	WNW6.6	WNW12
5-Sep	SW5	SW5	SSE3	SSW6	SSW5	S5	S6	S7	SSW8	SSW9	S10	S10	S9	SSE9	S8	S10	SSE6	SE5	ESE2	ESE3	SSW5	SSW5	SE2	ESE3	S5.6	S10
6-Sep	ESE3	ESE5	ESE6	ESE6	ESE6	ESE5	ESE4	SE4	SE4	SSW4	WSW4	WSW6	WSW8	SW8	W6	W7	WSW6	SW5	SSW3	SE1	SE2	SSE2	SSW2	WSW3	S2.3	SW8
7-Sep	W4	WSW3	SW4	SW4	SW3	S2	S3	SSE4	S7	SSW8	S7	SW6	SSW8	WSW8	W8	W8	NE3	SSE2	SSE2	SSE2	SSE3	SSE3	SSE3	SE3	SSW3.1	W8
8-Sep	SE3	SSE4	SSE4	SE4	SSE6	SSE5	SSE4	S5	SW5	SSW7	SSW7	WSW9	W10	W8	W6	W7	NW7	W2	NE2	ENE2	ESE2	SSE1	E1	SE1	SW2.6	W10
9-Sep	ESE2	S1	SE2	SSE2	SSE2	SE2	SE3	SE0	SW1	S3	SE6	SSE6	SE7	ESE6	E5	SSE5	SE6	ESE6	ESE3	SE4	SE5	ESE4	SE4	SE4	SE3.4	SE7
10-Sep	SSE3	SSE4	SSE5	SE6	ESE2	ESE2	ENE0	SE3	SE5	SE5	ESE8	SE10	ESE11	ESE10	SE11	SSE9	SSE8	S7	SSE4	SE4	SE5	SE6	SE7	SE8	SE5.6	ESE11
11-Sep	SE8	SE8	SSE8	SSE8	SE8	SSE7	SE7	SSE9	SSE11	S13	S17	S18	S18	S18	S16	S17	S15	S11	SSE6	SSE4	S5	S5	S7	S9	SSE10.2	S18
12-Sep	S9	S10	S8	S8	S6	SSE6	S6	C	SW5	WSW5	WSW5	WSW5	WSW5	WSW6	W5	WSW5	SW4	SSW3	SW4	SSW6	S5	SSW6	SSW5	SSW4	SSW5.0	S10
13-Sep	SW5	SW5	SSW4	SSW5	SW6	SW6	SW6	SW8	SW7	WSW9	SW10	WSW11	WSW12	SW13	WSW13	WSW12	WSW12	W14	W10	W10	W9	WSW10	WSW9	W8	WSW8.4	W14
14-Sep	W8	W8	W7	W8	W9	W8	W7	W8	WNW10	WNW10	WNW10	WNW13	WNW12	WNW12	WNW10	WNW11	W9	W7	WSW4	SW3	SSW4	SW3	S2	SE3	W7.1	WNW13
15-Sep	SE3	SE3	SE5	SSE5	S7	S7	S7	S9	S10	S10	S11	S12	S12	SSE13	S12	S13	S12	S11	SSE9	SSE9	SSE9	SSE10	S10	S10	S9.0	SSE13
16-Sep	S10	S6	SSW4	S7	S8	S7	SSW5	SSW6	SW6	W6	W6	SW5	SW6	WSW9	SW9	WSW9	SW8	SSW8	S5	S4	SSE5	S6	S6	S7	SSW5.8	S10
17-Sep	SSE6	SE4	SE4	SE5	SE6	ESE6	ESE7	ESE6	SE6	SE8	SSE8	S10	SSW10	SW7	SW7	SW7	SW6	SW4	SSW6	SSW6	SSW5	S5	S5	SSE4	S4.7	S10
18-Sep	SSE4	SSE5	S5	SSE5	SE4	SSE4	SSE4	S4	SW6	W8	W11	W13	W11	WSW11	SW7	SW9	SW9	SSW7	S5	S7	SSW7	SW6	SSW6	SSW8	SW5.5	W13
19-Sep	SSW8	SSW7	SSW7	S7	S6	S6	S6	S6	SSW7	SW8	SW8	SSW9	SW9	WSW7	W7	WSW6	SW4	SSW3	SSE3	S4	S3	WSW3	WSW3	W2	SSW5.3	SW9
20-Sep	WSW2	W3	W2	W2	W3	W2	SW1	WSW3	W3	NW4	N2	NNW7	N8	NNE7	N6	N4	NNE3	W2	ESE1	SE2	SE1	SSE2	SSE4	S5	NNW1.2	N8
21-Sep	S6	S6	S5	S7	S7	S8	S10	S9	S9	S11	S15	SSW16	SSW16	SSW16	SSW16	SSW15	SSW13	SSW12	S9	S9	S10	S10	S9	S9	S10.4	SSW16
22-Sep	S10	S12	S11	S12	S11	S11	S13	S13	S11	S12	S14	S16	S14	S16	S14	S13	S13	S11	SSE7	SSE8	SE7	SSE11	SSE10	SE7	S11.0	S16
23-Sep	SE6	SE7	SE7	SE7	SE7	SE9	SE8	SE9	SE12	SSE14	SSE16	SSE18	SSE18	SSE17	SSE17	SSE17	SSE15	SSE14	SE8	SE7	SE9	SE11	SE8	ESE7	SSE10.8	SSE18
24-Sep	SE9	SE9	SE7	SE8	SE8	SE9	SSE8	SSE7	S6	S7	SSW6	SW6	W5	WSW5	W4	SW2	SSW3	S3	S5	SSW5	SW4	S5	S5	S5	S4.5	SE9
25-Sep	SSW4	SSW5	SSW6	S3	SSE3	S5	S4	S4	SSW3	S1	WNW2	S2	SE5	E6	ESE8	E8	E9	ENE7	NE5	NE4	E7	E12	E11	E12	ESE3.8	E12
26-Sep	ESE14	ESE12	ESE11	SE10	SE8	SE2	SE3	SE3	SSE6	S7	SSW8	S7	S7	S5	S4	SW3	S3	SSE3	SSE2	S4	SE2	WSW2	WSW2	SSW1	SSE4.1	ESE14
27-Sep	SSW2	W4	W2	SSW1	SSW1	W3	WSW3	W3	WSW4	WSW6	WSW7	WSW6	WSW7	SW8	W8	WSW6	WSW6	SSW5	SSW4	S4	SSW5	SW3	WSW2	SSW2	WSW3.8	SW8
28-Sep	SW3	SSW2	S3	SSE1	SW3	SE1	SE1	NNW0	NE4	NE3	NNE5	N7	N7	NNE6	NNE9	NNE8	NNE9	NNE9	NNE8	NNE7	N7	N5	NNW5	NNW4	NNE3.7	NNE9
29-Sep	N5	NNW3	WNW1	NW3	W1	WNW2	NW3	NW4	NW6	NW7	NW8	NNW9	N8	N8	NW8	NW8	NW8	NW6	NW6	NW6	NW5	NW5	NW4	NW0	NW4.9	NNW9
30-Sep	S1	WSW2	SW2	S1	E0	S2	SSE2	S2	SSW3	S3	S3	S3	SSE4	S4	SE5	SSE4	SE4	ESE3	ESE4	SE4	SE4	SE4	SE3	SE4	SSE2.5	SSE5

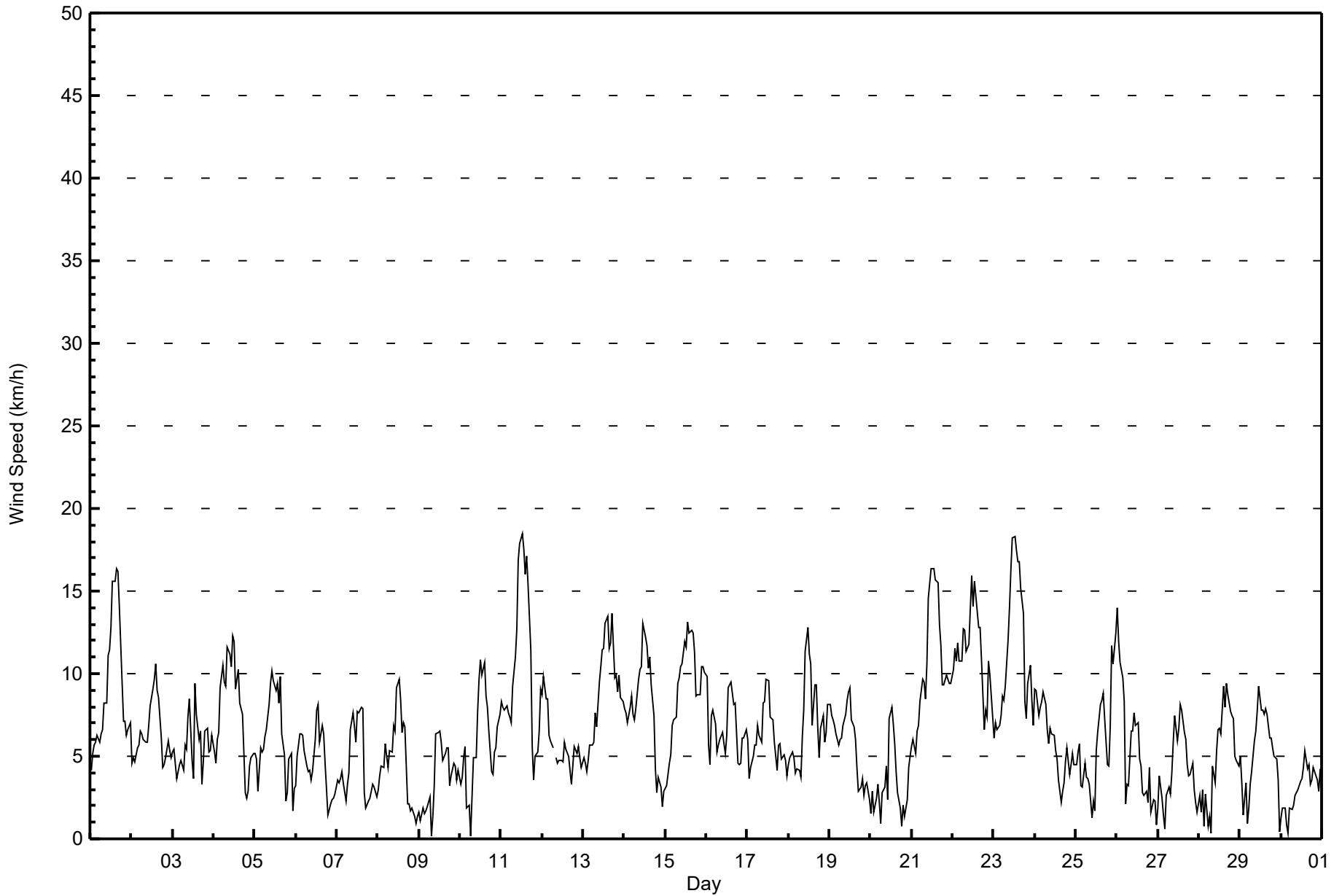
S3.2	S3.3	S3.4	S3.7	S3.5	S3.4	S3.5	SSW3.7	SSW4.1	SSW4.6	SSW5.3	SW5.6	SW5.2	SSW5.7	SW4.8	SW5.1	SW4.0	SSW3.5	S2.5	S2.7	S3.0	S3.5	S3.4	S3.4	Diurnal Average
ESE14	ESE12	S11	S12	S11	S11	S13	S13	SE12	SSE14	S17	SSE18	S18	S18	SSE17	S17	SW16	SW14	W10	W10	S10	E12	E11	E12	Diurnal Maximum

C - Calibration
 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 - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Mackay River - September 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	309	42.98	42.98
6 - 11	343	47.71	90.68
12 - 19	67	9.32	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: 719

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Mackay River - September 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	2	6	2	3	17	45	47	47	36	32	27	23	7	7	4	309
6 - 11	7	8	0	1	5	17	36	26	73	31	30	39	37	19	12	2	343
12 - 19	0	0	0	0	2	2	1	10	26	7	6	5	2	5	1	0	67
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	11	10	6	3	10	36	82	83	146	74	68	71	62	31	20	6	719

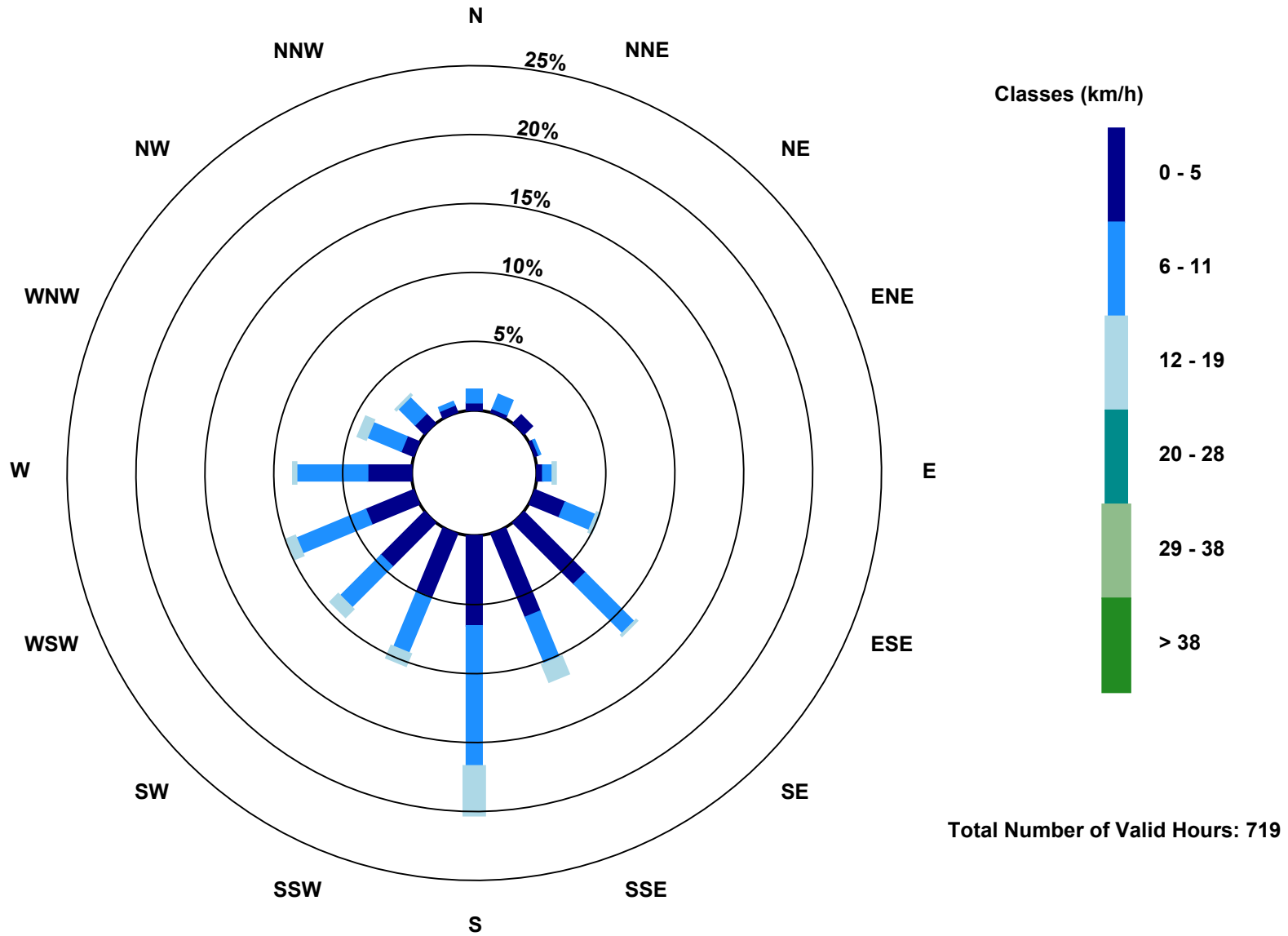
Total Number of Valid Hours: 719

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

Wind Speed (WS) - km/h
Mackay River





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Mackay River - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 7 km/h on Sep 1 17:00	Hours of Data: 719
Minimum Value: 0 km/h on Sep 30 01:00	Hours of Missing Data: 1
Percentiles: P ₁ = 0 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 3 P ₉₀ = 4 P ₉₉ = 6	Hours of Calibration: 1
	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-Sep	2	2	2	2	2	2	3	3	3	4	5	5	6	6	7	7	7	6	4	2	2	2	1	2	7
2-Sep	1	2	2	2	2	3	2	2	2	3	3	3	4	4	4	4	4	3	2	1	2	2	2	2	4
3-Sep	2	2	1	1	1	2	1	3	2	3	2	2	2	3	3	3	2	2	3	2	2	2	1	2	3
4-Sep	2	2	2	3	4	4	3	3	4	4	4	4	4	4	4	3	3	3	2	1	0	2	1	1	4
5-Sep	1	1	1	2	1	2	2	2	3	4	4	3	4	3	3	3	2	2	1	1	3	2	1	1	4
6-Sep	1	1	2	2	1	1	1	1	1	1	2	2	3	3	3	3	3	2	1	1	1	1	0	1	3
7-Sep	1	1	1	1	1	1	1	1	2	2	3	2	3	3	4	4	2	1	1	0	0	1	0	1	4
8-Sep	1	1	1	1	1	1	1	1	2	2	3	4	4	3	3	3	2	2	1	1	1	1	1	1	4
9-Sep	1	1	1	1	1	1	0	1	1	1	2	2	3	2	2	2	2	1	1	1	1	1	1	1	3
10-Sep	1	1	1	1	2	1	1	2	1	2	3	3	3	3	4	3	3	2	1	1	1	1	2	2	4
11-Sep	2	2	2	2	2	2	2	3	4	5	6	6	6	6	5	5	5	5	2	1	1	1	2	3	6
12-Sep	3	3	2	2	2	1	1	C	2	2	2	2	2	2	2	2	2	1	1	2	1	1	1	1	3
13-Sep	2	1	1	1	2	2	2	3	2	4	4	5	5	5	6	5	6	6	5	4	4	4	3	4	6
14-Sep	3	3	3	3	3	3	3	3	3	4	4	5	4	5	4	4	3	4	2	1	1	1	0	1	5
15-Sep	0	1	1	1	2	2	2	2	3	3	3	4	4	4	4	4	4	4	3	3	3	3	3	3	4
16-Sep	3	3	2	2	2	2	1	2	2	3	2	2	3	4	4	4	3	3	1	1	1	1	1	1	4
17-Sep	1	1	1	1	1	2	2	1	2	3	3	4	3	3	3	3	2	2	1	2	1	1	1	1	4
18-Sep	1	1	1	1	1	2	1	1	2	4	5	5	5	5	3	4	4	2	1	2	2	2	2	2	5
19-Sep	3	2	2	2	2	1	1	2	2	3	3	3	4	3	3	3	2	1	0	1	1	1	1	1	4
20-Sep	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	1	1	1	1	1	1	1	2
21-Sep	1	1	1	1	1	2	2	2	2	4	5	6	6	6	6	6	5	4	3	3	3	3	3	2	6
22-Sep	3	3	3	3	3	3	3	4	4	4	5	5	5	5	5	5	4	4	2	3	2	3	3	2	5
23-Sep	2	2	2	2	2	2	2	2	4	4	6	6	6	6	6	6	5	5	2	2	3	3	2	2	6
24-Sep	3	3	2	2	2	3	3	2	2	2	3	2	2	2	2	1	1	1	1	2	1	1	1	1	3
25-Sep	1	1	1	1	1	1	1	2	1	1	1	2	2	3	3	3	3	2	1	1	3	3	3	4	4
26-Sep	4	3	3	3	3	1	1	1	3	2	3	2	2	2	1	1	1	1	2	1	1	1	1	1	4
27-Sep	1	1	1	1	1	1	1	1	1	2	3	2	3	3	4	3	3	1	1	1	1	1	1	1	4
28-Sep	1	1	1	1	1	1	1	1	2	2	2	2	2	2	3	2	3	3	3	2	2	2	1	1	3
29-Sep	2	1	1	1	1	1	1	1	2	2	2	3	3	3	2	2	2	2	2	2	1	1	1	1	3
30-Sep	0	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	2	2

Diurnal Maximum

C - Calibration



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Mackay River - September 2023

Direction of Maximum Speed: 171 deg on Sep 11 13:00		Hours in Service: 720
Direction of Maximum Daily Speed Average: 176.7 deg on Sep 22		Hours of Data: 719
Direction of Minimum Speed: 64 deg on Sep 10 07:00	Direction of Minimum Daily Speed Average: 1.2 deg on Sep 20	Hours of Missing Data: 1
Monthly Average Direction: 197.2 deg		Percent Operational Time: 100.0

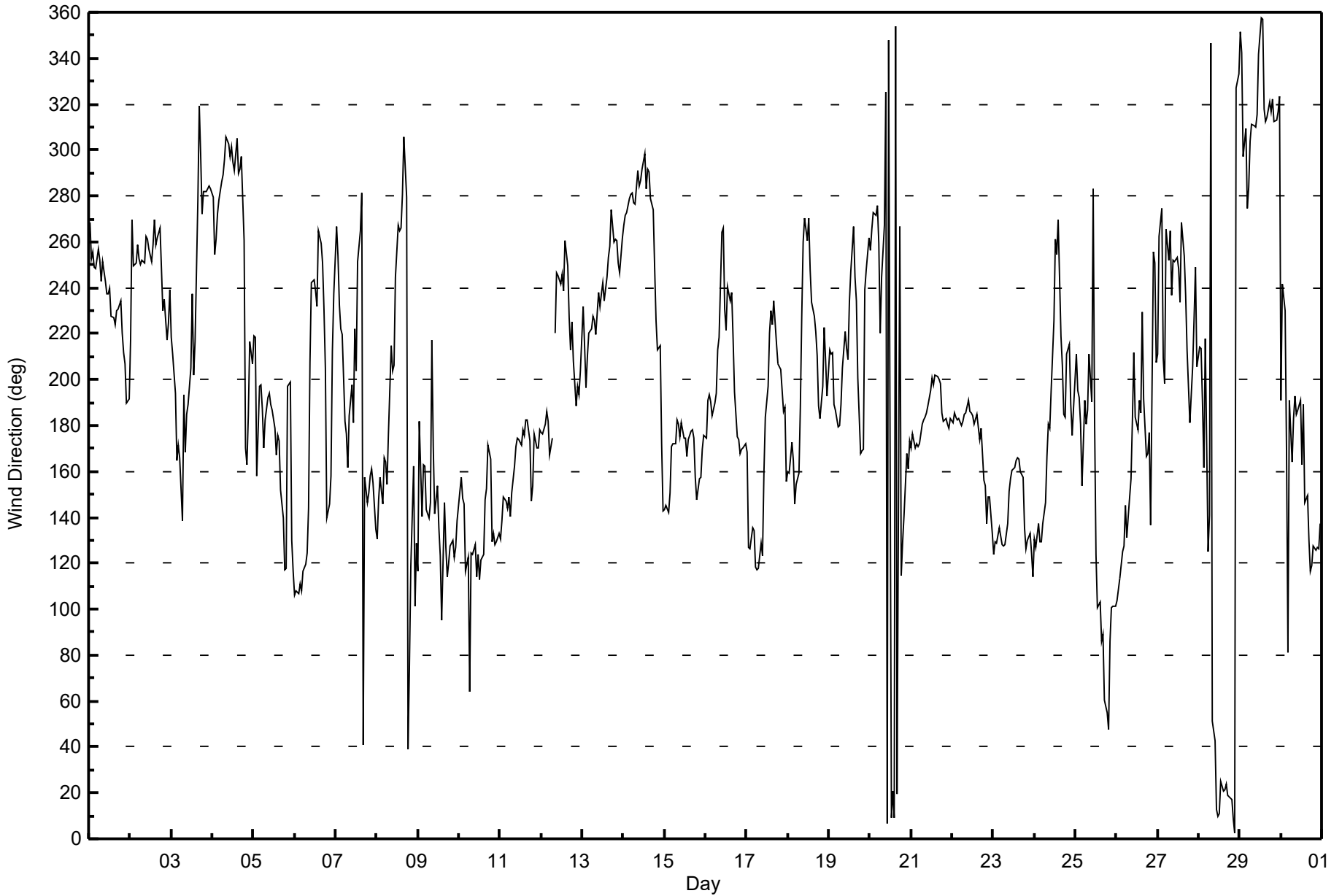
Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Sep	269	252	255	249	249	257	252	243	251	243	237	237	240	227	227	224	230	231	234	220	212	207	190	192	232.8
2-Sep	218	270	250	251	259	252	250	252	251	262	261	257	251	259	269	258	262	266	248	230	235	217	224	239	251.8
3-Sep	218	211	194	165	172	166	138	193	168	185	189	205	238	202	217	278	319	298	272	282	282	283	284	283	225.8
4-Sep	279	254	261	272	278	286	289	296	306	303	297	301	295	291	305	290	292	297	260	170	163	184	217	207	284.2
5-Sep	219	219	158	197	197	187	170	182	192	194	189	187	179	167	176	173	152	139	117	118	197	199	130	117	179.7
6-Sep	106	108	107	111	108	116	120	125	144	207	242	243	238	232	265	259	251	231	205	140	146	158	212	237	187.7
7-Sep	267	254	233	222	219	182	176	161	184	198	181	222	204	251	265	281	41	157	147	151	158	161	155	135	208.3
8-Sep	130	148	158	146	166	164	154	176	215	204	206	245	267	265	266	281	305	279	39	76	119	162	101	129	215.2
9-Sep	116	182	140	163	162	143	140	146	217	171	141	154	136	123	95	147	127	114	120	128	130	122	127	138	134.8
10-Sep	151	157	148	146	117	123	64	125	124	128	114	124	113	121	124	147	153	171	165	129	133	128	129	133	133.4
11-Sep	131	138	149	147	144	149	141	151	162	171	175	174	171	178	176	183	183	173	147	154	177	170	170	178	166.3
12-Sep	177	176	181	186	182	167	174	C	221	247	245	242	246	239	260	249	227	213	225	208	188	197	193	204	205.6
13-Sep	232	215	196	210	220	222	227	226	220	238	232	237	242	234	245	253	258	274	260	261	260	251	246	262	243.0
14-Sep	267	272	273	279	281	281	277	277	291	284	287	292	299	283	292	290	279	274	249	226	213	215	172	143	278.4
15-Sep	143	145	142	151	171	172	172	182	181	175	181	175	174	167	174	177	178	174	157	148	157	158	170	175	169.7
16-Sep	175	191	193	190	184	190	194	213	218	264	266	230	222	240	234	238	218	195	175	174	168	170	170	172	204.6
17-Sep	168	127	126	135	135	118	117	118	129	124	159	184	197	220	230	224	234	216	207	206	204	186	188	156	173.0
18-Sep	160	159	173	165	146	155	159	188	228	260	271	260	270	248	234	227	221	210	189	183	197	223	208	193	217.7
19-Sep	213	211	212	189	187	179	180	189	205	221	214	209	234	247	266	245	235	201	168	169	169	239	248	262	213.1
20-Sep	256	266	273	272	276	259	220	245	267	325	7	348	9	21	9	354	19	267	114	130	141	168	161	174	326.7
21-Sep	171	176	170	172	171	172	181	183	184	186	189	195	201	198	202	201	200	198	185	182	183	181	179	183	188.2
22-Sep	181	186	184	183	183	180	182	185	186	191	186	186	184	181	185	179	174	179	156	154	137	149	149	133	176.7
23-Sep	124	130	129	135	132	128	128	128	137	151	157	161	161	165	166	165	160	157	136	127	130	133	125	114	146.4
24-Sep	131	127	137	129	129	137	147	167	181	179	195	226	261	255	270	219	206	185	184	211	215	189	175	188	172.0
25-Sep	211	196	192	181	154	191	181	187	211	190	283	182	124	101	103	86	89	60	55	47	86	101	101	101	116.3
26-Sep	103	108	114	125	127	145	131	140	157	183	212	184	178	191	186	229	191	167	168	177	137	255	251	208	151.9
27-Sep	211	262	274	209	198	265	252	265	237	252	252	253	248	234	268	254	237	213	197	181	205	226	249	206	240.5
28-Sep	214	213	190	161	218	125	141	347	51	42	13	10	11	25	20	21	24	19	18	17	8	3	327	333	15.0
29-Sep	351	342	297	310	275	284	304	311	311	310	316	342	357	357	318	312	314	321	317	322	313	313	316	323	323.0
30-Sep	191	242	230	169	81	191	164	183	193	185	187	191	163	189	146	150	130	117	119	127	126	127	126	137	155.7

179.3 183.7 178.5 178.1 180.7 182.3 180.4 191.7 199.9 209.1 210.1 214.9 215.1 213.3 221.4 221.5 214.0 205.6 189.5 178.7 178.4 178.8 178.1 173.4

Diurnal Average

C - Calibration

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





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Mackay River - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 100 deg on Sep 25 12:00	Hours of Data: 719
Minimum Value: 8 deg on Sep 7 20:00	Hours of Missing Data: 1
Percentiles: P ₁ = 11 P ₁₀ = 18 Q ₁ = 22 Median = 28 Q ₃ = 41 P ₉₀ = 51 P ₉₉ = 80	Hours of Calibration: 1
	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-Sep	53	53	50	46	43	47	46	50	44	56	42	44	45	39	41	39	40	42	44	29	24	21	17	18	56
2-Sep	37	49	56	52	54	53	50	51	46	55	50	51	51	52	44	51	51	51	50	37	41	31	37	50	56
3-Sep	29	25	35	21	21	32	20	63	34	38	22	48	52	32	38	55	25	39	35	30	30	27	22	25	63
4-Sep	37	45	49	42	39	32	29	30	27	26	30	25	31	40	36	46	40	28	46	25	19	24	22	18	49
5-Sep	26	25	35	27	20	20	17	21	28	30	35	35	41	35	38	29	30	24	18	17	31	27	74	27	74
6-Sep	23	17	18	18	18	20	23	23	29	45	50	46	46	40	50	48	52	38	22	31	18	19	23	24	52
7-Sep	44	45	34	28	25	39	21	22	22	28	43	48	43	53	52	52	49	28	22	8	15	30	21	16	53
8-Sep	17	16	20	18	15	18	18	24	36	33	42	44	43	45	55	43	34	60	43	33	18	46	53	29	60
9-Sep	34	56	49	72	51	29	13	96	76	51	39	48	48	49	58	57	33	22	12	10	10	11	11	17	96
10-Sep	23	15	11	13	50	12	88	59	26	33	30	28	26	31	29	37	29	32	25	17	21	21	20	21	88
11-Sep	21	23	25	25	24	25	25	29	27	29	28	27	29	31	30	27	27	26	25	25	20	14	22	24	31
12-Sep	24	22	22	20	20	18	22	C	41	42	49	54	54	49	46	55	33	26	36	23	18	19	18	19	55
13-Sep	33	26	23	22	27	28	33	35	30	40	42	45	47	44	49	46	49	35	44	43	51	47	47	40	51
14-Sep	43	42	38	33	26	31	34	35	27	32	35	29	29	35	37	33	39	41	41	26	19	22	44	16	44
15-Sep	14	12	13	11	16	18	20	22	23	24	30	27	27	27	30	26	26	26	27	24	28	26	27	23	30
16-Sep	24	60	52	20	19	20	19	23	31	47	53	59	50	46	46	47	41	24	13	11	9	11	10	11	60
17-Sep	20	15	11	10	15	13	16	16	24	25	36	32	36	45	42	40	39	29	18	23	25	19	20	19	45
18-Sep	15	18	16	19	23	26	25	37	37	48	43	41	44	47	41	36	34	28	22	16	20	37	22	18	48
19-Sep	29	25	24	22	17	14	14	24	26	39	38	41	40	54	44	47	41	19	16	18	23	27	41	38	54
20-Sep	29	14	28	21	14	25	40	29	42	35	77	34	28	32	40	54	36	61	85	64	69	32	13	11	85
21-Sep	10	13	13	12	14	17	17	19	23	27	26	27	30	28	30	29	29	24	22	21	22	21	21	19	30
22-Sep	22	22	20	20	20	20	20	21	23	26	27	25	31	26	26	29	25	23	26	27	23	24	27	22	31
23-Sep	21	21	22	23	22	20	20	19	22	26	28	28	27	30	27	29	28	28	24	21	23	23	21	20	30
24-Sep	21	21	23	21	20	22	27	29	23	27	29	41	48	51	61	48	26	16	13	22	24	18	14	19	61
25-Sep	18	17	20	31	30	21	31	38	43	92	75	100	58	42	30	36	31	29	33	26	34	22	22	21	100
26-Sep	20	18	19	18	22	56	32	31	27	26	37	39	32	40	38	47	49	59	80	23	51	28	34	66	80
27-Sep	50	45	37	58	74	58	41	65	43	46	41	47	45	48	41	51	48	21	13	14	19	23	28	34	74
28-Sep	33	38	30	72	32	63	51	85	40	45	35	28	26	37	27	26	25	27	25	24	26	26	18	21	85
29-Sep	22	26	62	13	47	32	27	18	19	18	20	25	28	27	26	22	21	21	19	18	17	16	20	65	65
30-Sep	40	18	50	72	93	26	38	32	23	25	32	30	37	38	38	32	23	18	14	15	16	20	26	34	93

53	60	62	72	93	63	88	96	76	92	77	100	58	54	61	57	52	61	85	64	69	47	74	66	
Diurnal Maximum																								

C - Calibration



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

**AMS21
CONKLIN
SEPTEMBER 2023**

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

October 30, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CONKLIN (AMS21)
SEPTEMBER 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	686	34	34	100	1.8	0	0.5	0
TRS(ppb) Average	684	35	36	99.86	1.6	0	1	0
THC(ppm) Average	686	34	34	100	3.2	-	2.4	-
NMHC(ppm) Average	686	34	34	100	0.084	-	0.007	-
CH4(ppm) Average	686	34	34	100	3.2	-	2.4	-
O3 (ppb) Average	685	34	35	99.86	51	0	39.1	-
NO2 (ppb) Average	683	36	37	99.86	13.2	0	3.5	-
NO (ppb) Average	683	36	37	99.86	18.9	-	2.3	-
NOX (ppb) Average	683	36	37	99.86	29.6	-	5.2	-
PM2.5 (ug/m3) Average	717	2	3	99.86	519.4	98	316	14
Temperature 2 m (C) Average	720	0	0	100	24.3	-	18.8	-
Relative Humidity (%) Average	720	0	0	100	98.7	-	88.7	-
Wind Speed 10 m (km/h) Average	720	0	0	100	22	-	14	-
Wind Direction 10 m (deg) Average	720	0	0	100	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CONKLIN (AMS21)
 SEPTEMBER 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	686	0.24	0.3	-	0	0	0.1	0.2	0.3	0.6	1.8
TRS (ppb) Average	684	0.43	0.2	-	0.1	0.3	0.4	0.4	0.5	0.6	1.6
THC (ppm) Average	686	2.16	0.2	-	2	2	2	2.1	2.2	2.4	3.2
NMHC(ppm) Average	686	0	0.004	-	0	0	0	0	0	0	0.084
CH4(ppm) Average	686	2.16	0.2	-	2	2	2	2.1	2.2	2.4	3.2
O3 (ppb) Average	685	22.31	12.6	-	2.8	5.4	10.7	21.7	32.5	38.9	51
NO2 (ppb) Average	683	2.06	1.7	-	0.1	0.6	0.9	1.5	2.6	4.3	13.2
NO (ppb) Average	683	0.85	1.7	-	0	0	0.1	0.3	0.9	2.2	18.9
NOX (ppb) Average	683	2.91	3	-	0.1	0.7	1.2	1.9	3.6	5.9	29.6
PM2.5 (ug/m3) Average	717	48.22	81.9	-	1.9	7.1	13.6	20.6	40.9	106.2	519.4
Temperature 2 m (C) Average	720	11.51	6.3	-	-1.7	2.8	6.5	11.8	16.1	20.2	24.3
Relative Humidity (%) Average	720	72.37	20.5	-	29.1	40.8	55.4	75.4	91.6	96.8	98.7
Wind Speed 10 m (km/h) Average	720	6.2	4	-	0	2	3	5	9	12	22
Wind Direction 10 m (deg) Average	720	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CONKLIN (AMS 21)
SEPTEMBER 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
NO2, O3, TRS	26 Sep 2023 14:00	26 Sep 2023 14:00	1	Maintenance - sample manifold cleaned
PM2.5	26 Sep 2023 17:00	26 Sep 2023 17:00	1	DAS Failure - data not recorded

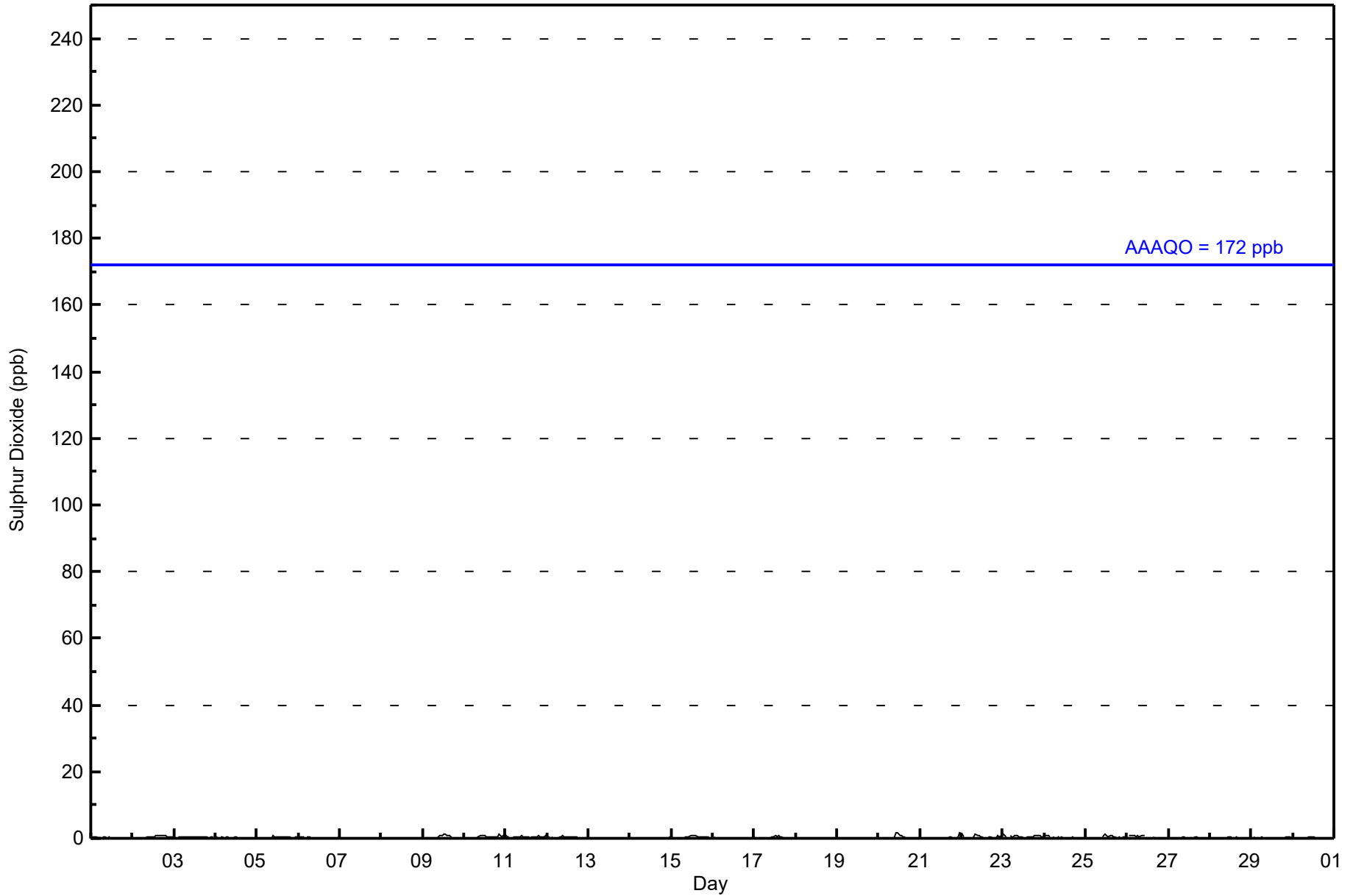


Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0		Hours in Service: 720																										
Maximum Value: 1.8 ppb on Sep 20 11:00		Maximum Daily Average: 0.5 ppb on Sep 23																										
Minimum Value: 0.0 ppb on Sep 8 04:00		Minimum Daily Average: 0.0 ppb on Sep 13																										
Maximum Diurnal Average: 0.4 ppb at hour 11		Minimum Diurnal Average: 0.1 ppb at hour 7																										
Monthly Average: 0.24 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 = 1.2																										
		Hours of Data: 686																										
		Hours of Missing Data: 34																										
		Hours of Calibration: 34																										
		Percent Operational Time: 100.0																										
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24				
1-Sep	0.2	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.2	
2-Sep	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.5	0.5	0.6	0.7	0.8	0.8	0.8	0.8	0.7	0.7	0.6	0.6	0.6	0.6	0.5	0.8	
3-Sep	0.5	Z	0.4	0.5	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.5	0.4	0.3	0.3	0.3	0.5	0.3	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.4	0.6	
4-Sep	0.3	0.2	Z	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.3	
5-Sep	0.2	0.2	0.2	Z	0.1	0.1	0.2	0.1	0.1	0.8	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.6	0.4	0.1	0.1	0.4	0.2	0.3	0.8	0.8	
6-Sep	0.2	0.2	0.3	0.4	Z	0.3	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.4	
7-Sep	0.2	0.2	0.1	0.1	0.1	Z	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	
8-Sep	Z	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.0	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	0.1	0.0	0.1	0.1	
9-Sep	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.8	0.8	1.1	1.2	0.7	0.7	0.3	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.3	1.2	1.2	
10-Sep	0.1	0.0	Z	0.0	0.1	0.0	0.1	0.1	0.3	0.8	1.0	1.0	0.7	0.5	0.4	0.4	0.5	0.5	0.5	0.3	1.3	0.7	0.4	1.4	0.5	1.4	1.4	
11-Sep	1.0	0.4	0.4	Z	0.3	0.4	0.4	0.5	0.5	0.7	0.4	0.4	0.4	0.3	0.2	0.3	0.3	0.4	0.3	0.8	0.4	0.4	0.5	0.8	0.5	1.0	1.0	
12-Sep	0.3	0.3	0.2	0.2	Z	0.1	0.2	0.3	0.4	0.7	0.4	0.3	0.2	0.4	0.5	0.2	0.3	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.2	0.7	0.7	
13-Sep	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	
14-Sep	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.2	
15-Sep	0.2	Z	0.2	0.1	0.2	0.2	0.1	0.1	0.4	0.2	0.4	1.1	0.8	0.9	0.9	0.6	0.3	0.2	0.3	0.3	0.4	0.4	0.1	0.0	0.4	1.1	1.1	
16-Sep	0.1	0.2	Z	0.2	0.2	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	0.0	0.1	0.1	0.2	0.1	0.2	0.2	
17-Sep	0.1	0.1	0.1	Z	0.0	0.0	0.0	0.1	0.0	0.2	0.3	0.4	0.7	0.6	0.7	0.6	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.7	0.7	
18-Sep	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	
19-Sep	0.0	0.0	0.1	0.1	0.0	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	0.0	0.1	
20-Sep	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1.8	1.5	1.0	1.0	0.6	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.3	1.8	1.8	
21-Sep	0.1	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.4	0.5	0.1	0.0	0.0	0.6	1.6	0.2	1.6		
22-Sep	1.2	0.2	Z	0.1	0.0	0.1	0.1	0.3	1.3	0.9	1.0	0.6	0.4	0.1	0.1	0.1	0.3	0.2	0.2	0.1	0.1	0.8	0.5	0.8	0.4	1.3	1.3	
23-Sep	1.1	0.9	0.5	Z	0.8	0.6	0.4	1.0	0.6	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.4	0.8	0.6	0.9	0.7	0.5	0.4	0.5	1.1	1.1	
24-Sep	1.0	1.1	0.8	0.6	Z	0.3	0.1	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.5	0.2	0.1	0.1	0.1	0.0	0.0	0.1	0.3	1.1	1.1	
25-Sep	0.1	0.2	0.2	0.1	0.2	Z	0.2	0.1	0.1	0.1	0.8	1.4	1.0	0.6	0.6	0.7	0.4	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.4	1.4	1.4	
26-Sep	Z	0.7	1.1	1.0	0.8	0.6	0.7	0.6	0.9	1.0	0.8	C	C	C	C	0.2	0.2	0.2	0.1	0.0	0.2	0.1	0.0	0.1	0.5	1.1	1.1	
27-Sep	0.1	Z	0.2	0.2	0.1	0.1	0.1	0.2	0.3	0.3	0.2	0.1	0.2	0.1	0.2	0.4	0.3	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.4	0.4	
28-Sep	0.2	0.2	Z	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.5	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.5	0.5
29-Sep	0.2	0.2	0.2	Z	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.3	0.2	0.2	0.4	0.4
30-Sep	0.2	0.2	0.1	0.1	Z	0.1	0.0	0.1	0.0	0.3	0.6	0.5	0.4	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.6	0.6	0.6
																								Diurnal Average				
																								Diurnal Maximum				
																								0.3 0.2 0.2 0.2 0.2 0.2 0.1 0.2 0.2 0.3 0.4 0.4 0.3 0.3 0.3 0.3 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.3				
																								1.2 1.1 1.1 1.0 0.8 0.6 0.7 1.0 1.3 1.0 1.8 1.5 1.1 1.2 0.9 0.8 0.8 0.8 0.8 0.8 1.3 0.8 0.6 1.6				
Z - zerospan C - Calibration																												
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb																												



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Conklin - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Conklin - September 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	686	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: 686

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Conklin - September 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	17	11	4	4	5	23	55	127	103	79	55	38	44	35	53	33	686
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	17	11	4	4	5	23	55	127	103	79	55	38	44	35	53	33	686

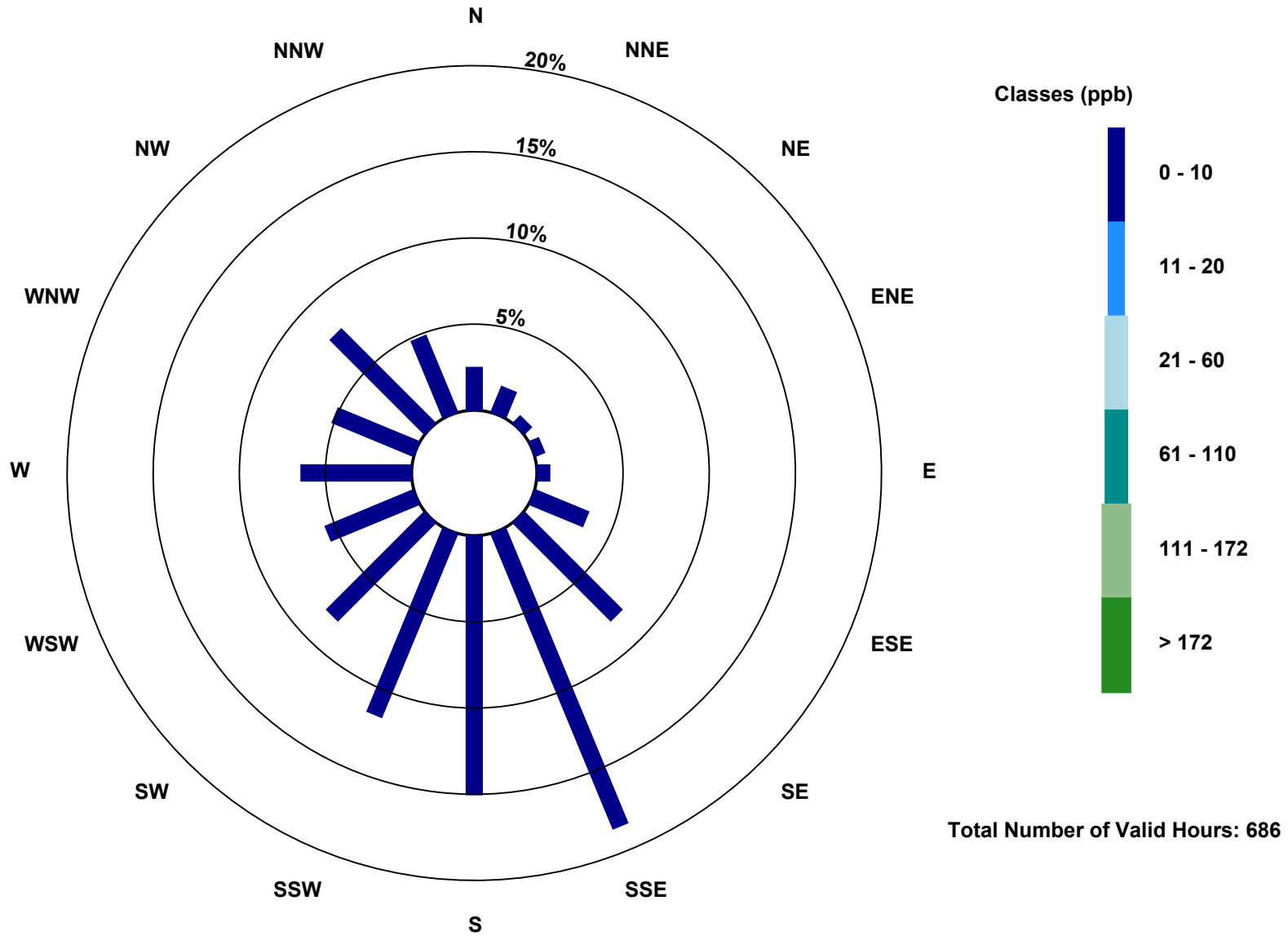
Total Number of Valid Hours: 686

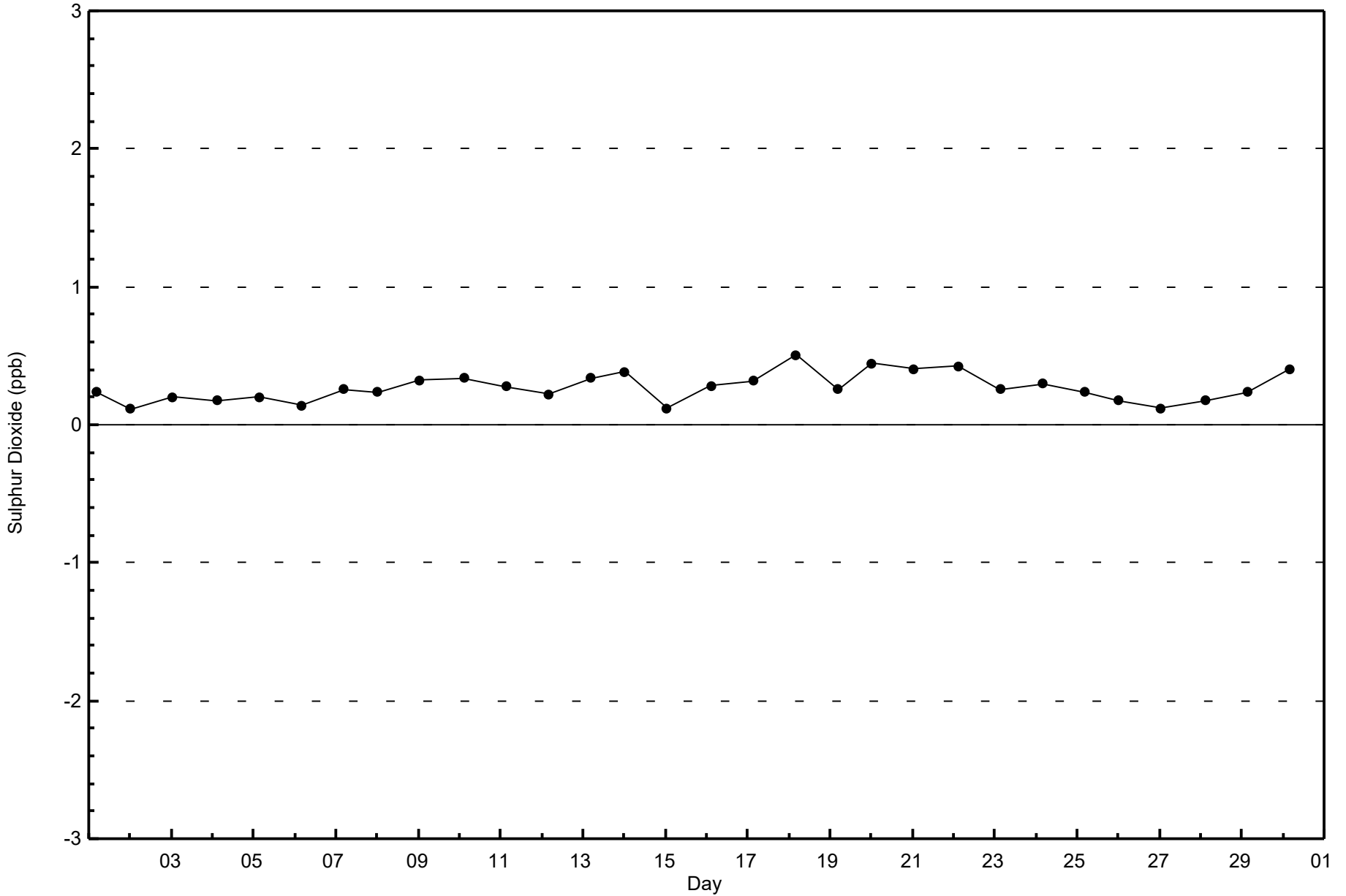
Total Number of Hours: 720

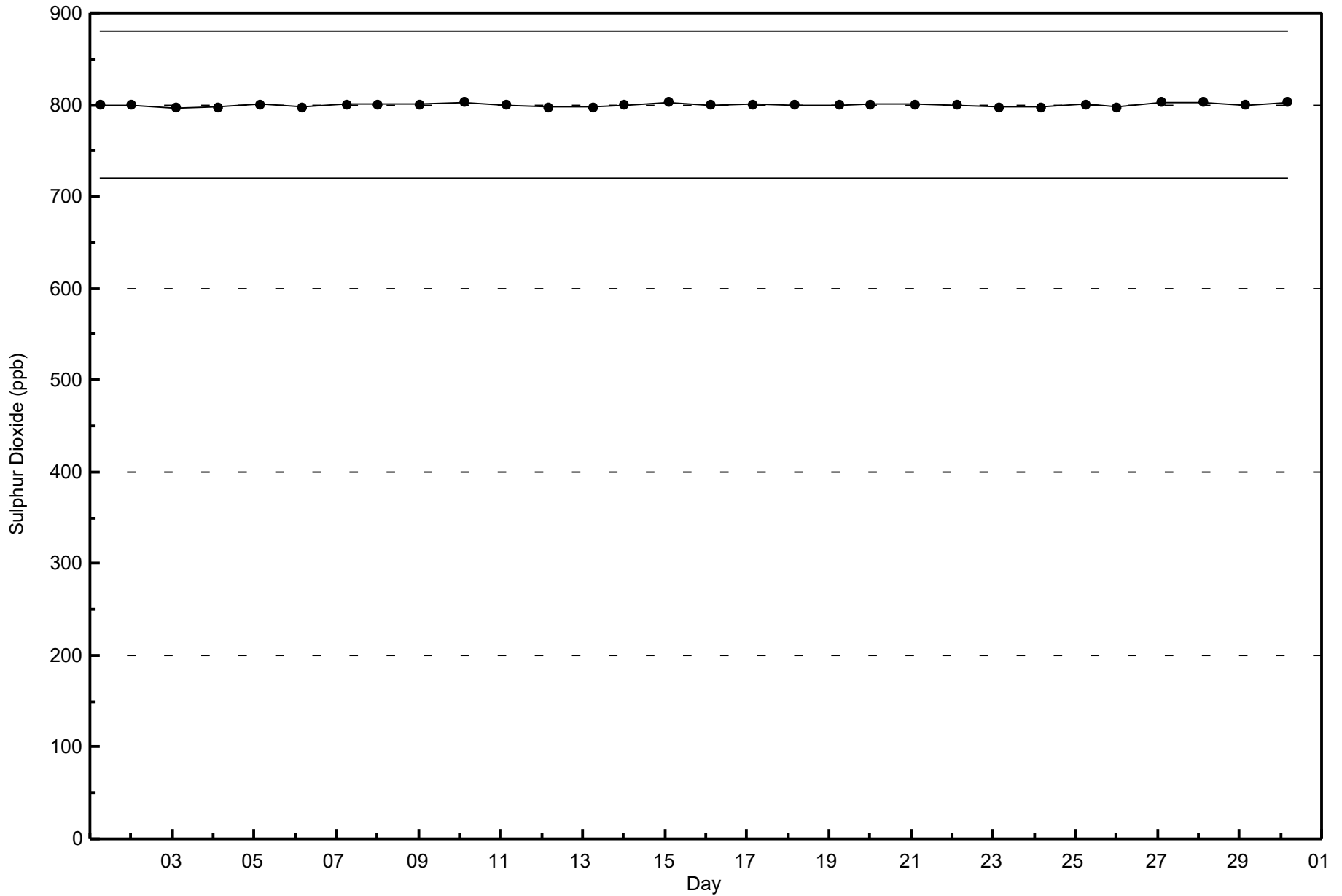


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Sulphur Dioxide (SO₂) - ppb
Conklin

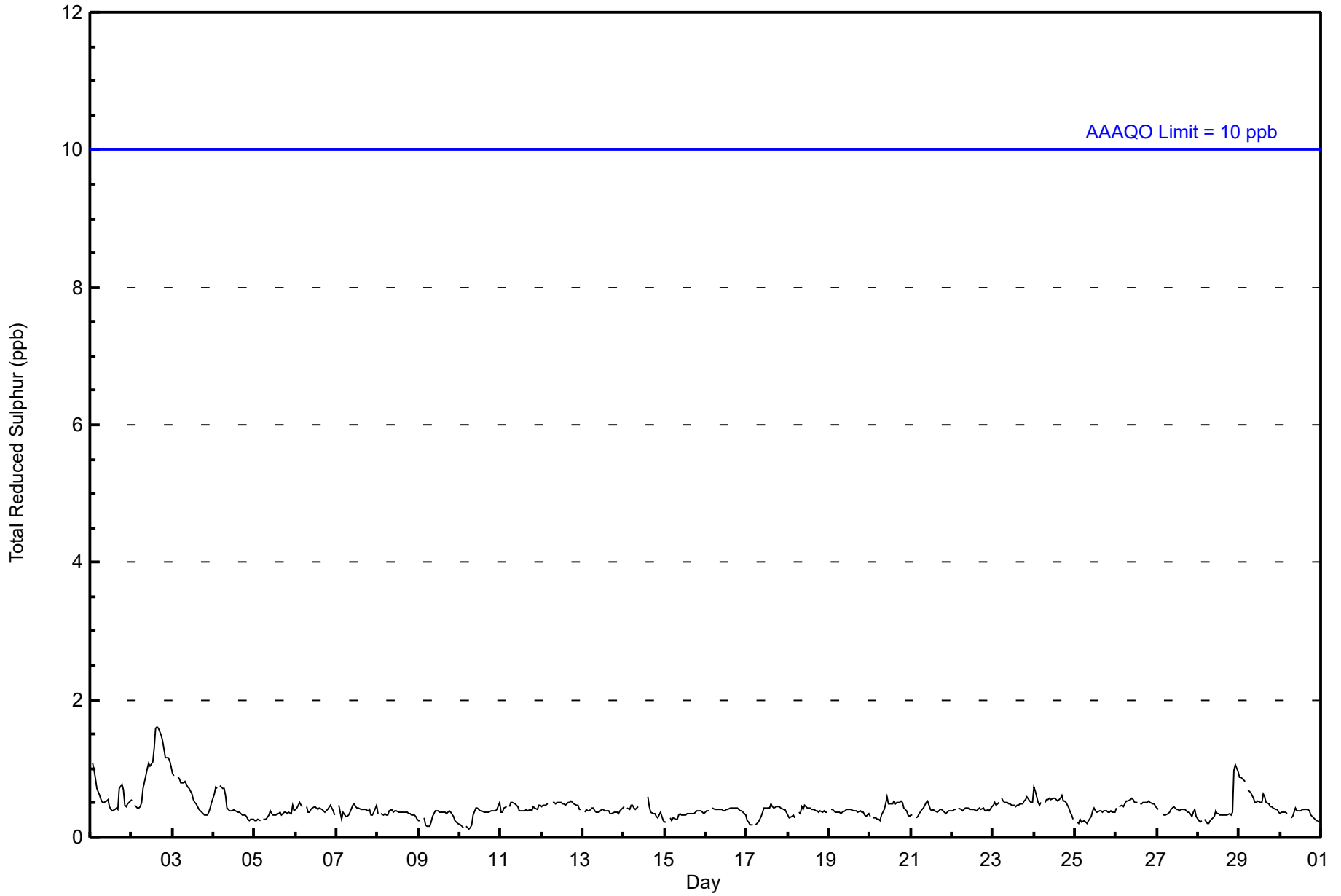








Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:														720							
Maximum Value: 1.6 ppb on Sep 2 16:00		Maximum Daily Average: 1.0 ppb on Sep 2														Hours of Data:		684									
Minimum Value: 0.1 ppb on Sep 10 06:00		Minimum Daily Average: 0.3 ppb on Sep 9														Hours of Missing Data:		36									
Maximum Diurnal Average: 0.5 ppb at hour 11		Minimum Diurnal Average: 0.4 ppb at hour 6														Hours of Calibration:		35									
Monthly Average: 0.43 ppb		Percentiles: P ₁ = 0.2 P ₁₀ = 0.3 Q ₁ = 0.4 Median = 0.4 Q ₃ = 0.5 P ₉₀ = 0.6 P ₉₉ = 1.2														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-Sep	Z	1.1	1.0	0.9	0.7	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.7	0.8	0.7	0.5	0.5	0.5	0.5	0.6	1.1	
2-Sep	0.6	Z	0.5	0.4	0.4	0.5	0.5	0.7	0.9	1.0	1.1	1.0	1.1	1.3	1.6	1.6	1.6	1.5	1.4	1.3	1.2	1.2	1.1	1.0	1.0	1.6	
3-Sep	0.9	0.9	Z	0.9	0.9	0.8	0.8	0.8	0.8	0.7	0.7	0.6	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.5	0.9	
4-Sep	0.6	0.7	0.7	Z	0.8	0.7	0.7	0.6	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	0.2	0.3	0.3	0.4	0.8	
5-Sep	0.2	0.2	0.3	0.2	Z	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.3	0.4	0.3	0.4	0.3	0.5	0.4	0.5	
6-Sep	0.4	0.4	0.5	0.5	0.5	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.3	0.4	0.5	
7-Sep	Z	0.5	0.4	0.3	0.4	0.3	0.3	0.3	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.5	0.4	0.5	
8-Sep	0.3	Z	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4
9-Sep	0.2	0.2	Z	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.2	0.2	0.3	0.4	0.4
10-Sep	0.2	0.2	0.1	Z	0.2	0.1	0.1	0.2	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	0.5	0.3	0.5	
11-Sep	0.4	0.4	0.4	0.5	Z	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.5	
12-Sep	0.4	0.5	0.5	0.5	0.5	Z	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.5	
13-Sep	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	0.3	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	
14-Sep	0.4	Z	0.4	0.4	0.5	0.4	0.5	0.4	0.4	0.5	C	C	C	C	C	0.6	0.5	0.4	0.3	0.3	0.3	0.3	0.4	0.3	0.2	0.4	0.6
15-Sep	0.2	0.2	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	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
16-Sep	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	0.3	0.4	0.4	
17-Sep	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
18-Sep	0.3	0.3	0.3	0.3	0.3	Z	0.4	0.3	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	
19-Sep	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	0.3	0.3	0.3	0.4	0.4	
20-Sep	0.3	Z	0.3	0.3	0.3	0.3	0.2	0.3	0.4	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.3	0.3	0.4	0.6	
21-Sep	0.3	0.3	Z	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.5	
22-Sep	0.4	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
23-Sep	0.5	0.5	0.5	0.5	Z	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.6	
24-Sep	0.7	0.7	0.5	0.5	0.5	Z	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.5	0.5	0.6	0.6	0.5	0.5	0.5	0.4	0.4	0.3	0.3	0.5	0.7	
25-Sep	Z	0.2	0.2	0.3	0.2	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	0.4	0.4	0.4	0.4	0.4	0.3	0.4	
26-Sep	0.4	Z	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.5	M	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.6	
27-Sep	0.4	0.4	Z	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.3	0.4	0.4	
28-Sep	0.2	0.2	0.2	Z	0.3	0.2	0.2	0.2	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	1.0	1.1	1.0	0.4	1.1
29-Sep	0.9	0.9	0.9	0.8	Z	0.7	0.7	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.6	0.9
30-Sep	0.4	0.4	0.4	0.4	0.3	Z	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	0.3	0.3	0.3	0.2	0.3	0.2	0.3	0.4
																								Diurnal Average		0.4	
																								Diurnal Maximum		0.9	
Z - zerospan C - Calibration M - Maintenance																											
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb																											





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Conklin - September 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	684	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: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Conklin - September 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	11	4	4	5	23	51	130	103	80	56	38	44	34	50	32	684
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	19	11	4	4	5	23	51	130	103	80	56	38	44	34	50	32	684

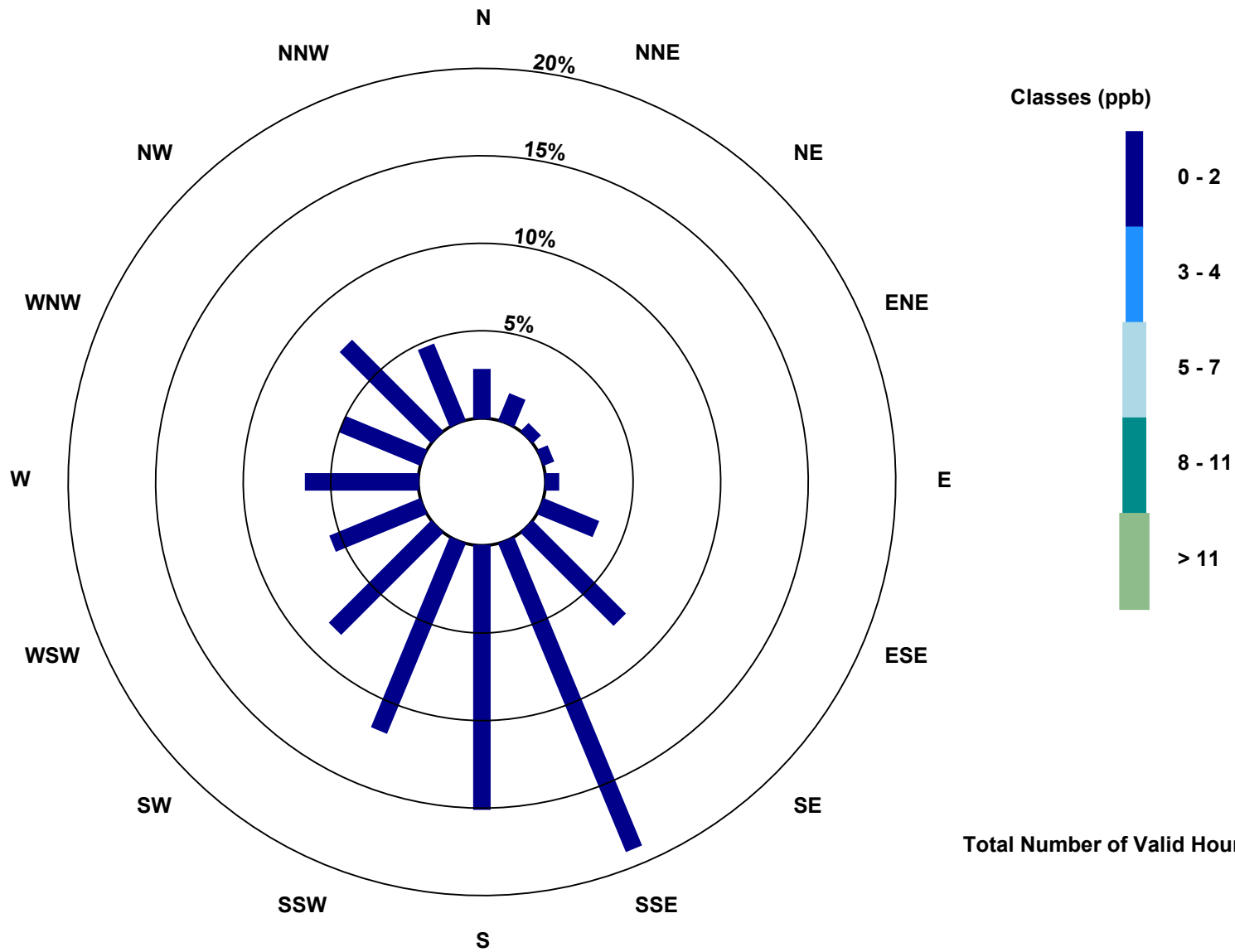
Total Number of Valid Hours: 684

Total Number of Hours: 720

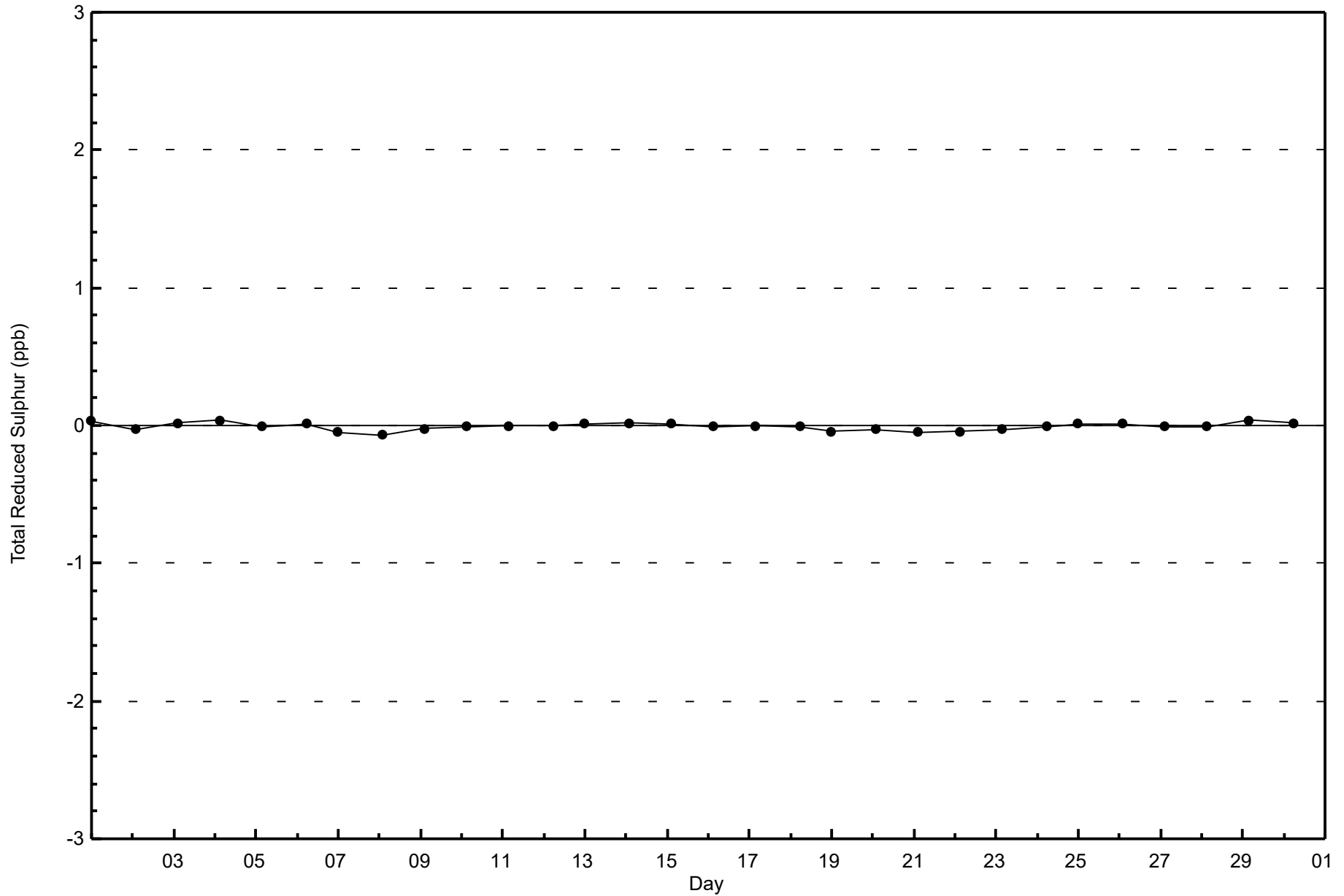


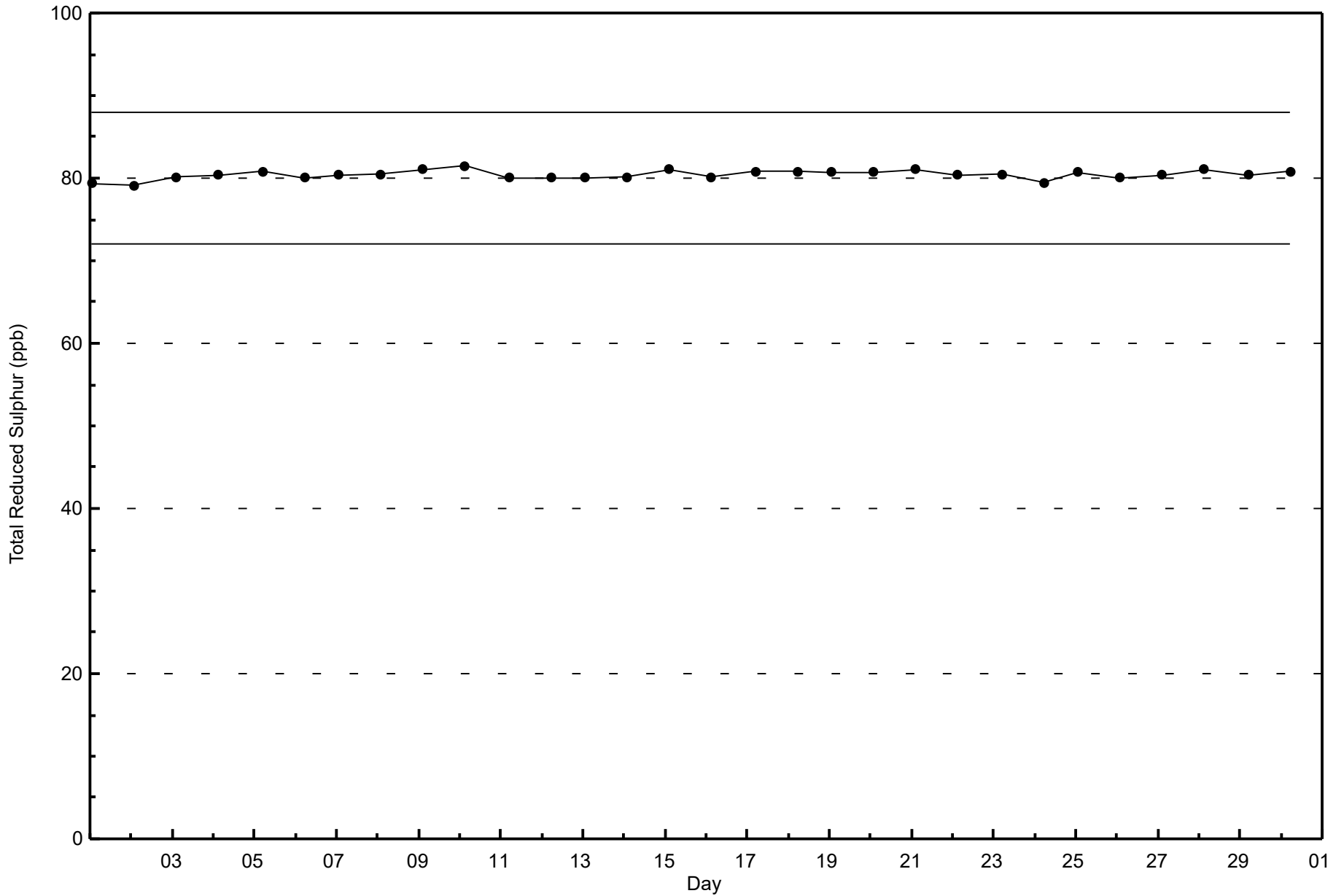
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Total Reduced Sulphur (TRS) - ppb
Conklin



Total Number of Valid Hours: 684







Wood Buffalo Environmental Association
Summary of Hour Averages

Total Hydrocarbons (THC) - ppm
Conklin - September 2023

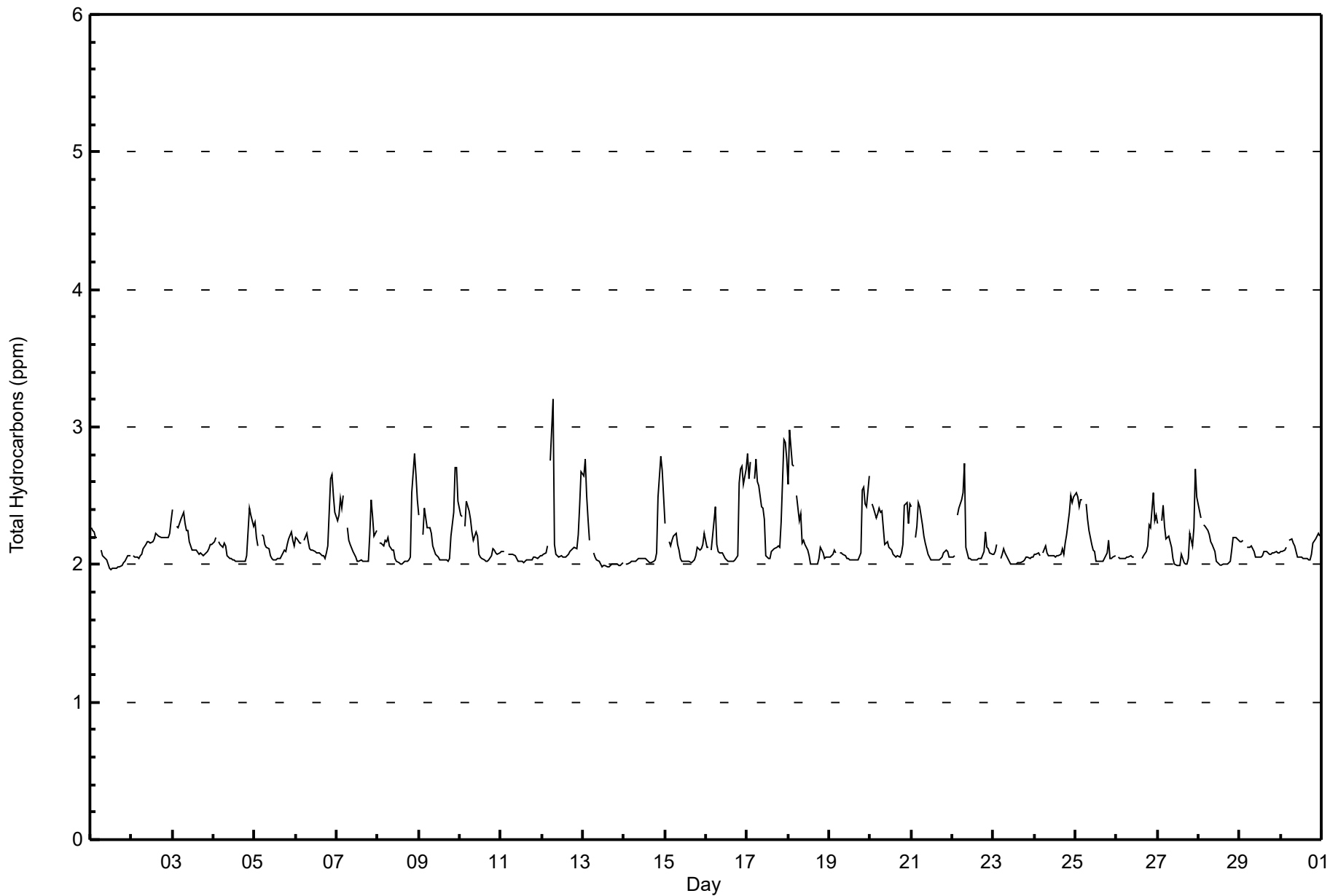
Maximum Value: 3.2 ppm on Sep 12 07:00		Maximum Daily Average: 2.4 ppm on Sep 17		Hours in Service: 720																											
Minimum Value: 2.0 ppm on Sep 1 13:00		Minimum Daily Average: 2.0 ppm on Sep 23		Hours of Data: 686																											
Maximum Diurnal Average: 2.3 ppm at hour 22		Minimum Diurnal Average: 2.0 ppm at hour 14		Hours of Missing Data: 34																											
Monthly Average: 2.16 ppm		Percentiles: P ₁ = 2.0 P ₁₀ = 2.0 Q ₁ = 2.0 Median = 2.1 Q ₃ = 2.2 P ₉₀ = 2.4 P ₉₉ = 2.8		Hours of Calibration: 34																											
				Percent Operational Time: 100.0																											
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24							
1-Sep	2.3	2.3	2.2	2.2	2.2	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	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.2	2.3
2-Sep	Z	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.3	2.2	2.3
3-Sep	2.4	Z	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.4
4-Sep	2.2	2.2	Z	2.2	2.1	2.1	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.4	2.4	2.3	2.1	2.1	2.1	2.1	2.1	2.4
5-Sep	2.3	2.2	2.1	Z	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	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.3
6-Sep	2.2	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	2.0	2.1	2.1	2.1	2.6	2.7	2.5	2.4	2.2	2.2	2.2	2.2	2.2	2.7
7-Sep	2.3	2.4	2.5	2.4	2.5	Z	2.3	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.5	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.5
8-Sep	Z	2.2	2.2	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.5	2.8	2.7	2.5	2.2	2.2	2.2	2.2	2.2	2.8
9-Sep	2.4	Z	2.2	2.4	2.3	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.4	2.7	2.7	2.5	2.2	2.2	2.2	2.2	2.2	2.7
10-Sep	2.4	2.3	Z	2.3	2.5	2.4	2.3	2.2	2.2	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.5
11-Sep	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	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
12-Sep	2.1	2.1	2.1	2.1	Z	2.8	3.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.4	2.7	2.2	2.2	2.2	2.2	2.2	2.2	3.2
13-Sep	2.6	2.8	2.5	2.3	2.2	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	2.1	2.1	2.1	2.1	2.1	2.1	2.8
14-Sep	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.5	2.8	2.7	2.5	2.1	2.1	2.1	2.1	2.1	2.8
15-Sep	2.3	Z	2.2	2.1	2.2	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	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3
16-Sep	2.1	2.1	Z	2.1	2.2	2.4	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	2.6	2.7	2.7	2.6	2.7	2.2	2.2	2.2	2.2	2.2	2.7
17-Sep	2.8	2.6	2.7	Z	2.6	2.8	2.6	2.6	2.4	2.4	2.3	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.9	2.9	2.8	2.4	2.4	2.4	2.4	2.4	2.9
18-Sep	2.6	3.0	2.7	2.7	Z	2.5	2.3	2.4	2.2	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	3.0
19-Sep	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.5	2.6	2.4	2.4	2.6	2.2	2.2	2.2	2.2	2.2	2.6
20-Sep	Z	2.4	2.4	2.3	2.4	2.4	2.4	2.4	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	2.4	2.5	2.3	2.4	2.2	2.2	2.2	2.2	2.2	2.5
21-Sep	2.4	Z	2.2	2.3	2.5	2.4	2.3	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.5
22-Sep	2.1	2.1	Z	2.4	2.4	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	2.1	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.7
23-Sep	2.1	2.1	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	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.1
24-Sep	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	2.4	2.5	2.4	2.5	2.2	2.2	2.2	2.2	2.5
25-Sep	2.5	2.5	2.4	2.5	2.5	Z	2.4	2.3	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.0	2.0	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.5
26-Sep	Z	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	C	C	C	C	2.0	2.1	2.1	2.1	2.1	2.3	2.3	2.5	2.3	2.4	2.1	2.1	2.1	2.1	2.1	2.5
27-Sep	2.3	Z	2.3	2.4	2.3	2.2	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.2	2.1	2.3	2.7	2.5	2.2	2.2	2.2	2.2	2.2	2.7
28-Sep	2.4	2.3	Z	2.3	2.3	2.2	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.4
29-Sep	2.2	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
30-Sep	2.1	2.1	2.1	2.1	Z	2.2	2.2	2.2	2.1	2.1	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2
																								Diurnal Average							
																								Diurnal Maximum							
																								2.16							
																								2.8							
																								2.1							
																								2.8							

Z - zerospan C - Calibration



Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Conklin - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Conklin - September 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	209	30.47	30.47
2.1 - 3.0	476	69.39	99.85
3.1 - 10.0	1	0.15	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 686

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Conklin - September 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	3	2	2	2	9	3	18	35	20	17	18	31	19	25	4	209
2.1 - 3.0	16	8	2	2	3	14	52	109	67	59	38	20	13	16	28	29	476
3.1 - 10.0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	17	11	4	4	5	23	55	127	103	79	55	38	44	35	53	33	686

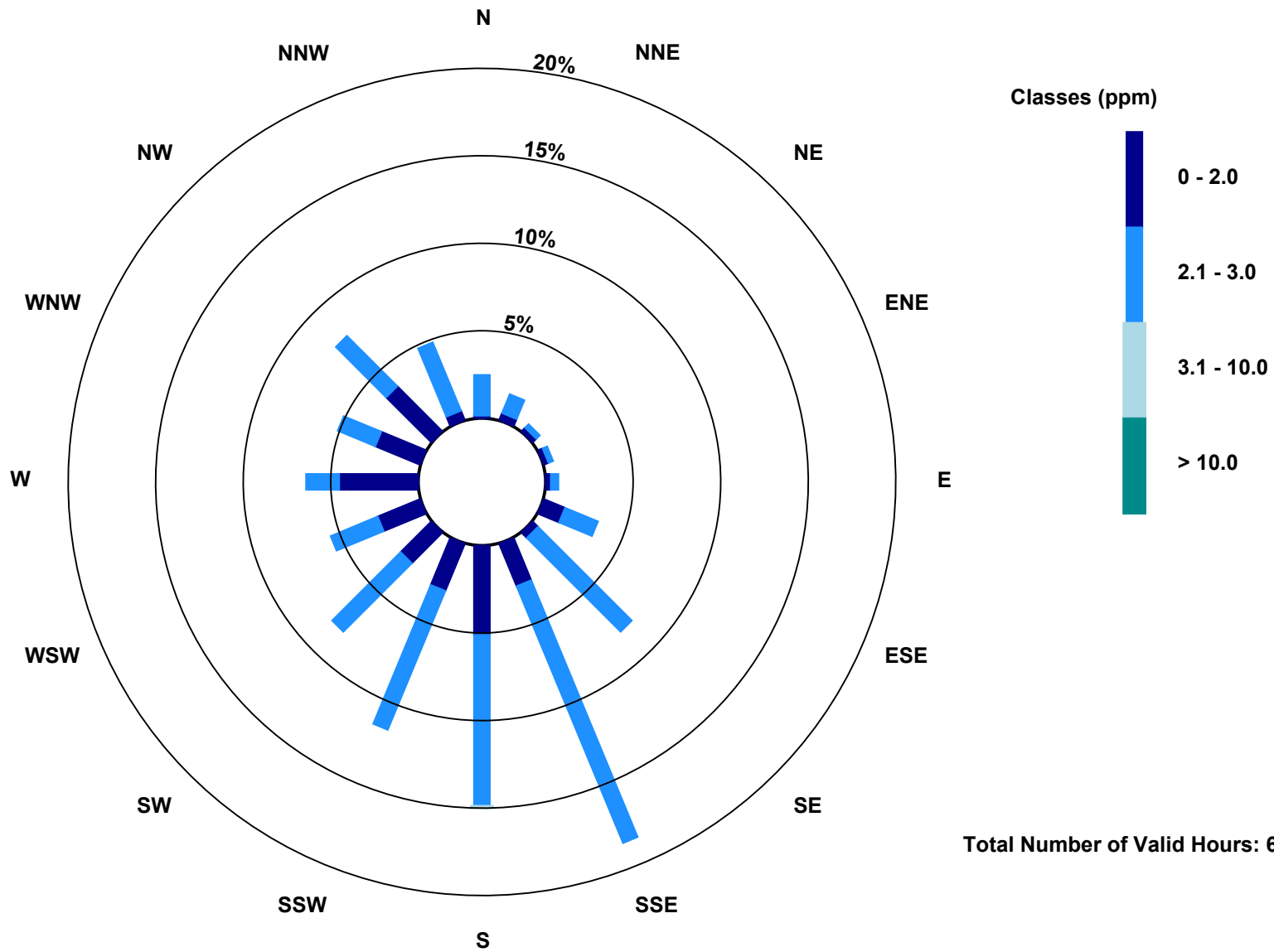
Total Number of Valid Hours: 686

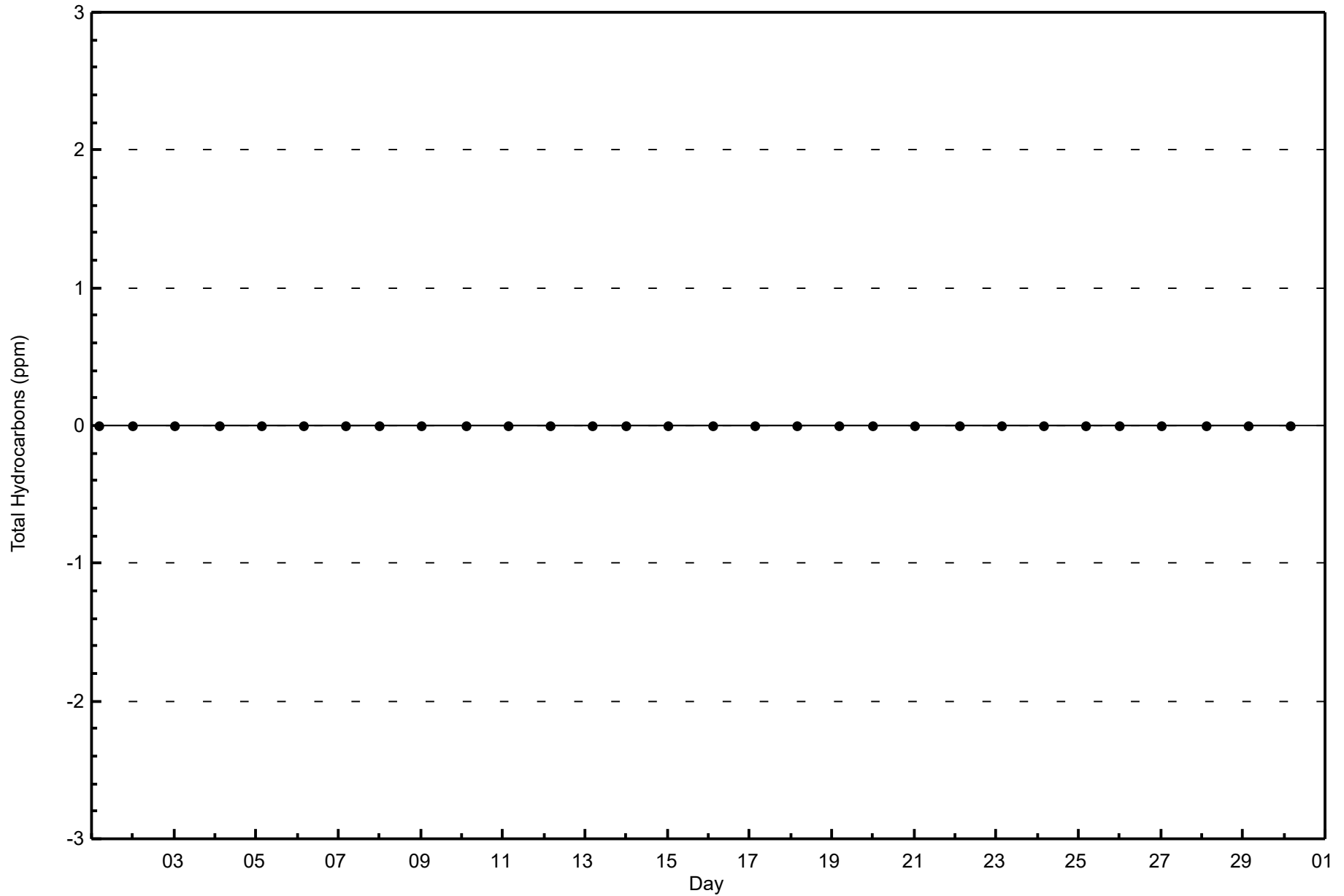
Total Number of Hours: 720

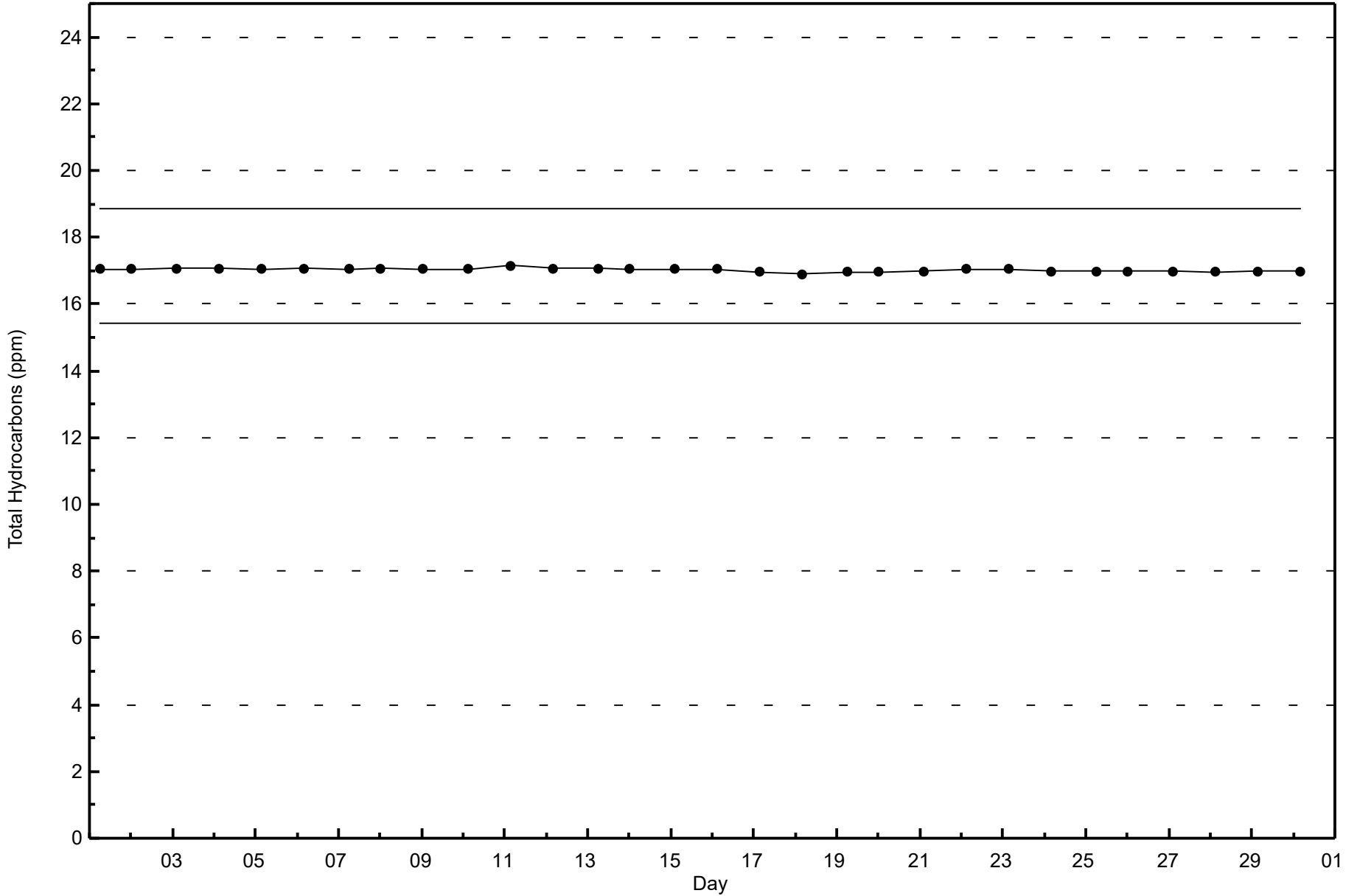


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Total Hydrocarbons (THC) - ppm
Conklin

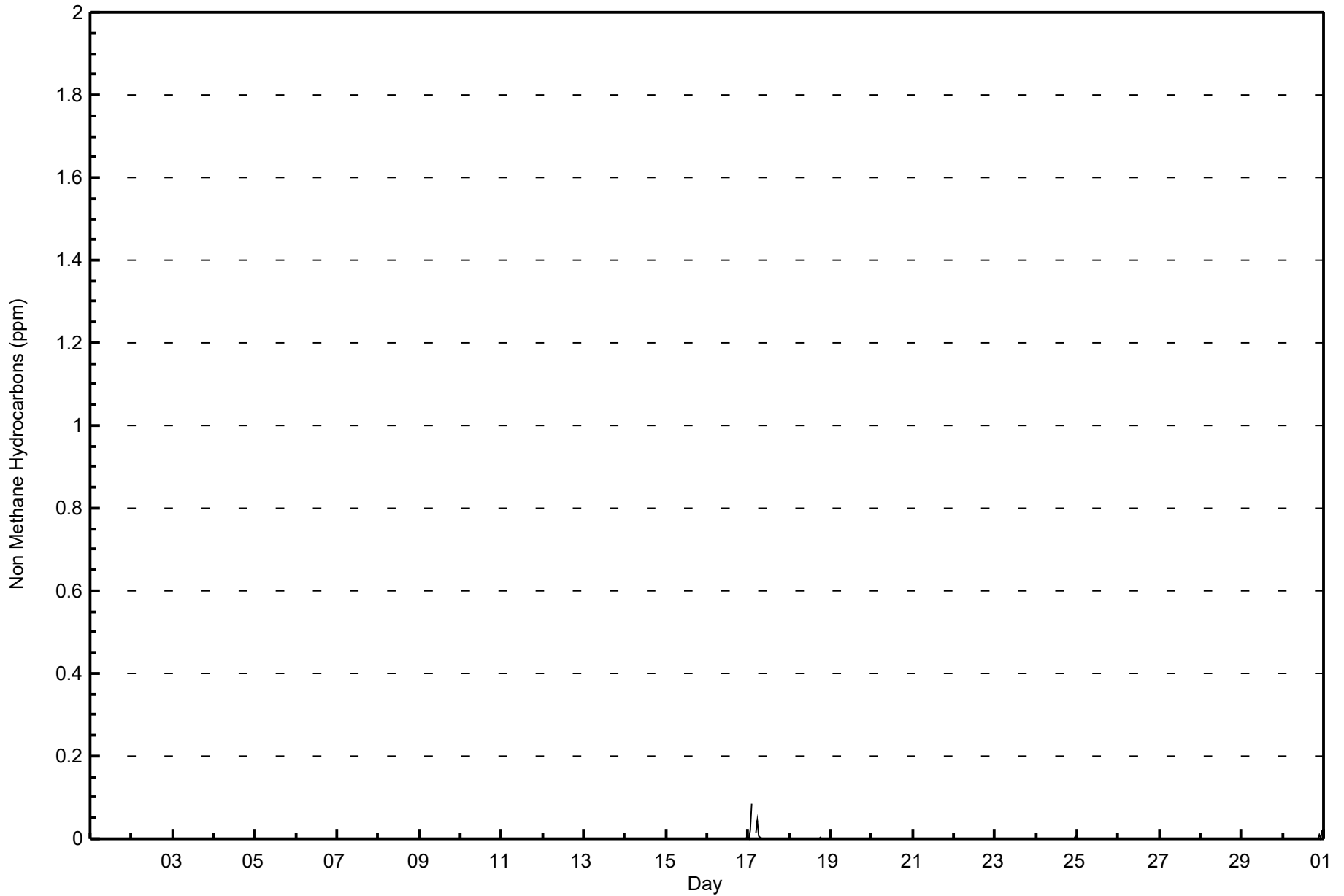








Maximum Value: 0.084 ppm on Sep 17 03:00		Maximum Daily Average: 0.007 ppm on Sep 17		Hours in Service: 720																																																				
Minimum Value: 0.000 ppm on Sep 1 01:00		Minimum Daily Average: 0.000 ppm on Sep 1		Hours of Data: 686																																																				
Maximum Diurnal Average: 0.003 ppm at hour 3		Minimum Diurnal Average: 0.000 ppm at hour 1		Hours of Missing Data: 34																																																				
Monthly Average: 0.000 ppm		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.0 P ₉₉ = 0.0		Hours of Calibration: 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-Sep	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																										
2-Sep	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																										
3-Sep	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																										
4-Sep	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																										
5-Sep	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																										
6-Sep	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																										
7-Sep	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																										
8-Sep	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																										
9-Sep	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																										
10-Sep	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																										
11-Sep	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																										
12-Sep	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																										
13-Sep	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																										
14-Sep	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																										
15-Sep	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																										
16-Sep	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	0.004	0.000																										
17-Sep	0.000	0.020	0.084	Z	0.015	0.043	0.008	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.084																										
18-Sep	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	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002																										
19-Sep	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																										
20-Sep	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																										
21-Sep	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																										
22-Sep	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																										
23-Sep	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																										
24-Sep	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	0.006	0.006																										
25-Sep	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																										
26-Sep	Z	0.000	0.000	0.000	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																										
27-Sep	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																										
28-Sep	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																										
29-Sep	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																										
30-Sep	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	0.002	0.000	0.009	0.000	0.020	0.001	0.001	0.001	0.001	0.020																										
																										0.000	0.001	0.003	0.000	0.001	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	Diurnal Average				
																										0.000	0.020	0.084	0.000	0.015	0.043	0.008	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	0.009	0.000	0.020	Diurnal Maximum	
Z - zerospan C - Calibration																																																								





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm
Conklin - September 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	678	98.83	98.83
0.006 - 0.05	7	1.02	99.85
0.06 - 0.1	1	0.15	100.00
> 0.1	0	0.00	100.00

Total Number of Valid Hours: 686

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Conklin - September 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	17	11	4	4	5	23	53	125	100	79	55	38	44	35	53	32	678
0.006 - 0.05	0	0	0	0	0	0	1	2	3	0	0	0	0	0	0	1	7
0.06 - 0.1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
> 0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	17	11	4	4	5	23	55	127	103	79	55	38	44	35	53	33	686

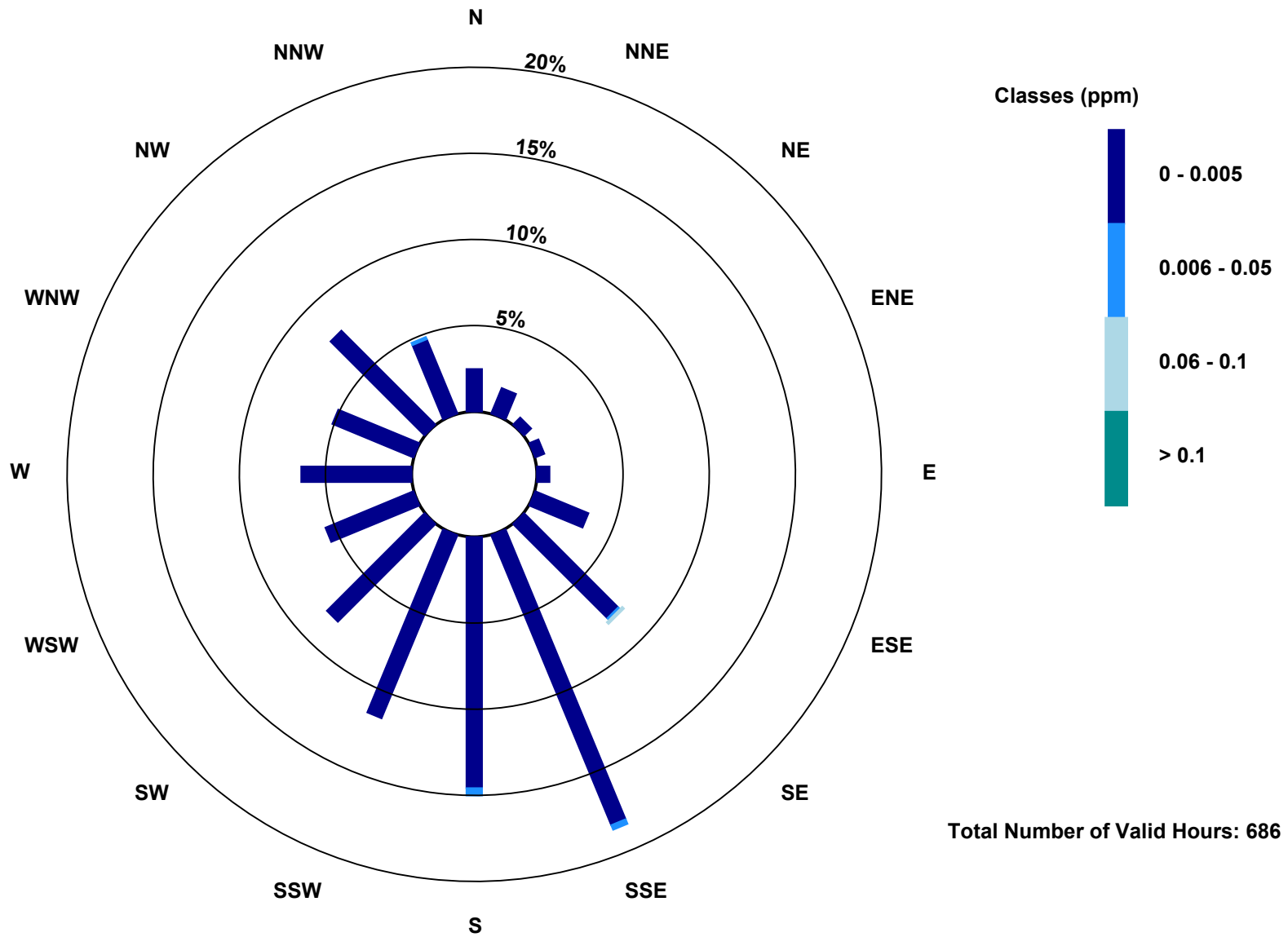
Total Number of Valid Hours: 686

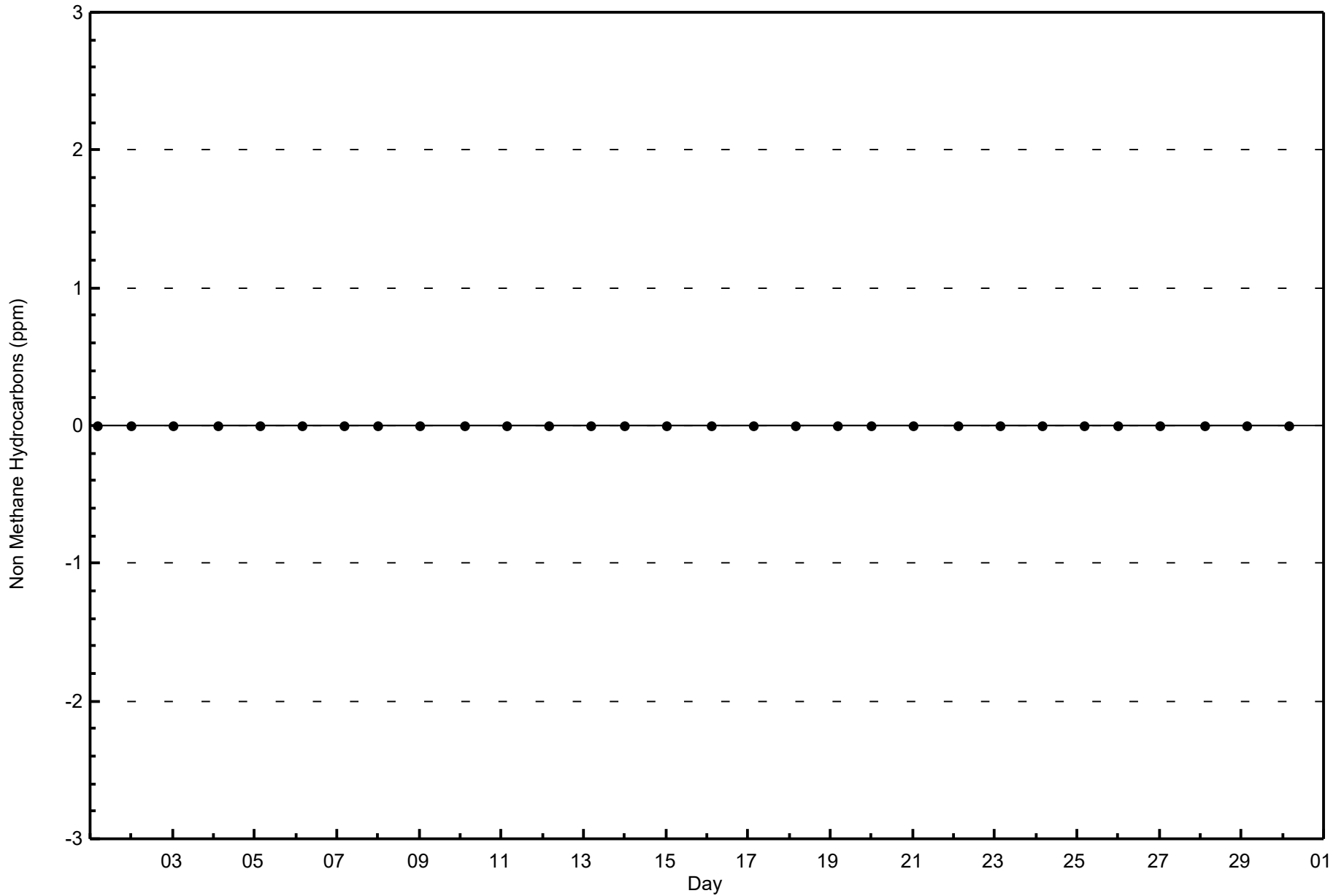
Total Number of Hours: 720

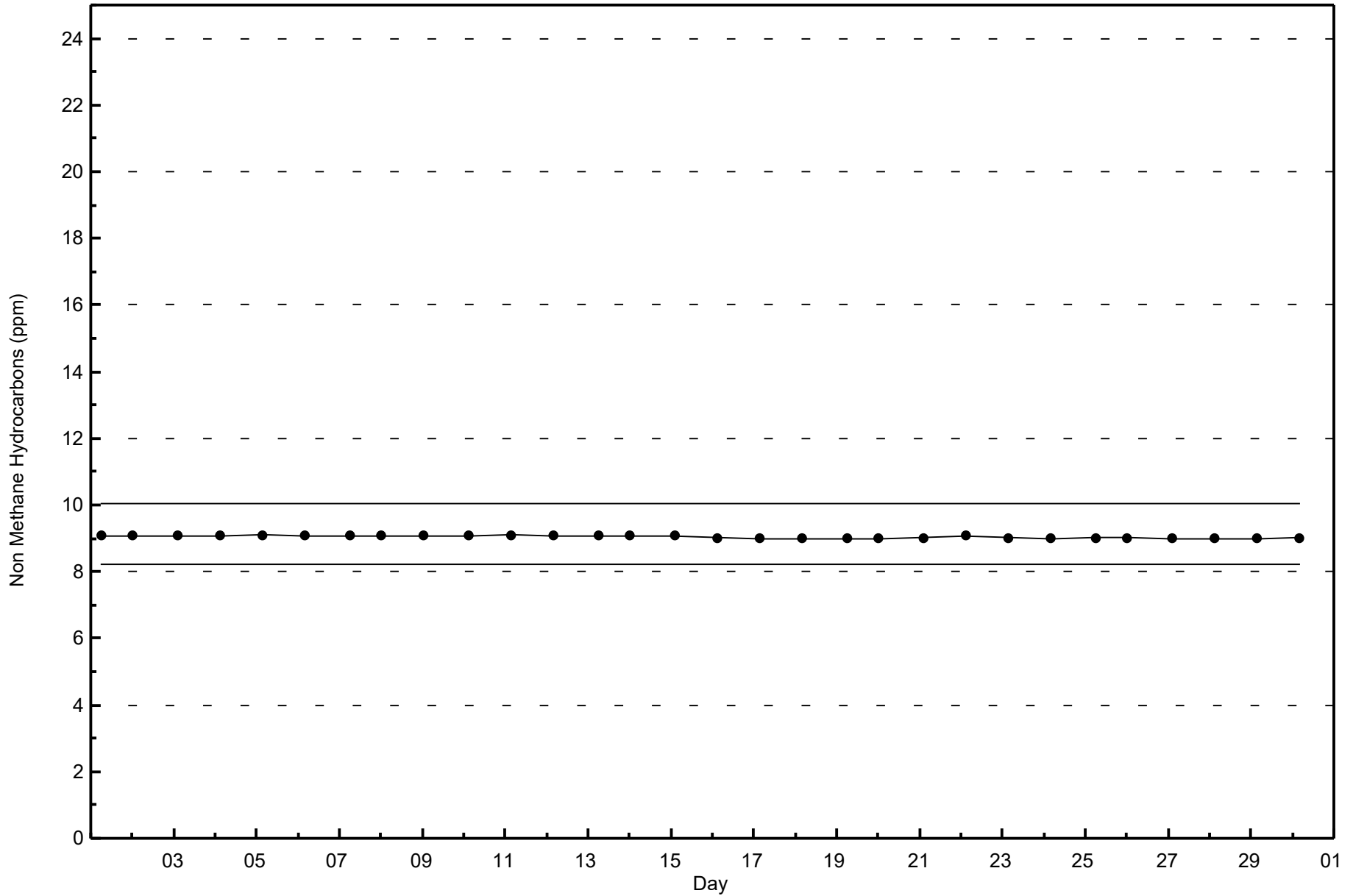


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Non Methane Hydrocarbons (NMHC) - ppm
Conklin









Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH₄) - ppm
Conklin - September 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 3.2 ppm on Sep 12 07:00	Maximum Daily Average: 2.4 ppm on Sep 17		Hours of Data:	686
Minimum Value: 2.0 ppm on Sep 1 13:00	Minimum Daily Average: 2.0 ppm on Sep 23		Hours of Missing Data:	34
Maximum Diurnal Average: 2.3 ppm at hour 22	Minimum Diurnal Average: 2.0 ppm at hour 14		Hours of Calibration:	34
Monthly Average: 2.16 ppm	Percentiles: P ₁ = 2.0 P ₁₀ = 2.0 Q ₁ = 2.0 Median = 2.1 Q ₃ = 2.2 P ₉₀ = 2.4 P ₉₉ = 2.8		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24						
1-Sep	2.3	2.3	2.2	2.2	2.2	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	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	
2-Sep	Z	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.3	2.3	
3-Sep	2.4	Z	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.4
4-Sep	2.2	2.2	Z	2.2	2.1	2.1	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.4	2.4	2.3	2.1	2.1	2.1	2.4	2.4
5-Sep	2.3	2.2	2.1	Z	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	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.3
6-Sep	2.2	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	2.0	2.1	2.1	2.1	2.6	2.7	2.5	2.4	2.2	2.2	2.2	2.7	2.7
7-Sep	2.3	2.4	2.5	2.4	2.5	Z	2.3	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.5	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.5
8-Sep	Z	2.2	2.2	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.5	2.8	2.7	2.5	2.2	2.2	2.2	2.2	2.8
9-Sep	2.4	Z	2.2	2.4	2.3	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.4	2.7	2.7	2.5	2.2	2.2	2.2	2.2	2.7
10-Sep	2.4	2.3	Z	2.3	2.5	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.5
11-Sep	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	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1
12-Sep	2.1	2.1	2.1	2.1	Z	2.8	3.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.4	2.7	2.2	2.2	2.2	2.2	2.2	3.2
13-Sep	2.6	2.8	2.5	2.3	2.2	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	2.1	2.1	2.1	2.1	2.1	2.8
14-Sep	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.5	2.8	2.7	2.5	2.1	2.1	2.1	2.1	2.8
15-Sep	2.3	Z	2.2	2.1	2.2	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	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3
16-Sep	2.1	2.1	Z	2.1	2.2	2.4	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	2.6	2.7	2.7	2.6	2.7	2.2	2.2	2.2	2.2	2.7
17-Sep	2.8	2.6	2.7	Z	2.6	2.7	2.6	2.6	2.4	2.4	2.3	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.9	2.9	2.8	2.4	2.4	2.4	2.4	2.9
18-Sep	2.6	3.0	2.7	2.7	Z	2.5	2.3	2.4	2.2	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.1	2.1	2.1	2.2	2.2	2.2	2.2	3.0
19-Sep	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.5	2.6	2.4	2.4	2.6	2.2	2.2	2.2	2.2	2.6
20-Sep	Z	2.4	2.4	2.3	2.4	2.4	2.4	2.4	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	2.4	2.5	2.3	2.4	2.2	2.2	2.2	2.2	2.5
21-Sep	2.4	Z	2.2	2.3	2.5	2.4	2.3	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.5
22-Sep	2.1	2.1	Z	2.4	2.4	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	2.1	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.7
23-Sep	2.1	2.1	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	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.1
24-Sep	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	2.4	2.5	2.4	2.5	2.2	2.2	2.2	2.5
25-Sep	2.5	2.5	2.4	2.5	2.5	Z	2.4	2.3	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.0	2.0	2.1	2.1	2.2	2.2	2.2	2.2	2.5
26-Sep	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	C	C	C	C	2.0	2.1	2.1	2.1	2.1	2.3	2.3	2.5	2.3	2.4	2.1	2.1	2.1	2.1	2.5
27-Sep	2.3	Z	2.3	2.4	2.3	2.2	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.2	2.1	2.3	2.7	2.5	2.2	2.2	2.2	2.2	2.7
28-Sep	2.4	2.3	Z	2.3	2.3	2.2	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.4
29-Sep	2.2	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	2.2
30-Sep	2.1	2.1	2.1	2.1	Z	2.2	2.2	2.2	2.1	2.1	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.2

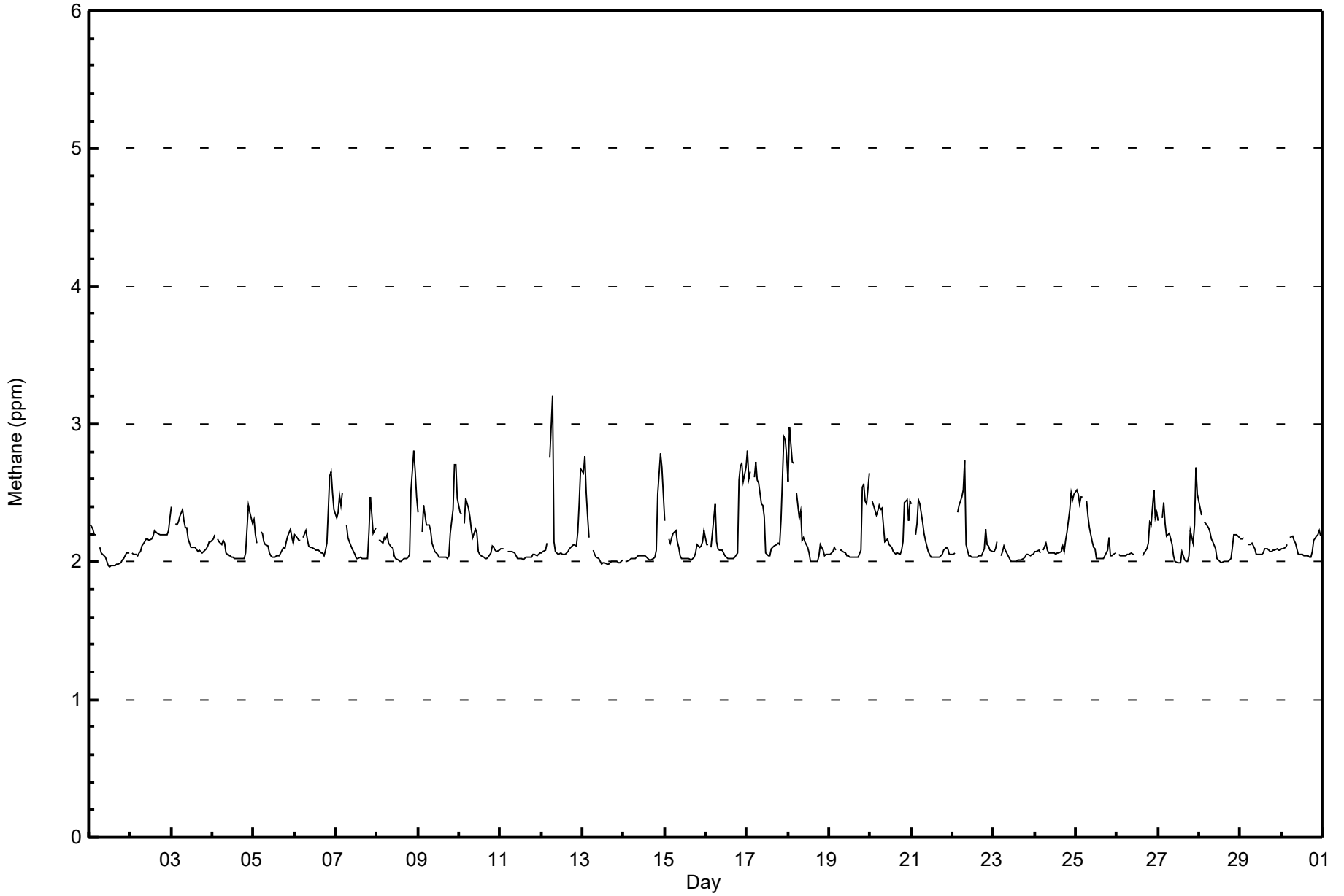
2.3	2.3	2.2	2.2	2.2	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.3	2.3	2.3	2.3	Diurnal Average	
2.8	3.0	2.7	2.7	2.6	2.8	3.2	2.7	2.4	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.6	2.7	2.9	2.9	2.8	Diurnal Maximum		

Z - zerspan C - Calibration



Wood Buffalo Environmental Association
Hourly Averages

Methane (CH₄) - ppm
Conklin - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Conklin - September 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	209	30.47	30.47
2.1 - 3.0	476	69.39	99.85
3.1 - 10.0	1	0.15	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 686

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Methane (CH₄) - ppm
Conklin - September 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	3	2	2	2	9	3	18	35	20	17	18	31	19	25	4	209
2.1 - 3.0	16	8	2	2	3	14	52	109	67	59	38	20	13	16	28	29	476
3.1 - 10.0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	17	11	4	4	5	23	55	127	103	79	55	38	44	35	53	33	686

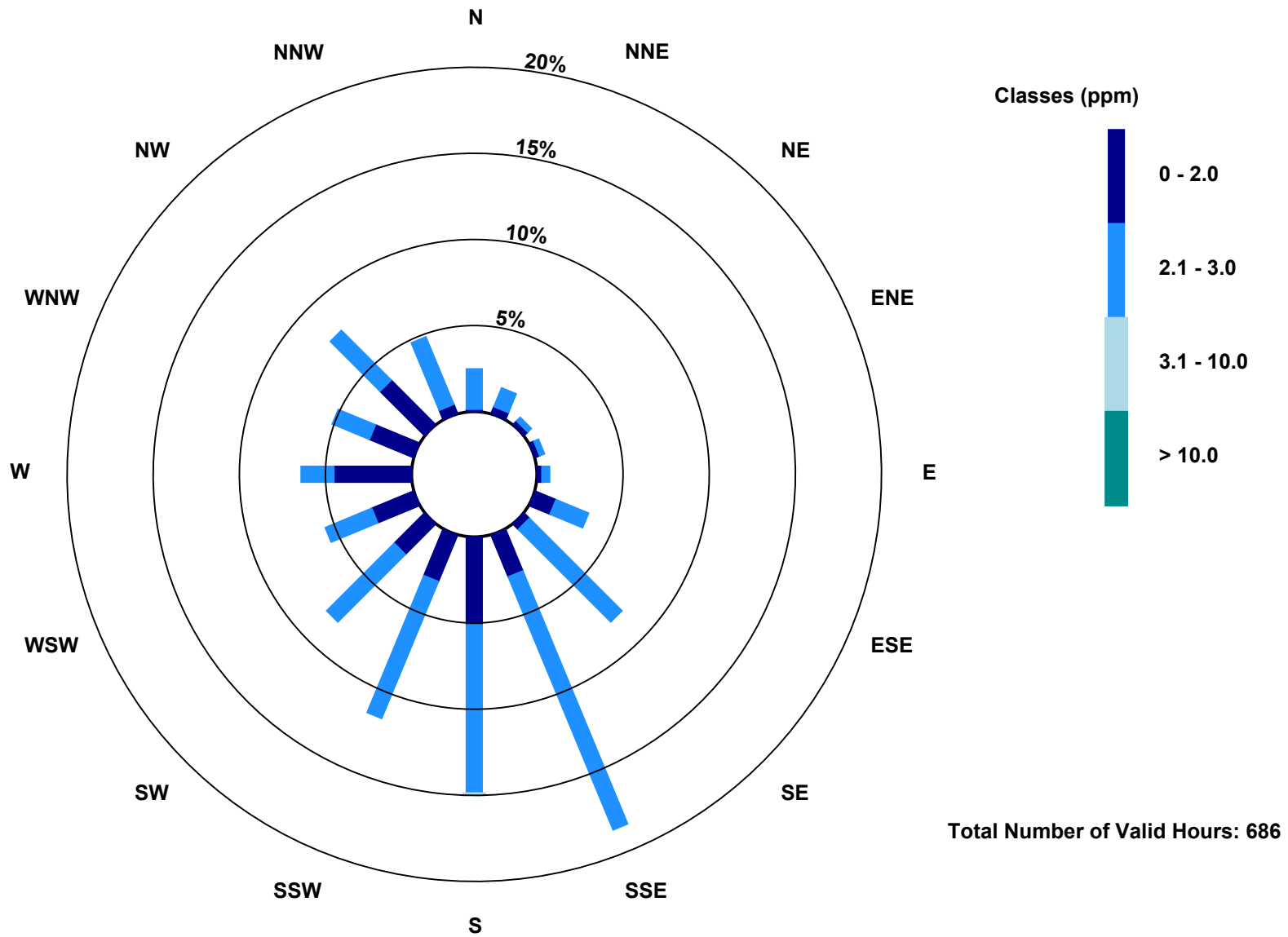
Total Number of Valid Hours: 686

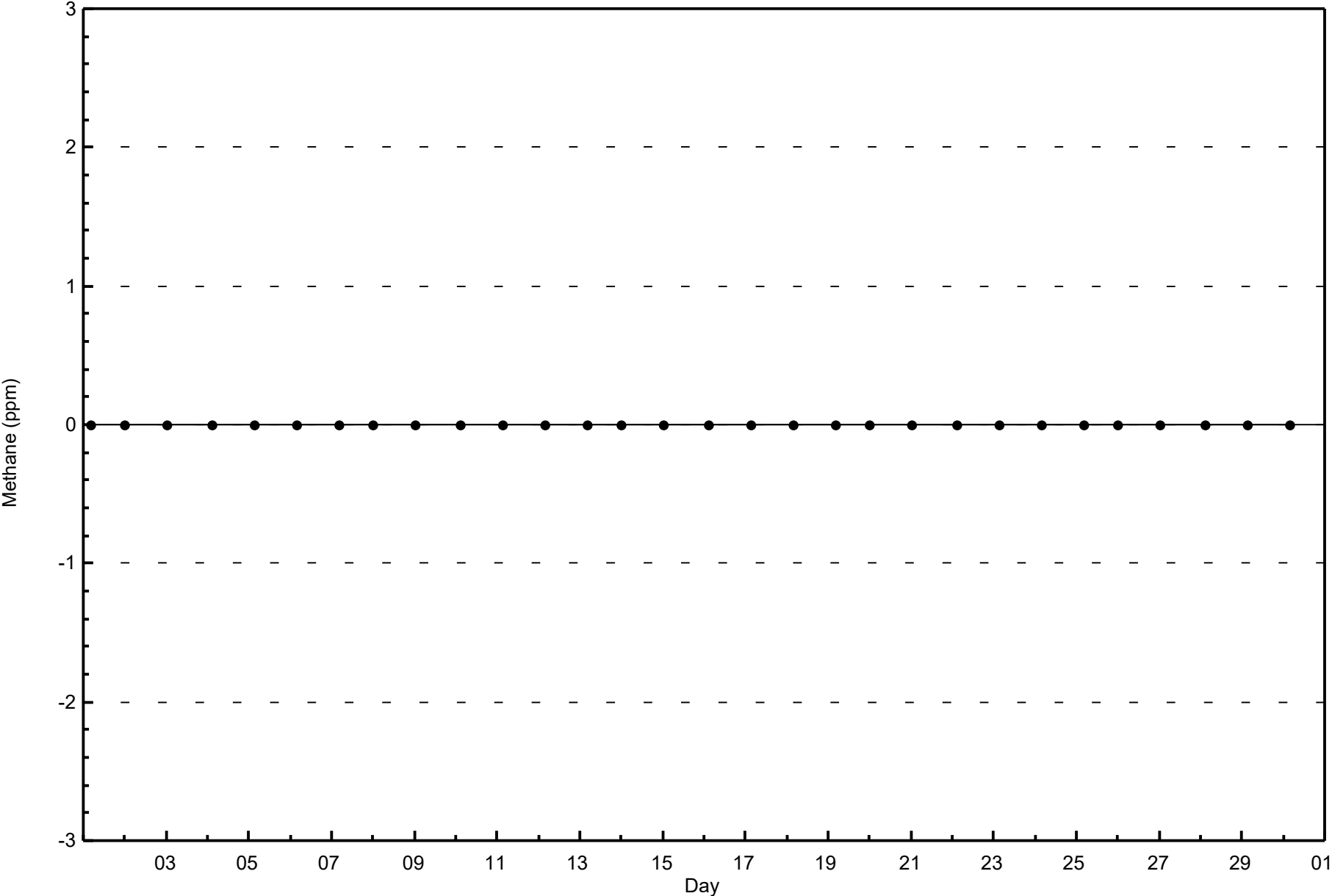
Total Number of Hours: 720

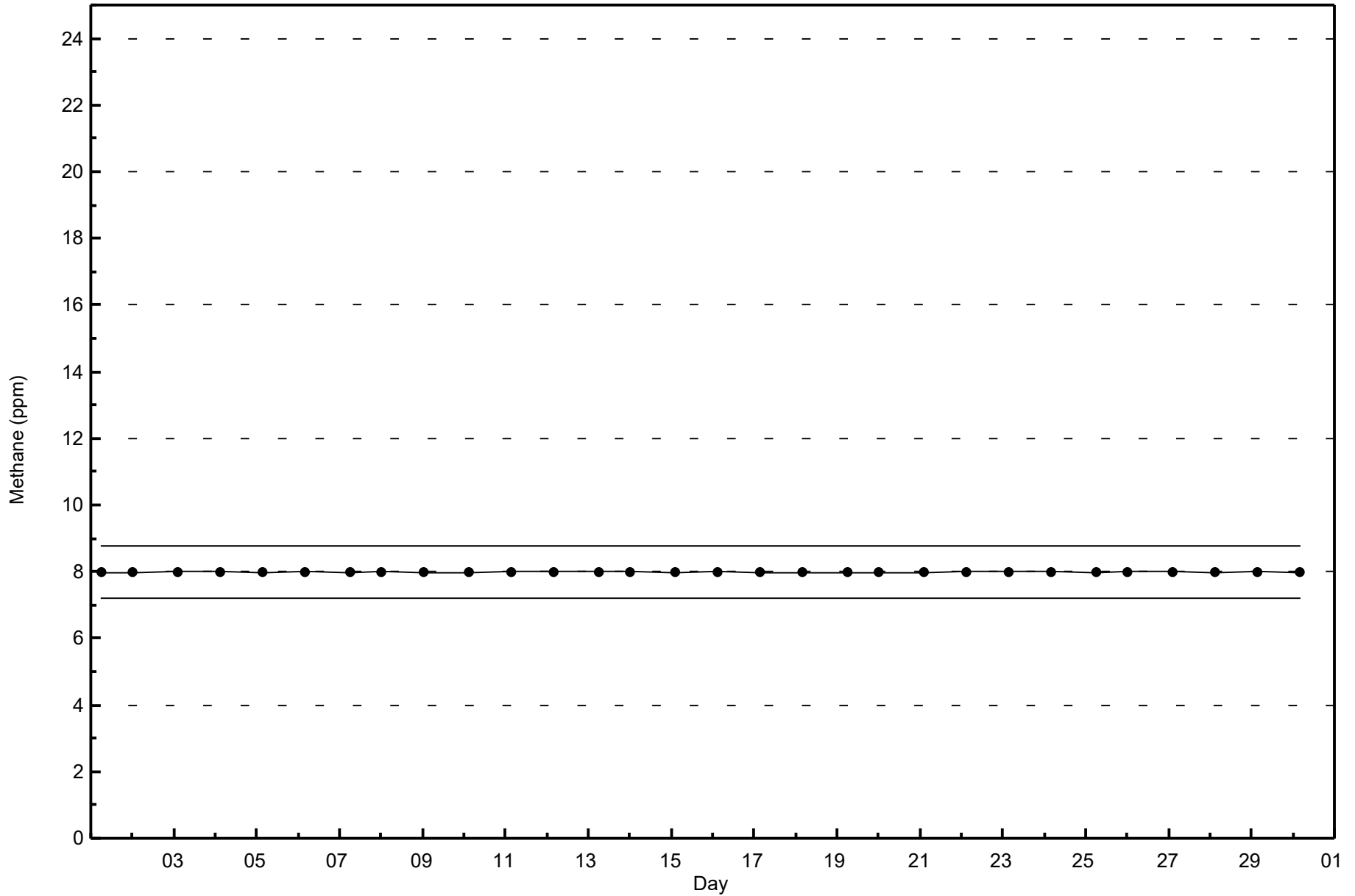


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Methane (CH₄) - ppm
Conklin









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

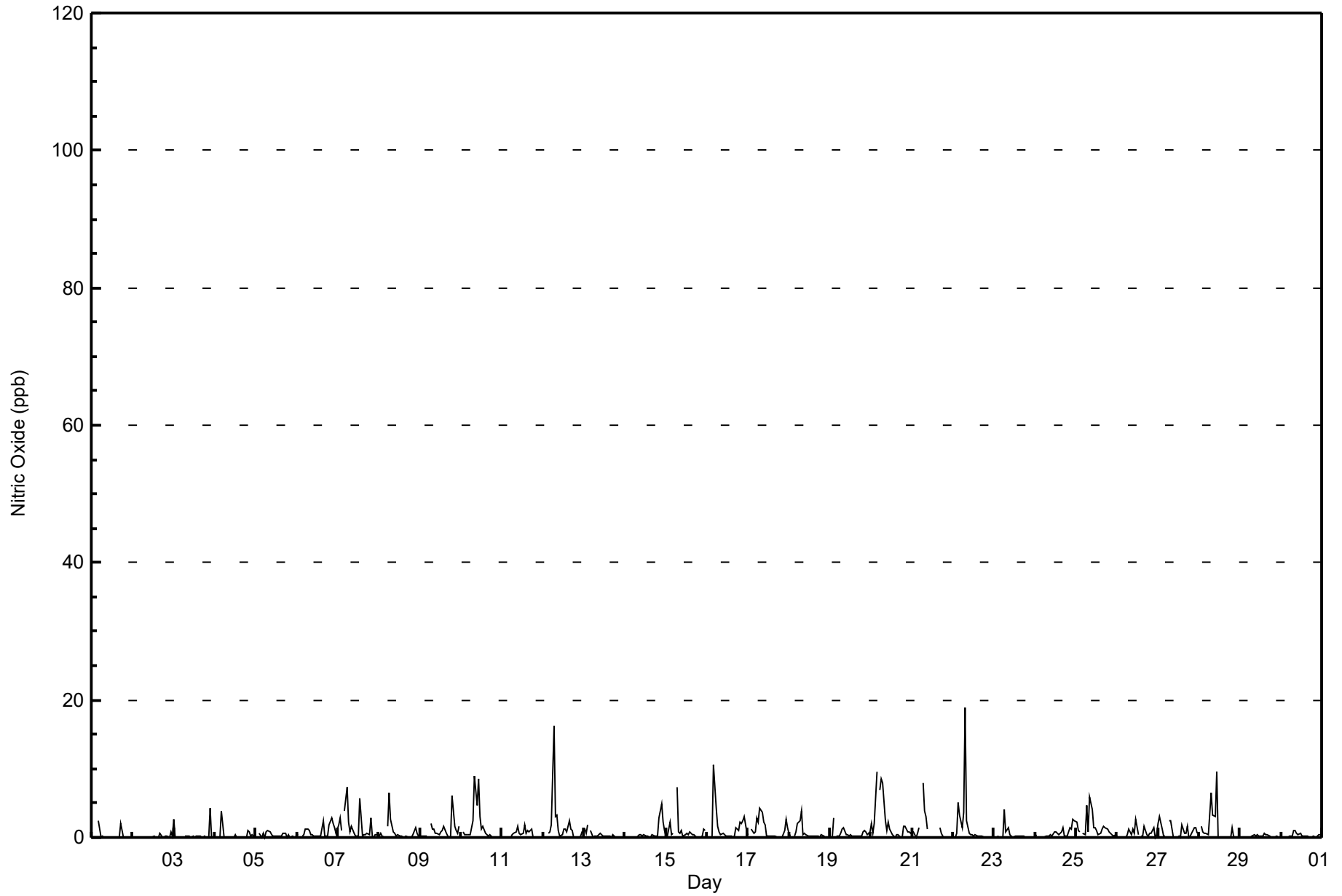
Conklin - September 2023

Maximum Value: 18.9 ppb on Sep 22 08:00																				Maximum Daily Average: 2.3 ppb on Sep 20					Hours in Service: 720		
Minimum Value: 0.0 ppb on Sep 1 01:00																				Minimum Daily Average: 0.1 ppb on Sep 2					Hours of Data: 683		
Maximum Diurnal Average: 2.7 ppb at hour 7																				Minimum Diurnal Average: 0.2 ppb at hour 19					Hours of Missing Data: 37		
Monthly Average: 0.85 ppb																				Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.3 Q ₃ = 0.9 P ₉₀ = 2.2 P ₉₉ = 8.5					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-Sep	0.0	0.0	0.0	Z	2.5	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	2.5	
2-Sep	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	0.1	0.1	0.1	0.5	0.0	0.1	0.1	0.1	0.0	0.8	0.2	0.1	0.8	
3-Sep	2.6	0.0	0.0	0.0	0.1	Z	0.3	0.1	0.1	0.2	0.1	0.2	0.1	0.2	0.1	0.1	0.0	0.1	0.1	0.0	0.0	4.4	0.1	0.0	0.4	4.4	
4-Sep	Z	0.0	0.0	0.0	4.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.8	0.1	0.4	0.1	0.3	4.0	
5-Sep	0.0	Z	0.7	0.1	0.7	0.1	0.9	1.1	0.9	0.5	0.2	0.1	0.3	0.2	0.1	0.1	0.6	0.5	0.1	0.3	0.1	0.3	0.1	0.1	0.3	1.1	
6-Sep	0.4	0.4	Z	0.2	0.5	1.2	1.2	1.0	0.5	0.5	0.3	0.2	0.3	0.2	0.2	2.5	0.2	0.1	0.1	1.7	2.8	2.1	1.4	0.6	0.8	2.8	
7-Sep	1.8	2.9	1.0	Z	3.9	7.3	2.2	0.9	1.6	0.7	0.2	0.3	0.2	5.7	0.1	0.3	0.5	0.5	0.3	2.8	0.2	0.0	0.4	0.4	1.5	7.3	
8-Sep	0.3	0.6	0.2	0.0	Z	1.7	6.5	2.7	0.8	0.7	0.2	0.4	0.2	0.2	0.1	0.0	0.1	0.1	0.0	0.0	0.4	1.4	0.6	0.2	0.8	6.5	
9-Sep	0.1	0.3	0.3	0.1	0.2	Z	2.0	1.3	1.2	0.6	0.6	0.5	0.7	1.1	1.7	0.7	0.2	0.1	0.1	6.1	1.7	1.0	0.7	1.7	1.0	6.1	
10-Sep	Z	0.7	0.5	0.4	0.5	0.4	1.5	2.4	8.9	4.7	8.6	3.1	1.1	1.5	0.5	0.4	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	1.6	8.9	
11-Sep	0.0	Z	0.0	0.0	0.0	0.0	0.5	0.7	0.7	1.6	0.6	0.4	0.6	1.8	0.7	0.9	0.9	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.8	
12-Sep	0.0	0.0	Z	0.7	0.9	1.8	16.3	3.1	3.2	1.1	0.3	0.5	1.3	1.2	0.8	2.5	1.3	1.1	0.0	0.0	0.0	0.0	0.2	0.7	1.6	16.3	
13-Sep	1.3	0.7	1.8	Z	1.0	0.1	0.1	0.2	0.1	0.5	0.3	0.3	0.3	0.3	0.1	0.1	0.1	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.8	
14-Sep	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.4	0.4	0.3	0.5	0.2	0.2	0.1	0.1	0.4	0.1	0.2	0.2	2.9	4.8	2.2	1.1	0.6	4.8	
15-Sep	0.2	0.2	2.2	0.4	0.7	Z	7.4	0.8	0.6	1.0	0.3	0.4	0.6	0.4	0.7	0.4	0.4	0.3	0.0	0.0	0.0	0.2	1.3	0.9	0.8	7.4	
16-Sep	Z	0.0	0.0	0.0	10.6	4.3	1.7	0.8	0.5	0.6	0.3	0.1	0.1	0.2	0.2	0.1	0.1	1.4	1.1	2.2	2.0	2.4	3.1	0.5	1.4	10.6	
17-Sep	0.4	Z	1.2	0.6	0.9	2.8	2.2	4.2	3.6	2.2	1.8	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.1	0.1	1.1	2.6	1.5	1.1	4.2	
18-Sep	0.6	0.1	Z	0.3	0.7	2.0	2.5	3.9	0.4	0.6	0.3	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.3	0.2	0.1	0.1	0.1	0.6	3.9	
19-Sep	0.1	0.1	2.8	Z	0.1	0.1	0.7	1.3	1.3	0.4	0.4	0.3	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.9	1.1	0.7	0.5	0.9	0.6	2.8
20-Sep	2.0	0.6	2.0	9.6	Z	6.9	8.5	7.9	2.4	1.1	2.3	1.2	0.5	0.2	0.1	0.5	0.4	0.0	0.1	1.7	1.7	0.8	0.9	0.6	2.3	9.6	
21-Sep	0.8	0.7	0.1	0.7	1.4	Z	8.0	3.8	3.0	1.2	C	C	C	C	C	C	1.4	0.7	0.2	0.0	0.0	0.0	0.0	0.0	--	8.0	
22-Sep	Z	0.0	0.5	5.1	3.3	1.4	3.6	18.9	2.4	0.5	0.4	0.4	0.2	0.4	0.1	0.2	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.1	1.7	18.9	
23-Sep	0.0	Z	0.1	0.0	0.0	0.0	4.2	0.8	1.5	0.3	0.3	0.1	0.2	0.1	0.1	0.2	0.2	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.4	4.2	
24-Sep	0.1	0.4	Z	0.0	0.1	0.0	0.3	0.1	0.2	0.4	0.3	0.9	0.9	0.5	0.3	0.9	1.4	0.2	0.1	0.2	1.4	1.2	2.7	2.5	0.7	2.7	
25-Sep	2.1	1.0	0.9	Z	0.6	0.5	4.7	0.9	5.9	4.1	1.3	1.5	1.0	0.5	0.7	1.1	1.6	1.4	1.1	0.7	0.6	0.5	0.3	0.3	1.4	5.9	
26-Sep	0.0	0.0	0.0	0.0	Z	0.0	0.4	1.3	0.4	1.1	0.6	2.6	0.4	M	0.1	0.1	1.5	0.5	0.3	0.7	0.6	1.3	0.1	0.3	0.6	2.6	
27-Sep	2.0	3.0	1.2	0.1	0.3	Z	2.5	2.4	1.2	0.1	0.0	0.0	0.2	0.0	1.8	0.5	0.6	1.6	0.1	0.3	1.0	1.5	1.4	0.5	1.0	3.0	
28-Sep	Z	1.6	0.9	0.6	0.6	0.4	3.5	6.5	3.3	3.0	9.5	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	1.4	0.2	0.0	0.0	0.0	1.4	9.5	
29-Sep	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.1	0.4	0.3	0.3	0.2	0.1	0.2	0.5	0.4	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.5	
30-Sep	0.1	0.1	Z	0.1	0.0	0.1	0.2	1.0	1.0	0.7	0.4	0.6	0.2	0.3	0.2	0.2	0.0	0.0	0.0	0.2	0.1	0.1	0.4	0.3	0.3	1.0	
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerspan																								C - Calibration		M - Maintenance	



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Conklin - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb
Conklin - September 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	683	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: 683

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Conklin - September 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	5	22	54	135	98	74	55	38	44	34	54	33	683
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	18	11	4	4	5	22	54	135	98	74	55	38	44	34	54	33	683

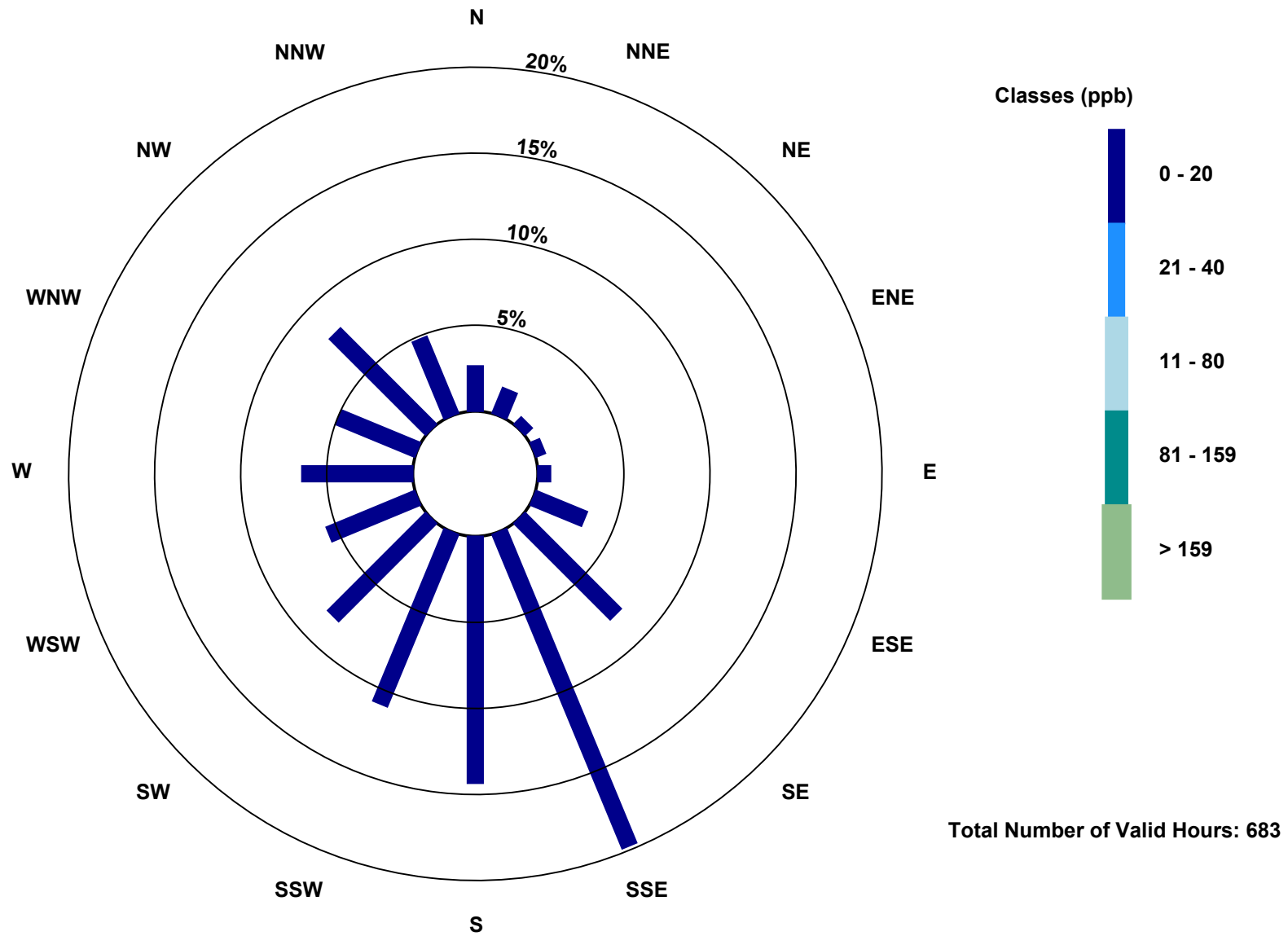
Total Number of Valid Hours: 683

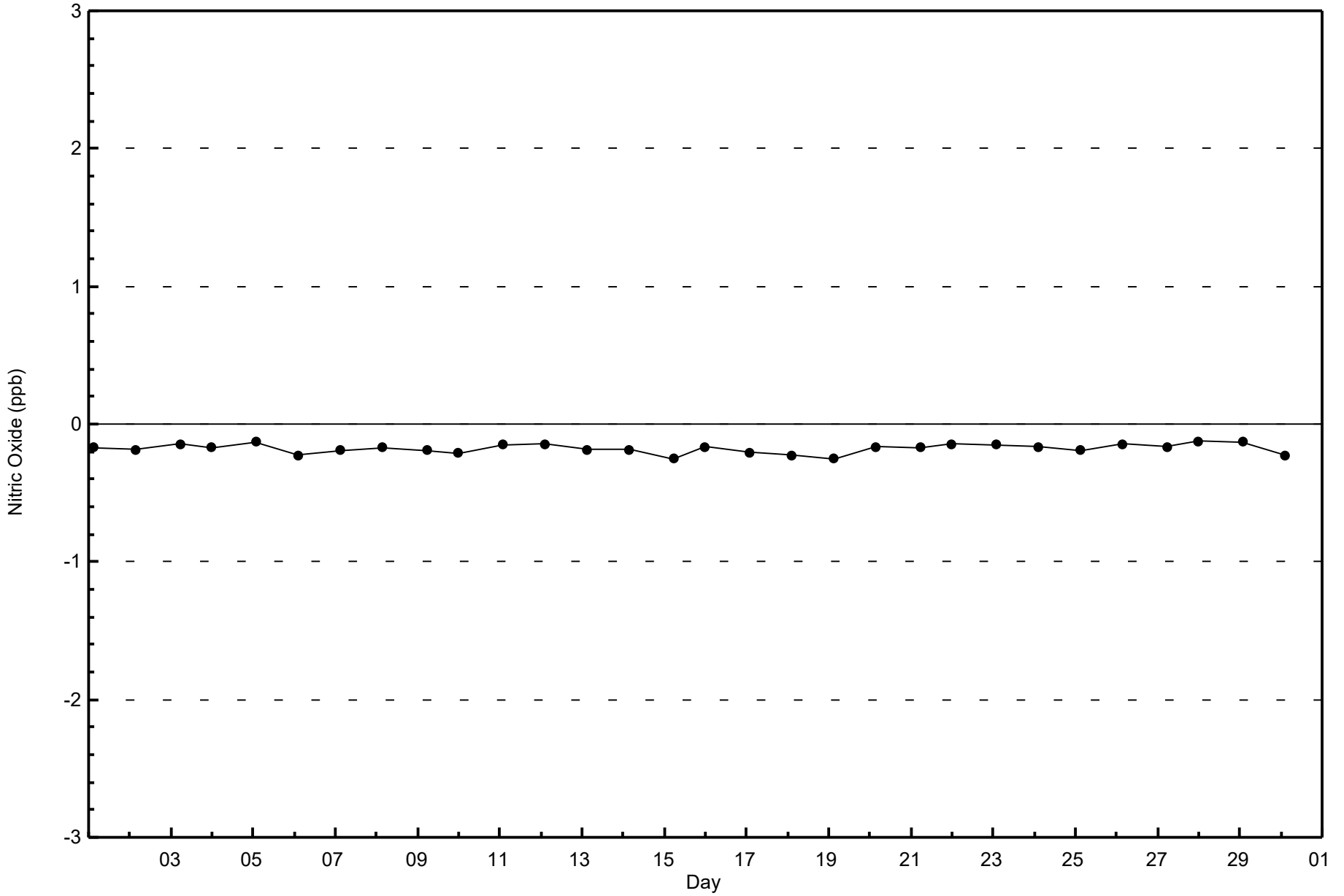
Total Number of Hours: 720

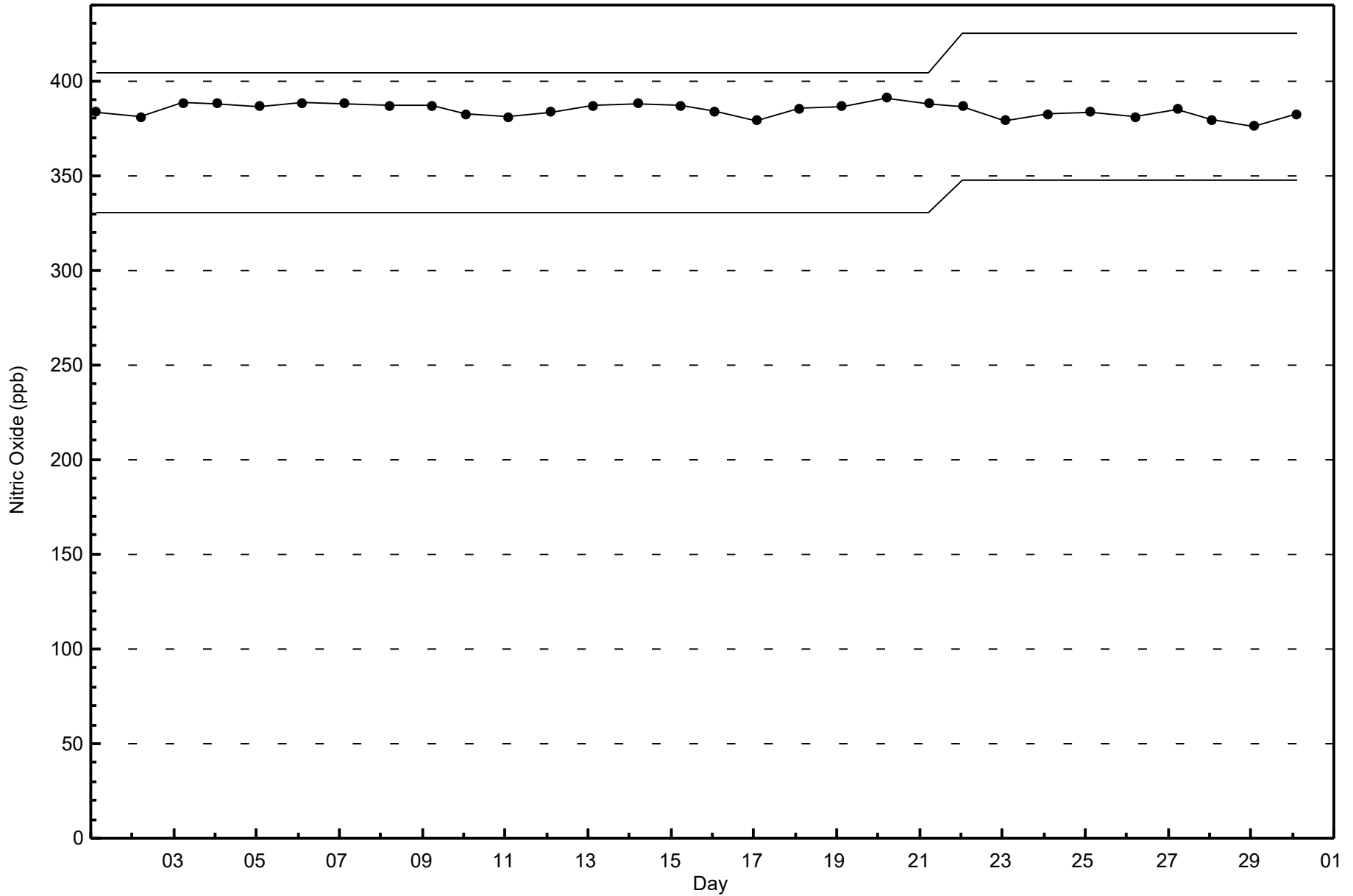


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitric Oxide (NO) - ppb
Conklin









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

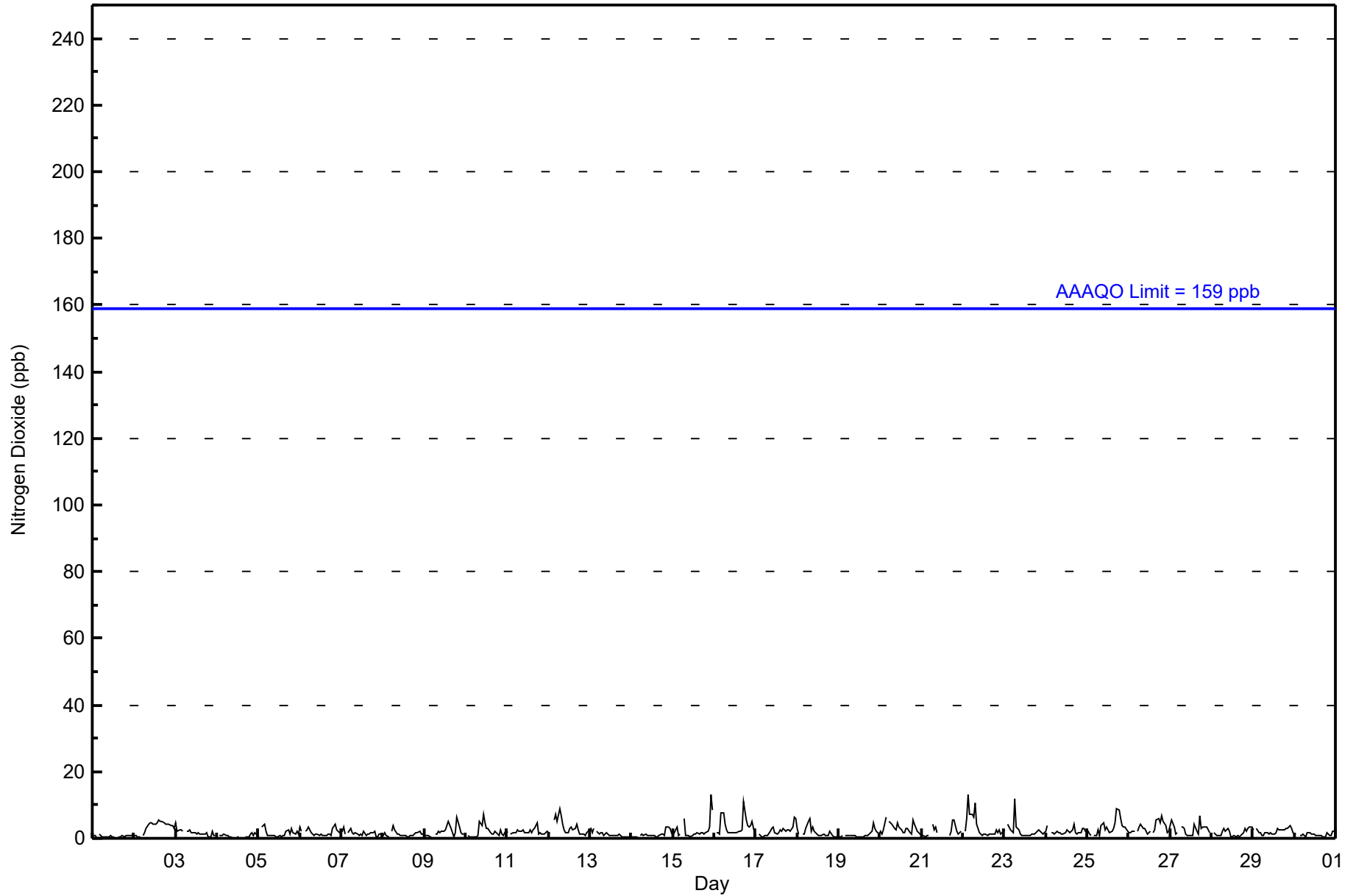
Conklin - September 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:														720						
Maximum Value: 13.2 ppb on Sep 15 23:00		Maximum Daily Average: 3.5 ppb on Sep 22		Hours of Data:														683								
Minimum Value: 0.1 ppb on Sep 4 10:00		Minimum Daily Average: 0.6 ppb on Sep 1		Hours of Missing Data:														37								
Maximum Diurnal Average: 2.9 ppb at hour 7		Minimum Diurnal Average: 1.5 ppb at hour 13		Hours of Calibration:														36								
Monthly Average: 2.06 ppb		Percentiles: P ₁ = 0.2 P ₁₀ = 0.6 Q ₁ = 0.9 Median = 1.5 Q ₃ = 2.6 P ₉₀ = 4.3 P ₉₉ = 8.4		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-Sep	0.8	0.7	0.6	Z	1.1	0.6	0.6	0.6	0.6	0.5	0.8	0.5	0.3	0.2	0.2	0.3	0.4	0.7	0.6	0.7	0.7	0.8	0.8	1.0	0.6	1.1
2-Sep	1.0	0.7	0.5	0.5	Z	1.0	1.5	3.1	4.1	4.5	4.7	4.4	4.4	4.5	5.3	4.9	5.1	4.5	4.3	4.1	4.1	4.0	3.8	3.0	3.4	5.3
3-Sep	4.7	2.3	2.4	2.4	2.2	Z	2.0	2.1	2.6	1.9	1.6	1.7	1.3	1.6	1.4	1.1	1.2	1.4	1.6	0.6	0.3	2.0	0.8	1.0	1.7	4.7
4-Sep	Z	1.0	0.8	0.9	1.3	0.8	0.7	0.5	0.3	0.1	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.4	1.4	1.6	0.7	1.8	0.9	0.7	1.8
5-Sep	0.6	Z	3.4	4.4	2.1	0.7	0.7	0.9	0.7	0.9	0.6	0.6	0.7	0.6	0.7	0.8	2.2	2.6	1.4	3.0	1.9	1.4	2.1	1.2	1.5	4.4
6-Sep	3.6	2.2	Z	2.2	2.4	3.3	1.8	1.2	1.0	1.1	1.1	1.0	1.2	0.8	1.0	0.9	1.1	1.1	0.7	2.8	4.1	2.5	2.1	1.5	1.8	4.1
7-Sep	2.3	3.4	1.4	Z	1.9	2.8	1.7	1.2	1.7	1.3	1.0	1.2	1.0	2.3	0.9	1.2	1.1	1.6	1.8	2.3	0.6	0.4	1.2	1.2	1.5	3.4
8-Sep	0.9	1.7	0.8	0.6	Z	2.2	3.8	2.4	1.1	1.1	0.7	0.8	0.7	0.8	0.6	0.6	0.9	0.9	1.1	1.5	1.7	2.0	1.4	1.1	1.3	3.8
9-Sep	0.7	0.9	0.9	0.4	0.4	Z	1.2	1.3	2.0	1.9	2.1	2.2	2.5	4.0	5.0	2.8	1.7	0.5	1.6	6.3	3.3	1.5	1.1	1.4	2.0	6.3
10-Sep	Z	0.9	0.6	0.5	0.4	0.4	0.4	0.7	5.1	3.9	7.3	4.5	3.1	2.9	1.6	1.4	1.4	2.0	1.3	1.0	2.4	1.1	0.9	2.6	2.0	7.3
11-Sep	1.7	Z	1.4	1.5	1.5	1.8	2.4	2.0	2.0	2.6	1.8	1.5	1.7	2.7	1.8	2.6	3.0	4.7	1.3	1.7	1.1	1.2	1.8	2.3	2.0	4.7
12-Sep	1.5	1.6	Z	5.6	7.1	4.9	8.8	6.8	4.3	2.4	1.6	1.9	3.0	3.2	2.7	3.1	4.2	2.6	1.4	1.3	1.1	0.9	1.5	2.3	3.2	8.8
13-Sep	3.0	1.5	3.1	Z	2.0	1.2	1.8	1.5	1.0	1.5	1.1	0.9	0.9	1.0	0.8	0.8	0.7	1.2	0.6	0.5	0.4	0.4	0.4	0.6	1.2	3.1
14-Sep	0.6	0.5	0.5	0.5	Z	0.9	1.2	1.0	1.3	1.0	0.9	1.0	0.7	0.7	0.5	0.5	1.0	1.1	1.3	0.8	3.4	3.4	2.9	1.7	1.2	3.4
15-Sep	1.0	1.7	3.4	0.9	1.2	Z	5.8	0.8	0.9	1.0	0.6	1.0	1.3	1.1	1.7	1.1	1.5	1.7	1.4	1.5	2.1	3.5	13.2	8.3	2.5	13.2
16-Sep	Z	1.7	1.5	1.4	7.8	7.5	4.4	2.5	1.9	1.8	1.8	1.7	1.6	1.7	2.0	2.0	2.7	10.9	5.4	3.7	3.3	3.8	4.9	1.1	3.4	10.9
17-Sep	0.8	Z	1.3	0.5	0.6	0.9	1.0	1.0	2.1	2.8	3.2	1.6	1.4	1.5	2.4	2.3	3.0	2.3	2.6	2.5	2.2	3.5	6.5	6.0	2.3	6.5
18-Sep	3.0	1.3	Z	1.1	1.4	2.9	5.0	6.1	2.1	3.3	2.2	1.3	0.9	0.9	1.0	1.3	0.8	0.8	0.8	2.0	0.7	0.4	0.5	0.4	1.7	6.1
19-Sep	0.4	0.5	0.8	Z	0.7	0.7	0.8	1.0	0.8	0.7	0.6	0.6	0.6	0.5	0.6	0.7	0.8	1.0	1.7	2.3	4.7	3.1	2.3	1.2	1.2	4.7
20-Sep	2.3	1.2	2.4	6.4	Z	4.9	4.5	4.4	2.9	2.4	4.6	3.3	2.4	1.8	1.7	3.0	3.1	1.5	1.2	5.4	4.4	2.2	1.7	1.1	3.0	6.4
21-Sep	0.9	1.0	0.4	0.9	1.0	Z	4.3	2.4	3.3	1.7	C	C	C	C	C	C	0.7	2.2	5.4	5.5	2.3	1.2	1.6	2.0	--	5.5
22-Sep	Z	2.2	6.0	13.0	7.3	7.0	6.5	10.7	4.2	1.5	1.4	1.0	1.1	1.4	0.8	1.2	1.3	1.4	1.2	2.7	1.8	2.4	1.4	2.2	3.5	13.0
23-Sep	2.7	Z	4.4	2.5	2.1	1.8	11.7	3.2	2.4	1.3	1.0	0.7	1.0	0.7	0.9	1.0	1.2	1.4	1.8	2.0	2.4	1.8	1.3	1.5	2.2	11.7
24-Sep	2.2	3.7	Z	1.6	1.8	1.4	2.1	1.5	1.7	1.4	1.3	1.7	2.5	2.3	1.6	2.5	4.2	1.7	1.4	1.6	1.6	2.8	2.8	2.2	2.1	4.2
25-Sep	2.1	1.1	0.9	Z	0.7	1.0	2.6	0.8	3.9	4.5	2.5	3.3	2.5	1.6	2.1	3.0	4.5	8.7	8.3	6.1	3.9	3.6	3.3	2.1	3.2	8.7
26-Sep	1.7	1.6	2.2	2.0	Z	2.0	3.2	4.1	2.9	2.9	2.1	1.4	2.0	M	1.8	2.6	5.7	6.1	4.5	6.8	4.9	3.9	1.5	2.2	3.1	6.8
27-Sep	3.9	5.4	3.2	1.4	1.5	Z	3.3	3.3	2.8	1.2	0.9	0.7	1.0	0.7	4.4	2.1	1.4	6.9	2.9	3.5	3.3	3.3	2.5	1.7	2.7	6.9
28-Sep	Z	1.7	1.1	0.8	0.8	0.8	2.3	3.1	2.0	2.9	2.3	0.6	0.4	0.8	0.6	0.9	0.6	0.8	1.6	3.0	2.0	3.1	3.5	3.5	1.7	3.5
29-Sep	2.7	Z	3.0	1.5	1.5	0.9	0.9	1.7	1.8	1.3	1.5	1.2	1.1	1.5	2.8	2.7	2.6	2.5	2.6	2.8	3.1	3.7	2.9	1.7	2.1	3.7
30-Sep	1.4	1.1	Z	1.0	0.8	1.1	0.6	1.8	1.7	1.5	1.2	1.3	1.0	0.9	1.0	0.8	0.6	0.3	0.4	1.9	0.9	0.7	2.2	2.2	1.1	2.2
																								Diurnal Average		
																								Diurnal Maximum		
																								1.9 4.7		
																								1.7 5.4		
																								1.9 6.0		
																								2.2 13.0		
																								2.1 7.8		
																								2.1 7.5		
																								2.9 11.7		
																								2.5 10.7		
																								2.2 5.1		
																								1.9 4.5		
																								1.8 7.3		
																								1.5 4.5		
																								1.5 4.4		
																								1.5 4.5		
																								1.7 5.3		
																								1.7 4.9		
																								2.0 5.7		
																								2.5 10.9		
																								2.1 8.3		
																								2.7 6.8		
																								2.3 4.9		
																								2.2 4.0		
																								2.5 13.2		
																								2.0 8.3		
																								Z - zerospan		
																								C - Calibration		
																								M - Maintenance		
																								Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb		



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Conklin - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Conklin - September 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	683	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: 683

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Conklin - September 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	5	22	54	135	98	74	55	38	44	34	54	33	683
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	18	11	4	4	5	22	54	135	98	74	55	38	44	34	54	33	683

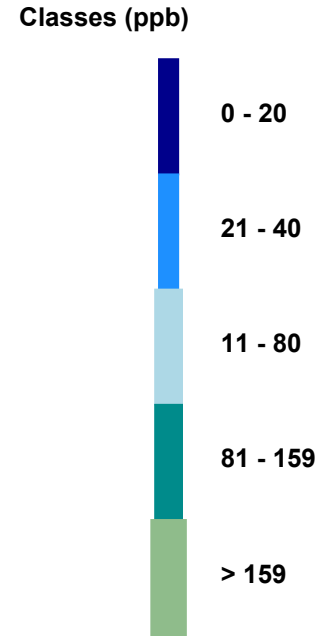
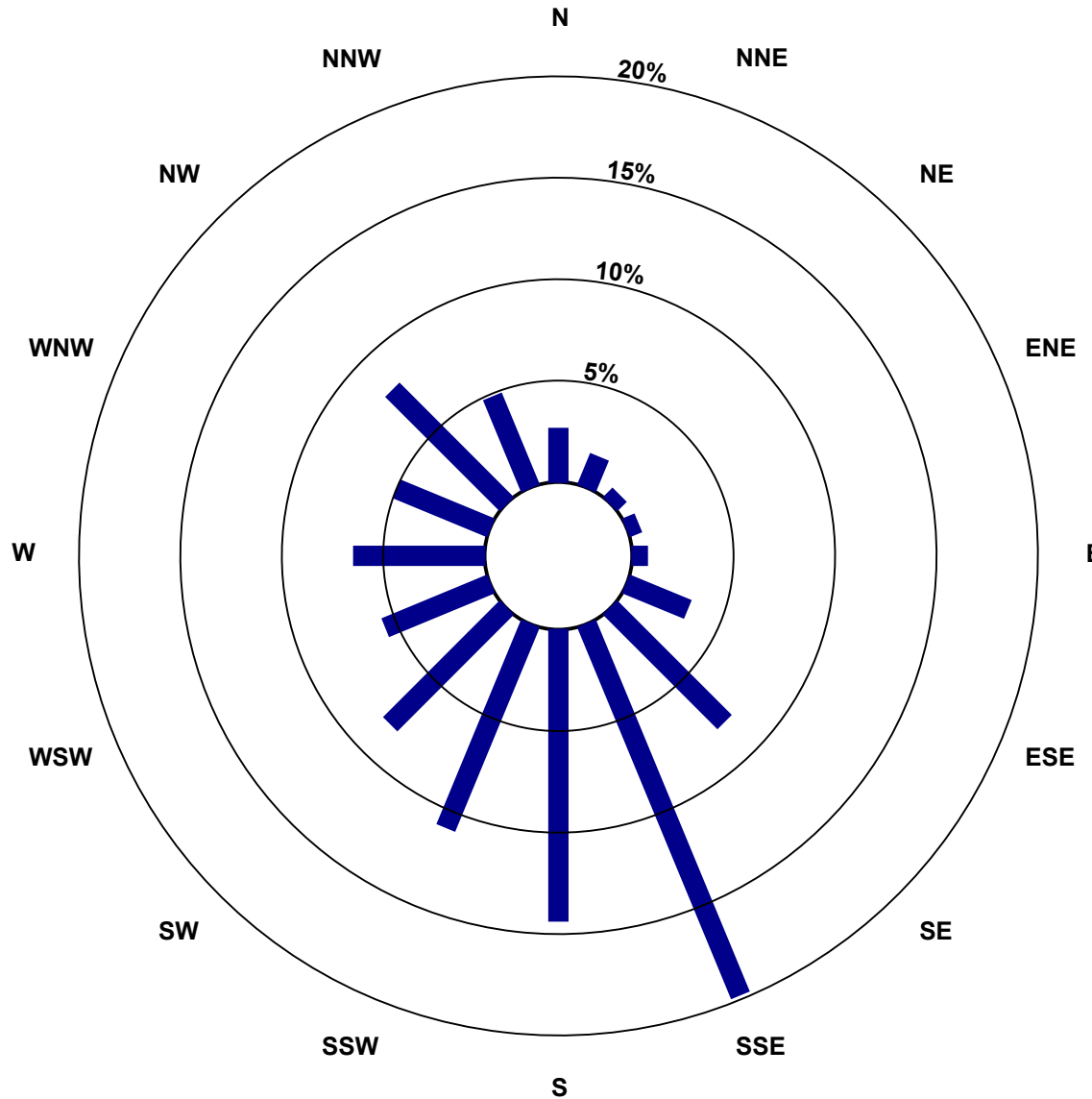
Total Number of Valid Hours: 683

Total Number of Hours: 720

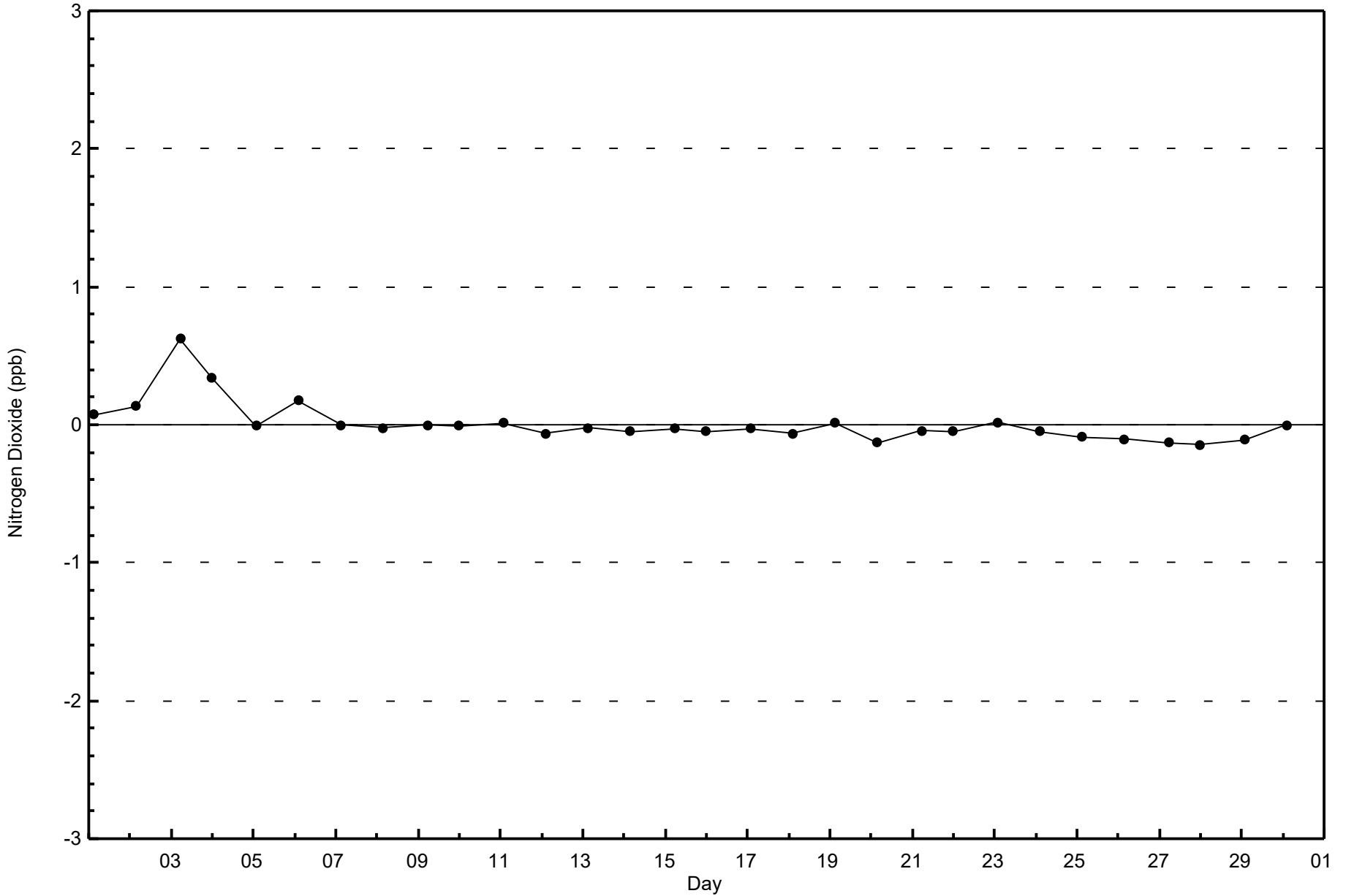


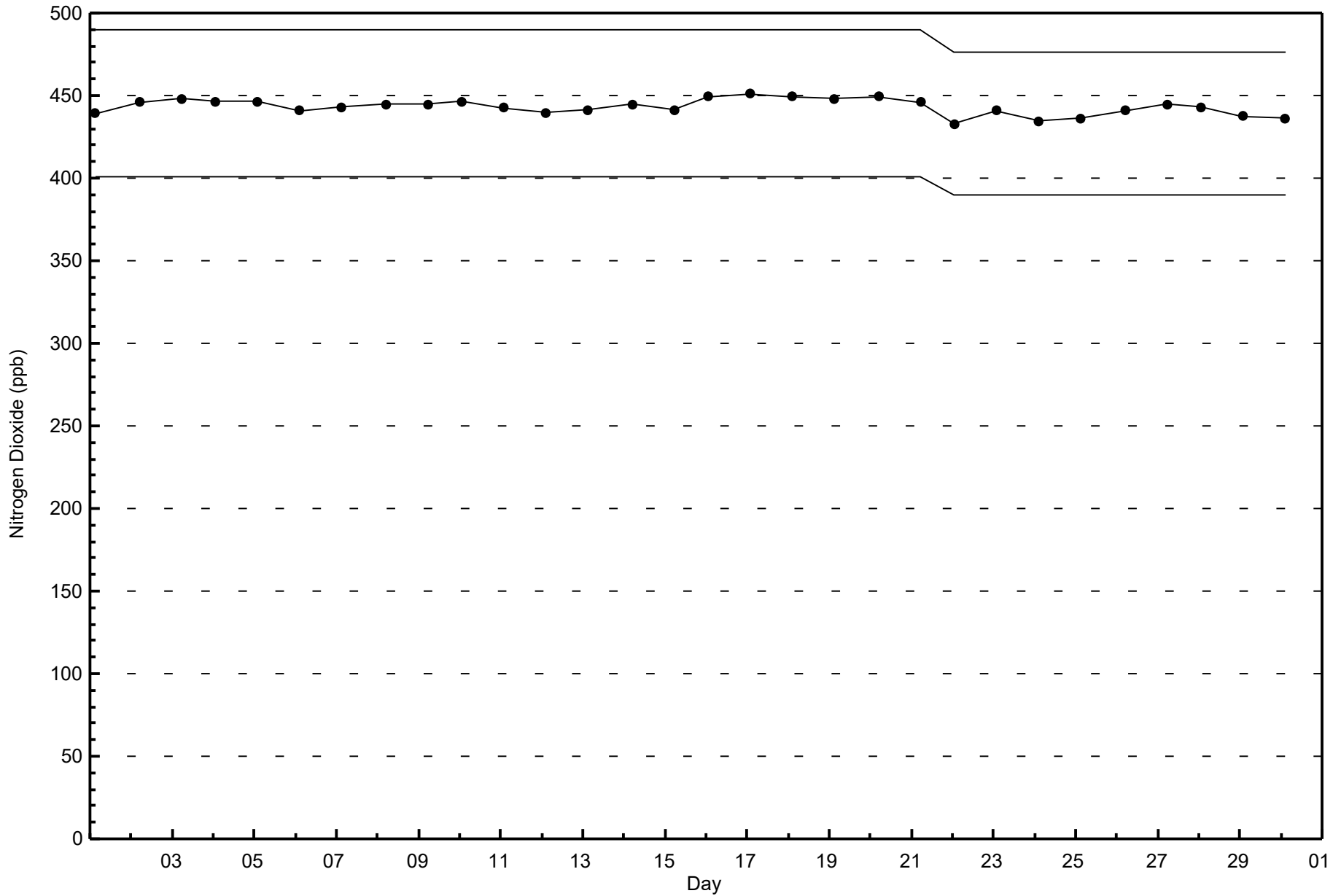
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitrogen Dioxide (NO₂) - ppb
Conklin



Total Number of Valid Hours: 683







Wood Buffalo Environmental Association
Summary of Hour Averages

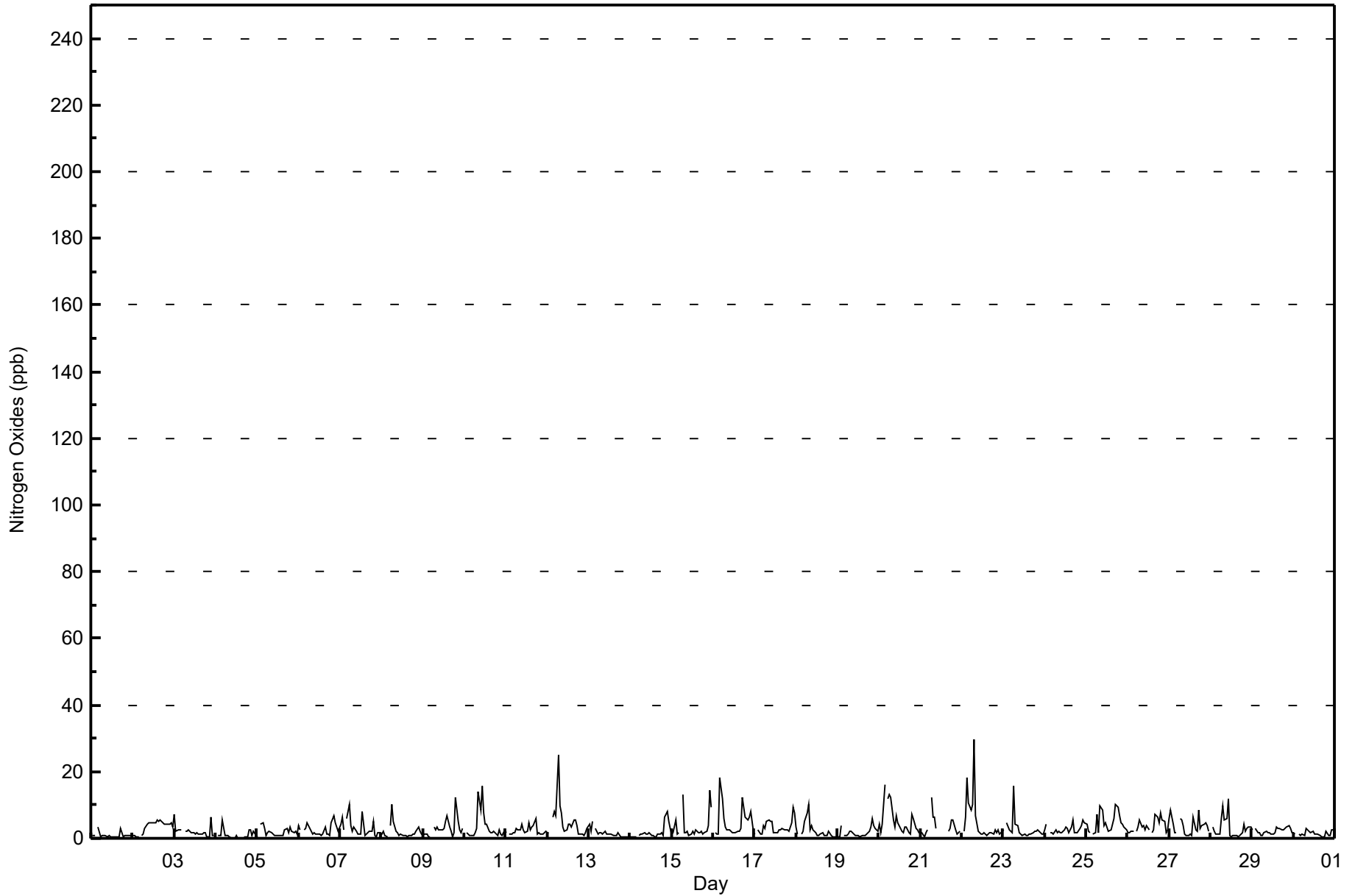
Nitrogen Oxides (NO_x) - ppb
Conklin - September 2023

Maximum Value: 29.6 ppb on Sep 22 08:00																						Maximum Daily Average: 5.2 ppb on Sep 20																						Hours in Service: 720			
Minimum Value: 0.1 ppb on Sep 4 10:00																						Minimum Daily Average: 0.8 ppb on Sep 1																						Hours of Data: 683			
Maximum Diurnal Average: 5.7 ppb at hour 7																						Minimum Diurnal Average: 1.8 ppb at hour 13																						Hours of Missing Data: 37			
Monthly Average: 2.91 ppb																						Percentiles: P ₁ = 0.2 P ₁₀ = 0.7 Q ₁ = 1.2 Median = 1.9 Q ₃ = 3.6 P ₉₀ = 5.9 P ₉₉ = 14.7																						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-Sep	0.8	0.7	0.6	Z	3.6	0.6	0.7	0.6	0.7	0.5	0.8	0.5	0.3	0.2	0.2	0.3	0.4	2.8	0.6	0.7	0.7	0.8	0.8	1.0	0.8	3.6																					
2-Sep	1.0	0.7	0.5	0.5	Z	1.0	1.5	3.1	4.1	4.6	4.8	4.5	4.6	5.4	5.0	5.6	4.5	4.4	4.2	4.2	4.0	4.6	3.2	3.5	5.6																						
3-Sep	7.3	2.3	2.4	2.4	2.3	Z	2.3	2.2	2.7	2.1	1.7	1.9	1.4	1.8	1.5	1.2	1.2	1.5	1.7	0.6	0.3	6.4	0.9	1.0	2.1	7.3																					
4-Sep	Z	1.0	0.8	0.9	5.3	0.8	0.8	0.6	0.3	0.1	0.2	0.2	0.7	0.2	0.2	0.2	0.3	0.4	2.4	2.4	0.8	2.2	1.0	1.0	5.3																						
5-Sep	0.6	Z	4.1	4.5	2.8	0.8	1.6	2.0	1.6	1.4	0.8	0.7	1.0	0.8	0.8	0.9	2.8	3.1	1.5	3.3	2.0	1.7	2.2	1.3	1.8	4.5																					
6-Sep	4.0	2.6	Z	2.4	2.9	4.5	3.0	2.2	1.5	1.6	1.4	1.2	1.5	1.0	1.2	3.4	1.3	1.2	0.8	4.5	6.9	4.6	3.5	2.1	2.6	6.9																					
7-Sep	4.1	6.3	2.4	Z	5.8	10.1	3.9	2.1	3.3	2.0	1.2	1.5	1.2	8.0	1.0	1.5	1.6	2.1	2.1	5.1	0.8	0.4	1.6	1.6	3.0	10.1																					
8-Sep	1.2	2.3	1.0	0.6	Z	3.9	10.3	5.1	1.9	1.8	0.9	1.2	0.9	1.0	0.7	0.6	1.0	1.0	1.1	1.5	2.1	3.4	2.0	1.3	2.0	10.3																					
9-Sep	0.8	1.2	1.2	0.5	0.6	Z	3.2	2.6	3.2	2.5	2.7	2.7	3.2	5.1	6.7	3.5	1.9	0.6	1.7	12.4	5.0	2.5	1.8	3.1	3.0	12.4																					
10-Sep	Z	1.6	1.1	0.9	0.9	0.8	1.9	3.1	14.0	8.6	15.9	7.6	4.2	4.4	2.1	1.8	1.7	2.3	1.3	1.0	2.4	1.1	0.9	2.6	3.6	15.9																					
11-Sep	1.7	Z	1.4	1.5	1.5	1.8	2.9	2.7	2.7	4.2	2.4	1.9	2.3	4.5	2.5	3.5	3.9	5.8	1.3	1.7	1.1	1.2	1.8	2.3	2.5	5.8																					
12-Sep	1.5	1.6	Z	6.3	8.0	6.7	25.1	9.9	7.5	3.5	1.9	2.4	4.3	4.4	3.5	5.6	5.5	3.7	1.4	1.3	1.1	0.9	1.7	3.0	4.8	25.1																					
13-Sep	4.3	2.2	4.9	Z	3.0	1.3	1.9	1.7	1.1	2.0	1.4	1.2	1.2	1.3	0.9	0.9	0.8	1.6	0.6	0.5	0.4	0.4	0.4	0.6	1.5	4.9																					
14-Sep	0.6	0.5	0.5	0.5	Z	0.9	1.2	1.1	1.7	1.4	1.2	1.5	0.9	0.6	0.6	1.4	1.2	1.5	1.0	6.3	8.2	5.1	2.8	1.8	8.2	8.2																					
15-Sep	1.2	1.9	5.6	1.3	1.9	Z	13.2	1.6	1.5	2.0	0.9	1.4	1.9	1.5	2.4	1.5	1.9	2.0	1.4	1.5	2.1	3.7	14.5	9.2	3.3	14.5																					
16-Sep	Z	1.7	1.5	1.4	18.4	11.8	6.1	3.3	2.4	2.4	2.1	1.8	1.7	1.9	2.2	2.1	2.8	12.3	6.5	5.9	5.3	6.2	8.0	1.6	4.7	18.4																					
17-Sep	1.2	Z	2.5	1.1	1.5	3.7	3.2	5.2	5.7	5.0	5.0	1.9	1.6	1.7	2.6	2.4	3.1	2.4	2.6	2.6	2.3	4.6	9.1	7.5	3.4	9.1																					
18-Sep	3.6	1.4	Z	1.4	2.1	4.9	7.5	10.0	2.5	3.9	2.5	1.5	1.0	1.0	1.2	1.5	1.0	1.0	0.9	2.3	0.9	0.5	0.6	0.5	2.3	10.0																					
19-Sep	0.5	0.6	3.6	Z	0.8	0.8	1.5	2.3	2.1	1.1	1.0	0.9	1.0	0.6	0.7	0.8	0.9	1.1	1.9	3.2	5.8	3.8	2.8	2.1	1.7	5.8																					
20-Sep	4.3	1.8	4.4	16.0	Z	11.8	13.0	12.3	5.3	3.5	6.9	4.5	2.9	2.0	1.8	3.5	3.5	1.5	1.3	7.1	6.1	3.0	2.6	1.7	5.2	16.0																					
21-Sep	1.7	1.7	0.5	1.6	2.4	Z	12.3	6.2	6.3	2.9	C	C	C	C	C	C	2.1	2.9	5.6	5.5	2.3	1.2	1.6	2.0	--	12.3																					
22-Sep	Z	2.2	6.5	18.1	10.6	8.4	10.1	29.6	6.6	2.0	1.8	1.4	1.3	1.8	0.9	1.4	1.6	1.6	1.2	2.7	1.8	2.4	1.4	2.3	5.1	29.6																					
23-Sep	2.7	Z	4.5	2.5	2.1	1.8	15.9	4.0	3.9	1.6	1.3	0.8	1.2	0.8	1.0	1.2	1.4	1.5	1.9	2.0	2.5	1.9	1.3	1.5	2.6	15.9																					
24-Sep	2.3	4.1	Z	1.6	1.9	1.4	2.4	1.6	1.9	1.8	1.6	2.6	3.4	2.8	1.9	3.4	5.6	1.9	1.5	1.8	3.0	4.0	5.5	4.7	2.7	5.6																					
25-Sep	4.2	2.1	1.8	Z	1.3	1.5	7.3	1.7	9.8	8.6	3.8	4.8	3.5	2.1	2.8	4.1	6.1	10.1	9.4	6.8	4.5	4.1	3.6	2.4	4.6	10.1																					
26-Sep	1.7	1.6	2.2	2.0	Z	2.0	3.6	5.4	3.3	4.0	2.7	4.0	2.4	M	1.9	2.7	7.2	6.6	4.8	7.5	5.5	5.2	1.6	2.5	3.7	7.5																					
27-Sep	5.9	8.4	4.4	1.5	1.8	Z	5.8	5.7	4.0	1.3	0.9	0.7	1.2	0.7	6.2	2.6	2.0	8.5	3.0	3.8	4.3	4.8	3.9	2.2	3.6	8.5																					
28-Sep	Z	3.3	2.0	1.4	1.4	1.2	5.8	9.6	5.3	5.9	11.8	0.7	0.4	0.8	0.6	1.0	0.6	0.8	1.6	4.4	2.2	3.1	3.5	3.5	3.1	11.8																					
29-Sep	2.7	Z	3.1	1.5	1.5	0.9	0.9	1.8	2.2	1.6	1.8	1.4	1.2	1.7	3.3	3.1	3.0	2.7	2.7	2.9	3.2	3.8	3.0	1.8	2.3	3.8																					
30-Sep	1.5	1.2	Z	1.1	0.8	1.2	0.8	2.8	2.7	2.2	1.6	1.9	1.2	1.2	1.2	1.0	0.6	0.3	0.4	2.1	1.0	0.8	2.6	2.5	1.4	2.8																					
																						2.5	2.2	2.5	2.9	3.4	3.4	5.7	4.8	3.7	2.9	2.9	2.0	1.8	2.1	2.0	2.1	2.4	3.0	2.2	3.4	3.0	3.0	3.2	2.5	Diurnal Average	
																						7.3	8.4	6.5	18.1	18.4	11.8	25.1	29.6	14.0	8.6	15.9	7.6	4.5	8.0	6.7	5.6	7.2	12.3	9.4	12.4	6.9	8.2	14.5	9.2	Diurnal Maximum	
Z - zerspan																						C - Calibration						M - Maintenance																			



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Conklin - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Conklin - September 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	681	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: 683

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Conklin - September 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	5	22	53	135	97	74	55	38	44	34	54	33	681
21 - 40	0	0	0	0	0	0	1	0	1	0	0	0	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	18	11	4	4	5	22	54	135	98	74	55	38	44	34	54	33	683

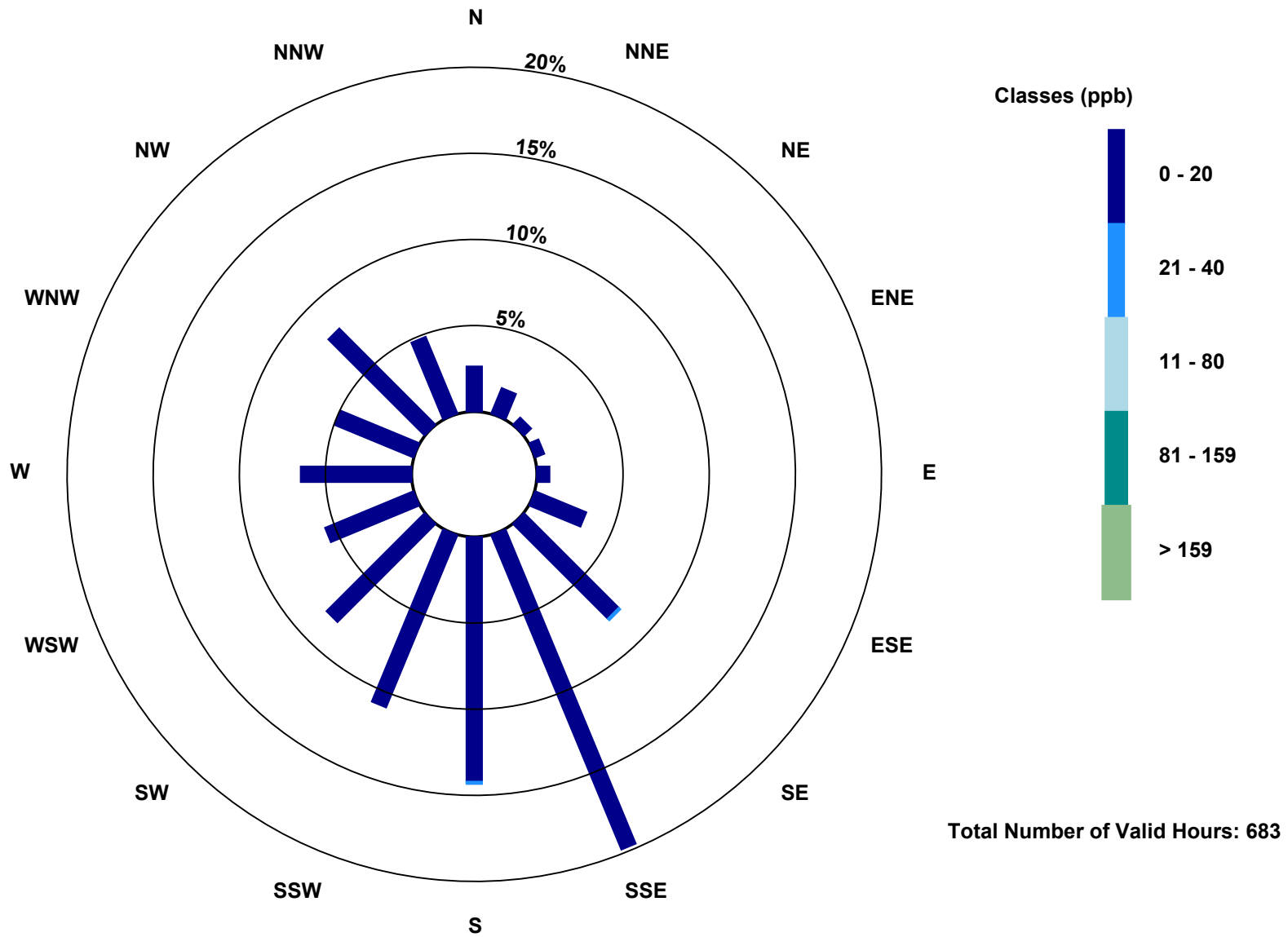
Total Number of Valid Hours: 683

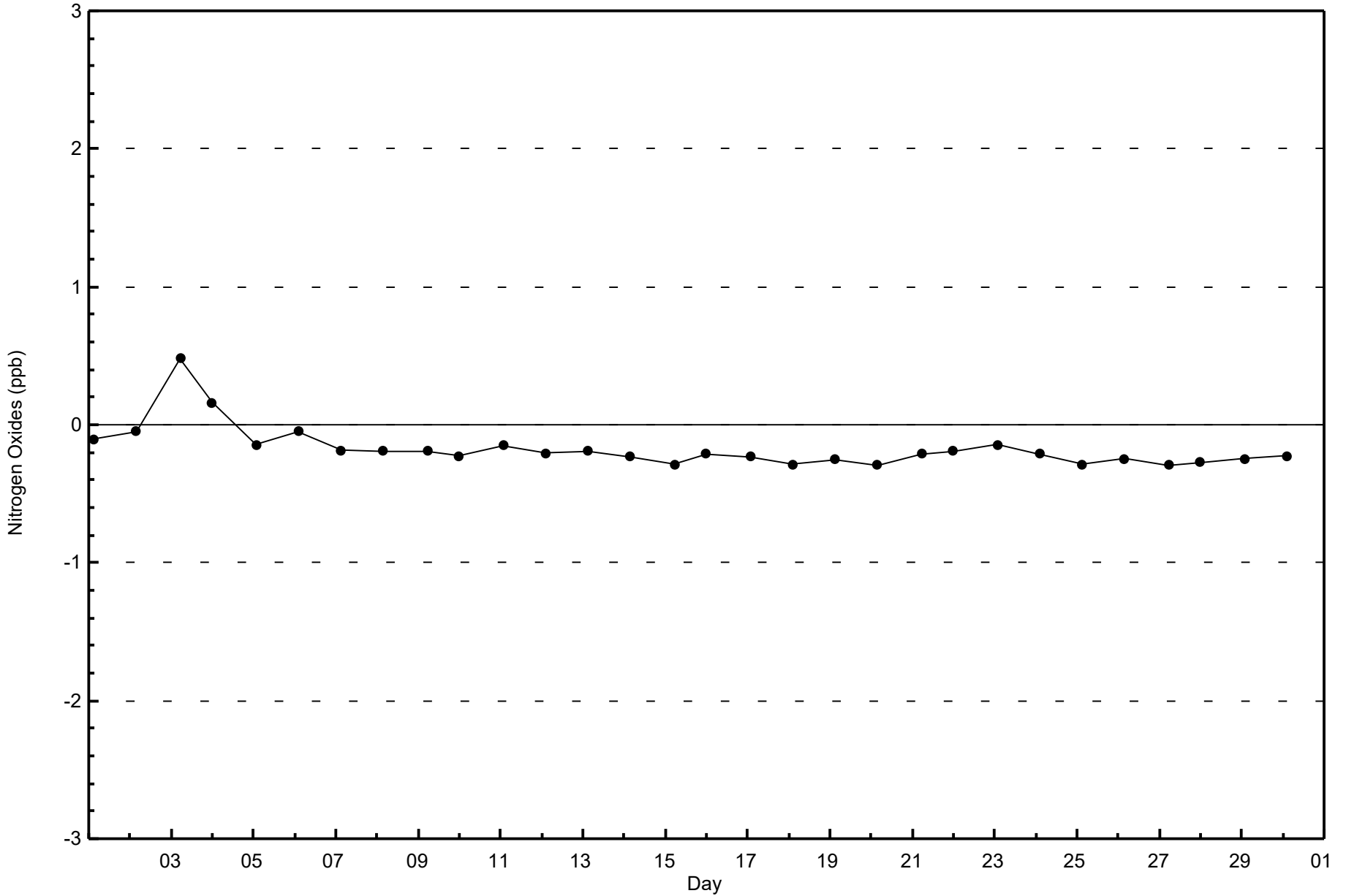
Total Number of Hours: 720

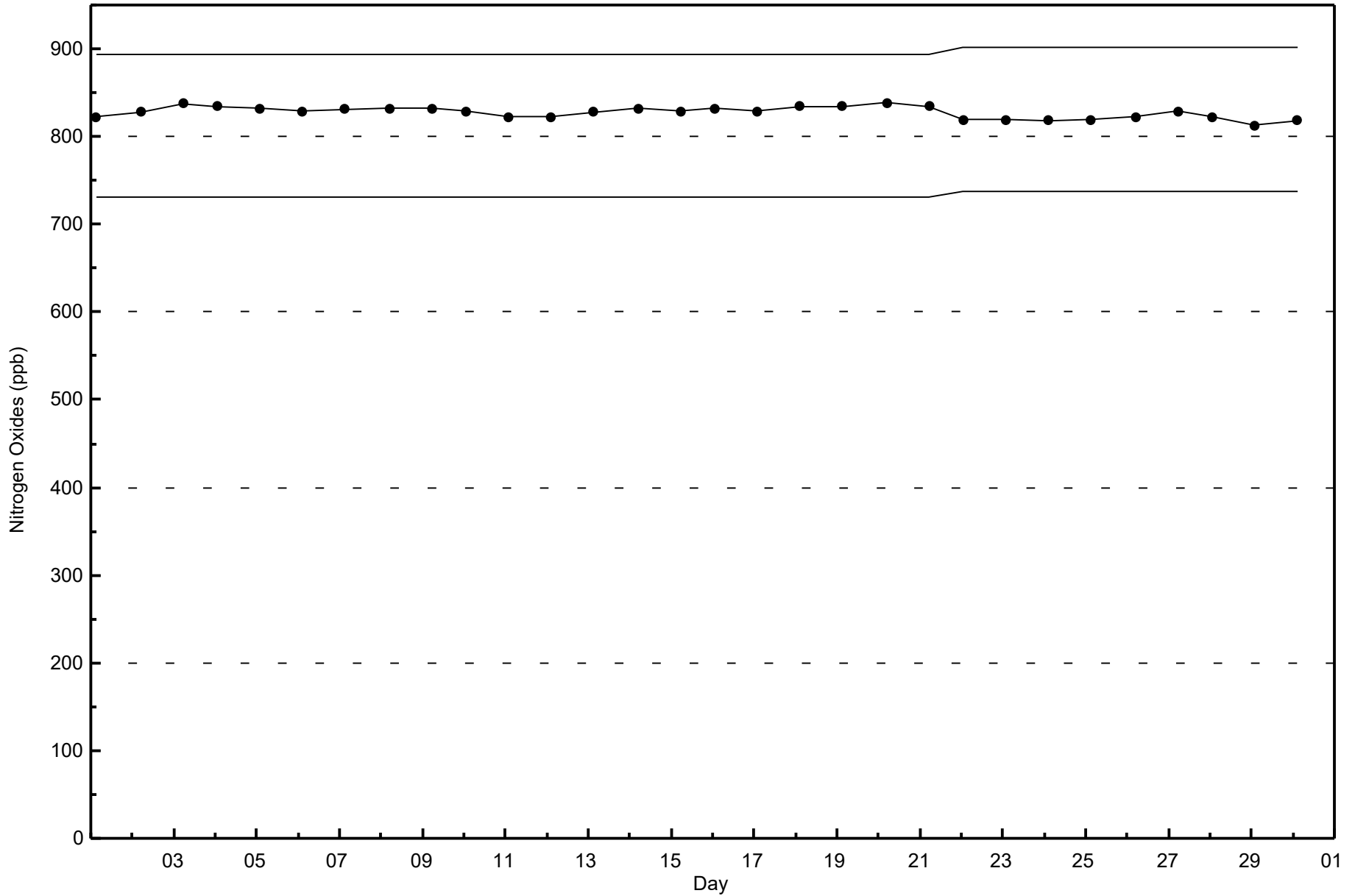


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitrogen Oxides (NO_x) - ppb
Conklin









Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O₃) - ppb

Conklin - September 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 51.0 ppb on Sep 11 19:00	Maximum Daily Average: 39.1 ppb on Sep 23		Hours of Data:	685
Minimum Value: 2.8 ppb on Sep 20 05:00	Minimum Daily Average: 11.6 ppb on Sep 29		Hours of Missing Data:	35
Maximum Diurnal Average: 34.4 ppb at hour 16	Minimum Diurnal Average: 12.6 ppb at hour 7		Hours of Calibration:	34
Monthly Average: 22.31 ppb	Percentiles: P ₁ = 3.0 P ₁₀ = 5.4 Q ₁ = 10.7 Median = 21.7 Q ₃ = 32.5 P ₉₀ = 38.9 P ₉₉ = 49.2		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-Sep	17.0	Z	16.6	17.5	14.6	19.1	19.1	20.2	21.5	24.8	31.1	34.1	37.3	37.3	37.3	37.9	38.2	37.3	38.7	37.4	36.2	34.8	35.4	36.5	29.6	38.7
2-Sep	34.2	30.6	Z	28.7	29.1	27.9	25.6	22.4	20.3	19.8	19.2	19.3	20.0	20.4	21.5	21.7	21.2	20.5	19.1	18.3	18.1	18.2	15.8	12.9	21.9	34.2
3-Sep	8.7	10.4	10.5	Z	10.7	9.0	8.2	11.1	14.7	15.5	27.0	33.1	29.2	27.1	27.0	30.2	29.8	26.2	23.5	22.7	20.7	19.0	19.2	18.7	19.7	33.1
4-Sep	18.0	16.4	14.8	13.8	Z	13.5	12.3	12.3	16.3	17.4	18.0	19.3	19.8	19.1	20.2	21.7	22.3	24.6	24.6	17.1	13.0	8.6	9.7	10.9	16.7	24.6
5-Sep	10.0	11.4	8.9	7.0	7.5	Z	11.0	11.2	12.0	21.6	28.9	30.6	30.9	31.7	31.7	30.3	27.3	26.1	26.3	17.9	10.2	9.2	15.1	16.2	18.8	31.7
6-Sep	Z	13.8	14.3	14.2	12.4	10.2	9.4	8.1	10.5	13.3	17.7	21.0	24.5	25.7	27.3	28.0	26.7	25.7	16.5	7.4	4.1	3.8	3.9	4.9	14.9	28.0
7-Sep	6.9	Z	3.4	3.3	4.1	3.7	7.0	9.3	10.7	17.0	23.2	27.9	31.1	30.8	30.8	30.2	30.4	27.5	23.6	12.0	8.9	11.3	11.2	10.0	16.3	31.1
8-Sep	11.3	11.8	Z	12.2	10.5	9.0	7.3	11.2	16.7	18.2	25.0	29.5	32.1	32.5	32.3	32.4	32.5	31.5	28.6	17.8	7.4	7.5	8.1	7.9	18.8	32.5
9-Sep	7.2	6.8	10.8	Z	4.1	3.5	4.0	8.5	14.3	23.9	29.2	35.9	36.2	36.2	33.7	38.1	29.0	29.8	17.8	5.4	4.1	3.5	3.3	3.1	16.9	38.1
10-Sep	3.1	3.0	2.9	3.0	Z	2.9	3.0	5.1	10.4	13.2	20.4	36.8	41.6	40.8	44.1	45.6	45.8	43.7	37.8	33.7	30.5	31.0	29.3	26.4	24.1	45.8
11-Sep	28.0	28.4	29.0	29.0	28.5	Z	26.7	27.1	30.1	36.0	C	C	C	C	50.2	49.5	49.6	48.8	51.0	45.7	41.9	39.8	38.0	36.1	37.5	51.0
12-Sep	Z	34.8	32.4	27.5	20.9	13.3	8.2	23.1	29.3	32.8	34.5	35.7	37.6	39.8	39.9	35.3	30.9	29.6	28.0	23.4	21.3	15.4	10.6	7.3	26.6	39.9
13-Sep	7.1	Z	8.9	9.8	14.0	20.3	18.2	20.0	21.8	21.6	25.0	28.5	30.7	31.6	32.9	35.5	36.9	37.5	37.0	34.5	33.9	33.3	31.8	29.7	26.1	37.5
14-Sep	27.1	26.2	Z	23.5	19.6	17.6	16.3	15.7	15.5	16.0	16.9	18.6	21.6	24.9	29.1	29.3	28.0	25.1	20.2	15.5	6.1	5.6	4.3	4.6	18.6	29.3
15-Sep	5.6	7.2	11.1	Z	11.6	11.0	7.7	14.0	18.8	28.3	34.3	35.9	38.9	42.4	44.6	47.2	49.2	48.4	46.0	44.7	44.0	38.4	14.3	14.3	28.6	49.2
16-Sep	28.5	37.2	37.0	36.7	Z	17.3	27.3	29.8	31.2	30.6	32.8	37.5	38.8	39.8	44.4	46.5	43.1	26.2	16.8	12.5	9.9	8.0	6.3	6.8	28.1	46.5
17-Sep	4.6	3.7	2.8	3.1	3.0	Z	2.9	3.2	6.9	13.1	21.2	43.6	45.1	49.4	49.9	50.9	47.1	44.2	44.5	41.3	28.3	17.7	12.2	8.9	23.8	50.9
18-Sep	Z	6.2	9.5	8.3	8.7	10.3	12.2	9.3	22.6	19.8	30.3	32.4	35.8	39.8	39.5	38.9	39.0	33.2	26.4	19.9	22.6	24.1	22.7	21.7	23.2	39.8
19-Sep	21.3	Z	18.2	17.2	17.3	17.1	16.3	15.5	16.2	19.7	22.9	24.1	24.8	25.1	25.7	26.0	25.5	25.9	19.1	9.5	5.4	5.6	4.6	4.2	17.7	26.0
20-Sep	3.3	4.5	Z	3.2	2.8	2.9	3.2	7.8	14.8	18.1	20.5	24.9	29.9	34.8	33.1	27.4	25.7	22.1	15.0	7.7	5.0	3.7	3.6	3.7	13.8	34.8
21-Sep	4.7	5.1	7.0	Z	3.6	5.8	4.7	8.7	10.5	15.8	24.1	28.6	29.7	31.2	32.5	33.2	35.0	37.5	32.5	22.4	18.0	22.4	29.4	29.8	20.5	37.5
22-Sep	30.6	30.4	24.6	13.6	Z	13.9	9.2	6.8	27.4	35.2	37.5	40.3	41.7	41.9	44.5	45.7	46.5	45.0	40.3	24.1	23.1	35.6	39.9	39.8	32.1	46.5
23-Sep	37.7	32.3	28.5	38.3	37.8	Z	24.6	33.1	35.4	39.3	42.4	44.1	45.4	47.0	46.5	46.5	47.0	44.0	41.2	39.1	36.1	37.1	38.6	37.6	39.1	47.0
24-Sep	Z	34.2	33.7	34.5	31.8	29.0	24.5	25.5	24.9	24.9	26.0	25.7	25.1	25.6	27.4	25.6	22.6	24.7	19.7	17.1	9.2	4.7	3.7	3.1	22.7	34.5
25-Sep	4.2	Z	4.2	5.7	6.3	6.7	5.7	5.3	10.3	19.9	27.7	31.4	37.3	38.6	37.2	37.6	37.2	32.1	25.6	29.6	33.7	33.7	32.6	34.2	23.3	38.6
26-Sep	36.4	39.3	Z	38.5	37.9	36.3	34.0	31.9	31.6	33.0	35.1	37.0	39.6	M	40.2	36.6	31.8	27.9	25.5	18.5	17.1	17.5	20.6	17.0	31.1	40.2
27-Sep	17.8	18.9	14.9	Z	14.0	17.1	16.1	16.7	22.3	29.7	35.4	40.1	41.3	38.9	24.4	34.1	36.6	30.6	17.3	9.6	6.0	5.2	4.7	4.6	21.6	41.3
28-Sep	3.7	2.9	3.8	4.7	Z	4.7	4.1	5.3	9.0	13.3	27.8	32.8	35.5	33.9	36.7	35.1	34.1	32.9	20.7	9.3	7.4	13.0	10.6	10.7	17.1	36.7
29-Sep	9.5	8.3	6.6	9.9	8.7	Z	7.4	7.4	10.6	14.9	17.3	20.0	19.7	16.6	13.0	13.2	11.0	12.5	12.2	9.9	9.5	8.7	9.5	9.3	11.6	20.0
30-Sep	Z	7.9	7.6	6.8	5.9	4.6	3.4	3.8	5.5	11.6	17.0	18.4	21.5	22.4	22.7	22.0	21.9	20.5	14.2	9.0	6.2	4.8	4.6	5.4	11.6	22.7

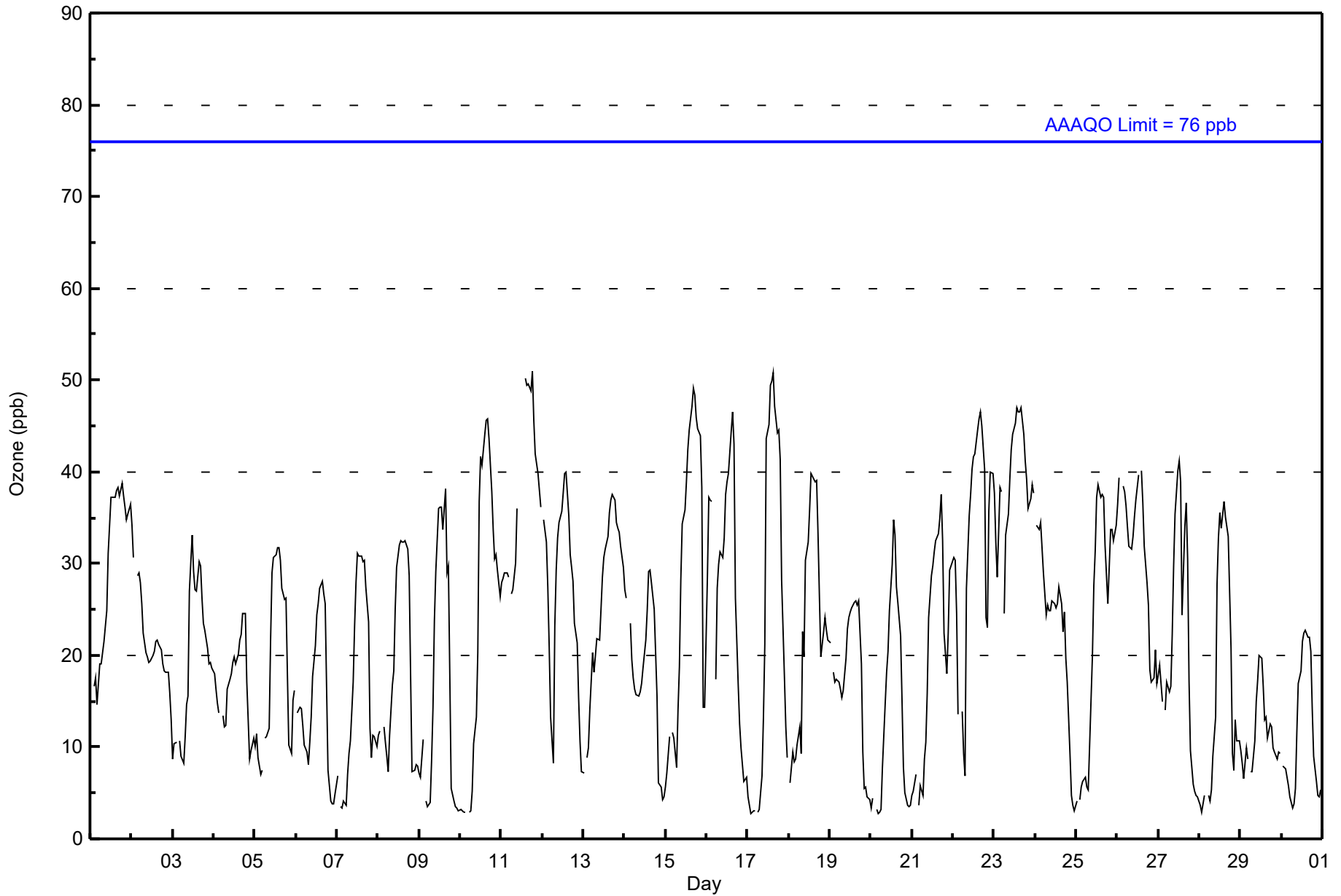
15.5	17.3	14.5	16.4	14.6	13.1	12.6	14.3	18.1	21.9	26.5	30.6	32.5	33.0	34.0	34.4	33.4	31.4	27.0	21.1	17.9	17.4	16.4	15.9	Diurnal Average	
37.7	39.3	37.0	38.5	37.9	36.3	34.0	33.1	35.4	39.3	42.4	44.1	45.4	49.4	50.2	50.9	49.6	48.8	51.0	45.7	44.0	39.8	39.9	39.8	Diurnal Maximum	

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
Conklin - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ozone (O₃) - ppb
Conklin - September 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	326	47.59	47.59
21 - 50	357	52.12	99.71
51 - 82	2	0.29	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Ozone (O₃) - ppb
Conklin - September 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	5	3	2	2	8	35	74	50	24	16	11	7	10	35	26	326
21 - 50	1	6	1	2	3	13	17	57	50	54	39	28	38	23	18	7	357
51 - 82	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	2
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	19	11	4	4	5	21	52	131	101	78	55	39	45	34	53	33	685

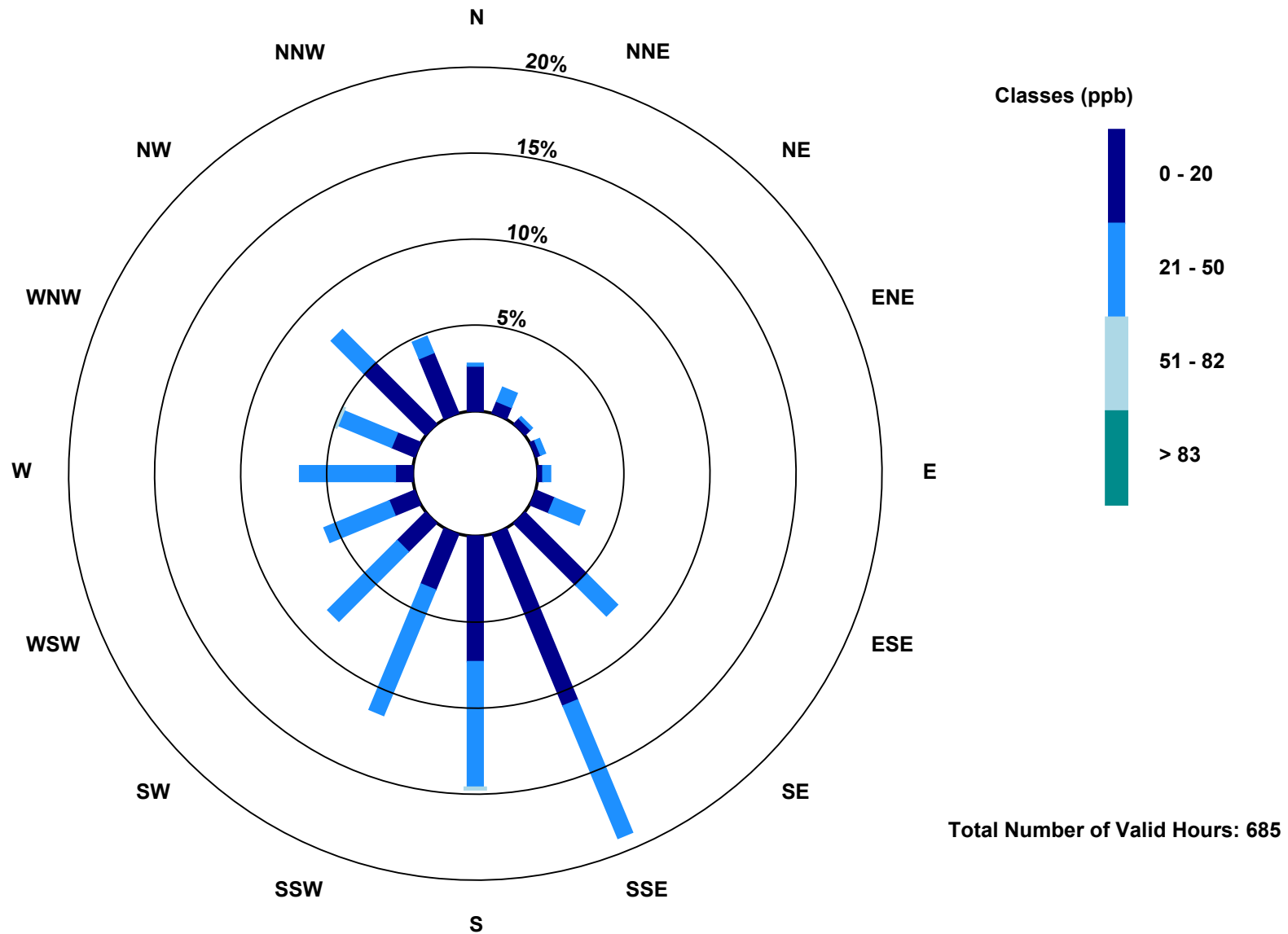
Total Number of Valid Hours: 685

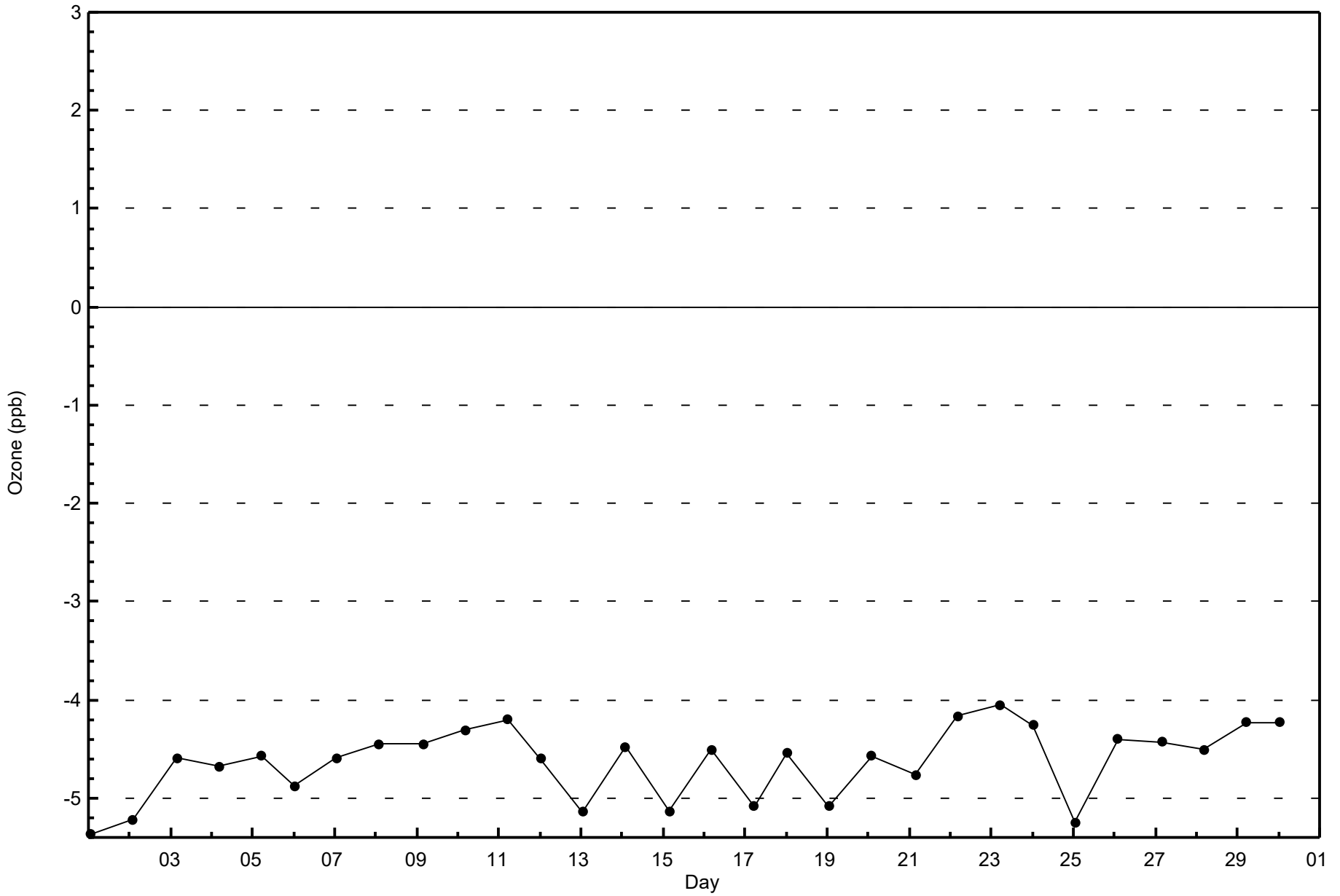
Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

Ozone (O₃) - ppb
Conklin

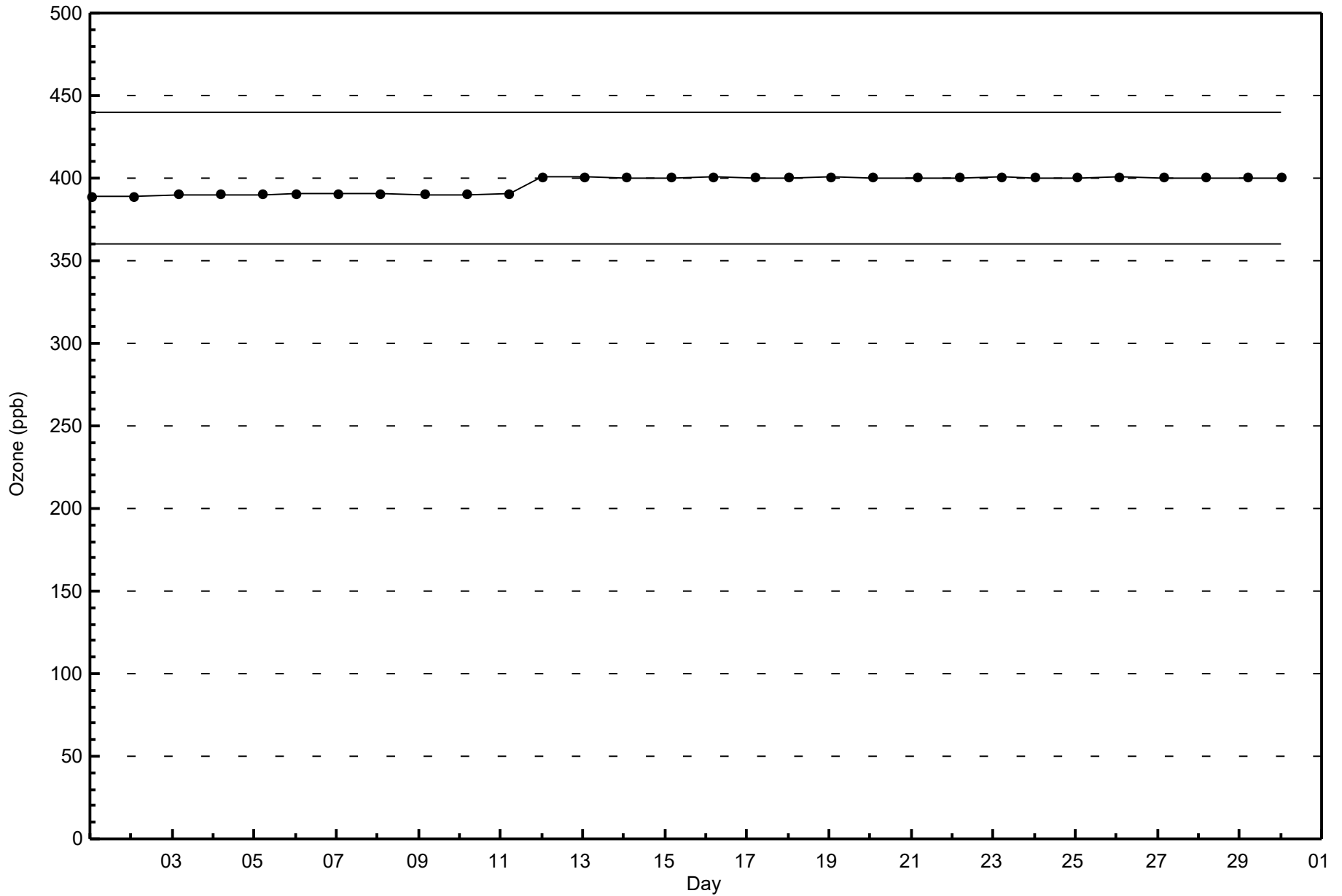






Wood Buffalo Environmental Association
Span Responses

Ozone (O₃) - ppb
Conklin - September 2023





Summary of Hour Averages

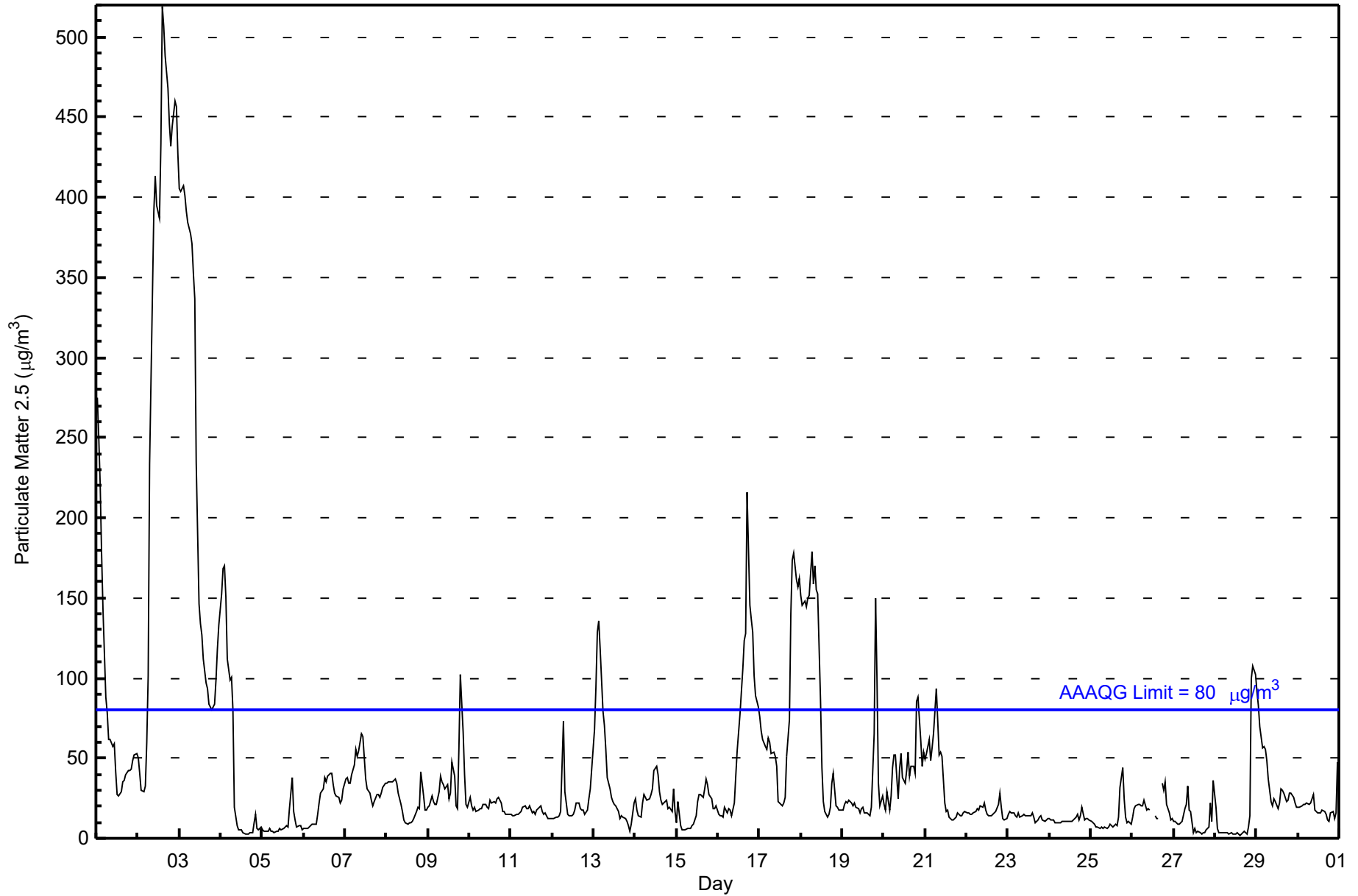
Conklin - September 2023

Number of Exceedences (AAAQO):	1-hr: 98	24-hr: 14	Hours in Service:	720
Maximum Value: 519.4 µg/m ³ on Sep 2 15:00	Maximum Daily Average: 316.0 µg/m ³ on Sep 2		Hours of Data:	717
Minimum Value: 1.9 µg/m ³ on Sep 28 15:00	Minimum Daily Average: 8.3 µg/m ³ on Sep 5		Hours of Missing Data:	3
Maximum Diurnal Average: 55.9 µg/m ³ at hour 1	Minimum Diurnal Average: 38.1 µg/m ³ at hour 13		Hours of Calibration:	2
Monthly Average: 48.22 µg/m ³	Percentiles: P ₁ = 2.8 P ₁₀ = 7.1 Q ₁ = 13.6 Median = 20.6 Q ₃ = 40.9 P ₉₀ = 106.2 P ₉₉ = 442.2		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-Sep	275.1	250.1	221.2	177.6	142.5	88.5	78.0	61.5	61.4	57.4	59.3	41.8	27.2	26.8	29.2	35.1	36.1	39.3	42.3	42.1	43.1	48.4	51.6	52.9	82.9	275.1
2-Sep	50.2	40.8	30.2	29.1	32.4	59.6	101.7	233.8	338.3	391.6	413.7	395.2	386.7	433.6	519.4	507.0	488.4	467.8	445.6	431.5	443.9	460.0	456.9	427.8	316.0	519.4
3-Sep	405.5	403.7	407.0	400.9	391.5	384.2	377.1	370.8	352.7	336.3	234.1	146.5	134.1	126.7	112.2	96.9	93.0	83.6	81.5	80.0	83.9	98.4	117.8	133.1	227.1	407.0
4-Sep	152.6	168.0	170.3	150.5	111.8	98.6	100.6	80.4	19.5	8.1	5.5	5.4	5.1	3.4	2.5	2.9	2.9	3.3	3.9	9.3	14.7	5.8	5.2	6.9	47.4	170.3
5-Sep	5.4	4.2	4.5	4.5	5.8	4.0	4.7	3.9	4.2	4.1	5.9	5.5	6.2	6.9	7.8	7.4	18.9	38.1	17.2	11.4	7.3	7.8	7.6	5.7	8.3	38.1
6-Sep	5.8	6.1	6.6	7.5	8.3	8.4	8.4	8.9	15.4	22.0	28.0	30.9	38.2	34.9	38.9	40.7	40.4	33.9	28.1	26.7	25.8	22.3	23.6	31.0	22.5	40.7
7-Sep	36.6	37.9	34.8	34.6	39.7	45.5	55.9	51.0	54.4	65.0	63.6	50.5	36.9	30.6	27.9	24.2	20.5	22.6	27.5	27.2	25.8	28.1	32.2	34.8	37.8	65.0
8-Sep	34.8	35.7	35.1	34.8	35.8	37.1	34.6	28.0	21.0	17.0	11.8	9.3	8.6	9.7	10.0	10.9	12.6	16.7	19.0	18.3	41.1	26.3	18.0	17.9	22.7	41.1
9-Sep	19.0	20.3	26.6	22.8	21.3	21.1	29.4	38.8	35.5	33.4	31.2	33.7	25.0	28.1	47.9	39.2	20.5	18.3	56.1	102.7	65.9	39.9	20.9	19.5	34.0	102.7
10-Sep	25.5	19.9	17.7	19.0	17.1	17.8	18.5	18.2	21.0	21.4	19.7	18.7	23.4	22.3	22.7	22.0	24.9	25.5	21.8	16.5	16.7	14.9	14.8	14.8	19.8	25.5
11-Sep	14.8	14.2	14.4	14.9	15.3	15.6	16.4	19.0	20.0	18.7	18.9	19.9	16.0	16.9	15.3	17.8	18.7	20.0	16.9	15.4	15.8	12.6	12.4	12.6	16.3	20.0
12-Sep	12.5	12.4	13.1	13.2	14.0	16.3	73.4	29.4	21.9	14.8	14.0	14.3	14.9	17.3	21.8	21.7	18.6	17.7	17.3	15.4	17.9	24.4	31.1	43.1	21.3	73.4
13-Sep	68.0	93.9	128.6	135.8	118.2	79.2	70.4	55.8	37.9	31.3	25.8	23.3	20.8	20.3	16.4	12.1	14.1	13.0	12.6	10.7	8.1	4.3	8.7	22.3	43.0	135.8
14-Sep	24.3	17.4	13.7	13.2	22.4	27.8	25.7	23.5	24.8	27.4	31.3	42.5	45.4	39.6	29.2	24.1	21.0	22.7	23.4	18.9	19.2	16.5	30.8	16.7	25.1	45.4
15-Sep	10.0	23.1	7.7	5.6	5.6	5.2	6.5	6.0	6.4	7.6	8.5	13.7	23.0	27.6	27.0	25.9	30.9	36.9	33.2	27.7	24.9	18.2	18.9	20.4	17.5	36.9
16-Sep	14.6	14.3	13.9	13.1	19.1	15.9	18.5	17.7	14.0	22.1	38.8	54.9	66.4	77.8	105.4	123.6	128.1	216.0	145.7	136.4	128.6	101.4	88.8	81.6	69.0	216.0
17-Sep	76.1	67.2	61.7	57.3	55.7	62.6	60.0	53.2	53.6	51.5	44.7	23.3	21.4	20.0	22.2	25.4	50.8	74.0	140.1	173.2	177.8	161.6	156.6	161.9	77.2	177.8
18-Sep	151.2	145.4	148.3	144.2	150.2	151.6	178.9	158.9	170.2	155.1	152.4	86.7	44.4	23.1	16.7	12.9	14.7	19.5	34.2	40.5	20.2	19.1	17.9	17.3	86.4	178.9
19-Sep	17.3	21.6	23.0	21.6	23.5	21.9	20.4	21.9	19.0	18.3	15.6	18.8	19.1	15.7	15.8	15.3	13.8	19.1	65.6	150.1	99.0	34.3	20.6	26.9	30.8	150.1
20-Sep	20.8	18.0	29.1	17.3	26.7	43.8	51.9	52.1	24.8	43.5	52.6	38.0	34.3	42.1	53.5	39.0	44.7	44.9	40.9	85.1	87.9	60.8	44.8	53.5	43.8	87.9
21-Sep	49.6	52.5	61.6	48.6	56.5	65.5	93.2	72.7	52.1	53.8	51.2	22.3	16.6	17.3	13.0	11.7	11.6	12.1	12.9	15.5	14.3	14.1	16.2	16.7	35.5	93.2
22-Sep	16.1	15.7	15.2	15.4	16.3	16.7	18.2	18.0	20.3	19.7	21.7	18.0	15.3	14.5	13.8	15.0	15.8	16.9	20.9	28.2	19.5	12.3	11.7	12.7	17.0	28.2
23-Sep	14.7	16.5	15.7	15.6	14.5	13.6	16.0	13.6	14.3	14.6	13.9	14.0	14.5	14.1	15.6	12.9	10.1	11.6	12.9	14.2	11.1	10.4	11.7	12.2	13.7	16.5
24-Sep	12.2	11.6	11.2	10.1	9.7	9.8	9.7	10.3	10.9	10.4	10.1	10.2	10.4	10.1	11.2	13.3	14.8	11.8	14.4	19.3	11.8	12.6	12.1	11.7	11.7	19.3
25-Sep	11.0	9.7	8.9	6.9	6.9	6.3	7.3	6.0	7.0	6.5	7.3	8.7	7.7	6.8	8.9	8.1	12.9	32.0	43.7	24.6	12.8	9.3	10.6	8.6	11.6	43.7
26-Sep	13.0	18.9	20.6	21.0	20.8	19.8	19.9	23.6	18.0	18.3	17.3	C	C	14.4	12.7	12.7	DF	34.7	30.3	35.0	21.4	16.1	11.9	12.2	19.6	35.0
27-Sep	10.9	10.5	9.2	8.7	9.3	10.7	18.9	20.8	32.9	17.9	16.9	3.5	5.8	3.6	4.1	3.4	2.5	3.3	3.8	5.2	7.2	22.5	10.8	36.2	11.6	36.2
28-Sep	19.1	6.3	3.9	3.3	3.6	3.1	3.4	3.3	3.0	3.2	2.8	2.6	2.6	3.2	1.9	2.4	3.2	4.2	2.7	6.6	14.2	99.3	107.3	102.7	17.0	107.3
29-Sep	91.9	82.6	69.6	56.8	57.3	56.0	48.2	37.3	23.2	20.6	24.7	23.3	18.7	22.4	31.2	30.2	28.5	22.9	23.9	27.9	27.8	25.8	21.8	19.6	37.2	91.9
30-Sep	19.3	19.1	20.1	21.4	21.5	21.8	21.3	21.8	24.8	27.2	17.2	15.9	15.6	16.2	17.7	17.0	14.8	11.2	10.9	16.2	16.8	12.1	15.7	48.0	19.3	48.0

55.9	55.3	54.8	50.8	49.1	47.6	52.9	52.0	50.8	51.3	48.6	41.1	38.1	38.2	42.4	41.0	42.3	46.5	48.3	54.4	50.8	48.0	47.0	49.4	Diurnal Average
405.5	403.7	407.0	400.9	391.5	384.2	377.1	370.8	352.7	391.6	413.7	395.2	386.7	433.6	519.4	507.0	488.4	467.8	445.6	431.5	443.9	460.0	456.9	427.8	Diurnal Maximum

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Conklin - September 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	47	6.56	6.56
6 - 15	185	25.80	32.36
16 - 25	204	28.45	60.81
26 - 80	184	25.66	86.47
> 81.0	97	13.53	100.00

Total Number of Valid Hours: 717

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - μg/m³
Conklin - September 2023

Concentration Ranges (μg/m ³)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	1	1	0	0	0	0	0	7	11	6	1	1	3	3	11	2	47
6 - 15	2	0	3	0	2	12	20	52	33	26	6	5	12	7	4	1	185
16 - 25	8	5	1	4	2	5	16	33	33	24	17	11	12	9	12	12	204
26 - 80	4	4	0	0	1	4	14	38	19	12	27	11	9	7	15	19	184
> 81.0	4	1	0	0	0	2	7	11	12	11	7	10	9	10	13	0	97
Totals	19	11	4	4	5	23	57	141	108	79	58	38	45	36	55	34	717

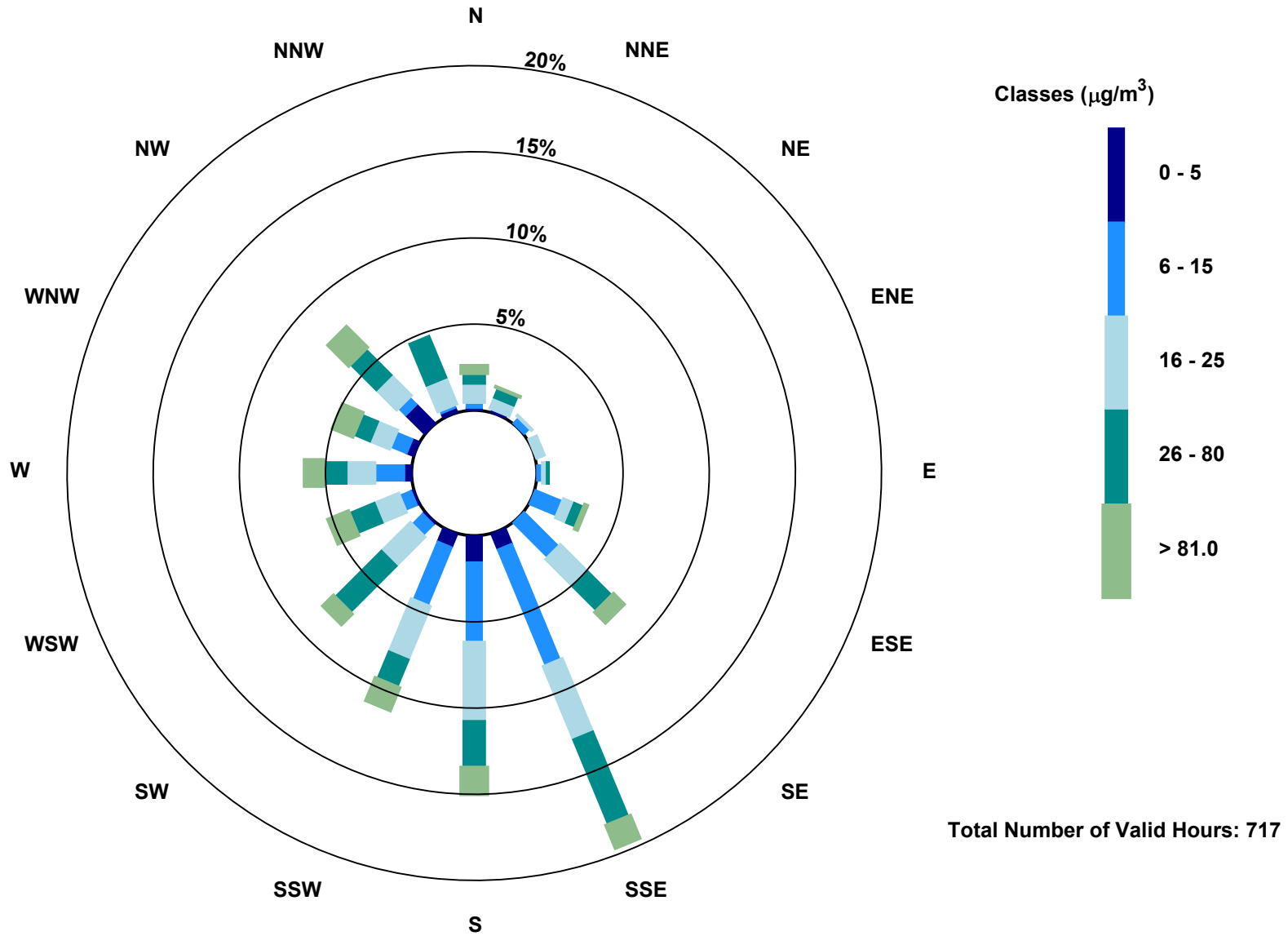
Total Number of Valid Hours: 717

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

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





Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature (AT) - C

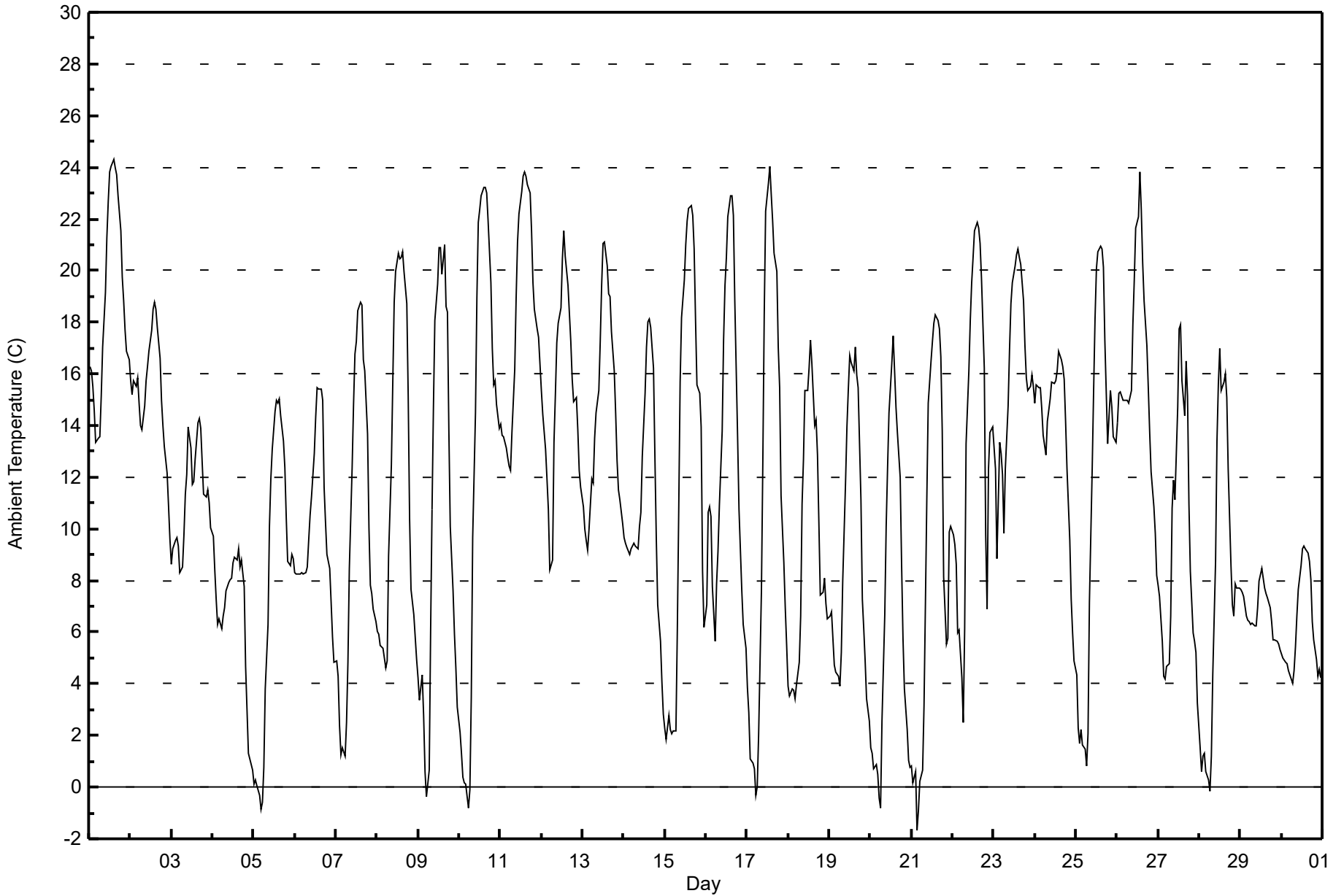
Conklin - September 2023

Maximum Value: 24.3 C on Sep 1 15:00 Maximum Daily Average: 18.8 C on Sep 1																						Hours in Service: 720 Hours of Data: 720				
Minimum Value: -1.7 C on Sep 21 04:00 Minimum Daily Average: 6.2 C on Sep 30 Maximum Diurnal Average: 18.4 C at hour 14 Minimum Diurnal Average: 5.8 C at hour 6 Monthly Average: 11.51 C Percentiles: P ₁ = -0.4 P ₁₀ = 2.8 Q ₁ = 6.5 Median = 11.8 Q ₃ = 16.1 P ₉₀ = 20.2 P ₉₉ = 23.7																						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-Sep	16.3	16.1	15.5	14.6	13.4	13.5	13.6	15.1	17.1	19.1	21.3	22.7	23.8	24.0	24.3	24.0	23.7	22.9	21.5	19.8	18.8	17.7	16.9	16.6	18.8	24.3
2-Sep	15.7	15.2	15.8	15.5	15.9	14.8	14.0	13.9	14.8	15.8	16.3	16.9	17.7	18.5	18.7	18.5	17.8	16.6	15.0	14.0	13.2	12.2	10.9	9.6	15.3	18.7
3-Sep	8.6	9.3	9.5	9.6	9.4	8.3	8.5	9.7	11.3	12.1	13.9	13.1	11.7	11.8	12.7	14.1	14.3	13.9	12.6	11.3	11.3	11.5	11.0	10.0	11.2	14.3
4-Sep	9.7	8.4	7.3	6.3	6.5	6.1	6.6	7.0	7.6	7.9	8.0	8.1	8.7	8.9	8.8	9.2	8.5	8.8	7.7	4.7	3.0	1.3	1.1	0.7	6.7	9.7
5-Sep	0.1	0.3	0.1	-0.3	-0.9	-0.6	0.8	3.8	6.3	10.1	11.9	13.1	14.6	15.0	14.8	15.0	14.4	13.4	12.4	10.4	8.8	8.6	9.0	8.8	7.9	15.0
6-Sep	8.3	8.3	8.2	8.3	8.3	8.2	8.3	8.5	9.6	10.5	11.2	12.9	14.3	15.5	15.4	15.4	15.0	11.6	10.3	9.0	8.4	7.2	5.8	4.8	10.1	15.5
7-Sep	4.9	4.3	2.4	1.2	1.5	1.2	2.5	4.8	8.5	12.4	14.8	16.8	17.3	18.5	18.8	18.6	16.6	16.1	13.7	10.0	7.8	7.5	6.9	6.4	9.7	18.8
8-Sep	6.0	5.9	5.5	5.4	5.0	4.6	4.9	9.0	12.5	15.7	18.8	20.0	20.7	20.5	20.5	20.7	20.0	18.7	15.2	10.4	7.6	6.7	5.8	5.0	11.9	20.7
9-Sep	4.2	3.3	4.3	2.8	0.6	-0.4	0.7	6.1	10.7	14.7	18.1	19.5	20.9	20.9	19.9	21.0	18.6	18.4	13.8	10.1	7.6	5.9	4.6	3.1	10.4	21.0
10-Sep	2.1	1.3	0.4	0.2	0.1	-0.8	-0.1	3.5	9.7	14.5	18.9	21.9	22.4	22.9	23.2	23.2	23.0	21.9	19.5	17.0	15.5	15.7	14.8	13.9	12.7	23.2
11-Sep	14.0	13.6	13.6	13.1	12.7	12.4	12.3	13.8	16.2	18.9	21.1	22.2	23.1	23.6	23.8	23.7	23.3	23.0	21.6	19.5	18.5	17.7	17.4	16.4	18.1	23.8
12-Sep	15.3	14.4	13.1	12.0	10.7	8.4	8.8	13.3	15.2	17.2	17.9	18.6	20.4	21.5	20.6	19.4	18.3	17.3	15.8	14.9	15.1	13.8	12.3	11.6	15.3	21.5
13-Sep	10.9	10.0	9.6	9.2	10.0	12.0	11.8	13.5	14.5	15.3	17.2	19.4	21.0	21.1	20.2	19.1	19.0	17.6	16.1	14.5	12.6	11.5	11.1	10.2	14.5	21.1
14-Sep	9.7	9.5	9.3	9.0	9.2	9.3	9.5	9.3	9.3	10.1	10.6	12.8	15.2	17.0	18.0	18.1	17.8	16.2	12.8	9.6	7.0	5.7	4.1	2.9	10.9	18.1
15-Sep	2.3	1.9	2.8	2.2	2.1	2.2	2.2	6.1	10.7	15.7	18.2	19.6	21.0	21.9	22.4	22.5	22.1	20.8	18.1	15.6	15.2	14.0	8.4	6.2	12.3	22.5
16-Sep	7.0	10.6	10.9	10.5	7.8	5.7	7.9	9.1	10.9	13.8	17.3	19.4	20.5	22.1	22.9	22.9	22.1	18.8	13.6	10.8	9.1	7.6	6.3	5.4	13.0	22.9
17-Sep	3.9	2.9	1.1	0.9	0.7	-0.3	0.0	2.0	7.6	12.6	18.3	23.3	23.4	24.0	22.9	21.9	20.7	20.0	17.0	15.4	11.3	8.7	7.0	5.5	11.2	24.0
18-Sep	3.9	3.5	3.8	3.7	3.4	4.0	4.8	6.6	11.0	12.7	15.4	15.4	16.2	17.3	16.4	14.0	14.2	12.8	10.2	7.4	7.6	8.1	7.1	6.5	9.4	17.3
19-Sep	6.6	6.8	5.8	4.7	4.4	4.3	3.9	5.2	8.0	11.8	13.9	15.4	16.7	16.5	16.1	17.0	15.9	15.5	11.1	7.3	6.1	4.9	3.4	2.6	9.3	17.0
20-Sep	1.5	1.3	0.7	0.9	0.5	-0.5	-0.8	2.6	6.7	10.1	12.4	14.5	16.4	17.5	16.1	14.7	13.7	12.0	8.6	5.7	3.8	2.2	1.1	0.8	6.8	17.5
21-Sep	0.8	0.2	0.6	-1.7	-0.9	0.2	0.7	3.2	7.1	11.2	14.9	16.5	17.3	18.0	18.3	18.0	17.7	16.6	13.8	8.1	5.5	5.8	9.9	10.1	8.8	18.3
22-Sep	9.8	9.4	8.6	6.0	6.1	4.3	2.5	6.1	13.3	16.1	18.0	19.5	20.5	21.5	21.9	21.7	21.0	19.7	16.2	9.8	6.9	12.3	13.7	13.9	13.3	21.9
23-Sep	13.1	12.3	8.8	13.4	12.9	12.1	9.8	12.3	14.8	16.9	18.7	19.6	20.2	20.6	20.8	20.5	20.3	18.8	17.1	15.9	15.4	15.5	15.9	15.5	15.9	20.8
24-Sep	14.8	15.6	15.5	15.5	14.7	13.6	12.9	14.2	14.6	15.0	15.7	15.6	15.7	16.1	16.8	16.5	16.3	15.8	14.1	12.3	9.5	7.3	6.0	4.9	13.7	16.8
25-Sep	4.3	2.3	1.7	2.2	1.6	1.5	0.8	2.1	7.1	12.4	15.3	18.1	20.1	20.7	20.9	20.9	20.1	17.3	13.3	14.4	15.4	14.7	13.6	13.4	11.4	20.9
26-Sep	14.1	15.2	15.3	15.0	15.0	15.0	15.0	14.9	15.4	17.9	19.7	21.7	22.1	23.8	22.4	20.3	18.8	17.1	15.4	13.7	12.2	10.9	9.8	8.2	16.2	23.8
27-Sep	7.8	7.4	5.6	4.3	4.2	4.7	4.8	6.6	10.8	11.9	11.1	14.7	17.7	17.9	15.8	14.4	16.5	15.1	11.0	8.4	6.0	5.7	5.2	3.3	9.6	17.9
28-Sep	1.5	0.6	1.2	1.3	0.6	0.3	-0.1	1.2	4.4	8.7	13.4	15.6	17.0	15.3	15.7	16.0	15.1	12.3	8.6	7.1	6.6	7.8	7.7	7.7	7.7	17.0
29-Sep	7.7	7.5	7.4	6.6	6.5	6.4	6.3	6.3	6.2	6.2	7.0	8.0	8.4	8.1	7.7	7.5	7.4	7.0	6.4	5.7	5.7	5.7	5.5	5.3	6.8	8.4
30-Sep	5.1	5.0	4.9	4.8	4.5	4.4	4.0	4.5	5.4	6.6	7.7	8.6	9.2	9.4	9.2	9.1	8.7	8.0	6.4	5.7	4.9	4.3	4.5	4.3	6.2	9.4
																								Diurnal Average		
																								Diurnal Maximum		



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Conklin - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Conklin - September 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	12	1.67	1.67
0 - 10	304	42.22	43.89
10 - 20	329	45.69	89.58
> 20	75	10.42	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

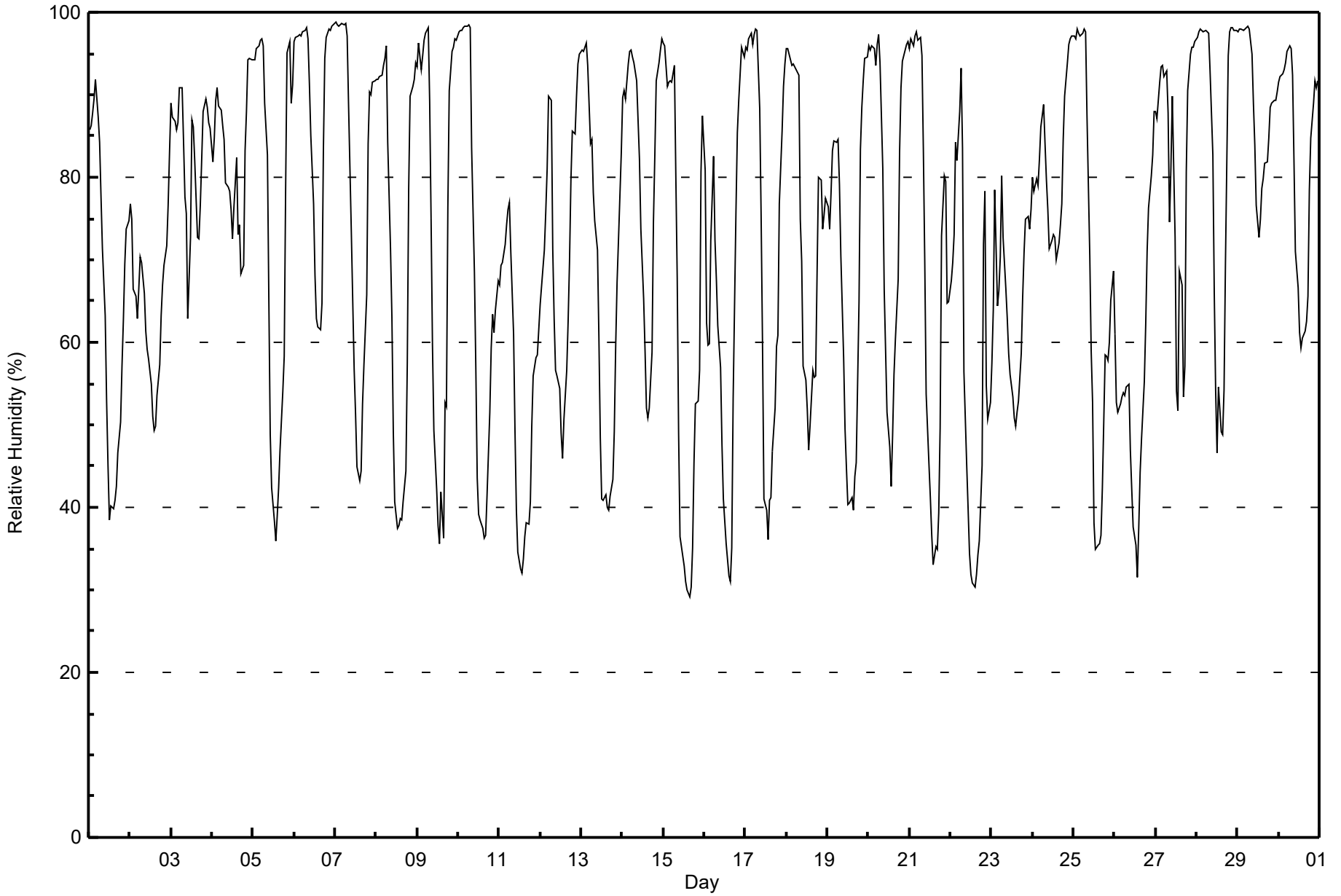
Relative Humidity (RH) - %
Conklin - September 2023

Maximum Value: 98.7 % on Sep 7 01:00 Maximum Daily Average: 88.7 % on Sep 29 Minimum Value: 29.1 % on Sep 15 16:00 Minimum Daily Average: 54.0 % on Sep 11 Maximum Diurnal Average: 89.9 % at hour 7 Minimum Diurnal Average: 47.3 % at hour 14 Monthly Average: 72.37 % Percentiles: P ₁ = 31.5 P ₁₀ = 40.8 Q ₁ = 55.4 Median = 75.4 Q ₃ = 91.6 P ₉₀ = 96.8 P ₉₉ = 98.4																								Hours in Service:	720																								
																								Hours of Data:	720																								
																								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-Sep	85.8	86.3	87.8	89.5	91.8	87.3	84.3	77.6	71.4	63.2	52.9	45.0	38.5	40.2	39.8	40.8	42.5	46.6	50.3	57.1	62.8	69.6	73.8	74.8	65.0	91.8																							
2-Sep	76.7	74.9	66.4	65.6	62.9	66.5	70.3	69.7	66.0	61.4	59.2	58.0	54.9	51.1	49.4	49.9	53.6	57.2	63.3	67.0	69.3	71.8	76.6	83.0	64.4	83.0																							
3-Sep	88.9	87.4	86.8	85.7	86.7	90.9	90.9	84.4	77.7	75.6	63.0	72.7	86.9	86.1	82.1	72.7	72.5	76.6	82.3	87.9	89.5	88.4	86.6	85.9	82.8	90.9																							
4-Sep	81.8	84.8	89.3	90.9	88.7	88.2	86.3	84.5	79.3	78.8	78.3	76.1	72.6	76.3	82.3	73.0	74.3	68.2	69.4	83.3	88.0	94.2	94.5	94.2	82.4	94.5																							
5-Sep	94.3	94.2	95.6	96.0	96.6	96.8	96.0	89.0	82.8	65.3	48.8	42.3	38.3	35.9	38.9	42.4	46.9	54.1	58.3	78.5	95.1	96.5	89.0	91.2	73.4	96.8																							
6-Sep	96.5	97.0	97.1	97.2	97.1	97.7	97.9	98.1	96.7	91.4	85.2	76.8	68.2	62.9	61.9	61.5	64.7	83.3	94.4	97.0	98.0	97.9	98.3	98.5	88.1	98.5																							
7-Sep	98.7	98.5	98.3	98.5	98.7	98.6	98.7	97.2	88.8	73.2	64.9	56.8	51.4	44.9	43.1	44.3	52.5	57.2	65.7	84.1	90.3	90.0	91.5	91.6	78.2	98.7																							
8-Sep	91.8	91.9	92.2	92.3	93.6	94.3	96.0	84.3	71.4	63.1	49.2	40.7	37.4	37.7	38.6	38.5	40.7	44.4	57.5	78.7	89.8	91.0	91.9	93.9	70.9	96.0																							
9-Sep	93.3	96.3	93.1	94.8	96.6	97.5	98.1	89.2	75.0	59.7	49.3	42.3	37.8	35.7	41.9	36.3	52.8	52.2	76.3	90.5	95.2	95.8	96.8	96.7	74.7	98.1																							
10-Sep	97.6	97.8	97.8	98.1	98.3	98.3	98.6	98.1	83.5	68.5	56.9	43.5	39.2	38.4	37.5	36.3	36.5	41.4	51.6	59.4	63.4	61.2	64.0	67.5	68.1	98.6																							
11-Sep	66.9	69.4	69.7	71.9	74.3	76.1	77.0	71.0	61.0	49.3	39.6	34.6	32.6	32.0	33.7	36.4	38.1	38.0	40.7	49.8	56.0	58.2	58.5	61.5	54.0	77.0																							
12-Sep	64.6	66.8	71.3	75.8	81.1	89.9	89.2	71.3	62.9	56.6	55.9	54.4	48.9	45.9	50.6	56.7	62.5	69.9	79.7	85.6	85.3	89.9	93.7	95.0	71.0	95.0																							
13-Sep	95.4	95.3	95.7	96.3	93.5	84.0	84.6	78.1	74.8	71.3	60.6	48.5	41.0	40.8	41.6	40.0	39.6	41.4	43.3	49.1	59.6	67.2	72.4	82.9	66.5	96.3																							
14-Sep	89.6	90.5	89.5	93.7	95.2	95.5	94.5	93.9	91.6	86.9	82.2	73.8	65.2	58.9	52.1	50.8	52.0	58.8	74.6	82.8	91.6	94.0	95.4	96.8	81.3	96.8																							
15-Sep	96.4	95.9	91.1	91.6	91.7	91.5	93.6	80.4	67.8	48.9	36.4	34.1	32.9	31.1	30.0	29.1	30.4	35.1	45.4	52.5	52.9	56.6	80.7	87.5	61.8	96.4																							
16-Sep	80.8	62.5	59.7	59.8	72.4	82.6	72.3	67.7	62.1	56.9	47.6	41.1	38.3	35.6	31.6	31.0	35.1	53.2	75.8	85.4	89.4	92.6	95.8	94.6	63.5	95.8																							
17-Sep	95.7	95.4	96.8	97.5	96.2	97.3	97.9	97.7	88.3	75.3	59.7	41.0	39.7	36.0	40.9	41.2	46.8	52.1	59.5	60.9	76.8	85.6	91.0	93.8	73.5	97.9																							
18-Sep	95.5	95.6	94.2	93.6	93.8	93.5	92.7	92.4	74.8	69.8	57.1	55.5	51.9	47.0	50.0	56.7	55.8	56.0	68.3	79.9	79.6	73.7	75.4	77.5	74.2	95.6																							
19-Sep	76.4	73.7	78.1	83.2	84.3	84.2	84.6	79.2	70.5	58.2	49.6	44.8	40.3	40.6	41.2	39.7	43.7	45.5	64.9	83.3	88.5	91.7	94.5	94.6	68.1	94.6																							
20-Sep	95.9	95.5	96.0	95.6	93.5	96.1	97.3	93.9	81.0	66.4	58.9	51.6	47.3	42.5	48.6	56.1	60.3	67.7	83.1	90.9	94.1	95.5	96.2	96.4	79.2	97.3																							
21-Sep	95.6	96.8	95.9	97.1	97.7	96.6	96.9	94.8	83.4	69.8	53.7	45.2	41.2	36.6	33.1	35.3	35.0	39.3	49.7	72.8	80.2	79.4	64.7	64.9	69.0	97.7																							
22-Sep	67.5	69.7	73.0	84.2	82.0	88.0	93.3	83.6	56.5	45.0	39.9	34.3	31.9	30.8	30.4	31.9	34.3	35.9	45.0	71.8	78.4	54.7	50.8	52.8	56.9	93.3																							
23-Sep	57.5	63.9	78.5	64.4	66.3	70.3	80.2	72.6	66.4	62.9	58.6	56.0	53.5	50.8	49.8	51.5	52.8	58.6	65.4	70.8	74.9	75.2	73.6	76.1	64.6	80.2																							
24-Sep	80.0	78.4	79.8	78.9	82.3	86.1	88.8	84.0	79.7	76.1	71.3	72.4	73.0	72.7	69.9	72.1	74.3	76.8	84.7	89.8	93.9	96.0	96.8	97.1	81.5	97.1																							
25-Sep	97.2	96.8	97.9	97.4	97.1	97.4	97.9	97.6	87.4	70.6	59.0	52.6	38.2	35.0	35.4	35.6	36.7	42.3	58.5	58.4	57.8	60.0	65.1	68.6	68.4	97.9																							
26-Sep	61.0	52.7	51.6	52.6	53.3	53.9	53.6	54.6	55.0	47.0	42.2	37.6	35.4	31.5	37.4	44.2	48.2	55.2	62.2	70.9	76.3	80.1	82.7	87.9	55.3	87.9																							
27-Sep	87.9	87.2	91.5	93.4	93.5	92.3	92.9	87.8	74.5	81.0	89.8	72.8	54.0	51.7	68.6	66.9	53.4	57.1	80.6	90.5	95.0	95.8	95.8	96.4	81.3	96.4																							
28-Sep	97.0	97.6	98.0	97.9	97.7	97.8	97.6	97.5	92.8	82.7	66.1	54.0	46.6	54.6	49.1	48.9	54.3	69.5	94.8	97.6	98.2	98.1	97.9	97.8	82.7	98.2																							
29-Sep	97.7	98.0	98.0	97.7	97.9	98.2	98.2	98.0	95.0	89.0	83.9	76.5	72.7	75.0	78.6	79.8	81.7	81.8	84.7	88.5	88.9	89.3	89.4	90.3	88.7	98.2																							
30-Sep	91.6	92.3	92.5	93.0	93.9	95.3	95.9	95.6	92.4	82.0	71.1	66.6	61.1	59.4	60.5	61.4	62.6	65.5	78.5	84.7	89.1	91.7	90.9	91.6	81.6	95.9																							
																								86.5	86.1	86.8	87.5	88.3	89.4	89.9	85.5	77.0	68.2	59.7	53.4	49.0	47.3	48.3	48.7	51.2	56.0	66.9	76.6	81.6	82.7	84.1	86.0	Diurnal Average	
																								98.7	98.5	98.3	98.5	98.7	98.6	98.7	98.1	96.7	91.4	89.8	76.8	86.9	86.1	82.3	79.8	81.7	83.3	94.8	97.6	98.2	98.1	98.3	98.5	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Conklin - September 2023





Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Conklin - September 2023

Maximum Speed: 22 km/h on Sep 11 12:00	Maximum Daily Speed Average: 13.9 km/h on Sep 11	Hours in Service: 720
Minimum Speed Value: 0 km/h on Sep 22 07:00	Minimum Daily Speed Average: 0.8 km/h on Sep 20	Hours of Data: 720
Maximum Diurnal Speed Average: 5.5 km/h at hour 12	Minimum Diurnal Speed Average: 2.4 km/h at hour 8	Hours of Missing Data: 0
Monthly Average Velocity: 3.3 km/h 203.2 deg	Percentiles: P ₁ = 0 P ₁₀ = 2 Q ₁ = 3 Median = 5 Q ₃ = 9 P ₉₀ = 12 P ₉₉ = 18	Percent Operational Time: 100.0

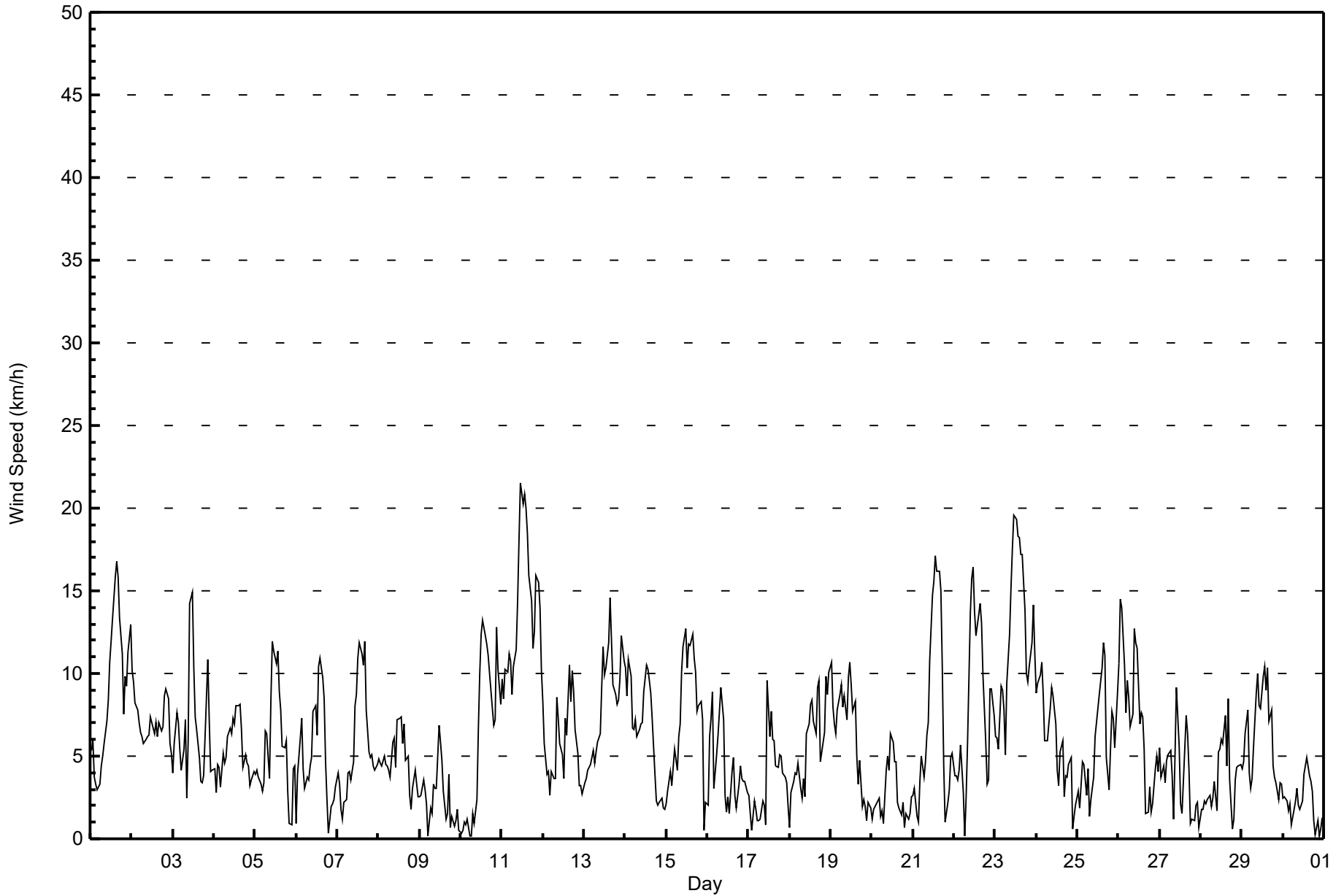
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Sep	NW5	NW6	WNW4	W3	WSW3	WNW3	WSW4	SW5	WSW6	W7	WNW8	W11	W12	SW13	SW16	SW17	SW16	SW13	SW11	SSW8	SW10	SW9	SW11	SW13	WSW8.0	SW17
2-Sep	SW10	SW10	SW8	SW8	WNW7	NW6	NW6	NW6	NW6	NW6	WNW6	W7	W7	WNW6	WNW7	WNW6	WSW7	W6	WSW7	WSW9	SW9	SW8	SSW6	S5	W5.8	SW10
3-Sep	SSE4	S6	SSW8	SSW7	S5	SSE4	S5	S7	WSW2	SW6	WSW14	WSW15	SW10	SSW7	SSW7	SSW5	SSW3	SW3	SW4	WSW6	WSW11	WSW7	NW4	NW4	SW5.4	WSW15
4-Sep	NW4	NW3	NW5	NW4	WNW3	W5	WNW5	WNW5	NW6	NW7	NW6	NW7	NW7	NW8	NW8	NW8	NW7	NW4	W5	SW5	SSW4	SE3	SSE4	S4	WNW3.9	NW8
5-Sep	S4	S4	SSE4	SSE3	SSE3	SSE3	S7	SSW6	SW4	SSW8	S12	S11	SSE11	SSE11	S9	S8	SE6	SSE6	SSE6	SSW3	NE1	SE1	SSE4	SSE4	S5.4	S12
6-Sep	ESE1	ESE4	SE6	SE7	SE4	SE3	SE4	SSE4	WSW4	W5	WSW8	WSW8	W6	SW10	SW11	SW10	SW8	WSW5	SSW2	NNW0	SE2	SE2	ESE2	ESE3	SSW3.0	SW11
7-Sep	SE4	SE3	E2	SE1	SE2	SSE2	SSW4	S4	S4	SSW5	SW8	WSW9	SW11	WSW12	WSW11	WSW11	SW12	SW8	SW5	SSW5	S5	S4	SSE4	SSE5	SSW4.8	SW12
8-Sep	SSE5	SSE5	SSE4	SSE5	SSE5	SSE4	SSE4	SSE4	SW6	SW6	WSW4	W7	WNW7	W7	WNW6	NW7	WNW5	NW5	WNW3	NW2	SE3	SSE4	SSE3	SSE3	SW2.2	W7
9-Sep	S3	SSE3	S4	SE3	S2	WSW0	S2	SSE2	NNW3	NNW3	SSE3	SE7	ESE6	SE5	SSE3	ESE1	N2	NNE4	NNW1	S1	SE1	SSE1	SSE2	NW0	SE1.4	SE7
10-Sep	ESE0	S1	NNW1	NNW1	SE1	WNW0	NE0	NNE2	ENE1	E2	ESE7	SE10	SSE12	SSE13	S12	S12	SSE11	SSE10	SSE8	SSE7	SE7	SSE13	SSE10	SSE8	SSE5.7	SSE13
11-Sep	SSE10	S8	S10	S10	S11	S11	S9	SSE10	SSE11	S14	S18	S22	S20	S21	S20	S19	S16	S14	S12	SSE13	S16	S16	S14	SSW10	S13.9	S22
12-Sep	SSW8	SSW6	S4	SSE4	SE3	SE4	S4	SSE4	S9	SSW7	WSW6	SW5	SSE4	SSE7	SSW6	SSW10	S8	SSW10	SSW9	SSW7	SW5	S3	S3	SE3	S5.3	SSW10
13-Sep	SSE3	SSE4	SSE4	S4	SSW4	NW5	NW5	NW5	W6	WSW6	W9	W12	WNW10	W10	W12	W15	W12	W9	W9	W8	WNW8	W10	W12	W11	W6.9	W15
14-Sep	W10	W9	WNW11	W10	WNW7	NW7	NW7	NW6	NW7	NW7	WNW7	NW9	WNW10	NW10	NW10	NW9	NW7	WNW4	WSW2	W2	SSE2	SE2	SSE2	S2	WNW5.7	WNW11
15-Sep	SSE2	SSE3	SSE4	SSE3	S4	SSE5	SSE4	S6	S7	S10	SSW12	SSW13	SSW13	SSW10	SSW12	SSW12	SSW12	S11	S10	SSE8	SSE8	SSE7	ENE0	NNE2	S6.7	SSW13
16-Sep	S2	SSW6	S7	S9	SE3	SE5	S6	SSW8	SW9	SSW7	SSW3	NW2	SW3	WSW2	WSW4	W5	W3	S2	S3	SSW4	S4	SE4	ESE3	SSE3	SSW3.5	SW9
17-Sep	SSE3	S2	SE0	S2	SSE2	SSE1	S1	N1	N2	NNE2	SE1	SSW10	WSW6	W8	WNW6	WNW6	WNW4	W4	W5	W5	SSW4	SE4	SE3	ESE2	WSW1.8	SSW10
18-Sep	SSW1	SSE3	S3	SSE4	S4	SE5	SSE3	SE2	SW4	NW3	WNW6	WNW7	WNW8	WNW8	WNW7	WNW6	W9	WSW10	SW5	SSW5	SSW6	SW10	SW9	SW10	WSW4.0	SW10
19-Sep	WSW11	SW8	SSW7	SSW6	SW8	SW9	SW9	SW8	SW9	SW7	WSW10	WSW11	WSW9	W8	W8	W5	W3	WSW5	SSW2	SSE2	SE2	S1	SSE2	SSE2	SW5.6	WSW11
20-Sep	SSE1	SSE2	SSE2	SSE2	SSE2	S1	SSE2	NNE1	NW4	NW5	NNW4	NNW6	NNW6	NNE5	NNW5	W2	NW2	NNE1	NNW2	SSE1	SSE1	SSE1	SSE2	SSE3	NNW0.8	NNW6
21-Sep	SSE3	SSE3	S1	ESE1	SE3	S5	SE4	SSE5	S6	SW7	SW11	SSW15	SW16	SSW17	SSW16	SSW16	SW15	SSW10	S4	NW1	WNW2	SW3	SSW5	SSW5	SSW6.6	SSW17
22-Sep	SSW4	SSW4	SSE4	SE4	SE6	SE3	SW0	SE3	SSW6	SSW14	SSW16	SSW16	SSW14	S12	S14	S14	S13	S10	SSE6	SSE3	SSE4	SSE9	SSE9	SSE7	S7.6	SSW16
23-Sep	S6	SSE6	SSE5	SSE9	SSE9	SSE8	SE5	SSE9	SSE12	SSE15	S18	S20	S19	S18	SSE18	SSE17	SSE17	SSE14	SSE10	SE9	SE10	SE12	SSE14	SE11	SSE12.0	S20
24-Sep	SSE9	SE9	SE10	SSE11	SSE9	SSE6	SSE7	S8	SSW9	SSW9	SSW7	SW4	SSW3	ESE5	SE6	SSE3	SSW4	SSW4	SSW4	SSW5	SSW5	SSW1	SSE1	S2	SSE5.1	SSE11
25-Sep	SSE3	SSE2	SSE3	SSE5	SSE5	SSE3	SSE4	NW1	ESE2	SE4	SE6	E7	ESE8	ESE9	ESE10	ESE12	ESE11	SE5	ESE3	ESE5	ESE8	ESE7	ESE6	SE9	SE5.3	ESE12
26-Sep	SE11	SSE15	SSE14	SSE11	S8	S10	S9	S7	S8	S13	S12	SSW12	SSW7	SW8	WSW7	WSW5	WSW2	SW2	SSW3	S2	SSE2	S4	S5	SSE4	S6.6	SSE15
27-Sep	SSE6	SSE4	SSE4	S3	SSW5	SSW5	SSW5	SSW4	W1	W5	NNW9	NNE6	E2	W2	SSW3	SSW7	SSW6	SSW4	W1	S1	NNW1	SSE2	S2	SSE1	SSW2.0	NNW9
28-Sep	S2	SSE2	SSE2	S2	S2	S3	S2	S2	S3	SSE2	NW5	NW5	WNW6	NW6	NNW7	WNW4	NNW9	WNW4	N1	SSW1	N4	NNE4	N4	N5	NW1.6	NNW9
29-Sep	N4	N5	NNW6	N8	NNW4	NNW3	NNW4	NNW5	N9	N10	N8	N8	N10	NNW10	NNW9	NNW10	NNW7	NNW8	NW4	NNW4	NW3	NW2	NW3	NNW3	NNW6.1	NNW10
30-Sep	NW2	NNW3	NNW2	NNW2	N2	SE1	N2	NNW2	N3	N2	SE2	WSW2	NNE4	ENE4	E5	ENE4	NE3	NE3	N1	NNW0	NNW1	SE0	SE1	NNW1	NNE1.4	E5
S2.8 S3.0 S3.1 S3.3 S2.9 S2.6 S2.4 S2.4 SW2.9 SW3.7 SW4.7 SW5.5 SW4.4 SW4.8 SW4.9 SW4.9 SW4.1 SW3.7SSW3.1SSW2.9 S3.2 S3.5 S3.2 S2.7																								Diurnal Average		
WSW11 SSE15 SSE14 SSE11 S11 S11 SW9 SSE10 SSE12 SSE15 S18 S22 S20 S21 S20 S19 SSE17 S14 S12 SSE13 S16 S16 SSE14 SW13																								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
Conklin - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Wind Speed (WS) - km/h
Conklin - September 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	374	51.94	51.94
6 - 11	273	37.92	89.86
12 - 19	68	9.44	99.31
20 - 28	5	0.69	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Conklin - September 2023**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	13	10	4	4	4	13	42	90	51	33	15	15	16	13	28	23	374
6 - 11	6	1	0	0	1	9	14	38	31	33	35	21	23	23	27	11	273
12 - 19	0	0	0	0	0	1	1	13	21	15	8	3	6	0	0	0	68
20 - 28	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	5
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	19	11	4	4	5	23	57	141	108	81	58	39	45	36	55	34	720

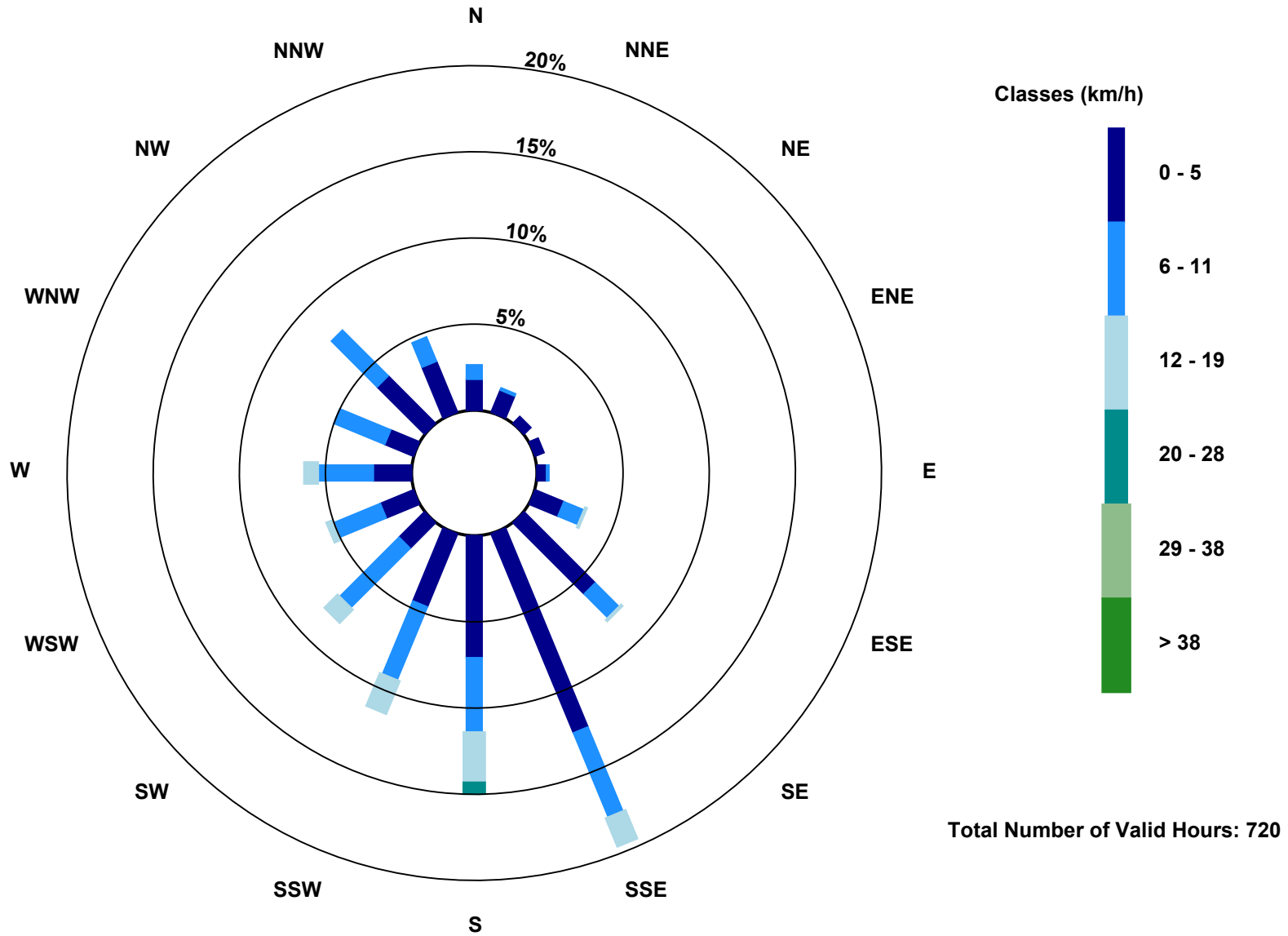
Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

Wind Speed (WS) - km/h
Conklin





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Conklin - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Sep 11 12:00 Minimum Value: 0 km/h on Sep 8 22:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 3 P ₉₀ = 4 P ₉₉ = 6																	Hours in Service: 720 Hours of Data: 720 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-Sep	2	2	2	1	1	2	2	2	2	3	4	4	5	5	5	5	6	4	4	2	3	2	3	4	6
2-Sep	3	2	3	3	3	3	3	2	2	3	3	3	3	3	3	3	3	2	2	2	3	2	2	1	3
3-Sep	1	2	2	2	2	1	1	2	2	2	5	5	3	2	2	2	1	2	2	3	3	3	2	2	5
4-Sep	2	1	2	2	2	2	2	2	3	3	3	3	3	4	4	3	2	2	2	1	1	1	1	1	4
5-Sep	1	1	1	1	1	1	1	2	1	3	3	3	3	4	3	2	2	1	2	1	1	1	1	2	4
6-Sep	1	2	2	2	2	1	1	1	2	2	2	3	3	3	4	3	3	4	1	1	1	1	1	1	4
7-Sep	1	1	1	2	2	2	1	1	1	2	2	3	4	4	4	4	5	2	2	1	1	1	1	1	5
8-Sep	1	1	1	1	1	1	1	1	2	2	3	3	3	3	3	3	2	3	1	1	1	0	1	1	3
9-Sep	1	1	1	1	1	1	1	1	1	1	1	2	2	2	1	1	2	2	1	1	1	1	1	1	2
10-Sep	1	1	1	1	1	1	1	1	1	1	2	3	4	4	4	4	4	3	2	1	2	4	2	2	4
11-Sep	3	3	3	3	3	3	3	3	3	5	6	7	7	6	6	6	5	4	4	3	4	4	4	3	7
12-Sep	2	2	1	1	2	2	2	2	2	2	2	2	2	3	2	3	2	3	3	2	2	1	1	1	3
13-Sep	1	1	1	1	2	3	2	2	3	3	4	5	4	5	6	6	6	5	4	4	4	5	6	5	6
14-Sep	5	4	5	4	3	3	3	3	3	3	4	4	5	4	4	3	2	1	1	1	1	1	1	1	5
15-Sep	1	1	1	1	1	1	1	1	2	3	3	4	3	3	3	3	3	3	2	2	2	2	1	1	4
16-Sep	1	2	1	2	2	2	1	2	3	2	1	1	2	1	3	2	1	1	1	1	1	1	1	1	3
17-Sep	1	1	1	1	1	1	1	1	1	1	1	3	2	3	3	3	2	2	2	2	1	1	0	1	3
18-Sep	1	1	1	1	1	1	1	1	2	2	3	3	3	4	4	3	4	4	2	1	1	3	2	4	4
19-Sep	4	2	2	2	3	3	3	3	2	2	4	4	4	4	4	3	1	2	1	1	1	1	1	1	4
20-Sep	1	1	1	1	1	1	1	1	2	2	2	2	3	2	2	1	1	1	1	1	1	1	1	1	3
21-Sep	1	1	1	1	1	1	1	1	1	2	4	5	5	5	5	5	5	4	2	1	1	2	2	2	5
22-Sep	1	2	1	1	1	1	1	1	4	4	5	5	4	4	4	4	4	3	2	1	1	2	2	2	5
23-Sep	2	2	2	3	2	2	2	3	4	5	6	6	5	5	5	5	5	5	2	2	2	3	4	3	6
24-Sep	2	2	2	3	3	2	2	2	2	2	2	2	1	1	2	2	1	1	1	1	1	1	1	1	3
25-Sep	1	1	1	1	1	2	1	1	1	1	2	2	3	3	3	3	4	3	1	1	2	2	2	2	4
26-Sep	3	4	4	3	3	3	3	2	3	4	4	4	3	3	3	3	2	2	2	1	1	1	1	1	4
27-Sep	1	1	1	2	2	2	1	2	1	2	5	4	1	2	2	3	2	1	2	1	1	1	2	1	5
28-Sep	1	1	1	1	1	1	1	1	1	1	2	2	2	3	3	2	3	5	2	1	2	2	1	1	5
29-Sep	2	1	2	3	1	1	1	1	2	3	3	3	3	3	3	3	2	3	2	1	1	1	1	1	3
30-Sep	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	1	1	1	1	1	1	1	1	2
																	Diurnal Maximum								



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Conklin - September 2023

Direction of Maximum Speed: 176 deg on Sep 11 12:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 174.2 deg on Sep 11	Hours of Data: 720
Direction of Minimum Speed: 215 deg on Sep 22 07:00	Hours of Missing Data: 0
Direction of Minimum Daily Speed Average: 0.8 deg on Sep 20	Percent Operational Time: 100.0
Monthly Average Direction: 203.2 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-Sep	319	326	293	261	246	286	238	233	258	273	282	271	263	236	231	236	229	228	220	211	215	214	222	233	242.2
2-Sep	228	226	218	235	298	305	320	316	312	310	296	264	278	285	289	284	253	263	243	238	236	228	208	191	260.2
3-Sep	148	183	195	198	176	166	172	180	256	222	238	239	224	202	202	196	195	221	230	243	237	258	314	310	217.2
4-Sep	305	313	322	322	303	268	291	296	304	314	312	319	316	317	318	319	321	308	259	220	210	144	160	172	299.9
5-Sep	179	171	161	168	160	164	186	201	223	201	183	185	163	163	173	175	143	148	161	202	38	145	159	155	173.7
6-Sep	112	123	136	135	140	124	141	158	239	268	248	245	280	234	232	231	232	249	213	340	134	124	103	117	209.5
7-Sep	141	130	100	131	139	168	192	188	189	199	220	241	233	243	244	237	232	235	230	207	191	180	148	157	213.7
8-Sep	160	155	161	166	156	165	161	154	218	225	256	268	291	275	289	320	299	310	292	308	141	150	150	167	224.9
9-Sep	169	160	173	146	188	240	185	157	343	348	154	142	118	127	157	117	11	13	327	175	145	157	155	314	140.8
10-Sep	111	177	336	336	129	287	49	16	76	99	111	135	147	152	172	169	167	160	150	156	155	152	155	156	152.3
11-Sep	160	169	172	173	172	177	171	163	167	172	178	176	174	175	177	181	176	169	169	164	170	178	185	195	174.2
12-Sep	192	193	177	161	138	141	173	166	189	202	238	215	167	166	205	209	190	200	203	204	216	173	174	126	190.7
13-Sep	148	167	156	174	204	305	320	309	278	257	264	266	289	276	266	260	267	275	263	277	284	263	279	281	268.1
14-Sep	270	278	283	266	298	307	312	313	304	311	299	304	302	311	314	312	315	302	250	266	163	138	150	169	295.6
15-Sep	157	158	158	165	170	160	156	170	180	190	205	198	201	192	207	198	178	170	157	153	157	150	66	22	179.6
16-Sep	169	194	181	182	146	137	180	197	221	212	193	317	227	246	258	264	260	176	191	196	169	142	123	153	193.4
17-Sep	163	185	141	176	151	165	178	357	354	13	136	203	240	261	301	298	289	279	272	268	207	141	138	123	241.4
18-Sep	210	152	177	151	172	140	166	142	228	308	288	299	285	288	283	298	261	249	224	203	212	225	216	231	240.3
19-Sep	237	217	202	198	216	217	227	220	216	232	249	237	251	271	262	281	277	251	206	152	133	183	148	151	230.4
20-Sep	150	148	161	163	163	185	158	30	324	323	342	340	330	22	338	268	317	29	348	147	147	147	157	153	338.7
21-Sep	168	159	178	121	144	172	134	165	182	222	219	213	221	202	212	208	214	209	172	323	292	234	212	212	204.6
22-Sep	208	194	155	127	143	131	215	145	196	200	198	200	199	188	179	180	174	172	157	165	168	160	155	167	179.5
23-Sep	173	156	166	168	165	162	130	149	154	159	169	174	170	183	168	164	157	157	151	140	139	141	149	144	159.9
24-Sep	148	138	137	149	154	159	152	150	186	198	213	210	218	198	122	124	155	213	195	197	199	203	168	188	168.5
25-Sep	153	164	161	165	168	159	167	318	123	137	128	101	105	106	113	121	118	126	107	123	117	116	116	133	125.0
26-Sep	146	152	154	158	169	174	182	180	178	184	186	206	197	214	243	254	255	225	207	173	164	176	183	163	180.8
27-Sep	155	160	158	186	199	196	208	202	266	274	337	20	79	265	199	203	196	207	278	172	334	148	170	161	200.6
28-Sep	181	164	163	186	180	171	181	172	189	162	323	310	295	316	337	296	347	289	3	201	350	18	2	354	314.2
29-Sep	354	353	340	353	333	330	335	345	350	351	351	356	350	343	338	341	333	333	323	329	325	326	323	328	342.1
30-Sep	320	331	340	336	354	140	356	337	353	349	141	239	19	62	81	67	49	48	359	343	330	139	124	338	19.7

185.7 178.4 177.4 177.9 178.4 183.0 190.7 190.9 218.0 219.9 224.2 222.6 225.4 218.6 222.5 220.5 214.6 214.3 203.9 197.3 190.4 177.3 177.9 184.4

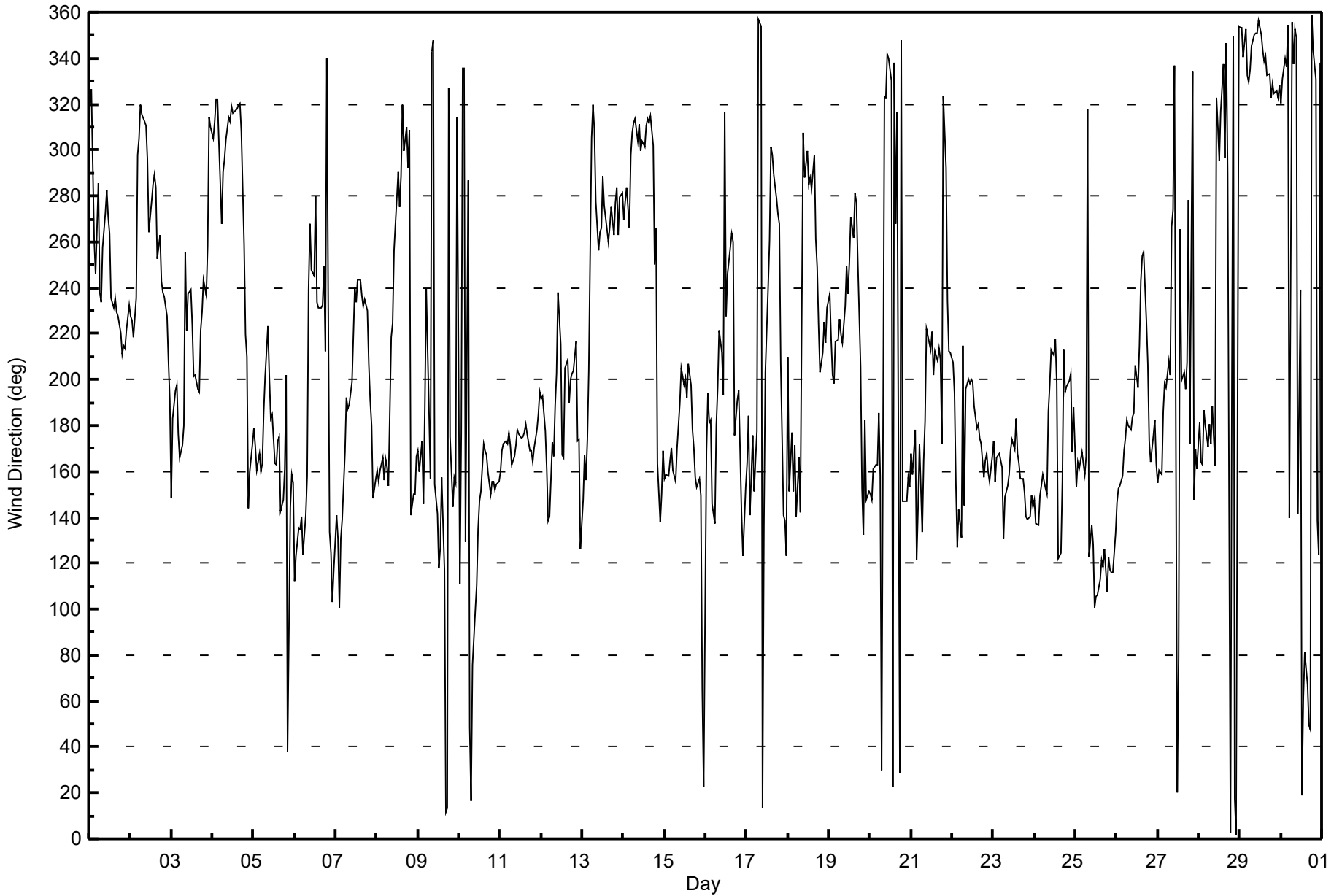
Diurnal Average

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Conklin - September 2023





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Conklin - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 102 deg on Sep 22 07:00 Minimum Value: 10 deg on Sep 24 21:00 Percentiles: P ₁ = 13 P ₁₀ = 17 Q ₁ = 21 Median = 28 Q ₃ = 46 P ₉₀ = 64 P ₉₉ = 95		Hours in Service: 720 Hours of Data: 720 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-Sep	41	31	41	38	48	62	39	32	48	42	51	43	42	34	28	25	26	26	24	21	20	20	20	22	62	
2-Sep	24	23	28	41	59	53	48	41	46	53	51	34	43	52	50	50	35	32	23	22	21	20	44	25	59	
3-Sep	36	26	21	23	27	18	18	18	67	31	25	20	22	18	21	24	25	25	25	30	19	43	47	43	67	
4-Sep	53	51	39	29	56	40	53	51	45	50	48	44	45	46	46	43	40	43	36	16	24	22	18	14	56	
5-Sep	13	19	21	19	43	24	17	20	49	29	25	27	31	27	26	33	27	19	30	24	62	100	20	21	100	
6-Sep	75	48	18	16	22	21	15	21	43	40	27	35	51	30	28	29	26	60	67	81	58	45	25	22	81	
7-Sep	18	20	52	75	67	52	28	23	31	38	29	32	28	33	30	27	24	23	22	15	11	28	15	15	75	
8-Sep	18	16	17	17	21	27	18	48	38	38	69	48	50	51	52	39	48	43	37	52	16	13	13	25	69	
9-Sep	29	32	23	26	51	99	61	60	33	55	61	28	46	48	32	82	68	22	90	20	76	15	21	82	99	
10-Sep	80	65	42	72	45	80	99	21	76	74	31	32	24	28	27	25	22	19	14	14	15	16	16	17	99	
11-Sep	19	23	20	20	20	21	20	20	21	24	23	21	23	23	22	23	22	20	19	17	20	19	19	21	24	
12-Sep	20	24	23	30	81	31	31	43	21	28	43	55	68	35	36	22	22	21	21	20	26	17	16	28	81	
13-Sep	20	15	20	18	54	62	52	59	48	39	41	42	49	46	45	37	41	46	34	45	49	41	45	47	62	
14-Sep	40	47	44	41	55	55	43	49	49	52	54	50	47	47	41	45	42	47	45	73	38	23	25	34	73	
15-Sep	27	29	19	28	21	18	23	17	21	20	24	24	32	26	25	22	21	19	14	13	16	14	90	42	90	
16-Sep	70	18	15	16	57	28	18	22	24	21	56	87	78	95	60	42	40	33	14	11	31	14	12	20	95	
17-Sep	24	53	77	38	67	77	85	75	57	78	97	30	49	42	48	46	55	49	48	47	23	23	17	43	97	
18-Sep	81	25	24	22	29	21	35	48	64	77	52	52	52	47	50	48	41	26	27	12	19	21	21	23	81	
19-Sep	23	26	23	24	24	25	23	24	20	37	36	34	44	46	42	52	44	26	56	21	44	61	42	33	61	
20-Sep	68	32	39	49	30	47	35	81	40	44	47	34	44	66	42	54	65	42	23	76	52	51	68	22	81	
21-Sep	21	26	74	75	14	17	16	18	19	26	26	26	26	22	28	22	24	20	27	72	29	34	31	27	75	
22-Sep	31	39	34	18	14	34	102	33	56	23	23	24	24	30	25	23	21	19	12	16	19	15	13	17	102	
23-Sep	18	18	26	19	18	17	21	17	18	22	22	22	23	21	24	22	19	18	16	14	14	14	16	14	26	
24-Sep	14	16	17	16	22	16	21	18	23	22	28	23	34	37	33	19	45	27	16	14	10	88	78	16	88	
25-Sep	22	30	20	14	16	73	23	58	30	41	32	34	34	32	28	21	21	27	29	20	20	21	25	15	73	
26-Sep	16	17	18	18	24	20	20	21	21	20	24	26	34	35	29	41	93	92	70	58	56	18	17	19	93	
27-Sep	20	49	26	34	17	22	21	26	98	49	35	69	78	89	28	20	22	15	98	76	85	49	62	90	98	
28-Sep	30	30	17	32	20	29	37	23	26	74	43	52	45	40	36	46	28	63	91	62	50	30	24	31	91	
29-Sep	36	24	20	21	21	19	17	17	19	20	26	30	25	20	22	20	21	20	21	15	21	33	26	22	36	
30-Sep	40	28	42	49	16	67	23	21	20	74	89	72	57	49	39	47	32	27	74	84	46	87	66	51	89	
		81	65	77	75	81	99	102	81	98	78	97	87	78	95	60	82	93	92	98	84	85	100	90	90	
		Diurnal Maximum																								



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

**AMS22
JANVIER
SEPTEMBER 2023**

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

October 30, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JANVIER (AMS22)
 SEPTEMBER 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	35	99.86	2.6	0	0.5	0
TRS(ppb) Average	631	35	89	92.5	1.2	0	0.4	0
THC(ppm) Average	684	34	36	99.72	2.4	-	2.2	-
NMHC(ppm) Average	684	34	36	99.72	0.193	-	0.092	-
CH4(ppm) Average	684	34	36	99.72	2.3	-	2.1	-
O3 (ppb) Average	681	36	39	99.58	54	0	39.2	-
NO2 (ppb) Average	678	36	42	99.17	5.5	0	2.9	-
NO (ppb) Average	678	36	42	99.17	2.6	-	0.6	-
NOX (ppb) Average	678	36	42	99.17	8	-	3.2	-
PM2.5 (ug/m3) Average	718	1	2	99.86	408.1	93	262.9	12
Temperature 2 m (C) Average	720	0	0	100	24.8	-	19	-
Relative Humidity (%) Average	720	0	0	100	99.2	-	88.5	-
Wind Speed 20 m (km/h) Average	715	0	5	99.31	24	-	14	-
Wind Direction 20 m (deg) Average	715	0	5	99.31	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JANVIER (AMS22)
 SEPTEMBER 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	0.17	0.2	-	0	0	0	0.1	0.2	0.5	2.6
TRS (ppb) Average	631	0.13	0.1	-	0	0	0.1	0.1	0.2	0.2	1.2
THC (ppm) Average	684	2.03	0.1	-	1.9	2	2	2	2.1	2.1	2.4
NMHC(ppm) Average	684	0.005	0.026	-	0	0	0	0	0	0	0.193
CH4(ppm) Average	684	2.02	0.1	-	1.9	2	2	2	2.1	2.1	2.3
O3 (ppb) Average	681	24.81	10.9	-	3.9	12.3	15.9	23	33.7	40.1	54
NO2 (ppb) Average	678	1.09	0.8	-	0	0.3	0.5	0.9	1.4	2	5.5
NO (ppb) Average	678	0.34	0.4	-	0	0	0.1	0.2	0.5	0.8	2.6
NOX (ppb) Average	678	1.44	1.1	-	0	0.4	0.7	1.2	1.8	2.7	8
PM2.5 (ug/m3) Average	717	42.41	73.1	-	2.9	4.8	10.2	16.2	35.5	100	408.1
Temperature 2 m (C) Average	720	12.48	5.5	-	1.2	5.5	8.1	11.9	16.4	20.6	24.8
Relative Humidity (%) Average	720	73.82	19.7	-	30.8	42.5	57.5	78.1	92.1	96.6	99.2
Wind Speed 20 m (km/h) Average	715	8.3	4	-	0	4	6	8	10	12	24
Wind Direction 20 m (deg) Average	715	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JANVIER (AMS22)
 SEPTEMBER 2023

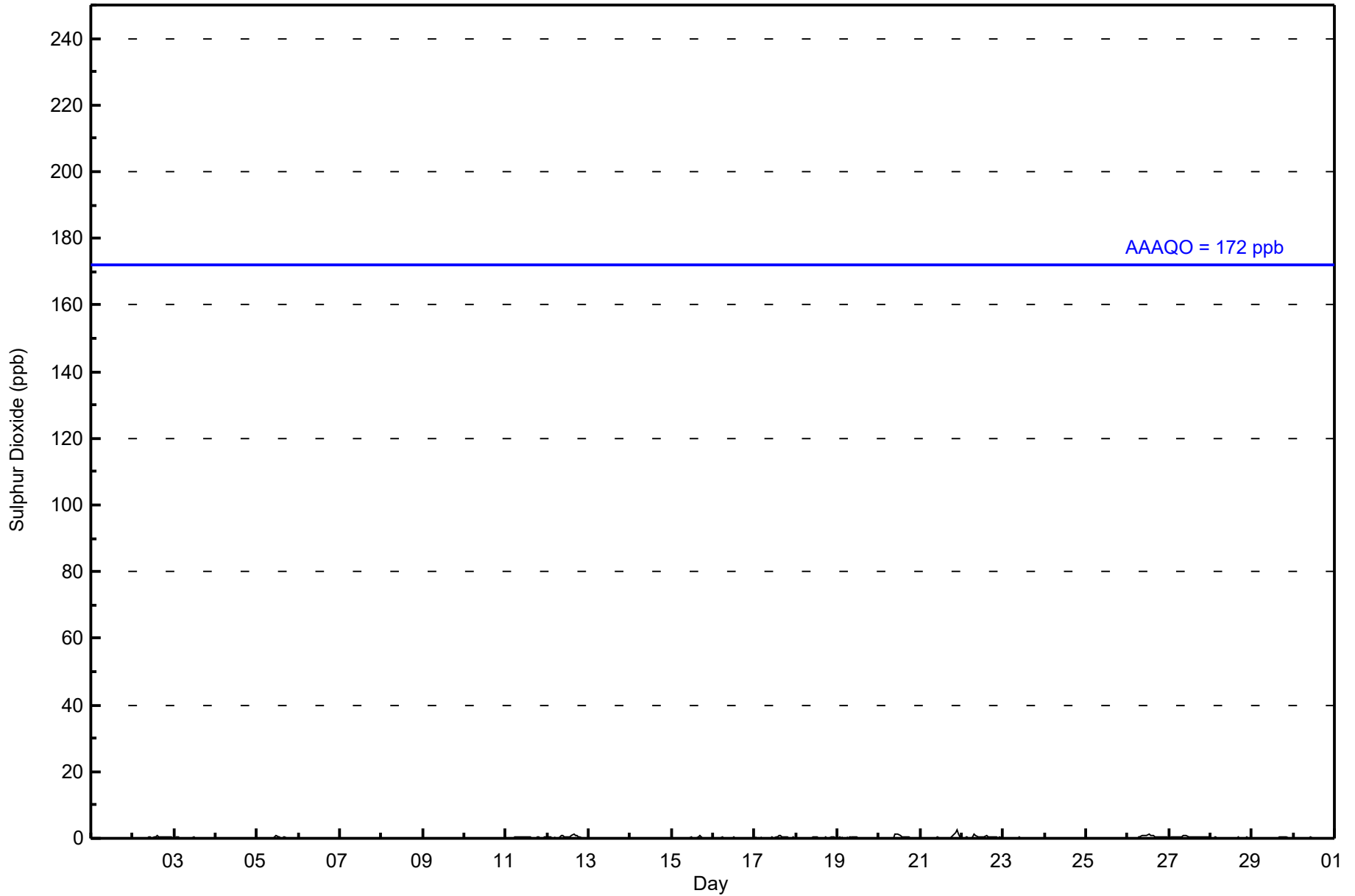
OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2	05 Sep 2023 15:00	05 Sep 2023 15:00	1	Maintenance - WBEA internal audit
TRS	05 Sep 2023 13:00	05 Sep 2023 15:00	3	Maintenance - WBEA internal audit
THC/NMHC/CH4	06 Sep 2023 11:00	06 Sep 2023 12:00	2	Maintenance - WBEA internal audit
O3	06 Sep 2023 11:00	06 Sep 2023 12:00	2	Maintenance - WBEA internal audit
NO2	05 Sep 2023 13:00	05 Sep 2023 16:00	4	Maintenance - WBEA internal audit
PM2.5	06 Sep 2023 13:00	06 Sep 2023 13:00	1	Maintenance - WBEA internal audit
TRS	01 Sep 2023 11:00	01 Sep 2023 13:00	3	Maintenance - reinitiated daily QA check
TRS	23 Sep 2023 05:00	24 Sep 2023 04:00	24	Unstable Operations - daily span outside AMD criteria
TRS	24 Sep 2023 06:00	25 Sep 2023 05:00	24	Unstable Operations - daily span outside AMD criteria
NO2	01 Sep 2023 11:00	01 Sep 2023 11:00	1	Maintenance - reinitiated daily QA check
NO2	02 Sep 2023 09:00	02 Sep 2023 09:00	1	Maintenance - reinitiated daily QA check
Wind Speed, Wind Direction	10 Sep 2023 03:00	10 Sep 2023 04:00	2	Flat line in sensor output signal
Wind Speed, Wind Direction	10 Sep 2023 07:00	10 Sep 2023 07:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	27 Sep 2023 20:00	27 Sep 2023 20:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	30 Sep 2023 07:00	30 Sep 2023 07:00	1	Flat line in sensor output signal



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Janvier - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Janvier - September 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: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Janvier - September 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	25	14	9	17	12	10	14	42	76	201	120	44	46	25	14	11	680
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	25	14	9	17	12	10	14	42	76	201	120	44	46	25	14	11	680

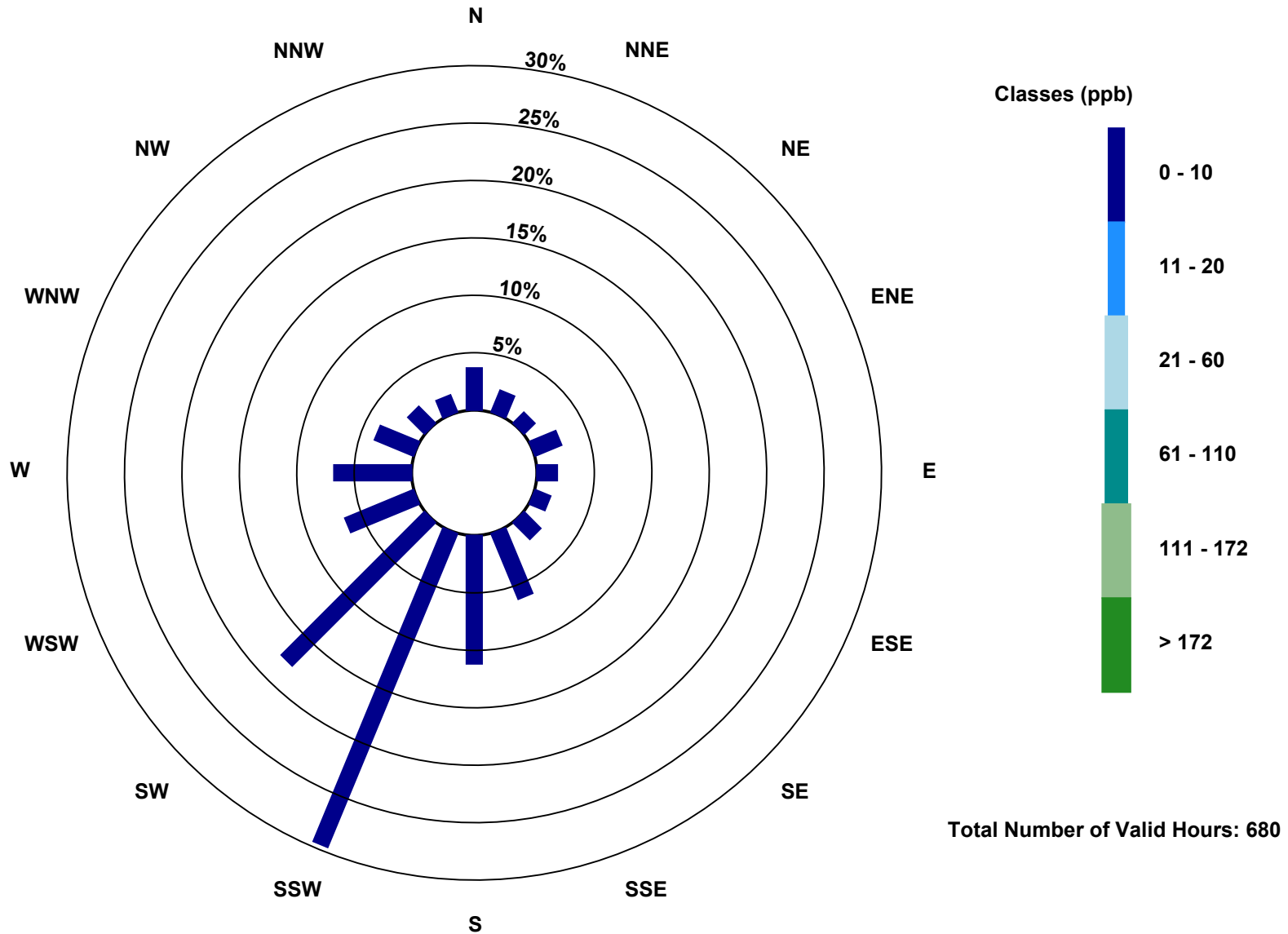
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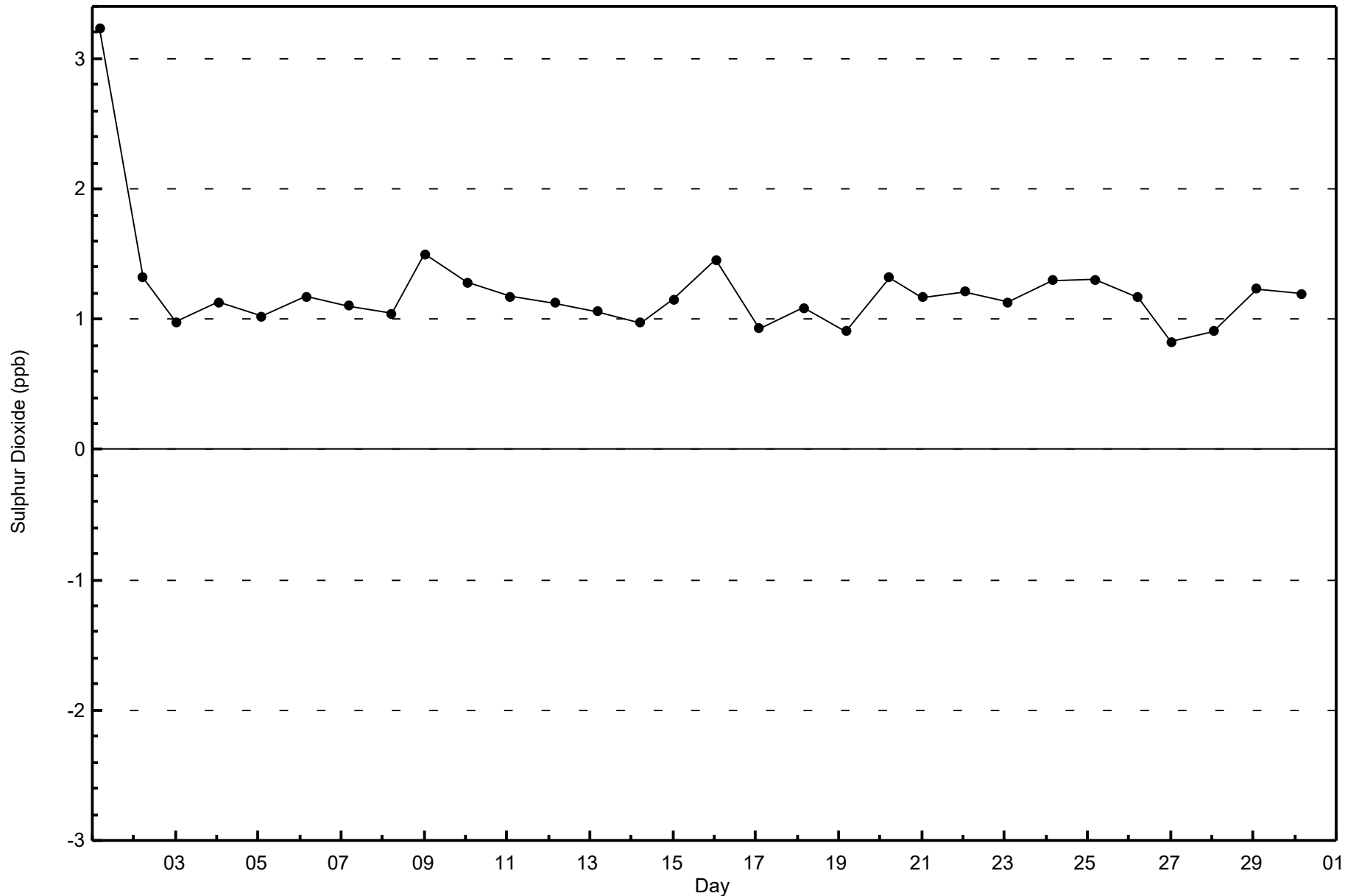
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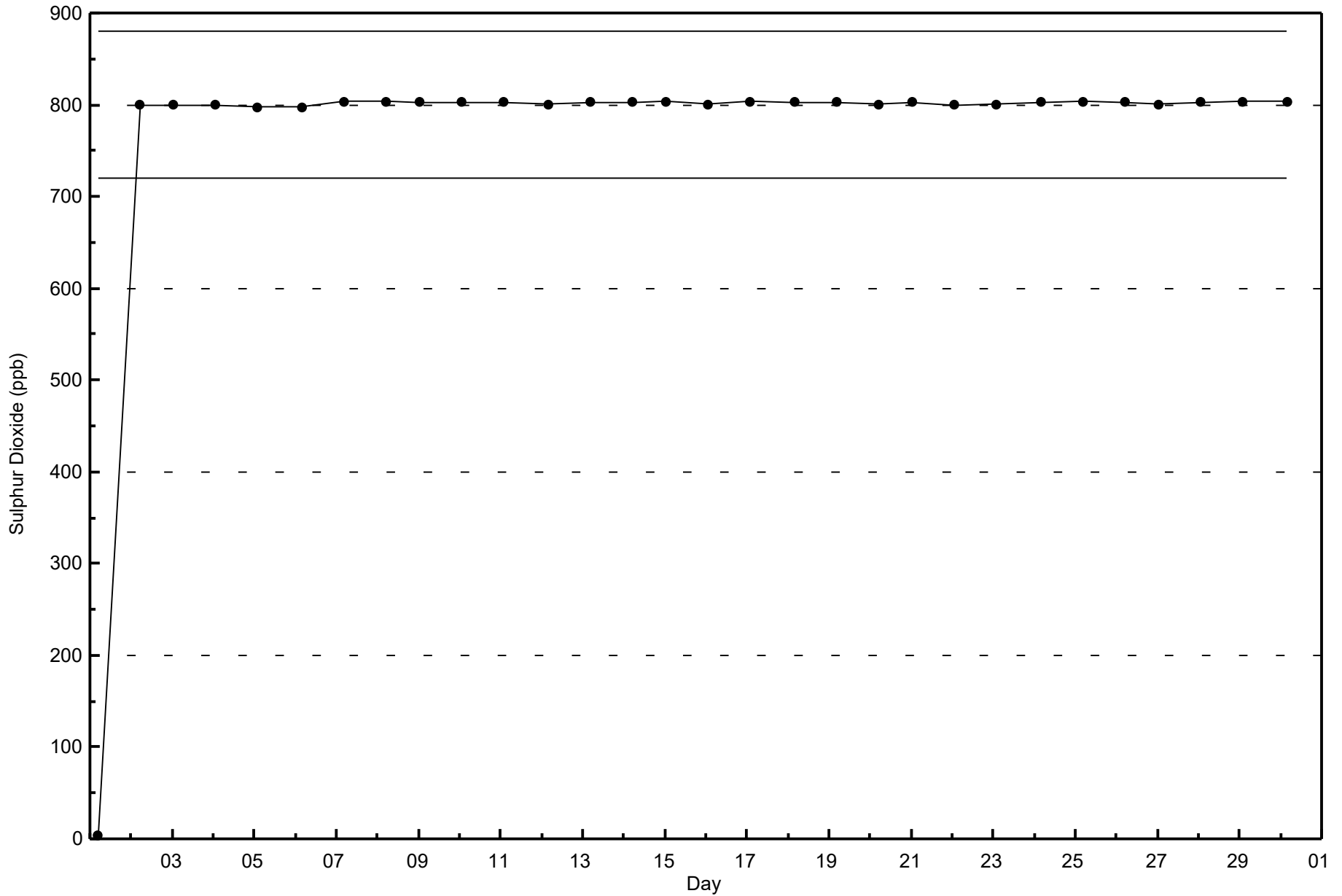


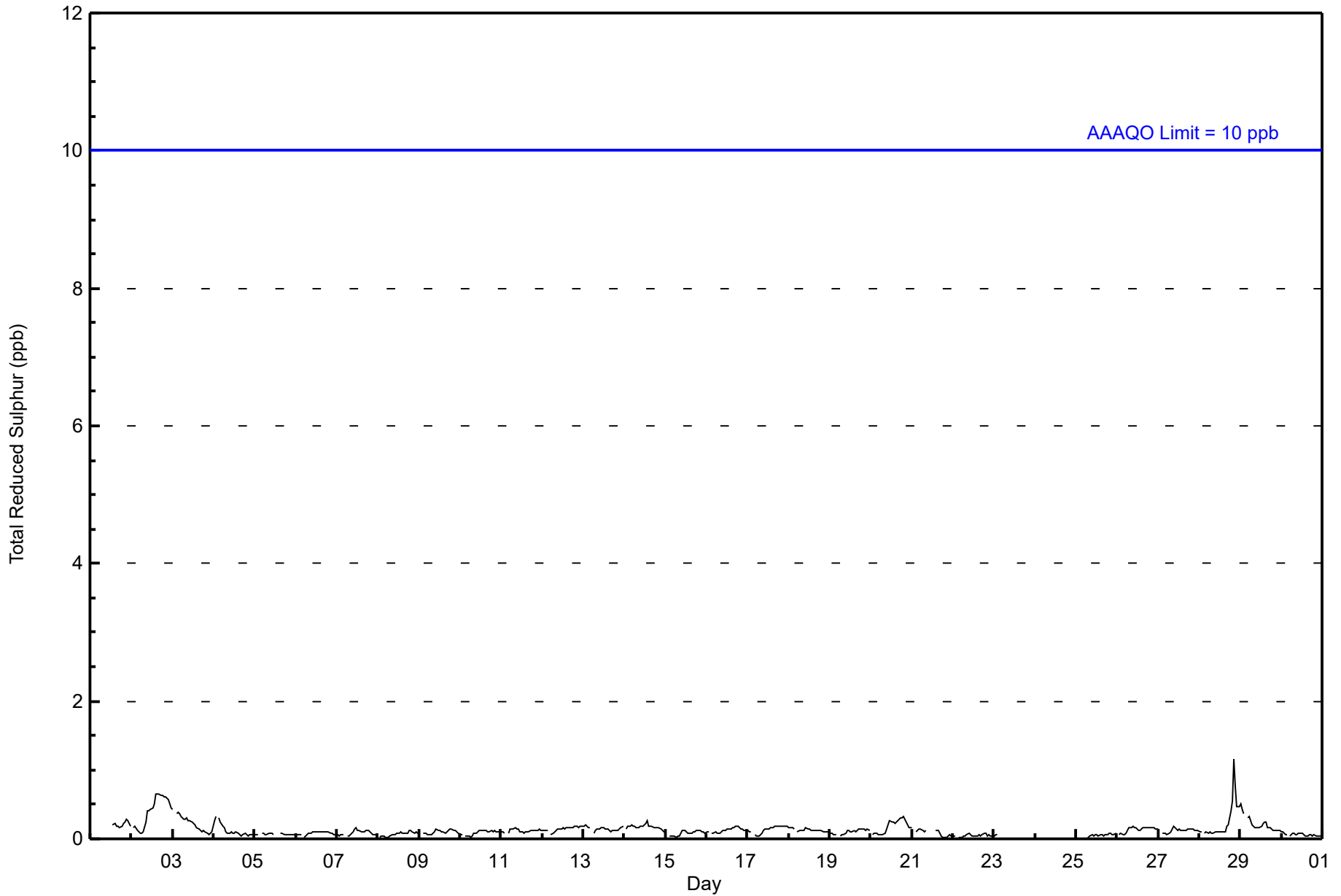
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Sulphur Dioxide (SO₂) - ppb
Janvier











Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Reduced Sulphur (TRS) - ppb
Janvier - September 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	631	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: 631

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Total Reduced Sulphur (TRS) - ppb
Janvier - September 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	25	14	11	17	12	11	7	28	65	191	111	41	43	26	14	11	627
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	25	14	11	17	12	11	7	28	65	191	111	41	43	26	14	11	627

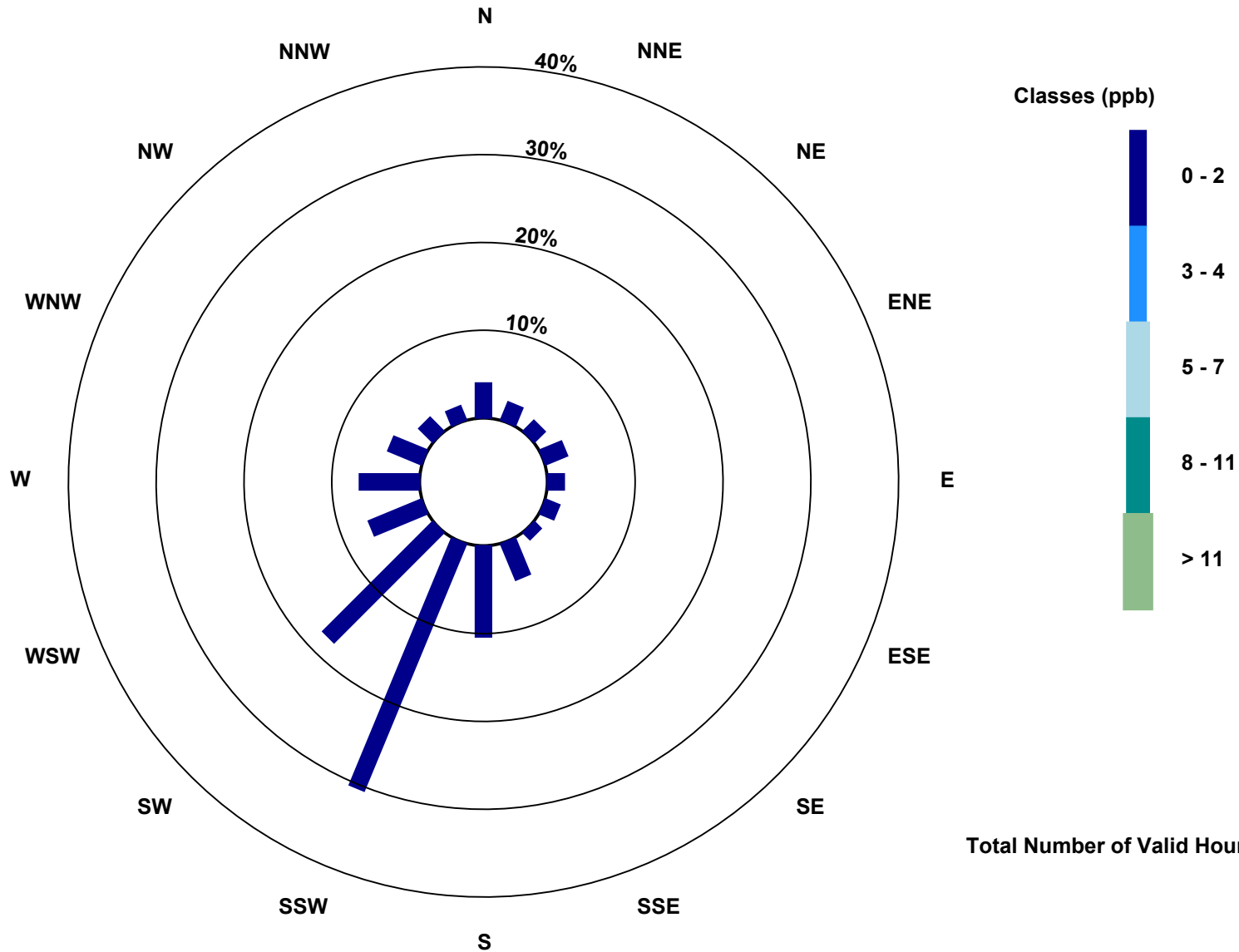
Total Number of Valid Hours: 627

Total Number of Hours: 720

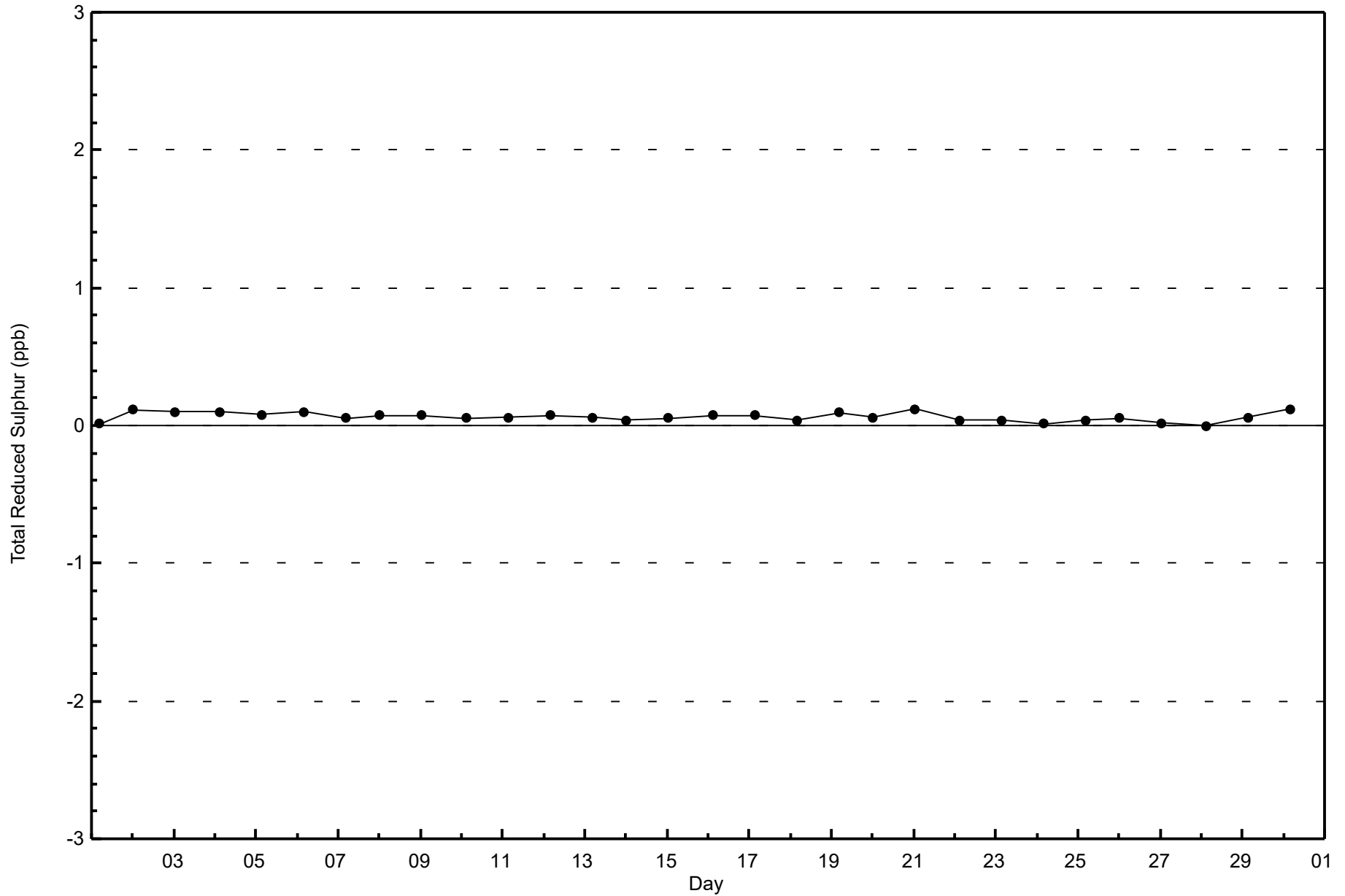


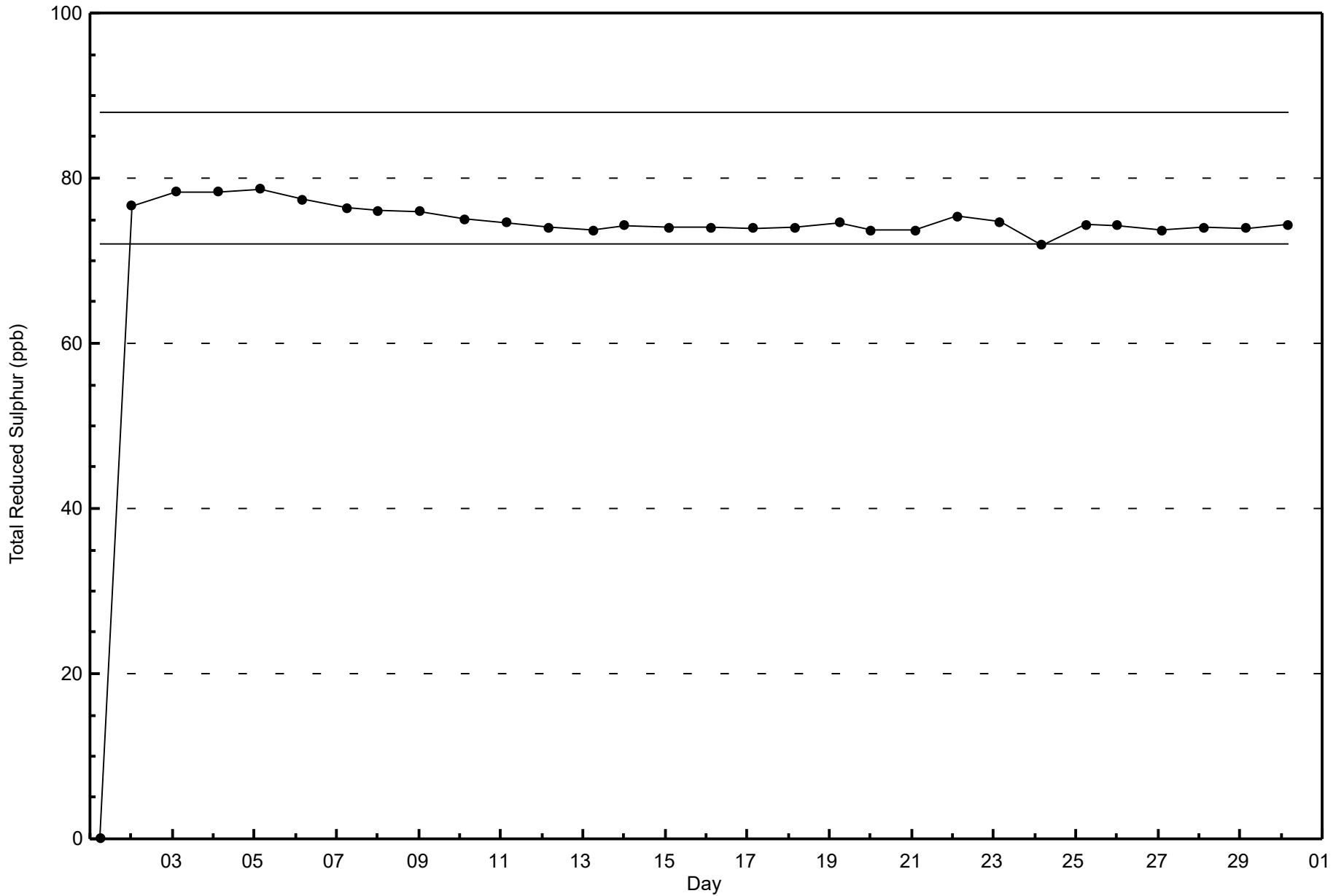
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Total Reduced Sulphur (TRS) - ppb
Janvier



Total Number of Valid Hours: 627

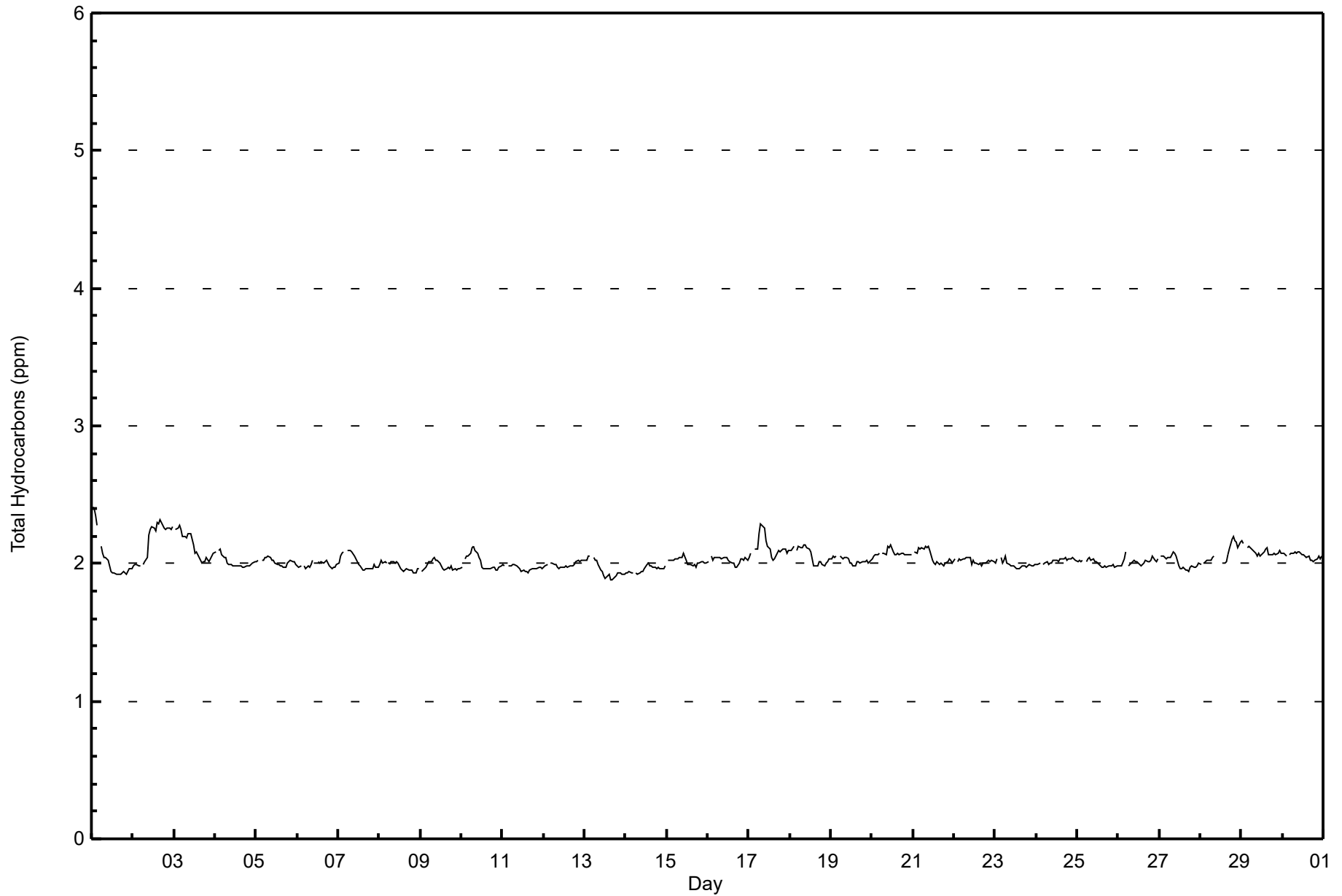






Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Janvier - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Janvier - September 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	507	74.12	74.12
2.1 - 3.0	177	25.88	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Total Hydrocarbons (THC) - ppm
Janvier - September 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	3	5	15	12	9	12	41	72	149	90	31	37	16	9	2	505
2.1 - 3.0	23	11	4	2	0	1	2	2	4	52	30	11	9	9	5	9	174
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	25	14	9	17	12	10	14	43	76	201	120	42	46	25	14	11	679

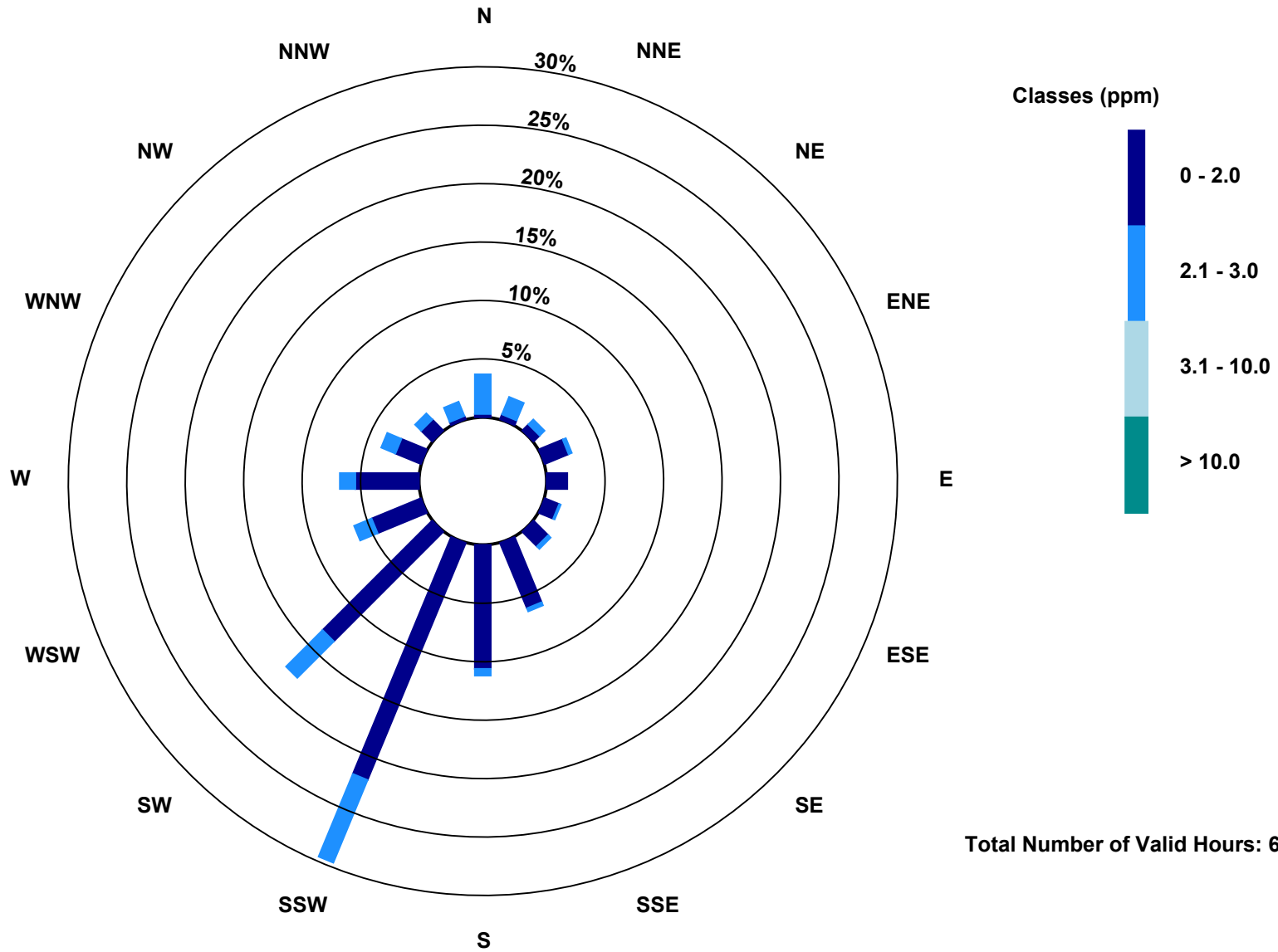
Total Number of Valid Hours: 679

Total Number of Hours: 720

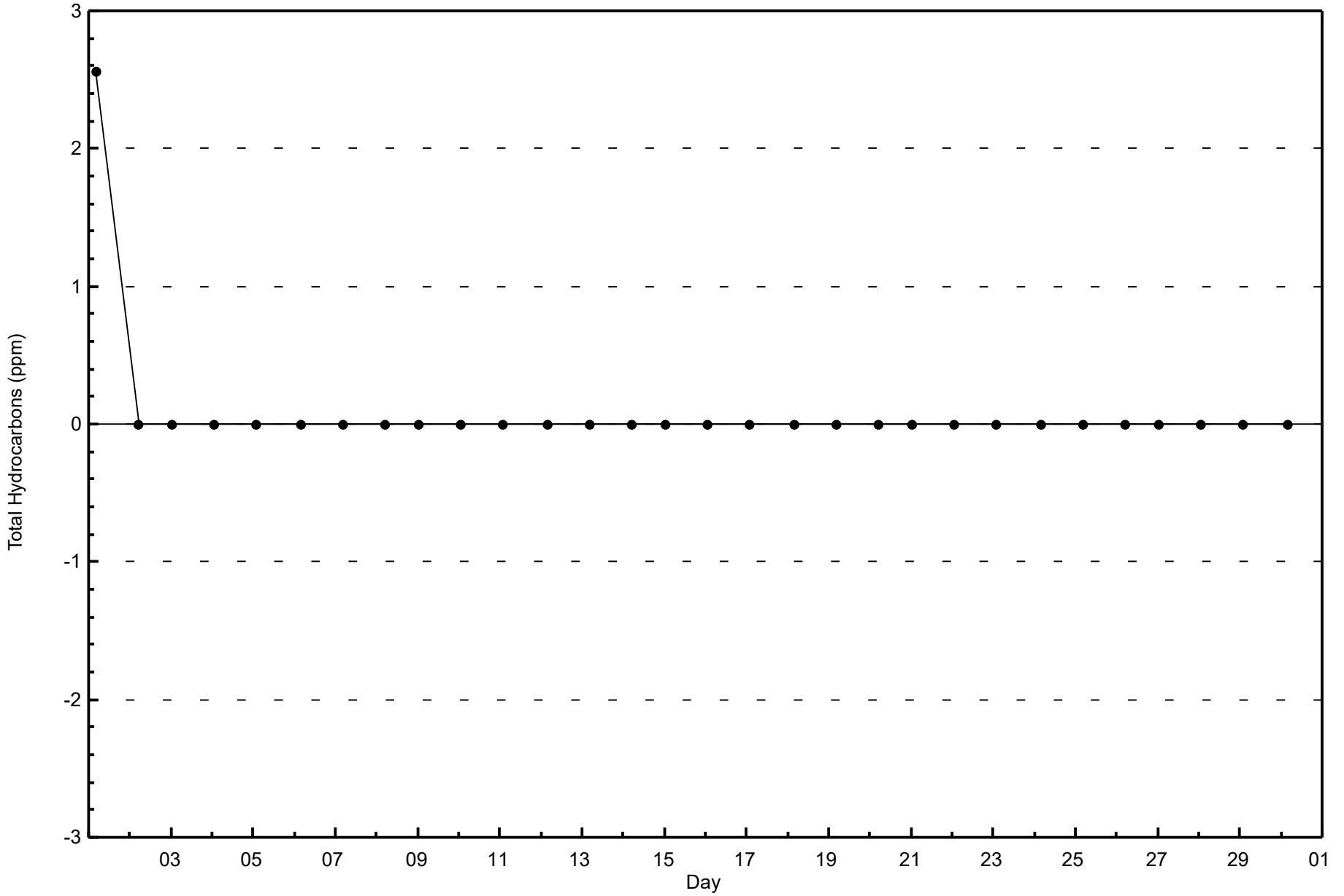


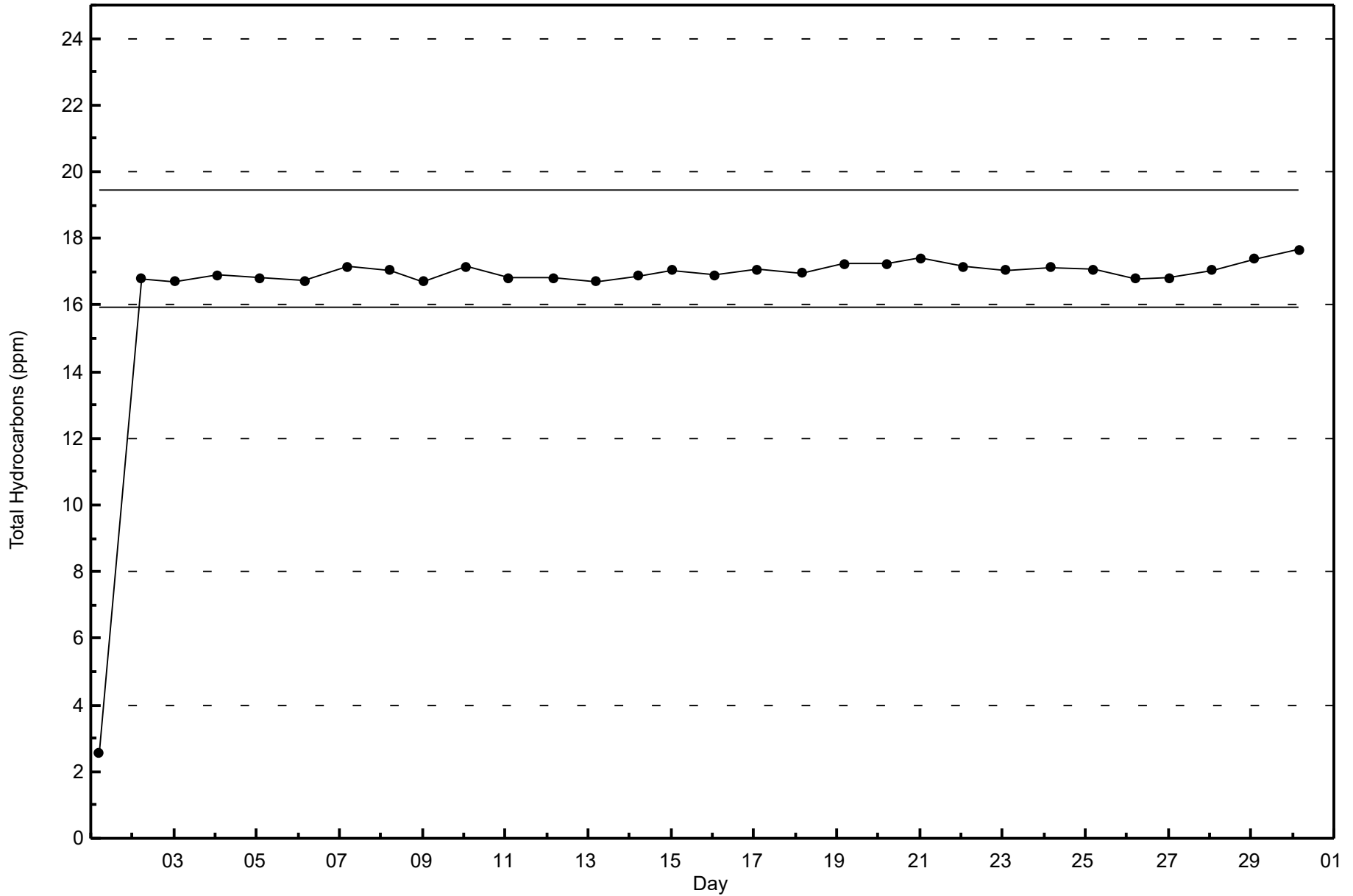
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Total Hydrocarbons (THC) - ppm
Janvier



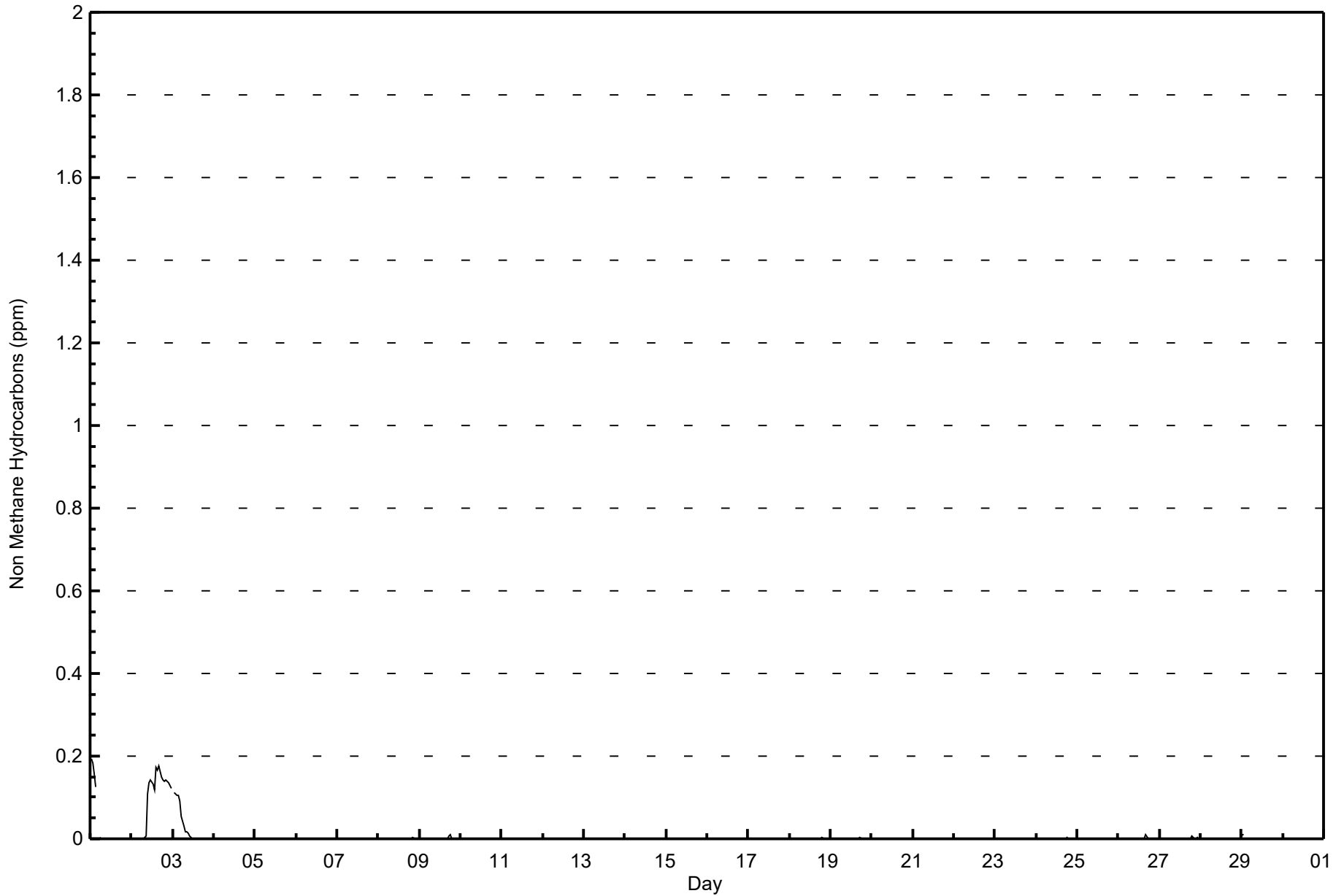
Total Number of Valid Hours: 679







Maximum Value: 0.193 ppm on Sep 1 01:00																				Maximum Daily Average: 0.092 ppm on Sep 2					Hours in Service:	720
Minimum Value: 0.000 ppm on Sep 1 07:00																				Minimum Daily Average: 0.000 ppm on Sep 5					Hours of Data:	684
Maximum Diurnal Average: 0.012 ppm at hour 2																				Minimum Diurnal Average: 0.001 ppm at hour 8					Hours of Missing Data:	36
Monthly Average: 0.005 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:	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-Sep	0.193	0.184	0.154	0.126	Z	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.029	0.193
2-Sep	0.000	0.000	0.000	0.000	0.001	Z	0.000	0.000	0.006	0.109	0.137	0.141	0.131	0.118	0.171	0.168	0.176	0.148	0.144	0.140	0.143	0.137	0.128	0.122	0.092	0.176
3-Sep	Z	0.113	0.106	0.106	0.092	0.056	0.032	0.016	0.016	0.012	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	0.024	0.113
4-Sep	0.000	Z	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002
5-Sep	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
6-Sep	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	M	M	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7-Sep	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
8-Sep	0.000	0.000	0.000	0.000	0.000	Z	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.003
9-Sep	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	0.011	0.000	0.000	0.000	0.000	0.001	0.011
10-Sep	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
11-Sep	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-Sep	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
13-Sep	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-Sep	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-Sep	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
16-Sep	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
17-Sep	0.000	0.000	Z	0.000	0.002	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	0.002
18-Sep	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	0.003	0.000	0.000	0.000	0.000	0.003
19-Sep	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	0.003	0.000	0.000	0.001	0.000	0.000	0.000	0.003
20-Sep	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-Sep	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
22-Sep	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
23-Sep	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-Sep	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	0.005	0.000	0.000	0.000	0.000	0.000	0.005
25-Sep	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-Sep	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	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.011
27-Sep	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	0.005	0.000	0.000	0.003	0.000	0.000	0.005
28-Sep	0.000	Z	0.000	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
29-Sep	0.010	0.011	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.011
30-Sep	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
																								Diurnal Average		
																								Diurnal Maximum		
																								Z - zerospan C - Calibration M - Maintenance		





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Janvier - September 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	650	95.03	95.03
0.006 - 0.05	10	1.46	96.49
0.06 - 0.1	18	2.63	99.12
> 0.1	6	0.88	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Janvier - September 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	24	14	9	16	12	10	14	43	76	190	113	34	43	23	14	10	645
0.006 - 0.05	1	0	0	1	0	0	0	0	0	4	2	0	1	0	0	1	10
0.06 - 0.1	0	0	0	0	0	0	0	0	0	7	5	4	1	1	0	0	18
> 0.1	0	0	0	0	0	0	0	0	0	0	0	4	1	1	0	0	6
Totals	25	14	9	17	12	10	14	43	76	201	120	42	46	25	14	11	679

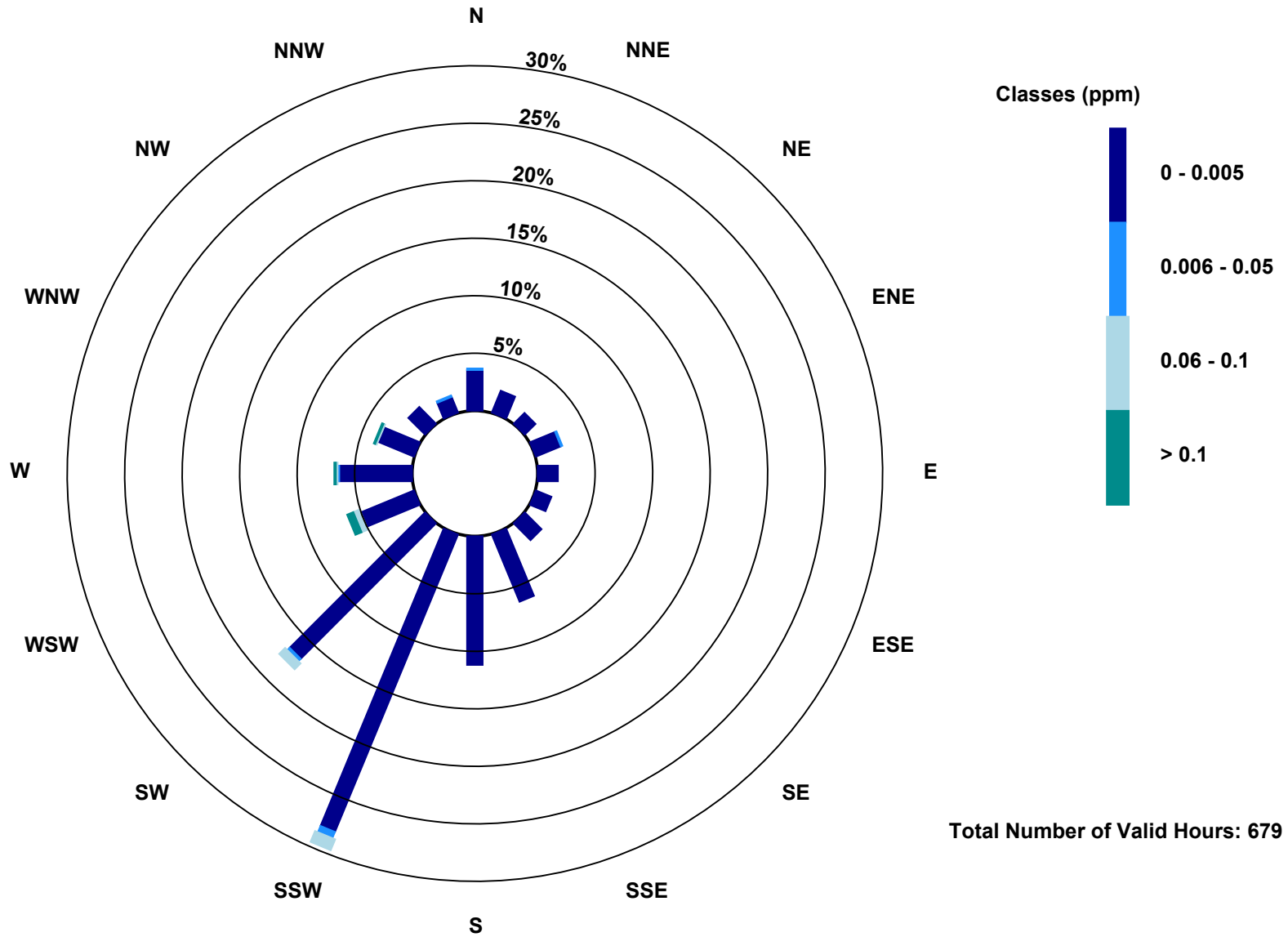
Total Number of Valid Hours: 679

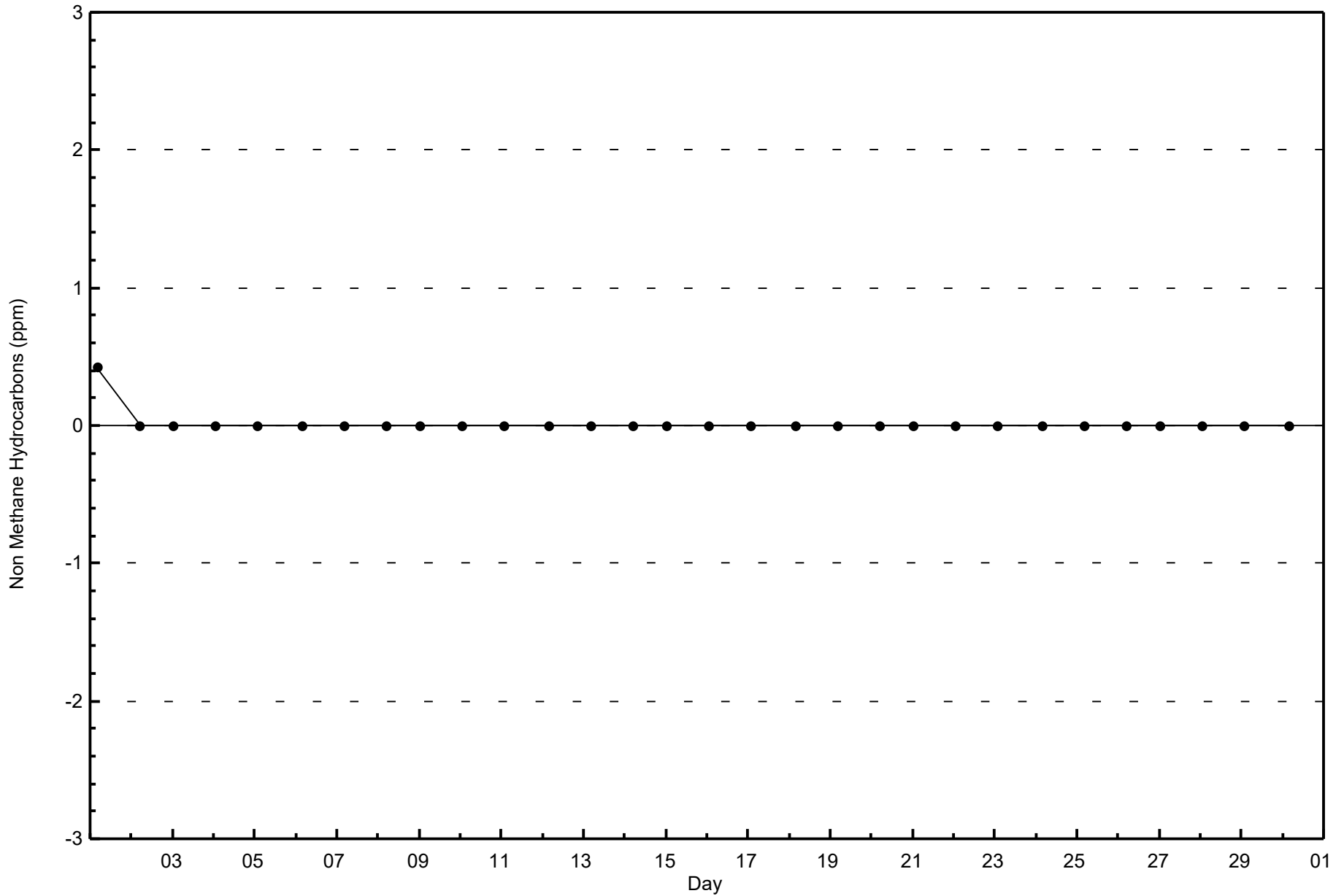
Total Number of Hours: 720

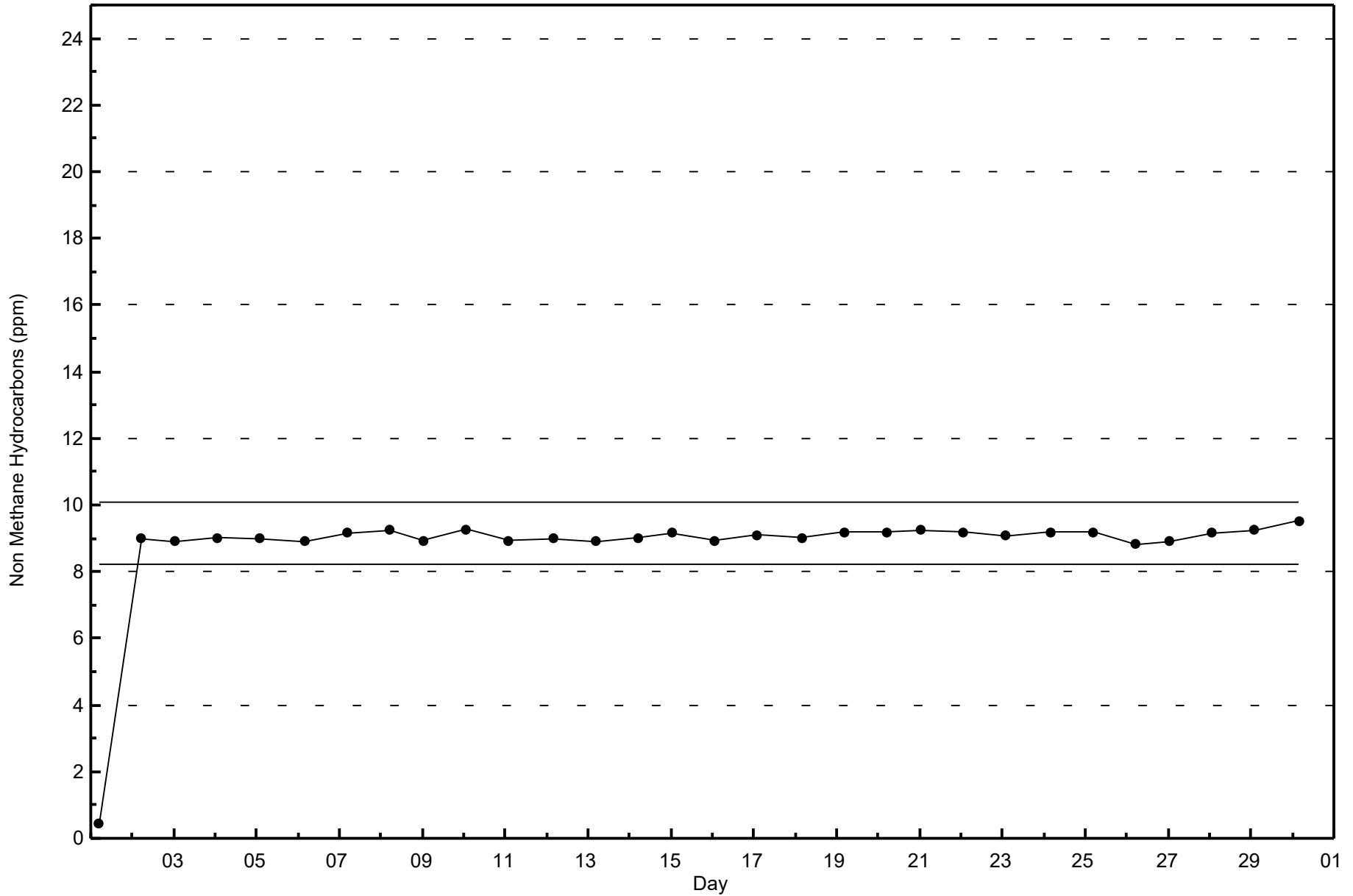


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Non Methane Hydrocarbons (NMHC) - ppm
Janvier









Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH₄) - ppm

Janvier - September 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 2.3 ppm on Sep 17 08:00	Maximum Daily Average: 2.1 ppm on Sep 17		Hours of Data:	684
Minimum Value: 1.9 ppm on Sep 13 17:00	Minimum Daily Average: 2.0 ppm on Sep 13		Hours of Missing Data:	36
Maximum Diurnal Average: 2.1 ppm at hour 6	Minimum Diurnal Average: 2.0 ppm at hour 16		Hours of Calibration:	34
Monthly Average: 2.02 ppm	Percentiles: P ₁ = 1.9 P ₁₀ = 2.0 Q ₁ = 2.0 Median = 2.0 Q ₃ = 2.1 P ₉₀ = 2.1 P ₉₉ = 2.2		Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Sep	2.2	2.2	2.2	2.1	Z	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	1.9	1.9	1.9	2.0	2.0	2.0	2.0	
2-Sep	2.0	2.0	2.0	2.0	2.0	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	2.1	2.1	
3-Sep	Z	2.1	2.1	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	
4-Sep	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	
5-Sep	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-Sep	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	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	
7-Sep	2.0	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	2.0	
8-Sep	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	
9-Sep	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	2.0	2.0	2.0	
10-Sep	2.0	Z	2.0	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	
11-Sep	2.0	2.0	Z	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
12-Sep	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-Sep	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	
14-Sep	1.9	1.9	1.9	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
15-Sep	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
16-Sep	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	
17-Sep	2.0	2.1	Z	2.1	2.1	2.1	2.2	2.3	2.3	2.3	2.2	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
18-Sep	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
19-Sep	2.0	2.1	2.0	2.1	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
20-Sep	2.0	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	
21-Sep	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	
22-Sep	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-Sep	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	2.0	
24-Sep	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	
25-Sep	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-Sep	2.0	2.0	2.0	2.0	2.1	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	
27-Sep	Z	2.1	2.1	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	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
28-Sep	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.1	C	C	C	C	2.0	2.0	2.0	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.2	2.1	
29-Sep	2.2	2.1	Z	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	2.1	
30-Sep	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	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.1	

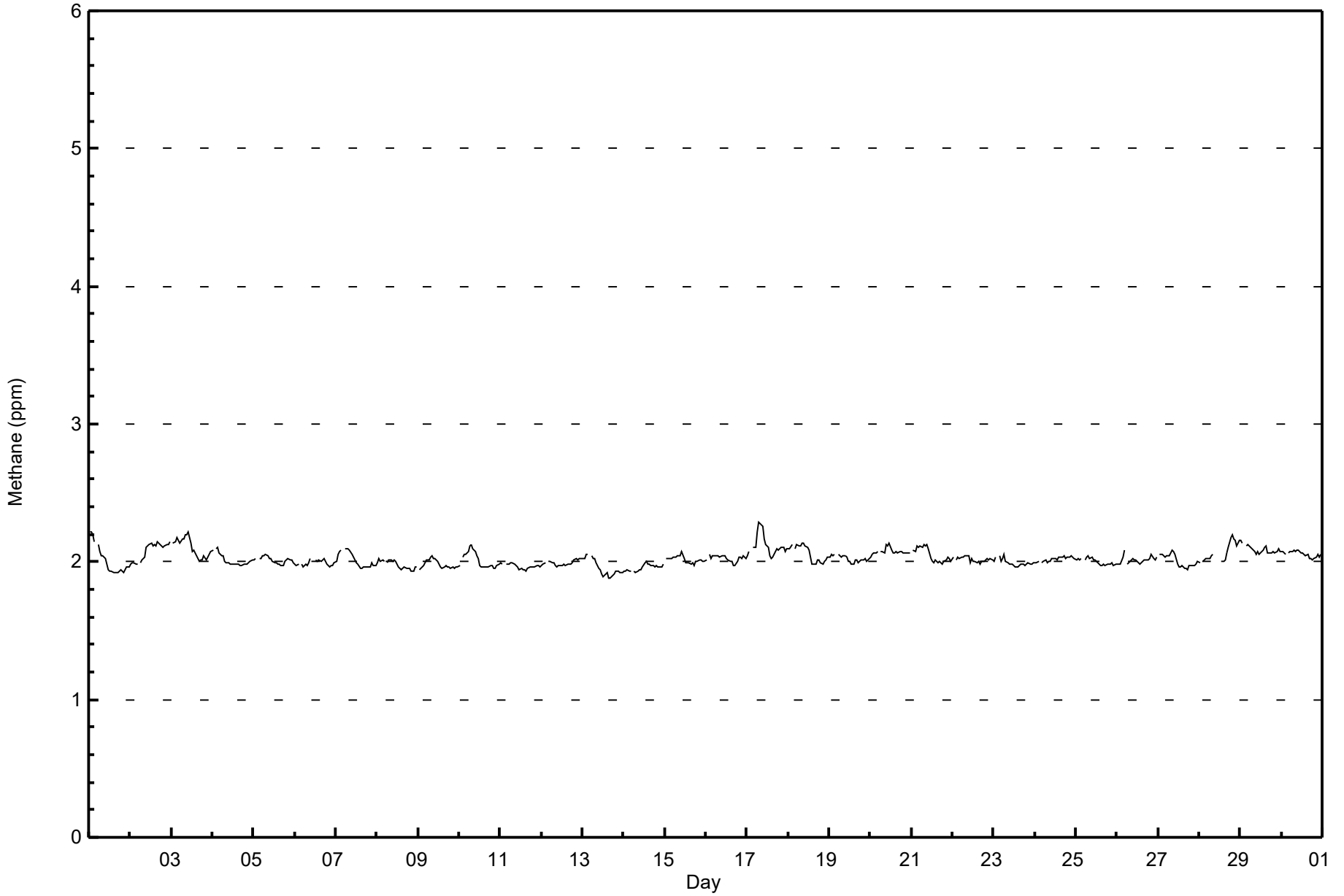
2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	Diurnal Average
2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.3	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.2	2.2	Diurnal Maximum

Z - zerospan C - Calibration M - Maintenance



Wood Buffalo Environmental Association
Hourly Averages

Methane (CH₄) - ppm
Janvier - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Janvier - September 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	507	74.12	74.12
2.1 - 3.0	177	25.88	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Methane (CH₄) - ppm
Janvier - September 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	3	5	15	12	9	12	41	72	149	90	31	37	16	9	2	505
2.1 - 3.0	23	11	4	2	0	1	2	2	4	52	30	11	9	9	5	9	174
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	25	14	9	17	12	10	14	43	76	201	120	42	46	25	14	11	679

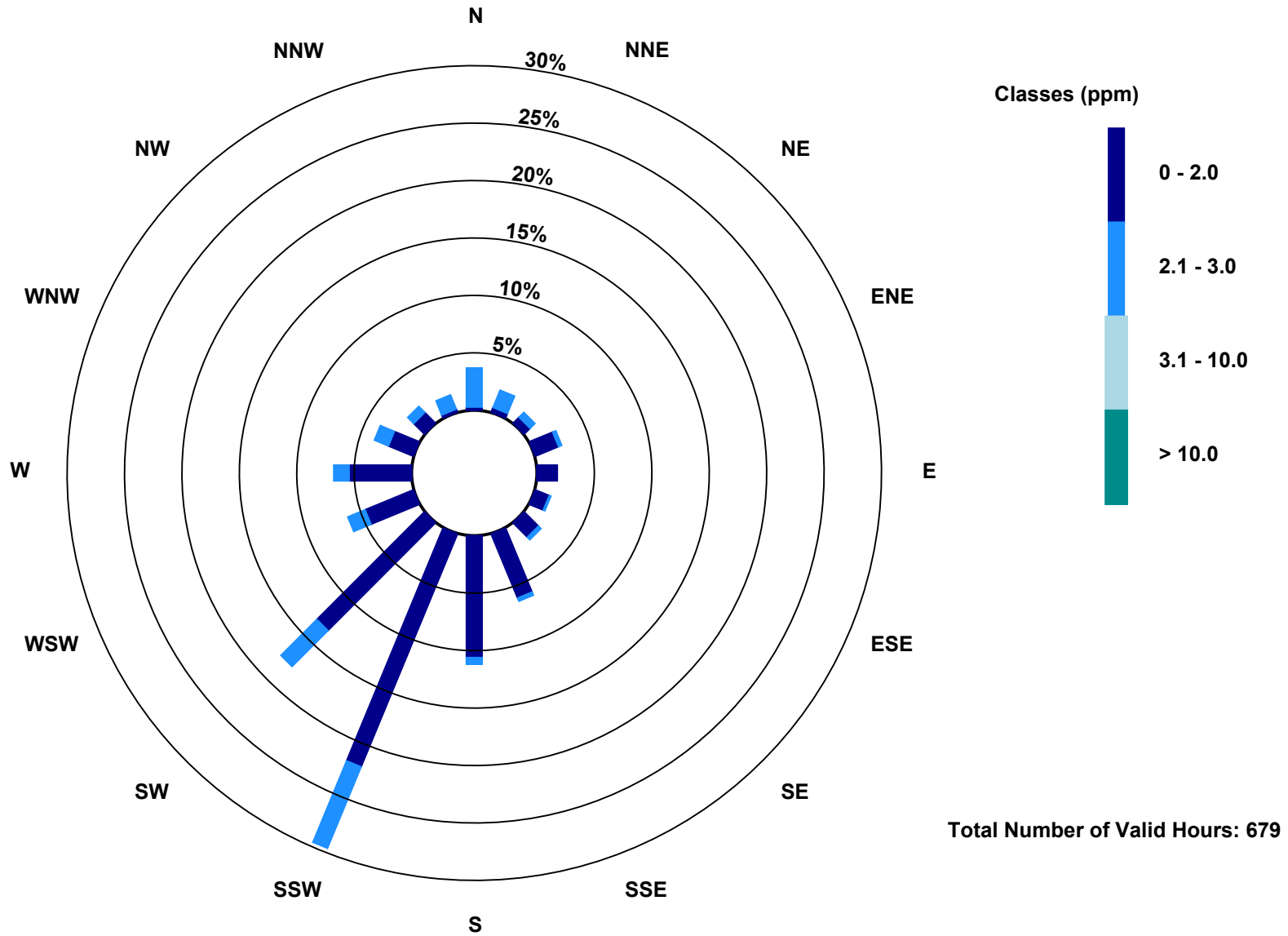
Total Number of Valid Hours: 679

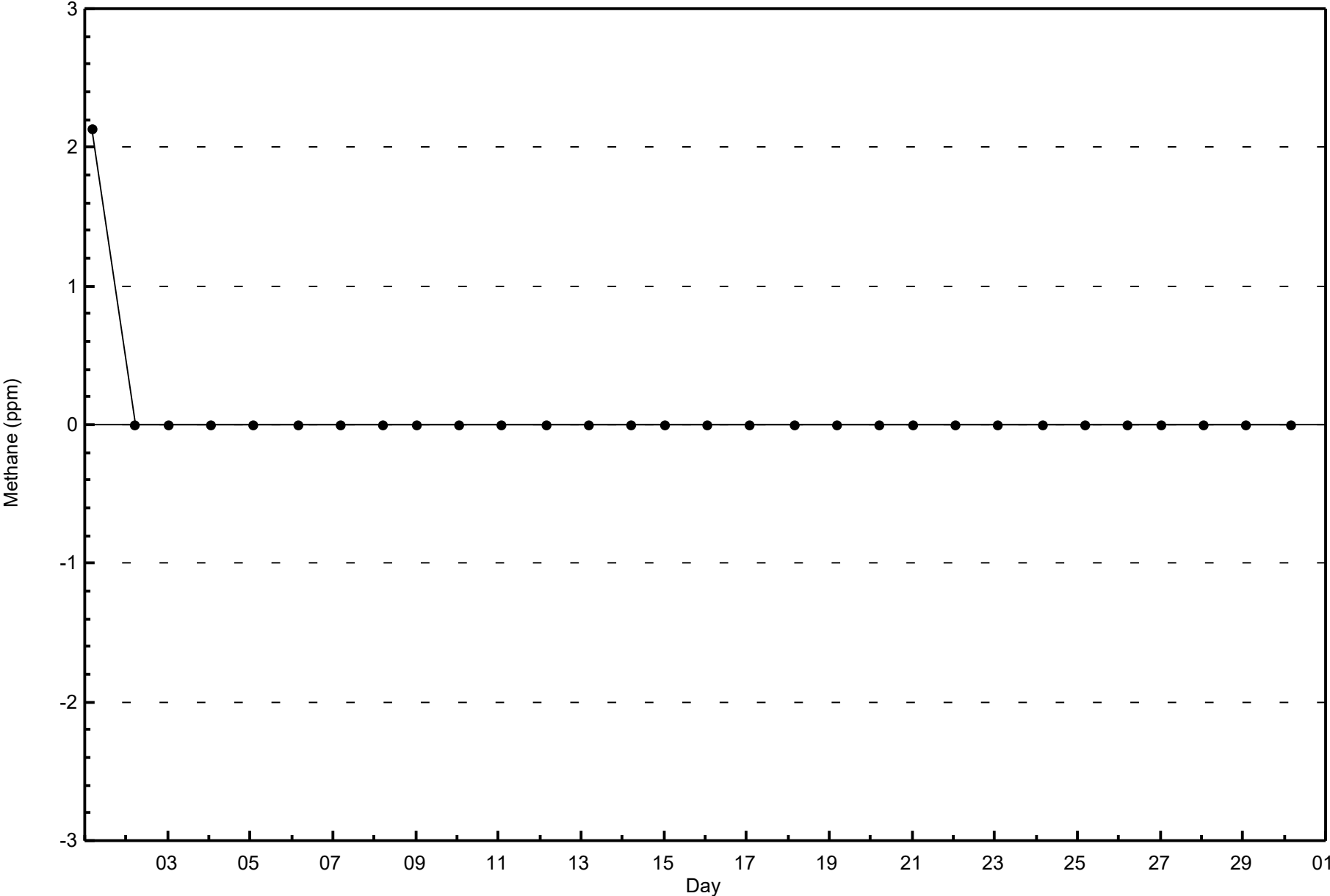
Total Number of Hours: 720

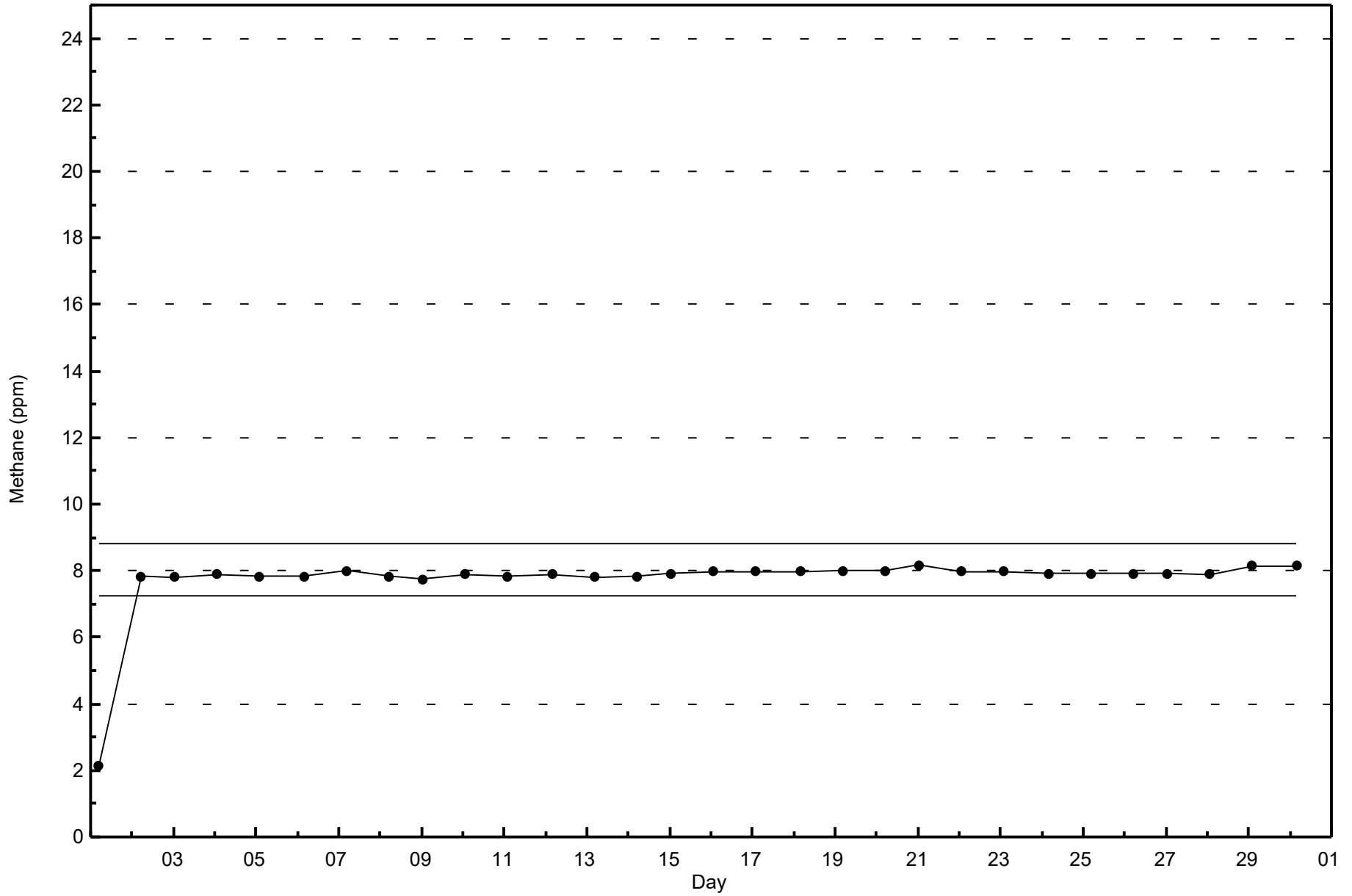


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Methane (CH₄) - ppm
Janvier









Wood Buffalo Environmental Association
Summary of Hour Averages

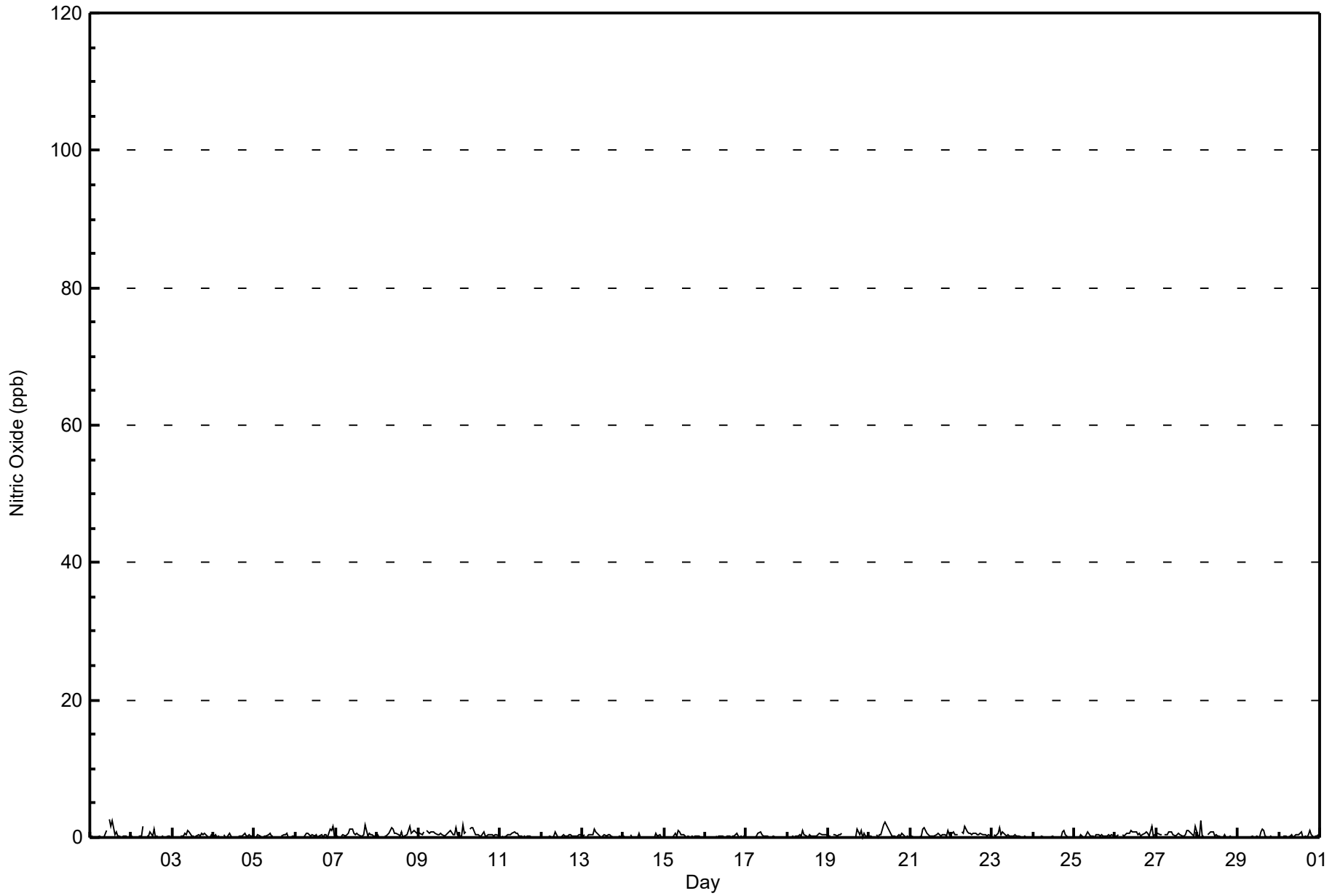
Nitric Oxide (NO) - ppb
Janvier - September 2023

Maximum Value: 2.6 ppb on Sep 1 12:00		Maximum Daily Average: 0.6 ppb on Sep 9		Hours in Service: 720																						
Minimum Value: 0.0 ppb on Sep 1 04:00		Minimum Daily Average: 0.1 ppb on Sep 14		Hours of Data: 678																						
Maximum Diurnal Average: 0.7 ppb at hour 9		Minimum Diurnal Average: 0.2 ppb at hour 6		Hours of Missing Data: 42																						
Monthly Average: 0.34 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.2 Q ₃ = 0.5 P ₉₀ = 0.8 P ₉₉ = 1.8		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-Sep	0.2	0.1	Z	0.0	0.0	0.3	0.0	0.0	0.1	1.0	M	2.6	1.5	2.5	0.5	0.8	0.2	0.1	0.0	0.2	0.2	0.1	0.0	0.1	0.5	2.6
2-Sep	0.2	0.1	0.0	Z	0.2	0.2	0.2	1.7	M	0.2	0.2	0.8	0.2	1.3	0.1	0.3	0.0	0.0	0.1	0.0	0.0	0.3	0.2	0.0	0.3	1.7
3-Sep	0.2	0.0	0.0	0.0	Z	0.3	0.3	0.6	0.4	1.1	0.8	0.3	0.2	0.0	0.3	0.4	0.2	0.6	0.3	0.6	0.1	0.0	0.0	0.5	0.3	1.1
4-Sep	0.2	0.4	0.0	0.2	0.0	Z	0.3	0.0	0.0	0.5	0.1	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.5	0.2	0.3	0.3	0.1	0.2	0.2	0.5
5-Sep	Z	0.0	0.3	0.2	0.0	0.0	0.1	0.2	0.4	0.7	0.2	0.3	M	M	M	M	0.3	0.4	0.4	0.6	0.1	0.1	0.2	0.3	0.3	0.7
6-Sep	0.0	Z	0.0	0.0	0.0	0.0	0.6	0.5	0.5	0.3	0.3	0.2	0.3	0.0	0.2	0.3	0.1	0.4	0.5	0.1	1.3	1.1	1.6	0.2	0.4	1.6
7-Sep	0.2	0.1	Z	0.2	0.4	0.2	0.4	0.6	1.3	1.2	0.6	0.4	0.5	0.4	0.2	0.3	0.4	1.8	0.2	0.5	0.4	0.5	0.2	0.2	0.5	1.8
8-Sep	0.5	0.0	0.0	Z	0.1	0.2	0.4	0.5	1.5	1.2	0.7	0.7	0.4	0.3	0.7	0.0	0.2	0.5	1.0	1.6	0.5	1.0	0.8	0.7	0.6	1.6
9-Sep	0.7	0.6	0.5	0.8	Z	0.9	0.6	0.9	0.8	0.7	0.5	0.4	0.3	0.5	0.4	0.3	0.4	0.7	0.8	1.0	0.4	0.4	1.4	0.5	0.6	1.4
10-Sep	0.2	0.2	1.7	0.6	0.8	Z	1.2	1.4	1.4	0.4	0.4	0.5	0.2	0.1	0.8	0.3	0.3	0.4	0.5	0.5	0.3	0.4	0.4	0.2	0.6	1.7
11-Sep	Z	0.2	0.1	0.3	0.4	0.4	0.4	0.6	0.8	0.6	0.7	0.3	0.1	0.0	0.2	0.1	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.8
12-Sep	0.0	Z	0.0	0.0	0.1	0.3	0.0	0.2	0.9	0.3	0.0	0.0	0.2	0.4	0.2	0.2	0.3	0.4	0.2	0.2	0.2	0.2	0.4	0.4	0.2	0.9
13-Sep	0.2	0.5	Z	0.3	0.4	0.3	0.3	1.1	0.8	0.4	0.1	0.0	0.3	0.4	0.2	0.3	0.3	0.2	0.0	0.0	0.0	0.1	0.2	0.0	0.3	1.1
14-Sep	0.2	0.0	0.0	Z	0.3	0.0	0.0	0.1	0.0	0.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.1	0.4	0.1	0.0	0.1	0.7
15-Sep	0.0	0.0	0.0	0.0	Z	0.1	0.6	0.2	1.0	0.9	0.4	0.3	0.2	0.1	0.2	0.1	0.2	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.2	1.0
16-Sep	0.0	0.0	0.1	0.1	0.0	Z	0.2	0.1	0.2	0.2	0.2	0.0	0.1	0.2	0.1	0.0	0.2	0.2	0.5	0.2	0.0	0.2	0.0	0.3	0.1	0.5
17-Sep	Z	0.0	0.0	0.1	0.1	0.1	0.3	0.5	0.8	0.5	0.3	0.2	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	0.8
18-Sep	0.0	Z	0.0	0.2	0.0	0.1	0.3	0.5	0.2	1.1	0.3	0.2	0.1	0.4	0.2	0.1	0.3	0.2	0.3	0.7	0.3	0.5	0.5	0.4	0.3	1.1
19-Sep	0.2	0.2	Z	0.4	0.4	0.2	0.5	0.5	0.6	C	C	C	C	C	C	0.0	0.0	1.3	0.4	1.0	0.0	0.6	0.1	0.1	--	1.3
20-Sep	0.2	0.2	0.0	Z	0.4	0.0	0.5	0.5	1.8	2.2	1.9	1.5	0.5	0.3	0.2	0.3	0.1	0.3	0.2	0.7	0.3	0.0	0.2	0.0	0.5	2.2
21-Sep	0.0	0.2	0.1	0.0	Z	0.1	0.1	1.3	1.5	1.1	0.7	0.3	0.3	0.1	0.2	0.4	0.5	0.3	0.1	0.3	0.4	0.3	1.1	0.3	0.4	1.5
22-Sep	0.7	0.9	0.5	0.3	0.5	Z	0.9	0.7	1.5	0.8	0.5	0.6	0.4	0.6	0.6	0.5	0.5	0.6	0.4	0.3	0.5	0.3	0.3	0.2	0.6	1.5
23-Sep	Z	0.4	0.2	0.6	1.4	0.4	0.9	0.5	0.2	0.4	0.2	0.2	0.2	0.3	0.3	0.2	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.3	1.4
24-Sep	0.0	Z	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.7	0.9	0.5	0.0	0.0	0.0	0.0	0.1	0.9
25-Sep	0.0	0.1	Z	0.0	0.3	0.0	0.0	0.5	0.9	0.2	0.3	0.2	0.1	0.3	0.4	0.2	0.3	0.3	0.3	0.1	0.3	0.3	0.4	0.2	0.3	0.9
26-Sep	0.2	0.2	0.4	Z	0.4	0.1	0.4	0.5	0.6	1.0	0.9	0.8	0.8	0.5	0.6	0.2	0.4	0.6	0.8	0.7	0.2	1.7	0.3	0.4	0.6	1.7
27-Sep	0.5	0.6	0.3	0.5	Z	0.3	0.5	0.9	0.9	0.7	0.4	0.3	0.4	0.5	0.4	0.1	0.3	0.5	0.9	1.0	0.6	0.3	0.1	1.6	0.5	1.6
28-Sep	0.1	0.2	2.4	0.2	0.2	Z	0.5	0.7	0.9	0.7	0.2	0.4	0.2	0.2	0.0	0.0	0.3	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.3	2.4
29-Sep	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.2	0.0	0.8	1.2	1.1	0.2	0.0	0.1	0.2	0.0	0.1	0.1	0.0	0.2	1.2
30-Sep	0.0	Z	0.1	0.2	0.2	0.0	0.1	0.3	0.1	0.3	0.5	0.3	0.5	0.8	0.1	0.3	0.0	0.5	0.9	0.4	0.1	0.1	0.2	0.4	0.3	0.9
																								Diurnal Average		
																								Diurnal Maximum		
																								0.2 0.7 0.2 0.9 0.3 2.4 0.2 0.8 0.3 1.4 0.2 0.9 0.1 1.2 0.1 1.7 0.1 1.8 0.1 2.2 0.1 1.9 0.1 2.6 0.1 2.5 0.1 1.2 0.1 1.1 0.2 0.5 0.1 1.8 0.1 1.0 0.1 1.6 0.1 1.3 0.1 1.7 0.1 1.6 0.1 1.6		
Z - zerospan C - Calibration M - Maintenance																										



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Janvier - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Janvier - September 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	678	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: 678

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Janvier - September 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	25	14	11	17	12	12	14	40	74	200	120	40	44	26	14	10	673
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	25	14	11	17	12	12	14	40	74	200	120	40	44	26	14	10	673

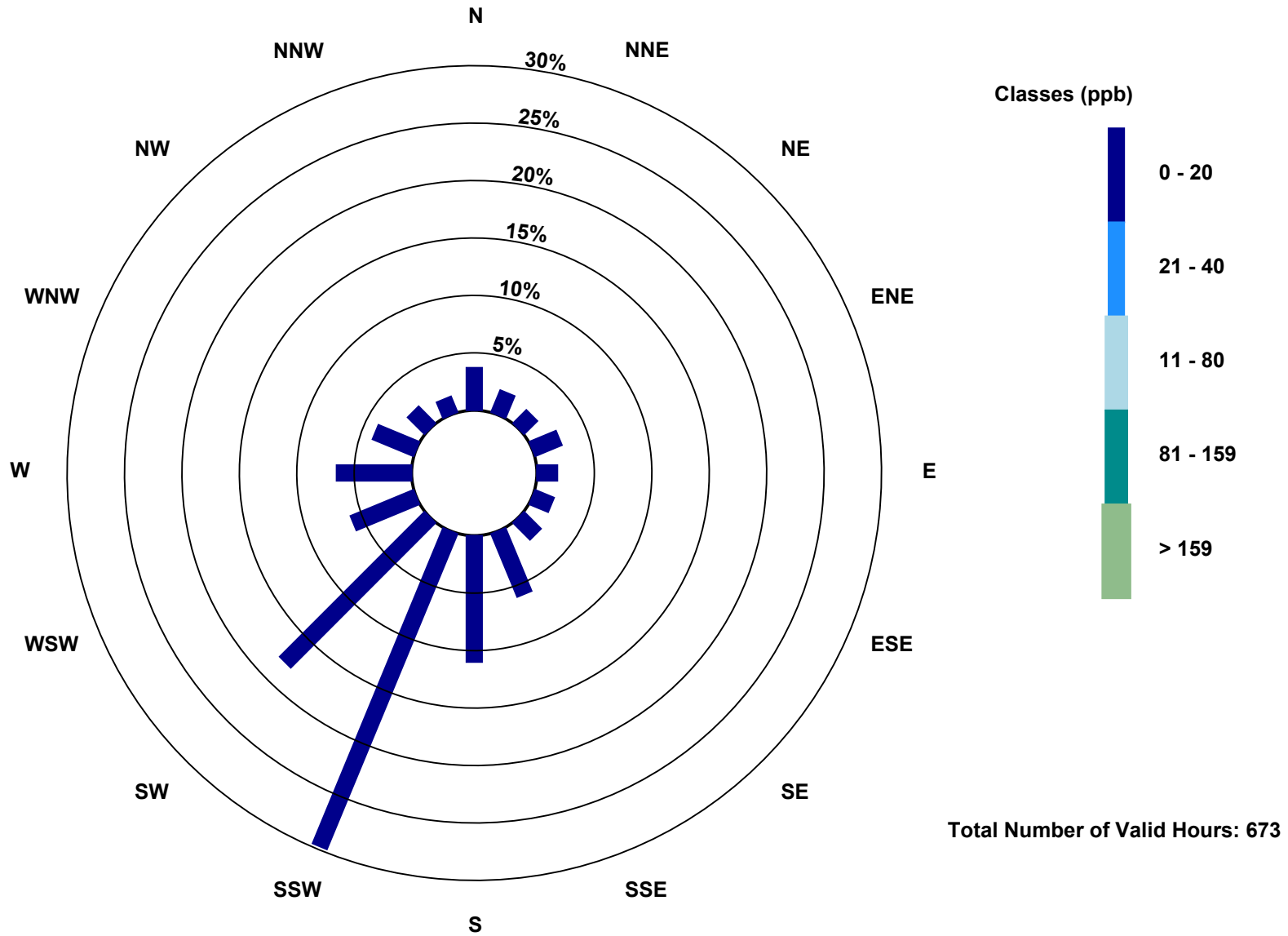
Total Number of Valid Hours: 673

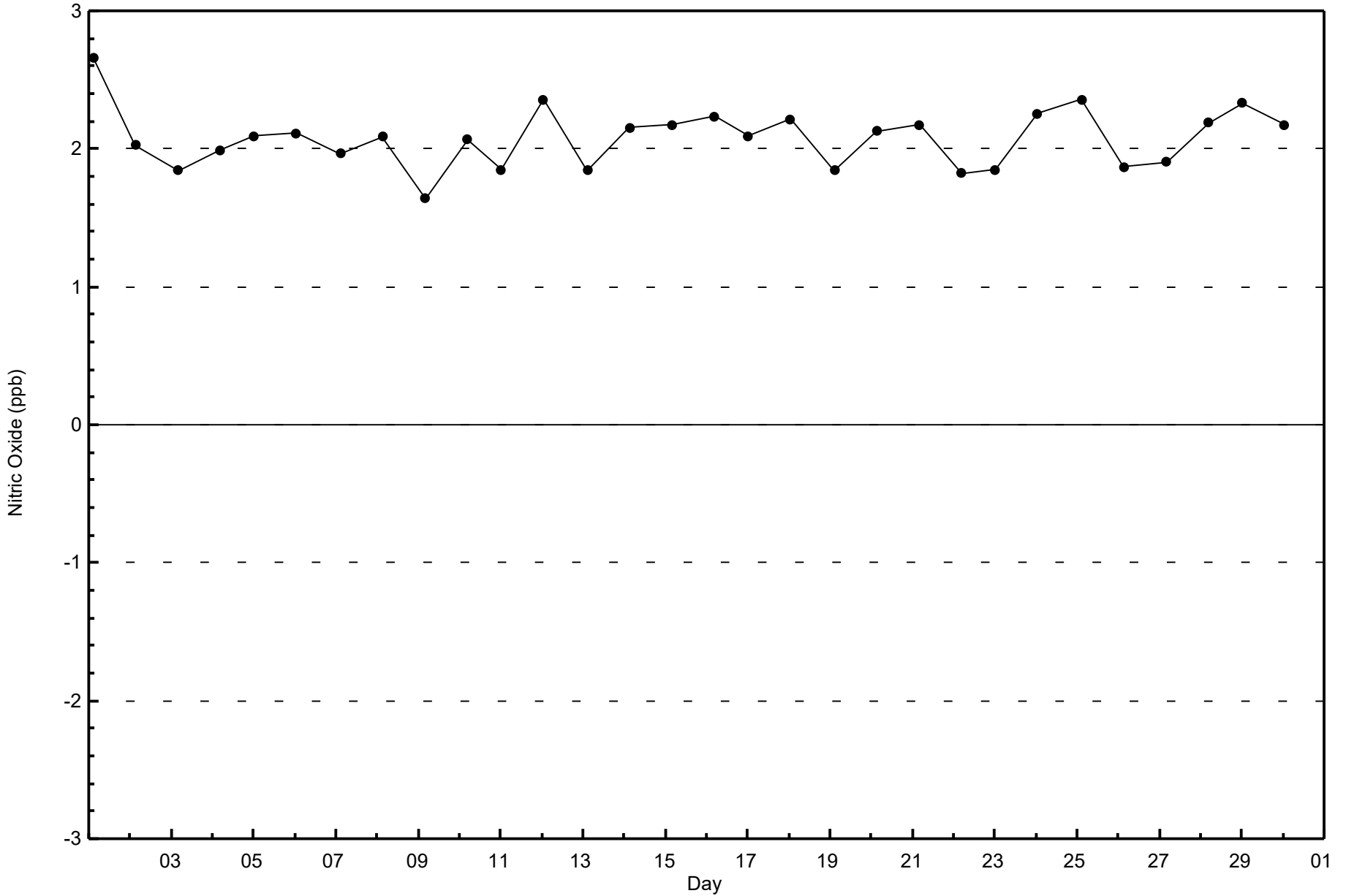
Total Number of Hours: 720

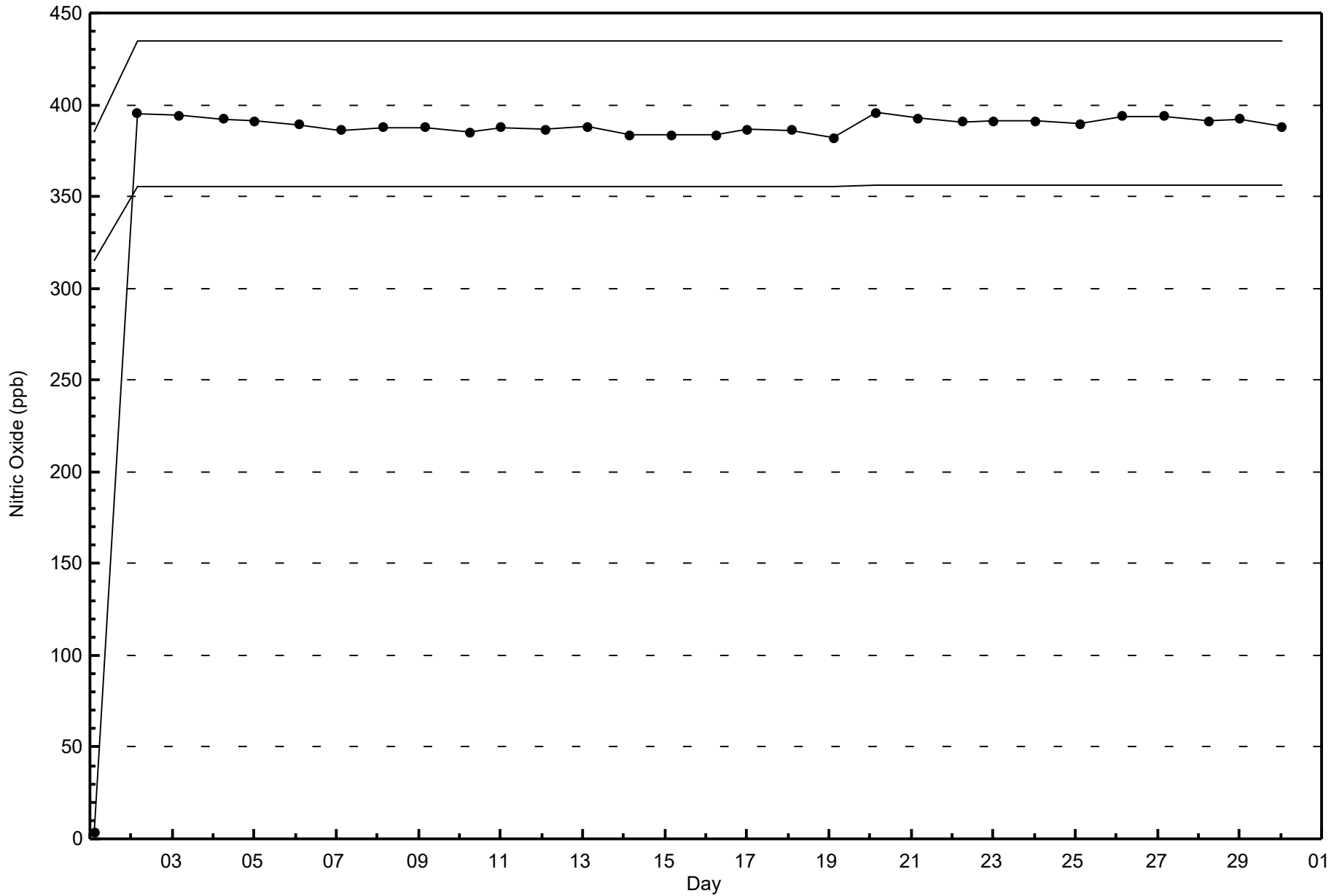


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitric Oxide (NO) - ppb
Janvier









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

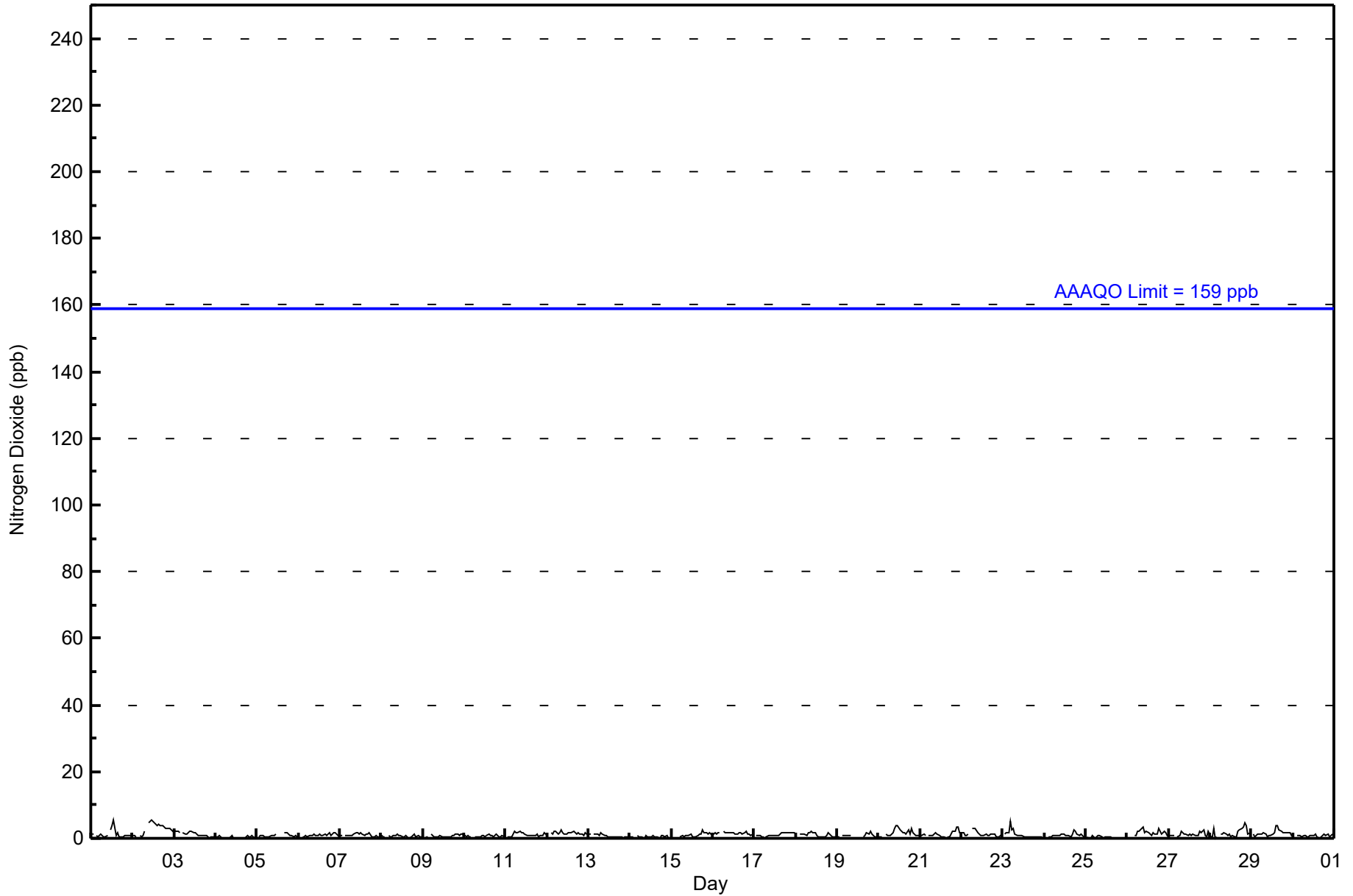
Janvier - September 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:														720						
Maximum Value: 5.5 ppb on Sep 1 14:00		Maximum Daily Average: 2.9 ppb on Sep 2		Hours of Data:														678								
Minimum Value: 0.0 ppb on Sep 4 08:00		Minimum Daily Average: 0.2 ppb on Sep 25		Hours of Missing Data:														42								
Maximum Diurnal Average: 1.4 ppb at hour 10		Minimum Diurnal Average: 0.8 ppb at hour 2		Hours of Calibration:														36								
Monthly Average: 1.09 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.3 Q ₁ = 0.5 Median = 0.9 Q ₃ = 1.4 P ₉₀ = 2.0 P ₉₉ = 4.4		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-Sep	1.3	1.2	Z	0.8	0.6	1.1	0.7	0.4	0.5	1.0	M	2.7	3.7	5.5	1.0	1.6	0.4	0.5	0.5	0.8	0.8	1.0	0.7	0.7	1.3	5.5
2-Sep	0.9	0.8	0.6	Z	0.8	0.6	0.8	2.0	M	4.6	4.9	5.4	4.7	4.4	4.0	4.1	3.8	3.8	3.4	3.0	2.8	2.8	2.7	2.1	2.9	5.4
3-Sep	2.6	2.3	2.1	1.8	Z	1.7	1.3	1.4	1.5	2.2	2.3	1.5	1.7	1.4	0.8	0.9	0.9	0.8	0.7	0.9	0.2	0.3	0.4	0.5	1.3	2.6
4-Sep	0.6	0.6	0.9	0.6	0.2	Z	0.2	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.3	0.4	0.7	0.3	0.2	0.3	0.9
5-Sep	Z	0.5	0.7	0.7	0.6	0.5	0.5	0.6	0.7	0.8	0.8	1.1	M	M	M	M	1.5	1.6	1.2	0.8	0.7	0.5	0.7	0.5	0.8	1.6
6-Sep	0.5	Z	0.6	0.5	0.7	0.6	0.9	1.0	0.9	1.2	1.0	0.9	1.1	0.9	0.9	1.1	0.9	1.3	1.6	0.9	1.9	1.6	1.4	1.0	1.0	1.9
7-Sep	0.9	0.8	Z	0.9	0.9	0.7	0.7	0.8	1.4	1.5	1.5	1.1	1.5	1.3	1.0	1.1	1.1	1.9	0.5	0.6	0.4	0.7	0.5	0.5	1.0	1.9
8-Sep	0.9	0.5	0.3	Z	0.7	0.3	0.5	0.8	0.9	1.1	0.8	0.8	0.5	0.4	0.8	0.3	0.2	0.6	0.9	1.4	0.3	1.0	0.6	0.4	0.7	1.4
9-Sep	0.4	0.2	0.3	0.2	Z	1.1	0.5	0.5	0.5	0.6	0.8	0.6	0.6	0.5	0.5	0.6	0.6	0.7	1.0	1.2	1.4	0.8	1.3	1.2	0.7	1.4
10-Sep	0.8	0.6	0.7	0.4	0.5	Z	0.4	0.3	0.6	0.5	0.8	0.9	0.5	0.7	1.1	0.8	0.7	0.6	1.1	0.8	0.5	0.5	0.7	0.3	0.6	1.1
11-Sep	Z	0.6	0.5	0.6	1.2	2.3	1.9	1.7	2.2	1.5	1.5	1.2	0.9	1.0	0.9	0.8	0.9	1.0	1.2	0.6	0.7	0.8	1.9	1.2	1.2	2.3
12-Sep	1.0	Z	1.8	1.4	2.0	2.3	1.3	1.6	2.6	1.9	1.4	1.4	1.5	1.5	1.8	2.0	1.7	1.4	1.5	1.3	1.3	1.0	1.5	1.1	1.6	2.6
13-Sep	1.1	1.4	Z	1.3	1.3	1.1	0.9	1.6	1.3	1.0	0.9	0.6	0.3	0.4	0.5	0.4	0.4	0.6	0.4	0.5	0.2	0.4	0.5	0.5	0.8	1.6
14-Sep	0.4	0.3	0.3	Z	0.8	0.4	0.5	0.5	0.2	0.9	0.3	0.4	0.4	0.7	0.4	0.3	0.3	0.1	0.7	0.8	0.5	0.9	0.2	0.2	0.5	0.9
15-Sep	0.2	0.2	0.2	0.1	Z	0.3	0.8	0.5	0.9	0.9	0.8	1.1	0.4	0.4	0.6	0.7	1.1	1.3	2.4	1.7	1.6	1.2	1.5	1.2	0.9	2.4
16-Sep	1.3	1.5	1.4	1.9	1.5	Z	2.0	1.7	1.8	1.7	1.7	1.9	1.5	1.3	1.3	1.5	1.6	1.4	1.7	2.0	1.1	1.1	0.7	1.3	1.5	2.0
17-Sep	Z	0.7	0.7	0.7	0.5	0.3	0.2	0.3	0.8	0.8	1.0	0.9	1.0	1.0	1.0	1.2	1.7	1.5	1.5	1.7	1.6	1.8	1.5	1.5	1.0	1.8
18-Sep	1.2	Z	1.1	1.3	1.2	1.2	1.0	1.9	1.5	2.0	1.7	1.6	1.0	0.5	0.4	0.4	0.3	0.5	0.9	1.6	0.7	0.5	0.3	0.3	1.0	2.0
19-Sep	0.5	0.5	Z	0.8	0.9	0.7	0.8	0.8	0.9	C	C	C	C	C	C	0.5	0.8	1.5	1.1	2.1	1.3	0.9	0.5	0.4	--	2.1
20-Sep	0.5	0.5	0.4	Z	1.4	0.9	1.0	0.9	1.7	3.1	3.7	3.9	2.5	2.1	1.7	1.7	1.3	2.4	1.3	2.9	1.5	0.9	0.8	0.8	1.6	3.9
21-Sep	0.7	0.9	1.1	0.7	Z	0.9	0.8	0.8	1.3	1.5	1.2	0.7	0.3	0.4	0.3	0.2	0.3	0.6	1.2	2.1	2.3	3.5	3.6	1.6	1.2	3.6
22-Sep	1.7	1.5	1.0	0.9	1.1	Z	2.9	3.0	2.9	1.6	1.2	1.0	1.0	1.0	1.1	0.9	0.9	1.4	1.2	1.3	0.6	0.5	0.6	1.3	1.3	3.0
23-Sep	Z	1.1	1.8	1.8	5.2	2.4	2.9	1.2	0.8	1.0	0.7	0.7	0.6	0.5	0.5	0.3	0.5	0.3	0.5	0.5	0.5	0.5	0.4	0.0	1.1	5.2
24-Sep	0.3	Z	0.6	0.4	0.5	0.7	0.9	0.7	0.7	0.9	1.2	1.3	0.8	0.7	0.7	0.6	1.1	2.7	2.3	1.3	0.9	1.1	0.9	0.5	0.9	2.7
25-Sep	0.1	0.3	Z	0.0	0.7	0.1	0.3	0.7	0.9	0.4	0.1	0.3	0.3	0.3	0.5	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.9
26-Sep	0.1	0.2	0.0	Z	0.7	0.7	2.1	2.0	3.1	3.2	1.7	2.1	1.8	1.3	0.8	1.8	1.3	1.4	3.0	2.0	1.2	2.3	1.5	0.9	1.5	3.2
27-Sep	0.8	0.8	0.7	0.7	Z	0.6	0.9	2.1	1.5	1.4	1.1	0.8	1.1	0.8	1.1	0.8	0.7	0.7	2.0	1.5	2.4	0.8	0.6	2.3	1.1	2.4
28-Sep	0.5	0.4	3.0	0.2	0.3	Z	1.1	1.4	1.5	1.1	0.8	1.1	0.6	0.7	0.3	0.6	2.1	2.4	3.0	3.5	4.5	3.7	1.2	1.6	1.5	4.5
29-Sep	Z	1.2	0.5	1.1	1.4	1.1	1.4	1.8	1.3	0.5	0.8	0.7	1.1	1.9	3.9	3.9	2.4	2.0	1.7	1.6	1.8	1.8	1.8	0.9	1.6	3.9
30-Sep	0.7	Z	0.9	1.0	0.9	0.6	0.8	0.7	0.4	0.5	0.9	0.8	0.9	1.1	0.5	0.2	0.4	0.9	1.2	0.9	1.1	0.6	0.7	1.3	0.8	1.3
																								Diurnal Average		
																								Diurnal Maximum		
																								0.8 0.8 0.9 0.8 1.1 0.9 1.0 1.1 1.2 1.4 1.3 1.3 1.2 1.2 1.0 1.0 1.0 1.2 1.4 1.4 1.2 1.1 1.0 0.9		
																								2.6 2.3 3.0 1.9 5.2 2.4 2.9 3.0 3.1 4.6 4.9 5.4 4.7 5.5 4.0 4.1 3.8 3.8 3.4 3.5 4.5 3.7 3.6 2.3		
Z - zerospan C - Calibration M - Maintenance																										
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb																										



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Janvier - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Janvier - September 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	678	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: 678

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Janvier - September 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	25	14	11	17	12	12	14	40	74	200	120	40	44	26	14	10	673
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	25	14	11	17	12	12	14	40	74	200	120	40	44	26	14	10	673

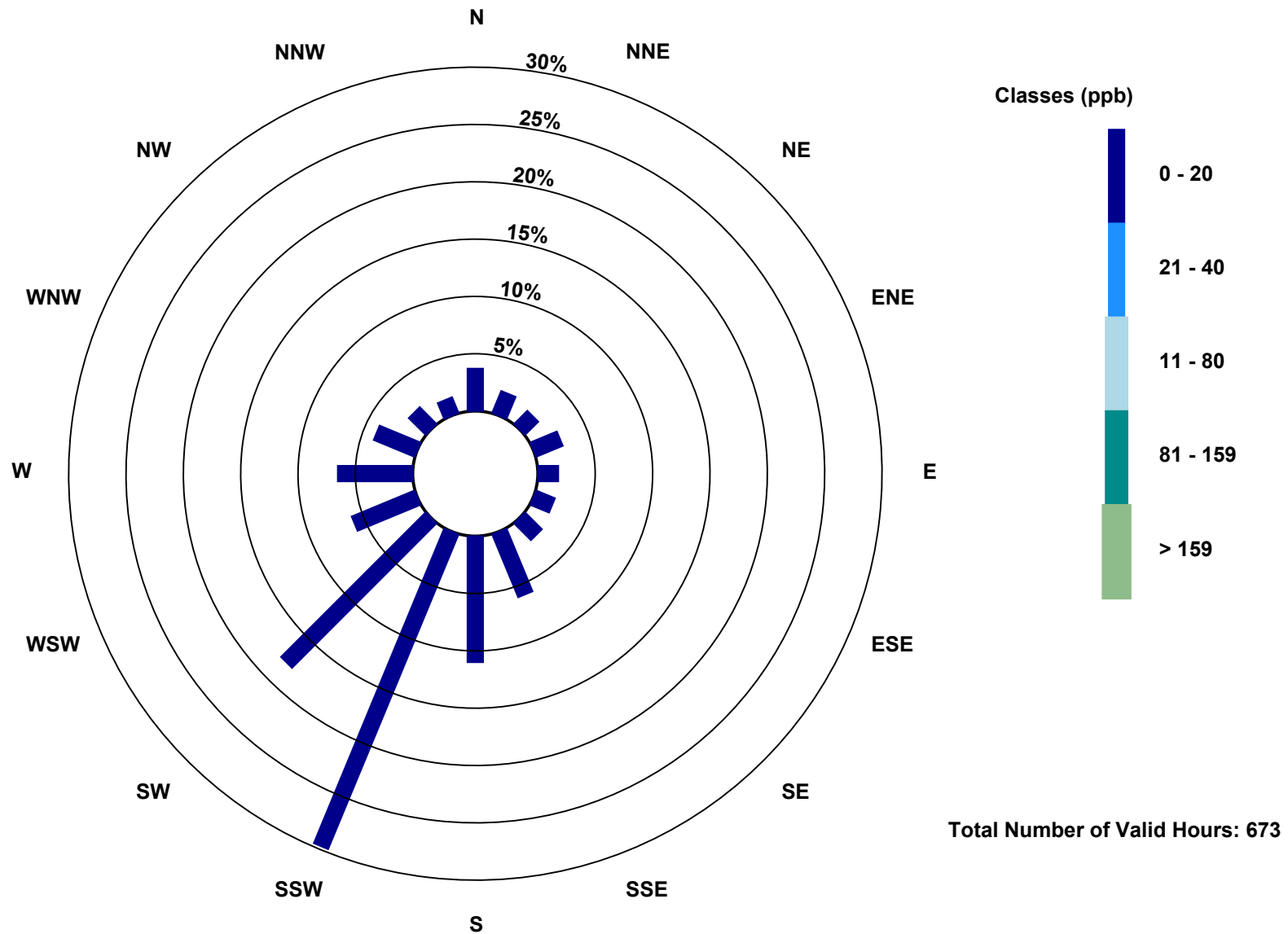
Total Number of Valid Hours: 673

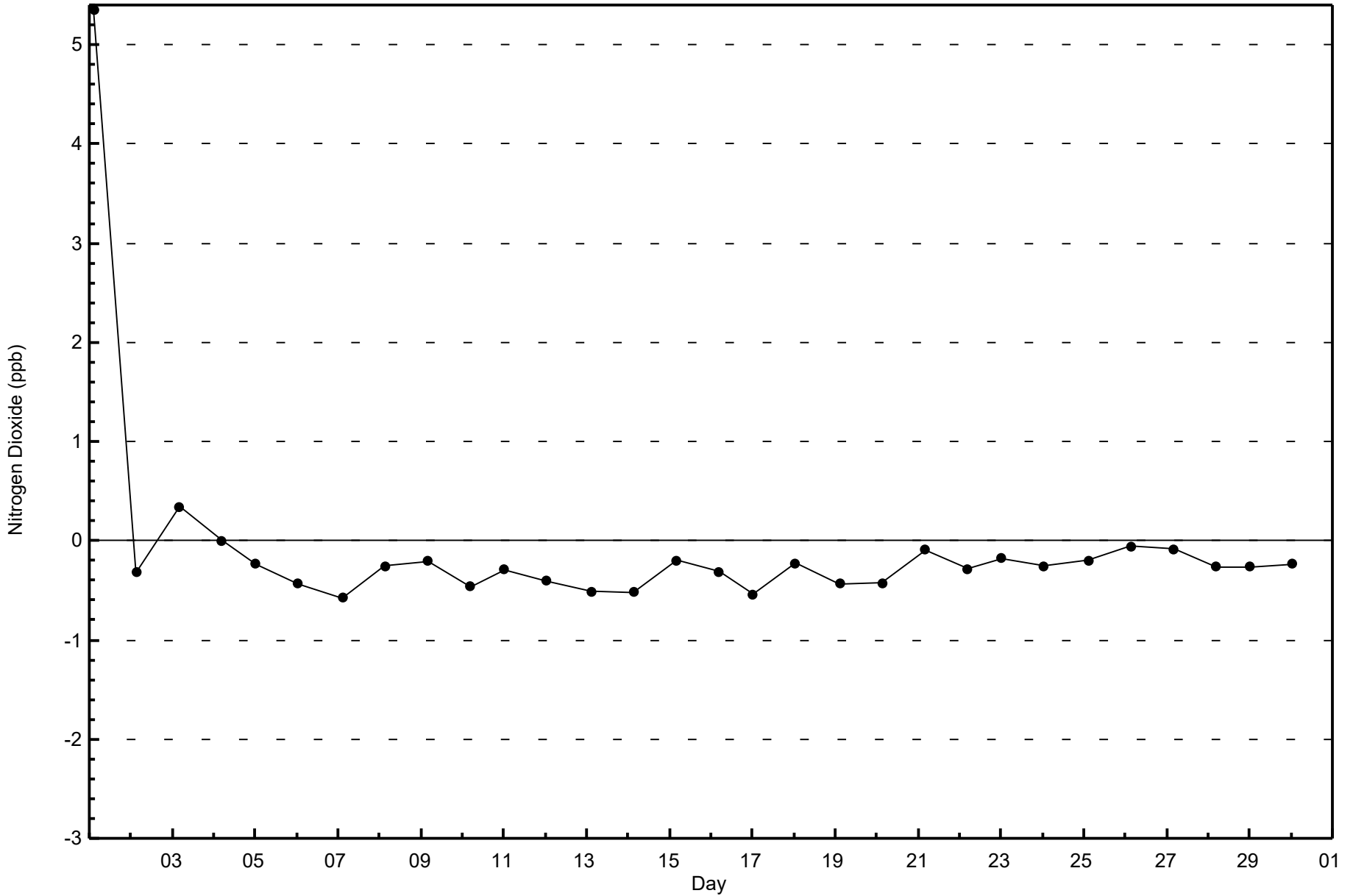
Total Number of Hours: 720

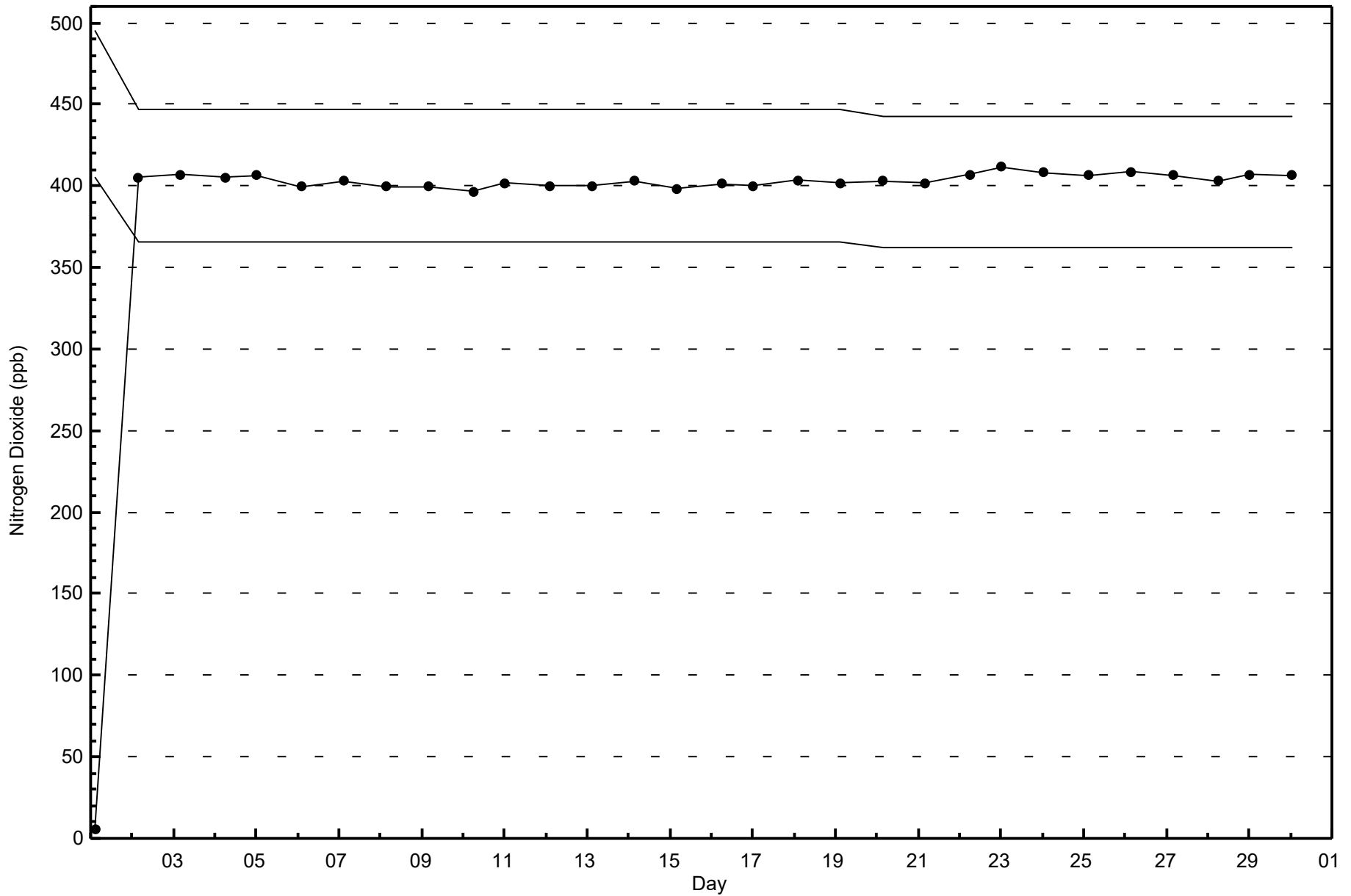


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitrogen Dioxide (NO₂) - ppb
Janvier









Wood Buffalo Environmental Association
Summary of Hour Averages

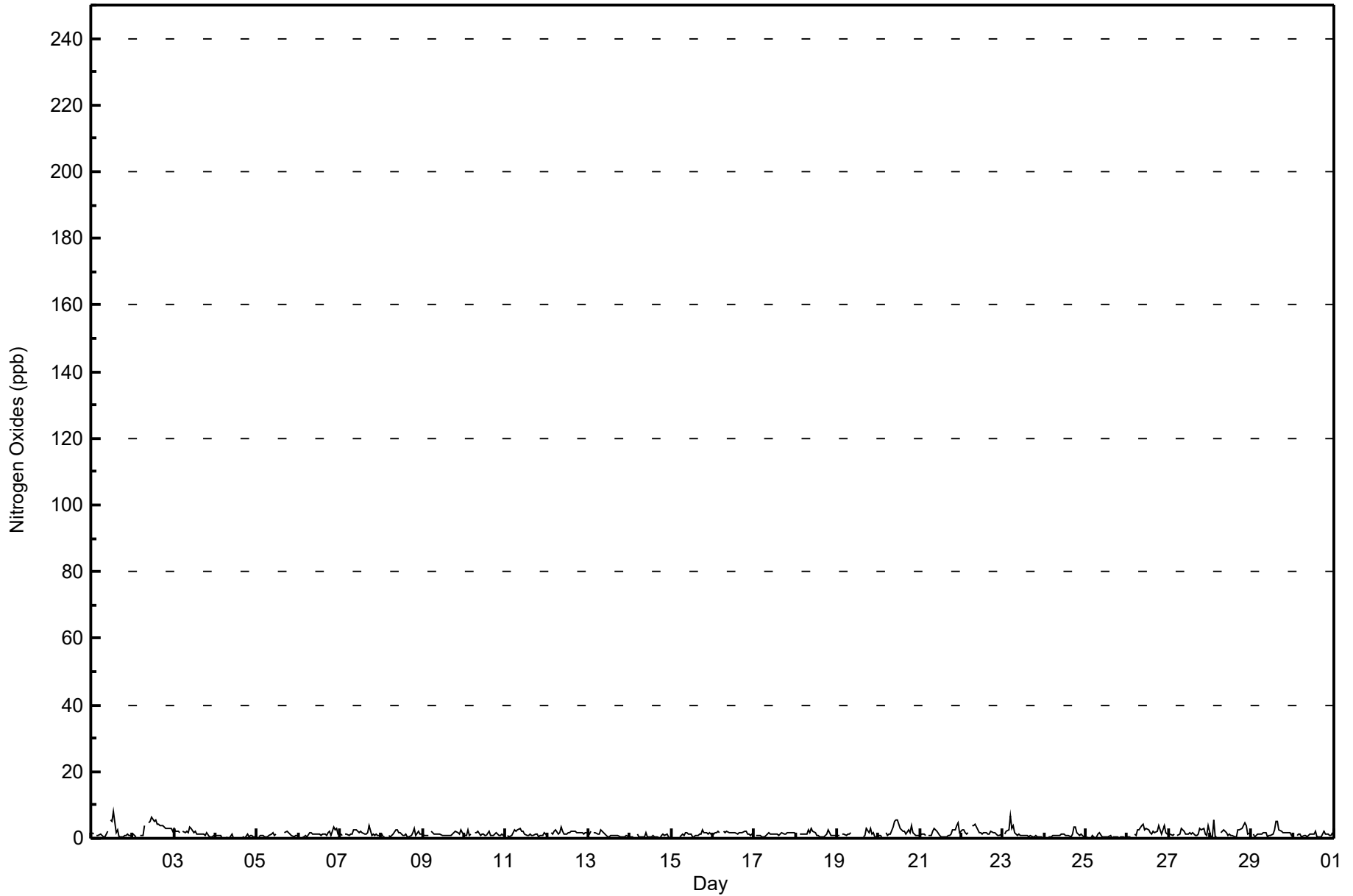
Nitrogen Oxides (NO_x) - ppb
Janvier - September 2023

Maximum Value: 8.0 ppb on Sep 1 14:00 Maximum Daily Average: 3.2 ppb on Sep 2																				Hours in Service: 720 Hours of Data: 678						
Minimum Value: 0.0 ppb on Sep 4 08:00 Minimum Daily Average: 0.5 ppb on Sep 4 Maximum Diurnal Average: 2.1 ppb at hour 10 Minimum Diurnal Average: 1.0 ppb at hour 1 Monthly Average: 1.44 ppb Percentiles: P ₁ = 0.1 P ₁₀ = 0.4 Q ₁ = 0.7 Median = 1.2 Q ₃ = 1.8 P ₉₀ = 2.7 P ₉₉ = 5.3																				Hours of Missing Data: 42 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-Sep	1.5	1.3	Z	0.8	0.6	1.4	0.7	0.4	0.6	2.0	M	5.3	5.2	8.0	1.5	2.4	0.6	0.6	0.5	1.0	1.0	1.1	0.7	0.8	1.7	8.0
2-Sep	1.1	0.9	0.6	Z	1.0	0.8	1.0	3.7	M	4.8	5.1	6.2	4.9	5.7	4.1	4.4	3.8	3.8	3.5	3.0	2.8	3.1	2.9	2.1	3.2	6.2
3-Sep	2.8	2.3	2.1	1.8	Z	2.0	1.6	2.0	1.9	3.3	3.1	1.8	1.9	1.4	1.1	1.3	1.1	1.4	1.0	1.5	0.3	0.3	0.4	1.0	1.6	3.3
4-Sep	0.8	1.0	0.9	0.8	0.2	Z	0.5	0.0	0.0	1.2	0.1	0.0	0.0	0.0	0.1	0.1	0.2	0.2	1.4	0.5	0.7	1.0	0.4	0.4	0.5	1.4
5-Sep	Z	0.5	1.0	0.9	0.6	0.5	0.6	0.8	1.1	1.5	1.0	1.4	M	M	M	M	1.8	2.0	1.6	1.4	0.8	0.6	0.9	0.8	1.0	2.0
6-Sep	0.5	Z	0.6	0.5	0.7	0.6	1.5	1.5	1.4	1.5	1.3	1.1	1.4	0.9	1.1	1.4	1.0	1.7	2.1	1.0	3.2	2.7	3.0	1.2	1.4	3.2
7-Sep	1.1	0.9	Z	1.1	1.3	0.9	1.1	1.4	2.7	2.7	2.1	1.5	2.0	1.7	1.2	1.4	1.5	3.7	0.7	1.1	0.8	1.2	0.7	0.7	1.5	3.7
8-Sep	1.4	0.5	0.3	Z	0.8	0.5	0.9	1.3	2.4	2.3	1.5	1.5	0.9	0.7	1.5	0.3	0.4	1.1	1.9	3.0	0.8	2.0	1.4	1.1	1.2	3.0
9-Sep	1.1	0.8	0.8	1.0	Z	2.0	1.1	1.4	1.3	1.3	1.3	1.0	0.9	1.0	0.9	0.9	1.0	1.4	1.8	2.2	1.8	1.2	2.7	1.7	1.3	2.7
10-Sep	1.0	0.8	2.4	1.0	1.3	Z	1.6	1.7	2.0	0.9	1.2	1.4	0.7	0.8	1.9	1.1	1.0	1.0	1.6	1.3	0.8	0.9	1.1	0.5	1.2	2.4
11-Sep	Z	0.8	0.6	0.9	1.6	2.7	2.3	2.3	3.0	2.1	2.2	1.5	1.0	1.0	1.1	0.9	1.0	1.2	1.2	0.6	0.7	0.8	1.9	1.2	1.4	3.0
12-Sep	1.0	Z	1.8	1.4	2.1	2.6	1.3	1.8	3.5	2.2	1.4	1.4	1.7	1.9	2.0	2.2	2.0	1.8	1.7	1.5	1.5	1.2	1.9	1.5	1.8	3.5
13-Sep	1.3	1.9	Z	1.6	1.7	1.4	1.2	2.7	2.1	1.4	1.0	0.6	0.6	0.8	0.7	0.7	0.7	0.8	0.4	0.5	0.2	0.5	0.7	0.5	1.1	2.7
14-Sep	0.6	0.3	0.3	Z	1.1	0.4	0.5	0.6	0.2	1.6	0.4	0.4	0.4	0.7	0.4	0.3	0.3	0.1	0.7	1.4	0.6	1.3	0.3	0.2	0.6	1.6
15-Sep	0.2	0.2	0.2	0.1	Z	0.4	1.4	0.7	1.9	1.8	1.2	1.4	0.6	0.5	0.8	0.8	1.3	1.4	2.6	1.8	1.7	1.2	1.5	1.2	1.1	2.6
16-Sep	1.3	1.5	1.5	2.0	1.5	Z	2.2	1.8	2.0	1.9	1.9	1.9	1.6	1.5	1.4	1.5	1.8	1.6	2.2	2.2	1.1	1.3	0.7	1.6	1.6	2.2
17-Sep	Z	0.7	0.7	0.8	0.6	0.4	0.5	0.8	1.6	1.3	1.3	1.1	1.1	1.1	1.0	1.2	1.8	1.5	1.5	1.7	1.6	1.8	1.5	1.5	1.2	1.8
18-Sep	1.2	Z	1.1	1.5	1.2	1.3	1.3	2.4	1.7	3.1	2.0	1.8	1.1	0.9	0.6	0.5	0.6	0.7	1.2	2.3	1.0	1.0	0.8	0.7	1.3	3.1
19-Sep	0.7	0.7	Z	1.2	1.3	0.9	1.3	1.3	1.5	C	C	C	C	C	C	0.5	0.8	2.8	1.5	3.1	1.3	1.5	0.6	0.5	--	3.1
20-Sep	0.7	0.7	0.4	Z	1.8	0.9	1.5	1.4	3.5	5.3	5.6	5.4	3.0	2.4	1.9	2.0	1.4	2.7	1.5	3.6	1.8	0.9	1.0	0.8	2.2	5.6
21-Sep	0.7	1.1	1.2	0.7	Z	1.0	0.9	2.1	2.8	2.6	1.9	1.0	0.6	0.5	0.5	0.6	0.8	0.9	1.3	2.4	2.7	3.8	4.7	1.9	1.6	4.7
22-Sep	2.4	2.4	1.5	1.2	1.6	Z	3.8	3.7	4.4	2.4	1.7	1.6	1.4	1.6	1.7	1.4	1.4	2.0	1.6	1.6	1.1	0.8	0.9	1.5	1.9	4.4
23-Sep	Z	1.5	2.0	2.4	6.6	2.8	3.8	1.7	1.0	1.4	0.9	0.9	0.8	0.8	0.8	0.5	0.8	0.4	0.5	0.6	0.5	0.5	0.4	0.0	1.4	6.6
24-Sep	0.3	Z	0.6	0.4	0.5	0.8	1.0	0.8	0.7	0.9	1.3	1.5	0.8	0.7	0.7	0.6	1.1	3.4	3.2	1.8	0.9	1.1	0.9	0.5	1.1	3.4
25-Sep	0.1	0.4	Z	0.0	1.0	0.1	0.3	1.2	1.8	0.6	0.4	0.5	0.4	0.6	0.9	0.2	0.4	0.3	0.3	0.2	0.3	0.3	0.4	0.2	0.5	1.8
26-Sep	0.3	0.4	0.4	Z	1.1	0.8	2.5	2.5	3.7	4.2	2.6	2.9	2.6	1.8	1.4	2.0	1.7	2.0	3.8	2.7	1.4	4.0	1.8	1.3	2.1	4.2
27-Sep	1.3	1.4	1.0	1.2	Z	0.9	1.4	3.0	2.4	2.1	1.5	1.1	1.5	1.3	1.5	0.9	1.0	1.2	2.9	2.5	3.0	1.1	0.7	3.9	1.7	3.9
28-Sep	0.6	0.6	5.4	0.4	0.5	Z	1.6	2.1	2.4	1.8	1.0	1.5	0.8	0.9	0.3	0.6	2.4	2.4	3.0	3.6	4.5	3.7	1.2	1.6	1.9	5.4
29-Sep	Z	1.2	0.5	1.1	1.4	1.1	1.4	1.8	1.5	0.5	0.8	0.9	1.1	2.7	5.1	5.0	2.6	2.0	1.8	1.8	1.8	1.9	1.9	0.9	1.8	5.1
30-Sep	0.7	Z	1.0	1.2	1.1	0.6	0.9	1.0	0.5	0.8	1.4	1.1	1.4	1.9	0.6	0.5	0.4	1.4	2.1	1.3	1.2	0.7	0.9	1.7	1.1	2.1
																								Diurnal Average		
																								Diurnal Maximum		
																								2.8 2.4 5.4 2.4 6.6 2.8 3.8 3.7 4.4 5.3 5.6 6.2 5.2 8.0 5.1 5.0 3.8 3.8 3.8 3.6 4.5 4.0 4.7 3.9		
Z - zerospan C - Calibration M - Maintenance																										



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Janvier - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Janvier - September 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	678	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: 678

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Janvier - September 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	25	14	11	17	12	12	14	40	74	200	120	40	44	26	14	10	673
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	25	14	11	17	12	12	14	40	74	200	120	40	44	26	14	10	673

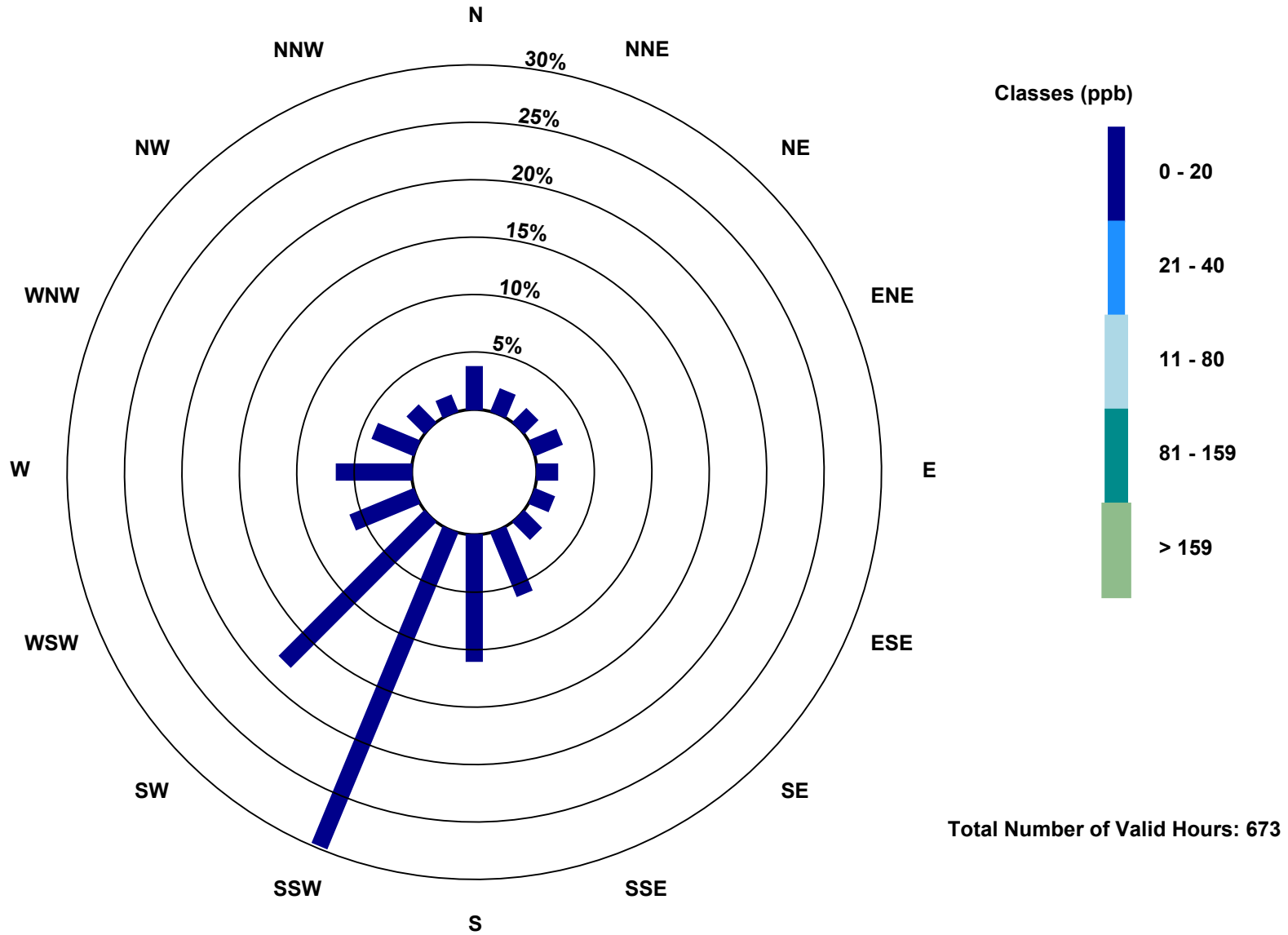
Total Number of Valid Hours: 673

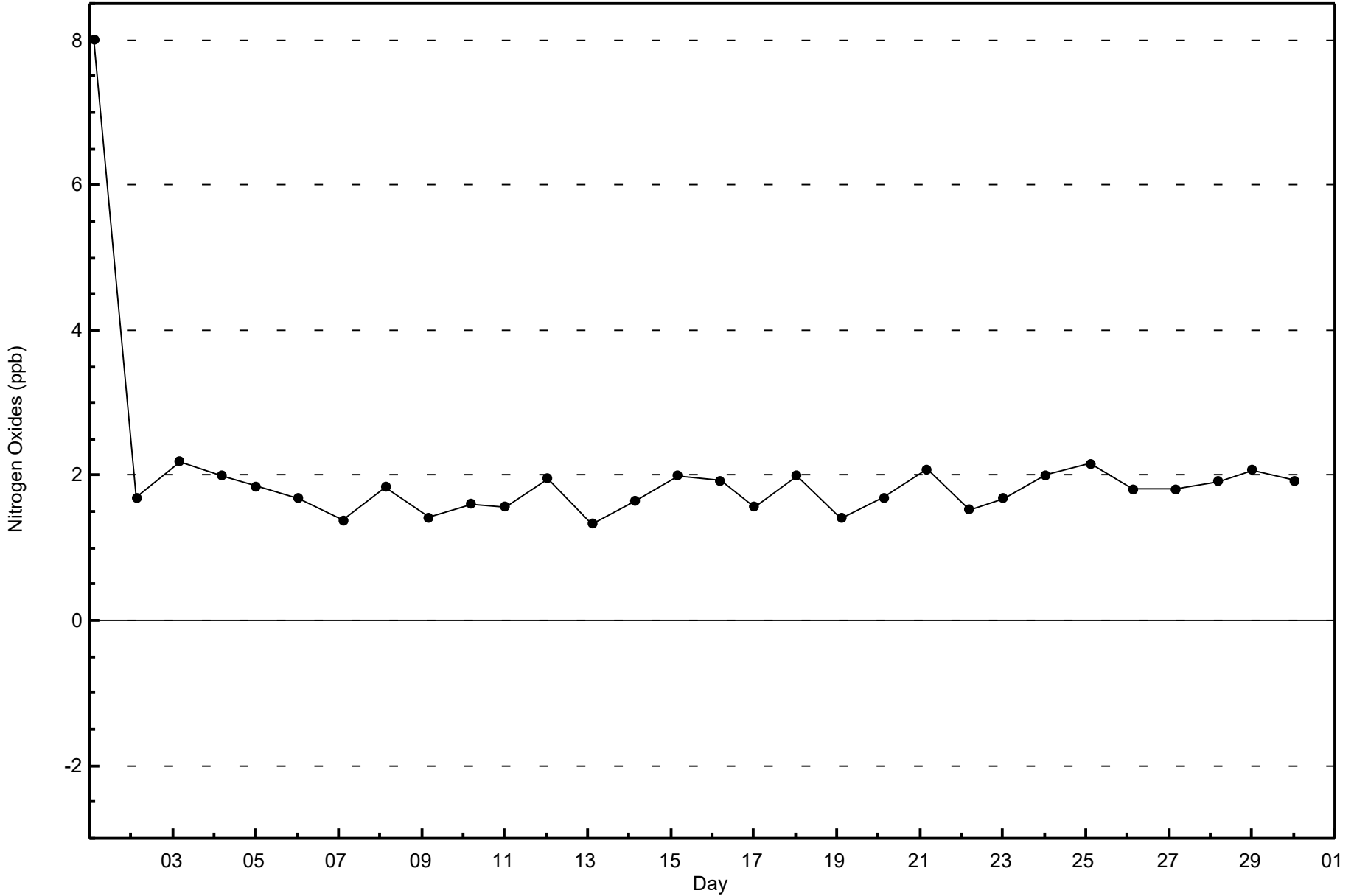
Total Number of Hours: 720

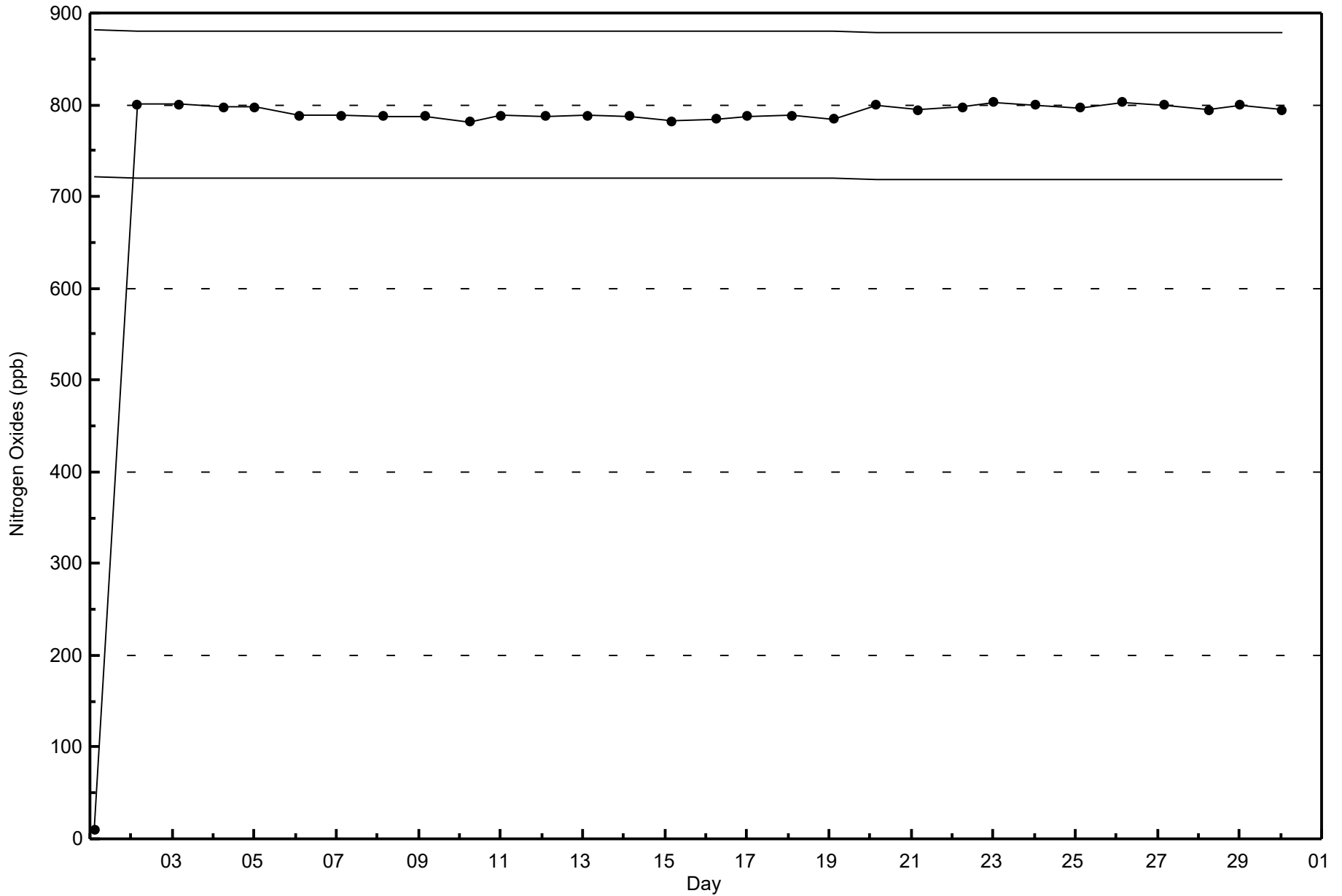


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitrogen Oxides (NO_x) - ppb
Janvier









Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O₃) - ppb

Janvier - September 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 54.0 ppb on Sep 11 14:00	Maximum Daily Average: 39.2 ppb on Sep 11		Hours of Data:	681
Minimum Value: 3.9 ppb on Sep 10 07:00	Minimum Daily Average: 14.1 ppb on Sep 29		Hours of Missing Data:	39
Maximum Diurnal Average: 35.8 ppb at hour 16	Minimum Diurnal Average: 16.7 ppb at hour 7		Hours of Calibration:	36
Monthly Average: 24.81 ppb	Percentiles: P ₁ = 5.2 P ₁₀ = 12.3 Q ₁ = 15.9 Median = 23.0 Q ₃ = 33.7 P ₉₀ = 40.1 P ₉₉ = 50.3		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-Sep	Z	14.5	15.3	16.0	17.0	15.4	15.3	16.9	16.6	M	23.7	29.1	33.9	35.0	36.3	36.7	35.8	37.5	36.7	36.1	35.0	33.9	33.6	33.4	27.4	37.5
2-Sep	32.3	Z	27.7	24.4	22.5	23.3	19.7	13.9	17.0	19.1	17.2	16.9	19.4	22.5	24.1	23.7	22.1	24.1	21.3	19.3	16.2	14.5	13.3	12.0	20.3	32.3
3-Sep	12.3	12.7	Z	12.3	11.9	11.6	10.1	8.1	9.8	9.5	10.8	15.9	20.3	19.9	20.6	25.4	21.0	13.7	11.9	13.8	18.7	17.3	17.2	13.4	14.7	25.4
4-Sep	17.2	16.4	16.2	Z	15.0	14.2	13.4	15.9	16.5	18.1	19.7	20.5	21.6	22.5	22.7	27.0	26.5	23.1	15.6	13.0	14.3	14.1	15.5	14.4	18.0	27.0
5-Sep	13.7	13.1	12.9	12.6	Z	12.6	13.0	13.4	14.3	16.5	21.5	29.6	29.7	30.8	33.0	32.6	31.3	23.4	18.1	15.4	14.9	13.5	12.6	16.5	19.3	33.0
6-Sep	17.3	17.7	14.8	16.9	16.0	Z	13.2	12.0	12.0	10.7	M	M	20.0	22.9	24.9	26.9	25.9	16.7	16.3	18.9	12.2	10.6	9.2	11.1	16.5	26.9
7-Sep	Z	9.0	8.8	8.0	7.9	7.0	7.7	7.8	8.0	C	C	C	C	C	C	27.2	26.1	17.2	14.2	11.1	8.7	7.9	14.8	14.5	--	27.2
8-Sep	13.9	Z	13.0	13.3	14.3	15.2	14.4	14.5	14.8	17.3	19.9	21.7	28.8	31.5	33.9	34.2	32.9	27.9	14.1	12.9	14.8	13.9	14.6	12.7	19.3	34.2
9-Sep	12.9	16.0	Z	14.8	13.9	11.3	10.1	11.0	11.3	15.8	18.6	24.2	29.1	35.4	39.5	37.4	32.3	22.9	18.0	17.0	12.9	10.9	8.7	8.3	18.8	39.5
10-Sep	7.5	5.0	4.3	Z	4.4	4.1	3.9	4.4	6.8	12.2	20.1	25.1	34.0	39.9	38.8	41.0	42.8	38.3	34.4	30.2	33.4	32.9	29.6	26.3	22.6	42.8
11-Sep	26.2	23.0	23.3	28.0	Z	26.5	26.1	26.9	29.0	33.7	39.6	47.1	53.4	54.0	53.4	53.2	52.0	50.1	48.3	46.1	44.0	40.7	37.4	38.6	39.2	54.0
12-Sep	38.3	36.2	33.4	30.4	25.5	Z	21.7	22.4	29.4	33.7	36.7	38.6	40.6	41.0	42.5	44.8	42.4	37.6	33.0	30.7	27.3	25.0	22.3	20.9	32.8	44.8
13-Sep	Z	19.6	15.7	14.2	14.4	14.1	12.3	13.5	17.0	20.4	22.1	28.4	31.6	32.8	35.3	40.1	38.8	38.4	38.9	37.9	36.5	34.2	32.4	30.3	26.9	40.1
14-Sep	28.2	Z	23.3	20.9	18.5	17.4	18.3	18.6	16.8	16.1	16.5	17.7	18.8	22.8	27.4	29.2	29.7	28.4	20.3	15.1	17.5	15.9	14.8	15.3	20.3	29.7
15-Sep	15.1	16.0	Z	17.3	16.5	17.3	13.6	15.8	15.7	19.5	24.3	33.7	38.4	39.6	41.3	43.3	45.1	47.2	40.0	43.0	41.8	37.2	36.4	37.1	30.2	47.2
16-Sep	36.7	33.0	26.2	Z	27.8	31.2	26.3	28.7	27.5	29.6	30.3	31.3	34.4	38.2	40.1	39.0	34.6	29.2	23.9	23.9	22.6	20.6	19.5	18.0	29.2	40.1
17-Sep	16.3	12.0	11.9	10.2	Z	6.3	4.8	5.2	9.8	16.0	23.4	28.2	33.0	41.2	48.9	53.2	46.5	43.4	43.8	41.7	33.9	26.4	31.4	29.9	26.8	53.2
18-Sep	27.4	26.3	23.8	23.4	24.1	Z	24.6	24.3	23.4	22.4	26.2	28.9	35.1	39.5	42.6	40.8	40.8	38.9	32.5	26.6	27.8	25.5	25.6	24.3	29.3	42.6
19-Sep	Z	21.4	20.0	19.2	18.1	17.8	17.0	17.0	17.4	19.8	22.2	24.6	26.6	26.9	27.4	27.5	25.4	18.4	16.7	14.9	15.8	17.3	18.2	16.0	20.3	27.5
20-Sep	15.2	Z	15.9	16.8	14.8	13.5	12.7	13.1	13.8	17.1	19.7	25.8	37.0	37.3	36.4	36.2	36.9	31.4	23.4	20.2	20.3	17.9	17.3	17.8	22.2	37.3
21-Sep	18.1	18.8	Z	16.5	15.5	15.1	12.8	11.0	12.3	14.9	21.6	28.8	31.6	32.9	33.5	34.6	35.0	36.5	36.9	36.0	33.6	31.1	25.4	24.1	25.1	36.9
22-Sep	22.0	19.2	25.9	Z	19.3	20.7	23.5	26.9	26.6	33.3	39.6	41.4	42.4	44.4	45.9	48.1	48.8	45.1	42.2	42.6	41.4	41.4	42.9	37.6	35.7	48.8
23-Sep	27.7	27.5	27.9	23.4	Z	21.5	16.9	32.0	36.4	38.9	40.7	43.2	45.1	47.4	50.9	49.1	48.4	46.8	45.0	42.4	42.3	41.4	40.5	41.6	38.1	50.9
24-Sep	41.3	39.7	39.3	37.5	35.7	Z	30.6	28.7	28.0	28.8	27.8	27.8	29.0	28.3	27.1	27.0	25.8	21.8	18.6	18.6	19.4	18.3	17.7	21.8	27.8	41.3
25-Sep	Z	21.2	20.7	17.6	16.4	18.2	17.8	18.9	20.0	22.4	28.2	33.4	36.5	38.5	38.8	40.9	40.6	39.4	39.7	38.8	37.7	37.3	38.2	39.1	30.5	40.9
26-Sep	40.3	Z	39.9	30.2	23.6	31.6	36.7	34.5	34.1	33.8	35.9	37.7	41.9	44.5	43.4	42.0	39.0	34.4	27.4	28.0	26.7	25.1	28.3	27.3	34.2	44.5
27-Sep	25.6	24.4	Z	26.9	26.2	27.4	24.8	22.9	23.0	23.7	27.6	37.4	36.8	40.0	39.4	38.0	36.3	32.7	25.5	23.2	24.5	22.6	22.4	22.3	28.4	40.0
28-Sep	18.3	18.9	15.9	Z	18.4	18.3	19.4	19.0	18.6	19.5	25.2	33.7	36.7	36.8	37.6	36.4	34.3	28.7	24.1	17.6	13.7	13.7	15.7	12.1	23.1	37.6
29-Sep	9.2	10.7	12.8	12.0	Z	12.5	12.1	11.9	14.5	19.3	20.4	20.7	18.0	14.9	11.6	10.3	13.5	16.1	16.3	14.4	13.0	12.3	13.0	14.9	14.1	20.7
30-Sep	14.7	14.2	11.7	10.9	10.2	Z	9.8	11.8	17.1	15.8	19.1	21.2	21.2	20.8	22.7	27.1	27.1	21.4	18.6	17.5	17.3	16.5	15.1	13.3	17.2	27.1

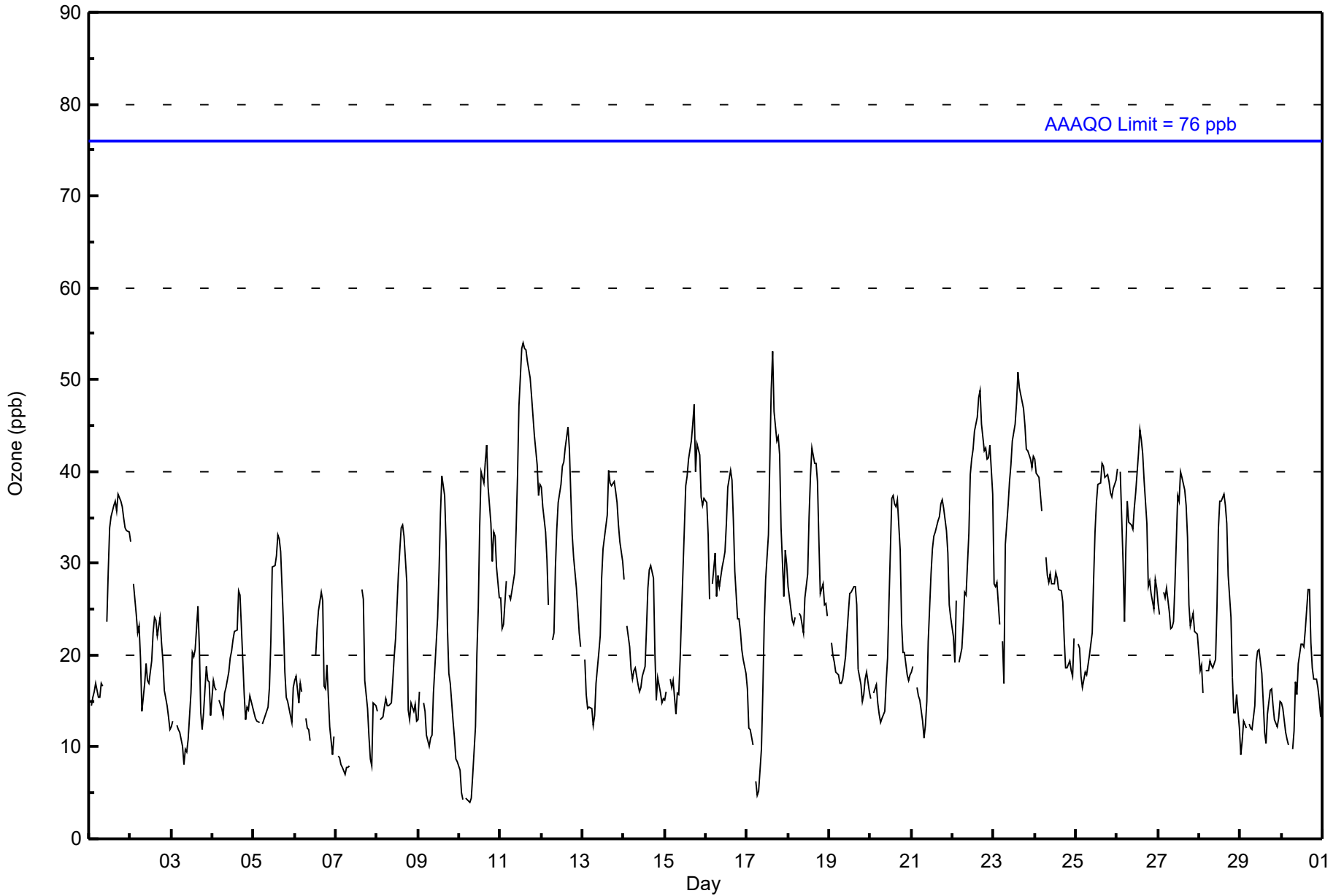
21.9	19.5	20.0	18.9	17.9	17.0	16.7	17.4	18.6	21.3	24.9	29.0	31.9	33.9	35.2	35.8	34.6	31.0	27.2	25.6	24.6	23.0	22.8	22.2	Diurnal Average	
41.3	39.7	39.9	37.5	35.7	31.6	36.7	34.5	36.4	38.9	40.7	47.1	53.4	54.0	53.4	53.2	52.0	50.1	48.3	46.1	44.0	41.4	42.9	41.6	Diurnal Maximum	

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 - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ozone (O₃) - ppb
Janvier - September 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	295	43.32	43.32
21 - 50	379	55.65	98.97
51 - 82	7	1.03	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 681

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Ozone (O₃) - ppb
Janvier - September 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	4	4	2	4	9	5	10	11	114	51	16	10	16	7	9	292
21 - 50	5	10	7	14	8	3	9	31	59	89	66	25	33	10	7	2	378
51 - 82	0	0	0	0	0	0	0	0	6	0	0	0	1	0	0	0	7
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	25	14	11	16	12	12	14	41	76	203	117	41	44	26	14	11	677

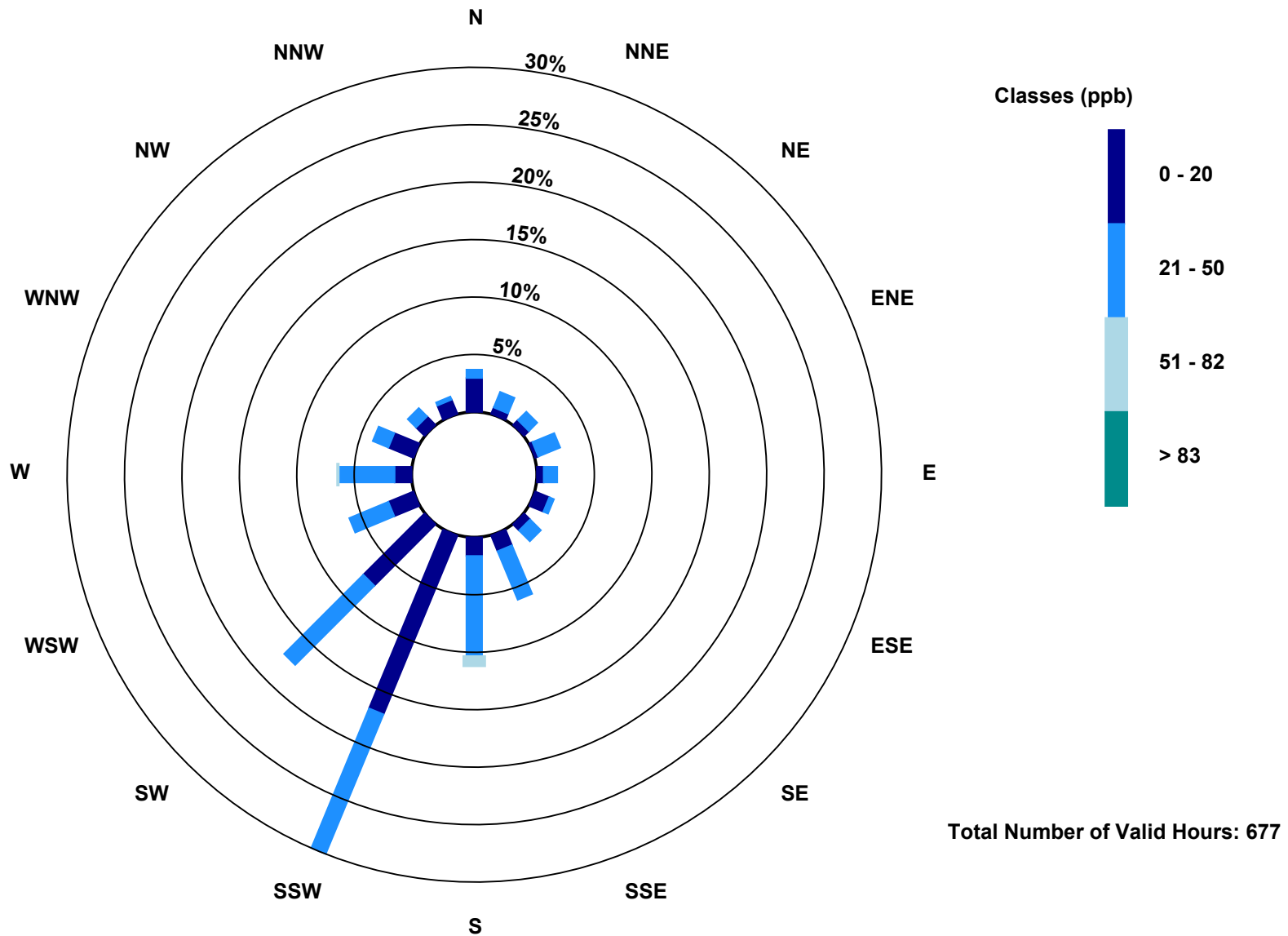
Total Number of Valid Hours: 677

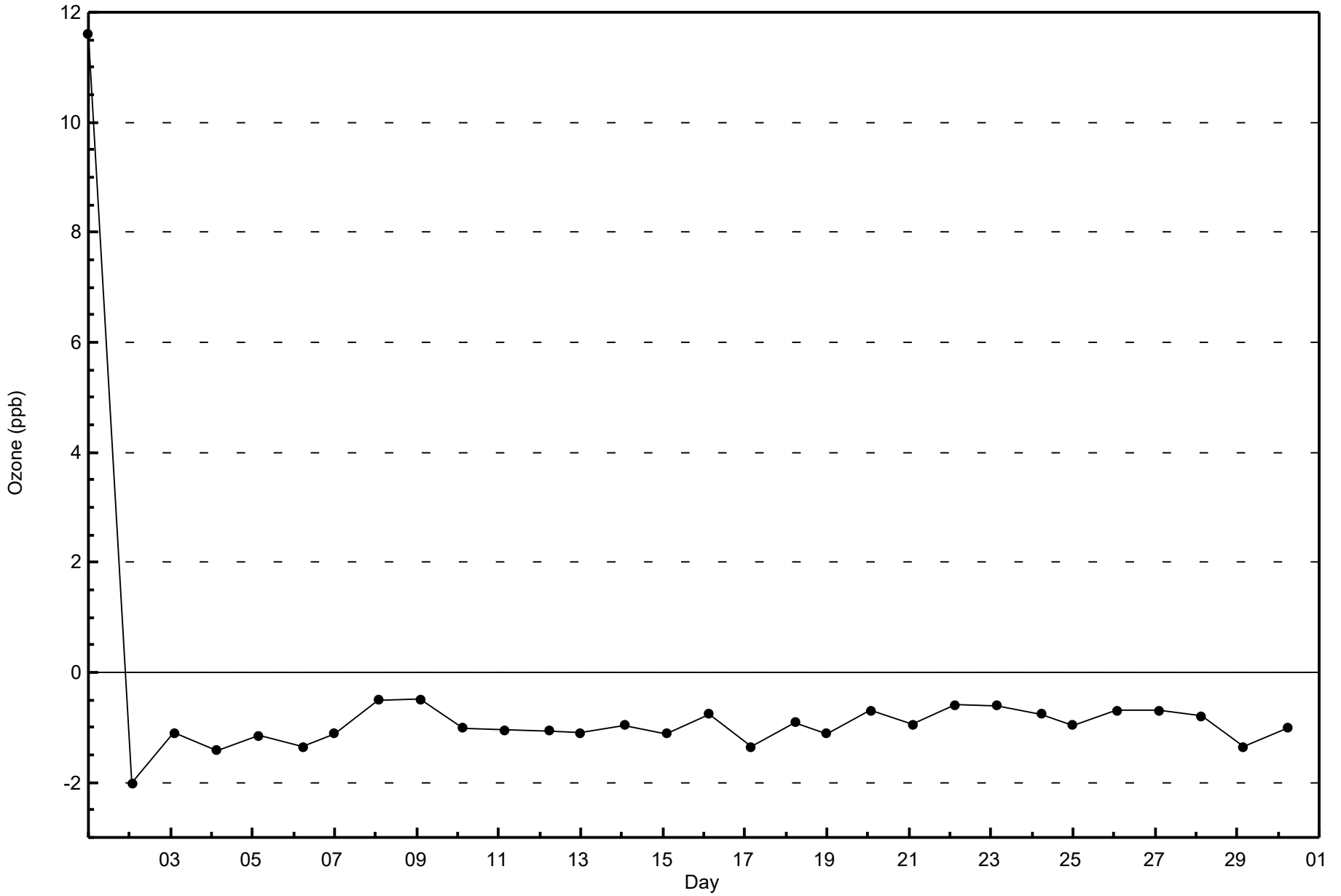
Total Number of Hours: 720

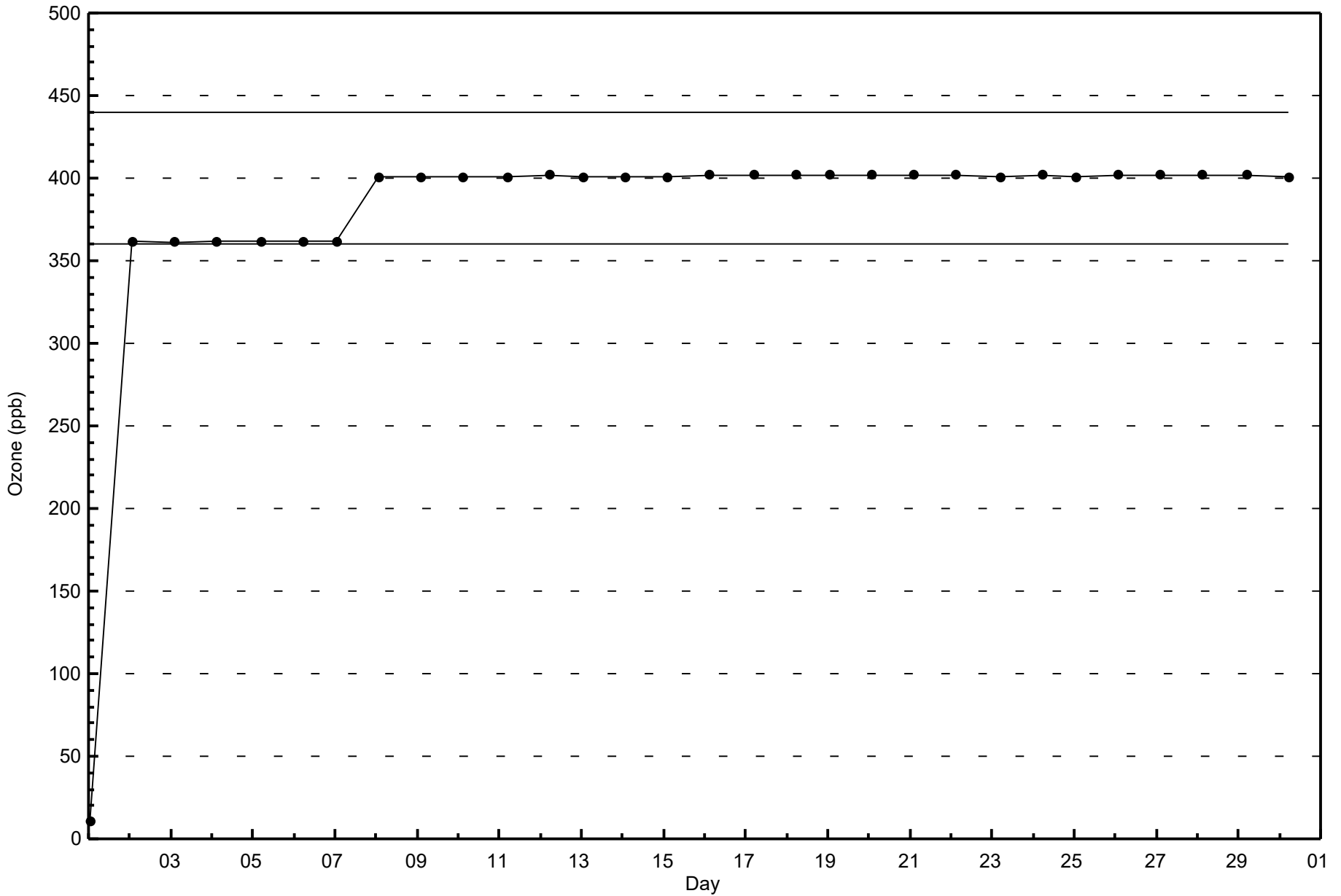


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Ozone (O₃) - ppb
Janvier









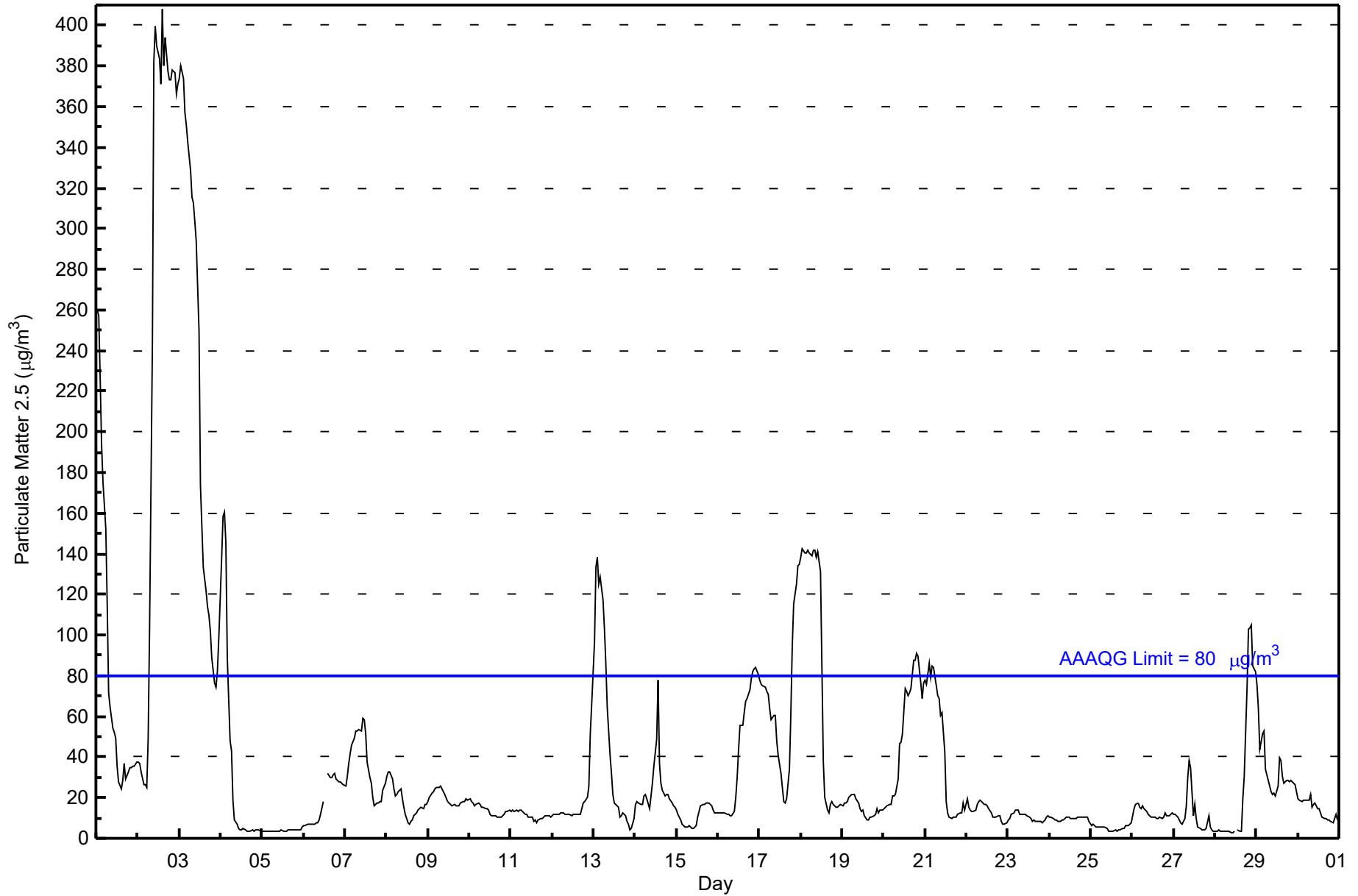
Summary of Hour Averages

Janvier - September 2023

Number of Exceedences (AAAQO):	1-hr: 93	24-hr: 12	Hours in Service:	720
Maximum Value: 408.1 µg/m ³ on Sep 2 15:00	Maximum Daily Average: 262.9 µg/m ³ on Sep 2		Hours of Data:	717
Minimum Value: 2.9 µg/m ³ on Sep 28 11:00	Minimum Daily Average: 3.9 µg/m ³ on Sep 5		Hours of Missing Data:	3
Maximum Diurnal Average: 54.2 µg/m ³ at hour 2	Minimum Diurnal Average: 32.6 µg/m ³ at hour 16		Hours of Calibration:	3
Monthly Average: 42.41 µg/m ³	Percentiles: P ₁ = 3.3 P ₁₀ = 4.8 Q ₁ = 10.2 Median = 16.2 Q ₃ = 35.5 P ₉₀ = 100.0 P ₉₉ = 379.7		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-Sep	259.6	257.0	226.2	193.7	175.1	152.3	114.3	71.4	64.6	54.3	52.1	49.5	35.6	27.8	24.1	28.5	36.6	29.0	32.3	35.0	35.1	35.7	35.5	37.2	85.9	259.6
2-Sep	37.4	37.1	33.0	26.1	26.2	25.3	49.6	104.5	244.7	382.1	399.9	389.8	383.3	371.4	408.1	380.4	394.1	377.1	372.9	373.3	378.2	376.6	366.5	370.9	262.9	408.1
3-Sep	373.8	380.0	373.7	357.0	350.7	342.4	328.5	315.4	312.6	303.6	294.0	249.8	173.7	153.7	133.3	121.4	113.7	109.8	102.3	88.8	76.7	74.7	82.2	98.5	221.3	380.0
4-Sep	137.8	158.7	160.3	145.5	88.7	48.1	43.0	18.8	8.9	7.3	4.7	4.1	4.5	4.5	4.1	3.3	3.2	3.3	4.5	3.8	4.0	4.2	3.9	3.6	36.4	160.3
5-Sep	3.6	3.4	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.7	3.7	4.0	3.7	3.7	4.1	4.0	4.4	4.0	4.4	4.1	4.0	4.1	5.8	3.9	5.8
6-Sep	6.6	6.0	6.8	6.6	7.1	7.1	7.2	7.5	7.4	9.3	11.9	18.1	C	C	31.6	29.9	29.6	31.2	32.0	28.9	28.0	27.7	27.4	26.1	17.9	32.0
7-Sep	25.4	30.3	37.0	41.6	46.0	49.1	52.5	52.7	53.8	53.0	59.3	58.2	51.6	37.7	30.0	27.3	19.9	16.2	17.4	17.3	18.1	17.9	23.4	26.8	35.9	59.3
8-Sep	30.7	32.4	32.4	29.4	24.4	20.9	21.5	22.9	24.4	19.5	15.0	11.9	7.9	7.3	8.2	9.2	10.8	12.6	13.7	14.6	14.9	14.4	16.6	16.7	18.0	32.4
9-Sep	17.8	19.9	22.0	22.9	24.2	24.9	25.0	26.0	24.6	22.8	21.6	18.1	17.4	16.7	15.6	16.8	16.2	15.6	16.3	17.3	17.9	18.2	19.2	19.0	19.8	26.0
10-Sep	19.2	18.2	17.3	15.8	16.9	17.5	16.6	15.0	15.1	14.7	14.9	14.2	11.5	11.1	11.3	10.8	10.6	10.3	10.4	11.1	12.0	13.1	13.3	13.7	13.9	19.2
11-Sep	13.5	13.7	13.4	13.7	13.5	13.7	13.8	13.1	12.0	11.7	10.7	10.4	10.1	8.4	8.8	8.0	8.8	9.7	10.1	10.6	10.9	11.0	10.8	10.7	11.3	13.8
12-Sep	11.2	11.7	11.8	12.0	12.0	12.4	12.2	12.1	12.0	11.7	11.5	11.4	11.8	11.7	11.6	11.5	11.6	14.7	17.0	18.0	20.2	25.4	51.5	65.9	17.2	65.9
13-Sep	96.9	133.6	138.3	125.1	128.6	117.5	103.4	86.0	64.9	41.3	31.9	21.2	17.3	17.0	15.2	10.2	11.4	12.2	10.8	8.3	6.8	4.3	4.7	9.5	50.7	138.3
14-Sep	16.6	17.8	17.2	16.3	17.0	21.0	21.5	19.4	14.6	20.5	27.2	35.3	48.6	78.0	36.6	27.2	23.7	21.0	21.5	21.5	19.2	17.6	16.2	14.9	24.6	78.0
15-Sep	14.1	12.1	9.0	7.2	6.5	5.4	5.6	6.4	5.4	4.8	4.7	6.3	10.2	13.5	16.3	16.7	16.6	17.1	17.2	17.5	15.8	13.6	12.6	12.5	11.1	17.5
16-Sep	12.7	12.4	12.5	12.7	12.5	11.8	11.7	11.3	11.3	13.4	19.8	30.2	43.9	55.7	55.7	61.7	67.6	68.8	73.0	78.8	82.0	83.2	84.1	80.8	42.0	84.1
17-Sep	77.7	76.0	75.0	74.1	72.5	70.6	64.2	58.1	60.2	60.6	48.0	40.7	31.8	24.7	18.3	17.6	19.5	34.2	60.8	94.8	115.1	125.3	134.0	135.1	66.2	135.1
18-Sep	138.2	142.5	140.1	140.5	141.8	140.5	139.0	142.0	141.9	138.0	141.4	131.5	84.4	37.8	20.0	14.1	12.7	16.7	18.0	16.5	15.0	15.6	16.2	16.6	81.7	142.5
19-Sep	16.2	17.3	17.4	18.3	19.9	21.7	21.8	21.4	19.6	17.3	14.7	13.4	13.6	11.3	8.7	8.9	10.3	10.7	10.9	12.1	14.6	12.5	13.6	13.9	15.0	21.8
20-Sep	14.7	15.2	16.2	16.6	16.8	20.5	20.6	21.8	29.1	46.5	47.3	51.2	73.4	72.5	70.3	71.2	73.6	87.6	87.7	91.1	89.8	76.2	68.5	76.3	52.3	91.1
21-Sep	77.7	76.0	86.1	79.5	84.6	83.8	75.1	70.1	69.0	60.7	62.2	42.1	17.8	12.2	10.5	10.0	10.1	10.2	10.7	11.8	12.2	12.6	17.4	14.1	42.3	86.1
22-Sep	19.5	15.5	14.1	13.4	13.4	14.0	16.7	18.2	18.6	17.6	16.8	16.5	15.9	14.6	12.4	10.5	10.6	10.8	11.2	11.1	8.3	6.8	7.2	7.8	13.4	19.5
23-Sep	9.4	9.8	11.7	12.6	13.7	13.8	13.6	12.1	11.5	11.5	12.1	11.2	10.5	9.8	8.6	8.8	8.7	8.7	8.6	8.3	7.5	8.9	10.3	11.0	10.5	13.8
24-Sep	10.5	10.4	9.7	9.1	8.7	8.6	8.7	8.9	8.7	9.9	10.7	10.4	9.5	9.9	9.4	9.6	10.3	10.7	10.2	10.6	10.7	10.2	10.1	8.1	9.7	10.7
25-Sep	6.5	6.8	6.3	5.8	5.5	5.5	5.5	5.3	5.2	4.8	3.6	3.2	3.7	3.6	4.0	3.5	3.9	4.5	4.6	4.8	6.2	6.6	6.0	7.8	5.1	7.8
26-Sep	11.0	14.5	17.0	17.1	15.2	14.8	15.7	14.9	13.6	12.1	11.1	10.7	10.1	10.1	9.8	9.7	10.3	9.9	10.5	12.2	10.8	11.1	11.9	12.2	12.3	17.1
27-Sep	12.1	11.6	10.7	9.1	7.9	7.3	9.6	16.0	29.9	38.1	34.9	10.9	16.4	10.0	5.2	4.5	4.2	4.2	4.4	5.2	11.0	5.6	4.4	3.7	11.5	38.1
28-Sep	3.7	3.6	3.8	3.3	3.2	3.1	3.2	3.6	3.4	3.1	2.9	3.6	C	4.1	3.4	3.5	19.7	30.3	74.6	103.1	103.7	105.1	85.0	82.1	28.5	105.1
29-Sep	75.7	64.1	43.4	51.6	52.9	33.9	31.1	28.4	23.1	21.4	21.9	20.7	26.0	39.3	38.2	30.7	27.1	28.6	28.2	27.9	28.6	27.4	26.3	23.2	34.2	75.7
30-Sep	19.6	18.7	18.3	18.7	18.6	18.7	19.0	21.9	15.1	16.5	17.0	14.5	14.9	12.6	10.7	9.5	9.7	9.3	8.7	8.2	7.7	9.7	11.8	9.0	14.1	21.9
52.3 54.2 52.8 50.0 47.6 44.3 42.5 41.0 44.3 47.7 47.6 43.8 41.4 37.6 34.8 32.6 33.7 34.3 36.8 38.9 39.5 39.2 39.8 41.1																								Diurnal Average		
373.8 380.0 373.7 357.0 350.7 342.4 328.5 315.4 312.6 382.1 399.9 389.8 383.3 371.4 408.1 380.4 394.1 377.1 372.9 373.3 378.2 376.6 366.5 370.9																								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}) - $\mu\text{g}/\text{m}^3$
Janvier - September 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	80	11.16	11.16
6 - 15	267	37.24	48.40
16 - 25	139	19.39	67.78
26 - 80	138	19.25	87.03
> 81.0	93	12.97	100.00

Total Number of Valid Hours: 717

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Janvier - September 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	0	1	2	5	5	2	2	6	5	28	12	2	2	0	6	1	79
6 - 15	0	1	2	4	5	7	9	33	58	80	31	13	15	5	4	0	267
16 - 25	6	2	6	7	2	2	2	5	8	38	22	9	12	8	1	5	135
26 - 80	16	9	0	1	0	1	1	0	6	33	38	9	11	6	3	4	138
> 81.0	4	1	1	0	0	0	0	0	2	40	21	10	5	8	0	1	93
Totals	26	14	11	17	12	12	14	44	79	219	124	43	45	27	14	11	712

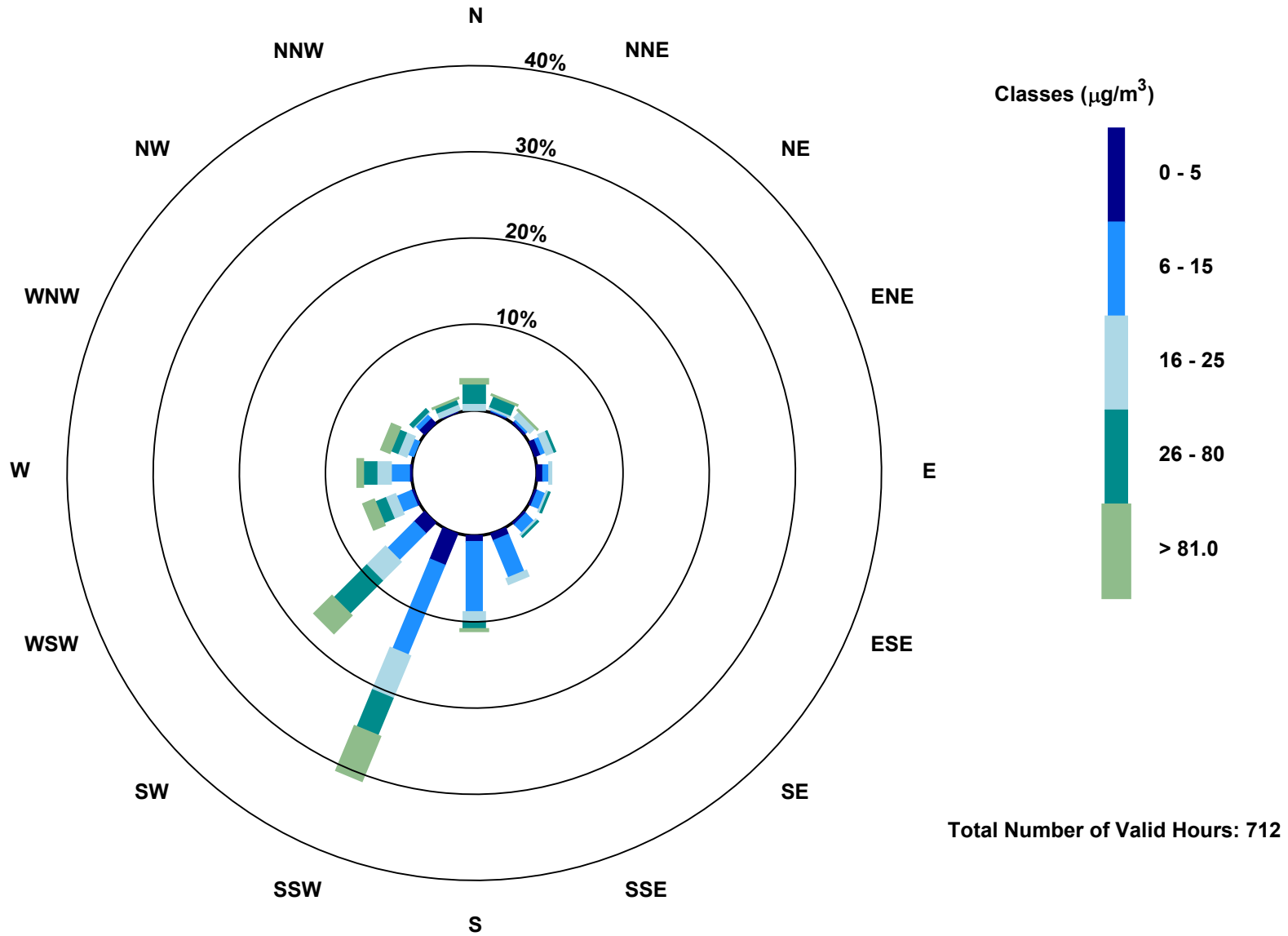
Total Number of Valid Hours: 712

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

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





Wood Buffalo Environmental Association
Summary of Hour Averages

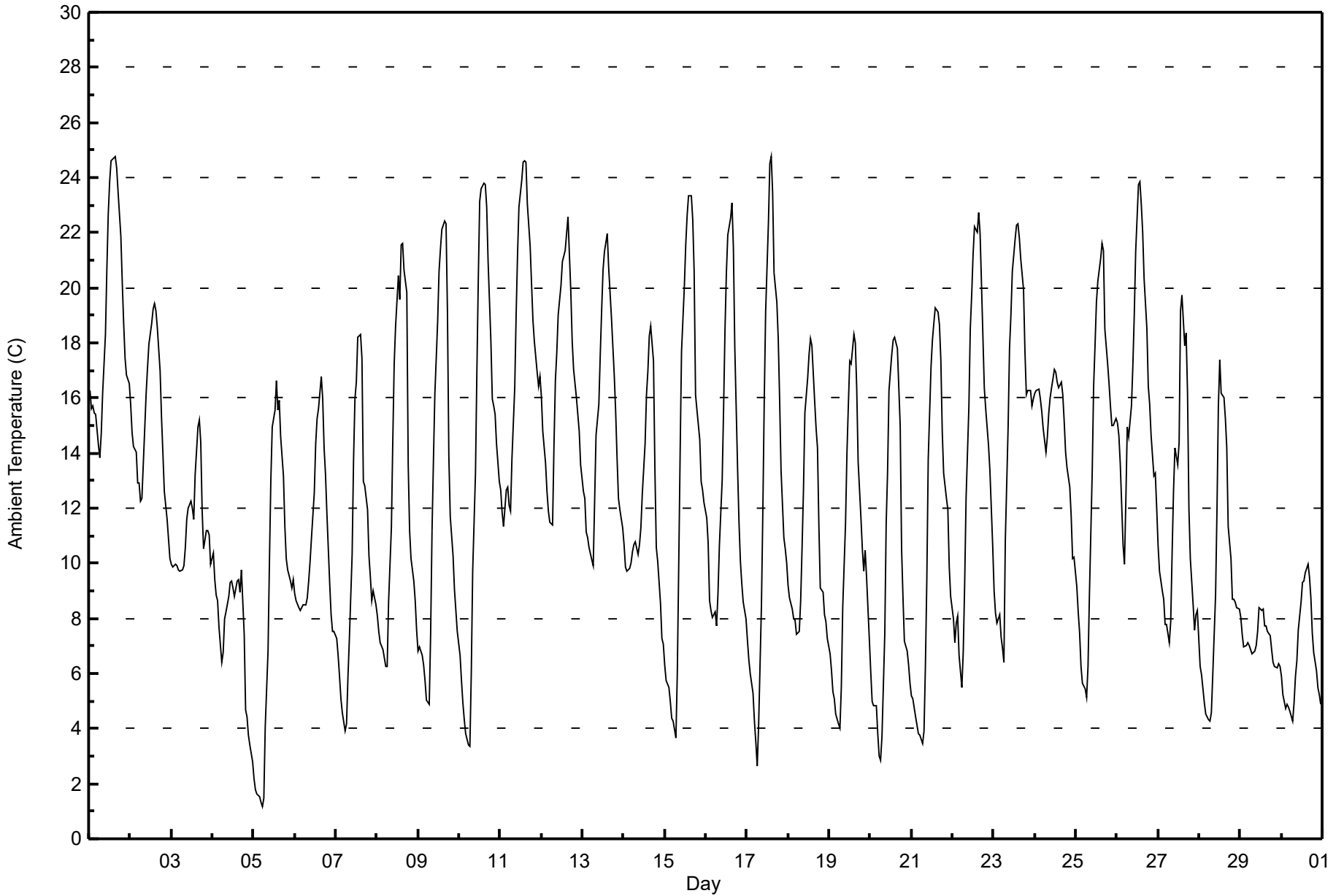
Ambient Temperature (AT) - C
Janvier - September 2023

Maximum Value: 24.8 C on Sep 17 15:00		Maximum Daily Average: 19.0 C on Sep 1		Hours in Service: 720																							
Minimum Value: 1.2 C on Sep 5 06:00		Minimum Daily Average: 6.7 C on Sep 30		Hours of Data: 720																							
Maximum Diurnal Average: 19.0 C at hour 15		Minimum Diurnal Average: 7.2 C at hour 7		Hours of Missing Data: 0																							
Monthly Average: 12.48 C		Percentiles: P ₁ = 2.7 P ₁₀ = 5.5 Q ₁ = 8.1 Median = 11.9 Q ₃ = 16.4 P ₉₀ = 20.6 P ₉₉ = 24.5		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-Sep	16.3	15.6	15.7	15.5	15.4	14.3	13.8	14.7	16.2	18.3	20.7	22.7	23.9	24.6	24.7	24.8	24.4	23.5	21.9	20.2	18.7	17.4	16.8	16.5	19.0	24.8	
2-Sep	15.8	14.8	14.2	14.0	12.9	12.9	12.3	12.3	14.9	16.1	17.1	18.0	18.7	19.2	19.4	19.2	18.6	17.0	15.3	14.0	12.6	11.6	10.9	10.2	15.1	19.4	
3-Sep	10.0	9.9	10.0	9.9	9.8	9.7	9.8	9.9	10.6	11.6	12.0	12.2	12.0	11.6	13.2	14.9	15.2	14.4	11.9	10.5	11.2	11.2	11.0	9.9	11.4	15.2	
4-Sep	10.4	9.4	8.8	8.7	7.7	6.4	6.8	8.0	8.2	8.8	9.3	9.4	9.1	8.8	9.3	9.4	9.0	9.7	7.4	4.7	4.4	3.8	3.4	2.8	7.6	10.4	
5-Sep	2.2	1.8	1.6	1.5	1.3	1.2	1.5	4.0	6.8	10.1	13.0	15.0	15.6	16.6	15.6	15.9	14.6	13.2	11.3	10.2	9.8	9.4	9.1	9.4	8.8	16.6	
6-Sep	8.9	8.7	8.4	8.3	8.4	8.5	8.5	8.7	9.4	10.0	10.9	12.5	14.3	15.2	15.6	16.8	16.0	14.2	13.2	11.8	9.3	8.1	7.6	7.5	10.9	16.8	
7-Sep	7.3	6.6	5.9	5.1	4.6	3.9	4.2	5.9	7.2	10.3	13.7	16.0	16.6	18.2	18.3	17.4	13.0	12.8	11.9	10.3	9.5	8.7	9.0	8.5	10.2	18.3	
8-Sep	8.1	7.5	7.1	6.9	6.6	6.3	6.3	8.6	11.3	14.5	17.2	18.6	20.4	19.6	21.6	21.6	20.6	19.8	13.6	11.2	10.1	9.3	8.7	7.6	12.6	21.6	
9-Sep	6.8	7.0	6.7	6.3	5.7	5.1	4.9	7.4	11.2	13.7	16.1	18.8	20.6	21.4	22.1	22.4	22.3	19.1	13.9	11.7	10.3	9.1	8.3	7.5	12.4	22.4	
10-Sep	6.7	5.7	4.9	4.3	3.8	3.4	3.4	6.0	9.7	13.3	17.0	20.3	23.2	23.6	23.8	23.7	23.0	20.9	18.1	16.0	15.7	15.4	14.3	12.9	13.7	23.8	
11-Sep	12.6	11.9	11.3	12.7	12.7	12.1	11.9	13.8	16.4	19.0	21.2	22.9	23.9	24.6	24.6	24.5	23.0	21.5	20.1	18.8	18.1	16.9	16.4	16.8	17.8	24.6	
12-Sep	16.1	14.8	13.6	12.6	11.9	11.5	11.4	14.3	16.6	17.6	19.0	20.1	21.0	21.1	21.4	22.6	21.2	19.9	18.1	17.0	16.0	15.4	14.8	13.6	16.7	22.6	
13-Sep	12.6	12.4	11.2	10.9	10.6	10.1	9.9	12.2	14.6	15.8	17.5	19.1	20.7	21.3	22.0	20.8	19.8	18.9	16.8	15.5	13.8	12.4	12.0	11.3	15.1	22.0	
14-Sep	10.7	9.9	9.7	9.8	10.0	10.4	10.7	10.8	10.3	10.7	11.3	12.5	14.3	16.1	17.0	18.3	18.6	17.4	13.4	10.6	10.1	8.6	7.3	7.1	11.9	18.6	
15-Sep	6.3	5.7	5.5	5.0	4.4	4.3	3.7	6.1	9.9	14.0	17.7	20.0	21.6	22.6	23.4	23.3	22.5	20.6	16.1	15.5	14.5	13.0	12.7	12.2	13.4	23.4	
16-Sep	11.6	10.7	8.7	8.3	8.0	8.3	7.7	8.9	10.6	13.0	15.6	18.4	20.6	21.9	22.5	23.1	21.4	17.9	13.4	11.5	10.0	9.3	8.6	8.0	13.3	23.1	
17-Sep	7.2	6.5	6.0	5.3	4.3	3.5	2.6	4.1	8.5	11.9	15.9	19.1	22.4	24.5	24.8	23.4	20.5	19.5	18.2	15.9	13.4	10.9	10.5	10.0	12.9	24.8	
18-Sep	9.2	8.8	8.4	8.0	7.9	7.4	7.5	8.6	10.6	12.6	15.4	16.8	17.6	18.2	17.9	15.8	14.9	14.2	11.3	9.1	8.9	8.1	7.9	7.3	11.4	18.2	
19-Sep	6.7	6.1	5.4	5.1	4.5	4.1	4.0	5.5	8.4	11.4	14.0	15.7	17.3	17.2	18.3	18.0	16.3	13.7	11.6	10.5	9.7	10.5	9.5	7.2	10.4	18.3	
20-Sep	6.0	5.0	4.8	4.8	3.8	3.0	2.9	3.7	7.4	11.5	13.3	16.3	17.6	18.1	18.2	18.0	17.8	15.0	10.5	8.8	7.2	6.8	6.3	5.6	9.7	18.2	
21-Sep	5.2	5.1	4.4	4.1	3.8	3.7	3.5	3.9	6.3	9.4	13.8	17.2	18.1	18.7	19.3	19.1	18.7	17.4	14.8	13.3	12.3	12.0	9.9	8.8	10.9	19.3	
22-Sep	8.0	7.1	7.8	8.1	6.6	5.5	6.8	9.3	12.3	15.6	18.5	19.7	21.2	22.2	22.0	22.7	22.0	20.2	16.4	15.6	14.9	14.3	13.4	10.6	14.2	22.7	
23-Sep	9.0	8.2	7.8	8.1	7.3	6.9	6.4	10.8	14.9	17.8	19.0	20.6	21.8	22.3	22.3	21.8	21.0	20.0	17.7	16.1	16.3	16.3	15.7	16.0	15.2	22.3	
24-Sep	16.2	16.3	16.3	16.0	15.5	14.9	14.0	14.6	15.5	16.0	16.4	17.0	16.9	16.6	16.4	16.6	16.1	15.2	14.0	13.5	12.7	11.7	10.2	10.2	14.9	17.0	
25-Sep	9.1	8.2	7.5	6.3	5.7	5.5	5.1	6.2	8.9	13.3	16.4	17.9	19.5	20.2	21.0	21.6	21.3	18.5	17.2	16.5	15.7	15.0	15.0	15.3	13.6	21.6	
26-Sep	15.1	14.6	13.6	10.7	10.0	12.3	15.0	14.6	15.7	17.2	19.0	21.3	23.8	23.8	23.0	22.0	20.3	18.5	16.4	15.7	14.6	13.2	13.3	12.0	16.5	23.8	
27-Sep	10.6	9.7	9.0	8.7	7.8	7.8	7.1	7.9	10.4	12.6	14.2	13.6	14.4	19.2	19.7	17.9	18.4	16.2	12.0	10.2	8.5	7.6	8.1	8.3	11.7	19.7	
28-Sep	6.3	5.9	5.4	4.9	4.5	4.3	4.3	4.6	5.9	8.8	11.9	15.7	17.4	16.2	16.0	15.3	14.2	11.4	10.2	8.7	8.7	8.6	8.4	8.4	9.4	17.4	
29-Sep	8.0	7.4	7.0	7.0	7.1	7.0	6.9	6.7	6.8	7.0	7.5	8.4	8.3	8.3	7.8	7.7	7.5	7.4	6.9	6.4	6.2	6.2	6.3	6.3	7.2	8.4	
30-Sep	5.9	5.2	4.7	4.9	4.8	4.6	4.3	4.9	5.9	6.5	7.6	8.6	9.3	9.4	9.7	10.0	9.5	8.7	7.5	6.8	6.1	5.5	5.2	4.9	6.7	10.0	
		9.5	8.9	8.4	8.1	7.6	7.3	7.2	8.6	10.7	12.9	15.1	16.8	18.1	18.7	19.0	19.0	18.1	16.5	14.0	12.6	11.6	10.9	10.4	9.8	Diurnal Average	
		16.3	16.3	16.3	16.0	15.5	14.9	15.0	14.7	16.6	19.0	21.2	22.9	23.9	24.6	24.8	24.8	24.4	23.5	21.9	20.2	18.7	17.4	16.8	16.8	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Janvier - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Janvier - September 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	286	39.72	39.72
10 - 20	350	48.61	88.33
> 20	84	11.67	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

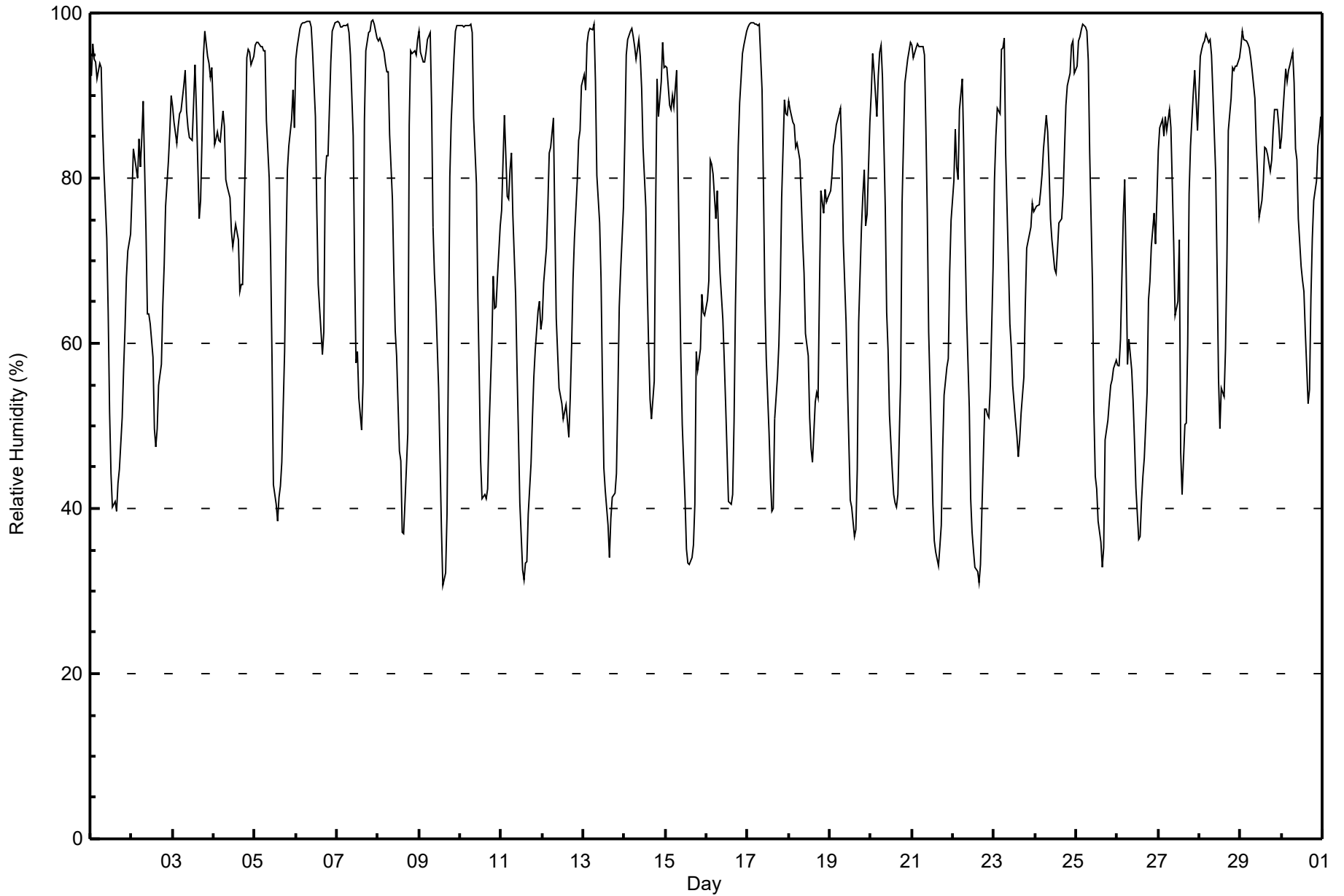
Relative Humidity (RH) - %
Janvier - September 2023

Maximum Value: 99.2 % on Sep 7 22:00 Maximum Daily Average: 88.5 % on Sep 6																						Hours in Service: 720 Hours of Data: 720																											
Minimum Value: 30.8 % on Sep 9 15:00 Minimum Daily Average: 58.0 % on Sep 22																						Hours of Missing Data: 0 Hours of Calibration: 0																											
Maximum Diurnal Average: 91.1 % at hour 7 Minimum Diurnal Average: 47.5 % at hour 16																						Percent Operational Time: 100.0																											
Monthly Average: 73.82 % Percentiles: P₁ = 33.0 P₁₀ = 42.5 Q₁ = 57.5 Median = 78.1 Q₃ = 92.1 P₉₀ = 96.6 P₉₉ = 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-Sep	92.4	96.2	94.3	94.0	92.1	93.9	93.4	86.2	80.9	72.8	63.7	51.7	44.3	40.2	40.9	39.7	43.0	44.8	51.0	56.7	61.7	68.0	71.2	73.2	68.6	96.2																							
2-Sep	78.0	83.5	82.3	80.0	84.7	81.3	84.8	89.4	73.5	63.5	63.6	62.3	58.2	49.6	47.4	49.7	55.0	57.5	64.5	69.5	76.6	82.1	85.5	90.0	71.4	90.0																							
3-Sep	88.6	86.7	84.3	86.3	87.8	88.2	91.1	93.1	88.1	86.1	84.9	84.6	89.0	93.8	88.3	75.2	77.3	84.7	94.7	97.8	94.7	93.8	92.3	93.5	88.5	97.8																							
4-Sep	84.1	84.7	85.6	84.6	84.4	88.2	86.3	79.8	79.0	77.6	73.5	71.6	73.0	74.4	72.6	66.3	67.2	67.2	83.0	94.7	95.6	95.3	93.8	94.7	81.5	95.6																							
5-Sep	96.2	96.5	96.4	96.0	96.0	95.5	95.5	87.0	80.0	70.9	58.4	42.9	40.5	38.4	41.4	42.6	45.6	59.0	71.3	81.0	83.9	87.1	90.7	86.0	74.1	96.5																							
6-Sep	94.5	96.0	98.1	98.6	98.8	98.8	99.0	99.1	99.0	98.3	95.2	87.5	76.1	67.1	64.3	58.7	61.4	79.9	82.8	82.6	94.0	97.8	98.4	98.9	88.5	99.1																							
7-Sep	99.0	98.8	98.3	98.3	98.4	98.5	98.7	97.7	94.9	85.1	69.1	57.6	59.0	53.3	49.5	55.2	87.0	95.5	97.6	97.8	98.9	99.2	98.6	97.0	86.8	99.2																							
8-Sep	96.6	97.0	96.5	95.3	93.9	92.9	92.9	85.3	77.5	68.7	61.5	58.5	47.0	45.7	37.1	37.0	40.8	49.1	86.4	95.5	95.1	95.4	94.9	96.7	76.5	97.0																							
9-Sep	97.7	95.3	94.1	94.1	95.3	96.8	97.6	88.6	74.1	68.5	65.0	54.6	46.1	37.7	30.8	32.2	39.4	58.3	80.1	87.0	94.7	97.9	98.4	98.5	75.9	98.5																							
10-Sep	98.5	98.4	98.3	98.4	98.5	98.6	98.6	97.6	87.4	79.3	65.9	56.1	45.8	41.2	41.7	41.3	42.3	49.5	60.0	68.2	64.3	64.4	68.0	74.3	72.4	98.6																							
11-Sep	76.2	82.0	87.6	77.8	77.4	81.1	83.1	75.7	65.8	56.9	49.0	40.6	32.6	31.3	33.3	33.5	39.3	45.4	51.0	56.0	59.1	63.9	65.0	61.7	59.4	87.6																							
12-Sep	62.9	67.2	71.5	76.7	83.0	83.7	87.3	74.6	63.1	58.8	54.6	52.8	50.8	51.7	52.6	48.7	53.5	59.8	67.7	72.8	79.7	84.6	85.7	91.2	68.1	91.2																							
13-Sep	92.5	90.7	96.2	97.6	98.2	98.0	98.6	91.8	80.4	74.5	67.7	55.2	44.9	42.2	37.9	34.1	38.8	41.3	41.9	44.3	53.5	64.5	68.8	76.5	67.9	98.6																							
14-Sep	84.7	94.9	96.8	97.9	98.2	97.1	95.9	94.4	96.7	94.7	90.8	83.8	76.5	66.9	59.5	53.3	50.8	55.4	76.3	92.1	87.4	91.7	96.5	93.4	84.4	98.2																							
15-Sep	93.5	93.5	88.7	88.3	89.9	88.7	93.0	81.2	69.4	58.5	50.1	41.0	35.1	33.5	33.2	34.1	35.6	40.6	59.1	56.7	59.4	66.0	63.7	63.4	63.2	93.5																							
16-Sep	65.2	67.6	82.2	81.7	80.4	75.1	78.4	72.8	68.4	62.9	58.0	52.5	46.9	40.8	40.6	41.6	50.5	64.5	83.9	89.1	92.1	95.1	96.2	97.8	70.2	97.8																							
17-Sep	98.3	98.6	98.8	98.8	98.7	98.7	98.5	98.7	90.7	78.9	65.6	58.1	49.2	43.6	39.7	40.0	50.9	56.0	59.8	66.6	77.7	89.4	87.9	87.7	76.3	98.8																							
18-Sep	89.3	88.2	86.8	86.4	83.7	84.3	82.2	77.4	72.3	68.5	61.2	58.5	50.9	47.3	45.6	52.9	54.1	53.5	66.4	78.5	75.8	78.7	77.2	77.6	70.7	89.3																							
19-Sep	78.6	80.5	83.9	84.8	86.4	87.8	88.4	82.6	72.4	62.5	54.9	47.9	41.1	40.2	36.6	37.4	44.8	62.6	74.0	78.0	81.0	74.2	75.6	86.7	68.5	88.4																							
20-Sep	90.3	95.0	92.8	87.4	92.3	95.2	96.2	92.3	76.5	63.8	59.1	51.4	44.6	41.7	40.7	40.2	41.7	55.8	76.9	84.2	91.6	94.4	95.4	96.5	74.8	96.5																							
21-Sep	96.1	94.7	95.8	96.3	96.0	96.0	95.9	95.0	86.2	75.8	61.4	47.8	40.4	36.1	34.8	33.0	35.4	37.9	47.2	53.7	57.2	58.1	68.6	74.9	67.3	96.3																							
22-Sep	79.6	86.0	81.4	79.8	88.2	92.1	84.1	72.7	63.9	52.2	41.2	37.1	34.9	32.9	32.5	31.0	33.2	39.7	52.0	52.0	51.4	51.1	54.8	69.1	58.0	92.1																							
23-Sep	79.8	85.0	88.4	87.7	95.6	95.8	96.9	82.9	69.4	62.5	59.5	54.9	50.6	48.9	46.2	48.2	51.6	55.8	64.6	71.5	72.4	74.1	77.0	76.0	70.6	96.9																							
24-Sep	76.2	76.6	76.8	78.5	80.4	83.5	87.7	85.7	81.1	75.0	72.5	69.0	68.6	71.4	74.5	75.0	77.9	83.4	88.7	91.2	92.7	96.2	96.6	92.7	81.3	96.6																							
25-Sep	93.6	96.7	97.1	98.0	98.6	98.3	97.7	94.3	83.1	67.1	51.6	43.8	42.3	38.4	36.0	33.0	35.2	48.3	50.6	52.8	54.9	55.5	56.9	57.9	65.9	98.6																							
26-Sep	57.3	57.3	60.5	75.4	79.9	69.3	57.5	60.5	56.8	53.0	48.1	42.5	36.3	36.6	40.9	43.9	46.1	54.1	65.2	67.5	71.7	75.7	72.0	77.4	58.6	79.9																							
27-Sep	83.4	86.1	87.2	85.0	87.4	85.7	88.3	86.1	79.2	72.0	63.4	65.0	72.5	46.8	41.6	50.1	50.3	59.9	78.1	83.9	90.4	93.1	89.5	85.8	75.5	93.1																							
28-Sep	94.7	95.5	96.2	96.7	97.4	96.5	96.8	94.9	90.3	80.6	68.9	55.8	49.6	54.6	53.6	59.3	70.0	85.8	89.7	93.4	93.0	93.6	93.6	94.6	83.1	97.4																							
29-Sep	96.0	97.8	96.8	96.6	96.3	95.7	94.5	93.0	89.7	84.0	79.9	75.2	77.2	79.7	83.8	83.6	82.9	80.9	82.2	85.7	88.3	88.4	86.4	83.5	87.4	97.8																							
30-Sep	84.9	88.0	93.2	91.8	93.0	93.8	95.2	91.5	83.5	82.2	75.0	69.2	67.7	66.2	61.4	52.8	54.4	65.6	72.7	77.3	79.6	84.0	85.3	87.5	79.0	95.2																							
																								86.6	88.5	89.6	89.6	91.0	91.0	91.1	86.7	79.1	71.8	64.4	57.7	53.1	49.7	48.0	47.5	51.9	59.7	70.6	75.9	78.9	81.8	82.8	84.5	Diurnal Average	
																								99.0	98.8	98.8	98.8	98.8	98.8	99.0	99.1	99.0	98.3	95.2	87.5	89.0	93.8	88.3	83.6	87.0	95.5	97.6	97.8	98.9	99.2	98.6	98.9	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Janvier - September 2023





Maximum Speed: 24 km/h on Sep 11 13:00	Maximum Daily Speed Average: 13.4 km/h on Sep 11	Hours in Service: 720
Minimum Speed Value: 0 km/h on Sep 20 10:00	Minimum Daily Speed Average: 0.2 km/h on Sep 28	Hours of Data: 715
Maximum Diurnal Speed Average: 6.7 km/h at hour 6	Minimum Diurnal Speed Average: 4.0 km/h at hour 19	Hours of Missing Data: 5
Monthly Average Velocity: 5.5 km/h 213.9 deg	Percentiles: P ₁ = 1 P ₁₀ = 4 Q ₁ = 6 Median = 8 Q ₃ = 10 P ₉₀ = 12 P ₉₉ = 19	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-Sep	W5	WSW6	WSW6	WSW7	SW8	SSW8	SW8	WSW10	SW10	SW9	WSW10	W13	W15	WSW15	WSW16	WSW18	SW18	SW16	SW15	SW12	SW10	SW10	SW11	SW12	WSW10.6	WSW18
2-Sep	SW12	SSW10	SSW9	SSW8	SSW10	SSW10	SSW8	W4	SW6	WSW7	SW6	SW6	W6	WNW8	WNW9	WSW7	WSW8	WSW9	WSW9	SW10	SW11	SSW11	SW10	SSW9	SW7.6	SW12
3-Sep	SSW10	SSW10	SSW12	SSW10	SSW11	SSW9	SSW5	SSW4	SW6	SSW6	SW8	SW12	SW12	SSW10	SW7	SW6	SSW4	SSW3	SSW6	SSW9	SW10	SW10	WSW9	W6	SW7.9	SW12
4-Sep	WNW6	WNW7	WNW9	WNW10	WNW8	WNW11	W8	WNW11	WNW11	NW10	NW9	NW11	NW9	NNW8	NW6	NW11	NW9	WSW6	SSW6	SSW8	SSW9	SSW9	SW10	SSW9	W6.6	NW11
5-Sep	SSW10	SSW10	SSW11	SSW11	SSW11	SSW12	SSW10	SW10	SW9	SW8	SW6	S10	S10	S9	SSE9	SSE8	S7	SE6	SE5	SSE5	SSE6	SSE3	ESE4	SSE6	SW7.2	SSW12
6-Sep	SE5	ESE4	ESE5	ESE8	ESE7	ESE5	SE4	SSE2	SSW5	SW6	WSW8	WSW8	WSW8	W11	W9	W9	WSW8	SW6	SW7	SW7	SW6	SW6	SW7	SW8	SW4.3	W11
7-Sep	SSW9	SSW10	SW9	SW8	SW7	SSW8	SSW9	SSW7	SW7	SW6	SW7	SW9	SW8	SW10	WSW10	WSW7	N5	S3	SSE6	SSE2	SSE4	SSW7	SSW10	SSW10	SW6.5	SSW10
8-Sep	SSW10	SSW11	SSW11	SSW11	SW11	SW11	SSW10	SW9	SW8	SW8	SW9	SW7	SW7	W9	W10	W10	WNW8	WNW6	WSW5	SW6	SSW7	SSW7	S5	S5	SW7.5	SSW11
9-Sep	SSW8	SSW9	SSW9	SSW9	SSW8	SSW7	SSW5	SW3	WSW1	NNW3	NE3	ENE5	ENE6	ENE7	NE6	ENE5	ENE5	NE4	ENE3	E5	ESE1	ESE2	WSW0	E0	SSE1.4	SSW9
10-Sep	NNE3	NE2	UO	UO	SSW2	SSW2	UO	WSW1	NW2	NW2	ENE4	ENE5	SSE8	S11	S10	S10	S9	SSE8	SSE9	SSE9	SSE9	SSE10	SSE7	SSE6	SSE4.8	S11
11-Sep	S7	S6	S10	S13	S14	S11	S12	S13	S11	S11	S14	S17	S24	S21	S22	S21	S17	S12	SSE10	SSE10	S11	SSW11	SSW14	SSW15	S13.4	S24
12-Sep	SSW12	SSW11	SSW8	SSW6	SSW7	S6	SSW3	SW5	SSW9	SW8	WSW7	WSW4	WSW5	SW6	S8	S8	S9	SSW9	SW9	SW9	SW8	SW8	SSW6	SSW8	SSW7.1	SSW12
13-Sep	SSW8	SW7	SSW7	SSW8	SSW9	SSW8	SSW8	SSW7	SW8	WSW8	WSW8	WSW12	W16	W14	WSW18	W19	W15	W13	W14	W14	W18	W16	W15	W13	WSW10.8	W19
14-Sep	W16	W12	W10	W11	W11	WNW10	WNW9	WNW11	WNW9	WNW11	WNW11	WNW12	WNW10	WNW10	NW12	NW13	WNW12	WNW9	W6	WSW7	WSW7	SW6	SSW8	SSW9	W9.1	W16
15-Sep	SSW8	SSW9	SSW10	SSW11	SSW10	SSW10	SSW7	SSW8	SSW5	S6	SSW5	SSW10	SSW11	SSW11	S11	S12	S9	SSE9	SSE10	S10	S10	SSW9	SSW8	SSW8	SSW8.9	S12
16-Sep	SSW11	SSW6	SSW7	SSW9	SSW8	SSW11	SSW7	SSW9	SW9	SW10	SW7	SSW5	SSW6	SSW8	SSW8	SSW6	SSW6	S4	S6	S5	SSW6	SSW7	S5	S5	SSW7.1	SSW11
17-Sep	S5	S4	S4	ESE1	SSW4	SE1	NNE2	W1	NNE2	N3	NNE3	N4	ENE2	W4	W9	W11	WNW7	W8	W9	WSW8	SW6	SSW6	SW9	SW8	WSW3.1	W11
18-Sep	SW9	SSW10	SSW11	SSW11	SSW11	SSW10	SSW10	SW9	SW8	SSW8	SW8	SW9	WNW11	W13	W14	W14	W13	WSW12	SW8	SSW9	SSW11	SW11	SW13	SW12	SW9.4	W14
19-Sep	SW12	SW11	SW9	SSW11	SSW13	SSW12	SSW10	SSW9	SSW9	SW11	SW11	SW11	WSW11	WSW9	W9	WNW9	W6	SSW5	SSW6	SW5	SSW7	SSW7	SSW8	SSW7	SW8.5	SSW13
20-Sep	SSW7	S6	SSW9	SSW9	SSW8	SSW8	SSW7	SSW7	SW4	SW0	NNW1	NNE5	NNE9	NNE10	NNE10	NNE9	N6	NNW3	NE2	W1	SSW7	SSW8	SSW8	SSW8	SW1.8	NNE10
21-Sep	SSW8	SSW9	SSW9	SSW9	SSW9	SSW10	SSW8	SSW6	SW6	SW7	SW8	SW12	SW18	SW19	SW16	SW17	SW16	SSW14	SSW12	S11	S12	SSW13	SSW9	SSW8	SSW10.8	SW19
22-Sep	SSW7	SSW7	SSW10	SSW8	SSW7	SSW8	SSW11	SSW11	SW7	SW10	SW16	SW19	SSW16	SSW15	SSW13	SSW14	S13	S9	SSE9	SSE10	SSE11	S11	S9	S6	SSW10.2	SSW19
23-Sep	S6	S3	S4	S6	SSE4	SSE5	SSE5	S11	S9	S10	S15	S15	S16	S16	S19	S17	S14	SSE12	SSE10	SE8	SE11	SE10	SE9	SSE11	SSE10.0	S19
24-Sep	SSE12	SSE13	SE13	SSE13	SSE10	SSE9	SSE7	SSE8	S9	SSW11	SSW10	SW7	WSW7	SW6	SW5	SSE5	SW5	SW6	SW6	SSW6	SSW8	WSW6	SSW4	SSW7	S6.7	SE13
25-Sep	SSW8	SSW8	SSW9	SSW8	SSW8	SSW10	SW8	SSW7	SSW6	S4	ENE4	ENE6	ENE7	ENE9	ENE10	E9	E8	E10	E12	E11	E11	E10	ESE11	SE10	SE4.5	E12
26-Sep	SE10	SSE6	SE3	S3	S3	SSW10	SSW13	S10	SSW12	SSW12	SSW13	SSW11	S10	SSE9	S11	SSW7	W7	WSW4	NNE1	S5	SW3	SW7	SW9	SW10	SSW6.9	SSW13
27-Sep	SW9	SSW9	SSW10	SW10	SSW9	SSW9	SSW10	SSW8	SSW7	SW7	SW13	SW10	WSW8	SW10	SW8	WSW5	SW1	SW5	SW4	UO	SSW5	SSW5	SSW8	SSW3	SW7.3	SW13
28-Sep	SSW5	SSW8	SW7	SSW7	SSW8	SSW8	SSW8	SSW9	SW5	SW4	SSW1	ESE2	ESE4	NE6	NNE7	NE8	NNE9	N6	NNE8	NNE6	N10	N7	N5	N6	NW0.2	N10
29-Sep	N7	NNW6	N7	N6	N6	N7	N7	N7	N8	N9	N9	N9	N9	NNW8	N9	N7	N8	N8	NNW6	WNW2	W3	W3	NW4	N5	N6.3	N9
30-Sep	NNW4	NNW3	NNW3	NE1	SE1	ENE1	UO	NE2	SSW1	NNW2	NW2	NW1	NE4	NE5	ENE5	E4	ENE3	SSE2	E2	ESE3	E1	S2	S2	SSE3	ENE1.2	ENE5

SSW6.3SSW6.2SSW6.7SSW6.7SSW6.7SSW6.5 SW5.8 SW5.5 SW5.3 SW5.4 SW5.5 SW5.5 SW5.1 SW5.3 SW5.2 SW4.4 SW4.1SSW4.0SSW4.9SSW5.6SSW6.0SSW6.1SSW6.2	Diurnal Average
W16 SSE13 SE13 SSE13 S14 SSW12 SSW13 S13 SSW12 SSW12 SW16 SSW19 S24 S21 S22 S21 SW18 SW16 SW15 W14 W18 W16 W15 SSW15	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 - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 8 km/h on Sep 11 13:00	Hours of Data: 715
Minimum Value: 1 km/h on Sep 30 03:00	Hours of Missing Data: 5
Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 2 Q ₃ = 3 P ₉₀ = 4 P ₉₉ = 6	Hours of Calibration: 0
	Percent Operational Time: 99.3

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

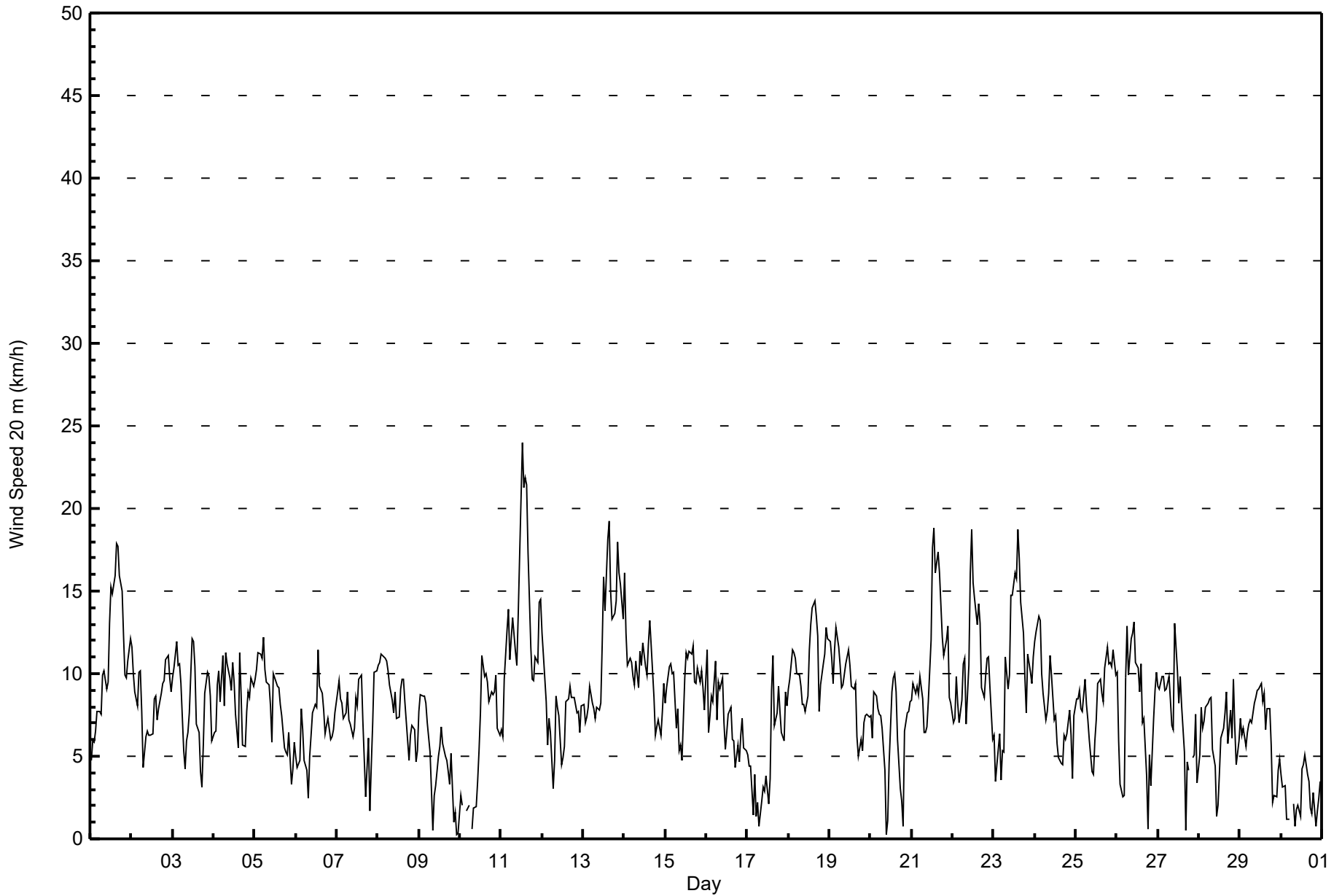
Diurnal Maximum

UO - Unstable Operation



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed 20 m (WS20m) - km/h
Janvier - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed 20 m (WS20m) - km/h
Janvier - September 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	142	19.86	19.86
6 - 11	478	66.85	86.71
12 - 19	91	12.73	99.44
20 - 28	4	0.56	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 715

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed 20 m (WS20m) - km/h
Janvier - September 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	8	11	5	10	6	11	18	21	13	8	7	1	5	7	142
6 - 11	21	8	3	6	6	3	7	29	39	179	92	30	20	24	7	4	478
12 - 19	0	0	0	0	1	0	1	4	18	19	19	6	19	2	2	0	91
20 - 28	0	0	0	0	0	0	0	0	4	0	0	0	0	0	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	26	14	11	17	12	13	14	44	79	219	124	44	46	27	14	11	715

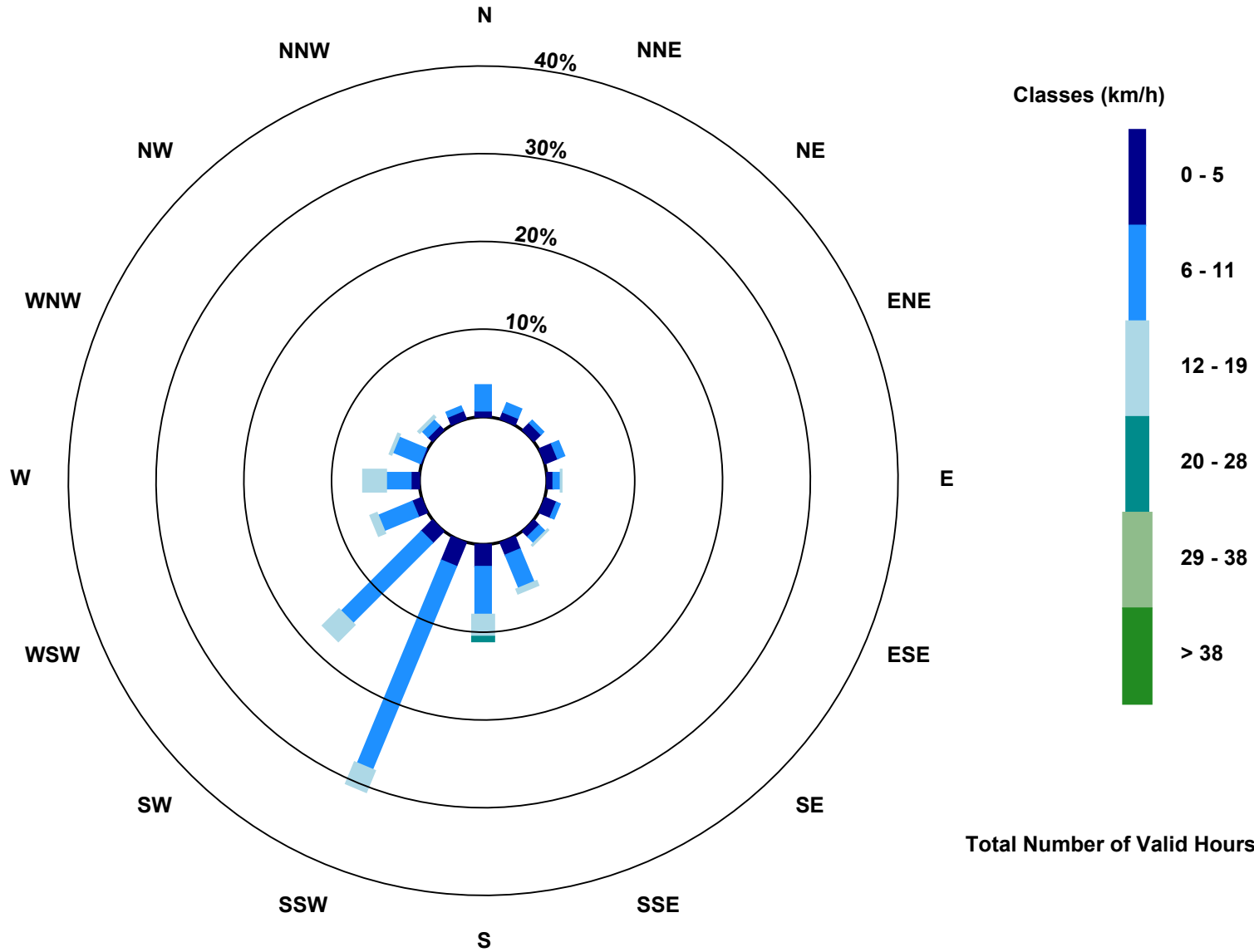
Total Number of Valid Hours: 715

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

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





Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction 20 m (WD20m) - deg

Janvier - September 2023

Direction of Maximum Speed: 188 deg on Sep 11 13:00																		Hours in Service:		720
Direction of Maximum Daily Speed Average: 185.9 deg on Sep 11																		Hours of Data:		715
Direction of Minimum Speed: 220 deg on Sep 20 10:00									Direction of Minimum Daily Speed Average: 0.2 deg on Sep 28									Hours of Missing Data:		5
Monthly Average Direction: 213.9 deg																		Percent Operational Time:		99.3

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Sep	276	248	254	245	233	209	228	242	233	223	255	265	265	252	246	240	224	233	220	219	222	231	228	225	237.4
2-Sep	215	196	200	209	204	209	210	260	229	256	230	236	264	282	286	257	251	254	241	233	215	211	217	206	228.8
3-Sep	210	212	212	213	213	205	197	205	214	192	227	225	218	213	226	234	203	212	200	209	221	232	249	266	217.3
4-Sep	295	293	286	291	289	287	264	295	300	305	311	310	321	332	305	310	313	238	199	201	208	210	215	209	280.3
5-Sep	206	204	205	208	212	209	205	217	232	234	228	189	190	169	153	166	171	141	139	168	150	162	114	154	191.3
6-Sep	129	115	123	120	118	120	128	155	196	236	242	255	247	266	262	260	239	218	221	218	216	215	214	215	215.4
7-Sep	208	209	217	221	224	200	206	212	218	217	227	230	229	235	245	239	3	173	147	158	159	207	210	208	215.3
8-Sep	211	209	210	211	215	215	213	216	220	223	223	221	235	264	260	269	285	294	239	224	213	204	173	181	225.6
9-Sep	210	206	203	208	204	207	210	229	256	337	52	71	66	59	53	74	74	49	60	83	102	112	249	96	147.9
10-Sep	27	35	UO	UO	206	200	UO	255	305	326	71	75	167	175	169	172	170	152	152	150	158	165	167	168	159.7
11-Sep	178	186	183	188	191	189	186	190	190	181	179	185	188	183	190	189	190	179	154	166	182	194	192	202	185.9
12-Sep	206	202	207	199	198	184	193	230	204	229	239	251	252	231	190	187	183	203	214	218	224	218	212	210	209.8
13-Sep	207	217	210	211	208	206	200	207	232	241	239	256	273	267	250	262	262	266	277	273	265	264	274	267	251.1
14-Sep	270	264	272	278	278	291	297	293	287	292	285	289	289	303	308	307	301	295	267	239	252	236	202	201	279.5
15-Sep	199	208	211	208	204	209	207	217	204	188	208	201	208	199	193	187	181	178	168	167	174	182	200	212	195.7
16-Sep	201	212	213	203	208	209	209	213	220	228	220	208	201	203	206	197	213	181	177	186	201	196	182	181	204.9
17-Sep	185	182	188	112	209	142	24	273	27	351	21	359	57	264	264	275	285	272	268	245	221	207	220	216	247.0
18-Sep	215	210	206	206	205	209	207	214	220	210	215	230	286	272	279	278	264	257	229	205	212	216	217	217	230.2
19-Sep	219	220	214	210	208	210	213	207	208	224	214	230	244	248	276	290	261	210	210	229	202	206	203	197	222.1
20-Sep	197	186	206	213	206	202	205	207	229	220	336	29	13	19	26	14	9	345	37	268	204	205	203	205	216.1
21-Sep	204	204	207	208	204	207	201	210	214	232	229	229	229	234	222	219	216	211	197	190	185	194	201	201	211.8
22-Sep	205	201	204	204	204	200	200	203	218	222	219	214	194	196	200	195	189	182	160	163	168	169	177	185	195.5
23-Sep	175	176	169	172	158	166	166	174	171	173	176	180	181	173	177	170	179	164	163	145	146	129	144	149	167.3
24-Sep	155	151	144	150	151	160	155	166	171	194	206	222	250	233	236	168	230	218	216	210	212	240	194	207	185.3
25-Sep	212	209	204	205	210	208	218	206	199	191	64	66	68	57	63	84	87	92	101	96	93	94	111	129	127.2
26-Sep	133	148	126	171	185	192	192	190	194	196	194	198	190	154	178	196	265	242	16	180	233	219	215	219	191.9
27-Sep	214	210	207	216	213	220	212	209	210	223	229	230	241	235	223	251	221	217	216	UO	201	206	210	211	218.9
28-Sep	199	207	214	197	208	202	212	211	221	214	204	108	110	52	27	45	22	9	13	18	8	9	3	7	326.3
29-Sep	2	347	357	1	360	4	357	1	356	4	0	1	359	348	359	360	358	352	348	288	272	278	316	355	353.9
30-Sep	348	340	348	39	126	64	UO	44	193	334	316	326	42	53	69	81	60	151	81	121	82	182	172	165	56.8

207.6 207.5 208.0 207.6 208.4 207.3 207.7 215.4 219.0 225.9 225.0 227.6 230.4 230.3 229.4 230.8 229.5 217.8 199.9 197.2 200.5 203.8 204.8 204.3

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

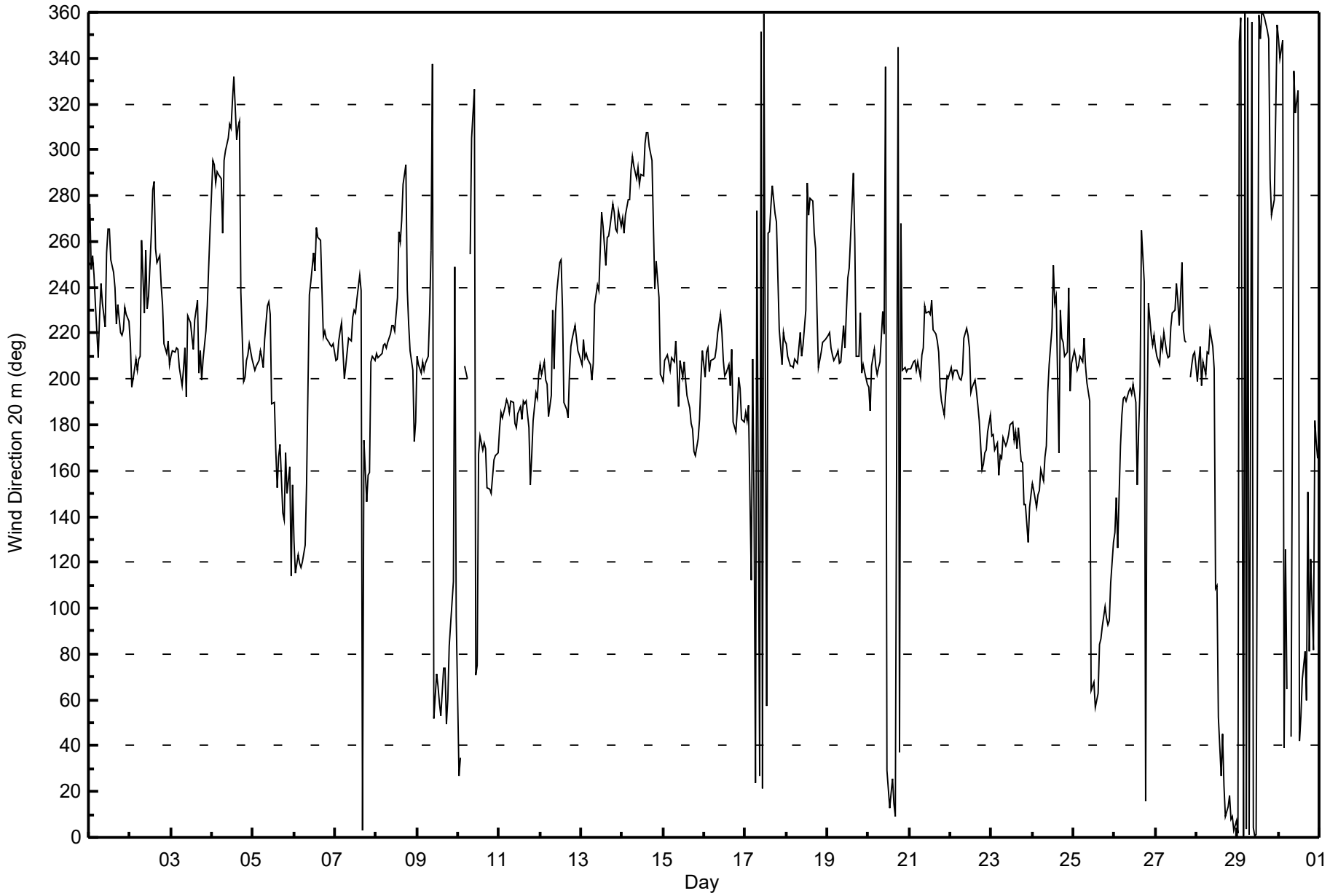
Wind Direction 20 m (WD20m) - deg
Janvier - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 106 deg on Sep 26 19:00	Hours of Data: 715
Minimum Value: 7 deg on Sep 20 06:00	Hours of Missing Data: 5
Percentiles: P ₁ = 8 P ₁₀ = 11 Q ₁ = 15 Median = 21 Q ₃ = 27 P ₉₀ = 38 P ₉₉ = 84	Hours of Calibration: 0
	Percent Operational Time: 99.3

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Sep	21	18	21	18	15	18	24	21	21	22	28	26	24	29	26	25	24	23	18	18	19	17	17	18	29
2-Sep	18	16	19	25	10	11	19	37	25	22	23	23	36	24	25	29	20	17	19	21	14	16	16	13	37
3-Sep	12	13	14	14	13	14	17	17	21	16	25	18	20	19	27	26	25	29	11	11	15	19	20	19	29
4-Sep	27	20	15	17	19	15	26	22	23	28	33	31	35	40	37	26	35	30	15	9	10	11	12	12	40
5-Sep	9	9	10	11	12	13	14	20	21	32	49	28	42	35	29	29	23	17	13	16	14	38	19	26	49
6-Sep	25	31	29	18	23	22	34	41	27	25	24	30	32	27	29	30	25	14	16	15	12	14	13	12	41
7-Sep	11	11	18	13	17	11	14	21	24	31	34	30	30	29	24	40	68	81	38	84	52	15	11	9	84
8-Sep	10	11	11	12	12	12	13	19	25	25	21	22	35	23	31	30	20	22	22	10	9	9	36	24	36
9-Sep	9	8	9	8	8	8	12	36	65	67	51	36	30	33	32	30	23	12	12	15	84	78	76	68	84
10-Sep	18	21	UO	UO	44	10	UO	39	34	76	62	37	38	29	31	27	26	18	18	17	20	24	23	22	76
11-Sep	21	19	16	16	15	17	16	15	19	23	26	23	20	21	20	18	19	18	22	22	20	17	14	17	26
12-Sep	15	13	13	18	14	21	24	22	22	31	32	53	49	49	28	25	22	16	17	15	15	15	14	10	53
13-Sep	10	14	12	12	13	12	9	15	22	23	26	27	25	26	26	24	27	23	20	19	23	23	24	24	27
14-Sep	20	21	21	18	21	19	22	20	21	24	19	21	21	27	30	26	27	19	23	17	15	18	9	8	30
15-Sep	9	10	11	11	11	11	13	20	24	15	35	29	28	24	24	24	19	18	15	17	16	16	17	19	35
16-Sep	13	20	14	11	12	10	16	19	18	22	26	27	21	25	24	23	15	15	8	12	9	9	12	12	27
17-Sep	11	14	13	58	17	56	64	84	58	54	62	54	70	55	26	22	17	13	15	20	24	13	13	11	84
18-Sep	9	11	11	11	13	12	12	18	18	18	23	26	25	30	24	21	23	22	20	10	12	15	15	16	30
19-Sep	17	16	15	14	13	15	16	16	17	23	24	28	34	30	33	28	21	23	13	13	8	10	9	9	34
20-Sep	11	10	10	11	9	7	10	11	27	99	93	64	30	30	30	23	27	41	26	74	9	7	10	9	99
21-Sep	10	9	10	10	11	11	10	15	20	23	26	30	24	24	29	26	23	18	14	15	14	15	11	12	30
22-Sep	15	10	11	12	10	9	12	15	27	23	24	22	21	22	25	23	22	20	16	19	20	19	18	14	27
23-Sep	14	19	28	17	25	21	18	17	22	24	23	25	26	30	23	27	26	24	22	23	24	20	25	24	30
24-Sep	23	24	23	24	28	29	23	21	27	19	20	33	24	24	26	34	27	15	13	17	11	22	46	13	46
25-Sep	12	10	10	10	11	13	19	15	13	18	61	30	30	26	26	33	30	23	23	24	23	25	27	29	61
26-Sep	30	41	54	66	90	26	16	17	16	18	20	24	36	36	24	50	30	53	106	46	51	14	13	14	106
27-Sep	12	16	14	14	11	13	11	12	17	23	21	24	27	27	33	39	94	21	15	UO	10	12	13	45	94
28-Sep	22	10	13	12	10	11	11	12	21	33	76	83	70	36	27	24	26	19	24	21	25	26	29	25	83
29-Sep	31	34	25	31	28	24	30	32	29	28	30	34	30	37	28	31	31	30	38	35	26	41	28	30	41
30-Sep	24	25	16	45	42	70	UO	25	70	69	67	91	44	38	35	42	34	63	60	21	71	56	37	14	91
	31	41	54	66	90	70	64	84	70	99	93	91	70	55	37	50	94	81	106	84	84	78	76	68	

Diurnal Maximum

UO - Unstable Operation





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS23 FORT HILLS SEPTEMBER 2023

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

October 30, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT HILLS (AMS23)
 SEPTEMBER 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	687	32	33	99.86	35.4	0	6	0
TRS(ppb) Average	685	33	35	99.72	2.7	0	0.6	0
THC(ppm) Average	684	32	36	99.44	5.6	-	2.8	-
NMHC(ppm) Average	684	32	36	99.44	1.257	-	0.397	-
CH4(ppm) Average	684	32	36	99.44	4.6	-	2.5	-
NO2 (ppb) Average	684	34	36	99.72	36.5	0	14.9	-
NO (ppb) Average	684	34	36	99.72	489.1	-	51.9	-
NOX (ppb) Average	684	34	36	99.72	522.7	-	66.5	-
PM2.5 (ug/m3) Average	717	2	3	99.86	585.7	217	296.7	23
Temperature 2 m (C) Average	719	0	1	99.86	26.2	-	20.7	-
Relative Humidity (%) Average	719	0	1	99.86	98.2	-	86.5	-
Wind Speed 10 m (km/h) Average	719	0	1	99.86	33	-	18	-
Wind Direction 10 m (deg) Average	719	0	1	99.86	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT HILLS (AMS23)
 SEPTEMBER 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	687	0.76	2.2	-	0	0	0.1	0.2	0.5	1.8	35.4
TRS (ppb) Average	685	0.3	0.3	-	0	0.1	0.1	0.2	0.4	0.6	2.7
THC (ppm) Average	684	2.42	0.5	-	2	2	2.1	2.3	2.5	3	5.6
NMHC(ppm) Average	684	0.183	0.203	-	0	0	0	0.1	0.3	0.5	1.257
CH4(ppm) Average	684	2.24	0.3	-	2	2	2.1	2.2	2.3	2.6	4.6
NO2 (ppb) Average	684	9.01	8.1	-	0	1	2.9	6.1	13.4	21.5	36.5
NO (ppb) Average	684	10.27	31.3	-	0	0	0.1	1.4	7.5	24.3	489.1
NOX (ppb) Average	684	19.28	36.1	-	0	1.1	3.4	8.7	21.8	42.1	522.7
PM2.5 (ug/m3) Average	717	73.75	84.7	-	3.7	11.8	18.5	39.5	90.1	183.6	585.7
Temperature 2 m (C) Average	719	14.01	5	-	3.9	7.6	9.9	13.5	17.8	21	26.2
Relative Humidity (%) Average	719	65.93	18.5	-	25.2	39.1	50.8	68.3	81.9	89.7	98.2
Wind Speed 10 m (km/h) Average	719	10.9	6	-	0	4	7	10	14	19	33
Wind Direction 10 m (deg) Average	719	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT HILLS (AMS23)
SEPTEMBER 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL PARAMETERS	11 Sep 2023 21:00	11 Sep 2023 21:00	1	DAS Failure - data not recorded
NO2, TRS	07 Sep 2023 09:00	07 Sep 2023 09:00	1	Maintenance - sample manifold cleaned
THC/NMHC/CH4	27 Sep 2023 12:00	27 Sep 2023 13:00	2	Maintenance - replaced support gas cylinder
THC/NMHC/CH4	27 Sep 2023 23:00	27 Sep 2023 23:00	1	Unstable Operation - flatline in analyzer output signal

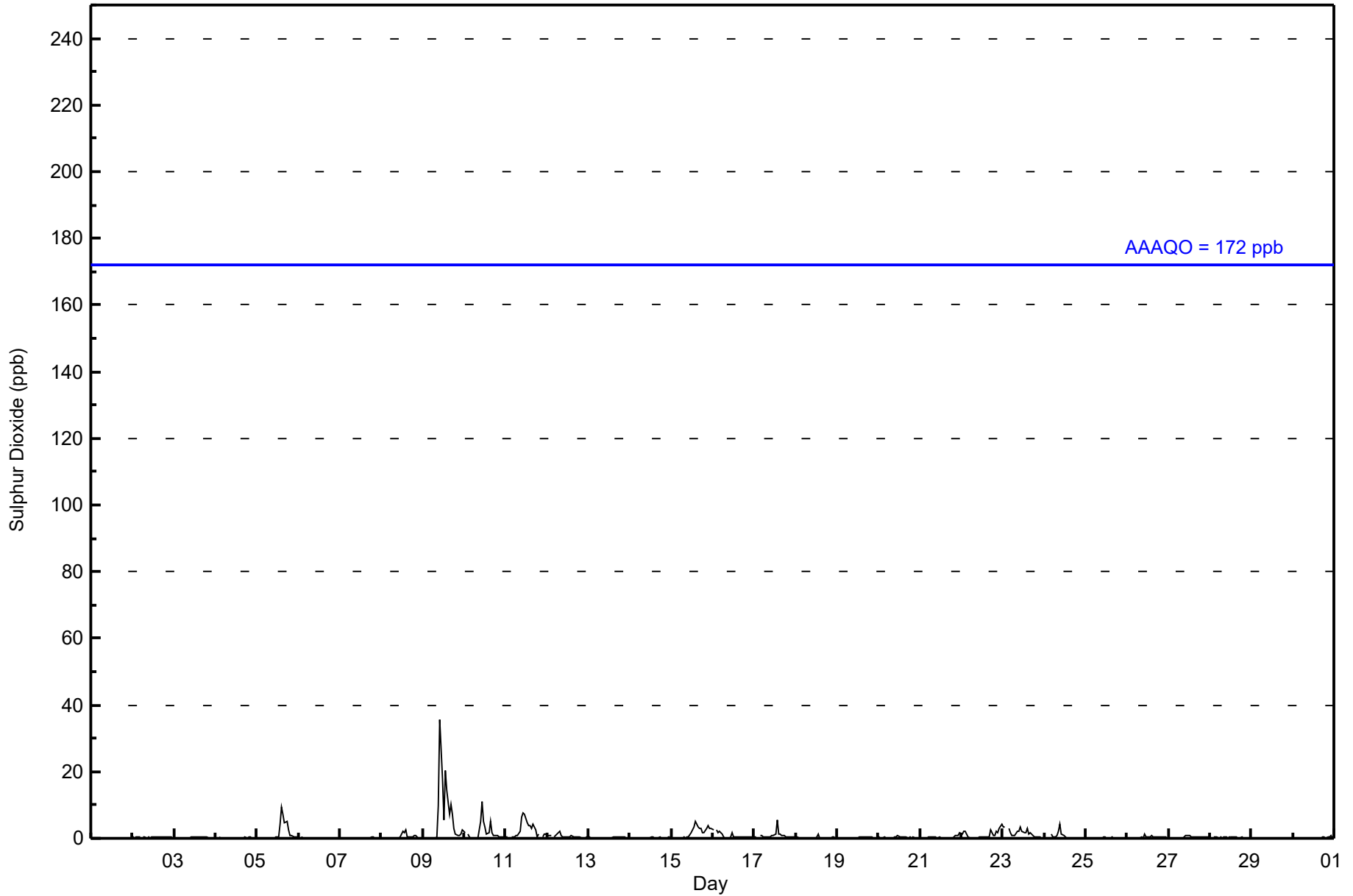


Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 720																	Daily Average		Daily Maximum				
Maximum Value: 35.4 ppb on Sep 9 11:00		Maximum Daily Average: 6.0 ppb on Sep 9																	Hours of Data: 687		Hours of Missing Data: 33						
Minimum Value: 0.0 ppb on Sep 1 15:00		Minimum Daily Average: 0.1 ppb on Sep 7																	Hours of Calibration: 32		Percent Operational Time: 99.9						
Maximum Diurnal Average: 2.3 ppb at hour 11		Minimum Diurnal Average: 0.2 ppb at hour 7																									
Monthly Average: 0.76 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.2 Q ₃ = 0.5 P ₉₀ = 1.8 P ₉₉ = 9.3																									
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-Sep	0.1	0.1	0.0	0.1	Z	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.2	
2-Sep	0.3	0.2	0.2	0.3	0.4	Z	0.3	0.3	0.2	0.2	0.2	0.6	0.5	0.5	0.4	0.5	0.6	0.5	0.5	0.3	0.4	0.2	0.2	0.2	0.3	0.6	
3-Sep	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.3	0.4	0.6	0.5	0.6	0.6	0.4	0.3	0.3	0.2	0.1	0.0	0.0	0.2	0.6	
4-Sep	0.0	Z	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.4	0.1	0.1	0.0	0.1	0.4	
5-Sep	0.1	0.1	Z	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.3	0.5	4.3	9.3	7.0	4.8	4.9	2.6	0.9	1.0	0.6	0.5	0.4	1.6	9.3	
6-Sep	0.2	0.1	0.2	Z	0.2	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.2	0.2	0.1	0.1	0.2	
7-Sep	0.1	0.0	0.0	0.0	Z	0.0	0.0	0.0	C	C	C	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.5	0.4	0.0	0.0	0.0	0.0	0.1	0.5	
8-Sep	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.3	2.0	1.9	2.5	0.5	0.3	0.4	0.4	0.7	0.8	0.1	0.1	0.0	0.4	2.5	
9-Sep	Z	0.1	0.1	0.0	0.2	0.0	0.1	0.1	0.2	9.6	35.4	17.6	5.5	20.3	14.2	7.3	10.3	7.1	3.0	1.4	1.0	0.8	1.3	2.5	6.0	35.4	
10-Sep	1.6	Z	1.2	0.6	0.1	0.0	0.0	0.0	0.2	5.2	10.9	5.0	3.2	1.4	1.7	5.1	1.8	0.9	0.9	0.6	0.5	0.3	0.3	0.3	1.8	10.9	
11-Sep	0.3	0.5	Z	0.6	0.4	0.3	0.7	0.8	2.0	6.2	7.5	7.4	4.6	3.9	3.7	2.9	4.1	2.6	0.4	1.3	DF	0.6	1.1	1.3	2.4	7.5	
12-Sep	0.9	0.7	0.9	Z	0.2	0.9	1.6	1.9	0.9	0.4	0.3	0.4	0.4	0.6	0.8	0.4	0.3	0.2	0.3	0.2	0.2	0.1	0.1	0.2	0.6	1.9	
13-Sep	0.3	0.2	0.2	0.2	Z	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.5	0.2	0.6	0.4	0.3	0.1	0.0	0.2	0.6	
14-Sep	0.1	0.1	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.1	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.4	0.1	0.4	
15-Sep	Z	0.0	0.0	0.1	0.0	0.0	0.0	0.3	0.2	0.3	0.5	1.6	2.6	3.4	5.1	3.4	3.0	2.9	1.6	1.8	2.8	3.7	2.8	2.8	1.7	5.1	
16-Sep	2.5	Z	2.6	1.9	1.9	1.1	0.3	0.1	0.1	0.1	0.4	1.6	0.6	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.6	0.2	0.7	2.6	
17-Sep	0.3	0.4	Z	0.9	0.7	0.4	0.4	0.2	0.2	0.6	0.8	0.7	1.1	5.5	1.1	1.1	1.0	0.7	0.5	0.4	0.5	0.4	0.5	0.3	0.8	5.5	
18-Sep	0.2	0.3	0.1	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.5	1.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.1	0.2	1.1	
19-Sep	0.1	0.0	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.2	0.1	0.2	0.2	0.3	
20-Sep	0.3	0.1	0.1	0.2	0.1	Z	0.2	0.1	0.1	0.4	0.5	0.7	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.1	0.3	0.1	0.0	0.1	0.2	0.7	
21-Sep	Z	0.0	0.0	0.0	0.0	0.3	0.4	0.3	0.3	0.2	0.2	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.9	1.0	0.9	1.5	0.3	1.5	
22-Sep	1.2	2.2	2.1	1.4	0.5	0.2	0.0	0.1	0.1	0.2	0.5	0.4	0.4	0.4	0.3	0.4	0.3	2.7	1.0	1.0	1.9	1.7	2.8	4.2	1.1	4.2	
23-Sep	3.6	3.5	Z	3.2	1.6	1.0	1.0	0.7	2.1	1.9	3.2	2.2	1.5	1.7	2.9	1.3	1.6	0.8	0.4	0.4	0.3	0.2	0.2	0.1	1.5	3.6	
24-Sep	0.1	0.1	0.1	Z	1.2	0.5	0.3	0.7	2.1	4.2	1.5	0.7	0.4	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.6	4.2	
25-Sep	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.3	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.3	
26-Sep	0.0	0.0	0.0	0.0	0.0	Z	0.2	0.2	0.3	0.2	1.4	0.5	0.5	0.6	0.7	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.1	0.3	1.4	
27-Sep	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.8	0.7	1.0	0.4	0.4	0.5	0.4	0.4	0.4	0.3	0.4	0.3	0.3	0.2	0.3	1.0	
28-Sep	0.3	Z	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.3	
29-Sep	0.1	0.1	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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	
30-Sep	0.1	0.1	0.1	Z	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.4	0.6	0.1	0.4	0.5	0.6	0.1	0.1	0.6	
																								Diurnal Average		Diurnal Maximum	
																								0.5 0.3 0.4 0.4 0.3 0.2 0.2 0.2 0.3 1.1 2.3 1.4 0.9 1.6 1.5 1.1 1.1 0.9 0.5 0.4 0.5 0.4 0.5 0.5		3.6 3.5 2.6 3.2 1.9 1.1 1.6 1.9 2.1 9.6 35.4 17.6 5.5 20.3 14.2 7.3 10.3 7.1 3.0 1.8 2.8 3.7 2.8 4.2	
Z - zerospan C - Calibration 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 - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	682	99.27	99.27
11 - 20	4	0.58	99.85
21 - 60	1	0.15	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 687

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

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

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	61	20	6	4	5	7	25	132	131	98	62	29	23	30	30	19	682
11 - 20	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	4
21 - 60	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	61	20	6	4	5	7	25	134	132	100	62	29	23	30	30	19	687

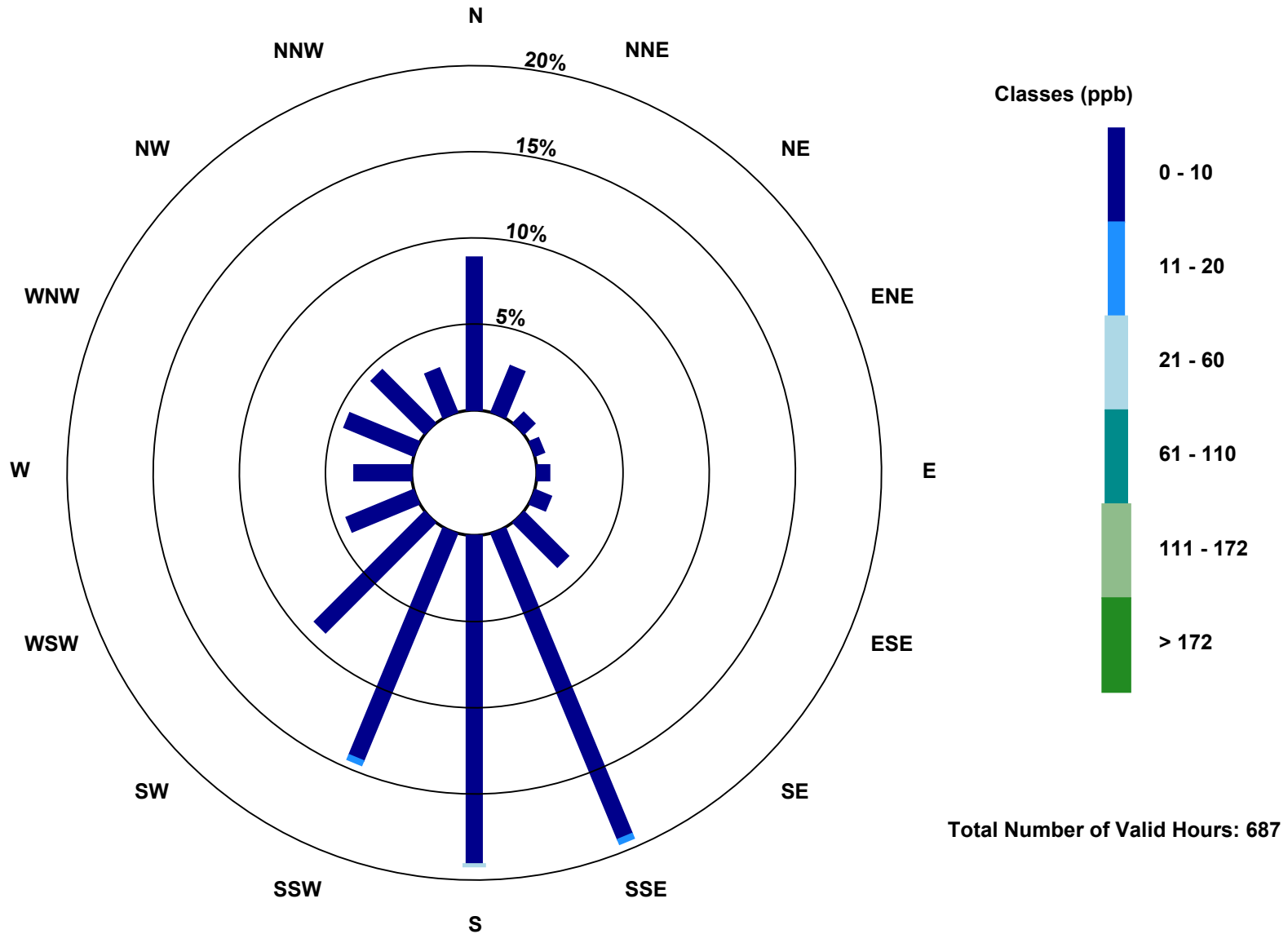
Total Number of Valid Hours: 687

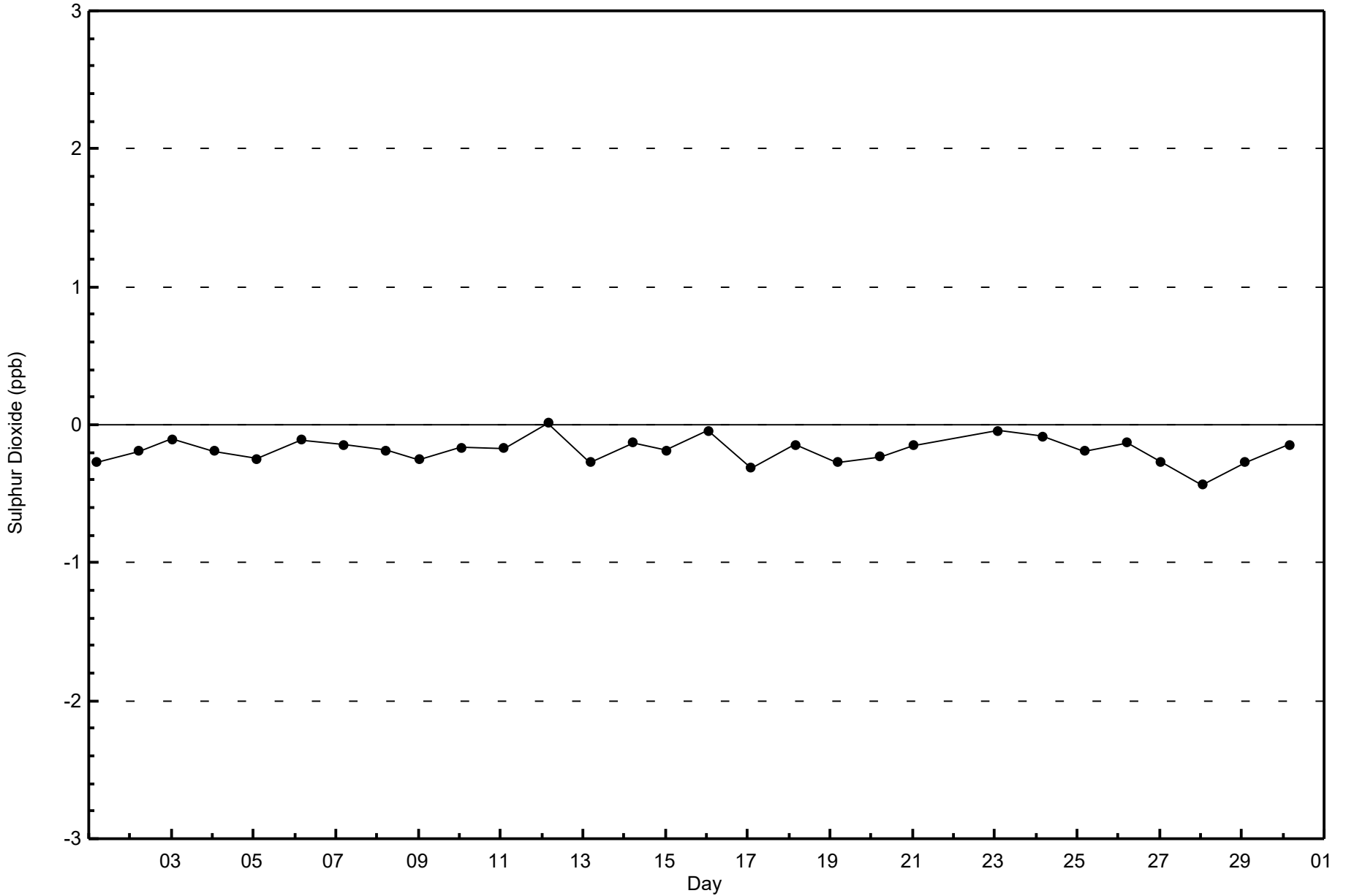
Total Number of Hours: 720

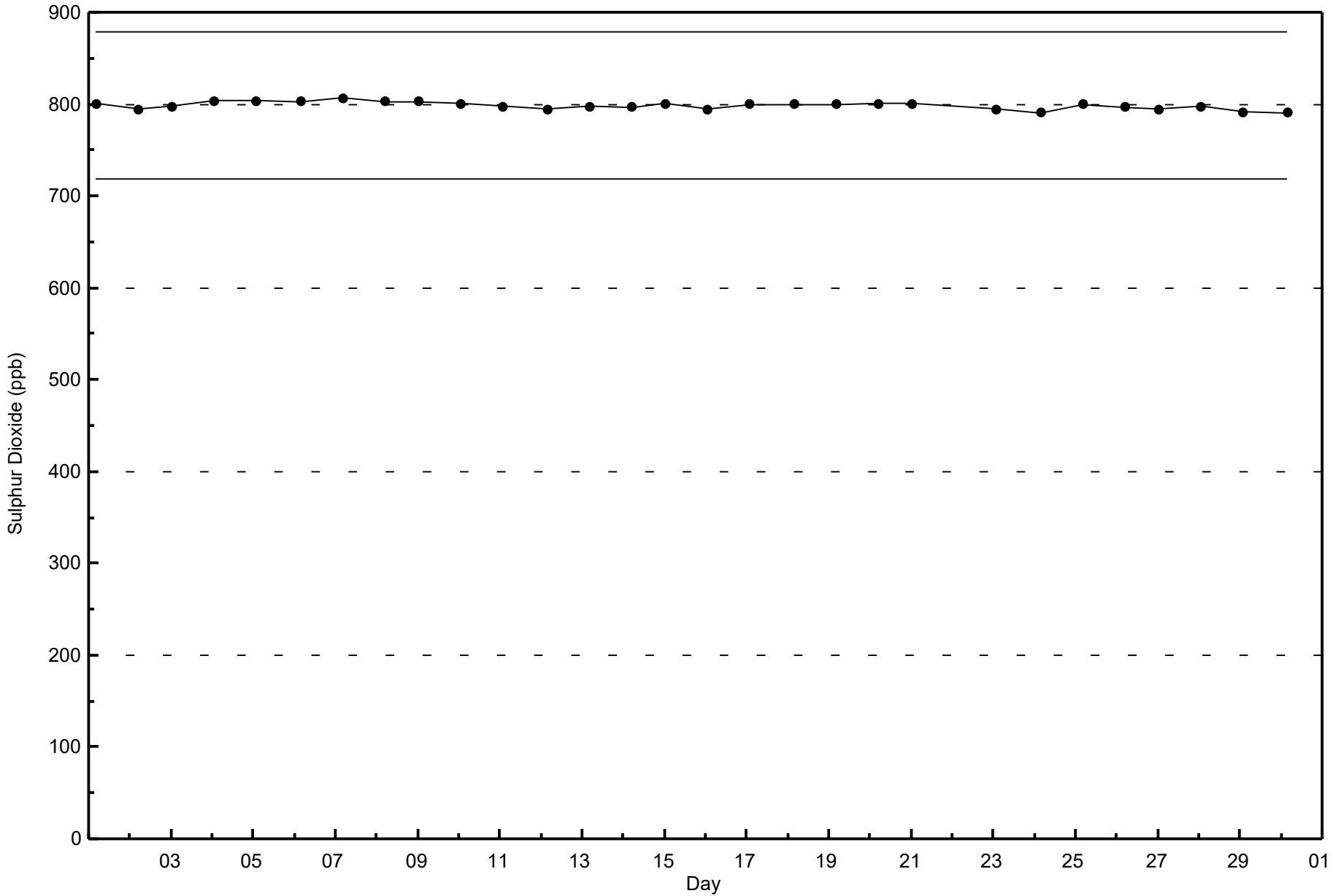


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Sulphur Dioxide (SO₂) - ppb
Fort Hills

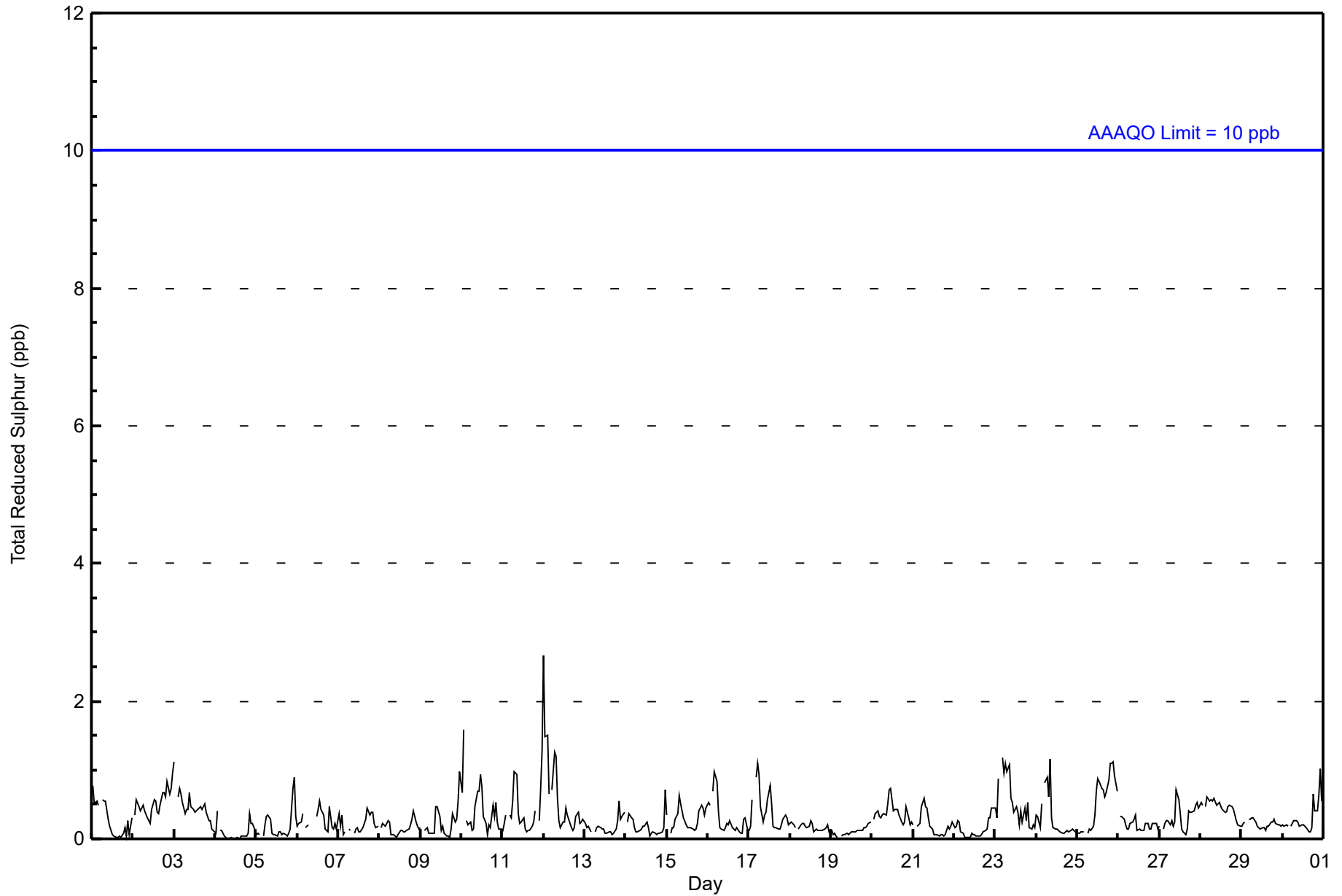








Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		720																		
Maximum Value: 2.7 ppb on Sep 12 01:00		Maximum Daily Average: 0.6 ppb on Sep 12				Hours of Data:		685																		
Minimum Value: 0.0 ppb on Sep 4 08:00		Minimum Daily Average: 0.1 ppb on Sep 4				Hours of Missing Data:		35																		
Maximum Diurnal Average: 0.4 ppb at hour 1		Minimum Diurnal Average: 0.2 ppb at hour 17				Hours of Calibration:		33																		
Monthly Average: 0.30 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.1 Median = 0.2 Q ₃ = 0.4 P ₉₀ = 0.6 P ₉₉ = 1.2				Percent Operational Time:		99.7																		
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Sep	0.8	0.5	0.5	0.6	0.5	Z	0.6	0.5	0.6	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.3	0.1	0.3	0.3	0.8
2-Sep	Z	0.3	0.6	0.5	0.4	0.4	0.5	0.4	0.3	0.3	0.2	0.4	0.6	0.5	0.4	0.4	0.5	0.7	0.7	0.6	0.8	0.6	0.7	1.0	0.5	1.0
3-Sep	1.1	Z	0.6	0.7	0.7	0.5	0.4	0.4	0.4	0.7	0.5	0.4	0.4	0.4	0.5	0.4	0.5	0.5	0.4	0.3	0.3	0.1	0.1	0.5	1.1	
4-Sep	0.1	0.4	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	0.1	0.4	0.2	0.2	0.1	0.1	0.4	
5-Sep	0.1	0.1	0.1	Z	0.0	0.2	0.3	0.3	0.3	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.7	0.9	0.3	0.2	0.9
6-Sep	0.2	0.2	0.2	0.4	Z	0.2	0.2	C	C	C	C	0.3	0.4	0.5	0.4	0.4	0.1	0.1	0.1	0.5	0.2	0.1	0.2	0.1	0.3	0.5
7-Sep	0.4	0.2	0.3	0.1	0.1	Z	0.1	0.1	M	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.3	0.4	0.3	0.4	0.4	0.2	0.2	0.2	0.2	0.4
8-Sep	Z	0.2	0.2	0.2	0.2	0.3	0.2	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.2	0.2	0.1	0.2	0.4
9-Sep	0.2	Z	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.5	0.5	0.3	0.1	0.2	0.1	0.0	0.1	0.0	0.1	0.4	0.2	0.3	0.5	1.0	0.2	1.0
10-Sep	0.7	1.6	Z	0.3	0.2	0.2	0.1	0.1	0.5	0.7	0.7	0.9	0.8	0.3	0.2	0.1	0.2	0.2	0.5	0.3	0.5	0.2	0.1	0.1	0.4	1.6
11-Sep	0.1	0.2	0.3	Z	0.3	0.3	0.5	1.0	0.9	0.4	0.2	0.2	0.3	0.1	0.1	0.1	0.1	0.2	0.2	0.4	DF	0.3	0.7	1.3	0.4	1.3
12-Sep	2.7	1.5	1.5	0.7	Z	0.7	1.3	1.2	0.6	0.3	0.2	0.2	0.3	0.4	0.4	0.2	0.2	0.1	0.2	0.3	0.4	0.2	0.2	0.3	0.6	2.7
13-Sep	0.2	0.2	0.2	0.1	0.1	Z	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.6	0.3	0.3	0.4	0.2	0.6
14-Sep	Z	0.2	0.4	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.7	0.2	0.7
15-Sep	0.3	Z	0.1	0.2	0.2	0.3	0.4	0.6	0.5	0.4	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.4	0.5	0.4	0.3	0.4	0.3	0.6
16-Sep	0.5	0.5	Z	0.7	1.0	0.8	0.4	0.2	0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.3	0.3	0.1	0.3	1.0
17-Sep	0.1	0.2	0.6	Z	0.9	1.1	0.9	0.5	0.3	0.3	0.4	0.6	0.8	0.5	0.2	0.2	0.2	0.1	0.2	0.2	0.3	0.3	0.3	0.2	0.4	1.1
18-Sep	0.2	0.2	0.2	0.2	Z	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.3
19-Sep	0.1	0.1	0.1	0.1	0.0	Z	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	0.2	0.3	0.1	0.3
20-Sep	Z	0.3	0.4	0.4	0.3	0.3	0.4	0.4	0.3	0.5	0.7	0.7	0.4	0.4	0.4	0.4	0.4	0.2	0.2	0.2	0.5	0.3	0.2	0.2	0.4	0.7
21-Sep	0.2	Z	0.2	0.2	0.2	0.5	0.6	0.5	0.5	0.3	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.6
22-Sep	0.2	0.2	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.3	0.3	0.4	0.4	0.1	0.4
23-Sep	0.5	0.3	0.9	Z	1.2	1.0	1.1	1.0	1.1	0.6	0.5	0.4	0.5	0.4	0.2	0.4	0.3	0.5	0.3	0.5	0.2	0.1	0.2	0.2	0.5	1.2
24-Sep	0.3	0.3	0.2	0.5	Z	0.8	0.9	0.6	1.2	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	1.2
25-Sep	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.2	0.4	0.7	0.9	0.8	0.7	0.7	0.6	0.7	0.9	1.1	1.1	1.1	0.9	0.7	0.5	1.1
26-Sep	Z	0.3	0.3	0.3	0.2	0.2	0.1	0.2	0.2	0.3	0.4	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.4
27-Sep	0.2	Z	0.1	0.2	0.3	0.3	0.2	0.3	0.2	0.2	0.7	0.6	0.4	0.1	0.1	0.1	0.1	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.3	0.7
28-Sep	0.5	0.5	Z	0.5	0.6	0.6	0.6	0.5	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.3	0.3	0.2	0.2	0.5	0.6
29-Sep	0.2	0.2	0.2	Z	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.3
30-Sep	0.2	0.2	0.2	0.2	Z	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.7	0.4	0.4	0.6	1.0	0.5	0.3	1.0
																								Diurnal Average		
																								Diurnal Maximum		
																								0.4 0.4 0.3 0.3 0.3 0.4 0.4 0.4 0.4 0.3 0.3 0.3 0.3 0.2 0.2 0.2 0.2 0.2 0.2 0.3 0.3 0.3 0.3 0.4		
																								2.7 1.6 1.5 0.7 1.2 1.1 1.3 1.2 1.2 0.7 0.7 0.9 0.9 0.8 0.7 0.7 0.6 0.7 0.9 1.1 1.1 1.1 1.0 1.3		
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

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	684	99.85	99.85
3 - 4	1	0.15	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Total Reduced Sulphur (TRS) - ppb
Fort Hills - September 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	60	20	6	4	4	7	23	134	133	100	64	26	23	31	31	18	684
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	60	20	6	4	4	7	23	134	134	100	64	26	23	31	31	18	685

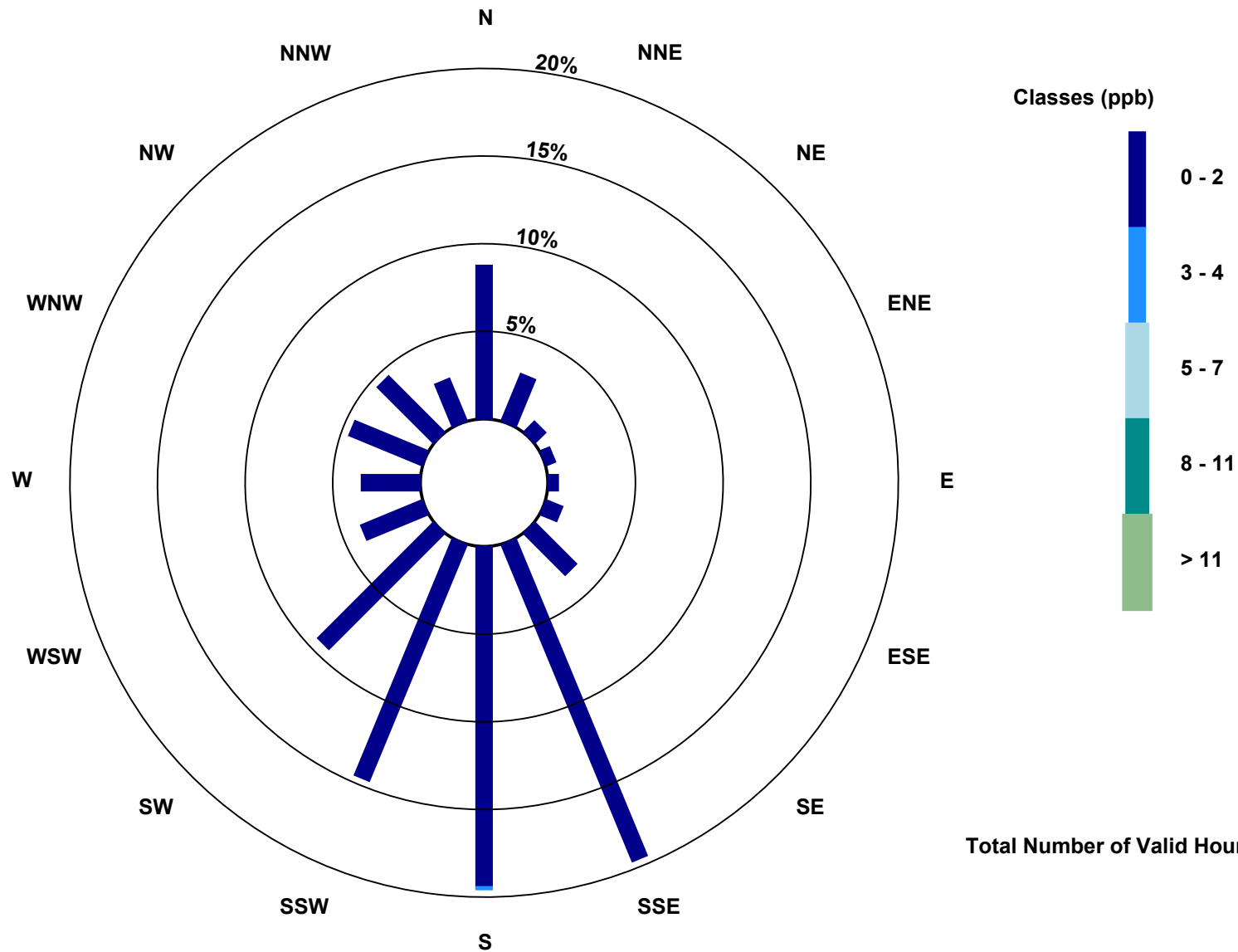
Total Number of Valid Hours: 685

Total Number of Hours: 720

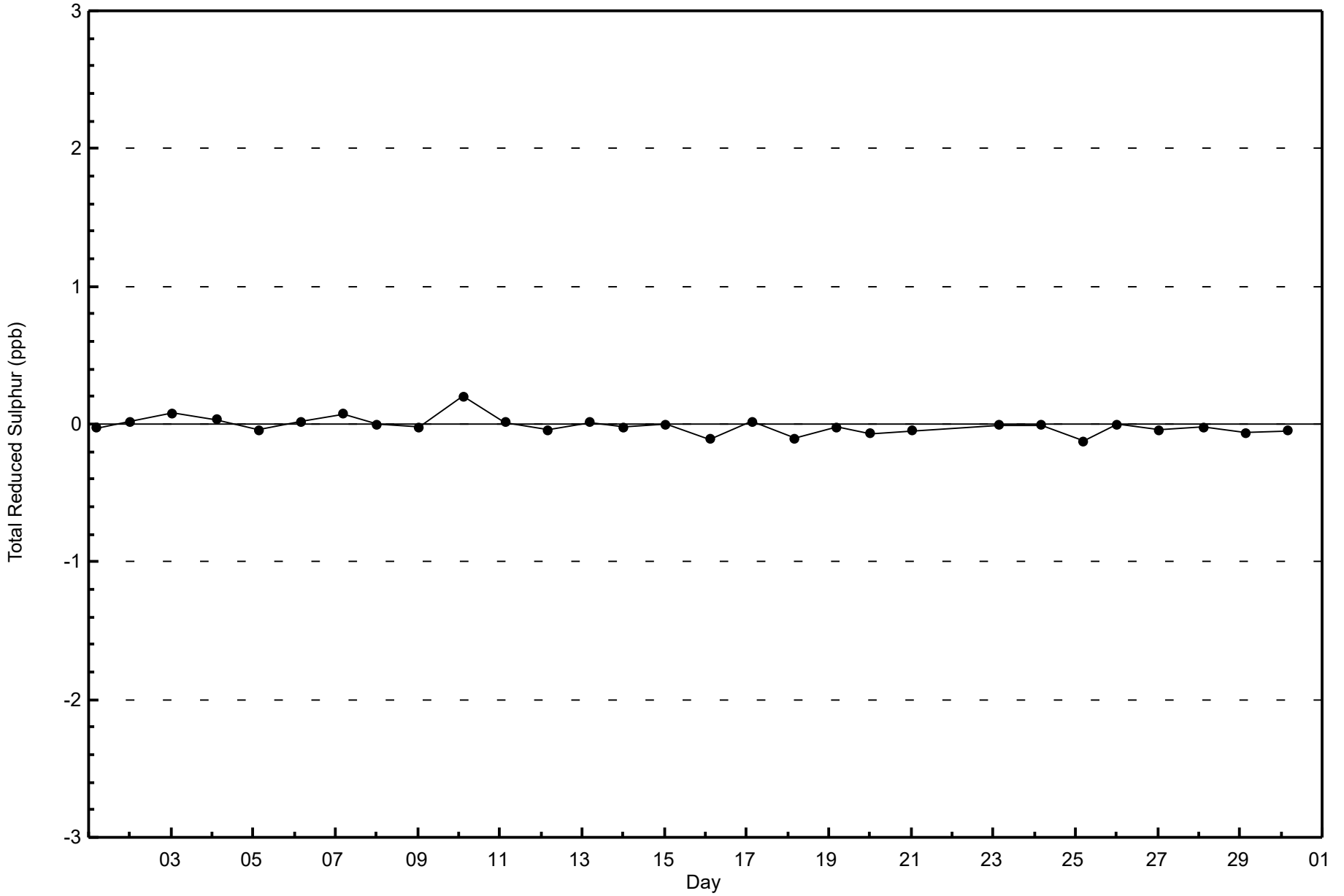


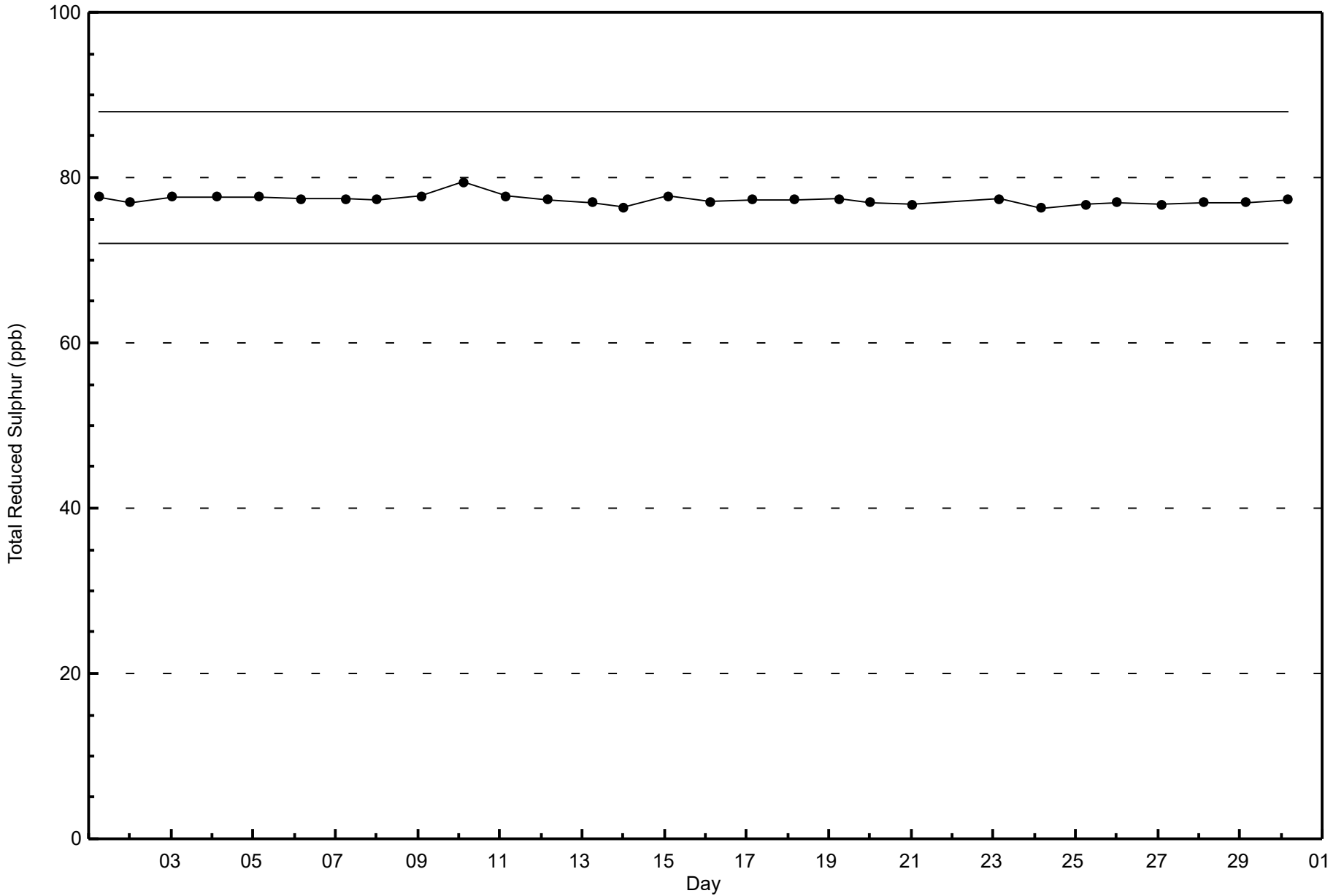
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Total Reduced Sulphur (TRS) - ppb
Fort Hills



Total Number of Valid Hours: 685







Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

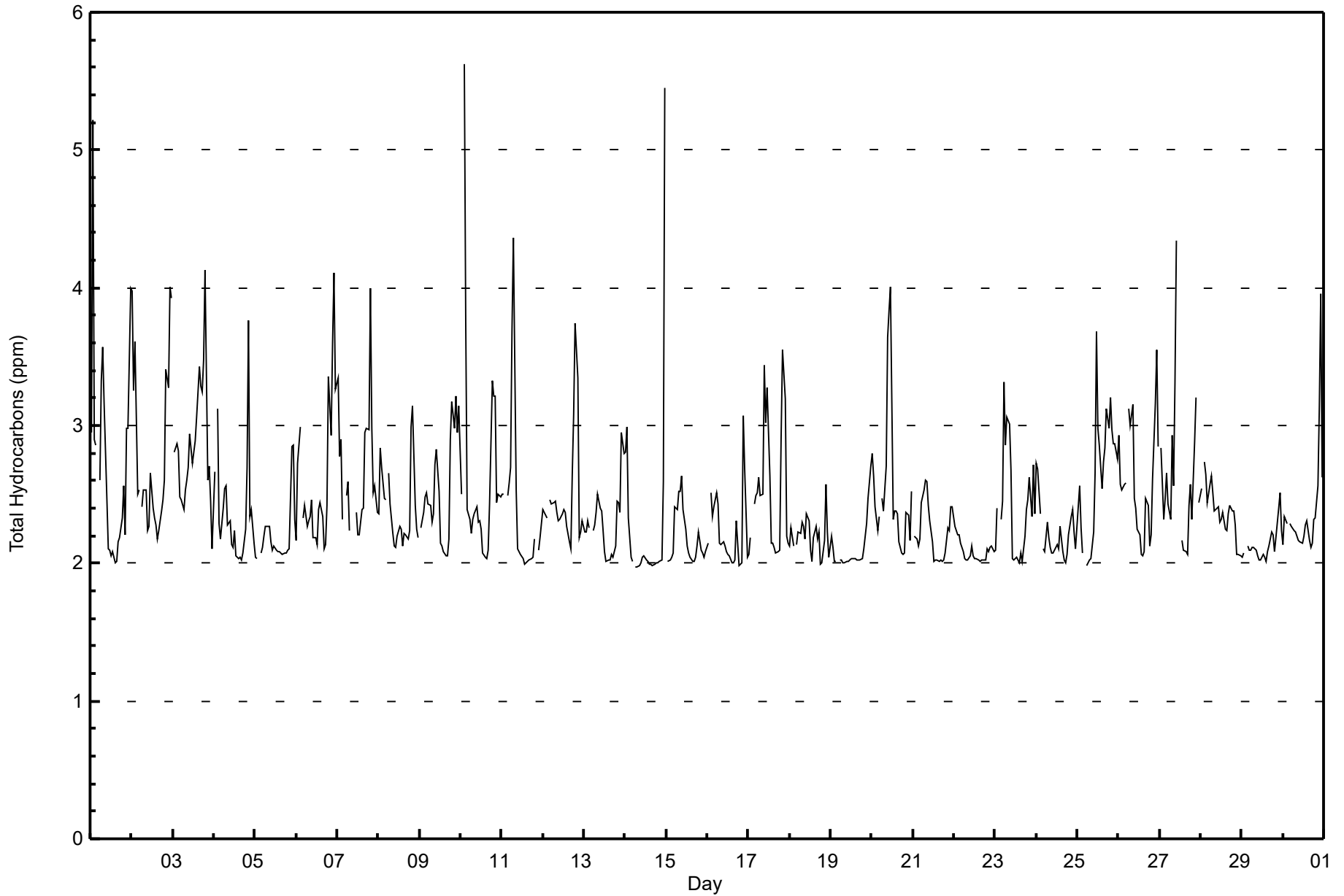
Fort Hills - September 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 720																																											
Maximum Value: 5.6 ppm on Sep 10 03:00		Maximum Daily Average: 2.8 ppm on Sep 3		Hours of Data: 684																																													
Minimum Value: 2.0 ppm on Sep 14 07:00		Minimum Daily Average: 2.1 ppm on Sep 22		Hours of Missing Data: 36																																													
Maximum Diurnal Average: 2.7 ppm at hour 23		Minimum Diurnal Average: 2.2 ppm at hour 15		Hours of Calibration: 32																																													
Monthly Average: 2.42 ppm		Percentiles: P ₁ = 2.0 P ₁₀ = 2.0 Q ₁ = 2.1 Median = 2.3 Q ₃ = 2.5 P ₉₀ = 3.0 P ₉₉ = 4.0		Percent Operational Time: 99.4																																													
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-Sep	2.9	5.2	2.9	2.9	Z	2.6	3.3	3.6	3.2	2.5	2.1	2.1	2.1	2.1	2.0	2.0	2.2	2.2	2.3	2.6	2.2	3.0	3.0	4.0	2.7	5.2																							
2-Sep	4.0	3.3	3.6	2.5	2.5	Z	2.4	2.5	2.5	2.2	2.3	2.7	2.4	2.3	2.3	2.2	2.2	2.4	2.5	2.6	3.4	3.3	4.0	3.9	2.8	4.0																							
3-Sep	Z	2.8	2.9	2.8	2.5	2.5	2.4	2.5	2.6	2.7	2.9	2.7	2.8	2.9	3.1	3.4	3.3	3.2	3.5	4.1	2.6	2.7	2.5	2.1	2.8	4.1																							
4-Sep	2.7	Z	3.1	2.3	2.2	2.4	2.5	2.6	2.3	2.3	2.1	2.1	2.2	2.1	2.0	2.0	2.0	2.1	2.3	2.7	3.8	2.3	2.4	2.1	2.4	3.8																							
5-Sep	2.0	2.0	Z	2.1	2.1	2.2	2.3	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.9																							
6-Sep	2.2	2.7	3.0	Z	2.3	2.4	2.3	2.3	2.3	2.5	2.2	2.2	2.1	2.4	2.4	2.3	2.1	2.1	2.4	3.4	2.9	3.6	4.1	3.3	2.6	4.1																							
7-Sep	3.3	2.8	2.9	2.3	Z	2.5	2.6	2.2	C	C	C	2.4	2.2	2.2	2.4	2.4	3.0	3.0	3.0	4.0	3.0	2.5	2.6	2.4	2.7	4.0																							
8-Sep	2.4	2.8	2.7	2.5	2.5	Z	2.7	2.4	2.2	2.1	2.1	2.2	2.3	2.2	2.1	2.2	2.2	2.2	2.2	3.0	3.1	2.4	2.3	2.2	2.4	3.1																							
9-Sep	Z	2.3	2.4	2.5	2.5	2.4	2.4	2.3	2.4	2.7	2.8	2.5	2.1	2.1	2.1	2.1	2.1	2.2	2.9	3.2	3.0	3.2	2.9	3.1	2.5	3.2																							
10-Sep	2.5	Z	5.6	3.7	2.4	2.3	2.2	2.3	2.4	2.4	2.3	2.3	2.2	2.1	2.0	2.0	2.1	2.4	3.3	3.2	3.2	2.4	2.5	2.5	2.6	5.6																							
11-Sep	2.5	2.5	Z	2.5	2.6	2.7	3.7	4.4	2.5	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	DF	2.1	2.2	2.3	2.4	4.4																							
12-Sep	2.4	2.4	2.3	Z	2.5	2.4	2.4	2.4	2.4	2.3	2.3	2.4	2.4	2.4	2.3	2.2	2.1	2.6	3.1	3.7	3.3	2.2	2.2	2.3	2.5	3.7																							
13-Sep	2.2	2.2	2.3	2.3	Z	2.2	2.3	2.4	2.5	2.4	2.4	2.2	2.1	2.0	2.0	2.0	2.1	2.0	2.1	2.4	2.4	2.4	2.9	2.8	2.3	2.9																							
14-Sep	2.8	3.0	2.3	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	2.6	5.5	2.3	5.5																							
15-Sep	Z	2.0	2.0	2.0	2.1	2.4	2.4	2.5	2.5	2.6	2.4	2.3	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.2	2.1	2.1	2.0	2.1	2.2	2.6																							
16-Sep	2.1	Z	2.5	2.3	2.4	2.5	2.4	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.3	2.0	2.0	2.0	3.1	2.7	2.0	2.2	3.1																							
17-Sep	2.1	2.2	Z	2.4	2.5	2.5	2.6	2.5	2.5	3.4	3.0	3.3	2.6	2.1	2.1	2.1	2.1	2.1	2.1	2.9	3.5	3.2	2.2	2.1	2.5	3.5																							
18-Sep	2.1	2.3	2.1	Z	2.1	2.2	2.2	2.3	2.3	2.2	2.4	2.3	2.1	2.0	2.2	2.3	2.2	2.2	2.0	2.0	2.2	2.6	2.2	2.0	2.2	2.6																							
19-Sep	2.2	2.1	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.3	2.5	2.7	2.1	2.7																								
20-Sep	2.8	2.6	2.4	2.2	2.3	Z	2.5	2.4	2.7	3.6	3.8	4.0	2.3	2.4	2.4	2.4	2.2	2.1	2.1	2.1	2.4	2.4	2.2	2.5	2.6	4.0																							
21-Sep	Z	2.2	2.2	2.1	2.2	2.4	2.5	2.6	2.6	2.4	2.3	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.3	2.2	2.4	2.4	2.2	2.6																							
22-Sep	2.3	2.2	2.2	2.2	2.1	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	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3																						
23-Sep	2.1	2.4	Z	2.3	2.5	3.3	2.9	3.1	3.0	2.7	2.0	2.0	2.0	2.0	2.1	2.0	2.2	2.4	2.5	2.6	2.3	2.7	2.4	2.4	2.4	3.3																							
24-Sep	2.7	2.7	2.4	Z	2.1	2.1	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.1	2.0	2.0	2.1	2.2	2.3	2.4	2.2	2.1	2.2	2.7																							
25-Sep	2.4	2.6	2.3	2.1	Z	2.0	2.0	2.0	2.0	2.2	2.7	3.7	3.0	2.9	2.5	2.7	2.8	3.1	3.0	3.2	3.0	2.9	2.9	2.8	2.6	3.7																							
26-Sep	2.9	2.6	2.5	2.6	2.6	Z	3.1	3.0	3.1	2.5	2.4	2.2	2.2	2.1	2.1	2.1	2.5	2.4	2.1	2.2	2.6	3.2	3.5	2.8	2.6	3.5																							
27-Sep	Z	2.8	2.3	2.5	2.7	2.4	2.3	2.9	2.6	3.3	4.3	M	M	2.2	2.1	2.1	2.1	2.4	2.6	2.3	2.9	3.2	UO	2.4	2.6	4.3																							
28-Sep	2.5	Z	2.7	2.6	2.4	2.6	2.6	2.5	2.4	2.4	2.4	2.3	2.3	2.4	2.2	2.2	2.4	2.4	2.4	2.4	2.3	2.1	2.1	2.1	2.4	2.7																							
29-Sep	2.0	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.0	2.0	2.1	2.1	2.2	2.2	2.1	2.2	2.4	2.5	2.2	2.1	2.5																						
30-Sep	2.1	2.3	2.3	Z	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.3	2.3	2.2	2.1	2.1	2.3	2.3	2.6	3.1	4.0	2.6	2.4	4.0																						
																								2.5	2.6	2.6	2.4	2.3	2.4	2.5	2.5	2.4	2.4	2.4	2.4	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.6	2.6	2.6	2.7	2.6	Diurnal Average	
																								4.0	5.2	5.6	3.7	2.7	3.3	3.7	4.4	3.2	3.6	4.3	4.0	3.0	2.9	3.1	3.4	3.3	3.2	3.5	4.1	3.8	3.6	4.1	5.5	Diurnal Maximum	
Z - zerospan																								C - Calibration				M - Maintenance				DF - DAS Failure				UO - Unstable Operation													



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	106	15.50	15.50
2.1 - 3.0	515	75.29	90.79
3.1 - 10.0	63	9.21	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Total Hydrocarbons (THC) - ppm
Fort Hills - September 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	0	0	0	0	0	17	34	21	4	5	4	7	7	2	106
2.1 - 3.0	54	16	5	4	5	5	15	111	96	69	46	16	18	22	20	13	515
3.1 - 10.0	2	4	1	0	0	2	8	6	2	10	12	8	1	1	3	3	63
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	61	20	6	4	5	7	23	134	132	100	62	29	23	30	30	18	684

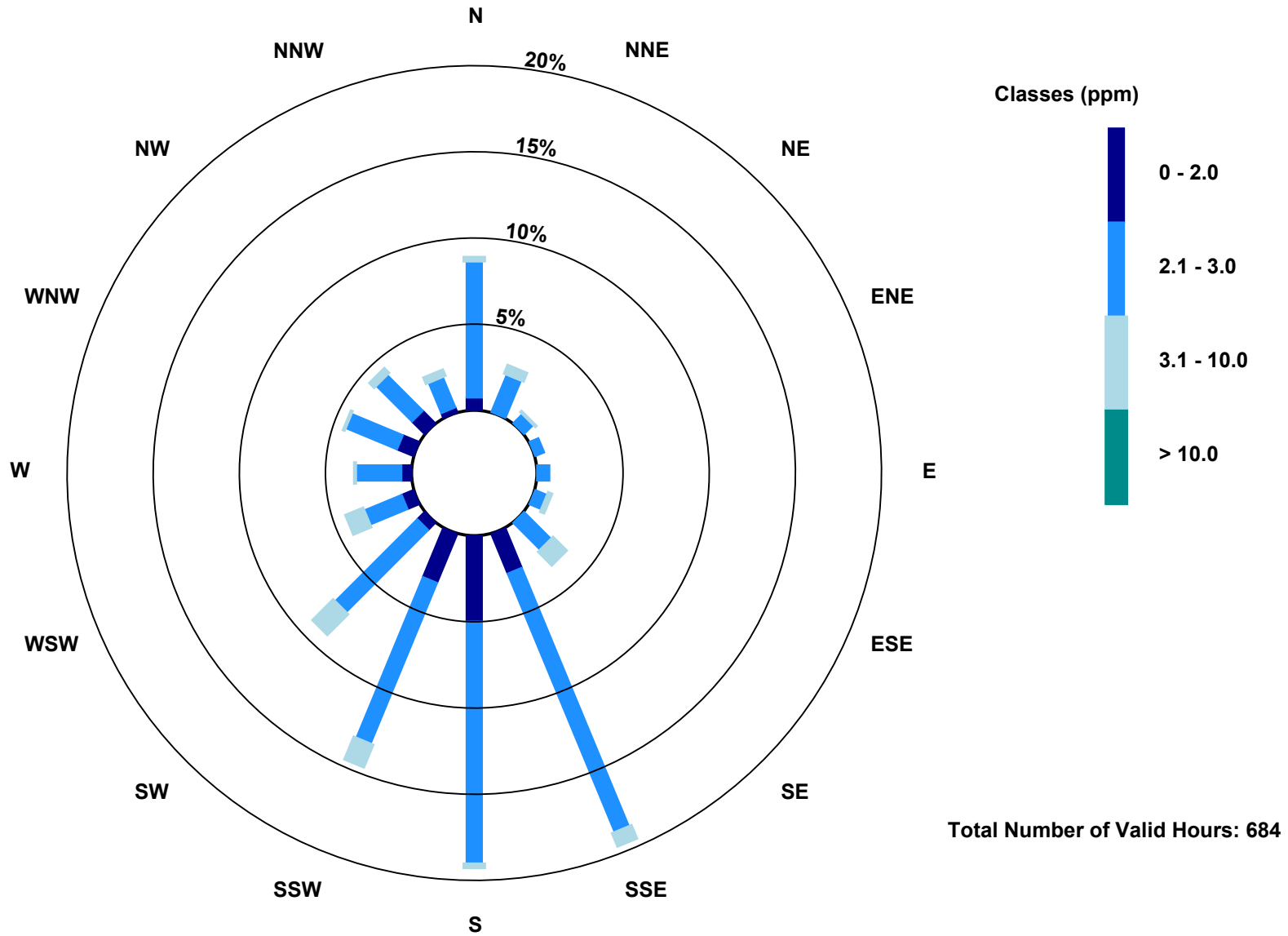
Total Number of Valid Hours: 684

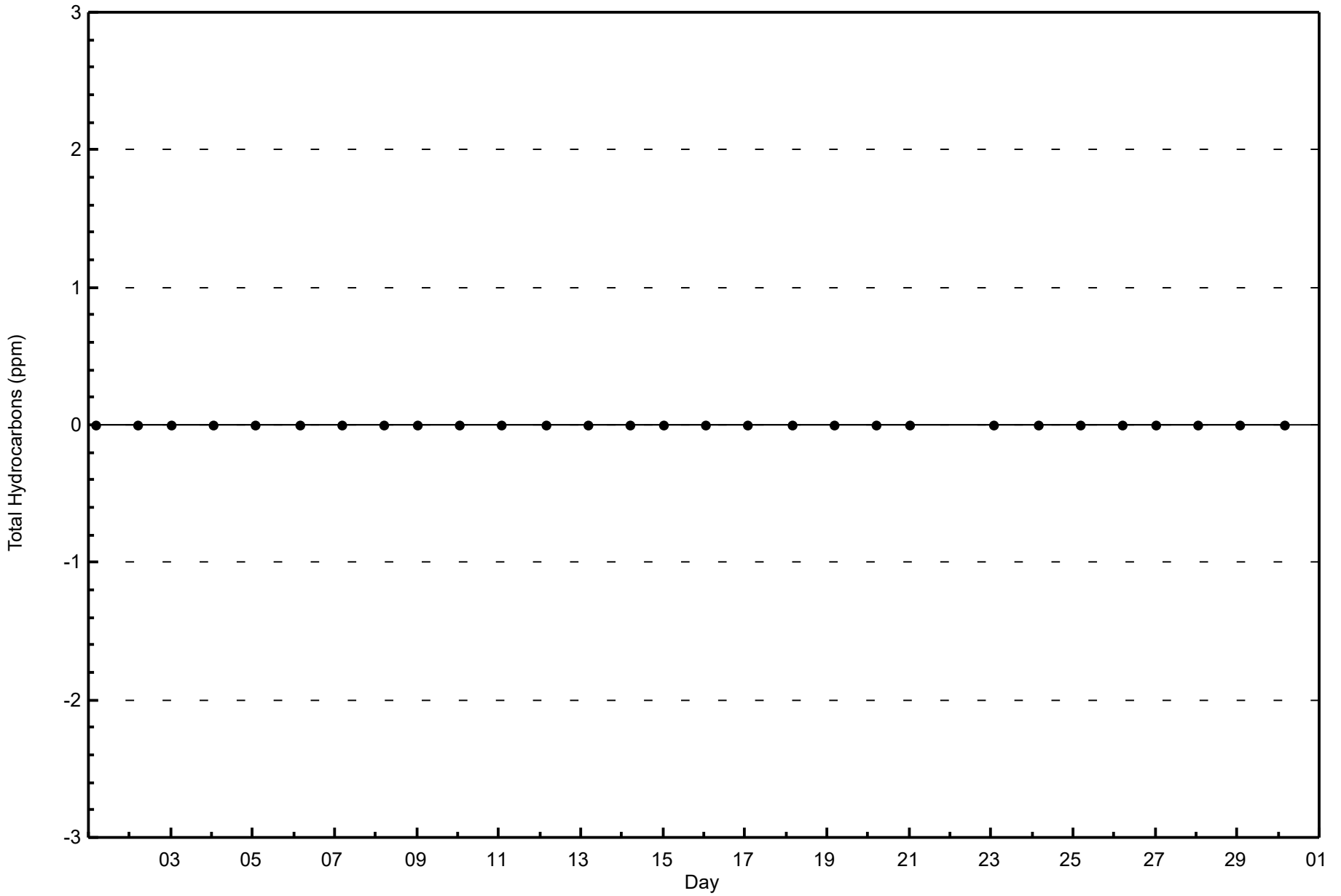
Total Number of Hours: 720

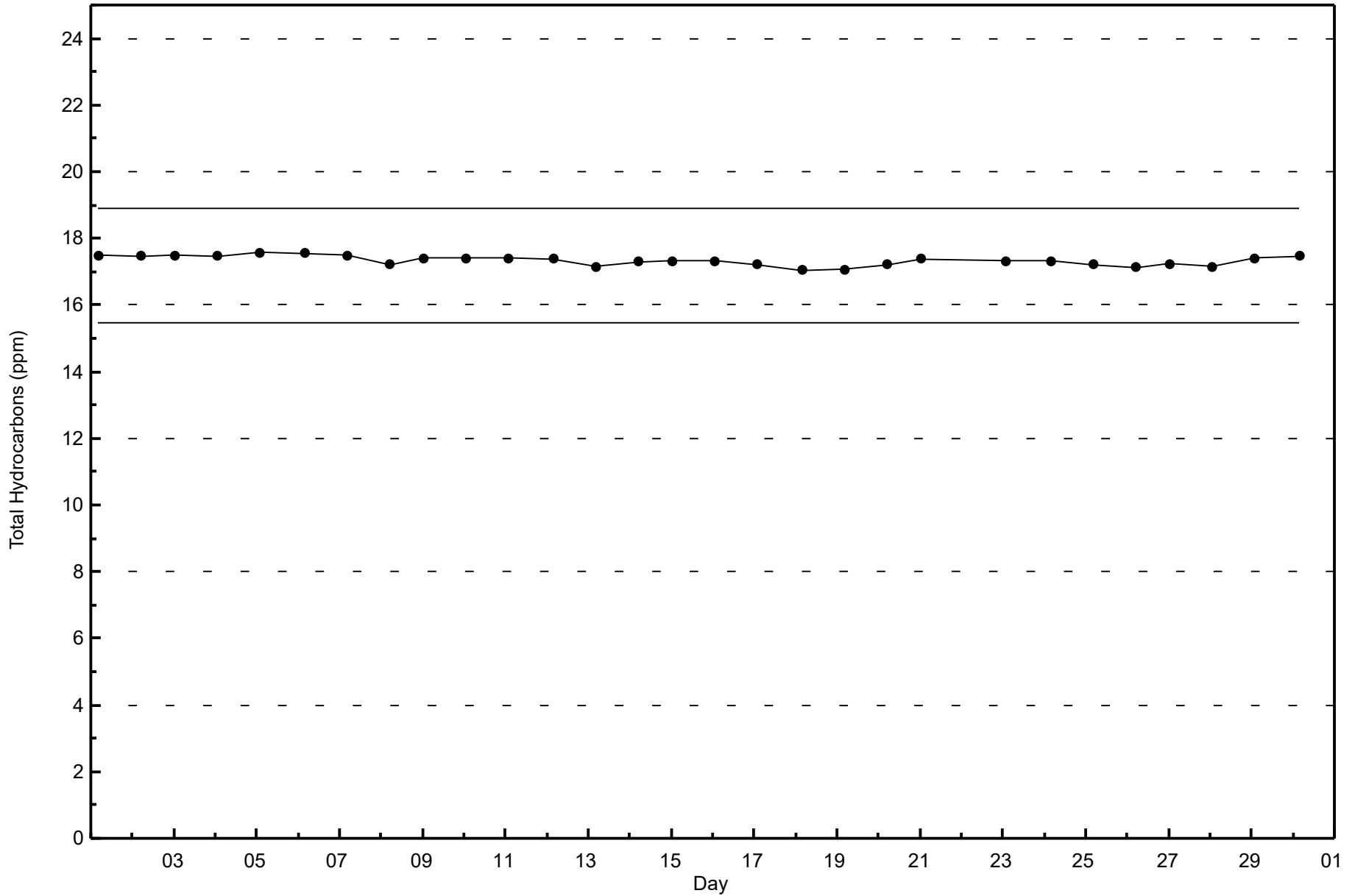


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Total Hydrocarbons (THC) - ppm
Fort Hills









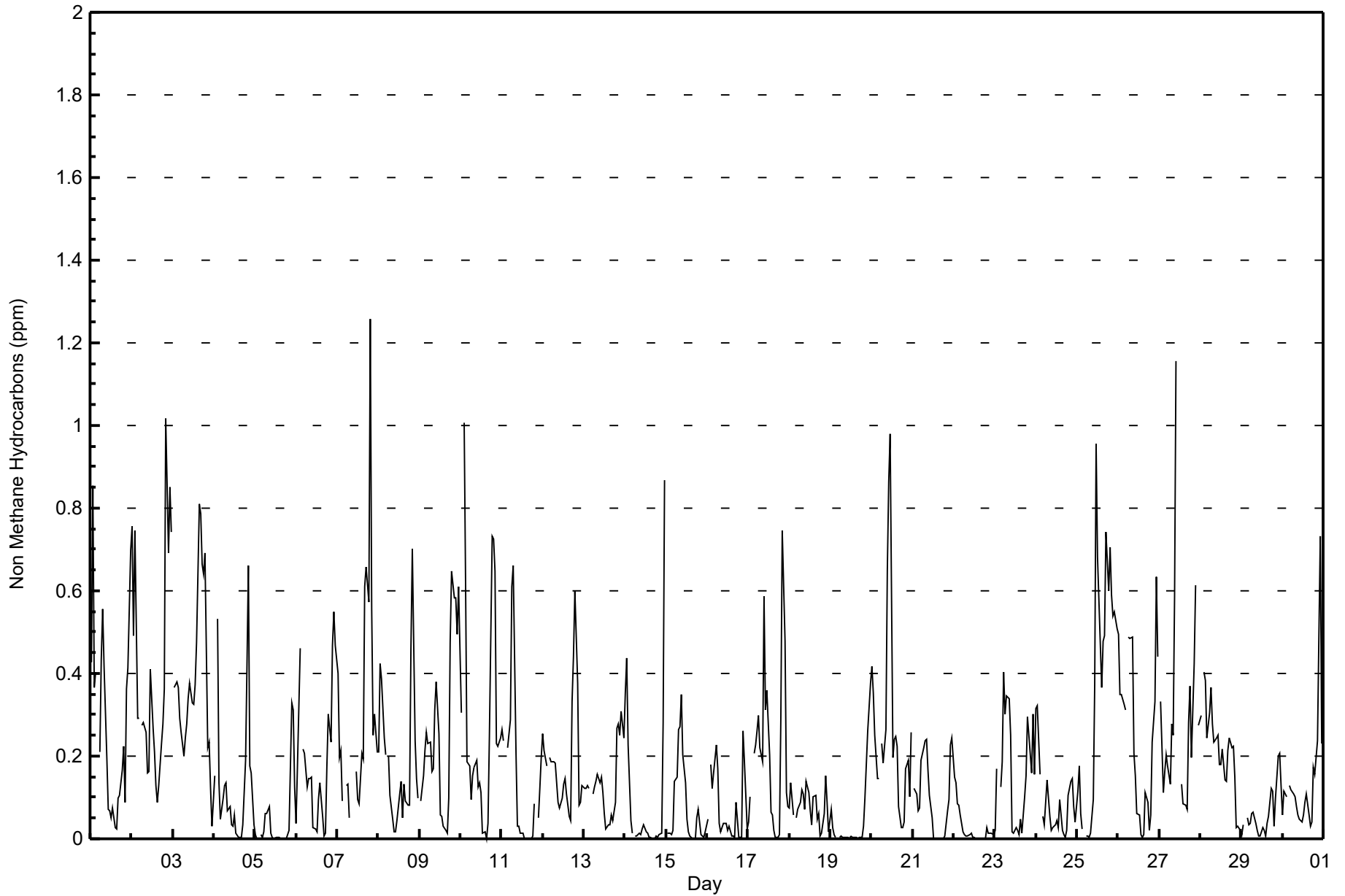
Summary of Hour Averages

Fort Hills - September 2023

Maximum Value: 1.257 ppm on Sep 7 20:00	Maximum Daily Average: 0.397 ppm on Sep 2	Hours in Service: 720
Minimum Value: 0.000 ppm on Sep 5 02:00	Minimum Daily Average: 0.027 ppm on Sep 22	Hours of Data: 684
Maximum Diurnal Average: 0.299 ppm at hour 21	Minimum Diurnal Average: 0.082 ppm at hour 15	Hours of Missing Data: 36
Monthly Average: 0.183 ppm	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.3 P ₉₀ = 0.5 P ₉₉ = 0.9	Hours of Calibration: 32
		Percent Operational Time: 99.4

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-Sep	0.427	0.855	0.367	0.403	Z	0.210	0.435	0.556	0.416	0.194	0.070	0.067	0.052	0.075	0.027	0.023	0.099	0.104	0.167	0.223	0.090	0.363	0.414	0.699	0.275	0.855
2-Sep	0.756	0.492	0.747	0.292	0.293	Z	0.275	0.281	0.258	0.158	0.162	0.411	0.266	0.209	0.130	0.089	0.130	0.231	0.279	0.364	1.017	0.693	0.850	0.743	0.397	1.017
3-Sep	Z	0.365	0.380	0.365	0.292	0.258	0.200	0.244	0.278	0.340	0.378	0.328	0.327	0.374	0.476	0.810	0.786	0.663	0.642	0.690	0.222	0.233	0.122	0.031	0.383	0.810
4-Sep	0.154	Z	0.534	0.137	0.048	0.098	0.129	0.137	0.066	0.077	0.034	0.029	0.057	0.013	0.005	0.005	0.004	0.033	0.190	0.421	0.661	0.176	0.160	0.032	0.139	0.661
5-Sep	0.011	0.000	Z	0.009	0.003	0.016	0.060	0.062	0.079	0.015	0.004	0.001	0.004	0.003	0.002	0.000	0.001	0.001	0.001	0.009	0.019	0.330	0.311	0.127	0.046	0.330
6-Sep	0.036	0.173	0.461	Z	0.218	0.206	0.124	0.145	0.147	0.149	0.028	0.025	0.015	0.096	0.135	0.056	0.008	0.013	0.174	0.302	0.235	0.467	0.550	0.467	0.184	0.550
7-Sep	0.401	0.196	0.215	0.091	Z	0.128	0.131	0.052	C	C	C	0.163	0.096	0.086	0.205	0.194	0.611	0.656	0.573	1.257	0.555	0.249	0.303	0.211	0.319	1.257
8-Sep	0.209	0.425	0.388	0.246	0.203	Z	0.199	0.104	0.048	0.017	0.017	0.045	0.110	0.139	0.051	0.131	0.092	0.080	0.082	0.459	0.701	0.237	0.145	0.099	0.184	0.701
9-Sep	Z	0.093	0.151	0.215	0.258	0.230	0.233	0.162	0.168	0.313	0.379	0.255	0.056	0.053	0.031	0.019	0.013	0.099	0.475	0.646	0.583	0.584	0.494	0.612	0.266	0.646
10-Sep	0.306	Z	1.007	0.620	0.188	0.175	0.096	0.152	0.172	0.189	0.124	0.136	0.110	0.014	0.016	0.000	0.036	0.248	0.733	0.727	0.646	0.232	0.224	0.245	0.278	1.007
11-Sep	0.264	0.236	Z	0.221	0.255	0.289	0.611	0.662	0.207	0.030	0.030	0.015	0.012	0.001	0.000	0.000	0.000	0.000	0.007	0.083	DF	0.050	0.122	0.195	0.149	0.662
12-Sep	0.253	0.212	0.178	Z	0.195	0.187	0.188	0.183	0.137	0.087	0.075	0.099	0.131	0.146	0.110	0.054	0.043	0.333	0.439	0.602	0.375	0.082	0.087	0.130	0.188	0.602
13-Sep	0.124	0.122	0.128	0.122	Z	0.110	0.125	0.140	0.157	0.135	0.150	0.111	0.061	0.023	0.032	0.035	0.058	0.045	0.088	0.269	0.279	0.251	0.309	0.246	0.136	0.309
14-Sep	0.354	0.437	0.228	0.044	0.015	Z	0.008	0.006	0.012	0.012	0.024	0.034	0.017	0.014	0.004	0.002	0.000	0.001	0.006	0.003	0.009	0.014	0.282	0.868	0.104	0.868
15-Sep	Z	0.014	0.013	0.011	0.020	0.138	0.151	0.264	0.271	0.348	0.203	0.135	0.048	0.018	0.007	0.001	0.002	0.001	0.052	0.072	0.010	0.008	0.005	0.017	0.079	0.348
16-Sep	0.047	Z	0.178	0.121	0.160	0.227	0.170	0.038	0.016	0.038	0.036	0.038	0.021	0.031	0.007	0.007	0.004	0.090	0.003	0.004	0.002	0.261	0.188	0.025	0.074	0.261
17-Sep	0.042	0.102	Z	0.205	0.228	0.261	0.298	0.220	0.188	0.585	0.311	0.360	0.204	0.064	0.058	0.022	0.003	0.002	0.010	0.292	0.746	0.478	0.113	0.079	0.212	0.746
18-Sep	0.074	0.135	0.057	Z	0.050	0.071	0.089	0.117	0.108	0.071	0.139	0.112	0.069	0.035	0.102	0.106	0.048	0.062	0.005	0.015	0.063	0.154	0.087	0.016	0.077	0.154
19-Sep	0.070	0.028	0.010	0.005	Z	0.004	0.008	0.003	0.003	0.004	0.002	0.001	0.006	0.004	0.002	0.005	0.000	0.003	0.002	0.032	0.098	0.181	0.261	0.376	0.048	0.376
20-Sep	0.418	0.352	0.250	0.145	0.144	Z	0.232	0.184	0.263	0.651	0.863	0.979	0.195	0.241	0.248	0.225	0.079	0.028	0.026	0.040	0.168	0.190	0.100	0.259	0.273	0.979
21-Sep	Z	0.122	0.110	0.068	0.075	0.191	0.219	0.238	0.241	0.167	0.105	0.052	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.008	0.067	0.097	0.229	0.245	0.097	0.245
22-Sep	0.151	0.134	0.085	0.081	0.059	0.018	0.009	0.007	0.005	0.009	0.015	0.003	0.003	0.001	0.000	0.000	0.000	0.001	0.002	0.028	0.013	0.014	0.012	0.009	0.027	0.151
23-Sep	0.022	0.168	Z	0.125	0.187	0.403	0.303	0.345	0.339	0.252	0.017	0.013	0.027	0.020	0.010	0.047	0.014	0.100	0.154	0.294	0.251	0.160	0.302	0.155	0.161	0.403
24-Sep	0.316	0.324	0.158	Z	0.053	0.035	0.144	0.100	0.053	0.019	0.026	0.033	0.044	0.029	0.096	0.022	0.011	0.005	0.021	0.104	0.140	0.145	0.079	0.040	0.087	0.324
25-Sep	0.115	0.175	0.061	0.025	Z	0.008	0.006	0.005	0.013	0.095	0.372	0.957	0.682	0.577	0.367	0.478	0.492	0.744	0.599	0.706	0.588	0.539	0.549	0.510	0.377	0.957
26-Sep	0.495	0.350	0.351	0.326	0.312	Z	0.489	0.484	0.487	0.207	0.154	0.060	0.058	0.009	0.003	0.012	0.111	0.087	0.021	0.058	0.234	0.332	0.634	0.440	0.248	0.634
27-Sep	Z	0.331	0.112	0.163	0.205	0.175	0.133	0.278	0.252	0.587	1.155	M	M	0.133	0.083	0.082	0.072	0.283	0.370	0.197	0.423	0.612	UO	0.275	0.296	1.155
28-Sep	0.299	Z	0.402	0.385	0.244	0.304	0.365	0.279	0.232	0.243	0.251	0.181	0.181	0.217	0.141	0.137	0.215	0.246	0.220	0.222	0.149	0.027	0.031	0.020	0.217	0.402
29-Sep	0.010	0.034	Z	0.052	0.034	0.036	0.060	0.064	0.038	0.019	0.007	0.006	0.026	0.020	0.005	0.038	0.055	0.121	0.117	0.029	0.097	0.199	0.206	0.129	0.061	0.206
30-Sep	0.058	0.114	0.101	Z	0.130	0.120	0.109	0.102	0.079	0.056	0.048	0.040	0.059	0.089	0.107	0.059	0.031	0.040	0.174	0.156	0.237	0.492	0.733	0.232	0.146	0.733
	0.216	0.230	0.267	0.179	0.155	0.156	0.187	0.187	0.163	0.175	0.178	0.162	0.101	0.091	0.082	0.089	0.101	0.144	0.188	0.277	0.299	0.262	0.272	0.251		Diurnal Average
	0.756	0.855	1.007	0.620	0.312	0.403	0.611	0.662	0.487	0.651	1.155	0.979	0.682	0.577	0.476	0.810	0.786	0.744	0.733	1.257	1.017	0.693	0.850	0.868		Diurnal Maximum

Z - zerspan	C - Calibration	M - Maintenance	DF - DAS Failure	UO - Unstable Operation
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**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	70	10.23	10.23
0.006 - 0.05	157	22.95	33.19
0.06 - 0.1	161	23.54	56.73
> 0.1	296	43.27	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

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

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	1	0	0	0	0	0	0	4	34	21	2	0	0	1	5	2	70
0.006 - 0.05	12	2	0	1	0	0	0	41	41	22	5	6	7	11	5	4	157
0.06 - 0.1	11	3	0	0	1	1	2	38	27	26	23	5	5	7	10	2	161
> 0.1	37	15	6	3	4	6	21	51	30	31	32	18	11	11	10	10	296
Totals	61	20	6	4	5	7	23	134	132	100	62	29	23	30	30	18	684

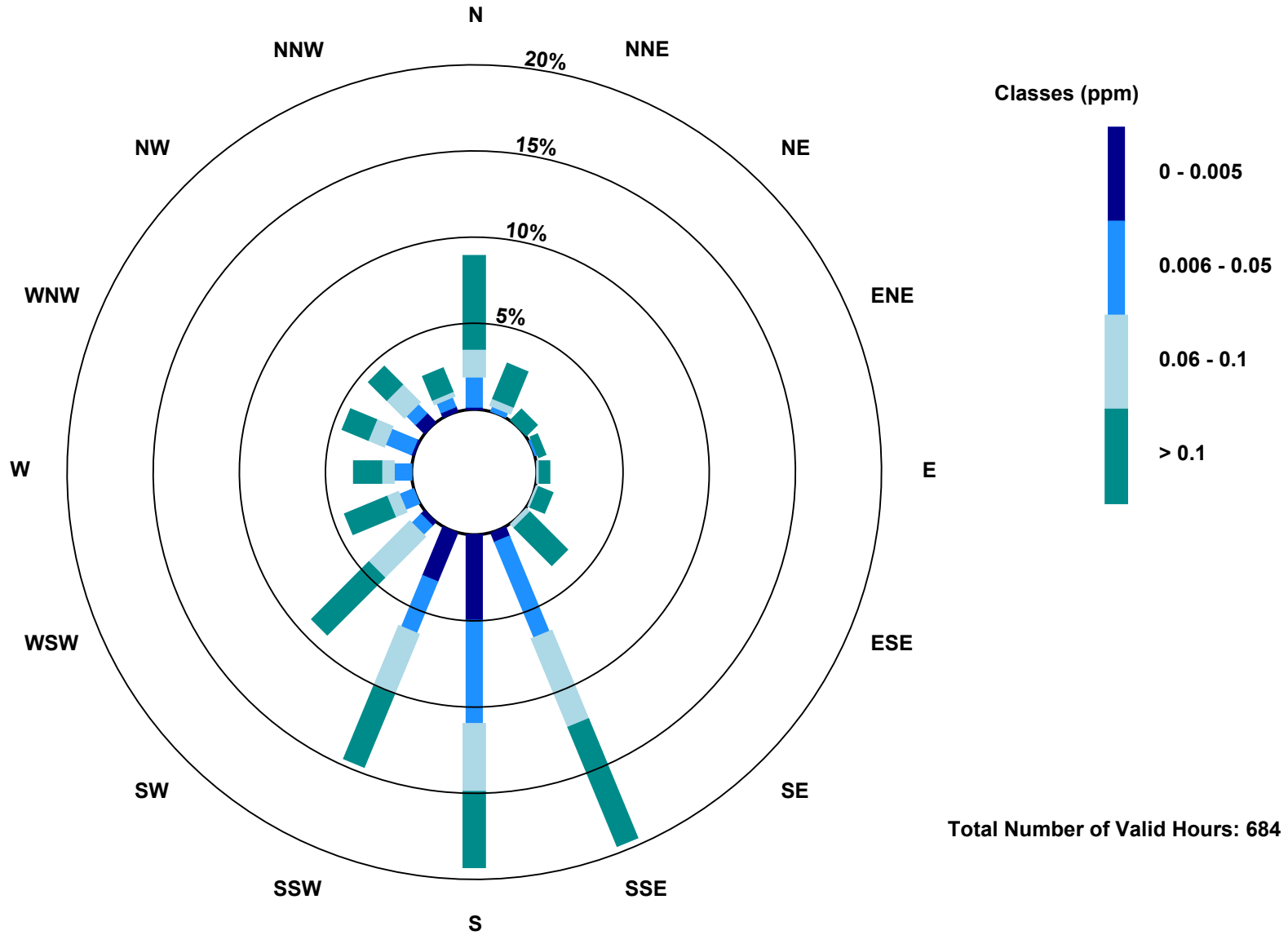
Total Number of Valid Hours: 684

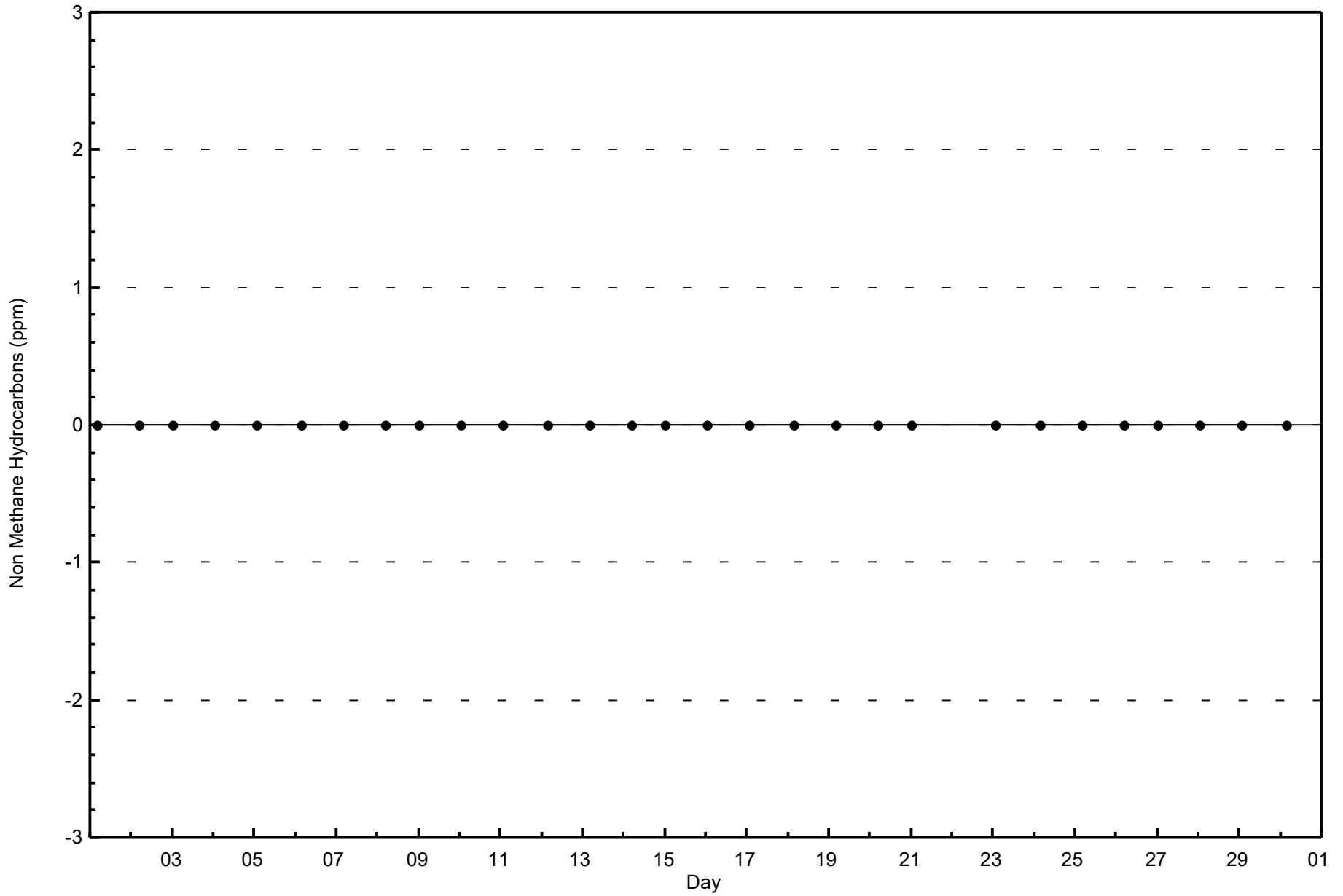
Total Number of Hours: 720

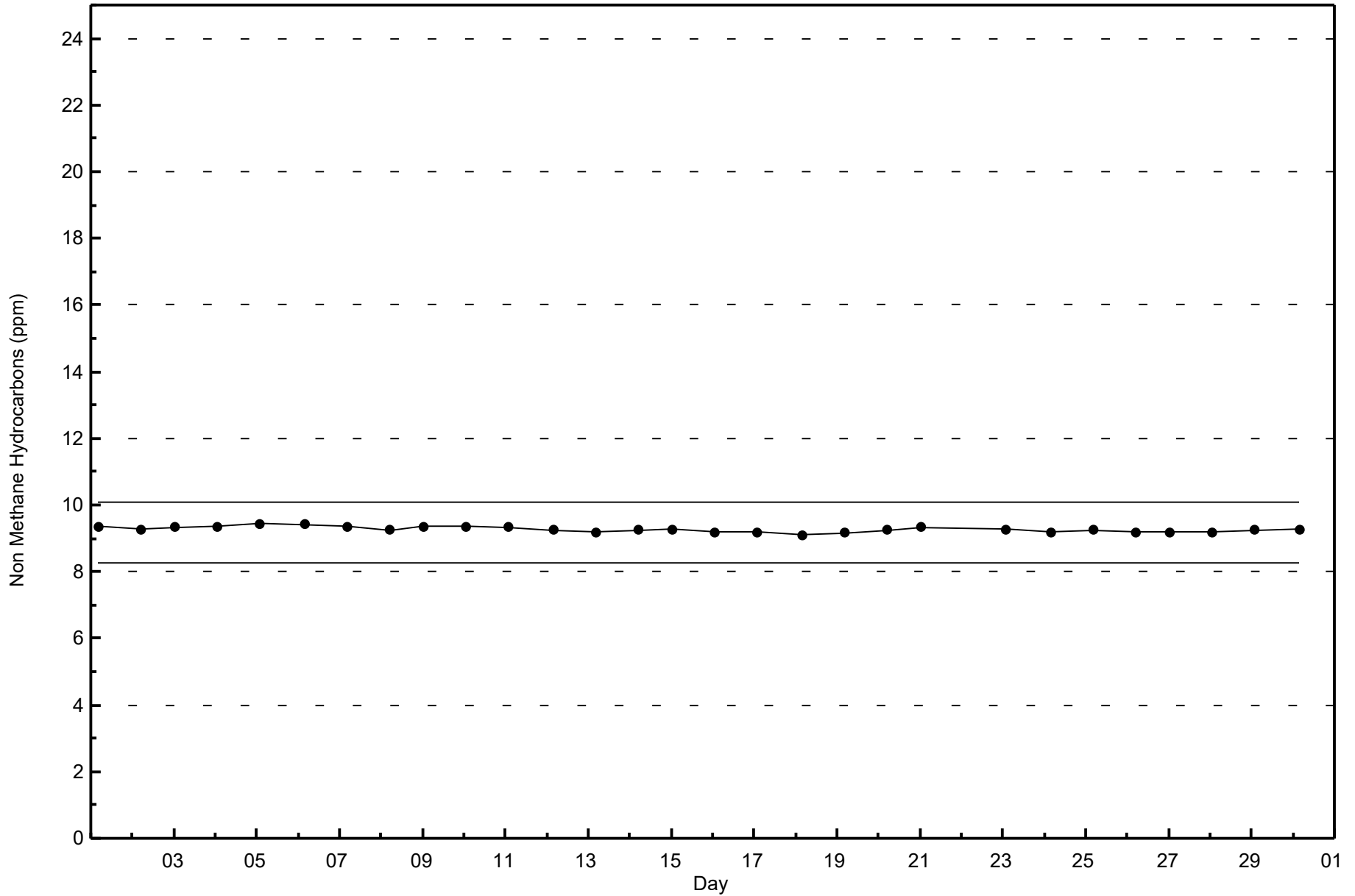


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Non Methane Hydrocarbons (NMHC) - ppm
Fort Hills







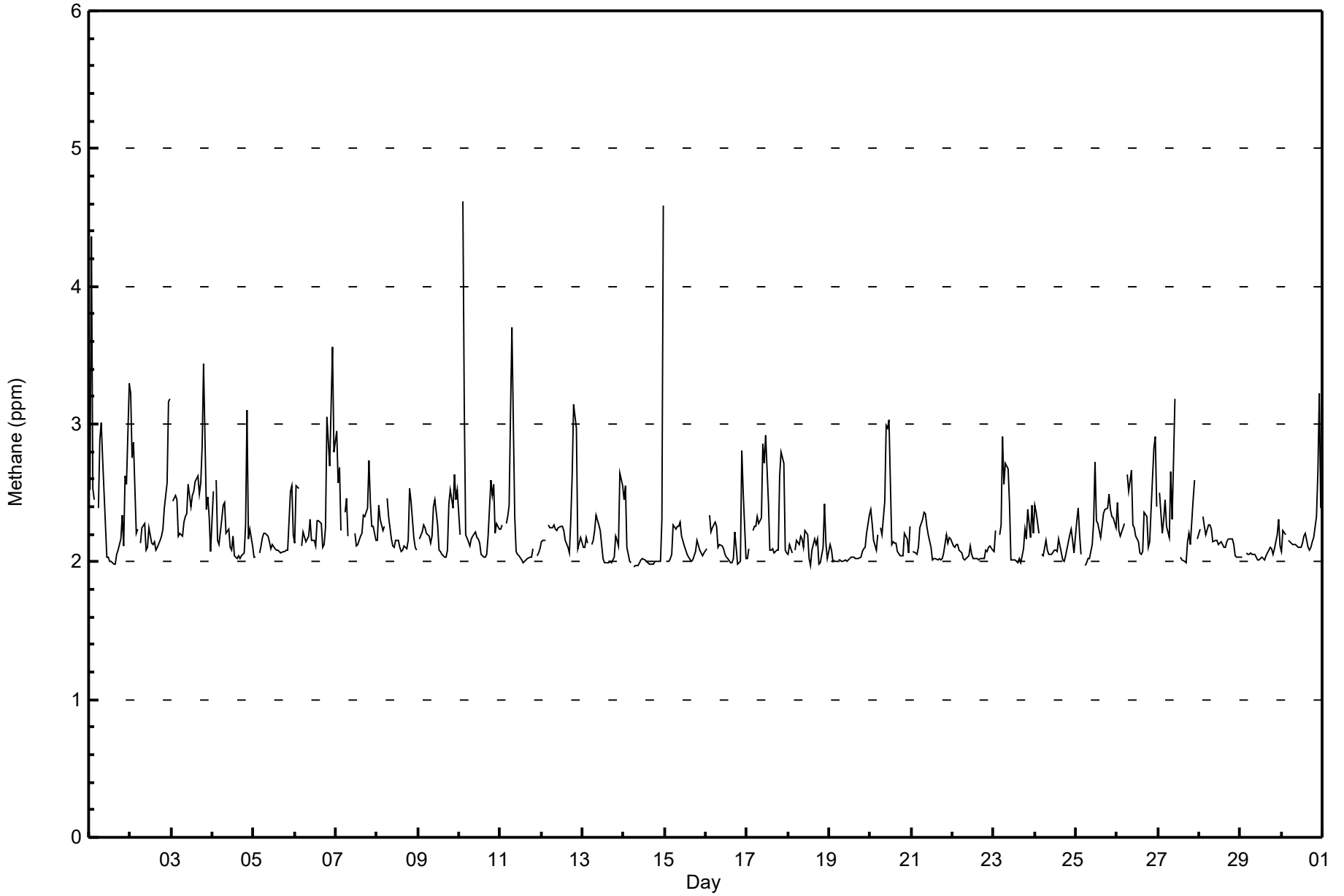


Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 720														Daily Average		Daily Maximum																											
Maximum Value: 4.6 ppm on Sep 10 03:00		Maximum Daily Average: 2.5 ppm on Sep 3		Hours of Data: 684														2.5		4.4																													
Minimum Value: 2.0 ppm on Sep 14 07:00		Minimum Daily Average: 2.1 ppm on Sep 19		Hours of Missing Data: 36														2.4		3.2																													
Maximum Diurnal Average: 2.4 ppm at hour 23		Minimum Diurnal Average: 2.1 ppm at hour 16		Hours of Calibration: 32														2.5		3.4																													
Monthly Average: 2.24 ppm		Percentiles: P ₁ = 2.0 P ₁₀ = 2.0 Q ₁ = 2.1 Median = 2.2 Q ₃ = 2.3 P ₉₀ = 2.6 P ₉₉ = 3.2		Percent Operational Time: 99.4														2.2		3.1																													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Sep	2.5	4.4	2.5	2.5	Z	2.4	2.9	3.0	2.7	2.3	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.3	2.1	2.6	2.6	3.3	2.5	4.4																								
2-Sep	3.2	2.8	2.9	2.2	2.2	Z	2.1	2.2	2.3	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.4	2.6	3.2	3.2	2.4	3.2																								
3-Sep	Z	2.4	2.5	2.4	2.2	2.2	2.2	2.3	2.3	2.4	2.6	2.4	2.5	2.6	2.6	2.5	2.6	2.8	3.4	2.4	2.5	2.3	2.1	2.5	3.4																								
4-Sep	2.5	Z	2.6	2.2	2.1	2.3	2.4	2.4	2.2	2.2	2.1	2.1	2.2	2.0	2.0	2.0	2.0	2.1	2.3	3.1	2.2	2.2	2.1	2.2	3.1																								
5-Sep	2.0	2.0	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	2.1	2.1	2.1	2.1	2.1	2.5	2.5	2.2	2.1	2.5																								
6-Sep	2.1	2.6	2.5	Z	2.1	2.2	2.1	2.2	2.2	2.3	2.2	2.2	2.1	2.3	2.3	2.3	2.1	2.1	2.2	3.1	2.7	3.1	3.6	2.8	2.4	3.6																							
7-Sep	2.9	2.6	2.7	2.2	Z	2.4	2.5	2.2	C	C	C	2.2	2.1	2.1	2.2	2.2	2.3	2.3	2.4	2.7	2.4	2.3	2.3	2.2	2.4	2.9																							
8-Sep	2.2	2.4	2.3	2.2	2.3	Z	2.5	2.3	2.2	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.5	2.4	2.2	2.1	2.1	2.2	2.5																							
9-Sep	Z	2.2	2.2	2.3	2.3	2.2	2.2	2.1	2.2	2.4	2.4	2.3	2.1	2.1	2.0	2.0	2.0	2.1	2.4	2.5	2.4	2.6	2.5	2.5	2.3	2.6																							
10-Sep	2.2	Z	4.6	3.1	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.0	2.0	2.1	2.2	2.6	2.5	2.6	2.2	2.3	2.2	2.4	4.6																							
11-Sep	2.2	2.3	Z	2.3	2.3	2.4	3.1	3.7	2.3	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	DF	2.0	2.1	2.1	2.2	2.2	3.7																							
12-Sep	2.1	2.2	2.2	Z	2.3	2.2	2.2	2.3	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.1	2.1	2.3	2.6	3.1	3.0	2.1	2.1	2.2	2.3	3.1																							
13-Sep	2.1	2.1	2.2	2.1	Z	2.1	2.2	2.2	2.3	2.3	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.2	2.1	2.6	2.5	2.2	2.6																								
14-Sep	2.5	2.6	2.1	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3	4.6	2.2	4.6																								
15-Sep	Z	2.0	2.0	2.0	2.1	2.3	2.2	2.3	2.3	2.3	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.2	2.1	2.1	2.0	2.1	2.1	2.3																							
16-Sep	2.1	Z	2.3	2.2	2.2	2.3	2.3	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.2	2.0	2.0	2.0	2.8	2.5	2.0	2.2	2.8																								
17-Sep	2.0	2.1	Z	2.2	2.3	2.3	2.3	2.3	2.3	2.9	2.7	2.9	2.4	2.1	2.1	2.1	2.1	2.1	2.1	2.6	2.8	2.7	2.1	2.1	2.3	2.9																							
18-Sep	2.1	2.1	2.1	Z	2.1	2.2	2.1	2.2	2.2	2.1	2.2	2.2	2.0	2.0	2.1	2.2	2.1	2.2	2.0	2.0	2.1	2.4	2.1	2.0	2.1	2.4																							
19-Sep	2.1	2.1	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.3	2.1	2.3	2.3																							
20-Sep	2.4	2.3	2.2	2.1	2.2	Z	2.2	2.2	2.4	3.0	3.0	3.0	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.2	2.2	2.1	2.3	2.3	3.0																							
21-Sep	Z	2.1	2.1	2.1	2.1	2.3	2.3	2.4	2.3	2.3	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.1	2.2	2.2	2.1	2.4	2.4																							
22-Sep	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.0	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																							
23-Sep	2.1	2.2	Z	2.2	2.3	2.9	2.6	2.7	2.7	2.4	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.4	2.2	2.4	2.2	2.3	2.9	2.9																							
24-Sep	2.4	2.4	2.2	Z	2.1	2.0	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.0	2.0	2.1	2.2	2.2	2.2	2.1	2.1	2.4	2.4																							
25-Sep	2.3	2.4	2.2	2.0	Z	2.0	2.0	2.0	2.0	2.1	2.3	2.7	2.3	2.3	2.2	2.3	2.3	2.4	2.4	2.5	2.4	2.3	2.3	2.2	2.3	2.7																							
26-Sep	2.4	2.2	2.2	2.2	2.3	Z	2.6	2.5	2.7	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.4	2.3	2.1	2.1	2.4	2.8	2.9	2.4	2.3	2.9																							
27-Sep	Z	2.5	2.2	2.3	2.4	2.3	2.2	2.7	2.3	2.7	3.2	M	M	2.0	2.0	2.0	2.0	2.1	2.2	2.1	2.5	2.6	UO	2.2	2.3	3.2																							
28-Sep	2.2	Z	2.3	2.3	2.2	2.3	2.3	2.2	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.0	2.0	2.2	2.3	2.3																							
29-Sep	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	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.1	2.1	2.3																							
30-Sep	2.1	2.2	2.2	Z	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.3	2.7	3.2	2.4	2.2	3.2																							
																								2.3	2.4	2.4	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.3	2.4	2.4	2.4	Diurnal Average	
																								3.2	4.4	4.6	3.1	2.4	2.9	3.1	3.7	2.7	3.0	3.2	3.0	2.5	2.5	2.6	2.6	2.5	2.6	2.8	3.4	3.1	3.1	3.6	4.6	Diurnal Maximum	
Z - zerospan																								C - Calibration				M - Maintenance				DF - DAS Failure				UO - Unstable Operation													



Wood Buffalo Environmental Association
Hourly Averages

Methane (CH₄) - ppm
Fort Hills - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Fort Hills - September 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	144	21.05	21.05
2.1 - 3.0	522	76.32	97.37
3.1 - 10.0	18	2.63	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Methane (CH₄) - ppm
Fort Hills - September 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	1	0	0	0	25	39	23	9	7	9	8	9	3	144
2.1 - 3.0	51	19	6	3	5	7	20	108	91	72	48	22	14	21	20	15	522
3.1 - 10.0	0	0	0	0	0	0	3	1	2	5	5	0	0	1	1	0	18
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	61	20	6	4	5	7	23	134	132	100	62	29	23	30	30	18	684

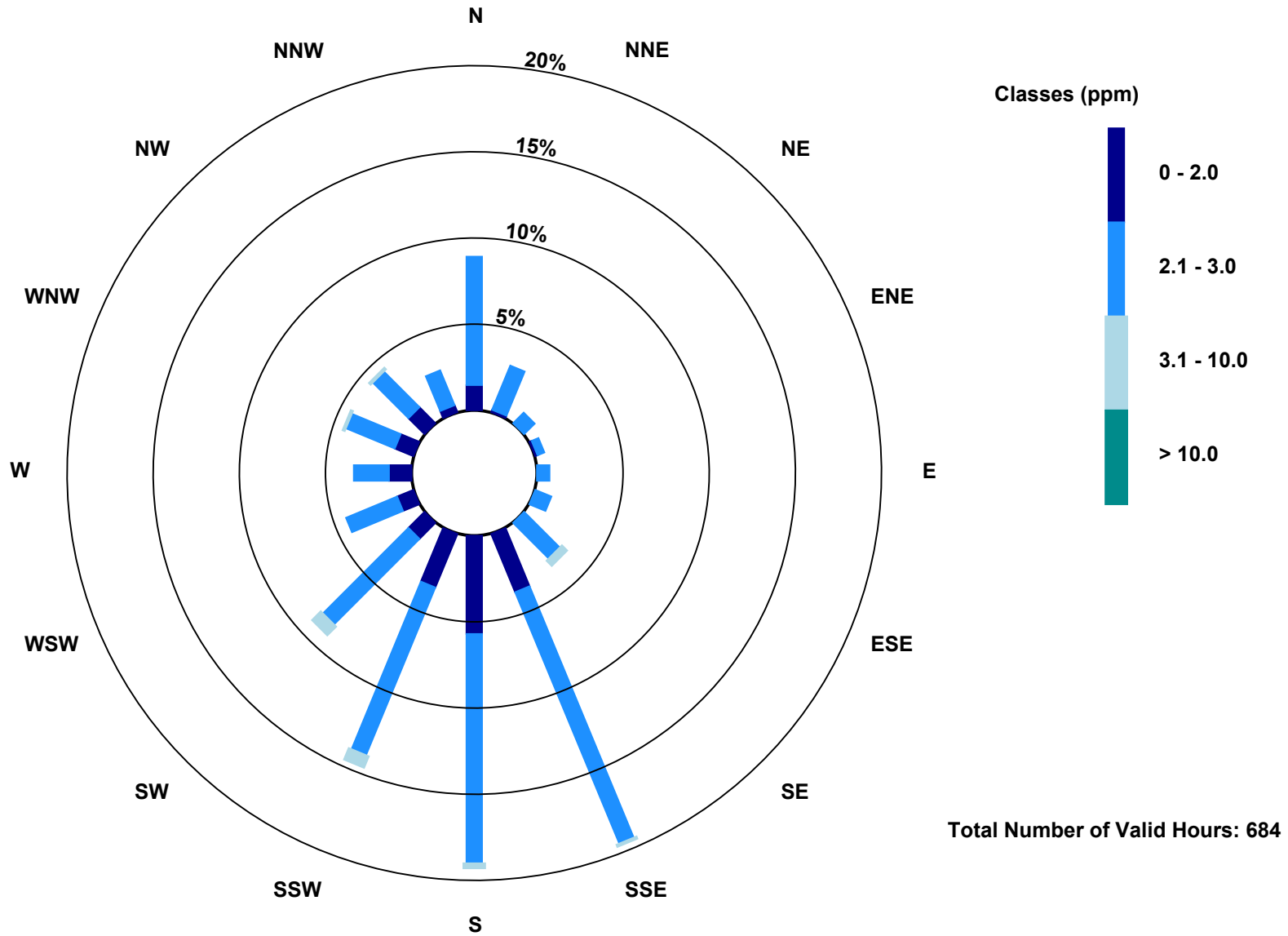
Total Number of Valid Hours: 684

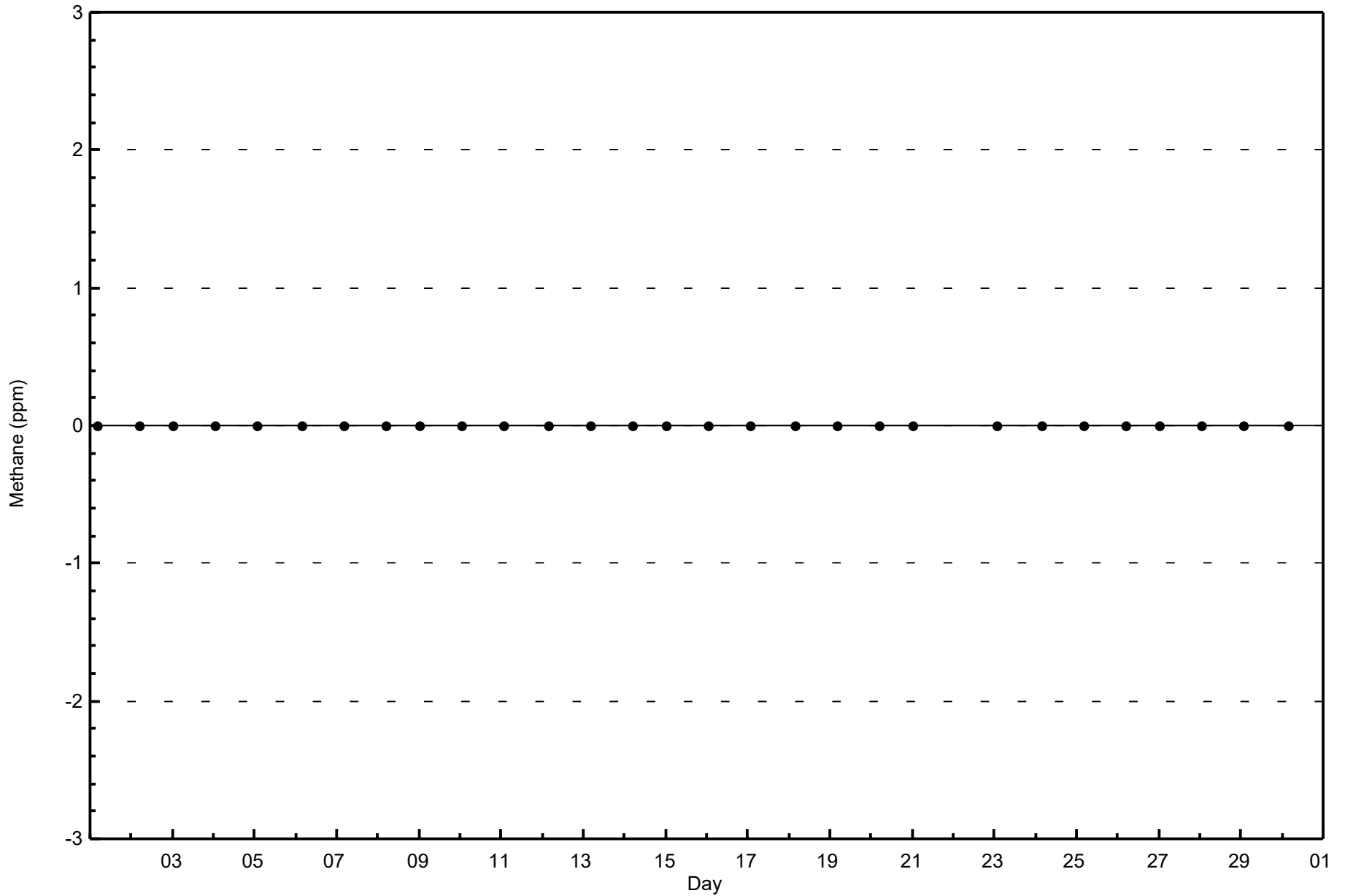
Total Number of Hours: 720

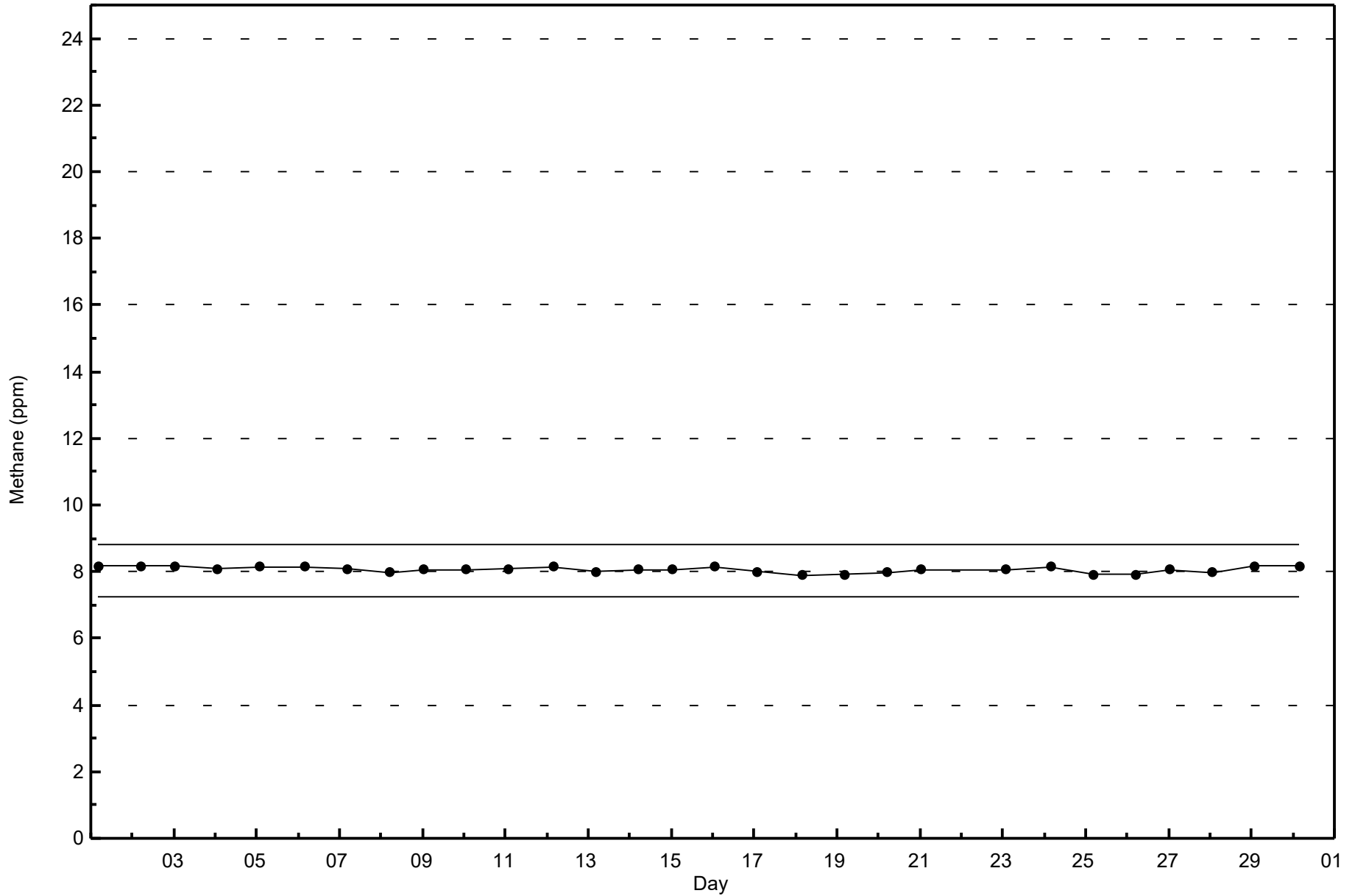


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Methane (CH₄) - ppm
Fort Hills









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

Fort Hills - September 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 489.1 ppb on Sep 10 00:00	Maximum Daily Average: 51.9 ppb on Sep 10		Hours of Data:	684
Minimum Value: 0.0 ppb on Sep 1 01:00	Minimum Daily Average: 0.2 ppb on Sep 22		Hours of Missing Data:	36
Maximum Diurnal Average: 27.0 ppb at hour 24	Minimum Diurnal Average: 1.0 ppb at hour 17		Hours of Calibration:	34
Monthly Average: 10.27 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 1.4 Q ₃ = 7.5 P ₉₀ = 24.3 P ₉₉ = 122.7		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-Sep	0.0	0.0	Z	12.5	6.1	0.0	9.2	17.6	8.8	2.3	0.1	0.0	0.2	0.2	0.0	0.0	0.3	0.0	0.1	0.0	0.0	1.0	2.0	19.2	3.5	19.2	
2-Sep	13.5	5.7	Z	14.3	0.1	0.0	0.0	0.0	0.4	4.6	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.2	6.9	21.9	13.1	4.3	21.9	
3-Sep	0.7	3.3	0.1	0.1	Z	0.1	0.0	1.4	2.8	3.3	10.4	2.9	4.8	6.7	6.1	21.5	8.5	3.7	1.1	0.2	0.0	0.0	0.0	0.0	3.4	21.5	
4-Sep	0.1	37.7	32.5	6.5	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	0.4	1.4	8.8	49.4	1.9	0.2	0.0	6.1	49.4	
5-Sep	Z	0.0	0.0	0.0	0.4	0.4	2.8	C	C	C	C	C	0.2	0.2	0.4	0.5	0.5	0.5	0.5	1.4	17.2	34.5	1.3	19.0	4.4	34.5	
6-Sep	0.0	Z	37.7	19.9	0.6	2.2	0.4	0.7	3.1	8.6	7.0	2.1	0.9	2.4	5.2	1.4	0.1	0.1	1.4	5.9	7.5	45.1	47.1	24.2	9.7	47.1	
7-Sep	29.7	12.4	Z	4.9	12.0	5.9	10.4	2.1	M	2.1	3.8	2.1	1.3	3.5	15.7	20.0	11.5	11.4	42.3	76.7	13.1	5.2	3.3	5.9	13.4	76.7	
8-Sep	6.8	11.8	29.5	Z	6.0	11.7	20.7	9.9	3.8	1.4	1.6	2.1	4.5	3.8	1.6	2.0	2.3	0.4	38.4	107.3	121.5	3.5	2.5	0.9	17.1	121.5	
9-Sep	22.6	16.1	18.6	4.4	Z	5.2	21.1	18.5	5.9	19.4	26.7	11.8	2.8	2.7	2.8	5.5	1.0	1.1	55.9	82.4	74.7	79.3	200.2	489.1	50.8	489.1	
10-Sep	312.0	253.5	222.0	128.5	9.5	Z	1.8	10.6	5.4	8.7	7.5	5.6	5.2	0.8	0.6	0.4	0.5	3.1	68.4	58.8	48.6	5.9	14.1	21.4	51.9	312.0	
11-Sep	Z	70.6	130.3	70.3	27.3	27.6	100.7	70.8	13.2	2.0	1.5	1.0	0.6	0.2	0.3	0.1	0.2	0.0	0.0	27.6	DF	4.5	28.2	36.8	27.9	130.3	
12-Sep	14.7	Z	0.0	8.4	0.0	0.2	6.3	1.5	1.7	2.2	2.3	2.4	4.8	2.3	0.7	0.2	0.0	0.8	2.6	5.6	0.1	0.0	0.0	18.7	3.3	18.7	
13-Sep	33.9	9.4	Z	17.7	2.5	0.1	0.4	0.6	1.4	1.7	1.8	1.0	0.7	0.5	0.6	0.6	0.6	0.3	0.1	0.2	0.2	0.0	4.5	1.6	3.5	33.9	
14-Sep	10.5	19.5	2.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.1	0.0	0.0	0.0	0.0	0.1	0.2	0.0	17.7	62.2	4.9	62.2	
15-Sep	13.2	1.9	9.5	14.1	Z	12.6	15.5	14.0	9.8	6.0	4.7	2.7	1.7	1.1	1.2	0.3	0.2	0.1	5.0	6.0	0.1	0.1	0.0	0.0	5.2	15.5	
16-Sep	13.0	15.3	5.3	9.0	0.9	Z	0.4	0.2	0.3	0.5	0.5	0.4	0.4	0.0	0.0	1.6	0.1	0.2	0.0	0.0	0.0	0.8	73.5	14.4	6.0	73.5	
17-Sep	Z	24.3	24.6	45.4	0.4	3.7	20.6	16.1	12.5	25.9	16.9	15.3	4.3	0.8	0.4	0.7	0.0	0.0	0.0	0.2	30.5	26.9	60.8	22.0	15.3	60.8	
18-Sep	38.3	Z	20.3	5.4	0.3	0.0	14.0	5.7	1.0	0.8	2.7	1.7	0.6	0.2	0.4	0.3	0.4	0.1	10.8	8.5	3.2	38.1	41.5	5.0	8.7	41.5	
19-Sep	6.8	1.4	Z	1.4	0.0	0.0	5.1	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	6.6	1.4	1.1	2.3	16.1	1.9	16.1	
20-Sep	27.3	5.1	1.8	Z	11.4	22.5	20.1	3.4	17.2	53.7	67.3	74.7	3.6	1.9	2.4	1.5	0.3	0.4	0.0	0.0	43.1	5.3	4.1	13.4	16.5	74.7	
21-Sep	1.0	1.4	2.4	2.1	Z	3.5	13.1	6.2	10.7	7.0	6.6	1.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	13.1	
22-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.8	2.3	0.5	0.2	0.4	0.3	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	2.3
23-Sep	Z	4.8	1.2	0.0	1.3	33.5	14.2	35.9	24.3	13.0	1.4	0.8	0.8	0.4	0.3	0.6	0.2	0.2	0.0	0.1	2.7	0.1	3.0	0.1	6.0	35.9	
24-Sep	1.7	Z	0.4	0.0	0.0	0.0	1.2	1.7	0.3	0.4	0.3	0.7	0.5	0.4	1.1	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.4	1.7	
25-Sep	2.1	2.0	Z	0.0	0.0	0.0	0.0	0.0	0.4	5.6	23.4	43.3	7.1	4.0	0.8	1.2	0.8	10.5	8.9	8.4	7.9	6.8	3.0	1.2	6.0	43.3	
26-Sep	7.0	1.1	4.2	Z	6.5	8.4	42.2	46.2	57.1	10.3	5.3	3.4	2.0	0.4	0.1	0.1	0.7	0.1	0.0	0.0	2.3	11.4	15.6	0.0	9.8	57.1	
27-Sep	7.4	3.1	0.3	2.1	Z	1.2	6.1	22.1	16.8	34.4	86.8	28.3	7.7	0.2	0.1	0.3	0.0	2.4	2.2	2.2	22.3	18.0	5.0	0.1	11.7	86.8	
28-Sep	2.2	7.7	6.3	1.7	2.1	Z	5.9	6.8	1.3	0.7	1.4	0.5	1.5	1.4	2.8	1.7	0.5	0.3	0.9	0.8	0.7	0.1	0.1	0.4	2.1	7.7	
29-Sep	Z	0.1	0.6	0.2	0.0	0.6	0.9	0.3	1.0	0.2	1.0	0.7	0.4	0.5	0.1	1.3	0.8	1.2	0.6	0.2	0.1	1.9	6.3	0.2	0.8	6.3	
30-Sep	1.0	Z	0.2	0.5	2.4	0.9	0.1	0.2	0.5	0.2	0.7	0.9	1.4	8.7	9.6	2.7	0.8	0.2	0.1	0.1	10.4	68.1	121.4	24.8	11.1	121.4	

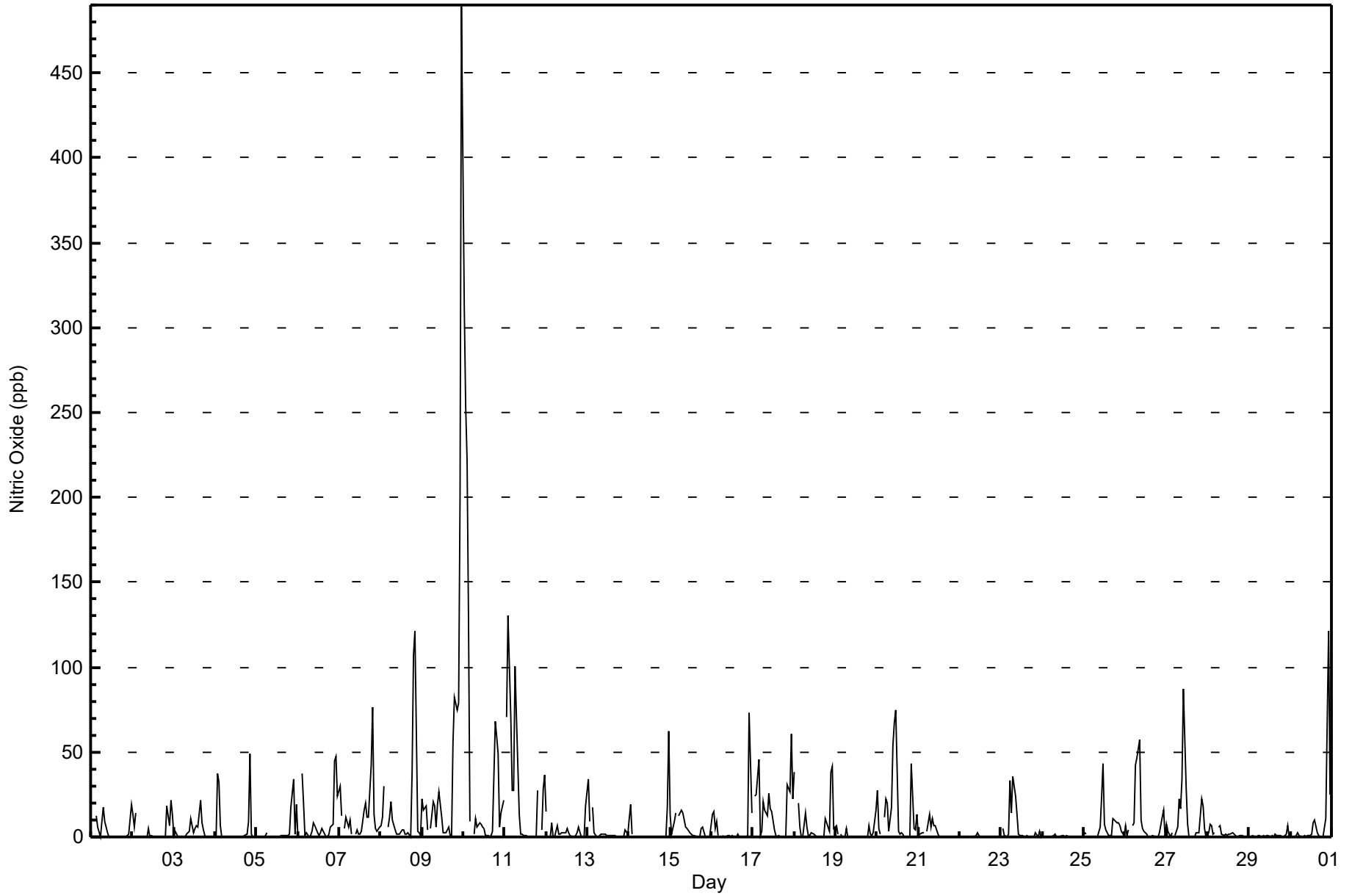
22.6	20.3	22.6	14.2	3.6	5.4	11.1	10.1	7.1	7.4	9.8	7.2	1.9	1.5	1.8	2.2	1.0	1.3	8.0	13.6	16.4	12.2	22.6	27.0	Diurnal Average	
312.0	253.5	222.0	128.5	27.3	33.5	100.7	70.8	57.1	53.7	86.8	74.7	7.7	8.7	15.7	21.5	11.5	11.4	68.4	107.3	121.5	79.3	200.2	489.1	Diurnal Maximum	

Z - zerspan C - Calibration M - Maintenance DF - DAS Failure



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	602	88.01	88.01
21 - 40	41	5.99	94.01
41 - 80	28	4.09	98.10
81 - 159	8	1.17	99.27
> 159	5	0.73	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

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

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	53	14	5	4	5	4	11	109	127	93	58	25	20	28	30	16	602
21 - 40	4	2	0	0	0	1	3	15	2	4	2	4	0	1	1	2	41
11 - 80	4	2	1	0	1	1	7	5	2	1	3	0	0	0	1	0	28
81 - 159	0	2	0	0	0	1	1	2	1	1	0	0	0	0	0	0	8
> 159	0	0	0	0	0	0	3	2	0	0	0	0	0	0	0	0	5
Totals	61	20	6	4	6	7	25	133	132	99	63	29	20	29	32	18	684

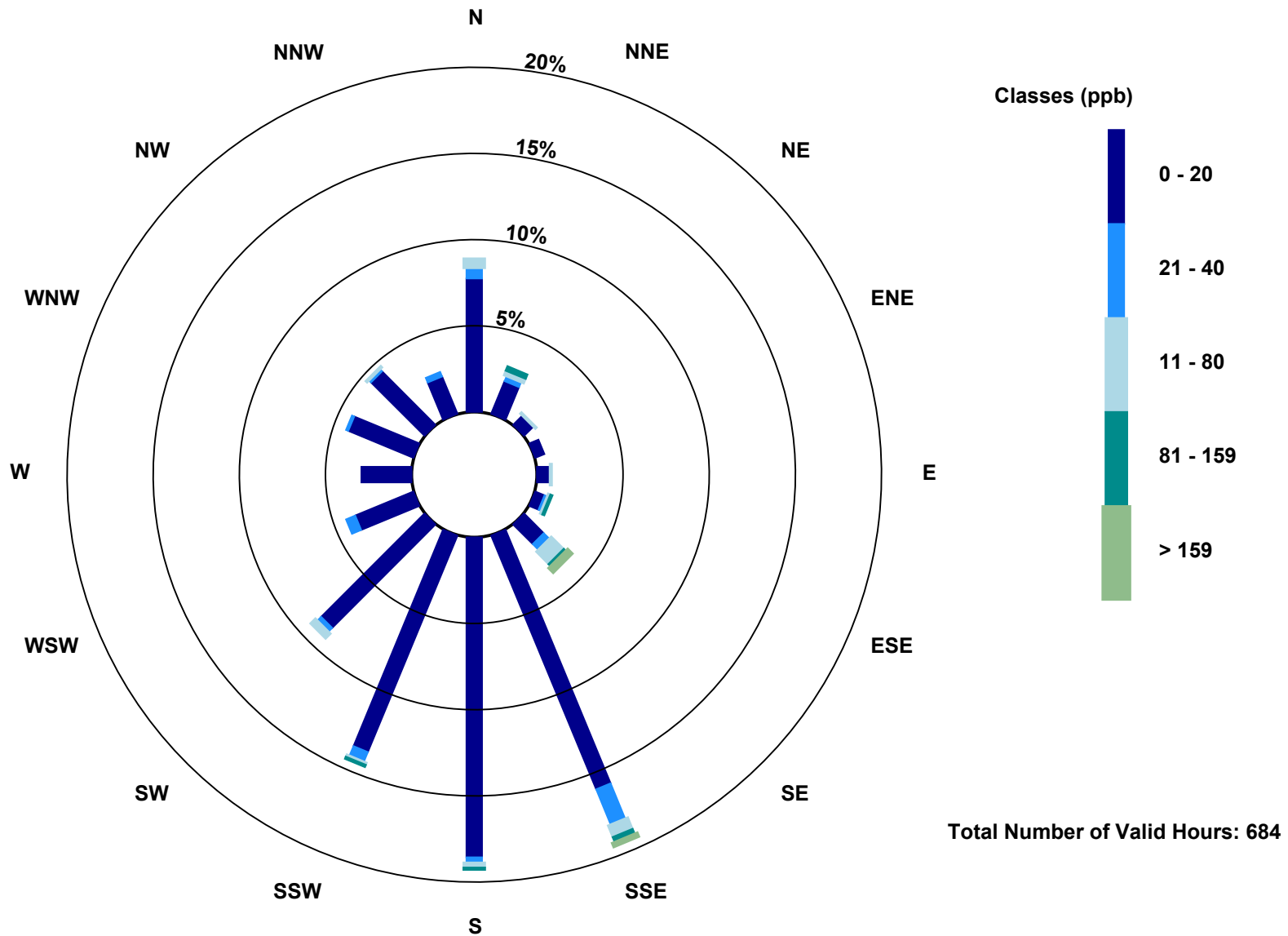
Total Number of Valid Hours: 684

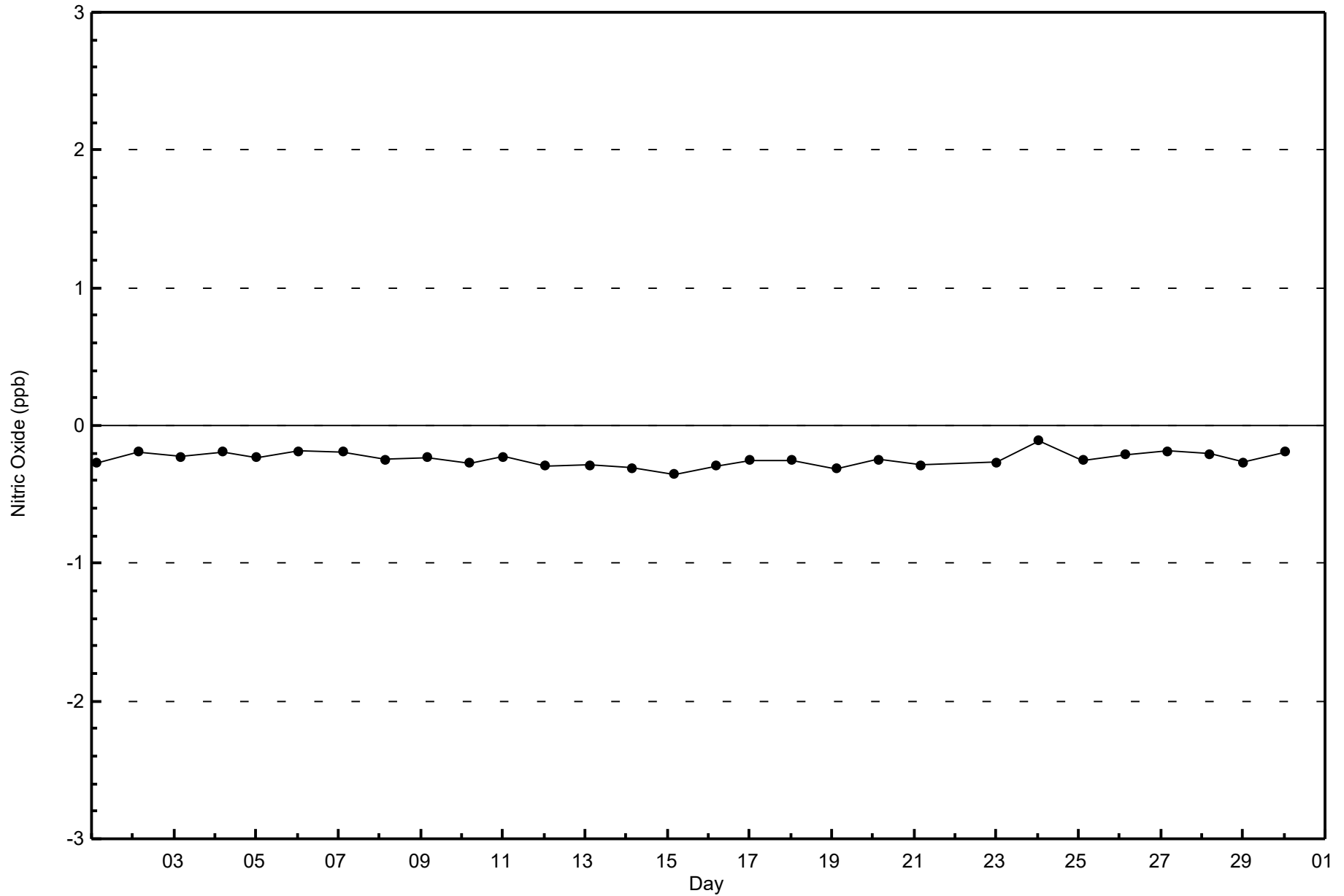
Total Number of Hours: 720

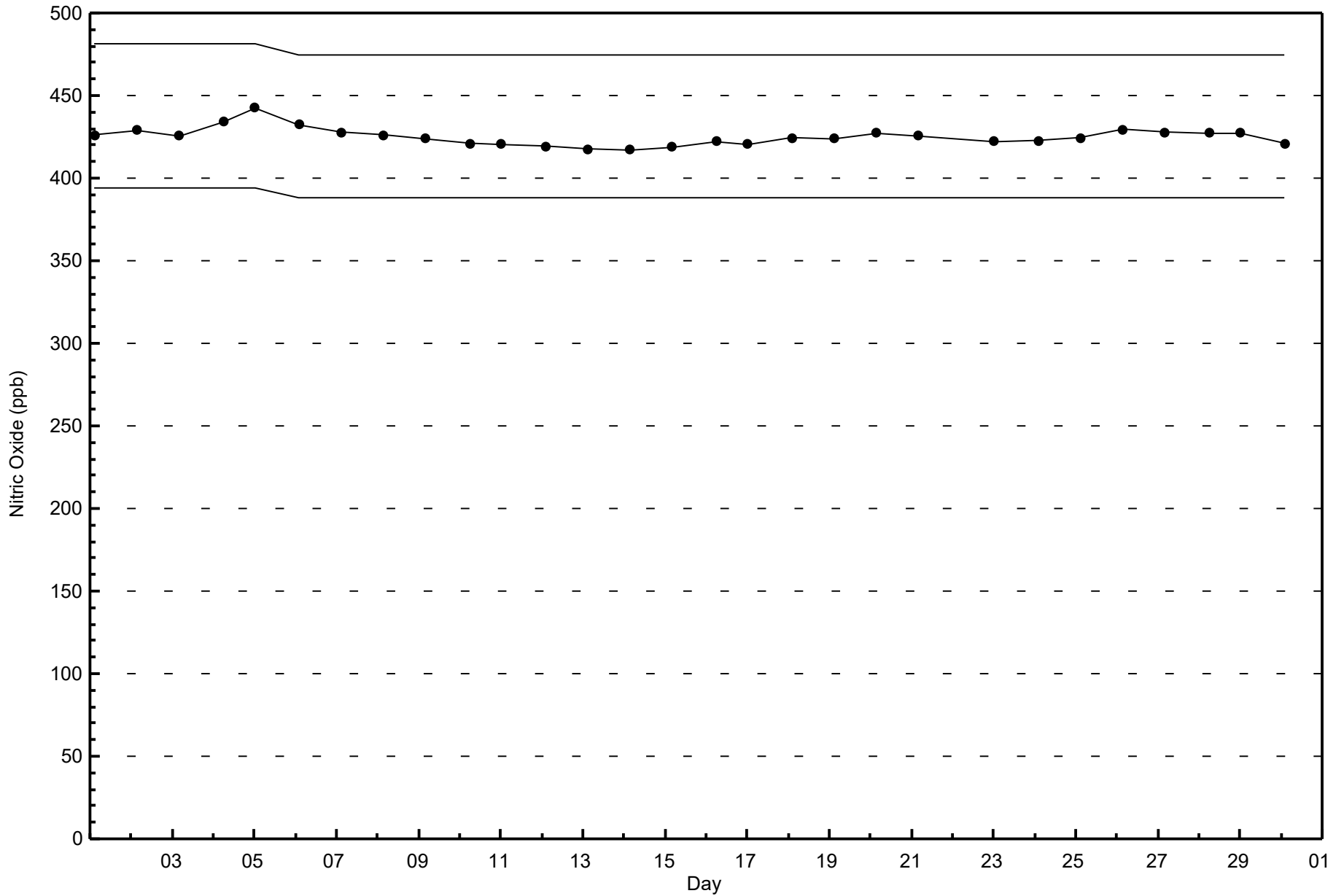


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitric Oxide (NO) - ppb
Fort Hills









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

Fort Hills - September 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 36.5 ppb on Sep 10 19:00	Maximum Daily Average: 14.9 ppb on Sep 17		Hours of Data:	684
Minimum Value: 0.0 ppb on Sep 4 09:00	Minimum Daily Average: 2.9 ppb on Sep 22		Hours of Missing Data:	36
Maximum Diurnal Average: 14.6 ppb at hour 21	Minimum Diurnal Average: 4.5 ppb at hour 14		Hours of Calibration:	34
Monthly Average: 9.01 ppb	Percentiles: P ₁ = 0.2 P ₁₀ = 1.0 Q ₁ = 2.9 Median = 6.1 Q ₃ = 13.4 P ₉₀ = 21.5 P ₉₉ = 33.0		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-Sep	3.1	3.7	Z	7.8	10.6	4.0	11.8	14.2	10.1	3.8	0.4	0.3	0.7	0.8	0.3	0.3	2.2	1.1	7.6	12.1	3.5	26.1	30.9	33.8	8.2	33.8
2-Sep	29.1	23.2	27.3	Z	6.0	5.9	5.8	6.5	5.6	9.5	3.8	10.0	4.5	3.4	2.2	2.3	3.0	3.3	3.3	3.3	20.9	16.2	26.3	24.7	10.7	29.1
3-Sep	15.3	10.3	9.5	8.8	Z	3.6	3.4	10.5	9.7	9.6	14.4	11.6	12.9	16.4	22.5	35.4	29.6	30.4	26.1	12.1	2.2	1.0	0.5	0.1	12.9	35.4
4-Sep	1.3	14.9	14.9	4.7	0.5	Z	0.3	0.2	0.0	0.1	0.1	0.0	0.2	0.1	0.3	0.5	0.7	2.8	11.9	19.2	26.0	11.9	9.6	4.5	5.4	26.0
5-Sep	Z	0.9	0.2	0.6	3.3	7.7	8.0	C	C	C	C	C	2.0	2.8	4.3	3.7	3.2	3.3	2.6	3.7	21.2	26.2	5.5	17.5	6.5	26.2
6-Sep	5.4	Z	20.6	21.5	7.4	14.5	8.6	7.1	11.5	11.6	9.3	5.3	2.6	7.2	5.6	2.9	1.0	1.6	8.8	19.1	16.5	16.5	14.3	14.8	10.2	21.5
7-Sep	9.7	6.8	Z	4.4	5.8	4.8	4.2	1.7	M	2.0	4.3	3.5	2.7	6.2	17.3	19.6	20.3	24.5	29.0	29.6	18.4	10.7	9.9	6.4	11.0	29.6
8-Sep	4.4	10.1	10.6	Z	7.1	8.2	7.9	5.8	3.0	1.6	2.1	3.2	6.6	8.0	6.0	6.7	8.6	5.2	17.1	32.9	29.2	12.4	7.0	4.1	9.0	32.9
9-Sep	7.0	9.3	8.7	7.3	Z	8.2	6.5	5.6	4.4	11.3	15.2	11.7	5.7	11.7	10.6	13.2	6.9	10.8	31.9	31.8	29.1	26.5	24.8	33.6	14.4	33.6
10-Sep	28.0	27.2	26.5	19.5	7.8	Z	3.4	6.1	6.1	8.3	8.3	8.3	8.3	3.6	3.1	2.9	3.9	15.5	36.5	31.4	27.6	15.4	18.6	20.7	14.7	36.5
11-Sep	Z	20.3	23.1	20.7	17.1	17.7	20.3	23.7	11.4	4.9	4.6	3.9	2.8	1.9	2.1	1.7	2.2	2.1	4.2	23.4	DF	10.2	26.3	27.6	12.4	27.6
12-Sep	21.4	Z	11.4	25.5	18.7	9.9	14.2	11.5	7.3	7.0	7.6	7.4	9.2	8.3	4.7	3.6	2.7	13.8	25.7	32.0	18.4	1.6	2.0	8.7	11.9	32.0
13-Sep	14.8	7.8	Z	8.7	3.1	1.7	3.7	2.9	3.8	3.6	3.3	2.4	1.9	1.5	2.0	2.0	3.4	2.9	5.2	13.1	12.2	10.1	18.4	13.2	6.2	18.4
14-Sep	15.6	14.8	5.5	Z	1.6	0.5	0.6	0.4	0.5	0.7	0.9	0.9	1.0	1.1	0.5	0.4	0.4	0.5	0.9	0.9	0.9	0.8	10.1	21.7	3.5	21.7
15-Sep	12.3	3.6	4.3	6.9	Z	11.7	9.2	8.7	7.1	6.8	5.9	4.5	3.7	3.1	3.5	2.0	1.8	1.7	13.9	16.6	3.7	4.6	4.1	4.3	6.3	16.6
16-Sep	18.1	17.9	15.4	15.7	9.6	Z	14.9	5.2	3.2	4.1	3.5	3.3	2.7	1.6	1.0	5.0	1.8	4.4	0.8	0.8	1.1	23.4	30.9	11.9	8.5	30.9
17-Sep	Z	13.8	16.9	18.9	13.0	16.9	18.7	16.8	13.7	22.9	18.7	21.9	12.7	5.3	4.2	4.0	2.2	1.9	1.7	20.5	33.5	24.9	24.8	14.3	14.9	33.5
18-Sep	20.5	Z	12.9	5.9	3.0	5.8	11.4	8.9	5.5	3.5	5.8	4.9	3.0	2.5	5.2	8.6	4.5	2.9	8.6	9.8	8.8	17.9	18.5	6.0	8.0	20.5
19-Sep	8.9	9.8	Z	2.5	0.9	1.4	3.3	0.8	0.7	0.9	0.4	0.5	0.7	0.5	0.5	0.6	0.5	0.8	1.3	4.5	8.5	9.5	12.1	14.9	3.7	14.9
20-Sep	17.1	13.2	8.7	Z	6.1	7.2	8.4	5.4	8.6	18.8	27.7	33.9	8.9	6.9	8.7	8.2	3.4	2.2	3.7	2.9	18.4	12.0	5.2	9.9	10.7	33.9
21-Sep	3.4	3.0	2.9	3.2	Z	11.3	11.0	8.1	7.8	6.5	6.1	3.2	0.5	0.5	0.5	0.5	0.6	0.5	1.4	4.2	1.7	6.5	7.9	5.5	4.2	11.3
22-Sep	5.9	4.1	4.2	5.0	5.0	3.6	1.4	1.0	1.0	2.2	4.8	2.1	1.5	2.1	2.1	1.9	2.1	1.7	1.8	2.0	2.9	2.7	3.0	5.4	2.9	5.9
23-Sep	Z	24.2	16.4	12.1	17.3	26.7	25.3	24.2	25.0	17.0	5.5	3.7	4.2	2.9	2.7	5.3	2.7	7.4	12.3	19.9	22.3	11.8	24.2	13.3	14.2	26.7
24-Sep	25.7	Z	11.6	5.7	4.9	3.7	12.5	10.9	5.2	3.7	3.2	4.3	4.1	3.0	6.8	2.5	0.6	0.7	5.0	8.7	15.7	15.1	9.6	6.2	7.4	25.7
25-Sep	16.5	16.6	Z	4.0	0.8	0.8	2.0	1.4	1.7	6.8	15.3	26.7	19.2	16.1	7.0	9.6	9.2	21.5	24.8	23.4	18.5	16.5	14.2	9.7	12.3	26.7
26-Sep	17.5	10.6	15.3	Z	18.0	19.1	24.0	18.7	19.4	12.3	9.9	7.4	5.8	3.6	3.4	4.5	14.6	7.0	3.2	6.0	16.8	19.7	23.6	7.5	12.5	24.0
27-Sep	16.6	15.9	6.1	8.8	Z	7.4	11.1	13.5	11.6	20.5	35.7	29.4	14.5	2.2	1.9	2.5	1.4	14.2	14.2	8.1	24.1	24.1	16.5	6.7	13.3	35.7
28-Sep	9.1	14.1	14.4	9.5	8.0	Z	7.1	6.2	3.2	2.5	3.2	1.6	2.9	3.3	5.6	6.8	3.6	4.5	5.2	4.1	3.9	0.9	1.5	3.4	5.4	14.4
29-Sep	Z	3.3	3.0	2.3	1.3	3.1	3.2	2.0	2.2	0.6	1.6	1.2	0.8	1.1	0.3	3.9	3.4	5.3	5.1	1.2	3.6	7.4	11.8	5.7	3.2	11.8
30-Sep	4.1	Z	7.1	7.1	5.4	3.5	2.7	3.1	2.2	0.8	1.2	1.6	2.0	5.9	8.5	5.5	3.7	2.8	6.5	10.3	12.8	16.4	15.3	10.0	6.0	16.4

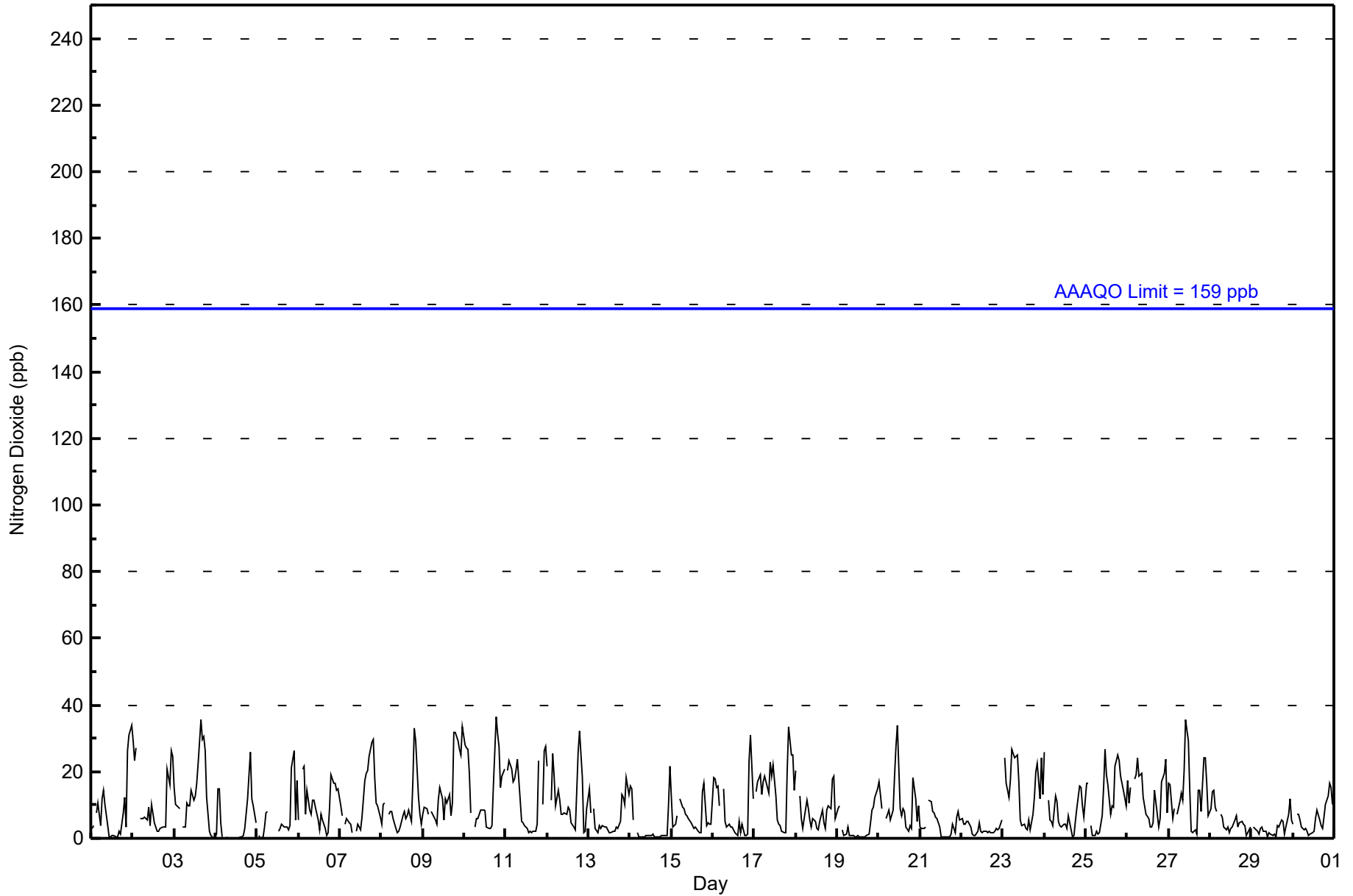
13.2	12.0	11.9	9.5	7.3	8.0	8.8	8.0	6.8	7.0	7.7	7.5	4.9	4.5	4.8	5.6	4.8	6.6	10.7	13.6	14.6	13.3	14.2	12.2	Diurnal Average	
29.1	27.2	27.3	25.5	18.7	26.7	25.3	24.2	25.0	22.9	35.7	33.9	19.2	16.4	22.5	35.4	29.6	30.4	36.5	32.9	33.5	26.5	30.9	33.8	Diurnal Maximum	

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 - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	606	88.60	88.60
21 - 40	78	11.40	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: 684

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

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

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	57	12	5	3	5	4	9	121	128	89	57	24	19	28	30	15	606
21 - 40	4	8	1	1	1	3	16	12	4	10	6	5	1	1	2	3	78
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	61	20	6	4	6	7	25	133	132	99	63	29	20	29	32	18	684

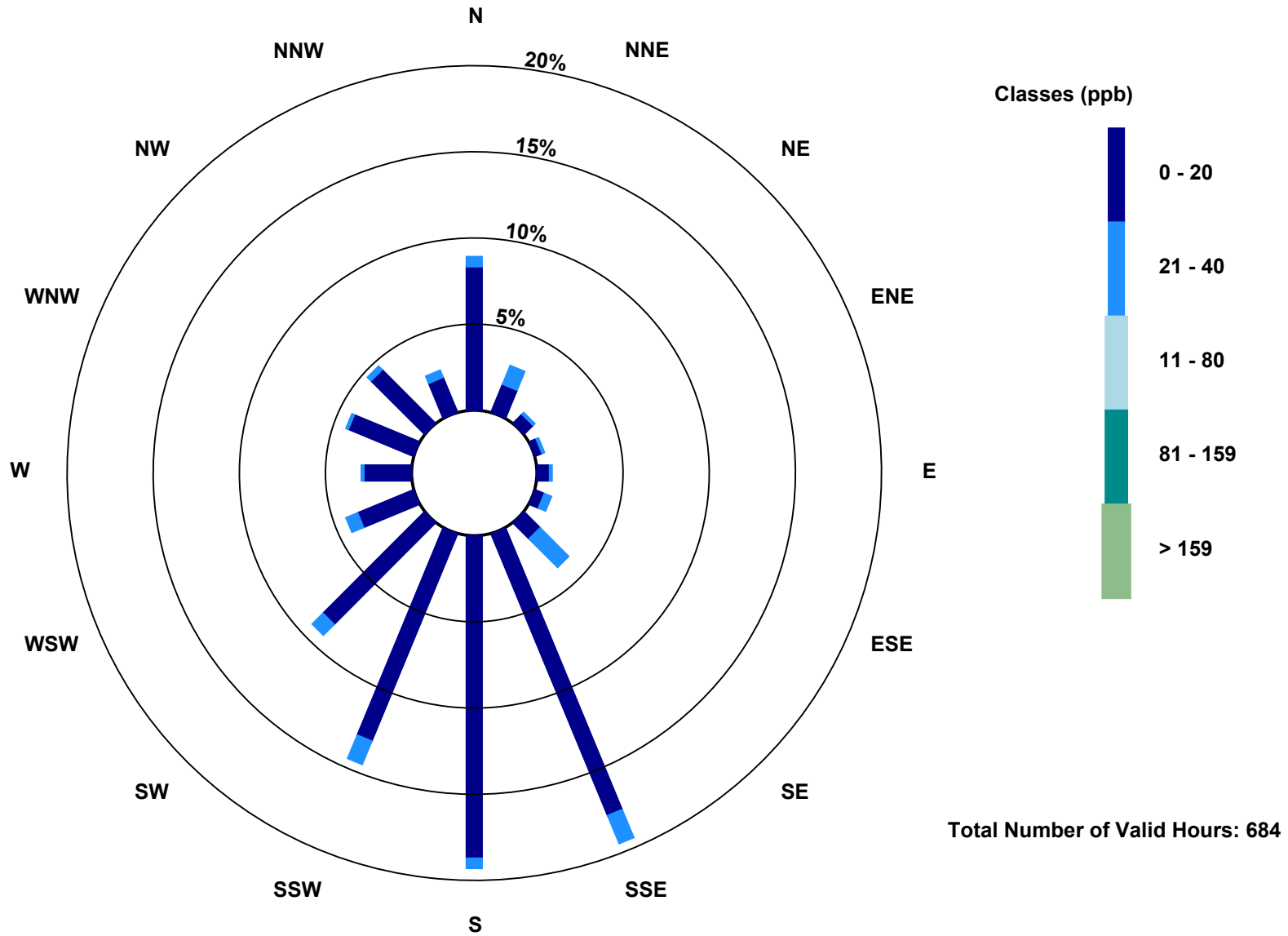
Total Number of Valid Hours: 684

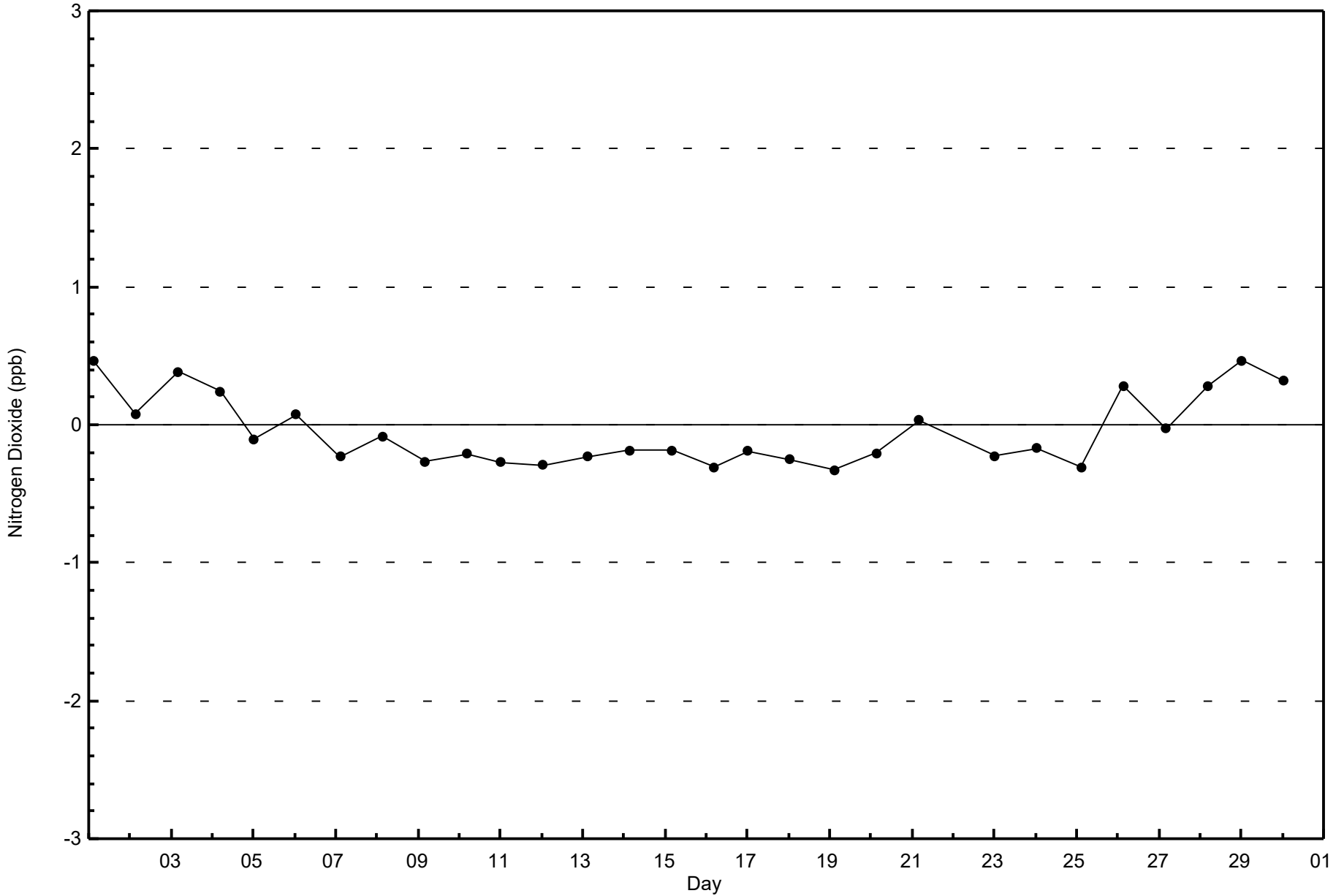
Total Number of Hours: 720

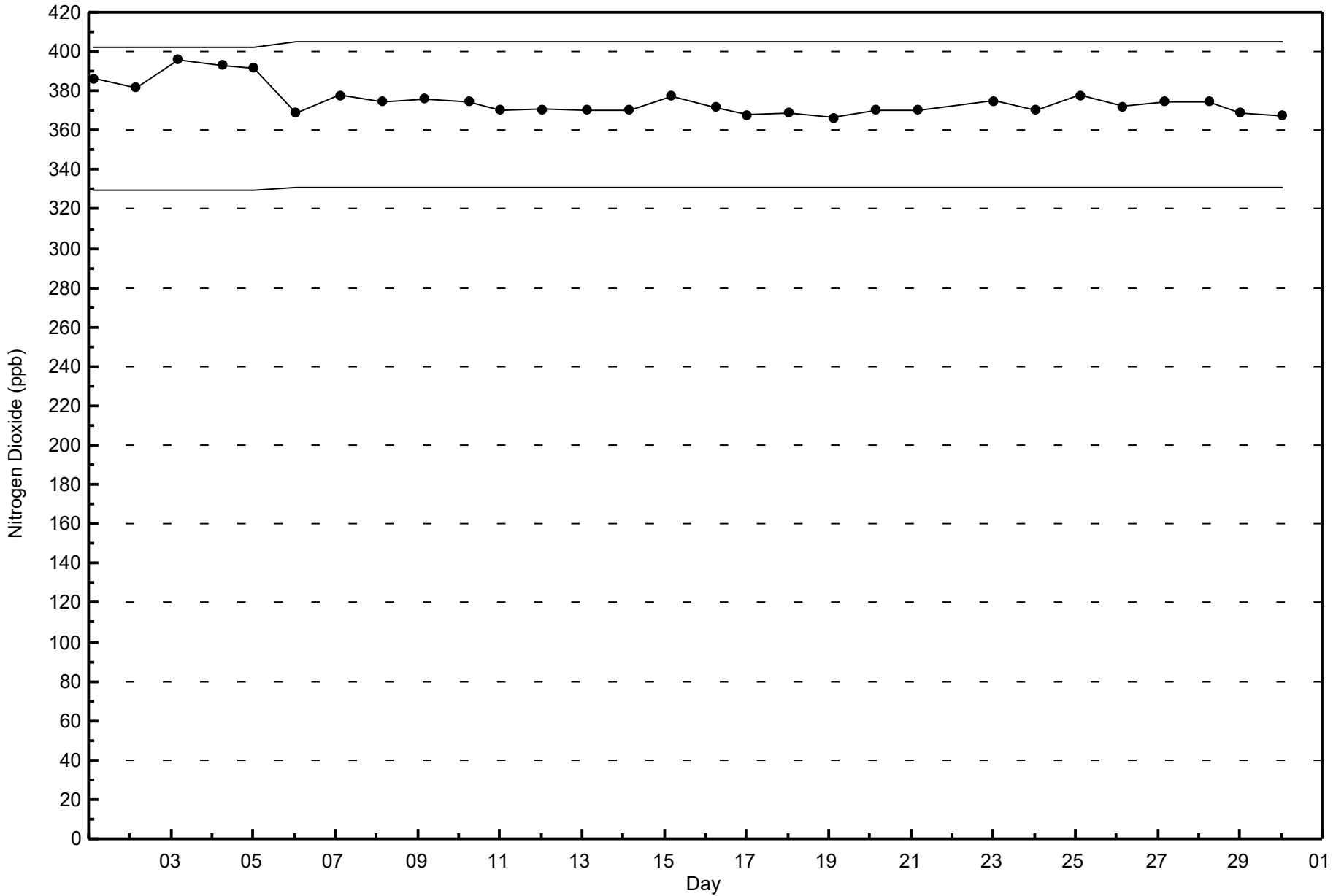


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitrogen Dioxide (NO₂) - ppb
Fort Hills









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_x) - ppb

Fort Hills - September 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 522.7 ppb on Sep 10 00:00	Maximum Daily Average: 66.5 ppb on Sep 10		Hours of Data:	684
Minimum Value: 0.0 ppb on Sep 4 12:00	Minimum Daily Average: 3.1 ppb on Sep 22		Hours of Missing Data:	36
Maximum Diurnal Average: 39.2 ppb at hour 24	Minimum Diurnal Average: 5.8 ppb at hour 17		Hours of Calibration:	34
Monthly Average: 19.28 ppb	Percentiles: P ₁ = 0.2 P ₁₀ = 1.1 Q ₁ = 3.4 Median = 8.7 Q ₃ = 21.8 P ₉₀ = 42.1 P ₉₉ = 148.5		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-Sep	3.1	3.7	Z	20.3	16.7	4.0	21.0	31.8	18.9	6.1	0.5	0.3	0.9	1.0	0.3	0.3	2.5	1.1	7.7	12.1	3.5	27.1	32.9	53.0	11.7	53.0
2-Sep	42.6	28.9	41.6	Z	6.1	5.9	5.8	6.5	6.0	14.1	3.8	11.2	4.5	3.4	2.2	2.3	3.0	3.3	3.3	3.3	39.1	23.1	48.2	37.8	15.0	48.2
3-Sep	16.0	13.6	9.6	8.9	Z	3.7	3.4	11.9	12.5	12.9	24.8	14.5	17.7	23.1	28.6	56.9	38.1	34.1	27.2	12.3	2.2	1.0	0.5	0.1	16.2	56.9
4-Sep	1.4	52.6	47.4	11.2	0.5	Z	0.3	0.2	0.0	0.1	0.2	0.0	0.2	0.1	0.4	0.6	0.8	3.2	13.3	28.0	75.4	13.8	9.8	4.5	11.5	75.4
5-Sep	Z	0.9	0.2	0.6	3.7	8.1	10.8	C	C	C	C	C	2.2	3.0	4.7	4.2	3.7	3.8	3.1	5.1	38.4	60.7	6.8	36.5	10.9	60.7
6-Sep	5.4	Z	58.3	41.4	8.0	16.7	9.0	7.8	14.6	20.2	16.3	7.4	3.5	9.6	10.8	4.3	1.1	1.7	10.2	25.0	24.0	61.6	61.4	39.0	19.9	61.6
7-Sep	39.4	19.2	Z	9.3	17.8	10.7	14.6	3.8	M	4.1	8.1	5.6	4.0	9.7	33.0	39.6	31.8	35.9	71.3	106.3	31.5	15.9	13.2	12.3	24.4	106.3
8-Sep	11.2	21.9	40.1	Z	13.1	19.9	28.6	15.7	6.8	3.0	3.7	5.3	11.1	11.8	7.6	8.7	10.9	5.6	55.5	140.2	150.7	15.9	9.5	5.0	26.2	150.7
9-Sep	29.6	25.4	27.3	11.7	Z	13.4	27.6	24.1	10.3	30.7	41.9	23.5	8.5	14.4	13.4	18.7	7.9	11.9	87.8	114.2	103.8	105.8	225.0	522.7	65.2	522.7
10-Sep	340.0	280.7	248.5	148.0	17.3	Z	5.2	16.7	11.5	17.0	15.8	13.9	13.5	4.4	3.7	3.3	4.4	18.6	104.9	90.2	76.2	21.3	32.7	42.1	66.5	340.0
11-Sep	Z	90.9	153.4	91.0	44.4	45.3	121.0	94.5	24.6	6.9	6.1	4.9	3.4	2.1	2.4	1.8	2.4	2.1	4.2	51.0	DF	14.7	54.5	64.4	40.3	153.4
12-Sep	36.1	Z	11.4	33.9	18.7	10.1	20.5	13.0	9.0	9.2	9.9	9.8	14.0	10.6	5.4	3.8	2.7	14.6	28.3	37.6	18.5	1.6	2.0	27.4	15.1	37.6
13-Sep	48.7	17.2	Z	26.4	5.6	1.8	4.1	3.5	5.2	5.3	5.1	3.4	2.6	2.0	2.6	2.6	4.0	3.2	5.3	13.3	12.4	10.1	22.9	14.8	9.7	48.7
14-Sep	26.1	34.3	7.5	Z	1.6	0.5	0.6	0.4	0.5	0.7	0.9	0.9	1.1	1.4	0.6	0.4	0.4	0.5	0.9	1.0	1.1	0.8	27.8	83.9	8.4	83.9
15-Sep	25.5	5.5	13.8	21.0	Z	24.3	24.7	22.7	16.9	12.8	10.6	7.2	5.4	4.2	4.7	2.3	2.0	1.8	18.9	22.6	3.8	4.7	4.1	4.3	11.5	25.5
16-Sep	31.1	33.2	20.7	24.7	10.5	Z	15.3	5.4	3.5	4.6	4.0	3.7	3.1	1.6	1.0	6.6	1.9	4.6	0.8	0.8	1.1	24.2	104.4	26.3	14.5	104.4
17-Sep	Z	38.1	41.5	64.3	13.4	20.6	39.3	32.9	26.2	48.8	35.6	37.2	17.0	6.1	4.6	4.7	2.2	1.9	1.7	20.7	64.0	51.8	85.6	36.3	30.2	85.6
18-Sep	58.8	Z	33.2	11.3	3.3	5.8	25.4	14.6	6.5	4.3	8.5	6.6	3.6	2.7	5.6	8.9	4.9	3.0	19.4	18.3	12.0	56.0	60.0	11.0	16.7	60.0
19-Sep	15.7	11.2	Z	3.9	0.9	1.4	8.4	0.8	0.8	1.1	0.4	0.5	0.7	0.5	0.5	0.7	0.6	0.8	1.4	11.1	9.9	10.6	14.4	31.0	5.5	31.0
20-Sep	44.4	18.3	10.5	Z	17.5	29.7	28.5	8.8	25.8	72.5	95.0	108.6	12.5	8.8	11.1	9.7	3.7	2.6	3.7	2.9	61.5	17.3	9.3	23.3	27.2	108.6
21-Sep	4.4	4.4	5.3	5.3	Z	14.8	24.1	14.3	18.5	13.5	12.7	5.0	0.6	0.5	0.5	0.5	0.6	0.5	1.4	4.2	1.7	6.5	7.9	5.5	6.6	24.1
22-Sep	5.9	4.1	4.2	5.0	5.0	3.6	1.4	1.0	1.1	3.0	7.1	2.6	1.7	2.5	2.4	2.1	2.3	1.8	1.8	2.0	2.9	2.7	3.0	5.4	3.1	7.1
23-Sep	Z	29.0	17.6	12.1	18.6	60.2	39.5	60.1	49.3	30.0	6.9	4.5	5.0	3.3	3.0	5.9	2.9	7.6	12.3	20.0	25.0	11.9	27.2	13.4	20.2	60.2
24-Sep	27.4	Z	12.0	5.7	4.9	3.7	13.7	12.6	5.5	4.1	3.5	5.0	4.6	3.4	7.9	2.7	0.6	0.7	5.0	8.7	15.7	15.2	9.6	6.2	7.8	27.4
25-Sep	18.6	18.6	Z	4.0	0.8	0.8	2.0	1.4	2.1	12.4	38.7	70.0	26.3	20.1	7.8	10.8	10.0	32.0	33.7	31.8	26.4	23.3	17.2	10.9	18.2	70.0
26-Sep	24.5	11.7	19.5	Z	24.5	27.5	66.2	64.9	76.5	22.6	15.2	10.8	7.8	4.0	3.5	4.6	15.3	7.1	3.2	6.0	19.1	31.1	39.2	7.5	22.3	76.5
27-Sep	24.0	19.0	6.4	10.9	Z	8.6	17.2	35.6	28.4	54.9	122.5	57.7	22.2	2.4	2.0	2.8	1.4	16.6	16.4	10.3	46.4	42.1	21.5	6.8	25.0	122.5
28-Sep	11.3	21.8	20.7	11.2	10.1	Z	13.0	13.0	4.5	3.2	4.6	2.1	4.4	4.7	8.4	8.5	4.1	4.8	6.1	4.9	4.6	1.0	1.6	3.8	7.5	21.8
29-Sep	Z	3.4	3.6	2.5	1.3	3.7	4.1	2.3	3.2	0.8	2.6	1.9	1.2	1.6	0.4	5.2	4.2	6.5	5.7	1.4	3.7	9.3	18.1	5.9	4.0	18.1
30-Sep	5.1	Z	7.3	7.6	7.8	4.4	2.8	3.3	2.7	1.0	1.9	2.5	3.4	14.6	18.1	8.2	4.5	3.0	6.6	10.4	23.2	84.5	136.7	34.8	17.2	136.7

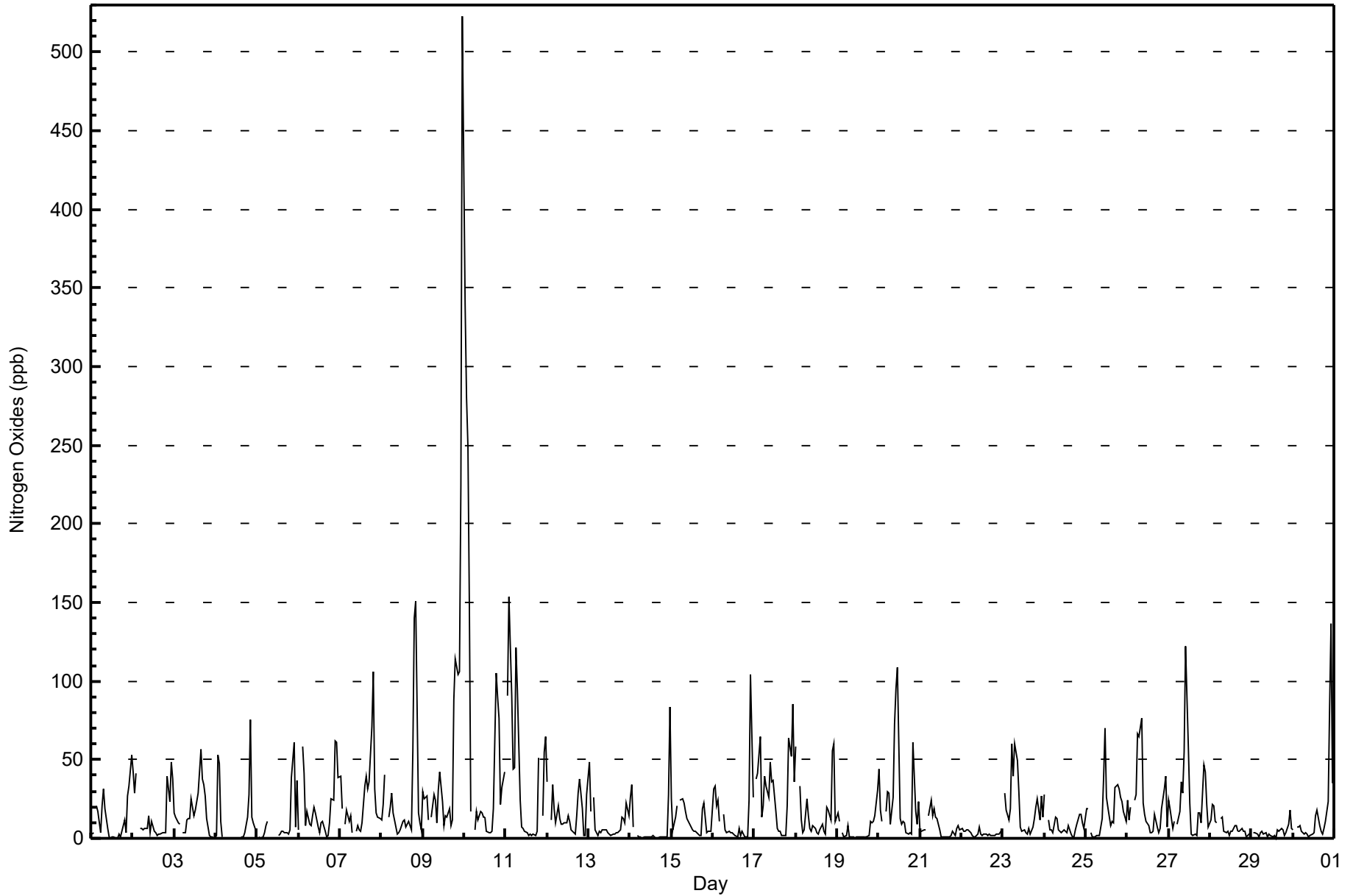
35.9	32.3	34.5	23.7	10.9	13.4	19.9	18.1	14.0	14.5	17.5	14.7	6.9	5.9	6.6	7.7	5.8	7.8	18.7	27.2	31.0	25.5	36.9	39.2	Diurnal Average	
340.0	280.7	248.5	148.0	44.4	60.2	121.0	94.5	76.5	72.5	122.5	108.6	26.3	23.1	33.0	56.9	38.1	35.9	104.9	140.2	150.7	105.8	225.0	522.7	Diurnal Maximum	

Z - zerspan C - Calibration M - Maintenance DF - DAS Failure



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	503	73.54	73.54
21 - 40	107	15.64	89.18
41 - 80	46	6.73	95.91
81 - 159	23	3.36	99.27
> 159	5	0.73	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

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

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	45	11	5	2	4	2	4	84	117	84	44	16	18	27	28	12	503
21 - 40	8	4	0	2	0	2	7	32	11	9	14	10	1	1	3	3	107
11 - 80	6	3	0	0	1	1	6	11	1	4	5	3	1	1	0	3	46
81 - 159	2	2	1	0	1	2	5	4	3	2	0	0	0	0	1	0	23
> 159	0	0	0	0	0	0	3	2	0	0	0	0	0	0	0	0	5
Totals	61	20	6	4	6	7	25	133	132	99	63	29	20	29	32	18	684

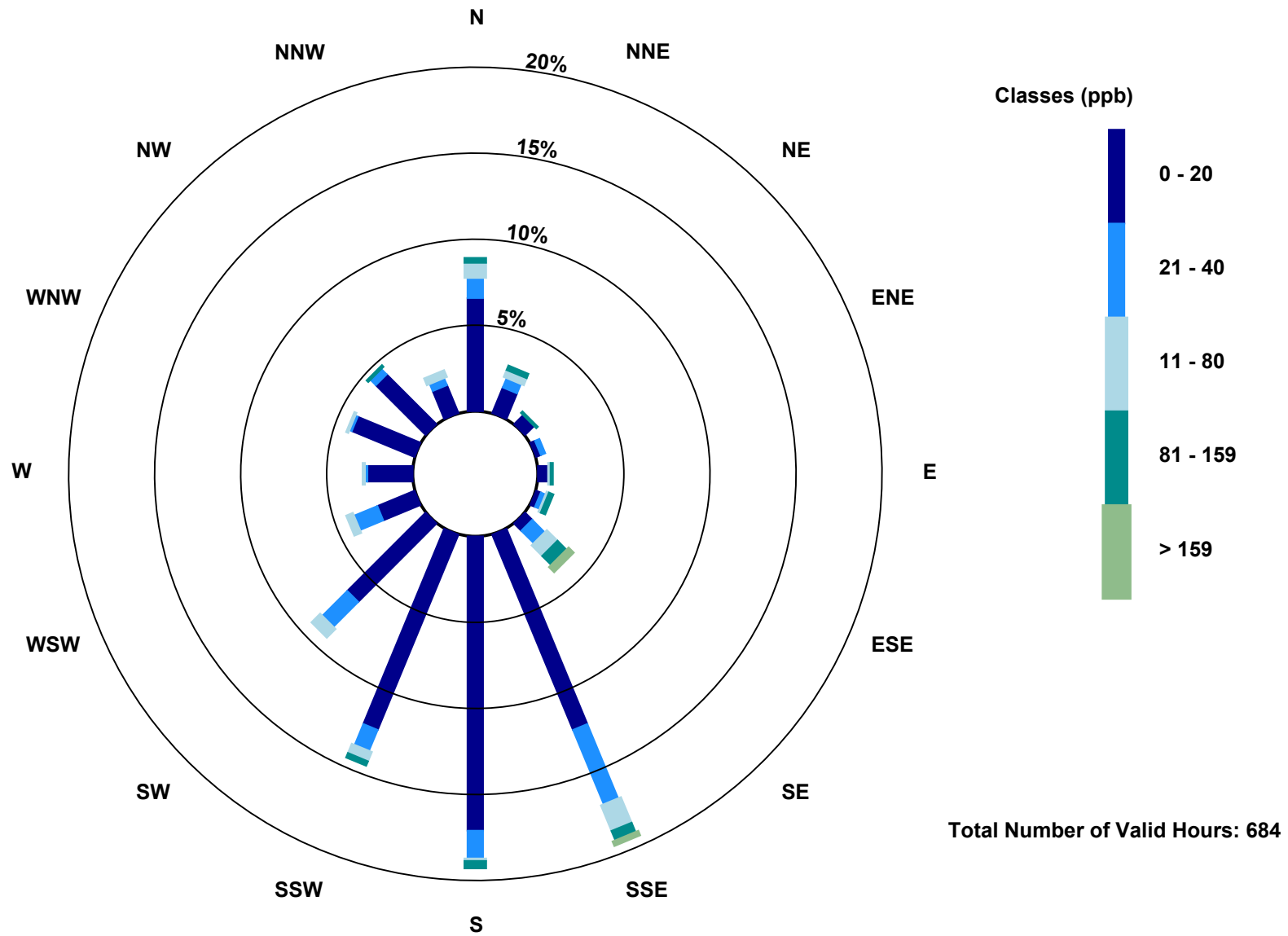
Total Number of Valid Hours: 684

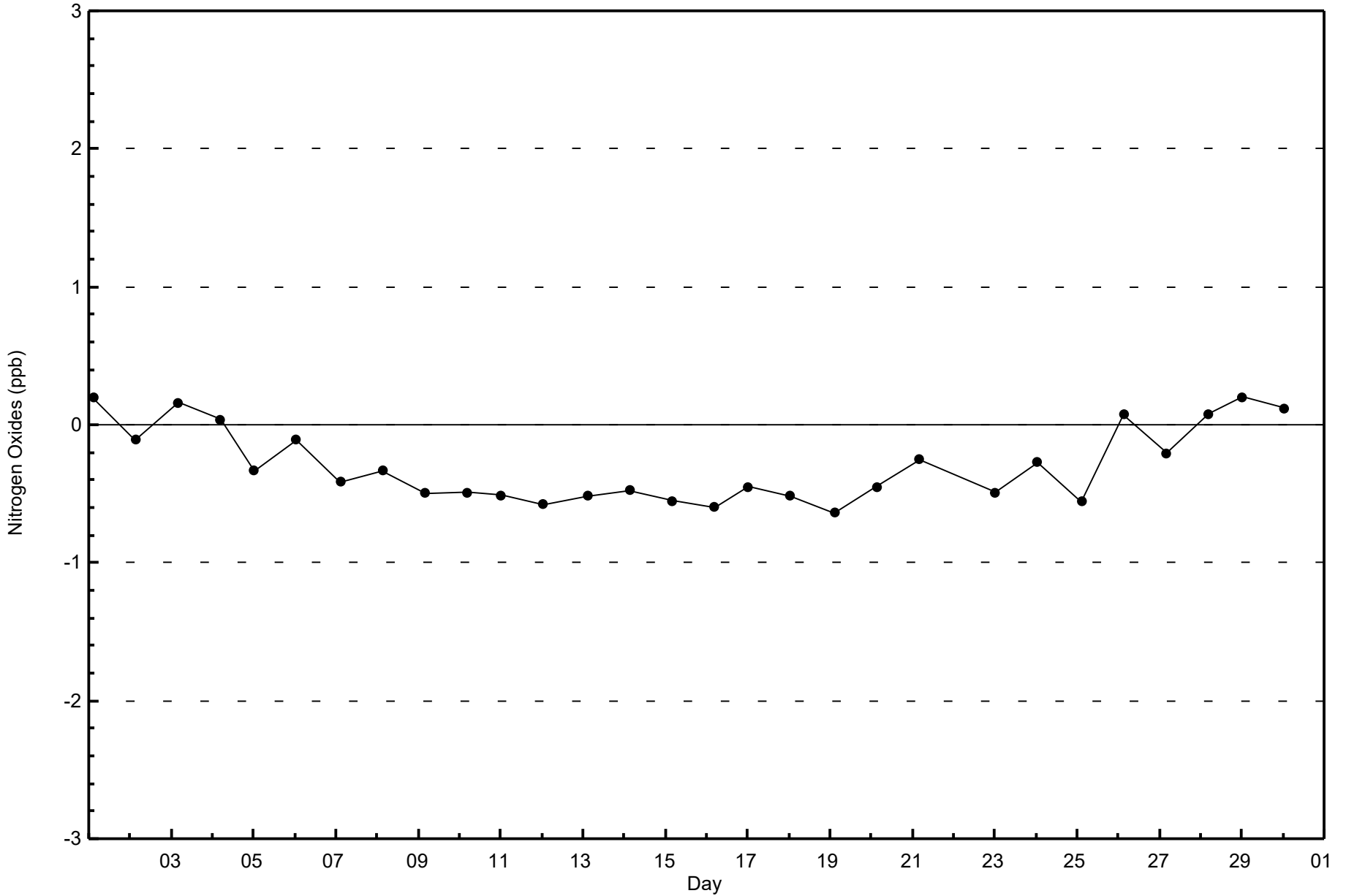
Total Number of Hours: 720

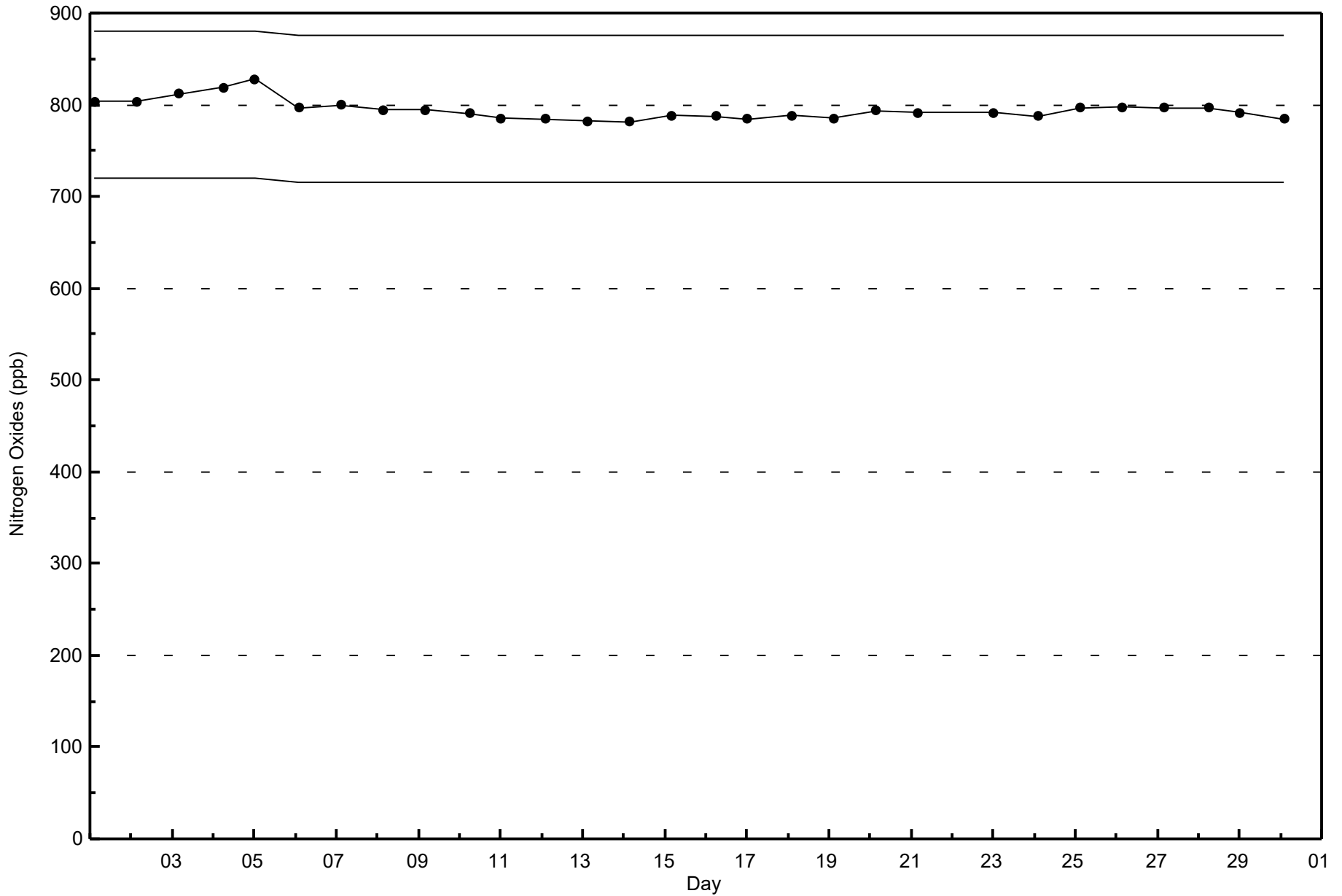


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitrogen Oxides (NO_x) - ppb
Fort Hills









Summary of Hour Averages

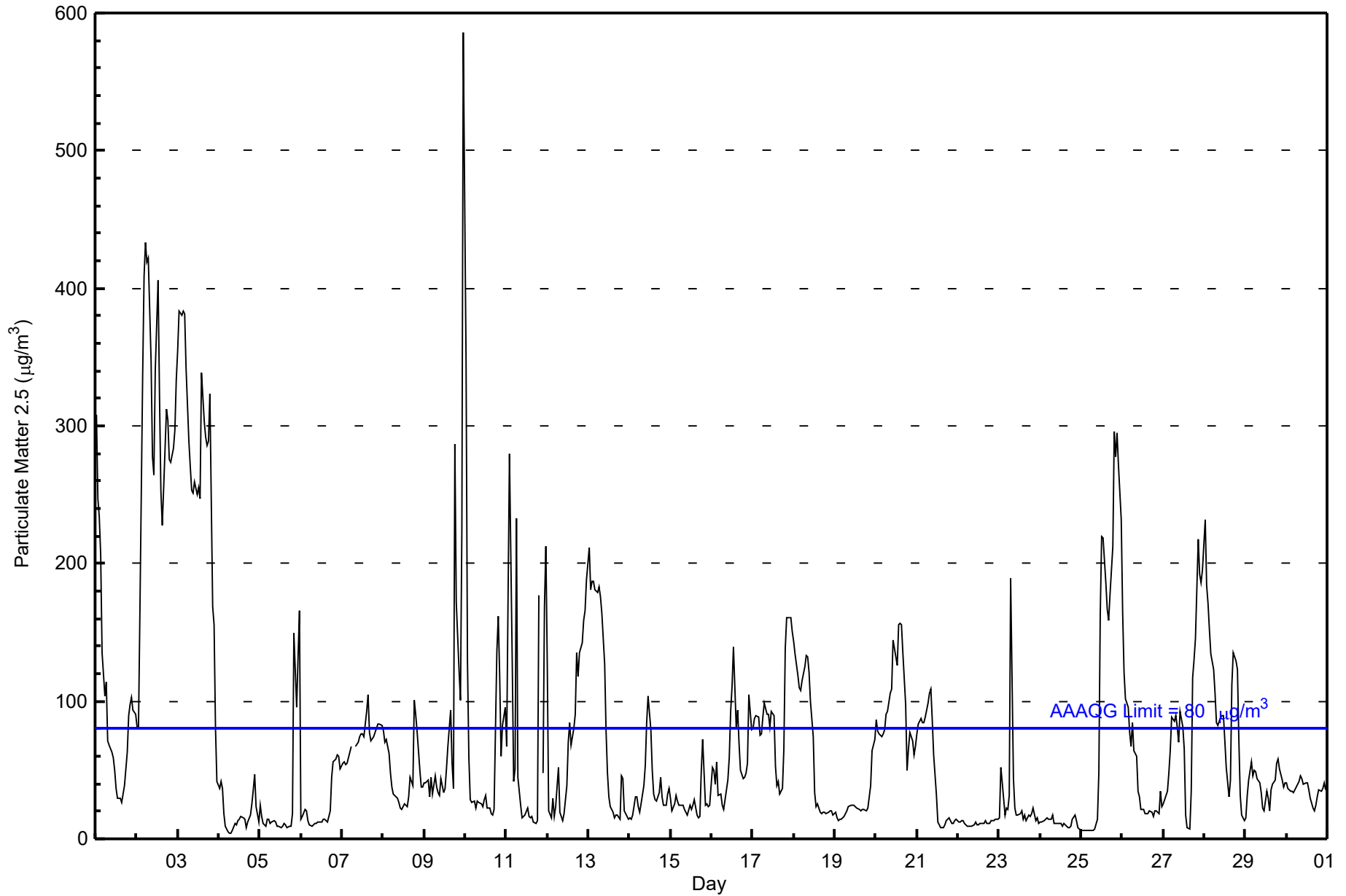
Fort Hills - September 2023

Number of Exceedences (AAAQO):	1-hr: 217	24-hr: 23	Hours in Service:	720
Maximum Value: 585.7 µg/m ³ on Sep 10 00:00	Maximum Daily Average: 296.7 µg/m ³ on Sep 2		Hours of Data:	717
Minimum Value: 3.7 µg/m ³ on Sep 4 07:00	Minimum Daily Average: 11.6 µg/m ³ on Sep 22		Hours of Missing Data:	3
Maximum Diurnal Average: 98.1 µg/m ³ at hour 24	Minimum Diurnal Average: 55.6 µg/m ³ at hour 16		Hours of Calibration:	2
Monthly Average: 73.75 µg/m ³	Percentiles: P ₁ = 6.0 P ₁₀ = 11.8 Q ₁ = 18.5 Median = 39.5 Q ₃ = 90.1 P ₉₀ = 183.6 P ₉₉ = 383.0		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-Sep	308.3	246.9	233.6	206.0	134.9	103.3	114.0	71.1	68.0	63.0	59.2	49.8	36.6	29.9	29.8	26.9	32.7	38.3	62.7	89.5	98.1	102.6	94.1	90.5	99.6	308.3
2-Sep	81.3	80.0	162.5	337.4	409.1	432.9	418.5	422.0	347.4	277.8	264.6	341.1	405.3	323.5	253.3	227.8	255.4	312.4	304.6	276.0	273.5	283.6	297.4	333.8	296.7	432.9
3-Sep	355.0	383.8	380.2	383.3	381.4	342.1	289.0	270.9	253.2	251.1	259.0	250.4	255.6	246.9	338.3	303.0	291.4	286.2	288.9	323.2	169.2	155.6	81.6	41.9	274.2	383.8
4-Sep	37.1	41.2	36.8	18.4	8.9	4.6	3.7	3.9	6.6	11.6	10.3	12.8	13.8	16.6	14.8	13.9	8.5	12.7	17.7	25.3	36.0	46.6	22.9	11.7	18.2	46.6
5-Sep	24.7	16.3	10.8	9.1	14.3	14.1	11.1	12.3	13.3	12.3	9.6	9.2	8.6	9.5	10.7	10.3	8.6	8.8	9.0	18.5	149.9	95.3	131.7	165.6	32.7	165.6
6-Sep	14.0	16.5	21.6	20.7	13.1	10.3	9.3	9.9	11.0	11.7	12.0	12.1	12.7	14.7	13.9	12.5	16.3	20.2	44.7	56.1	57.6	60.7	59.8	51.0	24.3	60.7
7-Sep	54.4	55.5	54.1	55.3	58.9	67.0	C	C	67.6	70.3	74.5	76.7	76.7	74.7	92.3	104.4	76.9	71.6	74.3	77.5	80.7	83.0	83.8	82.5	73.3	104.4
8-Sep	78.4	70.0	72.3	62.4	47.5	37.8	32.4	31.1	29.9	26.2	22.6	21.2	25.2	24.6	23.3	30.5	45.0	39.0	100.9	91.0	78.1	49.8	37.8	37.4	46.4	100.9
9-Sep	40.2	40.5	42.2	30.5	44.4	32.9	45.5	37.2	33.2	31.2	43.4	33.1	36.7	50.4	67.6	93.2	54.6	36.9	286.9	171.7	122.1	100.3	224.5	585.7	95.2	585.7
10-Sep	346.6	129.0	59.1	28.5	26.0	27.1	22.8	27.3	26.0	25.6	22.9	28.9	31.3	22.9	22.3	18.3	17.6	21.7	136.4	161.2	118.8	60.0	82.9	95.2	64.9	346.6
11-Sep	66.8	176.3	279.2	127.5	41.9	50.6	232.9	45.0	24.3	15.7	16.5	17.6	21.9	15.9	15.3	16.5	12.0	11.0	13.0	176.5	DF	47.5	168.7	212.9	78.5	279.2
12-Sep	127.6	20.5	15.4	29.8	16.7	23.6	51.7	19.1	16.5	13.1	17.9	38.3	70.3	84.5	68.4	80.2	90.8	134.8	118.2	134.8	142.9	158.4	165.9	188.6	76.2	188.6
13-Sep	211.3	181.2	186.7	187.3	180.6	179.4	183.3	176.2	163.6	127.5	77.9	47.3	30.7	23.6	18.8	15.7	17.3	17.1	14.6	45.7	43.2	20.2	17.9	14.1	90.9	211.3
14-Sep	15.0	14.1	17.3	30.6	30.1	23.2	19.0	25.5	38.2	52.8	84.3	104.0	79.3	49.8	32.1	28.7	27.7	34.1	45.0	30.4	24.8	24.7	32.4	36.1	37.5	104.0
15-Sep	30.0	20.6	25.6	31.2	27.2	24.1	24.3	24.6	20.9	19.2	16.9	24.2	21.6	24.1	28.4	17.7	15.5	16.4	49.3	72.0	24.2	25.7	23.7	24.1	26.3	72.0
16-Sep	51.7	49.4	39.7	56.0	31.9	32.4	24.3	21.8	28.2	42.8	58.8	93.0	110.8	139.6	80.4	93.7	68.7	49.5	43.5	45.2	47.7	54.9	104.6	79.8	60.4	139.6
17-Sep	80.1	87.0	89.3	88.5	74.9	76.1	88.2	98.3	90.1	91.0	81.8	92.3	89.9	53.3	38.3	41.9	32.6	37.1	64.7	138.7	160.4	160.3	160.7	150.7	90.3	160.7
18-Sep	143.4	134.4	119.3	109.8	108.3	115.0	125.5	133.3	132.1	121.2	99.3	73.9	33.3	23.5	25.1	19.2	18.2	19.7	19.1	18.7	19.5	20.8	20.6	17.8	69.6	143.4
19-Sep	18.9	14.8	13.1	14.7	14.7	16.8	18.0	20.3	23.1	24.2	24.7	24.4	23.7	22.1	21.5	20.4	21.2	20.9	20.7	22.6	30.7	38.5	63.6	71.7	25.2	71.7
20-Sep	86.6	78.6	76.1	74.4	75.9	79.0	90.5	92.9	105.8	108.4	144.6	138.1	125.6	156.0	156.2	155.7	135.2	98.1	49.5	65.5	76.9	71.5	61.5	66.7	98.7	156.2
21-Sep	76.7	83.5	87.5	84.5	84.2	88.7	98.5	106.1	108.7	86.8	60.9	31.8	11.9	10.1	8.3	7.7	9.7	13.0	14.4	15.5	11.5	11.6	13.5	13.9	47.5	108.7
22-Sep	12.5	12.5	13.1	13.1	10.9	9.6	8.7	8.9	9.3	10.0	11.7	10.4	10.0	11.5	11.6	11.3	12.8	11.3	11.1	13.1	13.0	13.7	14.2	14.5	11.6	14.5
23-Sep	15.1	51.5	40.5	17.4	22.6	21.6	31.6	189.7	43.5	22.1	17.1	16.8	18.5	19.9	14.7	17.1	13.0	16.8	16.2	18.3	22.1	13.6	14.9	10.8	28.6	189.7
24-Sep	11.8	12.4	13.6	14.3	15.0	14.3	14.7	17.3	11.1	11.5	11.1	11.6	10.7	9.6	11.3	9.4	8.1	7.7	9.2	14.2	16.9	13.4	8.3	6.8	11.8	17.3
25-Sep	6.0	5.8	6.3	6.4	6.0	5.7	6.0	5.7	7.6	13.8	47.9	163.1	219.3	218.5	185.7	166.7	158.2	178.1	212.3	296.4	278.1	294.9	271.9	231.5	124.7	296.4
26-Sep	164.5	121.1	101.6	95.5	76.8	66.9	84.0	63.8	59.5	34.9	30.1	21.1	20.9	18.8	18.3	18.4	20.6	19.4	16.5	19.9	20.2	18.7	35.0	23.4	48.8	164.5
27-Sep	25.3	28.4	34.3	47.8	63.6	88.5	85.3	89.8	81.6	69.7	92.9	81.0	65.2	17.2	8.3	7.6	34.5	117.0	129.9	145.3	217.7	192.0	186.0	195.0	87.7	217.7
28-Sep	231.4	183.9	170.9	151.4	134.2	123.0	105.5	84.7	82.9	88.5	89.8	89.5	70.9	52.3	30.1	43.1	112.4	135.6	128.8	123.6	72.4	32.0	17.3	13.4	98.6	231.4
29-Sep	15.6	31.2	42.5	55.5	46.2	49.8	49.0	44.2	40.6	33.9	22.3	20.2	34.8	29.1	20.7	35.3	39.5	43.1	55.3	57.8	50.4	42.4	38.1	40.7	39.1	57.8
30-Sep	40.3	36.8	34.8	34.3	33.8	35.5	40.0	42.0	45.6	43.3	39.5	40.9	40.2	35.1	29.1	22.0	20.2	24.1	30.6	35.8	34.9	36.5	40.6	35.9	35.5	45.6

92.4	80.8	82.7	80.7	74.5	73.2	80.3	75.7	66.3	60.4	60.8	65.8	67.1	60.9	56.3	55.6	55.8	61.7	79.6	92.7	85.9	77.6	85.9	98.1	Diurnal Average
355.0	383.8	380.2	383.3	409.1	432.9	418.5	422.0	347.4	277.8	264.6	341.1	405.3	323.5	338.3	303.0	291.4	312.4	304.6	323.2	278.1	294.9	297.4	585.7	Diurnal Maximum

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	3	0.42	0.42
6 - 15	132	18.41	18.83
16 - 25	133	18.55	37.38
26 - 80	235	32.78	70.15
> 81.0	214	29.85	100.00

Total Number of Valid Hours: 717

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - μg/m³
Fort Hills - September 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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	3
6 - 15	1	0	0	1	2	2	4	24	48	30	4	4	2	1	5	4	132
16 - 25	8	1	0	0	2	0	3	28	38	22	9	7	4	8	3	0	133
26 - 80	25	9	1	2	0	1	6	48	33	34	29	10	6	14	11	6	235
> 81.0	30	10	5	1	2	4	13	44	19	18	22	8	11	8	11	8	214
Totals	64	20	6	4	6	7	26	144	138	104	64	29	23	31	32	19	717

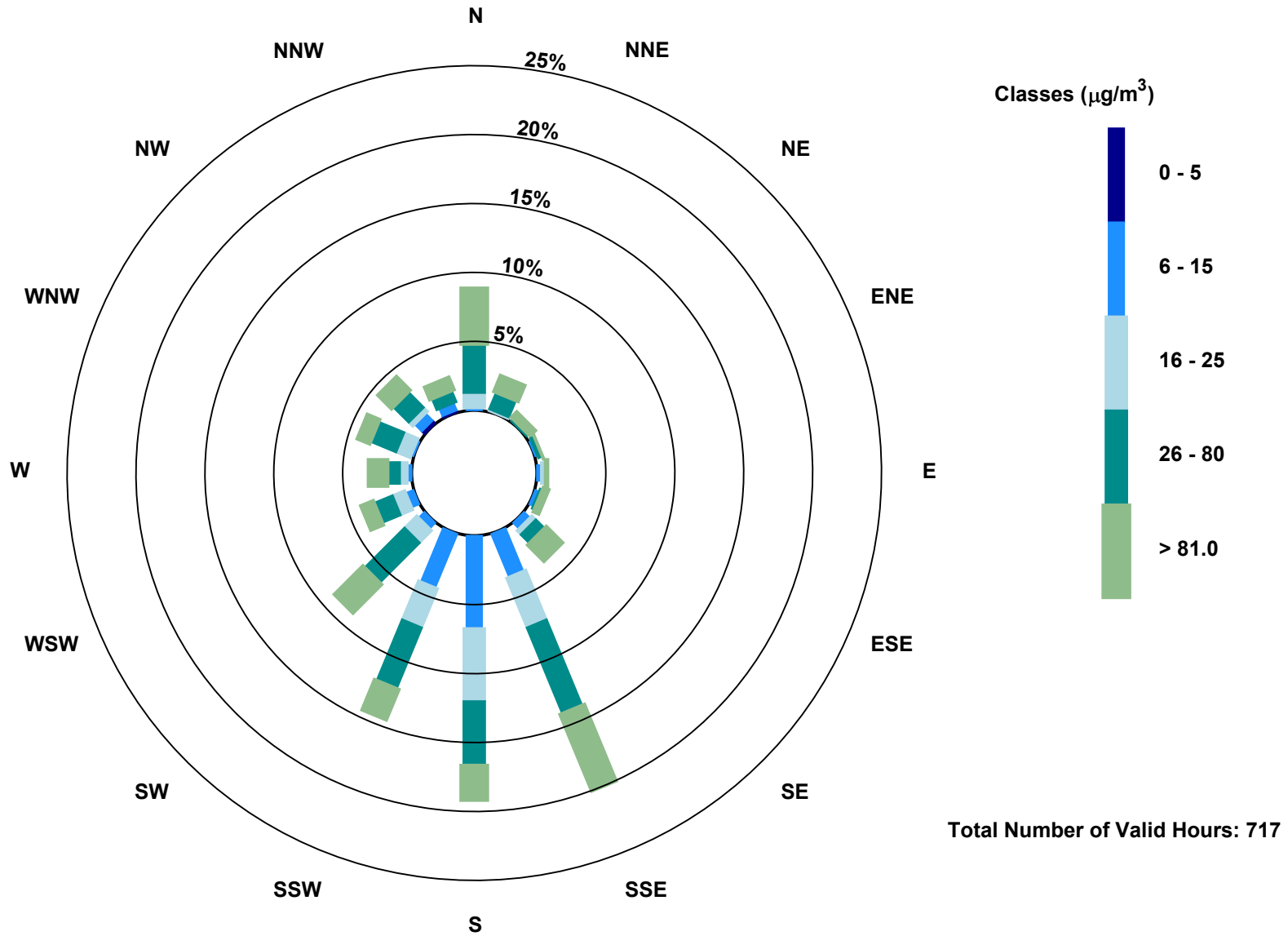
Total Number of Valid Hours: 717

Total Number of Hours: 720



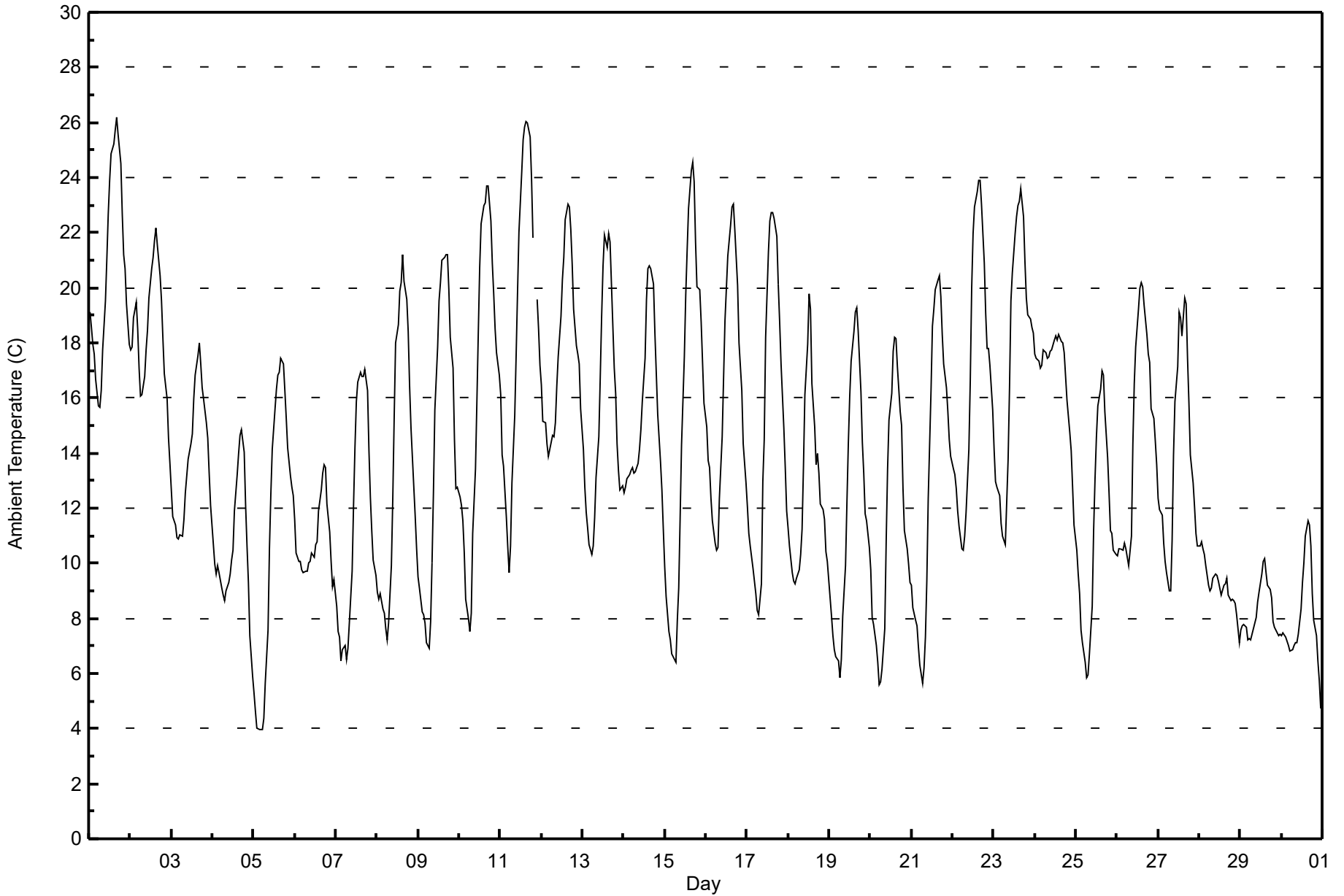
Wood Buffalo Environmental Association
Wind Rose Sep 2023

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





Maximum Value: 26.2 C on Sep 1 17:00		Maximum Daily Average: 20.7 C on Sep 1		Hours in Service: 720																																												
Minimum Value: 3.9 C on Sep 5 05:00		Minimum Daily Average: 8.0 C on Sep 30		Hours of Data: 719																																												
Maximum Diurnal Average: 19.3 C at hour 16		Minimum Diurnal Average: 9.4 C at hour 7		Hours of Missing Data: 1																																												
Monthly Average: 14.01 C		Percentiles: P ₁ = 5.4 P ₁₀ = 7.6 Q ₁ = 9.9 Median = 13.5 Q ₃ = 17.8 P ₉₀ = 21.0 P ₉₉ = 25.3		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-Sep	19.1	18.6	18.0	17.6	16.7	15.7	15.7	16.3	17.7	19.6	21.1	22.7	23.9	24.9	25.2	25.7	26.2	25.6	24.5	22.7	21.2	20.7	19.4	18.0	20.7	26.2																						
2-Sep	17.7	17.9	18.9	19.5	18.5	17.1	16.1	16.1	16.8	17.8	18.5	19.6	20.7	21.1	21.7	22.2	21.5	20.4	19.5	18.2	16.9	16.0	14.5	13.6	18.4	22.2																						
3-Sep	12.7	11.7	11.4	10.9	10.9	11.0	11.0	11.6	12.6	13.2	13.8	14.3	14.7	16.0	16.8	17.5	18.0	17.2	16.4	16.0	15.1	14.5	13.3	12.1	13.9	18.0																						
4-Sep	10.7	10.0	9.6	9.9	9.6	9.1	8.8	8.7	9.0	9.3	9.6	10.1	10.5	11.9	13.2	14.0	14.7	14.8	14.1	12.1	10.6	9.3	7.4	5.9	10.5	14.8																						
5-Sep	5.3	4.6	4.0	4.0	3.9	4.0	4.3	5.6	7.6	10.5	12.5	14.1	15.6	16.3	16.8	16.9	17.4	17.2	16.3	15.3	14.2	13.2	12.8	12.5	11.0	17.4																						
6-Sep	11.6	10.4	10.1	10.1	9.8	9.7	9.7	9.7	10.0	10.0	10.4	10.2	10.7	10.8	11.9	12.7	13.2	13.6	13.5	12.1	11.1	10.1	9.2	9.4	10.8	13.6																						
7-Sep	8.5	7.5	7.3	6.5	6.8	7.0	6.5	6.9	7.8	9.7	12.1	14.2	15.9	16.6	16.9	16.8	16.8	17.1	16.3	14.1	12.4	11.2	10.1	9.6	11.4	17.1																						
8-Sep	8.9	8.7	8.9	8.3	8.2	7.6	7.2	7.9	9.9	12.4	15.3	18.0	18.7	19.9	20.2	21.2	20.2	19.6	18.4	16.4	14.9	12.8	11.7	10.5	13.6	21.2																						
9-Sep	9.5	9.1	8.3	8.2	7.8	7.1	6.9	7.9	10.0	12.6	15.5	17.8	19.5	20.2	21.0	21.1	21.2	21.2	19.9	18.2	17.1	14.5	12.7	12.8	14.2	21.2																						
10-Sep	12.4	12.1	11.6	10.4	8.7	8.0	7.5	8.2	11.1	13.4	15.9	18.3	20.7	22.3	23.0	23.1	23.7	23.7	22.4	20.9	19.8	18.5	17.7	16.8	16.3	23.7																						
11-Sep	16.1	13.9	13.6	11.7	10.6	9.7	10.6	12.9	15.4	17.5	19.8	22.0	24.2	25.4	25.8	26.1	26.0	25.5	24.0	21.8	DF	19.6	18.5	17.2	18.6	26.1																						
12-Sep	16.5	15.2	15.1	14.3	13.9	14.2	14.6	14.6	15.1	16.4	17.5	19.0	20.3	21.1	22.5	23.0	22.9	22.1	20.9	19.2	17.9	17.6	17.2	15.6	17.8	23.0																						
13-Sep	14.1	12.7	11.8	11.3	10.7	10.3	10.6	11.7	13.1	14.6	16.7	19.0	20.8	21.9	21.4	22.0	21.7	20.1	17.1	16.2	14.4	13.4	12.7	12.8	15.5	22.0																						
14-Sep	12.5	12.8	13.1	13.2	13.4	13.5	13.3	13.3	13.6	14.1	14.9	15.9	17.4	19.6	20.7	20.8	20.7	20.2	18.4	16.9	15.4	13.7	12.7	11.2	15.5	20.8																						
15-Sep	9.9	8.8	7.5	7.2	6.7	6.6	6.4	7.9	9.1	11.6	14.3	17.5	19.7	21.3	22.9	24.2	24.6	23.9	21.6	20.1	19.9	18.8	17.3	15.8	15.2	24.6																						
16-Sep	14.9	13.7	13.5	12.3	11.5	10.7	10.5	10.6	12.3	14.6	16.7	18.8	20.0	21.2	22.3	22.9	23.0	22.1	20.1	18.0	17.2	16.3	14.3	12.9	16.3	23.0																						
17-Sep	12.0	11.1	10.6	9.8	9.3	8.9	8.3	8.2	9.2	13.0	14.5	18.2	21.3	22.4	22.7	22.7	22.5	21.9	20.1	18.8	17.2	14.9	13.5	11.9	15.1	22.7																						
18-Sep	11.3	10.6	9.7	9.3	9.3	9.5	9.8	10.3	11.2	13.6	16.1	18.0	19.8	19.2	16.5	15.0	13.6	14.0	13.3	12.1	12.0	11.6	10.4	10.1	12.8	19.8																						
19-Sep	8.7	8.1	7.4	6.9	6.6	6.4	5.9	6.5	8.1	9.9	12.2	14.4	16.1	17.4	18.4	19.1	19.3	18.5	16.2	14.4	13.3	11.8	11.6	10.6	12.0	19.3																						
20-Sep	9.8	8.1	7.8	7.0	6.4	5.6	5.7	6.2	7.6	10.8	13.4	15.2	16.2	17.7	18.2	18.2	17.1	15.5	15.0	12.7	11.2	10.5	10.0	9.3	11.5	18.2																						
21-Sep	9.2	8.4	7.9	7.7	7.0	6.3	5.6	6.2	7.3	9.4	12.4	16.3	18.6	19.2	19.9	20.3	20.5	19.7	18.3	17.2	16.4	15.5	14.5	13.9	13.2	20.5																						
22-Sep	13.4	13.2	12.7	11.9	11.3	10.5	10.5	11.0	11.8	14.1	16.6	20.0	21.9	23.0	23.5	23.9	23.9	23.0	20.9	19.1	17.8	17.8	17.2	15.5	16.9	23.9																						
23-Sep	14.1	13.0	12.8	12.4	11.5	11.0	10.8	10.7	13.8	16.4	19.5	20.5	22.0	22.6	23.0	23.2	23.6	22.6	20.9	19.6	19.0	18.9	18.5	18.3	17.4	23.6																						
24-Sep	17.6	17.4	17.3	17.1	17.2	17.7	17.7	17.5	17.5	17.7	17.8	18.1	18.3	18.1	18.3	18.0	18.0	17.7	16.8	15.9	14.7	14.1	12.8	11.4	16.9	18.3																						
25-Sep	10.5	9.6	8.9	7.6	7.1	6.4	5.9	6.0	6.7	8.4	11.2	13.1	14.6	15.7	16.3	17.0	16.8	15.5	13.8	12.5	11.2	11.1	10.5	10.3	11.1	17.0																						
26-Sep	10.3	10.5	10.5	10.5	10.7	10.5	10.2	9.9	11.0	14.4	16.5	17.8	19.2	20.0	20.2	20.0	19.4	18.3	17.6	17.3	15.6	15.2	14.4	13.6	14.7	20.2																						
27-Sep	12.4	11.9	11.8	10.7	10.1	9.7	9.0	9.0	10.8	13.9	15.9	17.2	19.1	18.9	18.3	19.6	19.4	17.4	15.8	13.9	12.9	12.1	11.1	10.6	13.8	19.6																						
28-Sep	10.6	10.8	10.5	10.3	9.9	9.2	9.0	9.1	9.4	9.6	9.6	9.4	9.1	8.8	9.2	9.3	9.4	8.8	8.6	8.7	8.6	8.5	8.1	7.1	9.2	10.8																						
29-Sep	7.6	7.7	7.8	7.7	7.2	7.3	7.2	7.4	7.8	8.0	8.6	8.9	9.6	10.0	10.2	9.7	9.2	9.1	8.8	7.9	7.7	7.5	7.4	7.4	8.2	10.2																						
30-Sep	7.4	7.5	7.3	7.2	7.0	6.8	6.9	7.0	7.1	7.1	7.4	8.3	9.3	10.0	11.0	11.5	11.4	10.6	8.9	7.9	7.4	6.5	5.7	4.7	8.0	11.5																						
																								11.8	11.2	10.9	10.4	10.0	9.6	9.4	9.8	11.0	12.8	14.5	16.2	17.6	18.4	18.9	19.3	19.2	18.6	17.3	15.9	14.6	13.9	12.9	12.1	Diurnal Average
																								19.1	18.6	18.9	19.5	18.5	17.7	17.7	17.5	17.7	19.6	21.1	22.7	24.2	25.4	25.8	26.1	26.2	25.6	24.5	22.7	21.2	20.7	19.4	18.3	Diurnal Maximum
DF - DAS Failure																																																





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	189	26.29	26.29
10 - 20	431	59.94	86.23
> 20	99	13.77	100.00

Total Number of Valid Hours: 719

Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

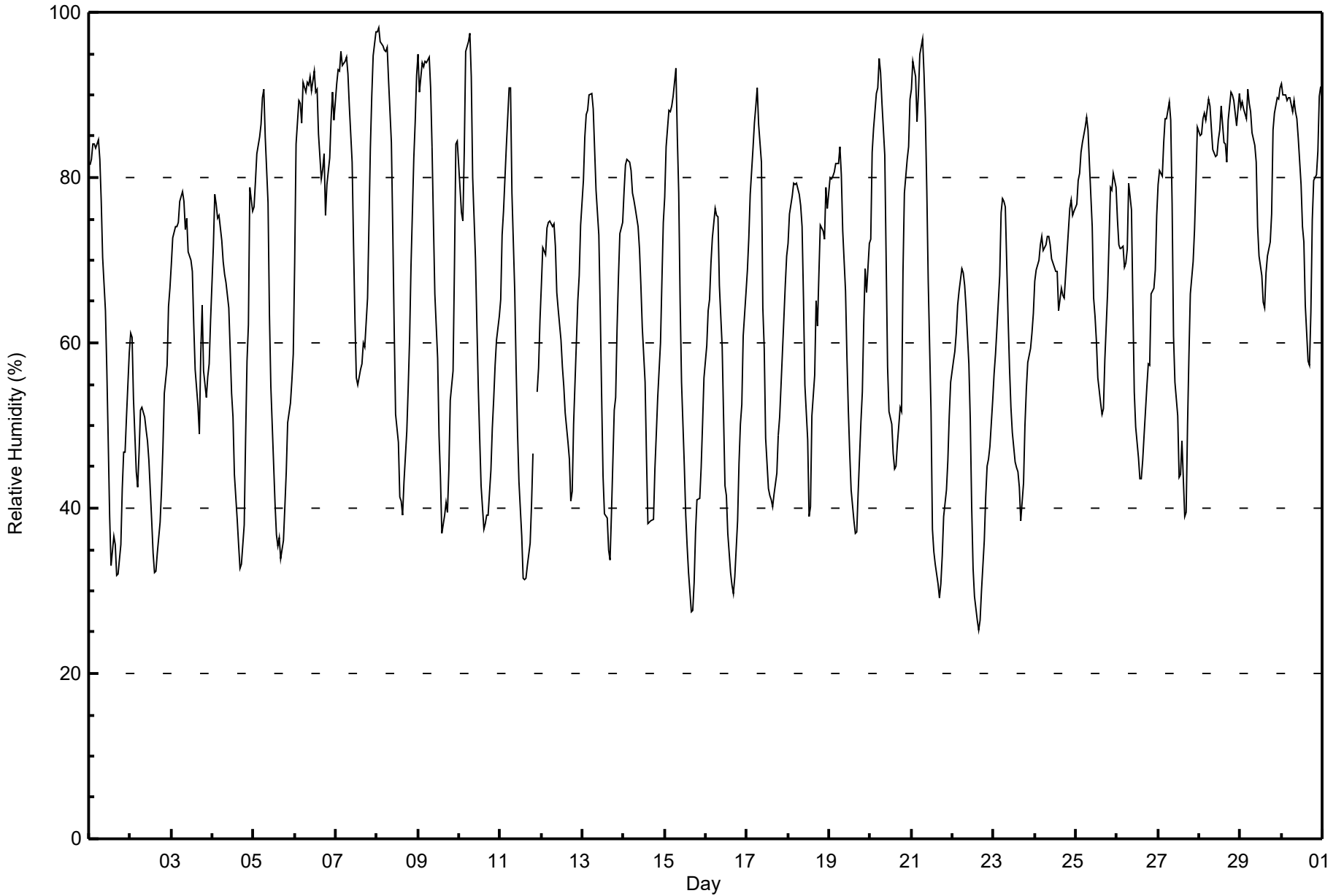
Relative Humidity (RH) - %
Fort Hills - September 2023

Maximum Value: 98.2 % on Sep 8 02:00 Maximum Daily Average: 86.5 % on Sep 28																						Hours in Service:	720																							
Minimum Value: 25.2 % on Sep 22 16:00 Minimum Daily Average: 47.9 % on Sep 2																						Hours of Data:	719																							
Maximum Diurnal Average: 83.9 % at hour 7 Minimum Diurnal Average: 44.9 % at hour 16																						Hours of Missing Data:	1																							
Monthly Average: 65.93 % Percentiles: P ₁ = 29.7 P ₁₀ = 39.1 Q ₁ = 50.8 Median = 68.3 Q ₃ = 81.9 P ₉₀ = 89.7 P ₉₉ = 95.9																						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-Sep	81.5	82.3	84.1	84.1	83.6	84.6	82.2	77.1	70.4	63.9	56.6	47.9	39.0	33.1	36.6	35.7	31.9	32.1	35.5	42.3	46.7	46.8	51.1	58.8	57.8	84.6																				
2-Sep	61.2	60.7	53.1	44.3	42.5	46.8	51.9	52.1	51.0	49.6	48.1	45.7	38.5	34.6	32.2	32.4	34.6	38.3	42.2	47.3	53.9	57.3	64.5	66.6	47.9	66.6																				
3-Sep	69.4	72.7	74.1	74.1	74.6	77.2	78.3	77.2	73.8	75.2	71.0	70.1	68.6	62.3	56.7	52.4	49.1	58.6	64.7	56.7	53.4	56.0	57.5	62.8	66.1	78.3																				
4-Sep	71.7	77.9	76.7	75.2	75.5	72.3	69.9	68.3	67.2	64.2	59.2	53.9	51.1	44.1	38.6	35.6	32.8	33.2	38.0	48.6	57.8	62.3	78.8	75.9	59.5	78.8																				
5-Sep	76.4	79.5	82.8	84.9	86.5	89.6	90.7	84.8	76.9	63.4	54.7	50.0	40.6	36.7	35.4	36.5	33.9	36.1	40.1	44.4	50.3	52.7	55.4	58.7	60.0	90.7																				
6-Sep	69.6	84.2	89.4	89.0	86.7	91.6	90.4	91.5	91.2	92.3	90.5	92.9	90.3	90.6	85.3	79.9	81.0	82.9	75.5	79.2	82.3	87.1	90.3	86.9	86.3	92.9																				
7-Sep	91.3	93.1	92.9	95.3	93.6	94.0	94.6	92.6	88.7	81.9	71.9	62.8	55.7	54.9	56.8	57.4	60.0	59.6	65.5	74.4	83.5	89.8	94.7	97.6	79.3	97.6																				
8-Sep	97.7	98.2	96.4	96.0	95.4	95.3	95.8	91.7	84.3	73.5	61.8	51.4	47.9	41.4	40.9	39.2	43.3	49.4	54.6	60.5	69.4	82.4	86.8	92.4	72.7	98.2																				
9-Sep	95.0	90.4	93.9	93.4	94.0	93.9	94.6	90.8	83.7	74.7	65.9	58.2	48.7	43.8	36.9	39.1	40.7	39.5	44.7	53.0	56.6	69.3	84.1	84.3	69.6	95.0																				
10-Sep	78.7	75.8	74.7	83.2	95.2	96.5	97.4	92.1	80.0	70.2	62.1	54.6	48.5	42.7	37.5	38.2	39.2	39.1	44.5	49.6	53.3	57.3	60.3	63.2	63.9	97.4																				
11-Sep	65.2	73.1	76.0	83.7	87.2	90.8	90.8	78.1	66.3	56.9	49.1	43.3	36.6	31.6	31.3	31.5	33.0	35.8	40.5	46.6	DF	54.0	56.9	62.7	57.4	90.8																				
12-Sep	66.9	71.5	70.7	73.9	74.6	74.8	74.1	74.4	71.8	66.1	64.1	60.4	57.1	54.7	51.6	48.0	46.0	40.8	42.0	50.2	60.2	65.0	68.2	74.3	62.6	74.8																				
13-Sep	79.6	84.9	87.7	88.1	90.0	90.2	88.3	83.5	78.4	73.1	64.1	53.5	43.9	39.4	38.7	34.9	33.8	39.3	51.9	53.4	61.7	67.9	73.2	74.5	65.6	90.2																				
14-Sep	78.4	81.5	82.1	81.8	80.8	78.1	77.3	76.2	74.0	71.3	67.0	61.9	55.3	46.3	38.2	38.4	38.4	38.7	44.7	49.0	53.4	60.0	67.4	74.6	63.1	82.1																				
15-Sep	77.6	83.8	88.1	87.9	88.7	89.8	93.2	85.0	78.1	65.0	55.3	45.0	39.1	35.5	32.2	27.4	27.7	31.0	37.1	41.0	41.2	45.0	50.2	55.8	58.4	93.2																				
16-Sep	59.7	64.0	65.3	69.7	72.8	76.3	75.5	75.2	67.0	59.5	51.0	42.7	41.6	36.9	32.2	30.7	29.7	31.7	38.5	45.4	50.2	52.6	60.9	66.1	54.0	76.3																				
17-Sep	68.8	72.7	78.0	83.6	86.6	88.7	90.9	86.4	81.9	64.3	59.4	48.5	42.3	41.5	41.0	40.2	41.7	44.2	48.8	51.0	54.9	62.9	66.9	70.5	63.2	90.9																				
18-Sep	72.0	75.6	77.8	79.4	79.1	79.3	77.9	76.5	74.0	65.3	54.9	48.3	39.0	40.2	51.2	56.1	65.0	62.1	68.3	74.3	73.6	72.5	78.9	76.3	67.4	79.4																				
19-Sep	80.1	79.8	80.2	80.7	81.8	81.7	83.7	80.3	73.5	66.3	58.4	51.9	46.5	42.2	38.6	36.9	37.1	41.9	50.5	54.2	62.6	69.0	66.1	72.0	63.2	83.7																				
20-Sep	72.5	83.0	86.0	90.2	90.8	94.4	92.7	89.1	82.7	69.9	57.1	51.7	50.2	46.6	44.8	45.2	47.7	52.2	51.8	68.6	78.1	82.1	83.8	89.4	70.8	94.4																				
21-Sep	90.7	94.1	92.1	86.8	90.2	95.0	96.9	92.5	87.2	78.3	67.4	51.8	37.4	34.8	33.3	30.8	29.1	30.9	34.3	38.9	42.2	45.8	51.2	55.2	61.9	96.9																				
22-Sep	57.8	58.9	61.1	64.6	66.3	68.9	68.5	66.9	64.2	57.4	50.7	40.1	32.8	29.3	26.4	25.2	26.5	30.0	36.1	41.4	45.1	46.0	47.4	53.1	48.5	68.9																				
23-Sep	56.3	58.7	61.7	68.1	75.7	77.5	77.2	76.4	62.8	57.0	52.2	49.2	45.7	45.0	44.3	42.5	38.5	43.1	50.1	54.4	57.6	59.3	61.1	63.5	57.4	77.5																				
24-Sep	67.5	68.8	70.0	71.9	72.8	71.2	71.9	72.9	72.9	71.9	70.2	69.1	68.7	68.7	63.9	66.5	65.7	65.4	68.2	70.8	76.4	77.4	75.5	76.0	70.6	77.4																				
25-Sep	76.8	79.7	80.5	83.1	84.2	86.1	87.3	85.8	81.6	74.0	65.4	63.2	60.2	55.7	52.8	51.4	52.0	57.9	66.3	72.5	78.8	78.4	80.5	78.9	72.2	87.3																				
26-Sep	74.9	71.9	71.4	71.7	69.1	69.6	71.4	79.3	76.1	64.7	54.1	49.9	46.1	43.5	43.5	45.8	48.7	54.8	57.4	57.3	65.9	66.6	68.9	75.4	62.4	79.3																				
27-Sep	79.1	80.8	80.2	84.3	87.2	87.1	89.2	86.9	76.7	60.8	55.3	51.2	43.7	44.1	48.1	39.0	39.5	50.0	58.6	66.0	69.8	73.7	79.5	86.2	67.4	89.2																				
28-Sep	85.1	85.3	87.2	87.8	87.0	89.4	88.7	86.0	83.4	82.6	82.8	84.6	85.8	88.7	84.2	84.1	81.8	86.9	90.3	90.0	89.4	87.9	86.2	90.1	86.5	90.3																				
29-Sep	88.4	89.1	88.3	87.1	90.6	89.0	87.9	85.4	83.9	81.9	74.0	70.5	68.1	65.0	64.2	68.4	70.5	72.3	75.5	85.8	87.7	89.7	89.5	90.8	81.0	90.8																				
30-Sep	91.3	90.1	90.1	89.4	89.7	89.7	88.0	89.4	87.9	87.1	84.8	79.1	74.1	72.3	64.6	57.7	57.3	63.8	74.9	79.6	80.4	83.2	89.9	91.1	81.1	91.3																				
																						76.0	78.7	79.8	81.1	82.4	83.6	83.9	81.5	76.4	69.4	62.6	56.8	51.4	48.2	46.1	44.9	45.2	48.0	53.0	58.2	63.3	66.7	70.8	74.1	Diurnal Average
																						97.7	98.2	96.4	96.0	95.4	96.5	97.4	92.6	91.2	92.3	90.5	92.9	90.3	90.6	85.3	84.1	81.8	86.9	90.3	90.0	89.4	89.8	94.7	97.6	Diurnal Maximum
DF - DAS Failure																																														



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Relative Humidity (RH) - %
Fort Hills - September 2023**

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	81	11.27	11.27
40 - 60	196	27.26	38.53
60 - 80	241	33.52	72.04
80 - 100	201	27.96	100.00

Total Number of Valid Hours: 719

Total Number of Hours: 720



Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

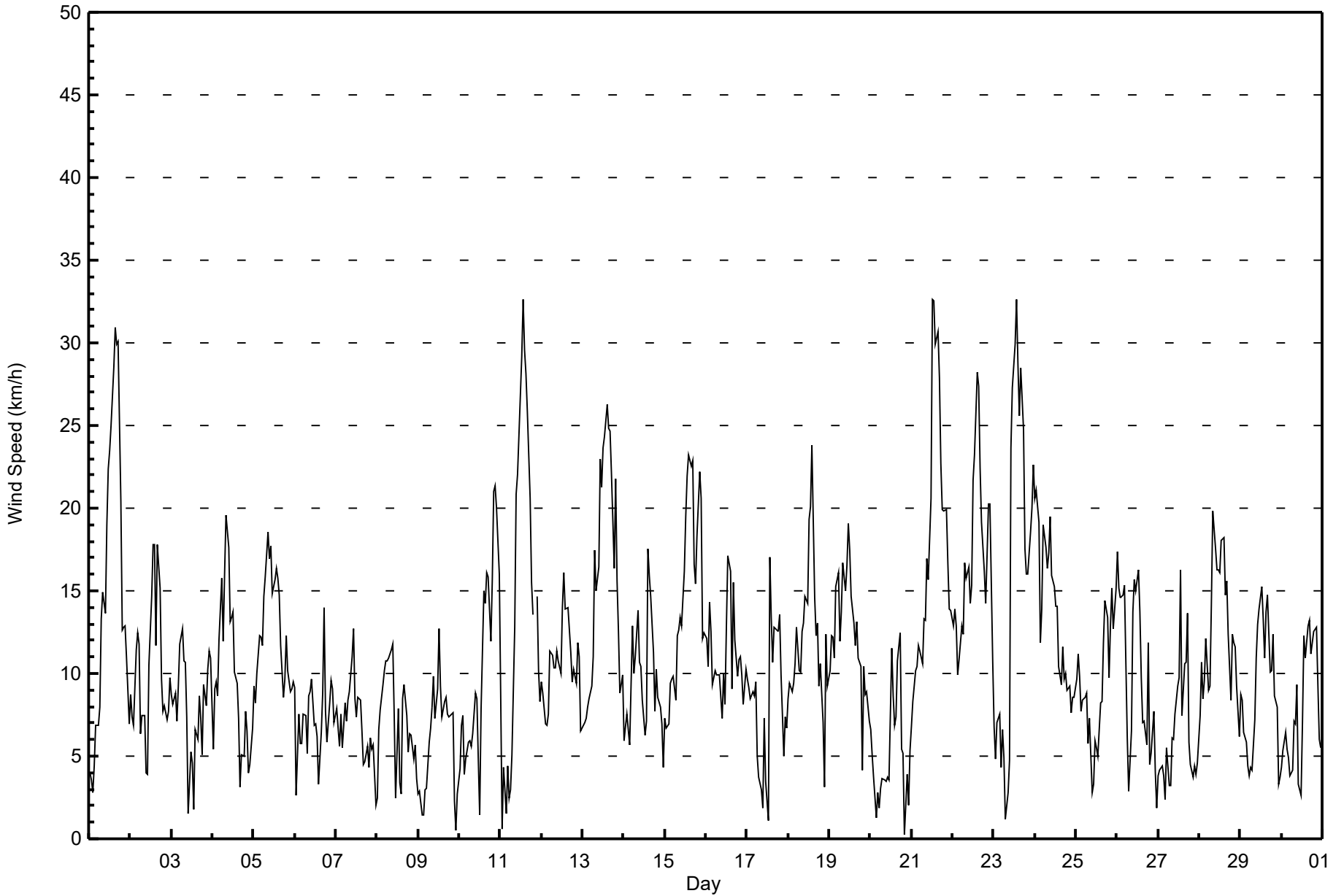
Fort Hills - September 2023

Maximum Speed: 33 km/h on Sep 21 13:00	Maximum Daily Speed Average: 17.3 km/h on Sep 21	Hours in Service: 720
Minimum Speed Value: 0 km/h on Sep 20 21:00	Minimum Daily Speed Average: 1.2 km/h on Sep 8	Hours of Data: 719
Maximum Diurnal Speed Average: 9.3 km/h at hour 14	Minimum Diurnal Speed Average: 3.7 km/h at hour 22	Hours of Missing Data: 1
Monthly Average Velocity: 5.8 km/h 194.0 deg	Percentiles: P ₁ = 1 P ₁₀ = 4 Q ₁ = 7 Median = 10 Q ₃ = 14 P ₉₀ = 19 P ₉₉ = 30	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-Sep	WNW4	WNW4	W3	SW4	SSW7	S7	SW8	SW13	SW15	SSW14	SSW19	SW22	SW23	SW25	SW29	SW31	SW30	SW30	SW20	SW13	SW13	SW13	SW11	SW7	SW14.8	SW31	
2-Sep	SSW9	SSW7	W7WNW11	NW12	NW12	WNW6	WNW7	NW7	NW4	WSW4	SW11	W15WNW18	NW18WNW12WNW18	W15	W10	W8	WSW8	SW7	SSW8	SSW10	SSW10	SSW10	SSW10	SSW10	W8.5	WNW18	
3-Sep	SSW9	S8	SSW9	SSW7	SSE9	SSE12	S13	SSE11	SSE11	S7	W2	SSE5	W5	WSW2	NNW7	SE6	SSE9	SSW7	WSW5	NW9	NW8	NW10	NW11WNW11	SSW3.8	S13		
4-Sep	WNW5	SW9WSW10	W9	NW12	NNW16	NW12	NW16	NW20	NW18	NNW13	NNW13	NW14	NW10	NW9	NNW7	NNW3	ENE5	E5	SE8	SE7	SSW4	SW4	SSE7	NW6.3	NW20		
5-Sep	SSE9	SSE8	SSE10	SSE12	SSE12	SSE12	S15	S16	S19	SSW17	SSW18	S15	S16	S16	S16	S15	S12	S9	S10	S12	SSE10	SE9	SSE9	SSE9	S12.2	S19	
6-Sep	SW9	WNW3	NNE8	E6	E6	ESE8	ESE7	E5	SE9	SSE9	SSE10	S7	SW7	WSW6	SSW3	SSW6	SSE9	S14	WSW8	SW6	SW8	SW10	SW9	WSW7	S4.1	S14	
7-Sep	SW8	SW7	S6	S8	S6	SSW8	SSW7	SSW8	SSW9	SSW11	SW13	SSW8	SSE7	SSE9	SE8	ESE7	ENE4	ENE5	NNE6	NE4	NNW6	N5	NNW6	NNW2	S3.4	SW13	
8-Sep	SW2	S7	SSE8	SSE9	SSE10	SSE11	SSE11	S11	S11	S12	S8	N2	N8	N3	NW3	N8	NNE9	N7	N5	NNE6	NNE6	NNW5	NNW6	NW4	SSE1.2	S12	
9-Sep	NW3	NW3	WNW1	W1	SSW3	S3	SSE6	SSE7	S8	S10	S7	SSW9	SSE13	SSE9	SSE7	SSE8	SSE9	SSE8	SE7	ESE7	SE8	NW2	SE1	SSE3	SSE4.8	SSE13	
10-Sep	SSE4	SE7	SE7	S4	SSW5	SSW6	SSW6	SSW6	SSW6	SSW9	SSW8	S5	SW1	S8	S15	S14	SSE16	SE16	SE12	SE16	SE21	SSE21	SSE20	SSE16	SSE9.6	SSE21	
11-Sep	SSE9	E1	SSE4	N2	NNW4	N2	SSW3	S5	S13	S21	S22	S24	S29	S33	S30	S28	S26	S21	S16	SSE14	DF	SSE15	SSE10	SSE8	S13.8	S33	
12-Sep	S10	S9	SSW7	S7	S8	SSE11	SSE11	S10	S10	SSW11	S11	S10	SSE14	SSE16	S14	S14	SSW13	SW11	SW9	SW10	SW9	SSW12	SW11	SSW6	S9.9	SSE16	
13-Sep	S7	SSE7	S7	SSE8	SSE8	SSE9	S11	SW17	SW15	SW16	SW23	SW21	SW24	WSW24	WSW26	WSW25	WSW25	W22	W16	WSW22	WSW16	W13	SW9	SW10	SW14.0	WSW26	
14-Sep	WSW6	SW7	W8	W6	W9WNW13WNW10WNW11WNW14WNW11	W10	W8	WSW6	NW7	NW18	NW16	NNW15	NW11	WNW8	NW10	NW9	WNW8	WSW7	SSW4	WNW8.8	NW18	SSW4	SSW4	SSW4	WNW8.8	NW18	
15-Sep	SE7	SE7	S7	SSE9	SSE10	SSE8	SSE12	S13	S13	S13	S13	S16	S16	S19	SSE22	SSE23	S23	S23	S17	SSE15	SSE18	S22	S21	S12	S12	S14.5	SSE23
16-Sep	SSE12	SSE10	SSE14	SSE13	SSE9	SSE10	SSW10	SSW10	SSW10	S7	SSW10	S8	S13	S17	SSW16	S9	SW16	SW12	S10	S11	SSW11	WSW10	S8	SSE10	S10.4	S17	
17-Sep	SSE10	SSE9	SSE8	SE9	SSE9	SSE10	SSE5	S4	WSW3	WSW2	WSW7	SSW3	SW1	SSW17	SW13	S11	S13	SSW13	SSW13	SW14	WSW10	SSW5	SSE7	SSE7	S7.1	SSW17	
18-Sep	SSE9	SSE9	SSE9	SSE9	SSE11	SSE13	SSE10	S10	SSW13	SW13	SW15	SSW14	WSW19	WSW20	WSW24	SW15	SW12	SW13	S9	SSE11	SSW7	SSE3	SSE12	SSE9	SSW9.6	WSW24	
19-Sep	S10	S12	SSE12	S11	S15	SSW16	S12	SSW14	SSW17	SSW15	SSW17	SSW19	SW17	SSW15	SSW13	S12	SSE13	SSE11	S10	WNW4	N10	N9	N9	N7	SSW9.0	SSW19	
20-Sep	N7	N5	NW4	W1	WNW3	SSW2	SSW3	SSW4	S4	SSE3	SSE4	N4	NNE12	NE9	ENE7	NE7	N11	W12	WNW5	W5	N0	NNW4	W2	S5	NNW1.7	W12	
21-Sep	S7	S8	S10	S10	SSE12	SSE11	SSE11	S13	SSE13	SSW17	SSW16	SSW21	SSW33	SSW33	SSW30	SSW31	SSW28	SSW23	S20	S20	S20	S17	S14	S14	S17.3	SSW33	
22-Sep	SSE13	S14	S13	S10	S11	S13	SSW12	SSW17	SSW16	SSW16	SSW14	SSW15	SSW22	S23	S28	S27	S22	S19	S16	S14	SSE17	S20	S20	S11	S16.3	S28	
23-Sep	SSE7	SE5	S7	SSW8	SSW4	SSW7	SSW5	NNW1	WNW3	SW5	S24	SSE27	SSE30	SSE33	S29	SSE26	SSE28	SSE25	SSE18	SSE16	SE16	SSE19	SE20	SSE23	SSE15.1	SSE33	
24-Sep	SE21	SE21	SSE19	SSE12	SSE14	SSE19	SSE18	SE16	S17	S19	SSW16	S15	SW14	WSW14	WSW10	SSW9	SSW12	S10	S10	SSW9	SSW9	SSW8	SSW9	SSW9	S12.2	SE21	
25-Sep	SW10	SSW11	SSW10	SSE8	SSE8	SSE9	SSE9	S6	S7	WNW3	N3	NNE6	ESE6	E5	NE8	NE8	NE12	NNE14	NNE13	NNE10	N13	N15	N13	N15	NE2.5	N15	
26-Sep	N17	N15	N15	N15	N15	N11	N6	SW3	SSE7	S14	SSW16	SSW15	S16	SSW14	SSW10	SSW7	SW7	SSW6	SSE12	W4	SSE5	WSW8	NW4	WNW2	SW1.7	N17	
27-Sep	S4	SSE4	SSE4	S4	SW2	SE5	SW3	SSE3	SSE6	ESE6	SE8	SE9	SE10	SW16	S7	W11	NW11	NNE14	NNW6	N5	N4	NNW4	NNW4	NW5	S1.3	SW16	
28-Sep	N7	N11	N8	N10	NNE12	N9	N9	NNE14	NNE20	N18	N16	N16	NNE16	N18	NNE18	NNE15	N16	N12	N8	N12	N12	N12	N9	N6	N12.6	NNE20	
29-Sep	N9	N8	N6	NNW6	WNW4	WNW4	WNW4	WNW4	N7	NNW11	N13	N14	N15	N13	N11	NNE14	NNE15	N10	N10	N12	N9	N8	N3	SW4	N8.1	N15	
30-Sep	SW4	SSW5	SSW6	SSW5	SSW5	SE4	SSE4	SSE7	SSE7	S9	SSW3	S3	SSE7	SSE12	SSE11	S13	S13	SSE11	SSE12	SSE13	SSE13	SE9	SSE6	S5	S7.4	S13	

S4.1	S4.2	S4.4	S4.0	S3.9	S5.0	S5.3	SSW5.9	SSW6.5	SSW7.4	SSW8.2	SSW7.9	SSW8.0	SSW9.3	SSW8.7	SSW8.1	SSW7.5	SSW6.2	SSW5.0	SSW4.3	SSW4.0	SSW3.7	SSW4.0	S4.5	Diurnal Average
SE21	SE21	SSE19	N15	N15	SSE19	SSE18	SW17	NNE20	S21	S24	SSE27	SSW33	S33	SSW30	SW31	SW30	SW30	SW20	WSW22	S22	SSE21	S20	SSE23	Diurnal Maximum

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	122	16.97	16.97
6 - 11	319	44.37	61.34
12 - 19	210	29.21	90.54
20 - 28	54	7.51	98.05
29 - 38	14	1.95	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 719

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

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

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	12	1	1	3	4	0	4	13	11	17	10	6	8	15	9	8	122
6 - 11	29	7	4	1	2	7	14	79	54	48	22	13	9	10	12	8	319
12 - 19	23	11	1	0	0	0	4	41	49	33	21	3	5	6	10	3	210
20 - 28	0	1	0	0	0	0	4	9	20	4	7	7	1	0	1	0	54
29 - 38	0	0	0	0	0	0	0	2	4	4	4	0	0	0	0	0	14
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	64	20	6	4	6	7	26	144	138	106	64	29	23	31	32	19	719

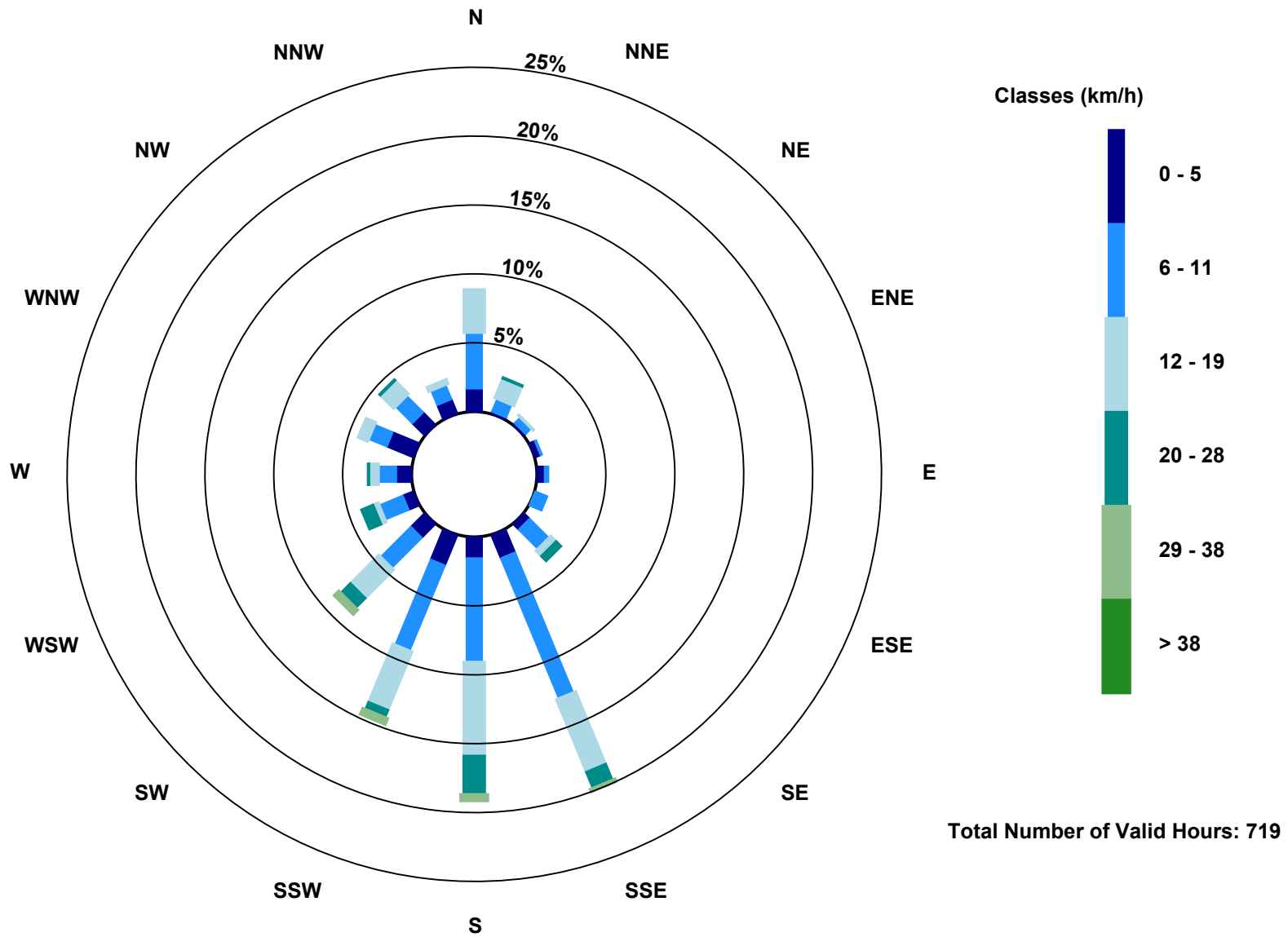
Total Number of Valid Hours: 719

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

Wind Speed (WS) - km/h
Fort Hills





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Sep 13 18:00	Hours in Service: 720 Hours of Data: 719 Hours of Missing Data: 1 Hours of Calibration: 0 Percent Operational Time: 99.9
Minimum Value: 0 km/h on Sep 9 05:00	
Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 3 P ₉₀ = 4 P ₉₉ = 6	

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Sep	1	1	2	2	1	1	4	2	2	2	3	4	5	6	5	5	5	5	5	1	2	2	2	1	6
2-Sep	3	2	1	3	3	3	2	3	2	2	1	3	4	5	4	3	4	3	2	1	2	2	2	2	5
3-Sep	2	3	2	2	1	2	2	3	3	3	2	2	2	1	2	2	1	1	2	2	2	3	3	3	3
4-Sep	1	2	3	3	5	4	3	4	4	4	3	3	3	3	4	3	3	1	1	1	1	1	1	1	5
5-Sep	1	1	1	1	1	2	1	3	2	3	4	3	4	4	4	3	3	3	2	2	1	1	3	2	4
6-Sep	2	2	1	1	2	2	3	2	2	2	1	2	2	2	2	2	2	2	3	1	1	2	1	2	3
7-Sep	2	3	2	1	1	2	1	2	2	3	3	3	3	2	3	3	1	1	1	2	1	1	1	2	3
8-Sep	1	1	1	2	2	2	1	1	1	2	3	2	2	2	1	5	2	1	2	1	2	1	1	1	5
9-Sep	1	1	1	1	0	1	1	1	1	2	2	2	3	3	2	1	1	1	1	1	2	1	1	1	3
10-Sep	1	2	2	1	1	1	1	2	1	4	2	2	2	4	3	3	3	3	2	2	4	2	2	3	4
11-Sep	3	1	2	1	1	1	1	3	3	4	3	4	5	5	6	6	5	5	2	2	DF	2	2	1	6
12-Sep	3	2	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	2	1	2	2	3
13-Sep	1	1	1	1	2	1	2	3	3	3	3	4	5	6	7	6	5	7	5	5	4	3	2	2	7
14-Sep	1	2	1	1	3	3	3	3	3	2	2	2	3	6	4	4	4	3	1	2	2	1	3	1	6
15-Sep	1	1	1	2	1	1	1	1	2	2	2	3	3	3	4	4	4	3	1	2	3	3	2	3	4
16-Sep	2	2	2	2	3	2	2	2	2	2	2	3	3	3	4	3	2	3	1	2	2	1	1	1	4
17-Sep	2	2	1	1	1	2	1	1	2	2	2	2	2	5	3	3	2	2	2	2	1	1	2	2	5
18-Sep	1	1	1	1	2	2	1	2	3	3	3	3	4	6	6	4	4	2	1	2	2	2	2	2	6
19-Sep	1	2	2	1	2	3	2	3	2	2	2	3	4	4	3	3	2	2	1	3	2	1	2	2	4
20-Sep	3	1	1	1	2	1	1	1	1	1	1	4	3	3	3	4	3	4	2	3	1	2	2	2	4
21-Sep	2	2	1	2	2	1	1	3	2	3	3	5	6	6	5	5	5	4	2	2	2	3	2	1	6
22-Sep	2	2	1	1	1	2	2	2	2	3	2	4	4	4	4	4	4	4	2	1	2	3	3	3	4
23-Sep	1	2	3	1	2	1	1	1	2	4	5	4	5	4	7	4	4	3	2	2	2	3	3	3	7
24-Sep	2	3	3	2	2	3	2	2	3	3	2	3	2	2	2	1	2	1	1	1	2	1	2	3	3
25-Sep	3	2	1	1	1	2	1	1	3	1	2	2	2	2	2	3	2	2	3	4	3	2	2	3	4
26-Sep	2	3	3	2	2	2	2	1	4	2	3	4	4	3	2	1	1	2	3	3	2	1	2	2	4
27-Sep	1	1	1	1	3	1	2	2	1	1	2	3	2	4	3	4	4	3	1	2	1	2	2	2	4
28-Sep	2	3	2	4	3	3	3	4	3	3	3	4	3	4	3	2	3	3	2	3	2	2	2	1	4
29-Sep	2	2	2	2	1	1	1	1	3	2	3	3	3	3	2	4	3	2	3	3	3	2	2	2	4
30-Sep	1	1	1	2	1	1	1	2	1	2	3	1	2	2	2	3	2	1	1	1	1	2	1	2	3

3	3	3	4	5	4	4	4	4	4	4	5	5	6	6	7	6	5	7	5	5	4	3	3	3	
Diurnal Maximum																									

DF - DAS Failure



Wood Buffalo Environmental Association
Summary of Hour Averages

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

Direction of Maximum Speed: 202 deg on Sep 21 13:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 188.8 deg on Sep 21	Hours of Data: 719
Direction of Minimum Speed: 350 deg on Sep 20 21:00	Hours of Missing Data: 1
Direction of Minimum Daily Speed Average: 1.2 deg on Sep 8	Percent Operational Time: 99.9
Monthly Average Direction: 194.0 deg	

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Sep	290	285	267	228	203	187	230	229	226	212	211	217	229	235	223	223	231	228	236	227	218	232	231	225	226.2
2-Sep	201	202	261	290	308	312	283	301	313	325	237	229	276	282	305	288	283	278	273	267	253	230	206	211	273.1
3-Sep	213	188	211	193	148	158	181	164	157	190	262	165	275	248	327	136	153	194	241	323	309	312	308	294	208.7
4-Sep	302	234	252	281	317	328	321	321	315	322	329	327	323	309	306	334	345	60	99	133	145	192	214	166	311.6
5-Sep	149	156	154	154	160	155	169	172	185	198	206	185	184	171	179	171	174	169	175	169	159	143	157	160	171.7
6-Sep	214	299	30	84	94	117	114	97	127	147	157	169	214	257	204	197	161	180	254	224	236	233	234	254	184.0
7-Sep	215	215	171	185	190	213	208	201	197	211	222	205	168	156	134	121	73	72	25	35	344	351	337	341	190.8
8-Sep	236	181	157	159	157	157	163	177	179	184	190	352	1	356	315	1	20	350	2	26	13	346	341	304	155.1
9-Sep	307	324	295	266	197	180	162	152	175	184	184	192	168	155	159	152	156	150	124	117	124	323	131	156	162.4
10-Sep	150	131	135	185	199	193	198	203	203	196	199	178	231	177	175	179	161	146	137	133	144	149	151	156	161.8
11-Sep	164	93	163	4	347	1	204	171	178	181	180	173	171	178	178	181	171	181	179	156	DF	166	151	166	174.3
12-Sep	170	173	196	182	179	161	162	188	189	192	188	174	157	166	178	187	209	230	222	224	216	194	216	193	188.4
13-Sep	169	166	171	160	167	160	190	219	214	219	226	227	235	243	239	243	242	268	270	253	252	259	220	232	230.6
14-Sep	246	233	272	274	277	286	286	287	290	287	277	268	256	324	325	308	296	312	300	307	317	290	258	200	289.3
15-Sep	146	167	176	158	148	154	165	168	185	175	182	169	170	164	168	182	184	175	161	161	172	169	177	179	170.3
16-Sep	161	161	166	159	161	160	194	195	204	186	205	186	175	189	206	182	215	216	184	188	210	239	182	168	187.4
17-Sep	155	154	155	146	153	158	166	173	244	248	253	205	220	198	225	184	182	205	213	230	241	194	164	166	190.9
18-Sep	150	151	164	168	153	153	157	169	199	218	226	209	250	257	241	226	219	221	171	164	195	158	151	168	198.4
19-Sep	172	170	166	179	175	197	176	196	203	207	202	205	214	206	202	188	166	164	174	286	352	353	352	7	193.3
20-Sep	359	349	315	265	297	205	194	194	184	166	161	10	18	48	75	38	1	278	298	266	350	336	272	179	342.5
21-Sep	187	176	171	171	161	155	155	171	166	192	203	198	202	204	206	203	202	198	180	177	179	186	186	176	188.8
22-Sep	166	172	178	176	175	185	198	211	205	203	213	213	194	187	182	183	186	173	169	172	163	170	173	175	184.2
23-Sep	162	124	177	198	204	192	193	337	290	224	181	164	159	160	170	160	162	158	158	155	145	150	144	148	162.5
24-Sep	142	144	154	163	163	163	157	162	171	180	197	188	219	242	241	206	194	188	184	199	205	206	206	213	180.5
25-Sep	216	212	213	160	165	165	165	173	189	291	11	21	122	96	44	40	39	28	14	23	359	8	1	2	37.5
26-Sep	9	4	4	7	9	7	8	232	165	189	206	193	190	200	197	199	221	209	158	269	156	257	311	286	230.2
27-Sep	174	155	157	180	217	142	227	157	158	119	127	145	134	219	182	259	316	12	338	352	6	341	335	313	186.6
28-Sep	351	10	11	11	21	10	8	23	14	9	8	0	15	10	15	14	7	4	359	6	5	1	355	353	8.7
29-Sep	350	356	349	346	290	284	291	287	352	347	1	2	6	6	349	12	17	11	358	356	8	5	358	216	355.6
30-Sep	233	209	193	205	198	142	148	161	159	175	208	170	148	149	160	187	180	164	159	161	161	142	162	191	169.6

178.6 173.9 178.5 177.8 174.4 173.2 182.9 193.2 197.9 201.6 207.0 197.7 199.3 201.5 204.9 198.8 199.5 201.8 192.2 192.6 192.1 199.8 191.7 188.1

Diurnal Average

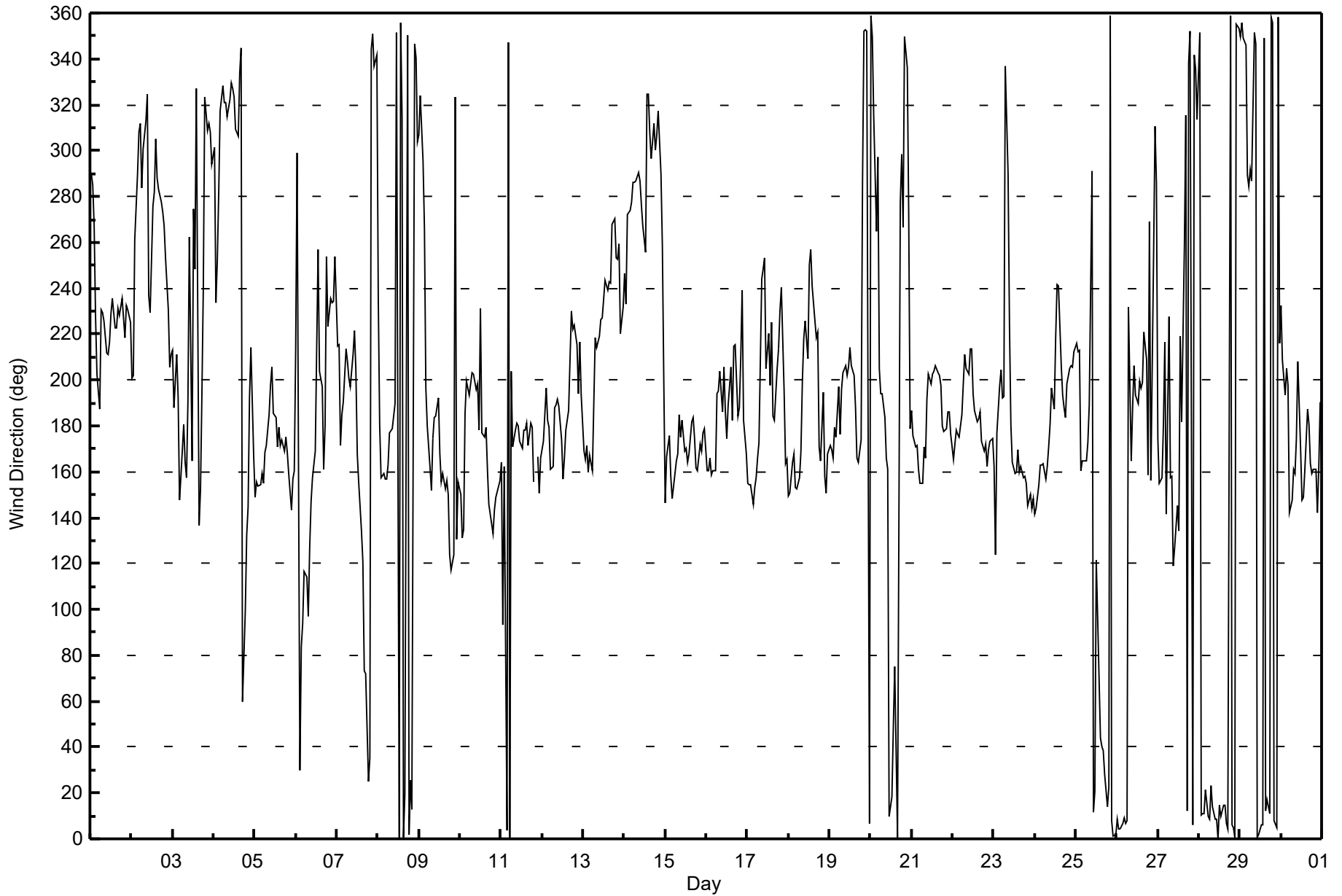
DF - DAS Failure

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



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 97 deg on Sep 17 13:00	Hours of Data: 719
Minimum Value: 4 deg on Sep 30 21:00	Hours of Missing Data: 1
Percentiles: P ₁ = 6 P ₁₀ = 9 Q ₁ = 11 Median = 14 Q ₃ = 21 P ₉₀ = 37 P ₉₉ = 82	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-Sep	27	31	44	36	10	11	32	11	8	14	12	12	16	16	14	13	12	11	9	9	10	11	9	16	44
2-Sep	19	23	13	18	12	14	21	30	19	46	47	31	16	18	15	20	13	11	14	12	16	31	20	15	47
3-Sep	20	39	12	40	19	15	9	18	26	56	89	39	43	63	15	34	23	15	51	15	11	15	15	13	89
4-Sep	23	11	17	18	22	13	14	14	14	15	17	20	15	37	36	50	82	37	22	11	18	35	30	19	82
5-Sep	9	15	14	10	10	10	9	9	9	13	15	21	22	20	24	15	24	16	8	9	8	8	17	15	24
6-Sep	23	54	11	22	20	20	28	28	15	17	9	19	23	28	72	36	15	17	19	11	8	8	11	12	72
7-Sep	19	20	28	23	24	20	25	15	12	15	15	30	45	30	24	26	19	22	16	42	10	9	8	28	45
8-Sep	36	22	13	13	10	11	12	11	15	16	38	74	27	66	47	45	13	12	12	6	15	15	9	26	74
9-Sep	46	31	41	42	26	36	13	12	16	18	22	20	20	15	18	11	9	9	13	13	11	68	77	29	77
10-Sep	12	11	9	30	14	10	12	12	13	24	20	46	83	61	16	13	12	11	8	8	8	7	7	8	83
11-Sep	12	86	31	79	15	16	26	23	15	11	11	12	12	13	13	14	11	11	8	11	DF	8	9	11	86
12-Sep	12	7	12	14	11	11	10	10	13	14	12	18	12	11	11	12	12	11	9	8	9	14	7	36	36
13-Sep	11	18	21	14	14	15	18	8	13	11	10	15	13	17	15	14	12	19	24	13	14	15	15	16	24
14-Sep	11	13	13	17	11	11	13	13	12	16	19	26	46	83	19	19	17	14	8	11	12	19	49	32	83
15-Sep	12	13	22	14	14	12	18	16	13	11	15	17	13	13	13	13	12	9	9	7	8	8	8	13	22
16-Sep	9	18	9	9	14	10	16	13	12	19	13	27	19	18	16	32	10	10	6	6	11	6	31	15	32
17-Sep	11	10	16	16	14	11	18	34	45	71	22	56	97	19	25	30	8	12	11	9	10	32	16	26	97
18-Sep	14	11	11	15	14	12	14	17	16	11	11	13	24	16	10	12	13	12	13	8	32	69	13	11	69
19-Sep	10	9	17	16	9	11	18	14	9	14	13	11	16	19	18	20	15	7	5	63	11	13	12	22	63
20-Sep	28	9	26	48	22	53	20	16	20	29	42	85	21	30	31	31	14	33	52	32	96	45	63	23	96
21-Sep	17	12	9	11	10	10	10	11	9	12	16	12	11	10	13	11	10	9	10	7	8	9	8	8	17
22-Sep	8	8	9	7	9	7	14	10	11	11	11	16	16	15	11	11	11	8	9	6	7	7	7	7	16
23-Sep	16	16	12	9	19	8	9	32	45	54	13	12	12	10	13	9	10	8	6	6	7	8	8	8	54
24-Sep	8	8	10	18	7	7	8	8	10	10	13	16	23	15	14	15	9	8	10	9	8	8	13	11	23
25-Sep	23	9	9	25	13	20	19	26	34	46	56	47	44	50	18	22	12	9	13	27	22	10	13	13	56
26-Sep	9	14	12	12	10	12	39	47	21	12	12	19	20	15	11	26	16	31	16	74	40	19	45	63	74
27-Sep	32	29	31	36	78	19	47	49	31	20	18	23	26	17	20	24	41	9	35	25	37	37	44	36	78
28-Sep	16	12	14	16	12	15	17	10	10	13	13	14	13	11	12	10	12	13	13	14	14	14	14	11	17
29-Sep	11	15	14	18	15	9	10	12	18	12	15	15	17	16	16	18	11	12	14	13	9	14	34	29	34
30-Sep	21	17	10	26	17	39	30	17	14	10	69	61	21	14	22	16	11	7	5	5	4	11	14	20	69

46	86	44	79	78	53	47	49	45	71	89	85	97	83	72	50	82	37	52	74	96	69	77	63	
Diurnal Maximum																								

DF - DAS Failure



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS25 WASKŌW OHCI PIMÂTISIWIN SEPTEMBER 2023

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

October 30, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WASKŌW OHCI PIMĀTISIWIN (AMS25)
 SEPTEMBER 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	35	99.86	11.3	0	4.7	0
H2S(ppb) Average	683	36	37	99.86	5.3	0	0.9	0
Temperature 2 m (C) Average	720	0	0	100	26.7	0	20.6	0
Relative Humidity (%) Average	720	0	0	100	100	-	94.7	-
Wind Speed 10 m (km/h) Average	714	0	6	99.17	15	0	9	0
Wind Direction 10 m (deg) Average	714	0	6	99.17	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WASKÖW OHCI PIMĀTISIWIN (AMS25)
 SEPTEMBER 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	0.91	1.9	-	0	0	0	0.1	0.6	3.2	11.3
H2S (ppb) Average	683	0.38	0.4	-	0	0.1	0.1	0.2	0.5	0.7	5.3
Temperature 2 m (C) Average	720	13.3	5.9	-	0.5	6	8.6	13.1	17.8	21.4	26.7
Relative Humidity (%) Average	720	69.27	20.6	-	24.3	39.9	52.7	70.9	87.3	96.9	100
Wind Speed 10 m (km/h) Average	714	4.8	3	-	0	1	2	4	7	9	15
Wind Direction 10 m (deg) Average	714	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WASKŌW OHCI PIMĀTISIWIN (AMS25)

SEPTEMBER 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
H2S, SO2	28 Sep 2023 07:00	28 Sep 2023 07:00	1	Maintenance - sample manifold cleaned
Wind Speed, Wind Direction	30 Sep 2023 20:00	30 Sep 2023 23:00	6	Intermittent unstable operation

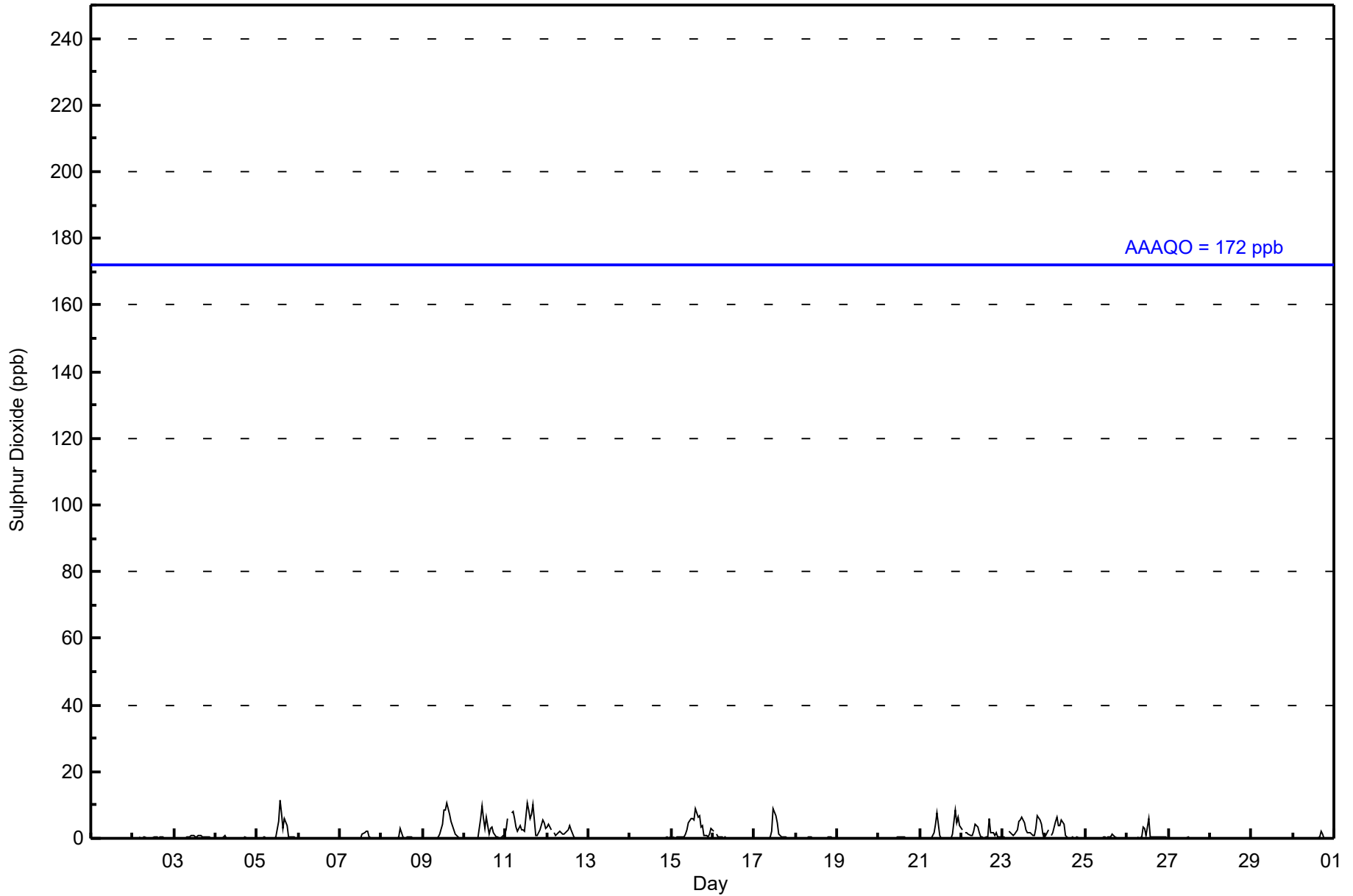


Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 720																					
Maximum Value: 11.3 ppb on Sep 5 14:00		Maximum Daily Average: 4.7 ppb on Sep 11		Hours of Data: 685																							
Minimum Value: 0.0 ppb on Sep 1 02:00		Minimum Daily Average: 0.0 ppb on Sep 6		Hours of Missing Data: 35																							
Maximum Diurnal Average: 1.9 ppb at hour 13		Minimum Diurnal Average: 0.4 ppb at hour 3		Hours of Calibration: 34																							
Monthly Average: 0.91 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.6 P ₉₀ = 3.2 P ₉₉ = 8.7		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-Sep	0.0	0.0	0.0	0.0	Z	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	0.0	0.0	0.0	0.0	0.1	0.2	
2-Sep	0.0	0.0	0.0	0.1	0.2	Z	0.2	0.2	0.2	0.1	0.1	0.2	0.3	0.4	0.2	0.2	0.2	0.3	0.2	0.1	0.1	0.2	0.1	0.1	0.2	0.4	
3-Sep	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.6	0.7	1.0	0.3	0.6	0.9	0.8	0.5	0.4	0.3	0.4	0.3	0.2	0.1	0.1	0.4	1.0	
4-Sep	0.1	Z	0.2	0.1	0.1	0.7	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.3	0.1	0.1	0.2	0.2	0.1	0.2	0.1	0.7	
5-Sep	0.1	0.1	Z	0.3	0.2	0.1	0.2	0.2	0.1	0.2	0.2	0.6	4.9	11.3	7.7	2.9	5.7	3.8	0.6	0.4	0.4	0.2	0.1	0.1	1.8	11.3	
6-Sep	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
7-Sep	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	1.1	1.7	2.3	2.1	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.4	2.3	
8-Sep	0.0	0.0	0.0	0.0	0.1	Z	0.2	0.1	0.0	0.1	0.5	2.9	0.6	0.1	0.2	0.2	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.3	2.9	
9-Sep	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3	1.5	4.4	8.6	8.4	10.6	7.1	5.0	3.7	2.4	1.1	0.6	0.1	0.0	0.0	2.3	10.6	
10-Sep	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	5.9	9.7	6.0	3.1	6.2	1.3	3.1	3.5	1.9	0.6	0.4	0.1	0.1	0.4	1.1	1.9	9.7	
11-Sep	2.5	6.0	Z	7.6	8.0	6.0	3.3	2.3	3.8	2.7	2.7	2.3	10.4	8.5	6.1	7.0	10.3	0.8	0.8	1.9	2.4	5.3	4.7	2.8	4.7	10.4	
12-Sep	3.3	4.2	2.4	Z	1.5	1.0	1.7	2.1	1.7	1.1	1.4	2.1	2.6	3.9	2.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	4.2	
13-Sep	0.0	0.0	0.0	0.0	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	0.1	0.0	0.1	0.1	
14-Sep	0.0	0.1	0.1	0.1	0.1	Z	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2
15-Sep	Z	0.3	0.2	0.4	0.6	0.5	0.3	0.5	1.2	2.5	4.8	5.9	5.8	5.4	9.0	6.2	6.9	3.5	3.9	0.8	0.7	0.4	1.3	3.0	2.8	9.0	
16-Sep	2.2	Z	1.4	0.6	0.3	0.3	0.2	0.2	0.2	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	2.2	
17-Sep	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.9	8.9	6.7	4.6	1.1	0.9	0.4	0.3	0.2	0.2	0.2	0.2	0.1	0.1	1.1	8.9	
18-Sep	0.1	0.0	0.0	Z	0.1	0.1	0.2	0.4	0.5	0.3	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.4	0.2	0.1	0.1	0.2	0.5	
19-Sep	0.2	0.2	0.1	0.1	Z	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.2	
20-Sep	0.1	0.2	0.1	0.1	0.1	Z	0.2	0.2	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.2	0.3	
21-Sep	Z	0.0	0.0	0.0	0.0	0.1	0.2	0.7	1.8	4.2	7.7	1.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	1.3	8.7	4.8	6.5	3.9	1.8	8.7	
22-Sep	2.7	Z	1.6	1.8	1.2	0.8	1.0	2.1	4.2	3.5	1.8	0.3	0.3	0.2	0.4	0.6	5.8	1.5	1.9	0.8	1.8	0.5	0.2	0.4	1.5	5.8	
23-Sep	0.5	0.6	Z	2.3	1.7	1.1	1.0	1.1	2.4	5.1	5.3	6.2	4.7	2.4	1.8	1.8	1.5	0.7	0.6	3.0	6.9	5.7	4.2	1.1	2.7	6.9	
24-Sep	0.5	0.9	2.6	Z	0.8	1.8	5.3	6.4	4.0	3.9	5.6	4.1	0.7	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.0	1.7	6.4	
25-Sep	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.2	0.3	0.5	1.3	1.0	0.5	0.1	0.0	0.1	0.1	0.1	0.1	0.2	1.3	
26-Sep	0.1	0.1	0.1	0.1	0.1	Z	0.2	0.2	0.4	3.5	2.8	0.7	6.0	0.6	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.3	0.2	0.2	0.8	6.0	
27-Sep	Z	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.2	0.4	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.4	
28-Sep	0.0	Z	0.1	0.1	0.0	0.0	M	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	0.0	0.0	0.0	0.1	
29-Sep	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	0.1	
30-Sep	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.4	1.9	1.1	0.1	0.0	0.0	0.0	0.0	0.0	0.2	1.9	
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerospan C - Calibration M - Maintenance																											
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb																											



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Waskow ohci Pimatisiwin - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Waskow ohci Pimatisiwin - September 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	683	99.71	99.71
11 - 20	2	0.29	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: 720



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Waskow ohci Pimatisiwin - September 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	14	2	8	6	13	102	165	77	45	45	45	40	40	32	31	677
11 - 20	0	0	0	0	0	0	2	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	12	14	2	8	6	13	104	165	77	45	45	45	40	40	32	31	679

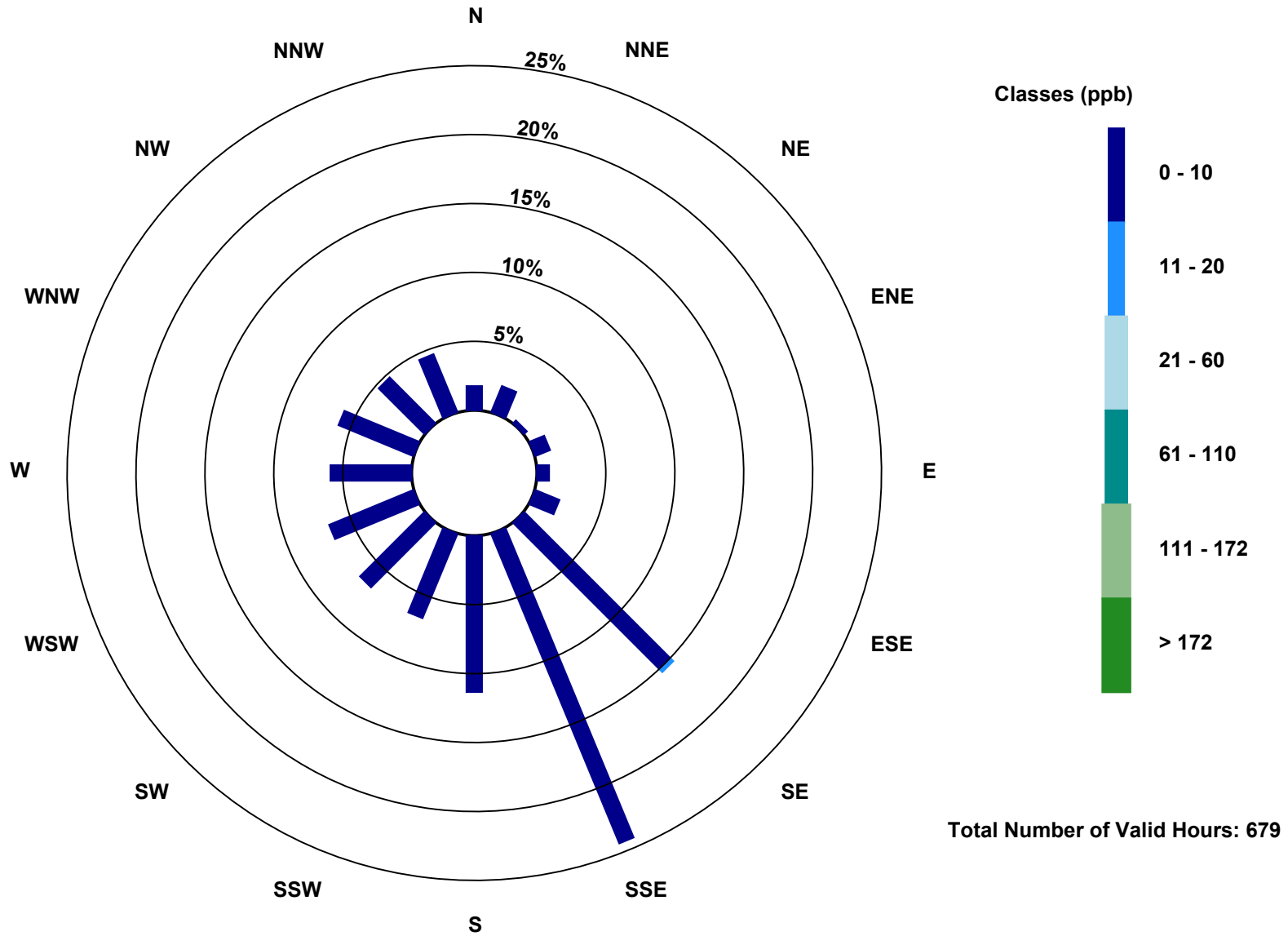
Total Number of Valid Hours: 679

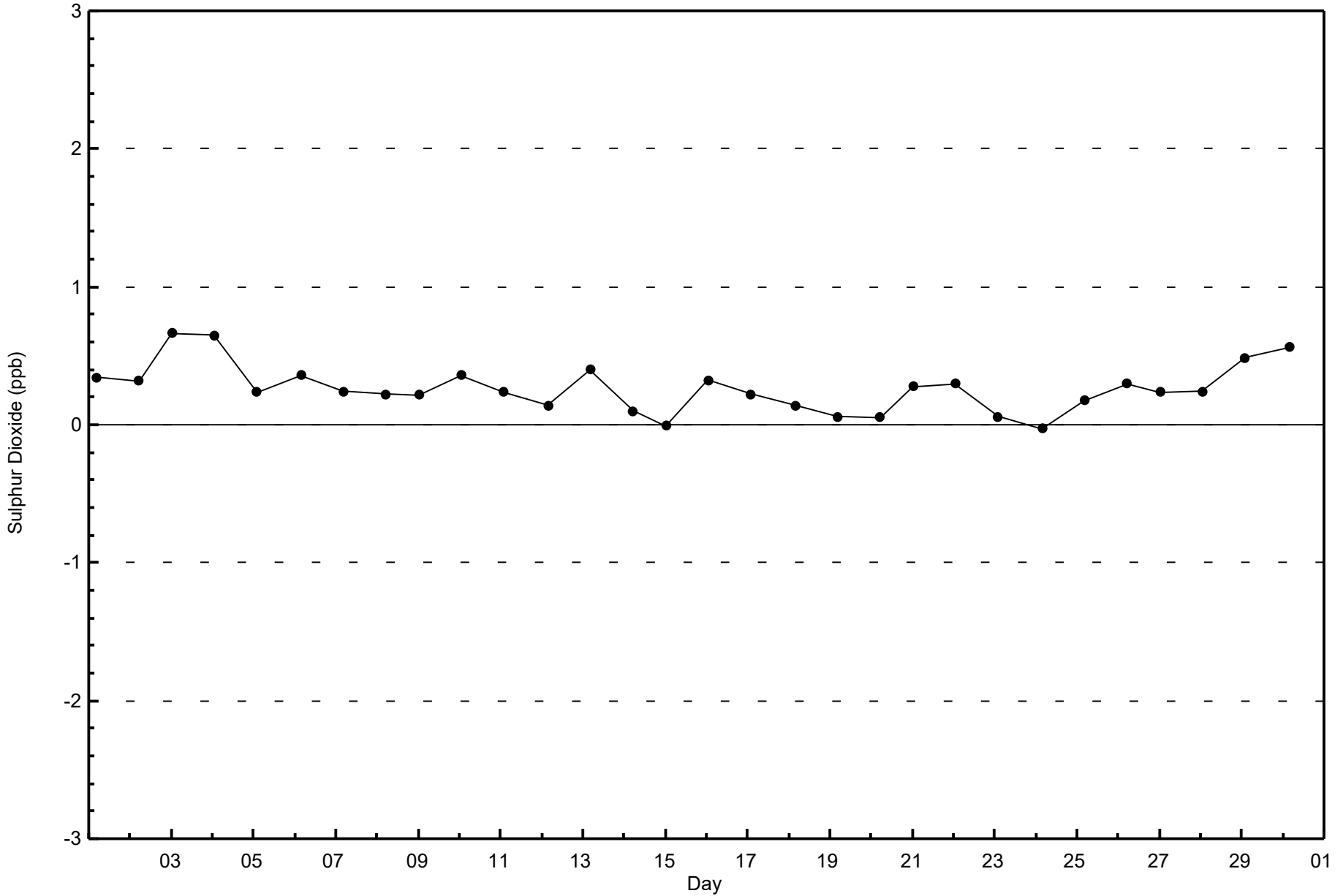
Total Number of Hours: 720

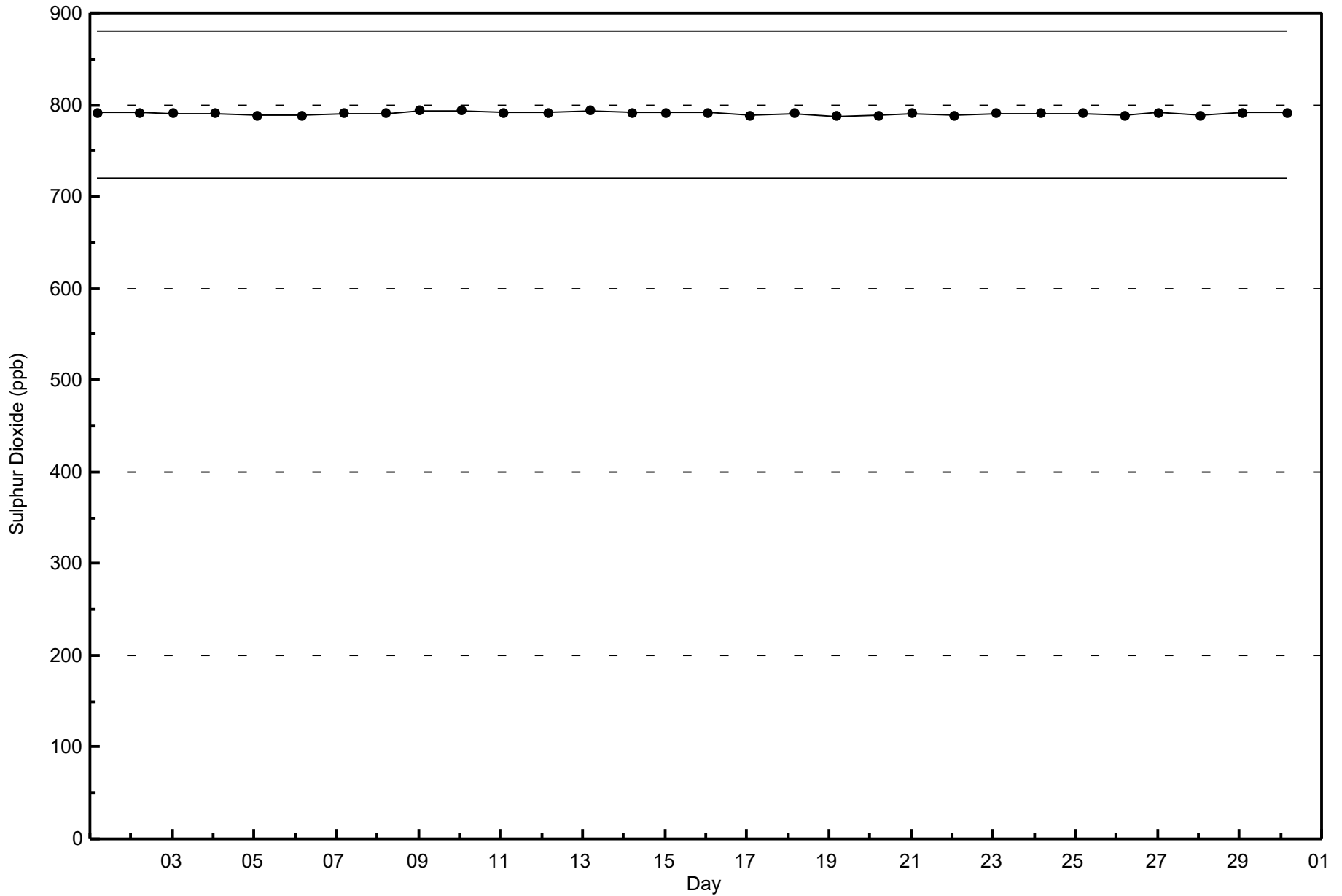


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Sulphur Dioxide (SO₂) - ppb
Waskow ohci Pimatisiwin



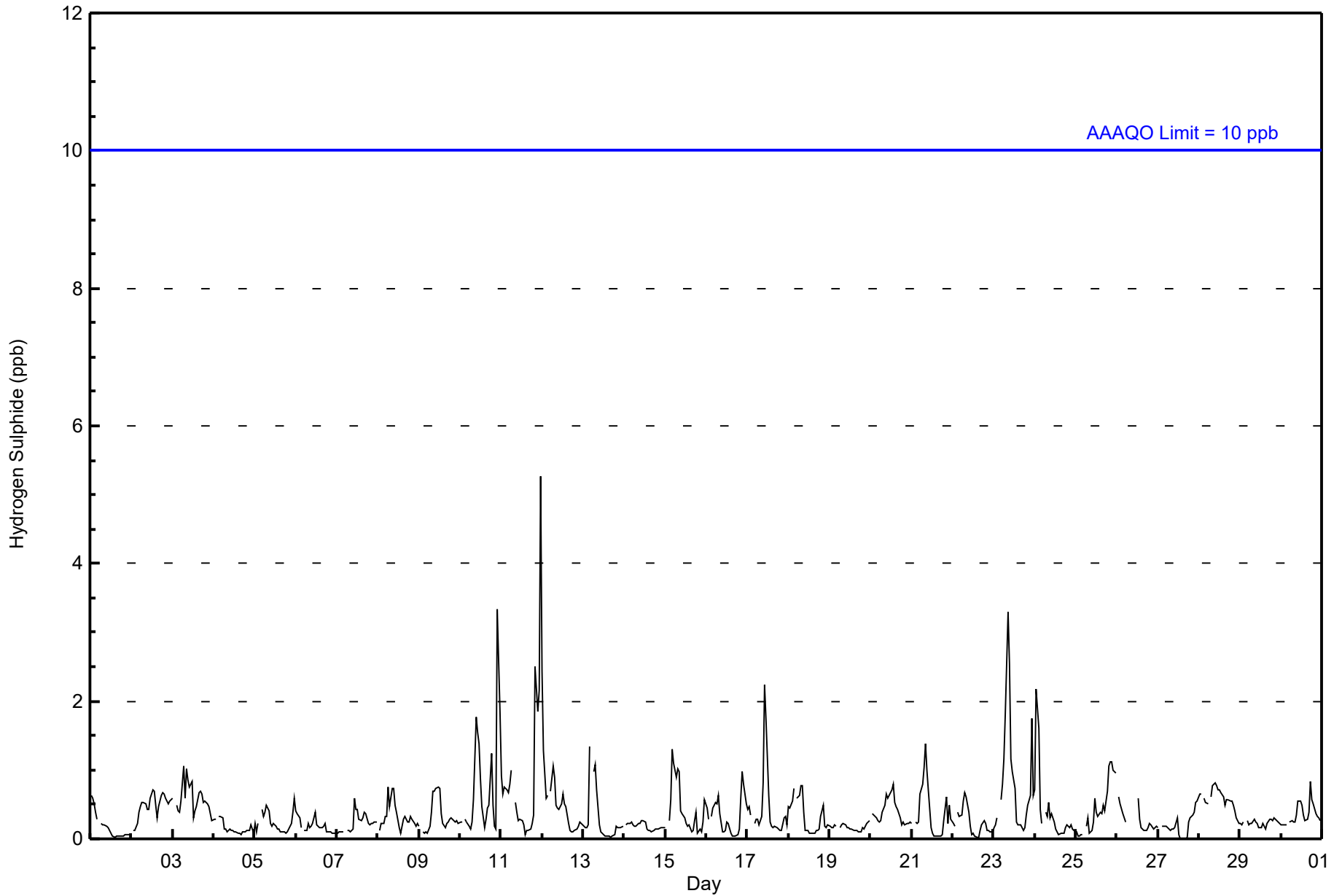






Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 720														Daily Average		Daily Maximum					
Maximum Value: 5.3 ppb on Sep 12 00:00		Maximum Daily Average: 0.9 ppb on Sep 11		Hours of Data: 683														0.2		0.6							
Minimum Value: 0.0 ppb on Sep 27 16:00		Minimum Daily Average: 0.2 ppb on Sep 4		Hours of Missing Data: 37														0.5		0.7							
Maximum Diurnal Average: 0.6 ppb at hour 9		Minimum Diurnal Average: 0.2 ppb at hour 16		Hours of Calibration: 36														0.6		1.1							
Monthly Average: 0.38 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.1 Median = 0.2 Q ₃ = 0.5 P ₉₀ = 0.7 P ₉₉ = 2.2		Percent Operational Time: 99.9														0.2		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-Sep	0.6	0.6	0.5	0.4	0.3	Z	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.6	
2-Sep	Z	0.1	0.1	0.2	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.6	0.7	0.7	0.5	0.3	0.5	0.6	0.7	0.7	0.6	0.5	0.5	0.6	0.5	0.7	
3-Sep	0.6	Z	0.5	0.4	0.4	0.6	1.1	0.6	1.0	0.8	0.8	0.8	0.3	0.4	0.5	0.7	0.7	0.6	0.5	0.6	0.5	0.5	0.4	0.3	0.6	1.1	
4-Sep	0.3	0.3	Z	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	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.3	
5-Sep	0.2	0.1	0.2	Z	0.4	0.3	0.4	0.5	0.4	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.6	0.2	0.6	
6-Sep	0.4	0.4	0.3	0.2	Z	0.1	0.1	0.2	0.2	0.2	0.2	0.4	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	0.4	
7-Sep	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.6	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.6	
8-Sep	Z	0.1	0.2	0.2	0.3	0.3	0.8	0.5	0.7	0.7	0.5	0.4	0.2	0.1	0.2	0.3	0.3	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.8	
9-Sep	0.2	Z	0.1	0.1	0.1	0.1	0.2	0.4	0.7	0.7	0.7	0.7	0.7	0.4	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.3	0.2	0.3	0.7	
10-Sep	0.2	0.2	Z	0.3	0.3	0.2	0.1	0.2	0.6	1.8	1.6	1.4	0.9	0.5	0.2	0.3	0.5	0.5	1.2	0.5	0.2	0.1	3.3	1.8	0.7	3.3	
11-Sep	0.9	0.6	0.8	0.7	0.7	0.8	1.0	Z	0.5	0.4	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.2	0.4	2.5	1.8	2.2	5.3	0.9	5.3	
12-Sep	2.4	1.3	0.6	0.6	Z	0.7	1.1	0.9	0.5	0.4	0.4	0.5	0.7	0.5	0.5	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.5	2.4	
13-Sep	0.2	0.2	0.2	0.2	1.3	Z	1.0	1.1	0.7	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3	1.3	
14-Sep	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.1	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
15-Sep	0.2	Z	0.3	0.6	1.3	1.1	0.9	1.0	1.0	0.4	0.4	0.3	0.2	0.2	0.2	0.1	0.1	0.3	0.4	0.1	0.1	0.1	0.2	0.6	0.4	1.3	
16-Sep	0.4	0.3	Z	0.3	0.5	0.5	0.5	0.6	0.4	0.1	0.1	0.1	0.3	0.2	0.1	0.0	0.0	0.0	0.1	0.1	0.6	1.0	0.8	0.5	0.3	1.0	
17-Sep	0.4	0.5	0.4	Z	0.2	0.3	0.3	0.2	0.3	0.8	2.2	1.7	0.6	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.3	0.3	0.2	0.4	2.2	
18-Sep	0.5	0.5	0.6	0.7	Z	0.6	0.6	0.8	0.8	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.5	0.2	0.2	0.2	0.3	0.8	
19-Sep	0.2	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.3	0.2	0.3	
20-Sep	Z	0.4	0.3	0.3	0.3	0.2	0.3	0.4	0.5	0.6	0.6	0.6	0.7	0.8	0.5	0.5	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.8	
21-Sep	0.2	Z	0.3	0.2	0.2	0.6	0.8	1.0	1.4	1.0	0.7	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.6	0.2	0.5	0.3	0.4	1.4	
22-Sep	0.2	0.2	Z	0.4	0.3	0.3	0.5	0.7	0.6	0.4	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.2	0.7	
23-Sep	0.2	0.2	0.3	Z	0.6	0.8	1.2	1.8	3.3	2.5	1.2	1.0	0.7	0.2	0.2	0.2	0.1	0.2	0.3	0.5	0.6	1.8	0.6	0.8	3.3		
24-Sep	0.7	2.2	1.6	0.4	0.2	Z	0.4	0.3	0.5	0.3	0.4	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.4	2.2	
25-Sep	0.1	0.0	0.0	0.1	0.1	Z	0.2	0.3	0.1	0.1	0.2	0.6	0.4	0.3	0.4	0.4	0.5	0.4	0.7	1.1	1.1	1.1	1.0	0.9	0.4	1.1	
26-Sep	Z	0.6	0.5	0.4	0.3	0.2	C	C	C	C	C	C	0.6	0.3	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.2	--	0.6	
27-Sep	0.2	Z	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.3	0.4	0.5	0.5	0.2	0.5	
28-Sep	0.7	0.6	Z	0.6	0.5	0.5	M	0.6	0.8	0.8	0.8	0.7	0.7	0.7	0.6	0.5	0.6	0.6	0.6	0.5	0.5	0.4	0.3	0.2	0.6	0.8	
29-Sep	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	0.2	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.3	
30-Sep	0.2	0.2	0.2	0.2	Z	0.2	0.3	0.2	0.2	0.3	0.6	0.6	0.5	0.3	0.3	0.3	0.4	0.8	0.6	0.5	0.4	0.3	0.3	0.3	0.4	0.8	
																								Diurnal Average		Diurnal Maximum	
																								0.4		2.4	
																								0.4		2.2	
																								0.4		1.6	
																								0.3		0.7	
																								0.4		1.3	
																								0.4		1.1	
																								0.5		1.2	
																								0.5		1.8	
																								0.6		3.3	
																								0.5		2.5	
																								0.5		2.2	
																								0.5		1.7	
																								0.3		0.9	
																								0.3		0.8	
																								0.2		0.6	
																								0.2		0.7	
																								0.2		0.8	
																								0.2		1.2	
																								0.3		1.1	
																								0.4		2.5	
																								0.3		1.8	
																								0.5		3.3	
																								0.5		5.3	

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
Waskow ohci Pimatisiwin - September 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	679	99.41	99.41
3 - 4	3	0.44	99.85
5 - 7	1	0.15	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: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Waskow ohci Pimatisiwin - September 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	16	13	2	7	7	13	102	159	78	45	45	41	41	40	33	31	673
3 - 4	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	3
5 - 7	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	16	13	2	7	7	13	104	161	78	45	45	41	41	40	33	31	677

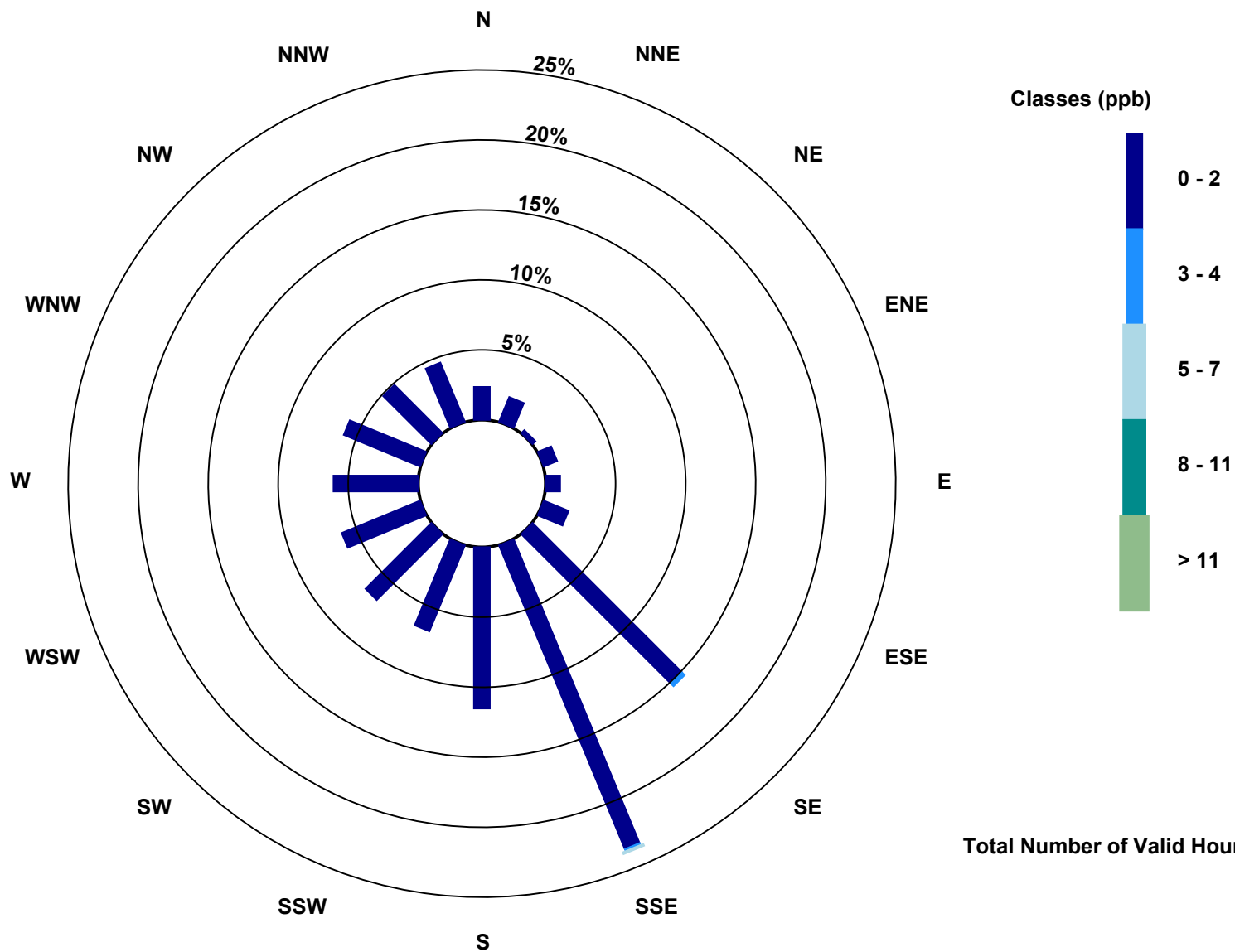
Total Number of Valid Hours: 677

Total Number of Hours: 720

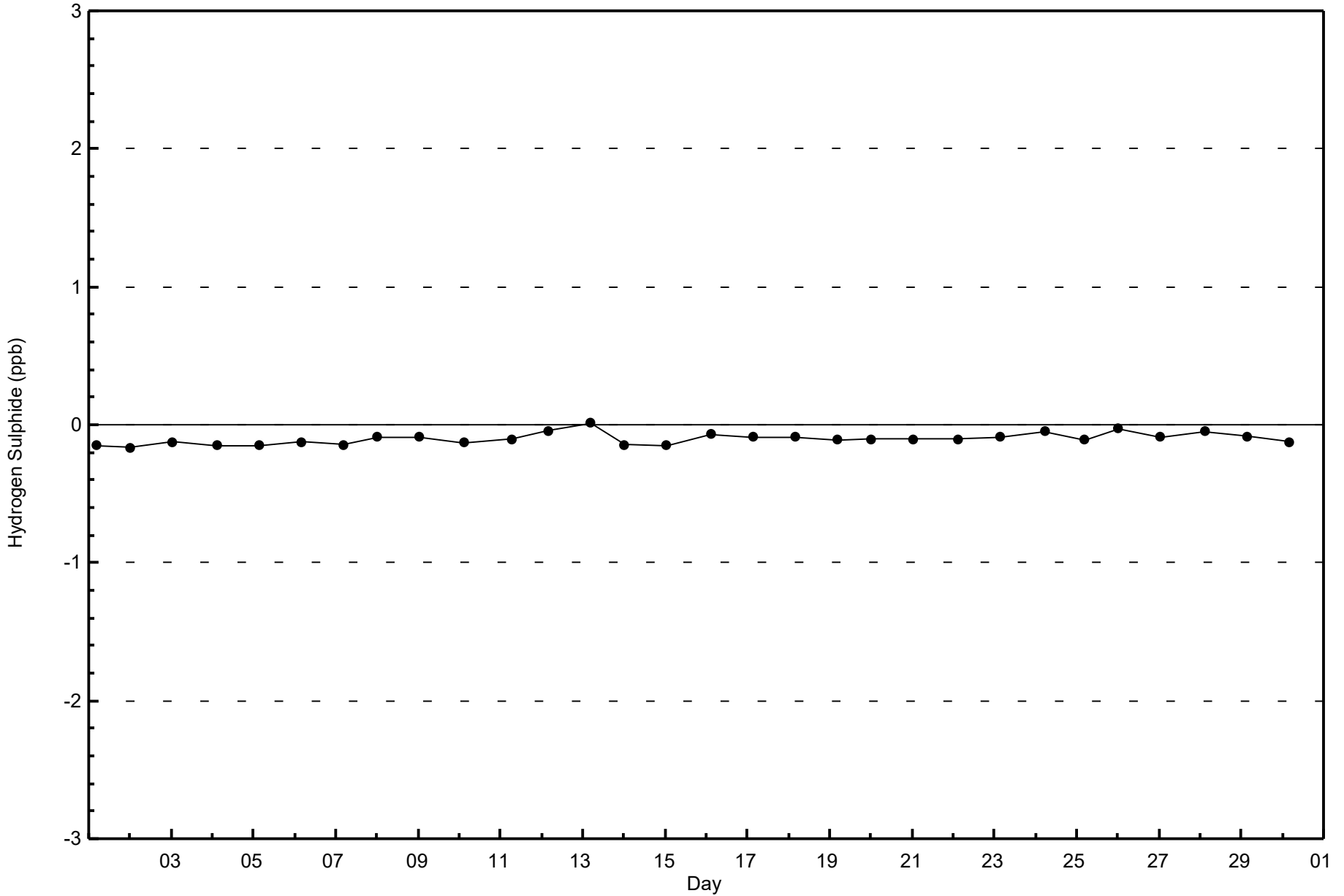


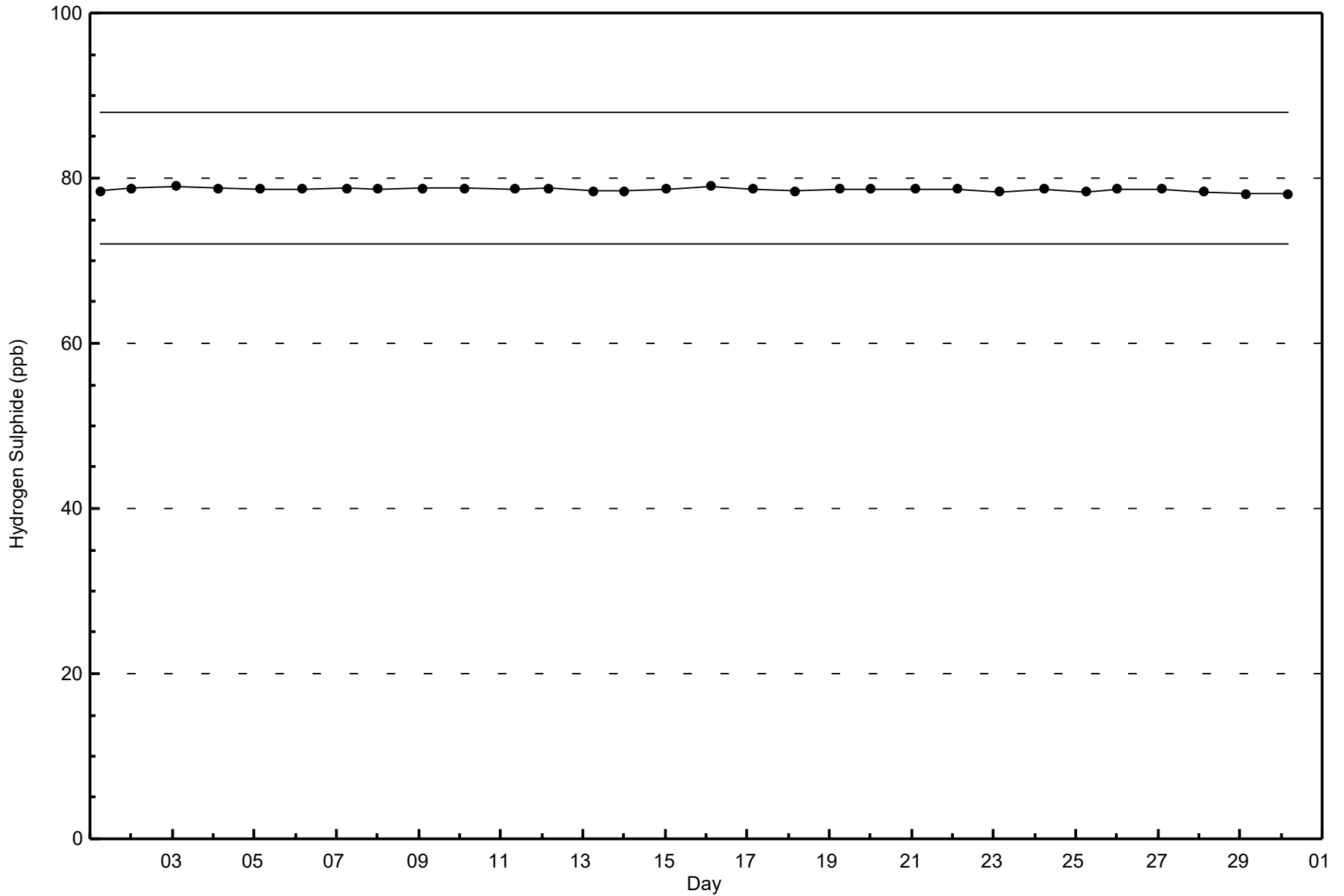
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Hydrogen Sulphide (H₂S) - ppb
Waskow ohci Pimatisiwin



Total Number of Valid Hours: 677







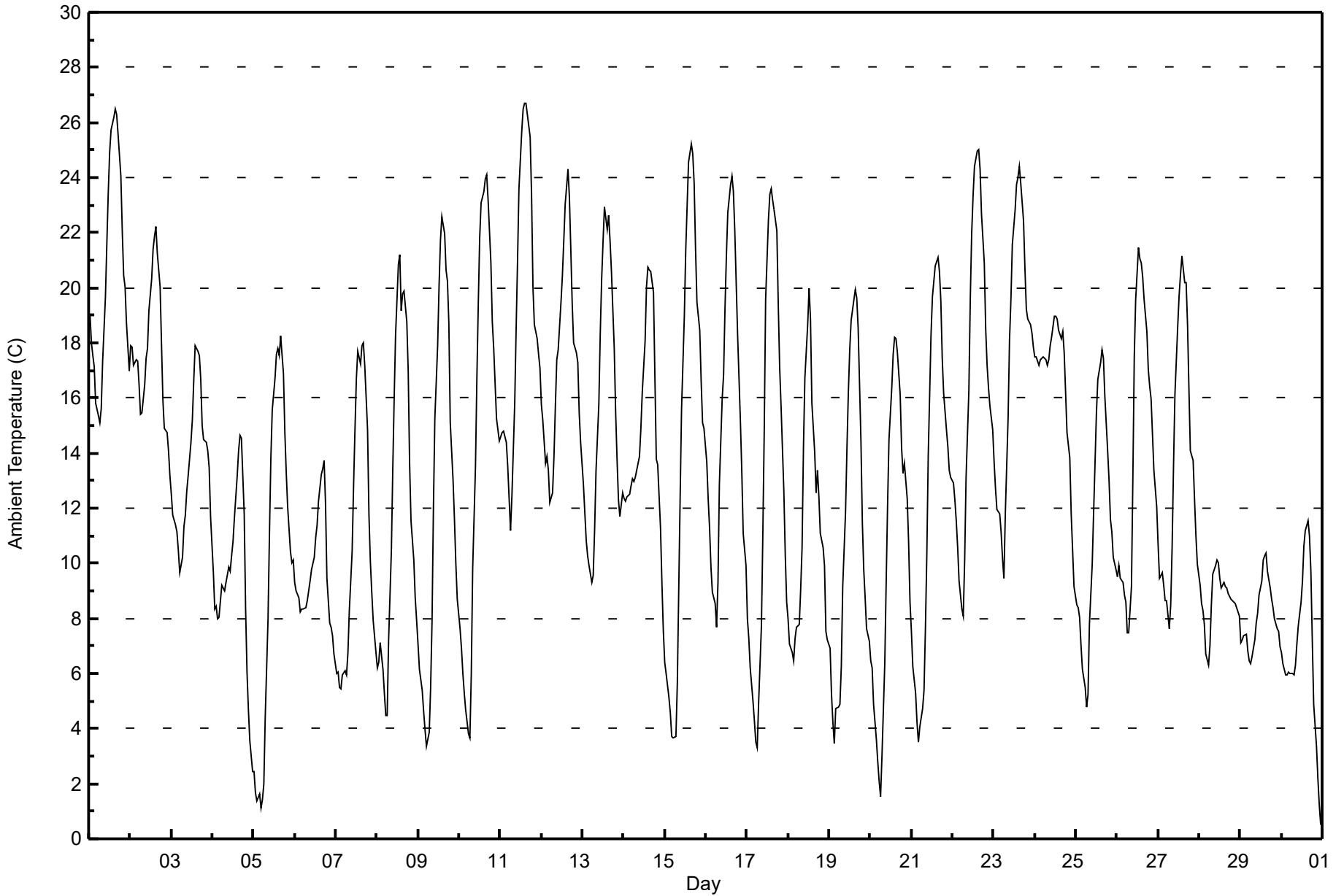
Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature (AT) - C

Waskow ohci Pimatisiwin - September 2023

Maximum Value: 26.7 C on Sep 11 15:00		Maximum Daily Average: 20.6 C on Sep 1		Hours in Service: 720																																												
Minimum Value: 0.5 C on Oct 1 00:00		Minimum Daily Average: 6.7 C on Sep 30		Hours of Data: 720																																												
Maximum Diurnal Average: 19.7 C at hour 16		Minimum Diurnal Average: 7.7 C at hour 7		Hours of Missing Data: 0																																												
Monthly Average: 13.30 C		Percentiles: P ₁ = 1.7 P ₁₀ = 6.0 Q ₁ = 8.6 Median = 13.1 Q ₃ = 17.8 P ₉₀ = 21.4 P ₉₉ = 25.7		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-Sep	19.0	18.0	17.5	17.1	15.8	15.3	15.1	15.6	17.4	19.7	21.6	23.5	24.9	25.7	26.2	26.5	26.3	25.6	24.1	22.1	20.4	20.0	18.7	17.0	20.6	26.5																						
2-Sep	17.9	17.8	17.2	17.4	17.3	16.5	15.4	15.5	16.5	17.5	17.8	19.2	20.3	21.4	21.9	22.2	21.2	20.1	18.0	15.9	14.9	14.8	14.1	13.2	17.7	22.2																						
3-Sep	12.5	11.7	11.4	11.1	10.5	9.7	10.2	11.3	11.7	12.6	13.2	14.4	15.2	16.6	17.9	17.7	17.5	16.7	15.0	14.5	14.4	14.1	13.5	11.7	13.5	17.9																						
4-Sep	9.6	8.3	8.4	8.0	8.1	9.2	9.1	9.0	9.3	9.8	9.7	10.3	10.8	11.6	13.2	14.1	14.6	14.6	11.8	8.3	6.1	4.7	3.6	2.5	9.4	14.6																						
5-Sep	2.4	1.7	1.4	1.6	1.1	1.4	2.0	4.4	8.0	11.1	13.8	15.6	16.7	17.6	17.8	17.6	18.2	16.9	14.7	13.3	12.0	10.4	10.0	10.1	10.0	18.2																						
6-Sep	9.3	9.0	8.8	8.3	8.3	8.4	8.4	8.6	9.0	9.4	9.7	10.2	10.9	11.4	12.2	13.2	13.4	13.7	12.2	9.5	7.8	7.7	7.4	6.7	9.7	13.7																						
7-Sep	6.0	6.1	5.5	5.4	6.0	6.1	6.0	6.8	8.3	10.4	12.8	14.8	16.7	17.7	17.3	17.9	18.0	17.2	14.8	11.7	10.0	9.0	7.9	6.8	10.8	18.0																						
8-Sep	6.2	6.4	7.1	6.2	5.3	4.5	4.5	7.2	10.5	13.4	16.0	18.3	20.8	21.2	19.2	19.8	19.9	18.7	17.0	13.6	11.6	10.1	8.7	7.9	12.3	21.2																						
9-Sep	7.1	6.2	5.4	4.6	4.0	3.4	3.9	5.5	7.9	12.0	15.2	17.9	20.0	21.7	22.6	22.0	20.6	20.2	18.7	15.1	13.0	11.6	10.0	8.7	12.4	22.6																						
10-Sep	7.6	6.9	6.0	5.3	4.7	3.8	3.7	5.9	9.8	13.5	16.7	19.4	21.8	23.1	23.5	23.9	24.1	23.2	20.9	18.8	17.8	16.5	15.3	14.5	14.4	24.1																						
11-Sep	14.6	14.8	14.8	14.4	13.5	12.4	11.2	12.5	15.8	18.5	21.0	23.6	25.7	26.5	26.7	26.7	26.3	25.5	23.4	20.1	18.7	18.2	17.6	17.1	19.1	26.7																						
12-Sep	15.8	15.2	13.6	13.9	13.4	12.2	12.6	13.9	15.7	17.4	17.7	19.5	20.5	21.7	23.0	24.3	23.3	21.4	19.4	18.0	17.6	17.3	15.5	14.4	17.4	24.3																						
13-Sep	12.9	11.8	10.8	10.3	9.9	9.3	9.6	11.2	13.4	15.8	18.3	20.3	21.6	22.9	22.1	22.6	21.7	20.6	17.8	15.4	13.8	12.3	11.7	12.6	15.4	22.9																						
14-Sep	12.3	12.3	12.4	12.5	12.8	13.1	13.0	13.1	13.6	13.9	14.9	16.2	18.0	20.0	20.7	20.6	20.6	19.9	16.8	13.8	13.6	11.3	9.3	7.6	14.7	20.7																						
15-Sep	6.4	6.0	5.1	4.6	3.7	3.7	3.7	5.6	9.0	12.4	15.6	19.0	21.4	23.0	24.5	25.2	24.9	23.8	21.4	19.5	18.5	16.6	15.1	14.9	14.3	25.2																						
16-Sep	13.7	12.4	11.3	9.9	8.9	8.5	7.7	9.3	12.9	16.0	16.8	19.2	21.2	22.7	23.7	24.1	23.5	22.1	18.3	16.7	15.1	13.3	11.1	9.9	15.3	24.1																						
17-Sep	8.0	7.3	6.2	5.0	4.3	3.5	3.3	4.9	7.7	11.1	14.8	19.6	22.5	23.4	23.6	23.2	22.9	22.1	19.4	17.1	15.7	12.6	10.3	8.6	13.2	23.6																						
18-Sep	8.0	7.1	6.8	6.5	7.3	7.7	7.8	9.0	10.6	14.2	16.7	18.7	20.0	18.9	15.8	14.0	12.5	13.4	12.4	11.1	10.6	9.9	7.5	7.2	11.4	20.0																						
19-Sep	6.9	5.3	4.2	3.4	4.7	4.8	4.9	6.3	9.2	11.8	14.1	16.2	17.8	18.8	19.6	19.9	19.6	18.5	14.4	11.5	9.8	8.7	7.6	7.2	11.1	19.9																						
20-Sep	6.5	6.2	4.9	3.6	2.8	2.1	1.5	3.0	6.3	9.3	12.1	14.5	16.4	17.6	18.2	18.1	17.6	16.1	14.2	13.3	13.6	12.4	10.8	8.6	10.4	18.2																						
21-Sep	7.5	6.2	5.3	4.2	3.5	4.1	4.7	5.4	7.6	10.3	13.9	18.3	19.7	20.2	20.8	21.1	20.6	19.5	17.4	16.2	14.8	14.2	13.4	13.1	12.6	21.1																						
22-Sep	12.9	12.3	11.6	10.6	9.4	8.3	8.1	10.1	13.1	16.3	19.6	22.0	23.3	24.4	25.0	25.0	24.3	22.7	20.9	18.5	17.2	16.4	15.7	14.8	16.8	25.0																						
23-Sep	13.7	12.7	11.9	11.8	11.2	10.2	9.5	11.8	15.3	18.1	19.6	21.5	22.8	23.7	24.0	24.4	23.8	22.4	20.7	19.2	18.8	18.7	18.4	17.8	17.6	24.4																						
24-Sep	17.5	17.5	17.2	17.4	17.4	17.5	17.4	17.2	17.4	17.9	18.2	18.9	18.9	18.8	18.4	18.1	18.4	17.6	16.2	14.8	13.8	11.8	10.5	9.1	16.6	18.9																						
25-Sep	8.5	8.4	8.0	7.0	6.2	5.5	4.8	5.3	7.8	10.0	11.8	13.6	15.4	16.7	17.3	17.7	17.4	16.1	14.1	13.0	11.6	11.1	10.2	9.7	11.1	17.7																						
26-Sep	9.5	9.9	9.4	9.3	8.8	8.6	7.5	7.4	9.2	13.1	17.5	19.6	21.4	21.1	20.9	20.4	19.6	18.4	17.0	16.4	16.0	13.4	12.7	12.1	14.1	21.4																						
27-Sep	10.7	9.5	9.6	9.2	8.6	8.7	7.6	8.5	10.6	13.5	16.1	18.6	19.8	20.5	21.1	20.2	20.2	18.6	16.3	14.1	13.7	12.3	11.0	10.0	13.7	21.1																						
28-Sep	9.2	8.5	8.3	7.8	6.7	6.3	7.0	8.5	9.6	9.9	10.1	10.0	9.4	9.1	9.3	9.1	9.1	8.9	8.7	8.6	8.6	8.5	8.4	8.1	8.7	10.1																						
29-Sep	7.1	7.2	7.4	7.4	6.8	6.5	6.4	6.6	7.2	7.9	8.2	8.9	9.4	10.1	10.3	10.4	9.7	9.1	8.7	8.4	8.0	7.6	7.5	6.9	8.1	10.4																						
30-Sep	6.7	6.3	5.9	5.9	6.0	6.0	6.0	6.0	6.3	7.1	7.7	8.6	9.4	10.6	11.2	11.6	11.0	9.7	7.2	4.9	3.3	2.2	1.2	0.5	6.7	11.6																						
																								10.2	9.6	9.1	8.7	8.2	7.9	7.7	8.8	10.9	13.1	15.0	17.0	18.4	19.3	19.6	19.7	19.4	18.4	16.4	14.4	13.4	12.3	11.2	10.3	Diurnal Average
																								19.0	18.0	17.5	17.4	17.4	17.5	17.4	17.2	17.4	19.7	21.6	23.6	25.7	26.5	26.7	26.7	26.3	25.6	24.1	22.1	20.4	20.0	18.7	17.8	Diurnal Maximum





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Waskow ohci Pimatisiwin - September 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	254	35.28	35.28
10 - 20	359	49.86	85.14
> 20	107	14.86	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



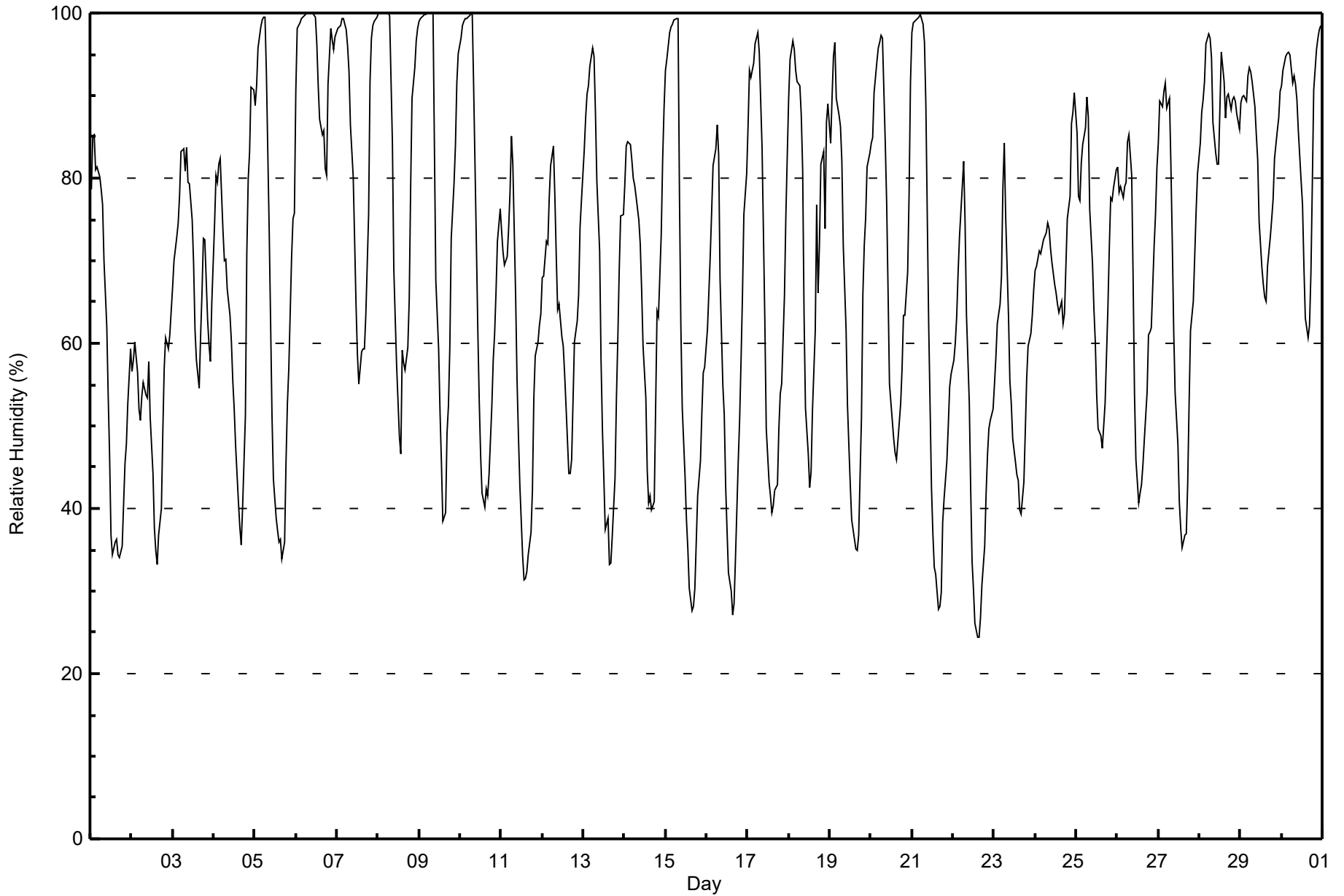
Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Waskow ohci Pimatisiwin - September 2023

Maximum Value: 100.0 % on Sep 6 07:00 Maximum Daily Average: 94.7 % on Sep 6																						Hours in Service:	720			
Minimum Value: 24.3 % on Sep 22 15:00 Minimum Daily Average: 49.5 % on Sep 22																						Hours of Data:	720			
Maximum Diurnal Average: 88.9 % at hour 7 Minimum Diurnal Average: 45.7 % at hour 16																						Hours of Missing Data:	0			
Monthly Average: 69.27 % Percentiles: P₁ = 28.1 P₁₀ = 39.9 Q₁ = 52.7 Median = 70.9 Q₃ = 87.3 P₉₀ = 96.9 P₉₉ = 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-Sep	78.7	85.1	85.2	81.0	81.3	80.1	78.6	76.7	69.9	62.1	53.7	46.5	36.8	34.4	36.0	36.2	34.5	34.1	35.5	40.5	45.4	47.9	52.7	59.2	57.2	85.2
2-Sep	56.6	57.9	60.1	56.5	52.1	50.6	53.6	55.3	53.7	53.3	57.8	50.9	44.2	37.6	34.9	33.2	36.7	40.1	49.2	56.9	60.6	59.3	60.9	63.9	51.5	63.9
3-Sep	66.7	70.1	72.8	74.6	77.9	83.2	83.5	80.9	83.7	79.4	79.4	75.0	69.6	61.7	58.0	54.6	60.8	66.1	72.7	72.5	62.9	59.8	57.9	64.9	70.4	83.7
4-Sep	74.6	80.3	79.5	81.7	82.4	73.5	70.0	70.2	66.6	63.3	60.2	55.5	52.0	47.6	40.9	37.7	35.5	40.1	51.2	70.9	79.8	83.2	90.9	90.7	65.8	90.9
5-Sep	88.8	91.2	95.8	98.2	99.1	99.6	99.5	92.8	73.5	62.5	51.2	43.5	38.8	37.2	36.0	36.3	33.9	36.0	45.5	52.7	57.0	70.6	75.0	75.8	66.3	99.6
6-Sep	90.5	98.2	98.9	99.3	99.5	99.6	100.0	100.0	100.0	100.0	100.0	99.6	96.2	91.2	87.1	85.2	85.8	81.2	80.4	91.4	98.1	96.8	95.6	97.1	94.7	100.0
7-Sep	98.1	98.3	98.5	99.2	99.3	97.9	95.9	92.9	86.4	80.2	72.5	64.7	58.7	55.2	59.0	59.3	59.3	63.3	75.6	91.8	97.0	98.5	99.0	99.6	83.4	99.6
8-Sep	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.7	84.2	68.9	63.0	57.2	48.7	46.6	59.1	57.6	56.7	59.5	65.2	78.6	89.7	93.5	96.6	98.2	80.1	100.0
9-Sep	99.1	99.3	99.7	99.8	99.9	100.0	100.0	100.0	100.0	83.7	67.6	59.3	51.6	45.5	38.4	39.5	49.1	52.3	59.4	72.7	79.4	83.9	91.6	95.0	77.8	100.0
10-Sep	96.9	98.4	99.0	99.4	99.4	99.6	99.9	100.0	91.2	71.8	61.5	53.0	46.4	41.9	40.2	42.4	41.5	44.0	52.4	57.9	61.1	66.3	72.4	76.3	71.4	100.0
11-Sep	73.6	71.1	69.5	70.6	73.9	78.3	85.1	81.7	65.7	55.6	48.8	42.8	34.3	31.4	31.6	32.3	34.3	37.1	42.3	53.4	58.5	60.1	62.1	63.5	56.6	85.1
12-Sep	68.0	68.2	72.4	72.0	77.6	81.5	84.0	78.0	70.6	64.0	64.8	60.9	59.7	56.3	52.3	44.2	44.3	45.9	53.1	60.1	62.8	65.9	74.0	77.2	64.9	84.0
13-Sep	83.3	87.3	90.2	91.2	93.6	95.8	94.8	87.9	79.7	71.2	58.0	49.6	43.7	37.5	38.8	33.1	33.4	36.6	43.7	53.3	60.7	68.9	75.4	75.6	66.0	95.8
14-Sep	79.4	83.8	84.4	84.0	82.1	80.0	79.2	77.8	74.9	72.0	66.4	59.6	53.4	44.5	40.6	41.6	39.9	40.9	52.4	63.9	63.2	73.3	82.2	88.5	67.0	88.5
15-Sep	93.1	94.3	97.6	98.3	98.6	99.1	99.4	99.3	78.2	62.3	52.3	44.0	38.6	35.1	30.3	27.6	28.1	30.4	35.9	41.4	45.8	51.5	56.5	57.2	62.3	99.4
16-Sep	61.7	66.1	70.6	76.0	81.5	83.6	86.4	83.0	67.8	55.0	51.3	42.7	37.3	32.2	30.1	27.1	28.4	33.8	45.8	50.9	57.9	65.8	75.5	80.4	58.0	86.4
17-Sep	86.3	93.1	92.2	93.9	96.2	96.9	97.6	95.2	83.8	73.1	62.5	49.6	43.3	41.5	39.5	40.3	42.2	42.9	49.7	53.9	55.0	65.8	75.5	82.8	68.9	97.6
18-Sep	89.7	94.3	96.7	95.7	93.1	91.8	91.2	87.6	81.1	63.3	52.2	46.7	42.5	44.4	51.9	61.5	76.8	66.1	72.1	81.8	83.3	73.9	86.9	89.0	75.6	96.7
19-Sep	84.3	89.8	94.8	96.4	89.7	87.7	86.3	82.1	71.9	61.7	52.6	47.7	42.8	38.6	36.3	35.0	34.8	36.8	51.0	66.0	71.9	75.3	81.3	83.1	66.6	96.4
20-Sep	84.2	84.9	90.4	94.1	95.7	96.5	97.3	96.9	84.3	76.9	66.3	55.1	50.8	48.5	46.8	45.9	48.2	52.8	56.9	63.4	63.4	68.6	78.0	91.5	72.4	97.3
21-Sep	97.7	98.8	99.2	99.3	99.5	99.8	98.7	96.4	88.8	75.4	62.3	42.5	37.0	32.8	32.1	27.8	28.2	29.8	38.3	41.3	45.8	50.0	54.8	56.2	63.8	99.8
22-Sep	58.0	60.0	63.2	68.4	72.9	78.9	82.0	74.6	63.4	52.8	42.3	33.5	30.2	26.2	24.3	24.4	26.8	30.6	35.4	41.6	46.4	49.7	50.6	52.0	49.5	82.0
23-Sep	55.1	58.2	62.4	64.8	68.2	78.8	84.3	75.2	63.4	55.5	52.7	48.5	45.6	44.1	43.4	39.8	39.4	43.2	49.3	55.8	59.7	61.2	63.3	66.4	57.4	84.3
24-Sep	68.7	69.3	71.2	70.9	71.7	72.5	73.5	74.6	74.0	71.6	69.8	67.1	66.0	64.7	63.7	65.0	62.3	63.6	69.3	75.2	77.8	86.7	88.0	90.3	72.0	90.3
25-Sep	85.4	77.8	77.3	81.8	84.1	86.0	89.8	87.5	76.3	69.7	64.2	60.2	53.8	49.6	48.8	47.3	50.0	52.7	64.3	71.6	77.7	77.4	78.8	81.0	70.5	89.8
26-Sep	81.3	78.3	78.9	77.7	79.0	79.5	84.3	85.3	80.4	67.9	53.9	45.8	40.7	41.8	42.9	45.2	48.3	54.0	60.9	61.4	61.8	71.8	75.7	81.2	65.7	85.3
27-Sep	84.3	89.3	88.7	90.5	91.6	88.6	89.6	81.6	72.2	61.6	54.0	47.8	40.9	37.6	35.3	36.8	36.9	43.0	52.7	61.6	65.1	70.5	76.0	80.5	65.7	91.6
28-Sep	84.2	88.0	89.4	91.7	96.2	97.4	97.0	94.5	86.8	83.1	81.7	81.7	88.5	95.3	91.8	87.3	89.8	90.1	88.3	89.6	89.9	89.4	87.8	85.9	89.4	97.4
29-Sep	89.1	89.8	90.0	89.3	92.4	93.4	92.8	91.7	88.7	85.3	82.2	74.8	69.2	67.2	65.6	65.1	69.2	72.8	75.0	77.5	82.4	85.8	87.3	90.6	82.0	93.4
30-Sep	91.3	93.1	94.8	95.0	95.3	95.0	91.6	92.4	91.3	89.5	85.8	79.6	76.7	69.3	63.0	60.7	62.2	68.5	79.1	90.7	95.5	97.0	98.0	98.5	85.6	98.5
																						Diurnal Average				
																						Diurnal Maximum				





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Relative Humidity (RH) - %
Waskow ohci Pimatisiwin - September 2023**

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	73	10.14	10.14
40 - 60	174	24.17	34.31
60 - 80	212	29.44	63.75
80 - 100	246	34.17	97.92

Total Number of Valid Hours: 720

Total Number of Hours: 720

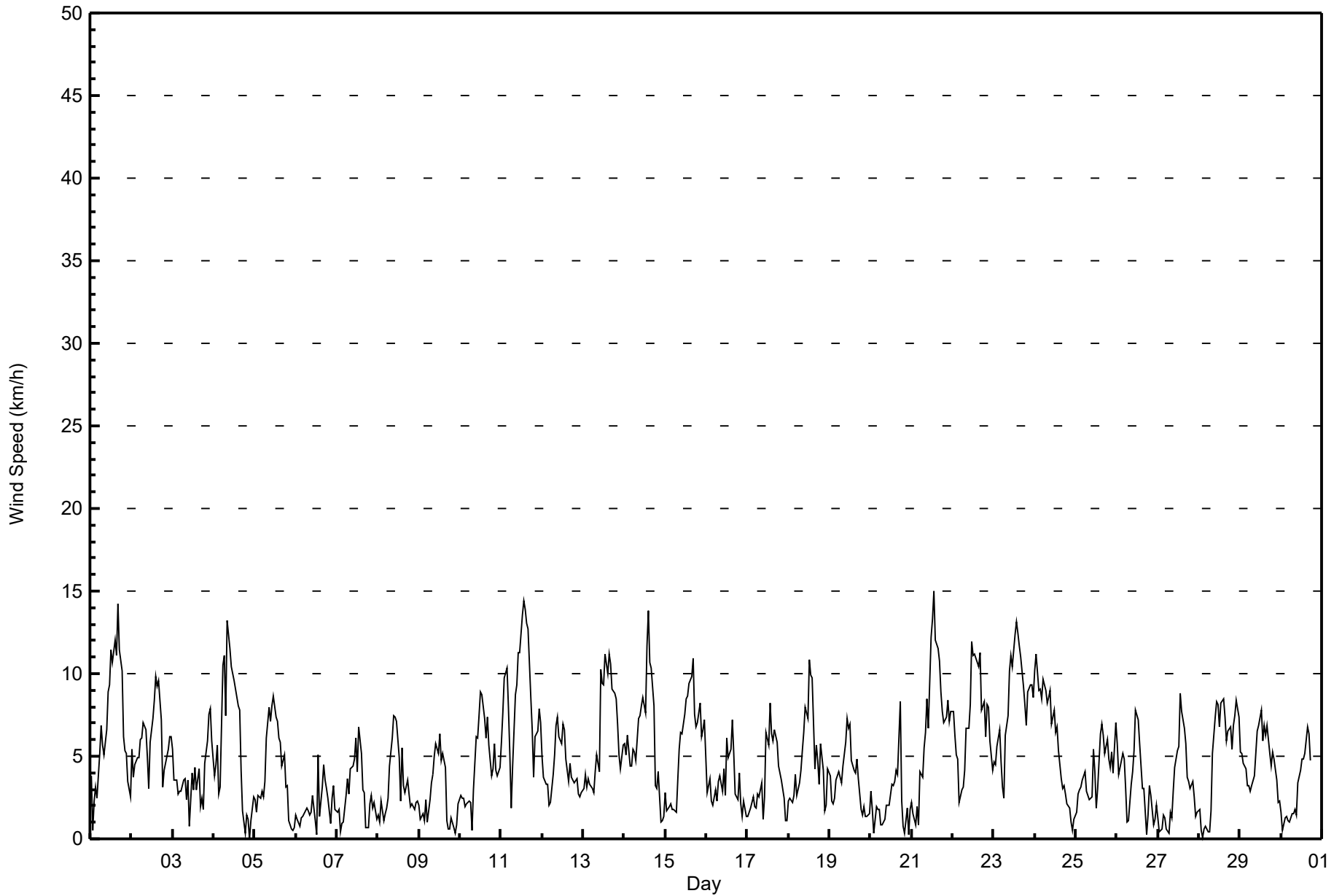


Maximum Speed: 15 km/h on Sep 21 14:00	Maximum Daily Speed Average: 8.6 km/h on Sep 11	Hours in Service: 720
Minimum Speed Value: 0 km/h on Sep 4 22:00	Minimum Daily Speed Average: 0.6 km/h on Sep 6	Hours of Data: 714
Maximum Diurnal Speed Average: 4.0 km/h at hour 13	Minimum Diurnal Speed Average: 1.3 km/h at hour 22	Hours of Missing Data: 6
Monthly Average Velocity: 2.1 km/h 184.1 deg	Percentiles: P ₁ = 0 P ₁₀ = 1 Q ₁ = 2 Median = 4 Q ₃ = 7 P ₉₀ = 9 P ₉₉ = 13	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-Sep	WNW4	ENE1	SW2	W3	WSW2	W5	W7	WSW6	SW5	SSW7	SSW9	SW9	SW11	SSW11	SSW12	SSW11	SSW14	SSW11	SSW10	SSW6	SSW5	SW5	W3	WSW3	SW6.3	SSW14	
2-Sep	W5	WSW4	W4	WNW5	WNW5	WNW6	WNW6	WNW7	WNW7	W5	SSE3	SW6	W7	WNW8	WNW10	WNW9	WNW10	W7	SW3	SW4	WSW5	WSW5	W6	W6	W5.5	WNW10	
3-Sep	W5	SW4	SSW4	SSE3	S3	S3	SSE4	SSE4	ESE2	SSE4	S1	SSE4	WSW3	WNW4	NNE3	NNW4	SE2	SSW2	WSW2	WNW5	WNW6	NW8	NW8	WNW6	WSW1.6	NW8	
4-Sep	W4	WSW5	WSW6	SW3	W3	NW10	NW11	NW7	NW13	NW10	NW10	WNW10	NW9	NNW8	NW8	NNW4	ENE2	ESE0	SW1	SW1	NW0	SSE1	S3	NW5.0	NW13		
5-Sep	SSE2	SSE2	SSE3	S2	SSE3	SSE3	SSE4	SSE6	SSE8	SSE7	S8	SSE9	SSE7	SE7	SE6	SSE6	SSE4	SSE5	SE3	SSE3	ESE1	S1	S1	S1	SSE4.1	SSE9	
6-Sep	NNW1	NNE1	NNE1	E1	ENE1	ENE2	E2	ESE2	E1	ESE2	SSE3	SE1	ESE0	NW5	NNE1	SE3	SE5	S4	SSW3	S2	SSW1	WSW2	W3	SW2	SSE0.6	NW5	
7-Sep	SSE2	WSW2	W0	E1	SSE1	SSW3	SSW4	SSW3	SSW4	SSE4	SSE5	S6	SSE4	SE7	SSE5	ESE3	SE3	S1	SW1	W2	W3	WSW2	WSW2	SSW1	S2.0	SE7	
8-Sep	S1	SSE1	S2	SSW1	S2	SSW2	S2	SSE4	SSE6	SSE7	SE7	SE7	SE5	NNE2	N5	NNE3	N3	NNW4	NNW3	WSW2	WSW2	W2	W2	W2	SSE1.1	SSE7	
9-Sep	W2	WSW1	WSW2	W1	WSW2	WSW1	S2	SSE3	SE4	SE5	SE6	SE5	SE6	SE5	SE5	SE4	SE1	E1	SE1	SSW1	SW1	WSW0	W1	W2	SSE1.8	SE6	
10-Sep	W3	W2	W2	WSW2	WSW2	WSW2	WSW2	WSW1	SE3	SE6	SSE6	SSE7	SSE9	SE9	SE7	SE6	SE7	SE6	SE4	SE4	SE6	SE4	SE4	SE4	SSE3.6	SSE9	
11-Sep	SE6	SSE8	SSE10	SSE10	SE8	SSE5	ESE2	ESE4	SE9	SE9	SE11	SE11	SSE14	SSE14	SSE14	SSE13	SSE13	SSE9	SSE7	SE4	SSE6	SSE7	SSE8	SSE7	SSE8.6	SSE14	
12-Sep	SSE5	S4	S3	SSE3	SSE2	SSE2	SSE4	SSE5	SE7	SE7	SE6	SE6	SE7	SE7	SE5	S3	SW5	SW4	SW4	SW3	SSW4	S3	S3	S3	SSE3.7	SE7	
13-Sep	S3	S4	SSE3	SSE4	SSE3	SSE3	S3	SSE4	S5	S4	SSW10	SW9	SW9	SW11	SW10	SW11	SW11	WSW9	WSW9	SW9	SW7	SSW5	SSW4	SW6	SSW5.9	SW11	
14-Sep	WSW6	W5	W6	WNW4	WNW4	WNW5	WNW5	WNW5	WNW7	WNW7	WNW8	W9	WNW8	WNW12	NW14	NW11	NW10	NW8	WNW3	W3	W4	ENE1	SSE1	S1	WNW5.7	NW14	
15-Sep	SSW3	SSE2	SSE2	S2	S2	SSE2	SSE2	SSE4	SSE5	SE6	SE6	SE8	SE8	SE9	SE9	SE10	SE11	SE8	SSE7	SE7	SE8	SSE6	SSE7	SSE7	SSE5.7	SSE11	
16-Sep	S3	SSE3	SSE4	SSE2	SE2	SSE3	SSE2	SSE4	S4	S3	SW4	SSE3	SSE6	S5	S5	SSW7	SSW5	SSE3	SSE2	S4	SE2	SE1	S2	SSW1	S3.1	SSW7	
17-Sep	SW1	S2	SW2	WSW3	SW2	WSW2	W3	WNW3	WNW3	SE1	SE3	SE6	SSE6	SSE8	S6	SSE6	SSE7	SSW6	SSW4	SW4	SW4	SW4	S2	SSE1	S1	S2.6	SSE8
18-Sep	SSE2	S2	SSE2	SSE3	SSE4	SSE3	SSE3	SSE4	SSE5	SSW6	SW8	WSW7	SW11	WSW10	SW10	S4	SSW6	SSW5	SE3	SSE6	SSE4	SSW2	SSE2	SSE4	SSW4.0	SW11	
19-Sep	S4	SW2	SSE2	S2	S4	S4	S4	SSE3	S4	S6	S7	S7	S7	SSW5	SSW4	S4	SSE5	SSE4	S2	SW1	W2	NNW1	WSW1	W2	S3.3	S7	
20-Sep	WNW3	WNW2	SW0	WSW2	WSW2	W2	SW1	SSE1	SE1	E2	E2	NNE2	NE3	ENE3	NE3	NNE4	N4	NW8	NNW2	S1	NNE0	W2	SSE0	SSW2	NNW0.8	NW8	
21-Sep	S2	WSW2	SSW1	SW2	S1	SSE4	SSE4	SSE5	SSE6	SE8	SE7	S12	S13	SSE15	S12	S12	S11	S9	SSE8	SSE7	SSE7	SSE8	SSE7	SSE8	SSE6.8	SSE15	
22-Sep	SSE8	SSE6	SSE5	SSE5	S2	SSE3	SSE3	SE4	SSE7	SE7	SSE8	SSE12	SSE11	S11	SSE11	SSE10	SSE11	SSE8	SSE8	SE6	SE8	SE8	SSE6	SSE4	SSE7.1	SSE12	
23-Sep	SSE5	SSE4	SE6	SSE7	SE5	ESE3	ESE2	SE6	SE7	SSE10	SE11	SE10	SE12	SE13	SE12	SE12	SE11	SE9	SSE8	SE7	SE9	SSE9	SE9	SE9	SE8.2	SE13	
24-Sep	SE10	SE11	SSE9	SSE9	SE8	SSE10	SSE9	SSE8	SSE9	SSE9	SSE7	SE8	SSW6	SW7	SSW5	S4	SSE3	SSE3	SSE3	SSE2	S2	WSW1	S1	ESE1	SSE5.6	SE11	
25-Sep	S2	SW3	S3	SSE3	SSE4	SSE4	S3	SSE3	SE2	WNW3	N5	NNE4	ENE2	NNE3	N6	N7	NNE6	NNE5	NNW6	NNW5	NW4	NNW5	NW4	NW7	N1.7	NW7	
26-Sep	NW6	NW4	WNW4	NW5	NW5	NW3	WSW1	SSE1	SSE3	SE4	SSE5	SSE8	S7	S6	S4	SSW3	SSW3	S0	SE1	WSW3	W3	SSW1	WNW1	S2	SSW1.6	SSE8	
27-Sep	SSE1	S0	ENE1	SSE1	SE1	ESE1	NW0	SSE2	SE1	SE3	SE4	SSE5	SW6	WSW9	WSW8	SW7	WSW6	W4	WNW3	NW3	NW3	NW3	W1	WNW2	SW1.7	WSW9	
28-Sep	WNW2	ESE1	NNE0	WNW1	SE1	WSW0	ENE0	N2	N5	N7	N8	NNW8	NNW7	NNW8	NNW8	N7	N6	NNW6	NNW7	NNW5	NNW7	NNW7	NNW8	NNW7	NNW4.7	NNW8	
29-Sep	NW5	NW5	NW5	WNW4	W3	W3	W3	W3	WNW4	NNW5	NNW6	NNW7	N8	N6	NNW7	NNW6	N7	N5	NNW4	NNW5	NNW5	NW4	NNW2	SW2	NNW4.2	N8	
30-Sep	WSW2	WNW1	SSW1	S1	SSW1	S1	SSE2	S2	WSW2	SSE1	SSE3	SSE4	SE5	SE5	SE5	SE7	SE6	SSE5	UO	UO	UO	UO	UO	UO	SSE2.6	SE7	

SSW1.6SSW1.7SSW1.8	S1.8	S1.6SSW1.4SSW1.5	S2.1	S2.4	SSE3.0	SSE3.2	SSE3.9	S4.0	S3.3	S2.4	S2.5	S2.9	SSW2.1	S1.8	SSW1.9SSW1.6SSW1.3SSW1.3SSW1.6	Diurnal Average								
SE10	SE11	SSE10	SSE10	SE8	NW10	NW11	SSE8	NW13	NW12	SE11	S12	SSE14	SSE15	SSE14	SSE13	SSW14	SSW11	SSW10	SW9	SSE9	SSE9	SE9	SE9	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 - September 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	455	63.73	63.73
6 - 11	238	33.33	97.06
12 - 19	21	2.94	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: 714

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Wind Speed (WS) - km/h
Waskow ohci Pimatisiwin - September 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	13	2	9	7	14	44	104	64	32	28	37	38	25	16	15	455
6 - 11	9	1	0	0	0	0	57	65	12	13	18	10	6	16	15	16	238
12 - 19	0	0	0	0	0	0	4	7	4	2	0	0	0	1	3	0	21
20 - 28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	16	14	2	9	7	14	105	176	80	47	46	47	44	42	34	31	714

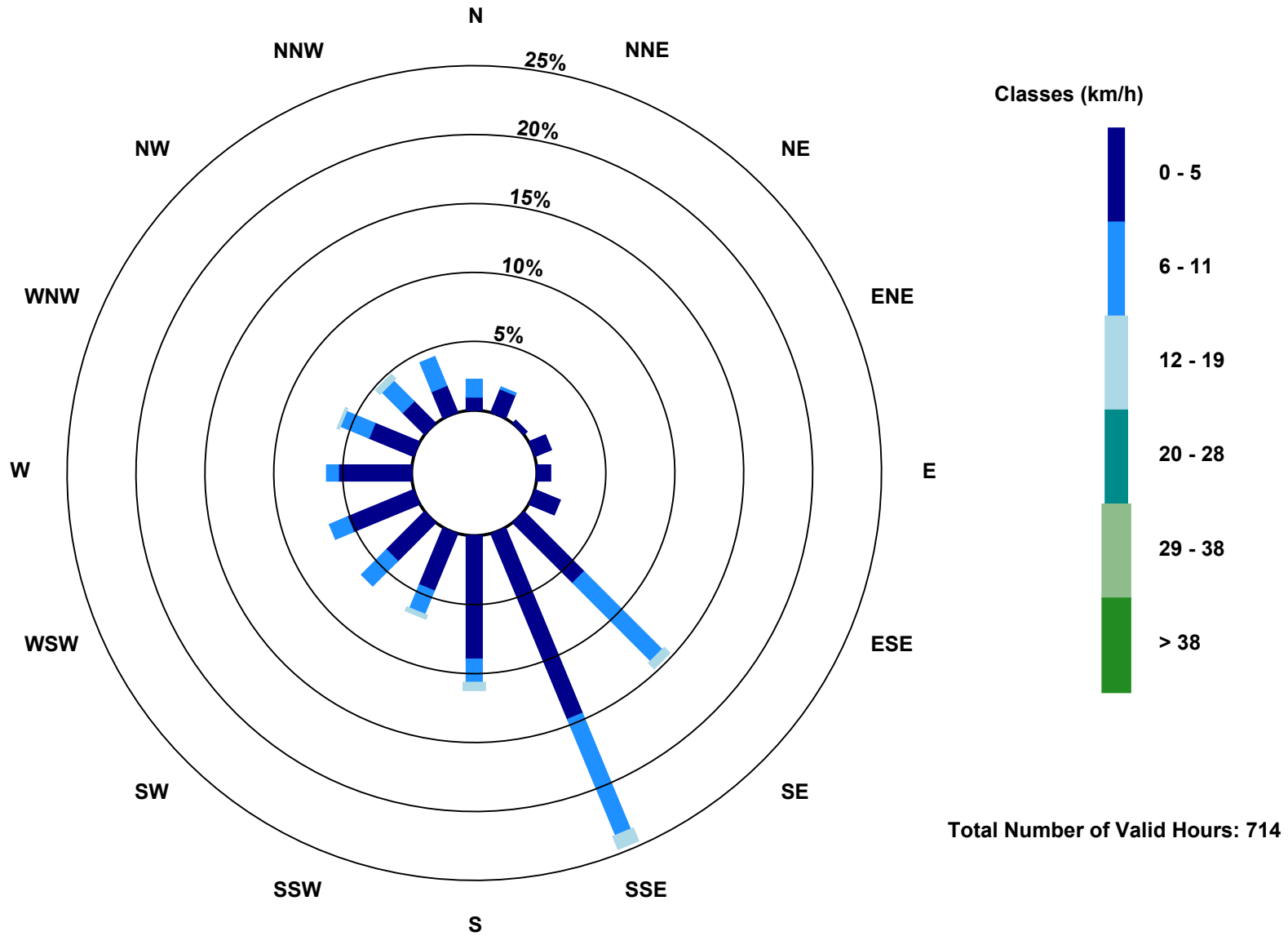
Total Number of Valid Hours: 714

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 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 - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 6 km/h on Sep 1 17:00 Minimum Value: 0 km/h on Sep 30 00:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 2 P ₉₀ = 4 P ₉₉ = 5																	Hours in Service: 720 Hours of Data: 714 Hours of Missing Data: 6 Hours of Calibration: 0 Percent Operational Time: 99.2								
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Sep	1	1	1	2	2	2	3	2	2	3	3	4	5	4	5	5	6	5	4	3	2	2	1	2	6
2-Sep	2	1	2	2	2	2	2	2	2	2	2	3	4	3	4	3	4	4	1	2	2	2	2	2	4
3-Sep	3	2	2	1	1	1	1	1	1	2	1	2	2	2	2	1	1	1	1	2	2	3	3	2	3
4-Sep	1	2	2	1	2	3	4	2	4	4	4	3	4	3	4	3	3	2	1	1	1	1	1	1	4
5-Sep	1	1	1	1	1	1	1	3	2	3	3	3	3	3	3	2	2	2	1	1	1	1	1	1	3
6-Sep	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	2	2	1	1	1	1	1	1	2
7-Sep	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	1	2	1	1	1	1	1	1	1	2
8-Sep	1	1	1	1	1	1	1	1	2	2	2	2	2	1	2	1	1	1	1	0	1	1	1	1	2
9-Sep	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	2
10-Sep	0	1	1	1	1	1	0	1	2	2	2	3	4	3	3	3	3	2	1	2	2	2	2	1	4
11-Sep	2	3	3	3	3	2	1	3	3	3	4	4	6	6	6	5	5	3	3	1	2	2	2	2	6
12-Sep	2	2	1	1	1	1	1	2	3	2	2	2	2	2	2	2	2	1	1	1	1	1	1	2	3
13-Sep	1	1	1	1	1	1	1	1	2	3	4	4	5	5	5	5	5	4	5	4	3	2	2	2	5
14-Sep	2	2	2	2	2	2	2	2	3	3	3	3	3	5	4	3	3	3	1	1	2	1	1	1	5
15-Sep	1	1	1	1	1	1	1	1	2	2	2	3	3	3	4	4	4	2	2	3	3	2	3	2	4
16-Sep	1	2	1	1	1	1	1	1	2	1	2	2	2	3	3	3	2	1	0	2	1	1	0	1	3
17-Sep	1	1	1	1	1	1	1	1	1	1	1	3	2	3	3	2	2	2	2	2	2	1	1	1	3
18-Sep	1	1	1	1	1	1	1	1	2	3	4	4	5	5	5	2	3	2	1	2	1	1	1	1	5
19-Sep	1	1	1	1	1	1	1	1	2	3	3	3	3	3	2	2	2	1	0	1	1	1	1	2	3
20-Sep	1	1	1	1	1	1	1	1	1	1	1	2	2	1	2	2	1	4	3	2	2	2	1	1	4
21-Sep	1	1	1	1	1	2	1	2	2	3	2	5	5	6	5	5	4	4	2	3	2	2	2	2	6
22-Sep	2	2	1	1	1	1	1	2	2	3	3	4	4	4	4	4	4	3	3	2	3	3	2	2	4
23-Sep	1	1	1	2	1	1	1	2	3	4	4	4	5	5	5	4	4	4	3	2	3	3	4	3	5
24-Sep	4	4	4	4	3	3	3	3	3	3	3	3	3	3	2	1	1	1	1	1	1	1	1	1	4
25-Sep	1	1	1	1	1	1	1	1	1	1	2	2	1	2	2	2	2	1	2	2	1	1	1	2	2
26-Sep	2	2	2	2	2	2	1	1	1	1	3	3	3	2	2	1	1	1	1	1	1	1	1	1	3
27-Sep	1	1	1	1	1	1	1	1	1	1	1	2	3	4	4	3	3	2	1	1	1	1	1	1	4
28-Sep	1	1	1	1	1	1	1	1	2	3	2	3	3	2	3	2	2	2	2	1	2	2	2	2	3
29-Sep	1	1	1	1	1	1	1	1	1	2	2	2	3	2	2	2	2	2	1	2	2	1	1	0	3
30-Sep	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	3	UO	UO	UO	UO	UO	UO	3
Diurnal Maximum																									
UO - Unstable Operation																									



Wood Buffalo Environmental Association
Summary of Hour Averages

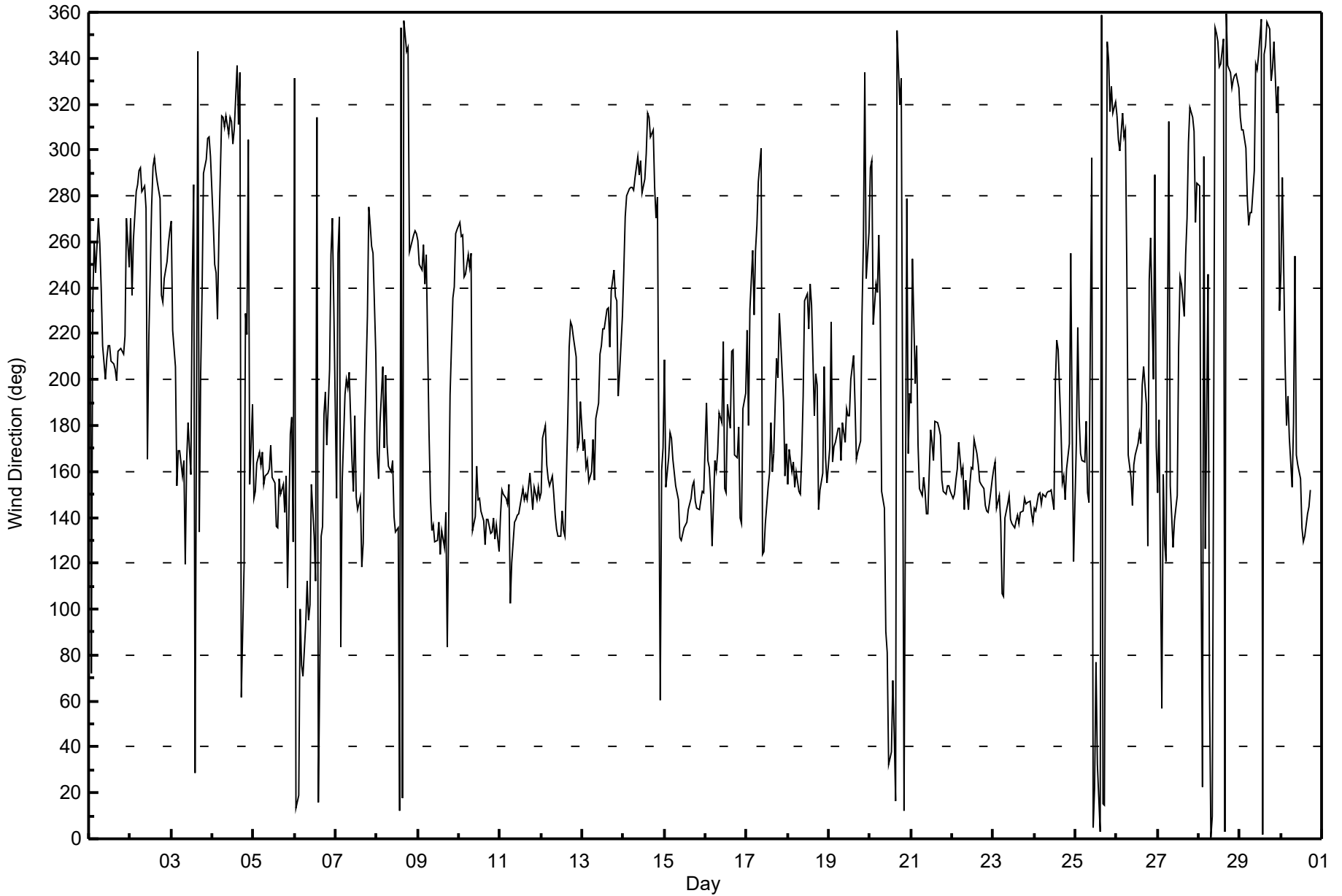
Wind Direction (WD) - deg
Waskow ohci Pimatisiwin - September 2023

Direction of Maximum Speed: 165 deg on Sep 21 14:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 146.9 deg on Sep 11	Hours of Data: 714
Direction of Minimum Speed: 304 deg on Sep 4 22:00	Direction of Minimum Daily Speed Average: 0.6 deg on Sep 6
Direction of Minimum Speed: 304 deg on Sep 4 22:00	Hours of Missing Data: 6
Monthly Average Direction: 184.1 deg	Percent Operational Time: 99.2

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Sep	296	72	235	260	247	270	260	240	215	200	209	215	215	208	207	204	200	212	213	212	211	219	270	249	219.1
2-Sep	270	237	261	282	285	291	292	282	285	274	166	218	276	293	296	290	286	279	236	233	244	251	259	265	272.5
3-Sep	269	221	206	154	169	169	158	165	120	165	181	159	243	285	29	343	134	202	238	290	296	305	306	297	250.8
4-Sep	268	250	246	226	263	315	314	310	315	307	314	312	303	309	337	311	334	62	120	229	220	304	154	189	303.9
5-Sep	148	151	163	169	163	168	154	158	159	161	172	157	155	136	135	157	150	154	142	158	109	176	183	129	155.0
6-Sep	331	14	19	100	75	71	94	112	95	102	154	132	113	314	16	132	136	185	195	171	205	254	270	233	152.8
7-Sep	148	255	271	84	155	194	200	196	203	165	152	184	149	143	149	118	129	176	228	275	268	258	255	211	176.9
8-Sep	169	157	181	206	170	202	172	162	160	165	140	133	136	12	353	18	356	343	345	256	258	263	265	264	163.1
9-Sep	261	250	248	259	241	254	176	149	134	137	129	130	138	124	134	127	142	83	137	194	236	240	264	266	151.5
10-Sep	269	263	263	245	246	254	249	255	134	141	163	148	148	143	139	128	139	139	133	134	140	131	137	125	150.1
11-Sep	141	152	150	149	146	154	102	120	138	139	141	142	149	152	148	150	147	159	151	143	153	148	153	148	146.9
12-Sep	151	175	180	163	157	153	158	150	141	135	132	132	143	134	132	183	214	225	223	219	210	170	173	190	161.0
13-Sep	169	174	162	165	155	160	174	156	183	189	211	215	222	222	231	231	214	238	248	236	235	193	203	228	212.8
14-Sep	248	271	280	283	284	284	283	288	297	289	295	281	287	298	316	314	306	309	284	270	279	60	161	170	292.0
15-Sep	208	153	166	177	174	165	154	151	147	131	130	136	137	138	143	148	154	155	147	144	143	148	151	151	147.1
16-Sep	190	165	162	150	127	165	160	168	186	181	217	153	151	189	179	213	213	167	166	179	139	137	187	194	177.4
17-Sep	222	180	231	257	228	256	268	286	301	124	125	137	153	159	181	160	168	209	201	229	217	191	158	172	188.8
18-Sep	155	170	160	164	153	160	152	150	167	193	234	238	222	242	232	184	203	198	144	152	159	206	166	155	194.2
19-Sep	170	225	164	171	173	179	179	165	181	173	187	184	184	200	211	190	165	168	174	228	260	334	244	264	186.0
20-Sep	292	295	224	241	238	263	230	151	144	90	81	32	38	69	45	17	352	320	331	185	12	279	168	194	347.0
21-Sep	190	253	198	215	171	153	150	157	151	141	141	178	172	165	182	181	179	176	156	151	150	154	154	151	164.9
22-Sep	148	150	156	161	173	159	162	144	156	143	154	161	161	174	168	163	155	154	152	145	143	142	147	157	155.9
23-Sep	161	164	144	150	138	107	105	139	146	149	139	137	136	139	141	137	142	143	148	146	146	147	142	138	142.0
24-Sep	144	143	150	151	146	150	149	151	151	152	143	199	217	213	179	155	158	148	161	172	255	180	121	157.2	
25-Sep	173	223	184	168	165	164	182	151	146	296	5	22	77	32	3	359	15	15	347	339	317	328	316	321	351.1
26-Sep	315	304	300	316	305	309	249	167	157	145	163	167	172	177	172	198	206	189	127	244	262	200	289	171	213.0
27-Sep	151	183	57	159	129	121	313	153	141	127	138	149	214	244	241	228	254	270	303	319	314	308	268	286	232.0
28-Sep	284	122	23	297	126	246	67	1	10	353	351	347	336	337	348	3	359	337	334	327	331	333	333	327	342.4
29-Sep	314	309	309	301	279	267	273	273	291	337	335	341	357	2	342	345	355	353	330	335	347	316	328	230	327.8
30-Sep	247	288	207	180	193	174	153	181	254	167	163	157	136	129	132	142	145	152	UO	UO	UO	UO	UO	UO	154.0

207.0	196.6	194.2	186.9	184.6	202.2	197.6	173.0	171.4	161.6	166.0	168.0	176.0	186.0	186.3	182.0	179.4	197.0	189.8	200.8	201.5	198.5	202.3	197.1
Diurnal Average																							

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





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg

Waskow ohci Pimatisiwin - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0																			Hours in Service: 720						
Maximum Value: 109 deg on Sep 7 03:00																			Hours of Data: 714						
Minimum Value: 11 deg on Sep 10 07:00																			Hours of Missing Data: 6						
Percentiles: P ₁ = 16 P ₁₀ = 22 Q ₁ = 27 Median = 36 Q ₃ = 50 P ₉₀ = 69 P ₉₉ = 97																			Hours of Calibration: 0						
Percent Operational Time: 99.2																									
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Sep	41	89	46	59	102	57	56	53	46	47	45	52	52	48	49	52	44	45	43	42	39	42	50	69	102
2-Sep	48	54	54	37	37	31	29	37	43	54	78	55	53	43	31	35	39	38	31	39	46	48	44	43	78
3-Sep	65	62	81	62	36	28	26	47	64	59	104	37	69	54	44	32	33	22	21	19	22	23	28	104	
4-Sep	45	48	52	71	73	21	20	24	25	27	24	24	35	32	43	43	72	54	67	66	33	88	47	27	88
5-Sep	44	47	31	32	30	42	31	27	27	35	44	39	45	37	42	41	47	33	28	30	60	73	79	77	79
6-Sep	64	56	77	67	46	40	33	36	31	49	42	58	104	29	84	49	31	54	40	21	74	63	42	71	104
7-Sep	59	94	109	66	70	58	56	54	43	49	46	44	65	33	30	41	63	93	80	61	22	49	35	66	109
8-Sep	45	57	51	62	54	55	20	22	27	32	31	34	58	69	20	35	26	23	28	38	22	56	42	46	69
9-Sep	54	69	59	91	12	45	22	18	27	30	31	38	31	42	35	34	41	46	50	53	90	91	39	40	91
10-Sep	13	13	13	18	17	14	11	58	48	31	40	32	29	32	33	40	33	35	32	28	30	29	30	31	58
11-Sep	28	24	21	22	23	27	35	38	26	29	28	31	32	32	32	30	27	29	30	22	22	23	21	23	38
12-Sep	25	27	23	23	46	37	23	22	29	28	29	29	27	30	34	58	39	41	33	41	43	38	25	36	58
13-Sep	33	27	22	20	20	29	32	21	36	56	43	49	49	52	57	50	46	49	57	48	47	31	44	48	57
14-Sep	50	52	41	38	37	38	39	45	37	37	36	40	44	38	25	27	26	22	25	19	36	76	61	58	76
15-Sep	31	53	36	34	24	21	38	31	34	30	29	29	30	32	36	31	27	23	27	28	23	26	25	22	53
16-Sep	39	57	21	40	60	34	30	26	58	62	45	86	45	62	50	50	51	25	22	37	41	30	22	79	86
17-Sep	42	31	21	23	43	36	30	37	37	86	53	31	42	39	48	48	35	35	34	49	49	34	52	86	86
18-Sep	39	35	29	34	23	43	31	29	28	43	51	59	45	51	46	42	40	50	30	21	23	84	76	26	84
19-Sep	27	57	40	38	29	23	27	26	44	45	44	46	50	75	69	67	30	19	31	52	68	52	56	83	83
20-Sep	33	22	90	45	37	58	53	69	76	31	48	84	57	49	49	40	27	19	78	105	98	72	86	51	105
21-Sep	34	47	67	35	59	28	32	24	24	27	28	38	38	33	41	37	35	33	23	23	23	21	20	21	67
22-Sep	20	18	19	27	25	20	22	23	24	28	37	32	34	37	38	35	27	24	22	23	23	24	31	34	38
23-Sep	22	21	19	18	27	36	30	27	31	27	26	29	29	28	28	30	27	27	24	23	25	25	26	27	36
24-Sep	26	26	25	30	27	24	22	23	24	29	29	31	44	48	43	35	34	27	31	25	28	83	87	68	87
25-Sep	68	61	57	33	30	30	42	44	74	62	34	64	85	87	30	30	27	20	24	27	32	15	28	15	87
26-Sep	24	31	30	31	27	50	96	59	26	23	52	37	46	37	35	48	50	108	85	66	52	77	92	36	108
27-Sep	36	91	75	58	69	75	97	80	88	41	37	42	52	46	53	48	46	56	21	17	20	17	63	84	97
28-Sep	57	75	88	82	52	93	74	71	27	29	25	22	42	22	23	28	29	21	20	22	19	19	19	18	93
29-Sep	16	18	16	19	24	22	18	20	25	23	21	26	29	35	25	21	22	23	17	18	20	21	46	22	46
30-Sep	29	72	38	51	67	50	41	72	53	47	20	26	27	31	29	26	26	22	UO	UO	UO	UO	UO	UO	72
Diurnal Maximum																									
68 94 109 91 102 93 97 80 88 86 104 86 104 87 84 67 72 108 85 105 98 91 92 86																									
UO - Unstable Operation																									



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS26 CHRISTINA LAKE SEPTEMBER 2023

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

October 30, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CHRISTINA LAKE (AMS26)
 SEPTEMBER 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	687	32	33	99.86	21.4	0	6.3	0
H2S (ppb) Average	685	34	35	99.86	1.4	0	0.8	0
NO2 (ppb) Average	682	37	38	99.86	21.3	0	14	-
NO (ppb) Average	682	37	38	99.86	54.2	-	24.1	-
NOX (ppb) Average	682	37	38	99.86	72.9	-	38.1	-
Temperature 2 m (C) Average	720	0	0	100	24.9	-	19.5	-
Relative Humidity (%) Average	720	0	0	100	97.9	-	87.7	-
Wind Speed 10 m (km/h) Average	720	0	0	100	28	-	21	-
Wind Direction 10 m (deg) Average	720	0	0	100	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CHRISTINA LAKE (AMS26)
 SEPTEMBER 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	687	1	2.3	-	0	0	0.1	0.3	0.8	1.8	21.4
H2S (ppb) Average	685	0.27	0.2	-	0	0	0.1	0.2	0.4	0.6	1.4
NO2 (ppb) Average	682	3.46	3.3	-	0.3	0.9	1.4	2.3	4	7.6	21.3
NO (ppb) Average	682	3.17	7.1	-	0	0	0.1	0.5	2.3	9	54.2
NOX (ppb) Average	682	6.63	10	-	0.3	1.1	1.7	3	6.5	16	72.9
Temperature 2 m (C) Average	720	12.6	5.5	-	-1	5.5	8.1	12.8	16.5	20	24.9
Relative Humidity (%) Average	720	67.63	18.4	-	31.2	40.5	52.6	68.4	83	92.9	97.9
Wind Speed 10 m (km/h) Average	720	10.7	5	-	0	4	6	10	14	18	28
Wind Direction 10 m (deg) Average	720	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CHRISTINA LAKE (AMS26)
SEPTEMBER 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
H2S, SO2, NO2	21 Sep 2023 01:00	21 Sep 2023 01:00	1	Maintenance - replaced station calibrator



Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 21.4 ppb on Sep 14 14:00	Maximum Daily Average: 6.3 ppb on Sep 4		Hours of Data:	687
Minimum Value: 0.0 ppb on Sep 5 02:00	Minimum Daily Average: 0.1 ppb on Sep 25		Hours of Missing Data:	33
Maximum Diurnal Average: 1.8 ppb at hour 13	Minimum Diurnal Average: 0.3 ppb at hour 20		Hours of Calibration:	32
Monthly Average: 1.00 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.3 Q ₃ = 0.8 P ₉₀ = 1.8 P ₉₉ = 12.9		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-Sep	3.4	13.3	5.6	2.4	Z	1.4	0.6	1.0	1.4	1.4	1.2	2.2	0.3	0.3	0.5	0.4	0.5	0.4	0.4	0.4	1.5	0.3	1.6	1.7	1.8	13.3	
2-Sep	0.8	0.5	0.3	0.3	0.3	Z	0.6	1.8	2.9	1.9	1.4	1.9	1.8	1.2	2.3	1.6	1.2	0.9	0.8	0.5	0.5	0.7	0.4	0.4	1.1	2.9	
3-Sep	Z	1.1	1.7	1.6	1.1	0.7	0.3	0.4	0.3	0.8	0.7	0.7	0.2	0.7	0.7	0.4	0.2	0.2	0.3	0.3	0.4	0.5	0.6	0.7	0.6	1.7	
4-Sep	1.0	Z	10.1	16.7	3.6	1.4	1.5	5.0	11.0	12.8	11.7	15.1	19.0	10.4	4.7	8.1	5.5	4.8	1.0	0.4	0.3	0.3	0.3	0.1	6.3	19.0	
5-Sep	0.0	0.0	Z	0.0	0.0	0.1	0.1	1.0	1.8	0.8	1.2	1.0	0.5	0.5	0.7	0.5	0.5	0.4	0.3	0.2	0.3	0.3	0.2	0.2	0.5	1.8	
6-Sep	0.2	0.2	0.1	Z	0.2	0.2	0.2	0.2	0.4	0.4	0.3	0.3	0.5	0.4	0.6	0.8	0.8	6.2	0.5	0.3	0.3	0.3	0.3	0.2	0.6	6.2	
7-Sep	0.2	0.2	0.2	0.3	Z	0.3	0.3	0.3	0.8	0.5	1.4	0.9	0.3	0.3	0.2	0.6	0.4	0.9	0.3	0.4	0.4	0.2	0.2	0.1	0.4	1.4	
8-Sep	0.1	0.1	0.1	0.1	0.2	Z	0.4	0.5	1.2	0.9	1.1	0.6	0.1	0.4	0.6	2.3	0.2	1.6	0.5	0.1	0.2	0.1	0.0	0.0	0.5	2.3	
9-Sep	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.8	0.5	0.7	1.0	1.1	0.5	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.2	1.1	
10-Sep	0.0	Z	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.5	0.8	0.4	0.3	0.4	0.4	0.3	0.3	0.4	0.4	0.3	0.5	0.4	0.3	0.3	0.3	0.8	
11-Sep	0.3	0.2	Z	0.7	0.7	0.7	0.6	0.3	0.4	0.5	1.4	1.5	0.6	0.5	0.8	1.0	2.0	1.4	0.5	0.5	0.4	0.6	5.5	5.8	1.2	5.8	
12-Sep	1.0	1.4	7.1	Z	5.8	2.6	0.6	1.5	0.7	1.2	1.6	2.0	1.6	1.3	0.6	0.4	0.5	0.3	0.3	0.6	0.4	0.3	0.1	0.1	1.4	7.1	
13-Sep	0.2	0.1	0.1	0.1	Z	0.2	0.4	0.4	0.7	0.8	0.2	0.2	0.4	0.2	0.5	0.3	0.2	0.3	0.6	0.6	0.3	0.2	0.4	0.3	0.3	0.8	
14-Sep	0.5	0.3	0.2	0.2	0.2	Z	1.1	2.1	0.2	0.3	0.3	2.9	10.5	21.4	14.1	19.3	10.4	6.4	0.1	0.2	0.2	0.3	0.3	0.2	4.0	21.4	
15-Sep	Z	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.3	0.4	0.5	0.4	0.5	0.6	2.2	1.8	1.3	2.8	0.5	0.4	0.4	0.3	1.5	0.6	2.8	
16-Sep	6.8	Z	5.5	1.4	1.1	0.4	0.8	0.9	1.4	0.9	1.2	1.7	0.9	0.5	0.2	0.3	0.5	0.9	0.7	0.3	0.2	0.1	0.0	0.0	1.2	6.8	
17-Sep	0.1	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.6	2.2	0.6	1.7	8.2	6.5	5.3	0.6	0.4	0.8	1.7	0.3	0.1	0.1	1.3	8.2	
18-Sep	0.1	0.1	0.1	Z	0.0	0.1	0.2	0.3	0.4	0.6	1.2	1.3	6.5	2.7	3.1	0.3	0.1	0.1	0.1	0.2	0.8	1.4	0.6	0.4	0.9	6.5	
19-Sep	0.3	0.2	0.2	0.2	Z	0.6	0.4	0.5	0.4	0.3	0.3	0.3	0.3	0.3	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.6	
20-Sep	0.0	0.1	0.0	0.1	0.0	Z	0.3	0.5	0.5	4.0	4.0	5.0	2.4	1.6	0.9	0.6	1.8	1.0	0.5	0.1	0.1	0.1	0.1	0.1	1.0	5.0	
21-Sep	M	0.1	0.2	0.1	0.0	0.1	0.0	0.1	0.1	1.0	1.2	0.5	0.3	0.2	0.2	0.2	0.2	0.3	0.4	0.4	0.5	0.7	0.9	1.0	0.4	1.2	
22-Sep	0.9	Z	1.2	2.2	1.9	3.5	0.9	1.3	1.2	0.6	0.7	0.6	0.5	0.3	0.8	1.0	0.6	2.6	0.4	0.6	0.5	1.0	1.2	0.9	1.1	3.5	
23-Sep	1.1	1.1	Z	0.8	0.7	0.7	0.6	0.5	0.6	0.4	0.4	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.2	0.0	0.0	0.3	0.2	0.1	0.4	1.1	
24-Sep	0.0	0.0	0.1	Z	0.1	0.0	0.0	0.4	0.5	0.4	0.5	0.6	0.6	0.8	0.6	0.7	0.3	0.1	0.1	0.1	0.1	0.1	0.2	0.0	0.3	0.8	
25-Sep	0.0	0.0	0.0	0.0	Z	0.2	0.1	0.0	0.0	0.1	0.3	0.2	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.3	0.3
26-Sep	0.2	0.1	0.1	0.2	0.3	Z	1.8	1.0	0.8	5.1	3.7	1.0	1.8	0.5	0.9	1.6	0.6	0.7	0.4	0.3	0.1	0.0	0.0	0.0	0.9	5.1	
27-Sep	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.9	1.3	11.4	1.9	0.2	1.0	0.2	0.1	0.0	0.2	0.1	0.0	0.1	0.0	0.0	0.1	0.8	11.4	
28-Sep	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.4	2.4	2.3	0.9	3.8	1.6	1.4	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.7	3.8	
29-Sep	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	0.3	0.9	1.5	0.1	1.5	
30-Sep	4.2	3.0	2.0	Z	0.4	0.3	0.3	0.2	0.5	0.7	0.5	0.3	0.3	0.3	0.2	0.2	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.6	4.2	

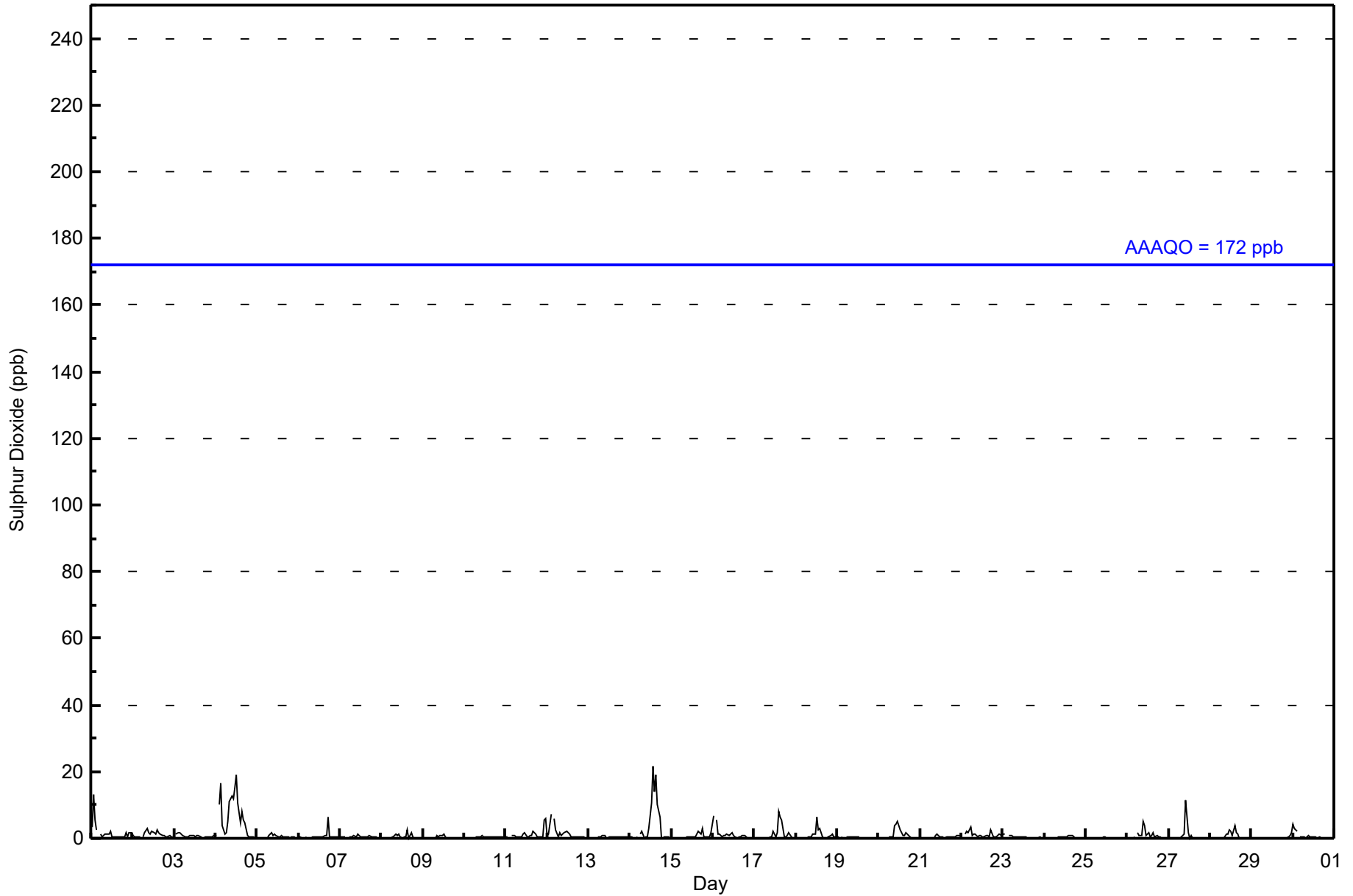
0.8	0.9	1.4	1.1	0.7	0.5	0.4	0.7	1.0	1.3	1.7	1.6	1.8	1.7	1.6	1.8	1.2	1.1	0.4	0.3	0.4	0.3	0.5	0.5	Diurnal Average	
6.8	13.3	10.1	16.7	5.8	3.5	1.8	5.0	11.0	12.8	11.7	15.1	19.0	21.4	14.1	19.3	10.4	6.4	2.8	0.8	1.7	1.4	5.5	5.8	Diurnal Maximum	

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
Christina Lake - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Christina Lake - September 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	676	98.40	98.40
11 - 20	10	1.46	99.85
21 - 60	1	0.15	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 687

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Christina Lake - September 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	18	9	16	9	22	31	65	85	112	92	97	67	21	14	9	676
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	4	6	0	10
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	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	9	18	9	16	9	22	31	65	85	112	92	97	67	25	21	9	687

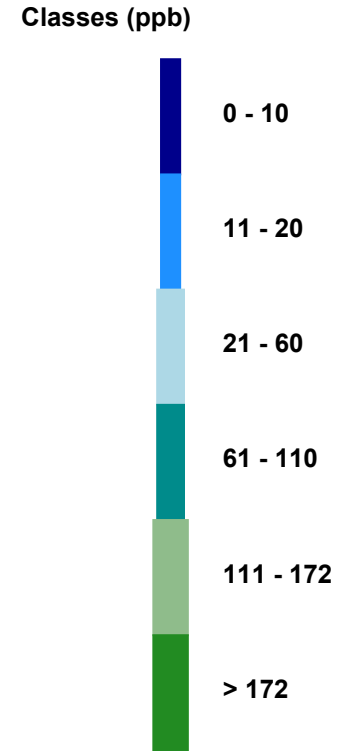
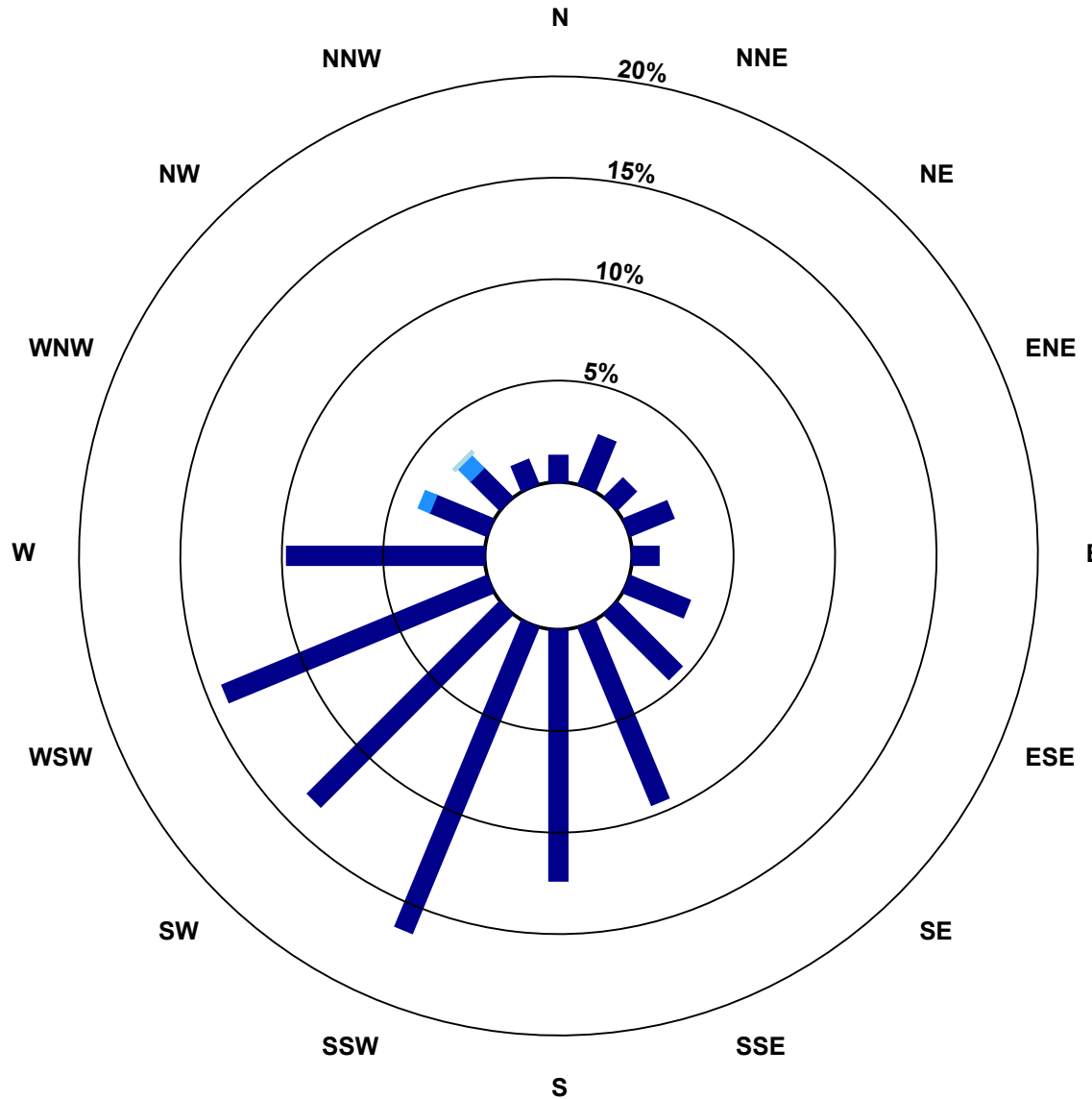
Total Number of Valid Hours: 687

Total Number of Hours: 720

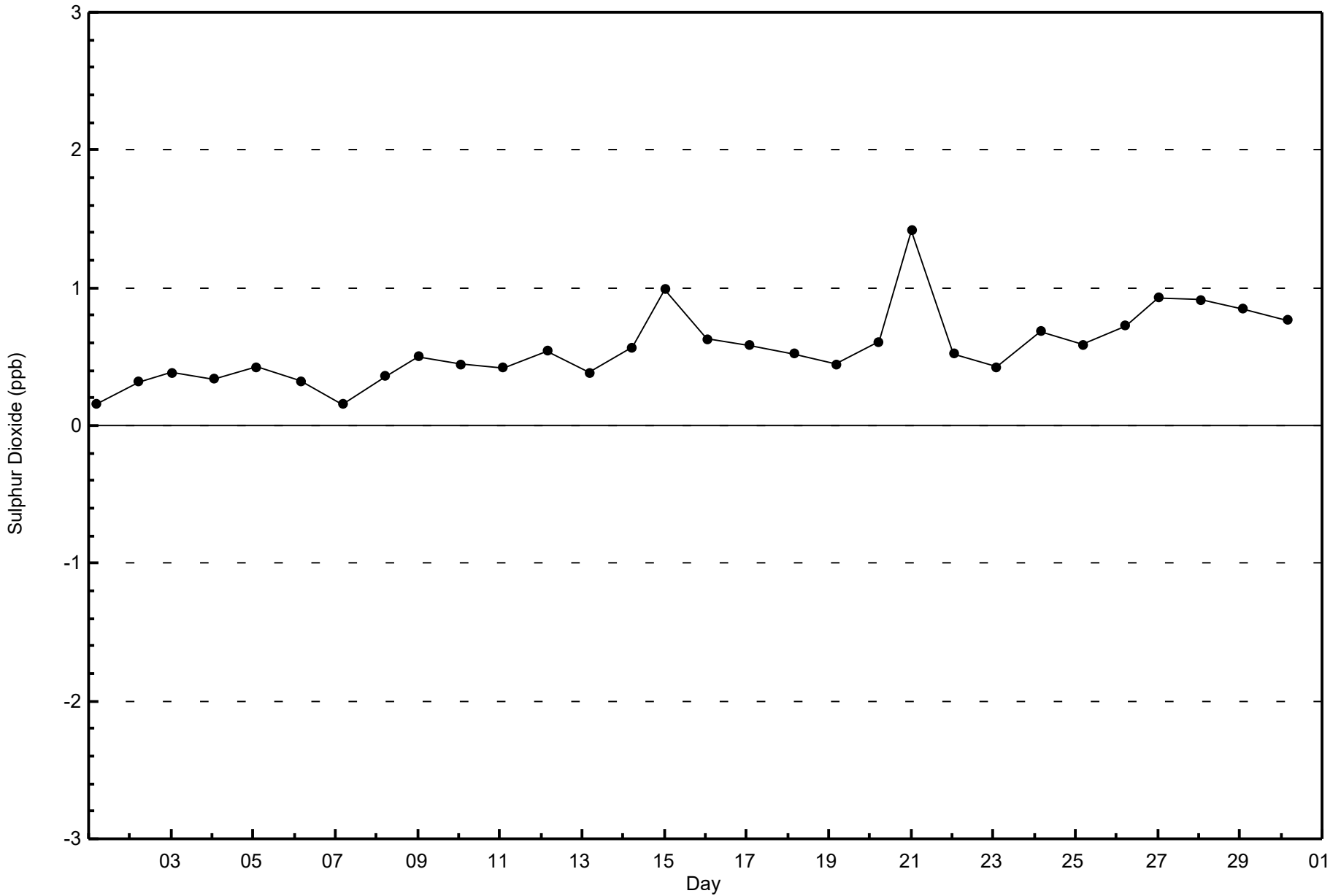


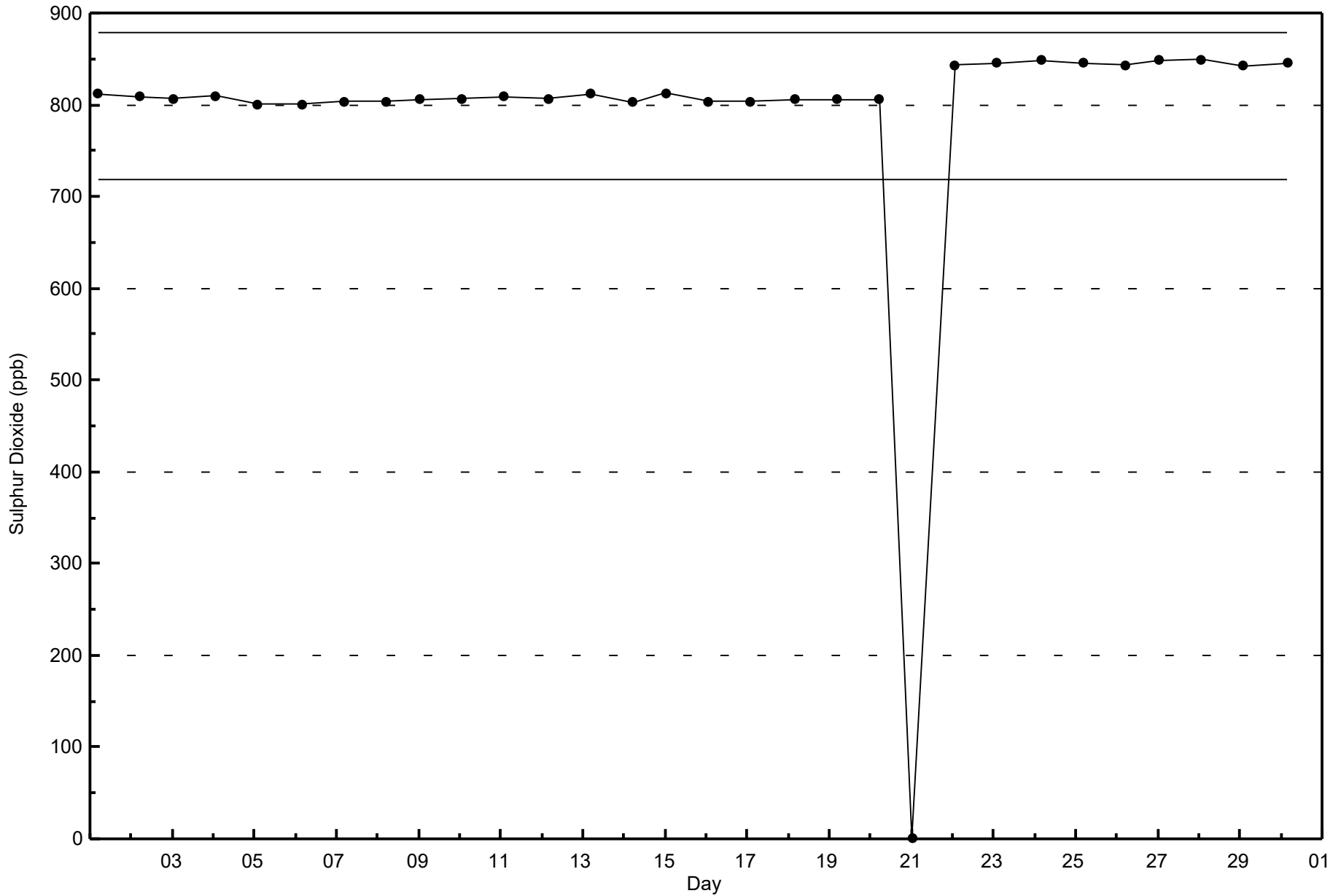
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Sulphur Dioxide (SO₂) - ppb
Christina Lake



Total Number of Valid Hours: 687







Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H₂S) - ppb

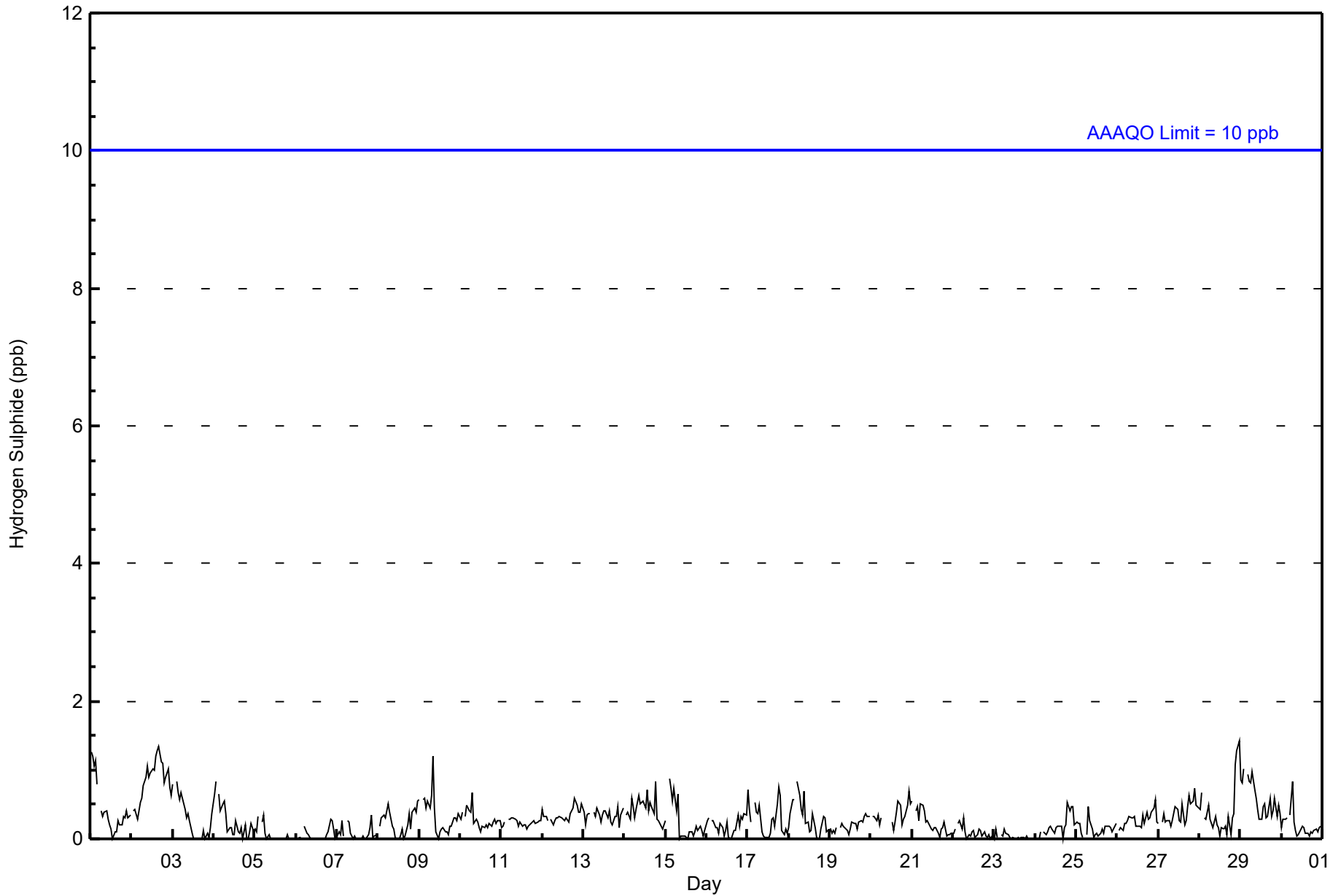
Christina Lake - September 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 1.4 ppb on Sep 29 00:00	Maximum Daily Average: 0.8 ppb on Sep 2		Hours of Data:	685
Minimum Value: 0.0 ppb on Sep 1 14:00	Minimum Daily Average: 0.0 ppb on Sep 23		Hours of Missing Data:	35
Maximum Diurnal Average: 0.4 ppb at hour 6	Minimum Diurnal Average: 0.2 ppb at hour 13		Hours of Calibration:	34
Monthly Average: 0.27 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.2 Q ₃ = 0.4 P ₉₀ = 0.6 P ₉₉ = 1.2		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-Sep	1.3	1.2	1.1	1.1	0.8	Z	0.4	0.3	0.4	0.4	0.3	0.2	0.1	0.0	0.1	0.1	0.3	0.2	0.2	0.3	0.3	0.4	0.3	0.3	0.4	0.4
2-Sep	Z	0.4	0.4	0.3	0.4	0.5	0.6	0.8	0.9	1.1	0.9	1.0	1.0	1.0	1.2	1.3	1.3	1.1	1.1	0.8	0.9	1.0	0.8	0.6	0.6	0.6
3-Sep	0.8	Z	0.8	0.7	0.6	0.7	0.5	0.4	0.3	0.4	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.2	0.4	0.4	0.4
4-Sep	0.6	0.8	Z	0.6	0.4	0.5	0.5	0.4	0.1	0.2	0.2	0.1	0.1	0.3	0.1	0.1	0.2	0.0	0.2	0.0	0.0	0.1	0.2	0.1	0.1	0.1
5-Sep	0.1	0.1	0.3	Z	0.2	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0
6-Sep	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	0.1	0.1	0.3	0.3	0.1	0.0	0.0	0.0
7-Sep	0.1	0.1	0.1	0.3	0.0	Z	0.3	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.0	0.1	0.1	0.1	0.1
8-Sep	Z	0.2	0.3	0.3	0.3	0.4	0.5	0.4	0.2	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.2	0.4	0.1	0.4	0.5	0.4	0.5	0.5	0.5
9-Sep	0.6	Z	0.6	0.6	0.4	0.5	0.4	0.6	1.2	0.4	0.1	0.0	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4
10-Sep	0.3	0.4	Z	0.3	0.5	0.4	0.4	0.7	0.2	0.3	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.3	0.3	0.3
11-Sep	0.2	0.2	0.2	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.2	0.2	0.3	0.3	0.3	0.3
12-Sep	0.4	0.3	0.3	0.3	Z	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.4	0.4	0.5	0.6	0.5	0.4	0.4	0.5	0.5	0.5
13-Sep	0.4	0.2	0.3	0.4	0.4	Z	0.4	0.3	0.4	0.4	0.2	0.3	0.4	0.4	0.3	0.4	0.2	0.2	0.3	0.3	0.5	0.2	0.3	0.4	0.4	0.4
14-Sep	Z	0.3	0.4	0.3	0.6	0.5	0.3	0.4	0.6	0.5	0.5	0.5	0.4	0.7	0.4	0.5	0.5	0.4	0.8	0.3	0.3	0.2	0.1	0.2	0.1	0.2
15-Sep	0.3	Z	0.9	0.7	0.5	0.7	0.4	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.2	0.1	0.2	0.1	0.0	0.1	0.1	0.1
16-Sep	0.3	0.3	Z	0.3	0.3	0.2	0.2	0.1	0.2	0.2	0.0	0.1	0.2	0.0	0.0	0.1	0.1	0.1	0.3	0.2	0.3	0.3	0.4	0.4	0.4	0.4
17-Sep	0.7	0.4	0.2	Z	0.5	0.4	0.4	0.5	0.1	0.1	0.0	0.0	0.0	0.1	0.3	0.3	0.2	0.5	0.8	0.6	0.1	0.1	0.1	0.1	0.1	0.1
18-Sep	0.2	0.4	0.6	0.6	Z	0.8	0.6	0.4	0.3	0.7	0.2	0.2	0.1	0.1	0.4	0.2	0.0	0.0	0.0	0.1	0.3	0.3	0.1	0.1	0.1	0.1
19-Sep	0.1	0.1	0.1	0.1	0.2	Z	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.2	0.1	0.2	0.3	0.2	0.3	0.4	0.3	0.3	0.3
20-Sep	Z	0.3	0.3	0.3	0.3	0.2	0.3	C	C	C	C	C	C	0.2	0.1	0.2	0.4	0.5	0.5	0.2	0.3	0.3	0.5	0.7	0.5	0.5
21-Sep	0.5	M	0.4	0.5	0.3	0.5	0.5	0.4	0.2	0.3	0.2	0.1	0.1	0.2	0.2	0.1	0.0	0.1	0.2	0.2	0.0	0.1	0.1	0.1	0.1	0.1
22-Sep	0.1	0.2	Z	0.2	0.3	0.1	0.3	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.1
23-Sep	0.0	0.1	0.0	Z	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24-Sep	0.0	0.0	0.0	0.1	Z	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.0	0.2	0.2	0.5	0.4	0.5	0.5	0.2	0.2	0.2
25-Sep	0.2	0.2	0.2	0.1	0.0	Z	0.1	0.5	0.3	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1
26-Sep	Z	0.1	0.2	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.4	0.2	0.4	0.3	0.3	0.4	0.4	0.6	0.3	0.3	0.3
27-Sep	0.2	Z	0.2	0.4	0.2	0.3	0.3	0.2	0.3	0.4	0.5	0.4	0.3	0.2	0.5	0.2	0.3	0.5	0.6	0.5	0.6	0.7	0.5	0.5	0.5	0.5
28-Sep	0.4	0.7	Z	0.3	0.3	0.5	0.3	0.2	0.2	0.3	0.2	0.2	0.0	0.2	0.1	0.2	0.1	0.3	0.1	0.3	0.4	1.1	1.3	1.4	1.4	1.4
29-Sep	0.9	0.8	1.0	Z	0.9	0.8	0.8	1.0	0.7	0.6	0.4	0.3	0.3	0.5	0.5	0.3	0.3	0.6	0.3	0.4	0.6	0.3	0.5	0.4	0.4	0.4
30-Sep	0.2	0.3	0.3	0.3	Z	0.3	0.8	0.3	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	0.2	0.2	0.2	0.2

0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	Diurnal Average
1.3	1.2	1.1	1.1	0.9	0.8	0.8	0.8	1.0	1.2	1.1	0.9	1.0	1.0	1.0	1.0	1.2	1.3	1.3	1.1	1.1	0.8	0.9	1.1	1.3	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
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Christina Lake - September 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	685	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: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Christina Lake - September 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	18	8	16	10	22	31	65	88	108	90	102	66	24	21	9	685
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	18	8	16	10	22	31	65	88	108	90	102	66	24	21	9	685

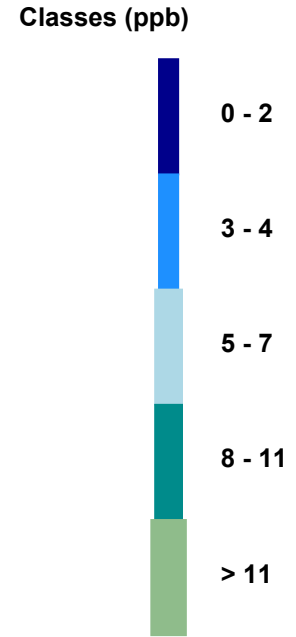
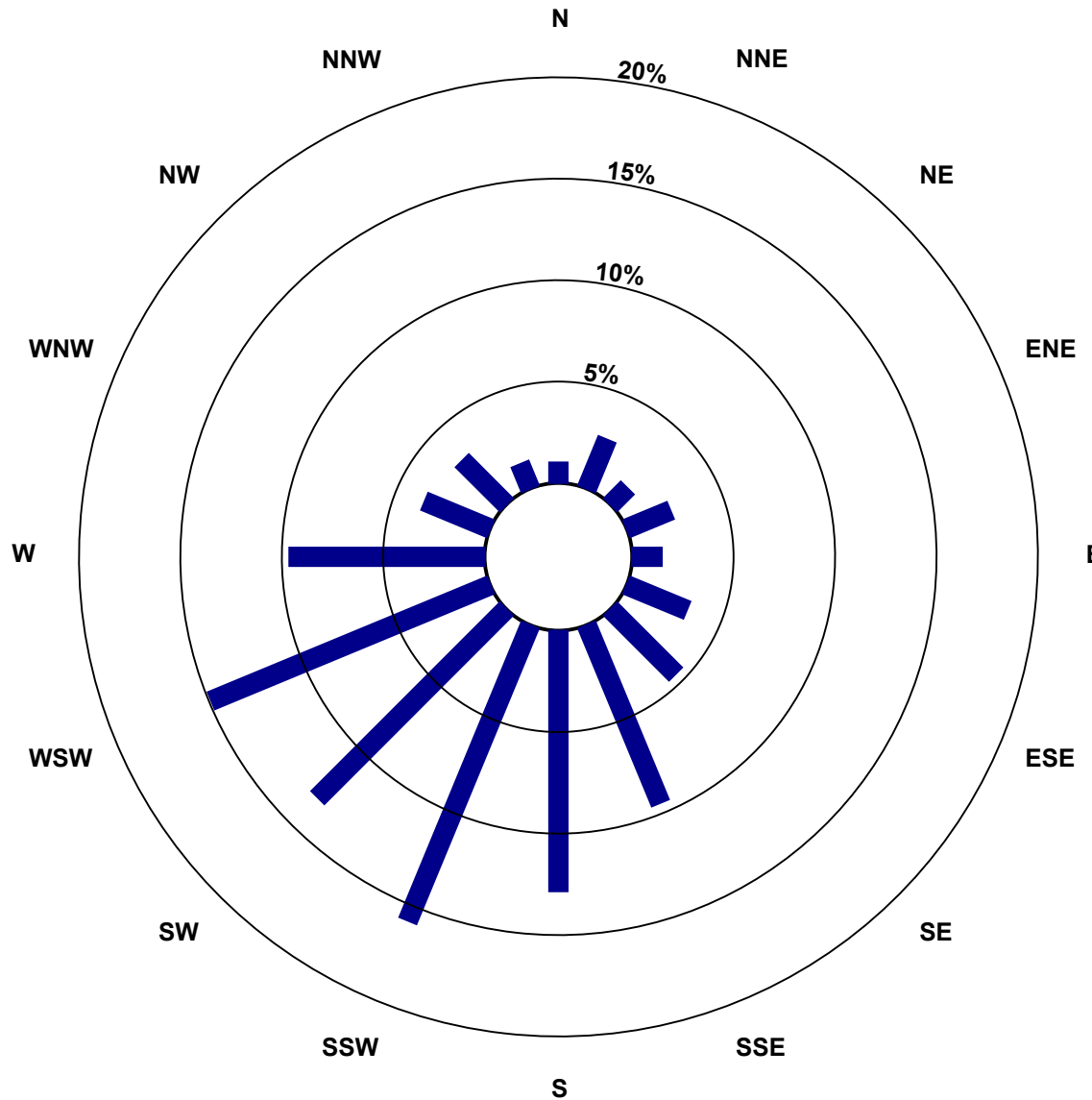
Total Number of Valid Hours: 685

Total Number of Hours: 720

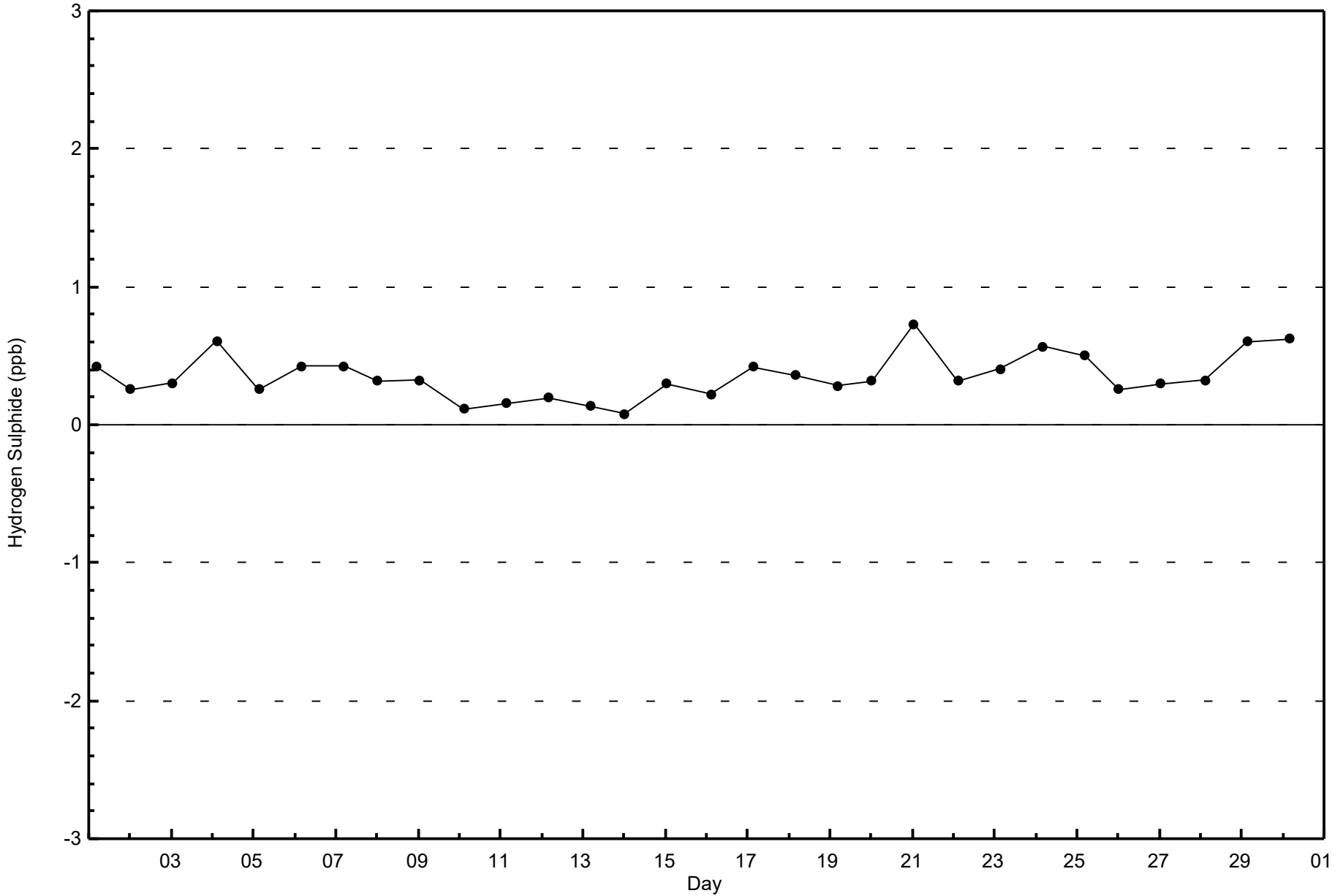


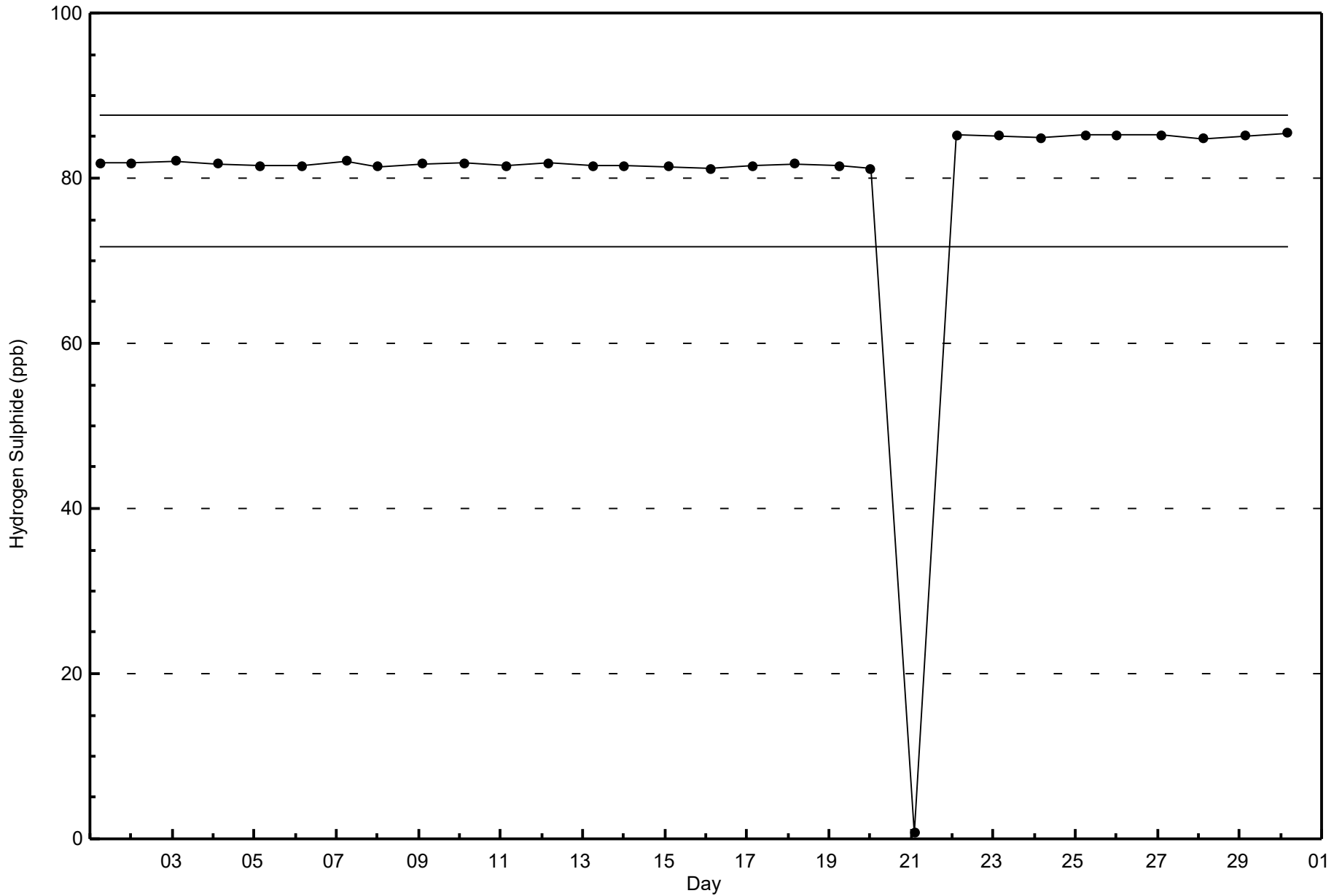
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Hydrogen Sulphide (H₂S) - ppb
Christina Lake



Total Number of Valid Hours: 685





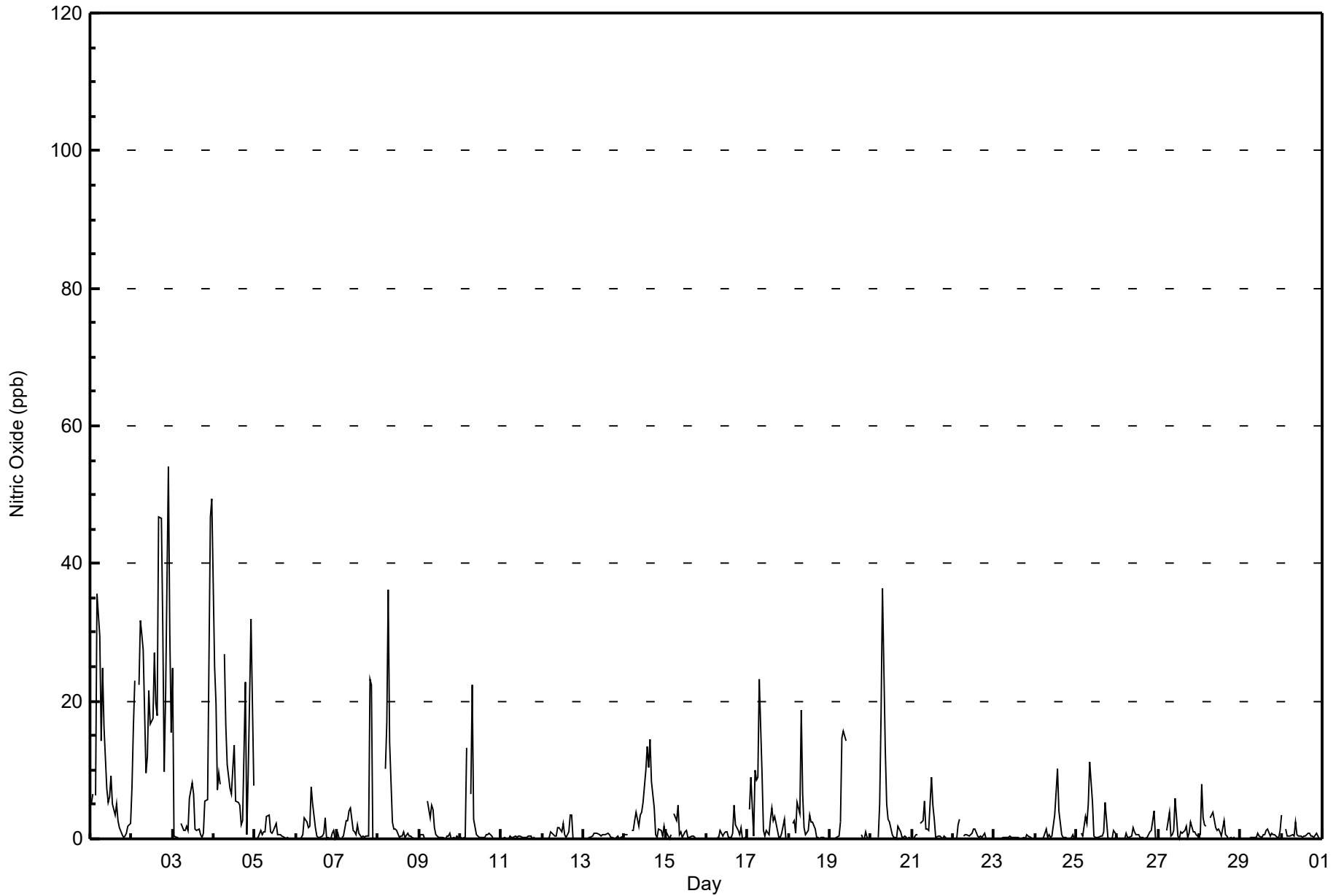


Maximum Value: 54.2 ppb on Sep 2 22:00																				Maximum Daily Average: 24.1 ppb on Sep 2					Hours in Service: 720		
Minimum Value: 0.0 ppb on Sep 20 02:00																				Minimum Daily Average: 0.2 ppb on Sep 23					Hours of Data: 682		
Maximum Diurnal Average: 8.0 ppb at hour 8																				Minimum Diurnal Average: 1.1 ppb at hour 4					Hours of Missing Data: 38		
Monthly Average: 3.17 ppb																				Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.5 Q ₃ = 2.3 P ₉₀ = 9.0 P ₉₉ = 35.8					Hours of Calibration: 37		
																									Percent Operational Time: 99.9		
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Sep	5.1	6.5	Z	6.2	35.6	29.4	14.3	24.8	16.3	7.3	5.2	6.2	9.2	5.2	3.5	5.2	2.6	1.6	0.5	0.2	0.5	0.8	1.8	2.3	8.3	35.6	
2-Sep	7.5	16.2	23.1	Z	22.4	31.7	29.8	27.5	9.6	12.0	21.7	16.6	17.5	27.1	19.6	17.8	46.7	46.5	30.7	9.8	20.8	54.2	29.9	15.5	24.1	54.2	
3-Sep	24.9	0.4	0.2	0.2	Z	2.3	1.2	1.1	1.7	1.2	5.9	8.2	6.6	1.5	1.2	1.5	0.7	0.2	0.7	5.4	5.8	26.4	46.8	49.4	8.4	49.4	
4-Sep	25.1	19.7	7.2	9.5	8.0	Z	26.9	16.5	10.7	7.3	6.5	10.1	13.7	5.6	5.3	4.8	2.0	2.7	22.7	0.5	9.6	20.6	31.9	7.7	11.9	31.9	
5-Sep	Z	0.1	0.2	1.2	0.7	1.0	1.1	3.2	3.4	1.0	0.9	1.3	2.3	0.6	0.7	0.5	0.4	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.8	3.4	
6-Sep	0.1	Z	0.1	0.1	0.6	3.0	2.5	1.6	1.9	7.6	5.0	1.7	0.5	0.3	0.2	0.4	0.8	3.0	0.1	0.3	0.0	0.7	1.3	0.0	1.4	7.6	
7-Sep	0.8	0.1	Z	0.2	0.4	2.7	2.6	4.1	4.5	1.3	1.0	0.5	2.1	0.9	0.3	0.4	0.2	0.4	0.5	23.2	22.3	0.1	0.0	0.0	3.0	23.2	
8-Sep	0.0	0.1	0.1	Z	10.3	16.8	36.3	14.0	2.5	1.4	1.4	1.2	0.2	0.3	0.5	1.0	0.1	0.7	0.3	0.3	0.2	0.0	0.0	0.1	3.8	36.3	
9-Sep	0.1	0.7	0.6	0.1	Z	5.4	3.1	4.9	4.2	1.6	0.6	0.2	0.1	0.2	0.1	0.1	0.4	0.3	0.9	0.1	0.1	0.1	0.3	0.1	1.1	5.4	
10-Sep	0.1	0.1	0.1	0.1	13.3	Z	6.6	22.3	2.9	0.7	0.5	0.1	0.1	0.2	0.1	0.5	0.6	0.9	0.4	0.0	0.1	0.0	0.0	0.0	2.2	22.3	
11-Sep	Z	0.1	0.1	0.0	0.0	0.3	0.1	0.3	0.4	0.2	0.4	0.4	0.2	0.1	0.2	0.2	0.5	0.4	0.1	0.1	0.1	0.0	0.1	0.0	0.2	0.5	
12-Sep	0.0	Z	0.0	0.1	0.1	1.0	0.6	0.5	0.5	1.7	1.6	1.1	2.1	0.6	0.2	0.9	3.5	3.4	0.0	0.0	0.0	0.1	0.0	0.1	0.8	3.5	
13-Sep	0.1	0.0	Z	0.2	0.2	0.3	0.8	0.8	0.7	0.6	0.4	0.6	0.7	0.7	0.5	0.2	0.1	0.1	0.1	0.5	0.1	0.2	0.5	0.4	0.4	0.8	
14-Sep	0.7	0.6	0.6	Z	1.1	1.3	2.6	3.9	1.8	3.5	3.8	5.2	10.0	13.4	10.3	14.5	8.3	4.4	0.6	0.1	1.5	1.2	0.5	1.9	4.0	14.5	
15-Sep	0.3	0.8	0.0	0.6	Z	3.7	2.6	4.9	0.6	1.0	0.2	0.9	1.2	0.1	0.3	0.4	0.4	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.8	4.9	
16-Sep	0.0	0.0	0.0	0.0	0.0	Z	0.2	0.2	1.2	0.4	0.7	1.1	0.9	0.2	0.2	0.9	4.9	2.1	1.2	0.6	1.6	0.1	0.1	0.4	0.7	4.9	
17-Sep	Z	4.2	8.9	0.5	9.9	8.5	9.0	23.1	9.4	1.3	0.4	1.3	0.6	2.8	4.4	2.7	3.3	1.2	0.2	0.3	0.9	2.8	0.1	0.1	4.2	23.1	
18-Sep	0.0	Z	2.2	2.7	0.9	5.3	3.6	18.8	6.5	1.7	0.7	1.2	3.4	2.5	2.5	1.5	0.3	0.1	0.1	0.3	0.1	0.1	0.0	0.0	2.4	18.8	
19-Sep	0.0	0.1	Z	0.1	0.1	0.4	2.4	14.6	15.7	14.3	C	C	C	C	C	C	C	C	C	0.5	0.0	0.1	1.0	0.3	0.1	--	15.7
20-Sep	0.0	0.0	0.0	Z	0.3	5.1	18.1	36.3	13.1	5.1	2.8	2.5	0.5	0.1	0.1	0.1	1.9	1.0	0.2	0.3	0.3	0.0	0.1	0.1	3.8	36.3	
21-Sep	0.0	0.0	0.5	0.6	M	2.2	2.6	5.6	1.5	1.3	1.2	9.0	4.8	2.8	0.2	0.3	0.5	0.2	0.1	0.5	0.0	0.1	0.0	0.0	1.5	9.0	
22-Sep	0.0	0.0	0.0	2.0	2.8	Z	0.5	0.5	0.5	0.3	0.6	0.8	1.4	1.4	0.4	0.2	0.3	0.2	0.7	0.0	0.0	0.1	0.0	0.0	0.6	2.8	
23-Sep	Z	0.0	0.0	0.1	0.0	0.2	0.3	0.2	0.3	0.3	0.2	0.1	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.7	0.4	0.1	0.1	0.1	0.2	0.7	
24-Sep	0.1	Z	0.1	0.1	0.0	0.2	1.5	0.3	0.5	0.3	0.5	3.5	6.8	10.2	4.1	0.7	0.3	0.1	0.2	0.1	0.0	0.2	0.7	0.0	1.3	10.2	
25-Sep	0.0	0.1	Z	0.8	0.5	3.3	2.1	5.0	11.1	5.3	0.5	0.2	0.1	0.2	0.4	0.5	1.0	5.2	0.3	0.0	0.1	0.1	1.3	0.5	1.7	11.1	
26-Sep	0.0	0.0	0.0	Z	0.1	0.7	0.1	0.2	0.4	1.6	1.1	0.5	0.6	0.2	0.2	0.3	0.1	0.1	0.6	1.0	1.2	4.0	0.1	0.0	0.6	4.0	
27-Sep	0.0	0.1	0.1	0.1	Z	1.2	3.8	0.4	0.6	1.3	5.9	0.5	0.1	1.0	0.8	1.2	1.8	0.2	0.8	2.4	0.9	1.0	0.6	0.5	1.1	5.9	
28-Sep	0.5	7.8	3.0	2.1	1.8	Z	3.1	3.4	3.9	1.7	1.3	1.4	1.0	0.4	2.6	0.7	0.5	0.0	0.3	0.1	0.2	0.0	0.0	0.1	1.6	7.8	
29-Sep	Z	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.7	0.4	0.2	0.5	0.7	1.2	1.4	0.3	0.8	0.6	0.6	0.2	0.3	1.3	0.4	1.4	
30-Sep	3.5	Z	1.5	0.3	0.4	0.4	0.5	0.5	2.5	0.6	0.3	0.3	0.2	0.3	0.3	0.8	0.8	0.4	0.5	0.1	0.8	0.4	0.0	0.0	0.7	3.5	
																								Diurnal Average			
																								Diurnal Maximum			
2.8 2.3 1.9 1.1 4.4 5.1 6.0 8.0 4.3 2.8 2.5 2.7 3.0 2.7 2.1 2.1 2.9 2.6 2.1 1.6 2.3 3.8 3.9 2.7																											
																								25.1 19.7 23.1 9.5 35.6 31.7 36.3 36.3 16.3 14.3 21.7 16.6 17.5 27.1 19.6 17.8 46.7 46.5 30.7 23.2 22.3 54.2 46.8 49.4			
Z - zerospan			C - Calibration			M - Maintenance																					



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Christina Lake - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb
Christina Lake - September 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	651	95.45	95.45
21 - 40	26	3.81	99.27
41 - 80	5	0.73	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 682

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Nitric Oxide (NO) - ppb
Christina Lake - September 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	19	9	16	9	22	29	63	88	108	89	79	56	26	20	9	651
21 - 40	0	0	0	0	1	1	0	1	0	0	2	13	8	0	0	0	26
41 - 80	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	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	9	19	9	16	10	23	29	64	88	108	91	97	64	26	20	9	682

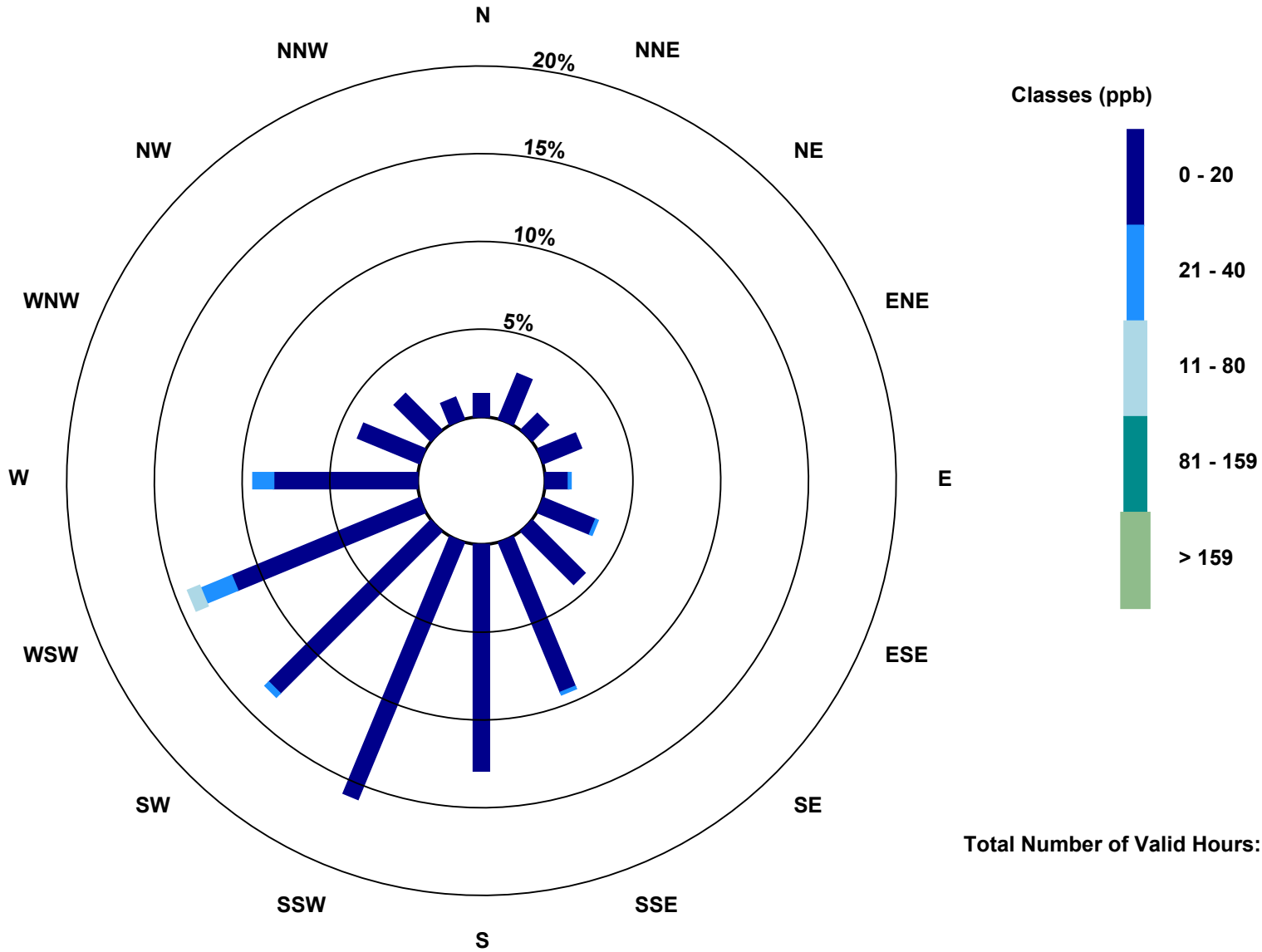
Total Number of Valid Hours: 682

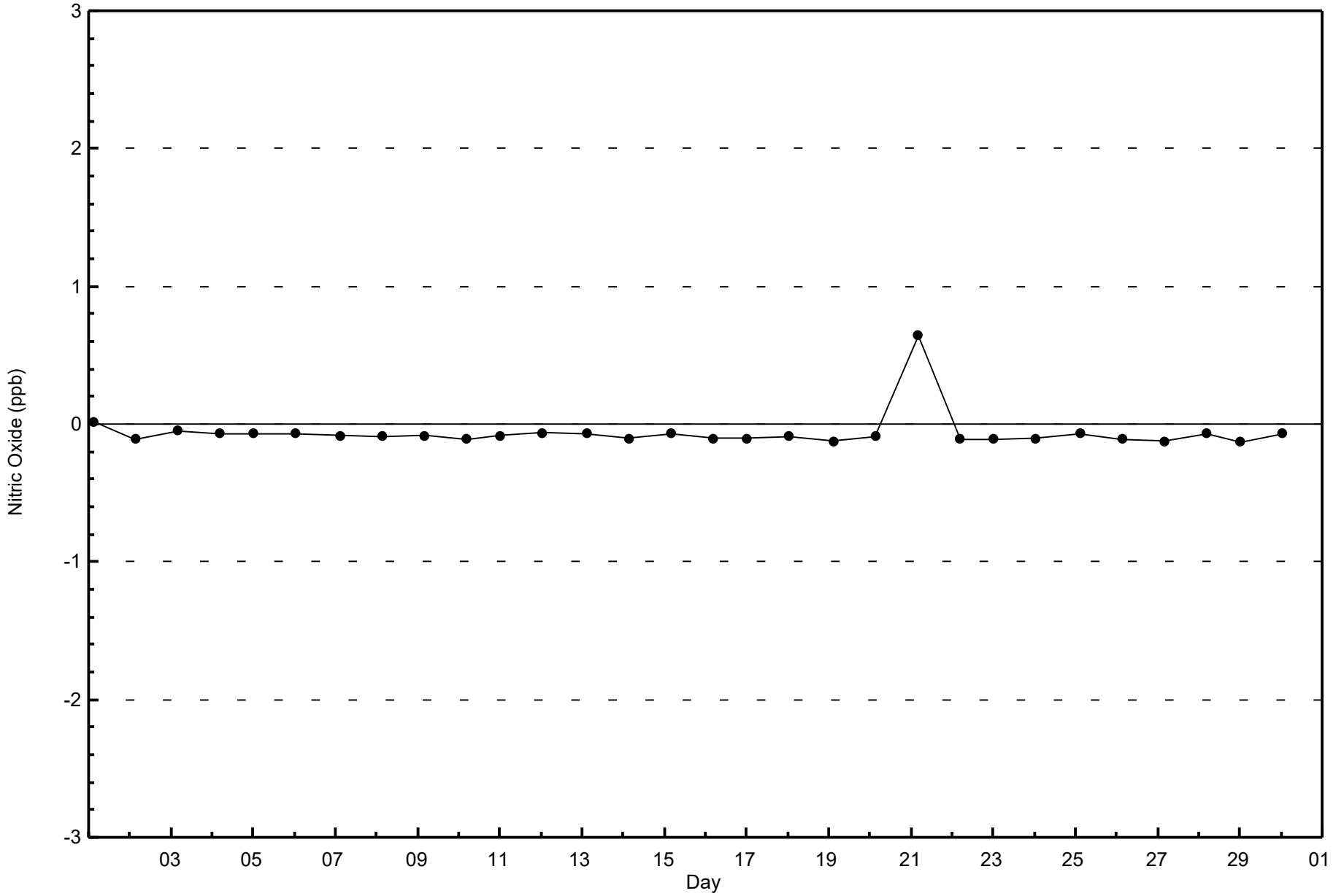
Total Number of Hours: 720

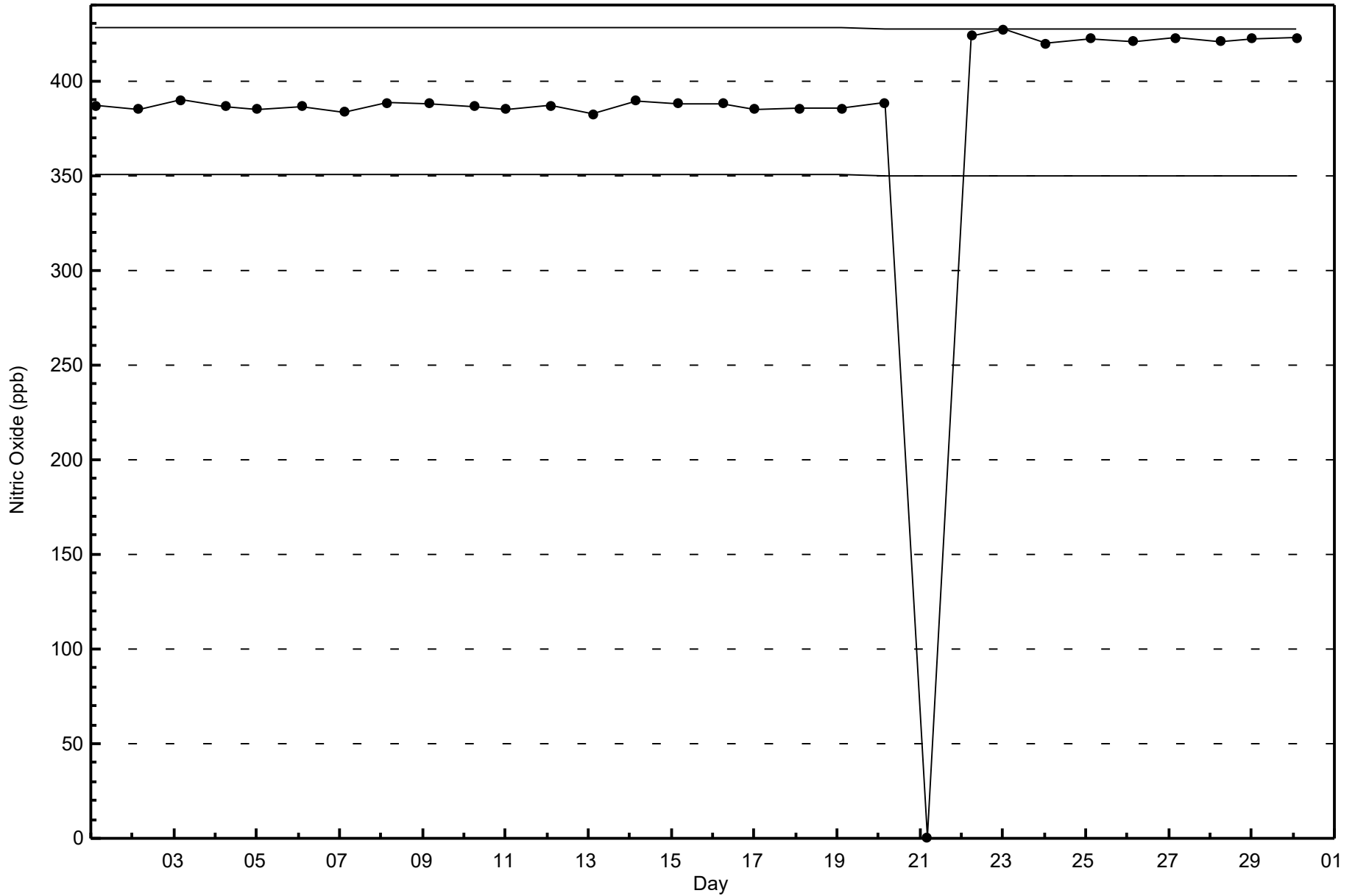


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitric Oxide (NO) - ppb
Christina Lake









Wood Buffalo Environmental Association
Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb
Christina Lake - September 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 21.3 ppb on Sep 2 06:00	Maximum Daily Average: 14.0 ppb on Sep 2		Hours of Data:	682
Minimum Value: 0.3 ppb on Sep 30 23:00	Minimum Daily Average: 1.5 ppb on Sep 5		Hours of Missing Data:	38
Maximum Diurnal Average: 4.8 ppb at hour 8	Minimum Diurnal Average: 2.7 ppb at hour 4		Hours of Calibration:	37
Monthly Average: 3.46 ppb	Percentiles: P ₁ = 0.6 P ₁₀ = 0.9 Q ₁ = 1.4 Median = 2.3 Q ₃ = 4.0 P ₉₀ = 7.6 P ₉₉ = 16.3		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-Sep	5.4	7.7	Z	5.3	14.8	14.2	8.0	11.5	9.0	6.1	5.4	6.2	8.0	4.6	3.6	4.6	3.1	2.4	1.3	1.1	2.9	2.7	5.7	6.1	6.1	14.8	
2-Sep	9.4	16.0	16.9	Z	14.5	21.3	18.4	16.1	11.2	10.9	12.4	12.0	12.3	14.3	12.1	12.6	18.2	18.1	14.7	7.2	10.4	18.7	13.9	10.4	14.0	21.3	
3-Sep	12.4	4.4	4.6	4.5	Z	3.6	3.5	3.4	4.4	4.2	6.0	8.9	7.9	4.5	3.7	2.6	2.5	1.3	2.3	5.5	4.9	13.5	15.4	14.7	6.0	15.4	
4-Sep	13.1	11.1	6.4	7.2	5.4	Z	8.3	6.8	5.0	4.1	4.2	6.1	6.9	3.5	4.0	3.2	2.3	3.2	12.9	1.5	6.4	13.4	17.6	5.4	6.9	17.6	
5-Sep	Z	0.7	1.7	2.2	1.5	1.7	1.5	3.2	2.8	1.4	1.5	1.7	1.6	1.2	2.1	1.6	1.9	1.5	0.8	1.1	0.7	0.5	0.6	0.7	1.5	3.2	
6-Sep	0.6	Z	0.5	0.6	0.9	2.2	4.5	1.7	2.0	4.0	3.1	2.2	1.4	1.3	1.2	1.5	1.8	4.2	1.2	1.5	1.1	2.2	1.4	1.3	1.8	4.5	
7-Sep	1.4	1.1	Z	2.5	1.8	2.7	2.5	3.7	3.7	2.2	2.4	1.9	2.5	1.5	1.1	1.2	1.1	2.1	3.4	9.5	9.0	1.4	1.4	1.0	2.7	9.5	
8-Sep	0.9	0.9	0.9	Z	4.0	5.5	8.7	5.4	2.5	2.2	2.5	1.7	0.7	1.2	1.7	2.1	1.1	2.8	3.7	3.3	1.3	1.1	0.9	0.8	2.4	8.7	
9-Sep	0.7	0.9	1.0	0.8	Z	3.2	1.6	3.2	5.3	2.8	1.9	1.4	1.1	0.8	0.8	0.6	1.5	1.3	2.7	2.4	1.3	1.2	1.4	1.3	1.7	5.3	
10-Sep	1.4	1.2	1.5	1.0	4.1	Z	2.8	7.1	3.2	1.6	1.7	0.8	0.8	1.1	0.9	1.4	1.5	1.5	1.3	1.0	0.7	0.6	0.6	0.8	1.7	7.1	
11-Sep	Z	1.1	1.3	1.2	1.4	1.8	1.7	1.2	1.3	1.3	1.8	1.7	1.0	1.0	1.3	1.8	2.9	2.3	1.6	1.8	1.6	1.7	6.8	6.4	2.0	6.8	
12-Sep	2.1	Z	7.8	8.2	6.4	5.2	2.6	2.6	1.8	2.9	3.1	3.0	4.0	2.4	1.9	2.3	5.1	4.8	1.6	1.9	1.8	1.9	1.7	1.7	3.3	8.2	
13-Sep	1.9	1.7	Z	2.6	3.0	3.1	4.3	3.3	3.0	2.4	1.3	1.0	1.8	1.9	2.2	2.3	1.2	1.1	1.6	2.5	3.0	1.4	1.6	2.9	2.2	4.3	
14-Sep	3.9	3.1	2.5	Z	3.1	2.4	3.4	3.9	3.7	4.0	4.5	3.6	5.9	8.4	7.7	10.7	8.5	7.5	5.4	2.1	8.8	2.6	4.1	2.8	4.9	10.7	
15-Sep	1.2	0.8	0.7	1.2	Z	3.4	3.0	2.6	0.9	1.3	0.7	1.5	1.8	0.9	1.0	1.9	2.5	1.9	3.0	1.5	1.5	1.9	1.7	3.1	1.7	3.4	
16-Sep	7.3	4.3	6.0	2.7	2.5	Z	2.8	3.0	4.1	2.9	3.5	4.5	3.7	2.0	2.0	3.8	9.1	6.5	3.1	3.1	3.4	1.1	1.1	2.1	3.7	9.1	
17-Sep	Z	1.9	4.2	0.9	3.8	3.1	3.9	7.0	6.6	2.7	1.5	3.2	2.1	6.9	10.2	8.0	7.2	7.6	6.9	9.1	7.2	7.3	2.3	2.7	5.1	10.2	
18-Sep	2.8	Z	4.1	3.3	1.9	4.6	6.9	10.4	4.5	7.0	3.7	3.8	5.4	3.9	5.6	5.0	1.4	1.3	1.7	1.4	2.0	2.1	1.0	1.2	3.7	10.4	
19-Sep	0.8	1.1	Z	1.3	1.6	3.5	3.5	8.3	8.0	7.4	C	C	C	C	C	C	C	C	C	2.6	0.7	1.1	1.7	1.9	2.1	--	8.3
20-Sep	1.0	0.7	0.9	Z	2.0	6.1	12.2	14.9	7.6	5.4	4.8	4.5	2.5	2.0	2.3	1.9	6.4	4.2	3.4	2.9	1.8	1.0	1.5	1.1	4.0	14.9	
21-Sep	1.0	0.7	0.8	1.2	M	1.2	2.4	3.8	1.8	2.2	2.1	4.4	3.1	1.7	0.7	0.7	1.0	1.1	1.4	2.2	1.1	1.7	1.9	2.3	1.8	4.4	
22-Sep	1.8	1.7	2.6	7.2	14.2	Z	2.0	2.3	1.8	1.4	1.5	1.9	2.2	2.0	1.7	1.5	1.3	2.8	1.4	1.2	0.9	2.3	1.9	1.6	2.6	14.2	
23-Sep	Z	2.2	2.0	1.9	1.6	1.8	2.8	1.6	1.2	1.1	1.0	0.7	0.7	0.9	0.8	0.8	0.8	0.9	1.2	5.1	3.8	1.1	0.6	0.6	1.5	5.1	
24-Sep	0.6	Z	1.1	1.0	1.1	1.0	2.3	1.3	2.2	1.7	1.7	3.6	4.5	8.0	4.9	2.6	2.5	2.6	2.6	1.4	1.3	2.0	3.1	0.9	2.3	8.0	
25-Sep	0.6	0.8	Z	1.2	1.1	2.3	2.5	2.9	6.0	4.2	1.4	0.9	0.8	0.8	1.1	1.4	4.7	14.4	3.0	0.6	0.5	1.5	12.5	7.0	3.1	14.4	
26-Sep	0.6	0.7	0.8	Z	1.4	1.8	3.9	2.9	2.6	5.4	3.8	1.9	2.4	1.5	1.8	3.0	2.7	3.3	5.0	4.0	5.0	5.0	2.1	2.4	2.8	5.4	
27-Sep	1.7	2.5	2.5	2.5	Z	7.3	8.0	3.3	3.0	3.2	8.3	1.4	0.6	2.7	4.1	3.8	5.0	2.9	3.3	7.2	3.1	6.9	3.6	2.2	3.9	8.3	
28-Sep	1.9	7.0	3.9	2.7	2.0	Z	7.8	3.3	5.1	3.2	2.8	2.4	2.1	1.2	3.9	1.7	1.4	0.5	0.9	1.7	2.8	3.1	3.5	3.5	3.0	7.8	
29-Sep	Z	1.7	1.8	1.5	1.1	1.3	1.3	1.6	1.3	1.3	2.1	1.1	1.2	1.6	2.0	3.6	3.7	3.4	3.6	3.2	3.2	3.8	4.2	3.5	2.3	4.2	
30-Sep	4.4	Z	2.6	1.9	1.9	3.4	3.3	1.2	2.9	1.2	1.1	1.4	1.2	1.5	1.4	2.0	2.6	1.6	2.3	1.8	5.0	2.7	0.3	0.6	2.1	5.0	

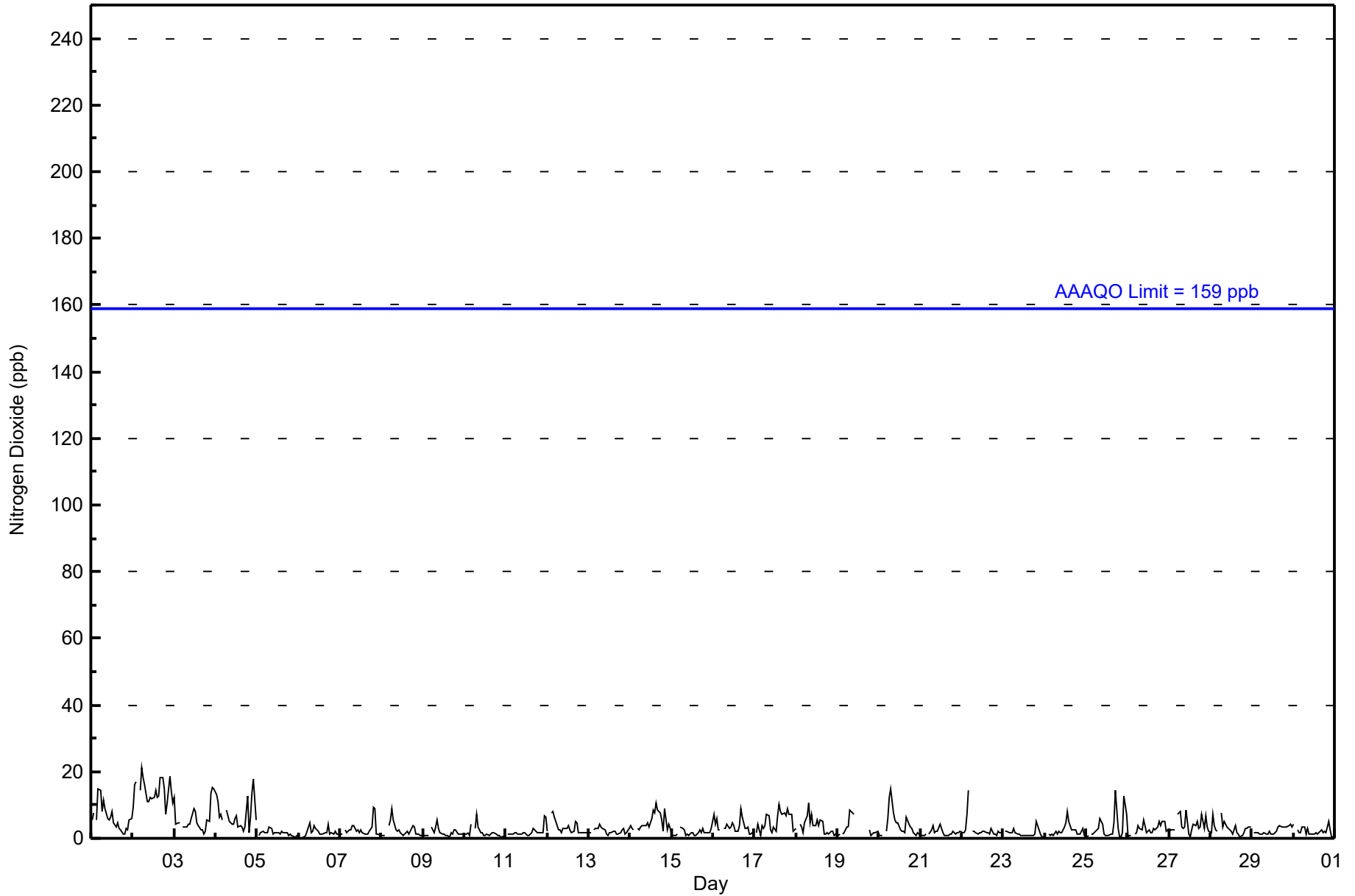
3.2	3.0	3.2	2.7	3.9	4.3	4.7	4.8	4.0	3.4	3.2	3.1	3.1	2.9	3.0	3.1	3.6	3.8	3.3	3.0	3.3	3.6	3.9	3.1	Diurnal Average	
13.1	16.0	16.9	8.2	14.8	21.3	18.4	16.1	11.2	10.9	12.4	12.0	12.3	14.3	12.1	12.6	18.2	18.1	14.7	9.5	10.4	18.7	17.6	14.7	Diurnal Maximum	

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



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Christina Lake - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Christina Lake - September 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	681	99.85	99.85
21 - 40	1	0.15	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: 682

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Christina Lake - September 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	19	9	16	10	23	29	64	88	108	91	97	63	26	20	9	681
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	9	19	9	16	10	23	29	64	88	108	91	97	64	26	20	9	682

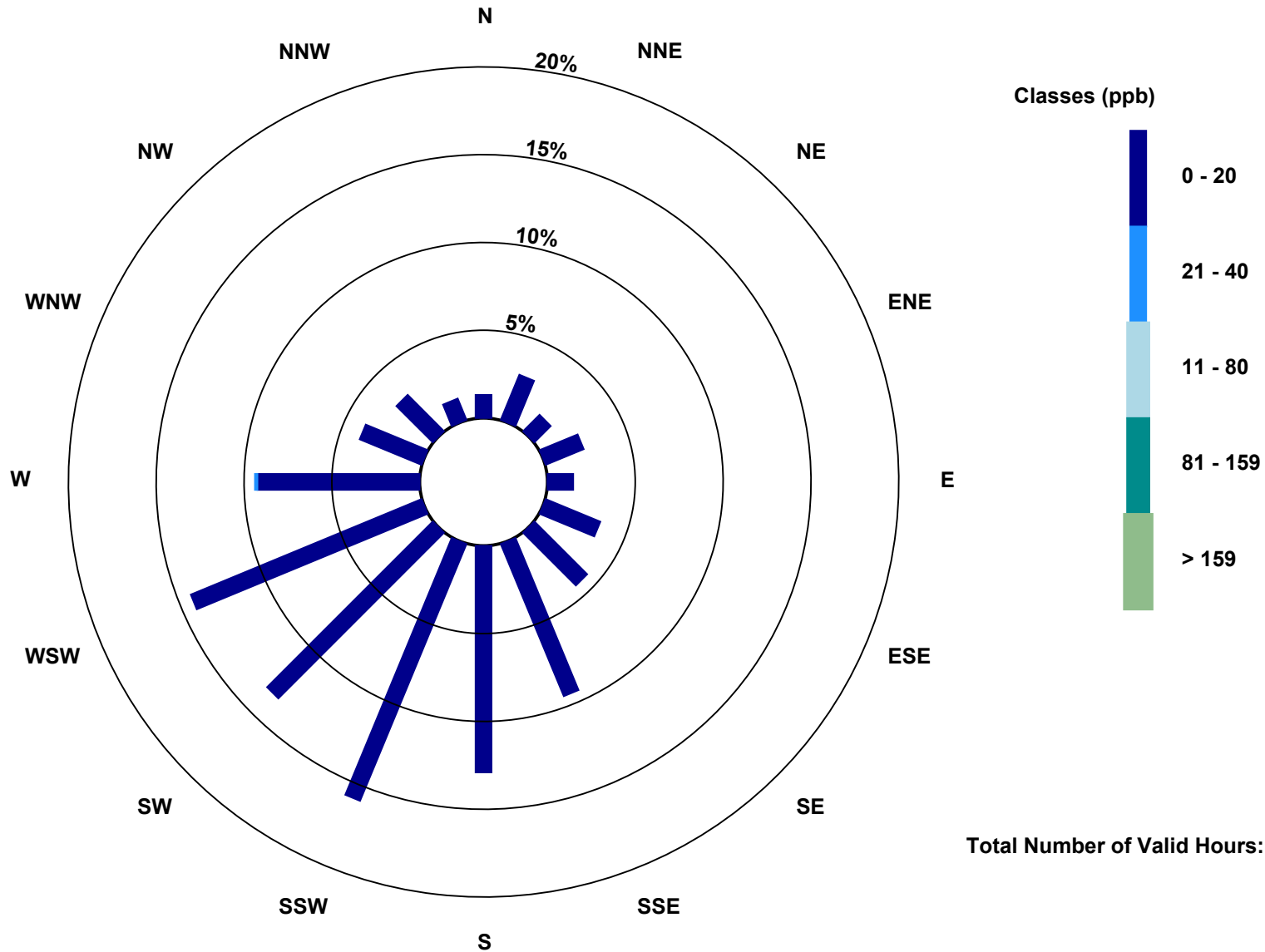
Total Number of Valid Hours: 682

Total Number of Hours: 720

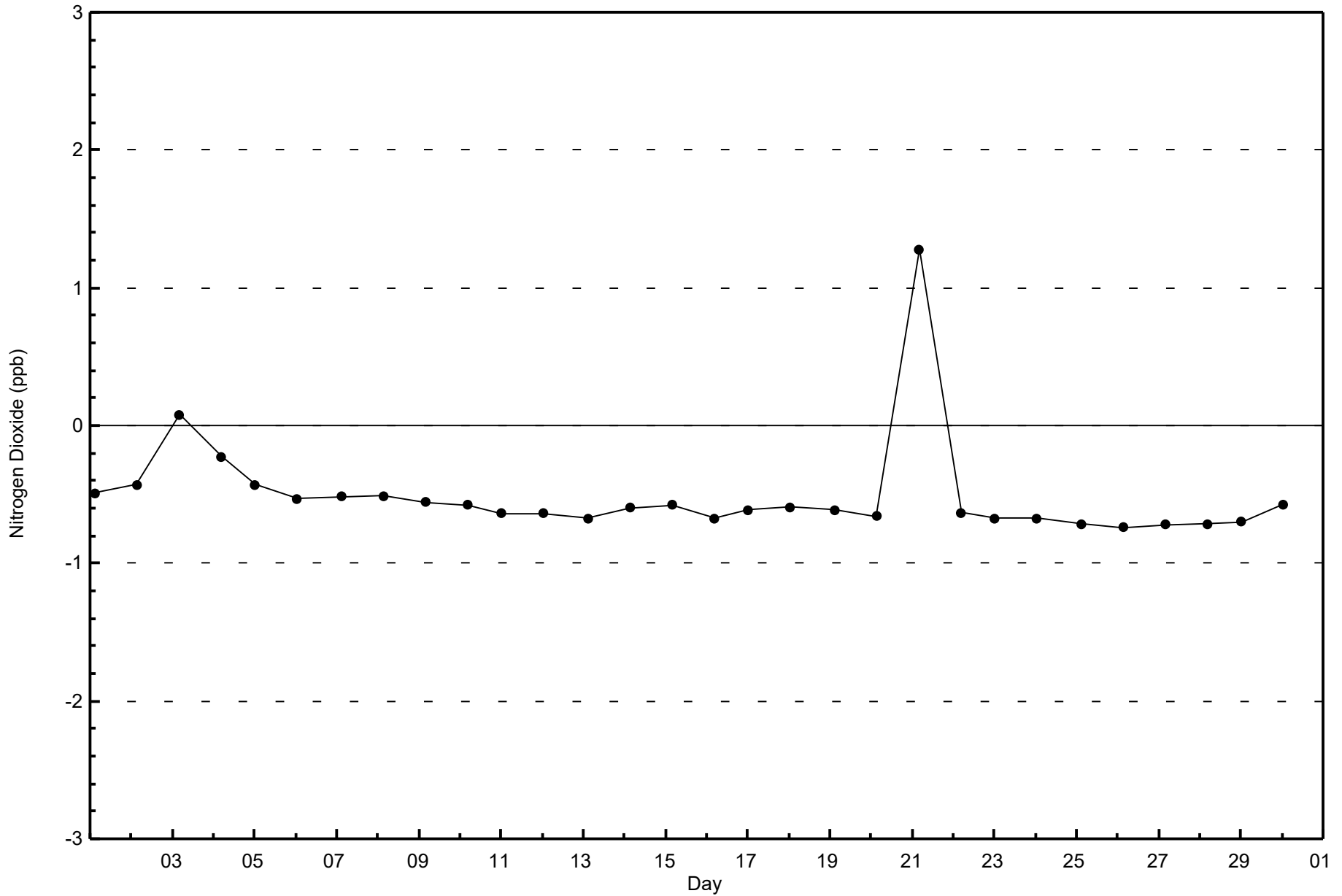


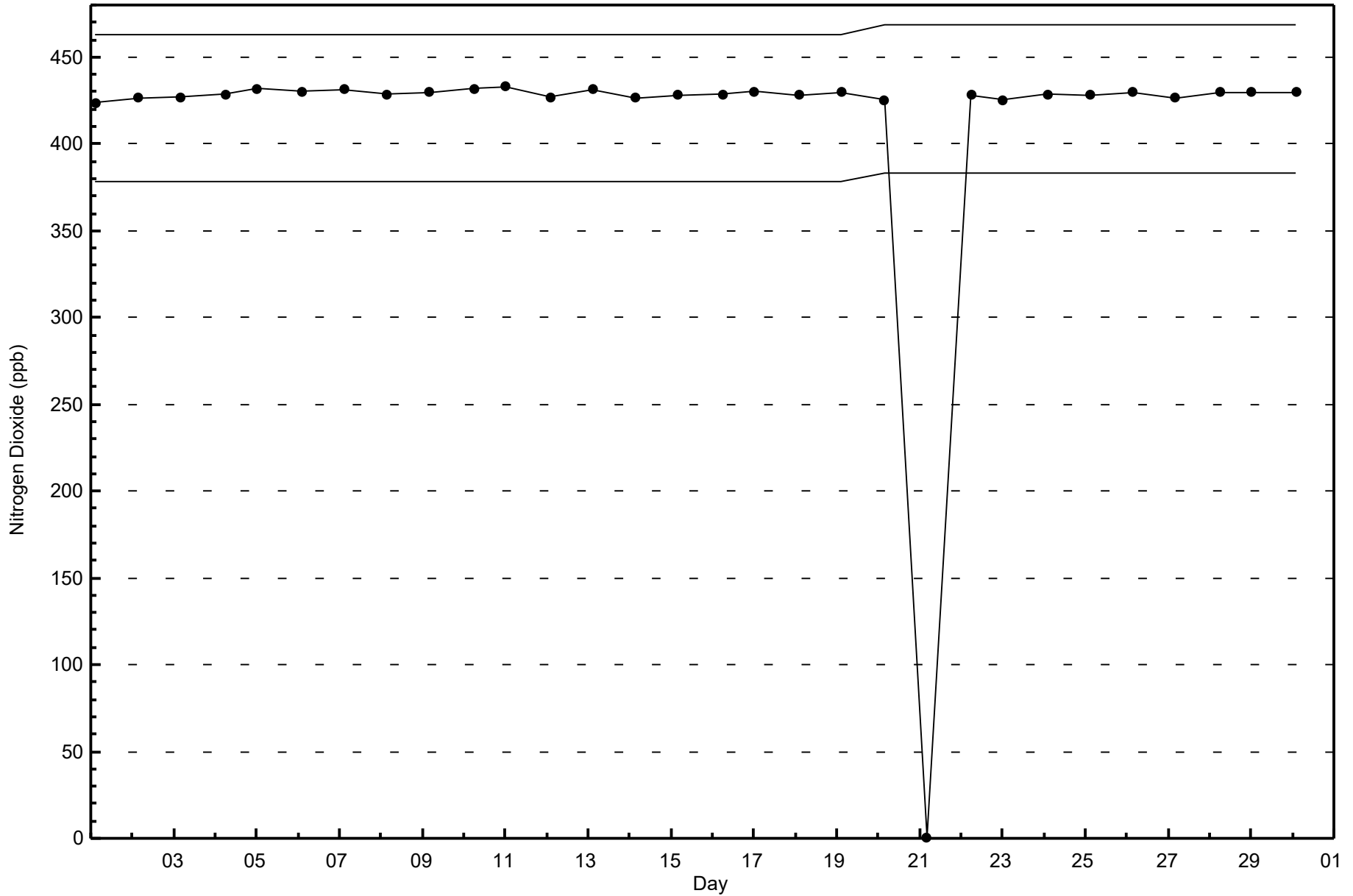
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitrogen Dioxide (NO₂) - ppb
Christina Lake



Total Number of Valid Hours: 682







Wood Buffalo Environmental Association
Summary of Hour Averages

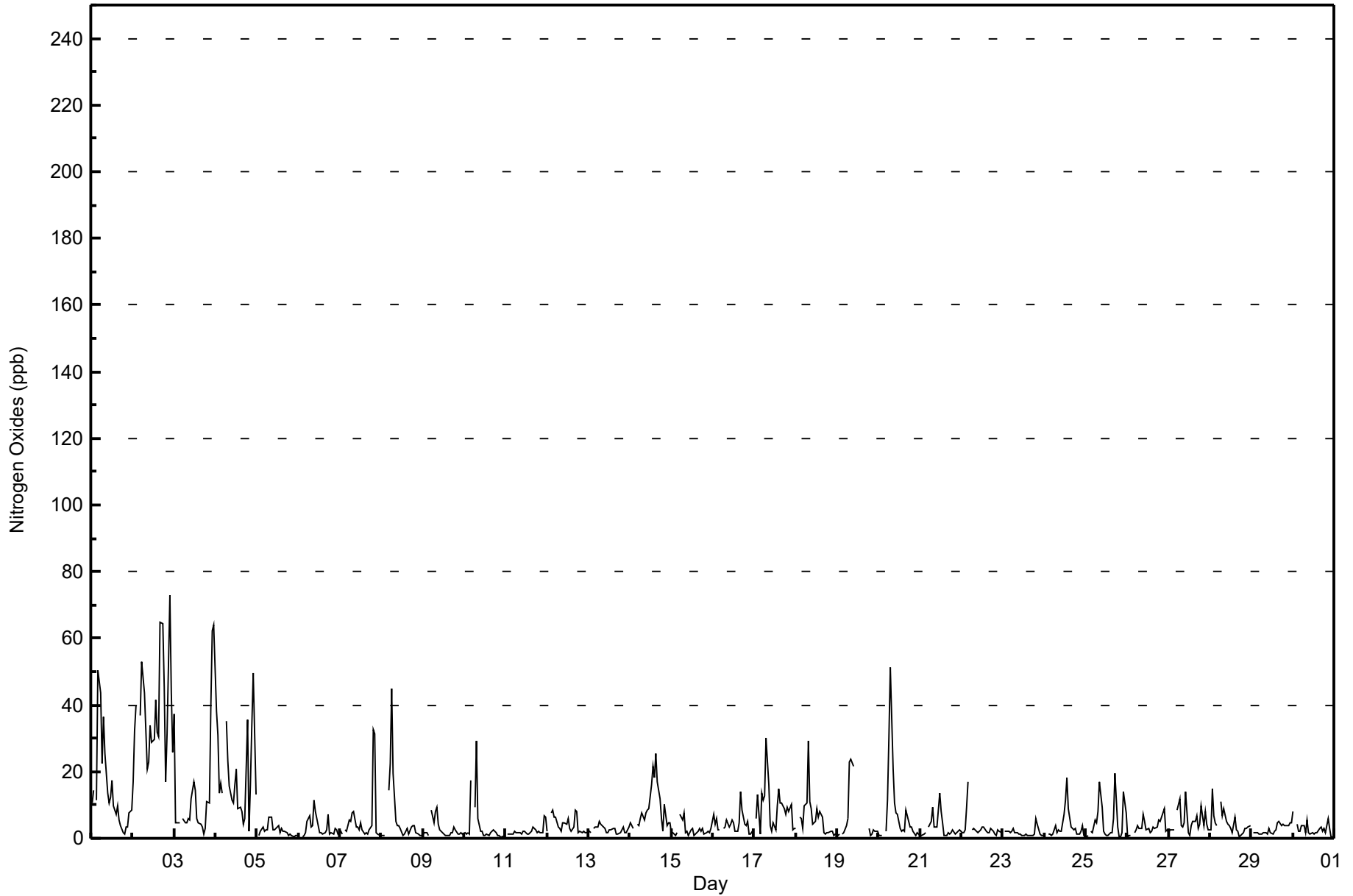
Nitrogen Oxides (NO_x) - ppb
Christina Lake - September 2023

Maximum Value: 72.9 ppb on Sep 2 22:00 Maximum Daily Average: 38.1 ppb on Sep 2																				Hours in Service: 720 Hours of Data: 682							
Minimum Value: 0.3 ppb on Sep 30 23:00 Minimum Daily Average: 1.7 ppb on Sep 23 Maximum Diurnal Average: 12.8 ppb at hour 8 Minimum Diurnal Average: 3.8 ppb at hour 4 Monthly Average: 6.63 ppb Percentiles: P ₁ = 0.6 P ₁₀ = 1.1 Q ₁ = 1.7 Median = 3.0 Q ₃ = 6.5 P ₉₀ = 16.0 P ₉₉ = 50.6																				Hours of Missing Data: 38 Hours of Calibration: 37 Percent Operational Time: 99.9							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Sep	10.5	14.2	Z	11.5	50.4	43.6	22.3	36.3	25.3	13.4	10.6	12.4	17.2	9.8	7.1	9.8	5.7	4.0	1.8	1.3	3.4	3.5	7.5	8.4	14.4	50.4	
2-Sep	16.9	32.2	40.0	Z	36.9	53.0	48.2	43.6	20.8	22.9	34.1	28.6	29.8	41.4	31.7	30.4	64.9	64.6	45.4	17.0	31.2	72.9	43.8	25.9	38.1	72.9	
3-Sep	37.3	4.8	4.8	4.7	Z	5.9	4.7	4.5	6.1	5.4	11.9	17.1	14.5	6.0	4.9	4.1	3.2	1.5	3.0	10.9	10.7	39.9	62.2	64.1	14.4	64.1	
4-Sep	38.2	30.8	13.6	16.7	13.4	Z	35.2	23.3	15.7	11.4	10.7	16.2	20.6	9.1	9.3	8.0	4.3	5.9	35.6	2.0	16.0	34.0	49.5	13.1	18.8	49.5	
5-Sep	Z	0.8	1.9	3.4	2.2	2.7	2.6	6.4	6.2	2.4	2.4	3.0	3.9	1.8	2.8	2.1	2.3	1.7	0.9	1.3	0.8	0.6	0.7	0.8	2.3	6.4	
6-Sep	0.7	Z	0.6	0.7	1.5	5.2	7.0	3.3	3.9	11.6	8.1	3.9	1.9	1.6	1.4	1.9	2.6	7.2	1.3	1.8	1.1	2.9	2.7	1.3	3.2	11.6	
7-Sep	2.2	1.2	Z	2.7	2.2	5.4	5.1	7.8	8.2	3.5	3.4	2.4	4.6	2.4	1.4	1.6	1.3	2.5	3.9	32.7	31.3	1.5	1.4	1.0	5.6	32.7	
8-Sep	0.9	1.0	1.0	Z	14.3	22.3	45.0	19.4	5.0	3.6	3.9	2.9	0.9	1.5	2.2	3.1	1.2	3.5	4.0	3.6	1.5	1.1	0.9	0.9	6.2	45.0	
9-Sep	0.8	1.6	1.6	0.9	Z	8.6	4.7	8.1	9.5	4.4	2.5	1.6	1.2	1.0	0.9	0.7	1.9	1.6	3.6	2.5	1.4	1.3	1.7	1.4	2.8	9.5	
10-Sep	1.5	1.3	1.6	1.1	17.4	Z	9.4	29.4	6.1	2.3	2.2	0.9	0.9	1.3	1.0	1.9	2.1	2.4	1.7	1.0	0.8	0.6	0.6	0.8	3.8	29.4	
11-Sep	Z	1.2	1.4	1.2	1.4	2.1	1.8	1.5	1.7	1.5	2.2	2.1	1.2	1.1	1.5	2.0	3.4	2.7	1.7	1.9	1.7	1.7	6.9	6.4	2.2	6.9	
12-Sep	2.1	Z	7.8	8.3	6.5	6.2	3.2	3.1	2.3	4.6	4.7	4.1	6.1	3.0	2.1	3.2	8.6	8.2	1.6	1.9	1.8	2.0	1.7	1.8	4.1	8.6	
13-Sep	2.0	1.7	Z	2.8	3.2	3.4	5.1	4.1	3.7	3.0	1.7	1.6	2.5	2.6	2.9	2.8	1.4	1.2	1.7	2.6	3.5	1.5	1.8	3.4	2.6	5.1	
14-Sep	4.6	3.7	3.1	Z	4.2	3.7	6.0	7.8	5.5	7.5	8.3	8.8	15.9	21.8	18.0	25.2	16.8	11.9	6.0	2.2	10.3	3.8	4.6	4.7	8.9	25.2	
15-Sep	1.5	1.6	0.7	1.8	Z	7.1	5.6	7.5	1.5	2.3	0.9	2.4	3.0	1.0	1.3	2.3	2.9	2.0	3.1	1.5	1.6	1.9	1.7	3.1	2.5	7.5	
16-Sep	7.3	4.3	6.0	2.7	2.5	Z	3.0	3.2	5.3	3.3	4.2	5.6	4.6	2.2	2.2	4.7	14.0	8.6	4.3	3.7	5.0	1.2	1.2	2.5	4.4	14.0	
17-Sep	Z	6.1	13.1	1.4	13.7	11.6	12.9	30.1	16.0	4.0	1.9	4.5	2.7	9.7	14.6	10.7	10.5	8.8	7.1	9.4	8.1	10.1	2.4	2.8	9.2	30.1	
18-Sep	2.8	Z	6.3	6.0	2.8	9.9	10.5	29.2	11.0	8.7	4.4	5.0	8.8	6.4	8.1	6.5	1.7	1.4	1.8	1.7	2.1	2.2	1.0	1.2	6.1	29.2	
19-Sep	0.8	1.2	Z	1.4	1.7	3.9	5.9	22.9	23.7	21.7	C	C	C	C	C	C	C	C	C	3.1	0.7	1.2	2.7	2.2	2.2	--	23.7
20-Sep	1.0	0.7	0.9	Z	2.3	11.2	30.3	51.2	20.7	10.5	7.6	7.0	3.0	2.1	2.4	2.0	8.3	5.2	3.6	3.2	2.1	1.0	1.6	1.2	7.8	51.2	
21-Sep	1.0	0.7	1.3	1.8	M	3.4	5.0	9.4	3.3	3.5	3.3	13.4	7.9	4.5	0.9	1.0	1.5	1.3	1.5	2.7	1.1	1.8	1.9	2.3	3.2	13.4	
22-Sep	1.8	1.7	2.6	9.2	17.0	Z	2.5	2.8	2.3	1.7	2.1	2.7	3.6	3.4	2.1	1.7	1.6	3.0	2.1	1.2	0.9	2.4	1.9	1.6	3.1	17.0	
23-Sep	Z	2.2	2.0	2.0	1.6	2.0	3.1	1.8	1.5	1.4	1.2	0.8	1.0	1.1	0.9	0.9	0.9	1.0	1.3	5.8	4.2	1.2	0.7	0.7	1.7	5.8	
24-Sep	0.7	Z	1.2	1.1	1.1	1.2	3.8	1.6	2.7	2.0	2.2	7.1	11.3	18.2	9.0	3.3	2.8	2.7	2.8	1.5	1.3	2.2	3.8	0.9	3.7	18.2	
25-Sep	0.6	0.9	Z	2.0	1.6	5.6	4.6	7.9	17.1	9.5	1.9	1.1	0.9	1.0	1.5	1.9	5.7	19.6	3.3	0.6	0.6	1.6	13.8	7.5	4.8	19.6	
26-Sep	0.6	0.7	0.8	Z	1.5	2.5	4.0	3.1	3.0	7.0	4.9	2.4	3.0	1.7	2.0	3.3	2.8	3.4	5.6	5.0	6.2	9.0	2.2	2.4	3.4	9.0	
27-Sep	1.7	2.6	2.6	2.6	Z	8.5	11.8	3.7	3.6	4.5	14.2	1.9	0.7	3.7	4.9	5.0	6.8	3.1	4.1	9.6	4.0	7.9	4.2	2.7	5.0	14.2	
28-Sep	2.4	14.8	6.9	4.8	3.8	Z	10.9	6.7	9.0	4.9	4.1	3.8	3.1	1.6	6.5	2.4	1.9	0.5	1.2	1.8	3.0	3.1	3.5	3.6	4.5	14.8	
29-Sep	Z	1.7	1.9	1.5	1.1	1.4	1.4	1.7	1.5	1.5	2.8	1.5	1.4	2.1	2.7	4.8	5.1	3.7	4.4	3.8	3.8	4.0	4.5	4.8	2.7	5.1	
30-Sep	7.9	Z	4.1	2.2	2.3	3.8	3.8	1.7	5.4	1.8	1.4	1.7	1.4	1.8	1.7	2.8	3.4	2.0	2.8	1.9	5.8	3.1	0.3	0.6	2.8	7.9	
																								Diurnal Average			
																								Diurnal Maximum			
5.9 5.3 5.1 3.8 8.3 9.4 10.6 12.8 8.3 6.2 5.6 5.7 6.1 5.7 5.1 5.2 6.5 6.4 5.5 4.6 5.6 7.4 7.8 5.8 38.2 32.2 40.0 16.7 50.4 53.0 48.2 51.2 25.3 22.9 34.1 28.6 29.8 41.4 31.7 30.4 64.9 64.6 45.4 32.7 31.3 72.9 62.2 64.1																											
Z - zerspan C - Calibration M - Maintenance																											



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Christina Lake - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Christina Lake - September 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	629	92.23	92.23
21 - 40	37	5.43	97.65
41 - 80	16	2.35	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 682

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Christina Lake - September 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	19	9	16	9	22	28	62	88	108	89	72	48	24	17	9	629
21 - 40	0	0	0	0	1	1	1	1	0	0	2	14	12	2	3	0	37
11 - 80	0	0	0	0	0	0	0	1	0	0	0	11	4	0	0	0	16
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	9	19	9	16	10	23	29	64	88	108	91	97	64	26	20	9	682

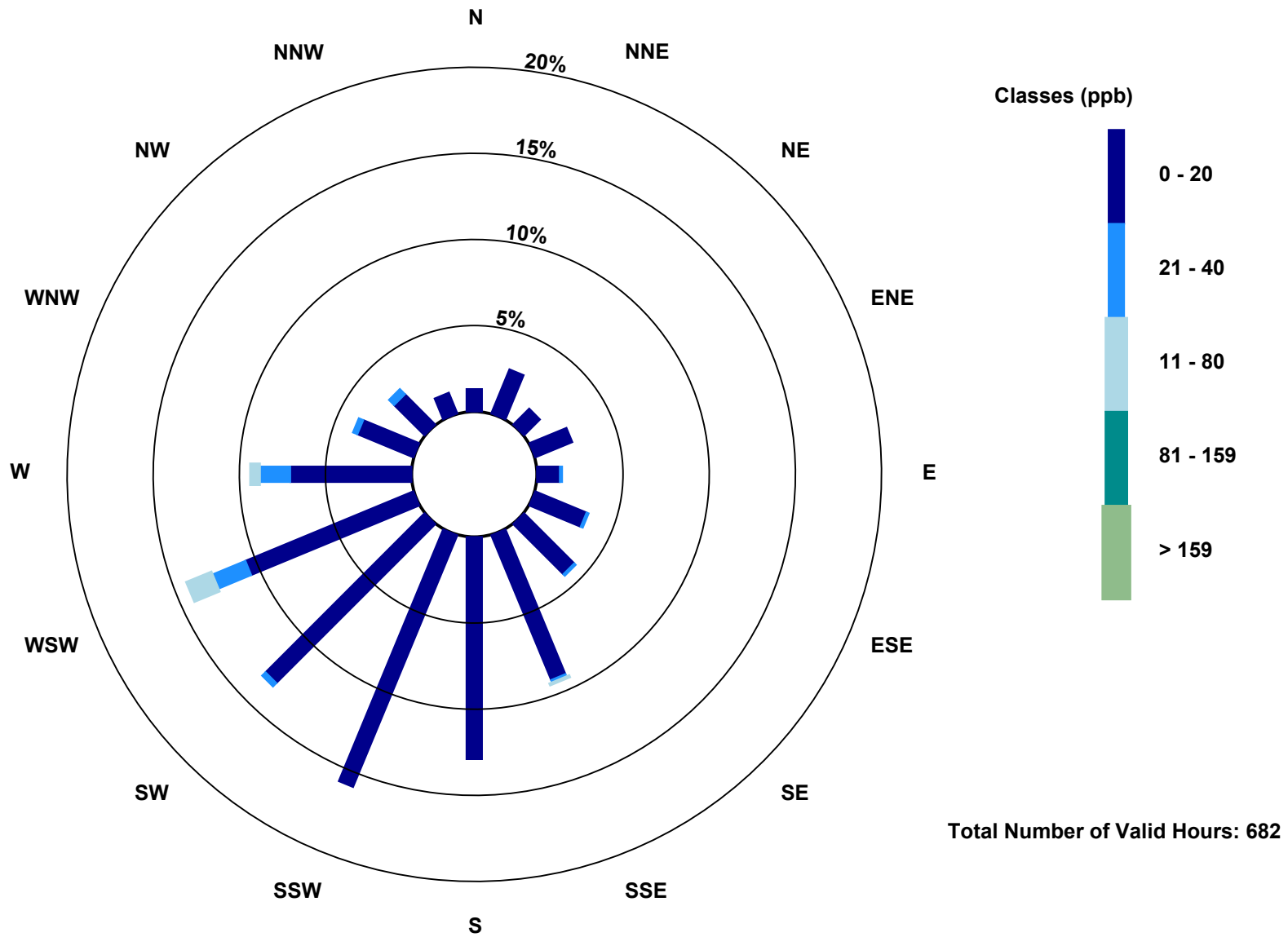
Total Number of Valid Hours: 682

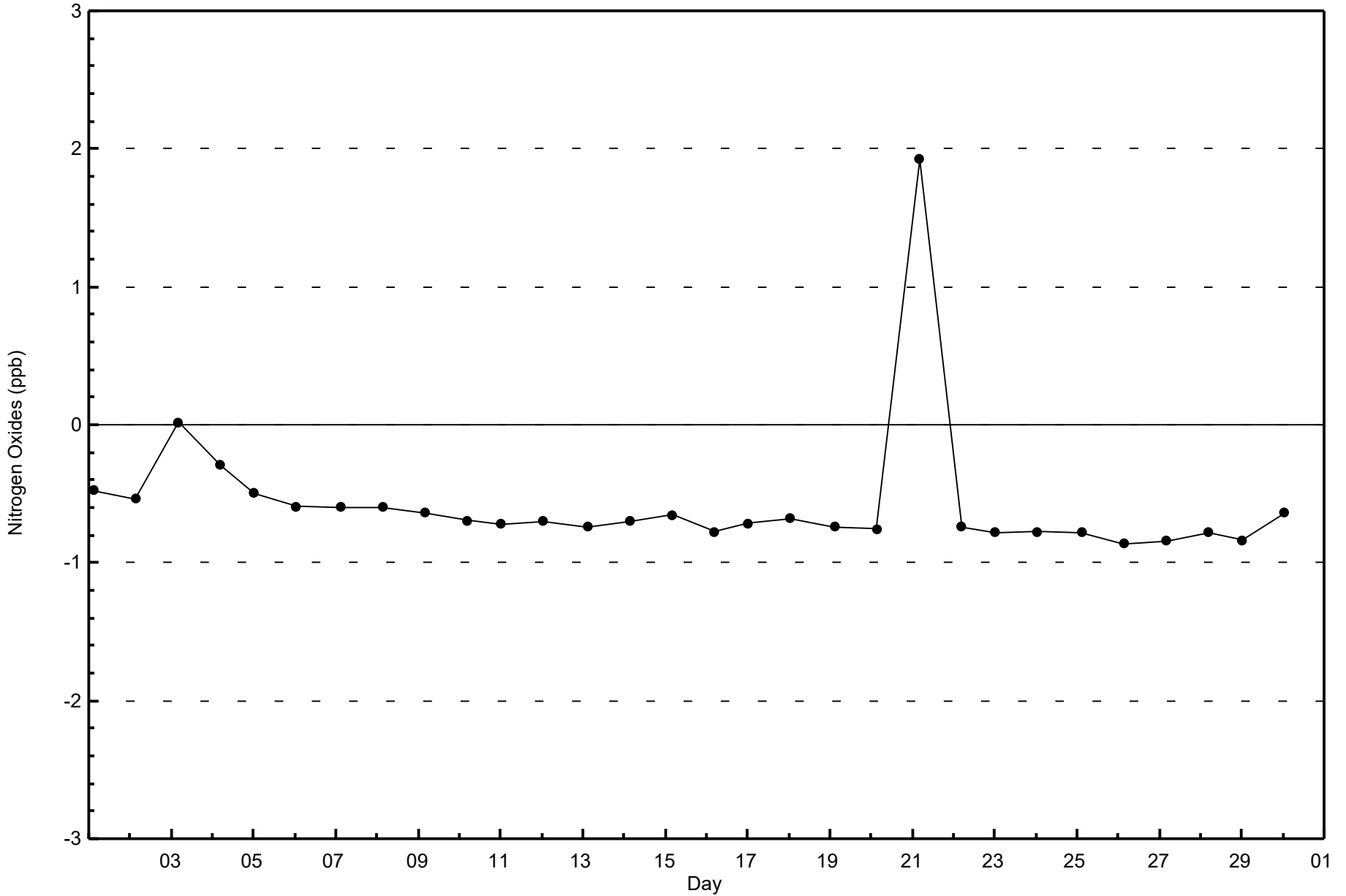
Total Number of Hours: 720

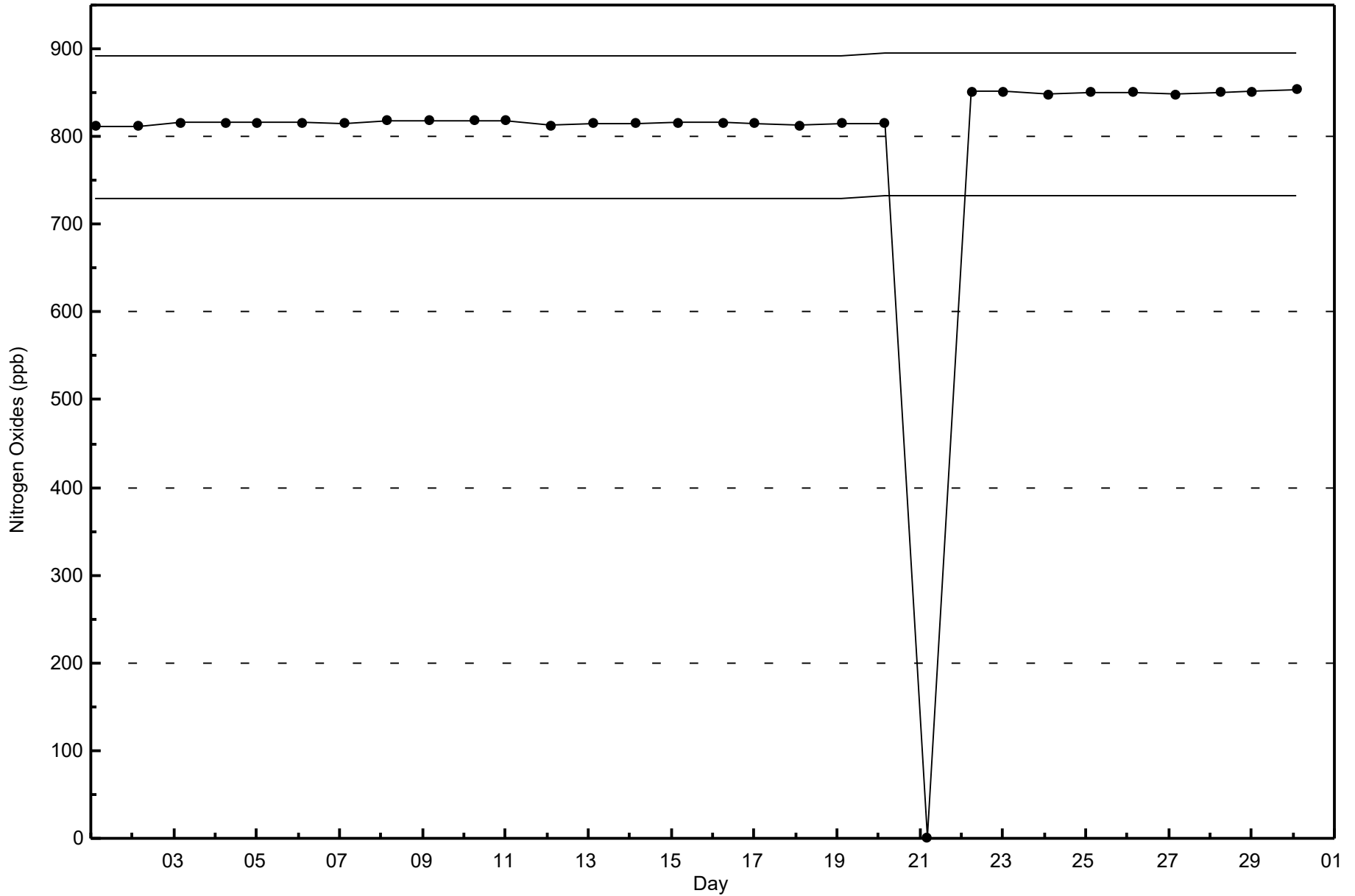


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitrogen Oxides (NO_x) - ppb
Christina Lake









Wood Buffalo Environmental Association
Summary of Hour Averages

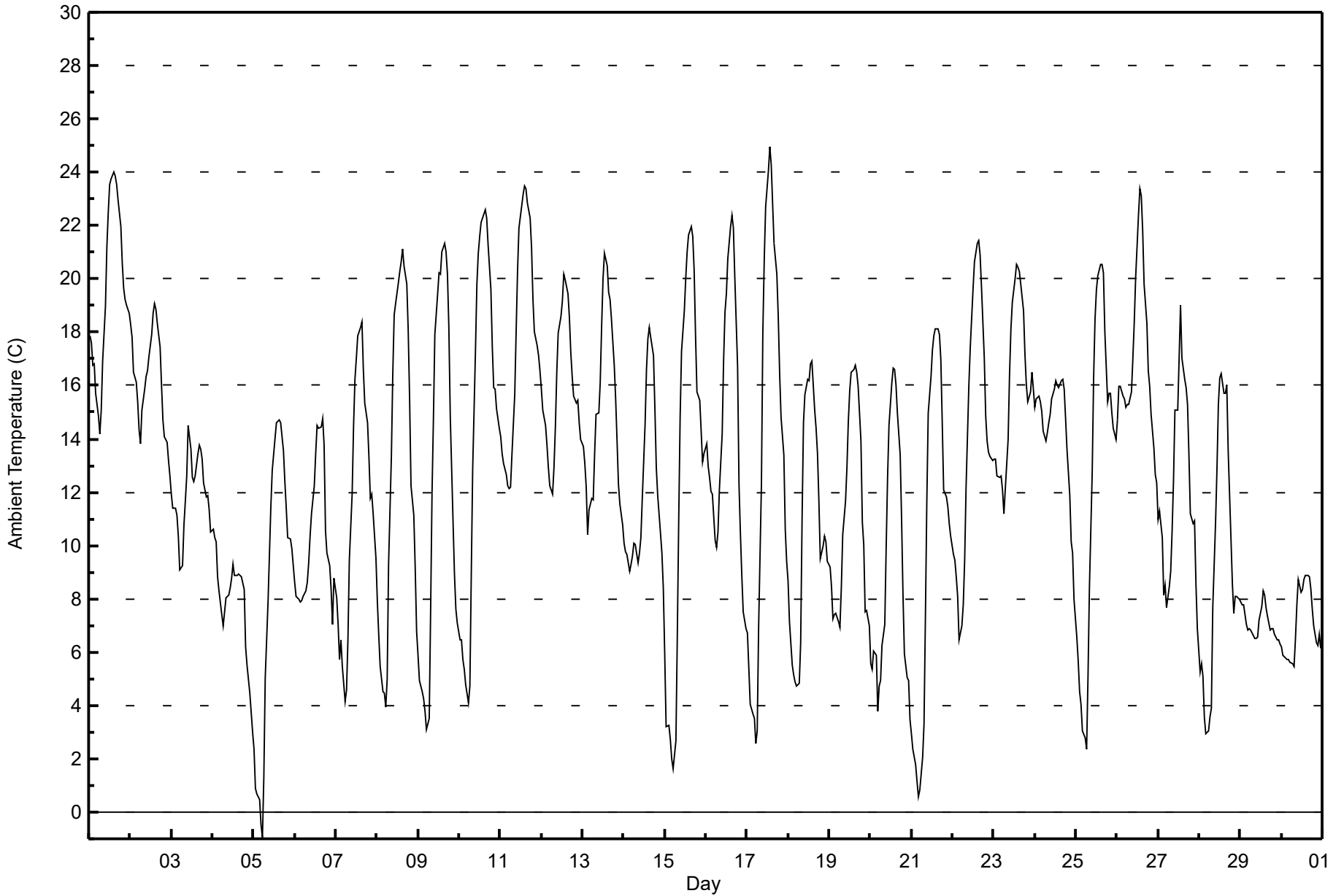
Ambient Temperature (AT) - C
Christina Lake - September 2023

Maximum Value: 24.9 C on Sep 17 14:00		Maximum Daily Average: 19.5 C on Sep 1		Hours in Service: 720																							
Minimum Value: -1.0 C on Sep 5 06:00		Minimum Daily Average: 7.0 C on Sep 30		Hours of Data: 720																							
Maximum Diurnal Average: 18.2 C at hour 15		Minimum Diurnal Average: 7.3 C at hour 6		Hours of Missing Data: 0																							
Monthly Average: 12.60 C		Percentiles: P ₁ = 1.2 P ₁₀ = 5.5 Q ₁ = 8.1 Median = 12.8 Q ₃ = 16.5 P ₉₀ = 20.0 P ₉₉ = 23.5		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-Sep	17.9	17.6	16.8	16.8	15.7	14.9	14.2	15.1	16.9	19.0	21.2	22.5	23.6	23.8	24.0	23.8	23.6	22.9	21.9	20.6	19.7	19.2	19.0	18.7	19.5	24.0	
2-Sep	18.3	17.8	16.5	16.1	15.4	14.3	13.8	15.1	15.9	16.4	16.6	17.1	17.9	18.7	19.1	18.8	18.3	17.4	16.0	14.7	14.1	13.9	13.2	12.6	16.2	19.1	
3-Sep	11.9	11.4	11.4	11.1	10.4	9.1	9.2	10.8	11.7	12.6	14.5	13.6	12.6	12.4	12.6	13.4	13.8	13.6	13.2	12.4	11.8	11.9	11.3	10.5	12.0	14.5	
4-Sep	10.6	10.3	10.1	8.8	8.3	7.4	7.0	7.5	8.1	8.1	8.4	8.8	9.3	8.9	8.9	8.9	8.9	8.8	8.4	6.2	5.5	5.0	4.5	3.0	7.9	10.6	
5-Sep	2.4	0.9	0.7	0.5	-0.5	-1.0	1.3	5.0	7.9	9.7	11.4	12.8	14.0	14.6	14.6	14.7	14.6	13.6	12.4	11.4	10.3	10.3	9.9	9.2	8.4	14.7	
6-Sep	8.6	8.1	8.0	7.9	7.9	8.1	8.3	8.6	9.4	10.3	11.2	12.2	13.4	14.5	14.4	14.4	14.8	13.8	10.5	9.7	9.2	8.4	7.0	8.8	10.3	14.8	
7-Sep	8.1	7.0	5.7	6.4	5.5	4.1	4.6	6.5	9.4	11.9	14.5	16.2	17.0	17.8	18.2	18.4	16.6	15.3	14.6	13.3	11.8	11.9	11.2	9.5	11.5	18.4	
8-Sep	7.9	6.6	5.5	4.5	4.4	4.0	5.0	9.3	13.4	16.5	18.6	19.1	19.8	20.3	20.7	21.1	20.5	19.8	18.1	15.5	12.3	11.1	9.1	6.8	12.9	21.1	
9-Sep	5.9	4.9	4.5	4.2	3.8	3.1	3.5	7.6	12.0	14.8	17.9	19.5	20.2	20.2	21.0	21.3	21.0	20.2	18.2	14.9	10.9	8.9	7.6	7.1	12.2	21.3	
10-Sep	6.5	6.5	5.7	5.4	4.8	4.1	4.7	8.9	12.9	17.4	19.8	21.0	21.6	22.1	22.4	22.6	22.3	21.3	19.6	17.4	15.9	15.9	15.1	14.4	14.5	22.6	
11-Sep	14.1	13.5	13.1	12.7	12.2	12.1	12.2	13.4	15.7	18.0	20.3	21.9	22.8	23.2	23.5	23.4	22.9	22.3	21.2	19.2	18.0	17.5	17.2	16.5	17.8	23.5	
12-Sep	15.9	15.1	14.5	13.8	12.9	12.2	11.9	12.9	14.4	16.5	18.0	18.6	19.2	20.2	20.0	19.4	18.6	17.2	16.3	15.6	15.3	15.4	14.6	14.0	15.9	20.2	
13-Sep	13.7	13.1	12.2	10.4	11.4	11.8	11.7	13.5	14.9	15.0	16.1	18.2	20.0	21.0	20.5	19.5	19.2	18.5	16.8	15.5	13.9	12.3	11.6	10.8	15.1	21.0	
14-Sep	10.1	9.8	9.7	9.0	9.3	9.6	10.1	10.1	9.3	9.7	10.3	11.8	14.6	16.6	17.8	18.2	17.8	17.1	15.1	12.9	11.9	10.5	9.7	8.4	12.1	18.2	
15-Sep	5.9	3.2	3.3	2.7	2.0	1.6	2.7	6.7	11.0	14.8	17.3	18.8	20.0	21.0	21.7	22.0	21.6	20.4	17.9	15.8	15.4	14.3	13.1	13.4	12.8	22.0	
16-Sep	13.8	13.0	12.6	12.0	11.9	10.2	9.9	10.5	12.1	14.2	16.9	18.8	19.4	20.8	22.0	22.4	21.9	20.0	16.7	12.3	10.4	8.9	7.5	6.9	14.4	22.4	
17-Sep	6.7	5.4	4.1	3.7	3.5	2.6	3.0	7.0	12.3	18.0	20.7	22.7	24.0	24.9	24.3	22.8	21.3	20.2	18.6	16.5	14.8	13.4	10.6	9.4	13.8	24.9	
18-Sep	8.7	7.2	5.5	5.1	4.9	4.7	4.8	6.4	11.0	14.6	15.6	16.2	16.2	16.8	16.9	15.1	14.4	13.5	11.7	9.5	10.0	10.3	10.1	9.4	10.8	16.9	
19-Sep	9.2	8.4	7.2	7.4	7.5	7.1	6.9	8.4	10.4	11.7	12.9	14.7	15.8	16.5	16.6	16.8	16.5	16.0	13.9	10.9	10.0	7.5	7.5	7.0	11.1	16.8	
20-Sep	5.6	5.4	6.0	5.9	3.8	4.7	4.9	6.3	7.1	10.0	12.5	14.5	16.1	16.7	16.6	16.0	15.0	13.4	11.0	8.1	5.9	5.1	4.9	3.5	9.1	16.7	
21-Sep	2.9	2.4	1.8	1.2	0.6	0.8	2.0	3.3	7.3	11.6	15.0	16.3	17.4	17.9	18.1	18.1	17.9	17.0	14.6	12.1	11.8	11.4	10.8	10.4	10.1	18.1	
22-Sep	9.7	9.4	8.8	8.1	6.5	7.0	7.8	9.4	12.2	16.0	17.4	18.5	19.6	20.6	21.3	21.4	20.9	19.7	17.0	14.8	13.9	13.5	13.3	13.2	14.2	21.4	
23-Sep	13.3	13.2	12.6	12.5	12.6	12.1	11.2	12.2	14.0	16.4	18.1	19.1	20.0	20.5	20.5	20.3	19.8	18.8	17.2	16.0	15.4	15.8	16.5	15.8	16.0	20.5	
24-Sep	15.2	15.5	15.6	15.4	15.0	14.3	13.9	14.2	14.6	14.9	15.5	15.8	16.2	16.0	15.9	16.2	16.2	15.9	14.7	13.6	11.9	10.1	9.7	8.0	14.4	16.2	
25-Sep	6.6	5.7	4.5	4.0	3.0	2.8	2.4	5.1	8.4	12.8	16.3	18.5	19.6	20.1	20.5	20.5	20.2	18.0	15.4	15.7	15.7	15.0	14.4	14.0	12.5	20.5	
26-Sep	14.7	16.0	16.0	15.6	15.5	15.2	15.3	15.3	15.8	17.0	18.4	20.1	22.4	23.4	23.1	21.8	19.8	18.3	16.5	16.0	14.9	13.7	12.6	12.3	17.1	23.4	
27-Sep	11.0	11.3	10.3	8.1	8.5	7.7	8.5	9.0	10.5	12.5	15.1	15.1	17.0	19.0	17.0	16.2	15.9	15.3	13.4	11.2	10.8	10.9	8.6	6.9	12.1	19.0	
28-Sep	5.3	5.6	5.1	3.6	2.9	3.0	3.6	3.9	7.7	10.9	12.9	15.3	16.3	16.5	15.7	15.7	16.0	13.5	10.2	8.5	7.5	8.1	8.1	8.0	9.3	16.5	
29-Sep	7.9	7.8	7.8	7.0	6.8	6.9	6.8	6.7	6.5	6.5	6.6	7.2	7.7	8.3	8.1	7.6	7.4	6.8	6.9	6.9	6.7	6.5	6.4	6.3	7.1	8.3	
30-Sep	6.2	5.9	5.8	5.7	5.7	5.6	5.5	5.5	6.5	7.8	8.7	8.2	8.3	8.7	8.9	8.9	8.8	8.4	7.6	7.0	6.4	6.2	6.7	6.1	7.0	8.9	
		9.8	9.3	8.7	8.2	7.7	7.3	7.6	9.1	11.3	13.5	15.3	16.4	17.4	18.1	18.2	18.0	17.6	16.6	14.9	13.1	12.1	11.4	10.7	10.0	Diurnal Average	
		18.3	17.8	16.8	16.8	15.7	15.2	15.3	15.3	16.9	19.0	21.2	22.7	24.0	24.9	24.3	23.8	23.6	22.9	21.9	20.6	19.7	19.2	19.0	18.7	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Christina Lake - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Christina Lake - September 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	2	0.28	0.28
0 - 10	250	34.72	35.00
10 - 20	393	54.58	89.58
> 20	75	10.42	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

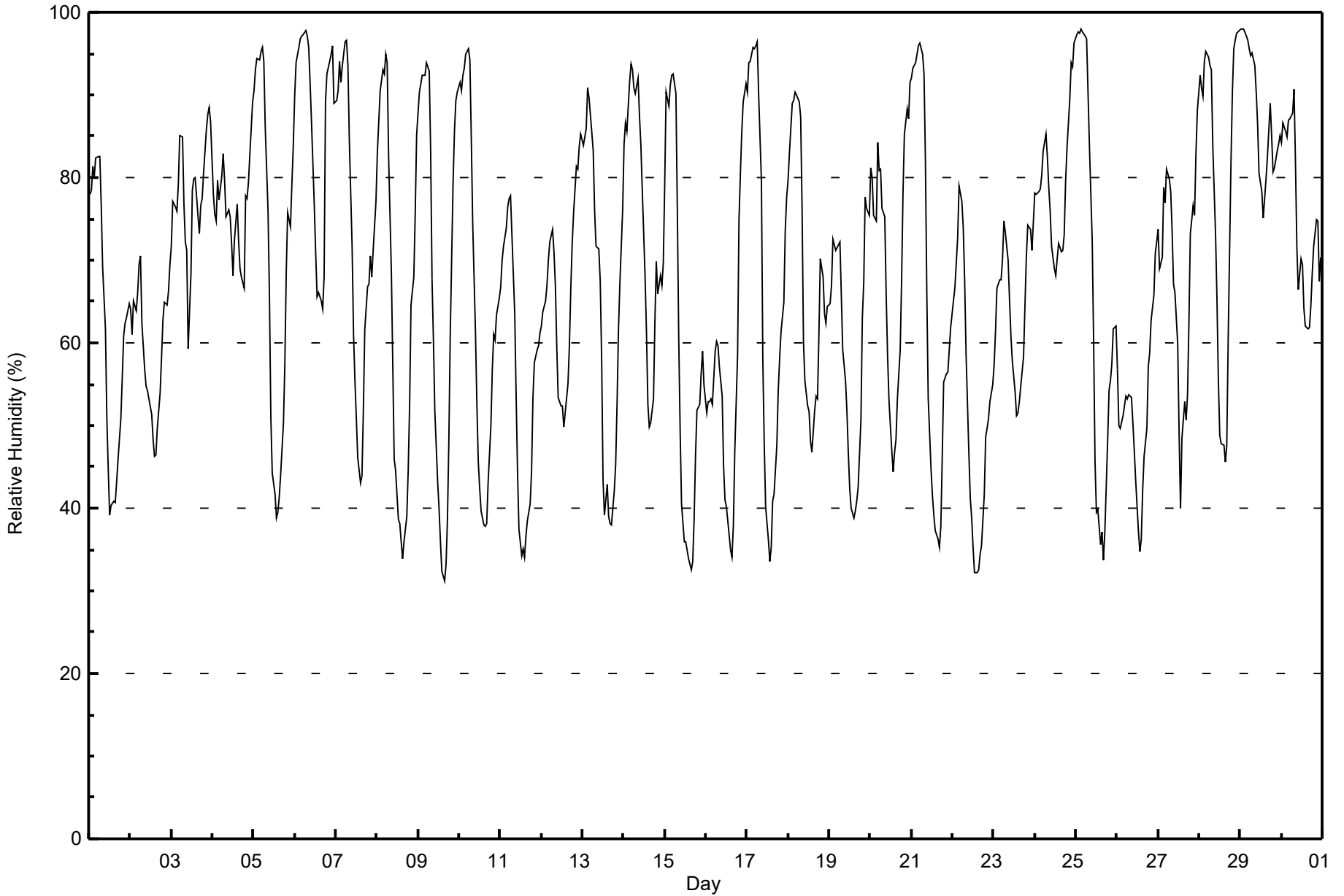
Relative Humidity (RH) - %
Christina Lake - September 2023

Maximum Value: 97.9 % on Sep 29 02:00																						Maximum Daily Average: 87.7 % on Sep 29																						Hours in Service: 720			
Minimum Value: 31.2 % on Sep 9 16:00																						Minimum Daily Average: 52.0 % on Sep 26																						Hours of Data: 720			
Maximum Diurnal Average: 84.8 % at hour 6																						Minimum Diurnal Average: 47.2 % at hour 15																						Hours of Missing Data: 0			
Monthly Average: 67.63 %																						Percentiles: P ₁ = 33.6 P ₁₀ = 40.5 Q ₁ = 52.6 Median = 68.4 Q ₃ = 83.0 P ₉₀ = 92.9 P ₉₉ = 97.6																						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-Sep	77.9	78.4	81.4	79.9	82.4	82.5	82.6	76.7	69.2	61.7	50.8	44.7	39.1	40.4	40.9	40.7	43.2	45.9	50.8	55.8	60.9	62.4	63.0	64.7	61.5	82.6																					
2-Sep	64.1	61.1	65.0	63.9	66.0	69.5	70.6	62.3	56.8	54.8	54.2	53.2	51.4	48.3	46.3	46.5	49.7	53.9	58.1	62.7	64.9	64.5	66.3	69.4	59.3	70.6																					
3-Sep	71.7	77.1	76.5	75.9	79.2	85.0	84.9	76.8	72.2	71.2	59.3	68.4	78.4	79.9	80.0	75.5	73.2	76.6	77.4	80.5	85.8	87.6	88.5	86.9	77.9	88.5																					
4-Sep	78.0	75.6	74.7	79.6	77.4	80.1	82.9	79.6	75.2	76.1	75.3	72.0	68.2	72.3	76.7	72.4	69.0	68.0	66.6	77.9	77.5	79.4	82.7	89.2	76.1	89.2																					
5-Sep	90.4	93.0	94.5	94.3	95.2	95.7	94.0	86.1	75.9	65.7	51.0	44.2	41.7	38.8	39.5	41.3	44.0	50.3	57.4	68.6	75.7	74.0	79.1	83.8	69.8	95.7																					
6-Sep	89.9	93.9	95.8	96.8	97.1	97.4	97.8	97.1	95.8	91.6	86.7	76.5	70.8	65.7	66.1	65.1	64.0	68.0	89.1	92.5	94.1	95.0	96.0	89.0	86.3	97.8																					
7-Sep	89.4	90.6	94.0	91.5	93.6	96.4	96.6	93.5	84.6	71.5	61.0	55.4	50.8	46.0	43.1	43.8	51.7	61.5	66.7	67.1	70.4	68.0	71.1	77.1	72.3	96.6																					
8-Sep	83.0	86.7	90.5	93.0	92.5	94.9	93.9	82.8	68.6	57.3	45.9	44.7	38.6	38.1	36.0	33.9	35.9	39.1	44.6	52.3	64.6	67.9	75.6	85.1	64.4	94.9																					
9-Sep	87.9	90.3	92.3	92.3	92.4	94.0	92.8	83.3	67.7	60.3	51.6	43.2	39.9	35.9	32.3	31.2	33.2	38.6	48.2	61.0	79.3	85.6	89.4	90.3	67.2	94.0																					
10-Sep	91.5	90.5	92.3	93.3	95.0	95.6	94.2	84.8	74.6	61.2	52.5	45.6	42.4	39.7	37.9	37.8	38.1	43.1	50.0	56.7	61.0	60.3	63.4	65.5	65.3	95.6																					
11-Sep	66.7	70.0	71.8	74.0	76.5	77.5	77.7	73.1	63.6	53.5	44.4	37.4	34.2	35.1	34.0	36.6	38.5	40.5	44.4	53.4	57.7	59.1	59.7	61.2	55.9	77.7																					
12-Sep	62.0	63.8	65.0	67.0	70.0	72.2	73.8	71.0	67.0	59.6	53.4	52.4	52.4	49.8	51.5	55.1	59.6	66.7	71.9	75.7	81.3	81.0	83.8	85.3	66.3	85.3																					
13-Sep	83.9	85.0	86.0	90.8	89.7	85.5	83.2	76.0	71.6	71.4	67.4	58.1	43.4	39.1	42.9	38.9	38.1	38.0	42.1	45.3	52.6	61.5	67.1	76.2	63.9	90.8																					
14-Sep	84.0	86.5	85.5	91.7	93.7	93.1	90.9	90.2	92.0	87.5	83.9	78.5	67.9	61.2	52.6	49.8	50.4	53.2	62.5	69.9	65.9	68.1	66.9	69.6	74.8	93.7																					
15-Sep	79.2	90.3	88.7	91.1	92.4	92.6	90.1	76.0	60.7	49.5	40.4	35.9	35.8	34.9	34.0	32.6	33.6	38.8	46.4	51.9	52.6	56.3	58.9	55.0	59.1	92.6																					
16-Sep	51.5	52.9	52.9	53.2	52.6	59.0	60.2	59.7	57.1	53.6	45.1	41.1	40.2	38.5	35.0	34.0	38.0	47.0	58.7	74.9	80.4	85.6	89.2	91.3	56.3	91.3																					
17-Sep	90.4	93.9	94.1	95.7	95.6	95.9	96.4	90.1	79.5	57.9	47.8	40.2	36.1	33.6	35.2	40.9	41.7	47.6	54.2	58.1	61.4	65.0	73.5	77.7	66.8	96.4																					
18-Sep	79.6	83.0	88.9	89.4	90.3	90.1	89.1	87.3	76.3	60.2	55.3	52.3	51.6	48.2	46.8	51.9	53.6	53.3	60.9	70.2	67.9	63.5	62.4	64.4	68.2	90.3																					
19-Sep	64.8	66.9	72.5	71.9	71.2	71.9	72.2	65.7	59.1	55.4	51.7	46.7	42.3	39.9	38.8	39.7	40.8	42.6	50.6	63.1	67.2	77.6	76.2	75.4	59.3	77.6																					
20-Sep	81.2	80.0	75.5	74.8	84.3	80.8	81.1	76.2	75.2	65.8	58.4	53.0	46.9	44.4	46.8	48.3	53.2	59.2	67.5	78.1	85.3	88.3	87.2	91.6	70.1	91.6																					
21-Sep	92.1	93.3	94.0	94.9	95.9	96.2	94.8	92.5	82.0	66.0	53.2	44.8	41.5	39.2	37.2	36.2	35.3	37.8	46.1	55.2	56.3	56.5	59.1	61.9	65.1	96.2																					
22-Sep	65.2	66.7	69.6	72.7	79.0	77.0	73.9	67.5	58.7	46.6	41.2	38.9	35.3	32.2	32.3	32.5	34.4	35.4	41.6	48.6	49.7	50.8	52.9	54.9	52.4	79.0																					
23-Sep	57.3	61.3	66.6	67.6	67.6	70.3	74.7	73.5	70.0	65.3	60.8	57.8	54.0	51.2	51.5	52.9	54.7	58.4	64.4	70.4	74.3	73.7	71.2	74.6	64.3	74.7																					
24-Sep	78.2	78.0	78.3	78.6	80.3	83.3	85.2	82.6	78.8	75.9	71.8	69.0	68.2	70.2	72.0	70.9	71.1	73.1	79.5	83.5	89.5	94.0	93.3	96.2	79.2	96.2																					
25-Sep	97.3	97.7	97.4	97.9	97.7	97.1	96.9	90.3	83.9	72.4	60.1	45.7	39.5	39.7	35.7	37.0	33.8	37.2	48.1	54.2	55.4	57.4	61.8	62.0	66.5	97.9																					
26-Sep	56.8	50.1	49.7	51.1	52.4	53.6	53.3	53.7	53.4	50.4	47.0	43.5	37.1	34.7	36.3	42.1	46.3	49.7	57.1	58.8	62.8	65.8	70.8	72.2	52.0	72.2																					
27-Sep	73.8	69.0	70.4	78.8	77.0	81.1	79.8	78.4	73.6	67.2	66.2	59.9	48.9	40.1	48.5	52.8	50.7	53.8	62.5	73.3	76.6	75.4	82.9	88.1	67.9	88.1																					
28-Sep	92.3	90.9	89.8	94.0	95.3	94.6	93.5	93.0	83.9	73.0	65.2	55.5	48.9	47.8	47.7	45.7	47.6	60.3	81.8	90.4	95.5	96.7	97.5	97.8	78.3	97.8																					
29-Sep	97.9	97.9	97.9	97.2	96.7	95.6	94.7	95.0	93.6	90.3	86.5	80.6	78.2	75.1	77.4	79.8	82.5	89.0	85.1	80.7	81.2	83.2	84.0	85.1	87.7	97.9																					
30-Sep	84.2	86.7	85.6	85.0	86.9	87.2	87.7	90.6	81.8	71.5	66.4	70.1	69.4	64.2	62.0	61.8	61.9	64.6	68.5	71.6	74.9	74.7	67.5	70.3	74.8	90.6																					
																						78.7	80.0	81.2	82.6	83.9	84.8	84.6	80.2	73.4	65.5	58.5	53.6	49.8	47.5	47.2	47.6	48.9	53.0	60.1	66.7	70.8	72.6	74.7	77.1	Diurnal Average	
																						97.9	97.9	97.9	97.9	97.7	97.4	97.8	97.1	95.8	91.6	86.7	80.6	78.4	79.9	80.0	79.8	82.5	89.0	89.1	92.5	95.5	96.7	97.5	97.8	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Christina Lake - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Christina Lake - September 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	67	9.31	9.31
40 - 60	188	26.11	35.42
60 - 80	256	35.56	70.97
80 - 100	209	29.03	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Christina Lake - September 2023

Maximum Speed: 28 km/h on Sep 11 13:00	Maximum Daily Speed Average: 20.7 km/h on Sep 11	Hours in Service: 720
Minimum Speed Value: 0 km/h on Sep 10 08:00	Minimum Daily Speed Average: 2.5 km/h on Sep 9	Hours of Data: 720
Maximum Diurnal Speed Average: 7.6 km/h at hour 12	Minimum Diurnal Speed Average: 4.8 km/h at hour 4	Hours of Missing Data: 0
Monthly Average Velocity: 6.1 km/h 219.7 deg	Percentiles: P ₁ = 1 P ₁₀ = 4 Q ₁ = 6 Median = 10 Q ₃ = 14 P ₉₀ = 18 P ₉₉ = 24	Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Sep	W14WNW12	W9	W11WSW11	WSW11	WSW10	WSW10	W12	W12	W14	W18	W18WSW20	WSW22	SW23	WSW24	SW23	SW19	SW15	SW17	SW17	SW18	WSW19	WSW14.9	WSW24			
2-Sep	WSW16	WSW13	WSW12	W12	W12	W10WSW12	W13	W15	W14	W13	W12	W12	W12	W14	W12WSW11	W11WSW10	WSW12	WSW14	WSW12	WSW10	WSW10	W12.0	WSW16			
3-Sep	WSW7	SW11	SW10	SSW7	SSW7	S4	SSW7	SSW9	S4	SSE3	WSW22	WSW21	WSW16	SW10	SSW7	SSW8	SSW7	SSW5	SW6	SW10	SW12	WSW12	WSW11	WSW10	WSW8.6	WSW22
4-Sep	W10WNW11	WNW16	NW18	WNW14	W11	W12WNW12	WNW15	NW18	NW17	WNW17	NW18	NW20	WNW15	NW17	NW18	WNW13	WSW9	SW8	WSW10	WSW9	WSW7	WSW7	WNW12.0	NW20		
5-Sep	SW6	SSW6	S3	S4	S4	S5	SSW7	SSW8	SW10	SSW11	S14	S13	S14	SSE13	S12	S12	SSE10	SE11	SE8	SW6	SSE7	SE9	SSE9	SE10	S8.1	S14
6-Sep	SE10	SE10	SE7	ESE6	ESE5	ESE4	SE4	S5	SW8	WSW10	W11	WSW13	W11	WSW15	WSW16	SW14	WSW14	W12	SSW7	SSW6	SSW3	SSW2	SSW4	WSW8	SW5.7	WSW16
7-Sep	SW8	SW6	SW6	WSW7	SW9	SSW10	SW7	SW7	SW7	SW8	SW9	WSW12	WSW14	WSW16	WSW18	WSW16	WSW17	SW9	SW9	SW11	SW10	SW12	WSW9	SW6	SW9.8	WSW18
8-Sep	SSW6	S5	S5	S5	S6	SSE3	SSE3	SSE3	SSW6	SW8	WSW9	WSW11	WSW14	W12	W12	WNW14	W10	WNW11	W10	WSW10	SW10	SW9	SSW6	SSW7	WSW6.6	WSW14
9-Sep	SW4	SW5	SSW3	SW4	SSW2	SSE3	S4	SSE2	ESE1	E3	ENE4	ENE5	E7	ENE4	ENE6	ESE5	E5	E6	ENE7	E6	E2	SSE2	SSW2	ENE4	ESE2.5	E7
10-Sep	SE3	E3	NE4	ENE2	S1	SE3	ESE1	ESE0	ENE4	ESE6	SE9	SSE16	SSE17	S17	SSE17	SSE16	SSE16	SSE14	SSE12	SSE11	SE11	SSE16	SSE16	SSE14	SSE8.8	SSE17
11-Sep	SSE16	SSE16	S17	S18	S18	S18	S18	S20	S19	S22	S23	S27	S28	S26	S26	S25	S23	S18	S17	SSE20	S20	S22	S22	S21	S20.7	S28
12-Sep	SSW22	SSW21	S19	S13	S6	SSE7	SSE8	S9	SSW10	SSW9	SW7	SW6	WSW7	SSW6	SSW10	SSW11	SSW9	SSW10	SSW8	SW11	WSW11	WSW11	SW9	WSW8	SSW9.7	SSW22
13-Sep	WSW8	WSW9	WSW7	SW6	WSW9	WSW11	WSW11	WSW11	W11	W11	W13	WSW16	W19	W19	W16	W21	W20	W17	W14	W14	W19	W15	W23	W22	W14.0	W23
14-Sep	W19	W19	W20	W15	W19	W19	WNW17	WNW15	W15	WNW18	W17	WNW16	WNW19	NW22	WNW25	NW22	WNW17	WNW12	W9	WSW11	WSW11	WSW12	WSW13	SW7	W15.2	WNW25
15-Sep	SW7	SSW5	SSW5	SW4	S4	SSE4	S3	SSE3	SSW7	SSW12	SSW14	SSW15	SSW13	S14	SSW14	S14	S15	S14	S11	SSE12	S16	SSE13	SSE11	S15	S9.8	S16
16-Sep	S17	SSW20	SSW20	SSW13	SSW13	SSW8	SSW8	SSW8	SW8	SSW8	SW6	WSW4	SW5	SSW6	SW8	SW8	SW8	SSW7	SSW9	SSW5	S5	SSW6	SSW5	SSE4	SSW8.5	SSW20
17-Sep	SSE5	S4	SE3	SSW5	SSE3	SE3	S2	E2	ENE3	SSE8	SSE13	SSW13	SSW9	WSW9	WNW15	WNW15	WNW17	W13	W14	W13	WSW11	WSW9	WSW6	WSW7	WSW5.6	WNW17
18-Sep	SW7	SSW4	SSW4	S5	SSW7	S5	SE4	SE3	SSE2	W9	W11	W14	WNW14	W18	W15	W18	W17	W14	SW9	SSW10	SW12	WSW14	SW15	WSW13	WSW8.5	W18
19-Sep	WSW15	WSW11	WSW8	WSW10	WSW13	SW13	SW13	WSW10	WSW12	WSW13	WSW14	W15	WSW16	W13	WSW14	WSW12	WSW9	WSW8	SW8	SW9	SSW6	SSW6	WSW5	SSW1	WSW10.3	WSW16
20-Sep	SW4	SW10	SW11	SW10	WSW9	WSW11	WSW8	W6	W7	WNW4	N5	N6	NNE10	NE12	NE12	NE9	WNW7	SW7	SSW6	SSW3	S5	SW5	SW5	SSW4	WSW2.7	NE12
21-Sep	SSW6	SSW3	SW3	SSW4	SSW6	SSW9	S6	SE3	S5	SSW10	SW13	SW19	SW18	SW19	SSW19	SSW20	SSW17	SSW16	SSW9	SSW9	SSW13	SSW15	SSW14	SSW14	SSW10.8	SSW20
22-Sep	SSW13	S9	SSE6	SSE6	SE5	S6	SSW11	SSW11	SSW11	SSW15	SSW22	SSW20	SSW18	SSW18	S17	S17	S16	S13	SSE10	SSE10	S10	S11	S12	S13	S12.1	SSW22
23-Sep	S13	SSE13	S11	S13	S18	SSE14	SE10	SSE13	SSE16	SSE18	S24	S25	S23	S23	S23	SSE22	SSE20	SSE17	SSE11	SE10	SE11	SE12	SSE18	SSE14	SSE16.0	S25
24-Sep	SE12	SE11	SSE14	SSE17	SSE15	SSE9	SSE10	SSE10	S11	SSW11	SSW11	WSW10	WSW8	WSW8	SW4	SE4	SSW3	SW7	SSW7	SW8	SW9	WSW6	SSW5	SSW4	S7.1	SSE17
25-Sep	SSE5	SSW4	SSW4	SSW3	SSW4	SW4	SSW3	SSE1	ESE2	ENE4	ESE7	SE8	SE7	ESE10	ESE16	ESE18	ESE13	ESE8	ESE10	ESE11	ESE13	ESE11	SE10	SE12	SE6.8	ESE18
26-Sep	SE16	SSE18	SSE17	SSE16	S17	S18	S16	S16	S18	S18	S17	S15	S12	SSE13	S13	SSW10	W8	W5	SW6	SSW5	SW7	SW9	SW9	WSW8	S11.2	S18
27-Sep	SW8	WSW9	WSW7	SW7	SW8	SW7	WSW11	SW11	SW10	WSW11	NW17	N15	NE9	NW4	WNW10	SW10	SW7	SSW6	SSE3	S3	SSW4	WSW5	SSW4	SW5	WSW5.2	NW17
28-Sep	SSW3	WSW5	SW6	SSW3	SW4	SW3	WSW4	SW5	SW7	NW1	NNE1	NW11	NNW7	NNW11	NW13	NW11	NNW10	NNE11	NNE12	E2	NE3	ENE9	NNE9	NNE8	NNW3.4	NW13
29-Sep	N11	NNE9	NNE10	NNE14	NNE12	NNE11	NNE13	NNE12	NNE15	N12	N15	NNE12	NE10	N11	N14	NNW18	NNW15	N10	NNW12	N11	N10	NW12	NW14	NW11	N11.4	NNW18
30-Sep	NW11	NW13	NW11	NNW8	NNW6	NNW1	NNE3	NE6	ESE4	ENE5	NNE5	NNE6	NE7	ENE3	ENE7	ENE7	ENE9	E7	ESE5	ESE6	ESE6	SE7	SE7	SSE6	NE2.9	NW13

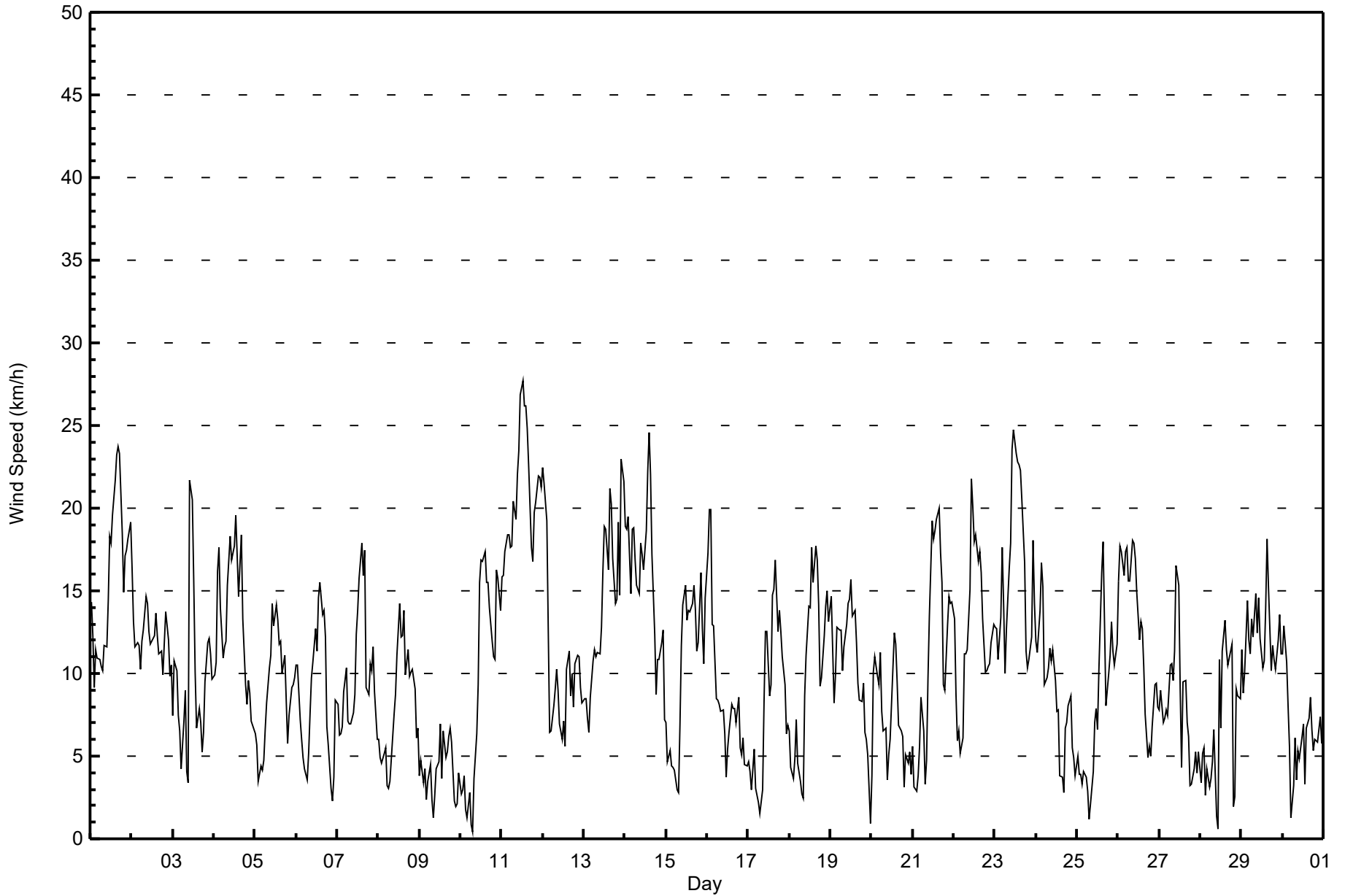
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SSW22	SSW21	SSW20	S18	W19	W19	S18	S20	S19	S22	S24	S27	S28	S26	S26	S25	WSW24	SW23	SW19	SSE20	S20	S22	W23	W22	Diurnal Maximum					

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 - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Wind Speed (WS) - km/h
Christina Lake - September 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	136	18.89	18.89
6 - 11	295	40.97	59.86
12 - 19	245	34.03	93.89
20 - 28	44	6.11	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Christina Lake - September 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	2	10	6	9	10	16	22	33	14	5	1	1	2	1	136
6 - 11	4	9	5	6	4	10	18	17	11	55	64	60	17	4	5	6	295
12 - 19	4	7	2	0	0	4	4	31	41	20	16	36	46	20	11	3	245
20 - 28	0	0	0	0	0	0	0	3	18	7	2	5	5	1	3	0	44
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	9	16	10	23	32	67	92	115	96	106	69	26	21	10	720

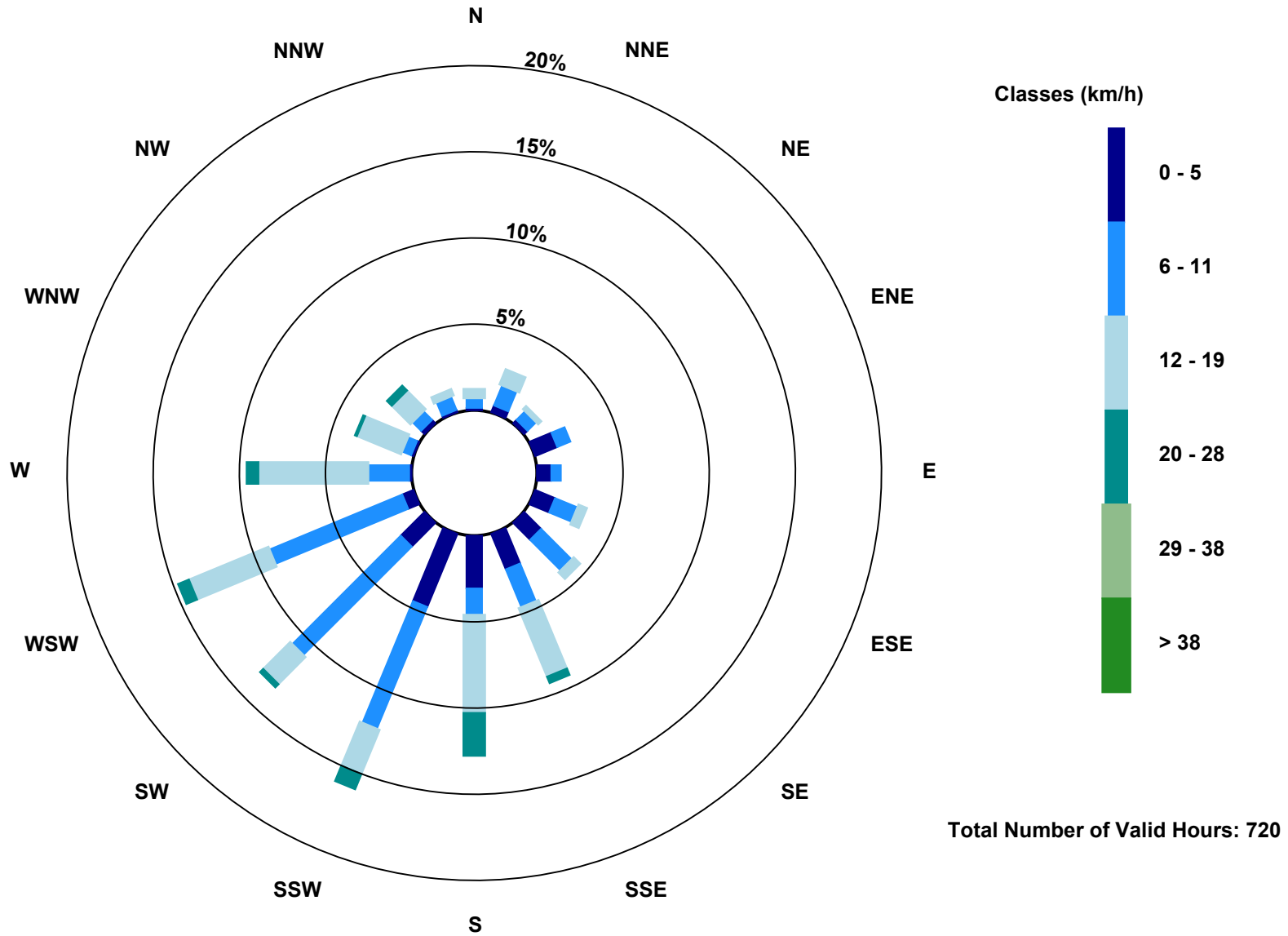
Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

Wind Speed (WS) - km/h
Christina Lake





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Christina Lake - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Sep 3 11:00 Minimum Value: 0 km/h on Sep 16 19:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 2 Q ₃ = 4 P ₉₀ = 5 P ₉₉ = 6																	Hours in Service: 720 Hours of Data: 720 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-Sep	4	3	3	4	2	2	2	2	3	3	4	5	5	6	6	6	6	6	4	3	4	4	4	4	6
2-Sep	4	4	3	3	3	2	2	3	4	4	3	3	3	3	4	4	3	3	2	2	3	3	2	2	4
3-Sep	2	2	3	1	2	1	1	3	1	2	7	5	4	3	1	1	1	1	1	2	2	3	2	3	7
4-Sep	4	4	4	4	4	3	3	3	5	5	4	5	5	4	5	4	4	3	2	1	1	2	1	1	5
5-Sep	1	1	1	1	1	1	1	2	2	3	3	4	4	3	4	3	3	2	2	1	3	2	2	2	4
6-Sep	2	2	2	1	1	1	1	2	1	2	3	4	3	4	3	3	3	6	2	1	2	2	2	2	6
7-Sep	1	1	1	3	2	2	1	1	2	2	3	4	4	4	4	5	5	2	2	1	1	1	1	1	5
8-Sep	3	1	1	1	1	1	1	1	1	2	2	3	4	4	4	4	3	3	3	2	1	1	2	2	4
9-Sep	1	2	2	3	2	1	2	1	1	1	2	3	3	3	3	3	2	2	1	1	1	1	1	2	3
10-Sep	1	1	1	1	1	1	1	1	2	2	3	4	4	4	4	4	4	3	3	2	2	3	3	3	4
11-Sep	3	3	3	4	4	4	4	4	4	5	6	7	7	7	6	6	6	4	4	4	4	4	5	5	7
12-Sep	5	4	5	4	2	2	2	3	2	2	2	2	3	3	2	2	2	3	2	2	2	2	1	2	5
13-Sep	1	2	2	1	3	2	2	2	3	3	4	4	6	5	5	7	7	5	5	6	6	5	6	6	7
14-Sep	5	6	6	4	5	5	5	4	5	4	4	5	6	6	6	6	5	5	2	1	2	1	1	3	6
15-Sep	3	1	1	1	2	1	1	1	2	2	4	3	4	3	3	3	3	3	2	2	3	2	2	4	4
16-Sep	3	3	4	4	4	1	2	2	2	2	2	2	2	2	2	2	1	1	0	1	2	1	1	2	4
17-Sep	1	2	1	1	1	1	2	1	3	3	3	4	2	3	4	4	4	3	3	3	2	1	1	1	4
18-Sep	3	1	1	2	1	1	1	1	1	4	3	4	4	5	5	5	6	4	1	1	2	3	2	2	6
19-Sep	3	3	2	2	2	3	3	3	3	3	4	4	4	4	4	3	2	2	1	1	3	1	3	1	4
20-Sep	3	1	1	1	1	1	2	2	2	2	2	3	4	3	4	2	3	3	2	2	1	1	2	2	4
21-Sep	1	2	2	1	1	1	2	1	2	2	5	4	5	5	5	5	4	4	2	1	3	2	2	2	5
22-Sep	2	3	1	1	1	2	2	3	3	5	5	5	5	4	4	4	4	3	1	1	2	2	2	2	5
23-Sep	2	2	2	3	3	3	2	3	4	4	6	6	6	5	5	5	5	5	3	2	2	3	4	3	6
24-Sep	2	2	3	4	3	2	2	3	3	3	2	2	2	2	2	2	1	1	1	1	1	1	2	1	4
25-Sep	2	2	1	2	1	2	1	1	1	2	2	3	3	3	4	4	3	2	2	2	2	2	2	3	4
26-Sep	3	4	3	3	4	4	4	3	4	4	4	4	3	3	3	3	3	4	2	1	1	1	1	2	4
27-Sep	1	2	2	1	2	2	2	1	3	5	6	3	4	2	3	2	1	2	2	2	2	2	3	2	6
28-Sep	1	2	2	1	3	2	2	2	2	2	1	3	3	6	6	2	3	4	6	1	4	2	1	2	6
29-Sep	4	2	2	3	2	3	3	3	3	3	3	3	2	3	3	3	3	3	3	2	2	2	2	2	4
30-Sep	2	2	2	3	2	2	3	2	2	2	2	2	2	2	2	1	2	1	1	1	1	1	1	1	3
																	Diurnal Maximum								



Wood Buffalo Environmental Association
Summary of Hour Averages

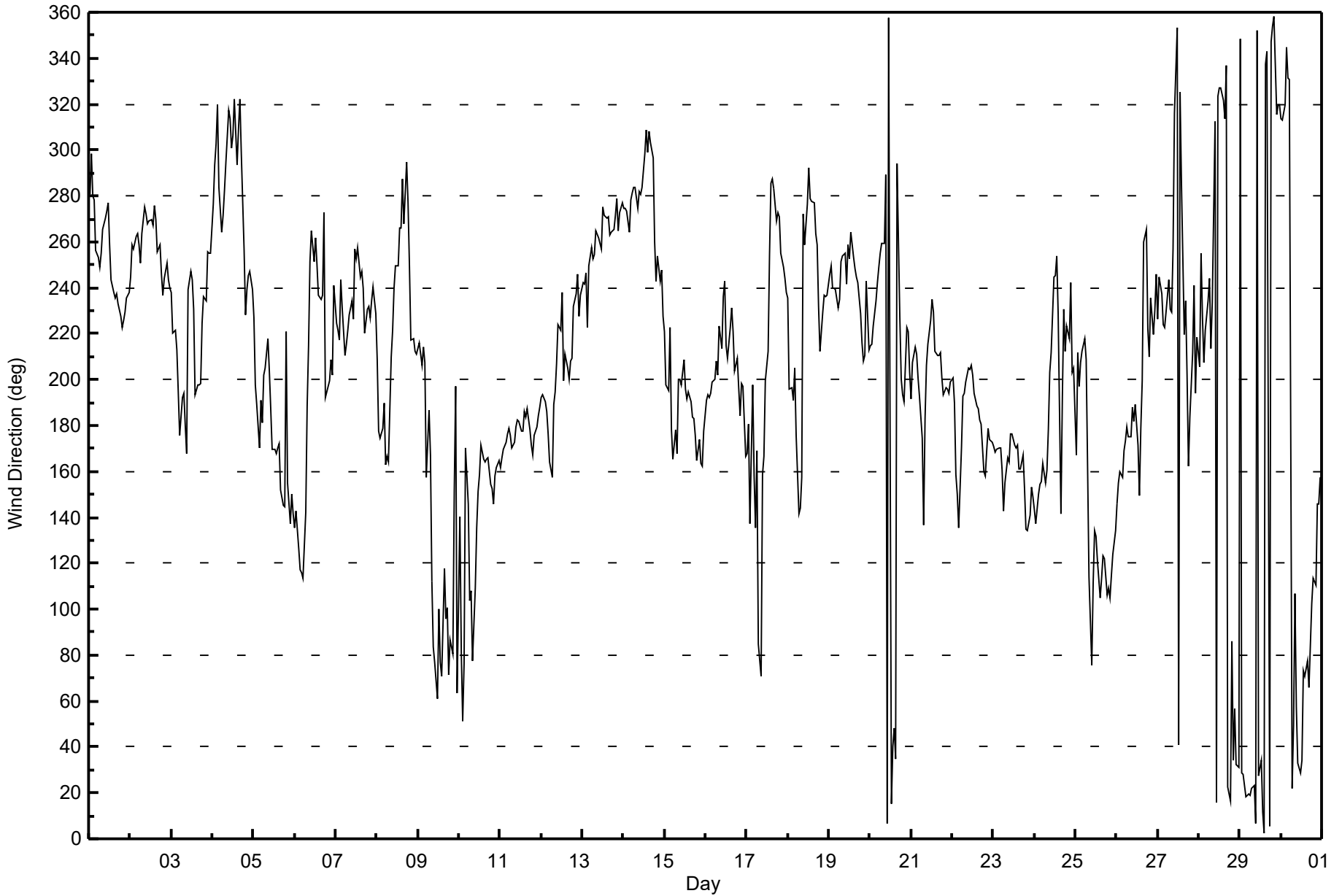
Wind Direction (WD) - deg
Christina Lake - September 2023

Direction of Maximum Speed: 178 deg on Sep 11 13:00		Hours in Service: 720
Direction of Maximum Daily Speed Average: 177.6 deg on Sep 11		Hours of Data: 720
Direction of Minimum Speed: 108 deg on Sep 10 08:00	Direction of Minimum Daily Speed Average: 2.5 deg on Sep 9	Hours of Missing Data: 0
Monthly Average Direction: 219.7 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-Sep	281	298	280	278	256	253	249	255	265	271	273	277	259	243	238	235	237	233	228	223	225	229	236	238	248.8
2-Sep	245	258	257	262	264	259	251	264	275	272	268	269	269	267	276	270	256	259	246	237	244	251	244	240	258.8
3-Sep	238	220	222	213	195	176	192	194	180	168	239	247	243	231	194	198	198	198	225	236	234	256	255	255	226.3
4-Sep	276	293	303	320	284	264	272	283	294	317	313	301	306	322	293	310	322	298	256	228	239	245	247	239	293.3
5-Sep	227	197	189	170	191	181	202	205	218	204	187	169	169	168	170	172	152	145	145	221	155	137	150	141	174.7
6-Sep	136	143	126	117	116	114	142	188	215	252	265	251	262	250	237	235	237	272	192	194	200	209	202	241	220.4
7-Sep	225	221	217	244	231	210	216	221	228	234	226	257	253	258	245	247	240	220	231	232	227	234	241	229	235.7
8-Sep	209	177	175	178	190	163	167	164	210	222	240	249	249	266	266	287	268	295	277	249	217	218	212	211	239.2
9-Sep	214	216	207	214	208	158	187	167	112	84	77	61	100	77	71	118	96	101	71	86	81	152	197	63	113.9
10-Sep	140	82	51	76	170	146	104	108	77	109	136	151	158	172	166	164	165	166	155	153	146	158	162	165	154.3
11-Sep	162	166	169	173	177	179	176	170	172	179	182	182	178	178	186	184	187	178	172	167	176	179	184	188	177.6
12-Sep	192	193	191	186	176	164	157	189	194	207	224	222	238	200	211	205	200	208	209	232	237	246	227	237	204.7
13-Sep	242	242	246	223	250	257	253	255	265	262	259	257	275	271	270	271	263	264	265	272	279	265	273	277	264.4
14-Sep	274	275	273	264	278	281	283	284	274	282	280	284	298	309	299	308	303	296	260	243	254	243	248	228	280.6
15-Sep	221	198	195	223	178	165	178	168	200	200	198	209	196	191	195	191	184	183	176	165	174	163	162	177	186.7
16-Sep	191	194	192	194	199	200	208	202	223	213	236	243	215	210	222	231	221	204	209	196	184	199	197	166	203.7
17-Sep	168	181	137	198	158	135	169	85	71	159	167	200	212	255	286	287	283	269	273	271	255	249	244	238	241.9
18-Sep	235	196	197	191	205	176	141	144	157	272	259	277	293	279	278	277	263	259	232	213	229	237	236	237	249.3
19-Sep	246	250	240	240	239	231	235	252	254	255	241	259	253	264	253	248	245	242	229	216	208	210	243	213	243.8
20-Sep	215	215	223	234	242	249	255	260	259	289	7	358	15	40	48	35	294	227	200	194	191	223	221	203	255.2
21-Sep	192	207	214	211	201	193	174	137	183	206	216	226	235	229	212	211	211	212	201	193	196	196	194	199	207.8
22-Sep	201	190	159	150	136	170	193	194	199	205	204	206	202	194	189	187	182	181	160	158	169	179	174	173	186.6
23-Sep	171	168	170	170	171	160	143	155	166	164	176	177	171	170	172	161	161	167	153	135	134	141	153	149	163.2
24-Sep	143	138	150	154	156	164	155	161	178	203	212	245	245	254	229	142	192	231	213	223	218	242	203	205	185.8
25-Sep	167	212	197	207	212	218	208	162	114	75	112	134	132	122	105	113	123	122	106	109	105	115	124	134	125.3
26-Sep	146	155	160	158	169	173	179	175	175	188	182	189	171	150	179	199	260	265	222	210	236	220	230	246	181.6
27-Sep	226	245	237	224	223	230	243	231	230	257	316	353	41	325	285	220	235	202	162	184	212	241	194	218	247.9
28-Sep	205	255	227	207	221	234	244	214	234	312	16	323	327	327	321	314	337	22	16	86	34	57	32	31	331.8
29-Sep	349	29	28	19	19	20	19	22	23	7	352	27	34	11	3	338	343	5	347	354	358	316	320	320	1.7
30-Sep	313	313	320	345	331	331	22	50	107	57	33	28	34	73	71	77	66	84	103	113	111	146	146	157	45.9

214.1 212.5 210.2 209.6 211.6 208.0 211.6 210.5 218.5 227.0 228.8 236.6 233.8 236.0 232.5 231.5 232.0 224.5 211.1 206.6 208.7 211.0 211.9 210.5
 Diurnal Average

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





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Christina Lake - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 104 deg on Sep 28 11:00 Minimum Value: 4 deg on Sep 16 19:00 Percentiles: P ₁ = 6 P ₁₀ = 10 Q ₁ = 13 Median = 17 Q ₃ = 23 P ₉₀ = 39 P ₉₉ = 80																			Hours in Service: 720 Hours of Data: 720 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-Sep	16	21	28	18	16	15	16	16	17	19	19	18	19	17	17	16	15	13	12	11	11	12	11	12	28
2-Sep	14	19	18	19	17	16	14	18	17	16	16	15	17	19	18	17	18	18	16	11	12	16	15	12	19
3-Sep	20	12	10	12	23	35	10	14	21	36	12	15	15	12	17	15	14	19	13	11	12	18	15	25	36
4-Sep	29	26	19	16	17	16	21	23	20	18	18	20	18	14	24	23	14	20	18	8	11	11	11	14	29
5-Sep	14	10	38	13	22	20	12	12	18	21	20	24	23	26	21	21	20	11	19	12	30	17	11	12	38
6-Sep	12	12	16	13	13	11	17	13	20	16	18	19	24	23	14	14	16	32	17	13	23	51	23	11	51
7-Sep	12	14	22	32	16	5	6	15	19	20	22	25	21	19	21	18	17	12	8	8	8	7	9	22	32
8-Sep	26	26	16	13	15	29	36	22	20	18	26	21	18	29	21	31	26	22	24	19	8	6	26	12	36
9-Sep	27	16	51	38	61	36	17	59	64	63	41	60	46	69	44	52	36	23	14	9	27	50	50	19	69
10-Sep	39	37	8	28	41	38	57	70	25	23	26	18	18	23	18	16	14	13	11	9	10	11	11	11	70
11-Sep	11	11	11	11	11	12	12	12	13	14	14	15	16	16	16	16	15	13	13	11	11	11	12	12	16
12-Sep	12	11	12	14	21	16	12	22	14	18	30	30	37	63	19	15	25	14	16	9	11	12	9	11	63
13-Sep	10	10	13	14	15	16	13	14	17	18	18	20	17	20	20	17	19	18	17	18	15	17	17	16	20
14-Sep	16	16	18	18	15	14	16	18	16	15	15	20	18	18	18	21	22	28	10	14	7	8	8	39	39
15-Sep	23	22	8	13	17	24	47	26	14	12	16	15	20	21	18	16	16	13	9	9	11	10	10	12	47
16-Sep	11	10	11	17	20	14	14	13	16	21	25	74	46	24	20	19	11	6	4	10	23	10	23	36	74
17-Sep	20	18	41	14	33	41	52	73	75	34	16	24	27	30	22	17	15	15	14	15	14	10	11	18	75
18-Sep	45	25	10	24	7	32	15	36	49	57	19	22	25	21	21	16	18	18	14	7	9	10	10	11	57
19-Sep	13	18	13	13	12	12	12	19	18	19	17	23	21	23	18	18	19	14	7	4	30	14	56	91	91
20-Sep	80	6	7	8	5	9	20	30	26	60	49	50	31	22	22	11	48	48	27	45	28	24	26	39	80
21-Sep	10	46	23	24	17	8	16	15	16	13	19	17	18	17	17	17	15	12	12	8	9	10	10	10	46
22-Sep	11	17	17	12	15	19	14	13	13	16	14	17	19	17	17	16	20	13	10	7	7	8	8	9	20
23-Sep	9	9	9	9	10	11	13	13	15	15	16	17	17	18	17	14	14	13	16	11	12	13	13	12	18
24-Sep	12	12	14	12	14	17	14	15	19	16	18	18	26	18	58	52	58	12	11	7	5	35	49	24	58
25-Sep	13	34	27	58	21	27	29	73	40	29	30	37	58	31	18	15	14	11	9	10	11	11	11	13	73
26-Sep	11	12	13	12	12	11	12	12	12	14	19	20	25	21	21	15	29	72	45	32	20	9	7	14	72
27-Sep	17	12	27	22	13	14	12	9	13	24	21	34	23	82	26	20	31	35	56	43	30	34	60	19	82
28-Sep	16	18	26	25	22	47	53	47	14	88	104	20	58	48	31	20	34	19	44	64	98	47	12	15	104
29-Sep	29	16	12	14	14	15	13	13	13	21	20	17	17	21	21	12	16	23	19	20	20	11	11	10	29
30-Sep	12	9	15	27	49	82	82	21	40	34	51	33	26	77	24	24	14	11	14	15	18	19	11	20	82
	80	46	51	58	61	82	82	73	75	88	104	74	58	82	58	52	58	72	56	64	98	51	60	91	
Diurnal Maximum																									



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS27
JACKFISH 2/3
SEPTEMBER 2023

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

October 30, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JACKFISH 2/3 (AMS27)
 SEPTEMBER 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	687	33	33	100	5.7	0	1.5	0
H2S (ppb) Average	685	35	35	100	1	0	0.6	0
NO2 (ppb) Average	685	35	35	100	6.9	0	2.9	-
NO (ppb) Average	685	35	35	100	7	-	0.6	-
NOX (ppb) Average	685	35	35	100	13.9	-	2.9	-
Temperature 2 m (C) Average	718	0	2	99.72	23.6	-	18.2	-
Relative Humidity (%) Average	720	0	0	100	99.6	-	94.6	-
Wind Speed 10 m (km/h) Average	720	0	0	100	17	-	10	-
Wind Direction 10 m (deg) Average	720	0	0	100	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JACKFISH 2/3 (AMS27)
 SEPTEMBER 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	687	0.41	0.6	-	0	0	0.1	0.2	0.5	1	5.7
H2S (ppb) Average	685	0.28	0.2	-	0	0.1	0.2	0.2	0.3	0.5	1
NO2 (ppb) Average	685	0.84	1	-	0	0	0.2	0.6	1.1	2	6.9
NO (ppb) Average	685	0.1	0.5	-	0	0	0	0	0	0.1	7
NOX (ppb) Average	685	0.94	1.3	-	0	0	0.2	0.6	1.2	2.1	13.9
Temperature 2 m (C) Average	718	12.23	4.8	-	1.8	6.2	8.4	11.9	15.5	19.2	23.6
Relative Humidity (%) Average	720	69.55	17.6	-	32.9	43.3	56.3	70.7	83.7	92.6	99.6
Wind Speed 10 m (km/h) Average	720	6.7	3	-	0	4	5	6	8	10	17
Wind Direction 10 m (deg) Average	720	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JACKFISH 2/3 (AMS27)
SEPTEMBER 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
Temperature 2 m	28 Sep 2023 23:00	29 Sep 2023 00:00	2	Flat line in sensor output signal



Wood Buffalo Environmental Association
Summary of Hour Averages

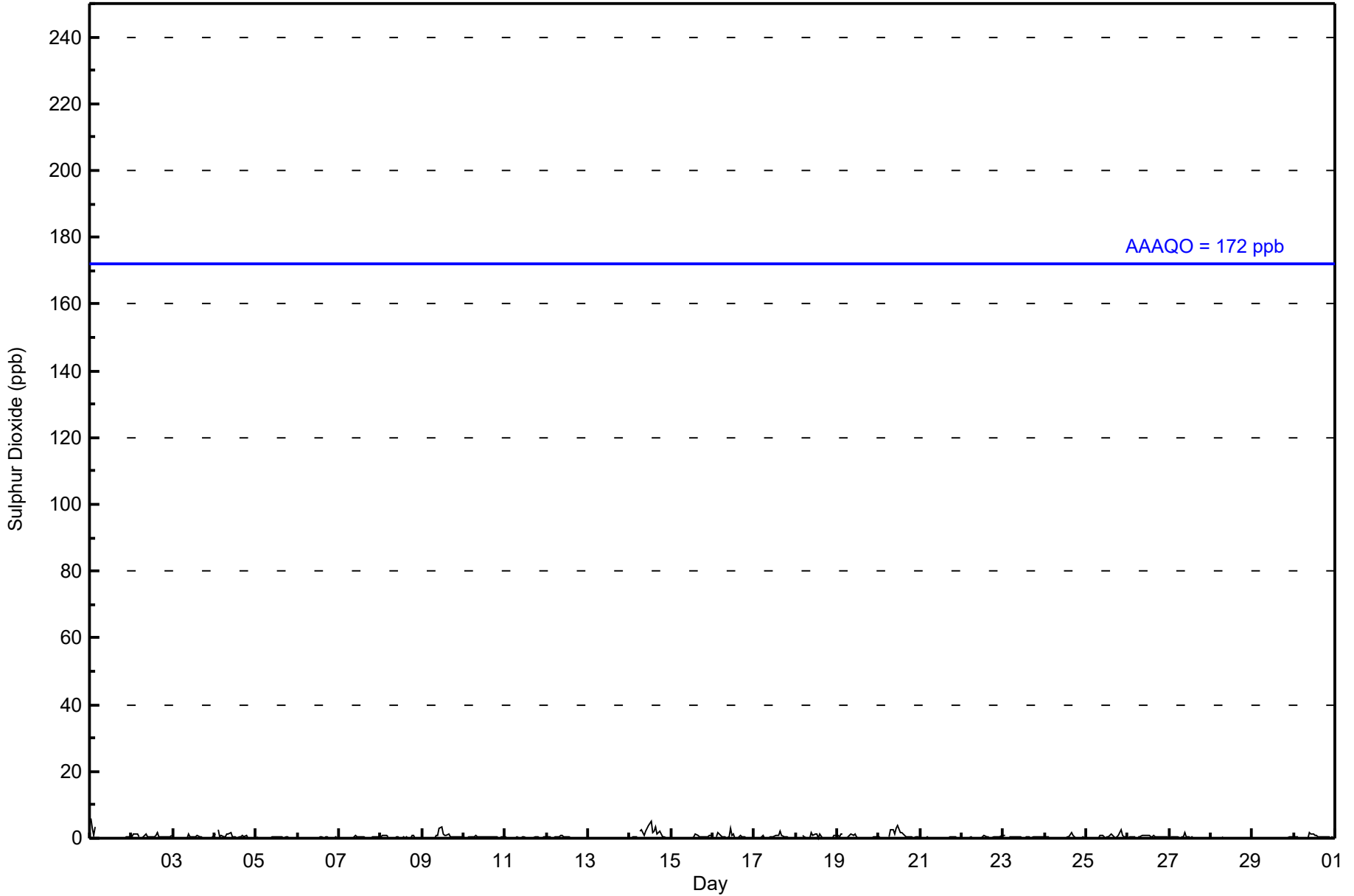
Sulphur Dioxide (SO₂) - ppb
Jackfish 2/3 - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 5.7 ppb on Sep 1 01:00 Maximum Daily Average: 1.5 ppb on Sep 14		Hours in Service: 720 Hours of Data: 687 Hours of Missing Data: 33 Hours of Calibration: 33 Percent Operational Time: 100.0																								
Minimum Value: 0.0 ppb on Sep 1 06:00 Maximum Diurnal Average: 0.7 ppb at hour 10 Monthly Average: 0.41 ppb		Minimum Daily Average: 0.0 ppb on Sep 13 Minimum Diurnal Average: 0.1 ppb at hour 6 Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.2 Q ₃ = 0.5 P ₉₀ = 1.0 P ₉₉ = 3.1																								
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Sep	5.7	2.9	0.8	3.3	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.4	0.4	0.6	5.7	
2-Sep	0.4	1.1	1.4	1.2	0.5	Z	0.0	0.2	1.1	0.4	0.5	0.5	0.6	0.7	1.5	0.5	0.5	0.4	0.4	0.6	0.4	0.4	0.8	0.6	1.5	
3-Sep	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	1.1	0.5	0.4	0.3	0.3	0.8	0.3	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.2	1.1	
4-Sep	1.4	Z	2.3	0.2	0.9	0.3	0.2	1.2	1.2	1.9	0.3	0.6	0.3	0.2	0.3	0.5	0.8	0.4	0.7	0.2	0.1	0.1	0.2	0.1	2.3	
5-Sep	0.1	0.2	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.5	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.2	0.1	0.1	0.2	0.1	0.0	0.5	
6-Sep	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.4	0.2	0.2	0.4	0.1	0.0	0.1	0.1	0.3	0.2	0.4	
7-Sep	0.1	0.2	0.2	0.1	Z	0.0	0.0	0.0	0.0	1.0	0.3	0.5	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.3	0.3	0.2	0.3	0.4	1.0	
8-Sep	0.5	0.7	1.0	0.7	0.2	Z	0.0	0.0	0.1	0.3	0.4	0.0	0.1	0.5	0.1	0.4	0.0	0.0	0.9	0.7	0.1	0.1	0.1	0.1	1.0	
9-Sep	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.8	1.0	2.9	3.4	1.2	1.0	1.0	1.1	0.6	0.4	0.3	0.2	0.3	0.3	0.2	0.3	3.4	
10-Sep	0.3	Z	0.1	0.5	0.5	0.4	0.5	0.6	0.5	0.5	0.5	0.6	0.5	0.4	0.3	0.2	0.3	0.3	0.3	0.4	0.2	0.1	0.2	0.5	0.6	
11-Sep	0.3	0.2	Z	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.3	0.4	0.2	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.2	0.2	0.3	0.3	0.4	
12-Sep	0.3	0.3	0.3	Z	0.1	0.2	0.3	0.4	1.0	0.8	0.2	0.5	0.6	0.2	0.2	0.1	0.0	0.1	0.0	0.0	0.1	0.2	0.0	0.0	1.0	
13-Sep	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	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.2	
14-Sep	0.2	0.2	0.2	0.2	0.3	Z	2.3	2.3	0.6	2.3	3.1	3.8	5.0	1.7	2.3	3.3	1.2	2.3	1.5	0.4	0.3	0.2	0.2	0.1	5.0	
15-Sep	Z	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.5	1.1	1.0	0.6	0.3	0.3	0.4	0.5	0.5	0.7	0.8	1.1	
16-Sep	0.8	Z	0.5	1.5	1.4	0.4	0.3	0.3	0.2	0.6	2.9	0.9	1.3	0.1	0.2	0.5	1.0	0.4	0.3	0.2	0.1	0.1	0.1	0.1	2.9	
17-Sep	0.1	0.2	Z	0.0	0.5	0.7	0.2	0.1	0.1	0.3	0.3	0.6	1.0	0.8	1.0	2.0	0.7	0.6	0.3	0.3	0.2	0.2	0.2	0.1	2.0	
18-Sep	0.1	0.2	0.2	Z	0.6	0.3	0.0	0.0	0.0	1.9	0.6	1.4	1.1	0.1	1.1	0.0	0.2	0.1	0.1	0.2	0.1	0.1	0.7	0.8	1.9	
19-Sep	1.0	0.5	1.4	1.4	Z	0.1	0.4	0.8	1.1	1.1	1.1	0.6	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.3	0.4	0.4	1.4	
20-Sep	0.4	0.2	0.2	0.1	0.0	Z	0.2	2.6	2.5	1.5	2.9	3.9	1.8	1.6	1.3	0.8	0.3	0.3	0.5	0.2	0.2	0.3	0.4	0.4	3.9	
21-Sep	Z	0.0	0.2	0.2	0.4	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.2	0.4	0.6	0.4	0.3	0.1	0.1	0.1	0.6	
22-Sep	0.1	Z	0.0	0.0	0.1	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.4	0.7	0.4	0.4	0.2	0.2	0.2	0.4	0.5	0.5	0.6	0.7	0.7	
23-Sep	0.7	0.7	Z	0.6	0.6	0.6	0.4	0.4	0.4	0.3	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.2	0.7	
24-Sep	0.3	0.3	0.3	Z	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.5	0.6	1.5	1.0	0.3	0.2	0.1	0.1	0.1	0.3	0.2	1.5	
25-Sep	0.1	0.1	0.1	0.1	Z	0.0	0.0	0.0	1.0	0.6	0.6	0.2	0.2	0.4	1.2	0.7	0.3	0.1	0.9	1.7	2.6	0.7	0.3	0.2	2.6	
26-Sep	0.2	0.2	0.3	0.4	0.4	Z	0.4	0.5	0.7	0.8	0.6	0.7	0.8	0.6	0.5	0.7	0.4	0.3	0.3	0.3	0.3	0.6	0.5	0.6	0.8	
27-Sep	Z	0.4	0.3	0.5	0.3	0.3	0.1	0.3	0.5	1.9	0.4	0.2	0.2	0.5	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.1	1.9	
28-Sep	0.2	Z	0.0	0.0	0.0	0.0	0.2	0.4	C	C	C	0.0	0.0	0.0	0.2	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.4	
29-Sep	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	0.0	0.1	0.0	0.1	0.1	0.1	0.2	0.4	0.3	0.4	
30-Sep	0.2	0.2	0.3	Z	0.0	0.0	0.0	0.0	0.1	1.7	1.3	1.2	1.0	1.0	0.6	0.3	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.2	1.7	
																								Diurnal Average		
																								Diurnal Maximum		
0.6 0.4 0.4 0.5 0.3 0.1 0.2 0.4 0.4 0.7 0.7 0.7 0.6 0.4 0.5 0.6 0.3 0.3 0.3 0.3 0.3 0.3 0.2 0.3 0.3 5.7 2.9 2.3 3.3 1.4 0.7 2.3 2.6 2.5 2.3 3.1 3.9 5.0 1.7 2.3 3.3 1.2 2.3 1.5 1.7 2.6 0.7 0.7 0.8																										
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
Jackfish 2/3 - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Jackfish 2/3 - September 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	687	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: 687

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Jackfish 2/3 - September 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	0	0	0	0	0	2	8	8	15	24	38	48	29	10	7	0	189
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	0	0	0	0	0	2	8	8	15	24	38	48	29	10	7	0	189

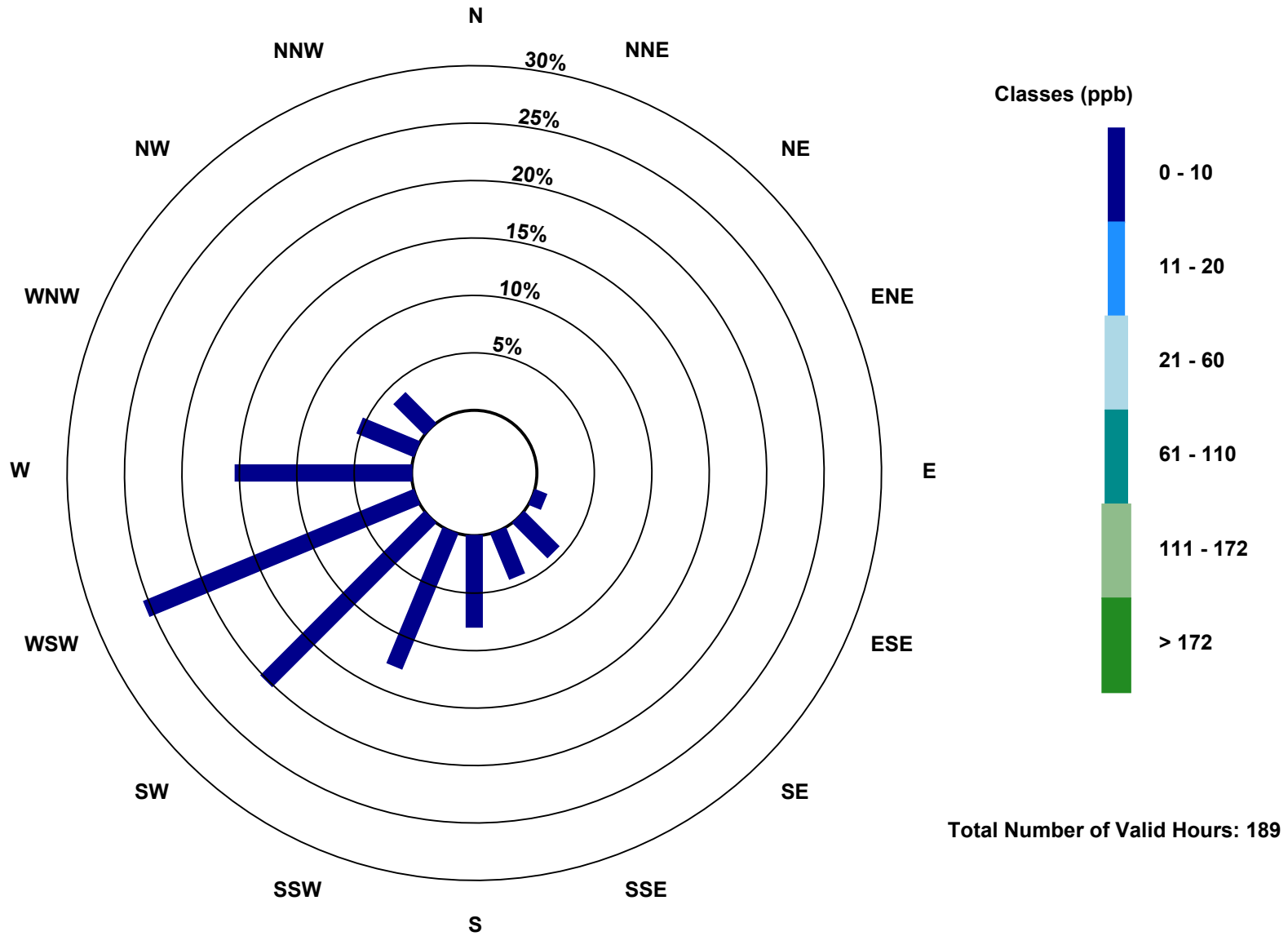
Total Number of Valid Hours: 189

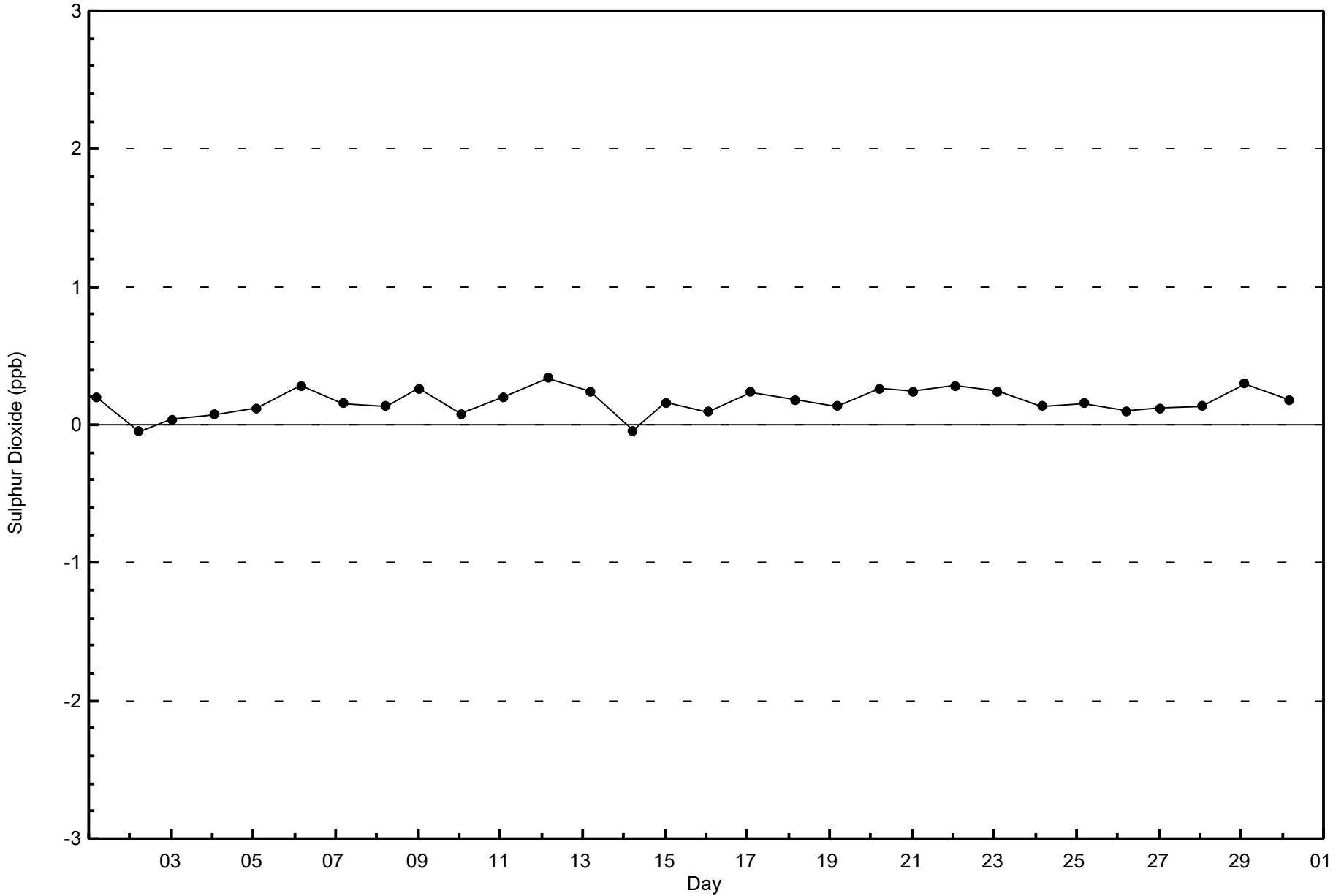
Total Number of Hours: 720

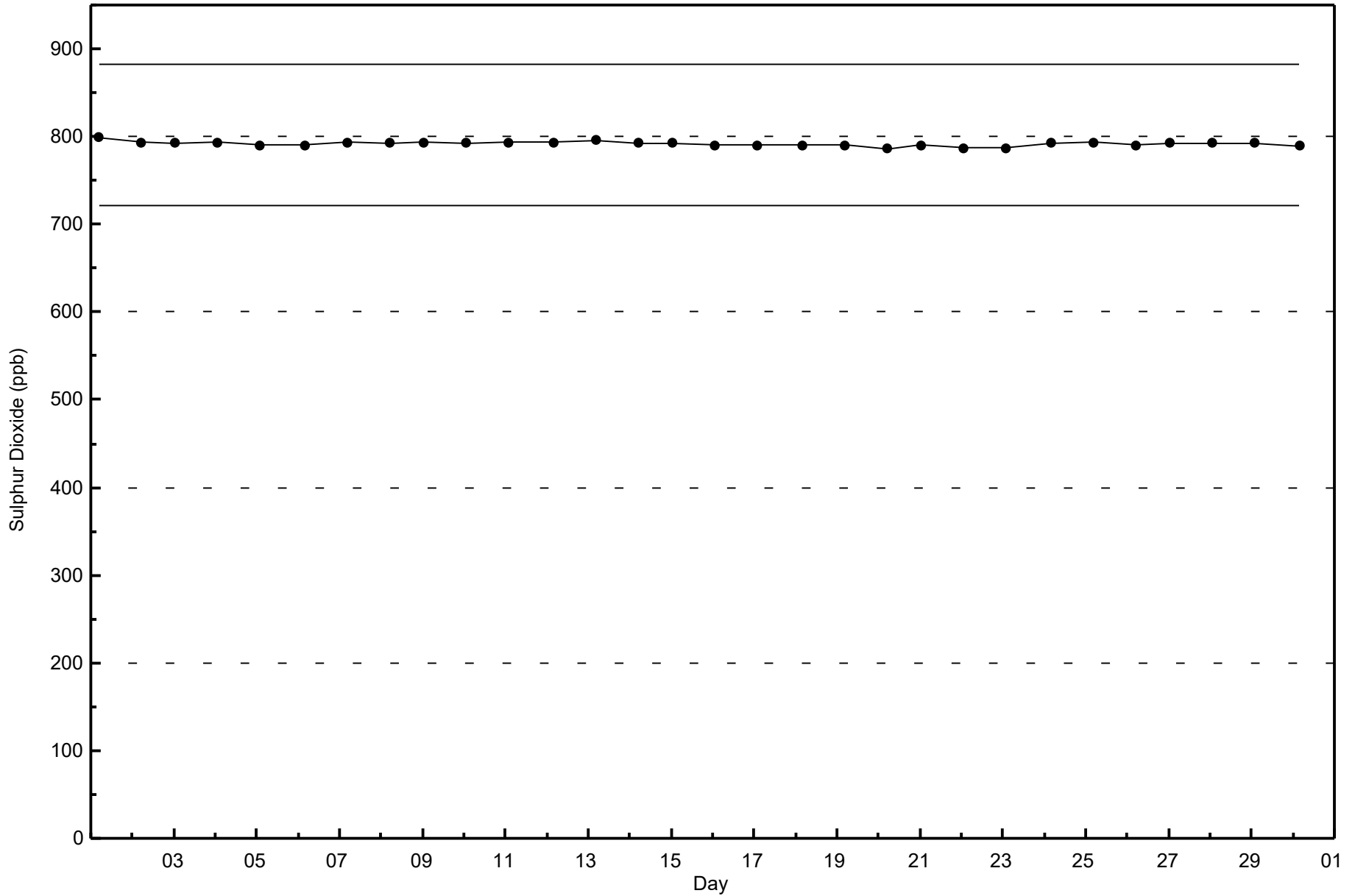


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Sulphur Dioxide (SO₂) - ppb
Jackfish 2/3





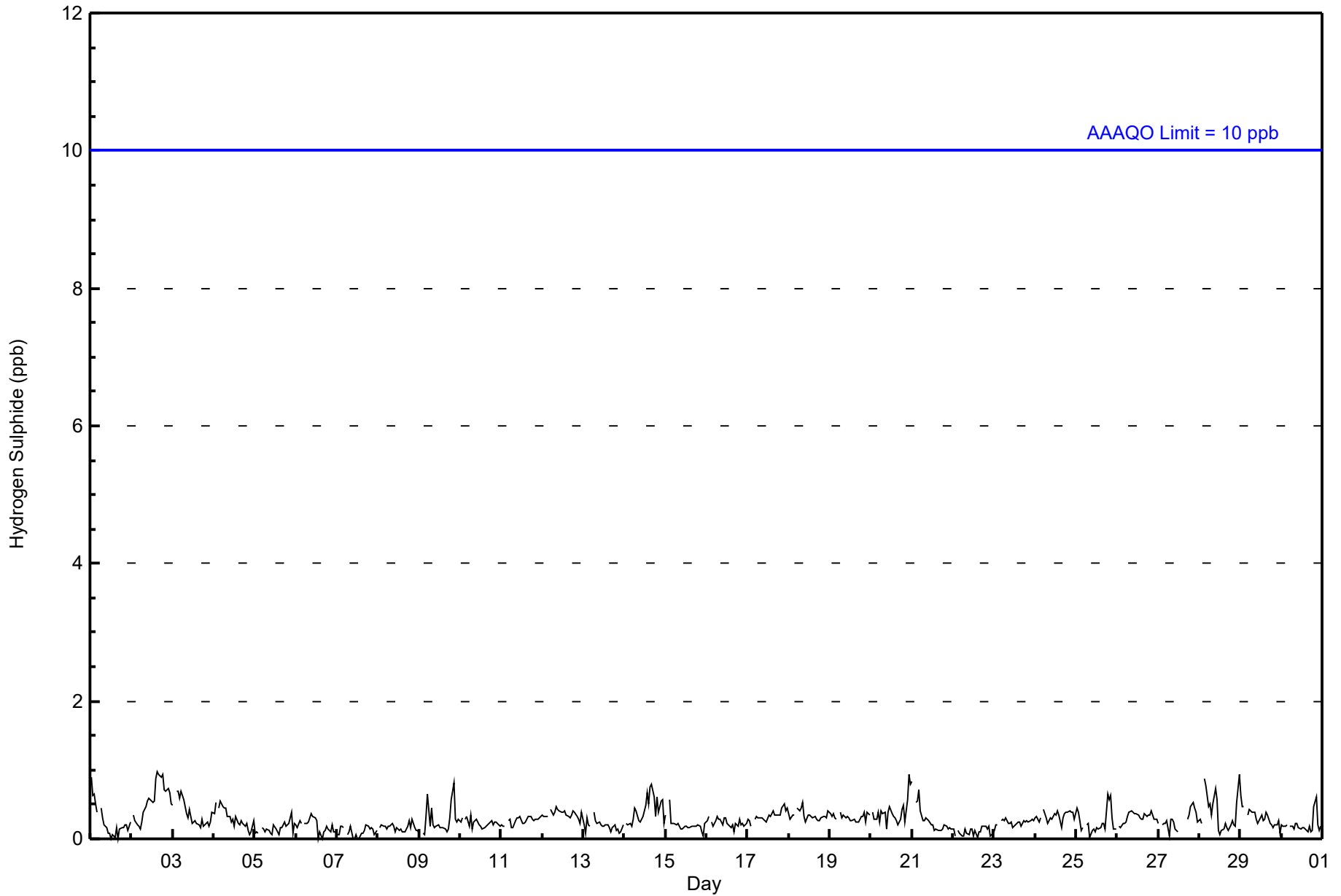




Wood Buffalo Environmental Association
Summary of Hour Averages

Hydrogen Sulphide (H₂S) - ppb
Jackfish 2/3 - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 1.0 ppb on Sep 2 16:00 Maximum Daily Average: 0.6 ppb on Sep 2		Hours in Service: 720 Hours of Data: 685																								
Minimum Value: 0.0 ppb on Sep 1 13:00 Maximum Diurnal Average: 0.3 ppb at hour 1 Monthly Average: 0.28 ppb		Minimum Daily Average: 0.1 ppb on Sep 7 Minimum Diurnal Average: 0.2 ppb at hour 15 Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.2 Median = 0.2 Q ₃ = 0.3 P ₉₀ = 0.5 P ₉₉ = 0.9																								
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Sep	0.9	0.6	0.6	0.5	0.4	Z	0.5	0.3	0.2	0.2	0.1	0.1	0.0	0.1	0.0	0.2	0.0	0.1	0.2	0.2	0.2	0.2	0.1	0.3	0.3	0.9
2-Sep	Z	0.3	0.3	0.2	0.2	0.1	0.2	0.4	0.5	0.5	0.6	0.6	0.5	0.6	0.9	1.0	0.9	0.9	0.9	0.7	0.7	0.7	0.7	0.5	0.5	1.0
3-Sep	0.5	Z	0.7	0.7	0.6	0.7	0.6	0.5	0.4	0.3	0.4	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.4	0.4	0.7
4-Sep	0.4	0.5	Z	0.5	0.5	0.5	0.4	0.4	0.3	0.3	0.2	0.3	0.2	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.3	0.3	0.5
5-Sep	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	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.1	0.2	0.2	0.4
6-Sep	0.2	0.2	0.3	0.2	Z	0.2	0.2	0.3	0.3	0.4	0.3	0.3	0.3	0.0	0.1	0.0	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.2	0.4
7-Sep	0.1	0.1	0.2	0.2	0.2	Z	0.1	0.1	0.2	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.2
8-Sep	Z	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.2	0.3	0.2	0.1	0.1	0.2	0.3
9-Sep	0.1	Z	0.1	0.1	0.3	0.6	0.2	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.3	0.6	0.8	0.3	0.2	0.3	0.3	0.8
10-Sep	0.2	0.3	Z	0.3	0.3	0.2	0.4	0.2	0.3	0.3	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.4
11-Sep	0.2	0.2	0.2	Z	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
12-Sep	0.3	0.3	0.3	0.3	Z	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.2	0.4	0.4	0.5
13-Sep	0.2	0.1	0.3	0.2	0.2	Z	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.4
14-Sep	Z	0.2	0.2	0.2	0.2	0.3	0.4	0.4	0.3	0.2	0.3	0.3	0.5	0.7	0.5	0.7	0.8	0.6	0.3	0.6	0.4	0.6	0.6	0.2	0.2	0.8
15-Sep	0.3	Z	0.6	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.0	0.2	0.2	0.6
16-Sep	0.3	0.3	Z	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.3
17-Sep	0.3	0.3	0.2	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	0.3	0.3	0.4	0.3	0.4	0.5	0.4	0.5	0.3	0.5
18-Sep	0.4	0.3	0.3	0.3	Z	0.4	0.4	0.5	0.5	0.3	0.2	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.5
19-Sep	0.4	0.3	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	0.2	0.3	0.3	0.3	0.3	0.4	0.2	0.4	0.3	0.3	0.4
20-Sep	Z	0.4	0.3	0.3	0.4	0.2	0.4	0.4	0.4	0.1	0.4	0.5	0.4	0.3	0.3	0.3	0.2	0.3	0.4	0.5	0.2	0.6	0.9	0.8	0.4	0.9
21-Sep	0.8	Z	0.5	0.6	0.7	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.1	0.3	0.8
22-Sep	0.1	0.0	Z	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.0	0.1	0.1	0.2
23-Sep	0.1	0.2	0.2	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	0.3	0.2	0.3	0.2	0.3	0.3	0.3	0.2	0.3
24-Sep	0.3	0.3	0.2	0.3	Z	0.4	0.3	0.2	0.3	0.3	0.3	0.4	0.4	0.3	0.2	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4
25-Sep	0.5	0.4	0.3	0.1	0.2	Z	0.2	0.2	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.6	0.6	0.6	0.3	0.1	0.1	0.3	0.6
26-Sep	Z	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.4
27-Sep	0.2	Z	0.2	0.2	0.2	0.3	0.0	0.3	0.3	0.2	0.1	0.1	C	C	C	C	C	0.3	0.3	0.5	0.5	0.4	0.4	0.2	0.3	0.5
28-Sep	0.3	0.2	Z	0.9	0.8	0.5	0.5	0.3	0.5	0.7	0.6	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.3	0.2	0.2	0.5	0.9	0.4	0.9
29-Sep	0.6	0.5	0.5	Z	0.3	0.4	0.4	0.4	0.4	0.3	0.2	0.3	0.3	0.3	0.3	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.1	0.3	0.6
30-Sep	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.5	0.6	0.2	0.1	0.2	0.2	0.6
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan C - Calibration Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb																										





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Hydrogen Sulphide (H₂S) - ppb
Jackfish 2/3 - September 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	685	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: 685

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Hydrogen Sulphide (H₂S) - ppb
Jackfish 2/3 - September 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	17	15	5	11	12	29	26	91	76	97	164	77	23	20	16	685
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	17	15	5	11	12	29	26	91	76	97	164	77	23	20	16	685

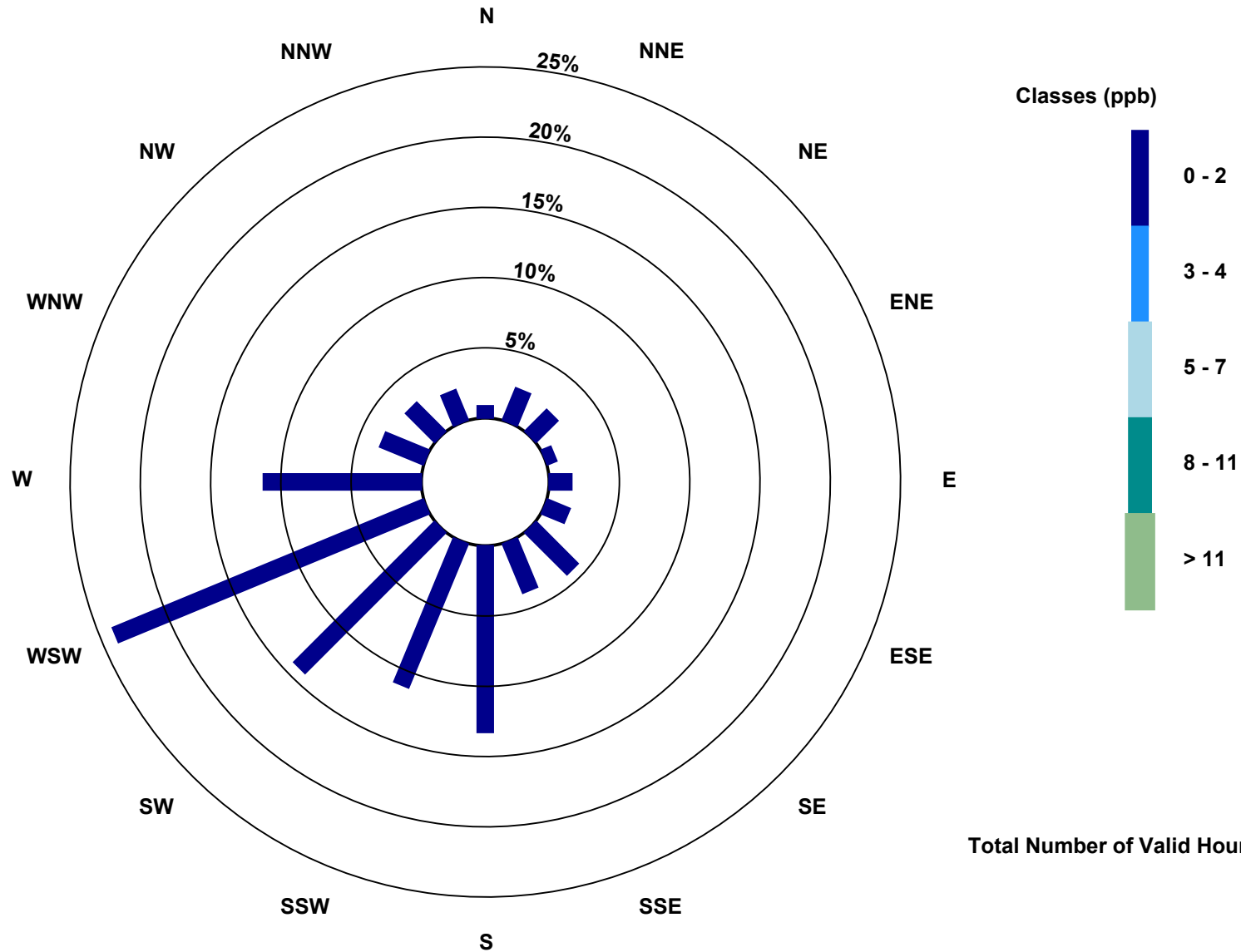
Total Number of Valid Hours: 685

Total Number of Hours: 720

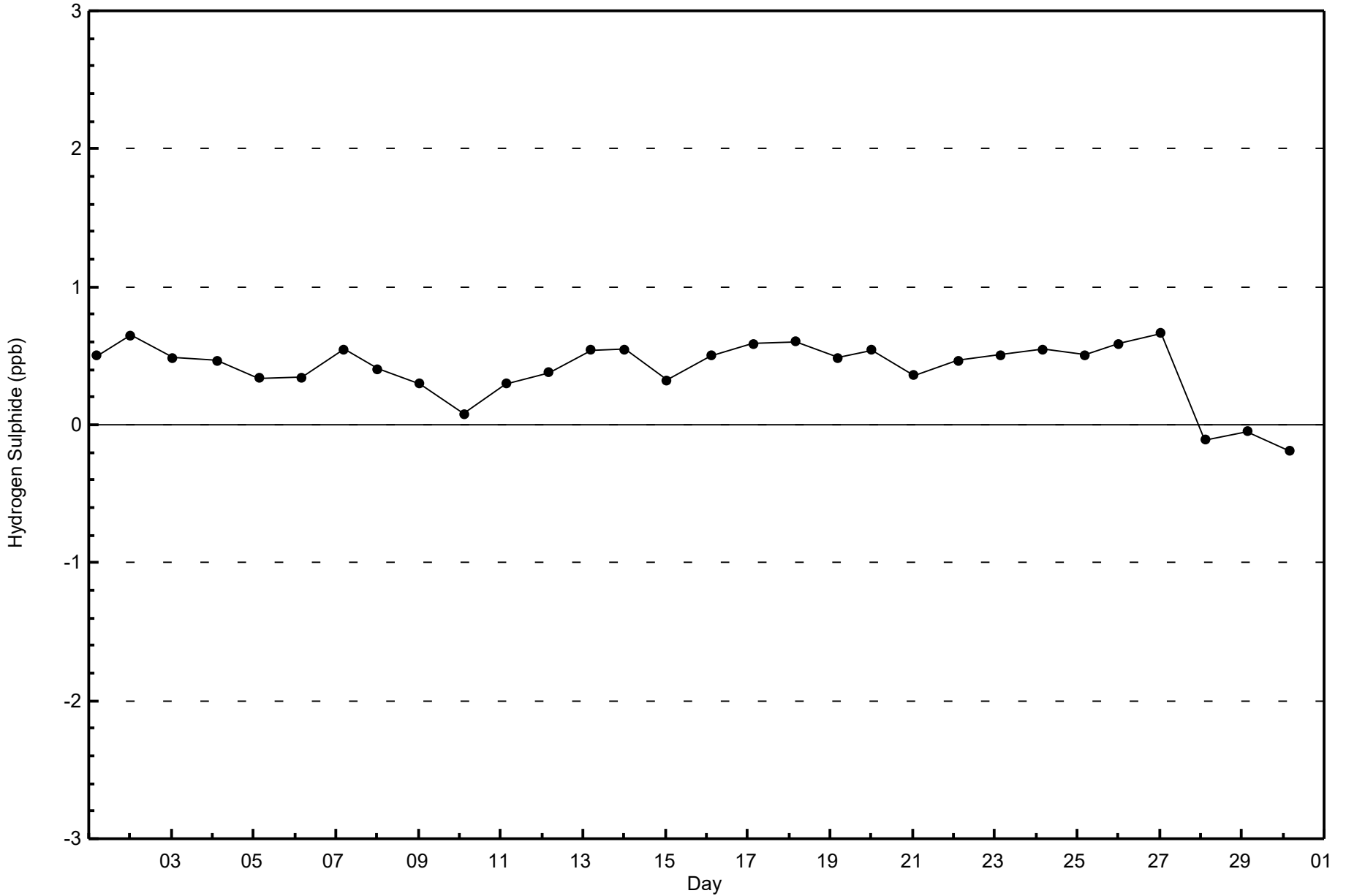


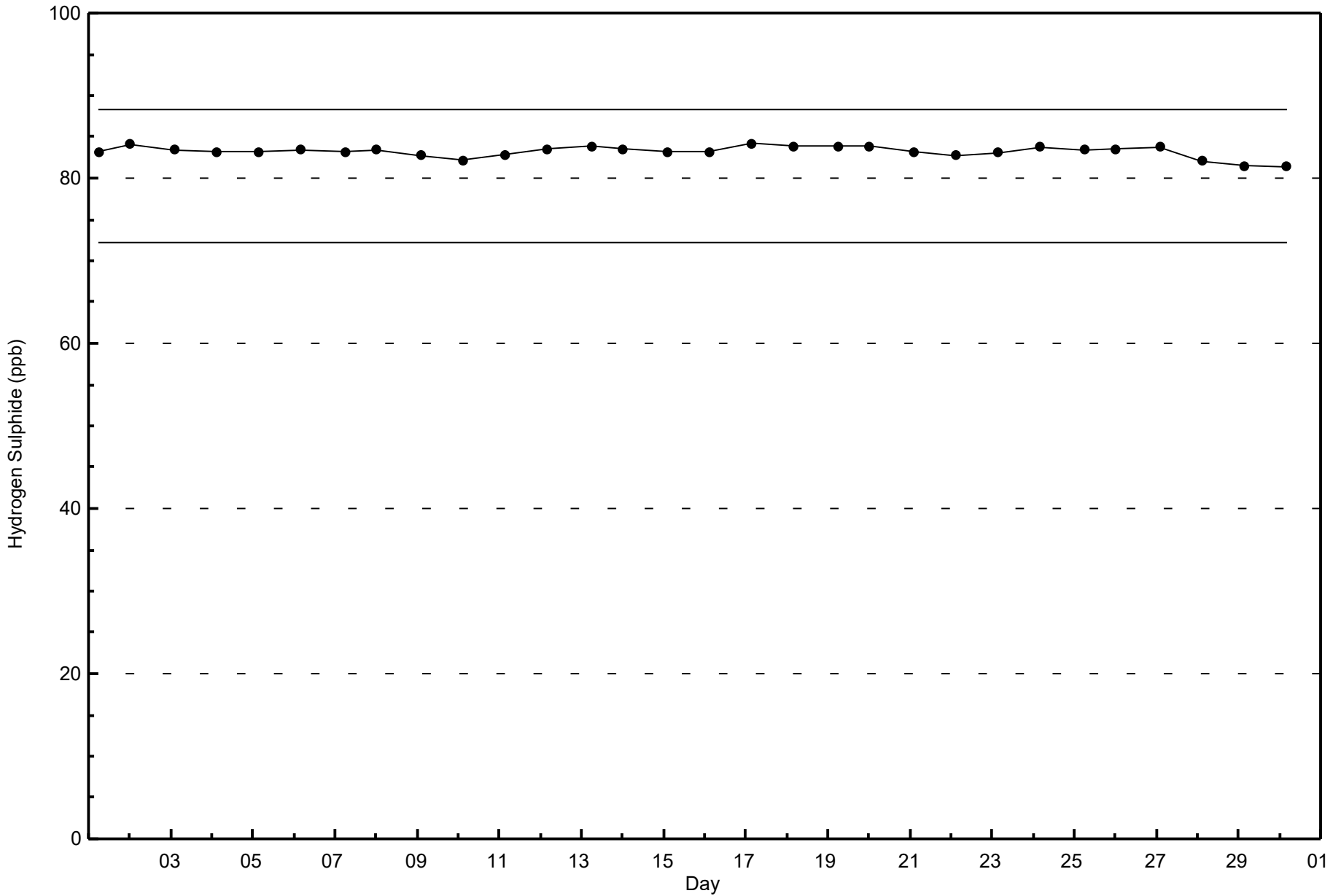
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Hydrogen Sulphide (H₂S) - ppb
Jackfish 2/3



Total Number of Valid Hours: 685







Wood Buffalo Environmental Association
Summary of Hour Averages

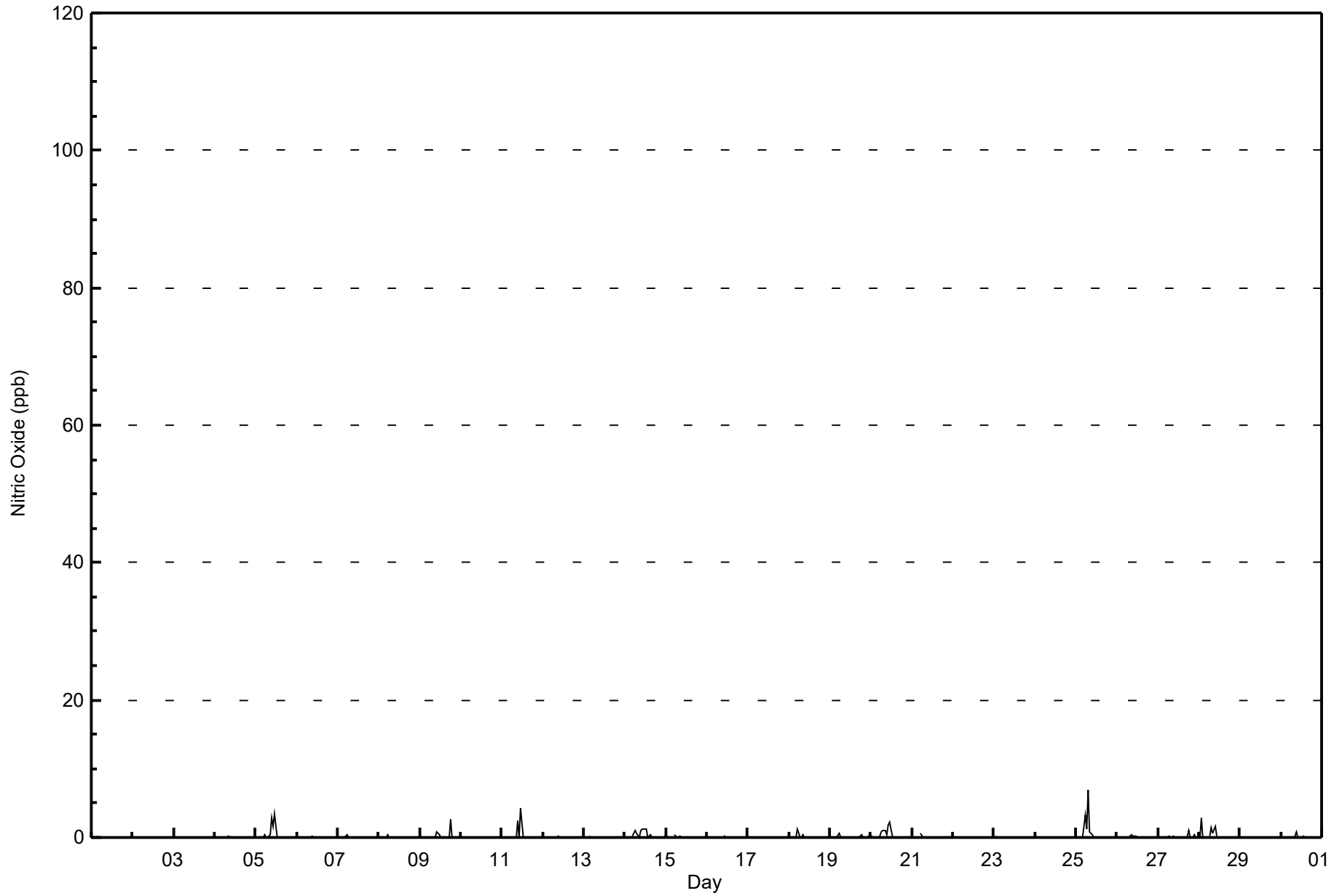
Nitric Oxide (NO) - ppb
Jackfish 2/3 - September 2023

Maximum Value: 7.0 ppb on Sep 25 08:00																				Maximum Daily Average: 0.6 ppb on Sep 25					Hours in Service: 720								
Minimum Value: 0.0 ppb on Sep 1 02:00																				Minimum Daily Average: 0.0 ppb on Sep 24					Hours of Data: 685								
Maximum Diurnal Average: 0.4 ppb at hour 12																				Minimum Diurnal Average: 0.0 ppb at hour 20					Hours of Missing Data: 35								
Monthly Average: 0.10 ppb																				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 = 2.5					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-Sep	0.0	0.0	Z	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Sep	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
3-Sep	0.0	0.0	0.0	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1		
4-Sep	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3		
5-Sep	Z	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.0	0.5	2.8	1.7	3.5	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	0.4	3.5	
6-Sep	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	
7-Sep	0.0	0.0	Z	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	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	
8-Sep	0.0	0.0	0.0	Z	0.1	0.3	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	
9-Sep	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	
10-Sep	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
11-Sep	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	4.4	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	4.4	
12-Sep	0.0	Z	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.3	
13-Sep	0.0	0.0	Z	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	
14-Sep	0.0	0.0	0.0	Z	0.2	0.5	1.0	0.7	0.0	1.1	1.1	1.2	1.3	0.0	0.2	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	1.3	
15-Sep	0.7	0.0	0.0	0.0	Z	0.5	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	
16-Sep	0.0	0.0	0.0	0.0	0.0	Z	0.1	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	
17-Sep	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	0.0	0.0	0.0	
18-Sep	0.0	Z	0.0	0.0	0.0	1.2	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	
19-Sep	0.0	0.0	Z	0.0	0.0	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	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.6	
20-Sep	0.2	0.0	0.0	Z	0.0	0.2	0.7	1.1	1.0	0.4	1.8	2.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	
21-Sep	0.0	0.0	0.0	0.0	Z	0.6	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	
22-Sep	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	0.0	0.0	0.0	
23-Sep	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	
24-Sep	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	0.0	0.0	0.0	
25-Sep	0.0	0.0	Z	0.0	0.0	3.2	1.3	7.0	0.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.0	
26-Sep	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.4	0.1	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	
27-Sep	0.0	0.0	0.0	0.0	Z	0.0	0.2	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.1	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	
28-Sep	0.0	2.7	0.0	0.0	0.0	Z	0.2	1.4	0.5	1.7	0.3	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	0.0	0.0	0.0	0.0	2.7	
29-Sep	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	0.0	0.0	0.0	
30-Sep	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.8	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	
																								Diurnal Average									
																								Diurnal Maximum									
																								0.0 0.1 0.0 0.0 0.0 0.3 0.1 0.3 0.1 0.4 0.2 0.4 0.1 0.0 0.0 0.0 0.0 0.0 0.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0									
																								0.7 2.7 0.0 0.3 0.2 3.2 1.3 7.0 1.0 2.8 1.8 4.4 1.3 0.1 0.2 0.5 0.0 0.1 2.7 0.0 0.0 0.4 0.0 0.5									
Z - zerospan C - Calibration																																	



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Jackfish 2/3 - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb
Jackfish 2/3 - September 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	685	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: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Jackfish 2/3 - September 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	4	19	15	5	11	12	29	26	92	74	103	160	79	22	19	15	685
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	4	19	15	5	11	12	29	26	92	74	103	160	79	22	19	15	685

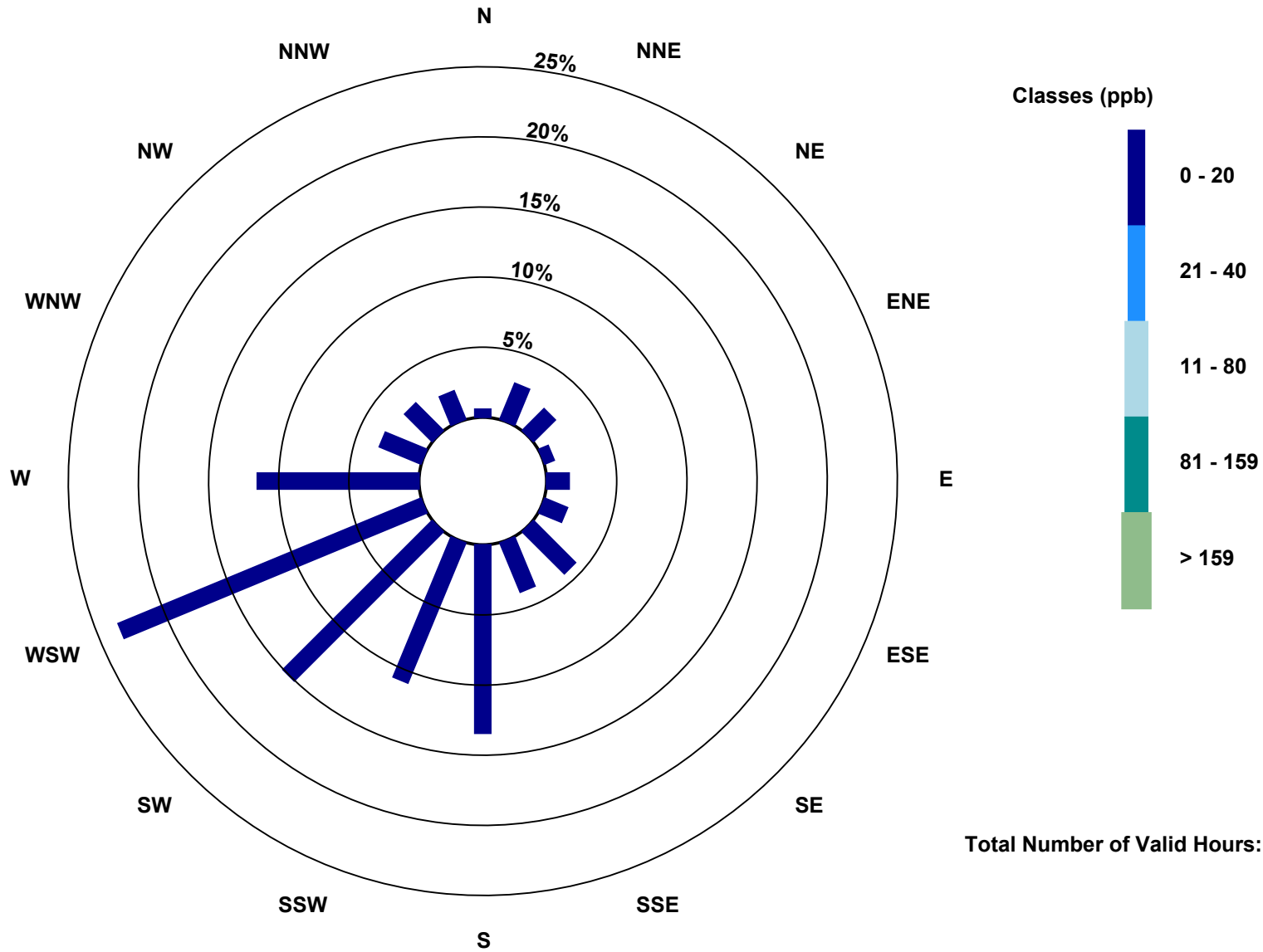
Total Number of Valid Hours: 685

Total Number of Hours: 720

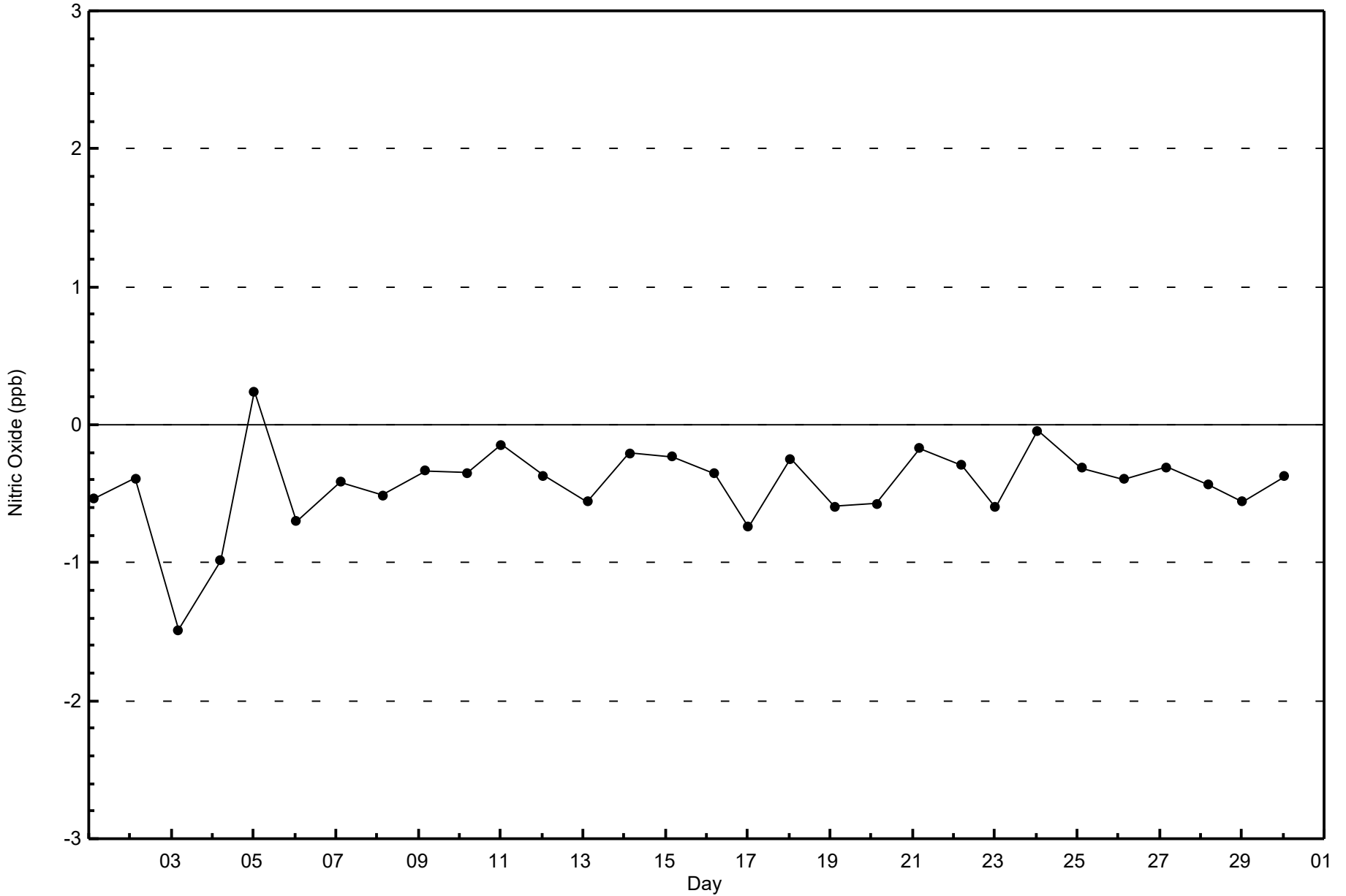


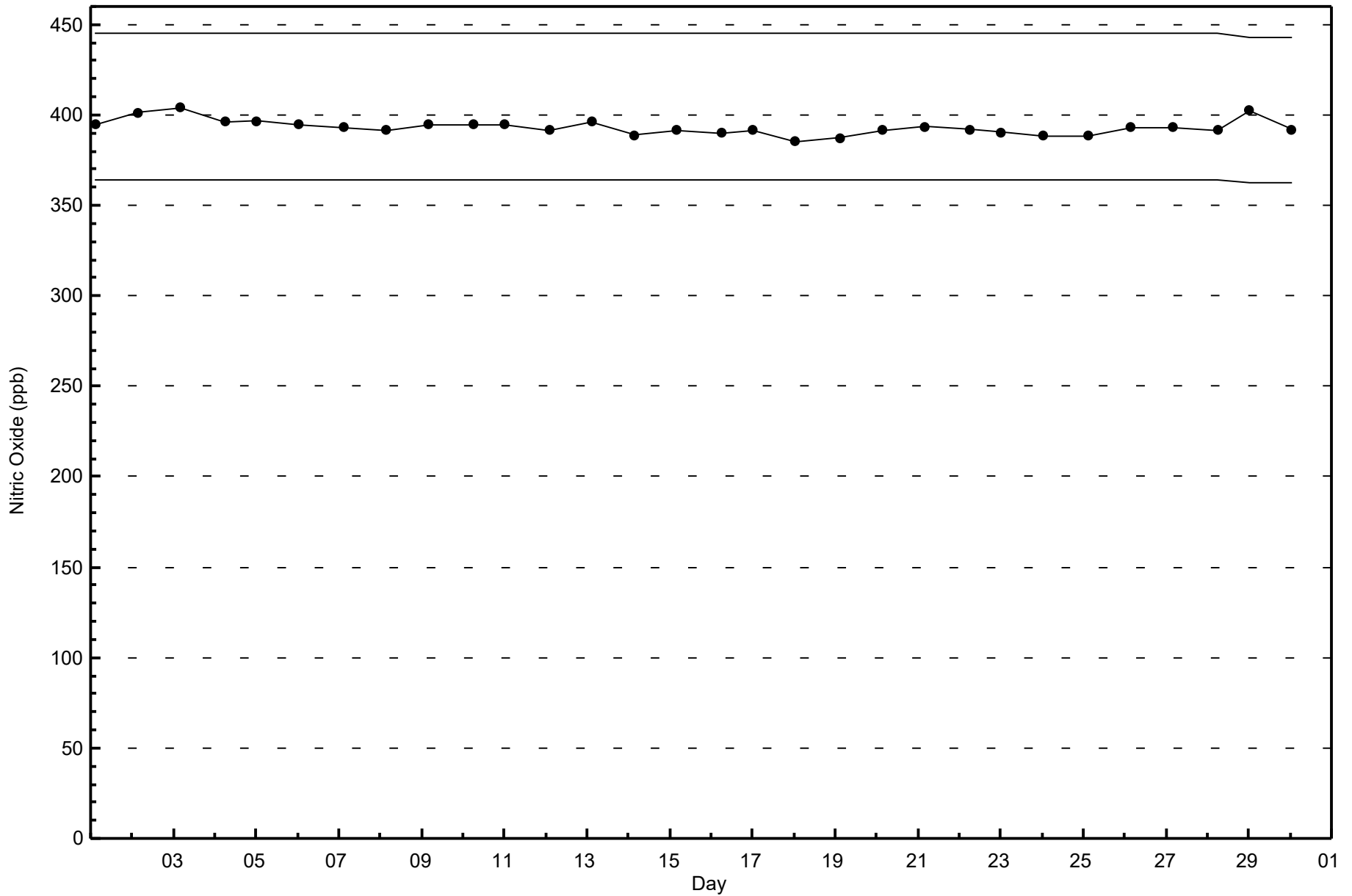
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitric Oxide (NO) - ppb
Jackfish 2/3



Total Number of Valid Hours: 685







Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

Jackfish 2/3 - September 2023

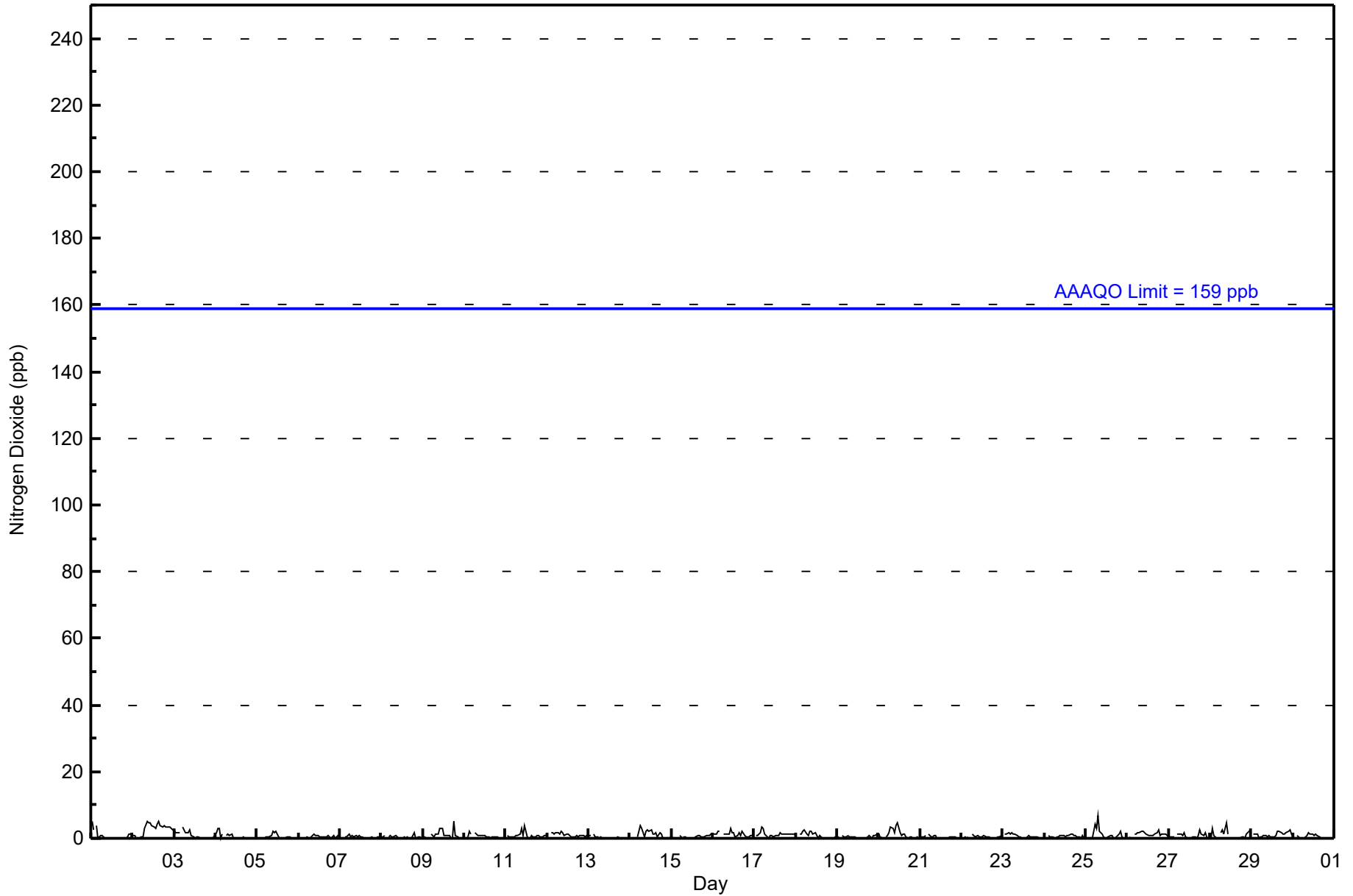
Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 720																	Daily Average		Daily Maximum				
Maximum Value: 6.9 ppb on Sep 25 08:00		Maximum Daily Average: 2.9 ppb on Sep 2		Hours of Data: 685																							
Minimum Value: 0.0 ppb on Sep 1 12:00		Minimum Daily Average: 0.2 ppb on Sep 13		Hours of Missing Data: 35																							
Maximum Diurnal Average: 1.4 ppb at hour 10		Minimum Diurnal Average: 0.5 ppb at hour 14		Hours of Calibration: 35																							
Monthly Average: 0.84 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.2 Median = 0.6 Q ₃ = 1.1 P ₉₀ = 2.0 P ₉₉ = 4.7		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-Sep	5.2	2.5	Z	3.7	0.2	0.9	0.8	0.3	0.1	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.5	1.3	1.2	0.8	5.2		
2-Sep	0.8	0.8	0.5	Z	0.5	0.6	0.6	2.8	4.9	4.7	4.5	3.7	3.4	3.1	4.2	5.1	3.8	3.6	3.8	3.3	3.5	3.3	2.8	2.5	2.9	5.1	
3-Sep	2.4	1.9	1.8	1.7	Z	3.3	1.9	1.9	1.9	2.6	1.0	0.3	0.1	0.6	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1.0	3.3	
4-Sep	1.9	2.9	3.0	0.0	1.2	Z	0.8	1.2	0.9	1.3	0.0	0.0	0.0	0.0	0.1	0.4	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.6	3.0	
5-Sep	Z	0.0	0.0	0.0	0.2	0.5	0.5	0.3	0.7	2.3	1.7	2.3	0.4	0.1	0.0	0.0	0.1	0.6	0.4	0.3	0.1	0.2	0.0	0.0	0.5	2.3	
6-Sep	0.0	Z	0.1	0.0	0.0	0.5	0.2	0.5	0.8	1.3	0.7	0.7	0.6	0.6	0.5	0.6	0.3	0.7	0.4	0.0	0.8	0.1	0.5	0.8	0.5	1.3	
7-Sep	0.1	0.1	Z	0.6	0.3	1.1	0.6	0.8	0.6	0.7	0.4	0.7	0.3	0.3	0.2	0.1	0.0	0.0	0.6	0.1	0.1	0.1	0.4	0.4	0.4	1.1	
8-Sep	0.4	0.4	0.9	Z	0.5	0.8	0.4	0.5	0.7	0.4	0.1	0.2	0.1	0.4	0.0	0.3	0.0	0.0	1.0	1.9	0.2	0.5	0.5	0.1	0.4	1.9	
9-Sep	0.1	0.4	0.2	0.0	Z	1.1	0.4	1.1	1.4	1.3	2.8	2.8	0.8	0.7	0.8	0.7	0.2	0.2	5.0	1.0	0.5	0.0	0.0	0.0	0.9	5.0	
10-Sep	0.0	0.1	0.5	2.2	1.3	Z	1.6	1.3	0.9	0.9	0.8	0.9	0.8	0.4	0.6	0.2	0.4	0.4	0.6	0.4	0.1	0.1	0.0	0.6	0.7	2.2	
11-Sep	Z	0.8	0.5	0.4	0.5	0.5	0.9	1.0	1.1	3.0	1.0	3.9	0.3	0.2	0.0	0.7	0.5	0.6	0.7	0.9	0.4	0.5	0.9	0.8	0.9	3.9	
12-Sep	1.1	Z	1.6	1.6	1.3	1.9	1.5	1.4	2.0	1.6	0.9	1.1	1.3	0.9	0.5	0.6	0.6	0.8	0.5	0.7	0.8	0.9	0.5	0.7	1.1	2.0	
13-Sep	0.7	0.9	Z	1.4	0.5	0.5	0.2	0.4	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.4	
14-Sep	0.0	0.0	0.0	Z	0.4	2.0	4.0	3.1	0.3	2.1	2.4	2.1	2.5	1.1	1.2	1.8	0.5	1.6	1.1	0.0	0.0	0.0	0.0	0.0	1.1	4.0	
15-Sep	0.7	0.0	0.0	0.0	Z	0.7	0.0	0.6	0.6	0.1	0.0	0.0	0.0	0.2	0.4	0.7	0.7	0.4	0.3	0.5	0.8	1.0	1.4	0.4	1.4		
16-Sep	1.4	1.2	1.3	2.1	2.0	Z	1.4	1.3	1.1	1.4	3.0	1.5	1.8	0.5	1.0	1.7	0.9	2.2	0.8	0.4	0.4	0.6	0.8	0.7	1.3	3.0	
17-Sep	Z	0.9	0.8	1.5	3.2	2.9	1.2	0.8	0.2	0.9	0.9	0.5	0.9	0.7	1.0	1.8	1.4	1.4	1.4	1.4	1.4	1.1	1.2	1.1	1.2	3.2	
18-Sep	0.9	Z	1.1	1.2	2.1	2.6	1.3	0.8	2.0	2.0	1.4	1.8	1.0	0.0	0.9	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.4	0.9	2.6		
19-Sep	0.3	0.0	Z	0.8	0.4	0.5	0.8	0.5	0.6	0.4	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.9	0.3	0.0	0.7	0.9	1.2	0.4	1.2	
20-Sep	1.2	0.0	0.3	Z	0.5	0.8	1.9	3.5	2.9	1.5	3.8	4.8	1.9	0.8	1.3	1.3	0.6	0.1	0.6	0.5	0.2	0.2	0.4	0.2	1.3	4.8	
21-Sep	0.5	0.4	0.6	1.0	Z	1.2	0.3	0.6	0.9	0.9	0.2	0.1	0.0	0.0	0.2	0.0	0.0	0.4	0.6	0.5	0.5	0.1	0.1	0.2	0.4	1.2	
22-Sep	0.2	0.2	0.6	0.2	0.5	Z	1.2	0.7	0.5	0.8	0.6	0.6	0.6	0.9	0.5	0.5	0.3	0.0	0.1	0.2	0.2	0.5	0.5	0.7	0.5	1.2	
23-Sep	Z	1.4	1.3	1.5	1.4	1.5	1.1	1.3	0.8	0.5	0.4	0.1	0.0	0.1	0.3	0.9	0.3	0.5	0.4	0.5	0.3	0.1	0.2	0.2	0.7	1.5	
24-Sep	0.3	Z	0.8	0.4	0.4	0.6	0.1	0.5	0.6	1.0	0.7	0.7	0.6	0.7	0.8	1.4	1.3	0.8	0.7	0.6	0.3	0.1	1.0	0.2	0.6	1.4	
25-Sep	0.0	0.0	Z	0.0	0.2	4.4	3.1	6.9	2.1	1.1	0.3	0.1	0.1	0.3	0.7	0.7	0.0	0.0	1.0	1.1	2.0	0.4	0.0	0.0	1.1	6.9	
26-Sep	0.0	0.2	0.4	Z	1.1	1.1	1.6	1.6	2.2	2.1	1.7	1.2	1.0	0.7	0.8	0.9	1.2	1.8	2.7	0.8	1.3	1.4	1.3	1.0	1.2	2.7	
27-Sep	0.6	0.6	0.4	0.5	Z	1.2	1.3	1.1	0.8	1.5	0.3	0.0	0.0	0.1	0.4	0.4	0.0	0.9	2.4	1.1	0.8	1.8	0.4	0.0	0.7	2.4	
28-Sep	0.0	2.9	0.9	0.4	0.0	Z	1.5	2.5	1.3	4.8	1.3	C	C	C	C	C	0.0	0.0	0.3	0.3	0.2	1.1	1.9	2.4	1.2	4.8	
29-Sep	Z	1.1	1.4	1.2	0.1	0.5	0.6	0.9	0.8	0.5	0.7	0.6	0.5	0.4	0.7	2.0	2.1	1.7	1.4	1.1	1.7	2.1	2.4	1.1	1.1	2.4	
30-Sep	0.6	Z	0.8	0.5	0.0	0.0	0.0	0.3	0.9	1.5	1.2	1.2	0.9	1.3	0.7	0.3	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.5	
																								Diurnal Average		Diurnal Maximum	
																								0.8		5.2	
																								0.8		2.9	
																								0.8		3.0	
																								0.9		3.7	
																								0.8		3.2	
																								1.3		4.4	
																								1.1		4.0	
																								1.4		6.9	
																								1.2		4.9	
																								1.4		4.8	
																								1.1		4.5	
																								1.1		4.8	
																								0.7		3.4	
																								0.5		3.1	
																								0.6		4.2	
																								0.8		5.1	
																								0.5		3.8	
																								0.6		3.6	
																								0.9		5.0	
																								0.6		3.3	
																								0.6		3.5	
																								0.6		3.3	
																								0.6		2.8	
																								0.6		2.5	

Z - zeronspan 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 - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Dioxide (NO₂) - ppb
Jackfish 2/3 - September 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	685	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: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Jackfish 2/3 - September 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	4	19	15	5	11	12	29	26	92	74	103	160	79	22	19	15	685
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	4	19	15	5	11	12	29	26	92	74	103	160	79	22	19	15	685

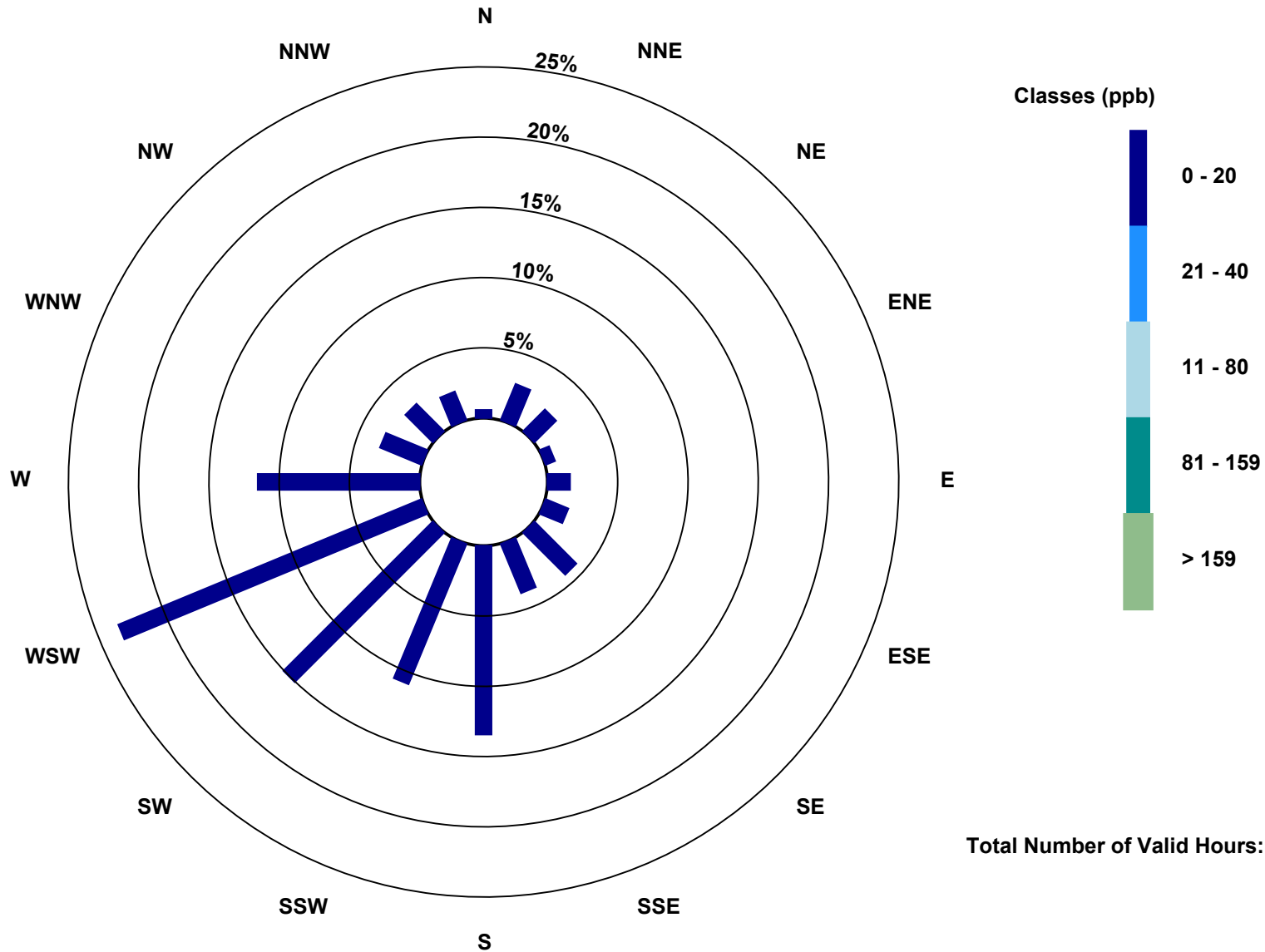
Total Number of Valid Hours: 685

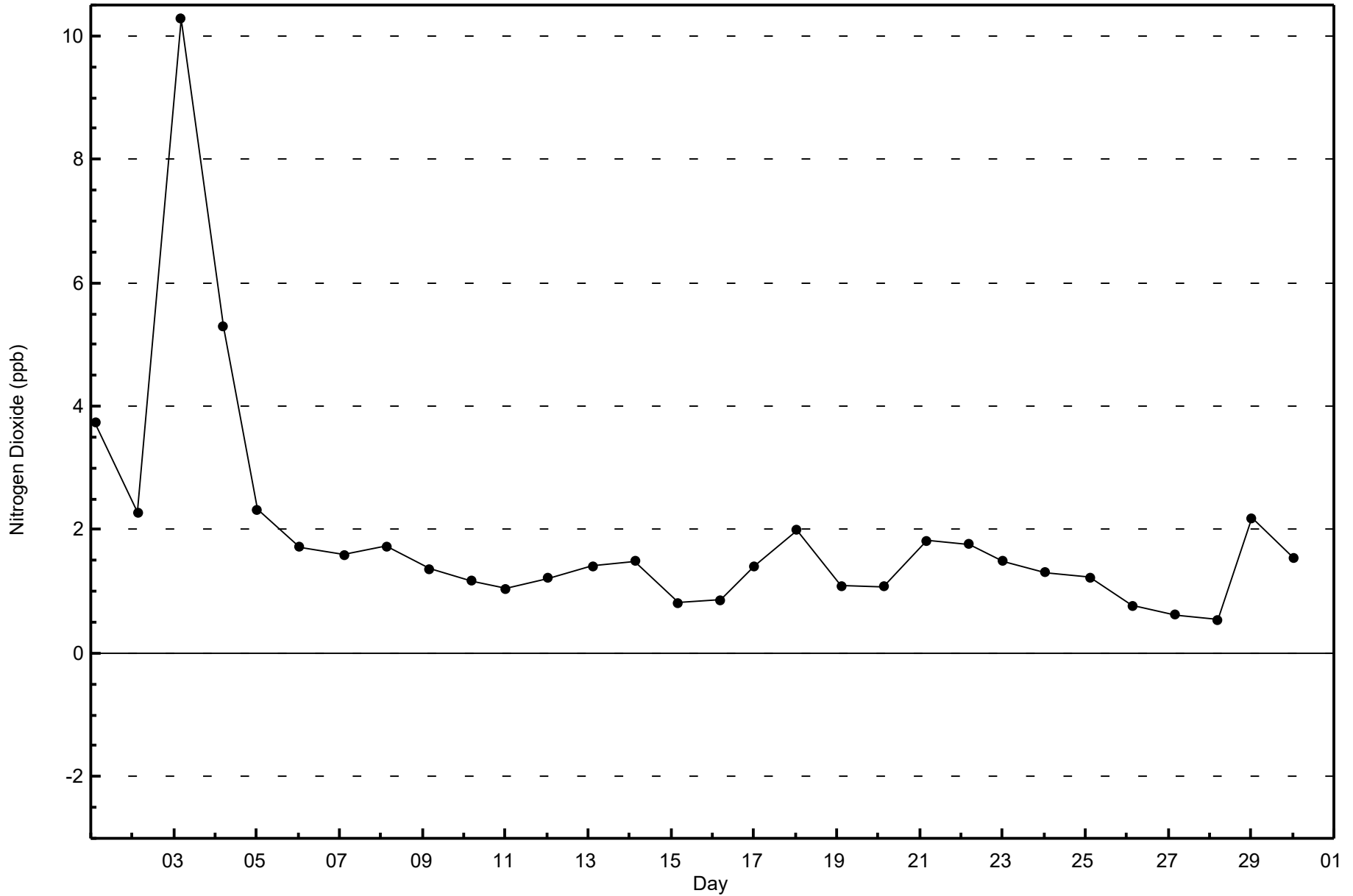
Total Number of Hours: 720

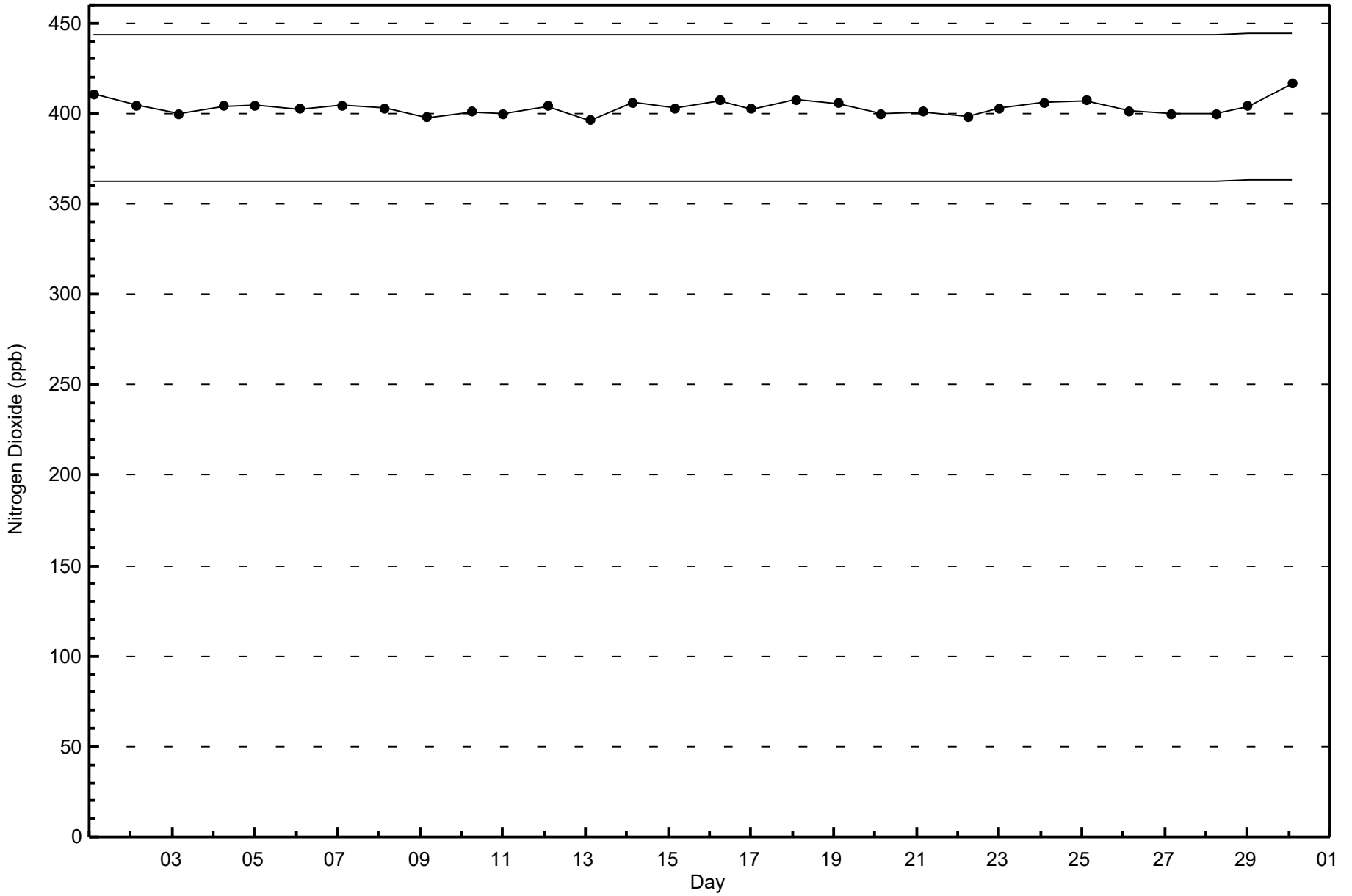


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitrogen Dioxide (NO₂) - ppb
Jackfish 2/3









Wood Buffalo Environmental Association
Summary of Hour Averages

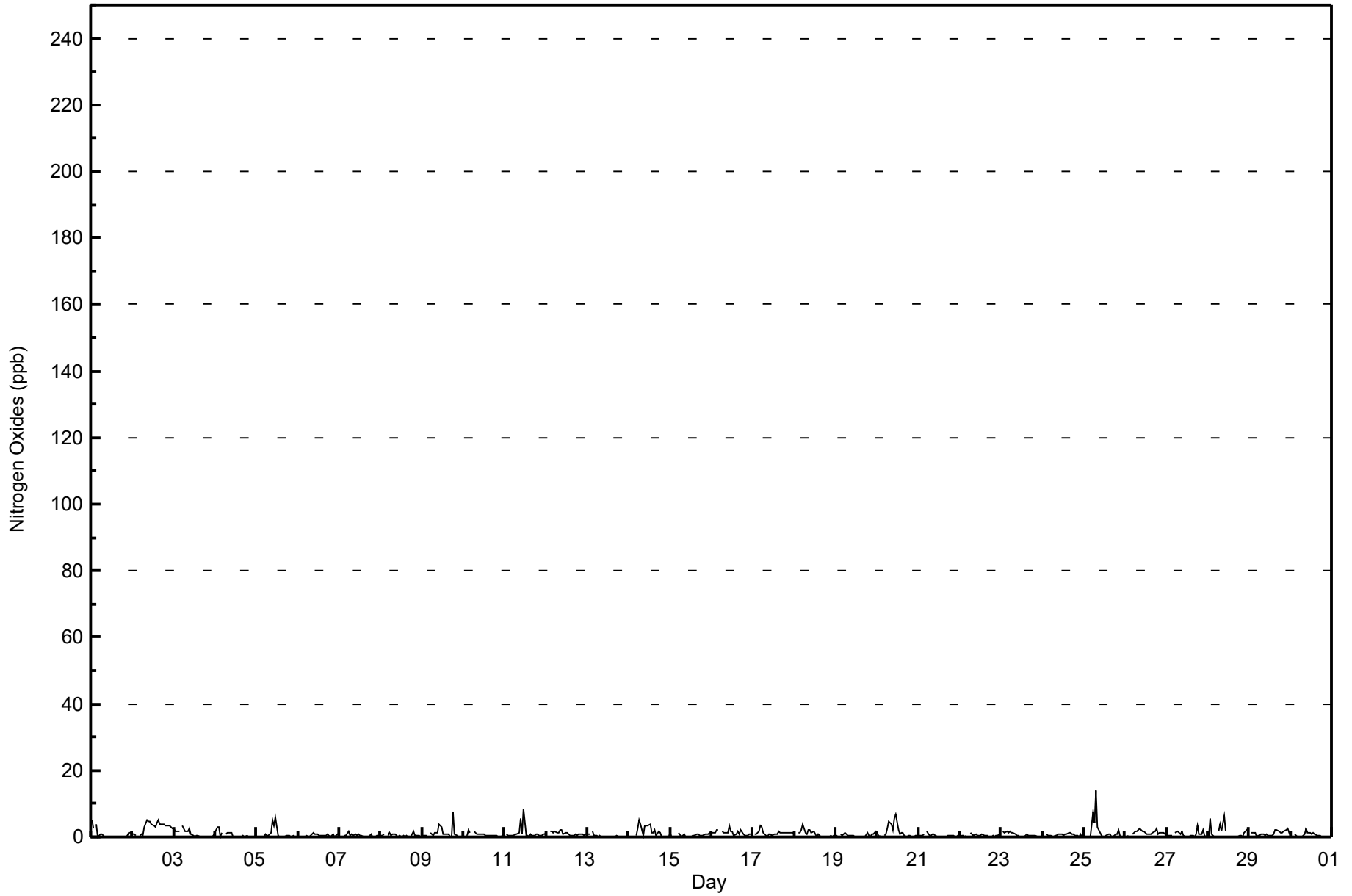
Nitrogen Oxides (NO_x) - ppb
Jackfish 2/3 - September 2023

Maximum Value: 13.9 ppb on Sep 25 08:00 Maximum Daily Average: 2.9 ppb on Sep 2																				Hours in Service: 720 Hours of Data: 685						
Minimum Value: 0.0 ppb on Sep 1 12:00 Minimum Daily Average: 0.2 ppb on Sep 13 Maximum Diurnal Average: 1.8 ppb at hour 10 Minimum Diurnal Average: 0.5 ppb at hour 14 Monthly Average: 0.94 ppb Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.2 Median = 0.6 Q ₃ = 1.2 P ₉₀ = 2.1 P ₉₉ = 5.6																				Hours of Missing Data: 35 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-Sep	5.2	2.5	Z	3.9	0.2	1.0	0.8	0.3	0.1	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.5	1.3	1.2	0.8	5.2	
2-Sep	0.8	0.8	0.5	Z	0.5	0.6	0.6	2.9	4.9	4.7	4.5	3.7	3.4	3.1	4.2	5.1	3.8	3.6	3.8	3.3	3.5	3.3	2.8	2.5	2.9	5.1
3-Sep	2.4	1.9	1.8	1.7	Z	3.4	1.9	1.9	1.9	2.6	1.0	0.3	0.1	0.6	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1.0	3.4
4-Sep	1.9	2.9	3.0	0.0	1.2	Z	0.8	1.2	1.2	1.3	0.0	0.0	0.0	0.0	0.1	0.4	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.6	3.0
5-Sep	Z	0.0	0.0	0.0	0.2	0.8	0.6	0.3	1.2	5.1	3.4	5.8	0.4	0.1	0.0	0.0	0.1	0.6	0.4	0.3	0.1	0.2	0.0	0.0	0.8	5.8
6-Sep	0.0	Z	0.1	0.0	0.0	0.5	0.2	0.5	0.8	1.5	0.7	0.7	0.6	0.6	0.5	0.6	0.3	0.7	0.4	0.0	0.8	0.1	0.5	0.8	0.5	1.5
7-Sep	0.1	0.1	Z	0.6	0.3	1.5	0.6	0.8	0.6	0.7	0.4	0.7	0.3	0.3	0.2	0.1	0.0	0.0	0.7	0.1	0.1	0.1	0.4	0.4	0.4	1.5
8-Sep	0.4	0.4	0.9	Z	0.6	1.1	0.4	0.6	0.8	0.4	0.1	0.2	0.1	0.4	0.0	0.3	0.0	0.0	1.0	1.9	0.2	0.5	0.5	0.1	0.5	1.9
9-Sep	0.1	0.4	0.2	0.0	Z	1.1	0.4	1.1	1.4	1.3	3.7	3.1	0.8	0.7	0.8	0.7	0.2	0.2	7.7	1.0	0.5	0.0	0.0	0.0	1.1	7.7
10-Sep	0.0	0.1	0.5	2.2	1.3	Z	1.7	1.3	0.9	0.9	0.8	0.9	0.8	0.4	0.6	0.2	0.4	0.4	0.6	0.4	0.1	0.1	0.0	0.6	0.7	2.2
11-Sep	Z	0.8	0.5	0.4	0.5	0.5	0.9	1.0	1.1	5.5	1.0	8.3	0.3	0.2	0.0	0.7	0.5	0.6	0.7	0.9	0.4	0.5	0.9	0.8	1.2	8.3
12-Sep	1.1	Z	1.6	1.6	1.3	1.9	1.5	1.4	2.0	1.9	0.9	1.1	1.4	0.9	0.5	0.6	0.6	0.8	0.5	0.7	0.8	0.9	0.5	0.7	1.1	2.0
13-Sep	0.7	0.9	Z	1.7	0.5	0.5	0.2	0.4	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.2	1.7
14-Sep	0.0	0.0	0.0	Z	0.6	2.5	5.0	3.8	0.3	3.2	3.5	3.3	3.8	1.1	1.4	2.3	0.5	1.6	1.1	0.0	0.0	0.0	0.0	0.0	1.5	5.0
15-Sep	1.4	0.0	0.0	0.0	Z	1.2	0.0	0.6	0.7	0.1	0.0	0.0	0.0	0.2	0.4	0.7	0.7	0.4	0.3	0.5	0.8	1.0	1.4	0.5	1.4	
16-Sep	1.4	1.2	1.3	2.1	2.0	Z	1.5	1.3	1.2	1.4	3.2	1.5	1.8	0.5	1.0	1.7	0.9	2.2	0.8	0.4	0.4	0.6	0.8	0.7	1.3	3.2
17-Sep	Z	0.9	0.8	1.5	3.2	2.9	1.2	0.8	0.2	0.9	0.9	0.5	0.9	0.7	1.0	1.8	1.4	1.4	1.4	1.4	1.4	1.1	1.2	1.1	1.2	3.2
18-Sep	0.9	Z	1.1	1.2	2.1	3.8	1.3	0.8	2.3	2.0	1.4	1.8	1.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.4	0.9	3.8
19-Sep	0.3	0.0	Z	0.8	0.4	1.1	0.8	0.5	0.6	0.4	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.1	1.2	0.3	0.0	0.7	0.9	1.7	0.4	1.7
20-Sep	1.4	0.0	0.3	Z	0.5	1.0	2.6	4.6	3.9	1.9	5.6	6.9	2.2	0.8	1.3	1.3	0.6	0.1	0.6	0.5	0.2	0.2	0.4	0.2	1.6	6.9
21-Sep	0.5	0.4	0.6	1.0	Z	1.8	0.3	0.6	1.0	0.9	0.2	0.1	0.0	0.0	0.2	0.0	0.0	0.4	0.6	0.5	0.5	0.1	0.1	0.2	0.4	1.8
22-Sep	0.2	0.2	0.6	0.2	0.5	Z	1.2	0.7	0.5	0.8	0.6	0.6	0.6	0.9	0.5	0.5	0.3	0.0	0.1	0.2	0.2	0.5	0.5	0.7	0.5	1.2
23-Sep	Z	1.6	1.3	1.5	1.4	1.5	1.1	1.3	0.8	0.5	0.4	0.1	0.0	0.1	0.3	0.9	0.3	0.5	0.4	0.5	0.3	0.1	0.2	0.2	0.7	1.6
24-Sep	0.3	Z	0.8	0.4	0.4	0.6	0.1	0.5	0.6	1.0	0.7	0.7	0.6	0.7	0.8	1.4	1.3	0.8	0.7	0.6	0.3	0.1	1.0	0.2	0.6	1.4
25-Sep	0.0	0.0	Z	0.0	0.2	7.6	4.4	13.9	3.0	1.4	0.3	0.1	0.1	0.3	0.7	0.7	0.0	0.0	1.0	1.1	2.0	0.4	0.0	0.0	1.6	13.9
26-Sep	0.0	0.2	0.4	Z	1.1	1.1	1.6	1.6	2.6	2.2	1.8	1.5	1.0	0.7	0.8	0.9	1.2	1.8	2.7	0.8	1.3	1.4	1.3	1.0	1.3	2.7
27-Sep	0.6	0.6	0.4	0.5	Z	1.2	1.5	1.1	0.8	1.7	0.3	0.0	0.0	0.1	0.4	0.4	0.0	1.0	3.5	1.1	0.8	2.2	0.4	0.0	0.8	3.5
28-Sep	0.0	5.6	0.9	0.4	0.0	Z	1.7	3.9	1.8	6.5	1.6	C	C	C	C	C	0.0	0.0	0.3	0.3	0.2	1.1	1.9	2.4	1.6	6.5
29-Sep	Z	1.1	1.4	1.2	0.1	0.5	0.6	0.9	0.8	0.5	0.7	0.6	0.5	0.4	0.7	2.0	2.1	1.7	1.4	1.1	1.7	2.1	2.4	1.1	2.4	
30-Sep	0.6	Z	0.8	0.5	0.0	0.0	0.0	0.3	1.0	2.3	1.3	1.3	0.9	1.4	0.7	0.3	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.5	2.3
																								Diurnal Average		
																								Diurnal Maximum		
																								0.8 0.9 0.8 0.9 0.8 1.6 1.2 1.7 1.3 1.8 1.3 1.5 0.7 0.5 0.6 0.8 0.5 0.6 1.1 0.6 0.6 0.6 0.6 0.6 0.6 0.6		
																								5.2 5.6 3.0 3.9 3.2 7.6 5.0 13.9 4.9 6.5 5.6 8.3 3.8 3.1 4.2 5.1 3.8 3.6 7.7 3.3 3.5 3.3 2.8 2.5		
Z - zerospan C - Calibration																										



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Jackfish 2/3 - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Jackfish 2/3 - September 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	685	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: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Jackfish 2/3 - September 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	4	19	15	5	11	12	29	26	92	74	103	160	79	22	19	15	685
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	4	19	15	5	11	12	29	26	92	74	103	160	79	22	19	15	685

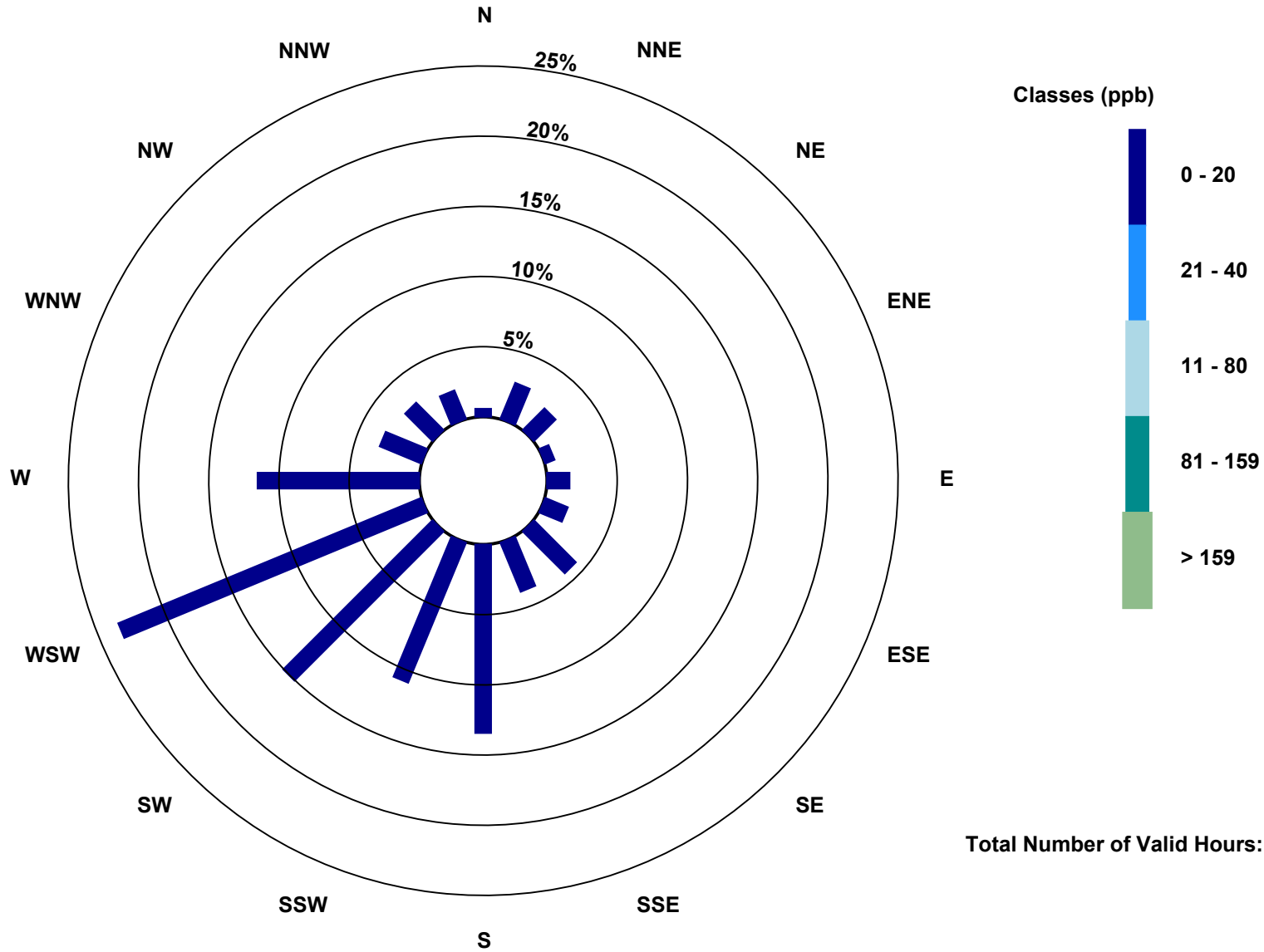
Total Number of Valid Hours: 685

Total Number of Hours: 720

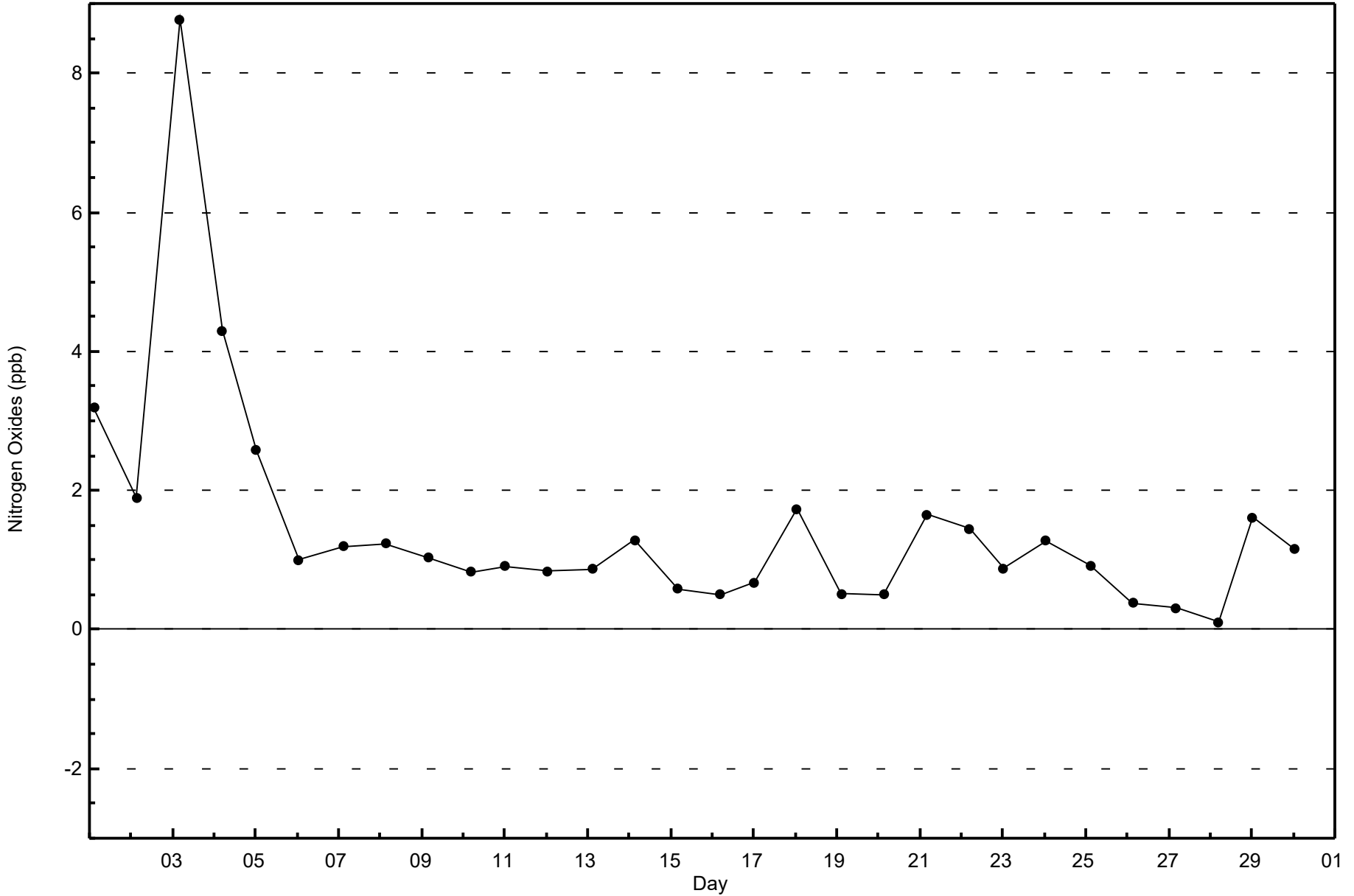


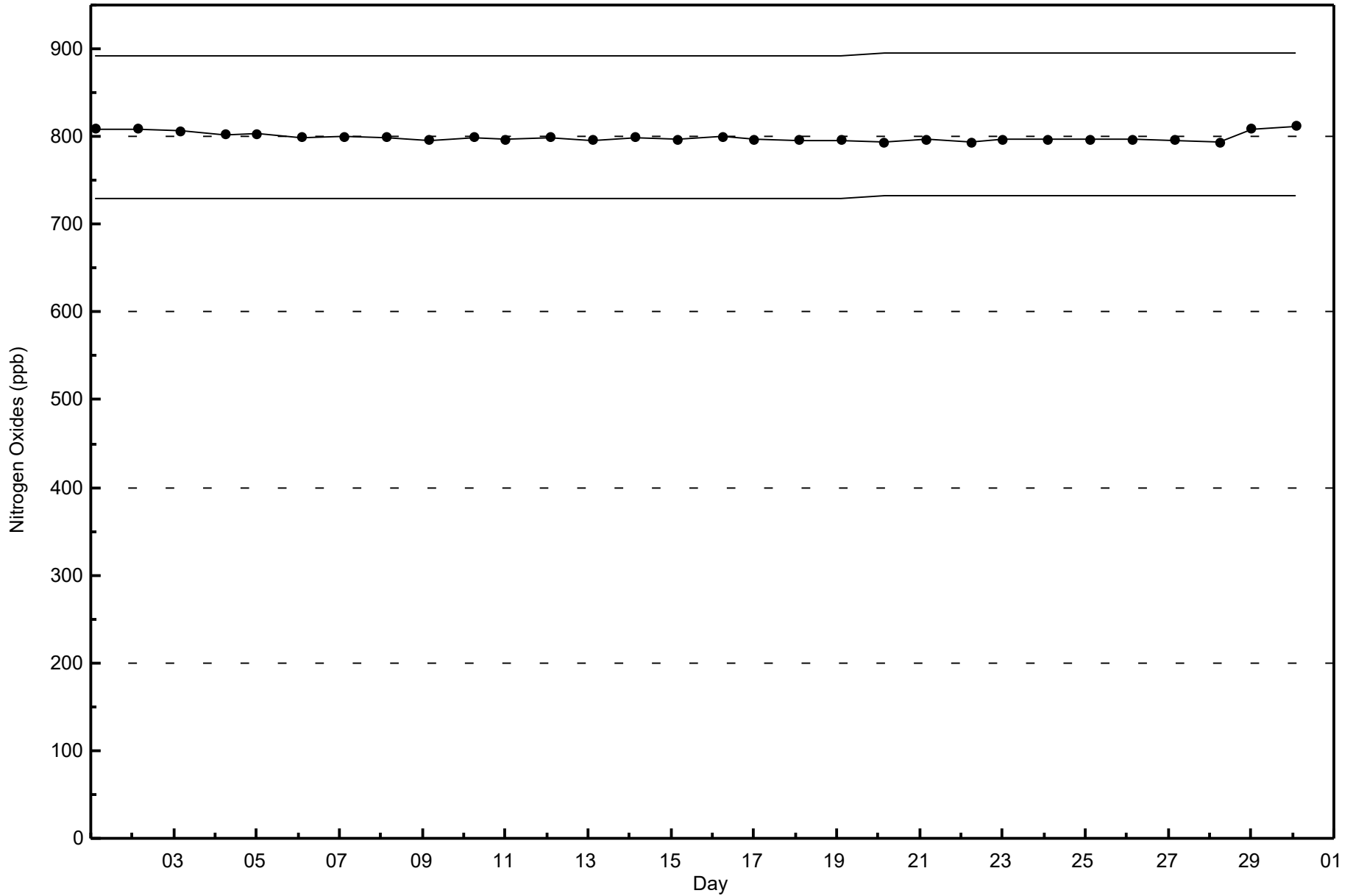
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitrogen Oxides (NO_x) - ppb
Jackfish 2/3



Total Number of Valid Hours: 685







Wood Buffalo Environmental Association
Summary of Hour Averages

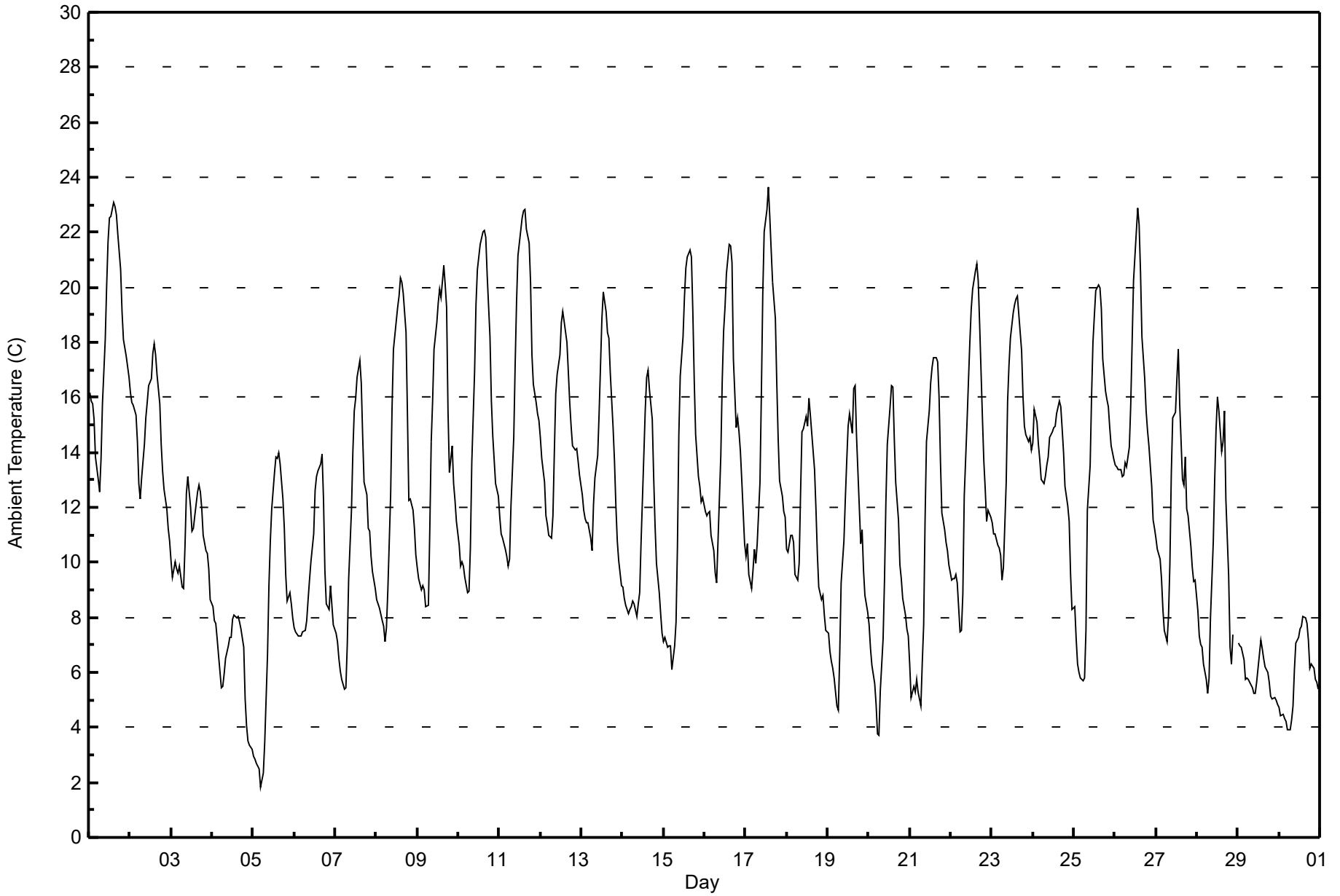
Ambient Temperature (AT) - C
Jackfish 2/3 - September 2023

Maximum Value: 23.6 C on Sep 17 14:00		Maximum Daily Average: 18.2 C on Sep 1		Hours in Service: 720																						
Minimum Value: 1.8 C on Sep 5 05:00		Minimum Daily Average: 5.9 C on Sep 30		Hours of Data: 718																						
Maximum Diurnal Average: 17.2 C at hour 15		Minimum Diurnal Average: 8.0 C at hour 7		Hours of Missing Data: 2																						
Monthly Average: 12.23 C		Percentiles: P ₁ = 3.2 P ₁₀ = 6.2 Q ₁ = 8.4 Median = 11.9 Q ₃ = 15.5 P ₉₀ = 19.2 P ₉₉ = 22.6		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-Sep	16.2	15.8	15.8	15.2	13.8	13.0	12.6	13.8	15.7	18.1	20.0	21.6	22.5	22.6	23.1	22.9	22.6	21.9	20.6	19.1	18.1	17.8	17.5	16.7	18.2	23.1
2-Sep	16.2	15.8	15.7	15.4	14.4	12.9	12.3	13.1	14.3	15.3	15.8	16.4	16.7	17.6	17.9	17.6	16.8	15.8	14.3	13.3	12.7	11.9	11.2	10.8	14.8	17.9
3-Sep	10.1	9.4	10.0	9.8	9.6	9.8	9.1	9.0	10.6	12.5	13.1	12.0	11.1	11.2	11.7	12.5	12.8	12.6	12.0	11.0	10.4	10.3	9.7	8.7	10.8	13.1
4-Sep	8.4	7.9	7.8	7.2	6.6	5.5	5.5	5.9	6.5	7.0	7.3	7.3	7.9	8.1	8.0	8.0	7.8	7.6	6.9	5.0	4.1	3.5	3.4	3.2	6.5	8.4
5-Sep	2.9	2.8	2.7	2.5	1.8	2.1	2.4	3.5	6.6	9.1	10.8	12.0	13.3	13.8	13.8	14.0	13.6	12.3	11.2	9.6	8.6	8.9	8.5	8.0	8.1	14.0
6-Sep	7.6	7.5	7.3	7.3	7.3	7.5	7.5	7.9	8.6	9.4	10.0	11.0	12.6	13.1	13.3	13.6	13.9	12.3	9.7	8.5	8.3	9.2	8.4	7.7	9.6	13.9
7-Sep	7.4	7.1	6.5	6.0	5.8	5.4	5.5	7.0	9.4	11.9	14.0	15.5	16.0	16.7	17.4	16.5	14.6	12.9	12.4	11.2	11.2	10.2	9.7	9.1	10.8	17.4
8-Sep	8.7	8.5	8.3	7.9	7.7	7.1	7.6	9.0	12.4	15.6	17.7	18.3	19.3	19.7	20.3	20.2	19.8	18.4	15.4	12.3	12.3	11.9	11.3	10.3	13.3	20.3
9-Sep	9.8	9.4	9.0	9.2	9.0	8.4	8.4	11.3	14.4	15.9	17.7	18.7	19.4	19.9	19.6	20.8	20.1	19.3	15.5	13.2	14.2	12.9	12.3	11.5	14.2	20.8
10-Sep	10.6	9.9	10.0	9.9	9.5	8.9	9.0	10.5	13.6	16.9	19.4	20.7	21.1	21.6	22.0	22.0	21.8	20.4	18.2	15.9	14.6	13.7	12.8	12.4	15.2	22.0
11-Sep	11.7	11.0	10.9	10.5	10.2	9.9	10.1	12.0	14.5	17.2	19.5	21.1	22.1	22.6	22.8	22.8	22.1	21.6	20.2	17.5	16.5	15.8	15.4	15.1	16.4	22.8
12-Sep	14.6	13.8	12.9	11.7	11.4	11.0	10.9	11.7	14.0	16.1	16.9	17.5	18.7	19.1	18.7	18.0	17.0	15.8	14.9	14.2	14.1	14.1	13.7	13.2	14.8	19.1
13-Sep	12.5	11.9	11.6	11.5	11.4	10.9	10.4	12.1	13.1	13.9	15.4	17.1	18.9	19.8	19.1	18.3	18.2	16.9	14.9	13.7	12.0	10.8	10.1	9.2	13.9	19.8
14-Sep	9.1	8.7	8.4	8.1	8.3	8.4	8.6	8.5	8.1	8.5	8.9	10.7	13.9	15.6	16.7	17.0	16.3	15.2	13.1	11.4	9.9	8.9	8.1	7.4	10.7	17.0
15-Sep	7.1	7.3	6.9	7.0	7.0	6.1	6.9	7.8	10.6	14.7	16.8	18.2	19.6	20.7	21.1	21.4	21.1	19.1	16.6	14.7	13.1	12.8	12.2	12.3	13.4	21.4
16-Sep	11.9	11.7	11.8	11.8	11.0	10.4	9.6	9.3	10.8	13.9	16.6	18.4	19.3	20.5	21.6	21.5	20.9	17.4	14.9	15.2	14.7	14.1	12.9	10.7	14.6	21.6
17-Sep	10.2	10.7	9.6	9.1	9.7	10.5	10.0	10.7	12.9	16.2	19.8	22.0	22.8	23.6	22.6	21.4	20.2	18.8	16.5	14.5	12.9	12.4	11.8	11.7	15.0	23.6
18-Sep	10.5	10.4	11.0	11.0	10.7	9.6	9.3	10.0	12.5	14.7	14.8	15.3	14.9	16.0	15.4	14.0	13.4	12.0	10.3	9.1	8.6	8.8	8.1	7.5	11.6	16.0
19-Sep	7.4	6.8	6.4	6.1	5.8	4.8	4.6	6.7	9.3	10.8	12.3	13.7	15.0	15.4	14.7	16.3	16.4	14.6	12.0	10.7	11.2	9.7	8.8	8.2	10.3	16.4
20-Sep	7.7	6.9	6.2	5.6	4.8	3.8	3.7	5.3	7.2	9.4	12.2	14.3	15.7	16.4	16.4	14.5	12.9	11.6	9.9	9.4	8.7	8.1	7.6	7.3	9.4	16.4
21-Sep	6.3	5.1	5.5	5.3	5.8	5.3	4.8	6.4	7.7	11.5	14.4	15.5	16.5	17.1	17.5	17.4	17.3	16.0	13.7	11.8	11.2	10.7	10.4	9.9	11.0	17.5
22-Sep	9.4	9.4	9.4	9.5	9.2	7.5	7.5	8.9	12.4	15.1	16.6	18.0	19.2	20.0	20.6	20.8	20.2	18.7	15.2	13.7	12.7	11.5	11.9	11.6	13.7	20.8
23-Sep	11.4	11.0	11.0	10.6	10.5	10.3	9.3	9.8	12.9	15.9	17.2	18.1	19.0	19.4	19.6	19.7	19.0	17.7	16.0	15.0	14.6	14.4	14.6	14.1	14.6	19.7
24-Sep	14.3	15.6	15.1	14.3	13.7	13.0	12.8	13.1	13.5	13.9	14.5	14.8	14.9	15.0	15.4	15.9	15.7	14.9	14.0	12.8	12.1	11.5	9.5	8.3	13.7	15.9
25-Sep	8.4	7.2	6.3	6.0	5.8	5.7	5.8	7.5	11.9	13.5	16.0	18.0	19.0	19.9	20.1	20.0	19.2	17.4	16.2	15.9	15.6	14.9	14.2	13.7	13.3	20.1
26-Sep	13.5	13.5	13.4	13.4	13.1	13.2	13.6	13.5	14.2	15.7	18.0	20.2	22.0	22.9	22.3	20.6	18.2	16.7	15.5	14.8	14.2	12.8	11.5	11.3	15.7	22.9
27-Sep	10.9	10.5	10.1	9.4	8.3	7.5	7.1	8.0	10.0	13.2	15.2	15.5	16.7	17.7	15.8	13.0	12.8	13.8	11.9	11.7	10.6	9.8	9.3	9.3	11.6	17.7
28-Sep	8.3	7.3	7.0	6.9	6.3	5.7	5.2	5.8	8.0	10.7	13.0	14.9	16.0	15.5	14.1	14.4	15.5	12.3	9.5	6.9	6.3	7.4	UO	UO	9.9	16.0
29-Sep	7.1	7.0	6.9	6.5	5.8	5.8	5.7	5.6	5.4	5.2	5.2	5.6	6.7	7.2	6.9	6.5	6.2	6.0	5.6	5.1	5.0	5.1	5.0	4.8	5.9	7.2
30-Sep	4.7	4.4	4.5	4.3	4.2	3.9	3.9	4.2	4.8	6.1	7.1	7.3	7.6	7.7	8.0	8.0	7.8	7.2	6.1	6.3	6.2	5.7	5.6	5.4	5.9	8.0
																								Diurnal Average		
																								Diurnal Maximum		
UO - Unstable Operation																										



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Jackfish 2/3 - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Jackfish 2/3 - September 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	262	36.49	36.49
10 - 20	405	56.41	92.90
> 20	51	7.10	100.00

Total Number of Valid Hours: 718

Total Number of Hours: 720



Wood Buffalo Environmental Association

Summary of Hour Averages

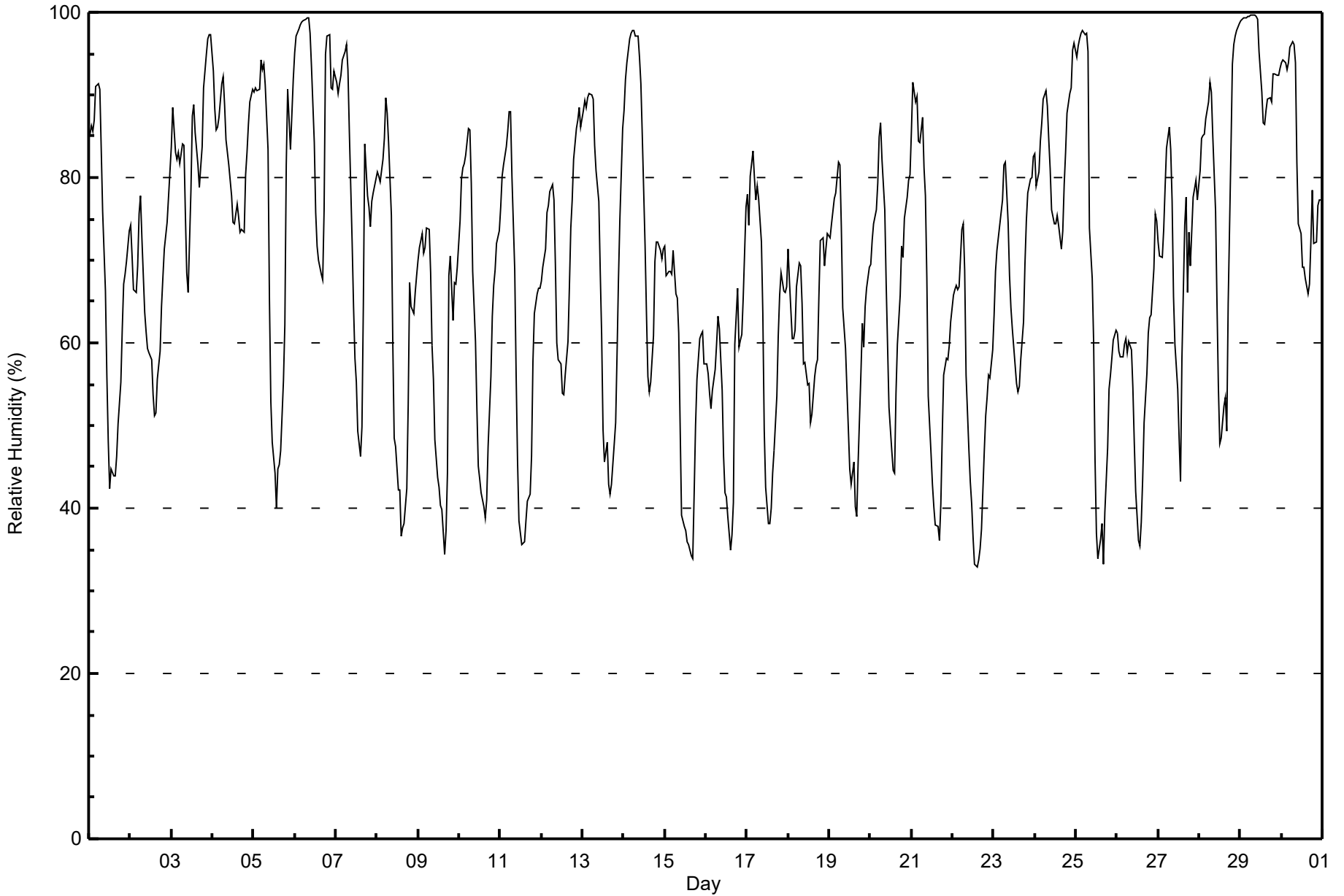
**Relative Humidity (RH) - %
Jackfish 2/3 - September 2023**

Maximum Value: 99.6 % on Sep 29 07:00																						Maximum Daily Average: 94.6 % on Sep 29																						Hours in Service: 720			
Minimum Value: 32.9 % on Sep 22 15:00																						Minimum Daily Average: 52.8 % on Sep 22																						Hours of Data: 720			
Maximum Diurnal Average: 84.7 % at hour 7																						Minimum Diurnal Average: 50.6 % at hour 14																						Hours of Missing Data: 0			
Monthly Average: 69.55 %																						Percentiles: P ₁ = 34.6 P ₁₀ = 43.3 Q ₁ = 56.3 Median = 70.7 Q ₃ = 83.7 P ₉₀ = 92.6 P ₉₉ = 99.3																						Hours of Calibration: 0			
																																												Percent Operational Time: 100.0			
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																							
1-Sep	85.3	86.2	85.7	87.0	91.0	91.3	90.6	83.4	75.9	66.3	56.1	48.1	42.4	44.7	44.0	43.9	46.3	50.1	55.3	61.6	67.2	68.3	69.8	73.6	67.3	91.3																					
2-Sep	74.2	70.6	66.5	66.1	69.3	75.6	77.8	72.7	63.8	61.4	59.4	58.9	58.0	53.7	51.2	51.6	55.7	58.9	64.3	67.9	71.4	74.5	77.7	80.7	65.9	80.7																					
3-Sep	83.8	88.5	83.1	82.2	83.1	81.7	84.1	83.9	75.7	68.5	66.1	78.5	87.5	88.8	85.4	81.5	78.8	81.4	83.7	90.8	95.0	96.8	97.3	97.3	84.3	97.3																					
4-Sep	92.9	88.3	85.7	86.0	87.3	91.3	92.1	88.9	84.5	81.6	79.7	77.7	74.5	74.4	76.8	75.2	73.3	73.7	73.3	80.3	83.1	86.4	89.2	90.7	82.8	92.9																					
5-Sep	90.4	90.8	90.6	90.6	94.2	93.0	93.7	91.2	83.4	65.2	52.8	47.9	44.3	40.0	44.7	45.3	47.0	55.5	62.2	81.5	90.7	83.4	87.7	91.9	73.2	94.2																					
6-Sep	95.0	97.1	98.0	98.4	98.7	99.0	99.1	99.3	99.3	97.5	93.4	84.3	75.8	71.7	70.0	68.3	67.6	76.0	94.9	97.2	97.3	90.9	90.8	92.9	89.7	99.3																					
7-Sep	91.5	90.2	91.3	92.4	94.2	95.3	96.1	93.1	85.7	72.2	64.4	58.2	55.3	49.3	46.2	49.9	64.5	84.1	77.7	76.5	74.0	77.1	78.2	79.8	76.5	96.1																					
8-Sep	80.7	80.2	79.5	82.2	84.7	89.6	87.7	84.2	75.3	60.1	48.5	47.4	42.2	42.2	36.6	37.6	38.2	42.4	52.5	67.3	64.3	63.5	66.1	68.1	63.4	89.6																					
9-Sep	70.0	71.5	73.2	70.9	71.6	73.9	73.8	68.5	59.7	55.5	48.2	43.8	42.5	40.4	39.8	34.5	37.2	44.3	68.1	70.5	62.7	67.3	67.1	69.1	59.3	73.9																					
10-Sep	74.7	79.9	81.2	81.7	82.7	86.0	85.8	79.4	68.6	60.1	52.1	45.0	43.6	41.8	40.1	38.8	40.9	47.4	55.9	63.2	67.0	68.9	72.0	73.6	63.8	86.0																					
11-Sep	76.5	80.2	81.5	83.8	85.6	88.0	88.0	80.2	68.8	56.2	45.7	38.4	35.6	35.8	35.9	38.4	40.9	41.7	46.3	57.8	63.5	66.0	66.5	66.7	61.2	88.0																					
12-Sep	67.5	69.1	71.4	75.7	76.6	78.2	79.1	77.2	69.5	60.0	57.9	57.5	53.8	53.8	56.1	60.2	66.8	73.9	77.3	82.2	86.0	86.9	88.4	86.0	71.3	88.4																					
13-Sep	88.2	89.3	88.5	89.7	90.3	90.1	89.5	83.9	80.9	77.2	68.7	60.9	49.5	45.7	48.0	42.8	41.6	43.0	47.8	50.3	58.6	67.7	74.9	85.9	68.9	90.3																					
14-Sep	88.2	91.9	93.8	96.8	97.5	97.9	97.8	97.2	97.1	94.6	91.4	85.2	71.7	63.4	55.9	54.0	55.2	60.9	69.8	72.2	72.3	71.1	70.1	71.4	79.9	97.9																					
15-Sep	71.7	68.1	68.6	68.7	68.3	71.1	66.0	65.5	61.1	50.1	39.1	37.8	37.3	35.9	35.6	34.2	33.9	41.7	50.1	55.6	60.6	61.1	61.4	57.5	54.2	71.7																					
16-Sep	57.5	56.3	53.8	52.0	54.3	56.8	59.8	63.3	61.7	54.2	46.3	41.9	41.4	39.0	34.9	36.8	40.7	59.8	66.6	59.6	60.3	61.1	65.4	76.4	54.2	76.4																					
17-Sep	77.9	74.2	80.3	83.2	79.9	77.3	79.1	77.5	72.2	63.6	49.5	42.6	38.1	38.1	39.9	44.2	47.0	53.5	60.9	65.8	68.5	66.3	66.2	66.7	63.0	83.2																					
18-Sep	71.3	67.5	60.5	60.6	61.5	66.8	69.7	69.4	64.7	57.4	57.6	54.9	55.1	50.3	51.4	55.9	57.2	57.9	65.6	72.3	72.7	69.3	71.4	73.2	63.1	73.2																					
19-Sep	72.7	74.3	75.9	77.5	78.1	81.8	81.5	74.0	64.3	59.3	54.4	49.7	44.7	42.8	45.7	40.2	38.9	45.6	56.4	62.4	59.6	64.3	66.7	69.1	61.7	81.8																					
20-Sep	69.5	72.5	74.4	76.1	79.4	85.0	86.6	82.3	76.1	67.1	59.6	52.2	47.0	44.6	44.2	53.8	59.8	65.8	71.7	70.3	75.1	77.6	79.7	80.3	68.8	86.6																					
21-Sep	85.6	91.5	89.1	89.9	84.5	84.3	87.3	81.2	77.8	67.9	53.6	46.6	42.8	40.2	37.9	37.8	36.1	40.5	48.9	56.1	58.1	58.1	59.6	62.5	63.2	91.5																					
22-Sep	65.8	66.4	67.0	66.5	66.7	73.8	74.4	68.9	56.1	47.1	43.2	40.5	36.4	33.3	32.9	33.7	35.2	37.5	47.0	51.3	53.4	56.0	55.7	59.1	52.8	74.4																					
23-Sep	63.3	68.6	71.2	74.3	75.7	77.4	81.6	81.9	74.5	68.1	64.2	61.8	57.2	55.1	54.0	54.8	57.9	62.5	69.4	74.8	78.1	79.9	80.0	82.5	69.5	82.5																					
24-Sep	83.0	78.9	80.7	84.3	86.7	89.4	90.5	88.7	84.7	81.0	76.1	74.4	74.4	75.4	74.2	71.4	73.5	79.2	83.1	87.7	90.1	90.8	95.5	96.2	82.9	96.2																					
25-Sep	94.6	95.9	96.8	97.5	97.8	97.4	97.5	95.2	73.9	67.8	60.1	46.0	37.0	33.9	36.3	38.1	33.2	39.4	47.3	54.5	56.0	58.1	60.4	61.6	65.7	97.8																					
26-Sep	61.1	58.9	58.2	58.2	59.9	60.6	58.9	60.2	59.1	54.6	47.9	42.0	36.1	35.5	38.3	43.6	50.4	56.2	61.2	63.1	63.4	69.0	75.7	74.8	56.1	75.7																					
27-Sep	72.2	70.5	70.3	73.7	78.8	83.6	86.1	83.5	77.2	65.5	59.8	54.4	48.4	43.3	58.1	74.2	77.6	66.2	73.3	69.3	77.6	78.6	79.6	77.2	70.8	86.1																					
28-Sep	80.8	84.8	85.1	85.3	87.1	89.2	91.5	90.3	85.0	75.9	64.9	54.8	47.9	48.4	52.3	53.4	49.3	64.8	83.6	93.7	96.0	97.1	97.9	98.6	77.4	98.6																					
29-Sep	99.0	99.1	99.3	99.3	99.4	99.5	99.6	99.6	99.6	99.6	99.6	99.1	95.2	90.3	86.7	86.4	88.2	89.5	89.6	89.2	92.6	92.6	92.4	92.3	93.2	94.6	99.6																				
30-Sep	93.9	94.2	93.9	93.1	93.9	95.8	96.4	96.2	93.9	81.9	74.4	73.2	69.1	69.2	67.8	66.0	67.2	72.2	78.4	72.0	72.3	76.5	77.3	77.3	81.1	96.4																					
																						79.3	79.8	79.8	80.8	81.9	84.0	84.7	82.0	75.7	67.9	61.1	56.7	52.7	50.6	50.7	51.6	53.4	58.9	66.1	70.7	72.9	74.2	76.0	77.8	Diurnal Average	
																						99.0	99.1	99.3	99.3	99.4	99.5	99.6	99.6	99.6	99.6	99.1	95.2	90.3	88.8	86.4	88.2	89.5	89.6	94.9	97.2	97.3	97.1	97.9	98.6	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Jackfish 2/3 - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Jackfish 2/3 - September 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	44	6.11	6.11
40 - 60	177	24.58	30.69
60 - 80	274	38.06	68.75
80 - 100	225	31.25	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Maximum Speed: 17 km/h on Sep 1 16:00	Maximum Daily Speed Average: 9.8 km/h on Sep 13	Hours in Service: 720
Minimum Speed Value: 0 km/h on Sep 30 05:00	Minimum Daily Speed Average: 0.8 km/h on Sep 9	Hours of Data: 720
Maximum Diurnal Speed Average: 5.3 km/h at hour 5	Minimum Diurnal Speed Average: 3.2 km/h at hour 19	Hours of Missing Data: 0
Monthly Average Velocity: 4.5 km/h 228.9 deg	Percentiles: P ₁ = 1 P ₁₀ = 4 Q ₁ = 5 Median = 6 Q ₃ = 8 P ₉₀ = 10 P ₉₉ = 14	Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Sep	WNW6	WNW7	WNW6	W5	W5	W6	WSW8	WSW8	WSW9	W9	W10	W12	W13	WSW14	WSW15	WSW17	SW16	WSW15	SW12	SW9	SW10	SW12	SW12	SW11	WSW9.7	WSW17	
2-Sep	WSW12	WSW12	WSW14	WSW12	W9	W7	W6	W6	W7	W7	W6	W7	W10	W8	W8	W8	WSW9	WSW9	WSW10	WSW10	WSW9	WSW8	SW8	WSW8	WSW8.5	WSW14	
3-Sep	SW8	SW7	SW8	SW7	SSW7	SSW7	S6	SSW6	SW6	WSW9	WSW14	WSW14	WSW11	WSW6	SW4	SSW4	SSW5	SW5	SW7	SW8	SW8	WSW10	W5	W5	SW7.1	WSW14	
4-Sep	W6	W6	WNW6	NW5	WNW5	W5	W6	W6	W7	WNW7	NW6	NW7	NW6	NW7	NW8	NW6	NW6	NW5	W4	WSW6	WSW7	WSW8	WSW8	WSW8	WNW5.7	WSW8	
5-Sep	WSW8	WSW7	WSW7	SW7	SW8	SW7	SSW7	SW6	SW6	SSW8	SSW8	SSW8	S7	S7	SSW6	SSE5	SE5	SE4	SSE3	WSW2	ESE4	ESE6	SE4	SE4	SSW4.6	SSW8	
6-Sep	SE6	SE6	SE5	SE4	SSE4	S3	S4	SSW3	WSW5	WSW7	WSW7	WSW8	WSW10	WSW11	WSW9	WSW9	WSW11	WSW5	S3	S4	S5	SW7	WSW7	WSW7	SW4.9	WSW11	
7-Sep	SW7	WSW8	WSW7	SW7	WSW8	SW6	WSW6	WSW6	WSW5	SW7	WSW9	WSW11	W10	WSW13	WSW12	WSW11	WSW7	SW5	SW7	SW6	SW8	WSW7	WSW8	SW8	WSW7.8	WSW13	
8-Sep	WSW8	SW8	SW8	SW8	SW8	SSW8	SSW8	SSW7	SW6	SW7	WSW6	WSW7	W8	WNW6	W11	W8	WSW10	WNW5	WNW4	SW3	SW7	WSW6	WSW6	W4	WSW6.4	W11	
9-Sep	WSW5	WSW5	WSW5	WSW5	WSW5	WSW6	WSW4	NW1	N2	NE5	NE4	E5	E3	NNE2	SW0	NE3	SE4	SE2	S1	SE1	E6	ESE5	SSE3	S4	S0.8	E6	
10-Sep	S4	S4	S4	S4	S4	S4	S5	S5	S4	SSE4	SSE6	SSE7	SSE7	SSE8	S7	S8	SSE6	SSE5	SE4	SE4	SE5	SE6	SE5	SSE5	SSE5.1	SSE8	
11-Sep	S5	SSW4	S5	S5	S5	S5	SSE5	S7	S7	S10	S11	S12	S13	S12	S12	SSW12	S10	S8	SSE6	SSE5	S6	S6	S6	S7	S7.6	S13	
12-Sep	S8	S7	S7	S6	S7	S7	S6	SSW7	SSW7	SW7	SW6	WSW6	WSW5	SW6	SW6	SW6	SW6	SSW6	SW7	SW6	WSW7	WSW7	WSW7	WSW8	SW6.0	WSW8	
13-Sep	WSW7	WSW8	WSW8	WSW9	WSW10	W9	W6	W7	W9	WSW9	WSW11	WSW13	W12	W12	W10	W13	W13	W11	W9	W9	W8	W10	W13	W12	W9.8	W13	
14-Sep	W10	W10	W10	W9	WNW10	WNW10	WNW8	WNW7	W8	WNW10	WNW10	WNW9	WNW10	WNW12	NW10	NW9	NW7	WNW5	W4	W4	W4	W4	W4	WSW5	WNW7.7	WNW12	
15-Sep	WSW6	WSW5	WSW6	SW6	SW7	SSW7	SSW9	SSW6	SW6	SSW7	SW8	SW10	SSW8	SSW8	S8	SSW8	SSW7	SSW6	SSW4	S5	S6	S6	SSW6	SSW6	SSW6.3	SSW10	
16-Sep	SSW7	SSW7	SSW8	SSW9	SSW9	SSW8	SSW9	SSW9	SW9	WSW8	WSW4	NNW3	WSW3	WSW5	WSW5	WSW7	SW5	S3	SSW4	SW6	SSW6	SW7	SSW6	SSW7	SW5.9	SSW9	
17-Sep	SSW6	S4	S5	S6	S6	SSE6	S7	S7	S6	S5	S7	SW7	SW7	WSW8	W8	W8	W6	W6	W7	W7	W5	WSW7	WSW8	WSW8	SW5.0	WSW8	
18-Sep	WSW7	WSW7	WSW8	WSW8	SW8	SW9	SW8	SSW7	SW8	WSW11	W9	W9	W9	W12	W9	W9	WSW13	WSW11	WSW7	SW7	SW8	SW9	WSW9	SW9	WSW8.3	WSW13	
19-Sep	WSW11	WSW11	SW11	SW11	WSW12	SW10	WSW11	WSW9	WSW10	WSW10	WSW10	WSW11	WSW12	WSW12	WSW10	W7	WSW10	WSW10	WSW7	SW5	SW5	SW6	WSW6	W5	W4	WSW8.8	WSW12
20-Sep	W5	W5	WSW5	WSW5	WSW7	WSW6	W5	W4	WNW4	NNW3	NNW4	N5	NNE7	NE7	NNE6	WNW2	W5	WSW5	SW3	WSW5	WSW5	SW4	WSW5	WSW5	W3.0	NE7	
21-Sep	SW4	SSW4	SW4	SW5	WSW8	SSW8	SSW8	SSW8	SSW7	SW7	SW11	SW13	WSW14	WSW14	SW13	SW12	SW11	SW8	SSW5	SSW5	SSW6	SSW7	SSW7	SSW7	SW8.0	WSW14	
22-Sep	SSW8	SSW10	SW9	SW9	SSW9	SSW8	SSW8	SSW9	SW12	SW13	SSW12	SSW11	SSW10	SSW10	SSW10	SSW8	SSW8	S5	ESE3	SE4	SE5	S4	S5	S5	SSW7.5	SW13	
23-Sep	SSW4	S4	S4	S5	S6	S6	S5	S5	S7	S8	S11	S10	S11	S10	S11	E10	SSE9	SSE8	SSE5	SE5	SE6	SE6	SSE7	SE5	S6.7	S11	
24-Sep	SE5	SSE7	SSE6	SE6	SSE6	S4	S5	S5	SSW6	SW7	SW8	WSW6	WSW5	WSW4	SSE1	S1	SW3	WSW5	SSW4	SW5	SW5	WSW5	SW3	SSW3	SSW3.9	SW8	
25-Sep	SW4	SSW4	S4	S3	S4	SSW3	SSW3	S3	SSE3	SE6	ESE7	SE6	ESE6	ESE6	E8	E10	E10	ESE6	E9	E11	E12	ESE9	ESE7	SE8	ESE5.2	E12	
26-Sep	SE7	SE7	SE7	SSE6	SSE6	S6	S7	S7	S8	S8	S9	SSW10	S5	SSE7	S6	SW6	WSW5	W2	WSW4	SW4	WSW7	WSW9	WSW9	WSW10	SSW5.5	WSW10	
27-Sep	WSW10	WSW9	WSW9	SW9	WSW9	WSW8	WSW8	WSW6	WSW6	WNW6	NNW7	N7	NNE2	NNE2	W3	SW3	SW5	SW6	WSW4	WSW4	SSW3	WSW4	SW4	SW7	WSW4.7	WSW10	
28-Sep	WSW4	WSW4	WSW4	WSW4	WSW5	WSW6	WSW4	WSW4	WSW4	W3	NW3	NNE6	NNW6	WNW4	N3	N2	NNW3	NW1	NE4	ENE2	NE1	NE6	NE7	NNE3	NW1.8	NE7	
29-Sep	N4	NE6	NNE4	NNE7	NNE6	NNE6	NNE6	NNE6	NNE7	NNE6	NNW6	NNE5	NNE4	NNW4	NNW5	NNW4	NNW4	NNW5	NNW3	NNW2	NNW3	NW2	NW3	NW2	N4.1	NNE7	
30-Sep	NW3	NW2	WNW3	NNW1	N0	ENE0	WSW1	NE1	NNE2	ENE4	NNE1	NNE3	NE3	NE5	NE4	NE5	NE4	NE3	ENE3	E5	E4	SE3	S3	S4	NE1.5	E5	

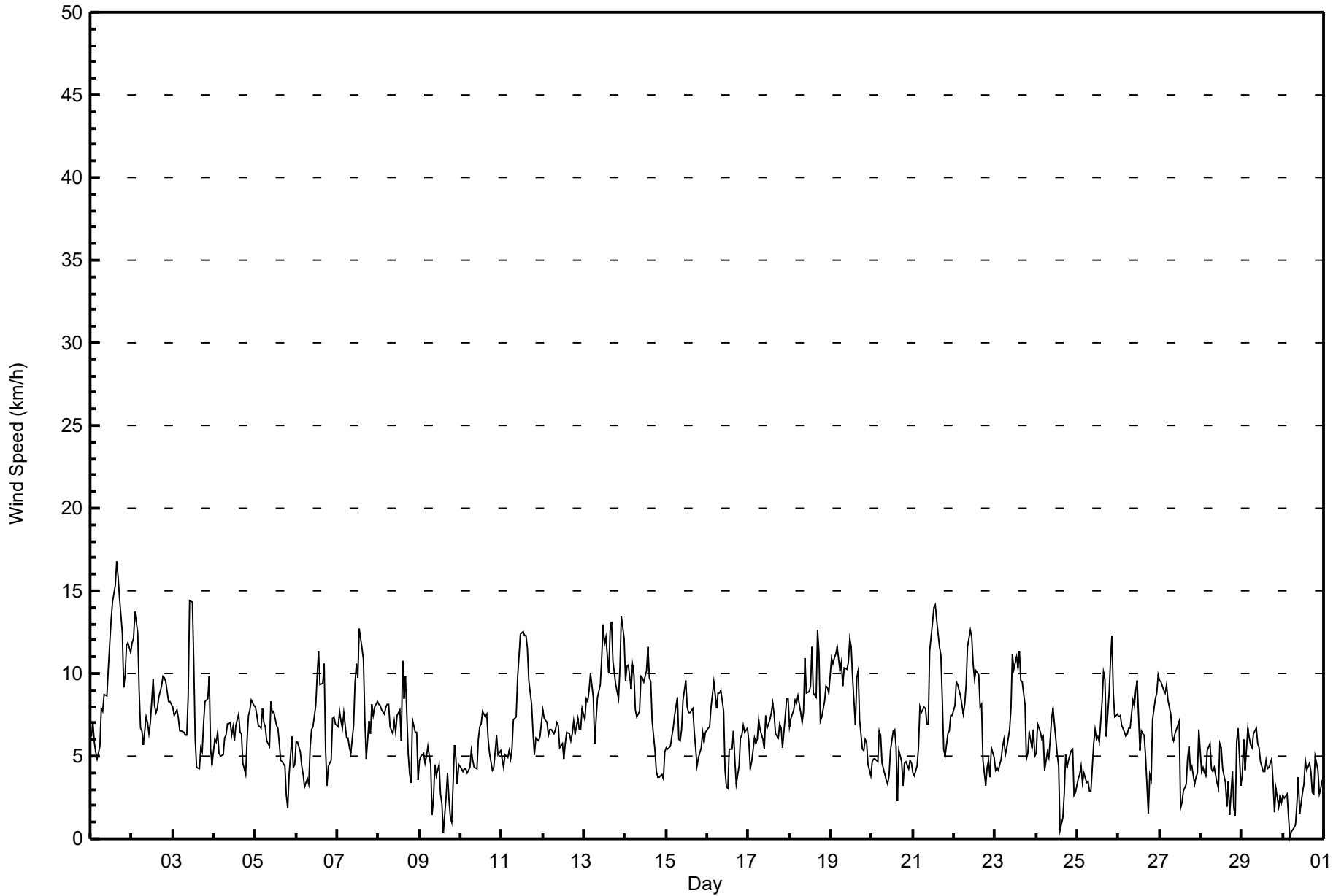
SW4.8 SW4.9 SW5.0 SW4.8 SW5.3 SW4.9 SW4.8 SW4.4 SW4.7 SW4.9 SW5.1 WSW5.1 WSW4.7 WSW4.8 WSW4.6 WSW4.6 SW4.9 SW3.9 SW3.2 SSW3.4 SSW3.8 SW4.3 SW4.5 SW4.6	Diurnal Average
WSW12 WSW12 WSW14 WSW12 WSW12 SW10 WSW11 SSW9 SW12 SW13 WSW14 WSW14 WSW14 WSW14 WSW15 WSW17 SW16 WSW15 SW12 E11 E12 SW12 W13 W12	Diurnal 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 - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Wind Speed (WS) - km/h
Jackfish 2/3 - September 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	250	34.72	34.72
6 - 11	425	59.03	93.75
12 - 19	45	6.25	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: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Wind Speed (WS) - km/h
Jackfish 2/3 - September 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	10	11	5	5	4	18	12	45	16	22	43	22	8	10	13	250
6 - 11	1	10	4	0	5	8	12	16	47	61	74	109	50	15	10	3	425
12 - 19	0	0	0	0	1	0	0	0	4	2	9	19	9	1	0	0	45
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	7	20	15	5	11	12	30	28	96	79	105	171	81	24	20	16	720

Total Number of Valid Hours: 720

Total Number of Hours: 720

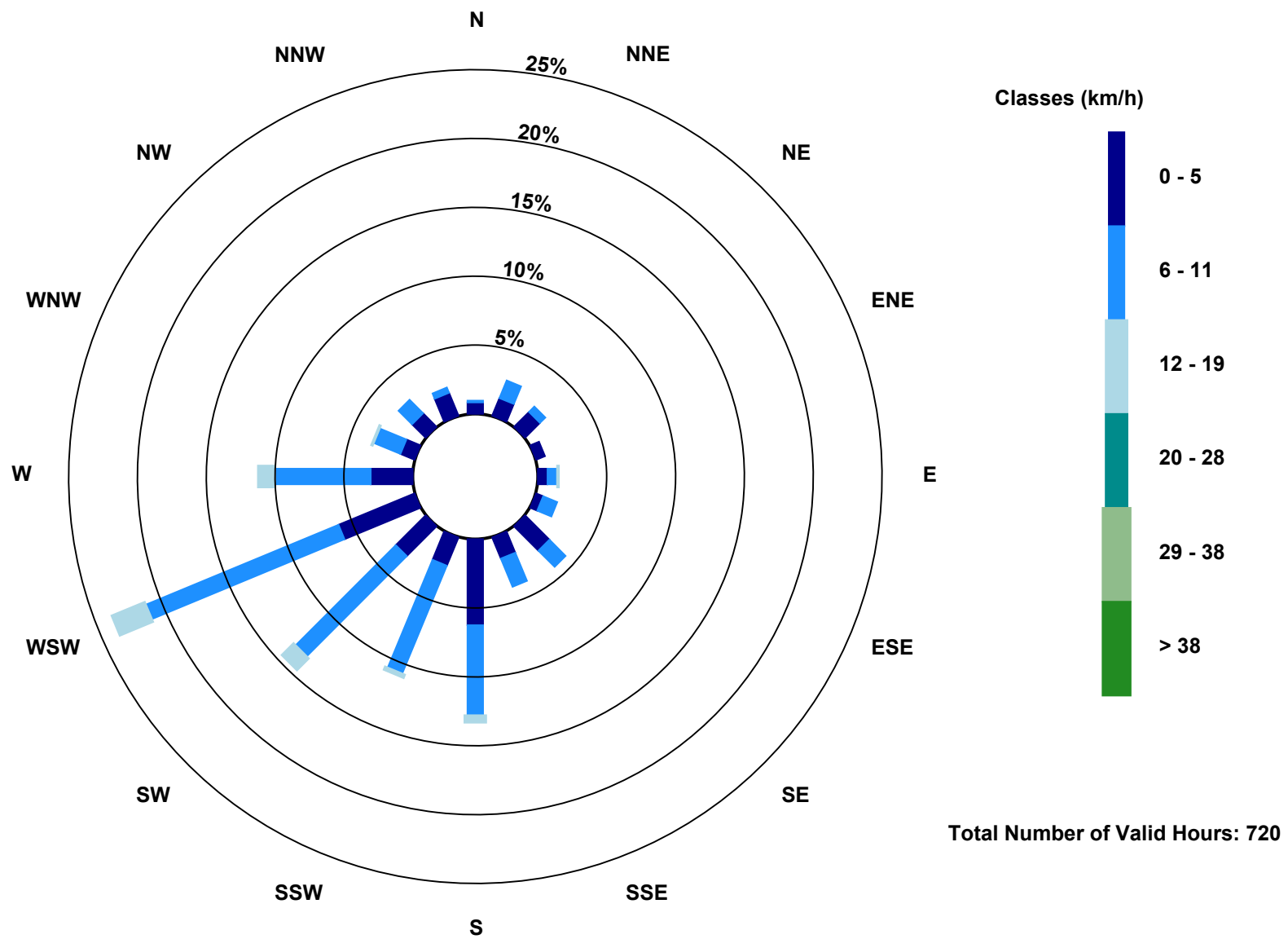


Wood Buffalo Environmental Association

Wind Rose Sep 2023

Wind Speed (WS) - km/h

Jackfish 2/3





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Jackfish 2/3 - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 6 km/h on Sep 1 16:00 Minimum Value: 0 km/h on Sep 21 02:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 3 P ₉₀ = 4 P ₉₉ = 5																	Hours in Service: 720 Hours of Data: 720 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-Sep	2	3	2	2	2	2	2	2	3	3	4	5	5	5	5	6	5	5	4	3	3	4	4	3	6
2-Sep	3	3	4	3	3	2	2	2	3	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	4
3-Sep	2	2	2	2	1	1	1	2	2	3	5	4	3	2	1	2	1	1	2	2	2	2	3	1	5
4-Sep	2	2	3	2	2	2	3	2	3	3	3	3	3	3	3	3	3	2	2	1	2	1	2	2	3
5-Sep	2	1	1	1	2	1	1	2	2	3	3	3	3	3	3	2	2	2	2	1	2	2	2	3	
6-Sep	2	2	2	2	2	1	1	1	2	2	3	3	4	4	3	3	3	3	1	1	1	2	2	1	4
7-Sep	1	2	1	2	2	1	1	1	1	2	3	4	4	4	4	4	4	1	2	1	2	1	1	2	4
8-Sep	2	2	1	1	1	1	2	1	1	2	2	3	3	3	4	4	3	2	2	1	1	1	2	1	4
9-Sep	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	1	1	1	2	2	2	2
10-Sep	2	1	1	1	1	1	1	1	1	2	2	3	3	4	3	3	3	2	2	2	2	3	2	2	4
11-Sep	2	2	2	2	2	2	3	3	3	4	5	5	5	5	5	5	4	3	3	2	3	3	3	3	5
12-Sep	3	3	3	2	2	2	2	2	2	2	2	2	2	3	2	2	2	2	2	1	2	2	1	2	3
13-Sep	2	2	2	2	2	3	2	2	3	3	4	5	4	5	4	5	5	4	3	4	4	4	5	5	5
14-Sep	4	4	4	4	4	4	3	3	3	4	4	4	5	5	4	4	4	3	1	1	1	1	1	1	5
15-Sep	1	1	1	1	1	1	2	1	2	3	3	3	3	3	3	3	3	2	2	2	3	3	2	2	3
16-Sep	2	2	3	3	3	2	2	2	2	2	2	1	2	2	2	2	1	1	1	1	1	1	1	1	3
17-Sep	1	1	1	2	2	2	3	2	2	2	3	3	3	3	3	3	2	3	3	3	2	1	2	2	3
18-Sep	2	2	1	2	2	2	1	1	2	3	4	4	3	4	4	4	5	4	2	2	2	3	2	2	5
19-Sep	2	2	3	3	3	2	3	2	3	3	4	4	4	4	3	4	3	2	1	1	1	1	1	1	4
20-Sep	1	1	1	1	1	1	1	1	1	1	2	2	3	3	3	2	2	2	1	1	1	1	1	1	3
21-Sep	0	0	1	1	1	1	2	2	2	2	4	5	5	5	5	4	4	3	2	2	2	2	2	2	5
22-Sep	3	3	3	3	3	2	2	3	4	4	5	4	4	4	4	3	4	3	1	2	2	2	2	2	5
23-Sep	2	2	2	2	2	3	2	2	3	4	5	4	5	4	5	4	5	4	2	2	3	3	3	2	5
24-Sep	2	3	3	3	3	2	2	2	3	3	2	2	2	2	1	2	1	2	1	1	1	2	1	1	3
25-Sep	1	1	1	0	1	1	0	1	1	3	2	3	3	3	3	4	3	2	4	4	4	3	3	3	4
26-Sep	4	3	3	3	2	2	3	3	3	3	3	4	3	3	3	3	2	2	2	1	2	2	2	2	4
27-Sep	2	2	2	2	2	2	2	1	2	3	3	4	2	2	2	4	1	1	1	1	1	1	1	1	4
28-Sep	2	1	1	1	1	1	1	1	1	1	2	2	3	2	2	2	2	1	2	2	2	2	2	2	3
29-Sep	2	2	2	3	3	2	2	3	3	3	2	2	1	2	2	2	2	2	2	1	1	1	1	1	3
30-Sep	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1	2
																	Diurnal Maximum								



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Jackfish 2/3 - September 2023

Direction of Maximum Speed: 240 deg on Sep 1 16:00 Direction of Maximum Daily Speed Average: 260.5 deg on Sep 13	Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0
Direction of Minimum Speed: 5 deg on Sep 30 05:00 Direction of Minimum Daily Speed Average: 0.8 deg on Sep 9	Percent Operational Time: 100.0
Monthly Average Direction: 228.9 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-Sep	287	302	298	281	274	266	255	254	258	262	267	267	260	245	240	240	235	237	233	229	227	232	235	235	249.5
2-Sep	239	244	249	252	263	263	265	272	281	277	275	270	260	269	274	276	258	258	247	244	243	248	234	239	256.2
3-Sep	231	224	228	224	208	198	187	197	221	242	245	246	241	245	216	196	209	215	234	234	232	245	263	266	229.8
4-Sep	276	274	293	319	293	274	281	281	279	299	312	312	317	313	310	312	305	309	278	239	247	242	243	247	284.5
5-Sep	245	238	242	226	231	218	204	215	216	212	198	197	174	182	200	168	140	137	147	237	109	114	133	126	196.7
6-Sep	133	136	138	142	165	171	185	193	239	253	257	257	248	244	244	246	240	258	185	181	189	226	241	240	223.3
7-Sep	236	241	246	232	242	228	240	248	247	236	241	247	261	243	249	242	240	217	236	235	235	245	243	235	241.1
8-Sep	238	231	231	222	221	203	209	208	226	235	243	254	279	300	262	270	254	284	282	225	224	237	247	260	242.1
9-Sep	252	242	239	244	245	247	251	307	8	40	55	98	90	22	224	50	146	126	171	132	100	111	156	176	179.0
10-Sep	183	186	188	185	179	176	176	182	187	166	148	157	155	164	178	170	160	157	145	131	132	142	145	152	163.4
11-Sep	177	195	180	176	183	178	166	171	177	185	187	191	190	187	187	194	191	186	168	155	171	186	184	180	183.1
12-Sep	186	190	181	183	189	184	181	198	212	222	227	254	242	220	229	222	215	212	219	221	240	248	242	248	214.7
13-Sep	238	245	240	241	249	259	266	264	262	257	254	257	269	260	268	272	260	263	261	263	277	262	272	276	260.5
14-Sep	273	275	269	269	282	286	287	286	278	286	287	286	299	303	304	304	306	300	278	266	266	261	261	255	284.5
15-Sep	246	247	239	232	221	195	204	198	215	212	214	217	208	207	189	205	197	199	203	182	189	184	192	193	207.4
16-Sep	194	199	199	204	202	209	203	197	218	241	251	329	249	244	258	246	230	190	202	220	210	216	202	193	215.0
17-Sep	193	185	187	184	185	167	171	169	173	178	179	216	222	257	275	275	278	272	272	274	260	250	246	237	224.2
18-Sep	252	242	239	238	225	227	214	208	234	249	267	276	277	269	276	270	253	257	239	219	229	231	237	234	245.8
19-Sep	249	238	236	236	240	231	238	241	249	251	247	246	250	257	264	254	247	245	221	222	225	237	259	261	243.7
20-Sep	261	259	256	253	250	253	262	276	298	327	339	349	15	36	29	300	261	256	223	248	243	235	238	240	275.7
21-Sep	223	199	224	220	237	207	205	202	200	218	235	233	239	237	230	222	220	221	210	198	202	203	210	204	220.0
22-Sep	206	211	214	219	210	200	200	207	216	218	211	209	198	201	201	198	199	185	113	124	137	176	170	190	201.0
23-Sep	197	184	187	173	181	178	180	186	187	180	181	175	180	169	185	171	163	168	149	136	135	132	148	128	170.2
24-Sep	139	161	147	139	158	188	181	183	202	219	221	238	241	245	149	90	218	240	205	214	222	240	232	212	199.9
25-Sep	230	193	187	184	189	201	196	170	148	124	121	142	117	104	93	100	101	107	99	101	100	108	119	125	122.3
26-Sep	141	143	145	160	168	172	176	170	173	181	184	204	173	159	180	219	245	271	247	217	238	239	240	244	191.9
27-Sep	241	241	241	234	245	251	254	256	250	282	330	2	28	32	281	226	234	227	242	240	199	258	228	227	251.0
28-Sep	253	257	251	241	246	246	256	244	256	274	315	15	348	302	357	4	348	314	45	78	56	40	41	13	310.5
29-Sep	4	40	12	20	22	28	22	15	23	12	348	27	15	339	336	334	341	336	339	341	331	313	311	304	2.7
30-Sep	308	309	302	334	5	63	238	37	28	63	26	22	39	49	44	39	40	41	60	95	101	140	177	174	52.3

229.7 227.4 228.1 224.2 226.1 220.5 218.2 219.2 229.4 235.3 236.1 241.7 241.8 240.8 240.7 238.2 232.5 232.6 223.5 213.5 211.6 221.7 224.9 224.2

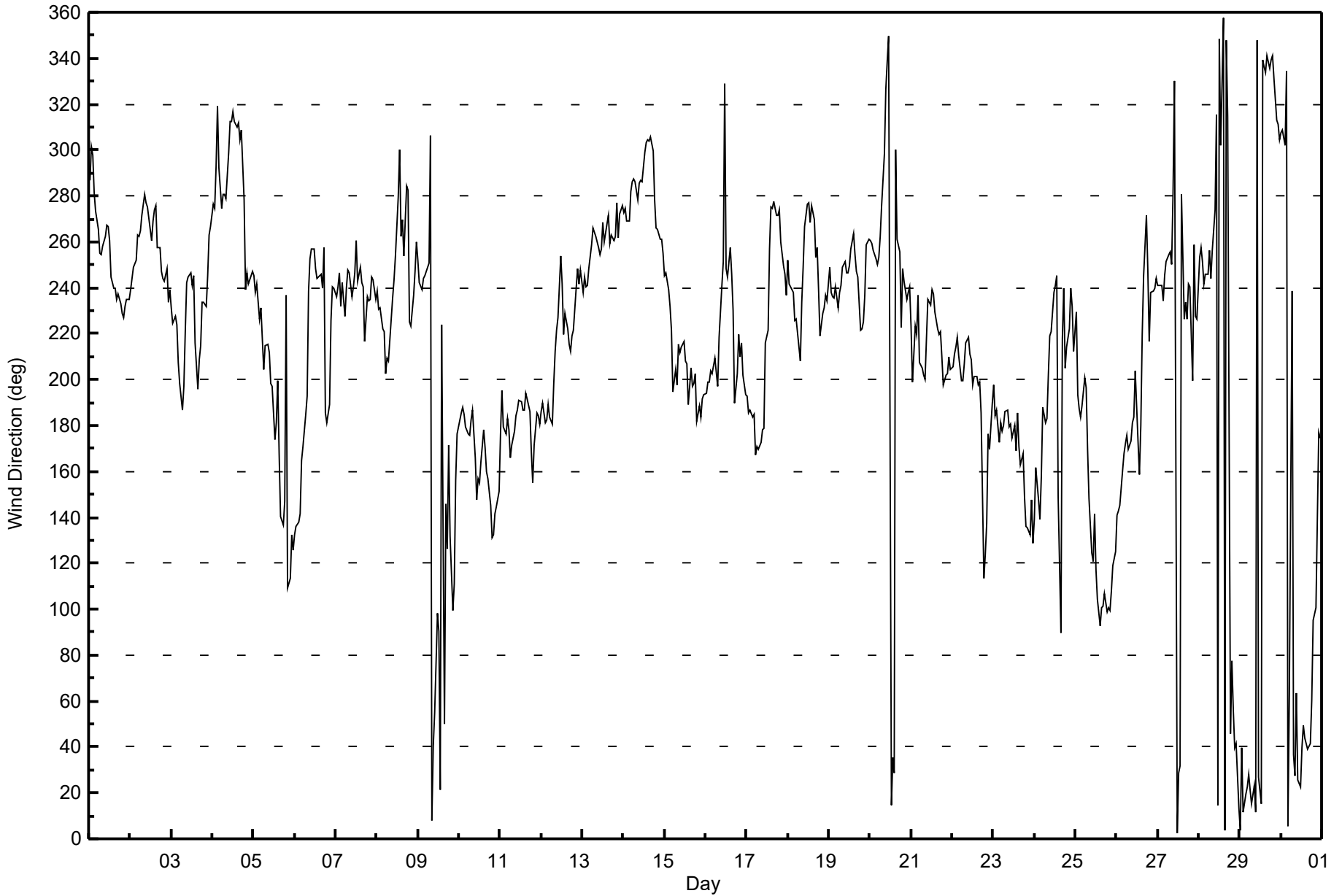
Diurnal Average

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Jackfish 2/3 - September 2023





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Jackfish 2/3 - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 105 deg on Sep 30 05:00 Minimum Value: 6 deg on Sep 25 05:00 Percentiles: P ₁ = 9 P ₁₀ = 15 Q ₁ = 20 Median = 34 Q ₃ = 51 P ₉₀ = 62 P ₉₉ = 91																			Hours in Service: 720 Hours of Data: 720 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-Sep	45	48	53	39	26	25	24	25	33	37	42	40	38	28	26	25	27	24	25	26	25	25	23	22	53				
2-Sep	20	18	21	20	28	27	30	35	39	43	45	41	31	43	46	44	28	27	17	17	19	18	15	16	46				
3-Sep	18	20	18	18	17	19	12	23	26	22	23	24	21	23	23	37	22	20	17	17	19	17	31	21	37				
4-Sep	32	29	54	63	48	34	44	45	46	55	59	56	59	59	54	60	55	62	50	16	14	15	14	63					
5-Sep	14	15	16	20	16	18	17	25	35	35	51	50	61	55	48	62	57	53	78	64	32	36	51	46	78				
6-Sep	43	44	43	52	55	49	35	35	33	25	37	34	37	28	30	26	26	57	17	9	15	23	16	15	57				
7-Sep	17	16	15	26	18	22	16	17	23	23	24	30	36	29	30	25	42	19	18	17	17	13	14	15	42				
8-Sep	15	16	15	17	19	15	17	15	19	23	40	43	51	63	43	45	34	51	55	35	19	15	15	16	63				
9-Sep	10	16	19	13	9	11	14	75	54	34	64	53	88	91	103	88	44	44	67	82	21	36	76	61	103				
10-Sep	40	23	25	29	37	20	18	20	30	51	53	57	59	57	56	52	58	64	60	51	56	61	71	77	77				
11-Sep	72	73	68	66	66	68	67	57	54	51	51	49	48	48	47	49	51	51	61	73	68	66	55	47	73				
12-Sep	43	45	44	45	35	35	35	31	31	37	39	44	62	45	28	29	30	22	22	19	18	17	15	14	62				
13-Sep	15	15	16	15	17	24	30	35	34	30	30	34	40	36	43	41	34	35	29	33	41	32	41	38	43				
14-Sep	42	40	37	39	41	44	48	42	38	40	42	44	52	50	50	49	65	58	25	25	22	19	17	12	65				
15-Sep	10	11	17	16	17	11	19	14	24	38	37	34	42	41	47	41	51	53	65	73	66	62	51	47	73				
16-Sep	41	34	30	29	23	23	18	16	20	27	49	71	64	41	47	29	22	20	14	17	17	16	13	9	71				
17-Sep	10	18	16	20	28	49	46	52	48	51	55	51	40	36	44	45	43	36	36	33	20	13	14	16	55				
18-Sep	17	21	15	15	18	17	17	16	17	21	45	41	45	40	44	41	31	25	19	22	22	22	19	20	45				
19-Sep	17	17	17	18	19	20	17	17	23	29	31	29	34	35	42	38	30	22	17	16	16	19	18	16	42				
20-Sep	17	14	12	14	13	12	22	36	53	67	69	58	56	55	57	75	31	20	18	11	11	12	12	12	75				
21-Sep	18	9	16	12	15	17	17	17	22	26	25	31	28	26	29	32	30	30	32	32	32	31	31	29	32				
22-Sep	26	26	27	27	26	26	25	24	26	29	35	38	45	40	40	49	46	65	65	52	66	81	74	61	81				
23-Sep	57	58	73	70	62	62	49	45	47	57	51	54	51	49	48	55	53	55	66	58	52	62	59	58	73				
24-Sep	66	58	55	59	60	63	54	66	45	32	35	32	30	32	91	99	58	22	18	19	18	23	43	18	99				
25-Sep	16	13	9	9	6	15	14	26	52	43	44	55	57	64	41	35	31	31	23	29	30	34	41	44	64				
26-Sep	53	59	55	56	52	53	50	43	41	36	37	36	58	54	48	44	37	92	62	32	20	16	15	15	92				
27-Sep	16	15	16	20	15	14	13	17	22	49	60	54	90	89	42	75	15	14	19	16	25	22	24	16	90				
28-Sep	19	9	12	12	9	10	15	15	22	42	76	57	62	65	71	84	63	103	41	29	62	27	26	59	103				
29-Sep	56	34	50	48	47	44	46	48	46	55	56	47	49	57	65	57	63	53	73	75	48	80	58	54	80				
30-Sep	50	48	52	85	105	77	66	78	53	54	92	65	58	38	54	37	31	24	26	20	23	48	34	42	105				
																			Diurnal Maximum					72 73 73 85 105 77 67 78 54 67 92 71 90 91 103 99 65 103 78 82 68 81 76 77					



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

**AMS29
SURMONT 2
SEPTEMBER 2023**

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

October 30, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - SURMONT2 (AMS29)
 SEPTEMBER 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	678	34	42	98.89	6.6	0	1.4	0
H2S (ppb) Average	669	36	51	97.92	1.1	0	0.5	0
THC(ppm) Average	677	34	43	98.75	2.8	-	2.6	-
NO2 (ppb) Average	676	36	44	98.89	7.6	0	4	-
NO (ppb) Average	676	36	44	98.89	3.7	-	0.6	-
NOX (ppb) Average	676	36	44	98.89	10.4	-	4.1	-
PM2.5 (ug/m3) Average	710	3	10	99.03	444	112	303.3	14
Temperature 2 m (C) Average	720	0	0	100	24.5	-	19.4	-
Relative Humidity (%) Average	718	0	2	99.72	100.7	-	92	-
Wind Speed 10 m (km/h) Average	704	0	16	97.78	14	-	8	-
Wind Direction 10 m (deg) Average	704	0	16	97.78	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - SURMONT 2 (AMS29)
 SEPTEMBER 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	678	0.36	0.6	-	0	0	0	0.2	0.4	0.8	6.6
H2S (ppb) Average	669	0.16	0.1	-	0	0.1	0.1	0.1	0.2	0.3	1.1
THC (ppm) Average	677	2.33	0.1	-	2.2	2.2	2.3	2.3	2.4	2.5	2.8
NO2 (ppb) Average	676	1.36	1.2	-	0.1	0.4	0.5	1	1.7	2.8	7.6
NO (ppb) Average	676	0.3	0.3	-	0.1	0.1	0.2	0.2	0.3	0.5	3.7
NOX (ppb) Average	676	1.67	1.3	-	0.3	0.6	0.8	1.2	2.2	3.1	10.4
PM2.5 (ug/m3) Average	710	45.32	73.8	-	2	6	10.2	16.5	43.2	122.3	444
Temperature 2 m (C) Average	720	12.28	5.5	-	0	4.8	8.1	12.2	16.4	19.7	24.5
Relative Humidity (%) Average	718	69.95	19.7	-	27.5	40.7	55	70.4	87.2	95.8	100.7
Wind Speed 10 m (km/h) Average	704	5	3	-	0	1	3	5	7	9	14
Wind Direction 10 m (deg) Average	704	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - SURMONT 2 (AMS29)
 SEPTEMBER 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
H2S, SO2, THC	06 Sep 2023 13:00	06 Sep 2023 13:00	1	Maintenance - sample manifold cleaned
H2S, SO2, NO2, PM2.5	08 Sep 2023 07:00	08 Sep 2023 13:00	7	Station power failure
H2S	19 Sep 2023 11:00	19 Sep 2023 17:00	7	Maintenance - replaced external converter
THC	08 Sep 2023 07:00	08 Sep 2023 14:00	8	Station power failure
NO2	19 Sep 2023 09:00	19 Sep 2023 09:00	1	Maintenance - verify daily QA response
Relative Humidity	06 Sep 2023 08:00	07 Sep 2023 04:00	2	Sensor operated out of range
Wind Speed, Wind Direction	08 Sep 2023 00:00	30 Sep 2023 08:00	16	Intermittent unstable operation



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb

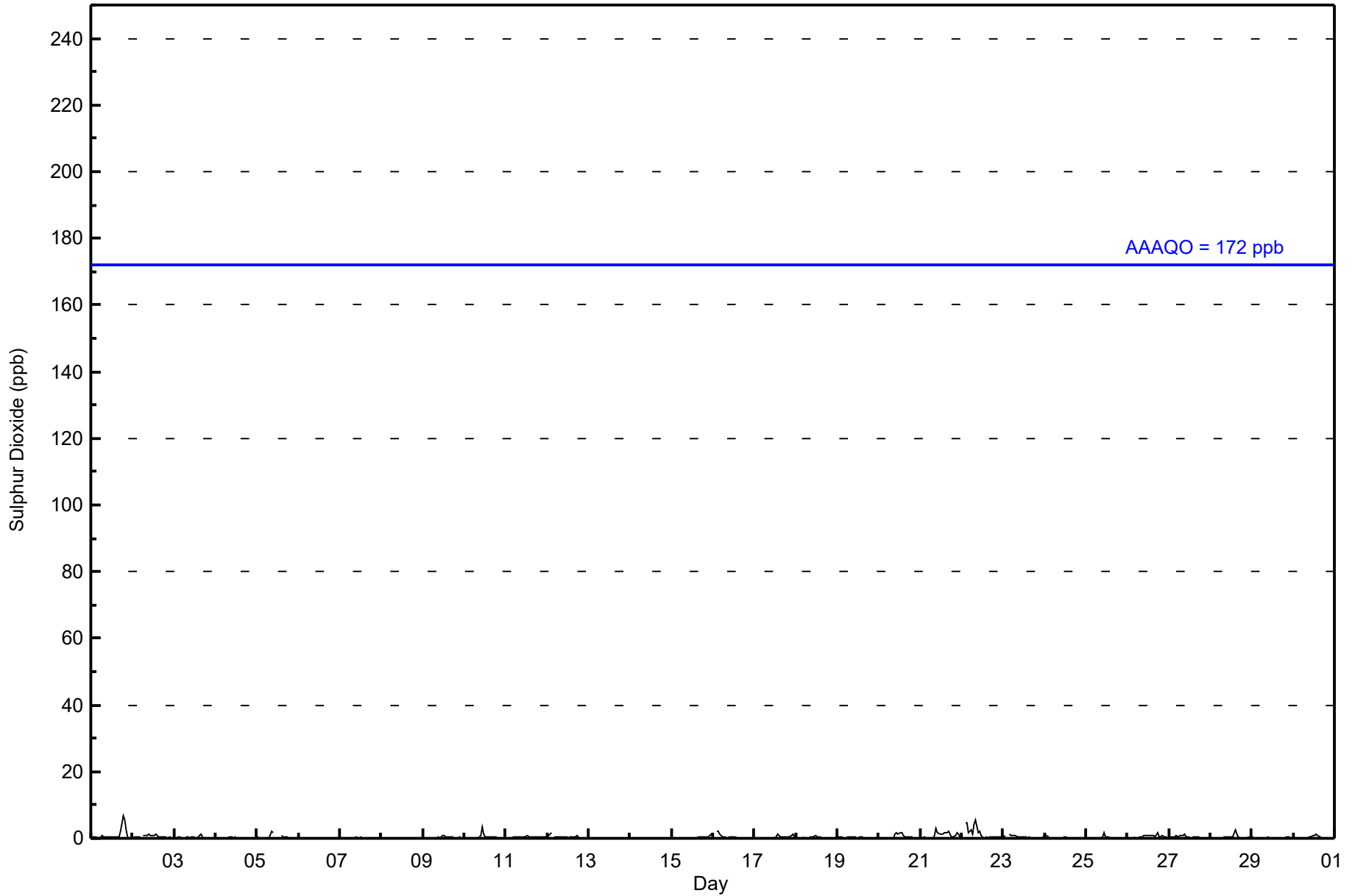
Surmont 2 - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0																	Hours in Service: 720																																
Maximum Value: 6.6 ppb on Sep 1 19:00																	Maximum Daily Average: 1.4 ppb on Sep 22				Hours of Data: 678																												
Minimum Value: 0.0 ppb on Sep 3 00:00																	Minimum Daily Average: 0.0 ppb on Sep 6				Hours of Missing Data: 42																												
Maximum Diurnal Average: 0.6 ppb at hour 11																	Minimum Diurnal Average: 0.2 ppb at hour 24				Hours of Calibration: 34																												
Monthly Average: 0.36 ppb																	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.2 Q ₃ = 0.4 P ₉₀ = 0.8 P ₉₉ = 3.0				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-Sep	0.4	0.3	0.3	0.3	Z	0.5	0.8	0.5	0.5	0.3	0.2	0.3	0.2	0.4	0.4	0.3	0.3	2.1	6.6	5.5	2.7	0.3	0.2	0.2	1.0	6.6																							
2-Sep	0.2	0.2	0.3	0.3	0.4	Z	0.7	0.7	0.8	1.1	0.7	0.8	1.0	1.1	0.9	0.6	0.3	0.4	0.4	0.3	0.1	0.3	0.2	0.0	0.5	1.1																							
3-Sep	Z	0.1	0.4	0.3	0.0	0.0	0.0	0.2	0.2	0.2	0.5	0.4	0.1	0.1	0.6	1.4	0.4	0.2	0.1	0.0	0.1	0.2	0.2	0.1	0.2	1.4																							
4-Sep	0.1	Z	0.1	0.0	0.0	0.1	0.1	0.0	0.3	0.3	0.0	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	0.1	0.3																							
5-Sep	0.3	0.2	Z	0.2	0.1	0.2	0.0	0.1	2.0	1.8	C	C	C	C	0.7	0.3	0.4	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.4	2.0																							
6-Sep	0.0	0.0	0.0	Z	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																							
7-Sep	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.4	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4																							
8-Sep	0.0	0.0	0.0	0.0	0.0	Z	PF	PF	PF	PF	PF	PF	PF	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	--	0.1																							
9-Sep	Z	0.1	0.1	0.2	0.0	0.1	0.1	0.1	0.2	0.3	0.2	0.7	0.7	0.6	0.5	0.4	0.3	0.2	0.2	0.1	0.1	0.4	0.1	0.1	0.3	0.7																							
10-Sep	0.1	Z	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.7	3.3	1.4	0.4	0.3	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.4	3.3																							
11-Sep	0.1	0.1	Z	0.1	0.3	0.4	0.3	0.4	0.5	0.6	0.5	0.5	0.6	0.6	0.5	0.4	0.2	0.3	0.4	0.4	0.3	0.4	0.6	0.6	0.4	0.6																							
12-Sep	0.8	0.8	1.7	Z	0.2	0.3	0.3	0.3	0.5	0.6	0.3	0.2	0.2	0.3	0.3	0.4	0.5	0.7	0.3	0.1	0.1	0.1	0.0	0.0	0.4	1.7																							
13-Sep	0.1	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1																							
14-Sep	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1																							
15-Sep	Z	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.6	0.5	0.3	0.4	0.5	1.1	1.2	0.3	1.2																							
16-Sep	1.1	Z	1.9	2.2	1.4	0.5	0.5	0.3	0.2	0.3	0.6	0.5	0.4	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.0	0.0	0.0	0.0	0.5	2.2																							
17-Sep	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	1.2	0.8	0.6	0.5	0.3	0.2	0.5	0.6	0.8	1.2	0.4	0.3	1.2																							
18-Sep	0.2	0.1	0.0	Z	0.3	0.2	0.1	0.2	0.4	0.6	0.4	0.7	0.6	0.5	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.7																							
19-Sep	0.3	0.4	0.3	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.1	0.0	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.3	0.2	0.4																							
20-Sep	0.2	0.1	0.0	0.0	0.0	Z	0.0	0.0	0.1	1.4	1.7	1.3	1.7	1.8	0.8	0.4	0.4	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.5	1.8																							
21-Sep	Z	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.7	2.9	1.5	1.2	1.2	1.3	1.5	1.9	2.3	1.3	0.5	0.3	0.9	1.8	1.2	0.4	1.0	2.9																							
22-Sep	0.7	Z	4.5	4.8	1.5	2.6	1.2	4.1	5.5	1.6	2.2	0.9	0.4	0.1	0.2	0.1	0.3	0.3	0.4	0.3	0.3	0.4	0.3	0.4	1.4	5.5																							
23-Sep	0.5	1.0	Z	1.1	0.8	0.8	0.7	0.8	0.6	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.2	0.1	0.5	0.4	1.1																							
24-Sep	1.2	0.9	0.5	Z	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.3	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.2	1.2																							
25-Sep	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.3	1.7	0.4	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.7																							
26-Sep	0.0	0.0	0.0	0.0	0.3	Z	0.0	0.3	0.6	1.0	0.9	0.8	0.8	0.8	0.8	0.7	0.4	1.5	0.6	0.5	0.7	0.4	0.4	0.1	0.5	1.5																							
27-Sep	Z	0.6	0.3	0.4	0.8	0.5	0.8	0.8	0.7	1.1	0.6	0.2	0.2	0.1	0.2	0.4	0.3	0.3	0.2	0.1	0.1	0.1	0.2	0.2	0.4	1.1																							
28-Sep	0.2	Z	0.2	0.2	0.2	0.0	0.0	0.1	0.3	0.4	0.6	0.3	0.4	0.5	2.6	1.4	0.4	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.4	2.6																							
29-Sep	0.4	0.2	Z	0.1	0.0	0.1	0.0	0.0	0.2	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.2	0.2	0.1	0.4																							
30-Sep	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.5	0.3	0.7	0.7	1.3	1.0	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.3																							
																								0.3	0.2	0.4	0.4	0.3	0.3	0.2	0.3	0.5	0.6	0.6	0.5	0.4	0.4	0.5	0.4	0.3	0.3	0.4	0.3	0.2	0.2	0.2	0.2	Diurnal Average	
																								1.2	1.0	4.5	4.8	1.5	2.6	1.2	4.1	5.5	2.9	3.3	1.4	1.7	1.8	2.6	1.9	2.3	2.1	6.6	5.5	2.7	1.8	1.2	1.2	Diurnal Maximum	
Z - zeronspan 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
Surmont 2 - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Surmont 2 - September 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	678	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: 678

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Surmont 2 - September 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	4	2	1	1	5	46	92	50	22	36	74	156	118	31	18	8	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	4	2	1	1	5	46	92	50	22	36	74	156	118	31	18	8	664

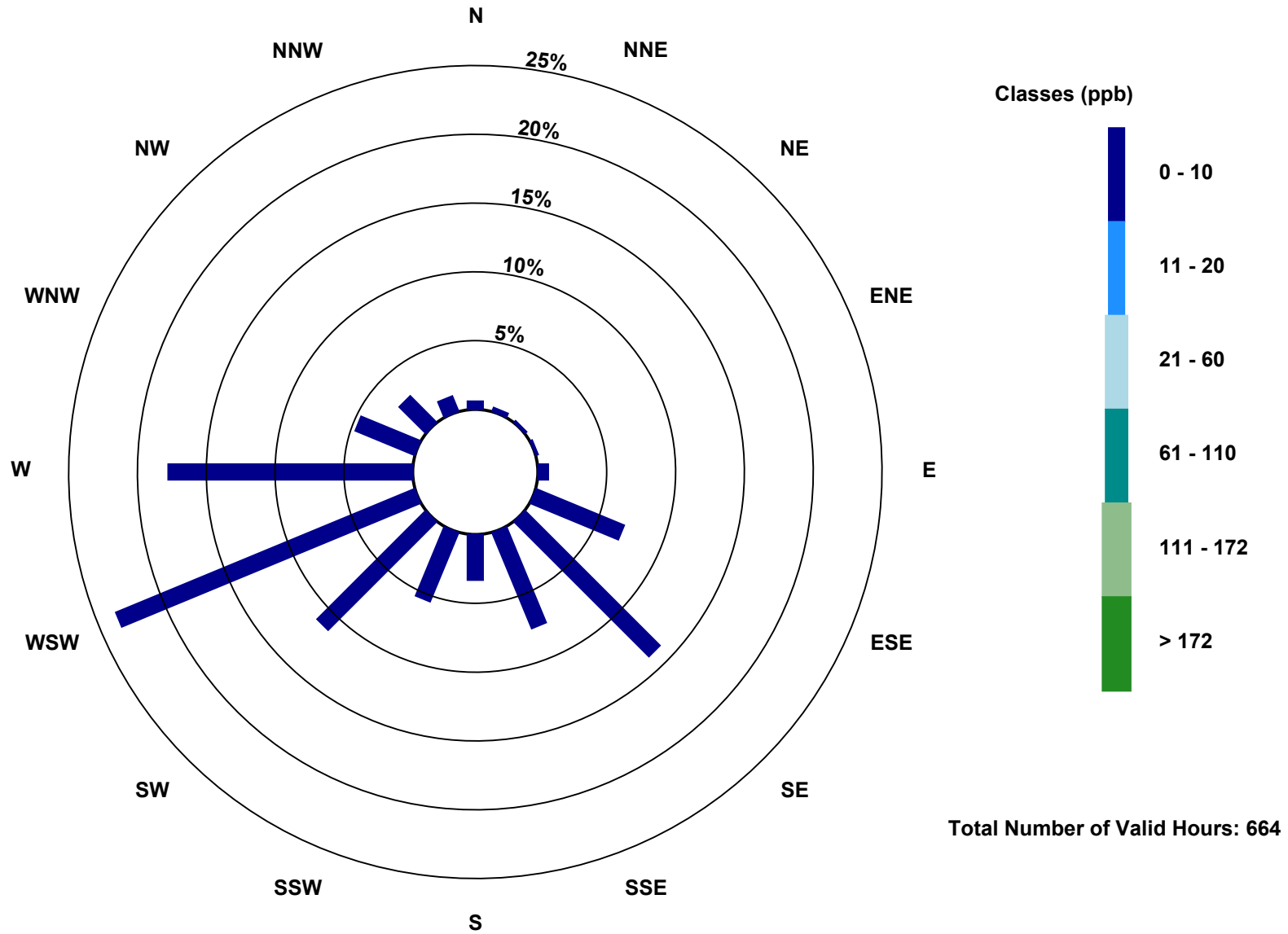
Total Number of Valid Hours: 664

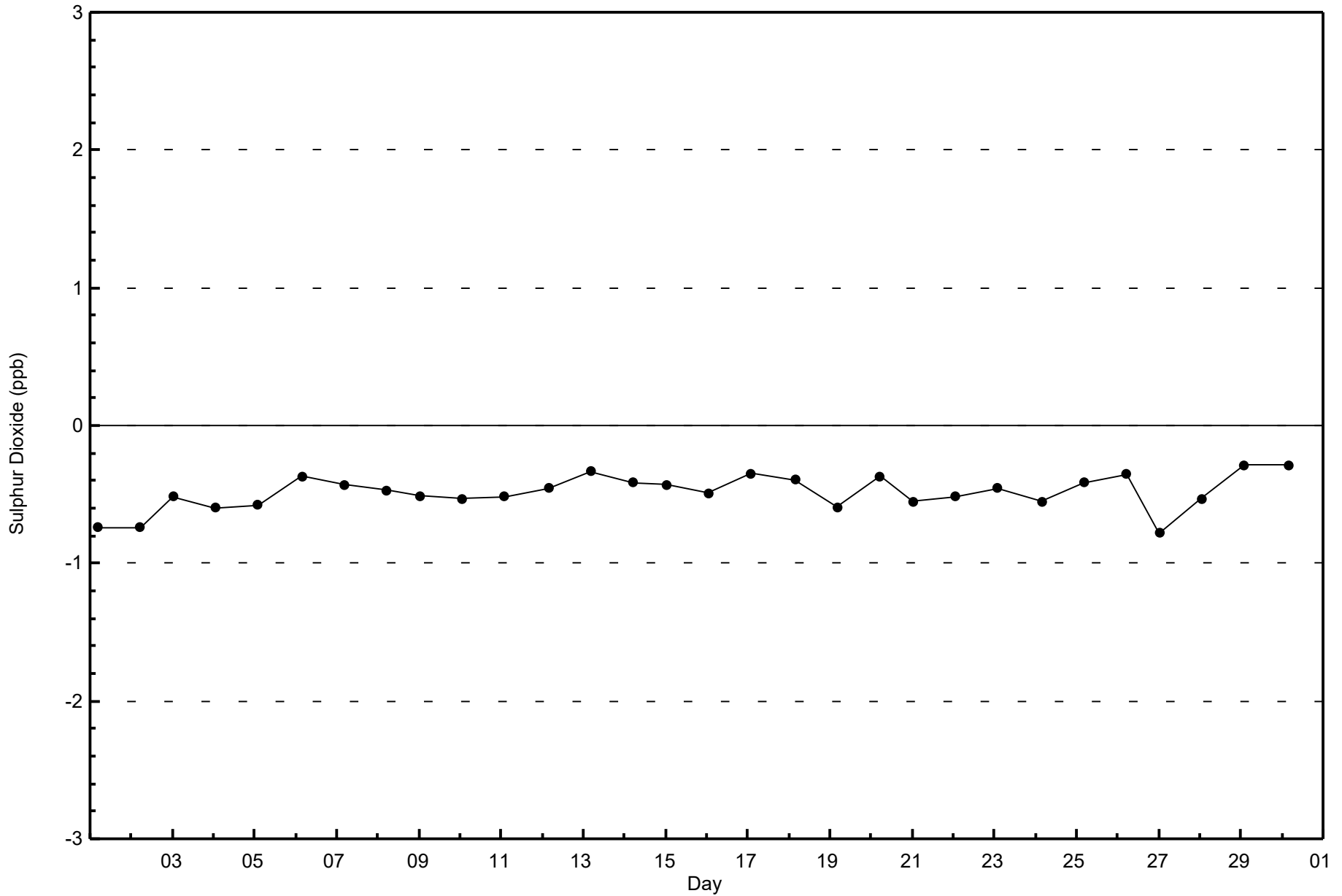
Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

Sulphur Dioxide (SO₂) - ppb
Surmont 2

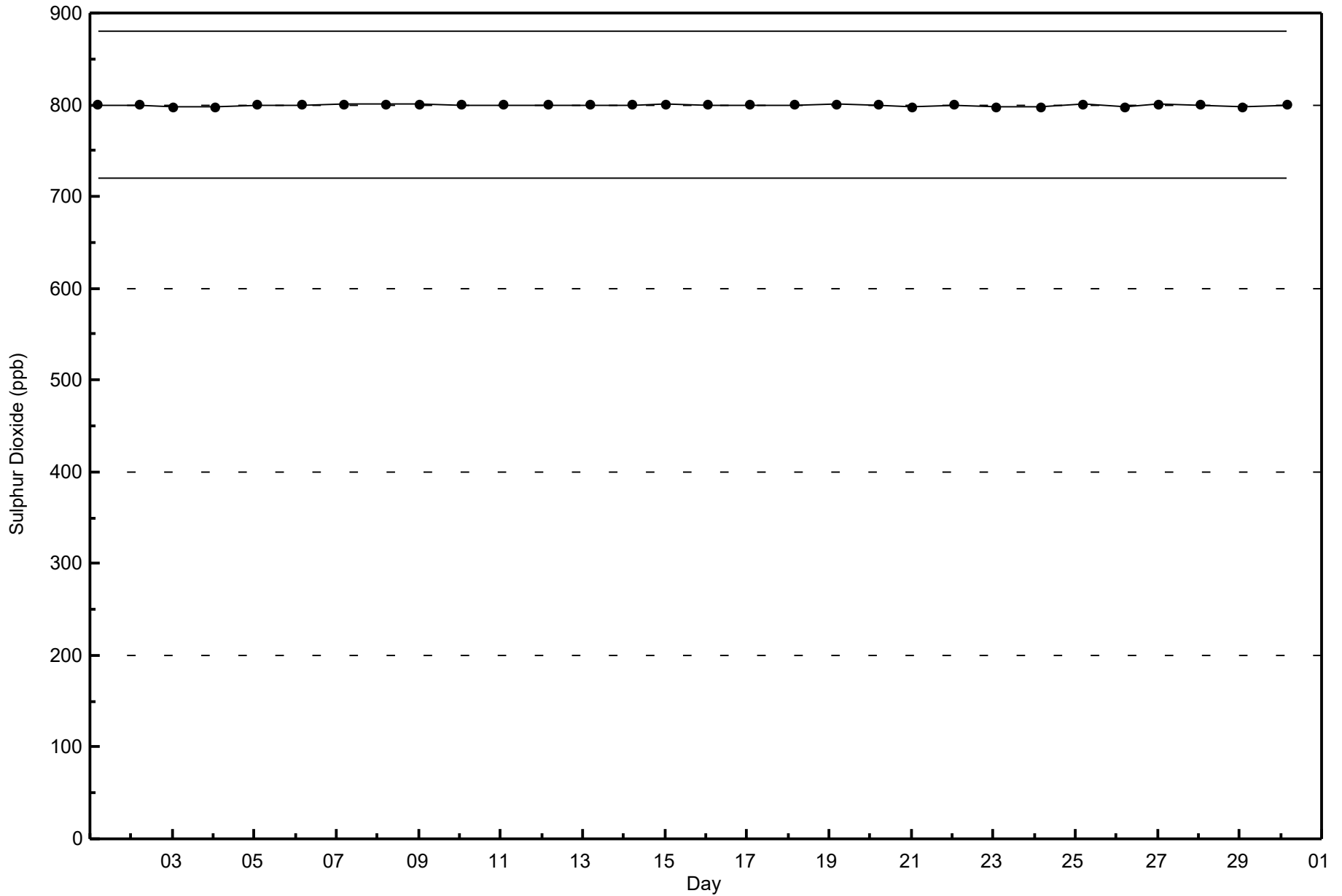






Wood Buffalo Environmental Association
Span Responses

Sulphur Dioxide (SO₂) - ppb
Surmont 2 - September 2023





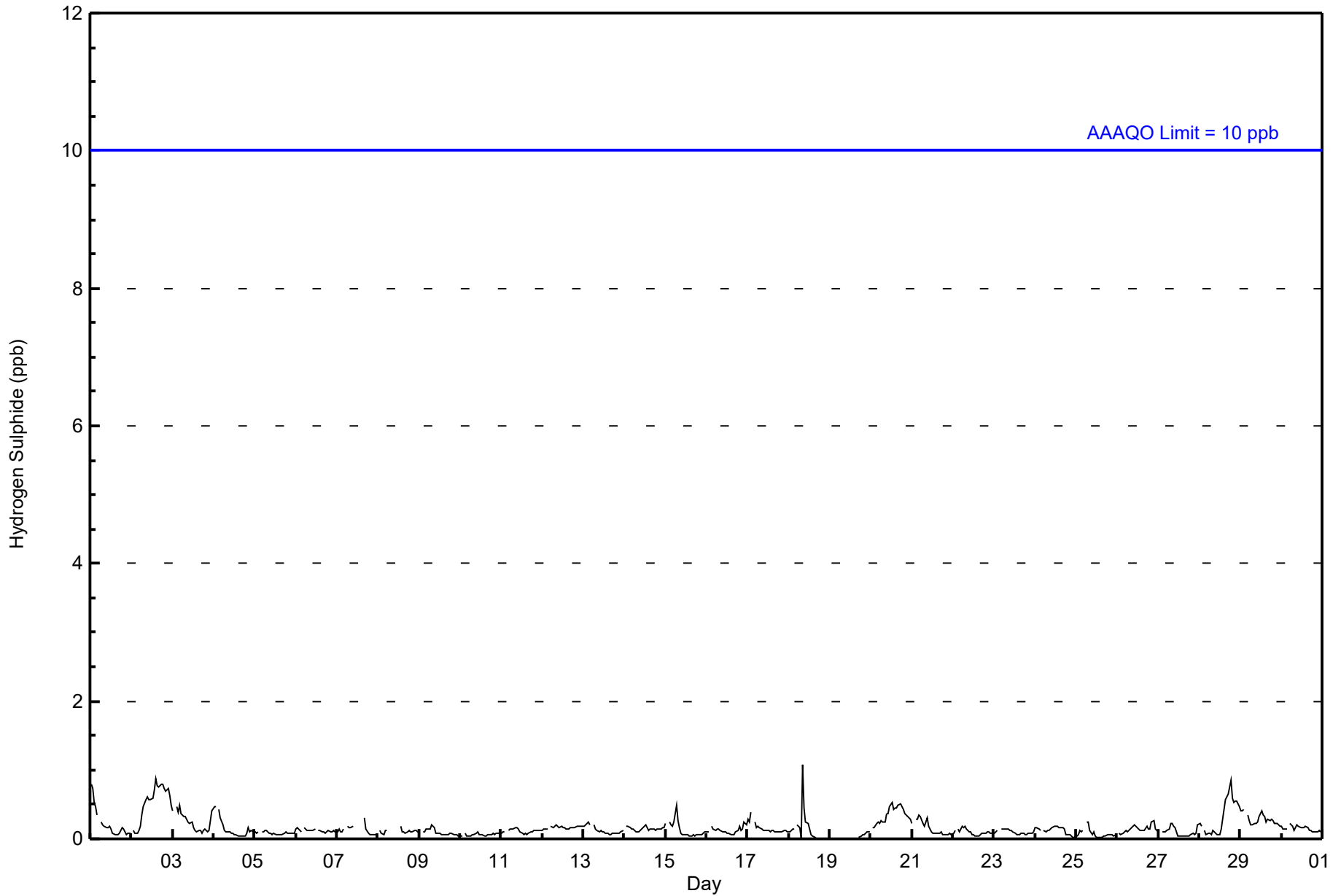
Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H₂S) - ppb

Surmont 2 - September 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 720																				Daily Average	Daily Maximum																									
Maximum Value: 1.1 ppb on Sep 18 09:00		Maximum Daily Average: 0.5 ppb on Sep 2		Hours of Data: 669																																														
Minimum Value: 0.0 ppb on Sep 18 08:00		Minimum Daily Average: 0.1 ppb on Sep 10		Hours of Missing Data: 51																																														
Maximum Diurnal Average: 0.2 ppb at hour 9		Minimum Diurnal Average: 0.1 ppb at hour 14		Hours of Calibration: 36																																														
Monthly Average: 0.16 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.1 Median = 0.1 Q ₃ = 0.2 P ₉₀ = 0.3 P ₉₉ = 0.8		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-Sep	0.8	0.7	0.5	0.5	0.3	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.8																							
2-Sep	Z	0.1	0.1	0.1	0.1	0.2	0.3	0.5	0.6	0.6	0.6	0.6	0.6	0.7	0.9	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.6	0.5	0.5	0.9																								
3-Sep	0.4	Z	0.5	0.4	0.5	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.4	0.2	0.5																								
4-Sep	0.5	0.5	Z	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.1	0.1	0.5																								
5-Sep	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																							
6-Sep	0.1	0.2	0.1	0.1	Z	0.2	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	0.2																							
7-Sep	0.1	0.1	0.1	0.1	0.1	Z	0.2	0.2	0.2	0.2	C	C	C	C	C	C	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	--	0.3																						
8-Sep	Z	0.1	0.1	0.1	0.1	0.1	PF	PF	PF	PF	PF	PF	PF	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																						
9-Sep	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.2																							
10-Sep	0.0	0.0	Z	0.1	0.1	0.0	0.0	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																						
11-Sep	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2																						
12-Sep	0.1	0.1	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2																						
13-Sep	0.2	0.2	0.2	0.2	0.2	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																						
14-Sep	Z	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.2																						
15-Sep	0.2	Z	0.2	0.2	0.2	0.2	0.5	0.3	0.2	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	0.5																						
16-Sep	0.1	0.1	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.2																						
17-Sep	0.3	0.2	0.4	Z	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.4																					
18-Sep	0.1	0.1	0.1	0.2	Z	0.2	0.2	0.0	1.1	0.4	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.1																					
19-Sep	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	M	M	M	M	M	M	M	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	--	0.1	0.1																						
20-Sep	Z	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.2	0.4	0.4	0.5	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	0.5	0.5																					
21-Sep	0.2	Z	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.3																					
22-Sep	0.1	0.1	Z	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2																					
23-Sep	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	0.1	0.2																					
24-Sep	0.2	0.2	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	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.2	0.2																					
25-Sep	0.0	0.1	0.1	0.1	0.1	Z	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.2	0.2																					
26-Sep	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.3	0.3																					
27-Sep	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.2																					
28-Sep	0.2	0.2	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4	0.6	0.6	0.6	0.6	0.9	0.6	0.5	0.6	0.6	0.5	0.3	0.3	0.9	0.9																					
29-Sep	0.4	0.4	0.4	Z	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4																					
30-Sep	0.2	0.1	0.1	0.1	Z	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2																				
																								0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.1	Diurnal Average		
																								0.8	0.7	0.5	0.5	0.5	0.4	0.5	0.5	1.1	0.6	0.6	0.6	0.6	0.6	0.7	0.9	0.8	0.8	0.8	0.9	0.7	0.7	0.7	0.6	0.5	Diurnal Maximum	
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**

**Hydrogen Sulphide (H₂S) - ppb
Surmont 2 - September 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	669	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: 669

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Surmont 2 - September 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	4	2	1	1	5	44	94	55	22	36	74	150	113	28	18	8	655
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	4	2	1	1	5	44	94	55	22	36	74	150	113	28	18	8	655

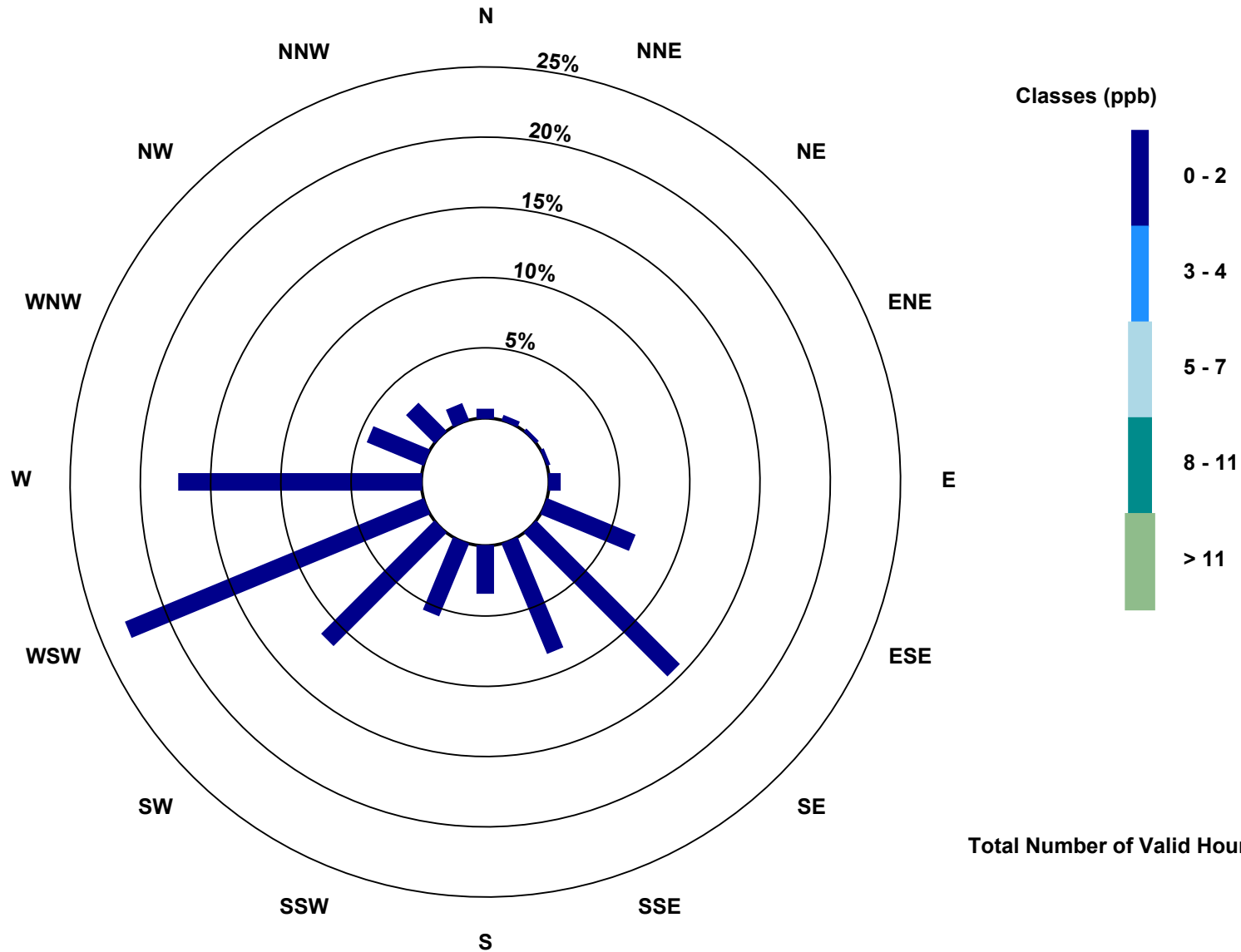
Total Number of Valid Hours: 655

Total Number of Hours: 720

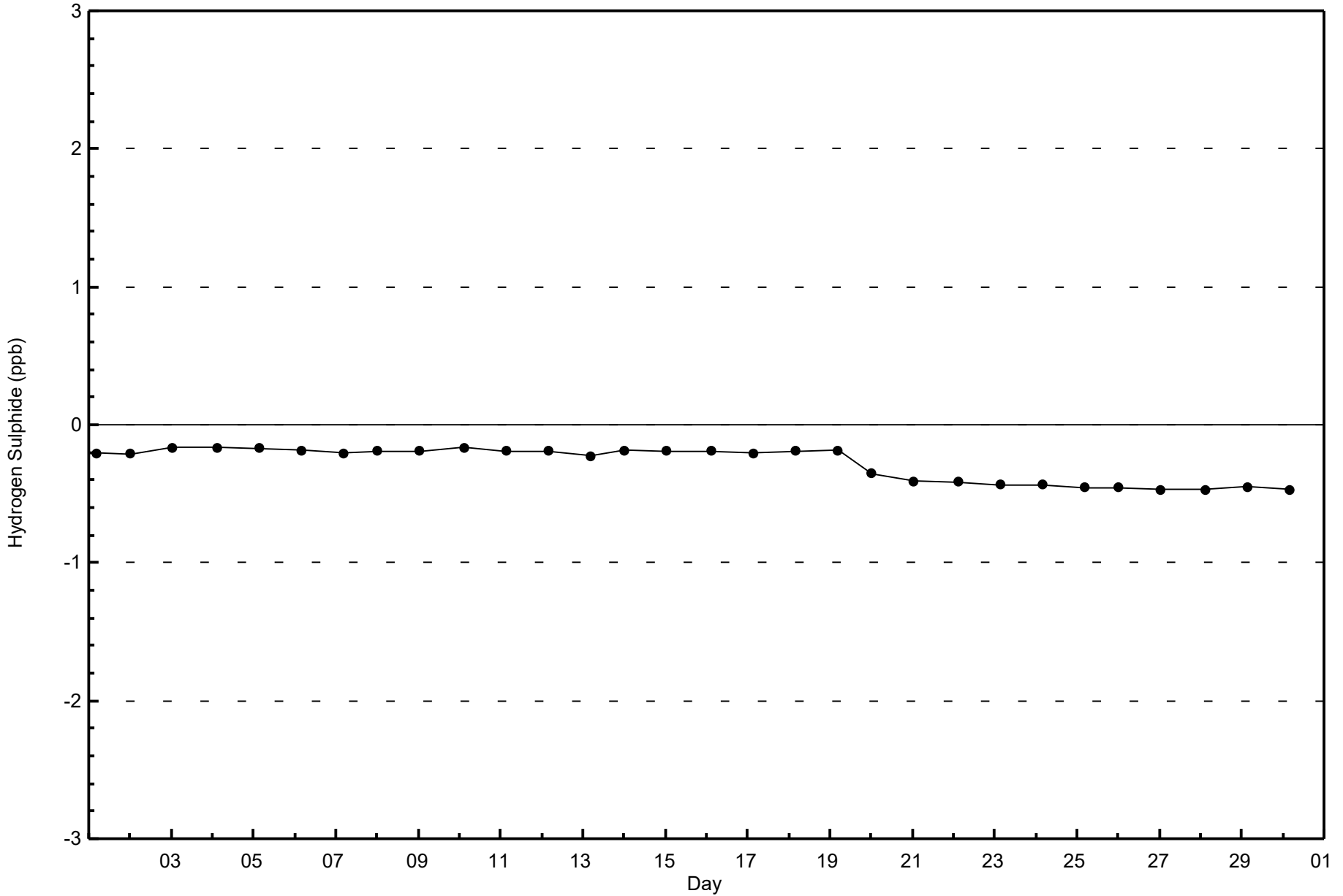


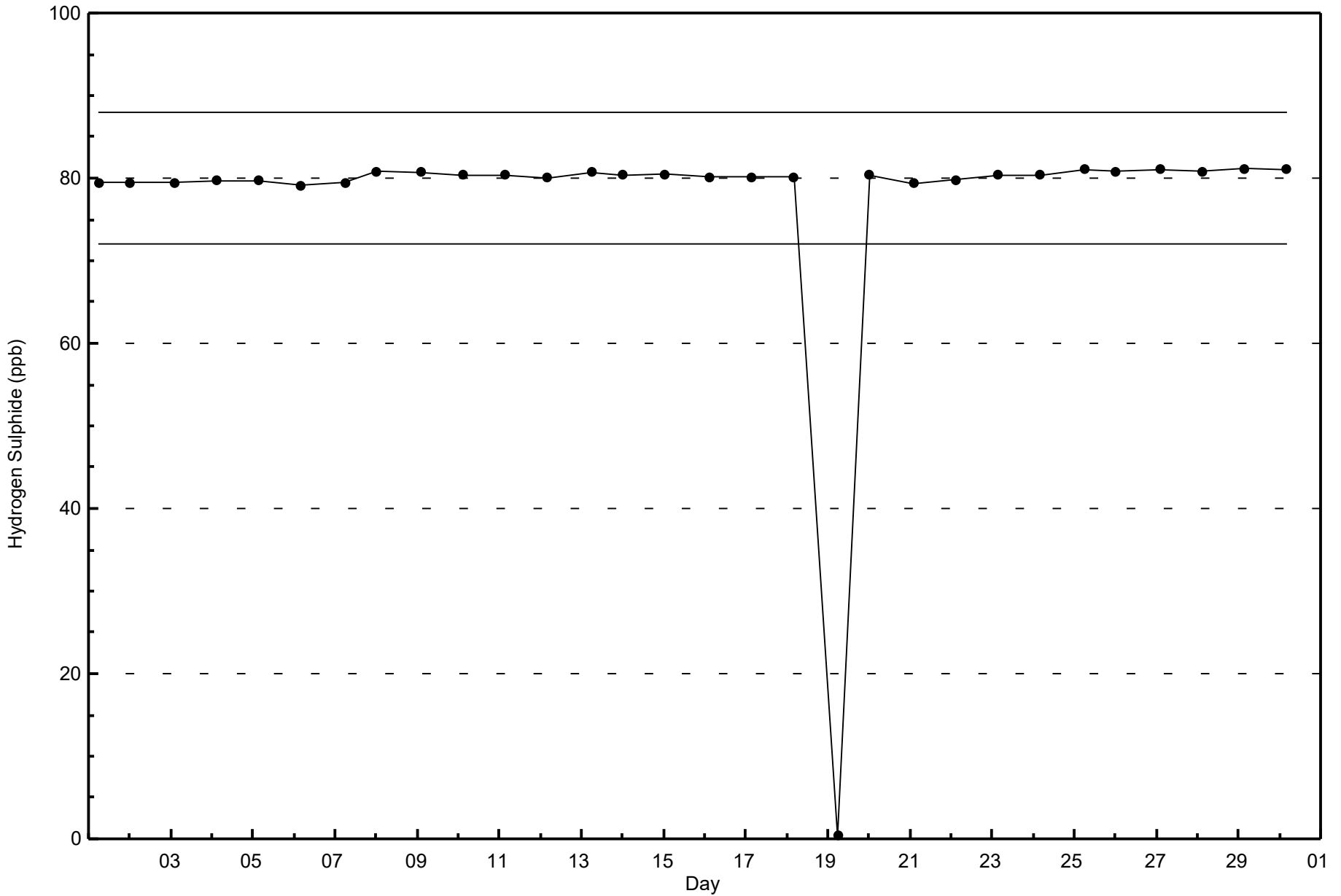
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Hydrogen Sulphide (H₂S) - ppb
Surmont 2



Total Number of Valid Hours: 655







Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

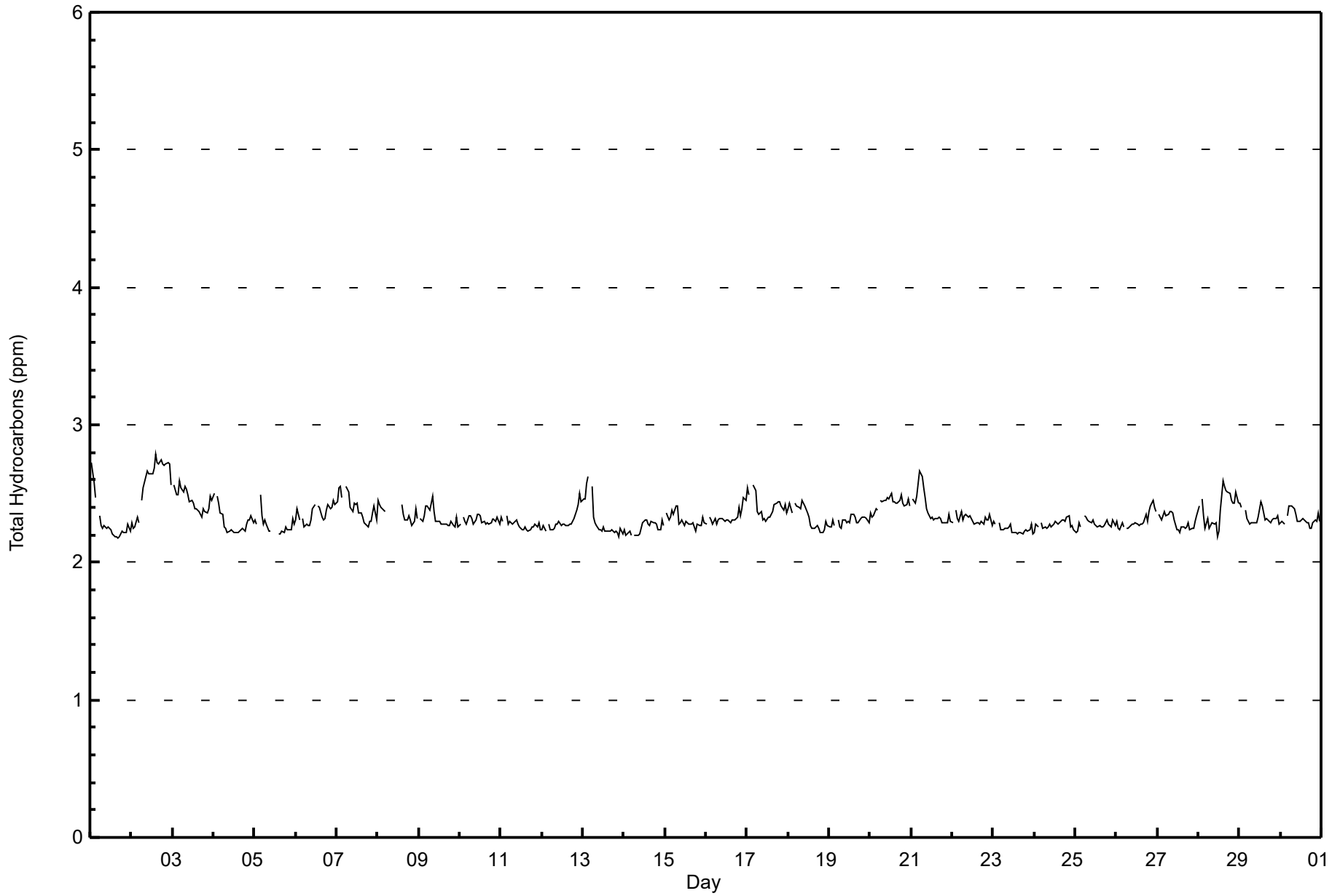
Surmont 2 - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 2.8 ppm on Sep 2 15:00 Maximum Daily Average: 2.6 ppm on Sep 2																			Hours in Service: 720 Hours of Data: 677 Hours of Missing Data: 43 Hours of Calibration: 34 Percent Operational Time: 98.8								
Minimum Value: 2.2 ppm on Sep 1 17:00 Minimum Daily Average: 2.2 ppm on Sep 23 Maximum Diurnal Average: 2.4 ppm at hour 4 Minimum Diurnal Average: 2.3 ppm at hour 17 Monthly Average: 2.33 ppm Percentiles: P ₁ = 2.2 P ₁₀ = 2.2 Q ₁ = 2.3 Median = 2.3 Q ₃ = 2.4 P ₉₀ = 2.5 P ₉₉ = 2.7																											
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Sep	2.7	2.7	2.6	2.5	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.3	2.2	2.3	2.7
2-Sep	2.3	2.2	2.3	2.3	2.3	Z	2.5	2.5	2.6	2.7	2.6	2.6	2.6	2.7	2.8	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.6	2.6	2.8	2.8
3-Sep	Z	2.6	2.5	2.5	2.6	2.5	2.5	2.6	2.5	2.5	2.4	2.5	2.4	2.4	2.4	2.4	2.3	2.3	2.4	2.4	2.4	2.4	2.5	2.5	2.4	2.6	2.6
4-Sep	2.5	Z	2.5	2.4	2.4	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.5	2.5
5-Sep	2.3	2.3	Z	2.5	2.3	2.3	2.3	2.3	2.2	2.2	C	C	C	C	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.3	2.3	2.3	2.5	2.5
6-Sep	2.3	2.4	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	M	2.4	2.4	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.5	2.4	2.4	2.5	2.5
7-Sep	2.4	2.5	2.6	2.5	Z	2.6	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.3	2.4	2.6	2.6
8-Sep	2.4	2.4	2.4	2.4	2.4	Z	PF	PF	PF	PF	PF	PF	PF	PF	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	--	2.4	2.4
9-Sep	Z	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.5	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.5	2.5
10-Sep	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4
11-Sep	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.3
12-Sep	2.2	2.3	2.2	Z	2.3	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.5	2.4	2.3	2.5	2.5
13-Sep	2.5	2.5	2.6	2.6	Z	2.6	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	2.2	2.2	2.2	2.2	2.6	2.6
14-Sep	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.3	2.3	2.3	2.3
15-Sep	Z	2.4	2.3	2.3	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.4	2.4
16-Sep	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.4	2.5	2.5	2.3	2.5	2.5
17-Sep	2.5	2.5	Z	2.6	2.5	2.5	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.6	2.6
18-Sep	2.4	2.4	2.4	Z	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.4	2.4
19-Sep	2.3	2.3	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4
20-Sep	2.4	2.3	2.3	2.4	2.4	Z	2.4	2.4	2.5	2.4	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.5	2.4	2.4	2.4	2.5	2.4	2.4	2.5	2.5
21-Sep	Z	2.5	2.4	2.5	2.6	2.7	2.6	2.5	2.5	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.7	2.7
22-Sep	2.3	Z	2.4	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.4	2.4
23-Sep	2.3	2.3	Z	2.3	2.2	2.2	2.2	2.3	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3
24-Sep	2.2	2.3	2.3	Z	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.3	2.3
25-Sep	2.2	2.2	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
26-Sep	2.3	2.2	2.2	2.3	2.3	Z	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.5	2.4	2.4	2.3	2.5	2.5
27-Sep	Z	2.3	2.3	2.3	2.4	2.3	2.3	2.4	2.4	2.4	2.3	2.2	2.2	2.2	2.3	2.3	2.2	2.3	2.3	2.2	2.3	2.2	2.3	2.3	2.3	2.4	2.4
28-Sep	2.4	Z	2.5	2.3	2.2	2.3	2.2	2.3	2.3	2.3	2.3	2.2	2.2	2.4	2.6	2.6	2.5	2.5	2.5	2.4	2.4	2.4	2.5	2.4	2.4	2.6	2.6
29-Sep	2.4	2.4	Z	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4
30-Sep	2.3	2.3	2.3	Z	2.3	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.3	2.3	2.4	2.3	2.3	2.4	2.4
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerospan C - Calibration M - Maintenance PF - Power Failure																											



Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Surmont 2 - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Surmont 2 - September 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	0	0.00	0.00
2.1 - 3.0	677	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: 677

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Surmont 2 - September 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	0
2.1 - 3.0	4	2	1	1	5	46	92	50	22	36	74	156	117	31	18	8	663	
3.1 - 10.0	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	0
Totals	4	2	1	1	5	46	92	50	22	36	74	156	117	31	18	8	663	

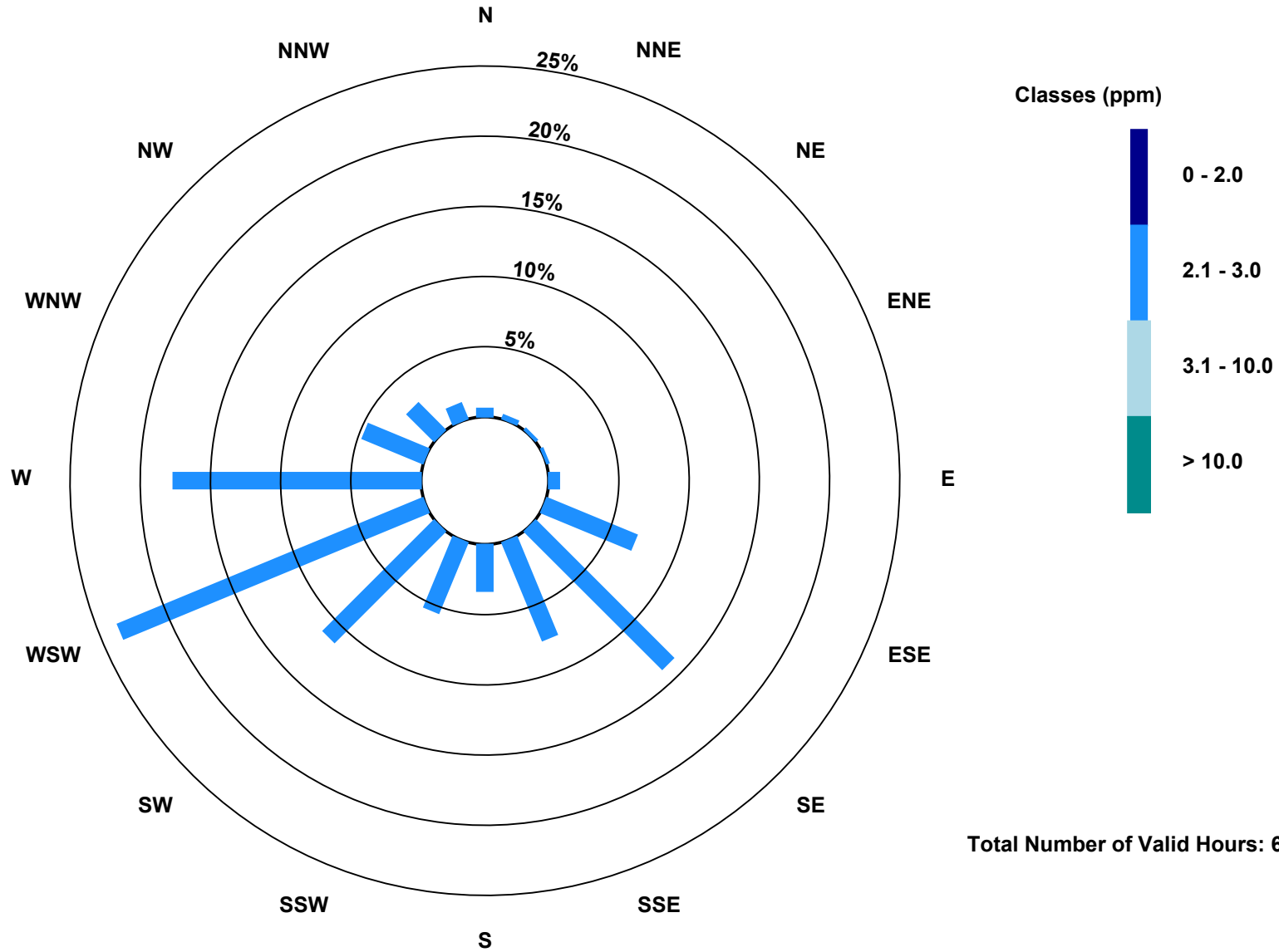
Total Number of Valid Hours: 663

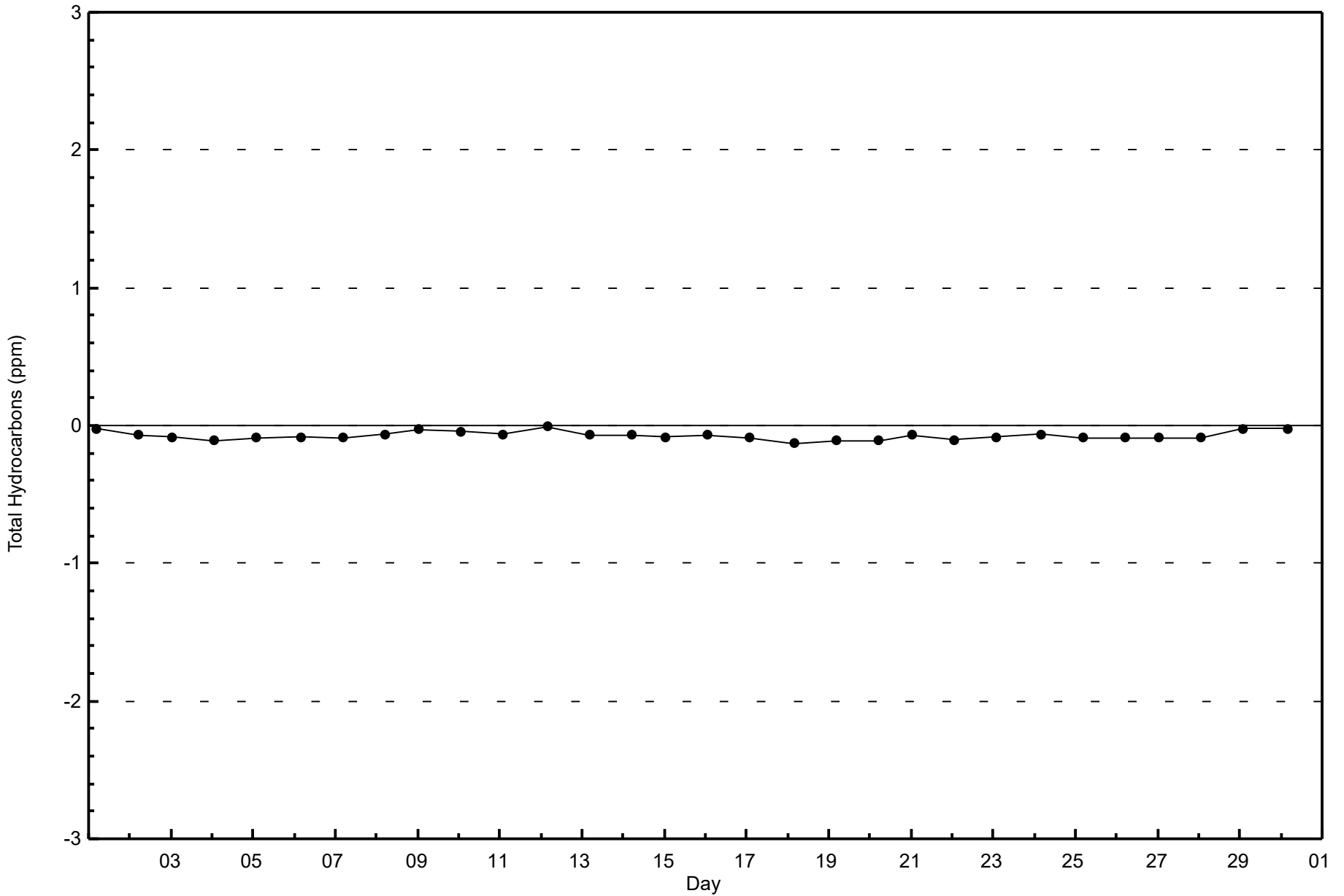
Total Number of Hours: 720

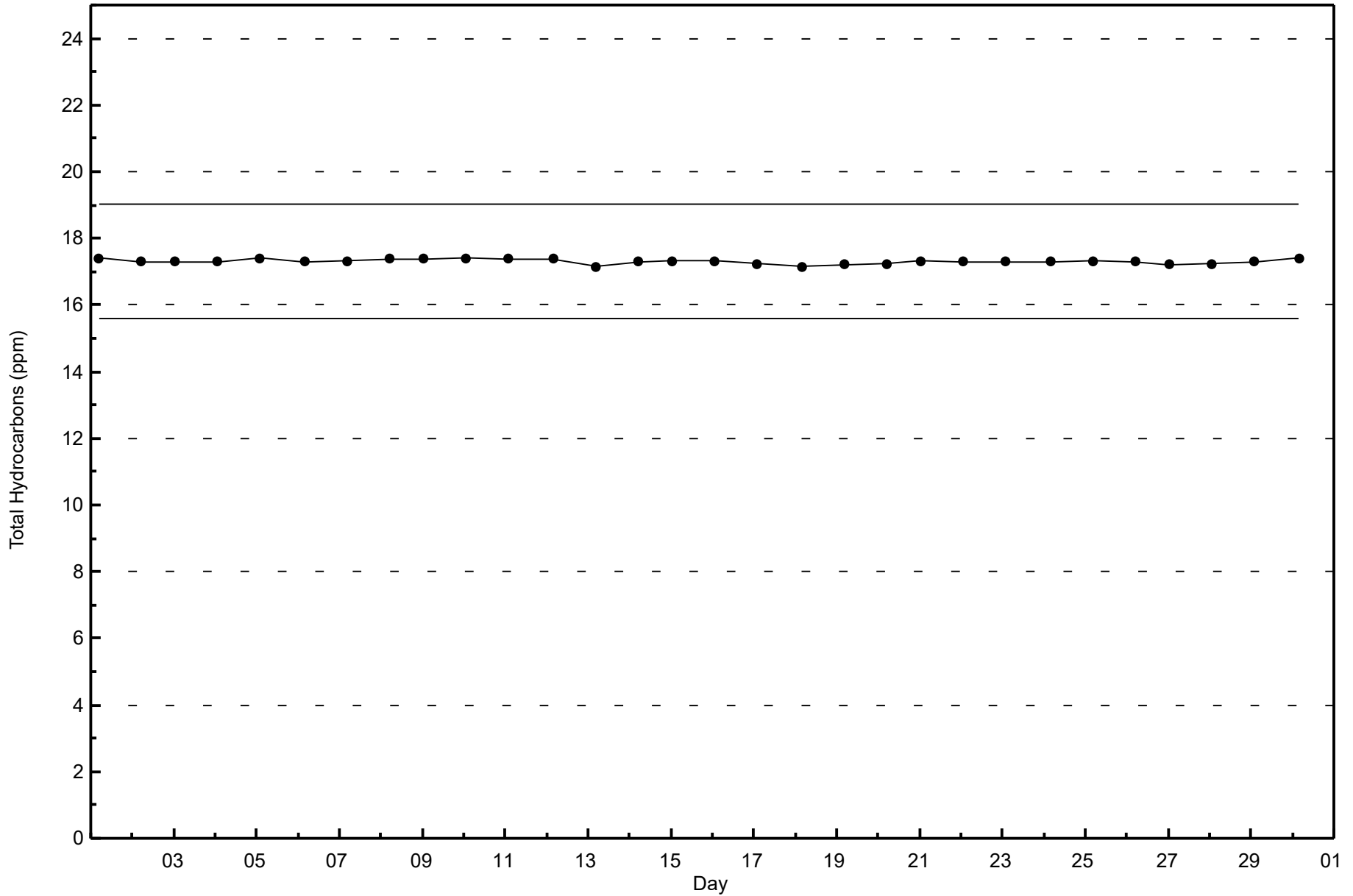


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Total Hydrocarbons (THC) - ppm
Surmont 2



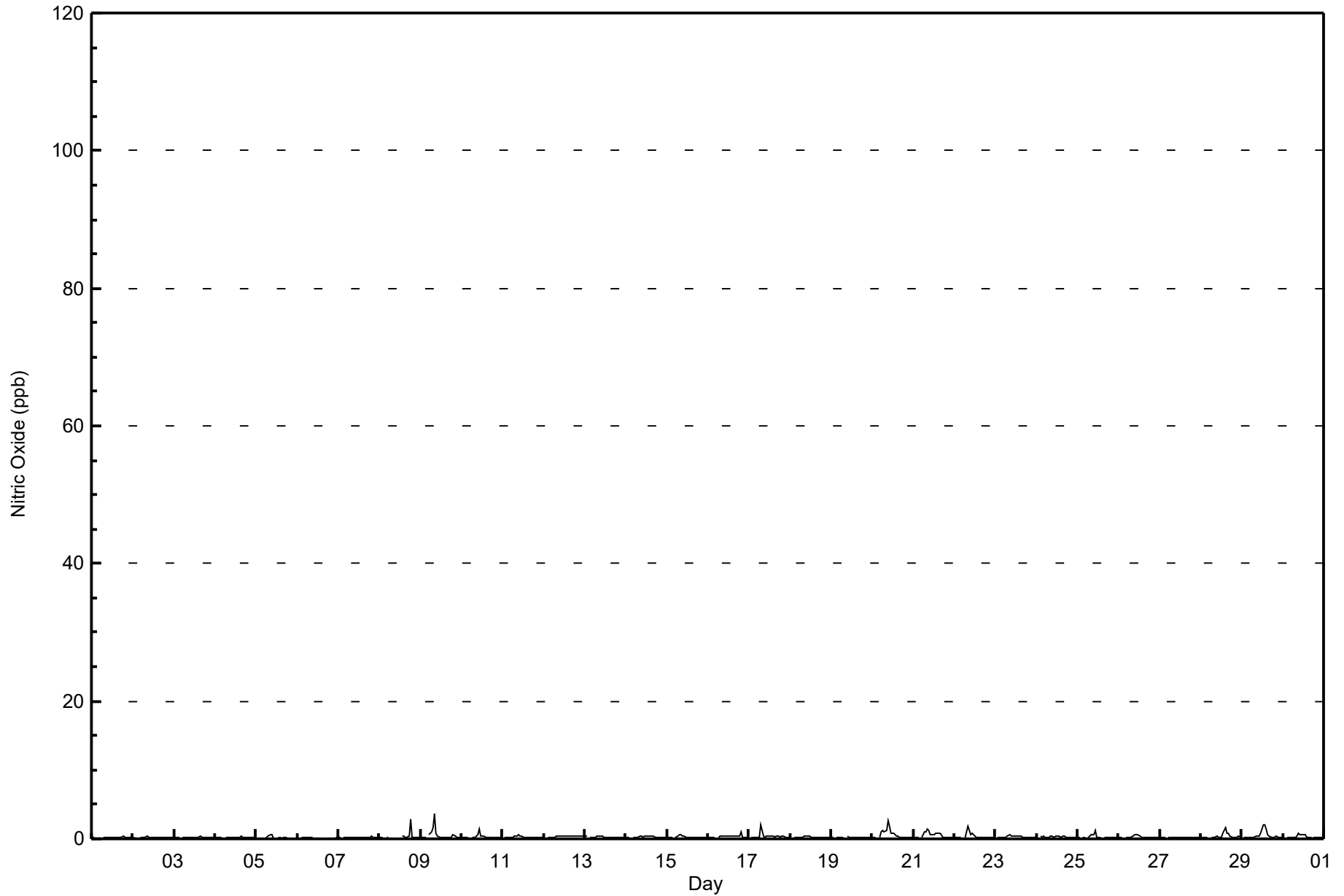






Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Surmont 2 - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Surmont 2 - September 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	676	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: 676

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Surmont 2 - September 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	4	2	1	1	5	48	95	53	20	37	73	153	115	31	18	8	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	4	2	1	1	5	48	95	53	20	37	73	153	115	31	18	8	664

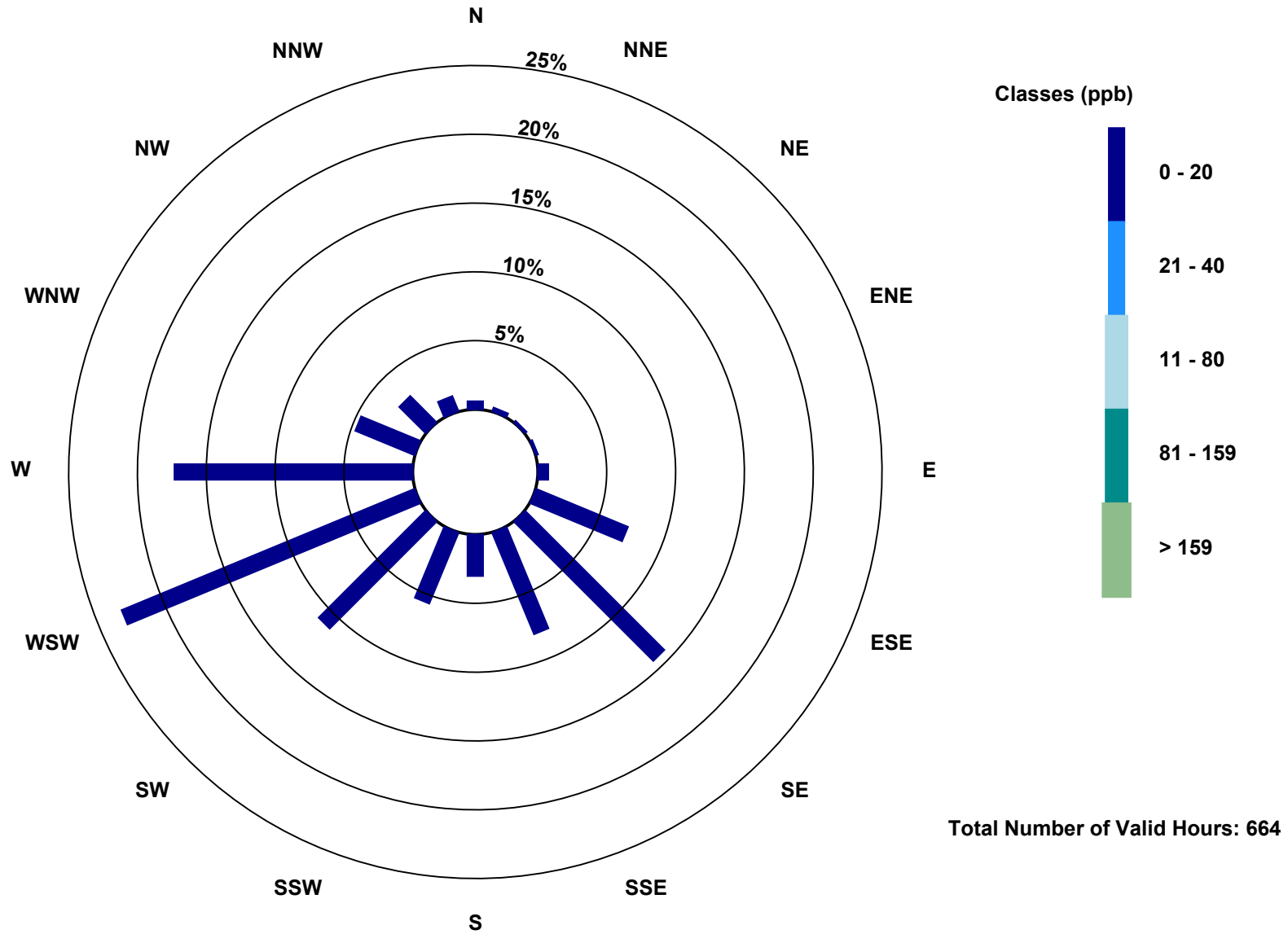
Total Number of Valid Hours: 664

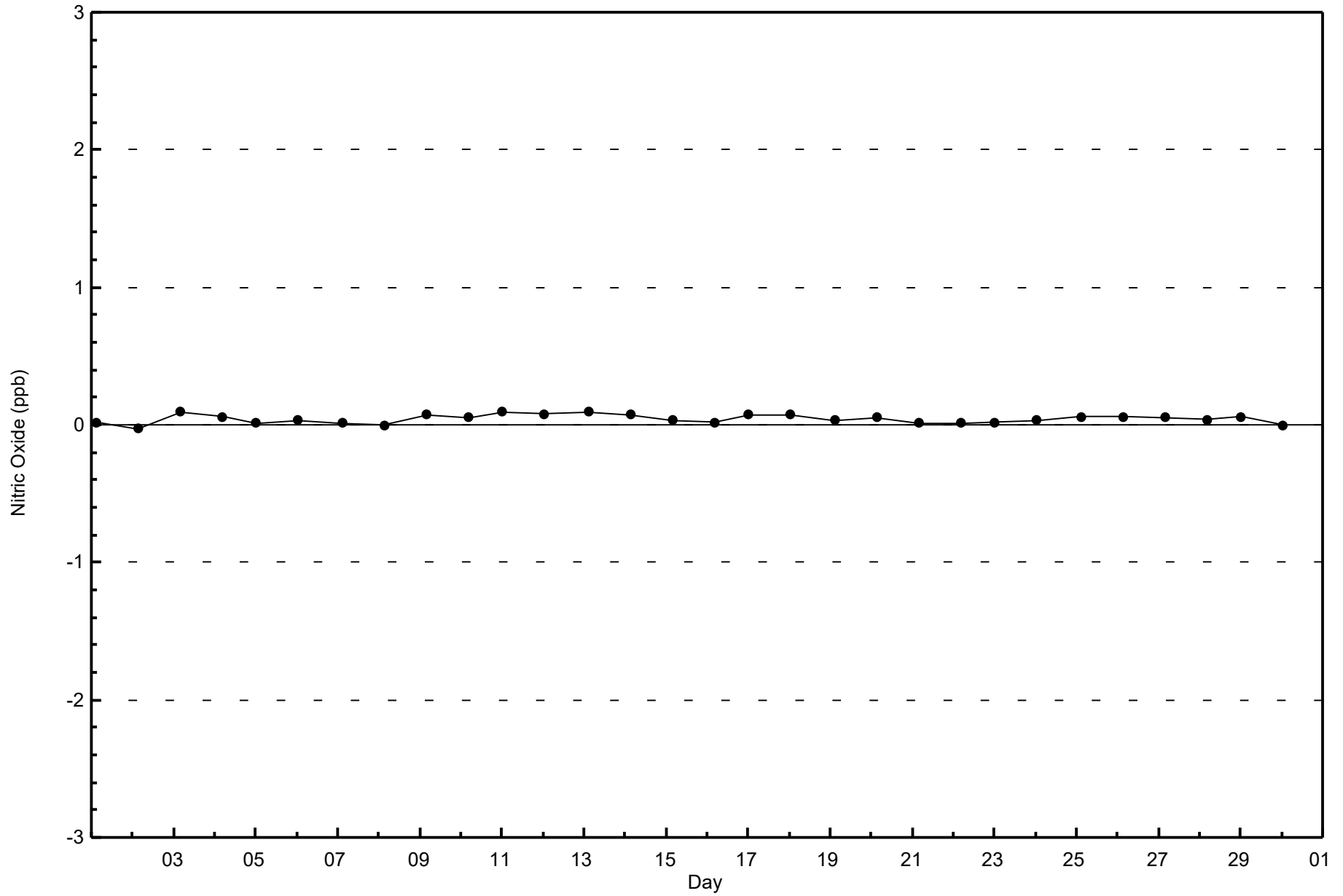
Total Number of Hours: 720

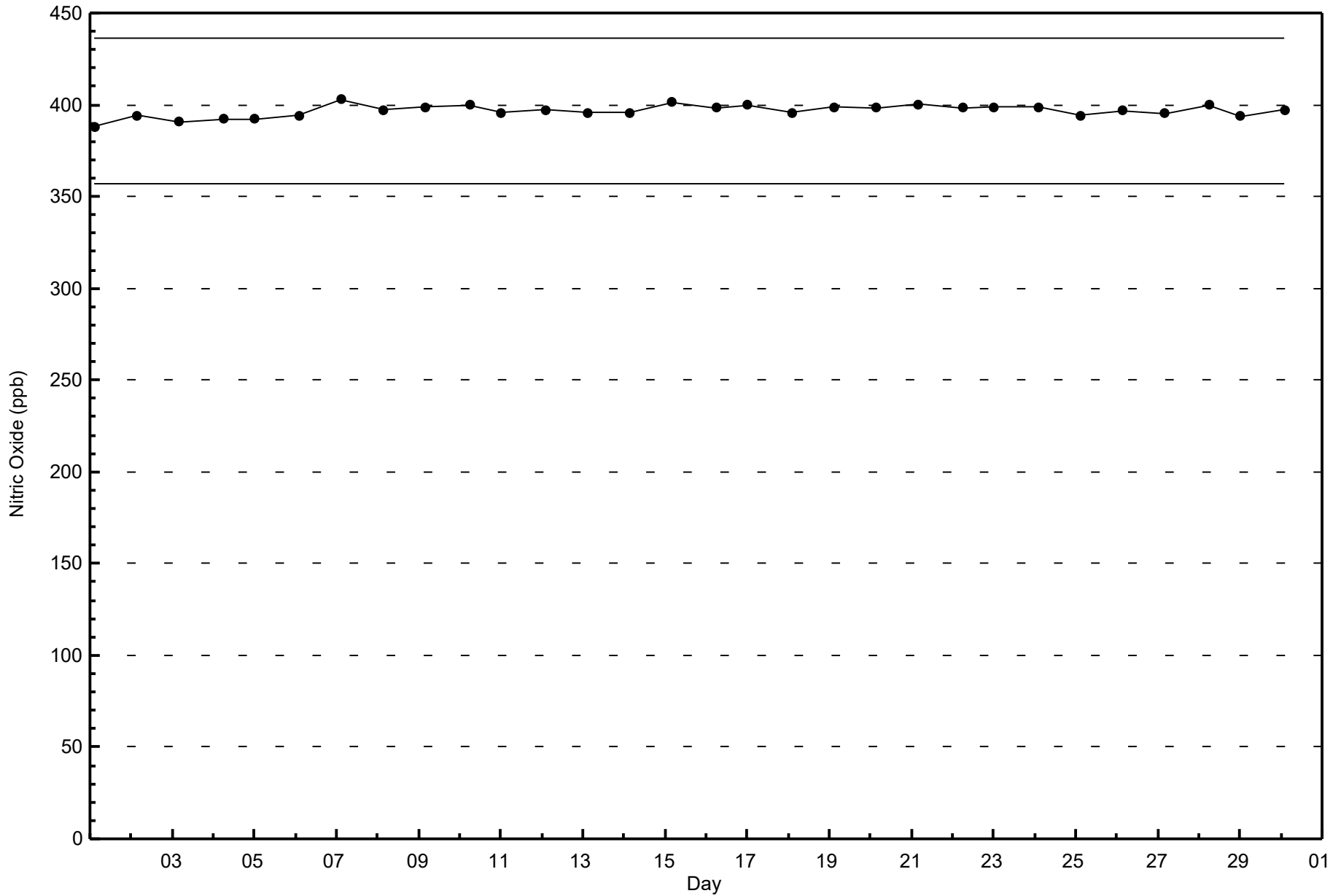


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitric Oxide (NO) - ppb
Surmont 2









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

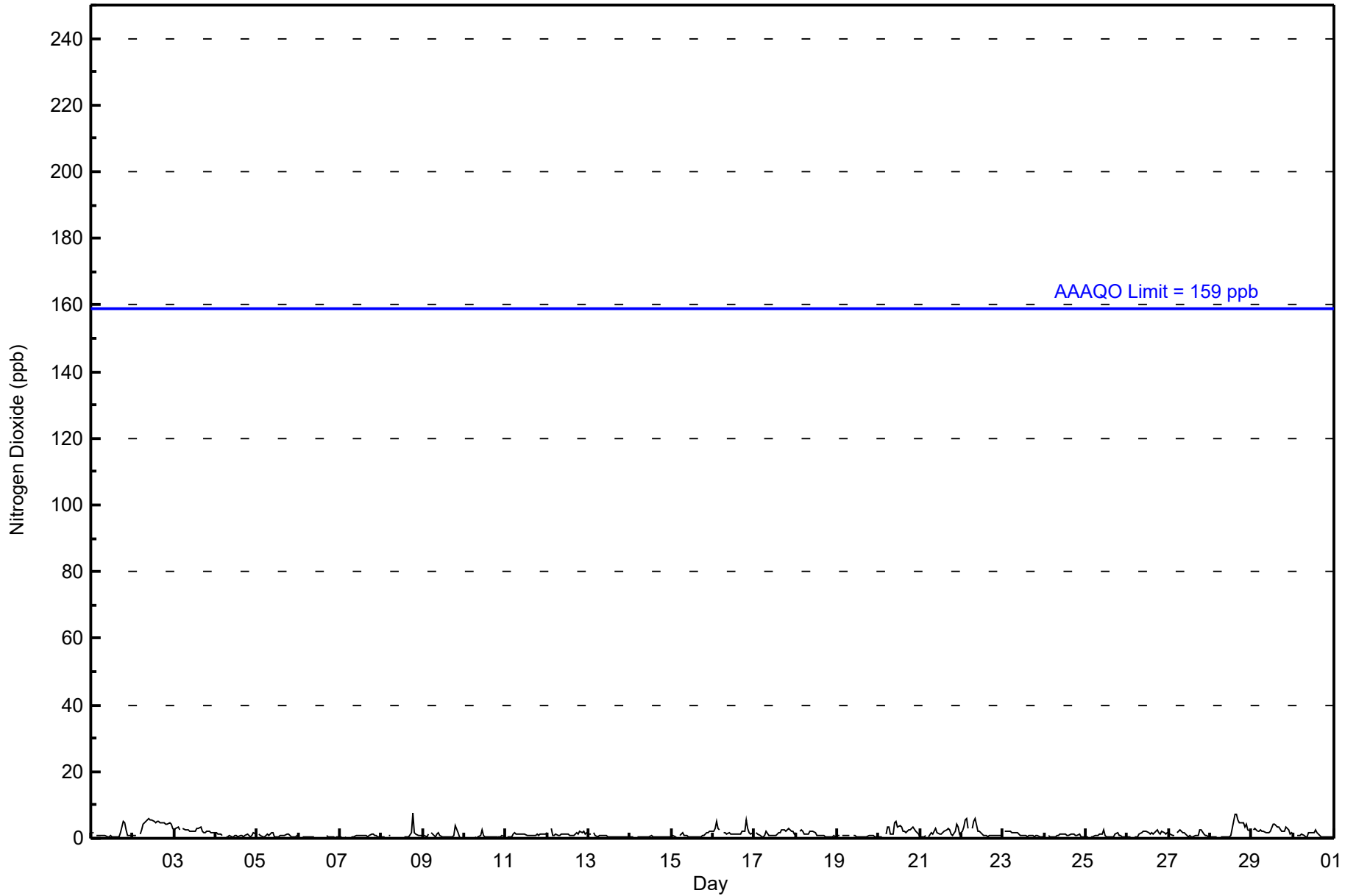
Surmont 2 - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0																	Hours in Service: 720																																
Maximum Value: 7.6 ppb on Sep 8 19:00																	Maximum Daily Average: 4.0 ppb on Sep 2					Hours of Data: 676																											
Minimum Value: 0.1 ppb on Sep 10 04:00																	Minimum Daily Average: 0.4 ppb on Sep 14					Hours of Missing Data: 44																											
Maximum Diurnal Average: 1.8 ppb at hour 20																	Minimum Diurnal Average: 1.0 ppb at hour 5					Hours of Calibration: 36																											
Monthly Average: 1.36 ppb																	Percentiles: P ₁ = 0.2 P ₁₀ = 0.4 Q ₁ = 0.5 Median = 1.0 Q ₃ = 1.7 P ₉₀ = 2.8 P ₉₉ = 5.6					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-Sep	1.7	1.6	Z	1.0	0.9	0.8	0.7	0.7	0.7	0.5	0.5	0.7	0.6	0.4	0.4	0.5	0.5	1.8	4.9	4.7	2.6	0.7	0.9	0.9	1.2	4.9																							
2-Sep	0.7	0.7	1.0	Z	1.3	2.5	4.1	4.8	5.6	5.9	5.4	5.3	5.0	4.6	4.9	5.0	4.7	4.6	4.6	4.2	4.4	4.6	4.1	3.1	4.0	5.9																							
3-Sep	2.7	2.8	3.4	2.5	Z	2.9	2.4	2.6	2.4	2.0	2.0	2.1	2.3	2.8	3.0	3.4	2.2	1.7	1.8	2.1	2.2	1.7	1.6	1.5	2.4	3.4																							
4-Sep	1.5	1.3	1.2	1.2	0.7	Z	0.4	0.5	0.7	0.6	0.4	0.7	0.8	0.4	0.7	0.7	0.6	0.8	1.1	0.7	0.6	0.9	1.7	1.4	0.9	1.7																							
5-Sep	Z	1.1	0.9	0.6	0.6	0.7	1.1	1.0	1.6	1.6	0.5	0.5	0.5	0.7	0.9	0.7	1.0	1.2	1.1	0.8	0.5	0.5	0.6	0.7	0.8	1.6																							
6-Sep	1.0	Z	0.6	0.4	0.4	0.4	0.3	0.4	0.3	0.4	C	C	C	C	C	C	0.7	0.5	0.5	0.6	0.3	0.2	0.3	0.4	--	1.0																							
7-Sep	0.4	0.2	Z	0.5	0.2	0.2	0.2	0.3	0.5	1.0	0.9	0.7	0.9	0.8	0.8	0.9	0.6	1.0	1.2	1.4	1.0	0.7	0.5	0.4	0.7	1.4																							
8-Sep	0.3	0.5	0.4	Z	0.8	1.0	PF	PF	PF	PF	PF	PF	PF	0.5	0.6	0.4	0.6	1.5	7.6	1.9	1.2	0.7	1.0	1.0	--	7.6																							
9-Sep	0.6	0.8	0.6	1.2	Z	1.5	0.9	0.3	1.2	1.7	0.7	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.9	3.9	1.8	0.4	0.2	0.2	0.9	3.9																							
10-Sep	0.2	0.2	0.2	0.1	0.1	Z	0.3	0.2	0.3	1.0	2.7	0.9	0.6	0.4	0.5	0.6	0.5	0.5	0.5	0.4	0.4	0.6	0.8	0.5	0.5	2.7																							
11-Sep	Z	0.5	0.4	0.5	1.1	1.7	1.3	1.4	1.1	1.4	1.2	1.1	0.9	0.7	0.7	0.8	0.8	0.9	1.2	1.0	1.1	1.2	1.4	1.3	1.0	1.7																							
12-Sep	1.7	Z	3.1	1.0	1.0	1.1	1.0	1.0	1.3	1.3	1.4	1.3	1.1	1.0	0.9	1.0	1.1	1.5	1.2	2.2	1.6	2.0	1.3	1.5	1.4	3.1																							
13-Sep	1.3	1.4	Z	1.5	0.9	0.6	1.0	1.0	0.9	0.9	0.8	0.5	0.4	0.4	0.5	0.4	0.5	0.4	0.5	0.4	0.4	0.3	0.3	0.4	0.7	1.5																							
14-Sep	0.5	0.5	0.4	Z	0.4	0.5	0.3	0.3	0.3	0.4	0.4	0.5	0.8	0.5	0.5	0.5	0.5	0.3	0.5	0.4	0.4	0.5	0.4	0.5	0.4	0.8																							
15-Sep	0.6	0.8	0.4	0.2	Z	1.0	1.6	0.8	0.9	0.7	0.6	0.4	0.3	0.4	0.4	0.5	0.6	0.6	0.7	1.0	1.5	1.6	2.0	2.1	0.9	2.1																							
16-Sep	2.1	2.9	5.1	3.0	2.5	Z	1.9	1.9	1.3	1.6	1.4	1.2	1.2	1.3	1.4	1.2	1.3	2.1	2.1	5.6	2.9	1.6	1.3	1.6	2.1	5.6																							
17-Sep	Z	1.6	1.2	1.0	0.6	0.3	0.7	2.1	0.9	0.8	0.9	1.0	1.0	1.4	1.6	1.7	2.6	2.4	2.1	2.5	2.8	2.3	2.2	1.4	1.5	2.8																							
18-Sep	1.5	Z	2.3	2.5	2.1	1.4	1.4	1.4	2.2	2.3	2.2	1.5	1.0	0.8	0.8	0.7	0.9	0.5	0.5	0.5	0.5	0.5	0.8	0.5	1.3	2.5																							
19-Sep	0.7	0.7	Z	0.7	0.7	0.9	0.8	0.9	M	0.7	0.7	0.4	0.5	0.4	0.4	0.3	0.5	0.5	0.9	1.0	0.7	0.8	0.6	0.5	0.7	1.0																							
20-Sep	0.4	0.4	0.5	Z	1.1	3.4	3.3	1.3	1.2	4.6	4.9	3.5	3.7	3.3	2.3	2.0	1.9	2.7	2.5	2.8	3.3	2.1	1.5	1.3	2.3	4.9																							
21-Sep	0.6	0.6	0.6	0.7	Z	0.6	1.8	1.3	2.3	3.1	1.7	1.2	1.2	1.8	2.0	2.4	3.0	2.5	1.4	0.9	2.1	4.4	3.3	1.4	1.8	4.4																							
22-Sep	2.1	3.3	5.4	5.8	2.8	Z	3.0	5.1	5.8	2.0	2.3	1.8	1.1	0.8	0.9	0.5	0.7	0.9	1.0	0.9	0.9	0.9	0.7	1.0	2.2	5.8																							
23-Sep	Z	2.0	2.1	2.3	2.1	1.9	1.8	1.9	1.9	1.2	0.9	0.8	0.8	0.8	0.6	0.7	0.7	0.8	0.5	0.7	0.7	0.5	0.5	0.6	1.2	2.3																							
24-Sep	0.8	Z	0.7	0.5	0.6	0.6	0.6	0.7	0.8	1.1	1.2	1.2	1.1	1.0	1.0	1.2	1.1	1.1	0.8	0.9	1.2	0.6	0.5	0.5	0.9	1.2																							
25-Sep	0.5	0.5	Z	0.5	0.5	0.8	0.9	0.7	1.1	1.3	2.4	0.7	0.5	0.5	0.3	0.3	0.4	1.1	1.5	0.7	0.8	0.6	0.4	0.4	0.8	2.4																							
26-Sep	0.4	0.4	0.4	Z	0.6	0.5	0.5	1.3	1.8	2.3	2.0	2.1	1.7	1.4	1.5	1.4	1.7	2.7	1.5	1.4	2.1	1.9	1.2	1.5	1.4	2.7																							
27-Sep	1.6	1.1	0.9	1.0	Z	1.8	2.4	2.2	1.5	1.5	1.1	0.4	0.7	0.4	0.5	0.7	1.0	0.9	2.4	2.7	1.1	0.9	0.8	0.5	1.2	2.7																							
28-Sep	0.6	0.4	0.3	0.3	0.4	Z	0.5	0.5	0.5	0.6	0.6	0.4	1.0	2.8	7.4	7.1	5.7	4.5	4.6	4.6	3.3	4.2	2.6	2.1	2.4	7.4																							
29-Sep	Z	2.7	2.8	2.3	2.3	2.4	2.1	2.1	1.7	1.6	1.6	2.2	4.4	4.1	3.8	3.3	3.2	2.3	2.1	2.3	3.5	2.5	1.4	1.5	2.5	4.4																							
30-Sep	1.3	Z	1.0	0.8	0.7	1.3	1.0	0.6	0.5	1.9	1.8	1.9	1.9	2.4	1.5	0.9	0.6	0.4	0.5	0.6	0.5	0.4	0.4	0.4	1.0	2.4																							
																								1.0	1.2	1.4	1.3	1.0	1.2	1.3	1.4	1.5	1.6	1.5	1.3	1.3	1.3	1.4	1.4	1.4	1.4	1.8	1.8	1.5	1.4	1.2	1.0	Diurnal Average	
																								2.7	3.3	5.4	5.8	2.8	3.4	4.1	5.1	5.8	5.9	5.4	5.3	5.0	4.6	7.4	7.1	5.7	4.6	7.6	5.6	4.4	4.6	4.1	3.1	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
Surmont 2 - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Surmont 2 - September 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	676	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: 676

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Surmont 2 - September 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	4	2	1	1	5	48	95	53	20	37	73	153	115	31	18	8	664
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	4	2	1	1	5	48	95	53	20	37	73	153	115	31	18	8	664

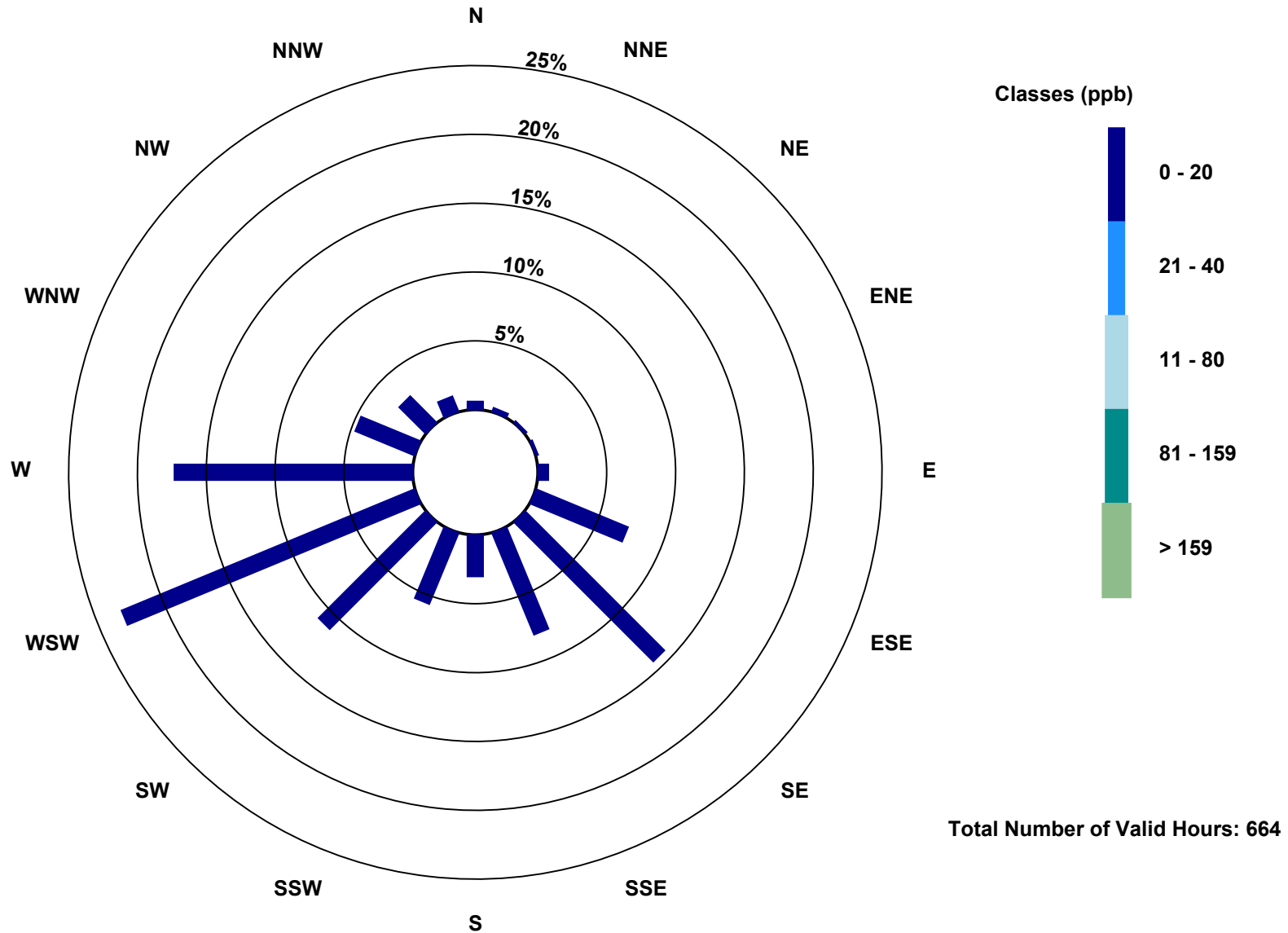
Total Number of Valid Hours: 664

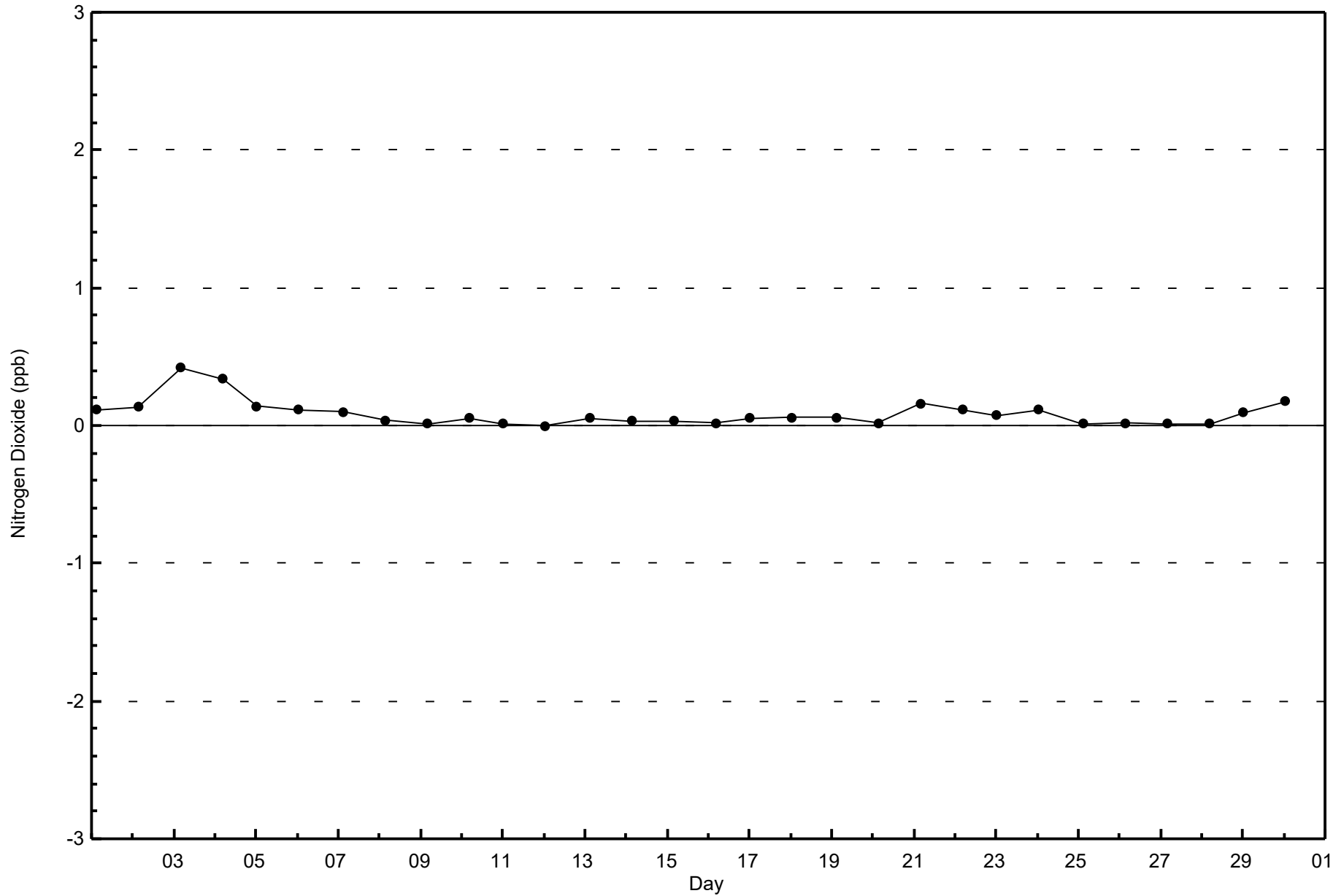
Total Number of Hours: 720

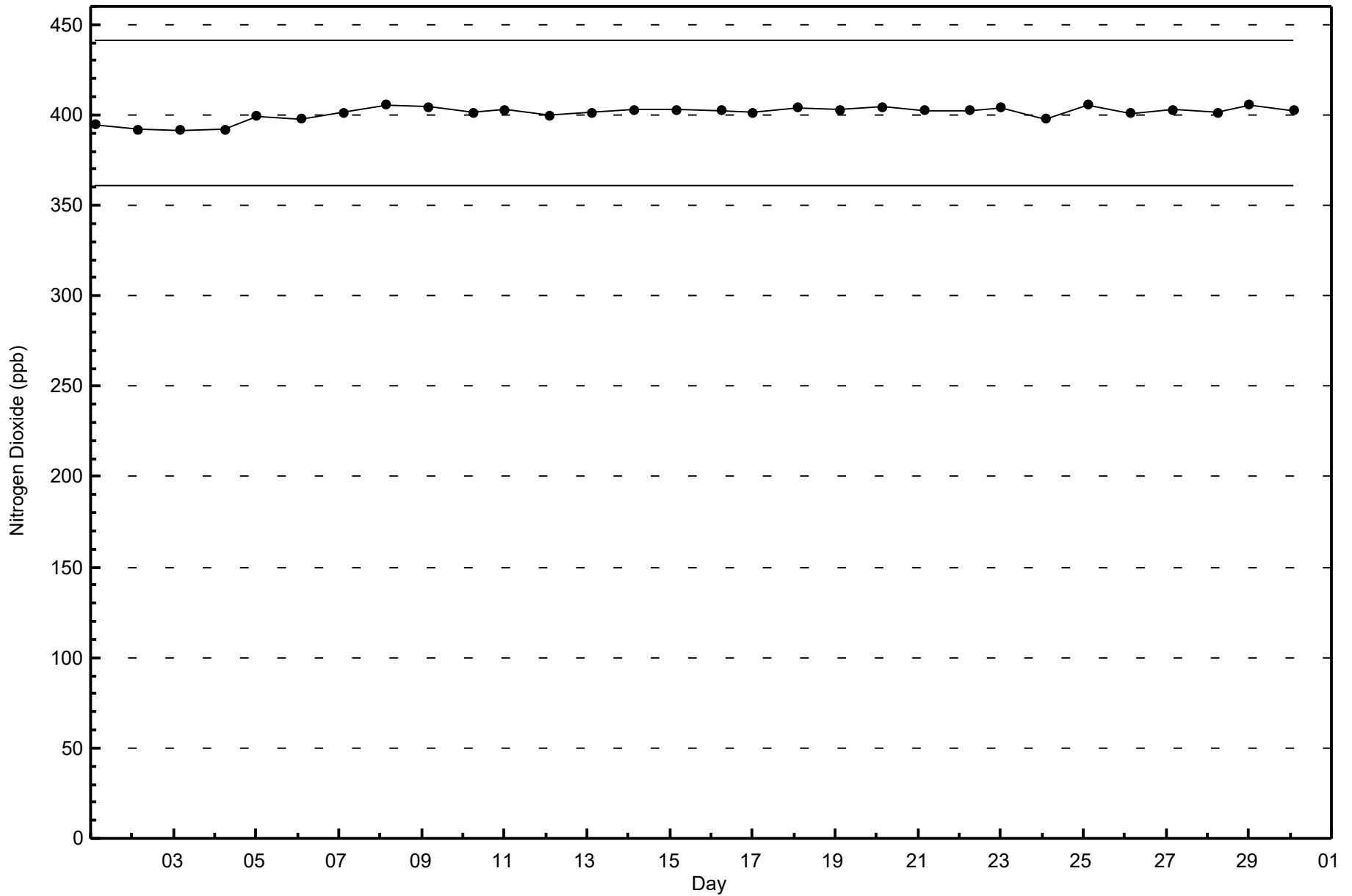


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitrogen Dioxide (NO₂) - ppb
Surmont 2









Wood Buffalo Environmental Association
Summary of Hour Averages

Nitrogen Oxides (NO_x) - ppb
Surmont 2 - September 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 10.4 ppb on Sep 8 19:00	Maximum Daily Average: 4.1 ppb on Sep 2		Hours of Data:	676
Minimum Value: 0.3 ppb on Sep 7 05:00	Minimum Daily Average: 0.8 ppb on Sep 14		Hours of Missing Data:	44
Maximum Diurnal Average: 2.1 ppb at hour 10	Minimum Diurnal Average: 1.2 ppb at hour 5		Hours of Calibration:	36
Monthly Average: 1.67 ppb	Percentiles: P ₁ = 0.4 P ₁₀ = 0.6 Q ₁ = 0.8 Median = 1.2 Q ₃ = 2.2 P ₉₀ = 3.1 P ₉₉ = 6.6		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-Sep	1.8	1.8	Z	1.1	1.0	0.9	0.8	0.8	0.9	0.6	0.6	0.9	0.7	0.5	0.6	0.6	0.6	2.0	5.2	4.9	2.7	0.8	1.0	1.0	1.4	5.2
2-Sep	0.8	0.8	1.1	Z	1.4	2.6	4.2	5.0	6.0	6.1	5.6	5.5	5.2	4.8	5.0	5.2	4.9	4.8	4.8	4.3	4.5	4.8	4.3	3.3	4.1	6.1
3-Sep	2.9	3.0	3.6	2.7	Z	3.1	2.6	2.9	2.7	2.3	2.2	2.3	2.5	3.0	3.2	3.7	2.5	1.9	2.0	2.3	2.4	1.9	1.8	1.7	2.6	3.7
4-Sep	1.7	1.5	1.4	1.4	0.9	Z	0.6	0.7	1.0	0.8	0.6	0.9	1.0	0.6	0.9	1.0	0.8	1.0	1.3	0.8	0.7	1.0	1.8	1.5	1.0	1.8
5-Sep	Z	1.2	1.0	0.7	0.7	0.8	1.4	1.5	2.3	2.2	0.6	0.6	0.6	0.8	1.0	0.8	1.1	1.3	1.2	0.9	0.6	0.6	0.7	0.8	1.0	2.3
6-Sep	1.1	Z	0.7	0.5	0.5	0.5	0.4	0.6	0.5	0.7	C	C	C	C	C	C	0.8	0.6	0.6	0.7	0.4	0.3	0.4	0.5	--	1.1
7-Sep	0.6	0.4	Z	0.6	0.3	0.3	0.4	0.5	0.8	1.2	1.1	0.9	1.1	1.0	0.9	1.1	0.8	1.3	1.5	1.7	1.2	0.9	0.7	0.6	0.9	1.7
8-Sep	0.5	0.6	0.5	Z	0.9	1.1	PF	PF	PF	PF	PF	PF	PF	0.9	0.9	0.7	0.9	1.9	10.4	2.1	1.4	0.9	1.2	1.2	--	10.4
9-Sep	0.8	1.0	0.7	1.4	Z	2.0	1.9	2.0	4.9	2.5	1.1	0.6	0.6	0.6	0.6	0.6	0.6	0.7	1.2	4.4	2.2	0.6	0.4	0.4	1.4	4.9
10-Sep	0.4	0.4	0.4	0.3	0.3	Z	0.5	0.4	0.5	1.5	4.1	1.3	0.9	0.7	0.8	0.9	0.8	0.8	0.8	0.7	0.7	0.9	1.1	0.7	0.9	4.1
11-Sep	Z	0.7	0.6	0.7	1.3	1.9	1.6	1.8	1.6	2.0	1.6	1.4	1.2	0.9	0.9	1.0	1.0	1.2	1.5	1.3	1.4	1.5	1.7	1.6	1.3	2.0
12-Sep	2.0	Z	3.4	1.3	1.2	1.3	1.3	1.4	1.8	1.8	1.9	1.7	1.5	1.4	1.3	1.4	1.5	1.8	1.5	2.5	1.9	2.3	1.6	1.8	1.7	3.4
13-Sep	1.6	1.7	Z	1.8	1.2	0.9	1.3	1.4	1.3	1.2	1.2	0.8	0.7	0.7	0.8	0.6	0.7	0.6	0.6	0.6	0.6	0.5	0.5	0.6	1.0	1.8
14-Sep	0.7	0.8	0.7	Z	0.7	0.8	0.6	0.6	0.6	0.8	0.7	0.8	1.2	0.9	0.9	0.8	0.8	0.6	0.8	0.6	0.6	0.7	0.6	0.7	0.8	1.2
15-Sep	0.8	1.0	0.6	0.4	Z	1.2	2.0	1.5	1.4	1.2	0.9	0.6	0.6	0.7	0.7	0.8	0.9	0.9	1.0	1.3	1.8	1.9	2.3	2.4	1.2	2.4
16-Sep	2.3	3.1	5.3	3.2	2.7	Z	2.2	2.2	1.7	2.0	1.7	1.6	1.6	1.7	1.8	1.5	1.6	2.5	2.4	6.7	3.2	1.9	1.5	1.8	2.4	6.7
17-Sep	Z	1.8	1.4	1.2	0.8	0.5	0.9	4.2	1.3	1.1	1.2	1.3	1.4	1.8	1.9	2.0	2.9	2.7	2.4	2.8	3.1	2.6	2.5	1.6	1.9	4.2
18-Sep	1.7	Z	2.6	2.8	2.4	1.6	1.6	1.7	2.7	2.7	2.6	1.9	1.3	1.1	1.1	0.9	1.2	0.7	0.7	0.7	0.7	0.7	1.0	0.7	1.5	2.8
19-Sep	0.8	0.8	Z	0.9	0.9	1.1	1.0	1.2	M	1.1	1.0	0.7	0.8	0.6	0.6	0.5	0.7	0.7	1.1	1.2	0.9	1.0	0.8	0.7	0.9	1.2
20-Sep	0.6	0.5	0.6	Z	1.3	4.4	4.6	2.3	2.4	7.3	6.8	4.4	4.5	3.9	2.7	2.3	2.2	2.9	2.7	3.0	3.6	2.3	1.7	1.5	3.0	7.3
21-Sep	0.8	0.8	0.8	0.9	Z	0.8	2.8	2.2	3.8	4.3	2.4	1.8	1.7	2.6	2.8	3.1	3.7	2.8	1.5	1.0	2.3	4.6	3.5	1.6	2.3	4.6
22-Sep	2.3	3.5	5.6	6.0	3.0	Z	3.3	6.0	7.6	2.6	3.0	2.3	1.4	1.0	1.1	0.7	0.9	1.1	1.2	1.1	1.1	1.1	0.9	1.2	2.5	7.6
23-Sep	Z	2.2	2.3	2.5	2.3	2.1	2.1	2.3	2.4	1.7	1.3	1.2	1.1	1.1	0.9	1.0	1.0	1.1	0.8	1.0	1.0	0.8	0.8	0.9	1.5	2.5
24-Sep	1.1	Z	1.0	0.8	0.9	0.9	0.9	1.0	1.1	1.4	1.3	1.6	1.5	1.3	1.5	1.4	1.4	1.0	1.1	1.4	0.8	0.7	0.7	0.7	1.1	1.6
25-Sep	0.7	0.6	Z	0.6	0.6	0.9	1.0	1.0	1.7	1.9	3.7	0.9	0.7	0.7	0.4	0.4	0.5	1.2	1.6	0.8	0.9	0.7	0.6	0.6	1.0	3.7
26-Sep	0.6	0.6	0.6	Z	0.8	0.7	0.7	1.5	2.1	2.9	2.7	2.7	2.1	1.7	1.7	1.6	1.9	2.9	1.7	1.6	2.3	2.2	1.5	1.7	1.7	2.9
27-Sep	1.8	1.3	1.1	1.2	Z	2.0	2.6	2.5	1.8	1.8	1.4	0.6	0.9	0.6	0.7	0.9	1.2	1.1	2.6	2.9	1.3	1.1	0.9	0.6	1.4	2.9
28-Sep	0.7	0.5	0.4	0.4	0.5	Z	0.6	0.7	0.8	0.9	0.9	0.6	1.2	3.6	9.0	8.0	6.5	5.0	4.8	4.8	3.5	4.5	2.9	2.3	2.7	9.0
29-Sep	Z	2.9	3.0	2.5	2.5	2.6	2.3	2.3	2.1	1.9	2.0	3.0	6.4	6.2	5.3	3.9	3.6	2.6	2.3	2.5	3.8	2.7	1.5	1.7	3.0	6.4
30-Sep	1.4	Z	1.1	0.9	0.8	1.5	1.1	0.8	0.9	2.7	2.4	2.6	2.5	2.9	1.7	1.0	0.7	0.5	0.6	0.7	0.6	0.5	0.5	0.5	1.3	2.9

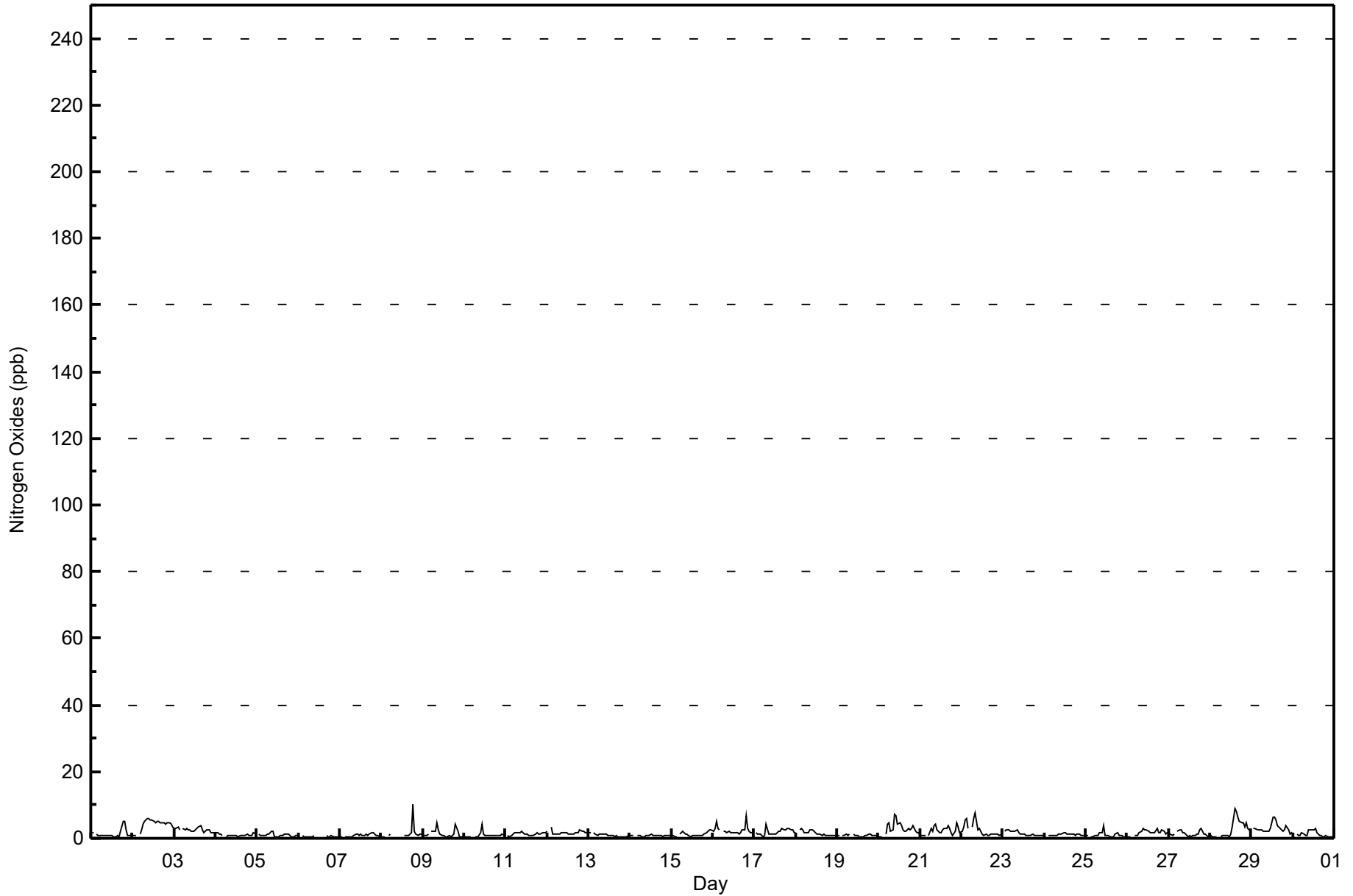
1.2	1.3	1.6	1.5	1.2	1.4	1.6	1.8	2.1	2.1	2.0	1.6	1.7	1.7	1.8	1.7	1.6	1.7	2.1	2.0	1.8	1.6	1.4	1.2	Diurnal Average	
2.9	3.5	5.6	6.0	3.0	4.4	4.6	6.0	7.6	7.3	6.8	5.5	6.4	6.2	9.0	8.0	6.5	5.0	10.4	6.7	4.5	4.8	4.3	3.3	Diurnal Maximum	

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



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Surmont 2 - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Surmont 2 - September 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	676	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: 676

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Surmont 2 - September 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	4	2	1	1	5	48	95	53	20	37	73	153	115	31	18	8	664
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	4	2	1	1	5	48	95	53	20	37	73	153	115	31	18	8	664

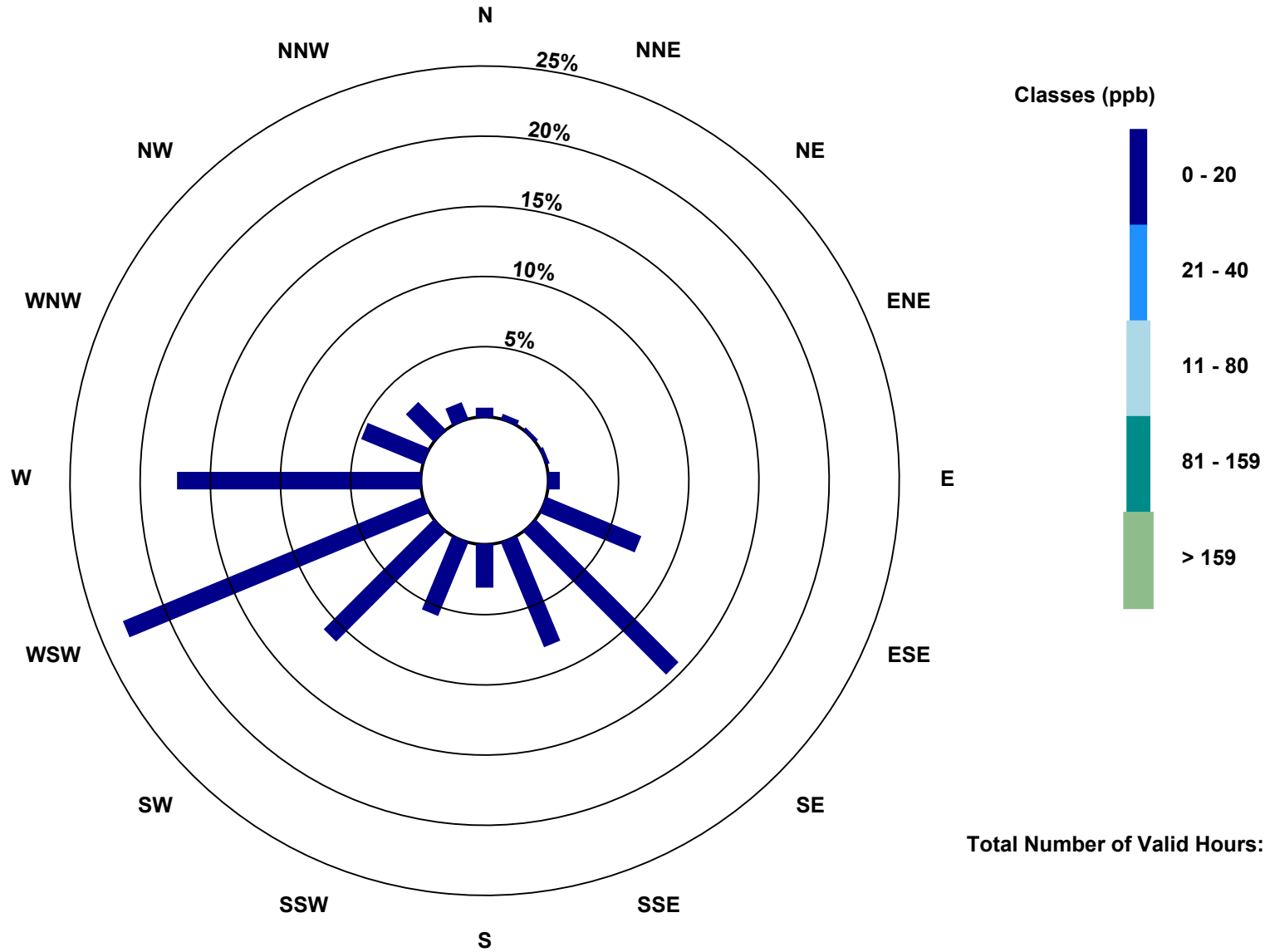
Total Number of Valid Hours: 664

Total Number of Hours: 720

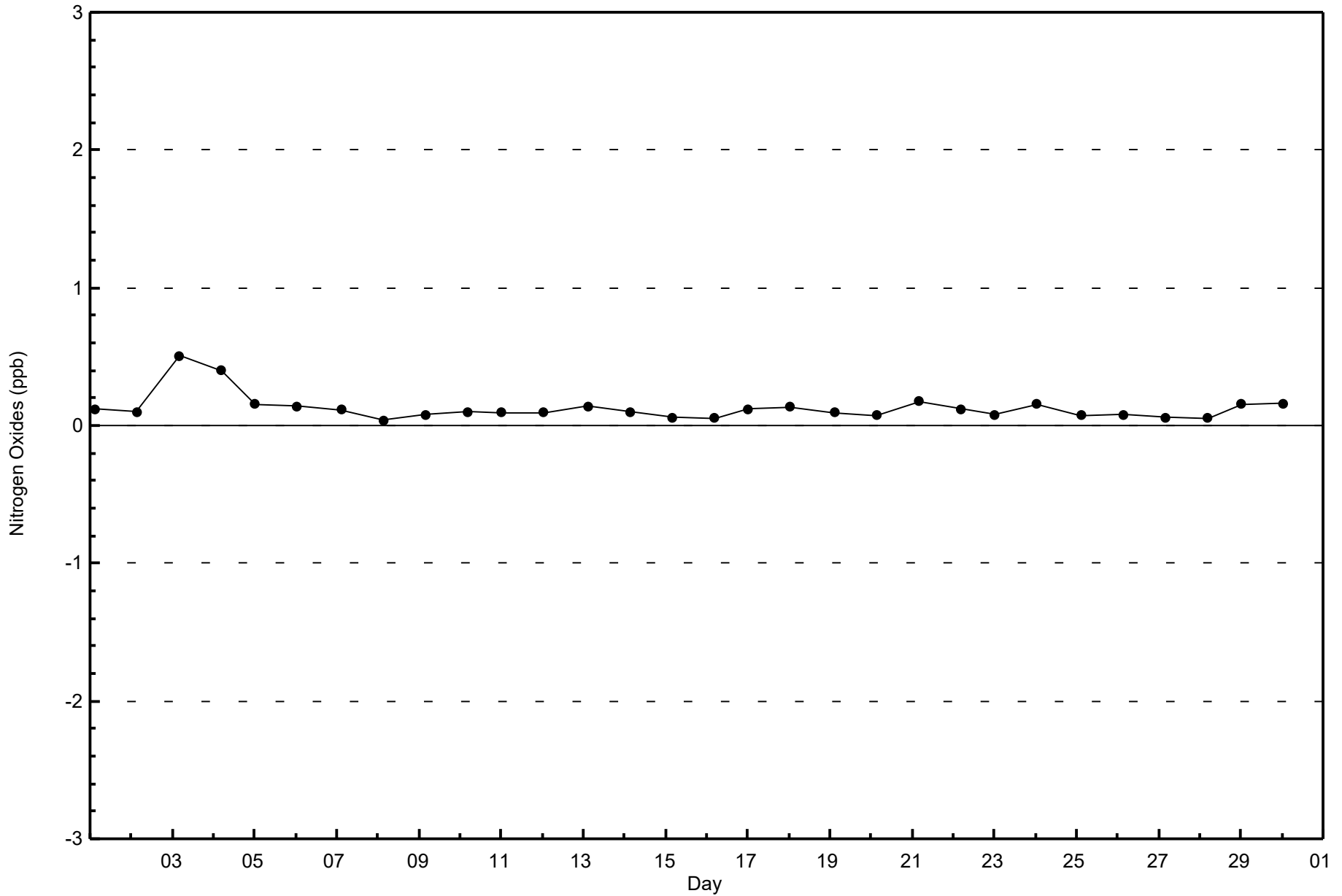


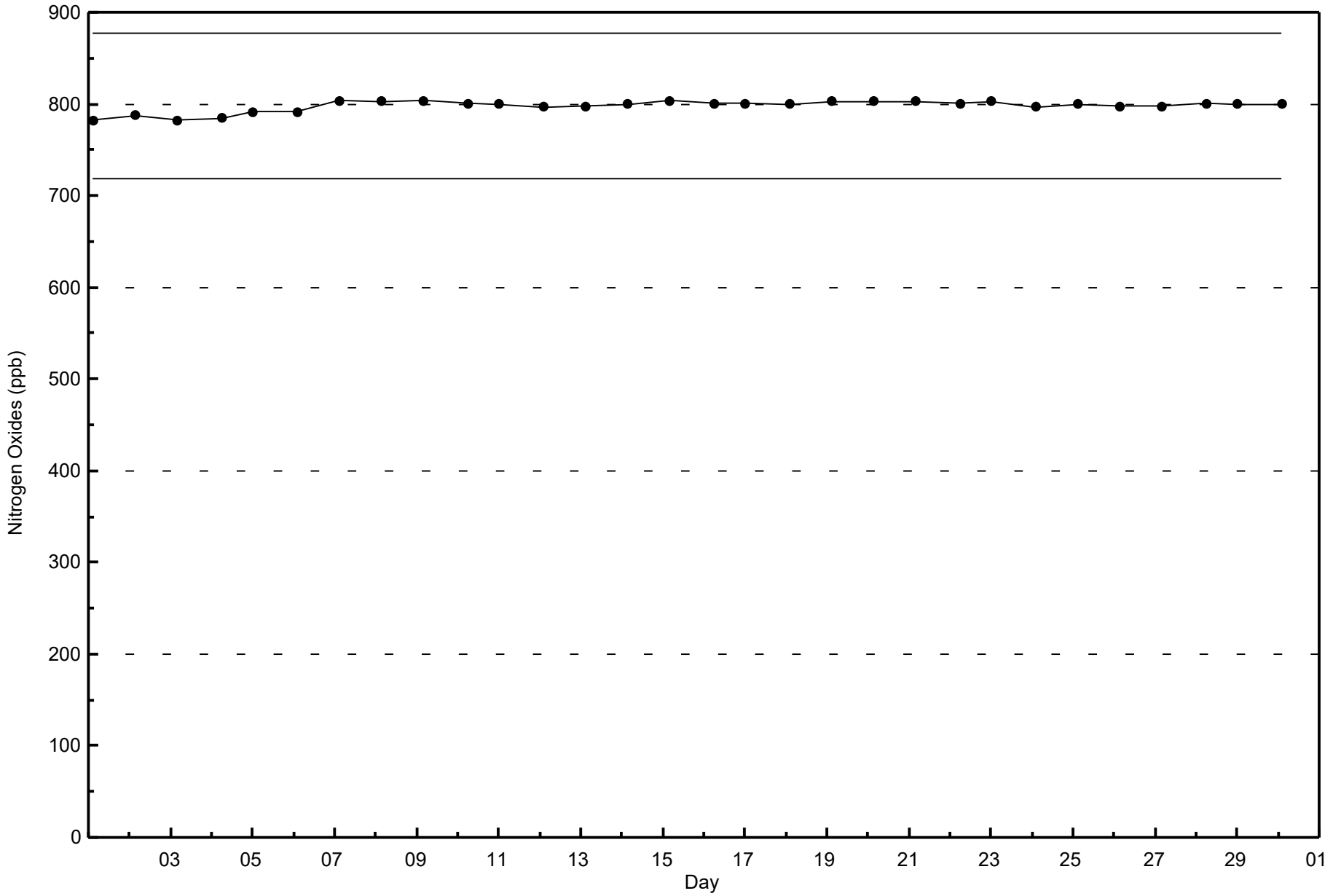
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitrogen Oxides (NO_x) - ppb
Surmont 2



Total Number of Valid Hours: 664







Summary of Hour Averages

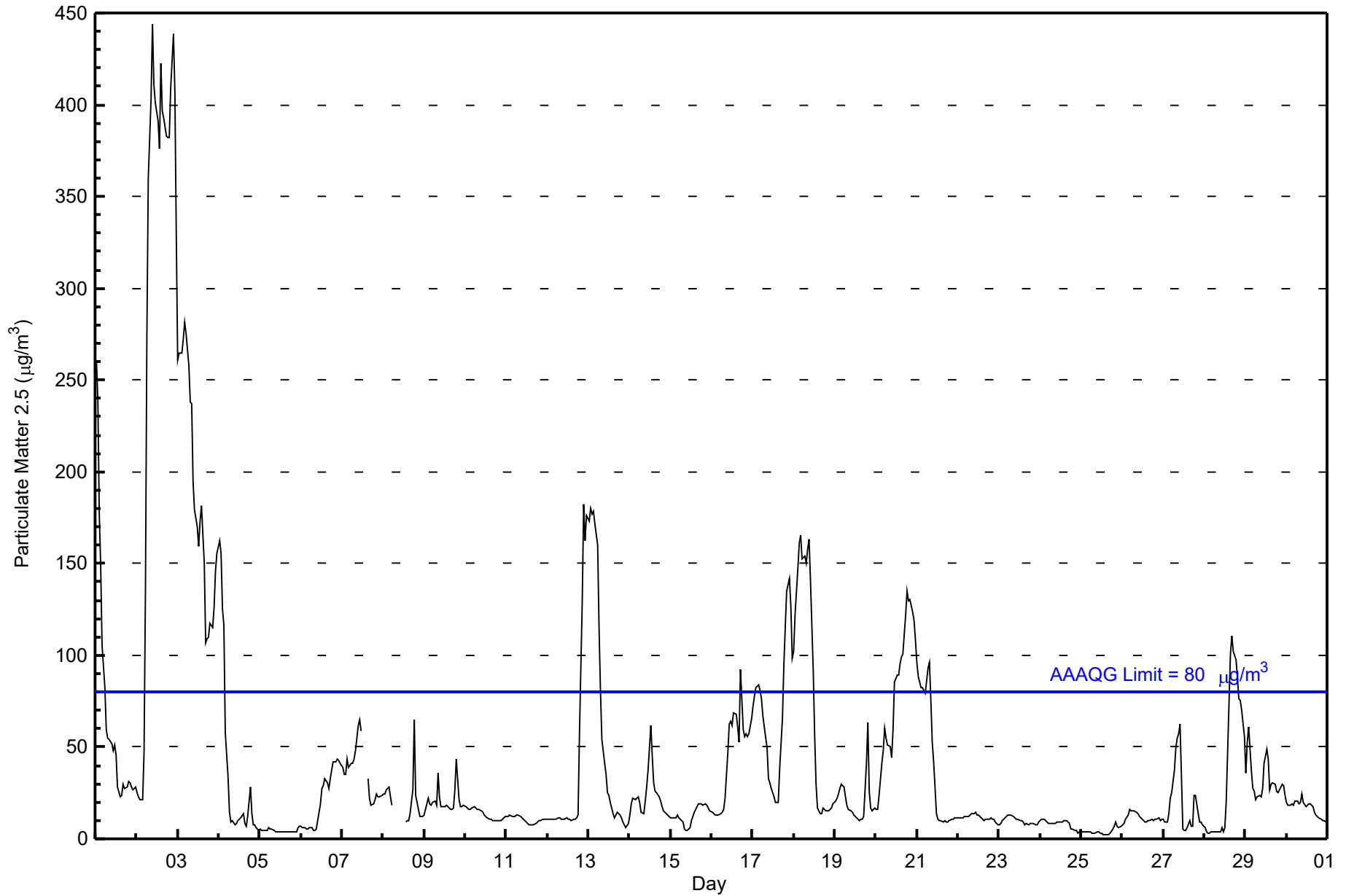
Surmont 2 - September 2023

Number of Exceedences (AAAQO):	1-hr: 112	24-hr: 14	Hours in Service:	720
Maximum Value: 444.0 µg/m ³ on Sep 2 10:00	Maximum Daily Average: 303.3 µg/m ³ on Sep 2		Hours of Data:	710
Minimum Value: 2.0 µg/m ³ on Sep 25 15:00	Minimum Daily Average: 4.2 µg/m ³ on Sep 25		Hours of Missing Data:	10
Maximum Diurnal Average: 49.5 µg/m ³ at hour 2	Minimum Diurnal Average: 37.8 µg/m ³ at hour 17		Hours of Calibration:	8
Monthly Average: 45.32 µg/m ³	Percentiles: P ₁ = 3.1 P ₁₀ = 6.0 Q ₁ = 10.2 Median = 16.5 Q ₃ = 43.2 P ₉₀ = 122.3 P ₉₉ = 400.8		Percent Operational Time:	99.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Sep	260.0	238.9	176.7	148.4	105.5	82.7	59.8	55.0	54.4	51.5	47.8	51.2	46.0	28.0	22.9	23.6	29.6	27.2	28.5	31.5	30.6	28.3	26.5	28.4	70.1	260.0
2-Sep	25.1	22.5	21.2	21.1	48.3	137.1	273.8	360.1	403.7	444.0	411.0	401.2	391.3	376.0	422.5	396.3	393.1	382.7	382.4	382.2	409.1	438.7	407.6	329.4	303.3	444.0
3-Sep	260.8	264.8	264.6	272.1	281.6	275.7	258.0	237.7	237.3	194.3	179.5	170.1	159.5	173.1	181.7	150.6	106.8	109.2	109.5	117.4	114.8	125.6	145.6	155.7	189.4	281.6
4-Sep	162.4	155.6	125.2	116.4	57.8	33.8	14.5	9.1	10.2	7.4	8.8	10.1	10.8	11.1	13.9	8.5	6.9	12.0	28.4	13.6	7.3	7.4	6.0	4.9	35.1	162.4
5-Sep	5.7	4.8	4.5	4.3	4.6	6.3	5.5	5.1	4.7	4.1	4.1	3.9	3.7	3.5	3.7	3.7	3.8	3.8	4.0	4.0	3.7	4.1	5.9	6.7	4.5	6.7
6-Sep	6.7	6.2	6.0	5.6	5.2	6.4	6.0	4.9	4.3	5.2	9.9	19.4	27.7	28.9	32.8	30.4	27.8	32.6	37.2	41.6	42.1	43.2	42.7	41.3	21.4	43.2
7-Sep	38.5	35.3	35.2	43.5	39.1	41.4	41.4	43.1	47.8	61.6	64.9	58.5	C	C	C	32.5	22.1	18.2	19.2	21.1	24.0	22.9	23.2	23.9	36.1	64.9
8-Sep	24.5	24.6	26.6	28.6	23.1	18.2	PF	PF	PF	PF	PF	PF	PF	9.0	9.9	10.2	13.5	26.6	64.8	23.5	20.2	12.4	12.5	12.3	--	64.8
9-Sep	12.7	16.0	21.9	19.4	18.6	19.5	20.3	18.5	35.8	22.8	17.9	17.6	17.5	18.0	17.8	16.3	16.4	16.7	26.3	43.6	21.1	17.3	17.6	18.0	20.3	43.6
10-Sep	17.4	16.5	15.8	16.0	16.9	17.4	17.0	15.9	15.6	15.2	14.2	12.9	12.1	11.4	10.4	10.4	10.1	9.9	9.8	9.9	9.9	10.2	10.9	12.1	13.3	17.4
11-Sep	12.4	12.1	12.6	12.5	12.3	12.5	12.9	12.6	11.9	11.6	10.8	9.8	8.6	7.8	7.5	7.4	7.8	8.4	9.0	9.6	10.0	10.4	10.6	10.8	10.5	12.9
12-Sep	10.5	10.8	10.5	10.6	10.6	10.6	11.1	11.1	10.9	10.7	10.8	11.1	11.0	11.0	10.3	10.4	10.8	11.2	12.9	57.4	130.0	182.2	162.2	176.2	38.1	182.2
13-Sep	172.9	179.9	177.2	178.4	171.5	159.9	114.1	80.6	54.2	41.1	34.9	25.0	23.4	19.6	13.8	11.4	12.9	14.8	13.0	11.6	9.4	7.4	6.2	8.4	64.2	179.9
14-Sep	12.9	18.8	22.1	21.7	21.8	22.6	19.9	14.6	13.6	20.6	28.1	37.7	61.9	44.8	30.1	26.0	25.0	22.7	20.7	17.7	14.9	13.8	13.3	12.0	23.2	61.9
15-Sep	11.6	11.4	11.7	11.6	12.9	11.4	10.3	8.8	5.3	4.6	4.8	6.2	9.7	12.0	14.6	17.4	19.3	19.3	18.8	18.4	18.8	18.6	16.9	15.4	12.9	19.3
16-Sep	14.2	14.0	13.3	12.7	12.6	13.4	14.9	16.2	21.8	47.5	62.7	64.4	61.7	68.8	68.1	61.0	52.9	92.1	59.8	55.5	57.2	55.7	57.2	65.6	44.3	92.1
17-Sep	72.5	77.6	82.5	83.8	81.1	75.9	67.4	60.8	49.2	32.9	30.3	27.6	22.8	19.6	19.7	20.0	38.1	65.3	94.3	114.9	135.4	141.8	126.8	98.7	68.3	141.8
18-Sep	102.2	121.7	147.3	160.9	165.3	152.7	153.8	149.9	157.7	163.5	140.8	91.6	56.1	29.9	16.9	13.5	13.8	17.0	15.9	15.0	15.6	16.4	16.7	19.1	81.4	165.3
19-Sep	20.6	21.9	24.1	27.5	29.4	28.4	23.0	18.5	15.7	15.2	14.5	12.7	12.1	11.4	9.9	11.0	10.5	11.9	41.5	63.0	25.7	17.0	15.5	16.5	20.7	63.0
20-Sep	15.7	16.2	23.3	41.5	48.3	60.2	54.9	51.4	50.6	44.5	59.2	85.6	89.4	89.3	95.4	99.3	100.5	122.2	135.1	129.4	130.3	123.4	119.3	108.5	78.9	135.1
21-Sep	96.5	88.6	82.6	82.6	80.7	79.1	93.2	95.7	75.3	52.4	41.7	14.1	11.0	10.1	9.9	9.3	9.8	9.3	9.2	9.9	10.7	10.9	11.2	11.2	41.9	96.5
22-Sep	11.6	11.5	11.4	11.6	11.8	12.2	12.1	12.7	13.5	13.9	14.2	12.9	13.0	12.0	10.8	10.2	10.7	10.5	10.5	11.1	10.8	10.7	8.8	7.6	11.5	14.2
23-Sep	8.0	8.6	9.9	11.3	12.2	12.8	12.8	12.7	12.1	11.6	11.0	10.9	10.2	9.7	9.4	7.8	8.6	8.0	8.2	8.5	8.1	7.4	7.7	9.0	9.9	12.8
24-Sep	9.9	10.3	10.3	9.9	9.0	8.5	8.4	8.4	8.3	8.5	8.8	9.2	9.3	9.3	9.5	9.7	9.3	8.2	5.3	5.1	4.7	4.4	3.3	3.4	8.0	10.3
25-Sep	3.7	3.8	3.9	4.0	3.7	3.5	3.3	3.1	2.8	3.8	3.6	3.1	2.8	2.6	2.0	2.2	2.4	3.3	5.7	7.1	9.0	6.9	6.3	7.2	4.2	9.0
26-Sep	7.4	8.0	10.3	13.3	15.6	15.6	15.6	15.1	14.4	13.7	12.2	11.4	9.7	9.2	9.1	9.9	10.2	10.3	10.2	10.6	10.6	11.7	9.7	10.5	11.4	15.6
27-Sep	10.3	9.1	8.8	13.7	22.4	24.8	37.6	49.3	54.6	57.1	62.5	5.5	4.3	4.9	6.3	9.7	6.6	6.6	23.6	23.5	13.4	9.0	9.4	7.3	20.0	62.5
28-Sep	6.2	3.9	3.2	3.3	3.7	3.8	3.7	3.7	3.9	3.8	6.4	4.1	6.1	20.3	74.8	100.6	110.3	102.0	97.9	87.8	76.3	75.8	70.1	55.6	38.6	110.3
29-Sep	35.6	52.8	61.3	36.7	27.5	26.1	21.2	22.6	24.0	22.7	27.1	41.5	48.5	43.1	26.6	29.5	30.4	29.5	26.2	25.3	27.0	29.8	29.0	23.8	32.0	61.3
30-Sep	20.0	18.6	18.7	18.8	18.6	20.2	20.7	18.9	19.5	24.1	20.0	17.6	18.3	19.0	19.3	17.5	14.7	12.8	12.1	11.4	10.8	10.2	10.0	9.4	16.7	24.1

48.9	49.5	48.1	48.1	45.7	46.4	48.5	48.8	49.4	48.6	47.0	43.0	41.4	38.4	40.7	38.9	37.8	40.8	44.7	46.0	47.0	49.1	46.9	43.6	Diurnal Average	
260.8	264.8	264.6	272.1	281.6	275.7	273.8	360.1	403.7	444.0	411.0	401.2	391.3	376.0	422.5	396.3	393.1	382.7	382.4	382.2	409.1	438.7	407.6	329.4	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}) - $\mu\text{g}/\text{m}^3$
Surmont 2 - September 2023**

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	63	8.87	8.87
6 - 15	274	38.59	47.46
16 - 25	126	17.75	65.21
26 - 80	135	19.01	84.23
> 81.0	112	15.77	100.00

Total Number of Valid Hours: 710

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - μg/m³
Surmont 2 - September 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	0	0	0	0	2	8	7	8	6	5	10	9	3	2	1	0	61
6 - 15	1	0	0	1	2	31	74	32	13	23	24	35	26	11	1	0	274
16 - 25	0	1	0	0	1	9	8	12	1	4	13	41	20	3	2	1	116
26 - 80	1	1	0	0	0	1	5	3	0	5	14	46	29	11	13	3	132
> 81.0	2	0	1	0	0	0	2	1	2	1	15	32	46	4	2	4	112
Totals	4	2	1	1	5	49	96	56	22	38	76	163	124	31	19	8	695

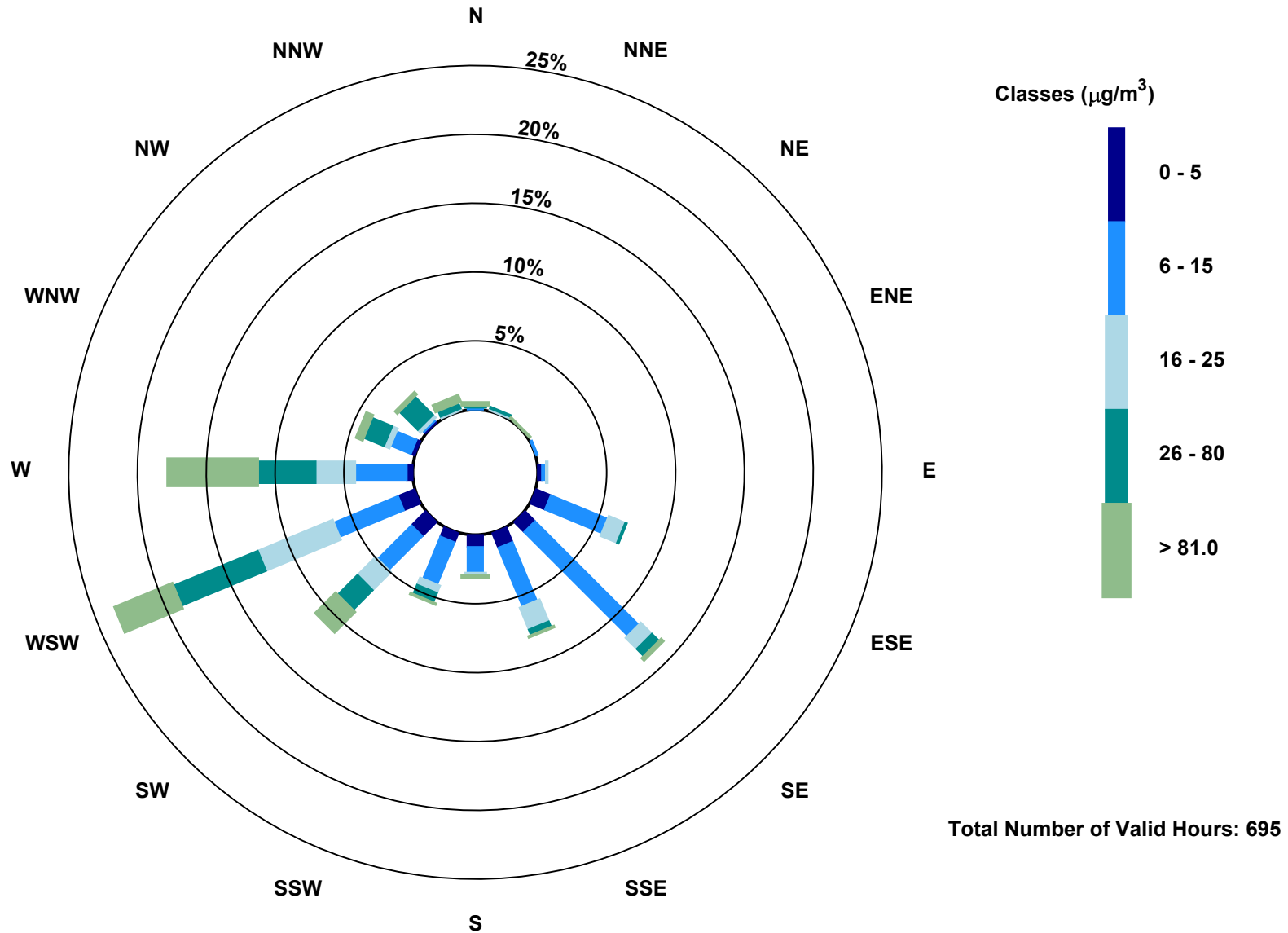
Total Number of Valid Hours: 695

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

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





Wood Buffalo Environmental Association
Summary of Hour Averages

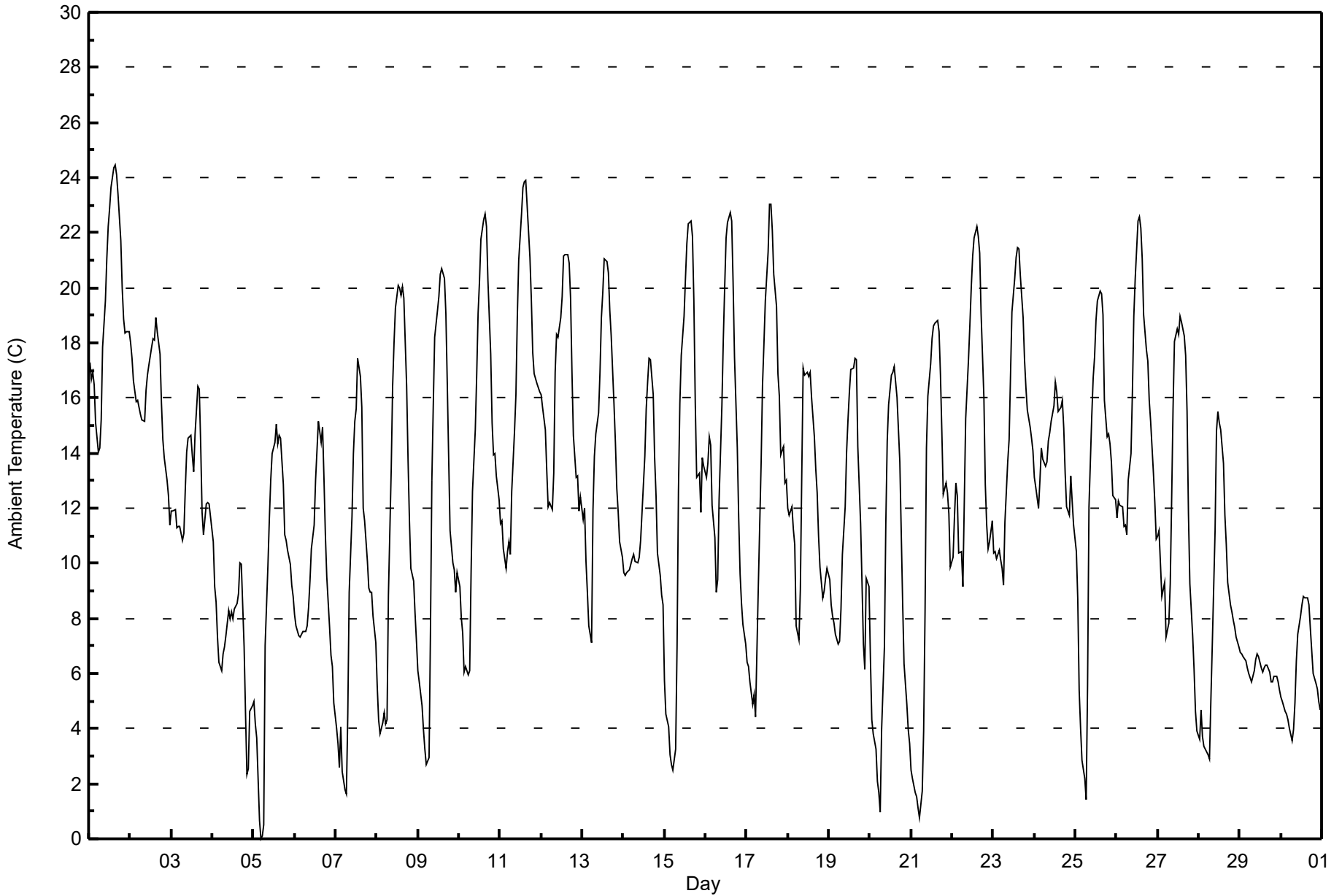
Ambient Temperature (AT) - C
Surmont 2 - September 2023

Maximum Value: 24.5 C on Sep 1 16:00 Maximum Daily Average: 19.4 C on Sep 1																				Hours in Service: 720 Hours of Data: 720						
Minimum Value: 0.0 C on Sep 5 05:00 Minimum Daily Average: 6.1 C on Sep 30 Maximum Diurnal Average: 18.1 C at hour 15 Minimum Diurnal Average: 7.1 C at hour 6 Monthly Average: 12.28 C Percentiles: P ₁ = 1.5 P ₁₀ = 4.8 Q ₁ = 8.1 Median = 12.2 Q ₃ = 16.4 P ₉₀ = 19.7 P ₉₉ = 23.3																				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-Sep	17.3	16.7	16.9	16.5	15.1	14.1	14.2	15.2	17.8	19.5	21.0	22.2	22.9	23.7	24.4	24.5	24.1	23.4	21.7	20.0	18.9	18.3	18.4	18.4	19.4	24.5
2-Sep	18.0	17.4	16.6	15.9	15.9	15.7	15.4	15.2	15.1	16.3	16.9	17.2	17.9	18.2	18.1	18.9	18.4	17.6	15.8	14.5	13.8	13.0	12.5	11.4	16.1	18.9
3-Sep	11.9	11.9	11.9	11.3	11.4	11.3	10.8	11.1	12.7	14.0	14.5	14.6	13.9	13.3	14.7	16.4	16.3	14.3	11.8	11.0	12.2	12.2	12.2	11.7	12.8	16.4
4-Sep	10.8	9.1	8.6	7.3	6.4	6.1	6.7	7.0	7.4	8.3	8.0	8.2	8.0	8.3	8.5	8.9	10.0	9.9	7.0	4.6	2.4	2.5	4.6	4.8	7.2	10.8
5-Sep	5.0	4.1	3.7	0.7	0.0	0.1	0.5	7.0	9.9	11.6	13.0	14.0	14.4	15.1	14.3	14.7	14.6	12.9	11.0	10.9	10.5	10.0	9.2	8.8	9.0	15.1
6-Sep	8.1	7.7	7.4	7.3	7.4	7.5	7.5	7.7	8.4	9.3	10.5	11.4	13.0	14.1	15.1	14.4	14.9	13.1	11.0	9.5	7.7	6.7	6.2	4.9	9.6	15.1
7-Sep	4.0	3.5	2.6	4.1	2.5	1.8	1.6	4.5	9.0	11.7	14.0	15.2	15.6	17.4	16.8	15.7	12.0	11.5	10.1	9.1	9.0	9.0	8.1	7.1	9.0	17.4
8-Sep	5.5	4.3	3.8	4.2	4.6	4.2	4.3	8.8	13.4	16.4	18.0	19.3	20.1	20.0	19.7	20.0	19.6	16.4	13.8	11.5	9.8	9.4	8.2	7.2	11.8	20.1
9-Sep	6.1	5.7	4.8	4.0	3.3	2.7	3.0	7.5	13.0	15.7	18.2	19.1	19.7	20.5	20.7	20.3	19.1	16.5	13.9	11.2	10.0	9.7	8.9	9.7	11.8	20.7
10-Sep	9.2	8.0	7.5	6.1	6.3	5.9	6.1	9.7	12.6	14.8	16.8	19.1	20.3	21.8	22.5	22.7	22.2	20.3	17.6	15.1	13.9	14.0	13.2	12.3	14.1	22.7
11-Sep	11.5	11.5	10.5	9.8	10.4	10.8	10.3	12.6	14.8	16.1	19.0	21.0	22.7	23.7	23.8	23.9	23.0	21.1	19.6	17.6	16.9	16.5	16.4	16.2	16.7	23.9
12-Sep	16.1	15.7	14.8	13.4	12.1	12.2	12.0	13.3	16.9	18.3	18.2	18.9	19.7	21.1	21.2	21.2	20.9	19.6	16.9	14.7	13.1	13.2	11.9	12.4	16.2	21.2
13-Sep	11.6	12.0	10.1	9.0	7.7	7.1	12.0	13.9	14.7	15.4	16.9	18.9	19.8	21.0	20.9	20.5	19.2	18.2	15.8	14.4	12.7	11.9	10.8	10.2	14.4	21.0
14-Sep	9.7	9.6	9.7	9.8	10.0	10.2	10.3	10.1	10.0	10.2	10.8	11.8	13.9	15.6	16.6	17.4	17.4	16.1	13.8	12.5	10.4	9.6	8.9	8.5	11.8	17.4
15-Sep	5.7	4.5	4.1	3.0	2.7	2.5	3.3	7.0	12.6	15.8	17.5	19.0	20.3	21.6	22.3	22.4	21.9	19.5	15.8	13.1	13.3	11.8	13.8	13.5	12.8	22.4
16-Sep	13.1	13.7	14.6	14.3	12.1	10.9	9.0	9.4	12.3	15.7	18.1	20.0	21.8	22.4	22.7	22.4	20.2	17.5	14.2	11.6	9.6	8.6	7.8	7.1	14.5	22.7
17-Sep	6.4	6.2	5.7	4.9	5.2	4.4	6.8	9.2	13.6	16.5	18.0	19.5	21.3	23.0	23.0	22.1	20.5	19.3	16.9	16.1	13.9	14.2	12.9	13.0	13.9	23.0
18-Sep	12.0	11.8	12.1	11.3	10.7	7.8	7.2	9.1	13.2	17.1	16.8	16.9	16.8	16.9	16.0	14.6	13.4	12.6	11.0	9.9	8.8	9.0	9.5	9.8	12.2	17.1
19-Sep	9.4	8.5	8.1	7.8	7.4	7.1	7.2	8.3	10.3	12.1	14.0	15.2	16.2	17.0	17.1	17.4	17.4	14.2	11.4	9.3	7.1	6.2	9.5	9.2	11.1	17.4
20-Sep	6.5	4.3	3.8	3.3	2.1	1.7	1.0	4.0	7.0	11.5	14.4	15.7	16.8	16.9	17.1	16.6	16.0	13.7	11.2	8.6	6.4	4.9	4.0	3.4	8.8	17.1
21-Sep	2.5	2.2	1.7	1.5	1.1	0.8	1.8	3.9	8.2	14.2	16.1	17.2	18.2	18.6	18.7	18.8	18.4	16.9	14.8	12.5	12.9	12.6	11.8	9.9	10.6	18.8
22-Sep	10.2	11.7	12.9	12.4	10.4	10.4	9.1	12.2	15.2	17.4	18.7	20.0	21.2	21.8	22.2	21.9	21.2	19.1	16.0	12.9	11.4	10.5	10.8	11.5	15.1	22.2
23-Sep	10.4	10.4	10.2	10.5	10.1	9.8	9.2	11.5	13.7	14.5	16.8	19.1	20.3	21.1	21.5	21.4	20.4	18.9	17.4	16.4	15.6	15.0	14.6	14.1	15.1	21.5
24-Sep	13.1	12.7	12.0	13.0	14.2	13.8	13.5	13.7	14.4	14.8	15.1	15.7	16.6	16.2	15.5	15.7	15.9	14.9	13.3	12.1	11.7	13.2	12.2	11.4	13.9	16.6
25-Sep	10.4	8.7	5.4	4.0	2.9	2.2	1.4	5.6	12.1	15.4	16.7	17.5	18.8	19.5	19.9	19.8	19.0	15.9	14.6	14.7	14.3	13.7	12.5	12.3	12.4	19.9
26-Sep	11.7	12.3	12.1	12.0	11.3	11.4	11.0	13.0	14.0	16.2	19.0	20.3	22.4	22.6	22.2	21.0	19.0	17.8	17.3	15.9	15.1	13.3	12.2	10.9	15.6	22.6
27-Sep	11.0	11.2	8.8	9.0	9.3	7.3	7.8	9.2	12.3	15.6	18.0	18.5	18.3	19.0	18.8	18.3	17.5	15.5	11.8	9.2	7.4	6.2	4.6	3.9	12.0	19.0
28-Sep	3.6	4.7	3.7	3.3	3.3	3.0	2.9	5.0	7.0	11.2	14.8	15.5	15.1	14.8	13.6	11.7	10.7	9.3	8.5	8.2	7.9	7.7	7.3	6.9	8.3	15.5
29-Sep	6.8	6.7	6.6	6.5	6.2	6.0	5.9	5.7	6.1	6.5	6.7	6.6	6.2	6.0	6.2	6.3	6.3	6.1	5.7	5.7	5.9	5.9	5.7	5.4	6.2	6.8
30-Sep	5.2	5.0	4.6	4.5	4.3	4.0	3.5	3.9	4.9	6.5	7.4	8.1	8.5	8.8	8.8	8.8	8.5	7.6	6.8	6.0	5.6	5.4	5.0	4.7	6.1	8.8
																								Diurnal Average		
																								Diurnal Maximum		



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Surmont 2 - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Surmont 2 - September 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	258	35.83	35.83
10 - 20	396	55.00	90.83
> 20	66	9.17	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

Relative Humidity (RH) - %
Surmont 2 - September 2023

Maximum Value: 100.7 % on Sep 6 07:00	Maximum Daily Average: 92.0 % on Sep 29	Hours in Service: 720
Minimum Value: 27.5 % on Sep 16 15:00	Minimum Daily Average: 51.3 % on Sep 22	Hours of Data: 718
Maximum Diurnal Average: 88.2 % at hour 7	Minimum Diurnal Average: 46.8 % at hour 15	Hours of Missing Data: 2
Monthly Average: 69.95 %	Percentiles: P ₁ = 30.5 P ₁₀ = 40.7 Q ₁ = 55.0 Median = 70.4 Q ₃ = 87.2 P ₉₀ = 95.8 P ₉₉ = 100.1	Hours of Calibration: 0
		Percent Operational Time: 99.7

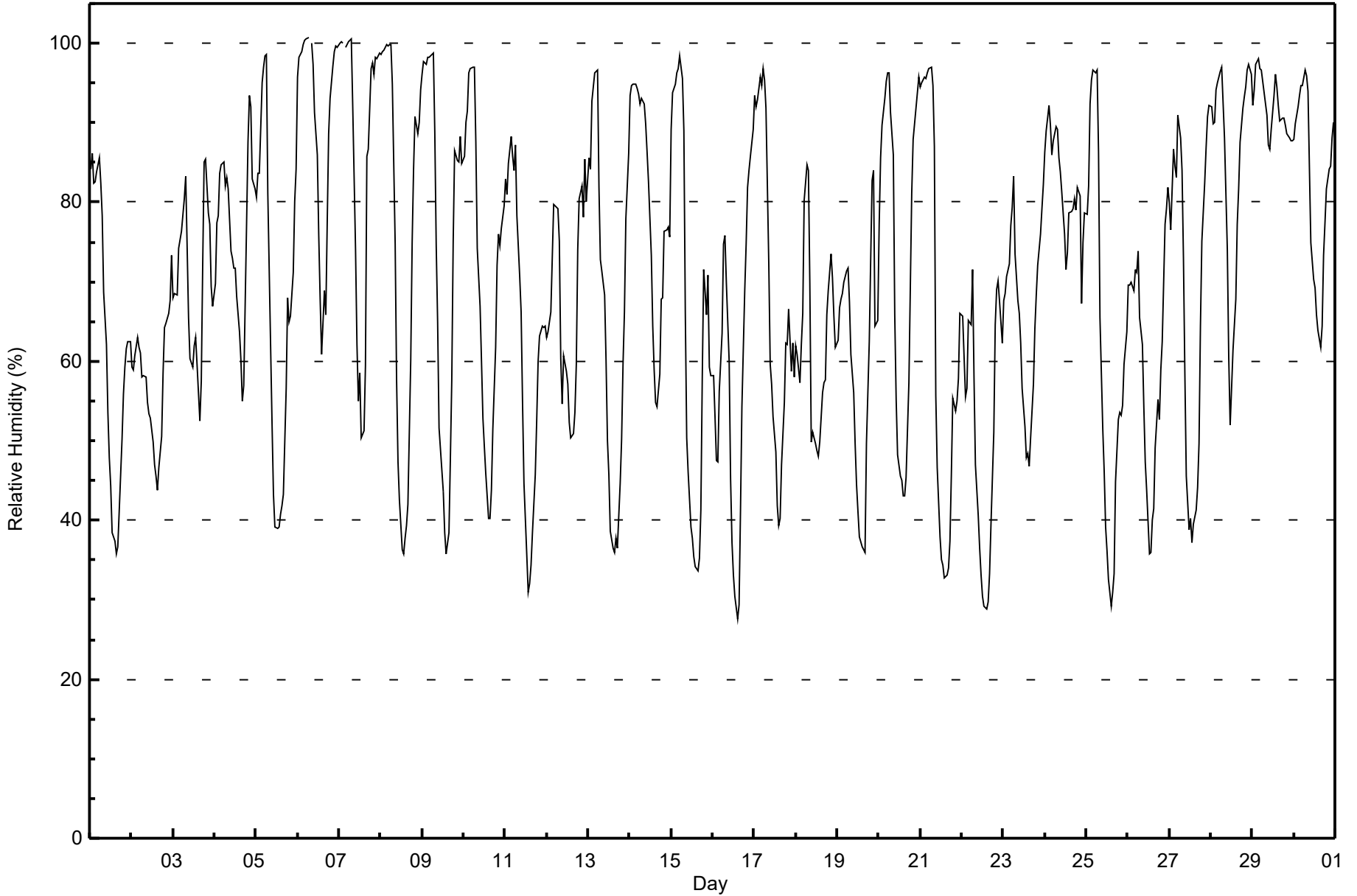
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Sep	84.1	86.1	82.4	82.5	83.8	85.6	82.4	78.3	68.7	62.2	53.5	47.9	44.4	38.5	37.3	35.7	36.6	41.2	50.2	55.9	59.3	61.6	62.4	62.5	61.8	86.1																							
2-Sep	59.2	58.9	60.6	63.0	61.8	61.0	57.9	58.1	58.0	54.7	53.4	52.9	49.8	46.9	45.6	43.7	46.6	50.6	58.5	64.3	64.7	66.0	67.7	73.3	57.4	73.3																							
3-Sep	68.0	68.5	68.3	74.2	75.2	76.3	80.5	83.3	74.5	65.6	60.3	59.3	61.9	63.0	59.5	52.5	57.5	72.1	85.1	85.5	78.6	77.2	69.4	66.9	70.1	85.5																							
4-Sep	69.8	77.4	78.3	83.6	84.8	85.0	82.1	83.0	81.7	73.8	73.0	71.7	71.7	68.1	63.8	60.1	55.0	56.9	77.2	87.6	93.5	92.1	83.0	81.8	76.4	93.5																							
5-Sep	80.5	83.7	83.7	95.0	97.1	98.5	98.6	81.1	61.7	52.2	43.3	39.2	39.0	39.1	40.7	41.8	43.2	56.6	67.9	64.9	65.8	71.3	80.1	84.2	67.0	98.6																							
6-Sep	95.7	98.2	99.0	99.8	100.4	100.5	100.7	OR	100.1	97.4	91.2	86.0	75.8	67.8	60.9	68.8	65.9	77.6	88.7	93.1	97.1	99.0	99.6	99.6	89.7	100.7																							
7-Sep	100.1	100.2	100.1	OR	99.4	100.2	100.4	100.5	92.2	74.1	62.2	55.0	58.5	50.4	51.2	59.4	85.9	86.6	96.8	97.6	96.2	98.2	98.0	98.8	85.3	100.5																							
8-Sep	98.5	98.9	99.2	99.8	99.8	99.8	99.9	94.8	74.7	57.6	47.4	42.6	36.3	35.8	37.8	39.3	42.0	60.1	74.9	84.1	90.7	88.6	90.1	94.1	74.4	99.9																							
9-Sep	96.2	97.7	97.4	98.2	98.3	98.5	98.9	88.7	74.5	65.0	51.6	46.2	43.7	38.4	35.7	38.4	47.7	57.6	75.2	86.5	85.2	85.1	88.2	85.0	74.1	98.9																							
10-Sep	85.7	90.1	91.4	96.2	96.8	97.1	97.0	87.6	74.2	66.9	60.0	52.8	49.3	45.9	40.2	40.3	43.7	51.4	61.8	72.1	76.0	74.5	76.7	79.6	71.1	97.1																							
11-Sep	82.9	81.0	84.9	88.2	85.8	84.1	87.2	78.4	70.6	66.1	54.8	44.7	35.6	31.0	32.1	34.3	38.4	45.7	52.5	60.0	63.1	64.4	64.3	64.4	62.3	88.2																							
12-Sep	62.9	63.7	66.2	73.0	79.8	79.5	79.1	75.0	60.4	54.7	60.8	58.7	57.1	52.4	50.3	51.0	53.5	59.6	74.0	80.4	82.0	78.1	85.5	80.0	67.4	85.5																							
13-Sep	85.5	84.3	92.8	94.5	96.3	96.6	81.8	72.7	71.3	68.3	60.1	50.1	45.7	38.6	36.5	35.9	37.7	36.5	44.6	50.2	59.6	66.2	77.9	86.2	65.4	96.6																							
14-Sep	93.5	94.6	94.8	94.9	94.2	93.6	92.4	93.1	92.3	89.8	86.4	82.5	73.3	64.4	58.9	54.8	54.2	58.4	67.8	68.0	76.3	76.6	77.0	75.7	79.5	94.9																							
15-Sep	89.2	93.8	94.9	96.3	96.8	98.5	95.7	89.0	66.2	50.4	46.1	39.2	37.7	35.4	34.1	33.6	35.2	41.3	58.0	71.6	65.8	70.8	59.3	58.2	64.9	98.5																							
16-Sep	58.2	53.0	47.4	47.3	56.2	63.6	74.7	75.8	70.0	60.0	45.2	37.3	33.2	30.4	27.5	29.5	41.1	54.2	68.8	74.8	81.9	83.9	85.9	89.2	57.9	89.2																							
17-Sep	93.5	92.0	92.9	95.8	94.7	96.9	95.3	91.8	72.2	59.6	57.2	53.0	48.5	41.9	39.4	40.2	46.9	54.7	62.3	62.1	66.6	58.7	62.3	58.1	68.2	96.9																							
18-Sep	61.9	60.8	57.4	62.1	66.0	80.3	84.7	84.0	69.8	49.8	51.0	49.6	48.7	48.0	49.9	56.0	57.3	57.6	65.9	69.0	73.5	70.5	65.7	61.8	62.6	84.7																							
19-Sep	62.6	66.7	67.9	68.6	70.0	71.4	71.7	67.5	60.9	56.1	49.6	44.6	41.0	37.9	36.6	36.2	36.0	49.6	62.5	72.8	82.7	83.9	64.4	65.1	59.4	83.9																							
20-Sep	77.3	85.6	89.6	93.1	95.2	96.3	96.3	91.2	86.0	65.9	55.2	48.3	45.6	45.1	43.1	43.1	45.3	57.3	69.2	81.1	87.9	91.8	93.8	95.8	74.1	96.3																							
21-Sep	94.5	95.0	95.8	95.6	96.2	96.9	97.1	94.8	87.0	55.7	46.7	37.9	35.0	34.3	32.7	33.1	34.1	37.5	45.6	55.3	53.8	55.0	57.9	66.1	63.9	97.1																							
22-Sep	65.7	60.6	55.6	56.5	65.1	64.6	71.6	58.0	47.1	40.6	36.4	33.1	30.4	29.2	28.8	29.7	33.3	39.6	51.1	64.5	69.1	70.2	67.6	62.4	51.3	71.6																							
23-Sep	67.6	68.5	70.7	72.3	77.1	79.3	83.2	73.4	67.7	66.1	62.3	56.6	51.8	47.9	48.4	46.8	50.4	57.1	64.0	68.4	72.1	75.9	79.2	82.3	66.2	83.2																							
24-Sep	86.3	88.9	92.3	89.8	86.0	87.7	89.4	89.2	85.7	83.8	81.2	76.0	71.5	73.7	78.6	78.9	79.1	80.4	79.0	81.8	80.8	67.2	74.9	78.6	81.7	92.3																							
25-Sep	78.4	82.1	92.5	95.4	96.6	96.2	96.7	86.2	65.6	51.4	46.2	39.1	36.1	32.7	29.1	30.9	33.2	44.9	52.6	53.5	53.2	54.5	59.6	63.7	61.3	96.7																							
26-Sep	69.6	69.6	69.9	68.9	71.6	71.2	73.9	65.5	62.2	54.2	47.3	43.8	35.7	36.0	40.0	41.4	49.2	55.2	52.7	58.8	62.5	77.3	79.3	81.9	59.9	81.9																							
27-Sep	79.9	76.5	86.7	84.5	83.2	90.9	88.2	84.0	73.0	58.3	45.6	38.7	40.2	37.2	39.4	41.2	44.1	49.6	64.5	75.1	82.3	86.9	90.7	92.2	68.0	92.2																							
28-Sep	91.9	89.9	90.0	94.1	95.0	96.4	96.9	92.6	88.0	74.1	60.5	52.0	56.7	61.4	67.8	77.2	81.7	87.5	91.8	93.2	94.6	96.6	97.4	96.1	84.3	97.4																							
29-Sep	92.2	94.1	97.3	98.0	96.9	96.6	95.2	93.8	91.0	87.2	86.7	89.2	93.4	96.1	94.5	92.1	90.2	90.6	90.6	89.8	88.7	88.1	87.7	87.7	92.0	98.0																							
30-Sep	87.9	89.9	92.0	93.5	94.8	94.7	96.6	95.9	93.9	84.4	74.9	70.3	69.2	65.8	63.9	61.7	64.4	73.3	77.3	81.6	84.2	84.5	88.1	90.0	82.2	96.6																							
																								80.6	81.7	83.1	84.6	86.5	87.9	88.2	83.0	74.7	64.9	58.3	53.3	50.6	47.8	46.8	47.6	51.0	58.0	67.7	73.5	76.3	77.1	77.8	78.7	Diurnal Average	
																								100.1	100.2	100.1	99.8	100.4	100.5	100.7	100.5	100.1	97.4	91.2	89.2	93.4	96.1	94.5	92.1	90.2	90.6	96.8	97.6	97.1	99.0	99.6	99.6	Diurnal Maximum	

OR - Out of Range



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Surmont 2 - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Relative Humidity (RH) - %
Surmont 2 - September 2023**

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	67	9.33	9.33
40 - 60	169	23.54	32.87
60 - 80	215	29.94	62.81
80 - 100	257	35.79	98.61

Total Number of Valid Hours: 718

Total Number of Hours: 720



Maximum Speed: 14 km/h on Sep 23 16:00	Maximum Daily Speed Average: 7.9 km/h on Sep 14	Hours in Service: 720
Minimum Speed Value: 0 km/h on Sep 7 06:00	Minimum Daily Speed Average: 1.1 km/h on Sep 30	Hours of Data: 704
Maximum Diurnal Speed Average: 3.1 km/h at hour 17	Minimum Diurnal Speed Average: 1.6 km/h at hour 8	Hours of Missing Data: 16
Monthly Average Velocity: 2.3 km/h 224.5 deg	Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 3 Median = 5 Q ₃ = 7 P ₉₀ = 9 P ₉₉ = 12	Percent Operational Time: 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-Sep	W6	W5	W6	W5	W4	W4	WNW5	WNW5	W6	W8	W9	W9	W10	WSW12	WSW11	WSW12	WSW12	WSW8	WSW5	SW5	WSW5	W7	WSW7	WSW8	W7.1	WSW12
2-Sep	WSW9	W7	WNW5	WSW8	WSW7	W7	W6	W6	W7	W7	W6	W6	WNW6	WNW7	W8	W9	W7	W7	W6	W6	W6	W7	W6	W4	W6.7	WSW9
3-Sep	WSW7	W5	WSW5	SW4	SW5	WSW5	WSW3	S3	SE3	SSE1	SW3	WSW9	W6	WSW9	WSW4	SW4	S3	SW2	SW2	W4	WSW6	WSW6	W6	W6	WSW4.1	WSW9
4-Sep	W6	W5	W7	W8	W7	W6	W7	WNW8	WNW7	WNW8	WNW7	WNW8	WNW6	NW6	W8	W7	WNW5	W4	WSW3	SW2	SSW1	WSW4	WSW5	W5	W5.6	WNW8
5-Sep	W5	WSW5	W3	SSW1	SSE1	WSW2	SSW1	SW1	SW6	S6	SE8	SE8	SSE8	SSE7	SSE5	SSE4	S2	SW2	S2	SW2	S3	SSW2	SW1	SW1	S2.8	SSE8
6-Sep	SW1	ESE2	ESE5	ESE5	ESE6	ESE6	ESE5	ESE4	SSE4	S3	WSW4	W5	W6	W7	W6	WSW4	W4	WSW2	SW3	WSW3	SW1	WSW1	SW2	SW1	SW1.3	W7
7-Sep	SW1	SW0	W2	WSW4	SSE1	W0	SE1	SW2	SW2	WSW4	WSW5	W5	SW4	WSW6	W5	WNW3	WSW4	WSW4	SW2	SW2	SSW2	SW1	UO	WSW2.4	WSW6	
8-Sep	UO	SSE2	SE1	UO	WSW2	WSW1	UO	SSE1	WSW3	WSW6	WSW7	W7	W7	W9	WSW7	WNW6	W5	WSW3	WSW4	SW1	W2	WSW3	WSW2	WSW1	WSW3.4	W9
9-Sep	SSW1	WSW1	UO	UO	UO	UO	UO	UO	SSE2	SE2	SE5	SSE5	SSE5	S4	SSW5	SW3	SW3	SW3	WSW3	WSW2	SW4	SW4	SW3	SW4	SSW2.5	SSE5
10-Sep	WSW3	WSW3	WSW3	WSW2	WSW2	WSW2	WSW1	SE2	SE5	SE6	SE7	SE8	SSE8	SE9	SSE8	SE8	SE6	SE5	SSE4	SSW3	S3	SSE4	SSE4	SSE4	SSE3.7	SE9
11-Sep	SE4	SE5	ESE6	ESE5	SE5	ESE6	ESE6	ESE7	SE6	SE9	SE10	SE11	SE12	SE12	SSE11	SSE11	SSE9	SSE6	SE6	SE6	SE6	SE7	SSE7	SSE7	SE7.3	SE12
12-Sep	S7	S6	SE4	ESE4	ESE2	SE3	SE3	SSE4	SSW3	SSW4	SE6	SE5	SE6	ESE7	ESE9	SE7	S5	S3	SW3	WSW2	W3	W4	SW2	WSW3	SSE3.2	ESE9
13-Sep	W3	WSW4	SW1	WSW1	SW1	WSW2	W7	W9	W8	W7	WSW6	W11	WSW11	W11	W12	WSW12	W11	W9	W6	W10	W10	W10	W10	W8	W7.4	W12
14-Sep	W9	W9	W10	W9	W8	W8	W8	W9	W9	W9	W10	W10	W11	W11	W10	W8	W7	WSW5	WSW6	WSW4	WSW4	WSW5	WSW4	WSW4	W7.9	W11
15-Sep	SW1	SW1	SW2	SW1	SW1	WSW1	SW2	SSW2	SSE4	SE5	SE7	SE8	SE8	SE8	SE8	SE7	SSE6	SSE5	SSE4	SE4	ESE5	ESE4	SE7	SE7	SE3.9	SE8
16-Sep	SE7	SSE6	SE5	ESE5	ESE3	SSW1	E1	SSE1	SSE2	SW2	WSW4	SW4	SW4	WSW5	W7	W6	WSW3	WSW3	WSW4	WSW4	SW2	WSW1	WSW2	WSW1	SSW2.1	SE7
17-Sep	WSW1	WSW2	WSW2	WSW2	WSW2	WSW2	SSW3	WSW0	ESE5	SE7	SE8	SE8	ESE8	SSE5	WSW7	WSW7	WSW4	W3	WSW3	W6	WNW4	W5	W5	WSW8	SW2.2	SE8
18-Sep	WSW7	WSW7	W6	W5	WSW4	SE1	SW1	WSW1	SW2	W5	W6	W7	W8	W9	W10	W9	WSW8	WSW9	WSW4	WSW4	WSW4	WSW5	W7	WSW8	W5.5	W10
19-Sep	WSW8	WSW8	WSW11	WSW10	WSW10	WSW9	WSW10	WSW9	WSW9	WSW9	WSW9	WSW9	WSW6	WNW6	W9	W6	W6	WSW3	SW3	SW2	UO	WSW3	WSW6	WSW5	WSW7.1	WSW11
20-Sep	W3	SSE1	WSW2	W1	WSW1	WSW1	UO	SSW1	WSW1	NW3	N4	NE6	N6	NNW6	NW6	WNW5	W4	WSW3	WSW3	WSW2	W1	W1	SSW0	WSW1	NW1.6	N6
21-Sep	SW1	SW2	WSW2	WSW1	WSW1	WSW1	SW2	SW1	SSE2	SSW5	SSW7	SW9	SSW8	SSW9	SSW9	SSW8	SW7	SSW6	S4	SSW3	SSE5	SSE5	SE6	ESE6	SSW3.8	SSW9
22-Sep	ESE6	SE6	SSE5	SSE6	SE5	S4	SE4	SE3	SSW5	SSW9	SSW9	S9	S7	S8	SSE8	S8	SE6	SE5	SE3	S2	SW2	SW1	SE4	SSE4	SSE4.6	SSW9
23-Sep	SSE3	SE4	SE5	ESE6	SE4	ESE5	SE4	SE6	SE8	ESE10	SE11	SE12	SE13	SE11	SE12	ESE14	SE11	SE9	SE7	SE6	SE7	SE6	ESE8	ESE7	SE7.8	ESE14
24-Sep	SE5	SSE3	SSE3	SSE5	SE6	SE6	SSE5	SE7	SE7	ESE5	SE4	SSW3	SE5	SE4	SSE3	SSE2	SSW2	WSW2	SW2	SW2	WSW2	WSW7	W5	WSW6	SSE2.7	WSW7
25-Sep	WSW6	WSW5	SW2	SSW1	SSW1	SSW2	SW2	S1	SE2	E3	ESE6	SE6	ESE7	SE7	ESE8	ESE8	ESE9	E5	E8	E8	ESE7	ESE5	ESE3	SE4	SE3.6	ESE9
26-Sep	ESE5	ESE7	ESE6	SSE4	SSW3	SSE4	SE4	SE5	SE6	SE8	SE9	SE7	S5	SSE4	SSE2	SW3	WSW2	SSW1	W3	SW3	WSW3	WSW5	WSW2	WSW4	SSE2.9	SE9
27-Sep	W5	W5	SW2	WSW4	WSW4	WSW3	WSW4	WSW3	WSW3	W4	WNW5	WSW5	NW5	WNW7	WNW7	W8	W6	WSW5	WSW5	SW3	SW2	WSW2	WSW1	SSW1	W3.8	W8
28-Sep	WSW3	WSW5	WSW2	SW1	SW2	UO	WSW1	UO	SW1	ESE3	ENE3	WNW5	N4	NNE5	NNE7	NNW5	NNW5	N5	NW5	NNW5	NNW6	NW4	NW4	NW5	NNW2.5	NNE7
29-Sep	NW5	WNW5	NW6	NW5	NW5	NW5	NW6	NW5	NW4	NNW4	NNW6	NNW6	NW6	NW6	NW6	WNW6	WNW5	WNW4	WNW3	W3	WNW4	WNW3	NW4	WNW3	NW4.6	NNW6
30-Sep	W3	WSW1	W1	UO	WSW1	WSW2	SW1	UO	SSE1	SE2	ESE3	ESE4	ESE4	E3	ESE4	ESE4	SSE2	SSW1	SW1	SW1	SSW1	SW1	SW1	SW1	SSE1.1	ESE4

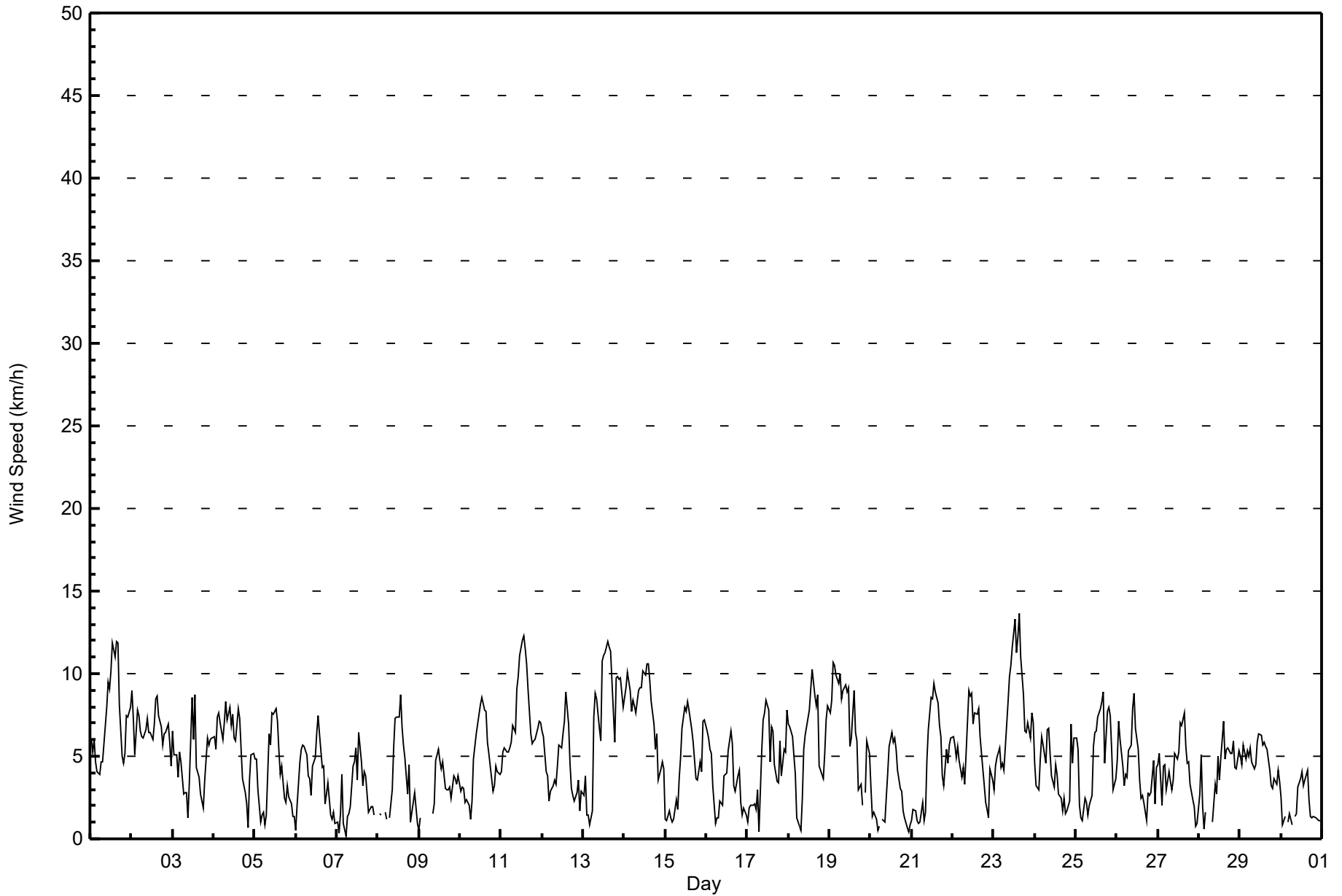
WSW2.6	SW2.6	SW2.0	SW1.9	SW1.7	SW1.7	SW1.8	SW1.6	SSW2.1	SSW2.3	SSW2.4	SSW2.9	SSW2.5	SW2.8	SW2.9	SW3.0	SW3.1	SW2.6	SW2.3	SW2.2	SW1.8	WSW2.5	SW2.4	SW2.6	Diurnal Average	
WSW9	W9	WSW11	WSW10	WSW10	WSW9	WSW10	W9	WSW9	ESE10	SE11	SE12	SE13	SE12	SE12	ESE14	WSW12	W9	E8	W10	W10	W10	W10	WSW8	Diurnal Maximum	

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 - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Surmont 2 - September 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	421	59.80	59.80
6 - 11	272	38.64	98.44
12 - 19	11	1.56	100.00
20 - 28	0	0.00	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 704

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Surmont 2 - September 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	0	1	4	24	37	43	15	30	74	116	40	17	12	4	421
6 - 11	1	1	1	0	1	24	54	14	7	8	3	47	86	14	7	4	272
12 - 19	0	0	0	0	0	1	5	0	0	0	0	4	1	0	0	0	11
20 - 28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	4	2	1	1	5	49	96	57	22	38	77	167	127	31	19	8	704

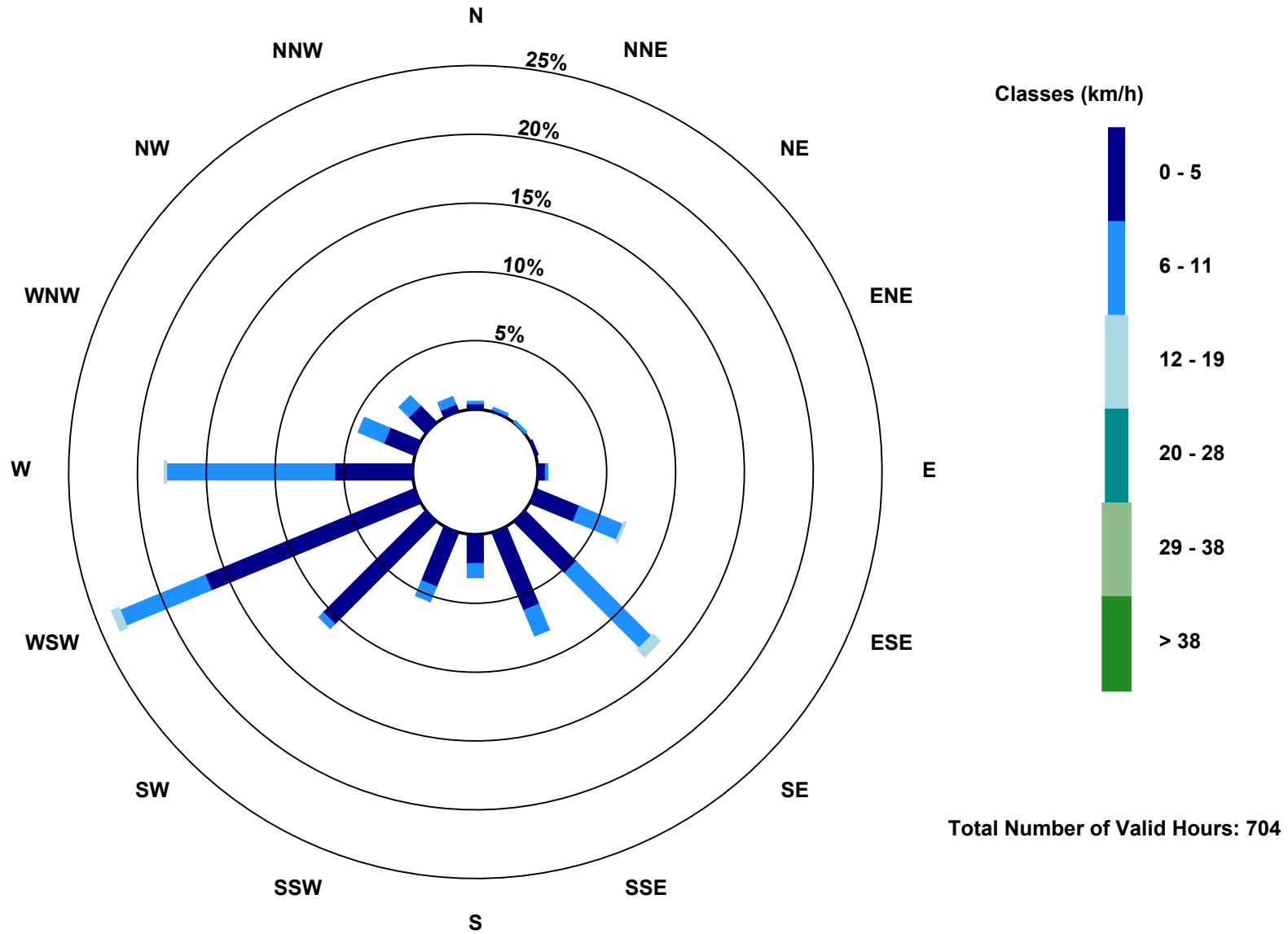
Total Number of Valid Hours: 704

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

Wind Speed (WS) - km/h
Surmont 2





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Surmont 2 - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 5 km/h on Sep 1 16:00	Hours of Data: 704
Minimum Value: 0 km/h on Sep 3 19:00	Hours of Missing Data: 16
Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 3 P ₉₀ = 3 P ₉₉ = 5	Hours of Calibration: 0
	Percent Operational Time: 97.8

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Sep	2	1	2	2	2	1	2	2	3	3	3	4	4	5	5	5	5	4	3	2	2	3	3	3	5
2-Sep	3	3	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	2	2	2	2	2	2	3
3-Sep	2	2	2	2	2	1	1	1	1	1	2	4	3	3	2	2	1	1	0	1	2	2	2	2	4
4-Sep	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	1	1	2	1	2	1	2	3
5-Sep	2	2	2	1	1	1	1	1	1	3	3	3	3	3	2	2	3	1	1	2	1	1	1	1	3
6-Sep	1	1	1	1	2	2	2	1	1	1	2	2	3	3	3	2	2	2	1	1	1	1	1	1	3
7-Sep	1	1	1	1	1	1	1	1	1	2	3	2	2	3	2	1	4	3	1	1	2	1	1	UO	4
8-Sep	UO	1	1	UO	1	1	UO	1	2	3	3	2	3	3	3	2	2	1	1	1	1	1	1	1	3
9-Sep	1	1	UO	UO	UO	UO	UO	UO	1	1	2	2	2	2	2	1	1	1	0	1	1	1	1	1	2
10-Sep	1	1	1	1	0	1	1	2	2	2	3	3	3	3	3	4	2	2	1	1	2	2	2	2	4
11-Sep	2	2	2	2	2	2	2	3	3	3	4	4	5	5	5	4	4	3	2	2	2	2	3	3	5
12-Sep	3	3	2	2	1	1	1	2	2	2	2	2	2	3	3	2	2	2	1	2	1	1	1	2	3
13-Sep	2	2	1	1	1	2	3	3	3	2	3	4	5	5	5	5	5	3	3	4	4	4	3	3	5
14-Sep	3	3	4	3	3	3	3	3	3	3	3	3	4	4	4	3	3	3	2	1	1	1	1	2	4
15-Sep	1	1	1	1	1	1	1	1	1	2	3	3	3	3	3	3	3	2	1	1	2	2	3	3	3
16-Sep	3	3	3	2	2	2	1	2	1	1	2	2	2	2	2	2	2	1	1	1	2	1	1	1	3
17-Sep	1	1	1	1	1	1	1	1	3	3	3	4	3	2	3	2	2	2	1	2	2	2	2	2	4
18-Sep	2	2	2	1	2	1	1	1	2	2	2	4	3	4	4	3	3	4	2	2	1	2	3	3	4
19-Sep	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2	1	1	1	UO	2	2	1	3
20-Sep	1	1	1	1	1	1	UO	1	1	2	2	2	2	3	3	2	2	1	1	1	1	1	1	1	3
21-Sep	1	1	1	1	1	1	1	1	1	3	3	4	4	4	5	4	3	3	2	2	2	2	2	2	5
22-Sep	2	2	2	3	2	2	2	2	3	4	4	4	4	4	3	3	2	2	1	1	1	1	2	2	4
23-Sep	1	1	2	2	2	1	1	2	3	4	4	5	5	5	5	4	4	3	3	2	2	3	2	2	5
24-Sep	2	1	1	2	2	2	2	2	3	2	1	2	2	1	1	1	2	1	1	1	2	2	2	1	3
25-Sep	1	1	2	1	1	1	1	1	1	2	2	2	3	3	3	3	3	2	3	3	2	2	1	1	3
26-Sep	2	2	2	2	1	2	2	2	2	3	3	3	3	2	1	1	2	2	2	2	1	2	2	2	3
27-Sep	2	2	1	2	2	1	1	1	2	1	2	3	3	3	3	3	2	1	1	1	1	1	1	1	3
28-Sep	2	1	1	1	1	UO	1	UO	1	1	1	2	2	2	3	2	2	2	2	2	2	2	2	2	3
29-Sep	2	2	2	2	2	2	2	2	2	2	2	3	3	3	2	2	2	2	1	1	1	1	2	1	3
30-Sep	1	1	1	UO	1	2	1	UO	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	2
	3	3	4	3	3	3	3	3	3	4	4	5	5	5	5	5	5	4	3	4	4	4	3	3	

Diurnal Maximum

UO - Unstable Operation



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Surmont 2 - September 2023

Direction of Maximum Speed: 122 deg on Sep 23 16:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 269.1 deg on Sep 14	Hours of Data: 704
Direction of Minimum Speed: 262 deg on Sep 7 06:00	Hours of Missing Data: 16
Direction of Minimum Daily Speed Average: 1.1 deg on Sep 30	Percent Operational Time: 97.8
Monthly Average Direction: 224.5 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-Sep	269	267	265	268	280	277	284	282	278	274	265	264	266	254	253	247	252	243	241	230	252	259	255	255	259.9
2-Sep	253	265	283	257	258	263	268	272	269	272	275	277	282	287	276	273	265	259	268	264	262	263	261	265	267.8
3-Sep	250	261	258	227	236	249	255	171	137	165	219	252	261	249	250	229	189	225	221	267	257	256	271	274	246.1
4-Sep	274	263	263	265	262	269	277	283	296	300	292	293	287	308	280	281	290	267	241	235	206	255	255	259	276.9
5-Sep	262	254	273	192	153	238	203	217	235	184	141	138	148	155	154	168	154	191	217	176	177	196	214	229	181.6
6-Sep	231	122	106	106	105	108	114	111	153	174	251	263	273	272	274	256	270	245	233	244	235	249	235	234	214.3
7-Sep	232	214	272	254	159	262	135	217	220	255	242	262	222	245	280	283	242	257	214	224	233	208	219	UO	244.5
8-Sep	UO	159	145	UO	246	248	UO	165	247	246	239	260	270	263	256	286	260	250	243	236	268	250	244	247	253.2
9-Sep	208	258	UO	UO	UO	UO	UO	UO	161	146	124	148	166	181	202	215	220	236	247	246	231	235	233	233	201.7
10-Sep	243	239	240	245	247	241	238	132	139	135	131	130	149	135	147	134	141	135	168	194	173	152	153	160	154.4
11-Sep	139	140	121	105	138	115	111	120	137	127	135	144	142	135	148	149	162	154	137	143	132	130	161	160	138.4
12-Sep	174	177	146	117	106	145	143	152	207	202	143	140	125	121	115	128	175	182	220	255	267	261	231	241	157.8
13-Sep	269	238	230	241	234	239	268	272	267	262	254	261	254	262	261	258	261	264	261	262	260	263	260	260	260.3
14-Sep	263	264	270	274	275	276	275	269	270	270	270	268	281	279	278	273	271	269	255	252	254	255	248	248	269.1
15-Sep	221	235	230	232	232	242	234	200	151	141	135	133	138	128	137	145	158	156	153	128	113	118	144	144	145.7
16-Sep	136	149	144	112	105	207	94	159	167	220	239	232	228	252	262	264	249	241	247	244	231	242	242	248	211.4
17-Sep	257	248	245	243	246	246	203	250	122	131	131	132	123	160	256	256	256	266	252	266	290	266	262	254	218.1
18-Sep	254	254	259	261	248	133	222	238	216	270	273	279	280	266	269	269	255	255	249	256	257	253	259	254	260.4
19-Sep	253	251	249	251	251	252	251	255	254	244	244	246	255	288	281	276	269	243	226	226	UO	253	254	258	254.4
20-Sep	259	163	250	261	244	251	UO	206	244	319	3	37	10	341	320	294	281	255	244	255	261	265	211	242	306.0
21-Sep	224	233	239	238	256	238	236	232	148	202	198	221	211	205	203	195	215	208	186	193	152	153	128	108	195.5
22-Sep	122	139	158	153	127	187	139	131	211	211	213	173	187	179	164	174	141	145	143	182	230	218	127	160	167.4
23-Sep	160	128	124	119	128	119	135	130	126	123	127	132	127	142	129	122	133	131	136	138	132	135	122	117	129.1
24-Sep	127	153	164	149	135	133	152	133	137	123	131	199	144	134	164	164	196	255	234	224	257	257	271	248	164.8
25-Sep	250	244	215	193	202	205	215	173	131	99	103	138	123	127	115	111	106	101	98	101	109	115	164	132	126.8
26-Sep	112	114	120	153	207	163	135	131	126	133	134	142	190	163	162	231	237	208	275	230	239	246	247	255	160.0
27-Sep	259	261	235	243	257	257	255	249	250	261	290	249	312	292	292	271	265	257	245	231	234	238	244	211	263.3
28-Sep	243	249	258	226	216	UO	246	UO	219	107	75	296	353	25	33	346	338	350	326	344	345	316	319	325	334.4
29-Sep	310	300	322	326	323	325	319	304	304	340	339	336	313	307	309	302	300	292	282	279	291	300	306	286	311.1
30-Sep	272	248	268	UO	251	238	216	UO	147	127	120	106	116	100	115	114	148	200	214	217	210	232	219	218	153.0

236.8 228.3 231.1 224.0 226.9 228.8 231.5 216.8 208.7 206.2 197.4 210.9 210.5 222.1 231.6 229.1 228.9 229.6 225.8 229.5 228.9 237.0 231.7 233.0

Diurnal Average

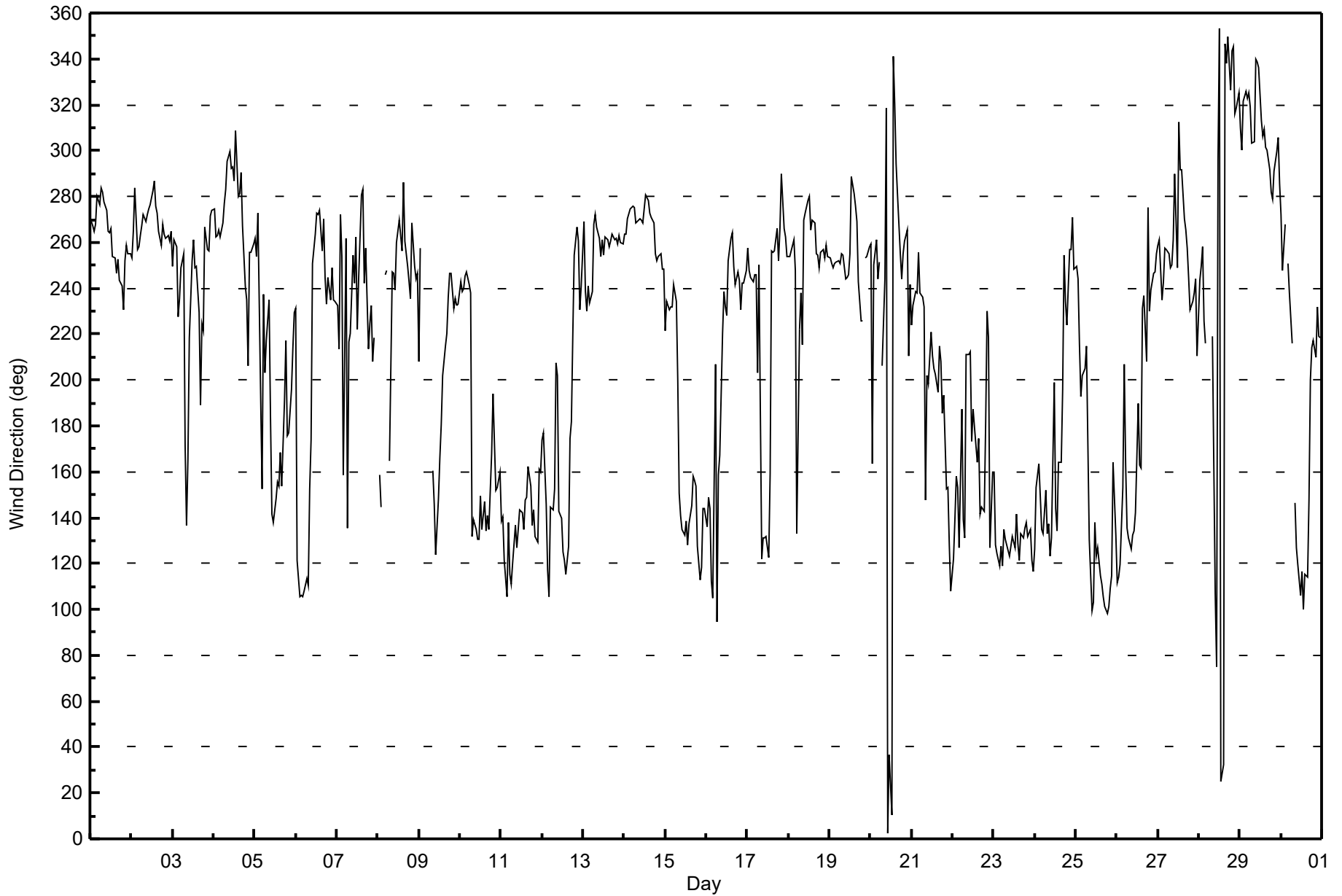
UO - Unstable Operation

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Surmont 2 - September 2023





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Surmont 2 - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 111 deg on Sep 16 06:00	Hours of Data: 704
Minimum Value: 5 deg on Sep 10 07:00	Hours of Missing Data: 16
Percentiles: P ₁ = 10 P ₁₀ = 21 Q ₁ = 31 Median = 43 Q ₃ = 54 P ₉₀ = 65 P ₉₉ = 90	Hours of Calibration: 0
	Percent Operational Time: 97.8

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Sep	27	24	25	33	39	30	41	49	39	37	38	42	42	38	44	41	43	50	63	66	52	39	32	35	66
2-Sep	29	38	47	25	23	23	28	30	26	29	31	30	38	37	36	34	29	30	29	24	24	25	25	35	47
3-Sep	31	34	32	41	23	26	23	42	70	107	90	45	54	37	62	70	46	33	19	21	22	22	28	31	107
4-Sep	31	24	27	26	28	32	39	39	56	59	51	61	56	67	43	44	55	37	20	38	45	31	24	26	67
5-Sep	34	34	67	67	55	41	60	51	41	62	53	57	53	62	55	66	59	50	34	55	49	50	25	39	67
6-Sep	68	71	28	28	36	36	42	41	56	63	37	43	44	38	43	39	31	24	11	35	26	30	38	55	71
7-Sep	66	68	46	23	83	76	74	71	65	40	61	47	52	55	34	42	57	35	20	39	25	43	23	UO	83
8-Sep	UO	35	41	UO	14	12	UO	56	79	41	47	39	45	42	39	43	31	24	12	54	44	44	52	50	79
9-Sep	46	50	UO	UO	UO	UO	UO	UO	52	75	45	54	61	67	50	48	33	22	11	18	26	23	21	22	75
10-Sep	13	14	18	29	14	10	5	80	57	51	49	48	55	48	57	55	49	49	49	58	62	50	52	51	80
11-Sep	49	52	44	37	52	46	49	50	62	52	48	53	55	54	53	51	58	65	53	53	54	53	55	60	65
12-Sep	66	62	74	58	83	50	57	54	74	56	47	54	45	43	38	43	55	54	44	13	24	21	19	29	83
13-Sep	40	34	20	16	39	95	29	32	30	33	43	39	40	37	36	40	35	34	28	31	33	31	36	31	95
14-Sep	32	31	32	34	37	38	35	31	31	29	31	33	36	39	40	35	32	27	21	19	25	18	15	22	40
15-Sep	44	49	17	14	59	34	21	27	38	47	47	50	48	44	48	58	62	53	45	45	47	59	63	59	63
16-Sep	58	59	68	69	90	111	101	87	69	52	47	47	59	47	42	37	25	10	10	17	14	16	11	14	111
17-Sep	7	22	18	31	15	64	56	72	60	51	51	49	53	68	44	30	25	29	20	25	36	30	25	22	72
18-Sep	22	20	21	22	55	79	48	80	59	36	39	50	42	38	37	36	35	36	40	37	47	41	32	30	80
19-Sep	30	30	26	28	29	30	27	31	30	32	39	38	64	57	38	48	34	23	13	16	UO	23	21	25	64
20-Sep	35	69	25	51	62	5	UO	35	61	83	74	58	58	66	63	53	44	21	14	19	8	86	61	35	86
21-Sep	42	10	9	39	51	10	11	17	79	69	64	58	65	66	70	62	66	71	63	62	63	54	45	28	79
22-Sep	45	57	77	73	56	64	46	84	96	73	71	58	72	64	61	61	50	58	43	47	38	64	49	51	96
23-Sep	50	38	37	35	39	35	38	56	46	43	45	47	46	53	46	42	49	50	53	54	45	47	40	32	56
24-Sep	46	49	50	53	47	45	61	49	61	55	51	62	58	52	57	51	60	19	38	42	26	30	33	16	62
25-Sep	13	15	52	18	43	39	54	70	65	77	44	54	47	43	37	36	24	23	22	23	24	39	55	47	77
26-Sep	36	32	34	48	54	54	47	45	47	47	46	52	59	61	61	76	85	103	75	78	37	18	66	21	103
27-Sep	24	26	67	35	23	25	21	32	23	34	56	46	45	47	52	37	27	18	10	16	21	15	39	61	67
28-Sep	27	20	49	39	36	UO	44	UO	48	38	78	53	65	60	47	55	53	45	58	53	47	53	64	47	78
29-Sep	40	50	48	52	43	46	52	40	58	67	47	51	48	48	47	44	41	36	33	32	37	39	39	42	67
30-Sep	42	56	9	UO	44	64	63	UO	41	53	49	48	47	59	41	29	47	15	21	41	41	65	20	42	65

68	71	77	73	90	111	101	87	96	107	90	62	72	68	70	76	85	103	75	78	63	86	66	61	
Diurnal Maximum																								

UO - Unstable Operation



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS30 ELLS RIVER SEPTEMBER 2023

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

October 30, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ELLS RIVER (AMS30)
 SEPTEMBER 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	687	33	33	100	35.1	0	5.4	0
TRS (ppb) Average	684	35	36	99.86	4.1	0	1.1	0
THC (ppm) Average	687	33	33	100	3.3	-	2.4	-
NMHC (ppm) Average	687	33	33	100	0.263	-	0.05	-
CH4 (ppm) Average	687	33	33	100	3.1	-	2.3	-
NO2 (ppb) Average	685	35	35	100	33.5	0	8.3	-
NO (ppb) Average	685	35	35	100	62	-	6.5	-
NOX (ppb) Average	685	35	35	100	77.8	-	11.7	-
PM2.5 (ug/m3) Average	718	2	2	100	421.1	170	278.1	21
Temperature 2 m (C) Average	720	0	0	100	26.7	-	20.8	-
Relative Humidity (%) Average	720	0	0	100	96.1	-	88.5	-
Wind Speed 10 m (km/h) Average	718	0	2	99.72	28	-	16	-
Wind Direction 10 m (deg) Average	718	0	2	99.72	-	-	-	-
Global Solar Radiation (W/m2) Average	720	0	0	100	624.7	-	192.4	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ELLS RIVER (AMS30)
 SEPTEMBER 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	687	0.84	2.6	-	0	0	0	0.1	0.3	1.9	35.1
TRS (ppb) Average	684	0.63	0.4	-	0.2	0.4	0.4	0.5	0.7	1.1	4.1
THC (ppm) Average	687	2.17	0.2	-	2	2	2.1	2.1	2.2	2.4	3.3
NMHC(ppm) Average	687	0.008	0.034	-	0	0	0	0	0	0	0.263
CH4(ppm) Average	687	2.16	0.2	-	2	2	2.1	2.1	2.2	2.3	3.1
NO2 (ppb) Average	685	4.19	5.1	-	0	0.4	0.8	2.2	5.5	10.9	33.5
NO (ppb) Average	685	1.46	5	-	0	0	0	0.1	0.5	2.8	62
NOX (ppb) Average	685	5.65	8.8	-	0	0.5	0.8	2.4	6.3	14.4	77.8
PM2.5 (ug/m3) Average	718	62.45	77	-	3.2	9.4	15.8	29.1	74.8	168.5	421.1
Temperature 2 m (C) Average	720	13.52	5.8	-	0.2	6.3	9	13.1	17.9	21.3	26.7
Relative Humidity (%) Average	720	64.44	19.2	-	23.2	37.6	48.8	66.5	79.7	90.1	96.1
Wind Speed 10 m (km/h) Average	718	9.5	5	-	1	4	6	9	12	16	28
Wind Direction 10 m (deg) Average	718	219.8	-	-	-	-	-	-	-	-	-
Global Solar Radiation (W/m2) Average	720	121.41	170.8	-	0	0	0.1	13.8	204.2	424.8	624.7

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ELLS RIVER (AMS30)
 SEPTEMBER 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
TRS	01 Sep 2023 09:00	01 Sep 2023 09:00	1	Maintenance - verify daily QA response
Wind Speed, Wind Direction	10 Sep 2023 03:00	10 Sep 2023 03:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	01 Oct 2023 00:00	01 Oct 2023 00:00	1	Flat line in sensor output signal



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb

Ells River - September 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 35.1 ppb on Sep 9 13:00	Maximum Daily Average: 5.4 ppb on Sep 9		Hours of Data:	687
Minimum Value: 0.0 ppb on Sep 1 13:00	Minimum Daily Average: 0.0 ppb on Sep 18		Hours of Missing Data:	33
Maximum Diurnal Average: 2.1 ppb at hour 13	Minimum Diurnal Average: 0.2 ppb at hour 6		Hours of Calibration:	33
Monthly Average: 0.84 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.3 P ₉₀ = 1.9 P ₉₉ = 11.8		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-Sep	3.9	3.7	3.2	2.4	Z	1.7	1.4	1.7	1.8	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	1.0	3.9	
2-Sep	0.0	0.0	0.0	0.2	0.4	Z	0.4	0.4	0.2	0.1	0.2	0.3	0.6	0.5	0.4	0.3	0.4	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.3	0.6	
3-Sep	Z	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.0	1.1	0.8	0.5	0.5	0.4	0.4	0.3	0.1	0.1	0.0	0.0	0.2	1.1	
4-Sep	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	0.1	0.3	0.2	0.4	0.1	0.1	0.0	0.0	0.1	0.1	0.4	
5-Sep	0.1	0.0	Z	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.2	0.3	0.4	1.3	1.4	0.2	0.6	0.3	0.5	0.6	0.4	0.4	0.2	0.3	1.4	
6-Sep	0.0	0.1	0.1	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	
7-Sep	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	0.1	0.2	0.3	1.5	0.9	0.3	0.3	0.2	0.2	0.2	0.1	0.2	1.5	
8-Sep	0.1	0.1	0.1	0.0	0.0	Z	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.9	0.5	0.5	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.9	
9-Sep	Z	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.7	8.4	3.3	9.7	35.1	19.0	14.7	8.8	8.3	6.1	4.3	2.7	1.3	0.4	0.2	0.2	5.4	35.1	
10-Sep	0.1	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.9	8.2	15.3	4.6	11.6	8.2	7.7	4.9	3.8	2.7	1.1	0.5	0.3	0.5	3.4	3.2	3.4	15.3	
11-Sep	5.7	5.2	Z	2.5	0.5	0.1	0.5	5.4	11.3	10.5	3.2	5.1	0.4	0.3	0.2	0.2	0.3	0.1	0.2	0.7	4.9	2.0	7.4	4.0	3.1	11.3	
12-Sep	3.9	1.2	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.4	3.9	
13-Sep	0.0	0.0	0.1	0.0	Z	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	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1	
14-Sep	0.1	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	0.0	0.1	0.1	0.0	0.1	0.1	0.2	
15-Sep	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.4	0.2	0.2	0.3	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.6	0.7	2.4	10.3	8.2	1.1	10.3
16-Sep	2.1	Z	0.5	0.4	0.4	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.2	2.1	
17-Sep	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.6	4.3	7.6	5.8	5.4	1.2	1.1	0.5	0.3	0.3	0.2	0.0	0.0	0.0	0.0	1.2	7.6	
18-Sep	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	
19-Sep	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	
20-Sep	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.3	0.3	0.3	0.2	0.3	0.2	0.2	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.3	
21-Sep	Z	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.2	
22-Sep	0.2	Z	0.3	0.2	0.0	0.0	0.0	0.0	0.1	0.3	0.4	0.3	0.4	0.2	0.1	0.3	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.5	0.1	0.5	
23-Sep	13.0	9.4	Z	3.5	0.9	0.2	0.3	0.7	5.2	11.0	21.5	14.1	4.4	2.4	0.4	0.8	2.1	6.8	0.3	1.5	1.7	2.1	4.1	5.1	4.9	21.5	
24-Sep	1.9	4.9	6.0	Z	4.2	2.0	2.1	5.5	8.4	2.7	0.9	0.5	0.4	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	1.8	8.4	
25-Sep	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.2	0.4	0.3	0.3	0.2	0.2	0.4	0.4	0.2	0.1	0.0	0.1	0.2	0.1	0.2	0.1	0.4	
26-Sep	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.3	1.5	0.5	0.5	0.5	0.5	0.4	0.3	0.4	0.4	0.2	0.2	0.1	0.1	0.1	0.1	0.3	1.5	
27-Sep	Z	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.2	1.3	0.8	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	1.3	
28-Sep	0.2	Z	0.2	0.0	0.1	0.1	0.1	0.1	0.1	0.1	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	0.1	0.2	
29-Sep	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.9	0.1	0.8	0.2	0.2	0.4	0.1	0.1	0.1	0.3	0.3	0.1	0.1	0.1	0.2	0.9	
30-Sep	0.1	0.1	0.1	Z	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.2	

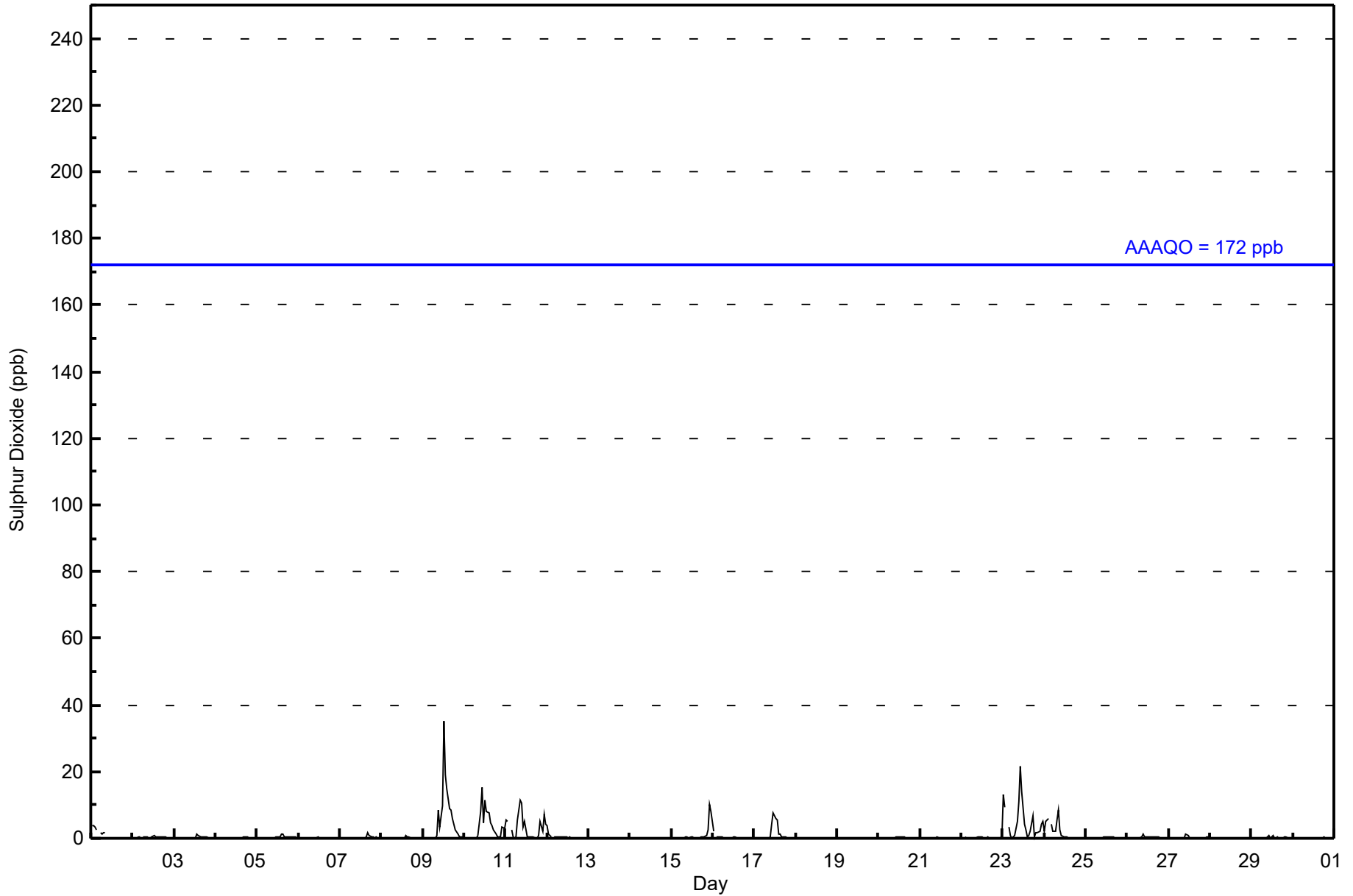
1.3	1.0	0.5	0.4	0.3	0.2	0.2	0.5	1.0	1.6	1.9	1.6	2.1	1.3	1.0	0.7	0.7	0.7	0.3	0.3	0.4	0.3	0.9	0.8	Diurnal Average	
13.0	9.4	6.0	3.5	4.2	2.0	2.1	5.5	11.3	11.0	21.5	14.1	35.1	19.0	14.7	8.8	8.3	6.8	4.3	2.7	4.9	2.4	10.3	8.2	Diurnal Maximum	

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



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Ells River - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Ells River - September 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	676	98.40	98.40
11 - 20	9	1.31	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: 687

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Ells River - September 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	41	19	4	5	6	3	22	114	137	91	92	32	32	29	32	15	674
11 - 20	0	0	0	0	0	0	3	6	0	0	0	0	0	0	0	0	9
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	41	19	4	5	6	3	25	122	137	91	92	32	32	29	32	15	685

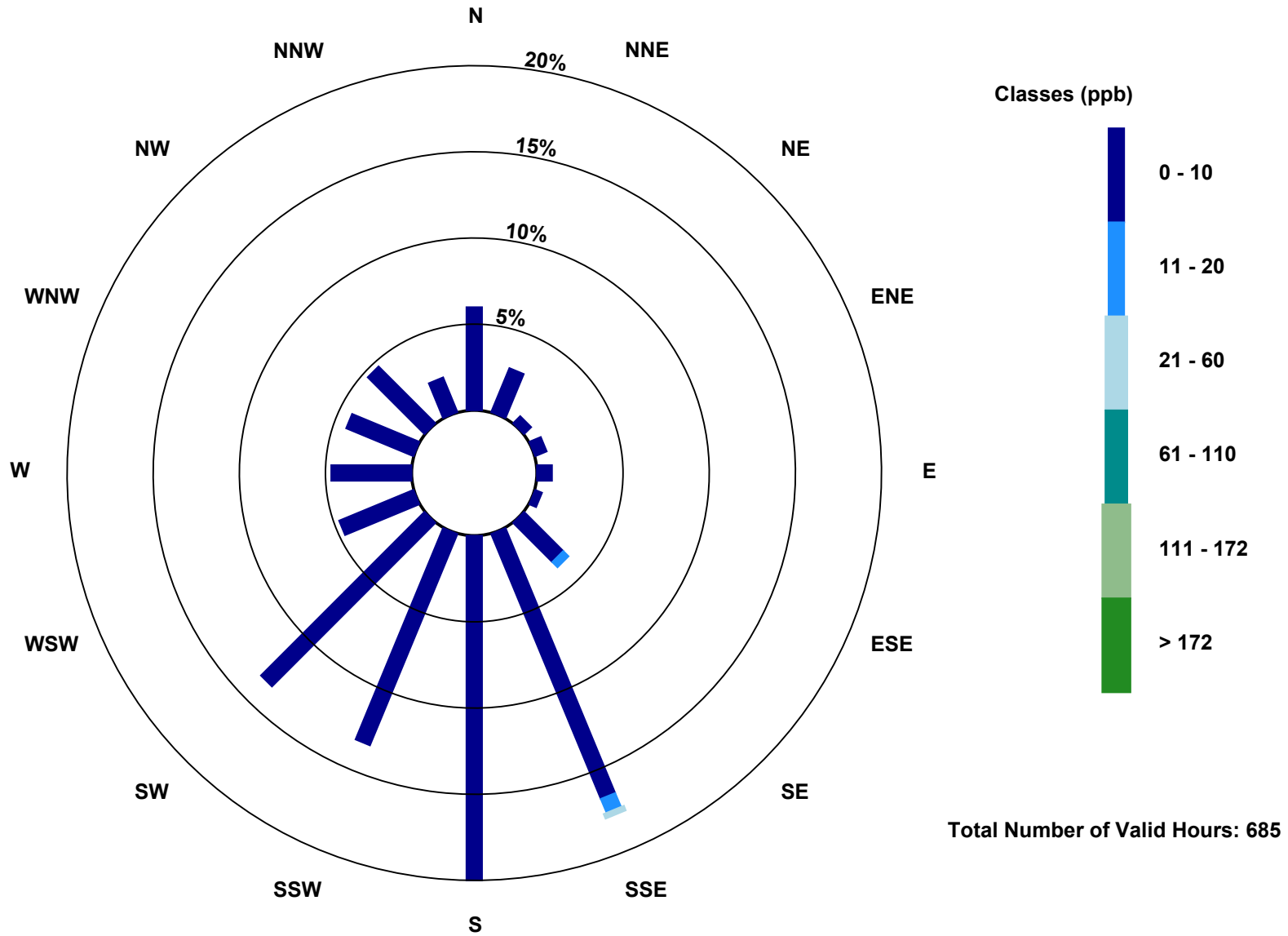
Total Number of Valid Hours: 685

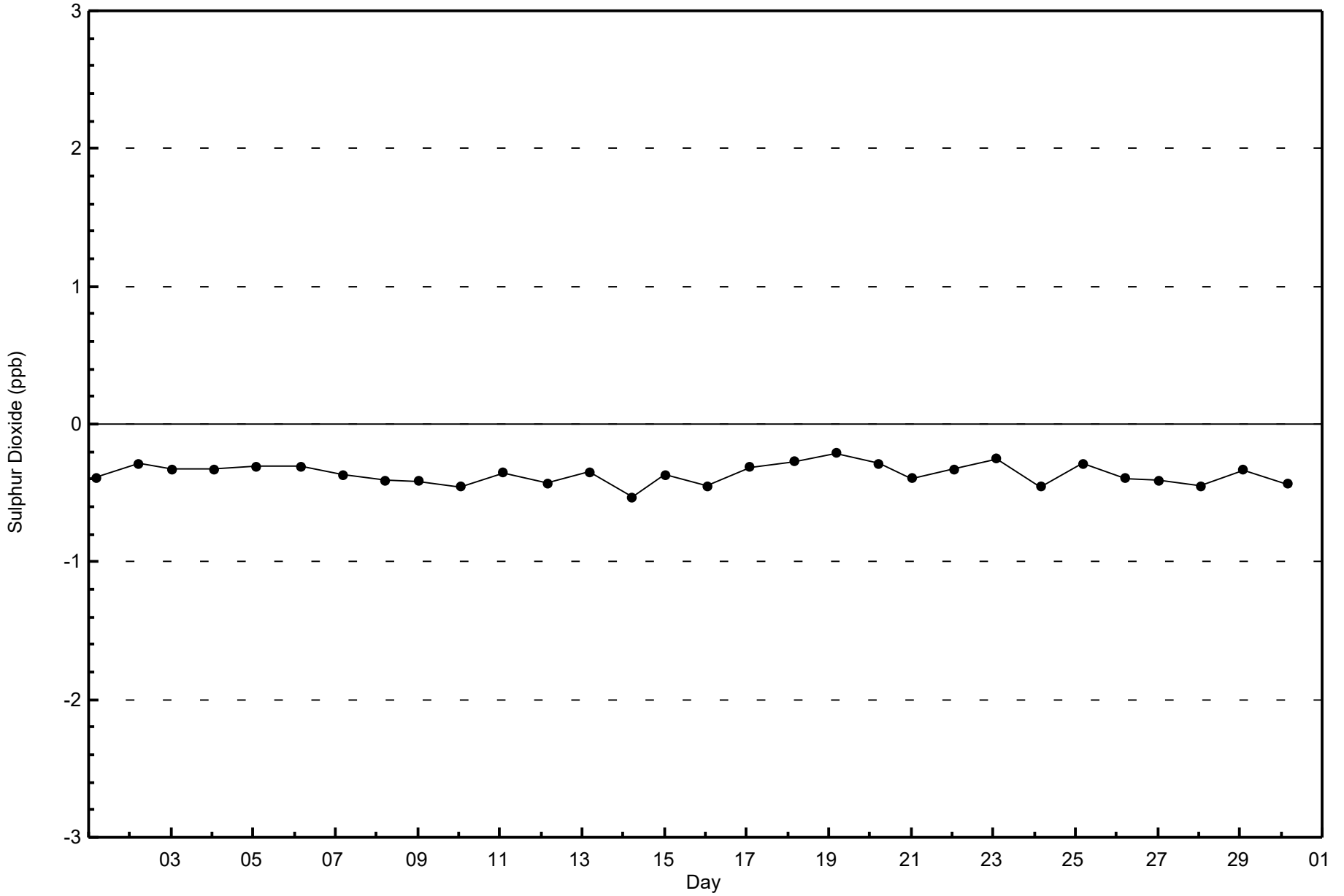
Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

Sulphur Dioxide (SO₂) - ppb
Ells River

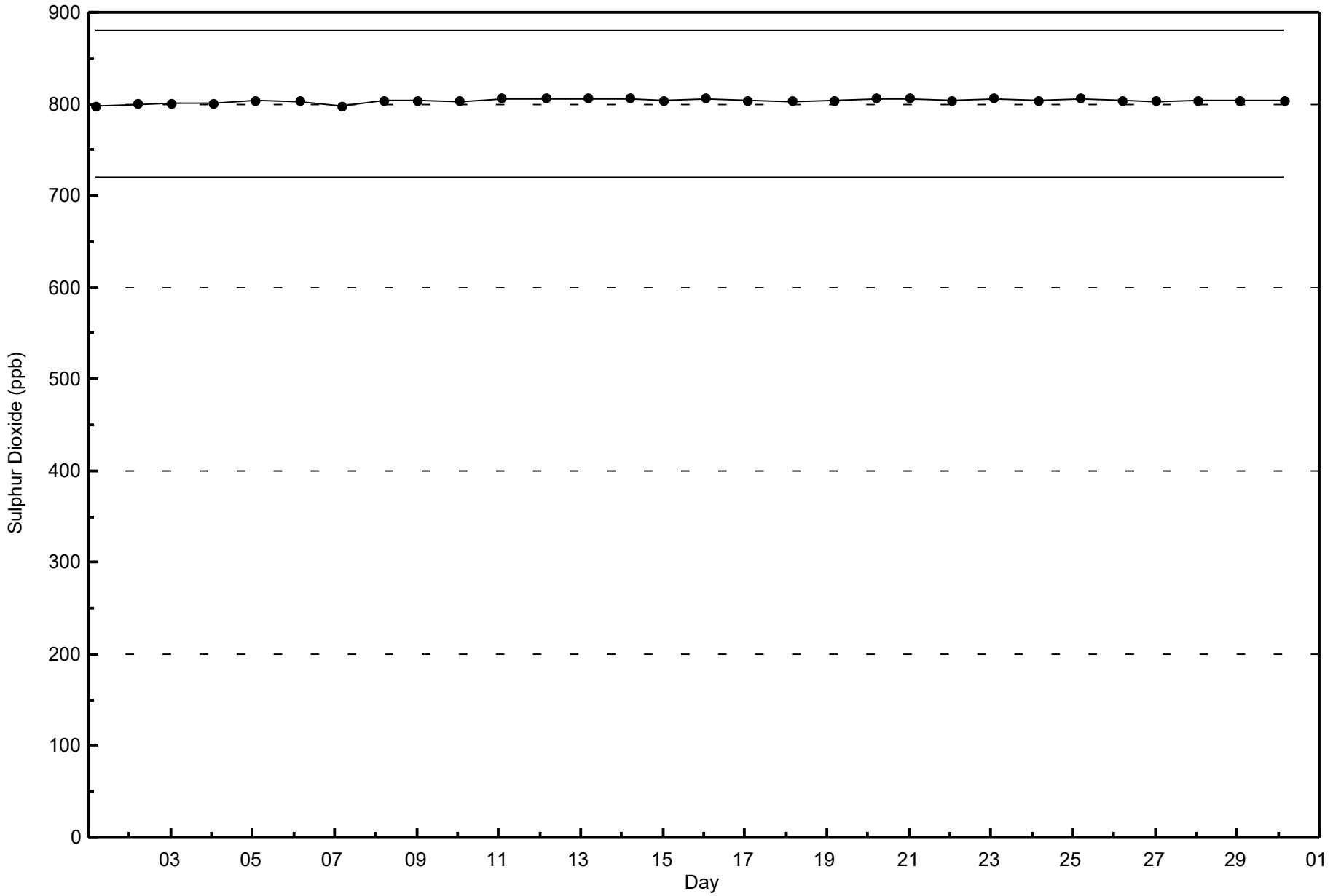


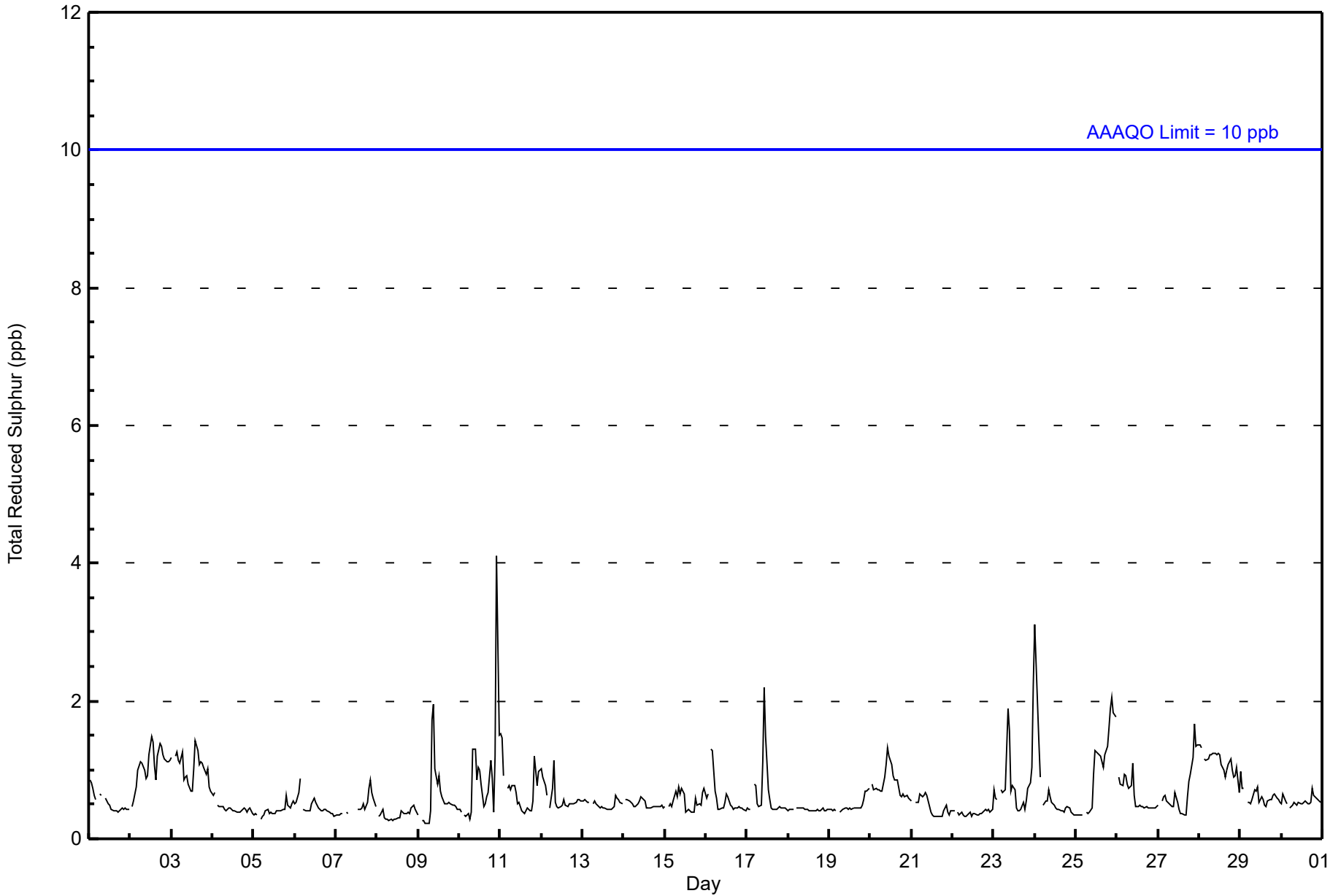




Wood Buffalo Environmental Association
Span Responses

Sulphur Dioxide (SO₂) - ppb
Ells River - September 2023







Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Reduced Sulphur (TRS) - ppb
Ells River - September 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	681	99.56	99.56
3 - 4	3	0.44	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Ells River - September 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	41	19	4	5	6	3	25	120	134	88	92	33	32	30	33	15	680
3 - 4	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	3
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	41	19	4	5	6	3	25	123	134	88	92	33	32	30	33	15	683

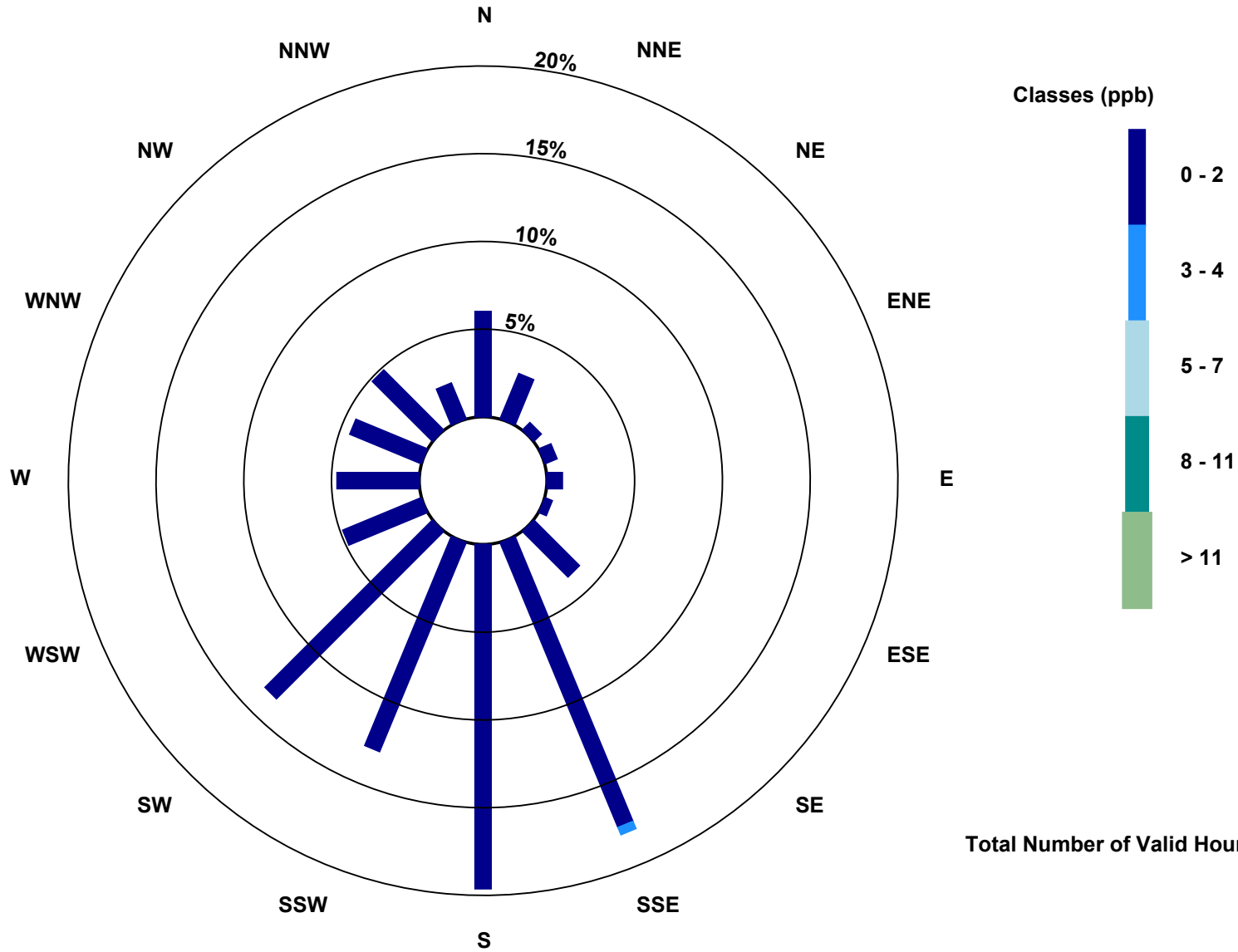
Total Number of Valid Hours: 683

Total Number of Hours: 720

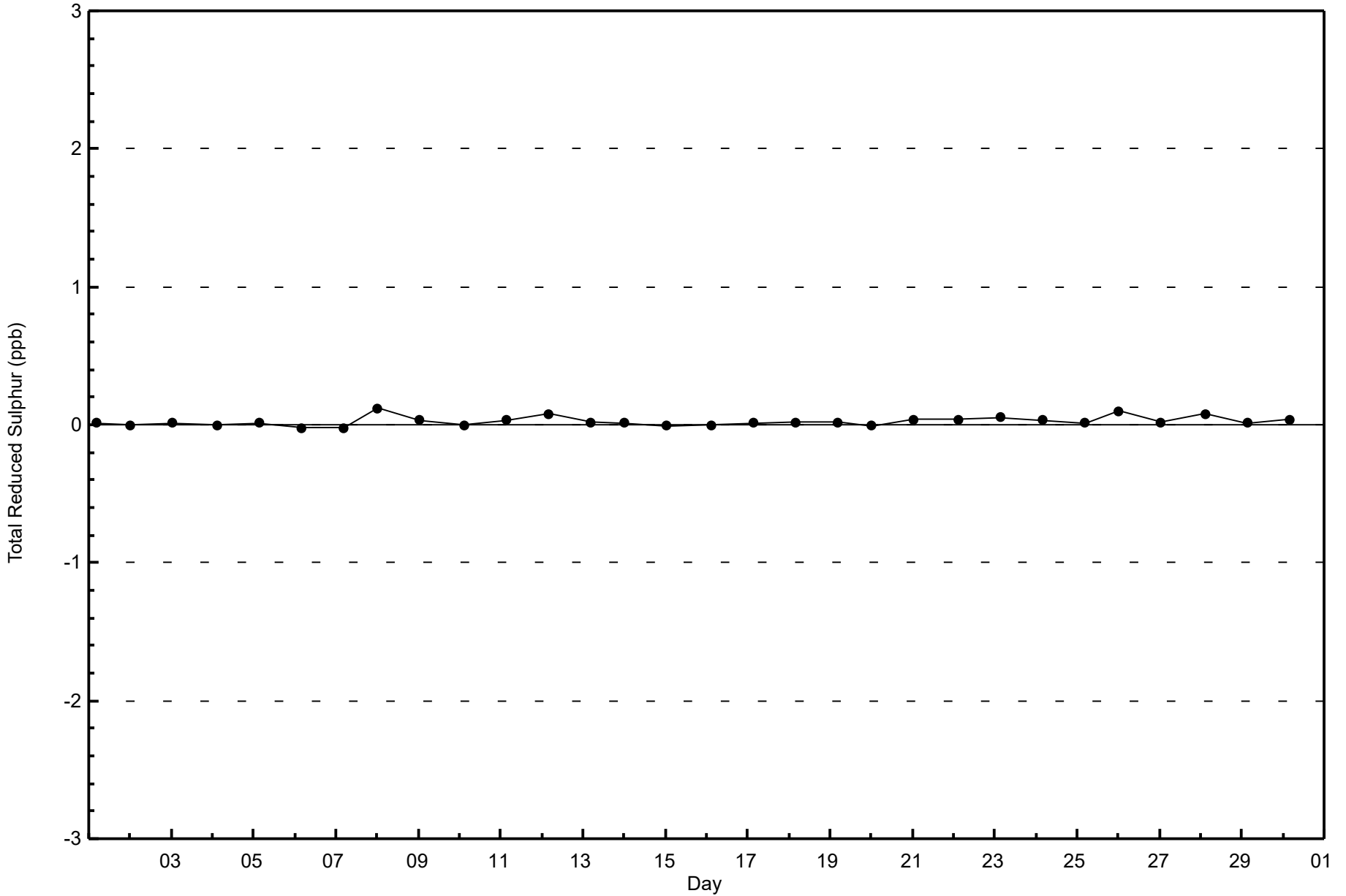


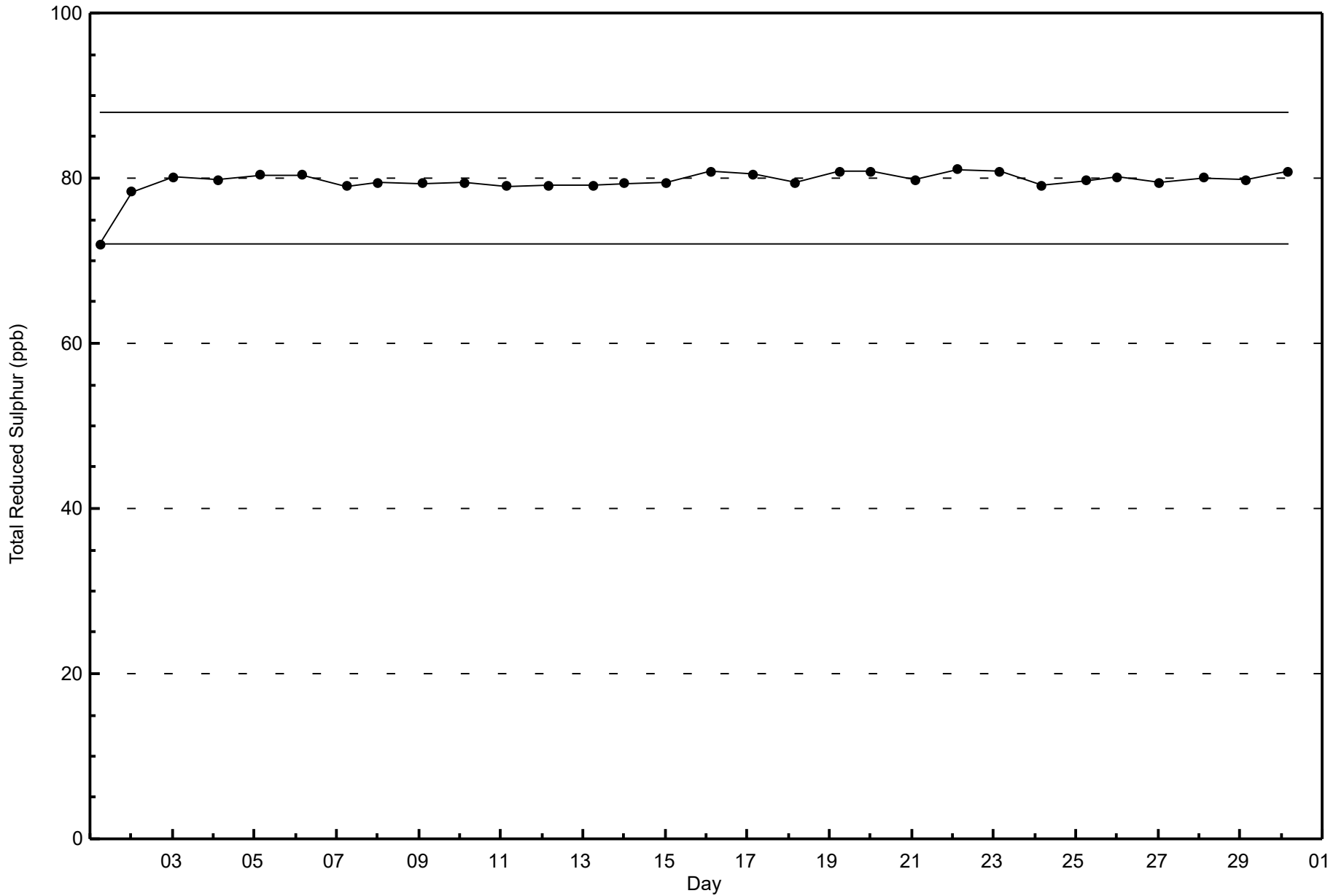
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Total Reduced Sulphur (TRS) - ppb
Ells River



Total Number of Valid Hours: 683



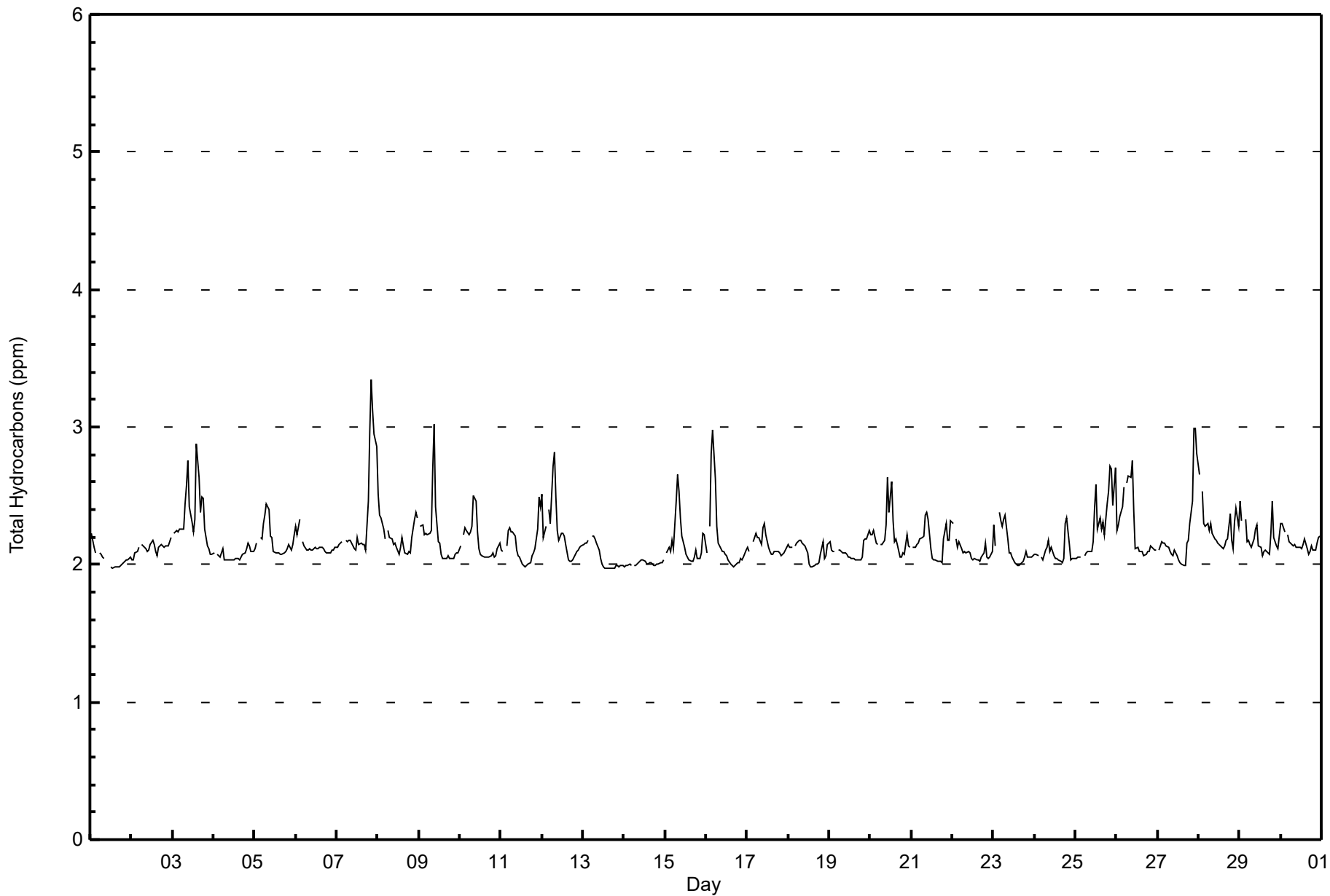




Wood Buffalo Environmental Association
Summary of Hour Averages

Total Hydrocarbons (THC) - ppm
Ells River - September 2023

Maximum Value: 3.3 ppm on Sep 7 21:00		Maximum Daily Average: 2.4 ppm on Sep 7		Hours in Service: 720																						
Minimum Value: 2.0 ppm on Sep 13 18:00		Minimum Daily Average: 2.0 ppm on Sep 14		Hours of Data: 687																						
Maximum Diurnal Average: 2.2 ppm at hour 9		Minimum Diurnal Average: 2.1 ppm at hour 17		Hours of Missing Data: 33																						
Monthly Average: 2.17 ppm		Percentiles: P ₁ = 2.0 P ₁₀ = 2.0 Q ₁ = 2.1 Median = 2.1 Q ₃ = 2.2 P ₉₀ = 2.4 P ₉₉ = 3.0		Hours of Calibration: 33																						
				Percent Operational Time: 100.0																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Sep	2.2	2.2	2.1	2.1	Z	2.1	2.1	2.1	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	2.1	2.1	2.0	2.2
2-Sep	2.0	2.0	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.2
3-Sep	Z	2.2	2.2	2.2	2.3	2.3	2.3	2.4	2.6	2.8	2.4	2.3	2.2	2.3	2.9	2.6	2.4	2.5	2.5	2.3	2.1	2.1	2.1	2.1	2.4	2.9
4-Sep	2.1	Z	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.2
5-Sep	2.1	2.2	Z	2.2	2.2	2.3	2.4	2.4	2.4	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.4
6-Sep	2.3	2.2	2.3	Z	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3
7-Sep	2.1	2.1	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.2	2.1	2.2	2.1	2.1	2.1	2.5	3.0	3.3	3.1	3.0	2.9	2.4	3.3
8-Sep	2.5	2.4	2.3	2.3	2.2	Z	2.3	2.2	2.2	2.1	2.2	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.4	2.3	2.2	2.5
9-Sep	Z	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.7	3.0	2.4	2.2	2.2	2.1	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.2	3.0
10-Sep	2.1	Z	2.2	2.3	2.2	2.2	2.2	2.3	2.5	2.5	2.2	2.1	2.1	2.1	2.0	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.5
11-Sep	2.1	2.1	Z	2.1	2.2	2.3	2.2	2.2	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.3	2.5	2.4	2.1	2.5
12-Sep	2.5	2.2	2.3	Z	2.4	2.3	2.7	2.8	2.5	2.2	2.2	2.2	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.8
13-Sep	2.2	2.2	2.2	2.2	Z	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	2.0	2.0	2.0	2.0	2.1	2.2
14-Sep	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-Sep	Z	2.1	2.1	2.1	2.2	2.1	2.5	2.7	2.5	2.3	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.2	2.2	2.2	2.7
16-Sep	2.1	Z	2.3	2.8	3.0	2.6	2.3	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	2.1	2.2	3.0
17-Sep	2.1	2.1	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3
18-Sep	2.1	2.1	2.1	Z	2.1	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.0	2.1	2.1	2.1	2.2
19-Sep	2.2	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.2	2.2	2.1	2.2
20-Sep	2.2	2.2	2.3	2.2	2.1	Z	2.1	2.1	2.2	2.3	2.6	2.4	2.6	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.2	2.6
21-Sep	Z	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.4	2.4	2.3	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.3	2.2	2.2	2.3	2.2	2.4
22-Sep	2.3	Z	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.1	2.0	2.1	2.1	2.1	2.3
23-Sep	2.3	2.1	Z	2.4	2.3	2.3	2.3	2.4	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.4
24-Sep	2.1	2.1	2.1	Z	2.1	2.0	2.1	2.1	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.3	2.3	2.1	2.0	2.0	2.0	2.1	2.3
25-Sep	2.0	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.2	2.4	2.6	2.3	2.3	2.3	2.3	2.2	2.4	2.5	2.7	2.7	2.4	2.7	2.3	2.7
26-Sep	2.2	2.3	2.4	2.4	2.6	Z	2.6	2.6	2.6	2.8	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	2.3	2.8
27-Sep	Z	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.2	2.2	2.3	2.5	3.0	3.0	2.8	2.2	3.0
28-Sep	2.7	Z	2.5	2.3	2.3	2.3	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.2	2.2	2.4	2.2	2.1	2.3	2.4	2.3	2.3	2.7
29-Sep	2.5	2.3	Z	2.3	2.2	2.2	2.1	2.1	2.2	2.3	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.5	2.2	2.1	2.1	2.2	2.2	2.5
30-Sep	2.3	2.3	2.2	Z	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.3
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan C - Calibration																										





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Ells River - September 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	146	21.25	21.25
2.1 - 3.0	539	78.46	99.71
3.1 - 10.0	2	0.29	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 687

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Total Hydrocarbons (THC) - ppm
Ells River - September 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	1	4	21	22	21	37	9	8	7	14	2	146
2.1 - 3.0	41	19	4	5	6	2	21	101	115	70	55	23	24	21	17	13	537
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	41	19	4	5	6	3	25	122	137	91	92	32	32	29	32	15	685

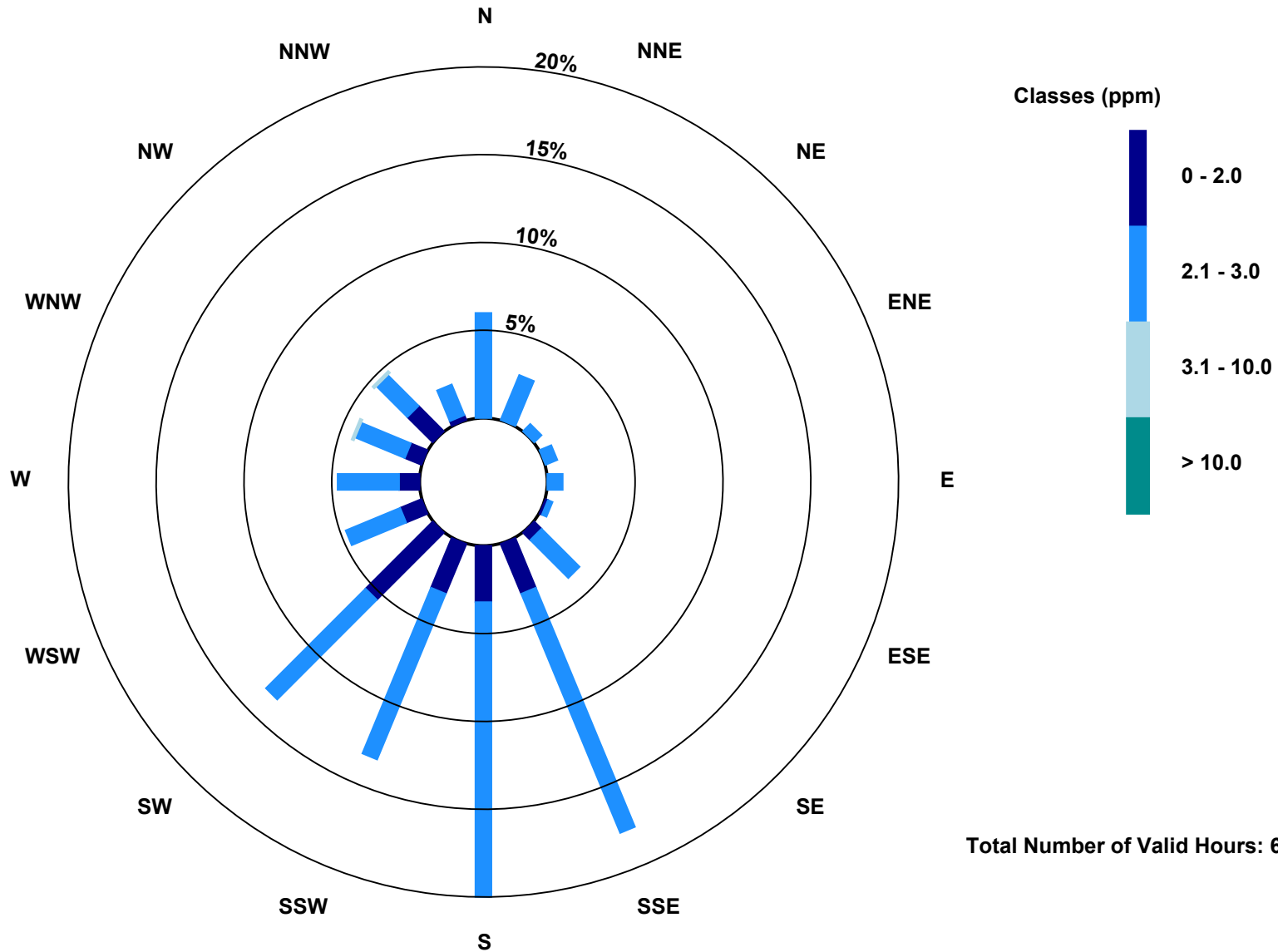
Total Number of Valid Hours: 685

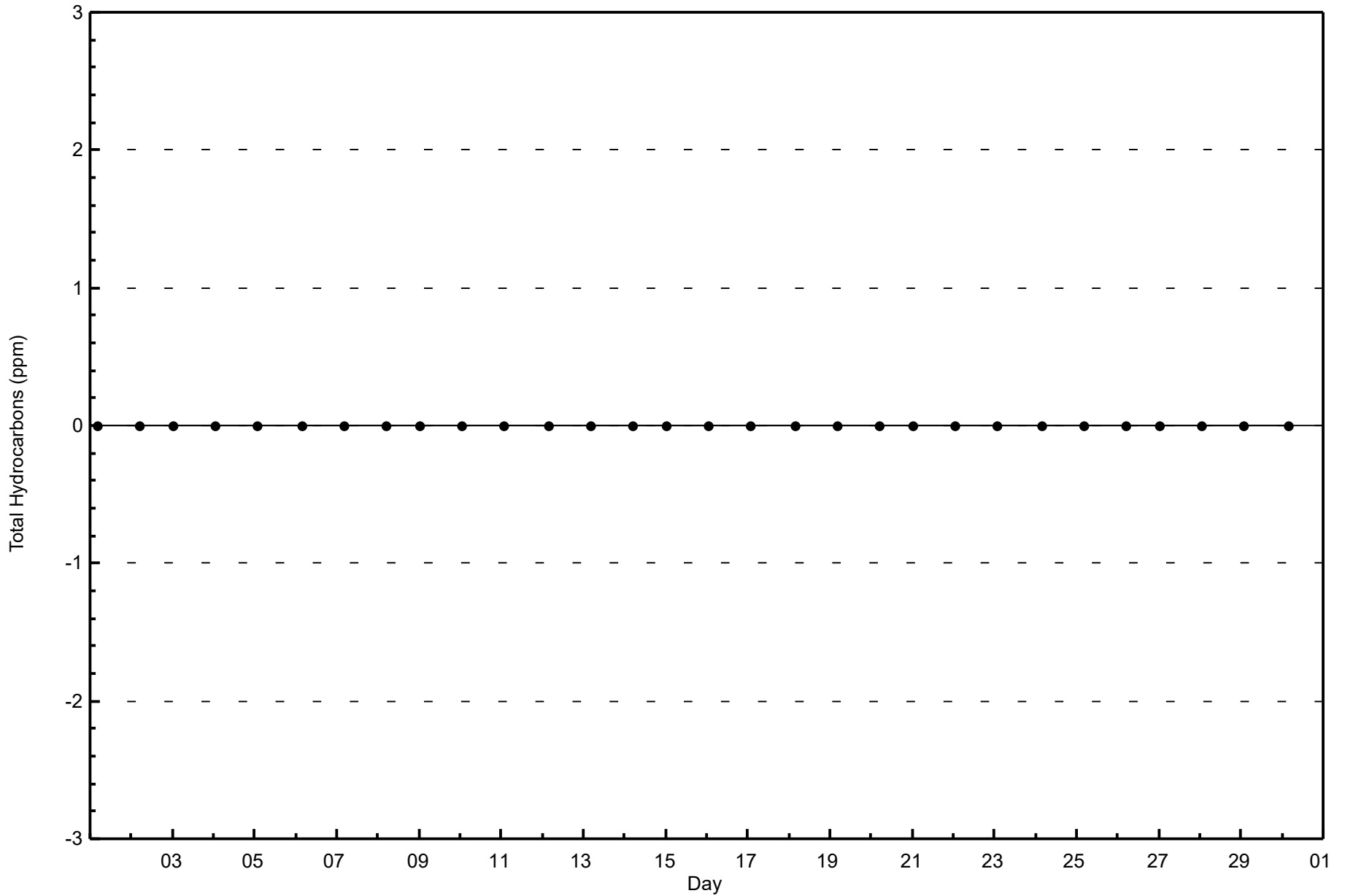
Total Number of Hours: 720

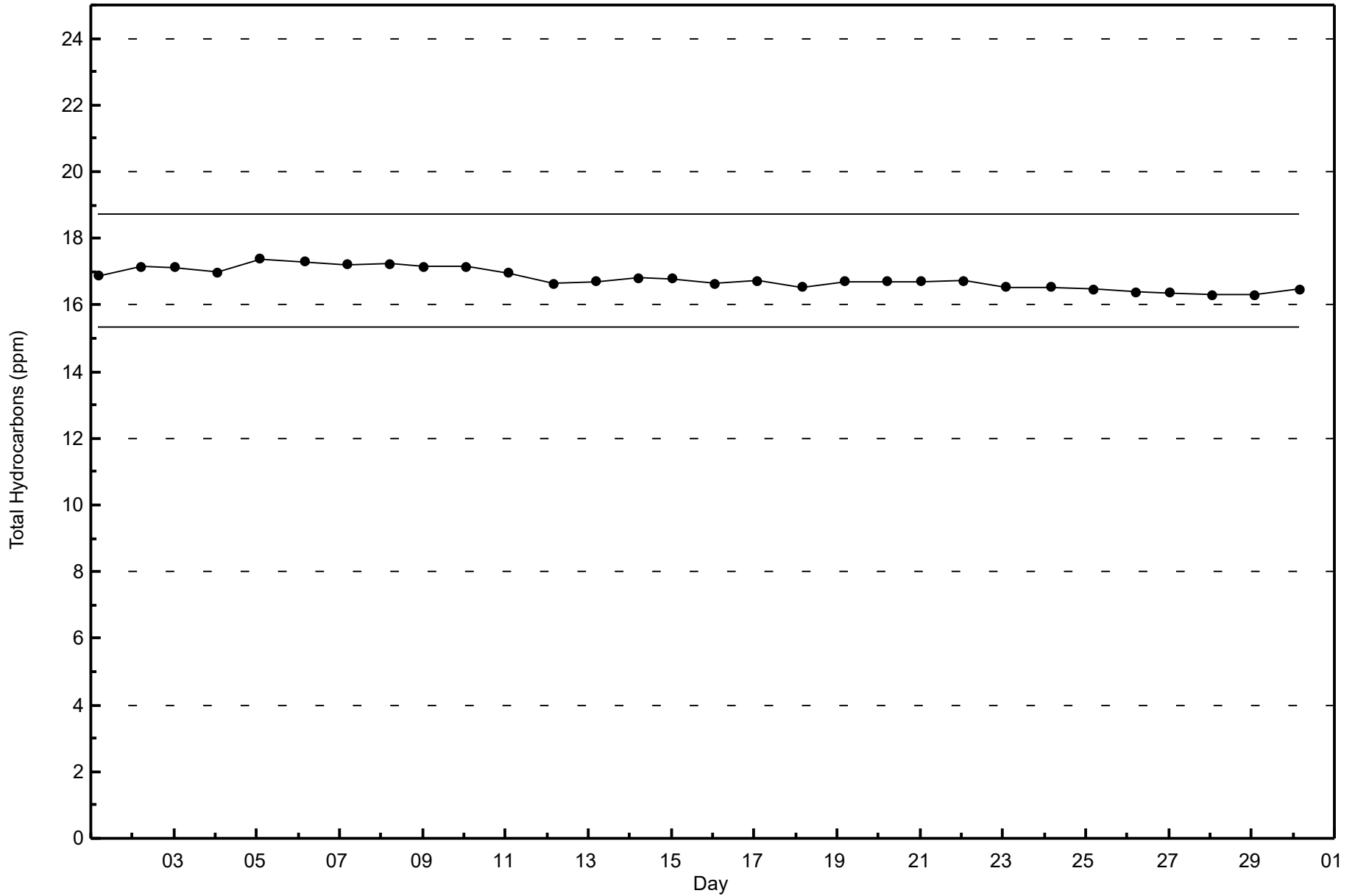


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Total Hydrocarbons (THC) - ppm
Ells River





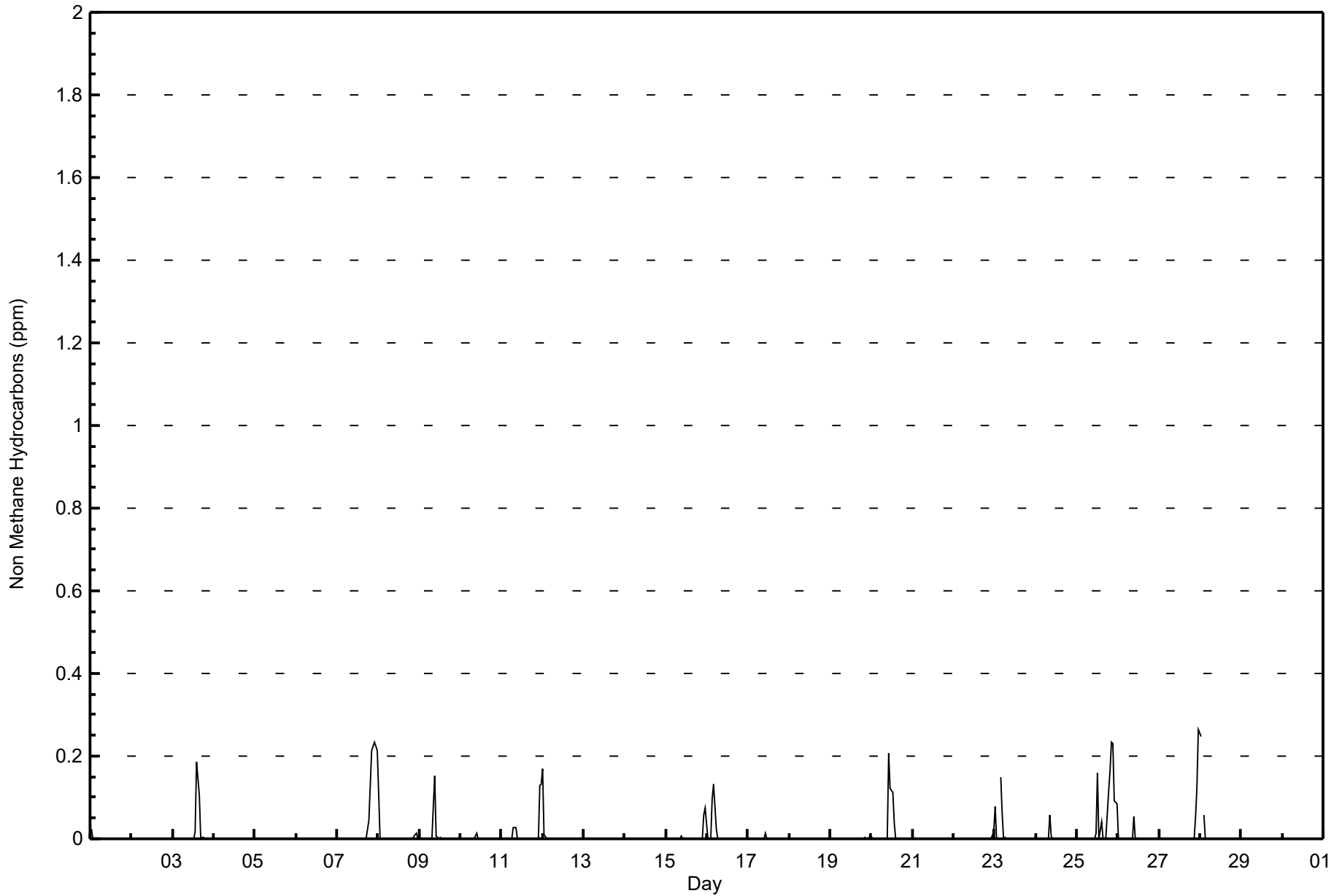




Summary of Hour Averages

Ells River - September 2023

Maximum Value: 0.263 ppm on Sep 28 00:00 Maximum Daily Average: 0.050 ppm on Sep 25		Hours in Service: 720 Hours of Data: 687 Hours of Missing Data: 33 Hours of Calibration: 33 Percent Operational Time: 100.0																									
Minimum Value: 0.000 ppm on Sep 1 02:00 Maximum Diurnal Average: 0.026 ppm at hour 24 Monthly Average: 0.008 ppm		Minimum Daily Average: 0.000 ppm on Sep 2 Minimum Diurnal Average: 0.000 ppm at hour 17 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-Sep	0.025	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	C	C	C	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.025	
2-Sep	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
3-Sep	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	0.018	0.185	0.104	0.000	0.003	0.003	0.000	0.000	0.000	0.000	0.000	0.014	0.185	
4-Sep	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	
5-Sep	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	
6-Sep	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	
7-Sep	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	0.045	0.129	0.213	0.225	0.233	0.214	0.046	0.233
8-Sep	0.109	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	0.011	0.015	0.000	0.006	0.109
9-Sep	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.077	0.151	0.007	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	0.010	0.151	
10-Sep	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.014	
11-Sep	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.027	0.028	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.130	0.132	0.014	0.132	
12-Sep	0.168	0.009	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	0.008	0.168	
13-Sep	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-Sep	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-Sep	Z	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	0.000	0.000	0.000	0.000	0.000	0.002	0.057	0.076	0.006	0.076
16-Sep	0.000	Z	0.000	0.096	0.133	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	0.000	0.000	0.000	0.000	0.011	0.133	
17-Sep	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.013	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.013	
18-Sep	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	
19-Sep	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	0.004	0.000	0.000	0.000	0.005	
20-Sep	0.002	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.003	0.208	0.123	0.113	0.037	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.021	0.208	
21-Sep	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	
22-Sep	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	0.017	0.001	0.017	
23-Sep	0.079	0.000	Z	0.150	0.061	0.001	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.013	0.150		
24-Sep	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.057	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	0.003	0.003	0.057	
25-Sep	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.013	0.160	0.000	0.041	0.000	0.000	0.003	0.115	0.166	0.235	0.230	0.093	0.086	0.050	0.235		
26-Sep	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.055	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.055		
27-Sep	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	0.051	0.124	0.263	0.019	0.263
28-Sep	0.247	Z	0.056	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.013	0.247		
29-Sep	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-Sep	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	
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerospan C - Calibration																											





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Ells River - September 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	632	91.99	91.99
0.006 - 0.05	19	2.77	94.76
0.06 - 0.1	21	3.06	97.82
> 0.1	15	2.18	100.00

Total Number of Valid Hours: 687

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm
Ells River - September 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	33	16	2	3	6	3	23	112	128	87	92	32	27	25	28	13	630
0.006 - 0.05	0	1	2	0	0	0	2	4	4	0	0	0	3	1	1	1	19
0.06 - 0.1	3	2	0	1	0	0	0	5	4	2	0	0	0	1	2	1	21
> 0.1	5	0	0	1	0	0	0	1	1	2	0	0	2	2	1	0	15
Totals	41	19	4	5	6	3	25	122	137	91	92	32	32	29	32	15	685

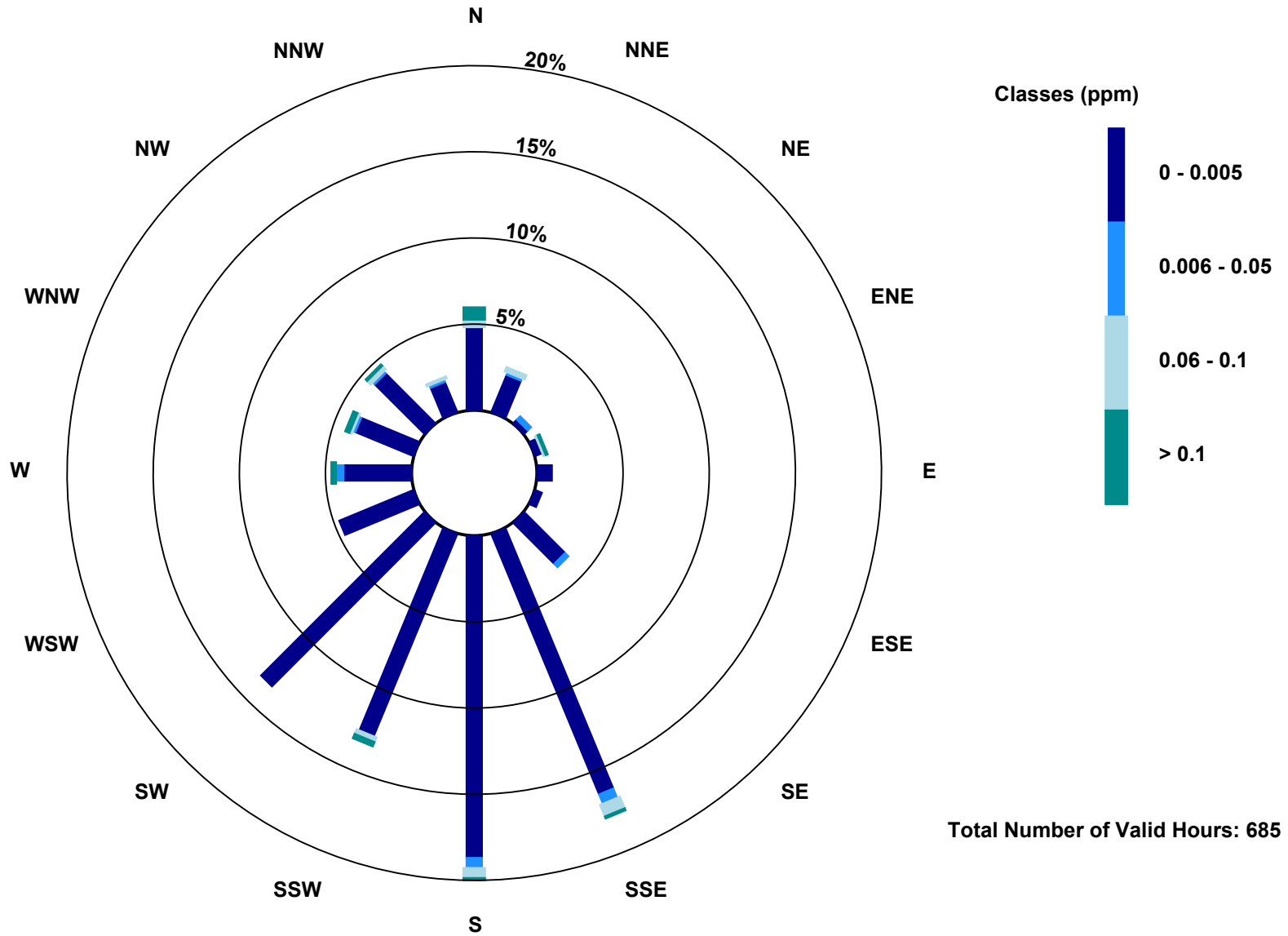
Total Number of Valid Hours: 685

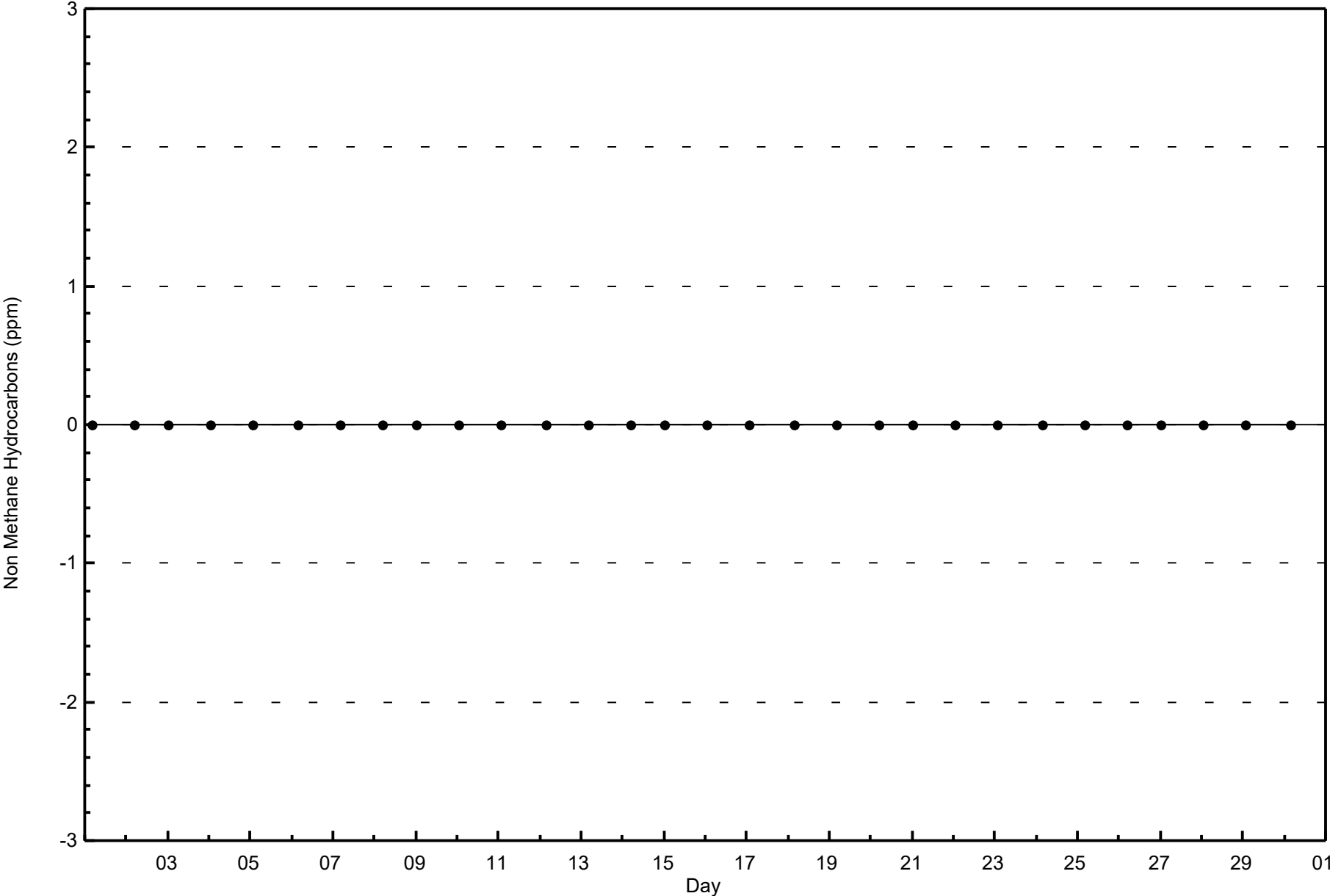
Total Number of Hours: 720

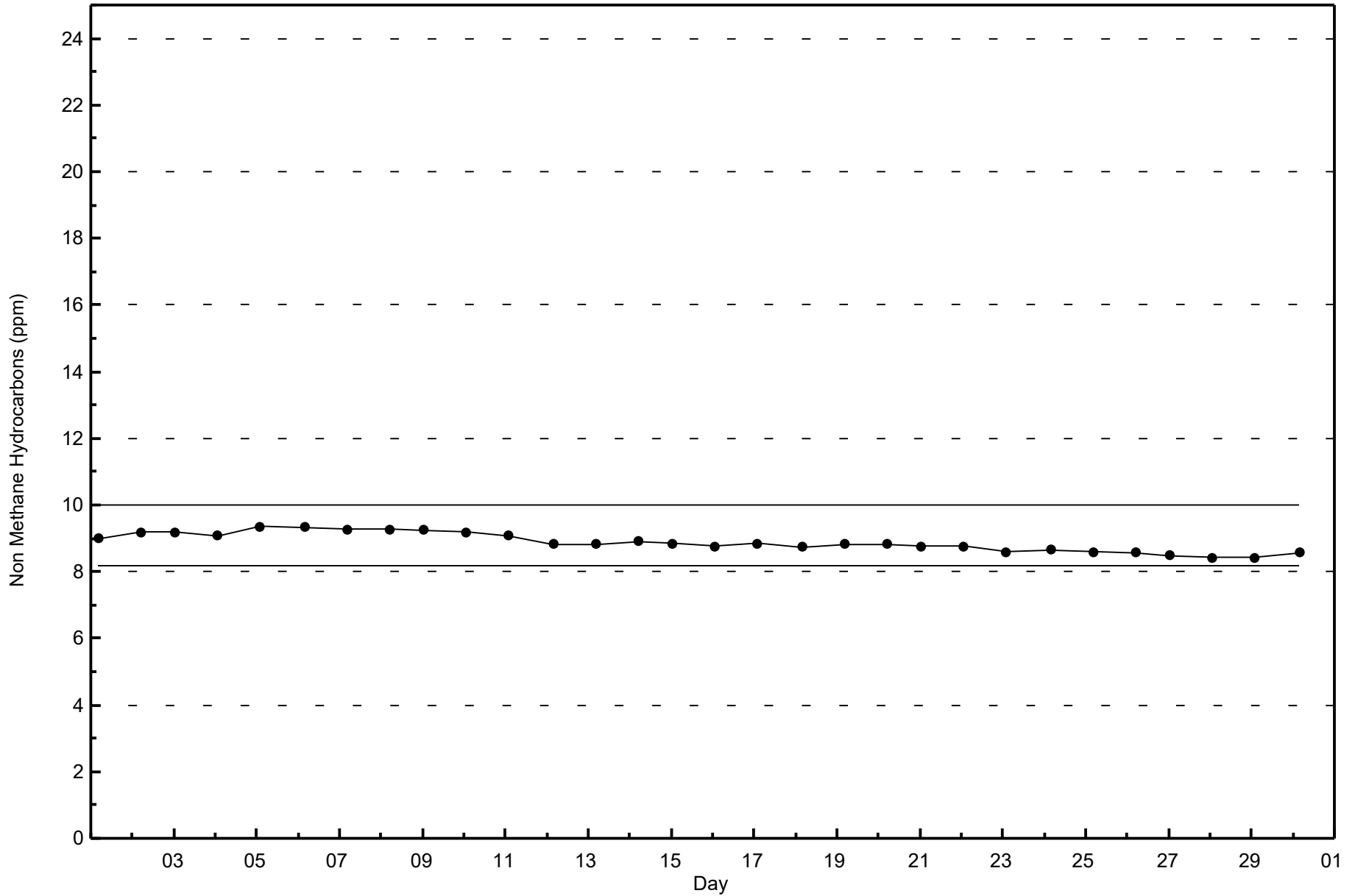


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Non Methane Hydrocarbons (NMHC) - ppm
Ells River







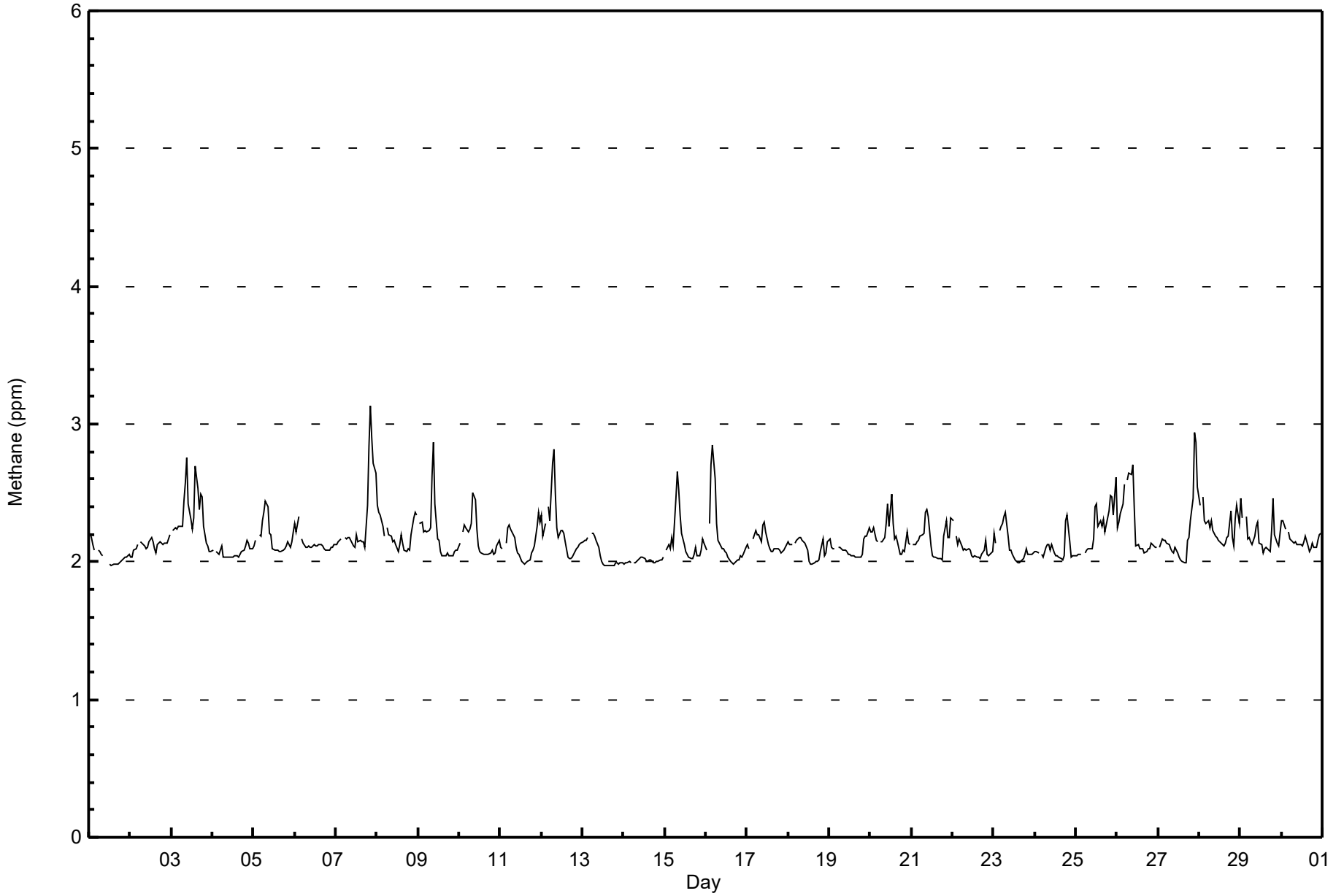


Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 3.1 ppm on Sep 7 21:00	Maximum Daily Average: 2.3 ppm on Sep 3		Hours of Data:	687
Minimum Value: 2.0 ppm on Sep 13 18:00	Minimum Daily Average: 2.0 ppm on Sep 14		Hours of Missing Data:	33
Maximum Diurnal Average: 2.2 ppm at hour 9	Minimum Diurnal Average: 2.1 ppm at hour 17		Hours of Calibration:	33
Monthly Average: 2.16 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:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Sep	2.2	2.2	2.1	2.1	Z	2.1	2.1	2.1	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	2.1	2.1	2.0	2.2
2-Sep	2.0	2.0	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.2
3-Sep	Z	2.2	2.2	2.2	2.3	2.3	2.3	2.4	2.6	2.8	2.4	2.3	2.2	2.3	2.7	2.5	2.4	2.5	2.5	2.3	2.1	2.1	2.1	2.1	2.3	2.8
4-Sep	2.1	Z	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.2
5-Sep	2.1	2.2	Z	2.2	2.2	2.3	2.4	2.4	2.4	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.4
6-Sep	2.3	2.2	2.3	Z	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3
7-Sep	2.1	2.1	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.2	2.1	2.2	2.1	2.1	2.1	2.4	2.8	3.1	2.9	2.7	2.6	2.3	3.1
8-Sep	2.4	2.4	2.3	2.3	2.2	Z	2.3	2.2	2.2	2.1	2.2	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.4	2.3	2.2	2.4
9-Sep	Z	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.6	2.9	2.4	2.2	2.2	2.1	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.9
10-Sep	2.1	Z	2.2	2.3	2.2	2.2	2.2	2.3	2.5	2.4	2.2	2.1	2.1	2.1	2.0	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.5
11-Sep	2.1	2.1	Z	2.1	2.2	2.3	2.2	2.2	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.3	2.4	2.3	2.1	2.4
12-Sep	2.3	2.2	2.3	Z	2.4	2.3	2.7	2.8	2.5	2.2	2.2	2.2	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.8
13-Sep	2.2	2.2	2.2	2.2	Z	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	2.0	2.0	2.0	2.0	2.1	2.2
14-Sep	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-Sep	Z	2.1	2.1	2.1	2.2	2.1	2.5	2.7	2.5	2.3	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.2	2.1	2.2	2.7
16-Sep	2.1	Z	2.3	2.7	2.8	2.6	2.3	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	2.1	2.2	2.8
17-Sep	2.1	2.1	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3
18-Sep	2.1	2.1	2.1	Z	2.1	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.0	2.1	2.1	2.1	2.2
19-Sep	2.2	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.2	2.2	2.1	2.2
20-Sep	2.2	2.2	2.3	2.2	2.1	Z	2.1	2.1	2.2	2.3	2.4	2.3	2.5	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.2	2.5
21-Sep	Z	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.4	2.4	2.3	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.3	2.2	2.2	2.3	2.2	2.4
22-Sep	2.3	Z	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.1	2.0	2.1	2.1	2.1	2.3
23-Sep	2.2	2.1	Z	2.2	2.3	2.3	2.3	2.4	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.4
24-Sep	2.1	2.1	2.1	Z	2.1	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	2.3	2.3	2.1	2.0	2.0	2.0	2.1	2.3
25-Sep	2.0	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.2	2.4	2.4	2.3	2.3	2.3	2.3	2.2	2.3	2.4	2.5	2.5	2.3	2.6	2.2	2.6
26-Sep	2.2	2.3	2.4	2.4	2.6	Z	2.6	2.6	2.6	2.7	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	2.3	2.7
27-Sep	Z	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.2	2.2	2.3	2.5	2.9	2.9	2.5	2.2	2.9
28-Sep	2.4	Z	2.5	2.3	2.3	2.3	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.2	2.2	2.4	2.2	2.1	2.3	2.4	2.3	2.2	2.5
29-Sep	2.5	2.3	Z	2.3	2.2	2.2	2.1	2.1	2.2	2.3	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.5	2.2	2.1	2.1	2.2	2.2	2.5
30-Sep	2.3	2.3	2.2	Z	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.3

2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	Diurnal Average
2.5	2.4	2.5	2.7	2.8	2.6	2.7	2.8	2.6	2.9	2.4	2.4	2.4	2.5	2.3	2.7	2.5	2.4	2.5	2.5	2.8	3.1	2.9	2.9	2.6	2.6	2.6	Diurnal Maximum

Z - zerospan C - Calibration





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Ells River - September 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	146	21.25	21.25
2.1 - 3.0	540	78.60	99.85
3.1 - 10.0	1	0.15	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 687

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Methane (CH₄) - ppm
Ells River - September 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	1	4	21	22	21	37	9	8	7	14	2	146
2.1 - 3.0	41	19	4	5	6	2	21	101	115	70	55	23	24	22	17	13	538
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	41	19	4	5	6	3	25	122	137	91	92	32	32	29	32	15	685

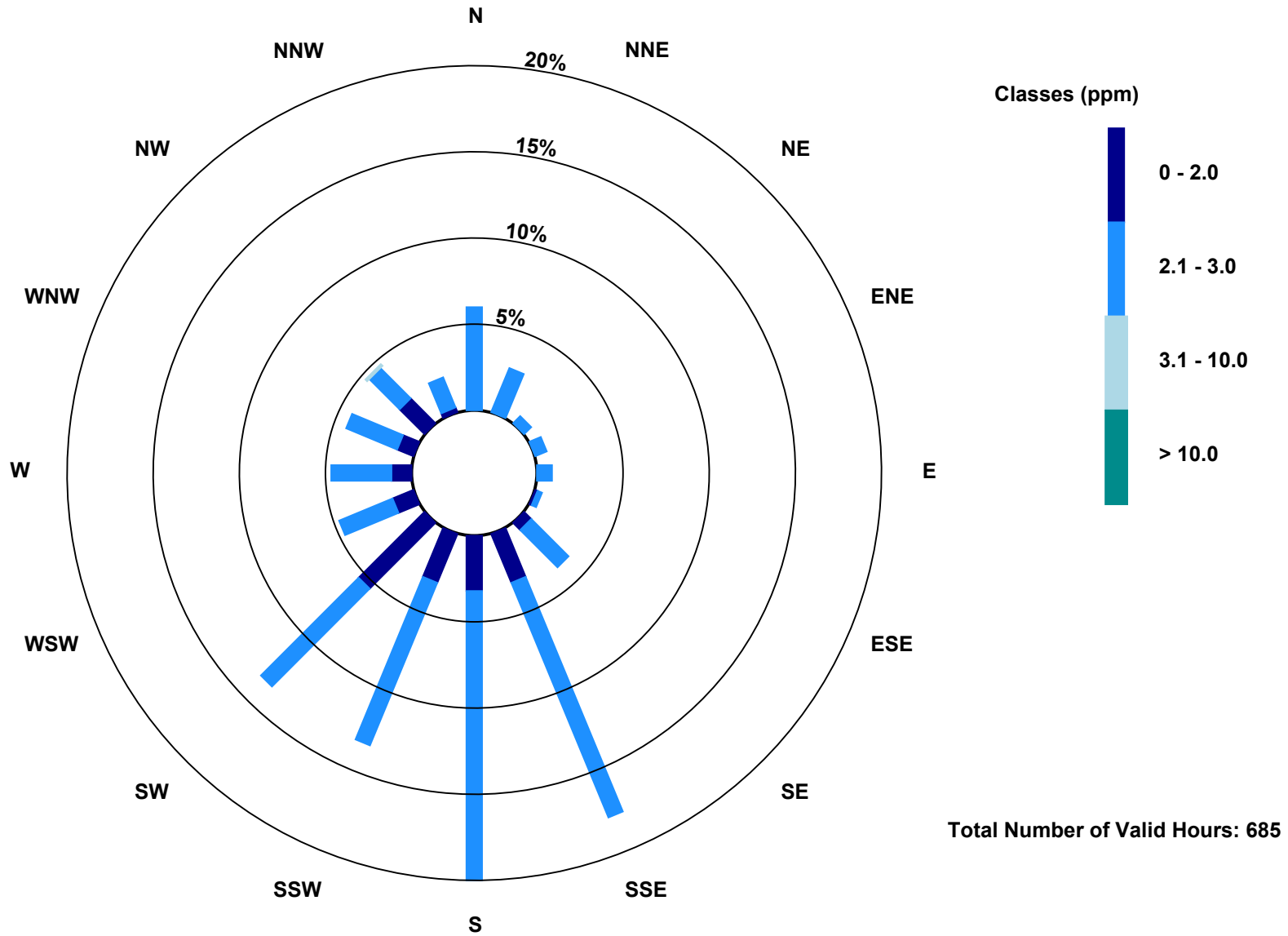
Total Number of Valid Hours: 685

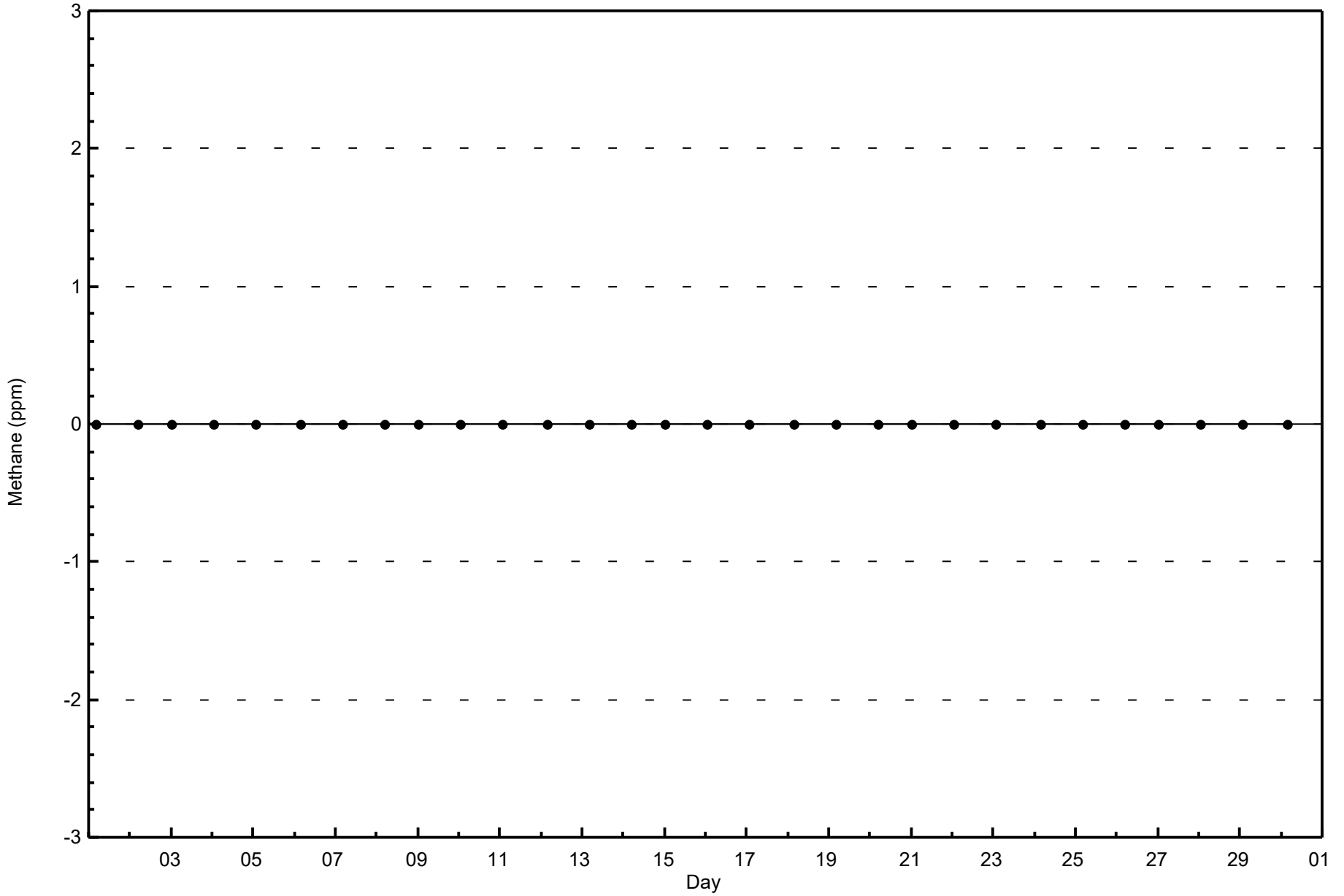
Total Number of Hours: 720

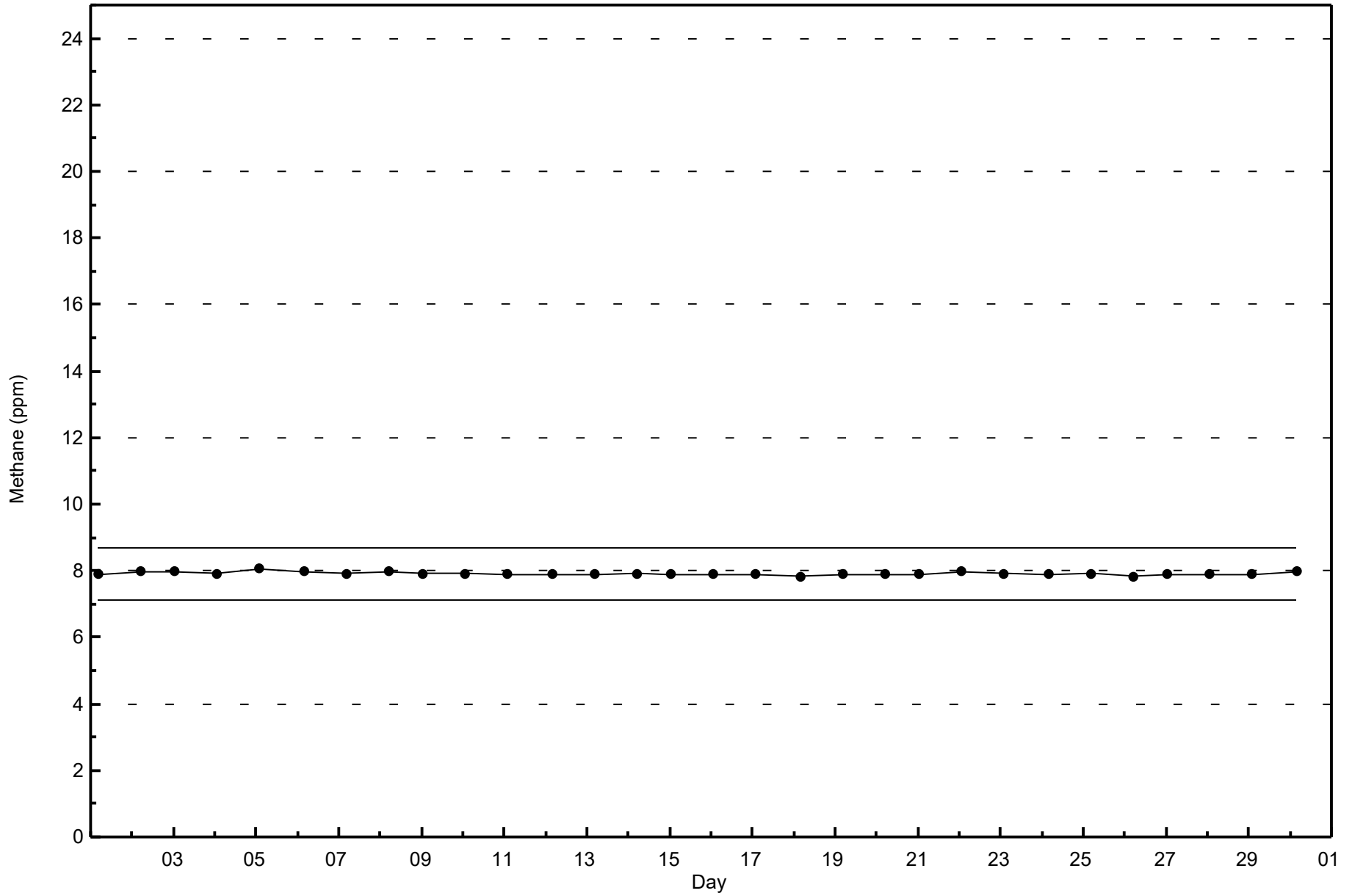


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Methane (CH₄) - ppm
Ells River







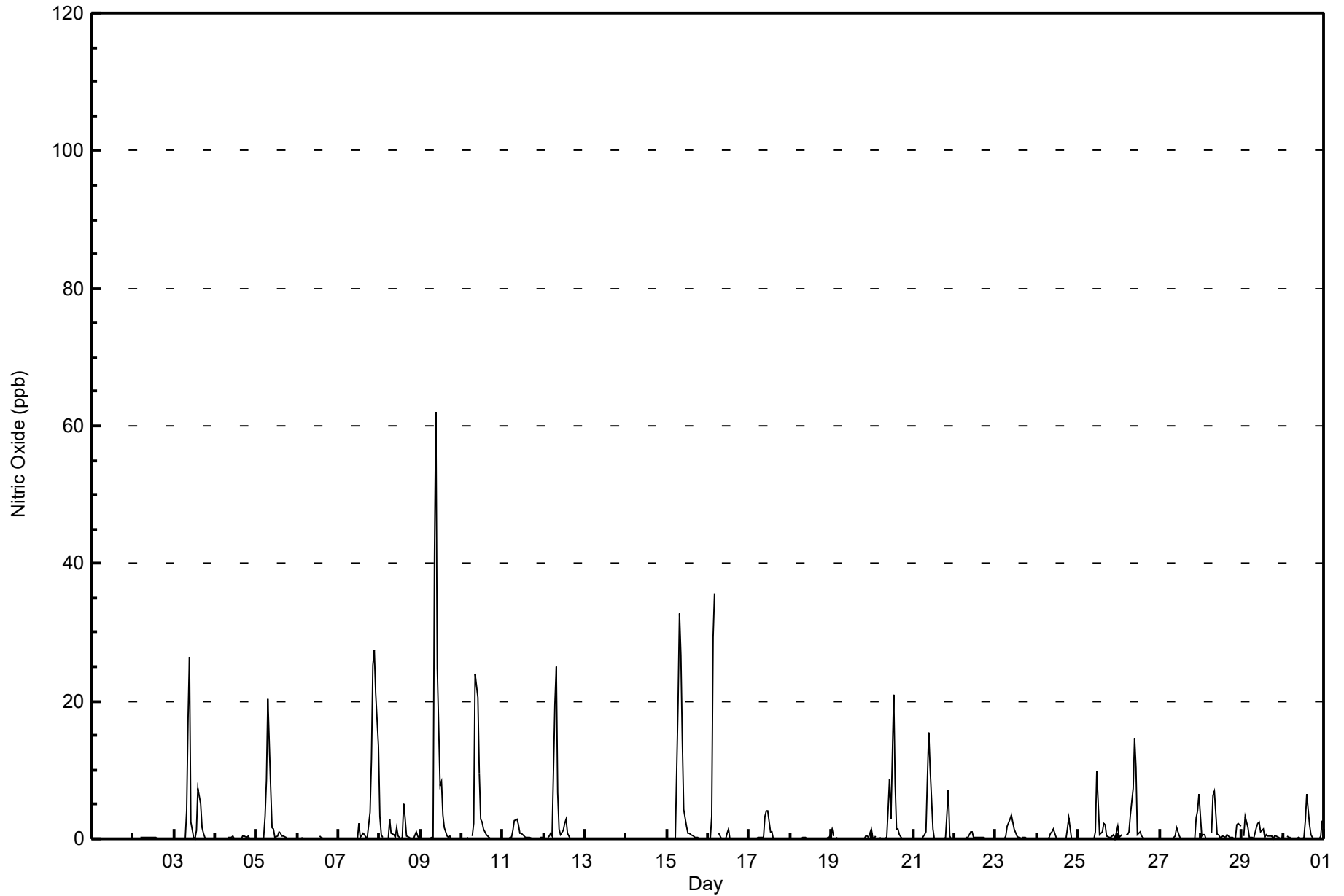


Maximum Value: 62.0 ppb on Sep 9 10:00 Maximum Daily Average: 6.5 ppb on Sep 9																				Hours in Service: 720												
Minimum Value: 0.0 ppb on Sep 4 03:00 Minimum Daily Average: 0.0 ppb on Sep 13																				Hours of Data: 685												
Maximum Diurnal Average: 6.1 ppb at hour 10 Minimum Diurnal Average: 0.1 ppb at hour 2																				Hours of Missing Data: 35												
Monthly Average: 1.46 ppb Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.5 P ₉₀ = 2.8 P ₉₉ = 26.4																				Hours of Calibration: 35												
																				Percent Operational Time: 100.0												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24								
1-Sep	0.0	0.0	Z	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	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1			
2-Sep	0.1	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1		
3-Sep	0.1	0.1	0.1	0.1	Z	0.1	0.1	4.2	17.3	26.4	2.5	0.3	0.1	1.2	7.4	5.0	1.7	0.8	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
4-Sep	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.0	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.4	0.2	0.3	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1			
5-Sep	Z	0.1	0.1	0.0	0.2	3.3	8.5	20.4	7.5	1.6	1.5	0.1	0.5	0.9	0.8	0.5	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
6-Sep	0.1	Z	0.3	0.0	0.0	0.0	0.0	0.1	C	C	C	C	C	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	0.1	0.3	
7-Sep	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	2.2	0.3	0.7	0.6	0.2	0.3	3.8	11.6	25.1	27.5	21.2	13.3	4.7	27.5	4.7	27.5			
8-Sep	3.3	0.5	0.1	Z	0.0	0.1	2.9	0.8	0.6	0.2	1.6	0.5	0.0	0.3	5.1	3.1	0.4	0.1	0.0	0.0	0.0	0.9	0.4	0.0	0.9	5.1	0.9	5.1	0.9	5.1		
9-Sep	0.0	0.0	0.0	0.0	Z	0.1	0.2	0.3	40.8	62.0	24.9	7.7	8.4	3.4	1.6	0.4	0.2	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.5	62.0	
10-Sep	0.0	0.0	0.0	0.0	0.2	Z	0.3	2.2	24.1	20.6	9.6	2.8	2.4	1.4	0.6	0.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	2.8	24.1	2.8	24.1	2.8	24.1	
11-Sep	Z	0.1	0.1	0.1	0.1	0.2	1.2	2.6	2.9	2.0	0.8	0.8	0.3	0.2	0.2	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.5	2.9	0.5	2.9	0.5	2.9	
12-Sep	0.1	Z	0.2	0.4	0.9	0.4	19.5	25.0	6.6	1.4	0.7	1.3	2.2	2.9	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	2.7	25.0	
13-Sep	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	0.0	0.0	
14-Sep	0.0	0.0	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
15-Sep	0.0	0.0	0.0	0.0	Z	0.1	19.9	32.7	26.7	14.5	4.3	1.9	0.9	0.8	0.6	0.4	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	4.5	32.7	4.5	32.7	4.5	32.7	
16-Sep	0.0	0.0	3.2	29.4	35.6	Z	0.8	0.3	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	35.6	
17-Sep	Z	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.2	3.3	4.1	4.0	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	0.6	4.1	0.6	4.1
18-Sep	0.0	Z	0.1	0.0	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	0.0	0.1	0.2	0.1	0.2	0.1	0.2	0.1	0.2	
19-Sep	1.4	0.5	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.3	1.3	0.2	1.4	0.2	1.4	0.2	1.4	
20-Sep	0.2	0.0	0.4	Z	0.1	0.0	0.0	0.0	0.2	4.3	8.7	2.8	21.0	8.0	1.4	1.4	0.6	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	2.1	21.0	2.1	21.0	2.1	21.0	
21-Sep	0.0	0.0	0.0	0.0	Z	0.1	0.6	0.9	8.6	15.6	10.2	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	7.1	0.4	0.0	0.1	2.0	15.6	2.0	15.6	2.0	15.6	
22-Sep	0.1	0.1	0.1	0.0	0.0	Z	0.1	0.1	0.2	1.0	1.0	0.2	0.1	0.3	0.2	0.1	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.0	0.2	1.0	0.2	1.0	
23-Sep	Z	0.0	0.0	0.0	0.0	0.0	0.4	1.9	2.8	3.4	2.5	1.4	0.4	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6	3.4	0.6	3.4	0.6	3.4	
24-Sep	0.1	Z	0.1	0.1	0.1	0.0	0.0	0.1	0.7	1.0	1.5	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	3.1	0.0	0.0	0.0	0.4	3.1	0.4	3.1	0.4	3.1	
25-Sep	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.0	9.7	5.3	0.7	1.1	2.2	2.0	0.4	0.2	0.1	0.5	0.6	0.1	1.7	1.1	9.7	1.1	9.7	1.1	9.7	1.1	9.7
26-Sep	0.1	0.4	0.6	Z	0.5	0.7	1.0	3.4	7.3	14.7	10.4	0.6	1.0	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	14.7	1.8	14.7	1.8	14.7	
27-Sep	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.4	1.5	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	0.7	6.5	0.7	6.5	0.7	6.5	
28-Sep	0.5	0.6	0.5	0.1	0.1	Z	0.7	6.4	6.9	0.6	0.6	0.2	0.2	0.4	0.2	0.6	0.5	0.2	0.2	0.1	0.1	2.0	2.3	1.8	1.1	6.9	1.1	6.9	1.1	6.9	1.1	6.9
29-Sep	Z	0.5	3.2	1.6	0.2	0.2	0.2	0.1	1.7	2.3	2.5	0.9	1.5	0.2	0.6	0.5	0.3	0.4	0.0	0.4	0.3	0.2	0.0	0.1	0.8	3.2	0.8	3.2	0.8	3.2	0.8	3.2
30-Sep	0.7	Z	0.3	0.1	0.2	0.1	0.0	0.0	0.1	0.3	0.0	0.1	0.2	2.6	6.4	2.0	0.5	0.2	0.1	0.0	0.0	0.1	0.3	2.7	0.7	6.4	0.7	6.4	0.7	6.4	0.7	6.4
																								Diurnal Average								
																								Diurnal Maximum								
																								Z - zerospan C - Calibration								



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Ells River - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb
Ells River - September 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	670	97.81	97.81
21 - 40	13	1.90	99.71
41 - 80	2	0.29	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Ells River - September 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	38	18	4	5	6	2	23	115	131	91	97	32	30	29	31	16	668
21 - 40	0	1	0	0	0	0	1	3	3	1	1	0	1	1	1	0	13
41 - 80	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	38	19	4	5	6	2	24	120	134	92	98	32	31	30	32	16	683

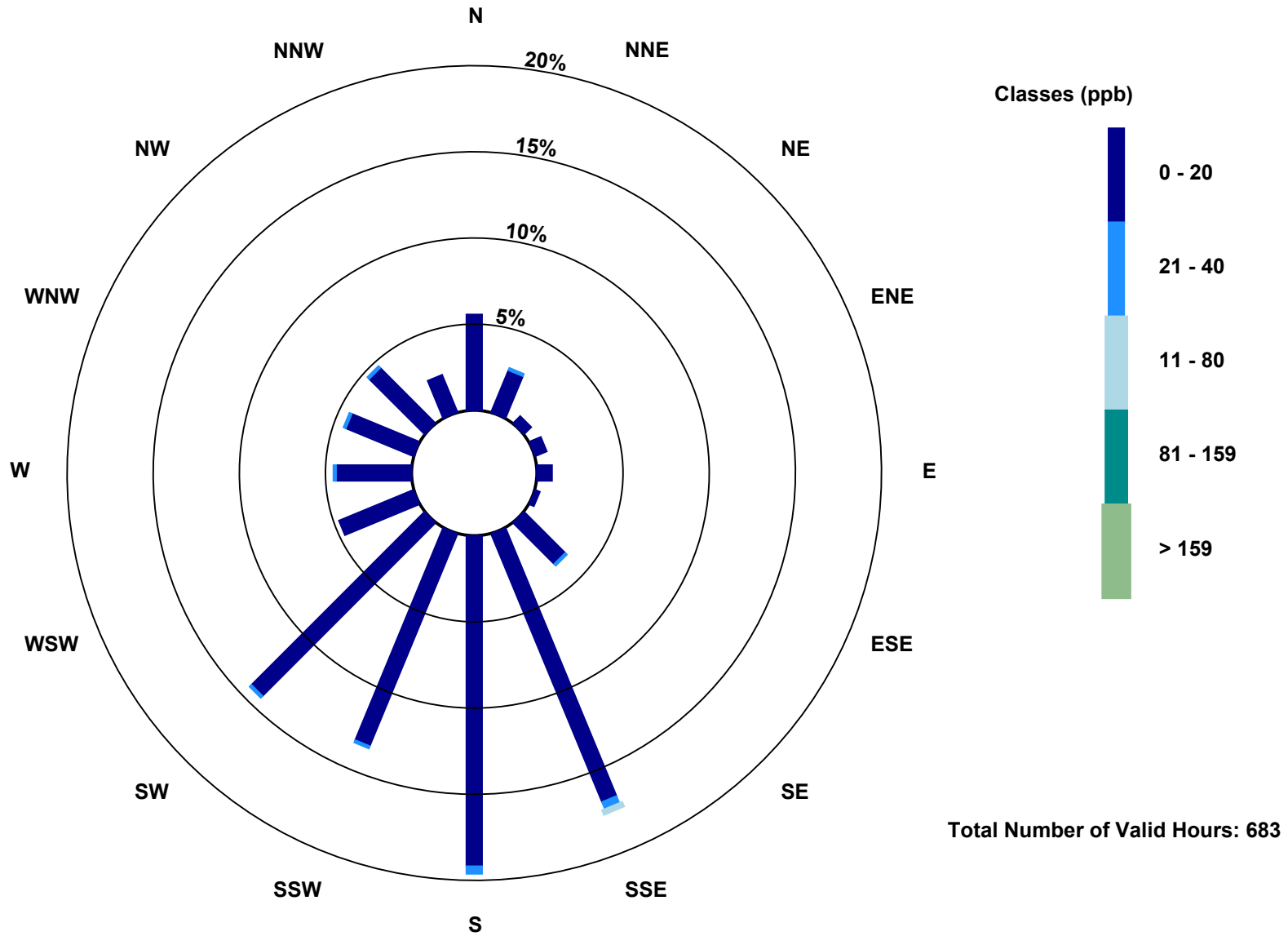
Total Number of Valid Hours: 683

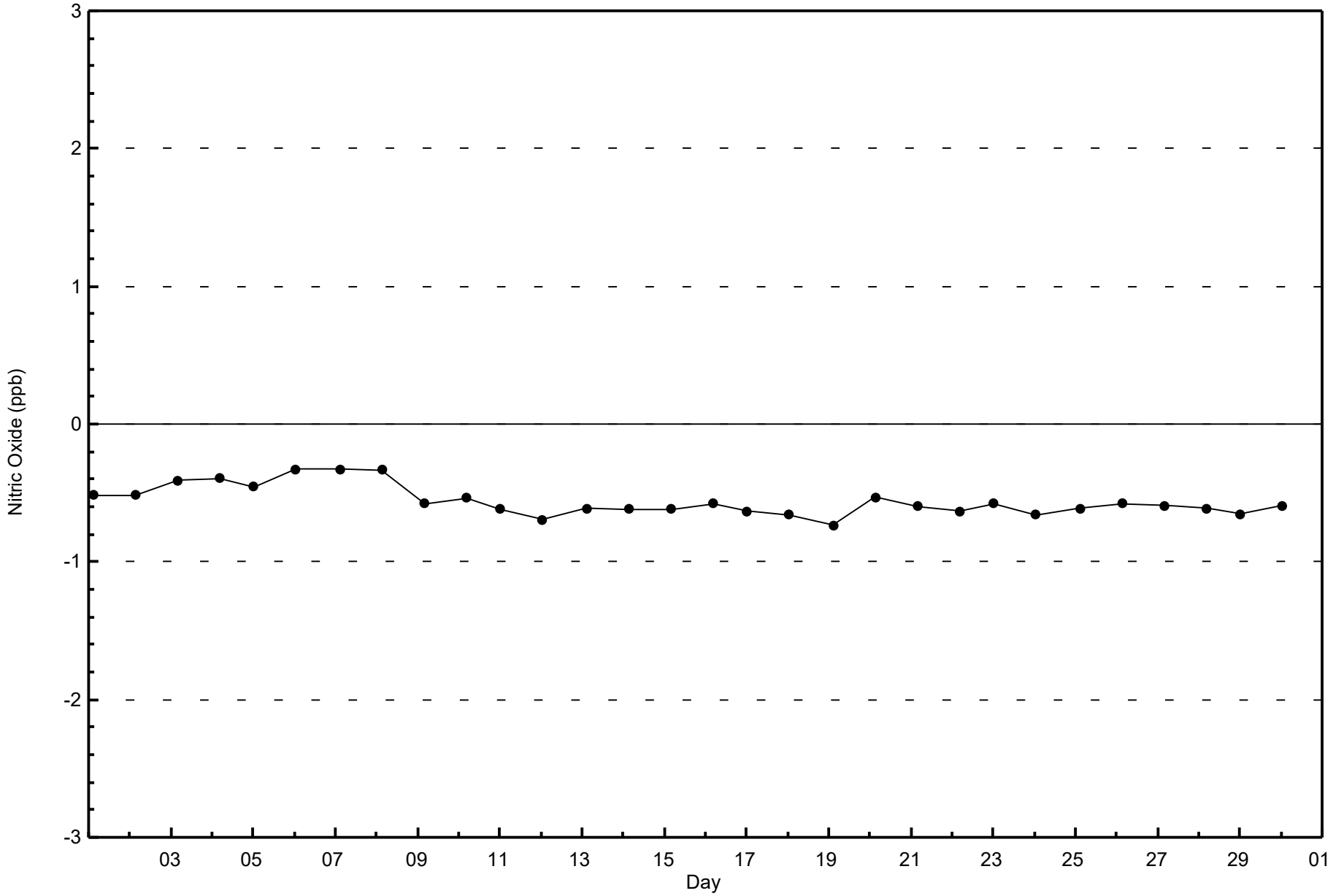
Total Number of Hours: 720

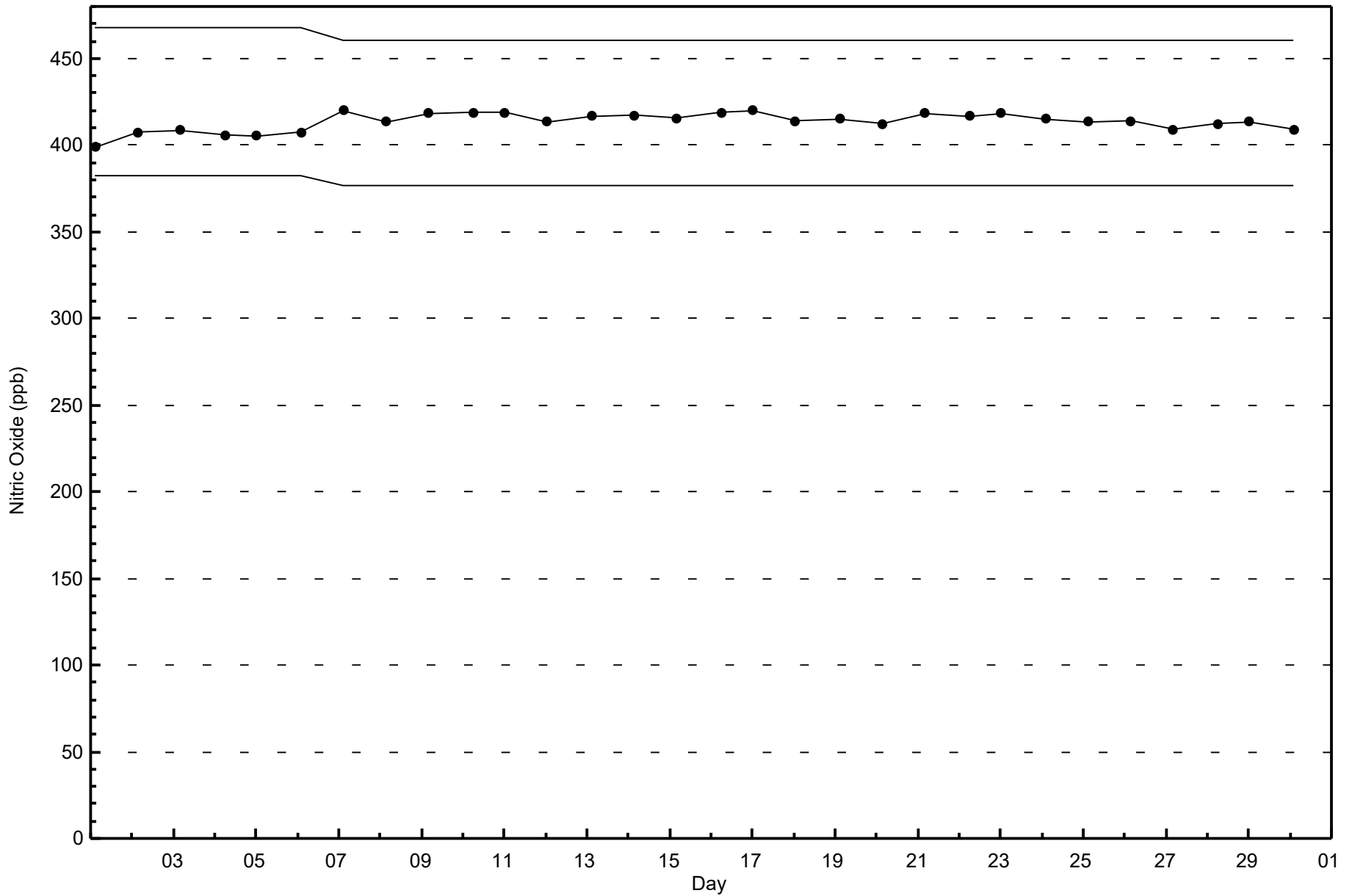


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitric Oxide (NO) - ppb
Ells River









Wood Buffalo Environmental Association
Summary of Hour Averages

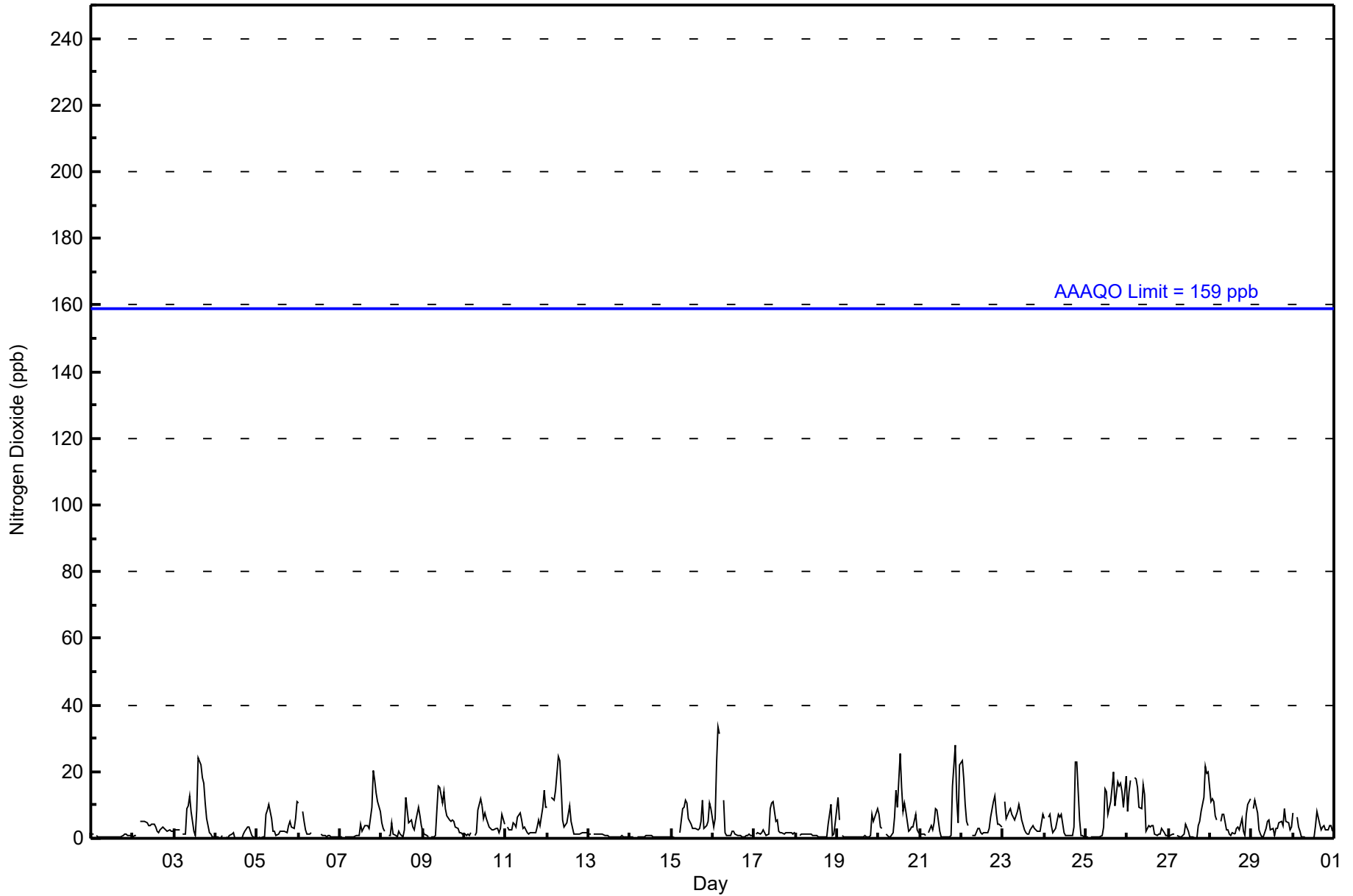
Nitrogen Dioxide (NO₂) - ppb
Ells River - September 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 720																																										
Maximum Value: 33.5 ppb on Sep 16 04:00		Maximum Daily Average: 8.3 ppb on Sep 25		Hours of Data: 685																																												
Minimum Value: 0.0 ppb on Sep 4 04:00		Minimum Daily Average: 0.5 ppb on Sep 14		Hours of Missing Data: 35																																												
Maximum Diurnal Average: 5.4 ppb at hour 20		Minimum Diurnal Average: 3.0 ppb at hour 6		Hours of Calibration: 35																																												
Monthly Average: 4.19 ppb		Percentiles: P ₁ = 0.1 P ₁₀ = 0.4 Q ₁ = 0.8 Median = 2.2 Q ₃ = 5.5 P ₉₀ = 10.9 P ₉₉ = 23.2		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-Sep	1.2	1.1	Z	0.7	0.6	0.6	0.5	0.5	0.5	0.4	0.5	0.4	0.4	0.3	0.3	0.4	0.4	0.5	1.0	1.2	1.1	0.9	0.7	0.8	0.7	1.2																						
2-Sep	0.6	0.8	1.0	Z	4.9	5.0	4.9	5.0	4.8	3.8	4.0	4.1	4.3	3.4	2.3	1.6	2.7	3.2	2.8	2.5	2.2	2.4	2.3	2.3	3.1	5.0																						
3-Sep	2.5	2.6	2.4	2.4	Z	1.3	1.2	8.9	9.8	12.6	8.0	2.1	1.0	8.4	24.1	21.9	18.1	16.6	10.6	5.9	1.7	1.1	0.4	0.3	7.1	24.1																						
4-Sep	0.3	0.3	0.1	0.0	0.7	Z	0.6	0.0	1.0	1.4	1.6	0.1	0.0	0.0	0.1	0.1	1.1	2.1	3.3	3.2	2.0	0.7	0.3	0.1	0.8	3.3																						
5-Sep	Z	0.3	0.1	0.3	0.6	7.4	8.4	10.0	6.1	2.0	2.3	0.7	1.3	2.3	2.2	2.2	2.1	1.8	3.8	5.0	3.5	3.0	6.1	11.0	3.6	11.0																						
6-Sep	10.4	Z	8.1	5.1	2.4	1.3	1.4	1.6	C	C	C	C	C	1.1	0.9	0.7	0.6	0.7	0.8	0.6	0.5	0.5	0.5	0.4	2.1	10.4																						
7-Sep	0.4	0.4	Z	0.5	0.5	0.5	0.5	0.5	0.6	0.7	0.7	0.7	4.1	2.2	3.9	3.9	3.7	2.8	9.5	20.5	17.2	13.4	11.0	8.0	4.6	20.5																						
8-Sep	4.8	2.8	2.0	Z	0.8	0.8	4.7	1.3	0.9	0.6	2.0	1.2	0.6	2.5	12.4	8.6	4.7	5.5	3.6	2.6	5.0	9.4	6.6	3.7	3.8	12.4																						
9-Sep	2.2	1.4	0.9	0.6	Z	0.5	0.6	0.7	8.6	15.8	15.1	10.6	13.9	8.9	6.6	5.3	5.0	5.5	4.9	3.4	2.8	1.9	1.6	1.3	5.1	15.8																						
10-Sep	1.1	0.9	1.1	1.0	1.7	Z	1.0	1.9	8.5	11.9	9.6	6.1	7.8	5.8	3.6	2.9	2.7	2.4	3.0	3.1	1.5	2.8	7.4	4.4	4.0	11.9																						
11-Sep	Z	3.4	2.5	2.7	4.7	4.1	3.3	6.5	7.5	5.5	2.9	3.4	1.9	1.2	1.5	1.6	1.8	1.5	3.4	5.6	3.7	9.5	14.6	9.3	4.4	14.6																						
12-Sep	9.4	Z	12.2	11.9	11.5	14.4	24.6	23.5	15.3	5.6	3.2	4.6	7.2	9.9	5.2	1.4	1.3	1.4	1.4	1.4	1.5	1.5	1.5	1.5	7.5	24.6																						
13-Sep	1.4	1.3	Z	1.2	1.1	1.1	1.1	1.2	1.1	0.9	0.8	0.7	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.7	0.6	0.6	0.5	0.5	0.8	1.4																						
14-Sep	0.5	0.5	0.5	Z	0.6	0.6	0.5	0.5	0.6	0.7	0.9	1.0	0.8	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.5	1.0																						
15-Sep	0.3	0.3	0.2	0.2	Z	1.6	9.1	9.2	11.5	10.5	6.1	4.1	2.8	3.1	2.8	2.4	3.0	4.9	11.5	2.9	3.7	5.0	10.6	8.9	5.0	11.5																						
16-Sep	3.2	5.9	22.4	33.5	31.3	Z	11.6	1.6	0.9	0.9	0.9	2.3	2.3	1.4	1.0	1.0	0.8	0.6	0.6	0.8	1.0	1.3	0.9	1.0	5.5	33.5																						
17-Sep	Z	1.2	1.8	1.1	1.5	2.5	1.8	0.8	1.3	8.9	10.5	10.9	5.1	5.7	2.0	1.8	1.5	1.4	1.7	1.8	1.6	1.5	1.4	1.5	3.0	10.9																						
18-Sep	1.4	Z	0.9	1.1	1.1	1.2	1.3	1.4	1.2	1.1	1.0	0.8	0.7	0.6	0.6	0.5	0.5	0.5	0.5	4.2	10.3	1.0	1.4	4.5	1.6	10.3																						
19-Sep	12.2	5.3	Z	1.0	0.5	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.5	0.5	0.7	7.1	5.0	6.2	9.1	2.4	12.2																						
20-Sep	7.1	3.5	2.9	Z	1.3	0.8	0.6	0.6	1.5	6.3	14.3	9.4	25.5	15.1	8.0	10.7	7.9	2.0	2.4	3.2	3.3	7.4	2.7	1.9	6.0	25.5																						
21-Sep	1.4	1.4	1.2	0.8	Z	1.7	3.9	2.5	4.6	8.9	8.6	2.3	0.4	0.4	0.4	0.4	0.4	0.4	0.8	15.6	28.1	11.7	4.8	22.2	5.3	28.1																						
22-Sep	23.2	18.0	10.0	5.0	3.7	Z	0.9	0.9	1.0	2.8	2.8	1.5	1.3	1.9	1.8	1.7	2.9	6.3	10.9	12.6	7.5	4.4	4.3	3.4	5.6	23.2																						
23-Sep	Z	10.9	5.8	8.2	8.7	7.4	6.5	5.3	8.2	10.2	8.0	5.7	2.5	1.5	1.4	1.1	2.5	4.0	2.8	2.6	2.2	2.0	4.6	7.4	5.2	10.9																						
24-Sep	6.1	Z	6.4	7.3	3.8	1.9	3.1	4.9	7.2	6.2	7.0	1.7	0.9	0.8	0.7	0.7	0.7	3.3	22.9	22.7	5.6	1.0	0.8	0.5	5.1	22.9																						
25-Sep	0.5	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.5	0.7	3.5	14.7	13.9	7.4	11.1	15.2	19.8	9.9	17.1	15.8	16.5	14.1	9.3	18.5	8.3	19.8																						
26-Sep	7.9	14.0	17.2	Z	18.2	17.7	15.3	9.4	8.9	16.3	13.3	2.3	4.0	3.5	3.9	3.8	1.3	1.0	1.3	1.4	3.1	1.7	0.8	0.8	7.3	18.2																						
27-Sep	0.8	0.9	1.1	1.1	Z	0.7	0.5	0.5	0.7	1.2	4.3	2.3	0.4	0.3	0.4	0.2	0.2	3.7	4.9	8.1	12.3	21.6	19.6	20.0	4.6	21.6																						
28-Sep	11.2	11.9	11.1	6.9	5.3	Z	4.9	7.2	7.3	2.6	2.6	1.3	1.0	1.7	1.2	3.1	3.3	2.7	6.1	2.0	0.9	7.0	10.1	11.9	5.4	11.9																						
29-Sep	Z	9.0	11.6	7.6	2.5	1.4	0.4	0.3	3.1	5.0	5.4	2.6	2.9	1.0	2.9	2.9	4.5	5.1	3.9	9.0	5.2	4.8	2.7	3.5	4.2	11.6																						
30-Sep	7.5	Z	6.2	3.3	2.0	0.5	0.3	0.2	0.1	0.1	0.2	0.2	0.5	3.7	8.0	4.2	2.6	3.4	3.7	2.7	2.7	3.7	3.9	2.1	2.7	8.0																						
																								4.7	3.9	5.2	4.2	4.4	3.0	3.8	3.6	4.3	5.0	4.9	3.4	3.7	3.2	3.7	3.4	3.3	3.2	4.7	5.4	5.2	4.7	4.6	5.4	Diurnal Average
																								23.2	18.0	22.4	33.5	31.3	17.7	24.6	23.5	15.3	16.3	15.1	14.7	25.5	15.1	24.1	21.9	19.8	16.6	22.9	22.7	28.1	21.6	19.6	22.2	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 - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Ells River - September 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	670	97.81	97.81
21 - 40	15	2.19	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: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Ells River - September 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	37	18	4	4	6	2	24	117	128	91	98	32	31	30	31	15	668
21 - 40	1	1	0	1	0	0	0	3	6	1	0	0	0	0	1	1	15
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	38	19	4	5	6	2	24	120	134	92	98	32	31	30	32	16	683

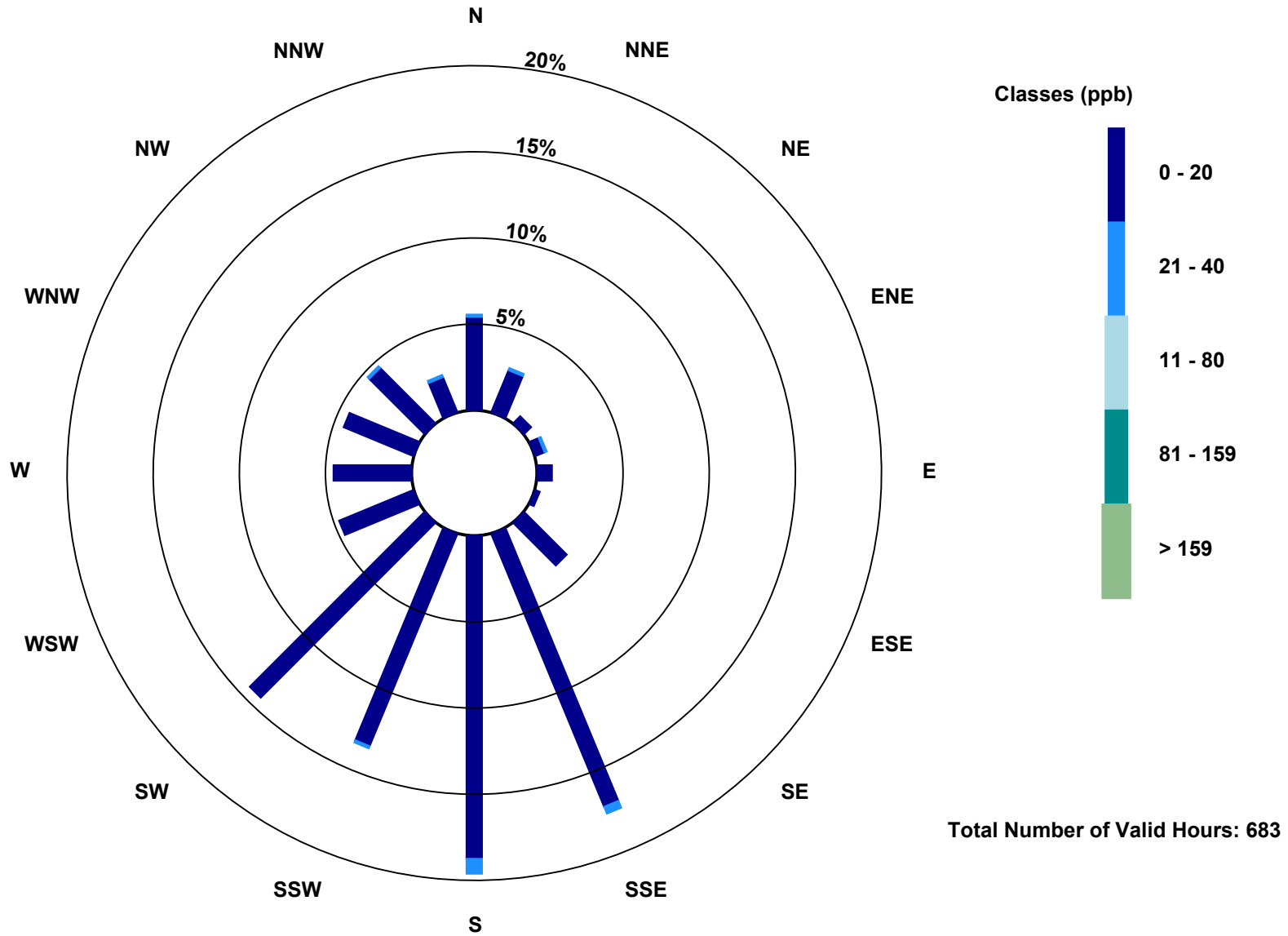
Total Number of Valid Hours: 683

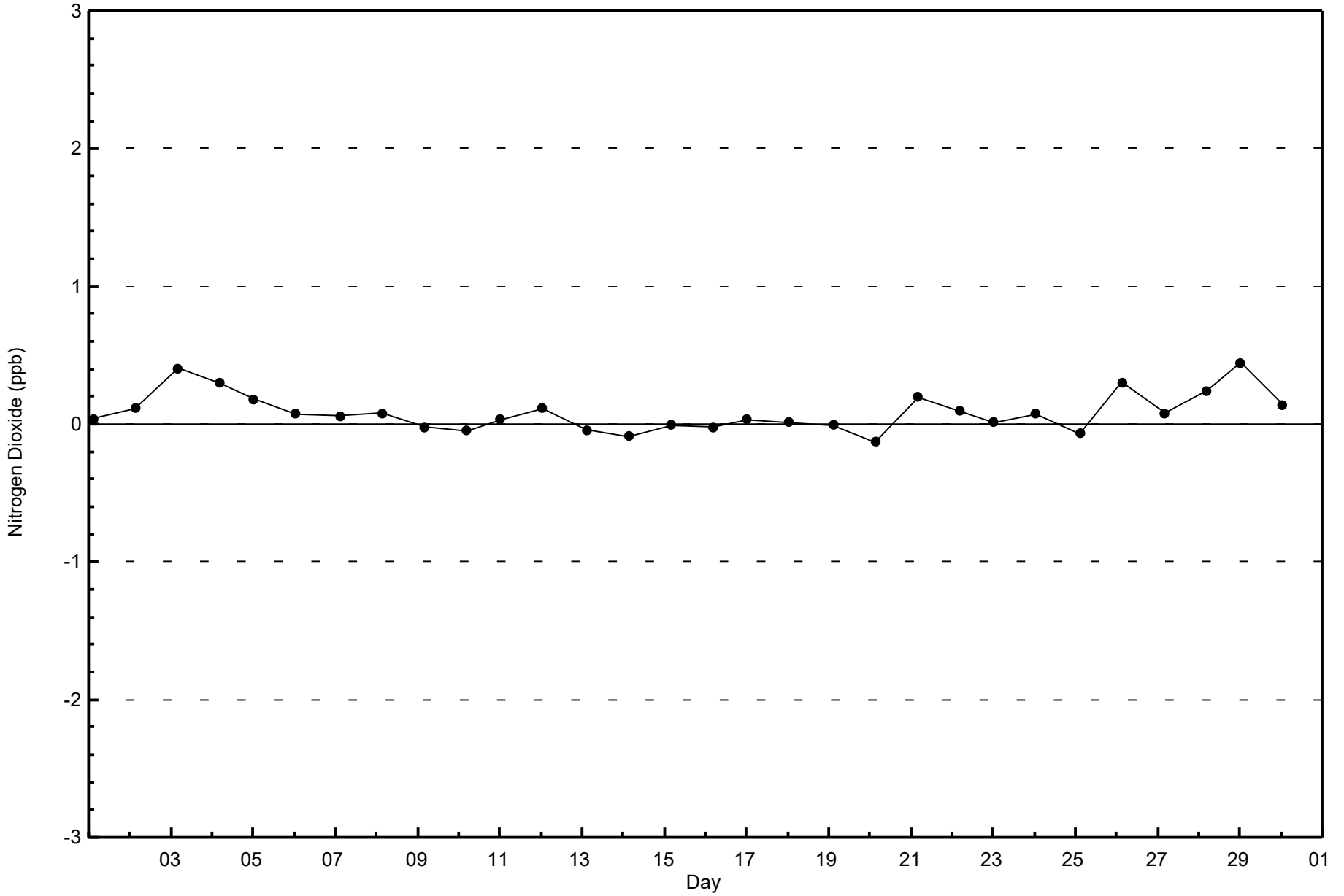
Total Number of Hours: 720

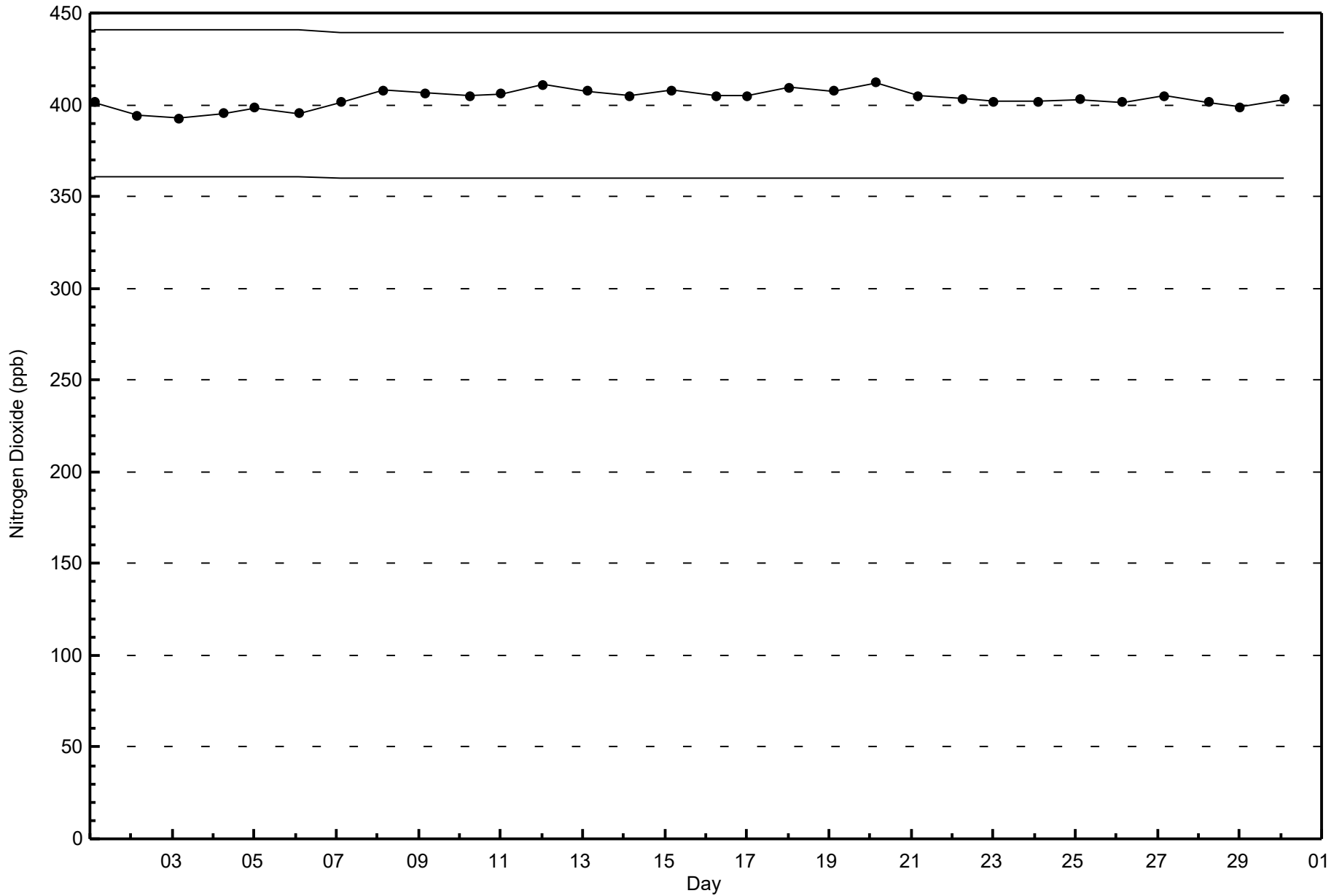


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitrogen Dioxide (NO₂) - ppb
Ells River









Wood Buffalo Environmental Association
Summary of Hour Averages

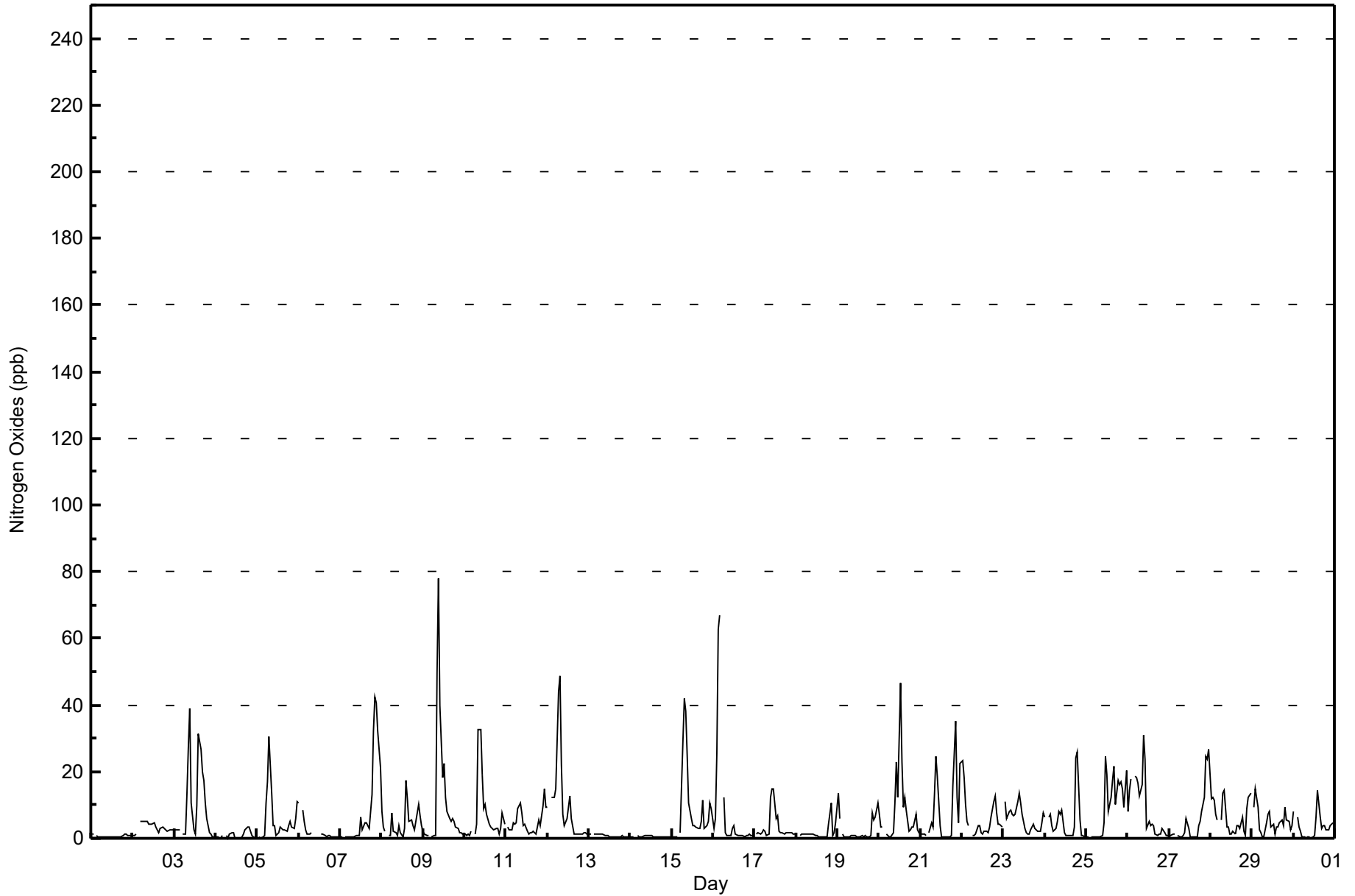
Nitrogen Oxides (NO_x) - ppb
Ells River - September 2023

Maximum Value: 77.8 ppb on Sep 9 10:00		Maximum Daily Average: 11.7 ppb on Sep 9		Hours in Service: 720																							
Minimum Value: 0.0 ppb on Sep 4 04:00		Minimum Daily Average: 0.5 ppb on Sep 14		Hours of Data: 685																							
Maximum Diurnal Average: 11.1 ppb at hour 10		Minimum Diurnal Average: 3.3 ppb at hour 6		Hours of Missing Data: 35																							
Monthly Average: 5.65 ppb		Percentiles: P ₁ = 0.2 P ₁₀ = 0.5 Q ₁ = 0.8 Median = 2.4 Q ₃ = 6.3 P ₉₀ = 14.4 P ₉₉ = 42.6		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-Sep	1.2	1.1	Z	0.7	0.6	0.6	0.5	0.5	0.5	0.5	0.6	0.5	0.4	0.3	0.3	0.4	0.4	0.5	1.0	1.2	1.1	0.9	0.8	0.8	0.7	1.2	
2-Sep	0.7	0.9	1.1	Z	5.1	5.2	5.1	5.2	5.0	4.0	4.2	4.3	4.5	3.5	2.4	1.7	2.8	3.3	2.9	2.5	2.3	2.5	2.4	2.4	3.2	5.2	
3-Sep	2.6	2.7	2.5	2.5	Z	1.4	1.3	13.1	27.1	39.0	10.5	2.4	1.1	9.6	31.5	26.9	19.8	17.4	10.8	5.9	1.7	1.1	0.4	0.3	10.1	39.0	
4-Sep	0.3	0.3	0.1	0.0	0.7	Z	0.7	0.0	1.3	1.7	1.9	0.1	0.0	0.0	0.1	0.2	1.4	2.5	3.5	2.0	0.8	0.4	0.2	0.9	3.5		
5-Sep	Z	0.4	0.2	0.3	0.8	10.7	16.9	30.4	13.6	3.6	3.8	0.8	1.8	3.2	3.0	2.7	2.5	2.0	3.8	5.0	3.5	3.0	6.1	11.0	5.6	30.4	
6-Sep	10.5	Z	8.4	5.1	2.4	1.3	1.4	1.7	C	C	C	C	C	1.4	1.1	0.8	0.6	0.7	0.8	0.6	0.5	0.5	0.5	0.4	2.2	10.5	
7-Sep	0.4	0.4	Z	0.5	0.5	0.5	0.5	0.5	0.6	0.7	0.7	0.7	6.3	2.5	4.6	4.5	3.9	3.1	13.3	32.1	42.3	40.9	32.2	21.3	9.3	42.3	
8-Sep	8.1	3.3	2.1	Z	0.8	0.9	7.6	2.1	1.5	0.8	3.6	1.7	0.6	2.8	17.5	11.7	5.1	5.6	3.6	2.6	5.0	10.3	7.0	3.7	4.7	17.5	
9-Sep	2.2	1.4	0.9	0.6	Z	0.6	0.8	1.0	49.4	77.8	40.0	18.3	22.3	12.3	8.2	5.7	5.2	5.9	5.0	3.4	2.8	1.9	1.6	1.3	11.7	77.8	
10-Sep	1.1	0.9	1.1	1.0	1.9	Z	1.3	4.1	32.6	32.5	19.2	8.9	10.2	7.2	4.2	3.3	2.9	2.5	3.0	3.1	1.5	2.8	7.5	4.4	6.8	32.6	
11-Sep	Z	3.5	2.6	2.8	4.8	4.3	4.5	9.1	10.4	7.5	3.7	4.2	2.2	1.4	1.7	1.7	2.0	1.5	3.4	5.6	3.7	9.6	14.7	9.4	5.0	14.7	
12-Sep	9.5	Z	12.4	12.3	12.4	14.8	44.1	48.5	21.9	7.0	3.9	5.9	9.4	12.8	6.1	1.4	1.3	1.4	1.4	1.4	1.5	1.5	1.5	1.5	10.2	48.5	
13-Sep	1.4	1.3	Z	1.2	1.1	1.1	1.1	1.2	1.1	0.9	0.8	0.7	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.7	0.6	0.6	0.5	0.5	0.8	1.4	
14-Sep	0.5	0.5	0.5	Z	0.7	0.6	0.5	0.5	0.6	0.8	1.0	1.0	0.9	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.5	1.0	
15-Sep	0.3	0.3	0.2	0.2	Z	1.7	29.0	41.9	38.2	25.0	10.4	6.0	3.7	3.9	3.4	2.8	3.2	5.0	11.6	2.9	3.7	5.0	10.6	8.9	9.5	41.9	
16-Sep	3.2	5.9	25.6	62.9	66.9	Z	12.4	1.9	0.9	0.9	1.0	3.1	3.7	1.4	1.0	1.0	0.8	0.6	0.6	0.8	1.0	1.3	0.9	1.0	8.6	66.9	
17-Sep	Z	1.2	1.8	1.1	1.6	2.7	1.9	0.9	1.5	12.2	14.6	14.9	6.0	6.8	2.0	1.8	1.5	1.4	1.7	1.8	1.6	1.5	1.4	1.5	3.6	14.9	
18-Sep	1.4	Z	1.0	1.1	1.2	1.3	1.4	1.5	1.3	1.2	1.1	0.9	0.7	0.6	0.6	0.5	0.5	0.6	0.6	4.3	10.4	1.0	1.5	4.7	1.7	10.4	
19-Sep	13.6	5.8	Z	1.1	0.6	0.5	0.6	0.6	0.6	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.7	0.5	0.5	0.7	7.5	5.4	6.5	10.4	2.6	13.6	
20-Sep	7.3	3.5	3.3	Z	1.4	0.8	0.6	0.6	1.7	10.6	23.0	12.2	46.5	23.1	9.4	12.1	8.5	2.0	2.5	3.2	3.3	7.4	2.7	1.9	8.1	46.5	
21-Sep	1.4	1.4	1.2	0.8	Z	1.8	4.5	3.4	13.2	24.5	18.8	3.8	0.4	0.4	0.4	0.4	0.4	0.4	0.8	15.8	35.2	12.1	4.8	22.3	7.3	35.2	
22-Sep	23.3	18.1	10.1	5.0	3.7	Z	1.0	1.0	1.2	3.8	3.8	1.7	1.4	2.2	2.0	1.8	3.2	6.5	10.9	12.6	7.5	4.4	4.3	3.4	5.8	23.3	
23-Sep	Z	10.9	5.8	8.2	8.7	7.4	6.9	7.2	11.0	13.6	10.5	7.1	2.9	1.6	1.5	1.1	2.6	4.1	2.8	2.6	2.2	2.0	4.6	7.5	5.8	13.6	
24-Sep	6.2	Z	6.5	7.4	3.9	1.9	3.1	5.0	7.9	7.2	8.5	1.9	1.0	0.8	0.7	0.7	0.7	3.3	24.4	25.8	5.6	1.0	0.8	0.5	5.4	25.8	
25-Sep	0.5	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.5	0.8	4.5	24.4	19.2	8.1	12.2	17.4	21.8	10.3	17.3	15.9	17.0	14.7	9.4	20.2	9.4	24.4	
26-Sep	8.0	14.4	17.8	Z	18.7	18.4	16.3	12.8	16.2	31.0	23.7	2.9	5.0	3.8	4.1	3.9	1.3	1.0	1.3	1.4	3.1	1.7	0.8	0.8	9.1	31.0	
27-Sep	0.8	0.9	1.1	1.1	Z	0.7	0.5	0.5	0.8	1.6	5.8	2.8	0.4	0.3	0.4	0.2	0.2	3.7	4.9	8.1	12.3	24.7	23.7	26.5	5.3	26.5	
28-Sep	11.7	12.5	11.6	7.0	5.4	Z	5.6	13.6	14.2	3.2	3.2	1.5	1.2	2.1	1.4	3.7	3.8	2.9	6.3	2.1	1.0	9.0	12.4	13.7	6.5	14.2	
29-Sep	Z	9.5	14.8	9.2	2.7	1.6	0.6	0.4	4.8	7.3	7.9	3.5	4.4	1.2	3.5	3.4	4.8	5.5	3.9	9.4	5.5	5.0	2.7	3.6	5.0	14.8	
30-Sep	8.2	Z	6.5	3.4	2.2	0.6	0.3	0.2	0.2	0.4	0.2	0.3	0.7	6.3	14.4	6.2	3.1	3.6	3.8	2.7	2.7	3.8	4.2	4.8	3.4	14.4	
		5.0	4.1	5.6	5.4	6.0	3.3	5.7	7.0	9.6	11.1	8.0	4.7	5.4	4.0	4.6	4.0	3.5	3.3	4.9	5.9	6.3	5.9	5.6	6.3	Diurnal Average	
		23.3	18.1	25.6	62.9	66.9	18.4	44.1	48.5	49.4	77.8	40.0	24.4	46.5	23.1	31.5	26.9	21.8	17.4	24.4	32.1	42.3	40.9	32.2	26.5	Diurnal Maximum	
Z - zerospan		C - Calibration																									



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Ells River - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Oxides (NO_x) - ppb
Ells River - September 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	643	93.87	93.87
21 - 40	32	4.67	98.54
41 - 80	10	1.46	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Ells River - September 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	16	3	4	6	2	23	108	122	90	97	32	30	28	29	15	641
21 - 40	2	2	1	1	0	0	1	9	9	1	1	0	1	1	2	1	32
11 - 80	0	1	0	0	0	0	0	3	3	1	0	0	0	1	1	0	10
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	38	19	4	5	6	2	24	120	134	92	98	32	31	30	32	16	683

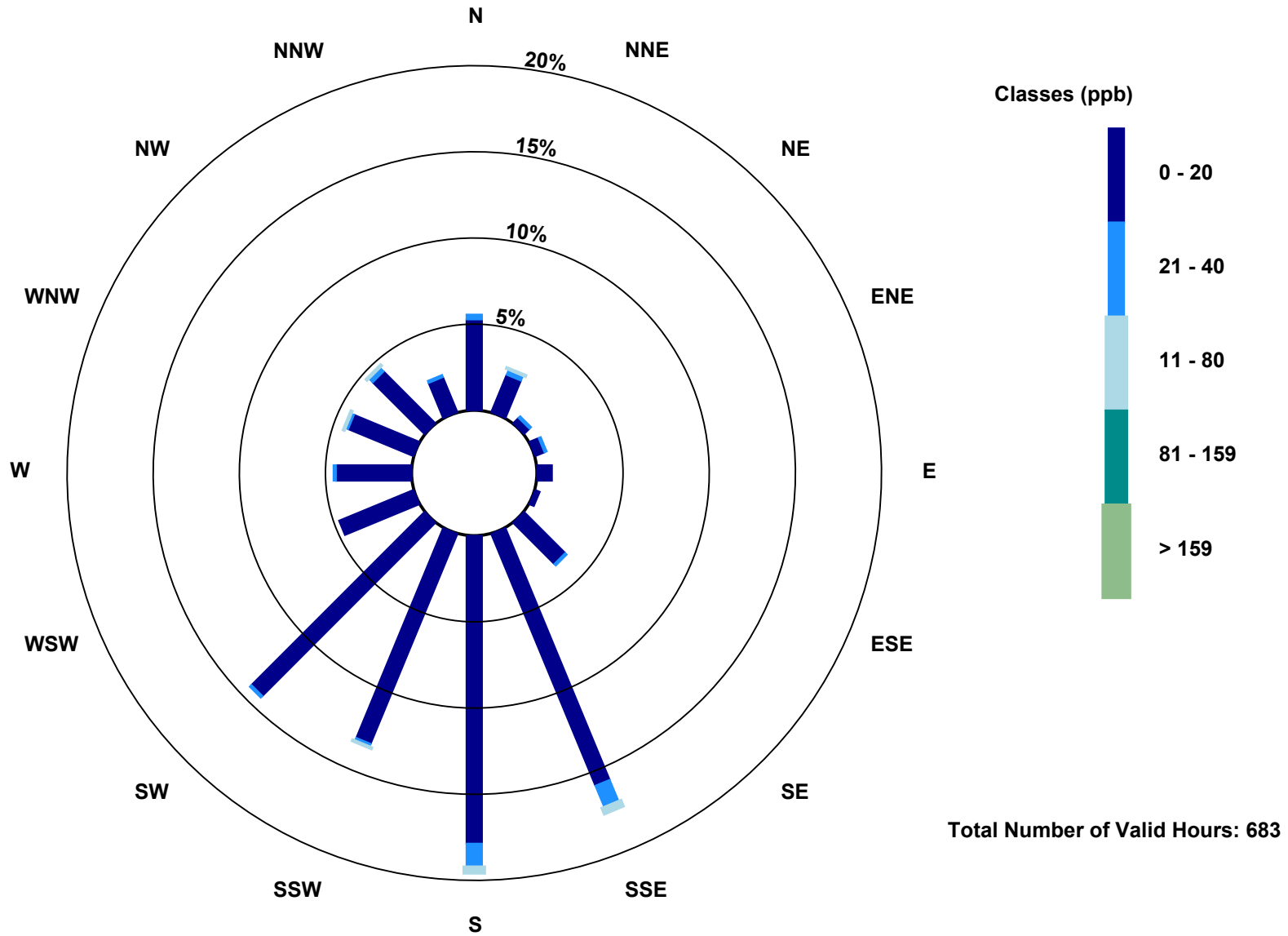
Total Number of Valid Hours: 683

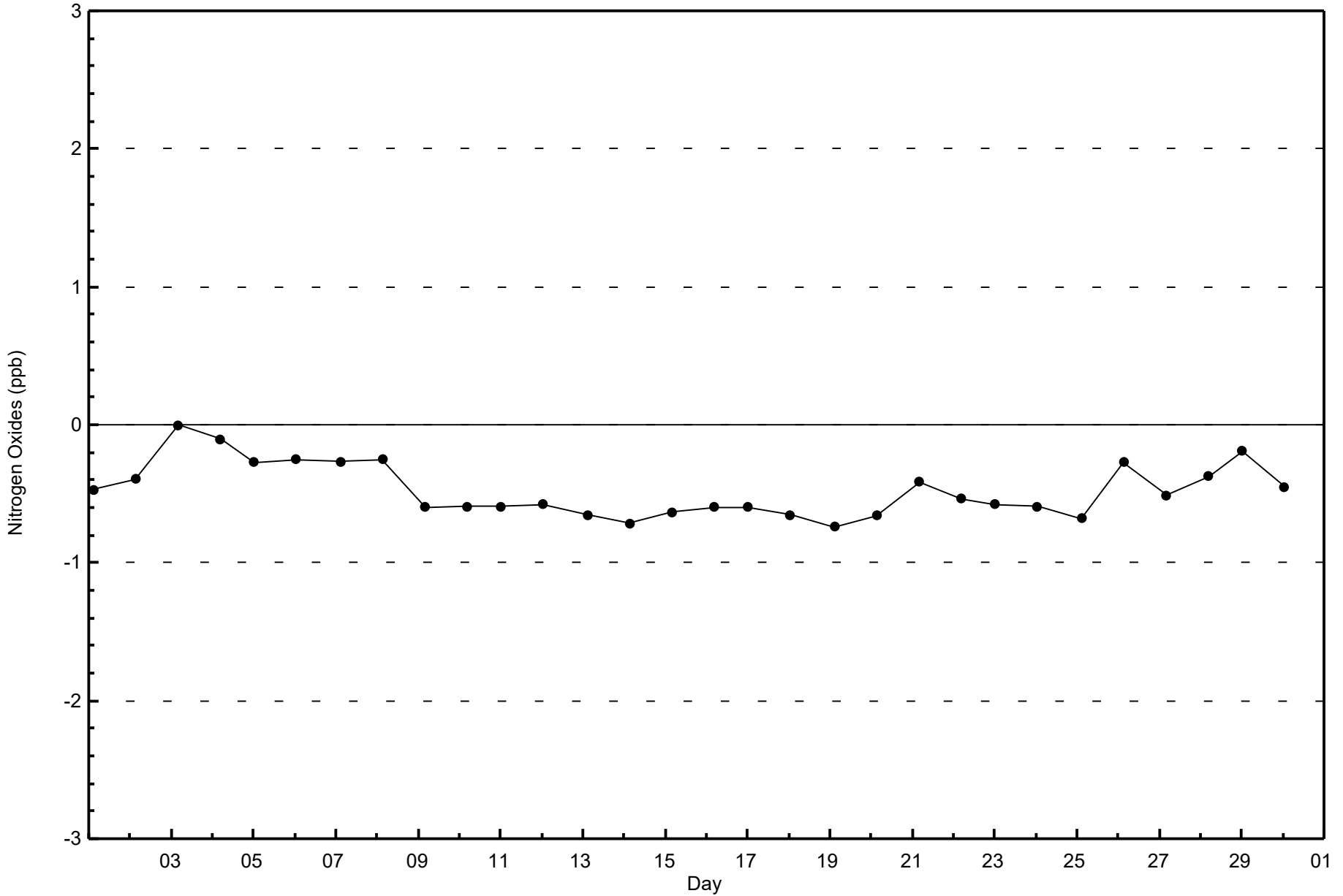
Total Number of Hours: 720

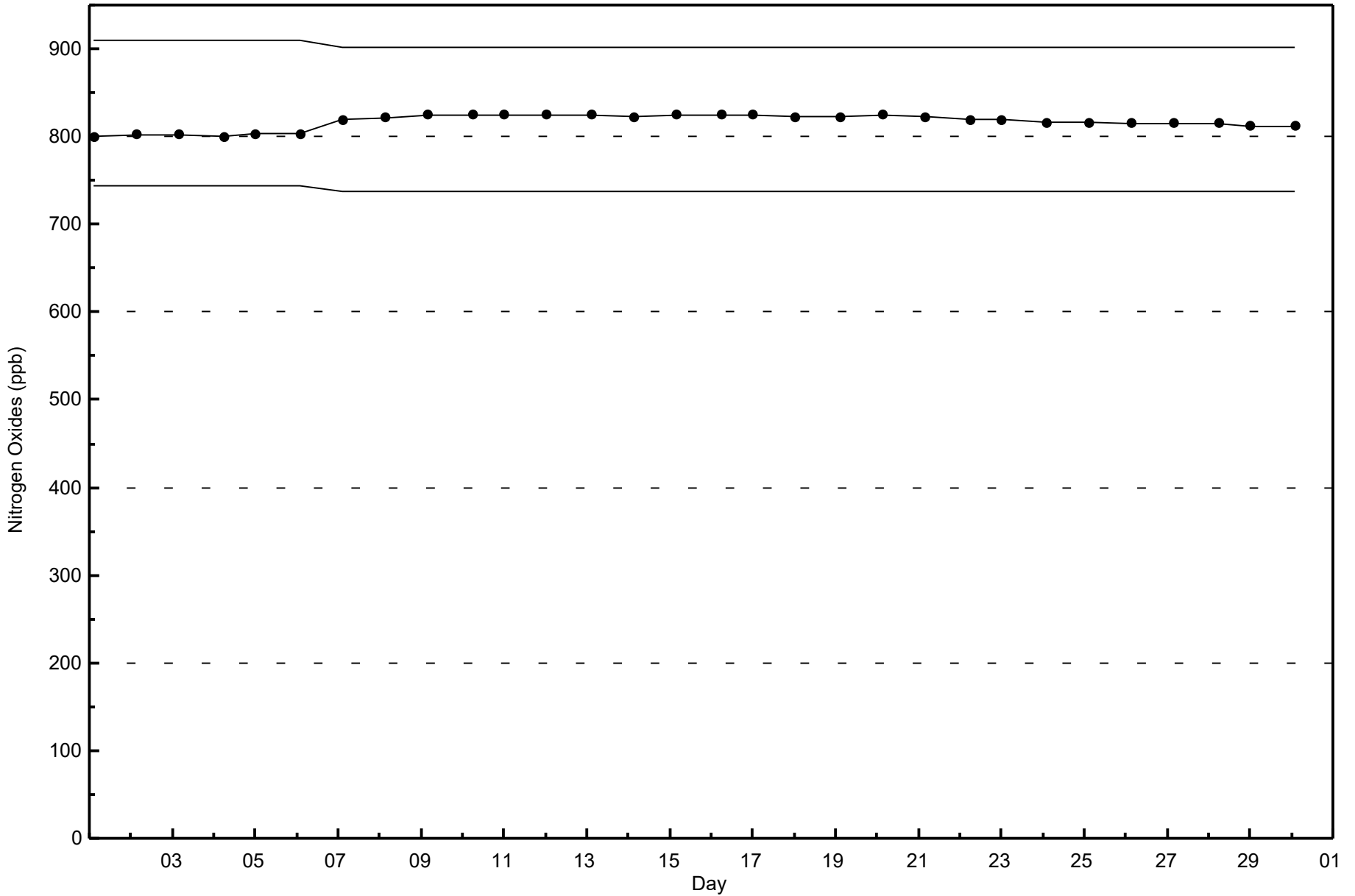


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitrogen Oxides (NO_x) - ppb
Ells River

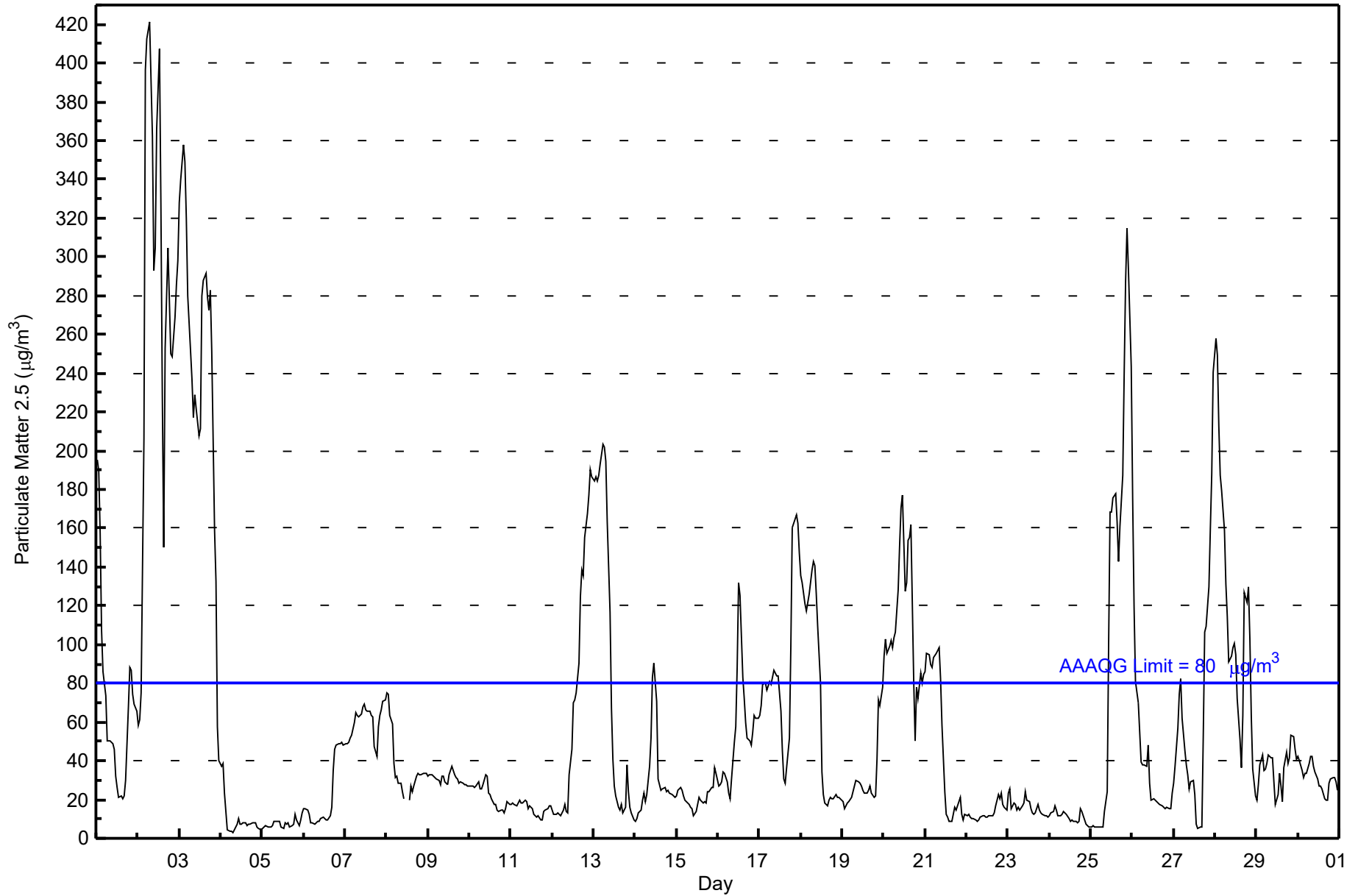








Number of Exceedences (AAAQO):		1-hr: 170		24-hr: 21		Hours in Service:		720																		
Maximum Value: 421.1 µg/m ³ on Sep 2 08:00		Maximum Daily Average: 278.1 µg/m ³ on Sep 2				Hours of Data:		718																		
Minimum Value: 3.2 µg/m ³ on Sep 4 08:00		Minimum Daily Average: 7.6 µg/m ³ on Sep 5				Hours of Missing Data:		2																		
Maximum Diurnal Average: 70.3 µg/m ³ at hour 5		Minimum Diurnal Average: 46.3 µg/m ³ at hour 16				Hours of Calibration:		2																		
Monthly Average: 62.45 µg/m ³		Percentiles: P ₁ = 5.2 P ₁₀ = 9.4 Q ₁ = 15.8 Median = 29.1 Q ₃ = 74.8 P ₉₀ = 168.5 P ₉₉ = 356.3				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-Sep	195.6	189.2	157.3	107.2	86.1	73.6	50.5	50.4	50.4	48.6	45.9	32.3	26.1	21.0	21.8	20.5	22.0	30.0	67.7	88.1	87.0	74.5	69.3	65.9	70.0	195.6
2-Sep	58.3	61.2	75.4	206.2	396.2	412.4	416.8	421.1	362.4	292.9	304.3	366.2	407.5	327.1	228.6	150.3	252.8	304.8	277.9	250.1	248.8	269.1	285.6	297.8	278.1	421.1
3-Sep	327.9	339.5	357.8	348.9	319.8	280.2	251.7	236.5	217.0	229.0	221.8	207.6	211.4	280.1	288.1	291.5	278.9	272.7	282.5	251.1	159.2	132.5	57.3	40.0	245.1	357.8
4-Sep	36.9	38.6	23.2	13.7	4.2	3.9	3.5	3.2	4.6	7.5	9.9	7.4	7.2	8.2	8.3	6.9	7.1	7.2	8.0	8.4	8.2	6.0	4.9	4.4	10.1	38.6
5-Sep	5.1	5.8	6.3	6.0	5.9	6.1	6.6	8.7	8.7	8.7	8.6	5.9	5.3	7.8	7.4	8.1	6.1	6.4	7.1	12.5	9.7	6.4	9.7	12.8	7.6	12.8
6-Sep	15.4	15.3	14.6	12.4	8.3	7.7	7.2	7.7	8.6	9.0	10.3	10.6	10.1	9.2	9.4	11.7	15.9	35.3	45.9	48.0	48.5	49.2	49.8	48.4	21.2	49.8
7-Sep	48.9	49.1	49.7	51.6	53.3	60.0	65.2	63.6	62.8	64.1	68.1	68.9	66.6	65.4	65.9	63.1	62.9	47.4	42.1	57.2	63.5	66.5	71.0	71.7	60.4	71.7
8-Sep	74.9	74.4	63.7	58.7	38.7	31.3	31.9	28.7	28.4	24.2	20.6	C	C	19.8	26.9	24.0	26.8	31.9	33.8	32.8	33.2	33.5	33.3	33.4	36.6	74.9
9-Sep	32.0	32.8	32.8	32.3	31.6	30.3	29.7	27.9	31.9	32.4	29.0	28.0	32.6	35.2	37.0	33.0	31.5	30.7	28.4	29.5	28.3	27.5	27.5	26.8	30.8	37.0
10-Sep	27.0	26.8	26.8	25.9	27.0	29.1	25.6	25.4	27.9	32.6	32.3	23.7	22.3	20.5	17.8	17.3	14.7	13.5	14.4	14.4	13.3	15.4	18.9	17.4	22.1	32.6
11-Sep	17.2	18.1	17.4	16.9	18.4	19.5	18.3	18.0	20.0	19.2	15.6	16.9	15.6	12.2	11.8	10.8	11.4	9.3	9.3	14.1	14.4	15.0	16.6	17.0	15.5	20.0
12-Sep	14.7	12.6	12.5	12.8	12.6	11.5	14.5	17.2	13.7	13.5	32.9	45.6	70.2	71.4	75.4	90.1	124.3	138.6	135.7	155.0	167.9	177.0	190.0	186.8	74.9	190.0
13-Sep	184.6	186.3	184.5	187.4	192.8	203.2	201.8	194.8	163.1	117.0	67.2	40.5	27.1	21.9	15.9	14.9	17.3	13.4	16.2	37.7	23.8	16.0	13.1	9.6	89.6	203.2
14-Sep	8.9	10.2	12.8	14.2	19.3	23.3	18.9	22.8	36.9	52.0	83.1	90.5	70.8	30.9	27.7	25.0	25.2	25.9	24.2	24.7	23.1	22.5	21.9	20.9	30.7	90.5
15-Sep	21.6	24.7	26.5	25.1	21.5	20.0	18.2	17.8	16.3	15.1	11.7	13.5	17.8	20.8	19.6	18.3	18.6	18.3	24.0	24.2	26.2	26.5	36.4	33.8	21.5	36.4
16-Sep	26.8	27.9	29.1	33.9	33.7	29.3	23.1	20.6	30.9	49.2	57.8	88.1	132.1	125.0	82.8	72.0	60.1	52.1	50.4	48.3	54.6	63.1	62.3	62.3	54.8	132.1
17-Sep	63.6	68.5	79.7	80.0	76.6	78.6	80.8	79.3	87.1	85.0	84.0	84.2	65.2	45.1	30.8	28.7	36.5	51.9	98.8	160.4	162.7	166.8	162.2	147.2	87.7	166.8
18-Sep	135.6	132.1	120.8	117.1	121.9	126.0	138.7	142.6	140.8	126.3	109.0	80.1	34.5	22.3	18.6	16.7	19.7	21.0	20.5	20.2	22.5	21.2	20.8	20.5	72.9	142.6
19-Sep	18.9	15.4	16.6	17.9	19.2	21.5	24.1	27.1	29.7	28.9	28.5	27.3	24.9	23.2	23.1	25.1	26.7	23.1	21.1	21.7	40.9	71.2	68.5	78.1	30.1	78.1
20-Sep	94.0	102.4	95.3	99.3	102.2	98.2	103.8	106.3	128.1	150.7	170.3	177.0	127.7	132.1	153.9	155.2	161.8	80.7	50.6	78.3	72.0	85.3	80.2	84.7	112.1	177.0
21-Sep	86.2	95.2	95.0	89.9	87.8	93.3	95.8	96.7	98.6	82.2	58.3	23.8	12.4	10.9	9.1	8.8	12.1	16.0	14.7	17.1	21.3	12.4	9.4	12.6	48.3	98.6
22-Sep	11.6	12.4	10.9	10.0	10.2	9.4	9.1	9.6	10.7	11.6	11.9	10.7	10.9	11.8	11.7	11.4	13.1	16.5	22.9	20.3	23.4	17.7	15.7	14.8	13.3	23.4
23-Sep	23.5	25.2	15.5	18.4	17.2	14.6	15.7	14.3	16.6	18.3	23.9	19.7	18.7	15.1	13.2	12.3	13.0	17.6	14.8	13.5	12.0	12.0	11.8	11.0	16.2	25.2
24-Sep	11.9	13.4	14.0	16.9	14.5	11.7	11.4	12.5	13.9	13.0	12.1	10.5	8.8	9.5	8.7	8.6	8.4	8.4	15.0	14.1	9.5	7.5	6.3	6.1	11.1	16.9
25-Sep	6.1	6.3	6.1	6.1	6.0	5.6	5.7	6.2	13.7	24.1	100.2	168.5	168.5	176.0	177.5	163.3	143.0	160.9	187.5	240.0	287.0	315.1	293.6	243.3	121.3	315.1
26-Sep	176.0	119.4	81.1	70.0	54.8	39.2	37.7	37.6	37.2	48.3	28.6	20.0	20.4	20.0	19.2	18.2	17.4	16.7	15.8	15.3	15.9	15.4	15.1	23.0	40.1	176.0
27-Sep	28.7	36.9	56.6	74.5	82.2	61.8	45.4	37.8	32.7	25.7	28.9	29.7	22.4	7.2	5.4	6.1	5.8	53.0	106.7	109.4	130.1	159.7	188.2	240.7	65.7	240.7
28-Sep	258.2	249.4	212.5	187.4	179.6	159.0	131.1	114.3	91.3	94.2	98.2	100.8	94.6	72.4	50.7	36.7	63.1	127.1	121.8	129.4	102.8	62.9	35.6	21.8	116.5	258.2
29-Sep	19.4	28.0	38.3	42.9	34.7	35.4	38.7	42.8	41.9	41.5	29.2	17.3	22.5	33.7	27.2	19.1	36.5	44.7	38.9	41.8	53.3	52.3	46.2	40.6	36.1	53.3
30-Sep	42.0	39.7	35.0	31.1	33.3	33.3	38.3	42.4	42.0	37.2	34.1	30.4	26.8	27.1	25.2	20.6	19.5	19.6	28.1	30.6	31.4	31.0	29.0	25.0	31.4	42.4
69.0 68.6 65.6 67.2 70.3 67.6 65.3 64.5 62.3 60.1 61.2 63.6 61.4 56.1 50.6 46.3 51.7 56.5 60.8 66.9 66.5 67.7 65.0 63.9																								Diurnal Average		
327.9 339.5 357.8 348.9 396.2 412.4 416.8 421.1 362.4 292.9 304.3 366.2 407.5 327.1 288.1 291.5 278.9 304.8 282.5 251.1 287.0 315.1 293.6 297.8																								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}) - $\mu\text{g}/\text{m}^3$
Ells River - September 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	10	1.39	1.39
6 - 15	166	23.12	24.51
16 - 25	138	19.22	43.73
26 - 80	236	32.87	76.60
> 81.0	168	23.40	100.00

Total Number of Valid Hours: 718

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Ells River - September 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	0	0	0	0	0	0	0	0	1	0	3	1	0	1	4	0	10
6 - 15	1	0	0	1	7	1	9	48	38	19	20	7	4	1	6	4	166
16 - 25	4	1	1	0	0	0	7	44	29	14	16	7	5	5	3	1	137
26 - 80	16	5	0	0	0	2	8	28	46	40	37	15	7	14	10	7	235
> 81.0	21	13	3	4	0	0	1	5	30	23	23	5	17	10	9	4	168
Totals	42	19	4	5	7	3	25	125	144	96	99	35	33	31	32	16	716

Total Number of Valid Hours: 716

Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

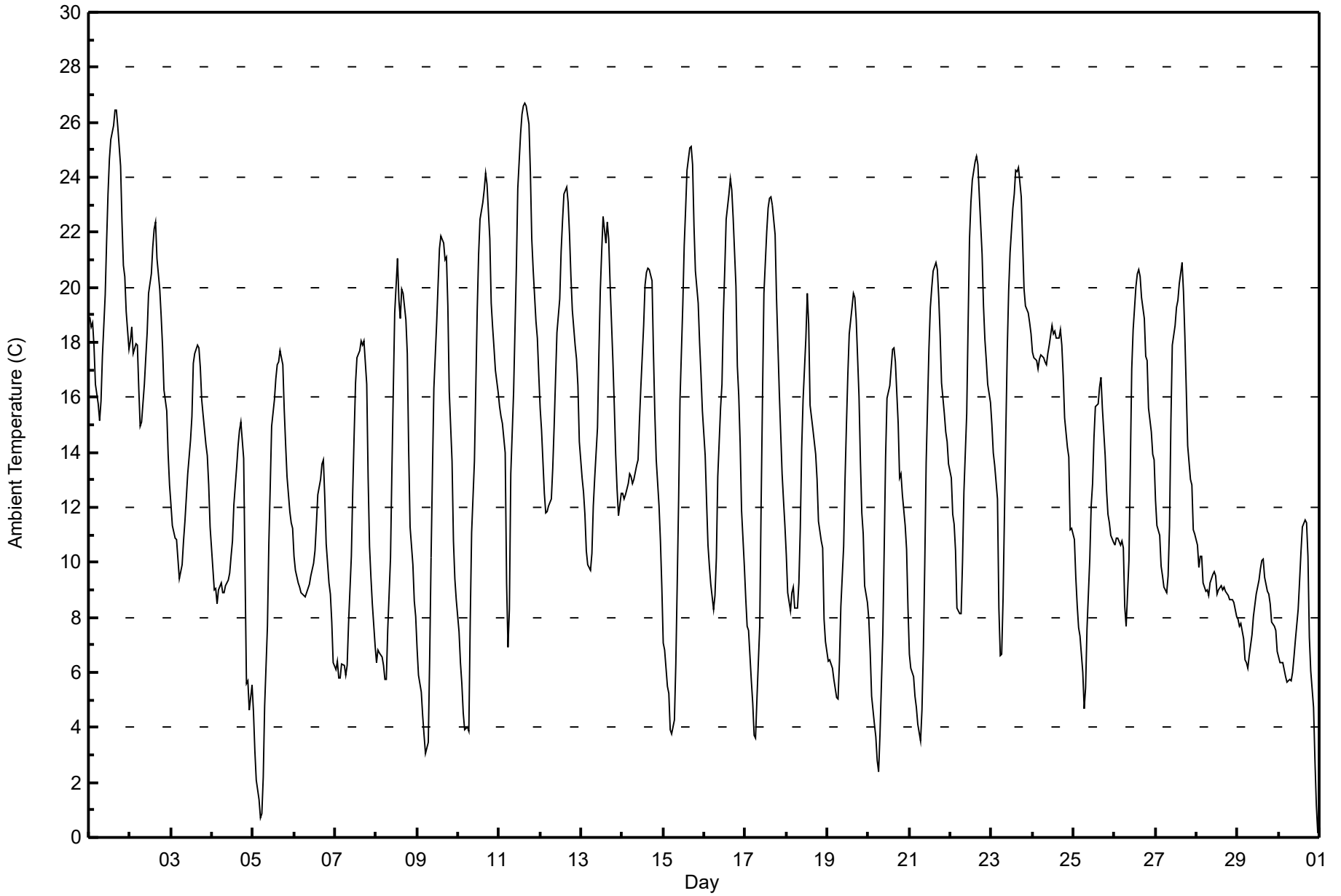
Ambient Temperature (AT) - C
Ells River - September 2023

Maximum Value: 26.7 C on Sep 11 16:00		Maximum Daily Average: 20.8 C on Sep 1		Hours in Service: 720																							
Minimum Value: 0.2 C on Oct 1 00:00		Minimum Daily Average: 6.8 C on Sep 30		Hours of Data: 720																							
Maximum Diurnal Average: 19.6 C at hour 16		Minimum Diurnal Average: 7.8 C at hour 7		Hours of Missing Data: 0																							
Monthly Average: 13.52 C		Percentiles: P ₁ = 2.5 P ₁₀ = 6.3 Q ₁ = 9.0 Median = 13.1 Q ₃ = 17.9 P ₉₀ = 21.3 P ₉₉ = 25.9		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-Sep	18.9	18.5	18.7	17.8	16.5	15.8	15.1	15.9	17.5	19.7	21.7	23.4	24.7	25.4	25.9	26.4	26.4	25.8	24.4	22.4	20.8	20.4	19.1	17.7	20.8	26.4	
2-Sep	18.0	18.6	17.6	17.9	17.9	16.3	14.9	15.1	16.5	17.5	18.4	19.8	20.5	21.5	22.1	22.4	21.0	19.9	19.0	17.8	16.3	15.5	13.9	12.8	18.0	22.4	
3-Sep	12.1	11.3	10.9	10.9	10.1	9.4	9.9	10.8	11.5	12.3	13.2	14.4	15.3	17.3	17.6	17.9	17.8	17.1	15.9	15.3	14.3	13.9	12.8	11.3	13.5	17.9	
4-Sep	9.8	9.0	9.1	8.5	9.0	9.3	8.9	8.9	9.1	9.4	9.6	10.2	10.8	12.1	13.5	14.2	14.8	15.1	13.8	9.6	5.6	5.7	4.7	5.5	9.8	15.1	
5-Sep	4.6	3.2	2.1	1.4	0.7	0.9	2.2	4.8	7.7	10.7	12.8	15.0	15.9	16.7	17.2	17.3	17.7	17.2	15.5	14.3	13.1	11.9	11.4	11.2	10.2	17.7	
6-Sep	10.2	9.7	9.3	9.1	8.9	8.8	8.7	8.9	9.0	9.2	9.5	10.0	10.4	11.4	12.5	13.0	13.6	13.7	12.4	10.7	9.3	8.9	7.8	6.3	10.1	13.7	
7-Sep	6.1	6.4	5.8	5.8	6.3	6.3	5.9	6.2	7.8	10.2	12.6	14.7	16.5	17.4	17.7	18.0	17.9	18.0	16.5	13.1	10.6	9.5	8.5	7.0	11.0	18.0	
8-Sep	6.3	6.8	6.7	6.6	6.3	5.8	5.7	7.5	10.2	13.4	16.3	19.1	21.0	19.5	18.8	19.9	19.8	18.8	17.6	14.1	11.3	9.9	8.6	8.1	12.4	21.0	
9-Sep	6.8	5.9	5.3	4.4	3.7	3.1	3.5	6.5	10.2	13.3	16.3	18.7	20.1	21.4	21.9	21.6	21.0	21.1	19.3	16.2	13.7	10.8	9.4	8.6	12.6	21.9	
10-Sep	7.5	6.4	5.6	4.5	3.9	4.0	3.9	7.9	11.1	13.7	16.4	19.2	21.2	22.5	23.1	23.5	24.1	23.7	21.8	19.4	18.6	17.8	17.0	16.2	14.7	24.1	
11-Sep	15.7	15.3	15.1	14.0	9.2	6.9	8.3	13.2	16.2	18.5	20.8	23.6	25.6	26.3	26.6	26.7	26.6	26.0	24.2	21.8	20.6	18.8	18.1	16.8	18.9	26.7	
12-Sep	15.6	14.8	12.5	11.8	11.9	12.1	12.3	13.4	14.9	16.7	18.4	19.6	21.3	22.4	23.4	23.6	23.1	21.9	20.4	19.2	17.9	17.4	16.4	14.4	17.3	23.6	
13-Sep	13.1	12.5	11.8	10.4	9.9	9.7	10.3	12.0	13.1	14.9	17.6	19.9	21.3	22.6	21.6	22.4	21.8	20.2	17.4	15.7	13.9	12.6	11.7	12.5	15.4	22.6	
14-Sep	12.5	12.3	12.5	12.9	13.2	13.1	12.9	13.0	13.5	13.7	15.2	16.4	18.6	20.1	20.5	20.7	20.6	20.2	17.7	15.4	13.7	12.0	10.8	9.1	15.0	20.7	
15-Sep	7.0	6.8	5.5	5.2	3.9	3.8	4.3	6.3	9.2	12.2	15.9	19.4	21.5	22.9	24.2	25.1	25.1	24.4	22.2	20.6	19.4	18.0	16.8	15.5	14.8	25.1	
16-Sep	13.9	12.2	10.6	9.9	9.2	8.3	8.8	10.2	13.1	15.6	16.5	19.0	20.6	22.5	23.4	24.0	23.5	22.5	20.1	17.1	16.1	14.3	11.9	9.9	15.5	24.0	
17-Sep	8.7	7.7	7.5	5.7	4.9	3.7	3.6	5.0	7.7	12.1	16.1	19.8	22.0	22.9	23.3	23.3	23.0	21.9	19.6	17.9	16.2	13.2	12.3	11.3	13.7	23.3	
18-Sep	10.3	8.9	8.2	8.9	9.1	8.3	8.4	9.3	11.2	14.1	15.9	18.1	19.8	18.7	15.7	14.8	14.4	13.9	13.0	11.5	10.8	10.5	7.9	7.1	12.0	19.8	
19-Sep	6.4	6.4	6.3	6.1	5.7	5.1	5.0	6.4	8.4	10.6	13.0	15.0	16.8	18.3	19.2	19.8	19.6	18.8	16.0	13.7	11.8	11.0	9.2	8.5	11.6	19.8	
20-Sep	7.9	6.7	5.1	4.1	3.7	2.8	2.4	3.8	7.4	10.5	13.8	16.0	16.4	17.1	17.7	17.8	17.3	15.1	13.1	13.2	12.5	11.4	10.5	8.3	10.6	17.8	
21-Sep	6.6	6.2	5.8	5.1	4.7	4.1	3.5	4.6	6.8	9.9	13.6	17.8	19.2	20.0	20.6	20.9	20.6	19.6	18.2	16.5	15.4	14.8	14.4	13.6	12.6	20.9	
22-Sep	13.1	11.7	11.4	10.4	8.3	8.1	8.2	10.0	12.6	15.4	18.6	21.8	23.1	23.9	24.6	24.7	24.4	23.3	21.2	19.3	18.1	17.4	16.5	15.8	16.7	24.7	
23-Sep	15.0	14.0	13.5	12.3	8.3	6.6	6.7	8.7	14.8	17.8	19.9	21.3	22.9	23.4	24.2	24.2	24.4	23.3	21.6	19.9	19.3	19.1	18.7	18.3	17.4	24.4	
24-Sep	17.7	17.4	17.4	17.0	17.4	17.6	17.5	17.3	17.2	17.6	17.9	18.6	18.3	18.4	18.2	18.2	18.5	17.9	16.8	15.2	14.2	13.8	11.2	11.2	16.8	18.6	
25-Sep	10.8	9.5	8.4	7.6	7.3	6.0	4.7	5.4	7.6	10.1	12.0	12.8	14.5	15.7	15.7	16.4	16.7	15.6	13.9	12.6	11.8	11.5	11.0	10.7	11.2	16.7	
26-Sep	10.6	10.9	10.9	10.6	10.8	10.5	8.4	7.7	10.1	13.5	17.0	18.5	20.0	20.5	20.6	20.4	19.6	18.8	17.5	17.3	15.6	14.8	13.9	13.7	14.7	20.6	
27-Sep	12.3	11.3	11.0	9.9	9.5	9.1	8.9	9.5	11.3	15.1	17.9	18.6	19.3	19.5	20.1	20.9	19.8	18.2	16.3	14.3	13.0	12.8	11.2	11.0	14.2	20.9	
28-Sep	10.6	9.8	10.2	10.2	9.2	9.0	9.0	8.8	9.2	9.5	9.7	9.5	8.8	9.0	9.2	9.0	9.1	9.0	8.8	8.6	8.6	8.7	8.5	8.0	9.2	10.6	
29-Sep	7.9	7.7	7.8	7.2	6.5	6.3	6.2	6.6	7.4	8.0	8.4	8.9	9.3	9.8	10.1	10.1	9.5	8.9	8.8	8.5	7.8	7.7	7.5	6.8	8.1	10.1	
30-Sep	6.6	6.4	6.3	6.1	5.9	5.6	5.7	5.7	6.0	6.5	7.2	8.3	9.3	10.4	11.3	11.5	11.5	10.2	7.3	6.1	4.7	2.8	1.2	0.2	6.8	11.5	
		10.8	10.1	9.6	9.1	8.4	7.9	7.8	9.0	10.9	13.1	15.1	16.9	18.2	19.0	19.4	19.6	19.4	18.7	17.0	15.2	13.8	12.9	11.8	10.9	Diurnal Average	
		18.9	18.6	18.7	17.9	17.9	17.6	17.5	17.3	17.5	19.7	21.7	23.6	25.6	26.3	26.6	26.7	26.6	26.0	24.4	22.4	20.8	20.4	19.1	18.3	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Ells River - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Ells River - September 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	237	32.92	32.92
10 - 20	377	52.36	85.28
> 20	106	14.72	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

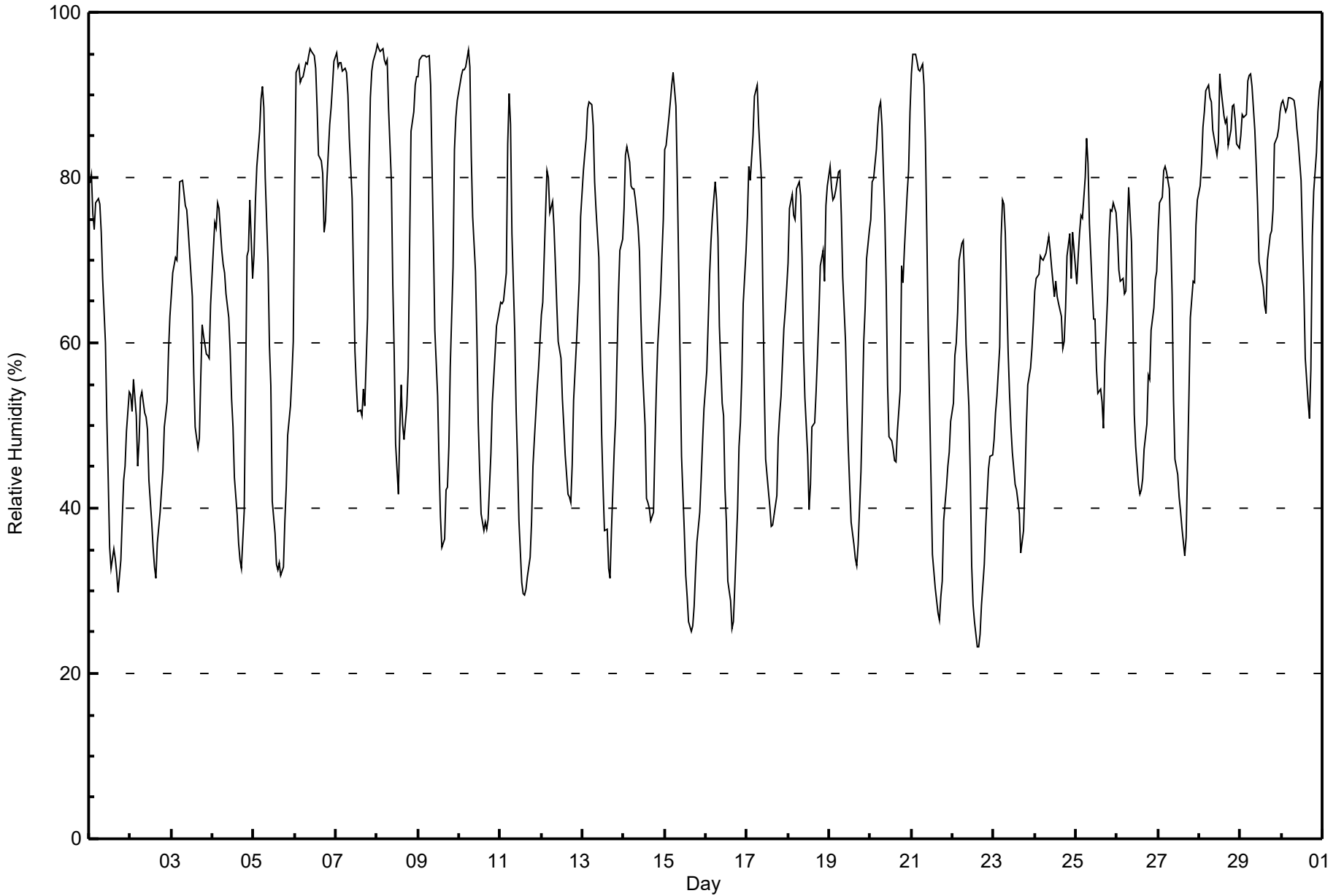
Relative Humidity (RH) - %
Ells River - September 2023

Maximum Value: 96.1 % on Sep 8 01:00 Maximum Daily Average: 88.5 % on Sep 6																						Hours in Service:	720			
Minimum Value: 23.2 % on Sep 22 16:00 Minimum Daily Average: 46.2 % on Sep 22																						Hours of Data:	720			
Maximum Diurnal Average: 83.1 % at hour 7 Minimum Diurnal Average: 43.0 % at hour 16																						Hours of Missing Data:	0			
Monthly Average: 64.44 % Percentiles: P₁ = 26.3 P₁₀ = 37.6 Q₁ = 48.8 Median = 66.5 Q₃ = 79.7 P₉₀ = 90.1 P₉₉ = 95.2																						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-Sep	79.3	80.3	75.5	73.8	76.9	77.4	76.7	73.4	67.9	60.0	50.8	43.3	35.3	32.7	35.1	33.9	32.1	29.9	33.7	38.9	43.3	45.0	49.4	54.0	54.1	80.3
2-Sep	53.7	51.6	55.7	51.2	45.1	48.2	53.3	54.1	51.6	51.0	49.4	43.4	38.2	35.3	32.9	31.6	35.8	39.5	42.1	44.6	49.9	52.8	58.9	63.3	47.2	63.3
3-Sep	65.7	68.5	70.3	70.1	74.6	79.4	79.6	78.1	76.7	76.0	73.8	68.3	65.7	56.2	49.8	47.2	48.5	55.7	62.2	60.9	58.6	58.5	58.1	64.6	65.3	79.6
4-Sep	71.4	74.6	73.9	76.9	76.3	71.2	69.5	68.5	65.9	63.1	59.0	53.2	49.8	43.8	39.1	35.7	33.7	32.7	39.6	54.9	70.5	71.2	77.2	67.8	60.0	77.2
5-Sep	70.7	77.0	81.4	85.6	89.5	91.0	88.6	80.0	69.7	59.7	54.8	40.9	37.0	33.2	32.5	33.4	31.9	33.0	38.5	42.5	48.9	52.5	56.0	60.1	57.8	91.0
6-Sep	79.0	92.7	93.5	91.5	92.0	92.1	93.9	93.7	94.7	95.6	95.2	94.7	93.2	88.4	82.8	82.0	80.5	73.5	74.7	79.6	86.5	88.6	91.2	94.0	88.5	95.6
7-Sep	95.0	93.4	93.9	94.0	92.9	93.1	92.7	90.0	84.8	77.4	67.8	59.0	54.9	51.8	51.8	51.2	54.4	52.4	63.0	81.0	89.7	92.9	94.1	95.2	77.8	95.2
8-Sep	96.1	95.6	95.3	95.6	94.3	93.7	94.2	88.4	79.4	67.2	58.8	47.8	41.7	49.7	54.9	50.2	48.4	52.4	57.0	71.5	85.6	87.9	91.2	92.1	74.5	96.1
9-Sep	92.2	94.2	94.8	94.7	94.7	94.6	94.7	91.2	81.4	72.1	61.6	53.5	45.7	39.1	35.3	36.3	42.2	42.5	47.4	57.2	69.2	83.4	87.3	89.3	70.6	94.8
10-Sep	91.4	92.3	93.0	93.1	93.4	95.4	93.4	82.6	75.2	68.7	60.5	50.1	44.3	39.3	37.3	38.3	37.4	38.6	46.7	52.7	55.7	58.8	62.0	64.0	65.2	95.4
11-Sep	64.9	64.8	65.1	68.4	84.1	90.2	86.4	73.2	61.3	51.9	45.8	38.5	31.0	29.7	29.6	30.1	31.7	34.0	38.3	45.1	48.2	54.5	56.9	60.2	53.5	90.2
12-Sep	63.4	64.9	75.8	80.9	80.0	75.8	77.1	74.0	69.4	64.5	60.1	58.2	53.3	50.0	46.4	41.7	41.4	40.6	45.3	53.1	59.8	63.6	67.5	75.2	61.8	80.9
13-Sep	80.9	82.9	84.7	88.4	89.1	88.9	86.3	79.5	76.2	70.3	59.8	49.0	42.8	37.2	37.4	32.8	31.6	37.2	47.0	50.8	58.5	65.9	71.2	72.6	63.4	89.1
14-Sep	76.3	82.8	83.8	81.9	79.0	78.6	78.6	77.5	74.1	71.1	63.3	57.2	50.0	41.2	40.6	40.0	38.5	39.6	47.2	54.2	59.6	65.9	70.5	75.0	63.6	83.8
15-Sep	83.3	84.0	87.3	89.1	91.2	92.7	88.7	79.7	68.9	57.8	46.2	37.2	31.9	29.4	26.3	25.0	25.8	28.1	32.4	36.0	39.4	43.5	48.0	52.0	55.2	92.7
16-Sep	56.6	62.4	68.2	72.2	75.2	79.4	77.2	72.6	62.0	52.7	51.2	42.5	38.3	31.2	28.7	25.4	26.3	30.5	39.8	47.5	50.4	55.7	64.7	71.0	53.4	79.4
17-Sep	75.3	81.4	79.7	85.1	89.9	90.5	91.2	86.4	79.7	66.1	54.8	46.0	42.1	40.1	37.9	38.0	39.1	41.6	48.4	51.3	53.6	61.7	64.0	66.7	62.9	91.2
18-Sep	69.7	76.2	78.0	75.4	75.0	78.7	79.5	77.7	70.4	59.3	53.4	46.5	39.8	42.8	49.8	50.4	54.0	58.5	63.4	69.3	71.1	67.5	76.6	79.0	65.1	79.5
19-Sep	81.4	78.7	77.3	77.6	78.5	80.7	80.9	75.4	68.0	60.1	52.9	47.1	42.5	38.3	35.6	33.9	33.0	35.5	44.5	51.7	60.3	64.2	70.2	73.6	60.1	81.4
20-Sep	74.9	79.4	79.9	83.4	86.3	88.5	89.1	86.2	75.4	67.0	54.9	48.6	48.2	47.1	45.8	45.7	49.3	54.2	69.3	67.2	71.4	78.1	80.9	88.0	69.1	89.1
21-Sep	92.6	95.0	94.9	94.0	93.0	92.9	93.7	91.2	84.2	73.3	61.3	43.3	34.4	32.3	30.3	27.3	26.5	29.3	31.1	38.5	42.5	45.0	46.7	50.5	60.2	95.0
22-Sep	52.7	58.4	59.9	63.7	70.0	72.1	72.4	67.0	59.8	52.4	44.0	33.1	28.2	26.2	23.3	23.2	24.8	28.3	33.3	37.8	41.4	44.8	46.3	46.4	46.2	72.4
23-Sep	48.3	51.5	53.6	59.5	72.7	77.3	76.7	73.2	59.0	53.9	49.9	46.7	42.9	42.3	40.9	39.3	34.6	37.3	42.9	49.9	55.0	57.0	59.4	62.6	53.6	77.3
24-Sep	66.2	67.8	68.3	70.4	70.1	70.0	70.9	71.9	73.0	71.1	69.2	65.6	67.4	65.6	64.8	63.2	59.3	60.2	64.2	70.5	73.2	67.7	73.4	71.3	68.1	73.4
25-Sep	67.2	70.6	73.4	75.4	75.1	80.0	84.8	81.7	74.5	66.6	62.9	57.0	53.8	54.4	52.8	49.7	57.6	65.8	72.4	76.1	75.9	76.9	75.7	68.5	84.8	84.8
26-Sep	73.1	68.8	67.4	67.9	66.0	66.3	73.7	78.8	72.3	63.3	51.4	47.4	42.9	41.7	42.3	43.5	47.1	50.2	56.1	55.6	61.4	64.2	67.7	68.7	59.9	78.8
27-Sep	73.6	76.9	77.6	80.8	81.4	80.7	78.7	73.2	65.8	53.1	45.9	44.1	41.3	39.6	37.7	34.2	36.5	44.9	53.5	63.1	67.5	67.4	74.2	77.3	61.2	81.4
28-Sep	79.0	81.7	86.2	88.0	90.4	91.1	89.7	89.2	85.8	83.7	82.8	84.2	92.6	90.6	87.4	86.7	87.2	83.9	85.7	88.6	88.8	87.0	84.1	83.5	86.6	92.6
29-Sep	85.1	87.7	87.3	87.7	91.6	92.3	92.5	91.0	85.7	81.5	76.6	69.8	67.7	66.7	64.6	63.6	70.0	73.0	73.6	76.1	84.1	85.0	86.0	88.0	80.3	92.5
30-Sep	89.0	89.3	88.0	88.4	89.7	89.7	89.5	89.2	88.2	86.0	84.3	79.6	72.6	66.5	58.1	52.9	50.9	56.7	72.9	78.3	83.1	88.0	90.5	91.8	79.7	91.8
																								Diurnal Average		
																								Diurnal Maximum		



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Ells River - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Ells River - September 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	99	13.75	13.75
40 - 60	200	27.78	41.53
60 - 80	243	33.75	75.28
80 - 100	178	24.72	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



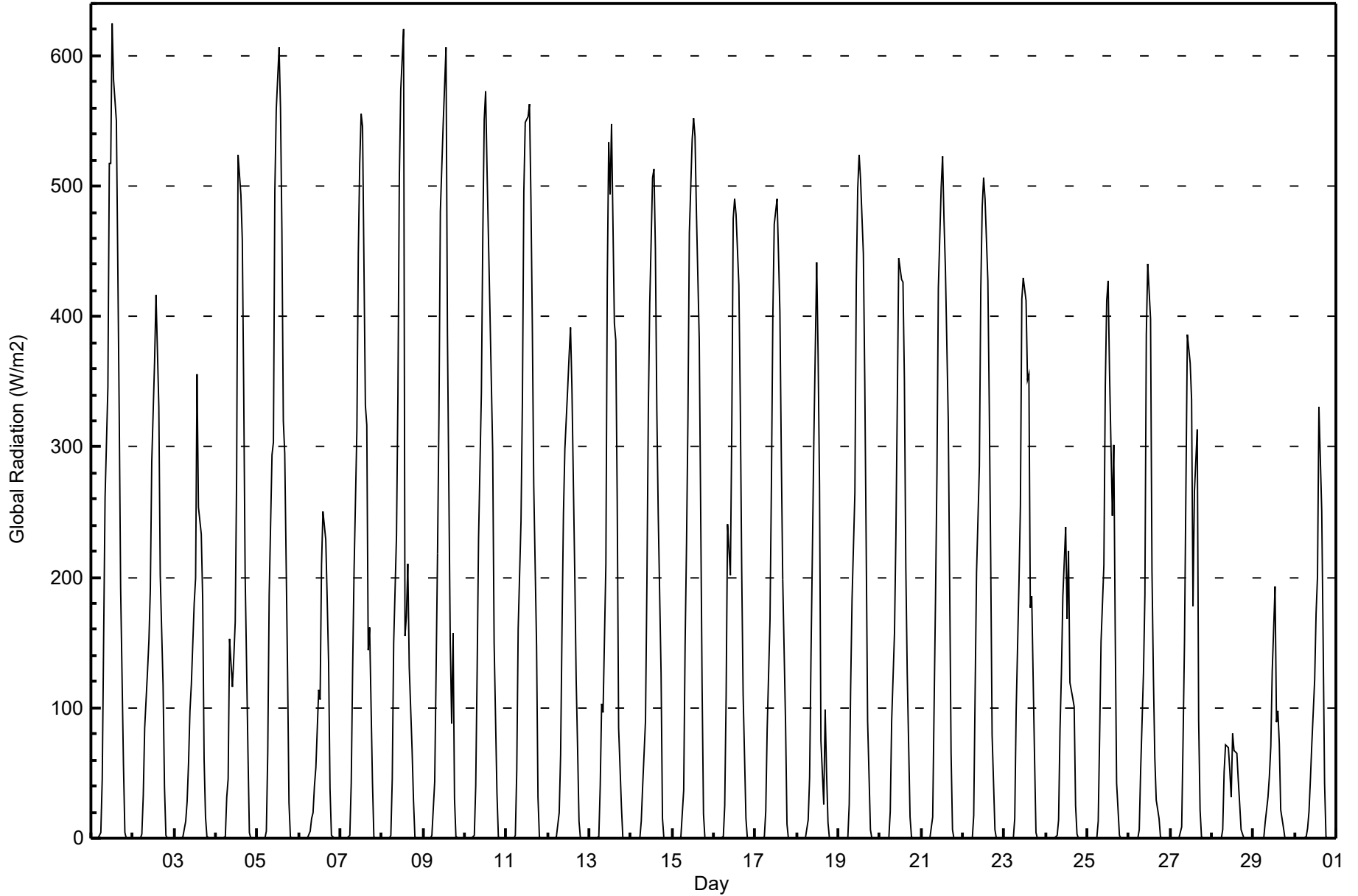
Wood Buffalo Environmental Association

Summary of Hour Averages

Global Radiation (GR) - W/m2

Ells River - September 2023

Maximum Value: 624.7 W/m2 on Sep 1 13:00 Maximum Daily Average: 192.4 W/m2 on Sep 1																							Hours in Service:	720		
Minimum Value: 0.0 W/m2 on Sep 1 01:00 Minimum Daily Average: 23.9 W/m2 on Sep 28																							Hours of Data:	720		
Maximum Diurnal Average: 416.8 W/m2 at hour 13 Minimum Diurnal Average: 0.0 W/m2 at hour 5																							Hours of Missing Data:	0		
Monthly Average: 121.41 W/m2 Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 13.8 Q ₃ = 204.2 P ₉₀ = 424.8 P ₉₉ = 570.6																							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-Sep	0.0	0.0	0.0	0.0	0.0	4.5	45.8	153.6	261.2	345.7	517.0	517.2	624.7	581.6	549.6	439.0	326.0	192.2	56.4	4.1	0.1	0.0	0.0	0.0	192.4	624.7
2-Sep	0.0	0.0	0.0	0.0	0.0	3.3	33.0	84.9	128.0	151.3	190.5	288.1	365.1	416.3	374.4	330.9	202.2	116.8	38.8	2.6	0.1	0.0	0.0	0.0	113.6	416.3
3-Sep	0.0	0.0	0.0	0.0	0.0	1.3	13.4	28.4	57.5	97.9	117.8	180.1	199.3	356.1	254.0	232.7	183.4	61.2	16.4	1.0	0.0	0.0	0.1	0.0	75.0	356.1
4-Sep	0.1	0.0	0.0	0.0	0.0	1.3	32.0	45.0	153.3	116.5	138.9	166.3	278.3	524.3	493.6	459.2	342.9	202.8	66.4	4.4	0.2	0.0	0.0	0.0	126.1	524.3
5-Sep	0.1	0.1	0.1	0.1	0.1	5.3	65.8	186.8	293.6	303.3	495.7	559.1	606.6	559.4	464.9	320.5	295.5	126.6	27.1	0.9	0.0	0.0	0.0	0.0	179.7	606.6
6-Sep	0.0	0.0	0.0	0.0	0.0	0.2	5.0	14.9	20.0	39.8	54.4	114.1	105.9	209.5	251.0	229.3	183.3	134.0	37.8	1.7	0.1	0.0	0.0	0.1	58.4	251.0
7-Sep	0.0	0.0	0.0	0.0	0.0	2.7	42.7	130.6	204.5	313.1	448.3	517.7	555.0	546.1	332.2	316.3	143.7	161.3	43.7	1.6	0.0	0.0	0.0	0.1	156.7	555.0
8-Sep	0.0	0.0	0.0	0.0	0.1	2.3	45.6	149.6	232.1	339.6	506.2	573.5	620.9	155.0	170.7	210.9	131.8	68.1	29.6	1.4	0.1	0.1	0.1	0.1	134.9	620.9
9-Sep	0.0	0.0	0.1	0.0	0.1	2.4	43.1	129.1	217.7	323.6	480.4	548.2	577.5	605.9	386.9	150.0	87.9	157.7	30.8	1.2	0.2	0.1	0.0	0.1	156.0	605.9
10-Sep	0.1	0.1	0.1	0.1	0.1	2.1	40.5	129.5	229.6	342.1	462.5	551.6	572.5	512.3	406.7	351.6	295.9	149.8	34.7	1.1	0.0	0.0	0.0	0.0	170.1	572.5
11-Sep	0.0	0.0	0.1	0.2	0.2	2.0	52.6	160.9	242.9	335.8	495.3	548.7	553.0	562.6	491.2	393.8	271.4	147.1	31.2	0.6	0.1	0.2	0.1	0.2	178.8	562.6
12-Sep	0.2	0.2	0.0	0.0	0.0	1.4	20.0	63.9	162.1	248.5	298.0	345.4	370.2	391.9	345.4	202.3	121.7	69.6	13.4	0.2	0.0	0.0	0.2	0.2	110.6	391.9
13-Sep	0.2	0.1	0.2	0.2	0.0	1.1	40.0	103.0	96.3	210.2	428.8	534.1	493.2	548.1	394.5	381.6	259.6	84.3	23.8	0.3	0.0	0.2	0.0	0.0	150.0	548.1
14-Sep	0.0	0.0	0.0	0.0	0.0	0.0	13.3	40.1	89.8	196.6	326.0	409.6	506.7	513.4	451.2	328.3	248.8	127.1	14.9	0.3	0.1	0.1	0.0	0.2	136.1	513.4
15-Sep	0.0	0.1	0.1	0.2	0.1	1.1	36.5	148.6	225.2	322.4	463.7	535.5	552.5	538.0	479.1	382.1	251.9	117.5	18.3	0.2	0.2	0.0	0.1	0.2	169.7	552.5
16-Sep	0.2	0.2	0.2	0.2	0.1	0.9	25.4	109.9	240.8	201.9	315.7	475.6	490.7	478.5	424.7	333.5	206.4	110.6	15.6	0.3	0.2	0.1	0.1	0.1	143.0	490.7
17-Sep	0.2	0.1	0.2	0.1	0.1	0.8	20.6	83.7	166.5	271.1	399.2	471.2	490.3	448.0	403.3	292.4	198.2	88.1	10.7	0.2	0.2	0.2	0.1	0.1	139.4	490.3
18-Sep	0.1	0.2	0.1	0.0	0.0	0.5	13.8	46.8	140.6	222.9	305.7	441.1	371.0	271.7	75.2	26.3	99.0	50.1	12.1	0.1	0.2	0.2	0.1	0.1	86.6	441.1
19-Sep	0.2	0.1	0.2	0.1	0.1	0.5	26.0	114.9	183.8	264.2	426.3	497.5	524.1	505.4	448.0	348.8	223.3	90.0	6.3	0.1	0.0	0.0	0.1	0.0	152.5	524.1
20-Sep	0.0	0.1	0.1	0.0	0.0	0.3	20.9	90.5	157.1	232.8	335.7	444.5	428.3	425.8	351.0	208.1	127.3	16.1	1.3	0.0	0.0	0.0	0.1	0.1	118.3	444.5
21-Sep	0.1	0.1	0.0	0.0	0.0	0.3	16.5	100.4	184.4	278.5	422.0	499.5	523.0	474.1	436.1	320.7	194.8	64.5	6.2	0.1	0.1	0.0	0.0	0.0	146.7	523.0
22-Sep	0.1	0.0	0.1	0.1	0.1	0.3	16.9	113.0	204.1	284.9	421.1	483.6	506.6	489.9	427.3	330.5	214.3	79.0	6.6	0.2	0.1	0.1	0.1	0.1	149.1	506.6
23-Sep	0.0	0.1	0.2	0.2	0.1	0.2	15.5	97.2	196.7	254.6	413.8	429.6	412.6	351.9	355.9	176.9	185.5	61.4	4.6	0.0	0.0	0.0	0.0	0.0	123.2	429.6
24-Sep	0.0	0.0	0.0	0.0	0.0	0.0	1.7	13.8	83.4	126.9	185.1	239.2	168.4	220.5	119.7	107.5	100.6	24.9	2.9	0.1	0.2	0.2	0.2	0.0	58.1	239.2
25-Sep	0.1	0.1	0.0	0.1	0.1	0.3	12.9	78.3	150.5	209.2	345.6	412.3	427.0	356.7	247.0	301.4	160.7	42.8	2.4	0.0	0.0	0.0	0.0	0.0	114.5	427.0
26-Sep	0.0	0.0	0.0	0.0	0.0	0.0	6.6	52.6	127.3	186.3	386.6	440.5	398.4	205.5	125.0	61.6	29.7	15.4	1.5	0.0	0.1	0.0	0.0	0.0	84.9	440.5
27-Sep	0.1	0.0	0.0	0.0	0.0	0.0	8.9	77.1	152.3	268.5	386.0	364.7	336.8	178.1	266.1	313.7	89.7	22.1	1.1	0.0	0.0	0.0	0.0	0.0	102.7	386.0
28-Sep	0.0	0.0	0.0	0.0	0.0	0.0	6.9	50.5	71.6	69.6	51.7	31.6	80.7	67.7	65.1	44.9	25.7	6.8	0.0	0.0	0.0	0.0	0.0	0.0	23.9	80.7
29-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.5	11.4	31.1	48.1	70.8	127.5	193.6	89.5	97.5	72.3	21.9	7.8	0.0	0.0	0.0	0.0	0.0	0.0	32.2	193.6
30-Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.9	8.1	20.7	45.4	73.0	121.8	172.3	200.3	331.1	250.9	150.0	42.4	1.5	0.2	0.3	0.2	0.2	0.2	59.1	331.1
																							Diurnal Average			
																							Diurnal Maximum			





Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

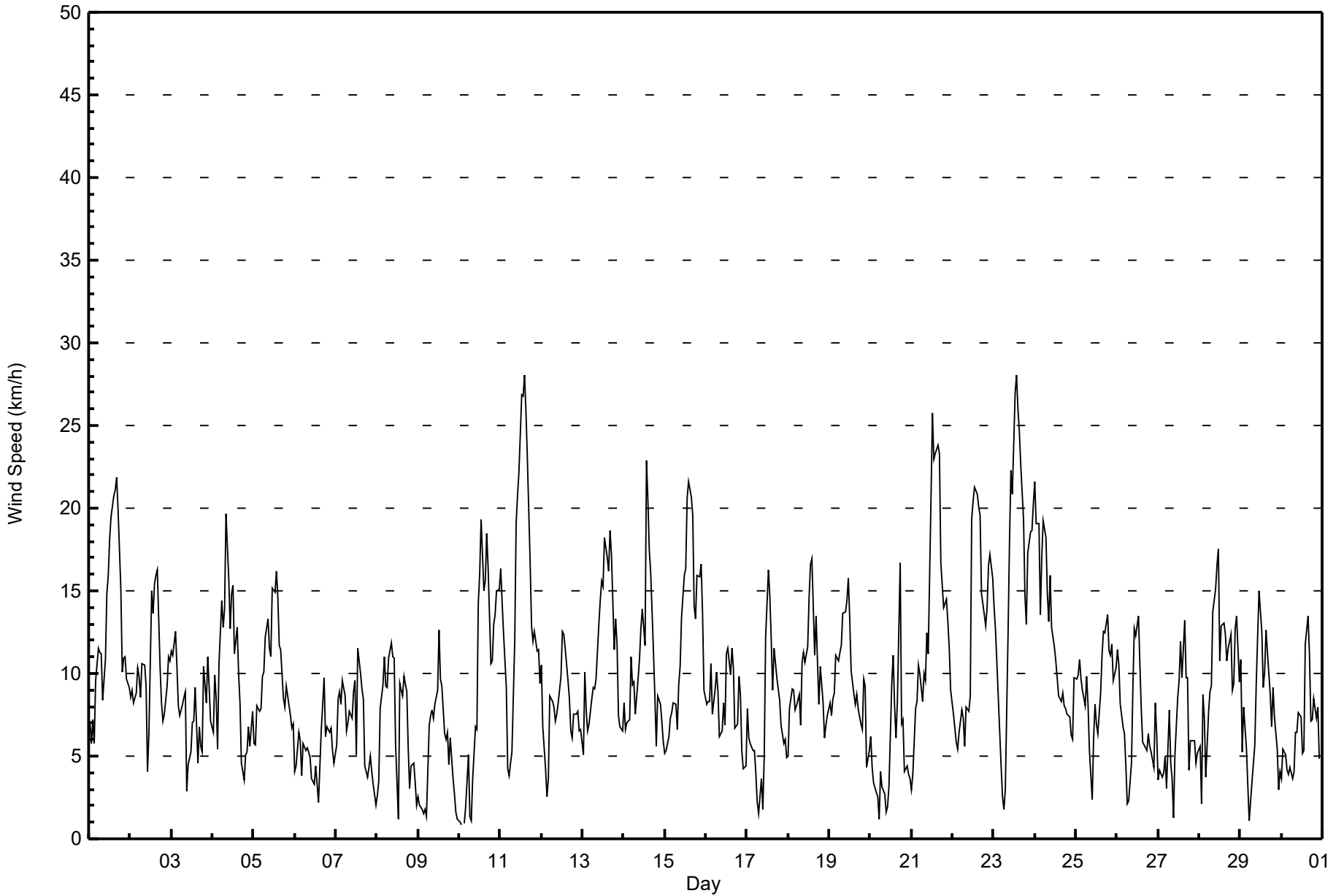
Ells River - September 2023

Maximum Speed: 28 km/h on Sep 23 14:00	Maximum Daily Speed Average: 15.0 km/h on Sep 23	Hours in Service: 720
Minimum Speed Value: 1 km/h on Sep 10 02:00	Minimum Daily Speed Average: 2.1 km/h on Sep 8	Hours of Data: 718
Maximum Diurnal Speed Average: 7.7 km/h at hour 13	Minimum Diurnal Speed Average: 3.9 km/h at hour 19	Hours of Missing Data: 2
Monthly Average Velocity: 5.0 km/h 195.9 deg	Percentiles: $P_1 = 1$ $P_{10} = 4$ $Q_1 = 6$ Median = 9 $Q_3 = 12$ $P_{90} = 16$ $P_{99} = 26$	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-Sep	W7	W6	WSW7	SW6	SW10	SW12	SW11	SW11	SSW8	SSW11	SW15	SW16	SW18	SW19	SSW21	SSW21	SW22	SW20	SW15	SSW10	SSW11	SW11	SW10	SW9	SW12.4	SW22
2-Sep	WSW9	SW9	WSW8	W9	WNW10	WNW10	W9	W11	W11	W9	W4	WSW6	W15	WNW14	WNW15	WNW16	W16	W10	WSW8	WSW7	SW8	SW9	SW11	SW11	W9.4	W16
3-Sep	SW11	SW11	SW13	SW10	SSW8	S7	S8	S9	SSE9	SW3	S5	SW5	WSW7	NW7	N9	ENE5	SE7	S6	SSW5	NW10	WNW8	NW11	NW9	W7	SW4.3	SW13
4-Sep	SW6	WSW10	WSW9	SW5	WNW11	NW14	NW13	NW14	NW20	NW16	NW13	NW15	NW15	NW11	NW13	NNW10	NNW8	NW5	E4	SSE5	SSW5	WSW7	WSW6	SW8	WNW7.5	NW20
5-Sep	SW6	SSW6	S8	S8	SSE8	SSE10	SSE10	S12	S13	S12	S11	SSE15	S15	SSE16	SSE15	SSE12	SSE11	SSE8	SSE8	SSE9	SSE9	SSE7	SSE7	S7	SSE9.8	SSE16
6-Sep	SSW4	N4	ENE6	E6	E4	E6	E5	E6	E5	ESE5	SE4	SSE3	WSW4	W3	SE2	S7	SSE8	SW10	SW6	SSW7	SW6	SW7	SW5	SSW5	SSE2.4	SSW10
7-Sep	SSW6	SW8	WSW9	WSW8	WSW10	SW9	SW7	SW7	SW8	SSW7	SSW9	SSW10	SSE5	S12	SSE10	SE9	ESE8	SSE4	WNW4	NW4	NW5	WNW4	W3	SSW2	SSW4.9	S12
8-Sep	SSW3	S3	S8	S9	S11	S9	S9	S11	S12	S11	SSE11	SW6	NW1	NNE9	NNE9	NE9	NNE10	N9	N5	WNW3	WNW4	W5	W3	WNW2	S2.1	S12
9-Sep	W3	SW2	SW2	S2	SSW2	SSW1	S7	S7	SSE8	SSE7	SSE8	SSE9	SSE13	SSE10	SSE9	SE6	SSE6	SE6	ESE5	SE6	SSE4	WNW3	W2	WSW1	SSE4.6	SSE13
10-Sep	NW1	WSW1	UO	WSW1	SSW2	S5	SW1	WSW1	SSE4	SE7	SE7	SE14	SSE16	SE19	SE15	SE16	SE18	SE16	SE11	SE11	SE13	SSE14	SSE15	SSE15	SE9.2	SE19
11-Sep	SSE16	SSE14	SSE12	S9	SW4	SW4	S5	SE5	SSE12	SSE19	SSE21	SSE22	S27	S27	S28	SSE26	SSE23	S17	SSE13	SSE12	SSE13	S11	SSE11	S9	SSE14.7	S28
12-Sep	S10	S7	SW4	SW3	SW4	SSE9	S8	S8	SSE7	SSW8	S8	SSE10	SSE13	SSE12	S11	S10	SSW8	SW7	SW6	SSW8	S8	SSW8	SSW7	S7	S7.4	SSE13
13-Sep	SSW5	SW10	SSW8	SSW7	S7	S8	SSW9	SW9	SW10	SW13	SW14	SW16	SW15	SW18	SW17	WSW16	SW19	W17	WSW11	WSW13	WSW12	SW7	SSW7	SSW7	SW10.9	SW19
14-Sep	SW8	WSW7	W7	WNW7	WNW11	WNW9	W10	W8	WNW10	W11	WNW13	NW14	WNW12	NW23	NW21	NW17	NW16	NW11	WNW9	W6	WNW9	W8	W7	SW6	WNW9.9	NW23
15-Sep	SW5	S5	S6	S7	S8	S8	S8	SSE7	S9	S10	S13	S16	S16	SSE21	SSE22	SSE21	SSE20	SSE14	SSE13	SSE16	SSE16	SSE17	SSE14	S9	SSE12.3	SSE22
16-Sep	S8	S8	S8	S11	SSW8	S9	SSW10	SSW9	SSW6	SSW7	SSW8	SSW7	S11	SSW12	SSW10	SW12	SW10	SSW7	S7	S10	SSW9	SSW5	SW4	SSE4	SSW8.0	SSW12
17-Sep	SSE8	S6	SSW6	S5	S5	S4	W2	WNW1	WNW4	SSE2	S5	SSE12	SSE16	S15	S12	S9	SSW11	SSW10	SSW9	SW8	SW7	S6	SSW6	S5	S6.5	SSE16
18-Sep	S5	S8	S9	SSW9	S8	S8	SSE9	S7	SSW11	SSW11	SW11	SW12	WSW15	WSW17	SW17	SW11	SW13	SSW11	S8	SSE10	S8	SW6	SSE7	SSE7	SSW8.8	SW17
19-Sep	S8	SSW7	S8	SSW9	S11	S11	SSW11	SSW12	SSW14	SSW14	SSW14	SSW16	SSW13	SW10	SSW9	S8	SSW9	S8	S7	WSW7	WNW10	NW9	WNW4	WNW5	SSW8.2	SSW16
20-Sep	W6	W4	WNW3	W3	NW3	S1	S4	S3	SW3	NNW2	N2	N3	NNE9	NE11	NE8	ENE6	NNE8	NW17	WNW7	SW7	NNW4	W4	SW4	SSW4	NW2.1	NW17
21-Sep	SW3	SSW4	S8	S8	S11	S10	S8	S10	S10	S12	S11	S21	SSW26	SSW23	SSW23	SSW24	S23	S17	S15	SSE14	SSE15	S13	S12	SSE9	S13.5	SSW26
22-Sep	SSE8	SSE7	S6	SSW5	SSE6	S8	SSW7	S6	SSW8	SSW8	SSW9	S19	S20	S21	S21	S20	SSE20	SSE15	SSE14	SSE13	SSE14	SSE17	SSE17	SSE16	S12.4	S21
23-Sep	SSE14	SSE13	S11	SSW6	WNW4	SW3	SSW2	NW3	SSE13	SE18	SSE22	SE21	SSE27	SSE28	S26	SSE25	SSE23	SSE19	SSE15	SSE13	SSE17	SSE19	SE19	SE20	SSE15.0	SSE28
24-Sep	SSE22	SSE19	SSE19	SSE14	SSE17	SSE19	SSE18	SSE15	SSE13	S16	S13	S12	SW11	SW10	SW9	S8	S9	SSE8	S8	S8	SSW7	SW6	SSW6	SW10	S11.1	SSE22
25-Sep	SW10	SW10	SW11	SW10	SW9	SSW8	S10	SW8	WSW5	NW2	NNE6	NNE8	ENE7	ENE6	NE9	NNE11	NE13	NNE12	NNE14	N11	N11	N12	N10	N10	N2.7	NNE14
26-Sep	N11	N11	N8	N7	NNW6	NNW4	NW2	SSW2	SSE5	S9	S13	SSE12	S13	SSE11	S8	SSW6	SSW6	SSW5	S6	SW6	S5	WSW4	W8	WSW6	SSW2.7	S13
27-Sep	SSW4	SW4	SW4	S4	SSW5	SSW3	WSW8	SW5	S4	SSW1	SE5	SSE9	SW10	SW12	SW10	SW13	WSW10	NNW10	NW4	N6	NNW6	NNW6	NW5	WNW5	WSW3.6	SW13
28-Sep	W6	NW2	NNW9	N7	N4	N8	NNE9	NNE9	NNE14	NNE15	N17	N18	N11	N13	N13	NNE12	N11	N12	N12	NNE9	N9	N13	N13	NNW10	N10.1	N18
29-Sep	N11	N5	N8	WNW5	WSW3	SSW1	WSW2	WSW3	NW6	N9	N12	N15	N13	N9	N10	N13	N11	NNE9	N7	NNW9	N7	NNW5	NNW3	SSW4	N6.5	N15
30-Sep	SSW4	S5	SSW5	SSW4	S4	S4	SSE4	S4	S6	SSW6	S8	S7	S5	SE5	SSE12	SSE13	S11	SSE7	SSE7	SSE8	SSE7	S8	S5	UO	S6.3	SSE13

SSW4.4	SSW4.6	SSW4.8	SSW4.5	SSW4.5	SSW4.5	SSW4.9	SSW4.5	SSW4.9	SSW5.3	S5.8	S6.7	SSW7.7	SSW6.8	SSW6.4	S6.1	S6.2	SSW4.4	S3.9	S4.3	SSW4.0	SSW4.0	SSW4.0	SSW4.6	Diurnal Average
SSE22	SSE19	SSE19	SSE14	SSE17	SSE19	SSE18	SSE15	NW20	SSE19	SSE22	SSE22	SSE27	SSE28	S28	SSE26	S23	SW20	S15	SSE16	SSE17	SSE19	SE19	SE20	Diurnal Maximum

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Ells River - September 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	151	21.03	21.03
6 - 11	371	51.67	72.70
12 - 19	158	22.01	94.71
20 - 28	38	5.29	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 718

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Ells River - September 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	0	0	1	4	2	5	10	24	26	21	10	11	14	11	6	151
6 - 11	23	13	4	4	3	1	9	43	89	57	57	20	19	12	8	9	371
12 - 19	13	6	0	0	0	0	9	57	21	7	20	5	3	5	11	1	158
20 - 28	0	0	0	0	0	0	2	15	10	6	2	0	0	0	3	0	38
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	42	19	4	5	7	3	25	125	144	96	100	35	33	31	33	16	718

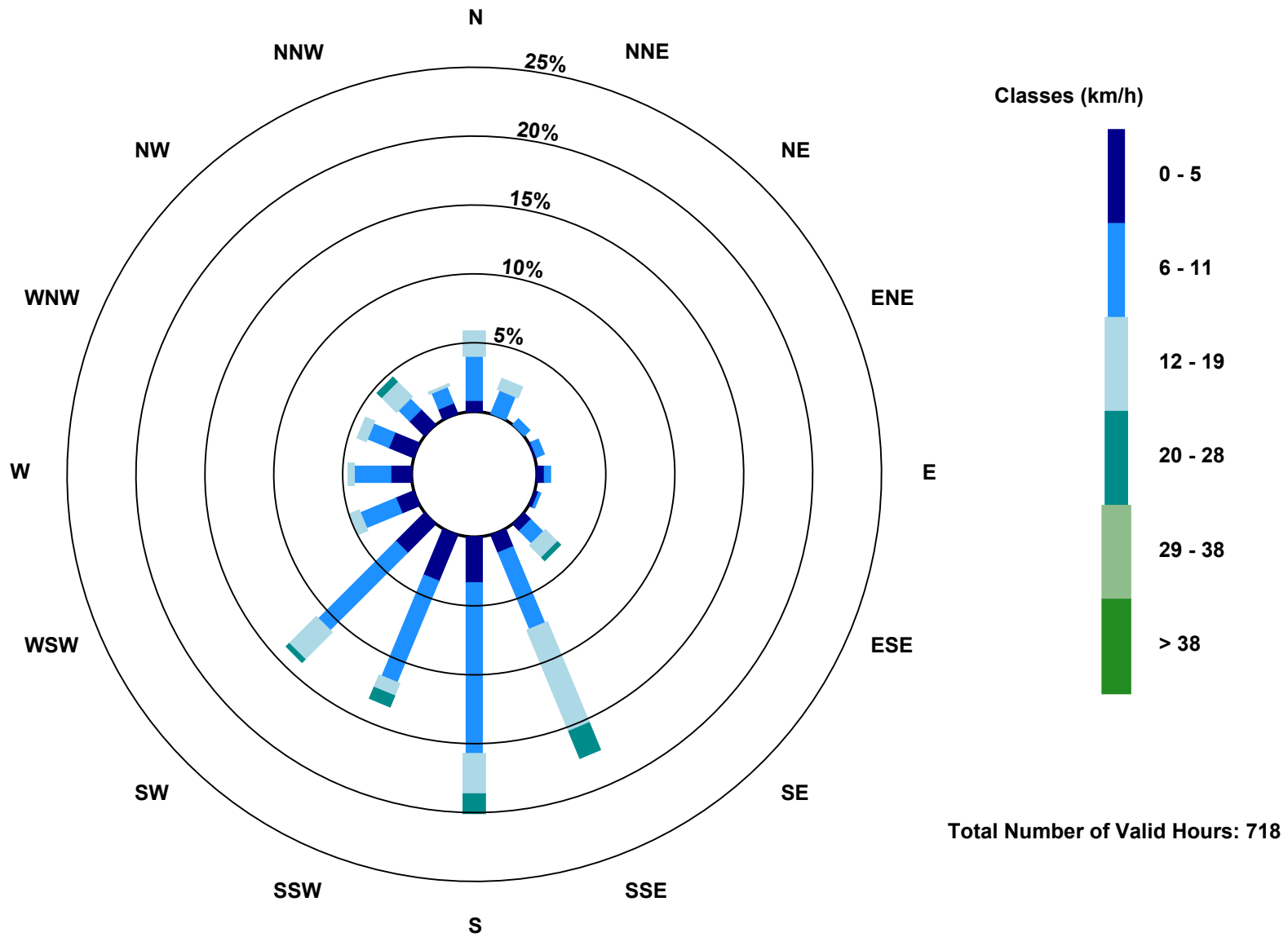
Total Number of Valid Hours: 718

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

Wind Speed (WS) - km/h
Ells River





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Ells River - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 8 km/h on Sep 23 09:00	Hours of Data: 718
Minimum Value: 0 km/h on Sep 19 19:00	Hours of Missing Data: 2
Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 3 P ₉₀ = 4 P ₉₉ = 7	Hours of Calibration: 0
	Percent Operational Time: 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-Sep	1	2	2	1	2	3	3	3	2	3	4	5	6	6	6	7	7	6	4	2	2	3	3	2	7
2-Sep	2	3	3	2	3	2	2	3	3	3	2	3	4	4	5	4	4	3	2	2	2	2	3	3	5
3-Sep	3	3	3	3	1	1	2	3	3	2	3	2	2	2	2	1	1	1	1	3	2	3	4	2	4
4-Sep	2	3	3	2	5	4	3	3	4	4	3	3	3	3	4	4	4	2	2	1	1	1	2	2	5
5-Sep	2	2	1	1	1	1	1	3	3	3	4	4	4	4	4	3	4	3	2	1	1	2	2	2	4
6-Sep	3	2	2	1	1	1	1	1	1	1	1	1	1	2	3	2	3	3	1	1	2	2	1	1	3
7-Sep	2	2	2	2	2	2	2	2	2	2	3	3	3	4	3	2	3	1	2	2	1	1	1	2	4
8-Sep	2	1	1	1	1	1	1	2	2	3	3	3	2	2	1	1	2	1	3	1	1	1	1	1	3
9-Sep	2	1	1	2	2	2	1	1	2	1	2	3	3	3	3	2	1	1	2	1	1	1	1	1	3
10-Sep	1	1	UO	1	2	1	1	1	3	2	3	3	4	4	3	3	3	3	2	1	2	2	2	2	4
11-Sep	2	2	3	2	1	1	1	1	4	5	4	5	7	6	6	5	6	4	3	1	2	1	2	1	7
12-Sep	1	1	1	1	2	1	1	2	2	2	2	2	3	3	3	2	3	2	1	1	2	1	2	1	3
13-Sep	2	2	2	1	1	1	2	3	3	4	4	4	5	6	7	5	6	6	4	4	4	2	1	2	7
14-Sep	2	2	3	3	4	2	3	2	3	3	4	4	5	5	4	4	4	3	1	2	2	1	2	1	5
15-Sep	2	1	1	1	1	1	1	1	3	2	4	4	4	4	4	4	4	3	2	3	3	3	2	2	4
16-Sep	1	2	1	1	3	1	1	2	2	2	2	2	3	4	4	4	3	2	1	2	1	1	1	3	4
17-Sep	2	1	2	2	2	2	2	2	1	2	2	4	3	4	4	3	3	2	2	2	2	1	2	1	4
18-Sep	2	1	1	2	2	1	1	1	2	3	3	4	5	6	5	3	5	3	1	1	1	2	2	1	6
19-Sep	1	2	2	2	2	2	2	3	3	3	4	4	4	3	3	3	3	2	0	2	2	3	1	3	4
20-Sep	3	1	1	1	2	2	2	2	1	1	1	2	3	3	2	2	2	4	3	3	2	2	1	2	4
21-Sep	1	2	2	1	1	1	2	1	2	3	3	6	7	7	6	6	6	4	3	2	2	2	2	2	7
22-Sep	1	1	2	1	1	2	1	1	2	3	3	4	4	5	4	5	4	5	2	2	2	3	3	3	5
23-Sep	2	2	2	2	2	1	2	1	8	4	5	5	8	7	7	6	6	5	3	2	3	3	3	3	8
24-Sep	4	4	4	3	4	3	4	3	3	4	3	3	3	3	2	2	2	1	1	1	2	1	1	2	4
25-Sep	3	2	2	2	2	2	2	2	2	1	4	2	2	3	2	3	2	2	2	2	2	2	1	1	4
26-Sep	1	1	1	2	2	2	2	1	3	2	3	4	4	2	2	2	1	2	3	2	2	2	2	2	4
27-Sep	1	2	1	2	2	1	3	2	1	1	3	3	3	4	4	4	3	3	2	2	2	1	2	2	4
28-Sep	3	1	3	3	1	3	2	2	3	2	2	3	3	2	2	2	3	3	2	2	2	2	2	2	3
29-Sep	2	3	3	2	1	1	2	2	1	2	2	3	2	2	4	2	2	1	1	3	2	1	1	1	4
30-Sep	1	0	1	2	1	1	1	2	2	1	1	1	2	2	3	3	2	1	1	1	1	1	3	UO	3
	4	4	4	3	5	4	4	3	8	5	5	6	8	7	7	7	7	6	4	4	4	3	4	3	

Diurnal Maximum

UO - Unstable Operation



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Ells River - September 2023

Direction of Maximum Speed: 162 deg on Sep 23 14:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 158.1 deg on Sep 23	Hours of Data: 718
Direction of Minimum Speed: 254 deg on Sep 10 02:00	Direction of Minimum Daily Speed Average: 2.1 deg on Sep 8
Direction of Minimum Speed: 254 deg on Sep 10 02:00	Hours of Missing Data: 2
Monthly Average Direction: 195.9 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-Sep	277	265	253	228	224	232	231	224	210	212	221	226	222	220	212	209	215	222	217	207	205	223	234	235	222.1
2-Sep	243	232	240	274	283	283	279	280	277	264	269	254	276	285	297	286	277	272	253	245	222	232	224	225	264.8
3-Sep	234	230	224	222	197	179	181	170	160	228	187	227	248	312	355	60	146	187	211	308	303	304	309	277	234.8
4-Sep	228	239	239	219	302	325	317	315	325	323	326	307	309	319	314	332	328	326	92	151	202	245	249	229	301.5
5-Sep	235	205	174	172	163	164	167	169	175	190	173	167	173	156	164	157	168	158	156	159	148	158	156	173	168.0
6-Sep	206	3	71	81	95	89	96	79	100	108	144	166	248	274	141	169	167	214	230	207	216	233	236	207	168.2
7-Sep	212	232	239	239	238	228	214	224	228	205	206	202	162	170	164	140	116	161	303	313	310	284	269	202	210.7
8-Sep	207	179	178	190	189	188	181	181	183	188	165	220	316	22	28	42	16	11	357	300	285	280	267	287	190.0
9-Sep	268	221	227	170	193	201	173	180	163	166	160	162	158	155	163	144	149	135	111	138	151	285	267	248	162.9
10-Sep	306	254	UO	241	199	189	222	240	157	129	138	141	150	140	144	129	136	140	138	138	143	148	147	149	144.1
11-Sep	150	156	167	179	229	225	170	142	161	165	158	164	173	177	169	168	166	179	165	151	160	171	165	180	167.4
12-Sep	172	187	217	218	227	168	171	175	168	196	174	167	154	163	177	191	211	222	223	210	189	199	204	187	185.2
13-Sep	204	222	213	194	191	189	201	215	215	216	225	228	233	229	234	245	235	266	255	239	242	214	203	208	226.8
14-Sep	230	251	278	302	294	287	272	279	294	279	283	305	289	312	321	318	312	306	302	272	285	275	262	231	292.5
15-Sep	222	176	175	188	174	181	190	163	175	171	177	171	170	159	163	166	165	166	156	161	161	157	158	181	168.1
16-Sep	170	186	183	185	198	186	194	192	213	211	206	195	169	213	199	228	219	197	177	186	193	212	224	160	195.7
17-Sep	168	169	196	173	186	188	269	295	288	163	189	149	151	177	189	175	194	201	202	217	215	184	212	189	185.8
18-Sep	179	177	183	194	191	174	164	169	203	212	225	232	238	237	234	217	220	213	171	162	190	219	158	167	203.2
19-Sep	172	197	183	201	178	188	195	199	202	202	197	202	210	222	202	186	193	181	189	252	294	308	287	284	205.7
20-Sep	276	273	282	278	305	191	191	190	226	342	8	1	13	41	40	57	18	320	283	215	335	264	223	199	321.6
21-Sep	223	193	182	177	181	191	190	177	178	177	184	183	192	193	193	194	190	187	174	160	164	171	174	168	183.4
22-Sep	163	159	175	194	166	180	193	182	195	205	203	178	181	169	170	173	168	164	166	164	159	160	163	163	172.3
23-Sep	154	160	175	199	284	227	197	315	149	146	161	146	155	162	169	163	163	160	156	150	151	152	145	141	158.1
24-Sep	147	147	155	160	155	153	152	157	164	169	178	182	219	225	222	185	187	167	169	179	199	216	213	230	171.9
25-Sep	229	226	227	222	219	197	182	214	249	314	32	33	77	64	38	28	34	17	14	358	351	360	354	354	352.7
26-Sep	357	356	352	356	338	345	310	211	160	178	188	167	172	167	183	207	210	208	178	229	186	250	277	257	211.2
27-Sep	203	232	223	187	211	204	241	226	170	199	125	161	223	226	232	235	253	340	323	351	348	330	305	288	242.1
28-Sep	278	318	344	5	1	351	27	30	15	15	3	11	356	8	5	20	6	358	357	12	7	351	350	348	3.2
29-Sep	351	10	351	294	242	203	246	253	305	354	352	357	5	9	354	353	9	14	349	348	357	346	338	213	349.6
30-Sep	195	182	208	196	189	184	166	182	187	198	179	170	175	140	147	167	179	161	148	155	164	178	185	UO	172.5

200.3 201.1 203.7 204.5 209.2 198.3 196.5 197.9 196.7 194.6 190.6 186.3 192.9 192.2 192.2 186.3 190.5 201.5 189.0 189.5 194.4 209.6 203.4 198.7

Diurnal Average

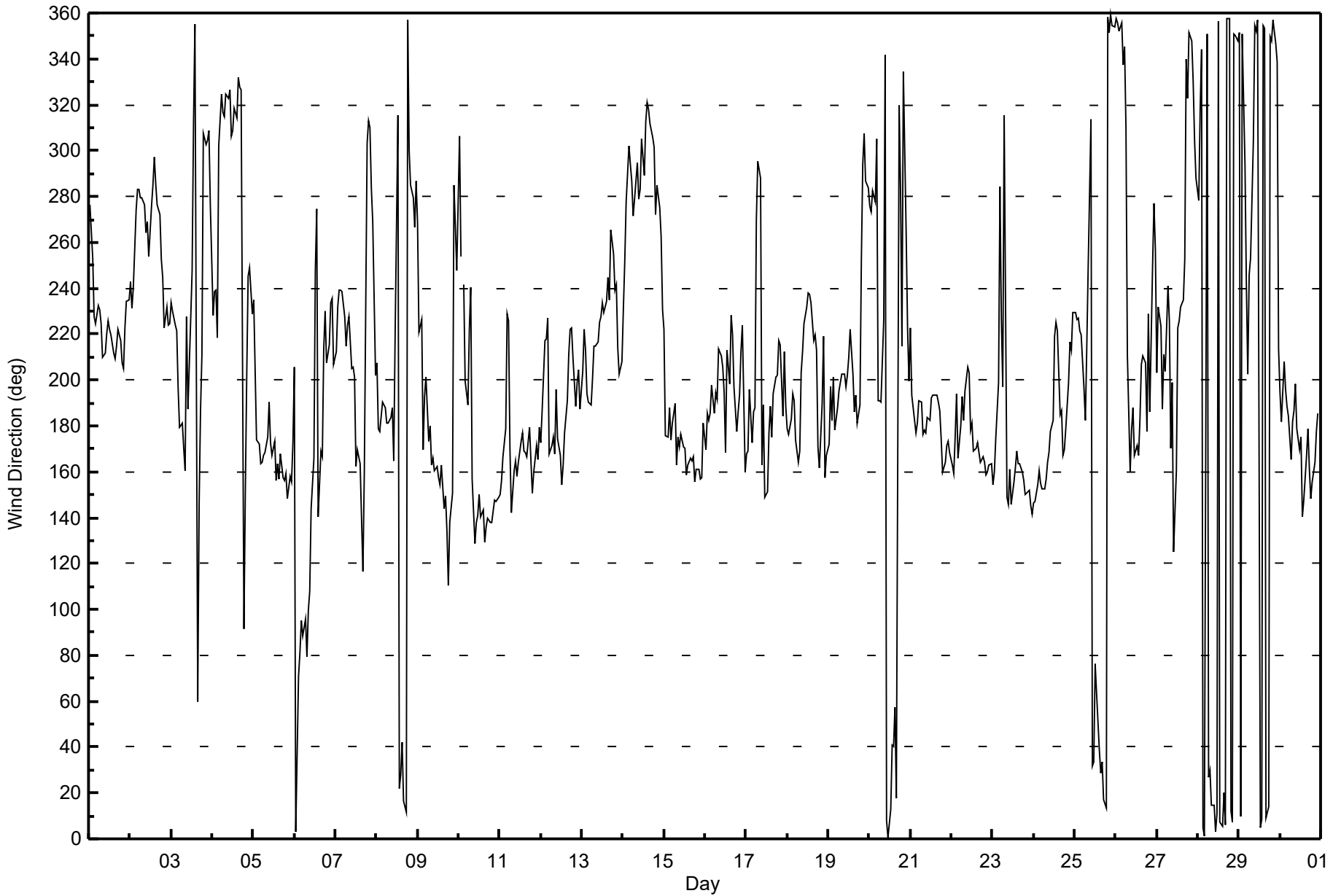
UO - Unstable Operation

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Ells River - September 2023





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Ells River - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 94 deg on Sep 8 13:00	Hours of Data: 718
Minimum Value: 3 deg on Sep 16 19:00	Hours of Missing Data: 2
Percentiles: P ₁ = 6 P ₁₀ = 9 Q ₁ = 13 Median = 19 Q ₃ = 26 P ₉₀ = 37 P ₉₉ = 81	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-Sep	14	17	17	24	18	16	16	20	22	21	21	23	25	23	22	24	24	22	19	16	14	20	22	20	25
2-Sep	27	24	25	21	18	17	19	19	21	22	54	29	20	21	16	19	20	19	21	24	18	21	18	19	54
3-Sep	19	19	18	19	16	11	16	25	26	67	59	36	26	28	20	45	16	19	27	12	9	16	18	21	67
4-Sep	20	22	26	32	27	13	13	13	13	14	15	15	16	26	26	29	44	51	66	25	24	15	20	14	66
5-Sep	37	22	9	12	10	11	9	12	16	27	26	27	24	21	24	16	23	14	10	8	7	8	12	18	37
6-Sep	50	22	24	13	16	13	16	15	15	12	28	38	24	49	89	33	21	19	20	10	18	19	19	33	89
7-Sep	20	17	15	15	14	16	23	21	24	25	26	27	64	42	22	19	25	35	51	36	9	30	24	58	64
8-Sep	47	20	11	9	8	10	9	12	13	21	23	76	94	11	11	8	9	7	17	17	7	12	41	40	94
9-Sep	46	60	51	83	68	39	9	11	16	22	24	28	18	28	29	24	11	9	10	9	35	30	39	45	83
10-Sep	37	38	UO	16	45	9	52	60	80	21	24	15	19	14	17	12	9	8	6	6	7	8	7	7	80
11-Sep	7	10	12	16	27	25	15	19	16	15	13	15	17	16	14	15	15	14	14	7	10	8	8	7	27
12-Sep	5	10	33	33	19	22	10	12	18	22	27	20	14	19	19	16	22	17	15	15	20	17	17	11	33
13-Sep	23	13	19	17	14	11	20	24	24	20	22	26	27	28	26	25	23	30	27	25	22	20	18	24	30
14-Sep	19	24	19	16	17	14	21	20	20	19	23	16	27	15	16	18	19	13	10	25	11	11	14	14	27
15-Sep	24	27	15	9	13	9	13	20	16	18	19	19	20	14	16	15	12	12	10	9	10	9	11	11	27
16-Sep	11	20	10	8	30	8	11	14	28	23	18	37	22	28	41	30	24	14	3	7	10	14	22	54	54
17-Sep	12	14	25	17	17	57	43	84	30	90	59	20	15	22	26	29	23	14	12	18	21	21	26	30	90
18-Sep	34	10	11	18	21	9	11	16	20	20	23	25	26	24	21	21	22	20	13	9	19	30	33	23	34
19-Sep	12	29	25	24	21	12	13	14	16	17	20	18	28	33	38	35	28	10	7	34	9	13	15	22	38
20-Sep	22	29	24	27	33	89	23	31	30	55	45	32	28	20	20	25	16	15	39	41	71	49	27	34	89
21-Sep	50	24	9	6	7	9	13	13	15	19	19	18	17	18	19	18	15	13	11	9	10	10	9	9	50
22-Sep	7	9	22	13	7	14	12	19	22	27	29	17	16	17	16	16	13	11	12	9	9	10	10	9	29
23-Sep	7	8	12	20	27	36	91	37	64	11	14	16	15	14	17	13	13	12	11	9	9	10	9	8	91
24-Sep	9	9	12	11	10	10	10	11	11	14	17	25	22	25	23	19	13	9	11	4	27	12	14	14	27
25-Sep	17	17	15	17	20	15	9	19	31	60	54	35	32	40	15	17	9	7	7	12	10	14	11	11	60
26-Sep	12	12	13	21	28	26	75	40	61	14	20	26	24	17	18	26	22	41	49	36	39	32	17	35	75
27-Sep	28	26	40	40	32	45	23	39	35	81	32	42	25	26	37	26	22	46	36	13	14	12	29	32	81
28-Sep	24	73	21	11	36	14	19	13	8	11	13	13	22	13	11	7	12	16	11	10	17	12	10	10	73
29-Sep	11	25	17	32	37	56	62	25	29	13	14	13	15	17	20	15	17	12	11	17	16	18	37	27	62
30-Sep	28	11	9	25	14	14	24	62	36	14	10	16	29	36	17	17	18	19	5	5	7	5	58	UO	62
	50	73	51	83	68	89	91	84	80	90	59	76	94	49	89	45	44	51	66	41	71	49	58	58	

Diurnal Maximum

UO - Unstable Operation



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS505 SAWBONES BAY SEPTEMBER 2023

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

October 30, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - SAWBONES BAY (AMS505)
 SEPTEMBER 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	686	34	34	100	13	0	5.2	0
H2S (ppb) Average	685	35	35	100	1.6	0	0.9	0
NO2 (ppb) Average	684	36	36	100	16.3	0	10.8	-
NO (ppb) Average	684	36	36	100	11.1	-	4.4	-
NOX (ppb) Average	684	36	36	100	25.2	-	15.2	-
Temperature 2 m (C) Average	720	0	0	100	25.2	-	19.2	-
Relative Humidity (%) Average	690	0	30	95.83	100	-	88.4	-
Wind Speed 10 m (km/h) Average	720	0	0	100	26	-	18	-
Wind Direction 10 m (deg) Average	720	0	0	100	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - SAWBONES BAY (AMS505)
 SEPTEMBER 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	686	1	1.8	-	0	0.1	0.1	0.3	1	2.8	13
H2S (ppb) Average	685	0.27	0.2	-	0	0.1	0.1	0.2	0.3	0.6	1.6
NO2 (ppb) Average	684	2.38	2.9	-	0	0.1	0.5	1.5	3	5.9	16.3
NO (ppb) Average	684	0.83	1.7	-	0	0	0	0.1	0.7	3	11.1
NOX (ppb) Average	684	3.21	4.4	-	0	0.1	0.5	1.6	3.8	8.6	25.2
Temperature 2 m (C) Average	720	12.55	5.3	-	-0.3	5.8	8.1	12.5	16.4	20.1	25.2
Relative Humidity (%) Average	690	67.59	18.7	-	28.9	39.4	53.2	69.3	82.9	91.6	100
Wind Speed 10 m (km/h) Average	720	10.2	5	-	0	4	6	10	14	17	26
Wind Direction 10 m (deg) Average	720	216.2	0	-	0	-	-	-	-	-	0

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - SAWBONES BAY (AMS505)
SEPTEMBER 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
Relative Humidity	10 Sep 2023 06:00	10 Sep 2023 06:00	1	Sensor operated out of range
Relative Humidity	17 Sep 2023 02:00	17 Sep 2023 05:00	4	Sensor operated out of range
Relative Humidity	21 Sep 2023 05:00	21 Sep 2023 05:00	1	Sensor operated out of range
Relative Humidity	21 Sep 2023 07:00	21 Sep 2023 07:00	1	Sensor operated out of range
Relative Humidity	25 Sep 2023 00:00	25 Sep 2023 07:00	8	Sensor operated out of range
Relative Humidity	28 Sep 2023 02:00	28 Sep 2023 02:00	1	Sensor operated out of range
Relative Humidity	28 Sep 2023 04:00	28 Sep 2023 05:00	2	Sensor operated out of range
Relative Humidity	28 Sep 2023 21:00	29 Sep 2023 08:00	12	Sensor operated out of range



Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 13.0 ppb on Sep 12 22:00	Maximum Daily Average: 5.2 ppb on Sep 2		Hours of Data:	686
Minimum Value: 0.0 ppb on Sep 6 04:00	Minimum Daily Average: 0.1 ppb on Sep 29		Hours of Missing Data:	34
Maximum Diurnal Average: 1.4 ppb at hour 12	Minimum Diurnal Average: 0.5 ppb at hour 2		Hours of Calibration:	34
Monthly Average: 1.00 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.1 Median = 0.3 Q ₃ = 1.0 P ₉₀ = 2.8 P ₉₉ = 9.9		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-Sep	0.3	0.4	0.3	0.5	0.8	Z	12.0	7.2	3.9	1.1	1.5	2.0	2.4	3.5	1.2	1.8	1.0	0.9	1.3	0.8	0.2	2.0	2.2	1.4	2.1	12.0
2-Sep	Z	3.4	3.6	4.2	8.2	11.0	12.4	1.0	0.6	0.9	2.3	7.0	7.0	7.2	1.6	0.7	5.8	10.6	12.3	3.9	4.4	4.6	4.1	1.9	5.2	12.4
3-Sep	7.2	Z	1.1	1.0	1.1	0.7	0.7	0.5	0.5	0.5	1.0	2.7	0.9	1.0	1.6	1.6	1.7	0.7	0.4	1.1	0.4	4.1	5.4	0.6	1.6	7.2
4-Sep	0.4	0.4	Z	0.4	0.4	0.3	0.3	0.3	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.6	0.6	2.9	4.8	1.4	2.9	0.8	4.8
5-Sep	5.0	0.7	0.3	Z	0.3	0.3	0.2	0.5	1.1	0.6	0.4	0.4	0.6	1.0	0.8	0.5	0.4	0.3	0.2	0.3	0.2	0.2	0.1	0.1	0.6	5.0
6-Sep	0.0	0.1	0.1	0.0	Z	0.0	0.0	0.0	0.0	3.2	4.9	4.2	4.5	3.7	0.5	0.6	0.7	1.5	1.1	0.2	0.2	0.2	0.0	0.1	1.1	4.9
7-Sep	0.0	0.0	0.0	1.2	1.4	Z	0.3	0.4	0.7	0.5	0.9	2.8	0.9	3.4	1.8	1.4	1.3	1.0	0.8	0.7	0.4	0.3	0.2	0.2	0.9	3.4
8-Sep	Z	0.3	0.2	0.2	0.2	0.1	0.2	0.6	1.9	2.8	2.2	2.7	0.6	1.3	0.4	0.5	0.9	0.0	0.1	0.1	0.1	0.0	0.4	0.4	0.7	2.8
9-Sep	0.1	Z	2.2	2.3	0.6	0.6	0.4	0.7	0.4	1.0	0.7	0.5	0.3	0.2	0.2	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.5	2.3
10-Sep	0.1	0.1	Z	0.1	0.0	0.0	0.1	0.1	0.2	0.5	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.5
11-Sep	0.0	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.5	0.5	0.3	0.3	0.2	0.2	0.3	0.4	0.2	0.1	0.2	0.3	0.3	0.2	0.5
12-Sep	0.2	0.2	0.2	0.3	Z	0.4	0.3	0.3	0.4	0.5	1.2	2.1	1.4	1.5	0.8	1.3	1.1	0.4	0.4	1.5	3.1	13.0	3.5	2.9	1.6	13.0
13-Sep	2.0	0.6	0.5	0.0	0.2	Z	1.8	1.1	2.1	4.6	3.9	2.7	2.1	2.5	1.5	4.8	4.8	3.0	1.7	3.6	0.1	2.0	4.4	0.6	2.2	4.8
14-Sep	Z	1.4	3.5	1.7	0.5	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.6	1.6	0.5	3.5
15-Sep	0.2	Z	1.1	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.2	0.2	0.1	0.4	0.7	0.3	0.1	0.4	0.3	0.2	0.3	0.4	0.2	1.1
16-Sep	0.6	0.5	Z	0.4	0.4	0.3	0.2	0.3	2.4	1.8	1.5	1.0	1.0	0.4	0.8	1.3	0.4	0.4	0.6	0.3	0.2	0.0	0.0	0.0	0.6	2.4
17-Sep	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	1.6	2.6	1.1	0.7	0.8	0.6	0.8	0.7	4.7	12.5	0.6	1.2	12.5
18-Sep	0.4	0.1	0.0	0.1	Z	0.2	0.2	0.3	0.6	9.8	8.5	5.0	4.1	4.4	2.8	2.0	5.4	8.5	4.5	0.2	0.5	1.8	0.5	0.7	2.6	9.8
19-Sep	1.0	1.9	0.4	0.2	0.1	Z	0.5	2.9	6.4	1.4	0.7	2.2	1.9	2.7	2.3	0.9	4.3	0.8	0.2	0.2	0.2	0.1	0.2	0.9	1.4	6.4
20-Sep	Z	0.6	4.9	8.6	4.2	1.3	0.3	0.2	0.2	1.1	1.5	1.5	1.1	1.0	0.7	0.5	0.2	0.1	0.3	0.3	0.2	0.5	0.3	0.4	1.3	8.6
21-Sep	0.2	Z	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.3	1.1	0.4	0.4	0.1	0.1	0.1	0.1	0.3	0.6	0.0	0.0	0.1	0.0	0.0	0.2	1.1
22-Sep	0.1	0.1	Z	0.1	0.0	0.1	0.1	0.2	C	C	C	C	0.2	0.1	0.1	0.1	0.1	0.4	0.4	0.3	0.2	0.1	0.2	0.3	0.2	0.4
23-Sep	0.3	0.4	0.5	Z	0.5	0.5	0.3	0.3	0.4	0.2	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.5
24-Sep	0.2	0.2	0.2	0.3	Z	0.3	0.3	0.2	0.2	0.2	0.2	0.6	0.8	0.6	0.9	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.2	0.2	0.3	0.9
25-Sep	0.2	0.2	0.1	0.1	0.1	Z	0.2	0.2	0.3	0.8	0.9	0.3	0.1	0.0	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.2	0.9
26-Sep	Z	0.1	0.1	0.1	0.1	0.2	0.4	0.5	0.7	0.7	0.6	0.5	0.5	0.7	0.6	0.6	2.0	0.4	0.4	1.4	0.8	0.5	0.4	0.8	0.6	2.0
27-Sep	1.1	Z	0.4	2.1	4.6	0.9	5.7	5.4	5.3	4.3	1.8	0.6	0.2	0.2	0.3	1.2	3.8	1.2	1.0	0.6	0.5	0.5	0.8	0.3	1.9	5.7
28-Sep	0.3	0.2	Z	0.2	1.0	2.3	1.1	1.3	2.0	0.9	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.4	0.3	0.3	0.5	0.2	0.1	0.6	2.3
29-Sep	0.0	0.0	0.1	Z	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.2	0.1	0.4	0.4	0.2	0.3	0.6	0.1	0.6
30-Sep	0.4	0.4	0.4	0.5	Z	0.4	0.4	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.0	0.1	0.0	0.1	0.2	0.5

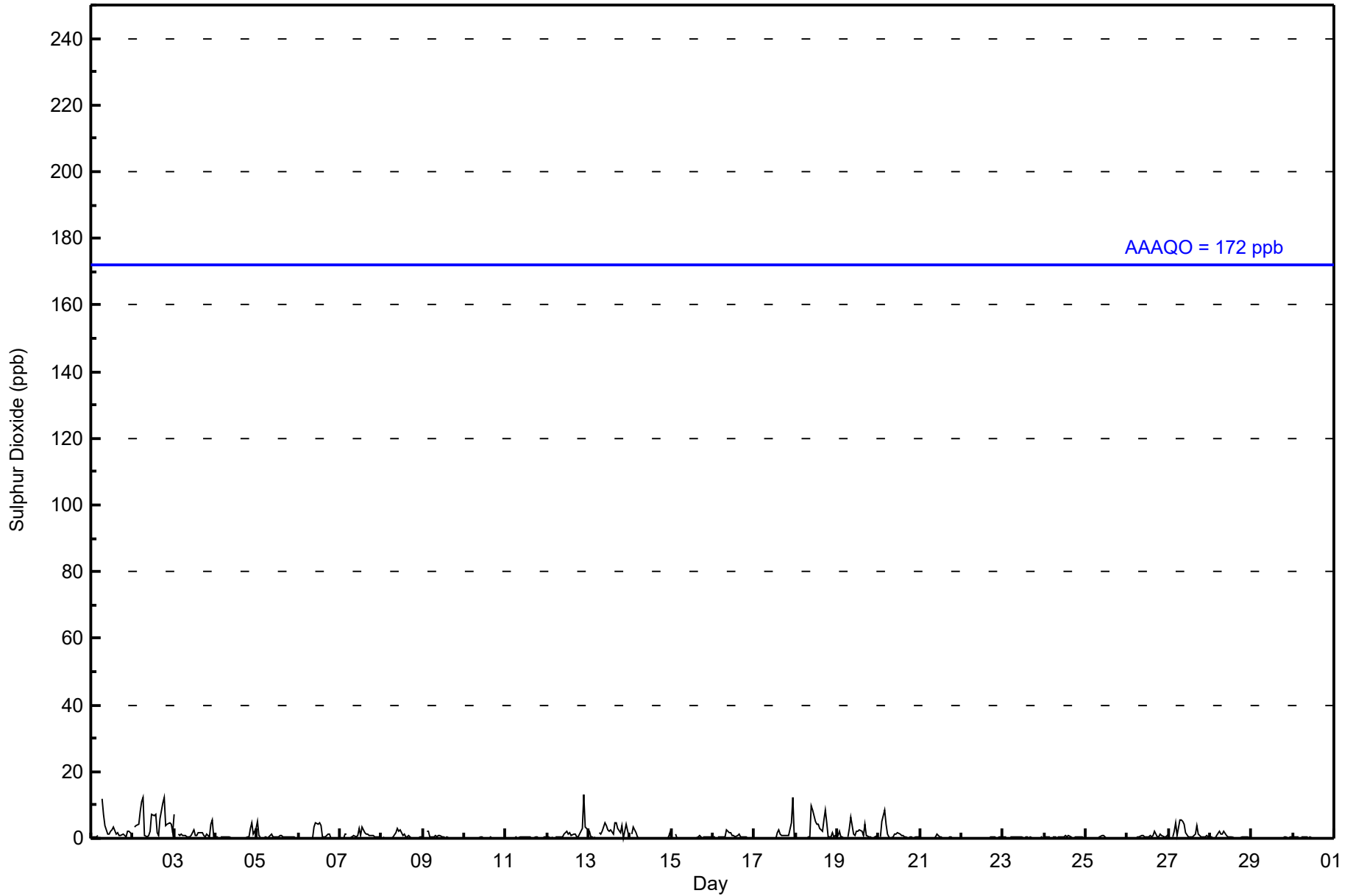
0.8	0.5	0.8	1.0	1.0	0.8	1.3	0.8	1.1	1.3	1.3	1.4	1.1	1.3	0.8	0.8	1.2	1.1	1.0	0.6	0.6	1.4	1.3	0.6	Diurnal Average	
7.2	3.4	4.9	8.6	8.2	11.0	12.4	7.2	6.4	9.8	8.5	7.0	7.0	7.2	2.8	4.8	5.8	10.6	12.3	3.9	4.4	13.0	12.5	2.9	Diurnal Maximum	

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



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Sawbones Bay - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Sawbones Bay - September 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	679	98.98	98.98
11 - 20	7	1.02	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: 686

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Sawbones Bay - September 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	25	12	5	4	17	29	35	90	117	64	62	53	64	67	23	12	679
11 - 20	0	0	0	0	0	0	0	0	0	0	0	1	6	0	0	0	7
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	25	12	5	4	17	29	35	90	117	64	62	54	70	67	23	12	686

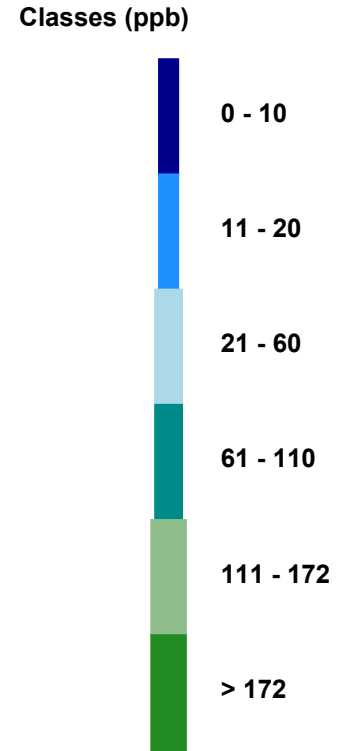
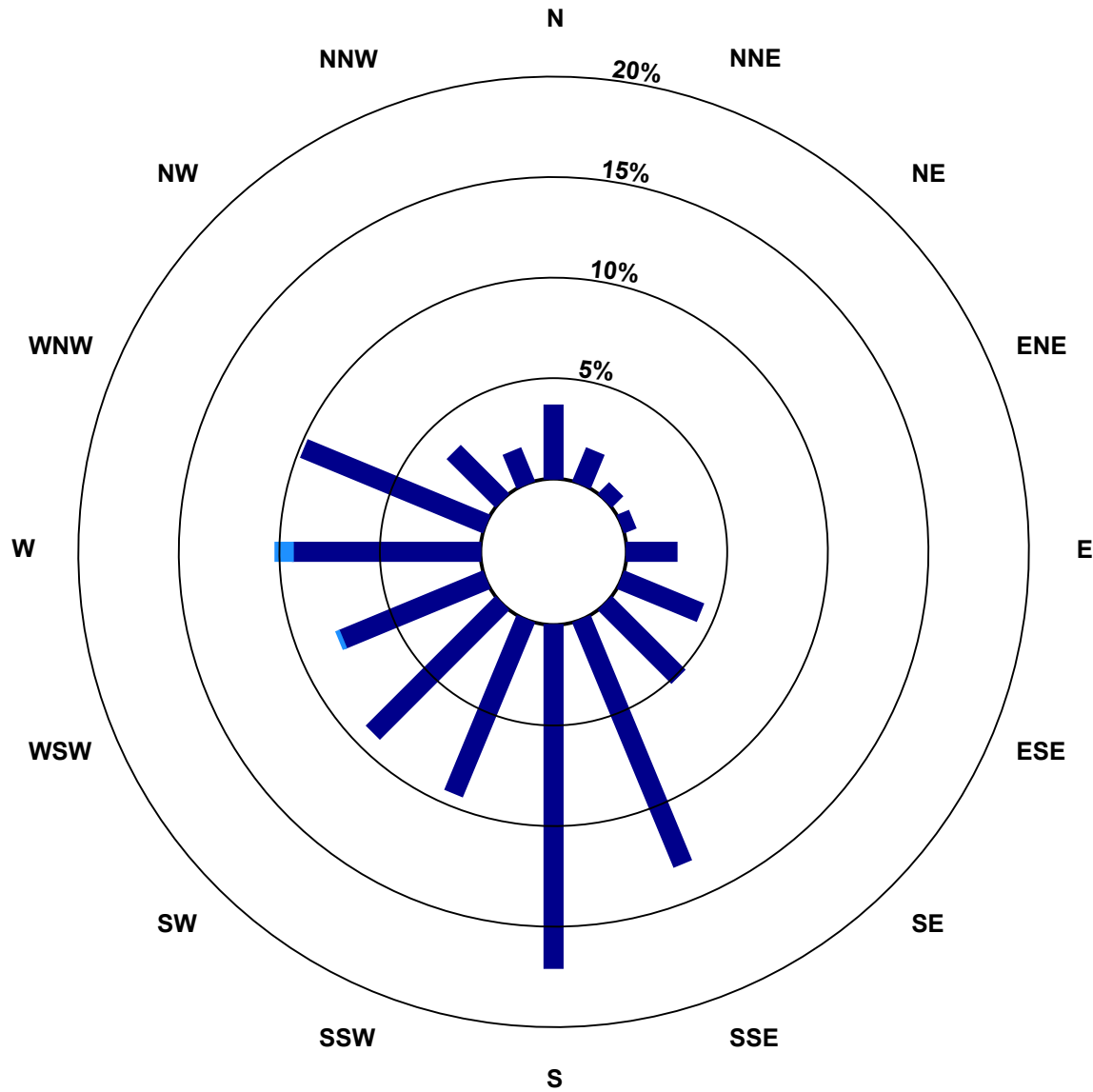
Total Number of Valid Hours: 686

Total Number of Hours: 720

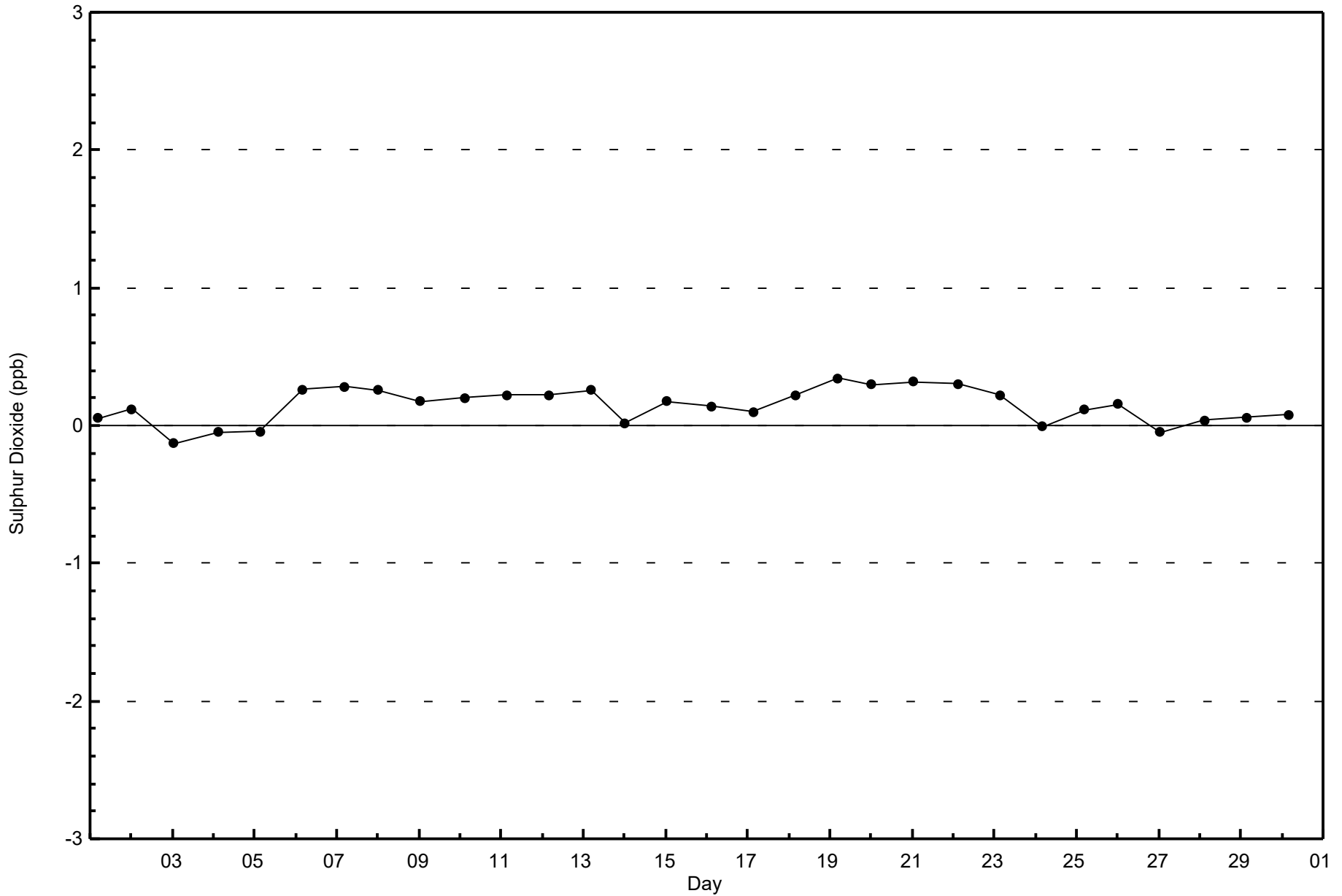


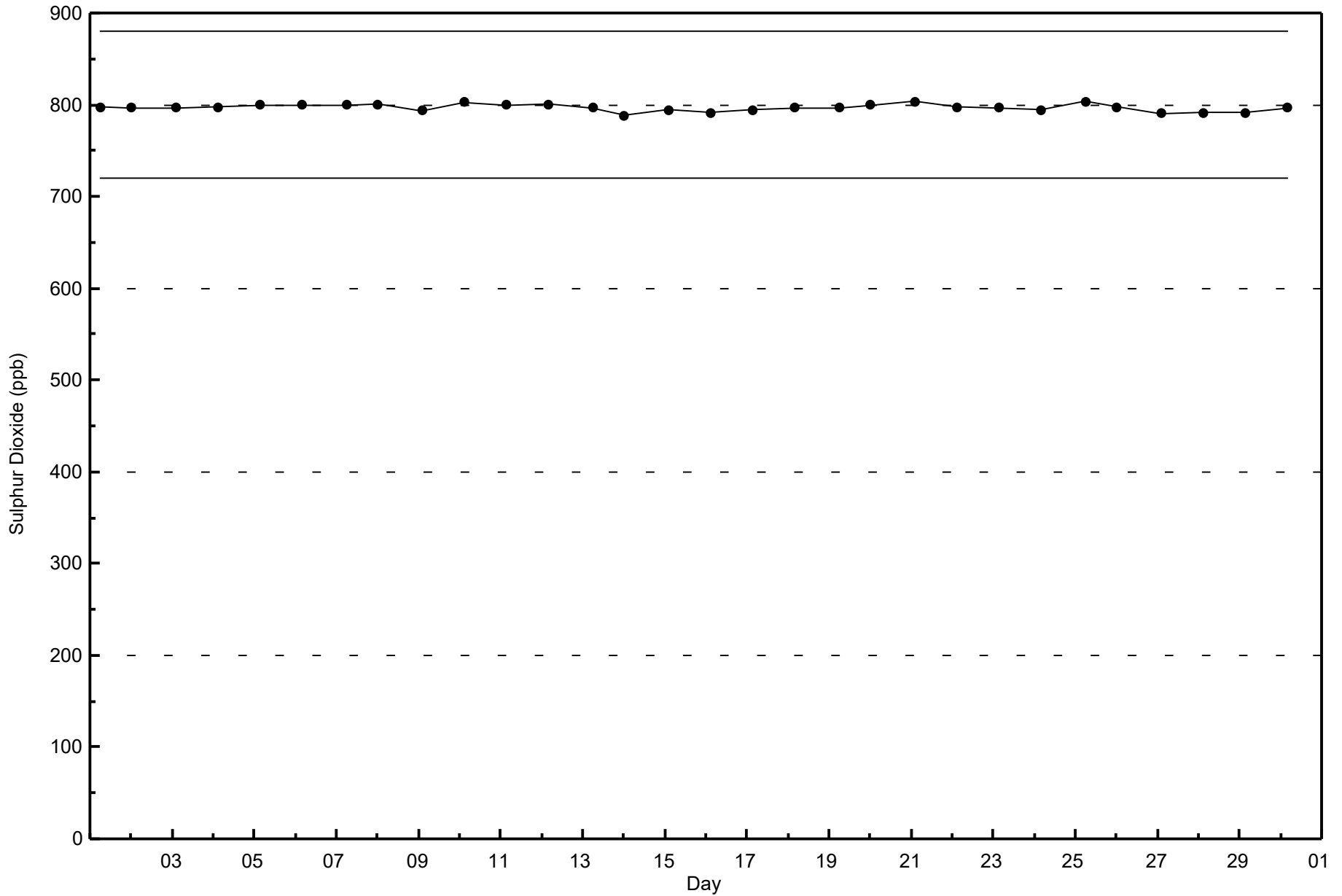
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Sulphur Dioxide (SO₂) - ppb
Sawbones Bay



Total Number of Valid Hours: 686







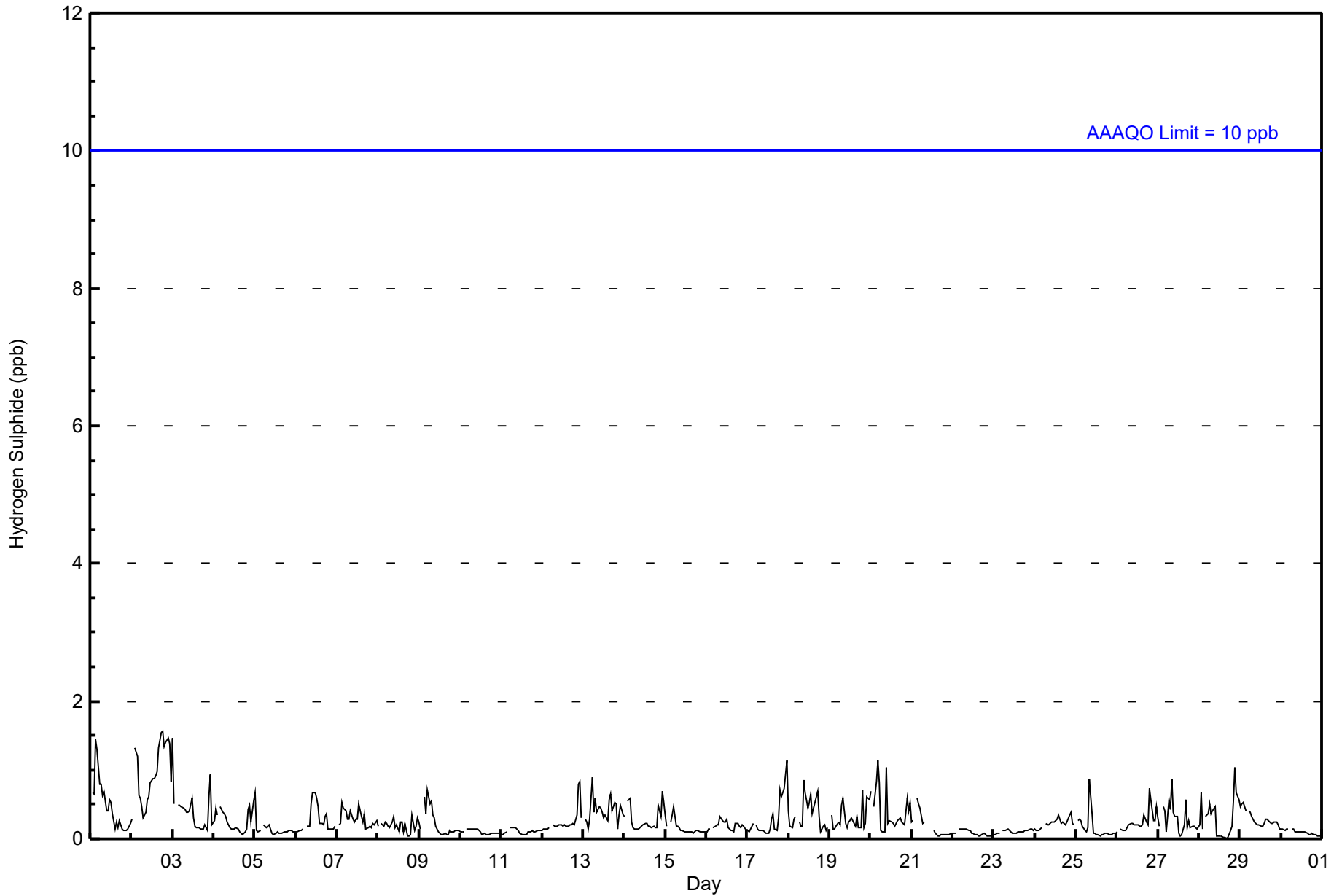
Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H2S) - ppb

Sawbones Bay - September 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		720																		
Maximum Value: 1.6 ppb on Sep 2 19:00		Maximum Daily Average: 0.9 ppb on Sep 2				Hours of Data:		685																		
Minimum Value: 0.0 ppb on Sep 28 17:00		Minimum Daily Average: 0.1 ppb on Sep 22				Hours of Missing Data:		35																		
Maximum Diurnal Average: 0.4 ppb at hour 4		Minimum Diurnal Average: 0.2 ppb at hour 15				Hours of Calibration:		35																		
Monthly Average: 0.27 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.1 Median = 0.2 Q ₃ = 0.3 P ₉₀ = 0.6 P ₉₉ = 1.3				Percent Operational Time:		100.0																		
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Sep	Z	0.7	0.6	1.5	1.3	0.8	0.8	0.6	0.7	0.4	0.4	0.6	0.5	0.4	0.1	0.2	0.2	0.3	0.1	0.1	0.1	0.1	0.1	0.2	0.5	1.5
2-Sep	0.3	Z	1.3	1.2	0.6	0.6	0.5	0.3	0.4	0.6	0.6	0.8	0.9	0.9	0.9	1.0	1.3	1.6	1.6	1.3	1.4	1.5	1.4	0.8	0.9	1.6
3-Sep	1.5	0.5	Z	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.6	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.1	0.6	0.9	0.2	0.4	1.5
4-Sep	0.3	0.4	0.4	Z	0.5	0.4	0.4	0.3	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4	0.5	0.2	0.5	0.3	0.5
5-Sep	0.7	0.1	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.7
6-Sep	0.1	0.1	0.1	0.1	0.1	Z	0.2	0.2	0.2	0.5	0.7	0.7	0.6	0.5	0.2	0.2	0.2	0.3	0.4	0.1	0.1	0.1	0.1	0.2	0.3	0.7
7-Sep	Z	0.2	0.2	0.5	0.5	0.4	0.3	0.3	0.4	0.3	0.2	0.3	0.3	0.5	0.3	0.2	0.4	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.5
8-Sep	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.1	0.2	0.3	0.1	0.2	0.0	0.0	0.1	0.3	0.1	0.2	0.3	0.2	0.3
9-Sep	0.2	0.1	Z	0.6	0.4	0.7	0.5	0.6	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.7
10-Sep	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
11-Sep	0.1	0.1	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
12-Sep	0.1	0.1	0.1	0.1	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.8	0.8	0.3	0.3	0.8
13-Sep	Z	0.3	0.2	0.2	0.3	0.9	0.4	0.6	0.4	0.5	0.5	0.4	0.3	0.4	0.3	0.6	0.6	0.4	0.5	0.5	0.2	0.3	0.5	0.3	0.4	0.9
14-Sep	0.3	Z	0.5	0.6	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.5	0.3	0.7	0.5	0.3	0.7
15-Sep	0.3	0.2	Z	0.2	0.3	0.5	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.5
16-Sep	0.1	0.1	0.2	Z	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.3	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.3
17-Sep	0.1	0.1	0.1	0.2	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.4	0.1	0.1	0.3	0.7	0.6	0.7	0.9	1.1	0.3	1.1
18-Sep	0.4	0.2	0.2	0.3	0.3	Z	0.2	0.2	0.2	0.8	0.7	0.4	0.5	0.7	0.4	0.5	0.6	0.7	0.3	0.1	0.2	0.2	0.1	0.2	0.4	0.8
19-Sep	Z	0.4	0.1	0.1	0.2	0.2	0.2	0.5	0.6	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.3	0.2	0.2	0.7	0.2	0.2	0.6	0.6	0.3	0.7
20-Sep	0.7	Z	0.5	0.8	1.1	0.8	0.1	0.1	0.1	1.0	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.6	0.4	0.5	0.4	1.1
21-Sep	0.2	0.3	Z	0.6	0.5	0.5	0.2	0.2	C	C	C	C	C	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.6
22-Sep	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	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1
23-Sep	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
24-Sep	0.1	0.1	0.1	0.1	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.2	0.2	0.2	0.4
25-Sep	Z	0.3	0.3	0.3	0.2	0.1	0.1	0.2	0.9	0.4	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.9
26-Sep	0.1	Z	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	0.3	0.2	0.2	0.7	0.6	0.3	0.3	0.5	0.2	0.7
27-Sep	0.3	0.2	Z	0.5	0.4	0.1	0.6	0.4	0.9	0.4	0.3	0.3	0.1	0.0	0.1	0.2	0.6	0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.3	0.9
28-Sep	0.2	0.7	0.2	Z	0.3	0.4	0.5	0.4	0.4	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.5	1.0	0.7	0.6	0.3	1.0
29-Sep	0.5	0.5	0.5	0.4	Z	0.4	0.4	0.3	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	0.1	0.3	0.5
30-Sep	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	0.1	0.1	0.0	0.0	0.0	0.1	0.1
																								Diurnal Average		
																								Diurnal Maximum		
																								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 0.3 0.3 0.3 0.3 0.3		
																								1.5 0.7 1.3 1.5 1.3 0.9 0.8 0.6 0.9 1.0 0.7 0.8 0.9 0.9 0.9 1.0 1.3 1.6 1.6 1.3 1.4 1.5 1.4 1.1		
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 - September 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	685	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: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Sawbones Bay - September 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	25	12	5	4	16	30	34	91	116	63	61	55	71	66	23	13	685
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	25	12	5	4	16	30	34	91	116	63	61	55	71	66	23	13	685

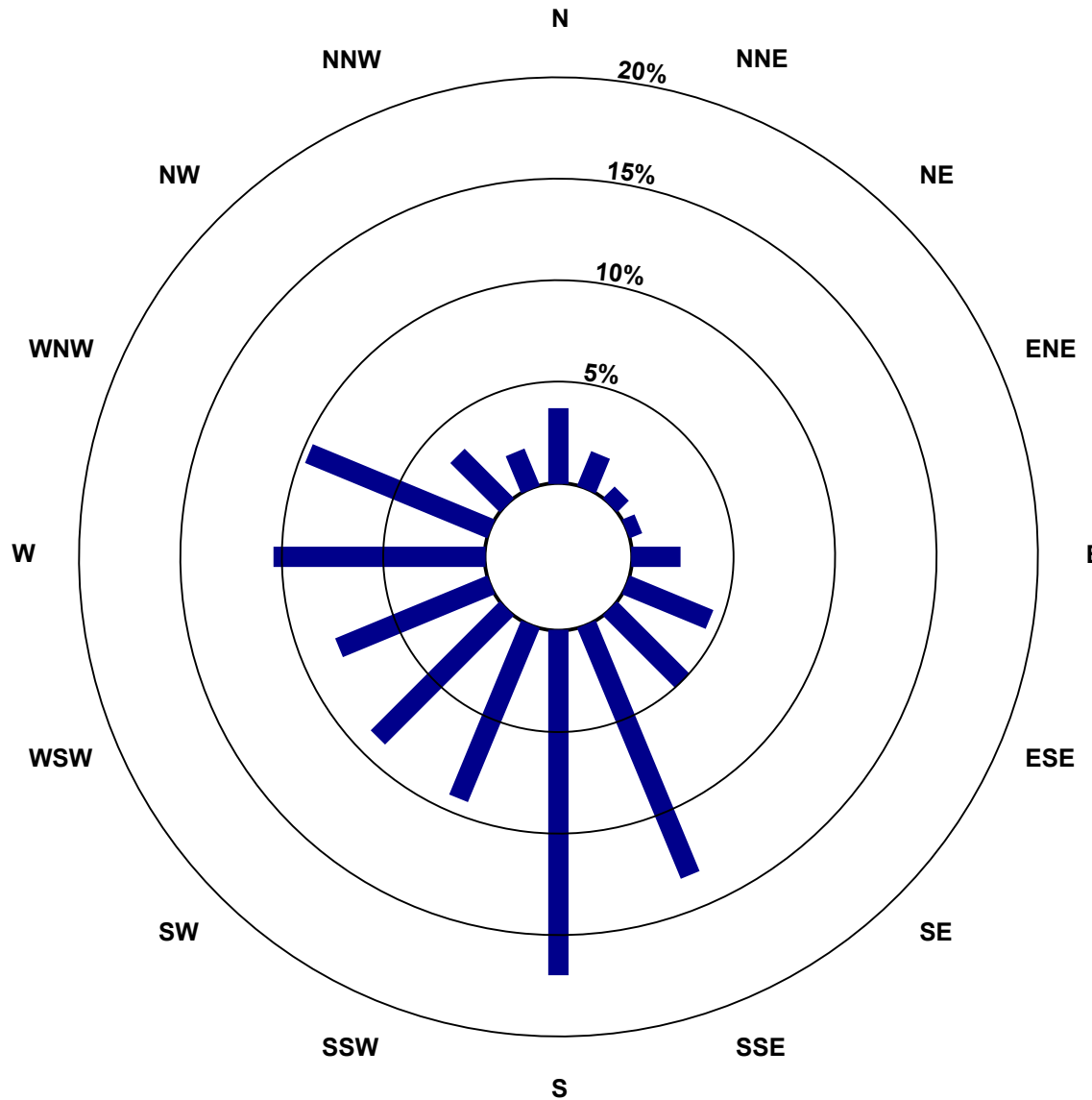
Total Number of Valid Hours: 685

Total Number of Hours: 720

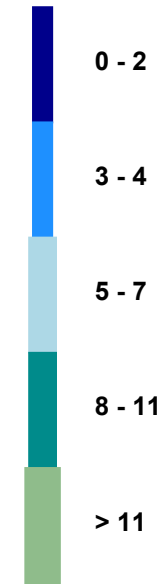


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Hydrogen Sulphide (H₂S) - ppb
Sawbones Bay



Classes (ppb)

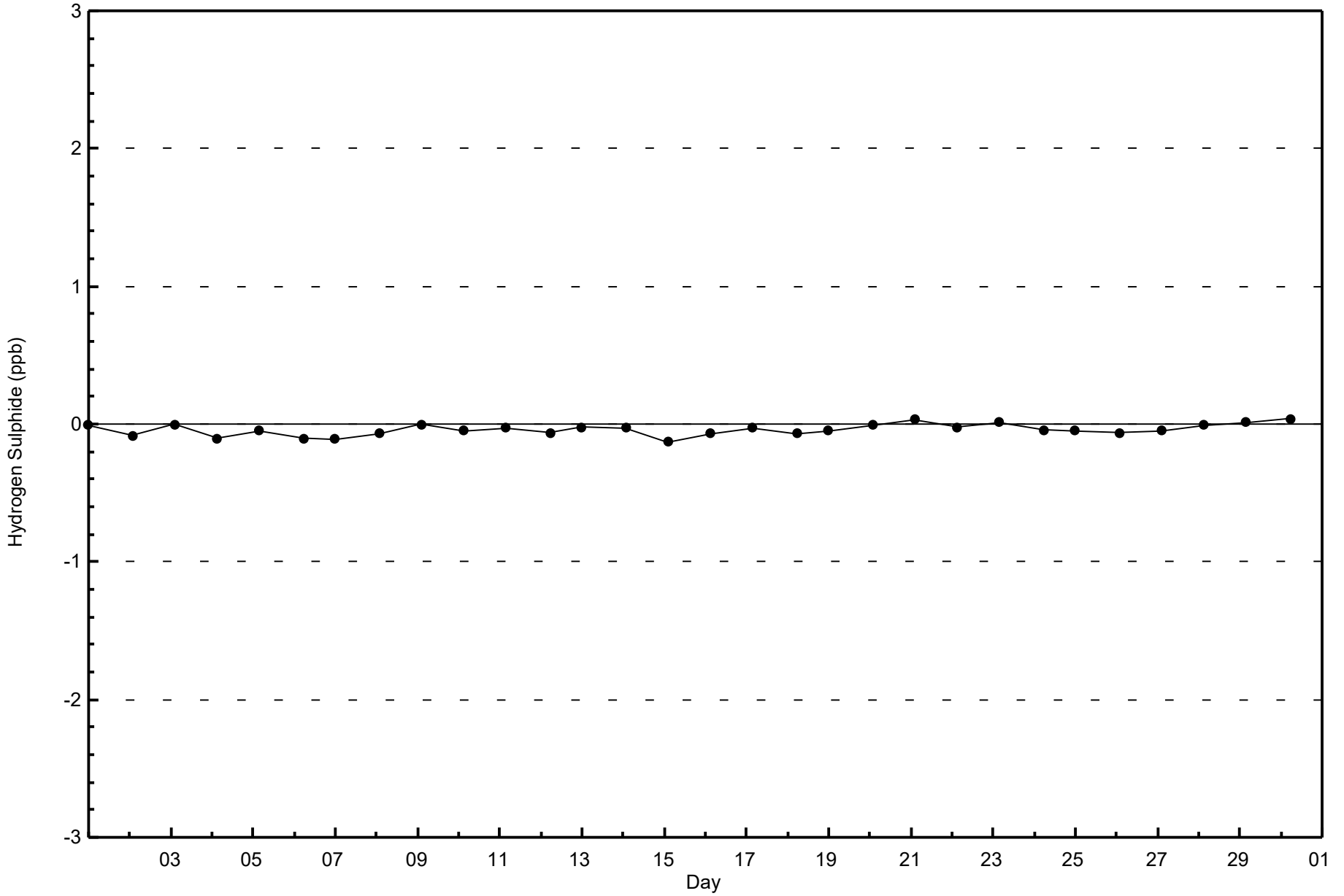


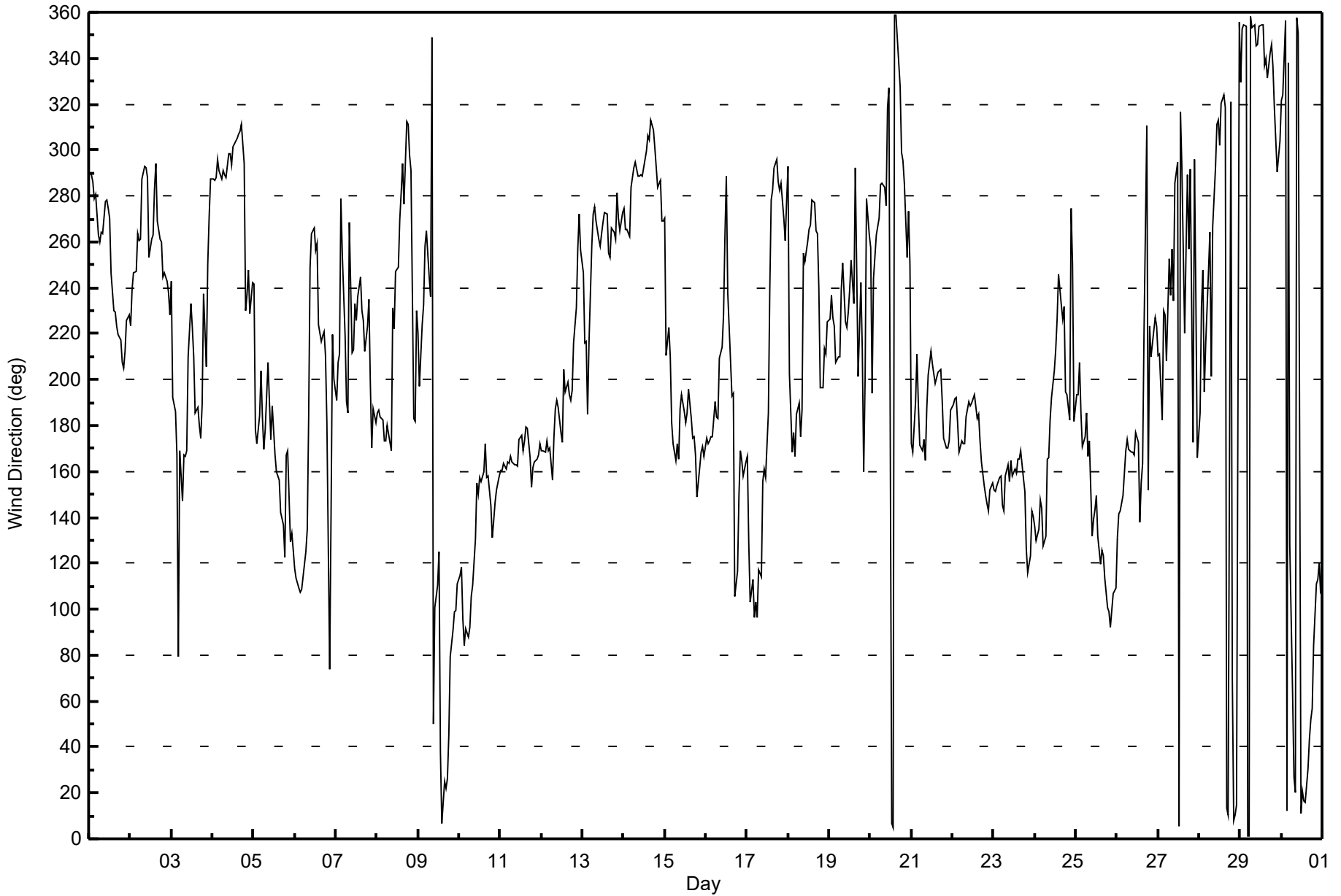
Total Number of Valid Hours: 685



Wood Buffalo Environmental Association
Zero Responses

Hydrogen Sulphide (H₂S) - ppb
Sawbones Bay - September 2023





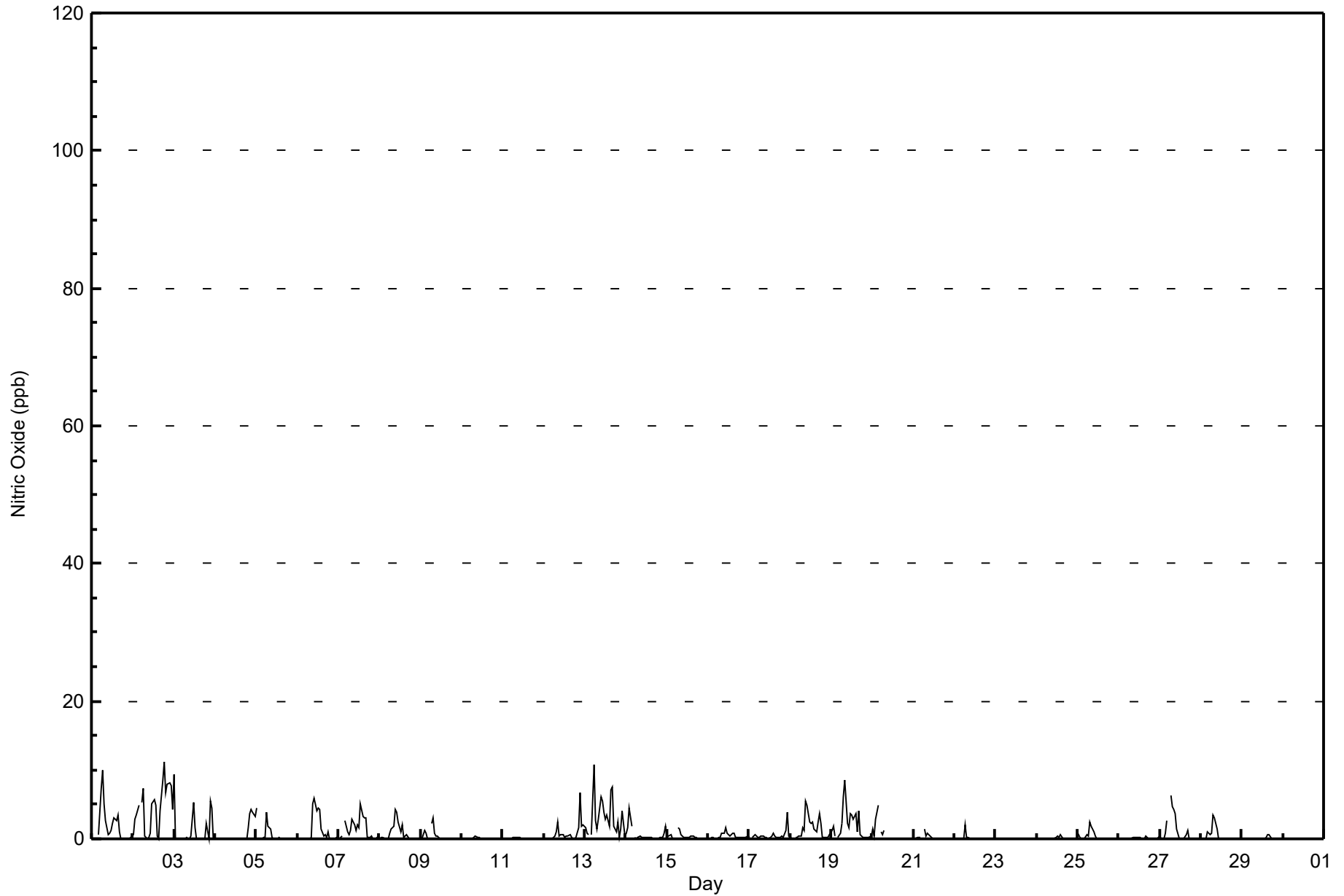


Maximum Value: 11.1 ppb on Sep 2 19:00																				Maximum Daily Average: 4.4 ppb on Sep 2					Hours in Service: 720	
Minimum Value: 0.0 ppb on Sep 1 01:00																				Minimum Daily Average: 0.0 ppb on Sep 23					Hours of Data: 684	
Maximum Diurnal Average: 1.5 ppb at hour 7																				Minimum Diurnal Average: 0.3 ppb at hour 2					Hours of Missing Data: 36	
Monthly Average: 0.83 ppb																				Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.7 P ₉₀ = 3.0 P ₉₉ = 7.9					Hours of Calibration: 36	
																									Percent Operational Time: 100.0	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Sep	0.0	0.0	0.0	Z	0.6	7.2	10.0	5.1	2.7	0.6	0.8	1.2	2.2	3.1	2.6	3.5	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.8	10.0
2-Sep	0.6	2.8	3.5	4.9	Z	5.3	7.3	0.3	0.0	0.1	0.8	5.1	5.7	4.8	0.4	0.0	4.0	8.6	11.1	6.6	7.9	8.2	7.8	4.2	4.4	11.1
3-Sep	9.3	0.0	0.0	0.0	0.0	Z	0.0	0.1	0.0	0.0	0.4	5.2	1.7	0.0	0.0	0.0	0.0	0.0	0.0	2.1	0.0	5.5	4.5	0.0	1.3	9.3
4-Sep	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	1.6	3.7	4.2	3.8	3.2	0.7	4.2
5-Sep	4.5	Z	0.0	0.0	0.2	0.1	3.8	1.8	1.4	0.2	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	4.5
6-Sep	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	5.1	6.0	4.1	4.5	4.3	1.3	0.4	0.5	0.3	1.0	0.0	0.0	0.0	0.1	0.1	1.2	6.0
7-Sep	0.0	0.2	0.5	Z	2.6	1.1	0.6	1.3	2.9	2.0	1.2	2.0	1.7	5.1	3.3	3.0	3.0	0.2	0.2	0.4	0.0	0.0	0.0	0.5	1.4	5.1
8-Sep	0.0	0.1	0.2	0.0	Z	0.0	0.8	1.5	1.8	4.3	3.8	2.5	0.9	2.0	0.3	0.4	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	4.3
9-Sep	0.0	0.0	1.2	0.9	0.1	Z	2.2	3.1	0.9	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	3.1
10-Sep	Z	0.0	0.0	0.1	0.1	0.1	0.1	0.3	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	0.1	0.4
11-Sep	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.2	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3
12-Sep	0.0	0.0	Z	0.0	0.0	0.1	0.4	0.9	2.3	0.4	0.6	0.5	0.2	0.3	0.3	0.6	0.1	0.1	0.0	0.2	1.5	6.7	1.9	2.0	0.8	6.7
13-Sep	1.6	0.9	0.6	Z	0.7	10.7	2.6	1.5	2.9	6.1	5.5	3.8	2.8	3.5	1.8	7.0	7.5	1.9	1.0	2.5	0.2	1.4	4.0	0.3	3.1	10.7
14-Sep	0.8	1.6	4.4	1.8	Z	0.1	0.1	0.1	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.3	0.2	0.7	1.9	0.6	4.4
15-Sep	0.2	0.4	0.6	0.1	0.1	Z	1.6	1.3	0.7	0.4	0.2	0.1	0.2	0.2	0.5	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.3	1.6
16-Sep	Z	0.1	0.1	0.1	0.1	0.0	0.1	0.2	0.9	0.8	1.6	0.8	0.6	0.4	0.8	0.8	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.4	0.4	1.6
17-Sep	0.2	Z	0.3	0.7	0.3	0.2	0.2	0.4	0.4	0.2	0.1	0.1	0.2	0.5	0.8	0.4	0.2	0.1	0.2	0.4	0.3	1.2	4.0	0.3	0.5	4.0
18-Sep	0.3	0.1	Z	0.2	0.2	0.3	0.4	1.7	1.2	5.5	4.9	2.4	2.2	2.5	1.5	1.1	2.3	3.6	2.1	0.1	0.2	0.2	0.2	0.5	1.5	5.5
19-Sep	1.1	1.9	0.5	Z	0.2	0.8	2.2	6.0	8.6	2.3	1.6	3.7	3.4	2.8	3.8	1.1	4.0	0.6	0.2	0.2	0.2	0.1	0.3	0.5	2.0	8.6
20-Sep	1.4	0.3	2.9	4.9	Z	1.0	0.6	1.2	C	C	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	4.9
21-Sep	0.0	0.0	0.2	0.1	0.1	Z	1.3	0.5	0.8	0.6	0.4	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	1.3
22-Sep	Z	0.0	0.0	0.0	0.0	0.0	2.1	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	2.1
23-Sep	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-Sep	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.5	0.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.5
25-Sep	0.7	0.2	0.0	Z	0.0	0.6	0.4	2.5	1.9	0.9	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	0.3	2.5
26-Sep	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.2	0.0	0.0	0.0	0.4	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.1	0.4
27-Sep	0.5	0.0	0.0	0.8	2.6	Z	6.3	4.7	4.3	3.7	1.4	0.0	0.0	0.0	0.0	0.6	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	6.3
28-Sep	Z	0.0	0.0	0.0	0.9	0.7	0.8	3.4	3.0	1.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	3.4
29-Sep	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7
30-Sep	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
																								Diurnal Average		
																								Diurnal Maximum		
0.8 0.3 0.6 0.6 0.3 1.1 1.5 1.3 1.3 1.2 1.1 1.1 0.9 1.0 0.6 0.7 0.9 0.5 0.5 0.5 0.5 0.9 0.9 0.5																										
9.3 2.8 4.4 4.9 2.6 10.7 10.0 6.0 8.6 6.1 6.0 5.2 5.7 5.1 3.8 7.0 7.5 8.6 11.1 6.6 7.9 8.2 7.8 4.2																										
Z - zerospan C - Calibration																										



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Sawbones Bay - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb
Sawbones Bay - September 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	684	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: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Sawbones Bay - September 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	12	5	4	18	29	35	89	116	69	63	57	66	65	22	12	684
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	12	5	4	18	29	35	89	116	69	63	57	66	65	22	12	684

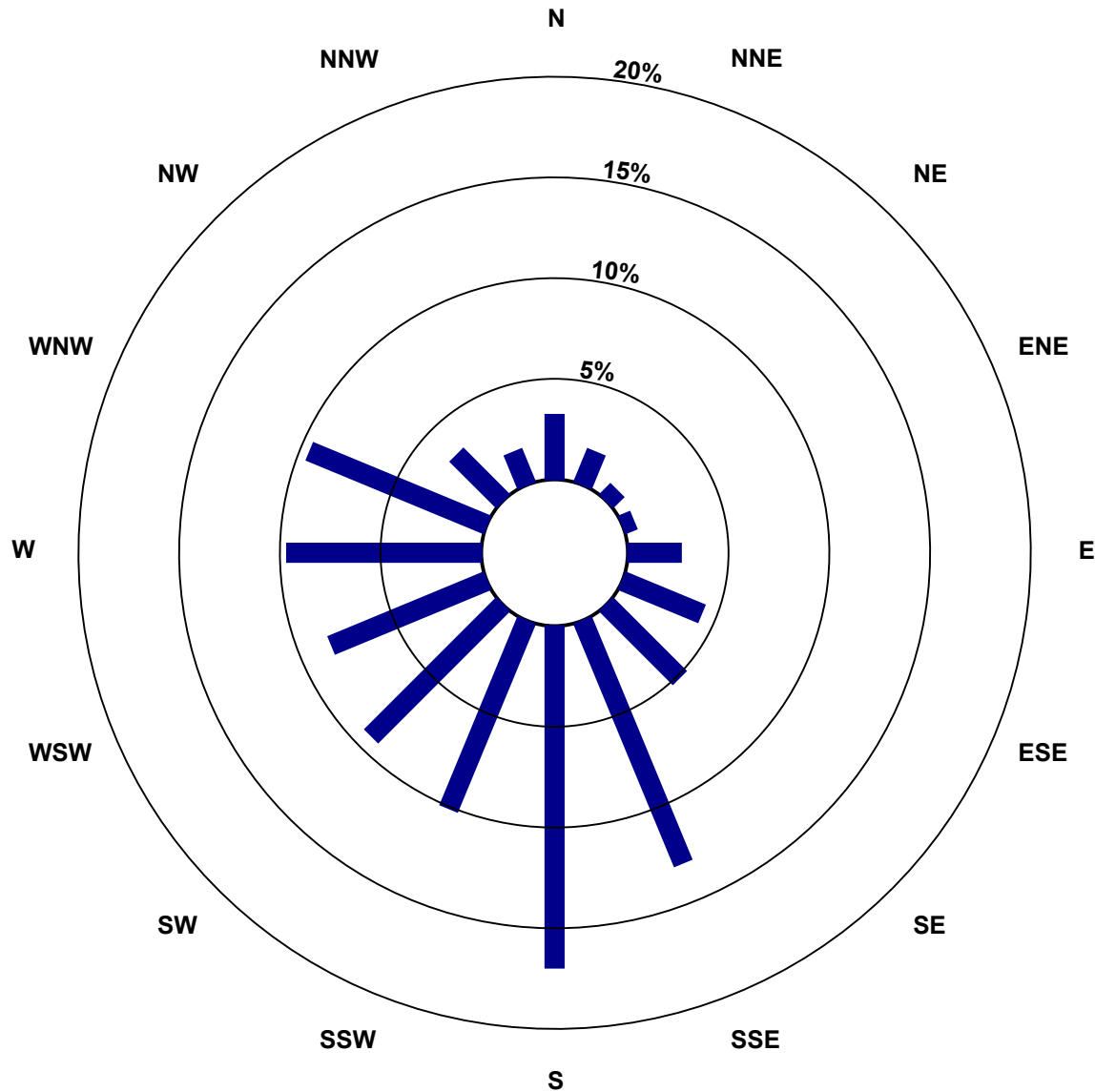
Total Number of Valid Hours: 684

Total Number of Hours: 720

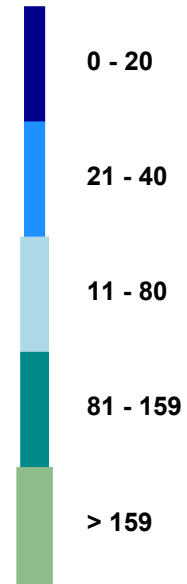


Wood Buffalo Environmental Association
Wind Rose Sep 2023

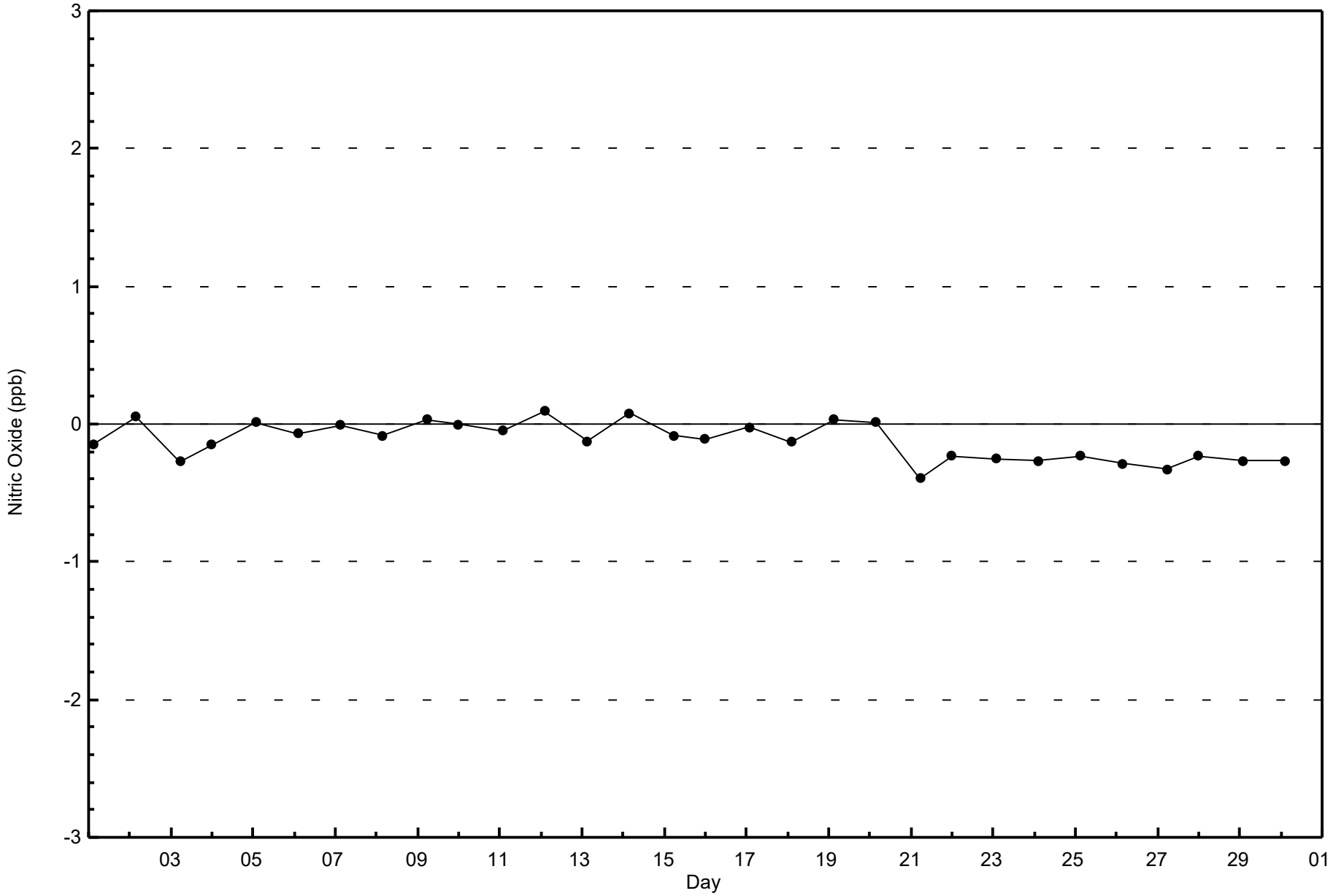
Nitric Oxide (NO) - ppb
Sawbones Bay

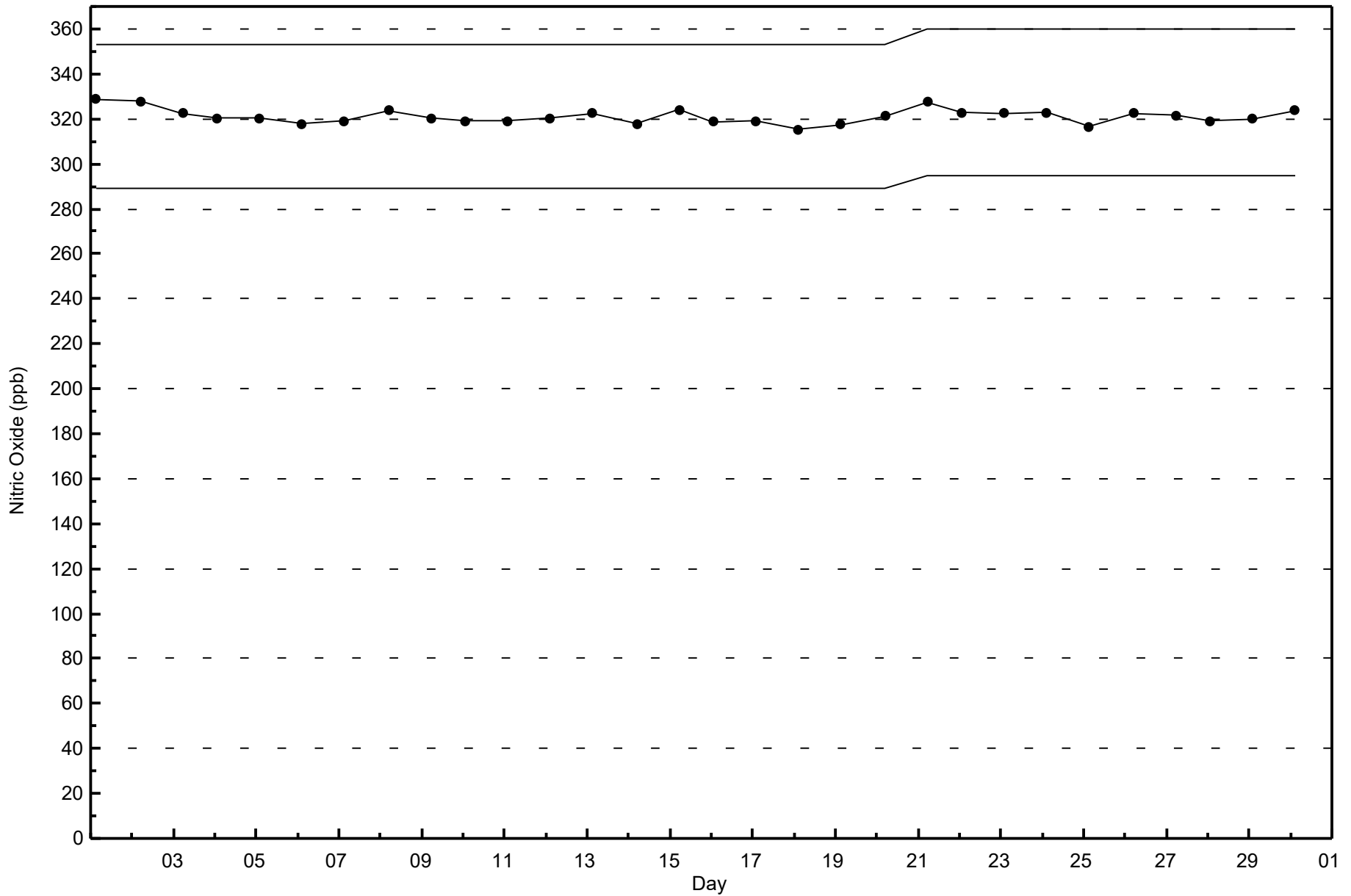


Classes (ppb)



Total Number of Valid Hours: 684







Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb
Sawbones Bay - September 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 16.3 ppb on Sep 2 04:00	Maximum Daily Average: 10.8 ppb on Sep 2		Hours of Data:	684
Minimum Value: 0.0 ppb on Sep 4 14:00	Minimum Daily Average: 0.2 ppb on Sep 10		Hours of Missing Data:	36
Maximum Diurnal Average: 3.4 ppb at hour 7	Minimum Diurnal Average: 1.7 ppb at hour 15		Hours of Calibration:	36
Monthly Average: 2.38 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.5 Median = 1.5 Q ₃ = 3.0 P ₉₀ = 5.9 P ₉₉ = 13.9		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-Sep	1.3	1.2	1.0	Z	3.2	8.5	10.8	6.3	4.3	2.2	2.7	3.4	4.9	6.7	5.6	7.2	4.3	1.9	2.7	3.0	0.9	2.7	5.7	9.0	4.3	10.8
2-Sep	9.9	14.8	15.6	16.3	Z	10.6	12.3	3.5	4.6	6.4	6.8	11.3	11.3	10.0	6.6	5.9	10.1	13.6	14.1	12.4	12.0	13.5	14.7	12.3	10.8	16.3
3-Sep	13.9	4.2	3.9	3.7	3.7	Z	4.8	4.5	3.1	3.8	4.4	13.0	8.9	2.8	3.1	2.8	3.0	2.3	1.4	12.1	1.5	10.4	7.2	1.2	5.2	13.9
4-Sep	Z	1.8	1.1	1.1	0.9	0.7	1.0	0.9	0.5	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.9	6.7	10.8	11.2	11.0	7.1	2.5	11.2
5-Sep	8.0	Z	1.5	1.5	2.8	2.2	3.8	2.1	2.1	1.0	0.3	0.2	0.7	1.6	1.2	0.5	0.4	0.2	0.2	0.4	0.7	0.3	0.2	0.3	1.4	8.0
6-Sep	0.1	0.2	Z	1.7	2.4	2.9	2.4	0.5	0.8	4.6	4.9	4.5	5.3	5.5	3.1	1.9	2.3	2.1	3.7	0.7	0.8	0.9	2.1	1.4	2.4	5.5
7-Sep	0.9	1.4	1.8	Z	3.5	2.7	2.3	2.6	3.6	3.2	2.6	4.2	3.5	8.5	6.6	5.9	6.0	1.6	2.9	4.0	2.7	3.2	2.4	4.2	3.5	8.5
8-Sep	1.7	1.8	1.4	0.7	Z	1.8	3.5	2.2	2.4	5.6	5.7	4.2	1.9	3.0	0.8	1.1	2.0	0.1	0.0	0.1	0.9	1.0	1.6	1.9	2.0	5.7
9-Sep	1.5	1.1	6.9	6.6	2.5	Z	5.7	4.5	1.5	1.6	1.3	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	1.5	6.9
10-Sep	Z	1.1	0.7	0.0	0.0	0.0	0.0	0.4	0.5	0.7	0.3	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	0.2	1.1
11-Sep	0.0	Z	0.6	0.5	0.5	0.8	1.1	0.6	1.1	0.5	0.5	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.4	0.3	0.2	0.5	0.7	1.1	0.5	1.1
12-Sep	0.8	0.7	Z	1.5	1.6	1.7	4.4	2.5	3.2	1.1	1.6	1.9	1.2	1.6	1.3	2.4	1.5	0.9	1.0	2.4	5.2	13.2	5.6	4.6	2.7	13.2
13-Sep	2.9	2.2	1.9	Z	1.8	10.6	2.7	1.9	3.0	7.1	6.6	3.8	2.9	4.1	2.3	10.2	11.1	4.9	3.2	6.4	0.1	3.0	7.2	0.5	4.4	11.1
14-Sep	1.2	2.4	6.1	2.7	Z	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	0.3	3.3	1.6	2.6	3.8	1.1	6.1
15-Sep	1.1	1.8	3.5	0.0	0.0	Z	4.2	1.9	0.5	0.2	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.3	0.3	0.4	0.3	0.1	0.7	1.7	0.8	4.2
16-Sep	Z	1.3	1.5	1.6	1.6	1.8	1.2	1.1	4.0	3.5	5.3	3.1	2.1	1.4	2.7	3.7	1.7	1.8	2.1	1.9	1.6	0.4	3.4	3.0	2.3	5.3
17-Sep	1.8	Z	2.1	4.8	3.3	4.0	1.1	1.0	0.6	0.0	0.0	0.1	1.1	2.6	1.7	0.7	0.8	2.5	3.3	2.9	7.4	14.6	2.6	2.6	14.6	
18-Sep	1.8	2.3	Z	1.6	2.4	4.3	3.5	2.8	2.3	9.7	10.2	5.5	3.8	4.2	2.3	2.4	5.4	8.4	4.8	0.2	0.8	2.2	0.1	0.8	3.6	10.2
19-Sep	1.4	2.8	0.1	Z	0.2	1.0	2.1	4.5	5.9	1.2	0.5	2.0	1.9	1.8	2.3	0.6	4.9	0.6	0.0	0.0	0.0	0.0	0.2	1.2	1.5	5.9
20-Sep	3.4	0.6	4.2	7.1	Z	1.8	0.7	0.9	C	C	C	C	C	C	1.3	1.2	1.0	1.1	1.4	1.3	1.5	3.2	2.0	2.7	--	7.1
21-Sep	2.3	1.7	2.7	2.1	2.7	Z	4.0	2.2	2.4	1.8	2.1	1.1	0.8	0.6	0.6	0.5	0.5	0.8	1.4	1.8	1.8	1.3	1.2	1.3	1.6	4.0
22-Sep	Z	1.7	1.7	1.7	2.5	1.4	4.3	2.2	1.3	1.3	1.0	0.7	0.6	0.5	0.5	0.5	0.6	1.0	1.2	0.7	0.4	0.5	0.6	0.8	1.2	4.3
23-Sep	1.2	Z	2.4	2.0	1.5	0.9	0.7	0.5	0.7	0.5	0.4	0.2	0.2	0.3	0.5	0.3	0.4	0.3	0.3	0.5	0.8	0.4	0.3	0.3	0.7	2.4
24-Sep	0.3	0.3	Z	0.7	0.4	0.5	0.4	0.8	1.0	1.0	1.2	1.8	2.7	1.9	3.4	1.3	1.9	1.3	1.0	1.3	1.6	2.0	2.0	1.5	1.3	3.4
25-Sep	1.4	2.0	1.3	Z	2.3	2.8	1.7	3.3	3.0	2.4	1.6	0.4	0.1	0.0	0.0	0.0	0.1	0.1	0.5	0.1	0.0	0.0	0.6	0.1	1.0	3.3
26-Sep	0.2	0.3	0.3	0.3	Z	1.3	1.9	2.4	2.4	1.8	1.8	1.3	1.2	1.2	1.0	1.2	3.9	1.2	1.4	3.9	1.9	1.6	2.0	2.7	1.6	3.9
27-Sep	3.3	1.7	1.3	4.3	8.0	Z	14.1	10.0	9.9	7.2	3.5	1.5	0.2	0.0	0.2	4.7	6.1	2.4	2.6	1.9	2.5	1.7	2.1	3.1	4.0	14.1
28-Sep	Z	2.9	2.5	3.4	5.7	6.1	5.1	7.6	6.0	2.9	0.5	0.3	0.1	0.1	0.1	0.1	0.0	0.0	1.0	1.9	2.7	3.7	3.0	2.0	2.5	7.6
29-Sep	1.3	Z	1.3	0.6	0.7	0.8	0.6	0.9	0.9	0.8	0.4	0.7	0.7	0.9	1.3	2.9	3.8	3.0	2.1	1.7	1.5	1.5	2.1	2.5	1.4	3.8
30-Sep	1.7	1.3	Z	1.1	1.0	1.0	1.0	0.8	0.6	0.4	0.3	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	3.0	1.1	2.0	0.7	0.7	3.0

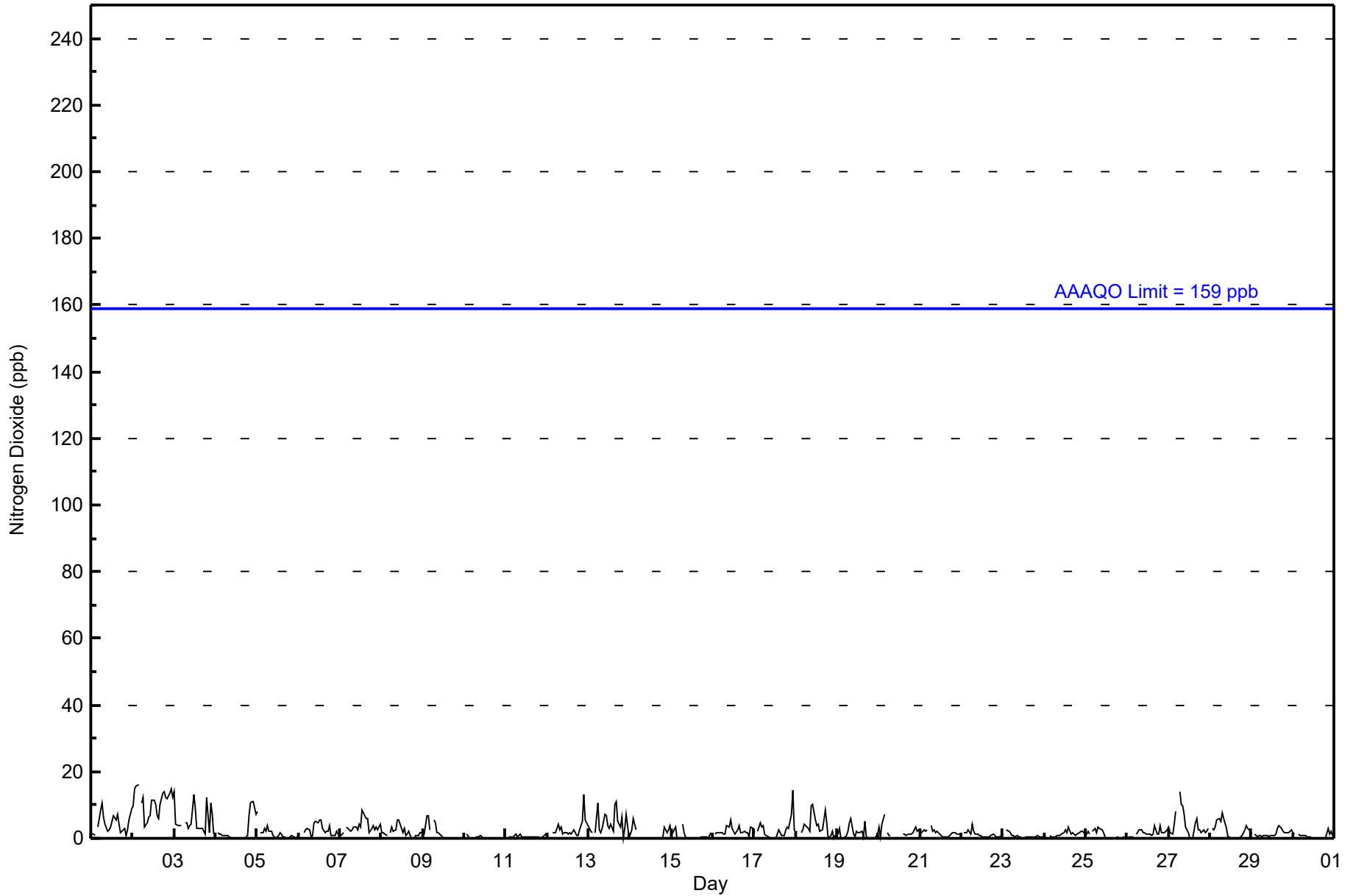
2.5	2.1	2.7	2.7	2.2	2.8	3.4	2.5	2.5	2.5	2.5	2.3	2.3	1.9	2.0	1.7	2.0	2.4	1.7	1.8	2.3	2.1	3.0	3.3	2.5	Diurnal Average	
13.9	14.8	15.6	16.3	8.0	10.6	14.1	10.0	9.9	9.7	10.2	13.0	11.3	10.0	6.6	10.2	11.1	13.6	14.1	12.4	12.0	13.5	14.7	12.3	Diurnal Maximum		

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



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Sawbones Bay - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Sawbones Bay - September 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	684	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: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Sawbones Bay - September 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	12	5	4	18	29	35	89	116	69	63	57	66	65	22	12	684
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	12	5	4	18	29	35	89	116	69	63	57	66	65	22	12	684

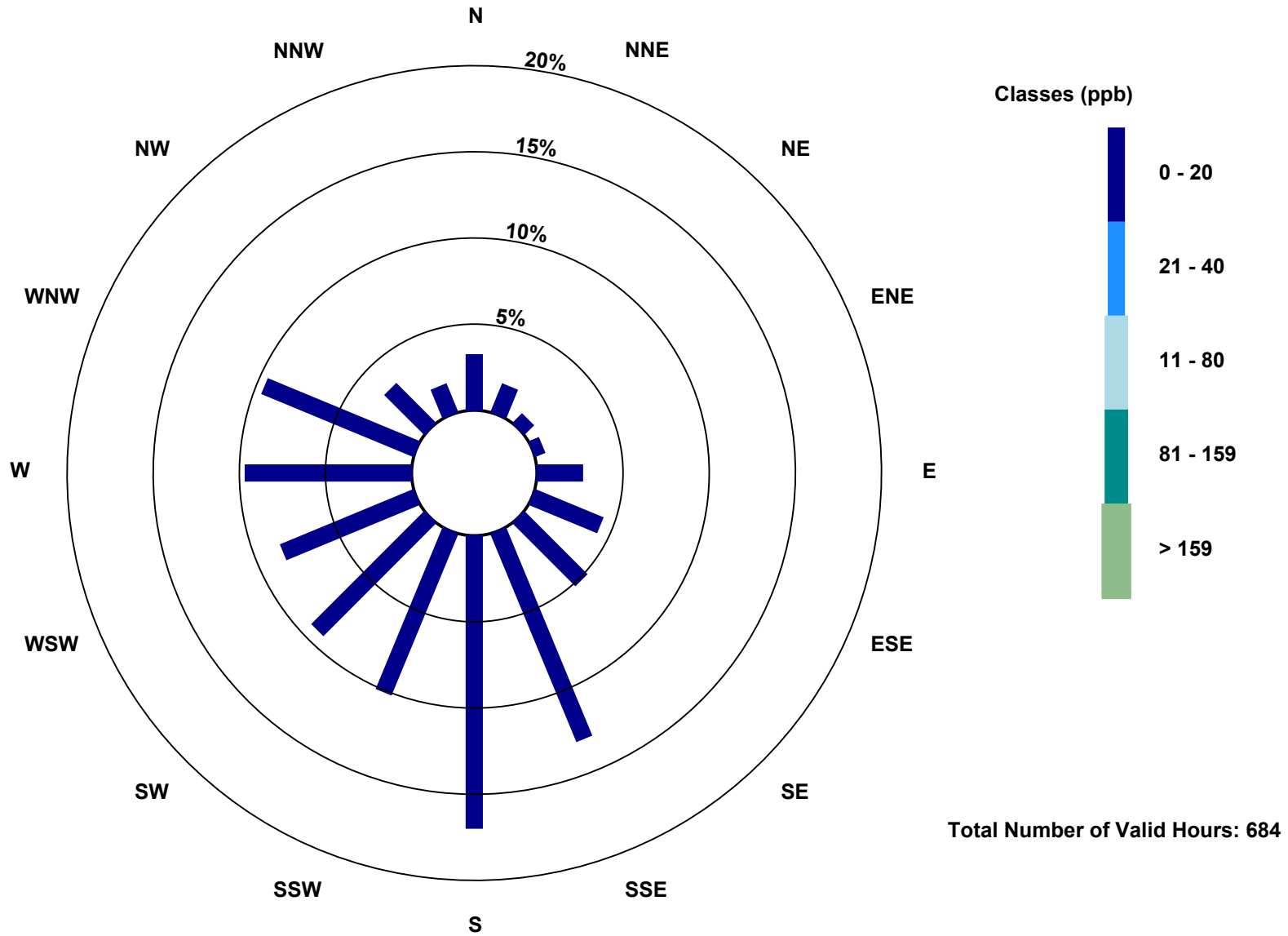
Total Number of Valid Hours: 684

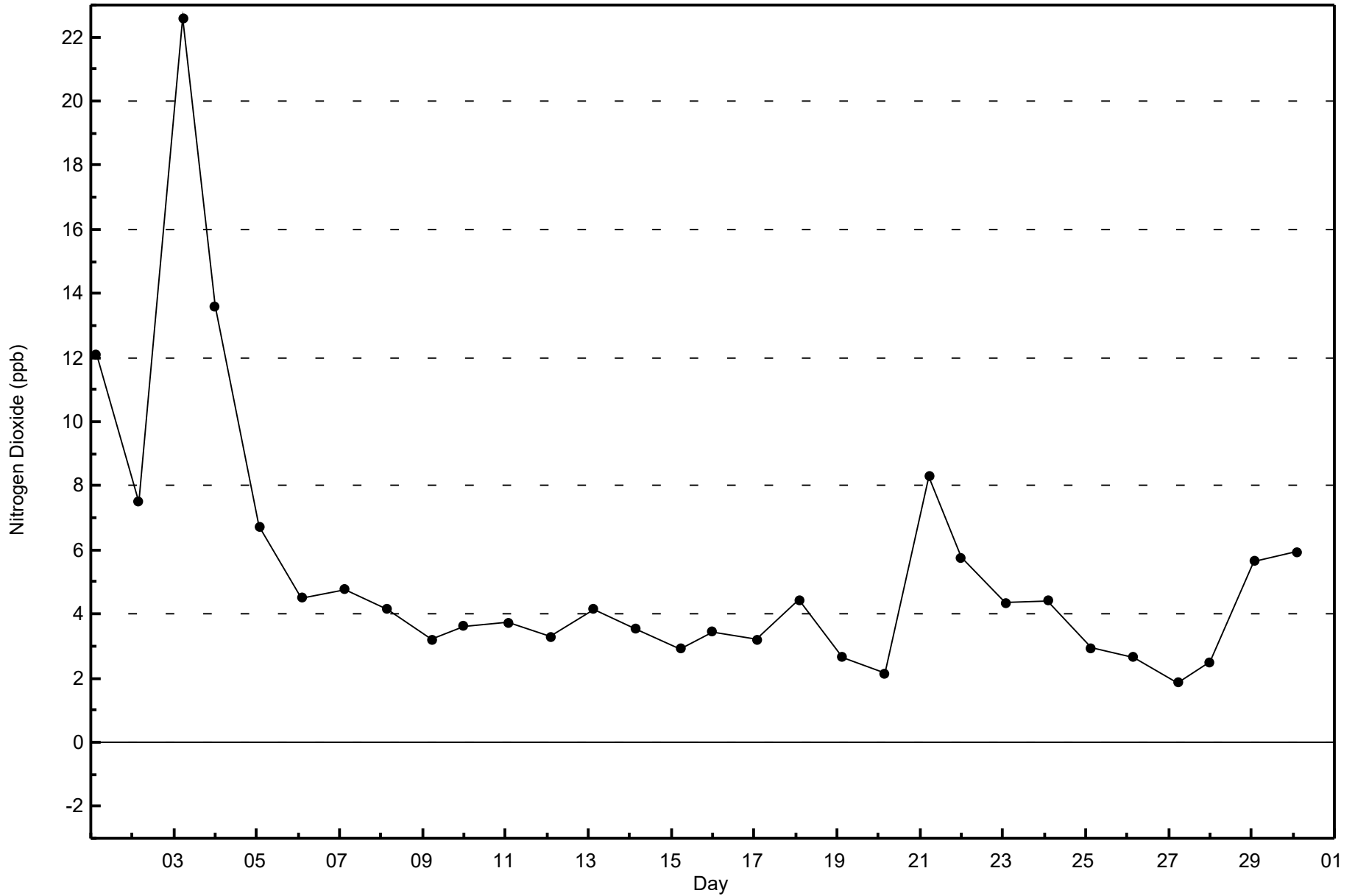
Total Number of Hours: 720

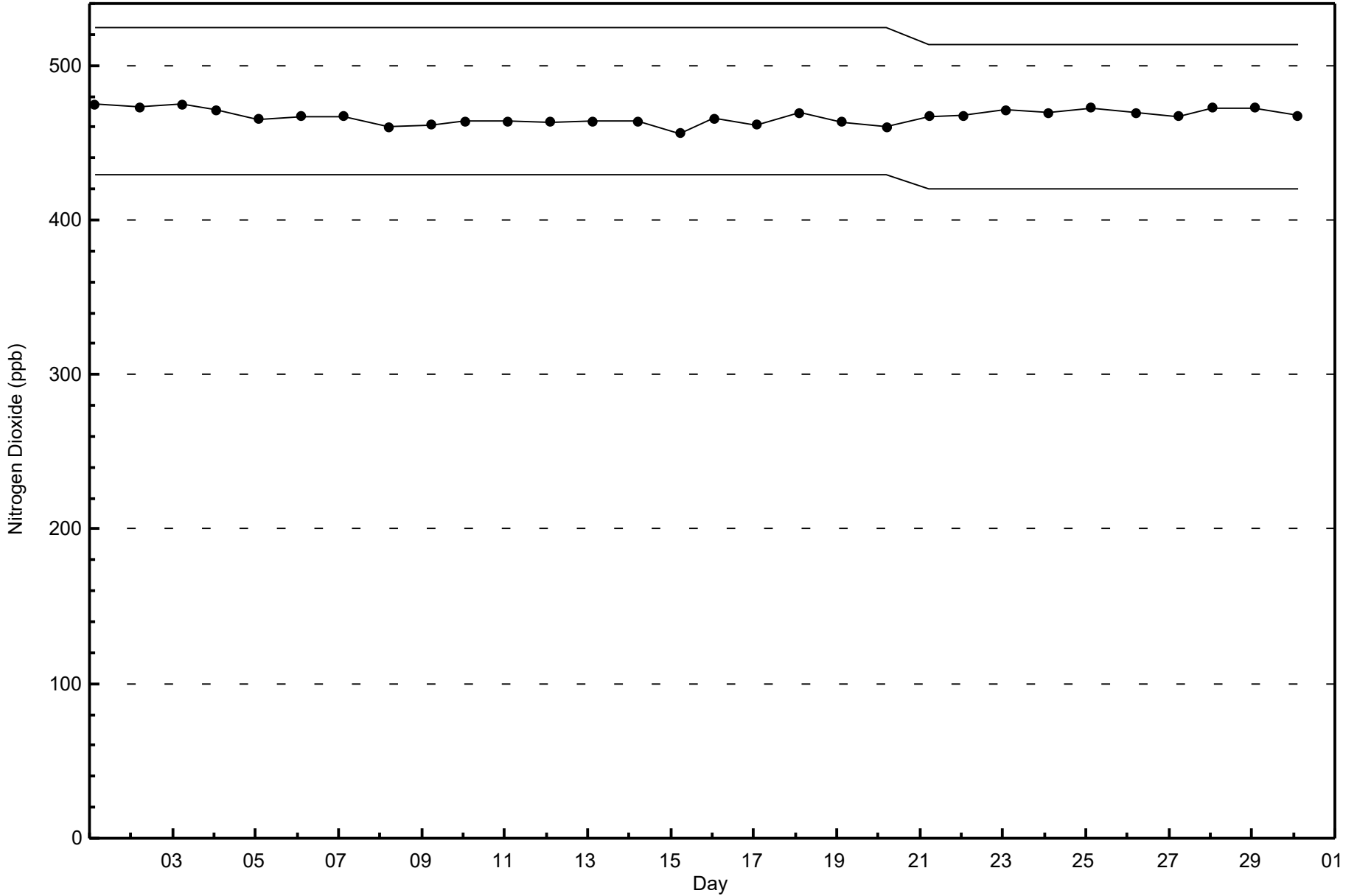


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitrogen Dioxide (NO₂) - ppb
Sawbones Bay









Wood Buffalo Environmental Association
Summary of Hour Averages

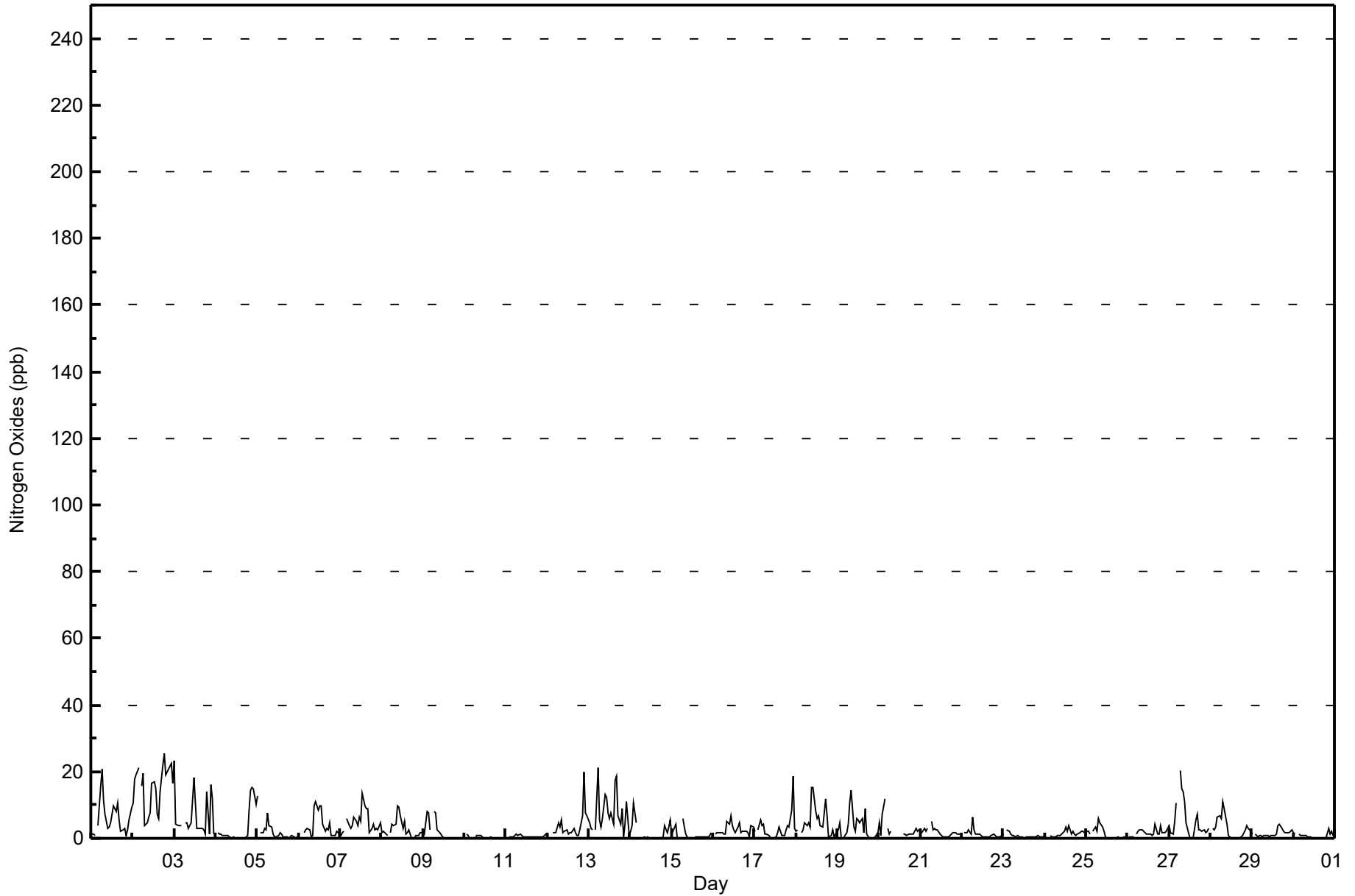
Nitrogen Oxides (NO_x) - ppb
Sawbones Bay - September 2023

Maximum Value: 25.2 ppb on Sep 2 19:00 Maximum Daily Average: 15.2 ppb on Sep 2																				Hours in Service: 720 Hours of Data: 684						
Minimum Value: 0.0 ppb on Sep 4 15:00 Minimum Daily Average: 0.2 ppb on Sep 10 Maximum Diurnal Average: 4.8 ppb at hour 7 Minimum Diurnal Average: 2.2 ppb at hour 18 Monthly Average: 3.21 ppb Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.5 Median = 1.6 Q ₃ = 3.8 P ₉₀ = 8.6 P ₉₉ = 20.9																				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-Sep	1.3	1.2	1.0	Z	3.8	15.7	20.8	11.4	7.0	2.8	3.5	4.6	7.1	9.8	8.2	10.7	5.3	1.9	2.7	3.0	0.9	2.7	5.7	9.5	6.1	20.8
2-Sep	10.5	17.6	19.1	21.2	Z	15.9	19.6	3.8	4.6	6.5	7.6	16.4	17.0	14.8	7.0	5.9	14.1	22.2	25.2	19.0	19.9	21.7	22.5	16.5	15.2	25.2
3-Sep	23.2	4.2	3.9	3.7	3.7	Z	4.8	4.6	3.1	3.8	4.8	18.2	10.6	2.8	3.1	2.8	3.0	2.3	1.4	14.2	1.5	15.9	11.7	1.2	6.5	23.2
4-Sep	Z	1.8	1.1	1.1	0.9	0.7	1.0	0.9	0.5	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.9	8.3	14.5	15.4	14.8	10.3	3.2	15.4
5-Sep	12.5	Z	1.5	1.5	3.0	2.3	7.6	3.9	3.5	1.2	0.3	0.2	0.7	1.8	1.2	0.5	0.4	0.2	0.2	0.4	0.7	0.3	0.2	0.3	1.9	12.5
6-Sep	0.1	0.2	Z	1.7	2.4	2.9	2.4	0.5	0.9	9.7	10.9	8.6	9.8	9.8	4.4	2.3	2.8	2.4	4.7	0.7	0.8	0.9	2.2	1.5	3.6	10.9
7-Sep	0.9	1.6	2.3	Z	6.1	3.8	2.9	3.9	6.5	5.2	3.8	6.2	5.2	13.6	9.9	8.9	9.0	1.8	3.1	4.4	2.7	3.2	2.4	4.7	4.9	13.6
8-Sep	1.7	1.9	1.6	0.7	Z	1.8	4.3	3.7	4.2	9.9	9.5	6.7	2.8	5.0	1.1	1.5	2.6	0.1	0.0	0.1	0.9	1.0	1.6	1.9	2.8	9.9
9-Sep	1.5	1.1	8.1	7.5	2.6	Z	7.9	7.6	2.4	2.0	1.7	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	1.9	8.1
10-Sep	Z	1.1	0.7	0.1	0.1	0.1	0.1	0.7	0.9	1.0	0.4	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	0.2	1.1
11-Sep	0.0	Z	0.6	0.5	0.5	0.8	1.2	0.8	1.4	0.7	0.6	0.4	0.4	0.3	0.4	0.3	0.4	0.5	0.4	0.3	0.2	0.5	0.7	1.1	0.6	1.4
12-Sep	0.8	0.7	Z	1.5	1.6	1.8	4.8	3.4	5.5	1.5	2.2	2.4	1.4	1.9	1.6	3.0	1.6	1.0	1.0	2.6	6.7	19.9	7.5	6.6	3.5	19.9
13-Sep	4.5	3.1	2.5	Z	2.5	21.3	5.3	3.4	5.9	13.2	12.1	7.6	5.7	7.6	4.1	17.2	18.6	6.8	4.2	8.9	0.3	4.4	11.2	0.8	7.4	21.3
14-Sep	2.0	4.0	10.5	4.5	Z	0.2	0.1	0.1	0.4	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.1	0.4	3.6	1.8	3.3	5.7	1.6	10.5
15-Sep	1.3	2.2	4.1	0.1	0.1	Z	5.8	3.2	1.2	0.6	0.2	0.1	0.2	0.2	0.6	0.5	0.3	0.4	0.4	0.5	0.4	0.2	0.7	1.8	1.1	5.8
16-Sep	Z	1.4	1.6	1.7	1.7	1.8	1.3	1.3	4.9	4.3	6.9	3.9	2.7	1.8	3.5	4.5	1.9	2.0	2.2	2.0	1.7	0.5	3.6	3.4	2.6	6.9
17-Sep	2.0	Z	2.4	5.5	3.6	4.2	1.3	1.4	1.0	0.2	0.1	0.1	0.3	1.6	3.4	2.1	0.9	0.9	2.7	3.7	3.2	8.6	18.6	2.9	3.1	18.6
18-Sep	2.1	2.4	Z	1.8	2.6	4.6	3.9	4.5	3.5	15.2	15.1	7.9	6.0	6.7	3.8	3.5	7.7	12.0	6.9	0.3	1.0	2.4	0.3	1.3	5.0	15.2
19-Sep	2.5	4.7	0.6	Z	0.4	1.8	4.3	10.5	14.5	3.5	2.1	5.7	5.3	4.6	6.1	1.7	8.9	1.2	0.2	0.2	0.2	0.1	0.5	1.7	3.5	14.5
20-Sep	4.8	0.9	7.1	12.0	Z	2.8	1.3	2.1	C	C	C	C	C	C	1.3	1.2	1.0	1.1	1.4	1.3	1.5	3.2	2.0	2.7	--	12.0
21-Sep	2.3	1.7	2.9	2.2	2.8	Z	5.3	2.7	3.2	2.4	2.5	1.1	0.9	0.6	0.6	0.5	0.5	0.8	1.4	1.8	1.8	1.3	1.2	1.3	1.8	5.3
22-Sep	Z	1.7	1.7	1.7	2.5	1.4	6.4	2.4	1.4	1.4	1.1	0.7	0.6	0.5	0.5	0.5	0.6	1.0	1.2	0.7	0.4	0.5	0.6	0.8	1.3	6.4
23-Sep	1.2	Z	2.4	2.0	1.5	0.9	0.7	0.5	0.7	0.5	0.4	0.2	0.2	0.3	0.5	0.3	0.4	0.3	0.3	0.5	0.8	0.4	0.3	0.3	0.7	2.4
24-Sep	0.3	0.3	Z	0.7	0.4	0.5	0.4	0.8	1.0	1.0	1.3	2.0	3.2	2.0	3.9	1.3	1.9	1.3	1.0	1.3	1.6	2.1	2.0	1.5	1.4	3.9
25-Sep	2.1	2.2	1.3	Z	2.3	3.4	2.1	5.8	4.9	3.3	2.1	0.4	0.1	0.0	0.0	0.0	0.1	0.1	0.5	0.1	0.0	0.0	0.6	0.1	1.4	5.8
26-Sep	0.2	0.3	0.3	0.3	Z	1.3	1.9	2.5	2.5	2.0	1.9	1.4	1.4	1.2	1.0	1.2	4.3	1.2	1.4	4.0	1.9	1.6	2.0	2.9	1.7	4.3
27-Sep	3.8	1.7	1.3	5.1	10.6	Z	20.4	14.7	14.2	10.9	4.9	1.5	0.2	0.0	0.2	5.3	7.2	2.4	2.6	1.9	2.5	1.7	2.1	3.1	5.1	20.4
28-Sep	Z	2.9	2.5	3.4	6.6	6.8	5.9	11.0	9.0	4.4	0.6	0.3	0.1	0.1	0.1	0.1	0.0	0.0	1.0	1.9	2.7	3.7	3.0	2.0	3.0	11.0
29-Sep	1.3	Z	1.3	0.6	0.7	0.8	0.6	0.9	0.9	0.8	0.4	0.7	0.7	0.9	1.4	3.6	4.4	3.0	2.1	1.7	1.5	1.5	2.1	2.5	1.5	4.4
30-Sep	1.7	1.3	Z	1.1	1.0	1.0	1.0	0.8	0.6	0.4	0.3	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	3.0	1.1	2.0	0.7	0.7	3.0
																								Diurnal Average		
																								Diurnal Maximum		
3.4 2.5 3.3 3.3 2.6 3.9 4.8 3.8 3.8 3.7 3.4 3.4 2.9 3.0 2.3 2.7 3.3 2.2 2.3 2.8 2.6 3.9 4.2 3.0 23.2 17.6 19.1 21.2 10.6 21.3 20.8 14.7 14.5 15.2 15.1 18.2 17.0 14.8 9.9 17.2 18.6 22.2 25.2 19.0 19.9 21.7 22.5 16.5																										
Z - zerospan C - Calibration																										



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Sawbones Bay - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Sawbones Bay - September 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	676	98.83	98.83
21 - 40	8	1.17	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: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Sawbones Bay - September 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	12	5	4	18	29	35	89	116	69	63	52	63	65	22	12	676
21 - 40	0	0	0	0	0	0	0	0	0	0	0	5	3	0	0	0	8
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	22	12	5	4	18	29	35	89	116	69	63	57	66	65	22	12	684

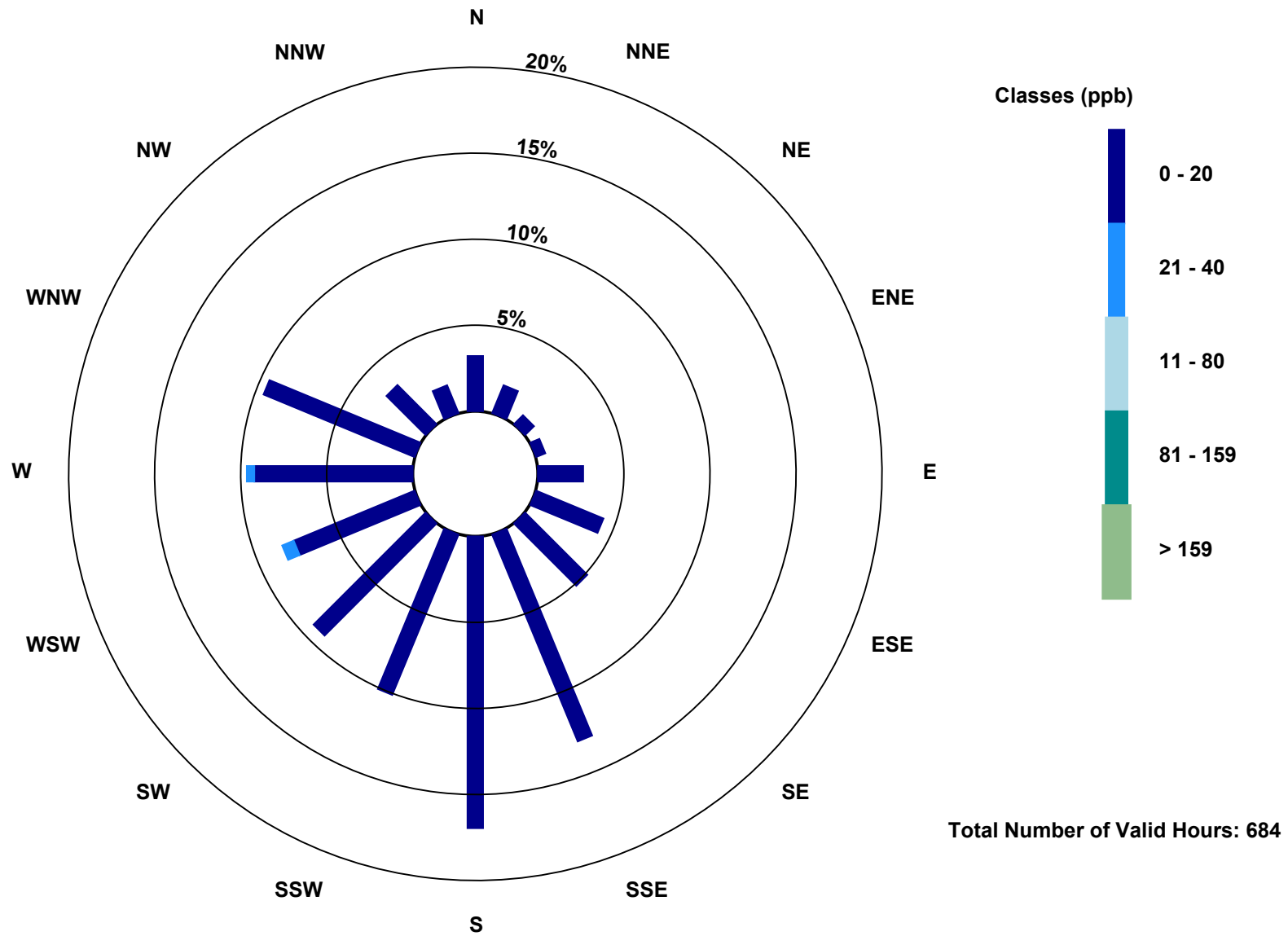
Total Number of Valid Hours: 684

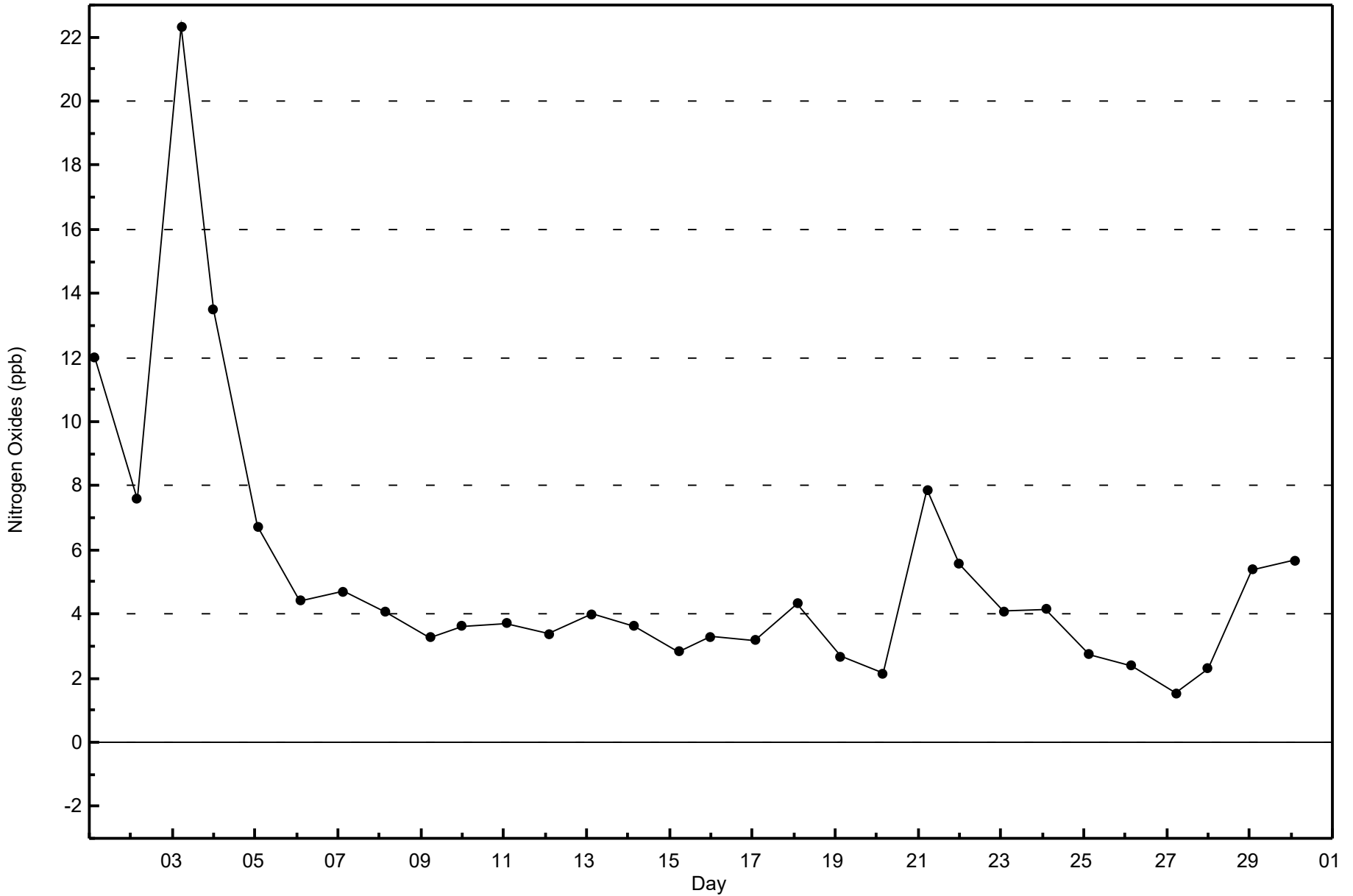
Total Number of Hours: 720

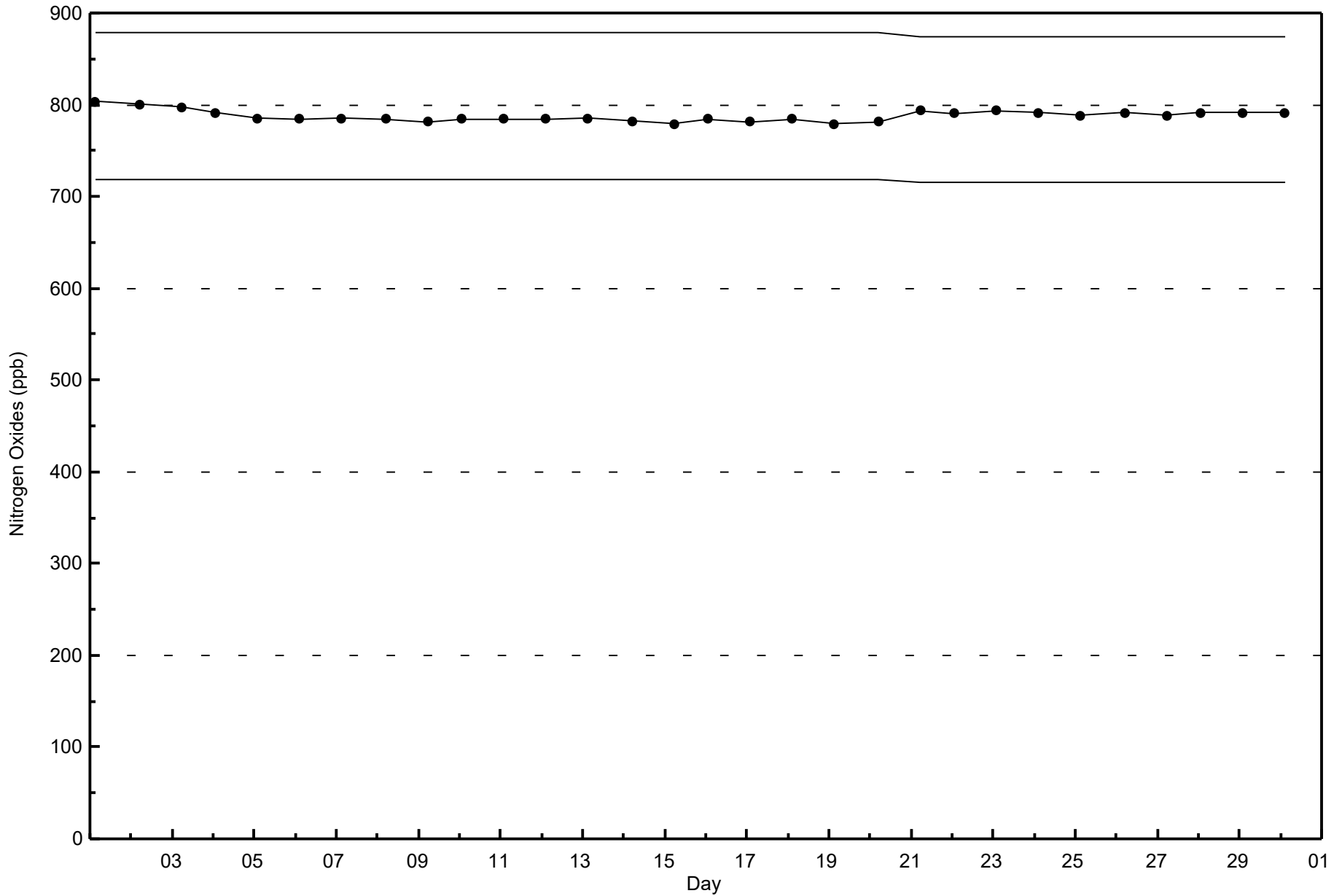


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitrogen Oxides (NO_x) - ppb
Sawbones Bay





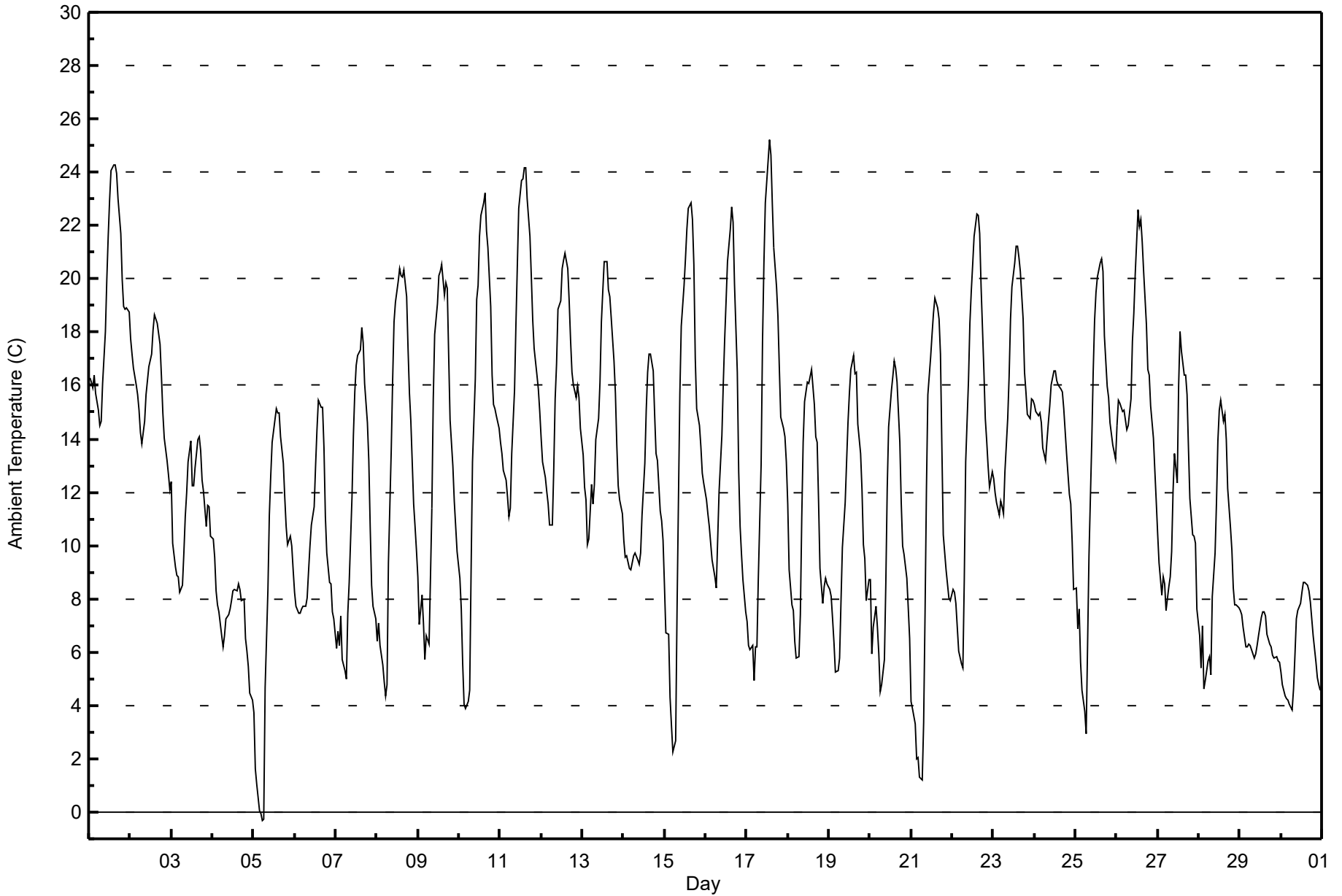




Wood Buffalo Environmental Association
Summary of Hour Averages

Ambient Temperature (AT) - C
Sawbones Bay - September 2023

Maximum Value: 25.2 C on Sep 17 14:00		Maximum Daily Average: 19.2 C on Sep 1		Hours in Service: 720																						
Minimum Value: -0.3 C on Sep 5 06:00		Minimum Daily Average: 6.2 C on Sep 30		Hours of Data: 720																						
Maximum Diurnal Average: 18.2 C at hour 15		Minimum Diurnal Average: 7.4 C at hour 7		Hours of Missing Data: 0																						
Monthly Average: 12.55 C		Percentiles: P ₁ = 1.7 P ₁₀ = 5.8 Q ₁ = 8.1 Median = 12.5 Q ₃ = 16.4 P ₉₀ = 20.1 P ₉₉ = 24.0		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-Sep	16.3	16.1	15.9	16.4	15.7	15.1	14.5	14.6	16.1	18.0	20.0	21.6	23.0	24.1	24.3	24.3	24.0	23.0	21.7	20.0	19.0	18.8	18.9	18.7	19.2	24.3
2-Sep	17.7	17.2	16.7	16.0	15.6	15.1	14.2	13.8	14.7	15.6	16.2	16.7	17.2	18.1	18.6	18.5	18.3	17.6	16.3	15.0	14.0	13.2	12.7	12.1	15.9	18.6
3-Sep	12.4	10.1	9.2	8.9	8.8	8.2	8.5	9.7	11.1	12.0	13.1	13.9	12.2	12.2	12.9	14.0	14.1	13.5	12.5	12.0	10.7	11.5	11.4	10.4	11.4	14.1
4-Sep	10.2	9.6	8.3	7.8	7.5	6.6	6.2	6.6	7.3	7.4	7.6	7.9	8.3	8.3	8.5	8.4	7.9	8.0	6.5	6.0	5.4	4.5	4.2	7.4	10.2	
5-Sep	3.7	1.6	1.1	0.0	-0.1	-0.3	-0.3	4.7	8.4	11.2	12.6	13.9	14.7	15.2	15.0	15.0	14.1	13.1	11.8	10.7	10.0	10.4	10.0	9.1	8.6	15.2
6-Sep	8.3	7.7	7.5	7.5	7.6	7.7	7.7	8.0	9.0	10.0	10.8	11.5	13.0	14.3	15.4	15.2	15.2	13.7	11.1	9.7	8.6	8.6	7.5	7.2	10.1	15.4
7-Sep	6.2	6.8	6.2	7.3	5.7	5.3	5.0	7.5	8.6	11.8	14.1	15.8	16.8	17.2	17.3	18.2	17.6	16.1	14.6	13.2	10.6	8.5	7.7	7.3	11.1	18.2
8-Sep	6.4	7.1	6.3	5.5	4.9	4.4	4.8	9.3	13.5	16.2	18.4	19.1	19.9	20.4	20.1	20.1	20.3	19.3	17.4	15.7	14.7	11.6	10.7	9.8	13.2	20.4
9-Sep	8.8	7.0	8.1	7.1	5.7	6.6	6.3	8.8	11.4	15.5	17.9	19.1	20.1	20.3	20.5	19.4	19.9	19.6	17.1	14.7	13.0	11.7	10.7	9.8	13.3	20.5
10-Sep	8.8	7.6	5.6	4.1	3.9	4.1	4.6	9.0	13.1	16.3	19.2	19.8	21.6	22.4	22.9	23.2	21.8	21.2	19.0	16.4	15.3	15.1	14.9	14.4	14.3	23.2
11-Sep	13.9	13.5	12.8	12.5	11.8	11.1	11.4	13.5	15.8	18.3	20.5	22.6	23.7	23.8	24.2	24.2	23.0	21.6	20.1	18.4	17.4	16.4	15.8	15.0	17.6	24.2
12-Sep	14.0	13.1	12.6	12.0	11.6	10.8	10.8	12.9	15.5	16.8	18.8	19.2	20.4	20.7	20.9	20.4	19.2	17.7	16.5	16.0	15.5	16.0	15.6	14.4	15.9	20.9
13-Sep	13.4	12.2	11.7	10.0	10.3	12.3	11.6	12.3	13.9	14.8	16.1	18.4	19.6	20.6	20.7	19.6	19.3	18.5	16.9	15.7	13.7	12.2	11.7	11.2	14.9	20.7
14-Sep	10.2	9.6	9.6	9.2	9.1	9.4	9.6	9.7	9.4	9.3	9.7	11.1	13.1	15.1	16.5	17.2	17.2	16.6	14.9	13.5	13.2	11.3	10.9	10.2	11.9	17.2
15-Sep	8.5	6.7	6.7	4.3	3.3	2.3	2.7	7.6	11.7	15.7	18.2	19.8	20.8	21.8	22.6	22.9	22.2	20.5	17.0	15.1	14.5	13.7	12.7	12.4	13.5	22.9
16-Sep	11.7	11.2	10.7	10.1	9.4	8.8	8.4	10.3	12.0	14.1	16.1	17.8	19.2	20.7	21.9	22.7	22.1	19.8	16.5	12.8	10.7	9.7	8.7	7.5	13.9	22.7
17-Sep	7.1	6.3	6.1	6.2	5.0	6.2	6.2	8.8	13.0	17.6	20.6	22.9	24.4	25.2	24.6	22.8	21.2	19.7	18.6	16.6	14.8	14.4	14.1	13.1	14.8	25.2
18-Sep	11.6	9.1	7.8	7.6	6.4	5.8	5.9	7.4	11.0	13.9	15.4	16.1	16.1	16.3	16.6	15.3	14.1	13.8	11.7	9.1	7.8	8.4	8.8	8.6	11.0	16.6
19-Sep	8.4	8.1	7.3	6.4	5.3	5.3	5.8	7.9	9.9	11.6	13.1	14.6	15.7	16.6	17.1	16.5	16.5	14.6	13.4	12.1	10.0	9.5	7.9	8.7	10.9	17.1
20-Sep	8.7	5.9	6.9	7.7	6.9	6.0	4.5	4.8	5.7	8.6	12.1	14.5	15.8	16.4	16.9	16.7	16.1	13.9	11.6	10.0	9.6	8.8	7.7	6.5	10.1	16.9
21-Sep	4.2	3.9	3.3	2.0	2.0	1.3	1.2	3.4	7.5	12.1	15.6	17.1	17.9	18.7	19.3	18.9	18.5	17.2	13.7	10.4	9.1	8.5	8.0	8.0	10.1	19.3
22-Sep	8.3	8.3	7.8	6.9	6.1	5.6	5.4	8.7	13.1	16.2	18.4	19.6	20.5	21.6	22.4	22.4	21.7	19.7	16.6	14.8	13.9	13.0	12.2	12.7	14.0	22.4
23-Sep	12.5	12.0	11.6	11.1	11.7	11.5	11.2	12.8	14.8	16.4	18.5	19.7	20.6	21.2	21.2	20.8	20.3	18.5	16.5	15.7	14.9	14.8	15.5	15.4	15.8	21.2
24-Sep	15.3	15.0	14.9	15.0	14.6	13.7	13.2	13.9	14.6	15.2	16.0	16.5	16.6	16.2	16.0	15.9	15.8	15.1	14.3	13.4	11.9	11.6	10.1	8.3	14.3	16.6
25-Sep	8.4	6.9	7.6	5.6	4.6	3.8	3.0	6.3	9.6	13.9	16.5	18.4	19.5	20.1	20.6	20.8	20.3	17.9	16.0	15.6	14.6	14.2	13.8	13.2	13.0	20.8
26-Sep	14.5	15.4	15.3	15.0	15.1	14.7	14.3	14.5	15.5	17.6	18.7	20.2	22.6	22.0	22.2	21.4	20.3	18.3	16.6	16.4	15.2	14.0	12.8	11.7	16.8	22.6
27-Sep	10.5	9.4	8.1	8.9	8.6	7.6	8.5	8.8	9.8	12.0	13.4	12.3	16.0	18.0	17.3	16.4	16.4	15.6	13.7	11.8	10.4	10.4	10.1	7.6	11.7	18.0
28-Sep	6.6	5.4	7.0	4.6	4.9	5.7	5.8	5.2	8.1	9.7	11.6	13.9	15.1	15.4	14.7	14.9	14.0	12.1	10.6	9.8	8.4	7.8	7.8	7.7	9.5	15.4
29-Sep	7.5	7.4	6.9	6.2	6.2	6.3	6.3	6.1	5.8	5.9	6.2	6.6	7.3	7.5	7.5	7.3	6.7	6.3	6.2	5.9	5.8	5.8	5.7	5.6	6.5	7.5
30-Sep	5.2	4.8	4.4	4.3	4.2	4.1	3.8	4.6	5.9	7.2	7.6	7.8	8.3	8.6	8.6	8.5	8.3	7.9	7.3	6.6	5.6	5.0	4.8	4.6	6.2	8.6
																								Diurnal Average		
																								Diurnal Maximum		





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Sawbones Bay - September 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	3	0.42	0.42
0 - 10	263	36.53	36.94
10 - 20	381	52.92	89.86
> 20	73	10.14	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Sawbones Bay - September 2023

Maximum Value: 100.0 % on Sep 6 05:00	Maximum Daily Average: 88.4 % on Sep 6	Hours in Service: 720
Minimum Value: 28.9 % on Sep 22 15:00	Minimum Daily Average: 54.1 % on Sep 26	Hours of Data: 690
Maximum Diurnal Average: 86.7 % at hour 7	Minimum Diurnal Average: 46.5 % at hour 15	Hours of Missing Data: 30
Monthly Average: 67.59 %	Percentiles: P ₁ = 30.6 P ₁₀ = 39.4 Q ₁ = 53.2 Median = 69.3 Q ₃ = 82.9 P ₉₀ = 91.6 P ₉₉ = 99.9	Hours of Calibration: 0
		Percent Operational Time: 95.8

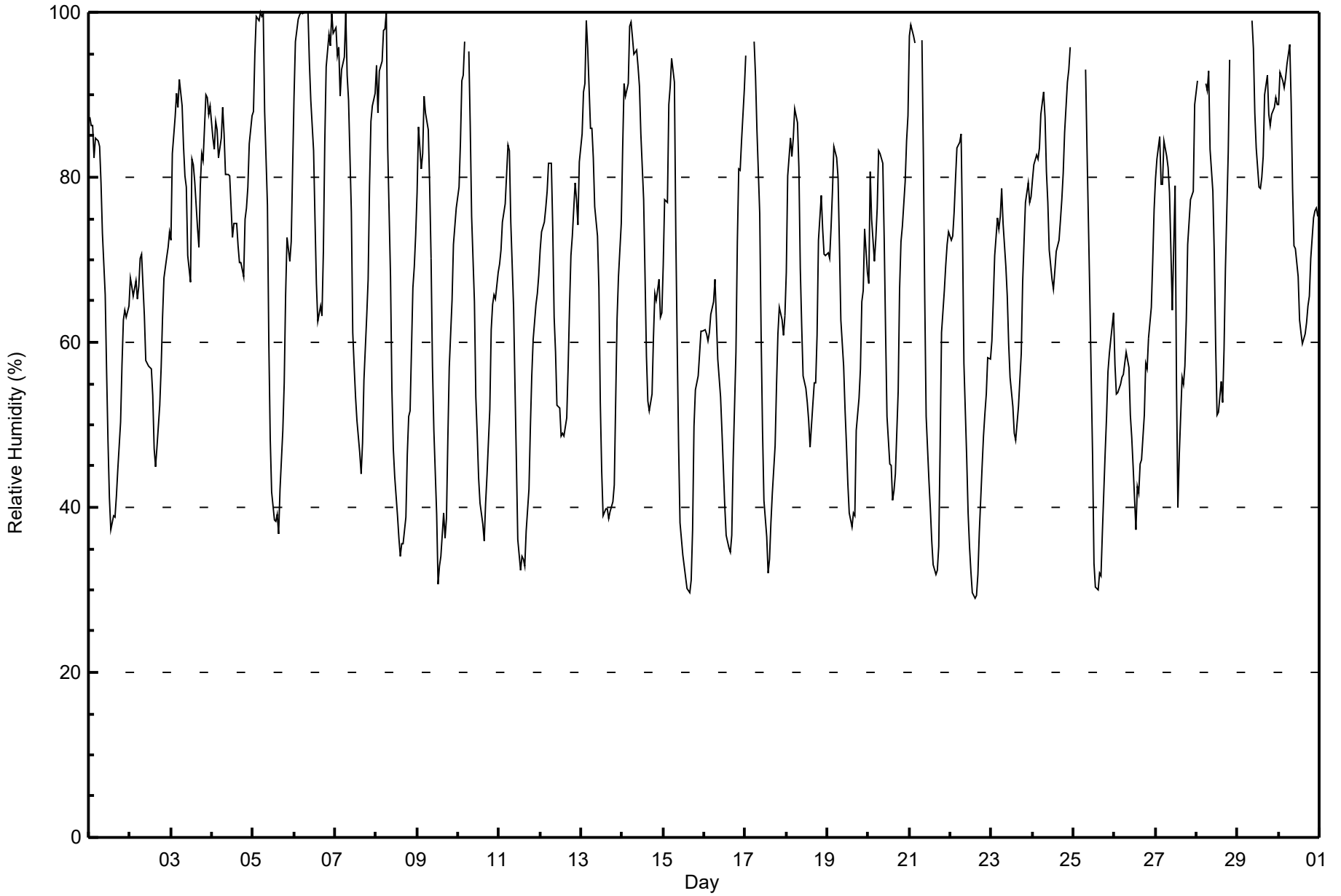
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Sep	87.2	86.3	86.2	82.3	84.7	84.4	83.7	79.4	73.3	65.7	56.4	48.0	41.2	37.3	39.1	38.8	41.3	44.5	50.3	57.4	62.6	63.9	63.1	64.4	63.4	87.2																							
2-Sep	67.8	66.8	65.5	67.4	65.2	66.8	70.1	70.6	63.2	57.9	57.5	57.1	56.8	53.5	47.1	45.0	47.3	52.3	56.9	63.0	67.8	70.3	71.5	73.3	61.7	73.3																							
3-Sep	72.5	82.9	87.3	90.1	88.4	91.8	88.7	83.8	80.2	78.9	70.5	67.3	82.2	81.6	79.4	74.0	71.6	79.0	83.0	82.1	90.0	89.6	87.6	88.7	82.1	91.8																							
4-Sep	84.7	83.4	86.7	85.7	82.5	84.8	88.5	85.2	80.4	80.4	80.2	76.5	72.7	74.4	74.3	71.7	69.6	69.6	67.9	74.8	76.2	78.8	84.1	87.5	79.2	88.5																							
5-Sep	88.0	95.0	99.5	99.0	99.9	99.5	99.8	87.9	76.6	59.9	48.3	41.9	38.4	39.1	36.8	42.2	49.3	55.1	65.8	72.8	69.8	72.2	81.0	69.0	99.9																								
6-Sep	89.6	96.4	99.1	99.7	100.0	99.8	100.0	100.0	100.0	93.9	89.3	83.2	75.0	67.0	62.5	64.3	63.1	71.0	84.3	93.5	97.2	96.0	99.9	97.5	88.4	100.0																							
7-Sep	98.2	94.8	95.8	89.8	93.1	94.5	100.0	92.4	89.3	75.7	61.2	57.0	53.4	50.6	46.6	44.1	47.8	55.4	63.2	67.7	79.0	86.8	88.7	90.2	75.6	100.0																							
8-Sep	93.5	87.8	92.9	94.1	97.8	97.9	100.0	83.6	67.9	54.2	47.2	43.8	39.0	36.3	34.1	35.5	35.5	38.8	46.5	51.1	51.7	66.5	69.1	73.1	64.1	100.0																							
9-Sep	78.1	86.1	80.9	82.9	89.8	87.8	85.8	79.0	70.1	57.0	49.3	39.2	30.7	32.8	34.1	39.4	36.2	38.6	48.4	56.9	65.1	71.9	74.0	76.3	62.1	89.8																							
10-Sep	78.9	84.3	91.6	92.3	96.4	OR	95.2	86.2	75.2	64.9	53.3	48.8	43.5	40.6	38.0	36.0	40.6	43.9	51.8	61.5	64.6	65.8	65.2	68.5	64.7	96.4																							
11-Sep	69.5	71.2	74.6	76.8	80.3	84.0	83.3	74.5	64.2	54.8	45.5	36.2	32.4	34.0	33.6	33.0	37.1	42.2	49.6	55.9	60.4	64.5	65.9	68.1	58.0	84.0																							
12-Sep	71.1	73.4	74.5	76.3	78.4	81.7	81.8	73.9	63.1	58.8	52.3	52.1	48.6	48.9	48.7	50.8	56.9	64.3	70.4	72.8	79.3	77.3	74.3	81.8	67.2	81.8																							
13-Sep	85.2	90.3	91.4	99.1	95.6	86.0	86.0	82.4	76.4	72.9	66.7	52.7	44.4	38.9	39.8	39.8	38.6	39.4	40.7	42.7	52.8	62.9	68.0	74.5	65.3	99.1																							
14-Sep	83.6	91.3	89.8	91.3	98.3	98.8	97.0	95.0	95.5	93.5	91.0	85.2	77.3	68.0	58.3	52.8	51.7	53.7	60.5	66.0	65.2	67.7	63.1	63.5	77.4	98.8																							
15-Sep	69.3	77.3	76.9	88.8	91.0	94.4	91.6	73.0	59.5	47.4	38.1	34.2	32.8	31.6	30.2	29.7	31.2	37.2	49.8	54.2	55.9	58.6	61.4	61.4	57.3	94.4																							
16-Sep	61.6	61.1	60.2	61.3	63.3	65.0	67.6	62.9	57.9	53.3	49.2	44.7	40.1	36.5	35.0	34.7	36.5	45.8	58.9	72.2	81.1	80.8	84.3	90.7	58.5	90.7																							
17-Sep	94.8	OR	OR	OR	OR	96.5	92.2	85.7	75.6	60.9	49.3	40.8	36.4	32.0	33.8	38.1	41.7	47.4	54.7	61.1	64.2	62.8	60.9	63.2	59.6	96.5																							
18-Sep	68.5	80.2	84.7	82.5	84.7	88.3	86.5	81.3	69.0	62.0	55.9	54.3	52.6	50.5	47.3	52.5	55.1	55.1	60.8	72.4	77.8	73.7	70.7	70.5	68.2	88.3																							
19-Sep	70.8	70.2	73.9	78.4	83.8	82.3	80.1	71.7	62.7	57.1	51.8	47.6	42.9	39.3	37.7	39.2	39.0	49.3	53.2	56.7	64.9	66.2	73.8	68.4	60.9	83.8																							
20-Sep	67.2	80.7	75.0	69.9	72.6	76.2	83.2	82.9	81.7	72.5	61.1	51.1	45.2	45.1	40.8	42.0	44.0	54.0	66.4	72.1	74.0	79.5	84.5	87.5	67.1	87.5																							
21-Sep	97.1	98.5	97.1	96.2	OR	100.0	OR	96.5	82.7	65.3	51.1	43.2	39.8	35.9	33.0	31.8	32.4	35.3	47.4	61.1	66.3	69.3	71.9	73.4	64.8	100.0																							
22-Sep	72.4	72.8	75.8	79.8	83.6	84.2	85.2	73.1	57.5	45.9	39.3	35.2	32.1	29.7	28.9	29.4	31.8	36.9	44.9	48.7	51.3	53.8	58.1	57.9	54.5	85.2																							
23-Sep	60.1	65.1	70.5	75.1	73.8	75.2	78.6	74.4	69.2	65.6	59.8	55.8	52.2	49.0	48.2	50.2	52.3	58.6	67.2	72.2	76.9	79.3	77.0	77.6	66.0	79.3																							
24-Sep	79.6	81.5	82.8	82.2	83.6	87.6	90.4	87.3	80.7	76.9	71.2	67.6	66.5	68.6	71.0	72.4	74.7	77.3	80.4	85.4	91.6	93.1	95.7	OR	80.4	95.7																							
25-Sep	OR	OR	OR	OR	OR	OR	OR	93.0	83.6	65.9	56.0	46.2	33.2	30.3	30.0	32.0	31.7	37.0	46.6	51.0	56.4	58.7	60.4	63.6	--	93.0																							
26-Sep	57.2	53.7	53.8	54.8	55.7	56.1	57.4	58.9	56.9	51.1	48.5	44.9	37.3	42.5	41.7	45.2	45.8	51.3	57.4	56.7	60.5	64.3	69.8	76.1	54.1	76.1																							
27-Sep	79.8	82.2	85.0	79.2	79.1	84.5	82.5	81.1	78.2	71.1	63.8	78.9	54.7	40.0	46.5	55.8	54.9	57.2	62.8	71.9	77.3	77.9	78.3	88.8	71.3	88.8																							
28-Sep	91.6	OR	89.8	OR	OR	91.4	90.5	92.9	83.4	78.3	70.9	59.7	51.2	51.6	55.3	52.7	59.1	68.9	83.1	94.2	OR	OR	OR	OR	--	94.2																							
29-Sep	OR	OR	OR	OR	OR	OR	OR	OR	98.9	95.6	87.7	83.5	78.8	78.7	80.0	82.5	89.9	92.4	87.6	86.3	87.6	88.5	89.7	88.9	--	98.9																							
30-Sep	88.8	92.6	91.7	90.9	92.1	93.8	96.1	88.9	78.7	71.7	71.3	68.0	62.8	61.2	59.7	61.0	62.4	64.4	65.5	70.3	75.0	75.9	76.2	75.3	76.4	96.1																							
																								78.8	81.0	82.7	83.3	84.5	86.4	86.7	82.0	75.1	67.0	59.8	54.8	49.8	47.5	46.5	47.0	48.7	53.7	60.5	66.6	70.5	72.9	74.5	76.1	Diurnal Average	
																								98.2	98.5	99.5	99.7	100.0	100.0	100.0	100.0	100.0	100.0	95.6	91.0	85.2	82.2	81.6	80.0	82.5	89.9	92.4	87.6	94.2	97.2	96.0	99.9	97.5	Diurnal Maximum

OR - Out of Range



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Sawbones Bay - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Sawbones Bay - September 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	74	10.72	10.72
40 - 60	166	24.06	34.78
60 - 80	240	34.78	69.57
80 - 100	204	29.57	99.13

Total Number of Valid Hours: 690

Total Number of Hours: 720

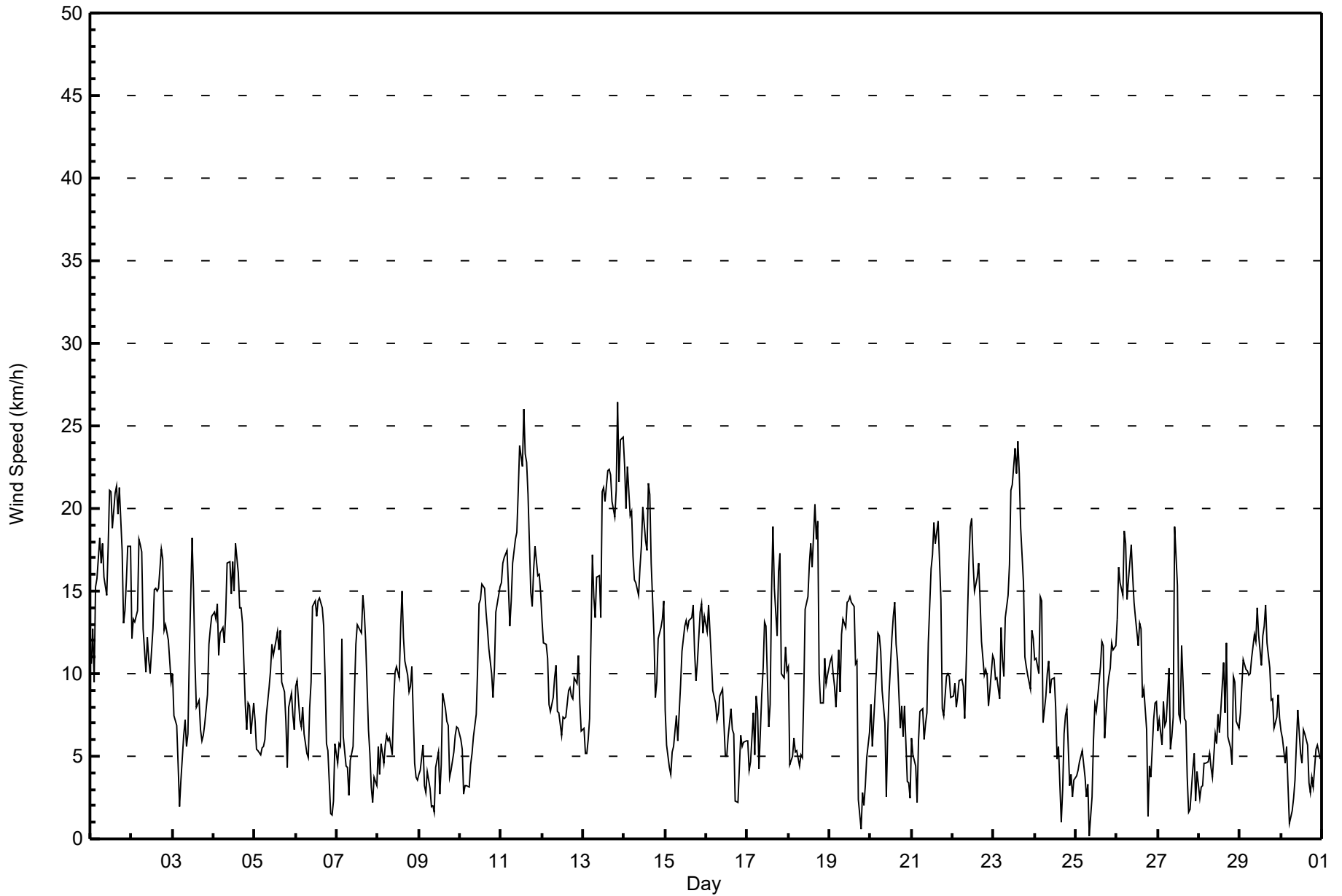


Maximum Speed: 26 km/h on Sep 13 21:00	Maximum Daily Speed Average: 17.9 km/h on Sep 11	Hours in Service: 720
Minimum Speed Value: 0 km/h on Sep 25 09:00	Minimum Daily Speed Average: 1.6 km/h on Sep 9	Hours of Data: 720
Maximum Diurnal Speed Average: 7.7 km/h at hour 12	Minimum Diurnal Speed Average: 3.6 km/h at hour 19	Hours of Missing Data: 0
Monthly Average Velocity: 5.1 km/h 218.5 deg	Percentiles: P ₁ = 2 P ₁₀ = 4 Q ₁ = 6 Median = 10 Q ₃ = 14 P ₉₀ = 17 P ₉₉ = 23	Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Sep	WNW11	WNW13	WNW9	W15	W16	W18	W17	W18	W16	W15	W18	W21	W21	WSW19	SW21	SW21	SW20	SW21	SW17	SSW13	SSW14	SSW16	SW18	SW18	WSW15.0	SW21
2-Sep	SW12	WSW13	WSW13	WSW14	W18	W18	W17	WNW13	WNW10	WNW12	WNW11	WSW10	W13	W15	WNW15	WNW15	W15	W18	W17	WSW13	WSW13	WSW12	WSW11	SW10	W12.9	W18
3-Sep	WSW10	SSW7	S7	SSE5	E2	S4	SSE6	SSE7	SSE6	S6	SSW11	SW18	SW15	SSW11	S8	S8	S7	S6	S6	WSW7	SSW9	WSW12	W13	WNW13	SSW6.7	SW18
4-Sep	WNW14	WNW13	WNW14	WNW11	WNW12	WNW13	WNW12	WNW14	WNW17	WNW17	WNW17	WNW17	WNW15	WNW18	NW16	NW14	NW14	NW13	WNW8	SW7	WSW8	WSW8	SW6	WSW8	WNW11.9	WNW18
5-Sep	WSW7	S5	S5	S5	SSW6	S6	S6	S7	SSW9	S10	S12	S11	SSE12	SSE13	SSE11	SSE13	SE10	SE9	ESE7	SSE4	S8	SE9	SE7	SE7	SSE7.4	SSE13
6-Sep	ESE9	ESE10	ESE7	ESE7	ESE8	ESE6	SE5	SE5	S8	WSW9	W14	W14	WSW13	W14	SW15	SW14	SW13	SW10	SSW6	S5	ENE2	SE1	SW2	SSW6	SSW4.7	SW15
7-Sep	S5	SSW6	SSW6	W12	WSW6	SW4	S4	S3	W5	SSW6	SSW9	SW12	SW13	SW13	WSW12	SW15	SW14	SSW12	SW7	SW5	SSW3	S2	S4	S3	SW6.9	SW15
8-Sep	S6	S4	S6	S5	S6	S6	S6	S6	S5	SW8	SW10	WSW10	WSW10	W13	W15	WNW12	W11	NW10	NW9	WNW9	WNW10	S5	S4	SW4	WSW5.2	W15
9-Sep	SW4	SSW4	SW6	SW3	WSW3	W4	WSW3	SW2	N2	NE2	E4	ESE5	SE3	NE5	N9	NNE8	NNE7	NNE7	NE4	E4	E5	E6	E7	ESE7	ENE1.6	N9
10-Sep	ESE6	ESE5	E3	E3	E3	E3	E5	ESE5	ESE6	SE8	SSE10	SSE14	SSE14	SSE15	SSE15	S14	SSE13	SSE11	SE10	SE9	SE10	SE14	SSE14	SSE15	SE8.8	SSE15
11-Sep	SSE16	SSE17	SSE17	SSE17	SSE15	SSE13	SSE14	SSE17	SSE18	SSE19	SSE21	S24	S23	S26	S23	S23	S21	SSE15	SSE14	SSE16	SSE18	SSE16	SSE16	S15	SSE17.9	S26
12-Sep	S13	S12	SSE12	S11	S8	S8	SSE9	S10	S11	S8	S8	S6	S7	SSW7	SSW7	SSW9	SSW9	S9	SSW8	SW10	SW9	WSW11	W8	WSW7	SSW7.9	S13
13-Sep	WSW7	SW5	SW5	S6	SW7	WSW17	W15	W13	W16	W16	WSW13	W21	W21	W20	W22	WSW22	WSW22	W20	W20	W21	W26	W22	W24	W24	W16.4	WNW26
14-Sep	W23	W20	W23	W20	WNW20	WNW17	WNW16	WNW15	WNW15	WNW16	WNW18	WNW20	WNW18	WNW17	NW22	NW21	NW17	NW12	WNW9	WNW10	WNW12	WNW13	W13	W14	WNW16.1	W23
15-Sep	W8	SSW6	SW4	SSW4	S5	S6	SSE7	S6	SSE8	S9	SSW11	S13	S13	S13	SSE13	S13	S14	S11	SSE10	SSE11	SSE14	S14	S12	SSE14	S9.3	SSE14
16-Sep	S13	S14	S13	S11	S9	S8	S7	S8	SSW9	SW9	SW7	W5	WNW5	WSW6	SSW8	SSW7	SSW6	ESE2	ESE2	SSE4	S6	SSE6	SSE6	SSE6	S6.4	S14
17-Sep	SSE6	SE4	ESE5	ESE8	E5	ESE9	E8	ESE4	ESE9	SSE10	SSE13	SSE13	S7	WSW8	W15	WNW19	WNW15	WNW12	WNW16	WNW17	WNW10	W10	W12	W10	WSW3.6	WNW19
18-Sep	WNW10	SSW5	SSE5	S6	SSE5	S5	S4	S5	S5	WSW9	WSW14	W15	W17	W18	W16	W20	W18	W19	WSW10	SSW8	SSW8	SSW11	SSW9	SW10	WSW8.6	W20
19-Sep	SW11	WSW11	SW10	SW9	SSW8	SSW11	SSW9	WSW12	WSW13	SW13	SW14	SW14	WSW15	WSW14	SW14	WNW11	WSW11	SSW2	WSW1	SSW3	SSE2	SSW3	W5	W6	SW8.7	WSW15
20-Sep	WSW8	SSW6	WSW7	W10	W12	W12	WNW11	WNW9	WNW7	W3	NW6	NNW9	N12	N14	N14	N12	NNW11	NNW7	WNW8	WNW6	WNW8	WSW3	W3	WSW2	NW6.1	N14
21-Sep	S6	SSE5	S4	SSW2	S6	S8	S8	S6	SSE7	S8	SSW12	SSW16	SSW17	SSW19	SSW18	SSW19	SSW17	SSW14	S8	S7	S10	S10	S10	S9	SSW9.9	SSW19
22-Sep	S9	S9	SSW8	S9	SSE10	S10	S9	S7	S10	S17	S19	S19	S17	SSW15	S16	S17	S14	SSE12	SSE10	SSE10	SE10	SE8	SSE9	SSE11	S11.4	S19
23-Sep	SSE11	SSE10	SSE10	SSE8	SSE13	SE11	SE10	SSE13	SSE15	SSE17	SSE21	SSE21	SSE24	SSE22	SSE24	SSE22	S19	SSE15	SSE11	SE10	ESE10	ESE9	SE13	SE12	SSE14.3	SSE24
24-Sep	SE11	SE11	SE10	SSE15	SE14	SE7	SE9	SE10	SSE11	S9	SSW10	SSW10	SSW8	SW5	WSW6	SW1	SW3	SW6	SSW7	SSW8	S3	W4	WSW3	S4	S6.1	SSE15
25-Sep	SSW4	SSW4	SSW5	S5	S5	S4	S3	SSE3	S0	SE3	SE6	SE8	SSE8	SE9	ESE10	SE12	ESE12	ESE6	E9	E10	E10	E12	ESE11	ESE12	SE6.1	SE12
26-Sep	SE13	SE16	SE15	SSE15	SSE19	S18	S15	S16	SSE18	S16	SSE14	S13	S12	SE13	SSE13	SSE9	SW9	NW7	SSE1	SW4	SSW4	SW7	SW8	SW8	SSE10.2	SSE19
27-Sep	SSW6	SSW7	S6	SW8	SW7	SSW7	WSW10	WSW5	WSW6	SW7	WNW19	WNW15	N8	NW7	WNW12	SW7	WSW7	WNW4	WSW2	WNW2	S4	WNW5	SW2	SSE4	WSW5.1	WNW19
28-Sep	S2	SW3	WSW3	SSW5	SW5	WSW5	W5	SSW4	W4	WNW6	NW6	NW8	WNW6	NW8	NW11	NW8	NNE12	N6	NW6	ENE5	N10	N10	NNE7	N7	NW3.7	NNE12
29-Sep	NNW8	N9	N11	N10	N10	N10	N10	N11	N12	NNW12	NNW14	N12	N11	N12	NNW13	NNW14	NNW12	NNW10	NNW8	NNW8	NW7	WNW7	WNW9	NW7	NNW9.9	NNW14
30-Sep	NW7	NW6	N5	NNE6	NNW3	SE1	ENE2	NNE2	NNE4	N6	N8	N5	NNE5	NNE7	NNE6	NNE6	NE3	NE3	NE4	E3	ESE5	ESE6	ESE5	ESE5	NNE3.2	N8

SSW4.8	SSW4.9	SSW4.6	SSW4.5	SSW4.4	SSW4.7	SSW4.1	SSW4.3	SW4.6	SW5.6	SW6.8	SW7.7	SW6.9	SW6.5	WSW6.7	SW6.6	SW6.2	SW4.6	SW3.6	SSW3.9	SSW3.9	SSW4.3	SSW4.8	SSW4.9	Diurnal Average
W23	W20	W23	W20	WNW20	W18	W17	W18	SSE18	SSE19	SSE21	S24	SSE24	S26	SSE24	S23	WSW22	SW21	W20	W21	WNW26	W22	W24	W24	Diurnal Maximum

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Sawbones Bay - September 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	139	19.31	19.31
6 - 11	311	43.19	62.50
12 - 19	229	31.81	94.31
20 - 28	41	5.69	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Sawbones Bay - September 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	5	4	11	10	7	10	31	14	16	11	9	4	0	1	139
6 - 11	16	8	0	0	6	19	22	31	63	41	26	27	7	23	15	7	311
12 - 19	7	1	0	0	1	2	8	46	26	15	18	17	39	38	6	5	229
20 - 28	0	0	0	0	0	0	0	7	6	0	4	2	17	3	2	0	41
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	26	12	5	4	18	31	37	94	126	70	64	57	72	68	23	13	720

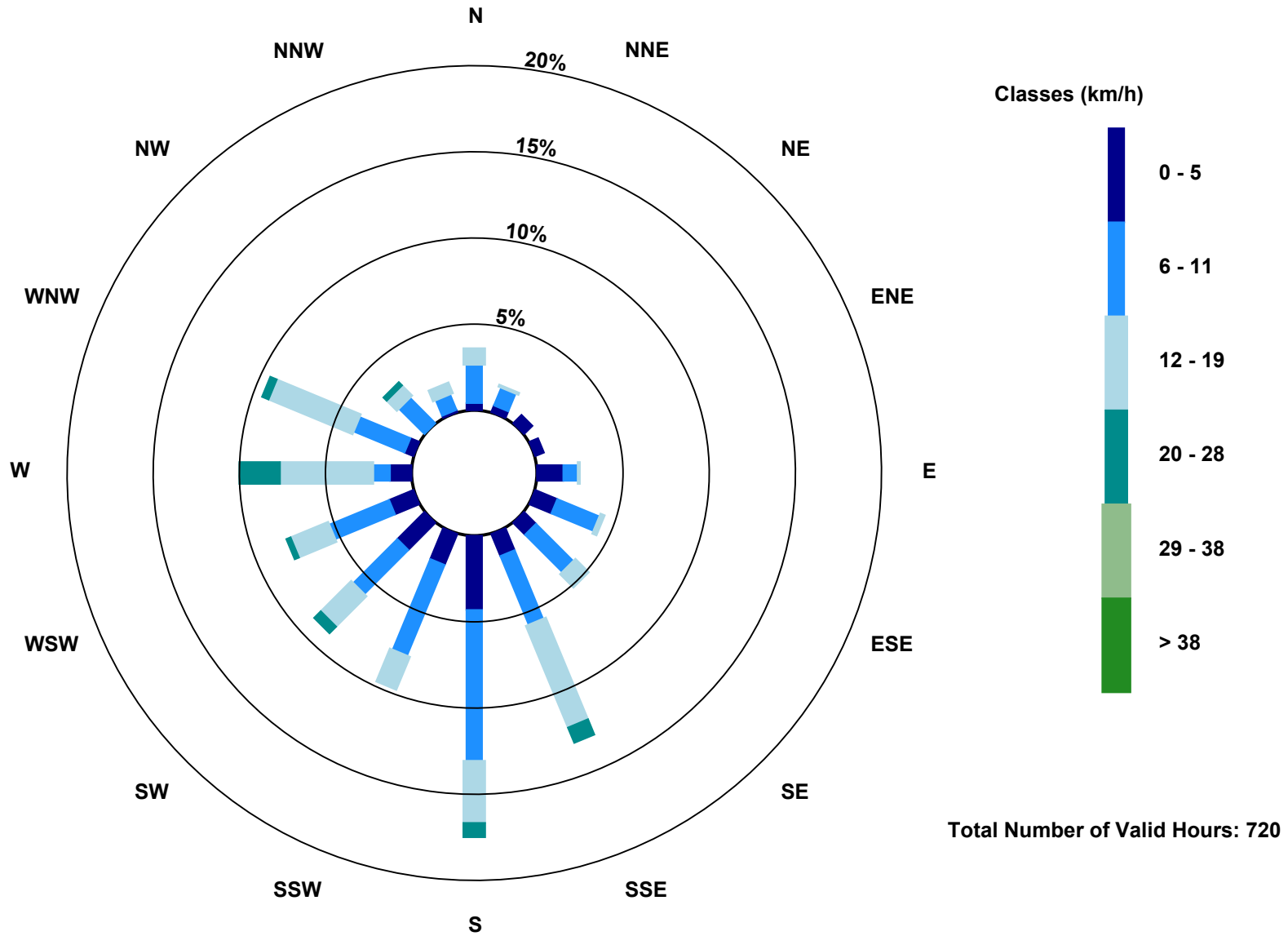
Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

Wind Speed (WS) - km/h
Sawbones Bay





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Sawbones Bay - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Sep 11 16:00 Minimum Value: 1 km/h on Sep 10 06:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 3 Q ₃ = 4 P ₉₀ = 5 P ₉₉ = 6																	Hours in Service: 720 Hours of Data: 720 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-Sep	2	3	3	3	3	4	4	3	3	3	4	5	5	5	6	6	6	6	5	4	4	4	4	5	6
2-Sep	3	4	3	5	4	4	4	5	2	3	2	3	3	3	3	3	3	4	4	4	5	4	3	2	5
3-Sep	4	2	2	2	1	2	2	2	1	1	6	5	4	3	2	2	2	1	2	2	2	5	3	2	6
4-Sep	2	2	3	2	3	2	2	3	3	4	3	3	3	4	3	3	3	3	3	1	2	4	1	3	4
5-Sep	3	1	2	1	1	2	1	1	3	3	4	4	5	4	4	4	3	2	2	1	4	2	2	5	
6-Sep	2	2	2	2	2	1	2	1	2	3	3	3	3	4	4	4	4	4	5	2	1	2	2	5	
7-Sep	2	2	2	3	4	4	2	2	2	2	3	4	4	4	5	4	5	5	2	2	2	2	1	5	
8-Sep	2	1	1	1	1	2	1	1	1	3	3	3	4	5	5	3	4	3	1	1	2	2	1	5	
9-Sep	1	1	1	1	1	2	2	1	1	1	3	3	3	2	2	2	2	2	1	1	2	2	1	3	
10-Sep	1	1	1	1	1	1	2	1	2	2	3	4	4	4	4	4	3	3	2	1	3	4	3	4	
11-Sep	3	3	4	4	3	3	3	4	5	5	6	7	6	7	6	7	6	4	3	3	4	3	4	7	
12-Sep	3	2	2	2	2	1	2	2	3	3	2	2	3	3	3	3	3	2	2	3	3	4	3	4	
13-Sep	5	2	1	1	3	4	4	3	4	4	4	5	5	5	6	6	5	5	4	6	4	6	6	6	
14-Sep	6	5	5	4	4	3	3	3	3	3	4	4	4	5	5	5	4	3	2	2	3	3	3	6	
15-Sep	3	2	1	1	2	1	1	1	2	3	4	4	4	4	4	4	4	3	2	2	3	3	3	4	
16-Sep	2	3	2	2	3	2	1	2	2	3	2	2	2	2	3	2	2	1	1	2	1	1	1	3	
17-Sep	1	1	1	2	2	1	2	2	3	3	4	5	3	3	5	3	3	3	4	4	3	2	4	5	
18-Sep	2	2	1	1	1	2	1	2	2	5	4	4	4	5	4	5	5	4	5	2	1	3	3	5	
19-Sep	3	2	2	2	2	3	3	4	3	4	4	4	4	5	4	3	4	3	2	2	1	2	3	5	
20-Sep	2	2	4	3	2	3	2	2	2	2	3	3	3	3	4	3	3	1	2	3	3	2	3	4	
21-Sep	1	1	1	2	2	1	1	1	2	3	4	5	5	6	6	5	5	5	2	1	1	1	1	6	
22-Sep	2	2	2	1	1	1	2	2	4	4	5	6	5	4	5	5	4	3	2	2	2	2	2	6	
23-Sep	2	2	2	2	3	3	3	3	4	5	6	5	6	6	6	6	5	5	2	3	3	2	3	6	
24-Sep	3	3	2	4	4	3	2	2	3	2	3	3	2	3	2	2	1	2	2	1	2	4	2	4	
25-Sep	1	2	1	1	1	2	2	2	1	2	2	3	3	3	4	3	3	2	3	3	3	3	3	4	
26-Sep	3	4	4	3	4	4	3	3	4	4	4	4	4	4	4	2	5	4	2	3	3	3	2	5	
27-Sep	2	2	2	4	4	2	5	2	2	3	5	4	3	4	3	2	3	2	2	1	1	4	2	5	
28-Sep	2	2	2	1	1	2	3	1	2	2	2	3	3	3	5	3	5	1	3	2	3	2	2	5	
29-Sep	2	3	2	2	2	2	2	3	3	3	3	3	2	3	3	3	3	2	2	2	1	1	1	3	
30-Sep	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	2	
Diurnal Maximum																									



Wood Buffalo Environmental Association
Summary of Hour Averages

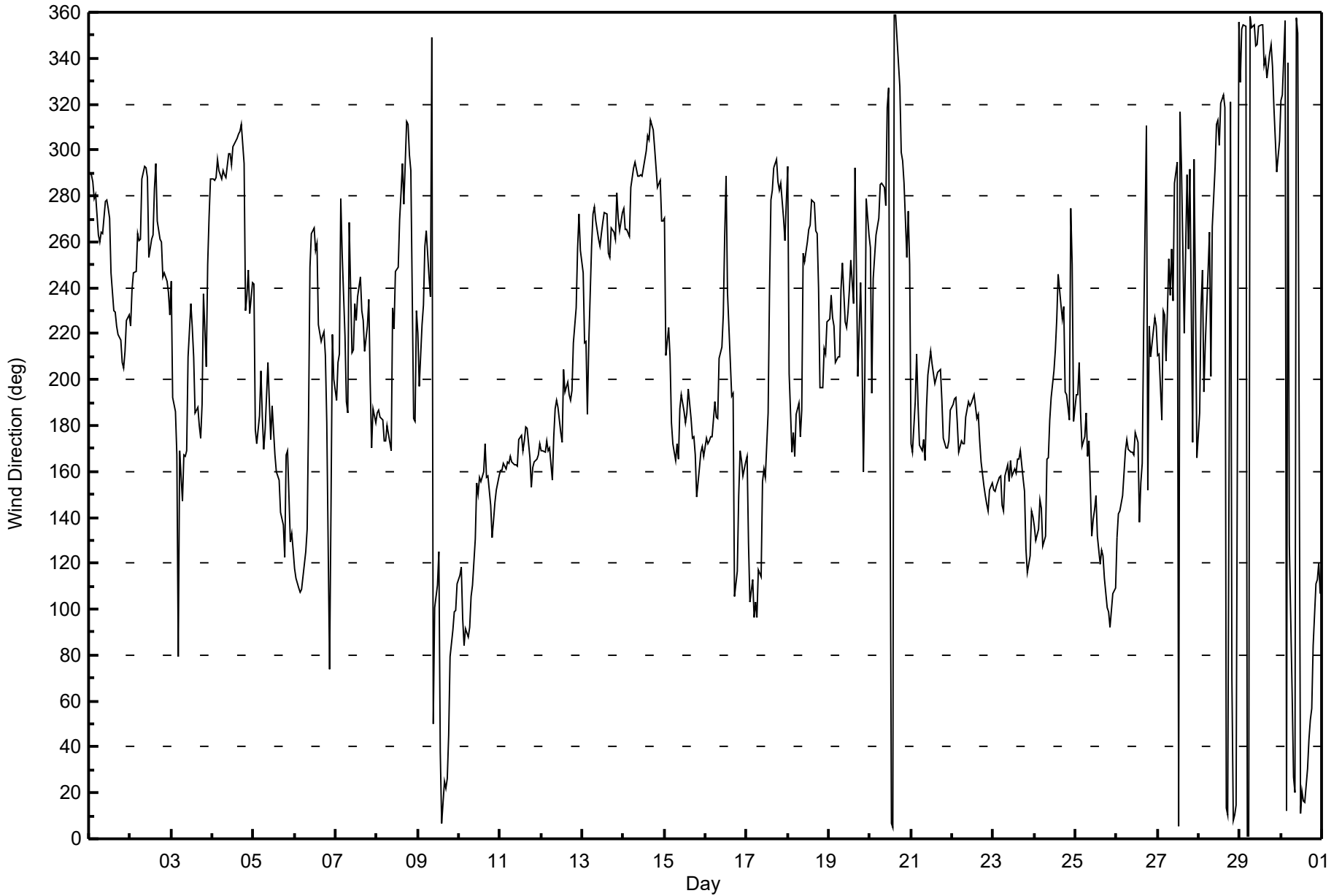
Wind Direction (WD) - deg
Sawbones Bay - September 2023

Direction of Maximum Speed: 281 deg on Sep 13 21:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 167.1 deg on Sep 11	Hours of Data: 720
Direction of Minimum Speed: 173 deg on Sep 25 09:00	Hours of Missing Data: 0
Direction of Minimum Daily Speed Average: 1.6 deg on Sep 9	Percent Operational Time: 100.0
Monthly Average Direction: 218.5 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-Sep	290	289	286	279	281	263	260	264	264	278	278	274	271	246	230	229	223	220	217	208	205	212	226	228	249.3
2-Sep	223	239	247	247	264	260	261	287	293	292	288	253	261	263	283	294	269	261	260	245	246	243	238	228	260.8
3-Sep	243	192	186	167	79	169	147	167	166	169	210	233	223	210	185	188	180	174	189	237	205	250	271	287	211.5
4-Sep	287	287	288	296	291	287	291	289	288	298	298	293	302	302	305	307	308	311	294	230	237	248	229	242	289.9
5-Sep	242	178	172	184	204	184	170	178	208	190	174	189	167	160	158	156	142	137	123	167	169	129	133	126	166.8
6-Sep	117	114	109	108	109	114	125	135	184	249	264	266	256	259	224	217	219	221	211	181	74	143	220	200	206.7
7-Sep	191	208	211	279	255	219	190	186	269	212	213	233	226	236	245	230	226	212	223	235	199	170	187	181	226.1
8-Sep	185	187	184	182	173	173	180	177	169	231	222	247	249	270	281	294	277	313	311	298	291	183	182	230	246.7
9-Sep	220	197	224	233	258	265	244	236	349	50	101	111	125	38	7	25	22	26	45	80	91	99	99	111	69.0
10-Sep	115	119	96	84	92	88	92	106	111	130	155	150	157	156	160	172	157	158	145	131	138	146	152	158	144.7
11-Sep	160	161	163	161	164	164	167	164	163	163	163	174	176	169	173	179	179	166	153	161	164	165	167	172	167.1
12-Sep	169	169	168	173	169	170	156	175	187	191	188	177	173	204	194	199	193	191	195	216	231	257	272	256	191.9
13-Sep	247	216	217	185	216	258	272	275	269	261	258	264	268	273	272	255	253	266	264	261	281	270	265	273	263.3
14-Sep	275	266	265	262	284	288	293	295	289	289	288	296	300	306	304	313	309	301	292	283	287	269	269	269	287.3
15-Sep	270	211	222	210	181	172	165	172	165	187	194	186	181	186	196	183	174	175	167	149	162	169	171	167	179.7
16-Sep	174	172	173	175	175	190	184	183	209	214	228	262	289	238	208	193	194	106	116	150	169	165	158	164	187.3
17-Sep	167	129	103	113	96	103	96	117	114	156	161	157	186	239	278	283	292	296	286	283	286	270	260	277	243.5
18-Sep	293	203	168	177	167	185	189	175	187	255	251	260	266	267	278	277	265	263	240	197	196	213	211	225	243.8
19-Sep	227	237	227	223	207	210	210	239	251	225	223	230	239	252	233	292	248	201	242	213	160	200	279	263	234.4
20-Sep	257	194	244	263	267	270	285	285	284	276	319	327	7	5	359	359	348	328	299	295	285	253	273	250	303.9
21-Sep	172	168	191	211	189	172	169	174	165	187	202	212	207	202	199	203	204	204	191	174	171	170	173	187	191.8
22-Sep	189	191	192	181	168	173	172	172	184	190	188	190	191	193	183	185	173	164	154	150	146	143	152	155	176.8
23-Sep	152	151	154	158	158	145	143	158	163	156	165	158	161	159	165	166	169	157	151	126	116	123	143	140	154.8
24-Sep	136	130	135	148	144	128	132	165	166	183	192	204	213	226	246	233	226	232	195	194	183	274	250	182	172.6
25-Sep	193	193	207	185	171	175	185	166	173	132	139	144	149	132	120	126	123	113	100	99	92	99	107	109	128.2
26-Sep	131	142	143	149	159	169	174	169	168	169	167	177	173	138	155	164	220	310	152	223	210	222	227	223	168.6
27-Sep	210	211	182	230	228	208	253	237	257	234	285	295	6	317	293	220	257	289	257	291	173	296	236	166	256.1
28-Sep	186	232	247	195	215	247	264	201	267	292	311	313	302	321	324	318	13	10	321	70	8	10	15	356	323.4
29-Sep	329	353	354	354	1	1	358	353	354	346	346	354	354	355	337	340	331	343	346	336	318	290	297	304	343.1
30-Sep	322	324	357	12	338	128	63	27	20	357	351	11	21	16	16	31	43	52	56	84	111	113	120	107	27.0

212.9 196.9 200.7 204.3 205.7 210.7 209.8 209.5 215.4 220.4 224.1 229.1 227.8 232.8 237.6 233.5 230.2 233.3 222.6 209.0 206.0 207.6 210.2 211.1
 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
Sawbones Bay - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 110 deg on Sep 19 19:00 Minimum Value: 5 deg on Sep 17 00:00 Percentiles: P ₁ = 8 P ₁₀ = 12 Q ₁ = 15 Median = 18 Q ₃ = 25 P ₉₀ = 39 P ₉₉ = 79																			Hours in Service: 720 Hours of Data: 720 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-Sep	10	10	10	10	10	12	11	11	14	17	18	17	21	24	18	20	18	17	18	17	17	17	17	16	24
2-Sep	19	19	15	16	12	10	12	16	12	14	17	21	17	14	16	12	17	13	12	20	18	18	19	17	21
3-Sep	23	25	20	44	43	44	16	20	19	18	25	19	17	18	19	18	18	15	36	21	20	19	18	9	44
4-Sep	10	10	9	12	12	11	12	12	11	14	13	12	14	16	17	20	15	14	29	16	21	20	18	26	29
5-Sep	31	29	15	12	14	19	10	17	22	27	27	26	29	26	14	22	22	17	18	21	14	20	19	19	31
6-Sep	15	13	19	16	15	14	22	23	17	31	15	17	22	23	20	19	19	25	38	25	42	85	73	20	85
7-Sep	31	26	23	19	50	42	26	72	40	28	23	26	24	26	33	23	22	21	27	19	59	76	26	57	76
8-Sep	22	31	20	34	25	12	10	16	27	24	26	32	40	38	20	18	30	14	9	8	12	38	38	57	57
9-Sep	38	24	17	38	35	20	67	51	57	78	71	53	90	58	28	14	18	21	30	33	27	20	14	11	90
10-Sep	12	11	15	13	14	12	20	12	18	26	23	21	24	24	25	23	18	16	14	14	15	16	16	16	26
11-Sep	15	14	15	14	14	14	15	16	16	17	18	18	21	17	19	20	18	18	15	15	15	14	15	15	21
12-Sep	14	13	12	13	15	13	13	20	22	26	28	35	39	39	28	23	20	19	20	22	23	16	33	44	44
13-Sep	47	25	26	16	25	12	15	14	15	14	17	16	18	19	20	19	18	14	14	12	13	15	14	14	47
14-Sep	15	14	14	12	12	10	12	13	11	10	10	11	16	16	15	16	13	8	8	12	12	10	11	16	16
15-Sep	37	21	26	20	25	11	17	18	19	25	25	24	23	23	22	23	19	16	12	12	15	14	14	15	37
16-Sep	15	13	13	14	13	17	15	17	21	22	22	38	42	40	27	25	33	64	52	15	7	14	8	5	64
17-Sep	9	18	15	12	15	11	22	28	15	25	20	24	43	34	23	14	11	12	12	11	20	16	15	12	43
18-Sep	13	48	15	12	18	22	18	21	38	35	22	19	18	19	20	15	15	15	30	14	15	16	20	18	48
19-Sep	20	18	15	17	20	18	20	22	20	23	19	24	26	29	27	33	24	90	110	69	79	46	39	30	110
20-Sep	28	21	33	16	10	11	11	10	17	58	39	33	22	23	20	21	15	15	9	19	23	26	61	56	61
21-Sep	10	8	19	65	18	8	8	12	16	26	24	20	23	21	20	19	19	19	15	9	8	8	8	14	65
22-Sep	15	15	14	13	7	9	8	13	21	18	19	20	21	21	21	18	18	15	14	12	13	12	13	12	21
23-Sep	12	11	12	12	14	19	17	17	16	19	17	19	16	18	17	16	18	17	15	18	14	15	17	19	19
24-Sep	19	18	18	18	17	20	19	16	17	20	21	28	24	50	29	88	67	16	23	15	68	68	63	26	88
25-Sep	28	35	22	14	9	21	36	24	95	47	39	36	39	37	27	24	20	22	20	21	23	20	14	14	95
26-Sep	19	17	18	16	14	14	15	15	13	15	17	24	30	27	20	21	38	57	89	64	61	20	14	17	89
27-Sep	28	19	31	39	31	21	25	33	26	24	15	17	30	37	16	29	22	68	73	65	22	46	64	23	73
28-Sep	47	45	46	18	34	36	34	28	46	14	31	34	51	32	23	24	19	12	54	40	18	16	17	18	54
29-Sep	18	21	16	16	15	16	17	14	15	17	15	19	18	16	16	15	14	14	14	12	17	9	11	20	21
30-Sep	14	14	14	13	20	66	36	20	41	42	29	34	59	29	22	17	26	31	33	26	16	10	11	23	66
	47	48	46	65	50	66	67	72	95	78	71	53	90	58	33	88	67	90	110	69	79	85	73	57	
Diurnal Maximum																									



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS507
KIRBY SOUTH
SEPTEMBER 2023

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

October 30, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - KIRBY SOUTH (AMS 507)
 SEPTEMBER 2022

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	685	33	35	99.72	18.3	0	2.2	0
H2S (ppb) Average	683	35	37	99.72	1.7	0	0.7	0
THC (ppm) Average	685	33	35	99.72	6	-	2.6	-
NO2 (ppb) Average	685	35	35	100	16.9	0	5.8	-
NO (ppb) Average	685	35	35	100	5.8	-	1.7	-
NOX (ppb) Average	685	35	35	100	19.9	-	7.2	-
Temperature 2 m (C) Average	720	0	0	100	23.2	-	17.8	-
Relative Humidity (%) Average	720	0	0	100	99.6	-	91.1	-
Wind Speed 10 m (km/h) Average	720	0	0	100	28	-	19	-
Wind Direction 10 m (deg) Average	720	0	0	100	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - KIRBY SOUTH(AMS507)
 SEPTEMBER 2022

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	685	0.66	1.5	-	0	0	0	0.2	0.6	1.4	18.3
H2S (ppb) Average	683	0.2	0.2	-	0	0.1	0.1	0.1	0.2	0.4	1.7
THC (ppm) Average	685	2.38	0.3	-	2.1	2.2	2.2	2.3	2.5	2.6	6
NO2 (ppb) Average	685	2.04	1.8	-	0.3	0.6	0.9	1.5	2.5	4.1	16.9
NO (ppb) Average	685	0.33	0.9	-	0	0	0	0	0.1	1	5.8
NOX (ppb) Average	685	2.37	2.5	-	0.3	0.6	0.9	1.6	2.7	5	19.9
Temperature 2 m (C) Average	720	11.96	4.7	-	0.9	6	8.2	11.8	15.3	18.7	23.2
Relative Humidity (%) Average	720	68.57	17.8	-	31	42	55	70.5	83.1	91.2	99.6
Wind Speed 10 m (km/h) Average	720	11.5	5	-	1	5	8	11	15	18	28
Wind Direction 10 m (deg) Average	720	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - KIRBY SOUTH (AMS507)
SEPTEMBER 2022

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
H2S, SO2, THC	15 Sep 2023 13:00	15 Sep 2023 14:00	2	Maintenance - sample manifold cleaned



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb

Kirby South - September 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 18.3 ppb on Sep 18 17:00	Maximum Daily Average: 2.2 ppb on Sep 19		Hours of Data:	685
Minimum Value: 0.0 ppb on Sep 1 17:00	Minimum Daily Average: 0.0 ppb on Sep 5		Hours of Missing Data:	35
Maximum Diurnal Average: 1.3 ppb at hour 14	Minimum Diurnal Average: 0.2 ppb at hour 20		Hours of Calibration:	33
Monthly Average: 0.66 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.2 Q ₃ = 0.6 P ₉₀ = 1.4 P ₉₉ = 7.6		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-Sep	0.6	0.5	0.0	0.1	Z	0.0	0.3	2.7	1.3	0.1	0.1	1.5	7.5	2.9	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.8	7.5
2-Sep	1.9	7.1	11.6	7.0	3.0	Z	0.1	0.2	0.2	0.3	0.5	0.5	0.6	0.7	0.8	0.7	0.6	3.7	1.1	1.2	1.0	0.5	0.4	0.2	1.9	11.6
3-Sep	Z	0.3	0.2	0.3	0.3	0.4	0.3	0.3	0.3	0.6	1.7	0.4	0.6	0.4	0.3	0.8	0.7	0.4	0.3	0.3	0.4	0.1	0.0	0.0	0.4	1.7
4-Sep	0.4	Z	0.7	0.1	0.3	0.2	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.3	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7
5-Sep	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	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
6-Sep	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	1.3	1.8	6.1	5.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	6.1
7-Sep	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.8	4.0	3.2	2.7	3.7	2.5	1.2	0.2	3.9	0.0	0.0	0.0	0.0	0.0	0.0	1.0	4.0
8-Sep	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.2	0.3	2.8	1.4	2.8	1.2	2.7	7.6	4.1	0.7	0.2	0.2	0.2	0.0	0.1	1.1	7.6
9-Sep	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.1	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.9	0.1	0.9
10-Sep	2.3	Z	0.8	1.0	1.2	0.9	0.6	0.9	0.7	0.6	0.5	0.7	0.8	0.5	0.4	0.5	0.6	0.5	0.4	0.0	0.0	0.2	0.0	0.0	0.6	2.3
11-Sep	0.4	0.6	Z	0.5	0.4	0.3	0.3	0.3	0.2	0.3	0.4	0.2	0.1	0.0	0.0	0.1	0.0	0.2	0.4	0.2	0.3	0.5	0.5	0.3	0.6	0.6
12-Sep	0.4	0.4	0.8	Z	0.8	0.7	0.6	0.6	0.5	0.6	0.6	2.0	1.9	0.5	0.4	0.3	0.3	0.4	0.2	0.3	5.1	0.1	0.0	0.0	0.8	5.1
13-Sep	1.3	0.5	0.3	0.3	Z	0.2	0.2	0.0	0.2	4.8	3.1	7.6	0.6	2.6	4.9	12.2	0.9	6.4	0.2	0.1	2.1	0.0	0.0	0.0	2.1	12.2
14-Sep	0.9	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	C	C	C	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.1	0.9
15-Sep	Z	0.3	0.6	0.5	0.5	0.7	0.5	0.4	0.2	0.0	0.0	0.0	M	M	0.8	0.3	0.3	0.6	0.2	0.1	0.6	0.7	1.0	1.1	0.5	1.1
16-Sep	0.8	Z	0.5	0.5	0.4	0.4	0.3	0.2	0.1	1.5	0.5	0.3	0.4	1.6	1.9	0.6	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.4	1.9
17-Sep	0.0	0.0	Z	0.5	0.1	0.2	1.0	0.2	0.1	0.3	0.1	0.2	0.3	1.0	0.6	0.8	0.3	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.3	1.0
18-Sep	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	5.2	1.6	0.3	0.1	0.4	0.3	6.4	18.3	7.9	0.8	0.0	0.1	0.2	0.2	0.8	1.8	18.3
19-Sep	3.3	1.4	1.9	0.7	Z	0.4	0.2	0.5	0.3	4.3	0.6	5.9	5.5	8.6	10.5	2.5	1.5	1.7	0.5	0.2	0.1	0.0	0.1	0.0	2.2	10.5
20-Sep	0.5	1.4	1.4	0.1	0.0	Z	2.7	1.3	1.9	2.3	4.8	3.6	2.1	1.4	1.4	1.0	0.2	0.1	0.1	0.0	0.1	0.3	0.4	0.3	1.2	4.8
21-Sep	Z	0.2	0.0	0.1	0.3	0.2	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.3
22-Sep	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.1	0.1	0.1	0.0	0.0	0.2	0.1	0.0	0.2	0.7	1.2	1.2	1.0	0.2	1.2
23-Sep	0.9	1.1	Z	1.2	1.2	0.9	0.9	0.4	0.4	0.4	0.4	0.2	0.1	0.2	0.3	0.3	0.4	0.6	0.5	0.4	0.6	0.6	0.4	0.3	0.6	1.2
24-Sep	0.4	0.6	0.5	Z	0.5	0.4	0.6	0.5	0.4	0.2	0.2	0.1	0.2	0.3	0.4	0.3	0.3	0.1	0.1	0.2	0.2	0.2	0.4	0.2	0.3	0.6
25-Sep	0.0	0.2	0.1	0.1	Z	0.3	0.3	0.3	0.7	1.1	0.9	0.6	0.4	0.4	0.4	0.1	0.0	0.2	0.1	0.2	0.0	0.0	0.1	0.4	0.3	1.1
26-Sep	0.6	0.4	0.5	0.6	0.5	Z	0.8	0.8	1.0	0.9	0.5	0.5	0.3	0.3	0.5	0.5	0.3	0.4	0.3	0.4	0.6	0.2	0.5	0.2	0.5	1.0
27-Sep	Z	0.2	0.0	0.0	0.2	0.3	0.1	0.0	0.0	0.1	0.6	0.2	0.5	0.4	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.8
28-Sep	0.0	Z	1.8	0.4	1.1	0.1	0.3	0.4	0.5	0.1	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.4	0.3	0.3	1.3	0.2	0.4	1.8
29-Sep	0.2	0.3	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.5	0.5	0.5	0.2	0.0	0.1	0.3	0.4	0.4	0.5	0.6	0.9	1.2	0.3	1.2
30-Sep	0.6	0.7	0.4	Z	0.6	0.8	0.7	0.5	0.4	2.3	2.9	1.3	0.7	0.9	0.3	0.1	0.1	0.0	0.2	0.3	0.1	0.2	0.2	0.2	0.6	2.9

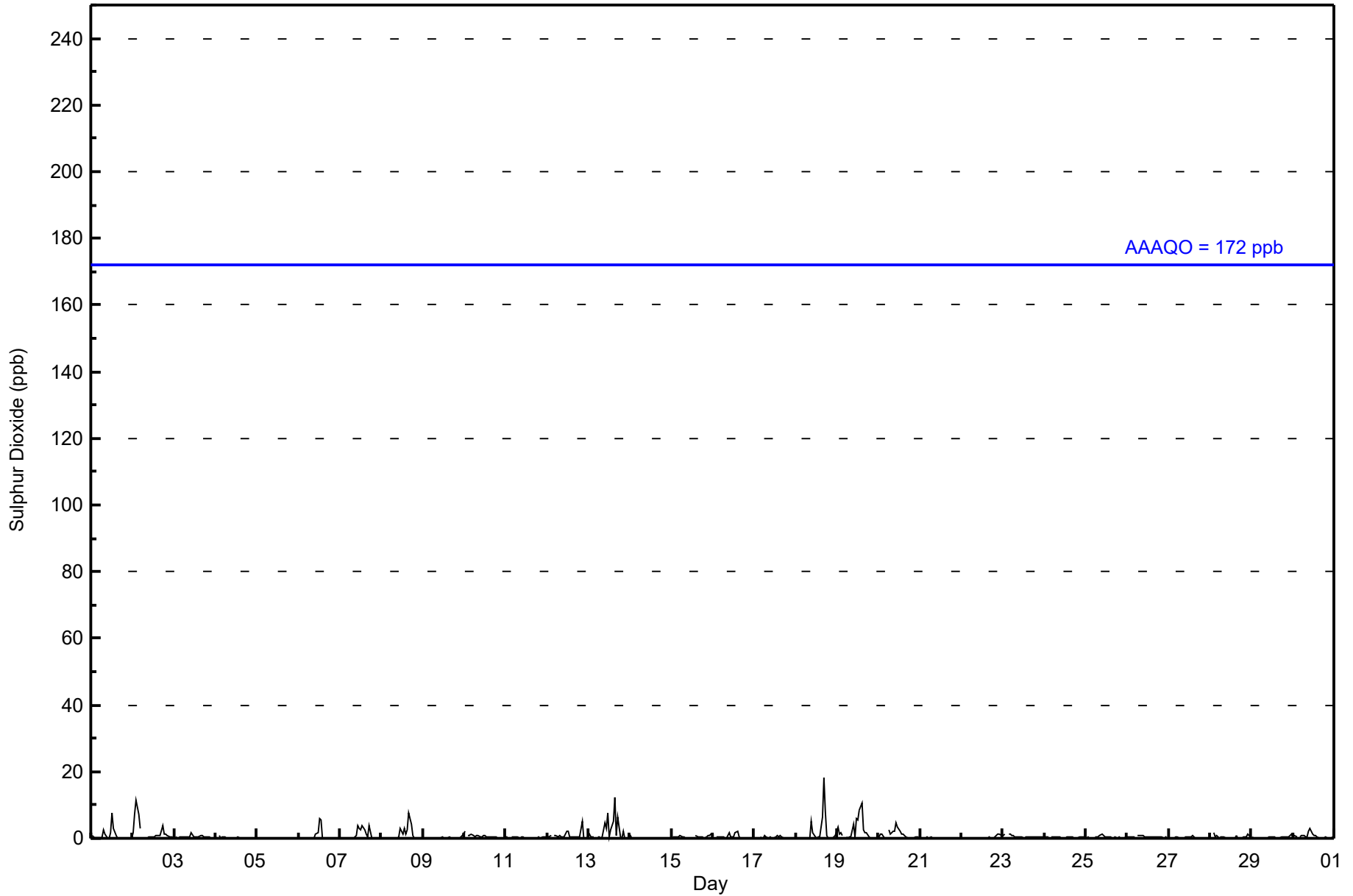
0.6	0.7	0.9	0.6	0.5	0.3	0.4	0.4	0.3	0.9	0.9	1.2	1.2	1.3	1.0	1.1	1.1	1.1	1.1	0.2	0.2	0.4	0.2	0.3	0.3	Diurnal Average	
3.3	7.1	11.6	7.0	3.0	0.9	2.7	2.7	1.9	5.2	4.8	7.6	7.5	8.6	10.5	12.2	18.3	7.9	1.1	1.2	5.1	1.2	1.3	1.2	Diurnal Maximum		

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
Kirby South - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Kirby South - September 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	682	99.56	99.56
11 - 20	3	0.44	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: 720



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Kirby South - September 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	14	18	19	8	7	13	22	41	87	46	100	73	87	89	43	15	682
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	3	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	14	18	19	8	7	13	22	41	87	46	100	73	90	89	43	15	685

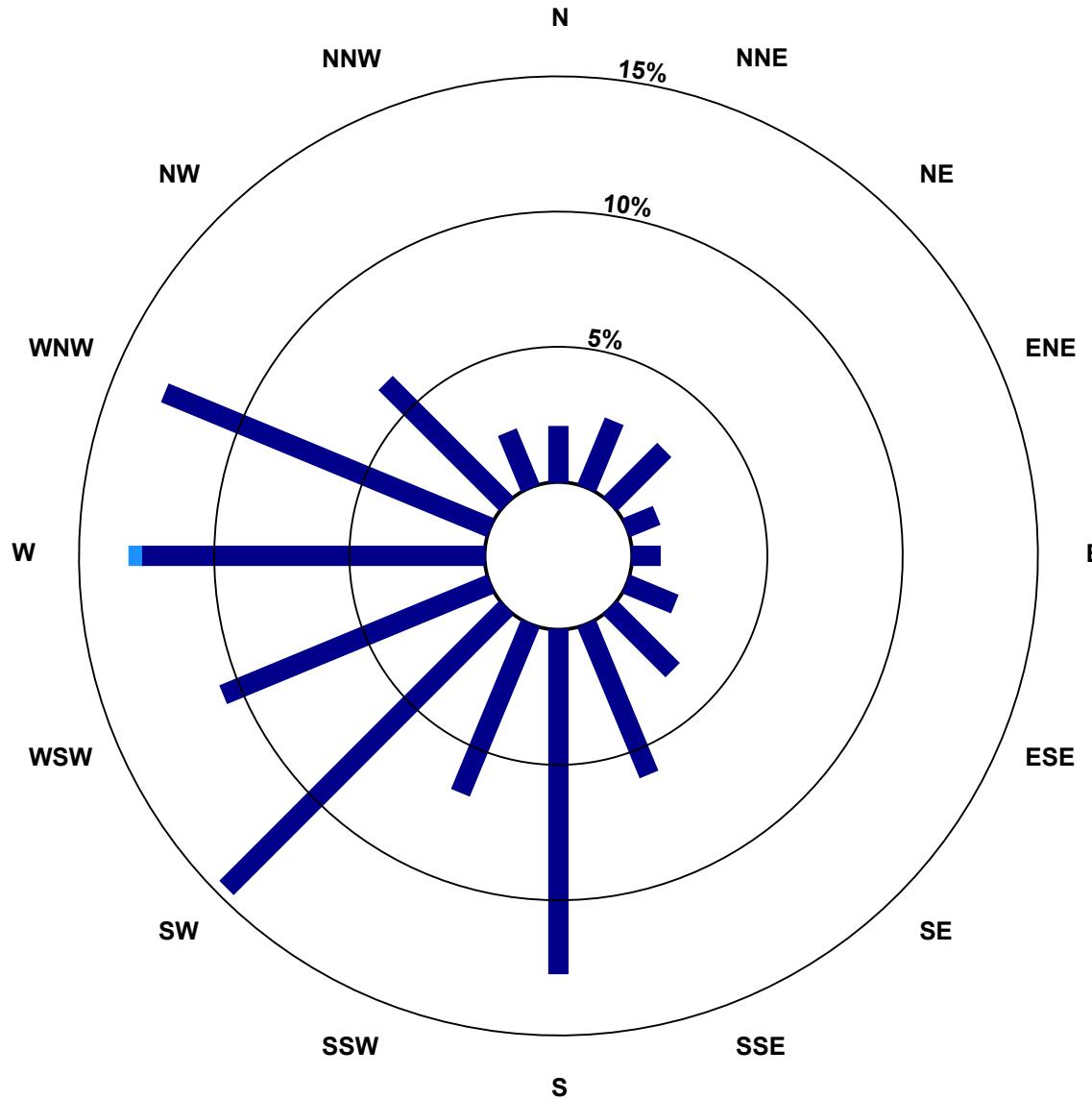
Total Number of Valid Hours: 685

Total Number of Hours: 720

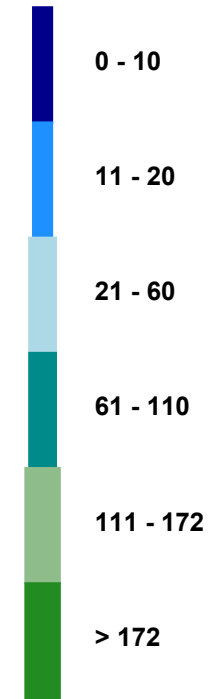


Wood Buffalo Environmental Association
Wind Rose Sep 2023

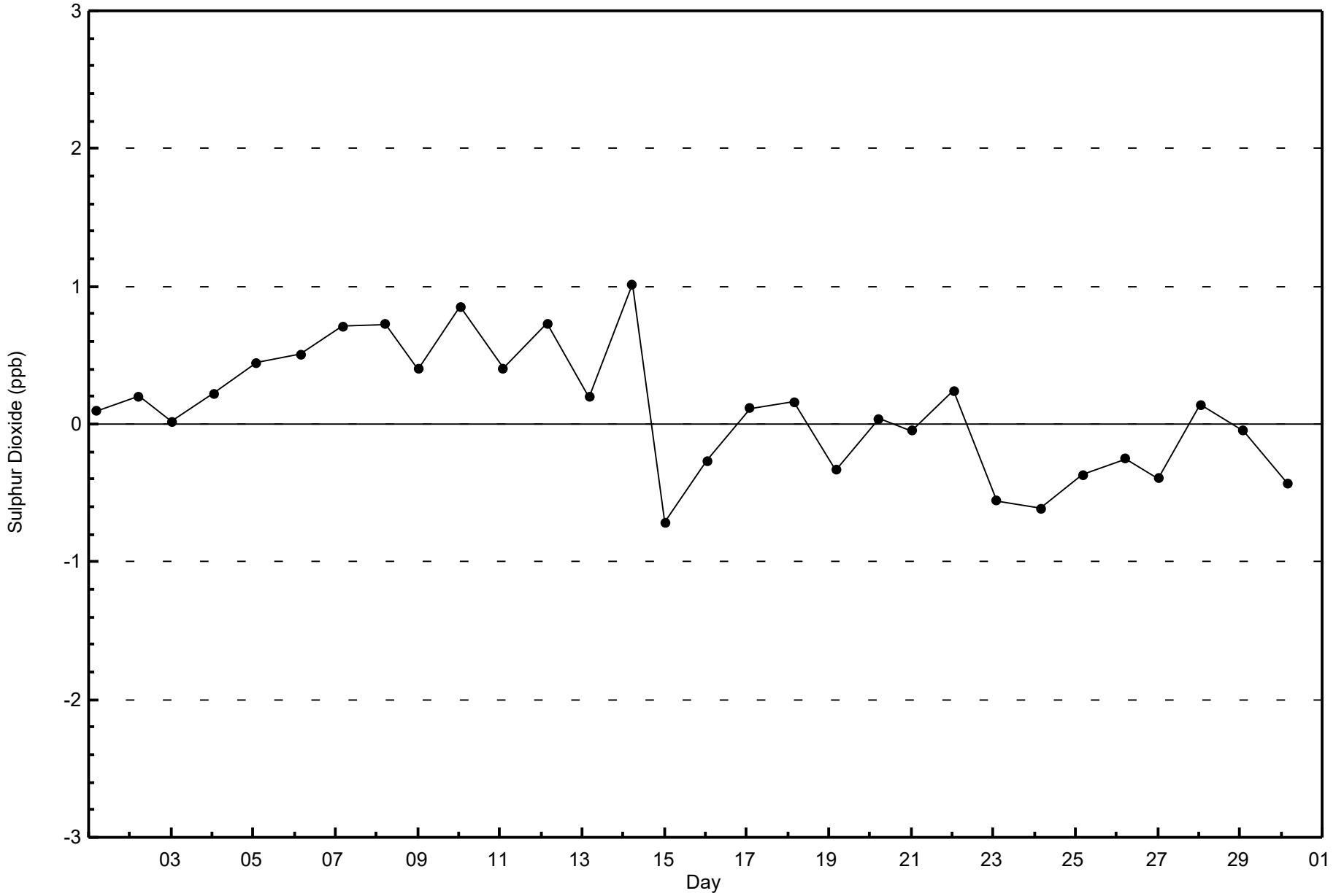
Sulphur Dioxide (SO₂) - ppb
Kirby South

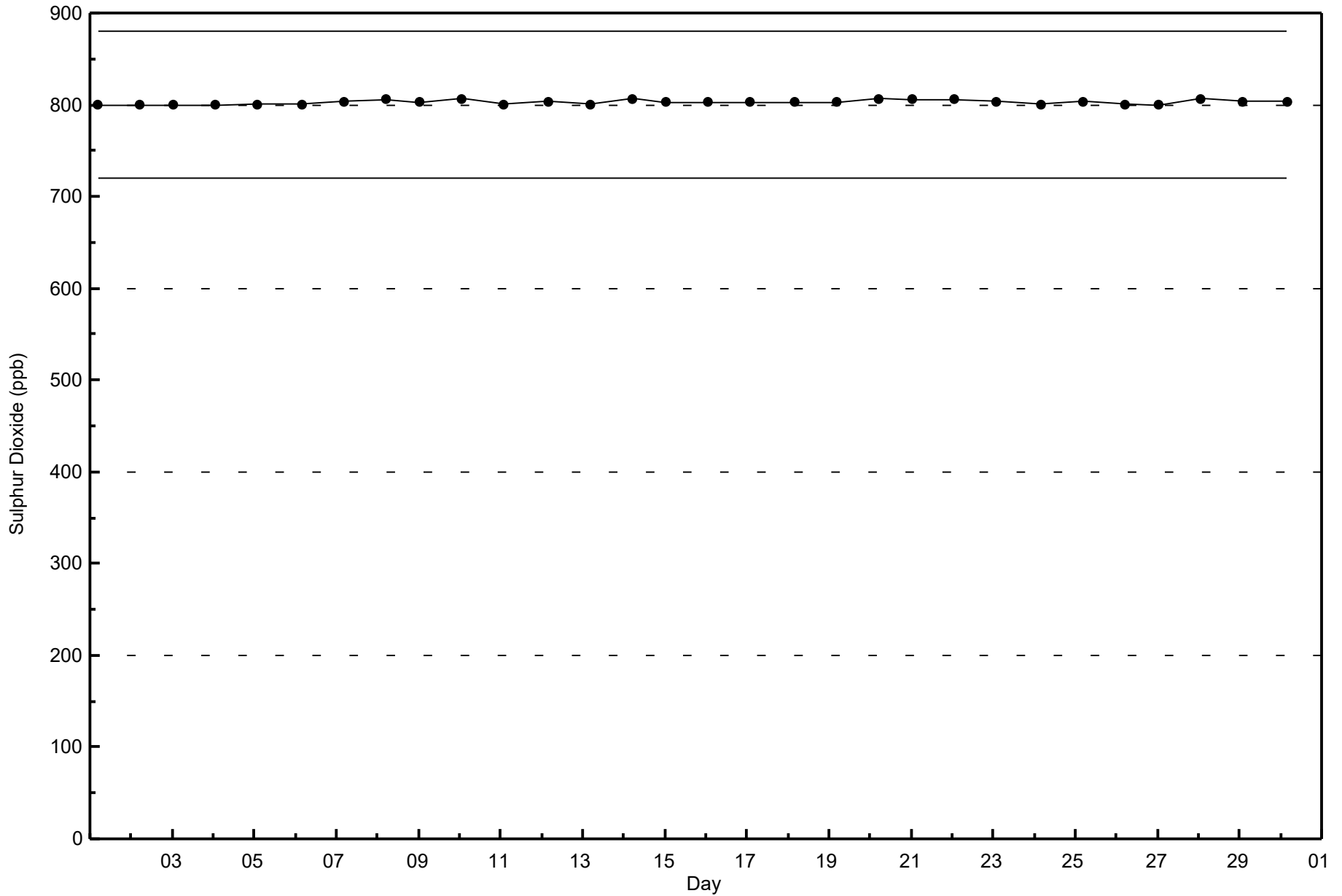


Classes (ppb)



Total Number of Valid Hours: 685







Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H₂S) - ppb

Kirby South - September 2023

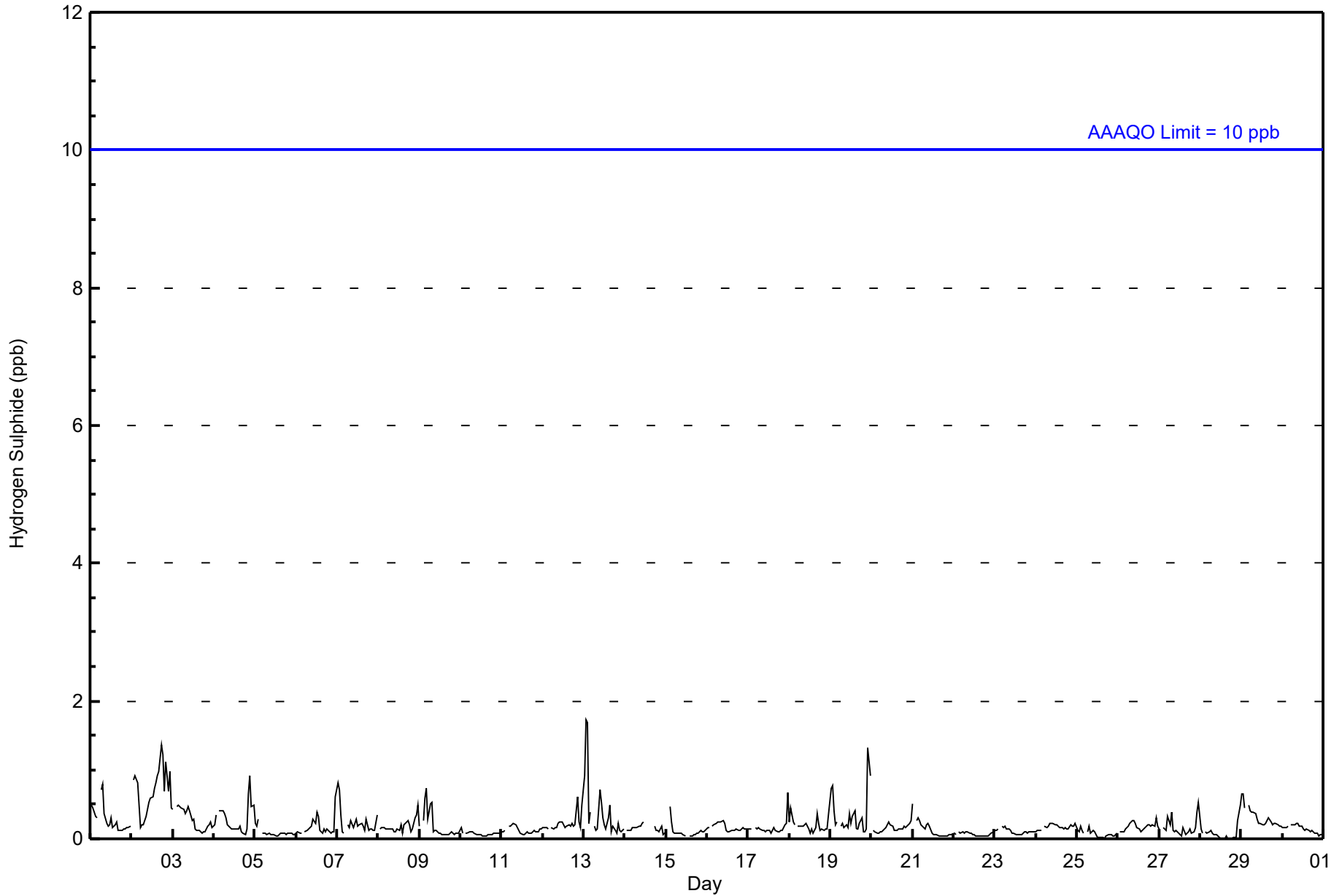
Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 720																	Daily Average		Daily Maximum				
Maximum Value: 1.7 ppb on Sep 13 02:00		Maximum Daily Average: 0.7 ppb on Sep 2		Hours of Data: 683																	Hours of Missing Data: 37		Hours of Calibration: 35				
Minimum Value: 0.0 ppb on Sep 28 14:00		Minimum Daily Average: 0.1 ppb on Sep 22		Hours of Calibration: 35																	Percent Operational Time: 99.7						
Maximum Diurnal Average: 0.3 ppb at hour 2		Minimum Diurnal Average: 0.1 ppb at hour 20		Percent Operational Time: 99.7																							
Monthly Average: 0.20 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 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-Sep	0.5	0.4	0.4	0.3	0.3	Z	0.7	0.8	0.4	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.8	
2-Sep	Z	0.9	0.9	0.8	0.5	0.2	0.2	0.2	0.3	0.4	0.5	0.6	0.6	0.7	0.8	0.9	1.0	1.4	1.2	0.7	1.1	0.7	1.0	0.4	1.4		
3-Sep	0.4	Z	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.5	0.4	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.5		
4-Sep	0.2	0.3	Z	0.4	0.4	0.4	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.6	0.9	0.5	0.5	0.9		
5-Sep	0.2	0.2	0.3	Z	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	0.3		
6-Sep	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.2	0.2	0.3	0.2	0.4	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.6	0.6		
7-Sep	0.8	0.7	0.3	0.1	0.1	Z	0.2	0.2	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.3	0.1	0.1	0.1	0.1	0.1	0.4	0.8		
8-Sep	Z	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.3	0.2	0.1	0.1	0.3	0.3	0.5	0.5		
9-Sep	0.2	Z	0.3	0.6	0.7	0.3	0.5	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.7		
10-Sep	0.2	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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2		
11-Sep	0.1	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2		
12-Sep	0.2	0.2	0.2	0.1	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.6	0.2	0.2	0.5	0.6		
13-Sep	0.9	1.7	1.7	0.2	0.4	Z	0.2	0.1	0.1	0.7	0.5	0.3	0.2	0.1	0.3	0.5	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.1	1.7		
14-Sep	Z	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	C	C	C	C	C	0.2	0.1	0.1	0.1	0.1	0.3		
15-Sep	0.1	Z	0.5	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	M	M	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5		
16-Sep	0.2	0.2	Z	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	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.3		
17-Sep	0.2	0.1	0.1	Z	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.7	0.7		
18-Sep	0.3	0.4	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.3	0.4		
19-Sep	0.7	0.8	0.4	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.4	0.2	0.3	0.4	0.1	0.2	0.2	0.3	0.1	0.1	0.1	1.3	0.9	1.3		
20-Sep	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	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3		
21-Sep	0.5	Z	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.5		
22-Sep	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	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1		
23-Sep	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	0.2		
24-Sep	0.1	0.1	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2		
25-Sep	0.1	0.1	0.2	0.1	0.1	Z	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.2		
26-Sep	Z	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3		
27-Sep	0.1	Z	0.2	0.1	0.1	0.3	0.2	0.4	0.1	0.1	0.1	0.1	0.1	0.0	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.5	0.5		
28-Sep	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	0.3	0.5	0.5		
29-Sep	0.7	0.7	0.5	Z	0.5	0.4	0.4	0.4	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.7		
30-Sep	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.2		
																								Diurnal Average		Diurnal Maximum	
																								0.3		0.9	
																								0.3		1.7	
																								0.3		1.7	
																								0.2		0.8	
																								0.2		0.7	
																								0.2		0.5	
																								0.2		0.7	
																								0.2		0.8	
																								0.2		0.4	
																								0.2		0.5	
																								0.2		0.6	
																								0.2		0.6	
																								0.1		0.7	
																								0.2		0.8	
																								0.1		0.9	
																								0.2		1.0	
																								0.2		1.4	
																								0.1		1.2	
																								0.2		0.7	
																								0.2		1.1	
																								0.2		0.9	
																								0.2		1.3	
																								0.3		0.9	

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
Kirby South - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Kirby South - September 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: 720



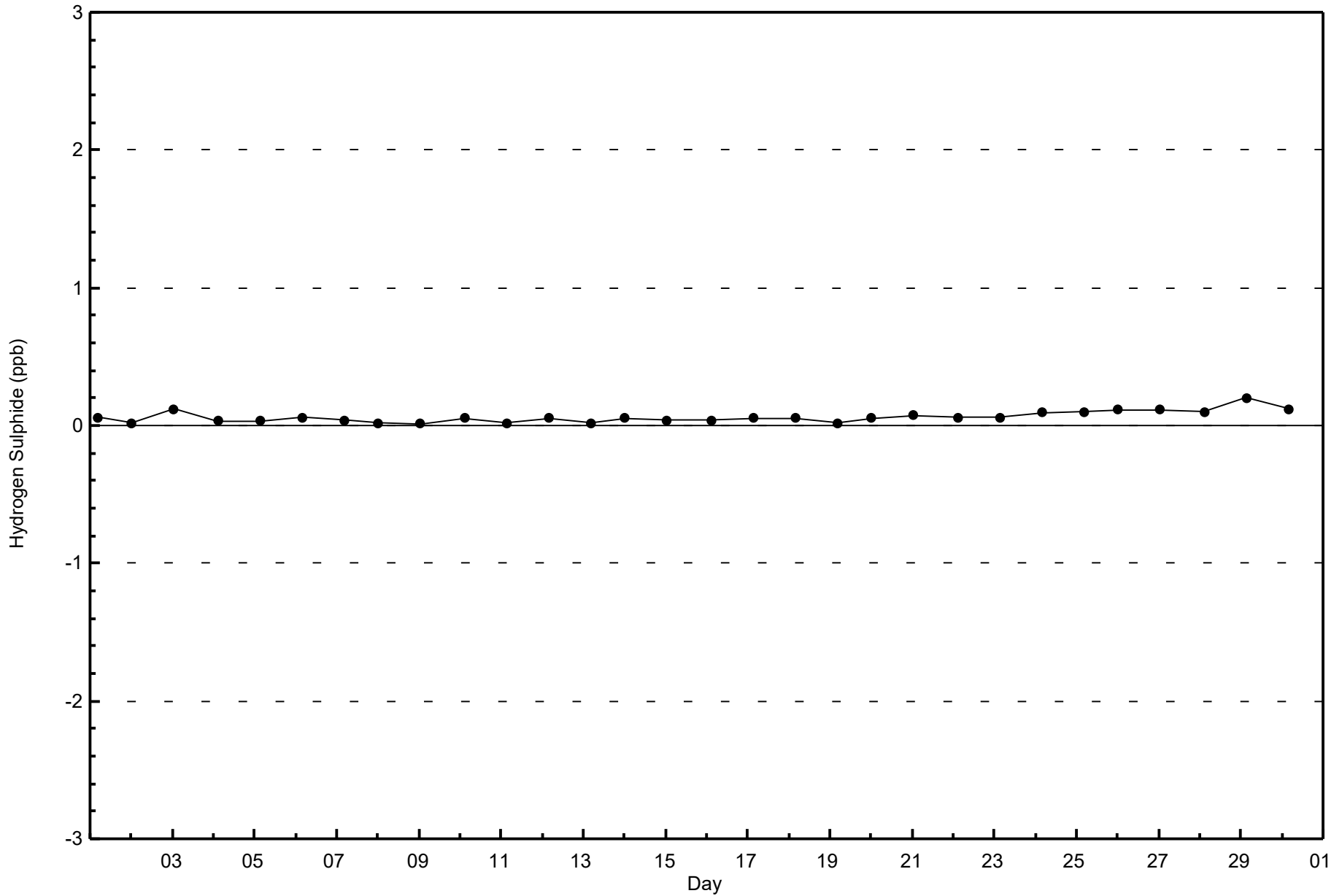
Wood Buffalo Environmental Association
Frequency Distribution

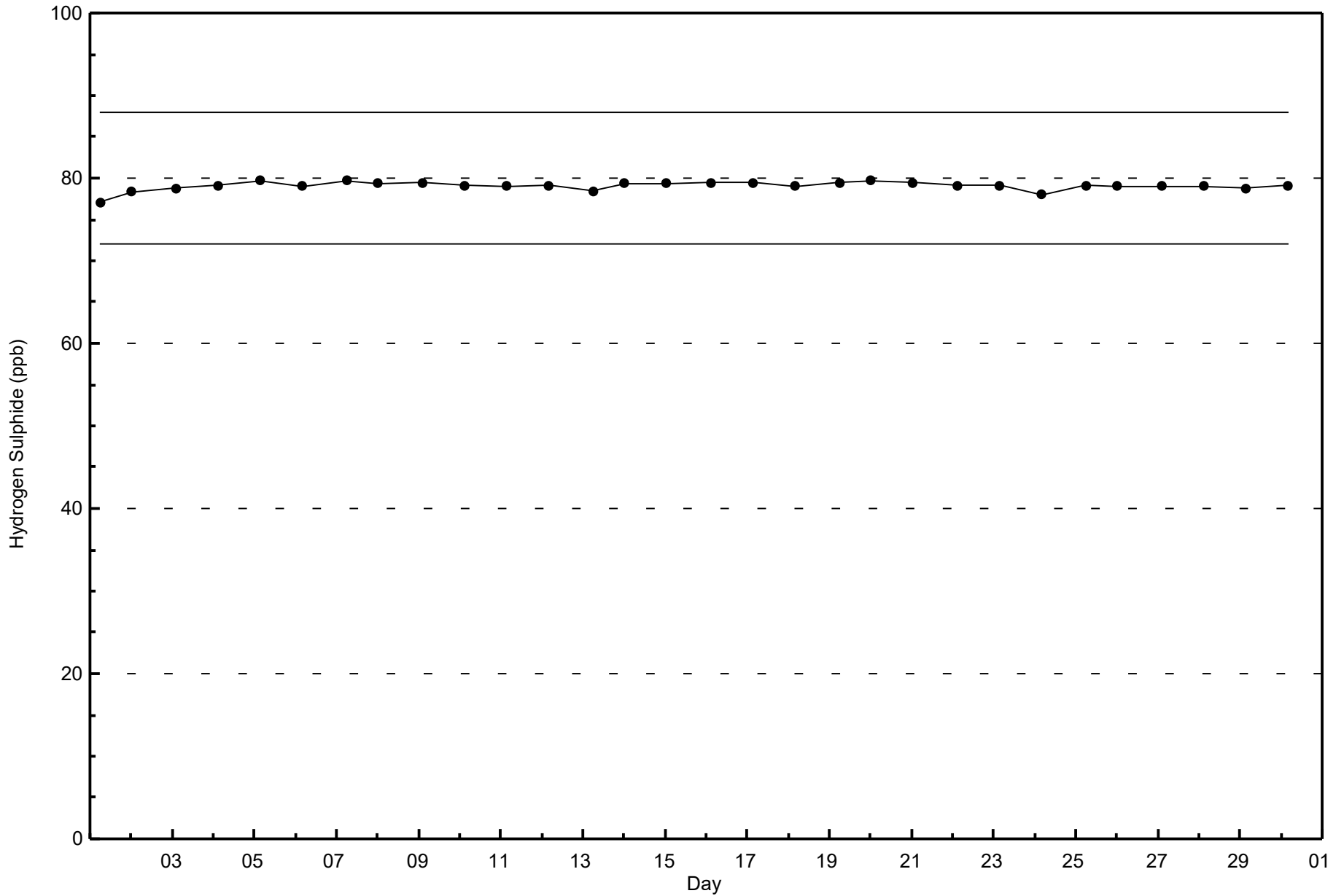
Hydrogen Sulphide (H₂S) - ppb
Kirby South - September 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	13	17	20	8	7	13	22	41	87	46	102	70	89	91	42	15	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	13	17	20	8	7	13	22	41	87	46	102	70	89	91	42	15	683

Total Number of Valid Hours: 683

Total Number of Hours: 720

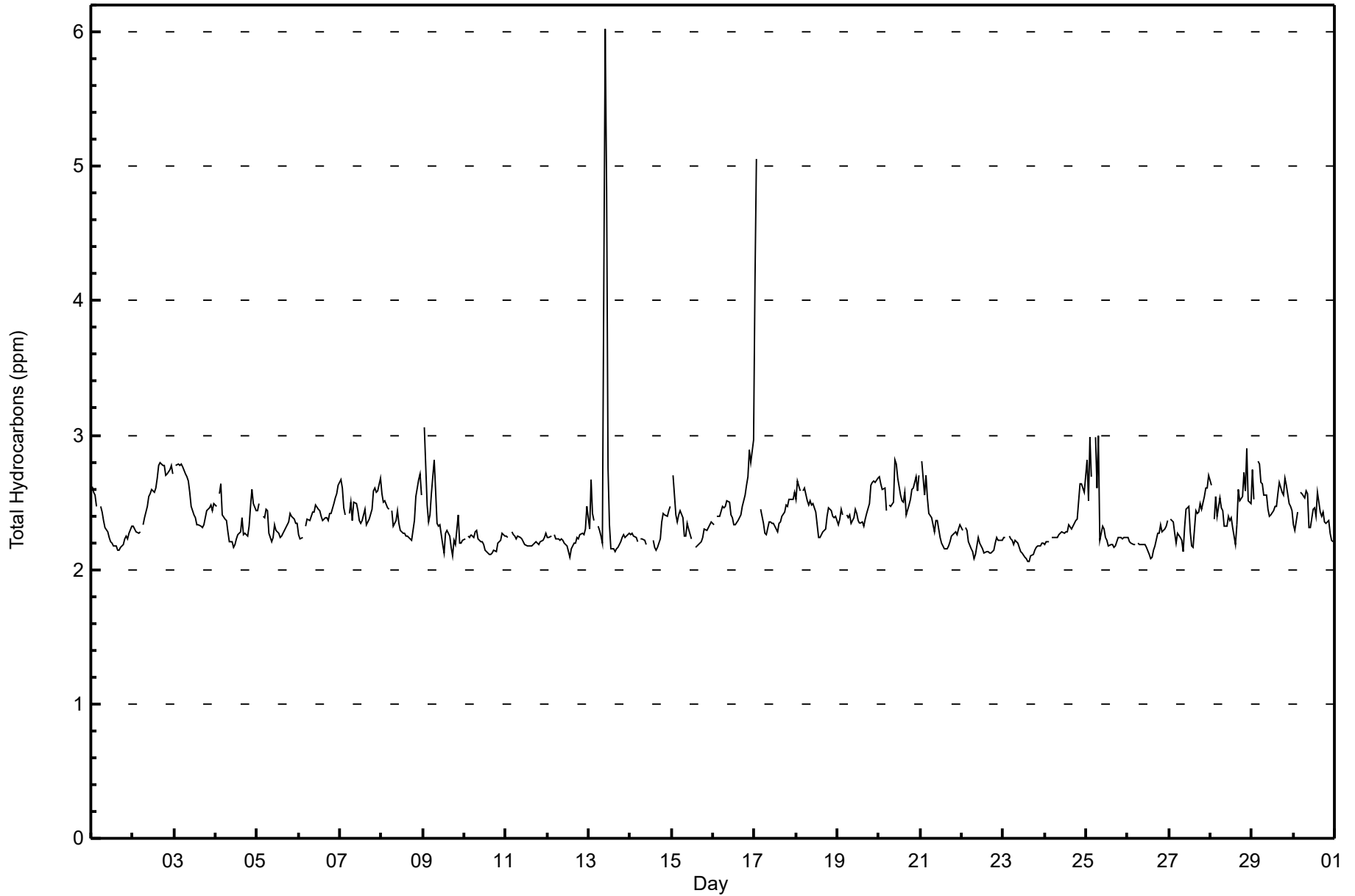






Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Kirby South - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Kirby South - September 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	0	0.00	0.00
2.1 - 3.0	680	99.27	99.27
3.1 - 10.0	5	0.73	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Kirby South - September 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.1 - 3.0	14	18	19	8	7	13	21	40	87	46	100	73	88	88	43	15	680
3.1 - 10.0	0	0	0	0	0	0	1	1	0	0	0	0	2	1	0	0	5
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	14	18	19	8	7	13	22	41	87	46	100	73	90	89	43	15	685

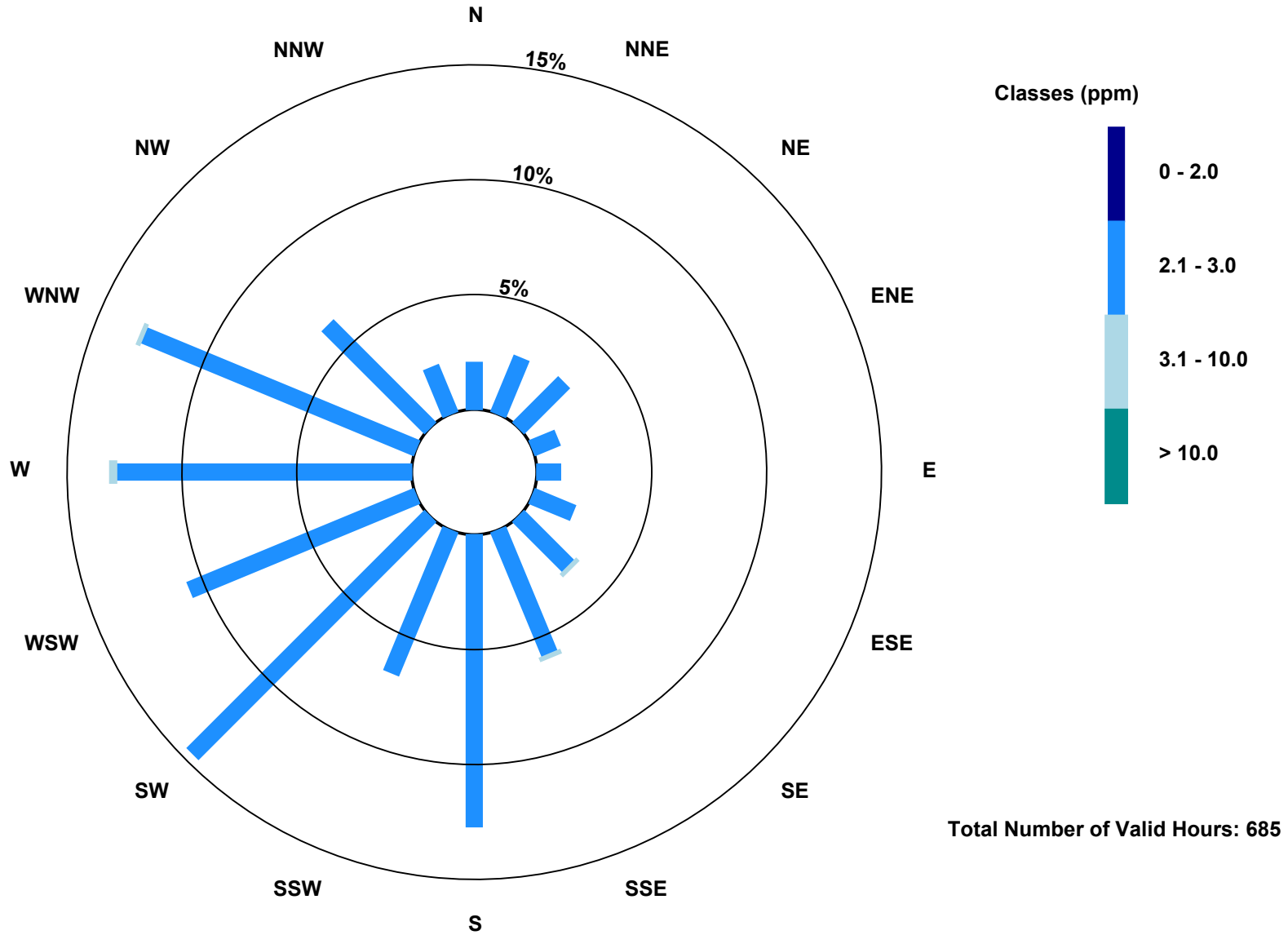
Total Number of Valid Hours: 685

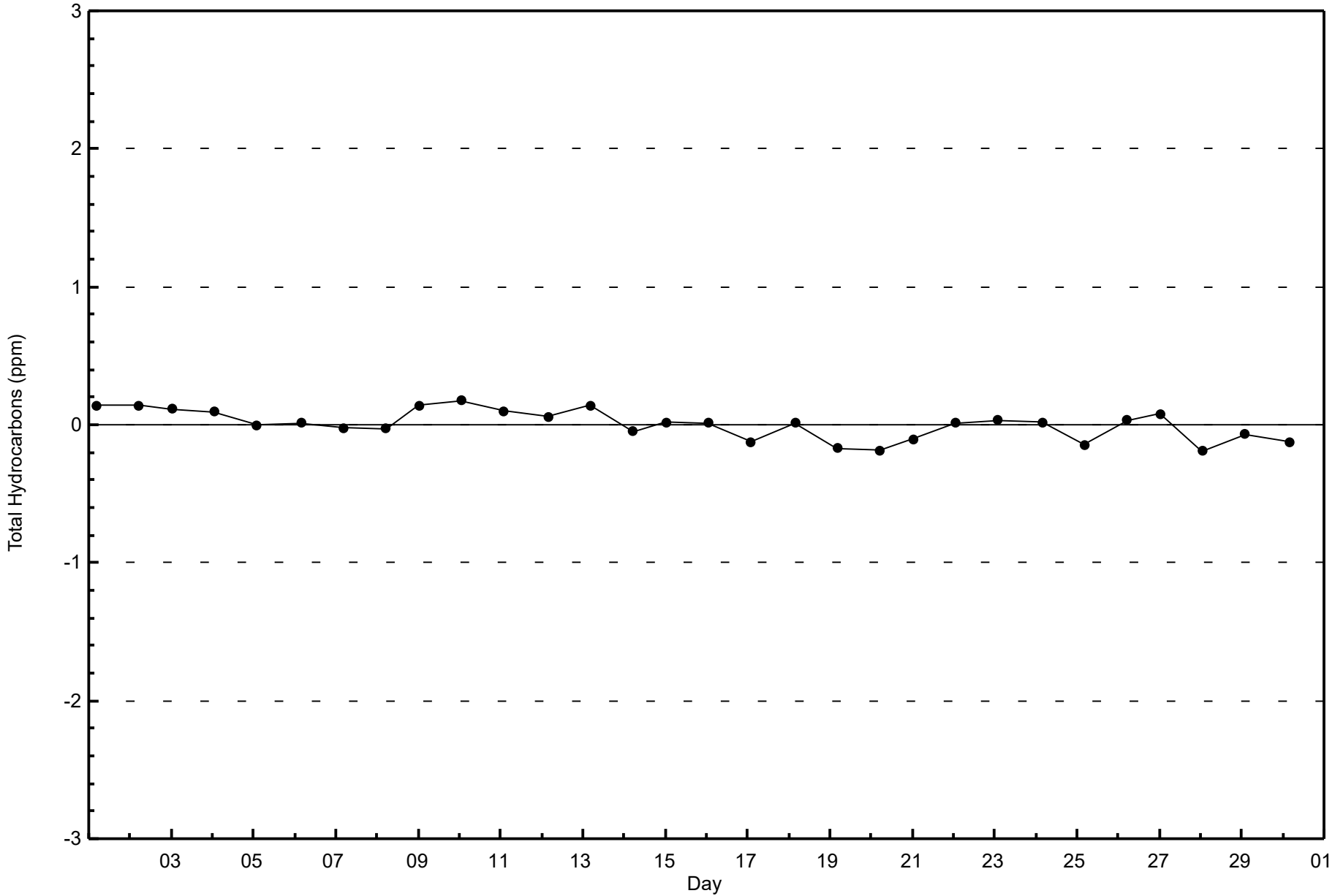
Total Number of Hours: 720

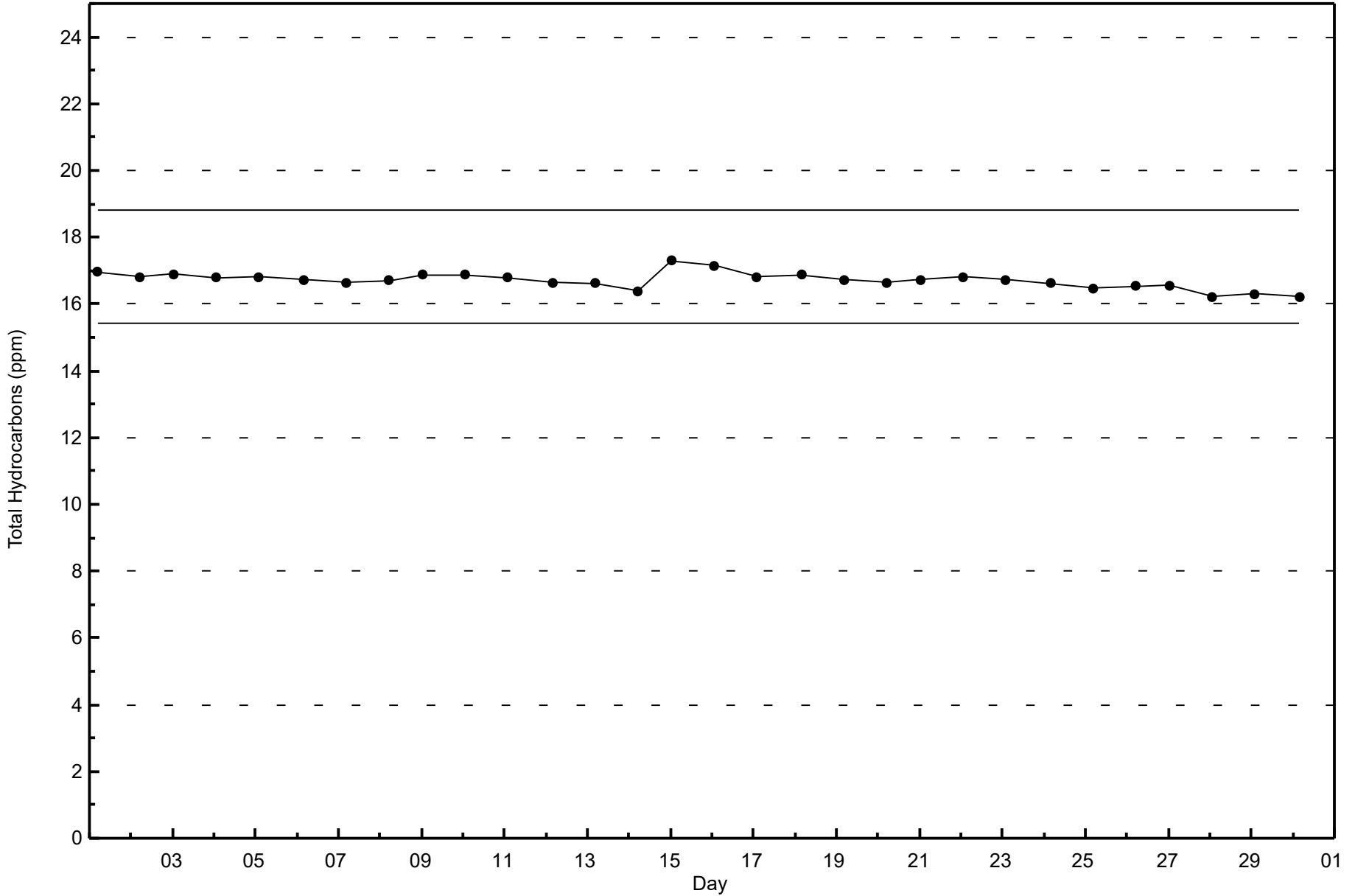


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Total Hydrocarbons (THC) - ppm
Kirby South







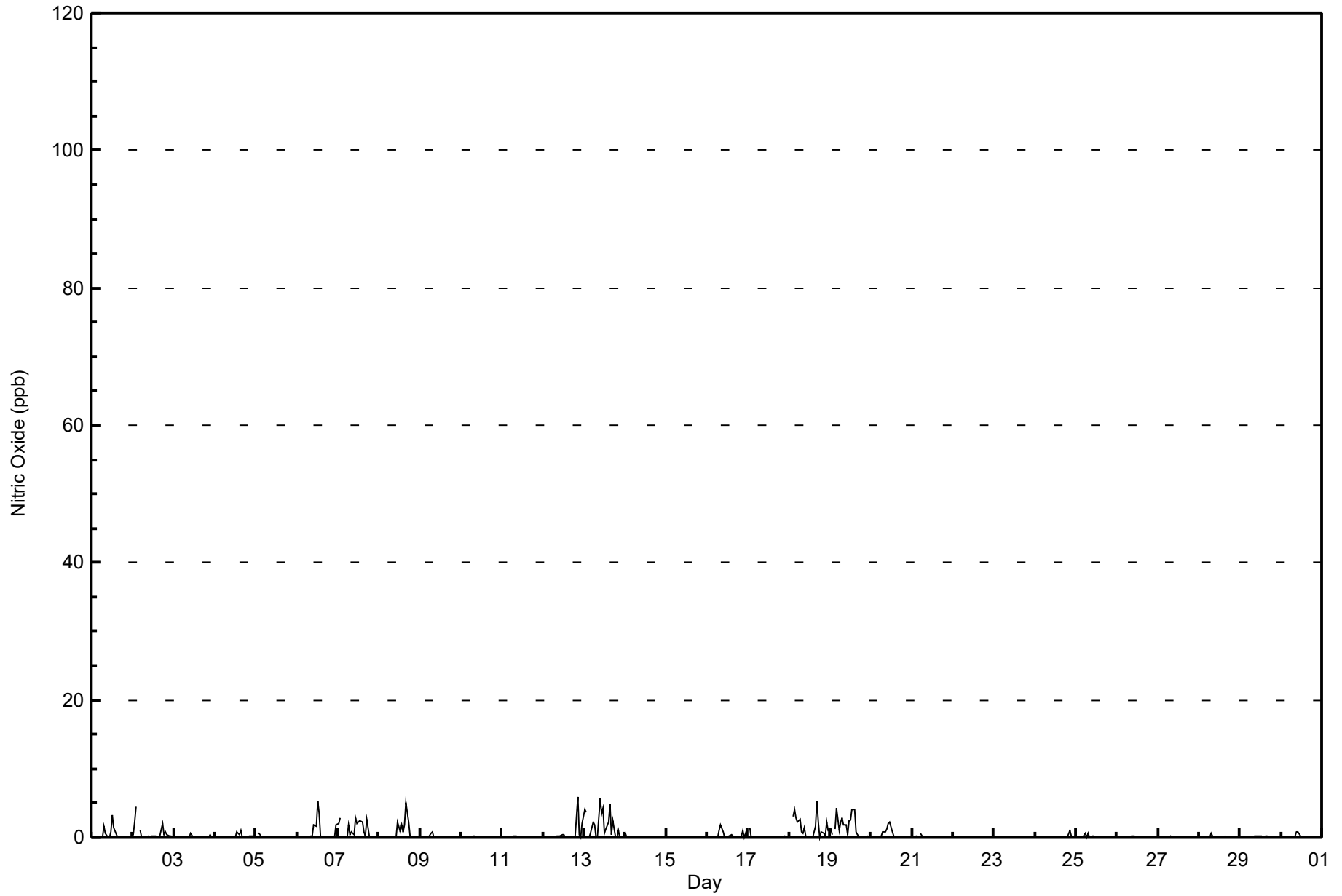


Maximum Value: 5.8 ppb on Sep 12 21:00																				Maximum Daily Average: 1.7 ppb on Sep 13					Hours in Service: 720				
Minimum Value: 0.0 ppb on Sep 1 01:00																				Minimum Daily Average: 0.0 ppb on Sep 23					Hours of Data: 685				
Maximum Diurnal Average: 0.6 ppb at hour 12																				Minimum Diurnal Average: 0.0 ppb at hour 19					Hours of Missing Data: 35				
Monthly Average: 0.33 ppb																				Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.1 P ₉₀ = 1.0 P ₉₉ = 4.4					Hours of Calibration: 35				
																				Percent Operational Time: 100.0									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24					
1-Sep	0.0	0.0	Z	0.0	0.0	0.0	0.1	1.5	0.6	0.0	0.0	0.8	3.3	1.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	3.3			
2-Sep	0.5	2.3	4.5	Z	1.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	2.0	0.4	0.9	0.5	0.1	0.2	0.0	0.6	4.5			
3-Sep	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.1	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.1	0.7			
4-Sep	0.0	0.0	0.0	0.0	0.0	Z	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.4	1.0	0.0	0.0	0.0	0.0	0.1	0.3	0.3	0.1	0.1	1.0			
5-Sep	Z	0.7	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7			
6-Sep	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	1.9	1.6	5.3	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	0.6	5.3			
7-Sep	2.0	2.8	Z	0.0	0.0	0.0	1.9	0.3	0.9	0.5	2.9	2.1	2.3	2.5	2.2	0.9	0.2	2.6	0.0	0.0	0.0	0.0	0.0	0.1	1.1	2.9			
8-Sep	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	0.8	1.9	0.8	1.9	5.0	2.3	0.2	0.0	0.0	0.0	0.0	0.0	0.7	5.0			
9-Sep	0.0	0.0	0.0	0.0	Z	0.0	0.6	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	0.1	0.9			
10-Sep	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2			
11-Sep	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2			
12-Sep	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.8	0.5	0.0	2.0	0.4	5.8			
13-Sep	4.0	3.7	Z	0.0	0.5	2.3	1.8	0.0	0.3	5.6	3.4	4.3	0.6	1.2	2.3	4.9	0.3	2.4	0.0	0.0	1.0	0.0	0.0	0.0	1.7	5.6			
14-Sep	0.6	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	0.6			
15-Sep	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	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	0.1			
16-Sep	0.0	0.0	0.0	0.0	0.0	Z	0.0	1.1	1.8	0.8	0.1	0.0	0.0	0.1	0.3	0.1	0.0	0.0	0.0	0.0	0.3	1.0	0.1	1.2	0.3	1.8			
17-Sep	Z	1.5	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	0.2	0.0	0.0	0.1	1.5			
18-Sep	0.0	Z	3.0	4.0	2.9	2.2	2.6	0.8	0.6	1.5	0.1	0.0	0.0	0.1	0.0	1.7	5.3	2.3	0.0	0.8	0.6	0.2	2.2	1.0	1.4	5.3			
19-Sep	1.1	0.5	Z	1.2	4.3	1.1	2.2	2.9	1.9	1.9	0.3	2.5	2.5	4.0	4.1	0.8	0.3	0.3	0.0	0.0	0.0	0.0	0.1	0.0	1.4	4.3			
20-Sep	0.0	0.0	0.0	Z	0.0	0.0	0.2	0.8	0.8	1.1	2.1	2.2	0.8	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	2.2			
21-Sep	0.0	0.0	0.3	0.2	Z	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	0.6			
22-Sep	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1			
23-Sep	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-Sep	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	1.0	0.2	0.0	0.0	0.1	1.0			
25-Sep	0.0	0.0	Z	0.0	0.0	0.7	0.1	0.5	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7			
26-Sep	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.2	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	0.3			
27-Sep	0.0	0.0	0.0	0.0	Z	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	0.2			
28-Sep	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.7	0.3	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	0.7			
29-Sep	Z	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.2	0.2	0.1	0.2	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2			
30-Sep	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.8	0.9	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.9			
																								Diurnal Average					
																								Diurnal Maximum					
0.3 0.5 0.3 0.2 0.4 0.3 0.3 0.3 0.3 0.5 0.5 0.6 0.6 0.5 0.4 0.4 0.4 0.4 0.0 0.1 0.3 0.1 0.1 0.2																													
4.0 3.7 4.5 4.0 4.3 2.3 2.6 2.9 1.9 5.6 3.4 4.3 5.3 4.0 4.1 4.9 5.3 2.6 0.4 0.9 5.8 1.0 2.2 2.0																													
Z - zerospan C - Calibration																													



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Kirby South - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Kirby South - September 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	685	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: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Kirby South - September 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	14	18	19	8	7	13	20	43	88	42	103	71	86	92	46	15	685
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	14	18	19	8	7	13	20	43	88	42	103	71	86	92	46	15	685

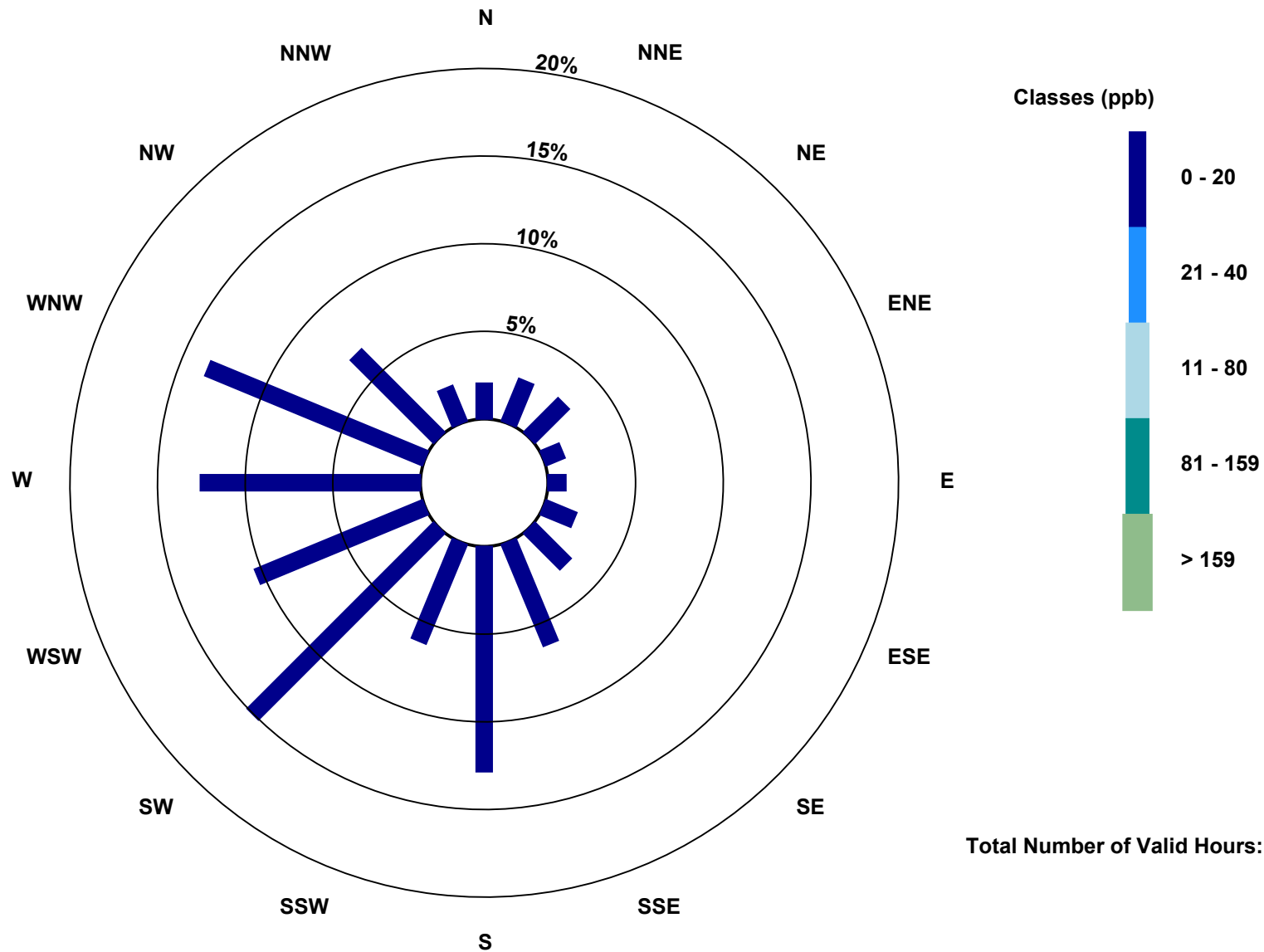
Total Number of Valid Hours: 685

Total Number of Hours: 720

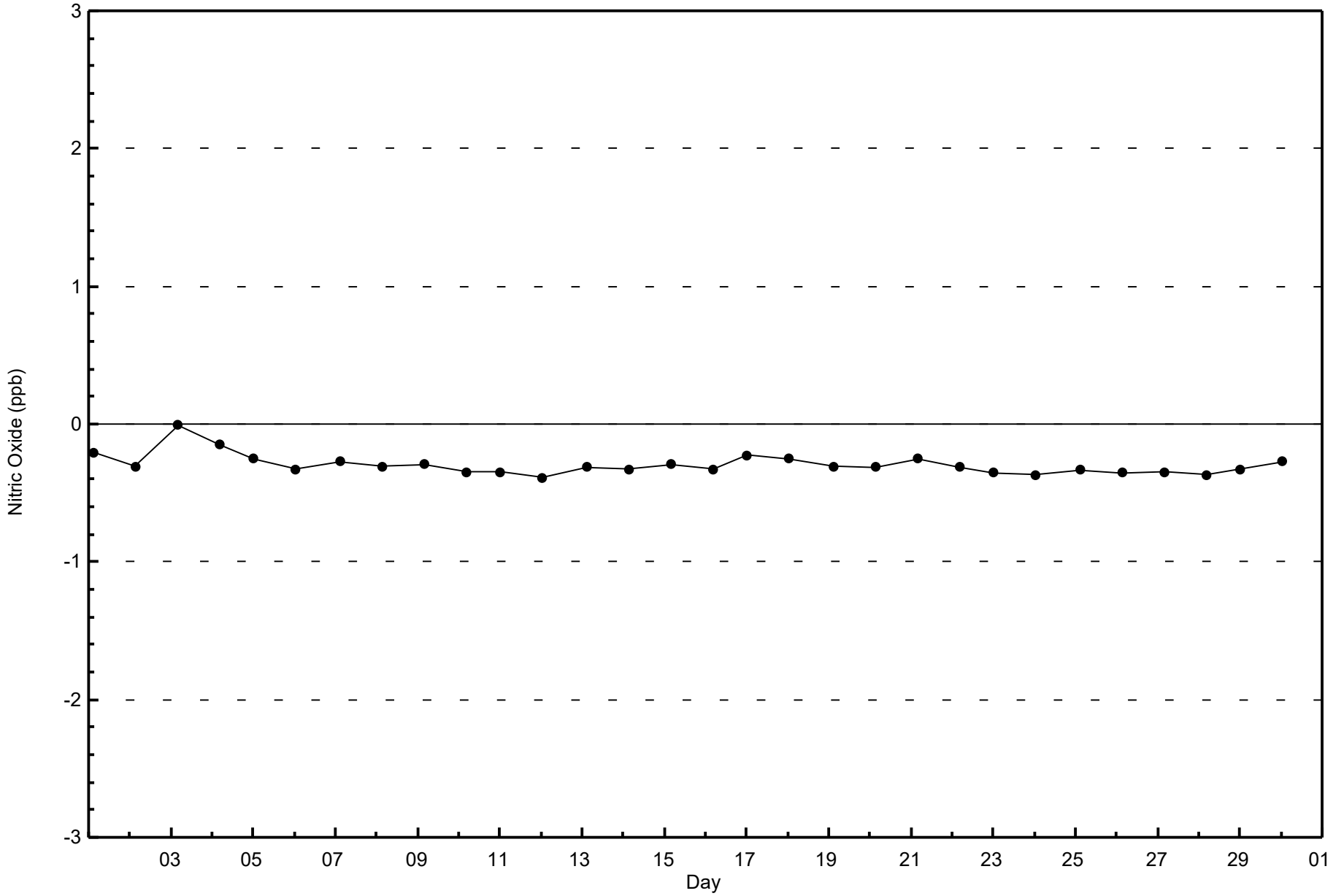


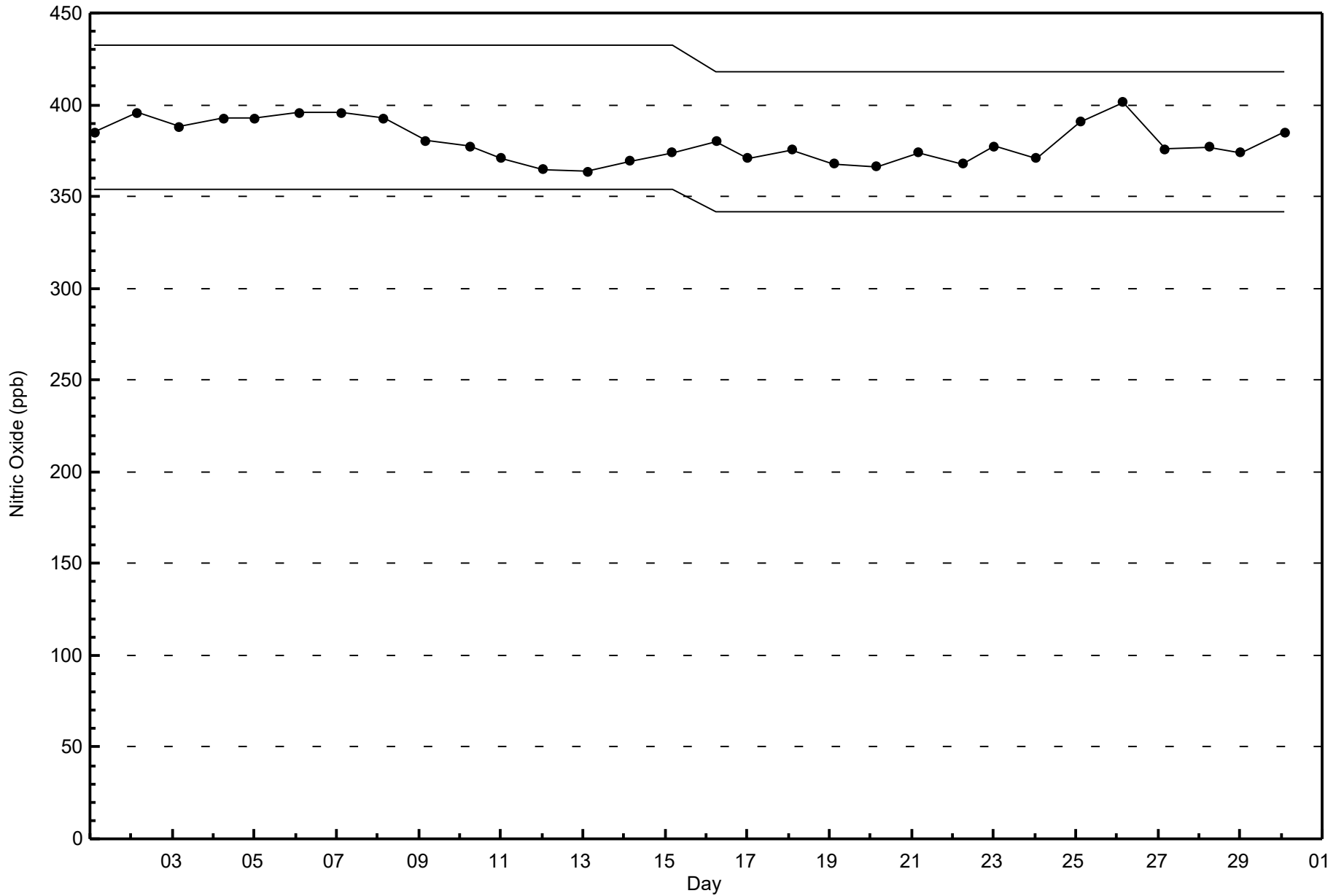
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitric Oxide (NO) - ppb
Kirby South



Total Number of Valid Hours: 685







Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

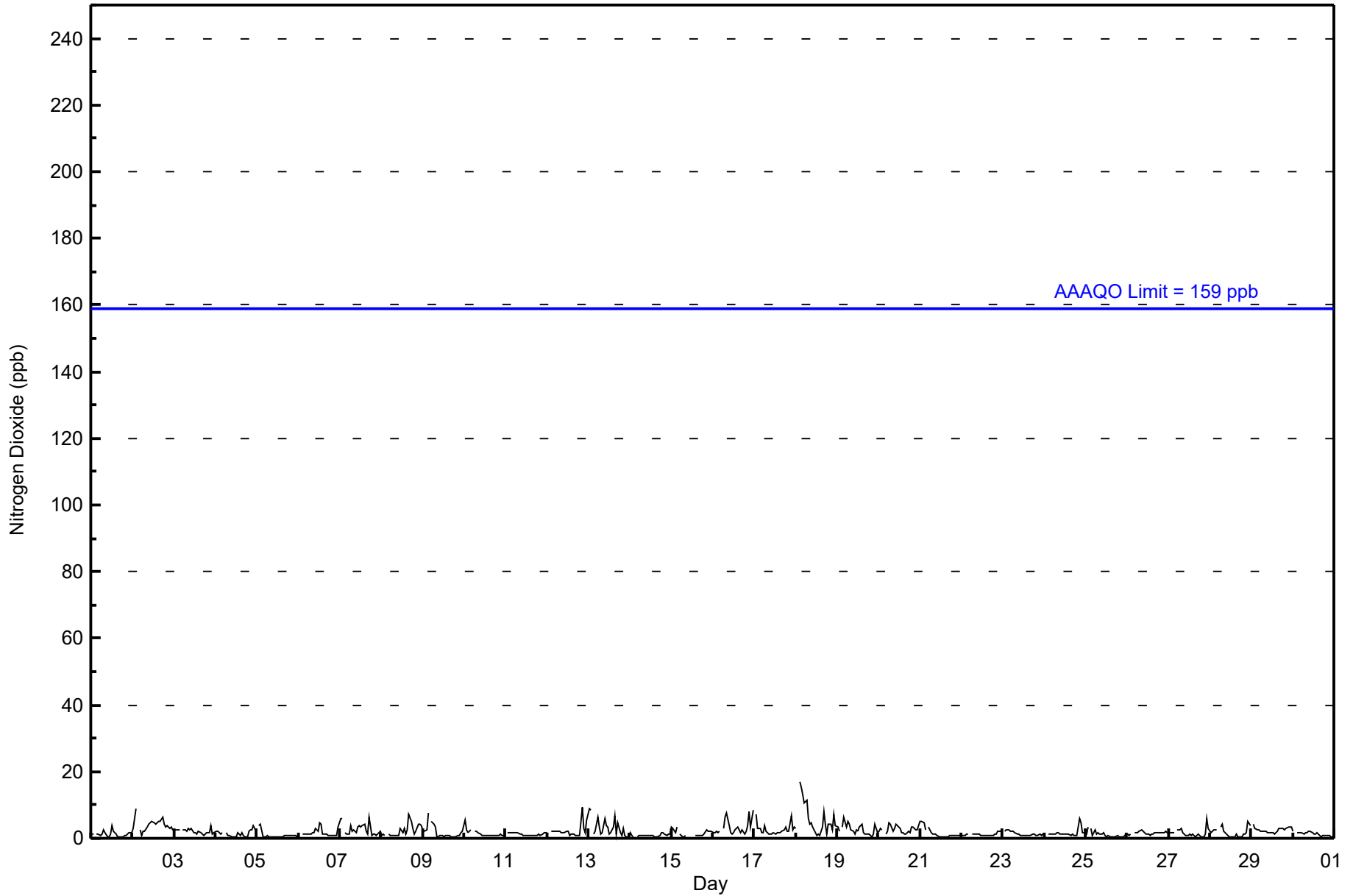
Kirby South - September 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 16.9 ppb on Sep 18 03:00	Maximum Daily Average: 5.8 ppb on Sep 18		Hours of Data:	685
Minimum Value: 0.3 ppb on Sep 5 12:00	Minimum Daily Average: 0.9 ppb on Sep 14		Hours of Missing Data:	35
Maximum Diurnal Average: 3.1 ppb at hour 2	Minimum Diurnal Average: 1.3 ppb at hour 19		Hours of Calibration:	35
Monthly Average: 2.04 ppb	Percentiles: P ₁ = 0.4 P ₁₀ = 0.6 Q ₁ = 0.9 Median = 1.5 Q ₃ = 2.5 P ₉₀ = 4.1 P ₉₉ = 8.7		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-Sep	1.4	1.1	Z	1.1	1.4	1.0	1.2	2.4	1.5	0.6	0.6	1.4	3.9	2.2	1.3	0.6	0.5	0.5	0.6	0.7	0.8	1.4	1.8	1.7	1.3	3.9
2-Sep	2.8	5.9	8.8	Z	2.4	1.0	2.0	2.0	3.3	4.2	4.6	4.9	4.6	4.3	4.6	5.2	5.0	6.2	4.3	3.5	3.8	3.0	3.4	2.6	4.0	8.8
3-Sep	2.6	2.7	2.7	Z	Z	2.7	2.7	2.3	2.8	2.7	2.9	1.7	1.7	1.3	2.2	1.7	1.4	0.8	1.4	1.8	1.5	3.8	1.2	1.6	2.1	3.8
4-Sep	2.2	2.2	1.7	1.3	1.5	Z	2.7	1.9	0.9	0.8	0.5	0.5	0.4	0.4	1.5	1.0	1.6	0.7	0.5	0.4	2.0	2.5	2.7	3.8	2.1	1.4
5-Sep	Z	4.0	4.4	0.6	0.6	0.6	0.8	0.6	0.5	0.4	0.4	0.3	0.4	0.5	0.5	0.6	0.9	1.0	0.8	0.8	0.8	0.7	0.7	0.6	0.9	4.4
6-Sep	1.2	Z	1.4	1.4	1.3	1.3	1.4	1.4	1.7	1.5	3.0	2.3	4.8	4.2	1.2	1.3	1.4	1.0	0.8	0.9	0.9	0.9	1.0	3.6	1.7	4.8
7-Sep	6.1	6.0	Z	1.5	1.1	1.2	3.7	2.2	2.5	1.6	3.5	3.7	3.4	3.7	4.1	2.0	1.4	6.3	0.8	1.3	1.1	1.0	1.1	2.2	2.7	6.3
8-Sep	0.9	1.1	1.0	Z	1.1	1.0	0.9	0.9	1.0	0.8	0.8	2.9	1.9	2.9	1.3	2.6	7.0	5.0	2.9	1.1	2.3	4.4	4.2	4.0	2.3	7.0
9-Sep	2.5	2.3	2.7	7.6	Z	5.0	4.2	3.2	0.6	0.5	0.7	0.8	0.6	0.8	0.7	0.7	0.6	0.5	0.5	0.6	0.7	0.9	1.6	2.0	1.8	7.6
10-Sep	5.4	2.5	1.8	2.0	2.7	Z	2.2	2.0	1.9	1.3	1.0	1.0	1.0	0.8	0.7	0.8	0.8	0.9	0.8	0.7	0.7	1.2	0.7	1.0	1.5	5.4
11-Sep	Z	1.5	1.7	1.6	1.6	1.5	1.6	1.7	1.4	1.2	0.9	0.7	0.7	0.7	0.8	0.9	0.9	0.9	1.0	1.2	0.9	1.2	1.6	1.6	1.2	1.7
12-Sep	1.6	Z	2.0	2.3	2.0	2.0	2.2	2.0	1.7	1.5	1.6	2.3	2.0	0.9	1.4	1.3	0.9	0.9	0.9	1.0	9.5	3.1	1.8	5.4	2.2	9.5
13-Sep	8.7	8.6	Z	1.1	2.2	6.2	3.3	1.4	1.5	6.0	3.8	3.5	1.4	1.9	3.3	6.8	1.4	4.7	1.5	1.0	2.8	0.7	0.3	0.5	3.2	8.7
14-Sep	1.6	0.7	0.6	Z	0.5	0.8	0.8	0.9	0.8	0.9	0.7	0.8	0.7	0.7	0.6	0.5	1.0	1.8	1.7	1.2	0.8	1.2	1.4	1.4	0.9	1.8
15-Sep	3.3	2.9	1.9	3.2	Z	1.1	0.5	0.4	1.0	C	C	C	C	C	0.8	0.8	0.8	0.9	1.0	1.4	2.4	2.0	2.1	2.0	1.6	3.3
16-Sep	1.9	1.8	2.1	1.8	2.0	Z	3.0	6.5	7.6	3.8	1.9	1.3	1.9	2.4	3.3	2.4	1.7	2.7	1.4	2.2	3.8	8.2	3.2	8.6	3.3	8.6
17-Sep	Z	7.4	2.9	2.8	1.9	1.8	3.8	2.2	1.2	1.4	1.3	1.6	1.3	1.7	1.5	1.8	2.1	2.4	3.5	2.3	2.1	6.6	2.7	3.6	2.6	7.4
18-Sep	3.0	Z	16.9	15.3	13.2	10.6	11.6	6.0	4.1	4.8	3.2	1.9	0.9	1.1	0.8	3.4	7.9	4.3	1.4	4.3	4.3	2.7	7.2	4.0	5.8	16.9
19-Sep	3.3	2.2	Z	3.3	6.2	3.6	4.9	4.1	2.6	2.1	1.2	2.5	2.3	3.3	4.1	1.5	1.3	1.4	1.4	0.9	0.6	1.1	4.4	1.7	2.6	6.2
20-Sep	2.2	3.0	2.6	Z	1.4	2.1	4.6	4.1	2.1	2.8	4.4	3.8	2.8	1.5	1.6	1.4	1.3	2.0	1.5	3.3	3.3	2.5	2.4	3.9	2.6	4.6
21-Sep	5.1	5.0	4.5	2.4	Z	3.3	1.6	1.2	1.1	1.2	0.8	0.6	0.5	0.5	0.5	0.4	0.5	0.8	1.0	0.9	0.8	0.8	0.8	0.9	1.5	5.1
22-Sep	1.0	1.0	1.0	1.1	1.2	Z	1.3	1.4	1.3	1.3	1.1	0.9	0.9	0.9	0.9	0.9	0.7	0.7	0.8	1.1	1.4	2.0	2.2	2.1	1.2	2.2
23-Sep	Z	2.2	2.6	2.4	2.2	2.0	2.2	1.5	1.3	1.3	0.9	0.8	0.7	0.8	0.9	0.8	0.8	1.1	1.1	0.9	1.0	1.2	1.0	1.2	1.3	2.6
24-Sep	1.3	Z	1.2	1.2	1.3	1.4	1.4	1.5	1.6	1.4	1.4	1.3	1.3	1.4	1.2	0.9	1.1	0.8	0.8	0.8	5.8	4.5	1.7	1.5	1.6	5.8
25-Sep	1.4	3.2	Z	2.8	0.8	2.7	1.1	1.7	1.1	1.4	1.5	0.9	0.4	0.7	0.6	0.4	0.3	0.6	0.8	0.3	0.4	0.3	0.4	1.1	1.1	3.2
26-Sep	1.4	1.0	1.1	Z	1.7	1.9	1.9	2.2	2.5	2.3	1.8	1.4	1.1	0.9	1.1	1.3	1.7	1.9	1.8	1.6	1.8	1.6	2.0	1.7	1.6	2.5
27-Sep	1.6	1.6	1.5	1.6	Z	2.6	2.4	3.0	1.5	1.4	1.0	0.7	1.1	0.8	1.4	0.6	0.9	1.1	0.7	0.5	0.6	1.1	6.1	2.8	1.6	6.1
28-Sep	1.6	2.2	2.4	2.4	2.6	Z	3.5	4.2	2.0	1.1	0.8	0.4	0.3	0.4	0.4	1.2	0.4	0.5	0.4	1.1	1.3	1.6	4.9	3.8	1.7	4.9
29-Sep	Z	4.2	3.0	2.7	2.5	2.1	2.1	2.1	2.0	1.9	1.5	1.6	1.6	1.4	1.5	2.3	2.8	2.8	2.8	2.7	3.0	3.3	3.5	3.4	2.5	4.2
30-Sep	2.3	Z	1.8	1.6	1.5	1.6	1.4	1.5	1.6	2.1	2.1	1.7	1.4	1.4	1.5	0.9	0.6	0.7	0.7	0.7	0.7	0.7	0.6	0.5	1.3	2.3

2.7	3.1	3.0	2.7	2.3	2.4	2.5	2.3	1.9	1.9	1.7	1.7	1.6	1.6	1.5	1.6	1.6	1.8	1.3	1.4	2.1	2.2	2.3	2.4	Diurnal Average	
8.7	8.6	16.9	15.3	13.2	10.6	11.6	6.5	7.6	6.0	4.6	4.9	4.8	4.3	4.6	6.8	7.9	6.3	4.3	4.3	9.5	8.2	7.2	8.6	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
Kirby South - September 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	685	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: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Kirby South - September 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	14	18	19	8	7	13	20	43	88	42	103	71	86	92	46	15	685
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	14	18	19	8	7	13	20	43	88	42	103	71	86	92	46	15	685

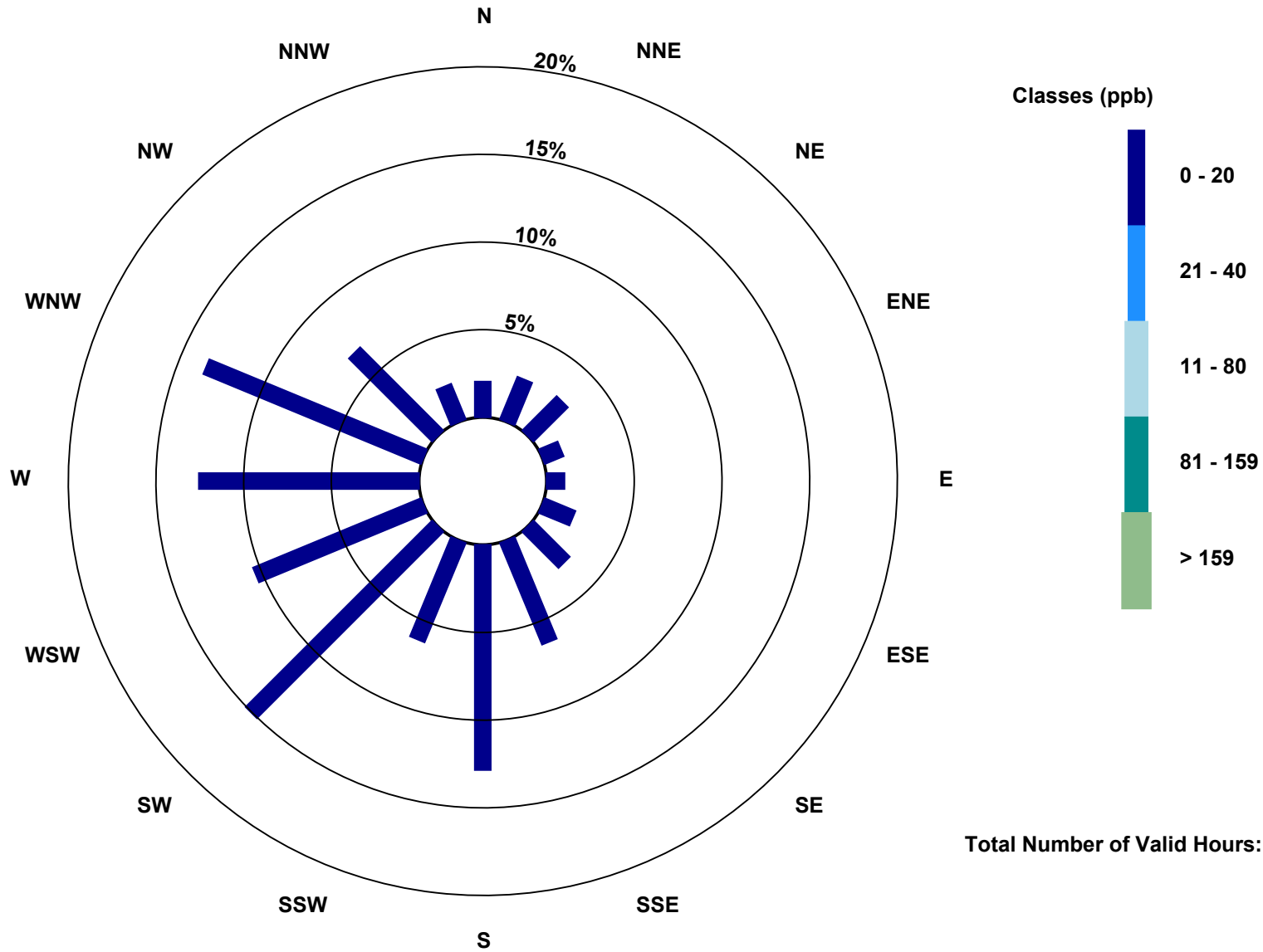
Total Number of Valid Hours: 685

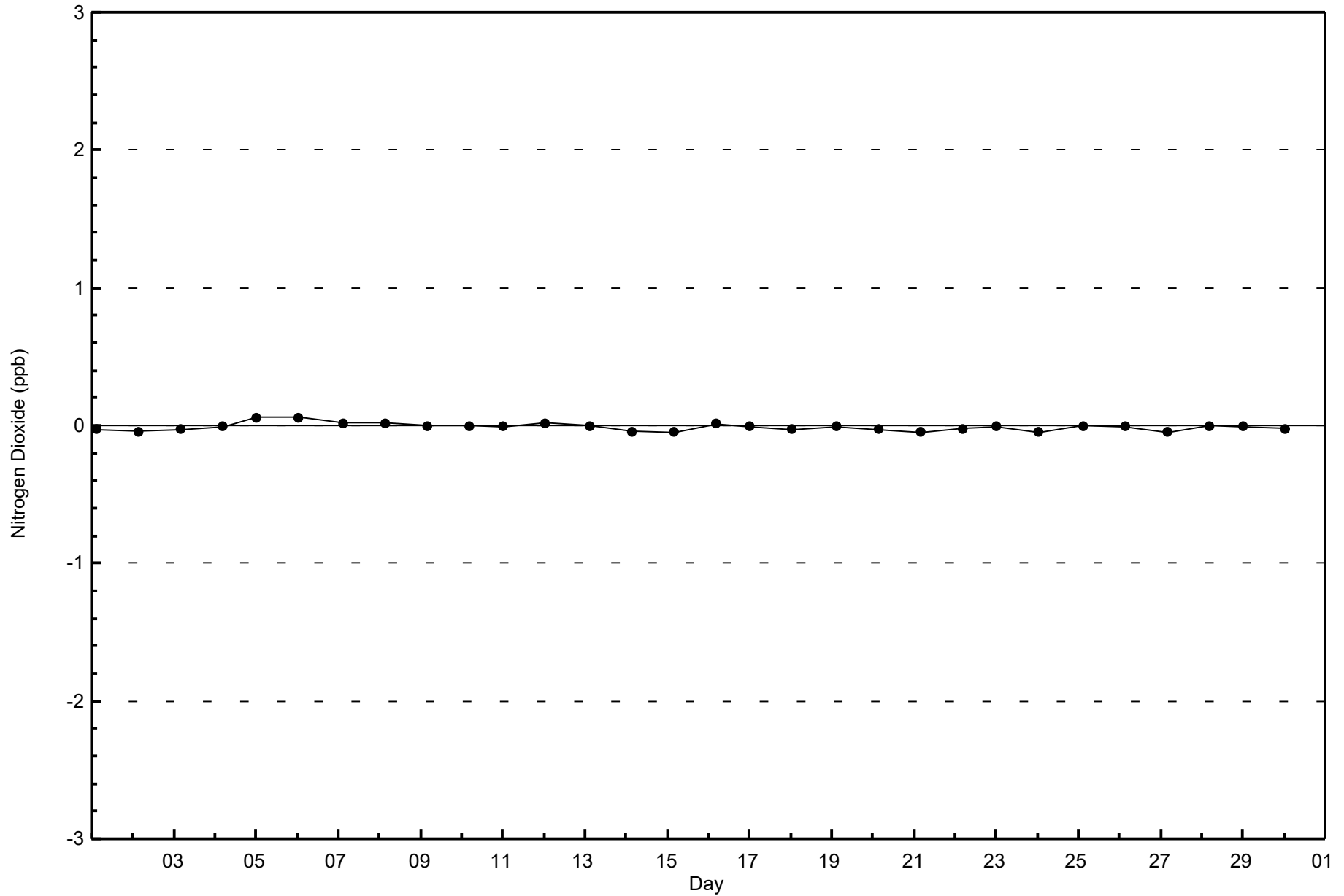
Total Number of Hours: 720

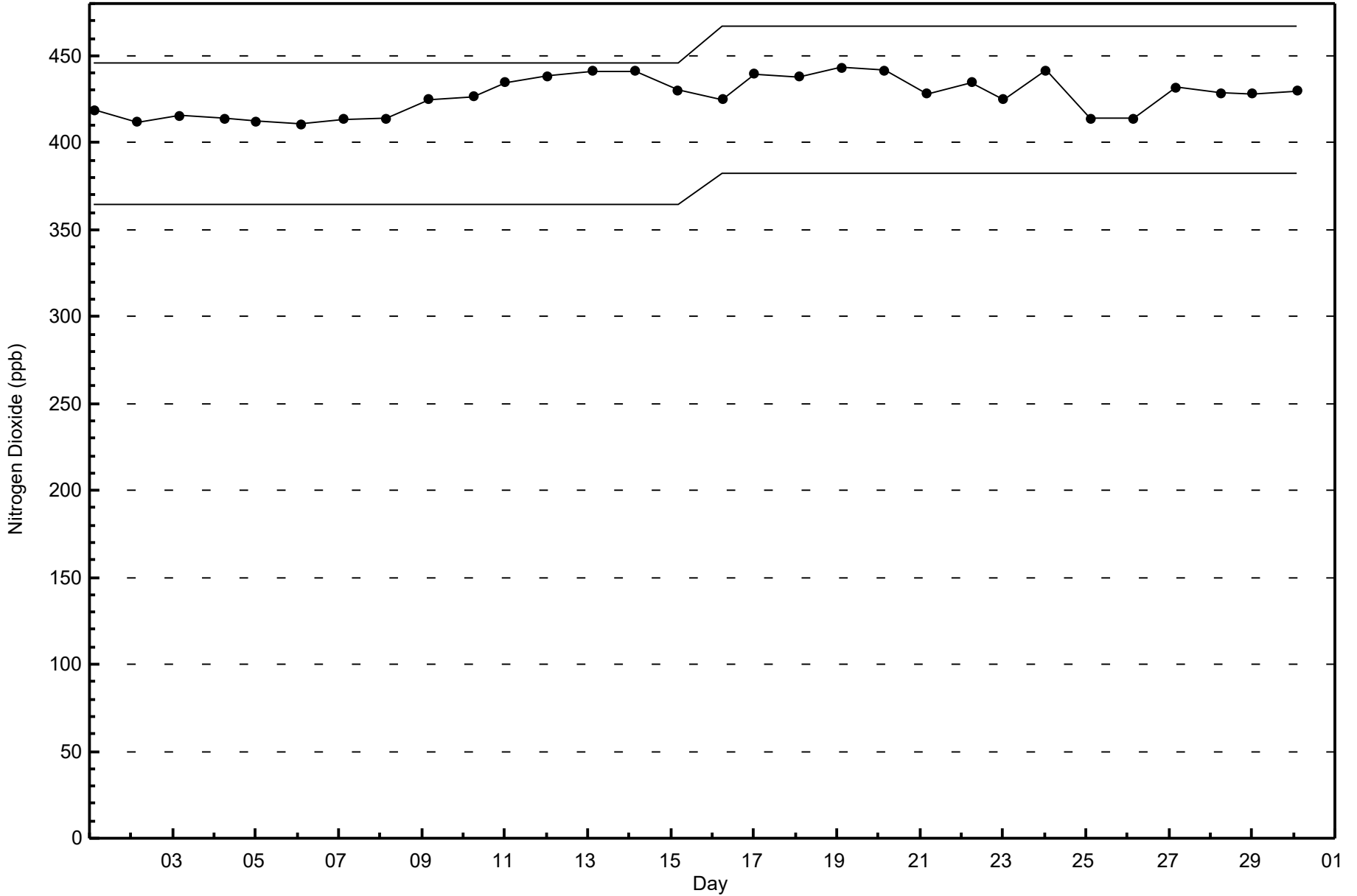


Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitrogen Dioxide (NO₂) - ppb
Kirby South









Wood Buffalo Environmental Association
Summary of Hour Averages

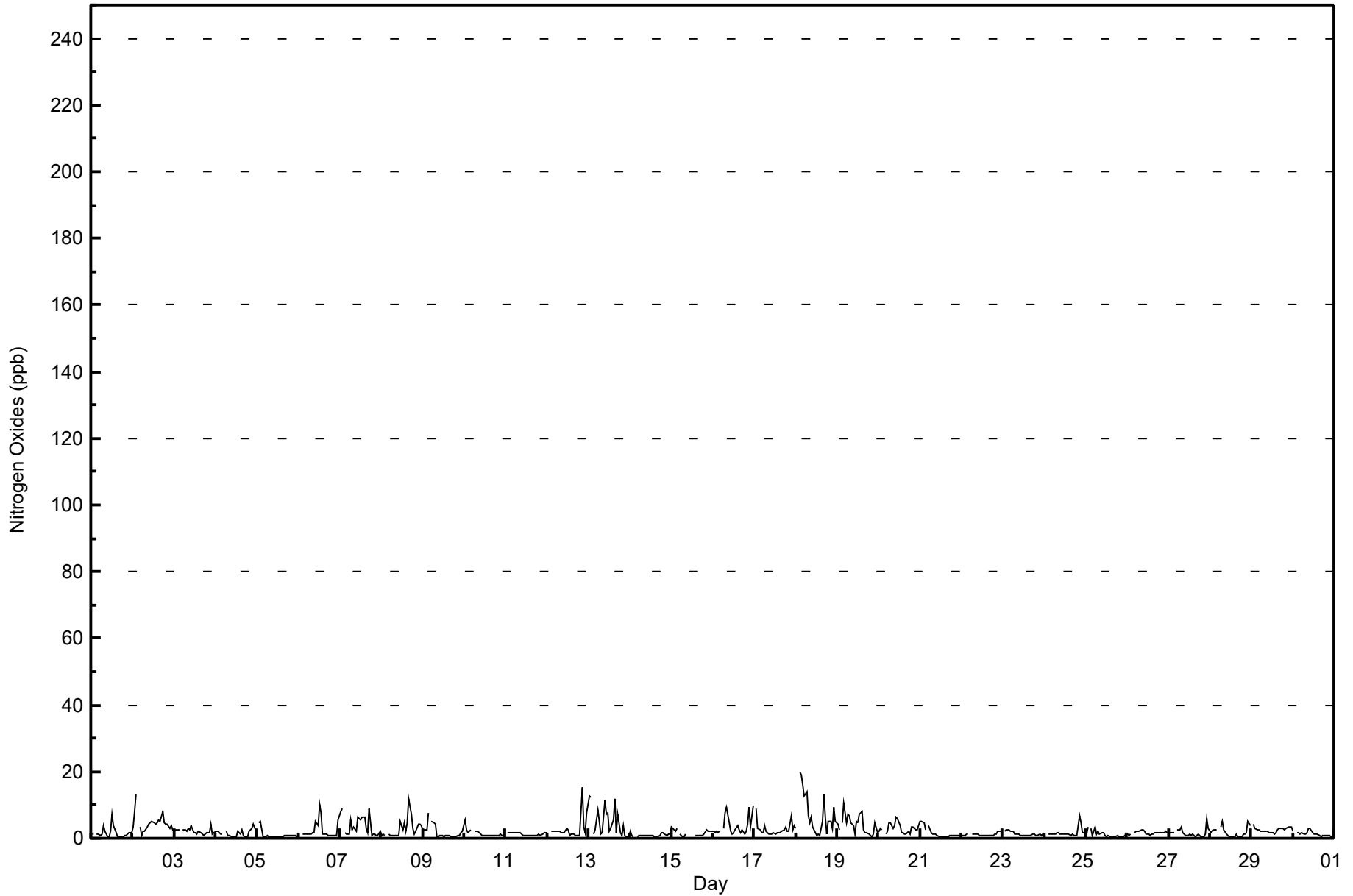
Nitrogen Oxides (NO_x) - ppb
Kirby South - September 2023

Maximum Value: 19.9 ppb on Sep 18 03:00		Maximum Daily Average: 7.2 ppb on Sep 18		Hours in Service: 720																																													
Minimum Value: 0.3 ppb on Sep 28 13:00		Minimum Daily Average: 1.0 ppb on Sep 14		Hours of Data: 685																																													
Maximum Diurnal Average: 3.5 ppb at hour 2		Minimum Diurnal Average: 1.3 ppb at hour 19		Hours of Missing Data: 35																																													
Monthly Average: 2.37 ppb		Percentiles: P ₁ = 0.4 P ₁₀ = 0.6 Q ₁ = 0.9 Median = 1.6 Q ₃ = 2.7 P ₉₀ = 5.0 P ₉₉ = 12.8		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-Sep	1.4	1.1	Z	1.1	1.4	1.0	1.3	3.9	2.1	0.6	0.6	2.2	7.2	3.6	1.7	0.6	0.5	0.5	0.6	0.7	0.8	1.4	1.8	1.7	1.6	7.2																							
2-Sep	3.3	8.2	13.3	Z	3.4	1.0	2.0	2.0	3.3	4.3	4.7	5.1	4.8	4.4	4.7	5.3	5.1	8.2	4.7	4.4	4.3	3.1	3.6	2.6	4.6	13.3																							
3-Sep	2.6	2.7	2.7	2.7	Z	2.7	2.7	2.3	2.9	2.8	3.6	1.7	1.7	1.3	2.2	1.7	1.4	0.8	1.4	1.8	1.5	4.2	1.2	1.6	2.2	4.2																							
4-Sep	2.2	2.2	1.7	1.3	1.5	Z	2.7	2.1	0.9	0.8	0.5	0.5	0.4	2.2	1.4	2.6	0.7	0.5	0.4	2.0	2.6	3.0	4.1	2.2	1.6	4.1																							
5-Sep	Z	4.7	5.1	0.6	0.6	0.6	0.8	0.6	0.5	0.4	0.4	0.3	0.4	0.5	0.5	0.6	0.9	1.0	0.8	0.8	0.8	0.7	0.7	0.6	1.0	5.1																							
6-Sep	1.2	Z	1.4	1.4	1.3	1.3	1.4	1.4	1.8	1.6	4.9	3.9	10.1	7.6	1.2	1.3	1.4	1.0	0.8	0.9	0.9	0.9	1.0	5.4	2.4	10.1																							
7-Sep	8.1	8.8	Z	1.5	1.1	1.2	5.6	2.5	3.4	2.1	6.4	5.8	5.7	6.2	6.3	2.9	1.6	8.9	0.8	1.3	1.1	1.0	1.1	2.3	3.7	8.9																							
8-Sep	0.9	1.1	1.0	Z	1.1	1.0	0.9	0.9	1.0	0.8	0.8	5.1	2.7	4.8	2.1	4.5	12.0	7.3	3.1	1.1	2.3	4.4	4.2	4.0	2.9	12.0																							
9-Sep	2.5	2.3	2.7	7.6	Z	5.0	4.8	4.1	0.6	0.5	0.7	0.8	0.6	0.8	0.7	0.7	0.6	0.5	0.5	0.6	0.7	0.9	1.6	2.0	1.8	7.6																							
10-Sep	5.4	2.5	1.8	2.0	2.7	Z	2.2	2.2	2.1	1.3	1.0	1.0	1.0	0.8	0.7	0.8	0.8	0.9	0.8	0.7	0.7	1.2	0.7	1.0	1.5	5.4																							
11-Sep	Z	1.5	1.7	1.6	1.6	1.5	1.6	1.9	1.6	1.2	0.9	0.7	0.7	0.7	0.8	0.9	0.9	0.9	1.0	1.2	0.9	1.2	1.6	1.6	1.2	1.9																							
12-Sep	1.6	Z	2.0	2.3	2.0	2.0	2.2	2.1	1.8	1.6	1.7	2.8	2.5	0.9	1.4	1.3	0.9	0.9	0.9	1.0	15.3	3.6	1.8	7.4	2.6	15.3																							
13-Sep	12.7	12.3	Z	1.1	2.7	8.5	5.1	1.4	1.8	11.6	7.2	7.8	2.0	3.1	5.6	11.7	1.7	7.1	1.5	1.0	3.8	0.7	0.3	0.5	4.8	12.7																							
14-Sep	2.2	0.7	0.6	Z	0.5	0.8	0.8	0.9	0.8	0.9	0.7	0.8	0.7	0.7	0.6	0.5	1.0	1.8	1.7	1.2	0.8	1.2	1.4	1.0	2.2	1.4																							
15-Sep	3.3	2.9	1.9	3.2	Z	1.1	0.5	0.4	1.1	C	C	C	C	C	0.8	0.8	0.8	0.9	1.0	1.4	2.4	2.0	2.1	2.0	1.6	3.3																							
16-Sep	1.9	1.8	2.1	1.8	2.0	Z	3.0	7.6	9.4	4.6	2.0	1.3	1.9	2.5	3.6	2.5	1.7	2.7	1.4	2.2	4.1	9.2	3.3	9.8	3.6	9.8																							
17-Sep	Z	8.9	2.9	2.8	1.9	1.8	3.8	2.2	1.2	1.4	1.3	1.6	1.3	1.8	1.5	1.8	2.1	2.4	3.5	2.3	2.1	6.8	2.7	3.6	2.7	8.9																							
18-Sep	3.0	Z	19.9	19.3	16.1	12.8	14.2	6.8	4.7	6.3	3.3	1.9	0.9	1.2	0.8	5.1	13.2	6.6	1.4	5.1	4.9	2.9	9.4	5.0	7.2	19.9																							
19-Sep	4.4	2.7	Z	4.5	10.5	4.7	7.1	7.0	4.5	4.0	1.5	5.0	4.8	7.3	8.2	2.3	1.6	1.7	1.4	0.9	0.6	1.1	4.5	1.7	4.0	10.5																							
20-Sep	2.2	3.0	2.6	Z	1.4	2.1	4.8	4.9	2.9	3.9	6.5	6.0	3.6	1.7	1.6	1.4	1.3	2.0	1.5	3.3	3.3	2.5	2.4	3.9	3.0	6.5																							
21-Sep	5.1	5.0	4.8	2.6	Z	3.9	1.6	1.2	1.1	1.2	0.8	0.6	0.5	0.5	0.5	0.4	0.5	0.8	1.0	0.9	0.8	0.8	0.8	0.9	1.6	5.1																							
22-Sep	1.0	1.0	1.0	1.1	1.2	Z	1.3	1.4	1.3	1.4	1.1	0.9	0.9	0.9	0.9	0.9	0.7	0.7	0.8	1.1	1.4	2.0	2.2	2.1	1.2	2.2																							
23-Sep	Z	2.2	2.6	2.4	2.2	2.0	2.2	1.5	1.3	1.3	0.9	0.8	0.7	0.8	0.9	0.8	0.8	1.1	1.1	0.9	1.0	1.2	1.0	1.2	1.3	2.6																							
24-Sep	1.3	Z	1.2	1.2	1.3	1.4	1.4	1.5	1.6	1.4	1.4	1.3	1.3	1.4	1.2	0.9	1.1	0.8	0.8	0.8	6.8	4.7	1.7	1.5	1.7	6.8																							
25-Sep	1.4	3.2	Z	2.8	0.8	3.4	1.2	2.2	1.1	1.6	1.7	0.9	0.4	0.7	0.6	0.4	0.3	0.6	0.8	0.3	0.4	0.3	0.4	1.1	1.2	3.4																							
26-Sep	1.4	1.0	1.1	Z	1.7	1.9	1.9	2.2	2.7	2.6	2.0	1.5	1.1	0.9	1.1	1.3	1.7	1.9	1.8	1.6	1.8	1.6	2.0	1.7	1.7	2.7																							
27-Sep	1.6	1.6	1.5	1.6	Z	2.6	2.4	3.2	1.6	1.4	1.0	0.7	1.1	0.8	1.4	0.6	0.9	1.1	0.7	0.5	0.6	1.1	6.1	2.8	1.6	6.1																							
28-Sep	1.6	2.2	2.4	2.4	2.6	Z	3.5	4.9	2.3	1.1	0.8	0.4	0.3	0.4	0.4	1.3	0.4	0.5	0.4	1.1	1.3	1.6	4.9	3.8	1.8	4.9																							
29-Sep	Z	4.2	3.0	2.7	2.6	2.1	2.1	2.2	2.1	2.1	1.7	1.7	1.8	1.4	1.5	2.4	3.0	2.8	2.8	2.7	3.0	3.3	3.5	3.4	2.5	4.2																							
30-Sep	2.3	Z	1.8	1.6	1.5	1.6	1.4	1.5	1.7	2.9	3.0	1.9	1.4	1.4	1.5	0.9	0.6	0.7	0.7	0.7	0.7	0.7	0.6	0.5	1.4	3.0																							
																								3.0	3.5	3.3	2.9	2.6	2.7	2.9	2.6	2.2	2.3	2.2	2.2	2.2	2.1	1.9	2.0	2.0	2.2	1.3	1.5	2.4	2.3	2.4	2.7	Diurnal Average	
																								12.7	12.3	19.9	19.3	16.1	12.8	14.2	7.6	9.4	11.6	7.2	7.8	10.1	7.6	8.2	11.7	13.2	8.9	4.7	5.1	15.3	9.2	9.4	9.8	Diurnal Maximum	
Z - zerospan																								C - Calibration																									



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Kirby South - September 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Oxides (NO_x) - ppb
Kirby South - September 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	685	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: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Kirby South - September 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	14	18	19	8	7	13	20	43	88	42	103	71	86	92	46	15	685
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	14	18	19	8	7	13	20	43	88	42	103	71	86	92	46	15	685

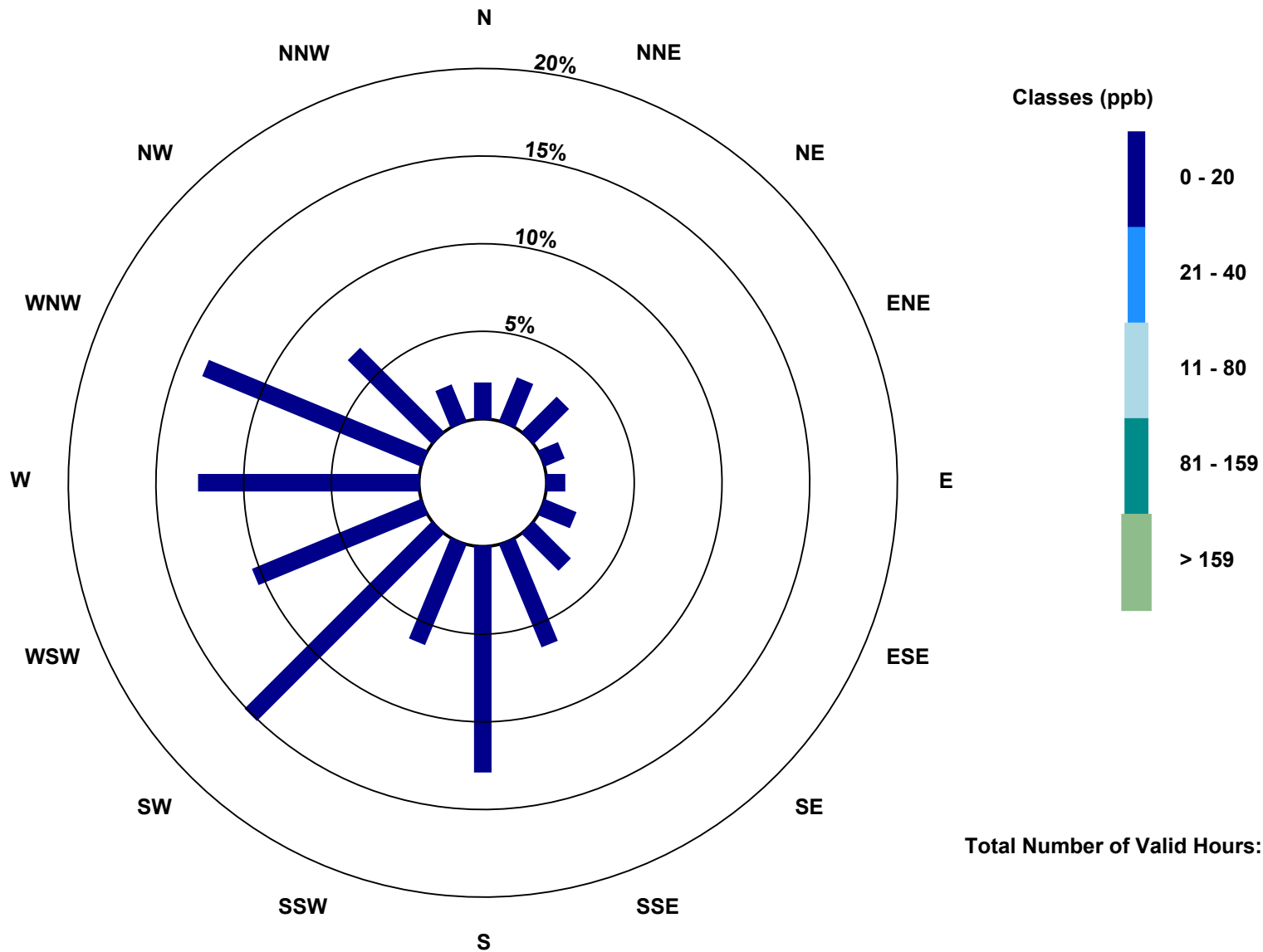
Total Number of Valid Hours: 685

Total Number of Hours: 720

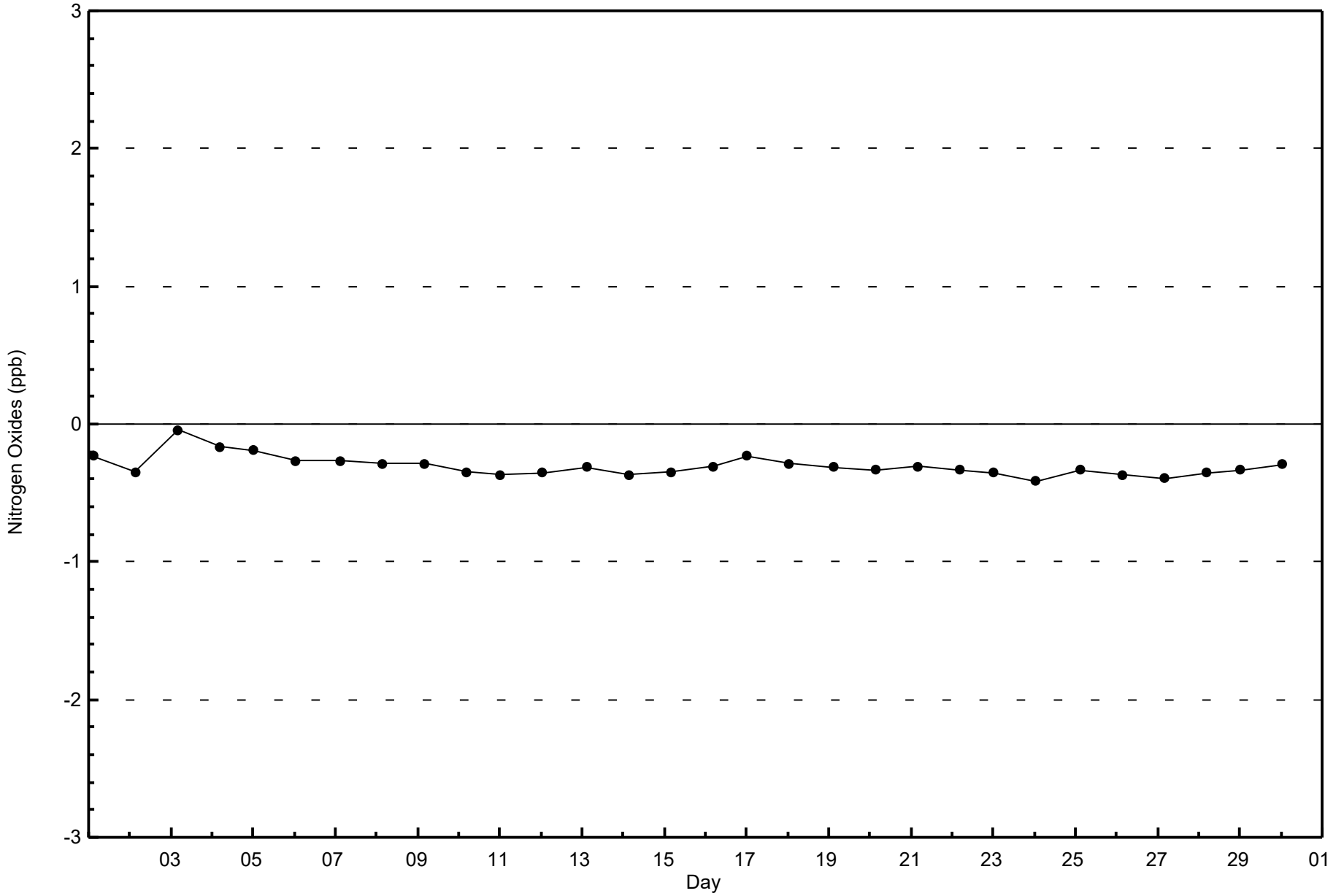


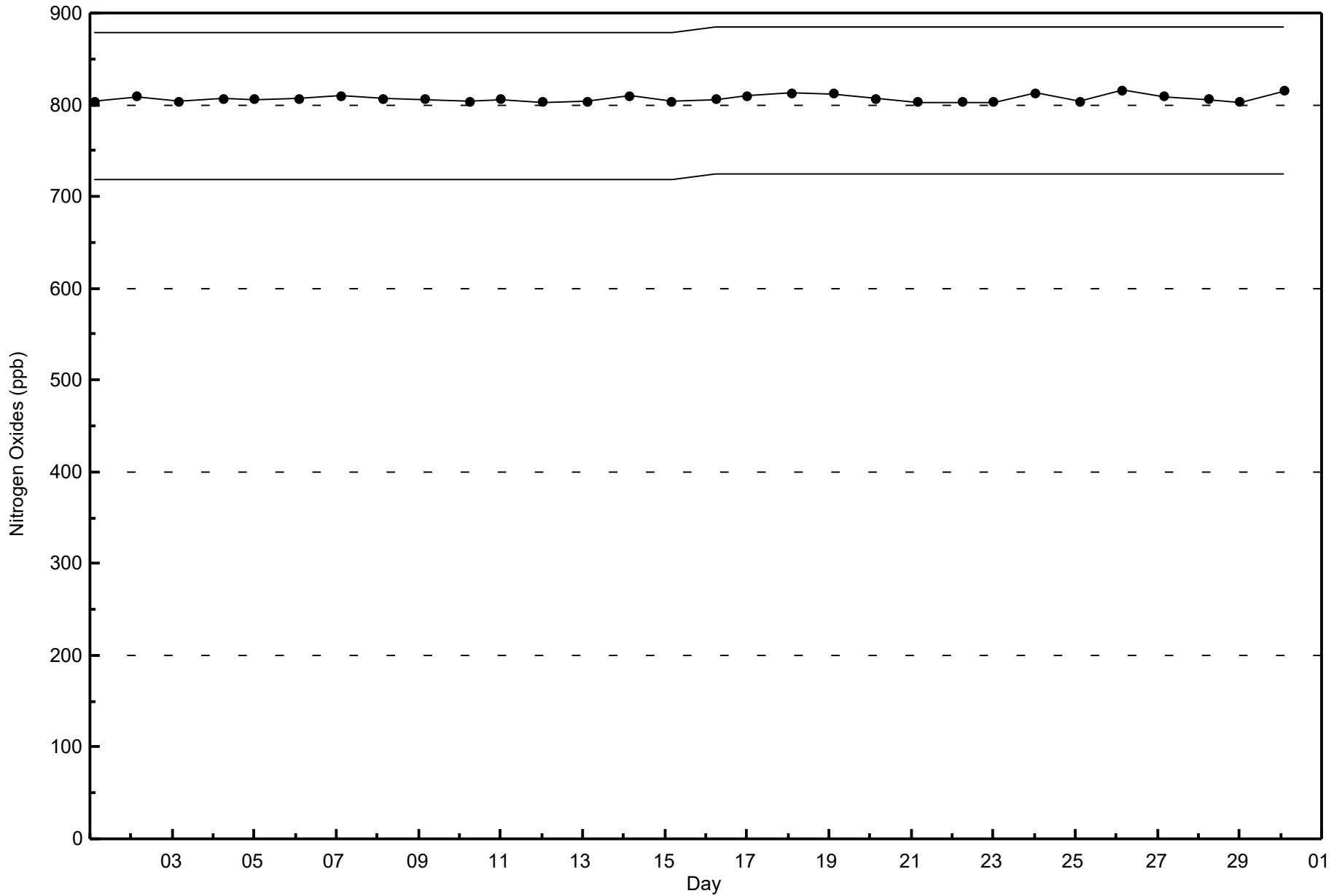
Wood Buffalo Environmental Association
Wind Rose Sep 2023

Nitrogen Oxides (NO_x) - ppb
Kirby South



Total Number of Valid Hours: 685







Wood Buffalo Environmental Association
Summary of Hour Averages

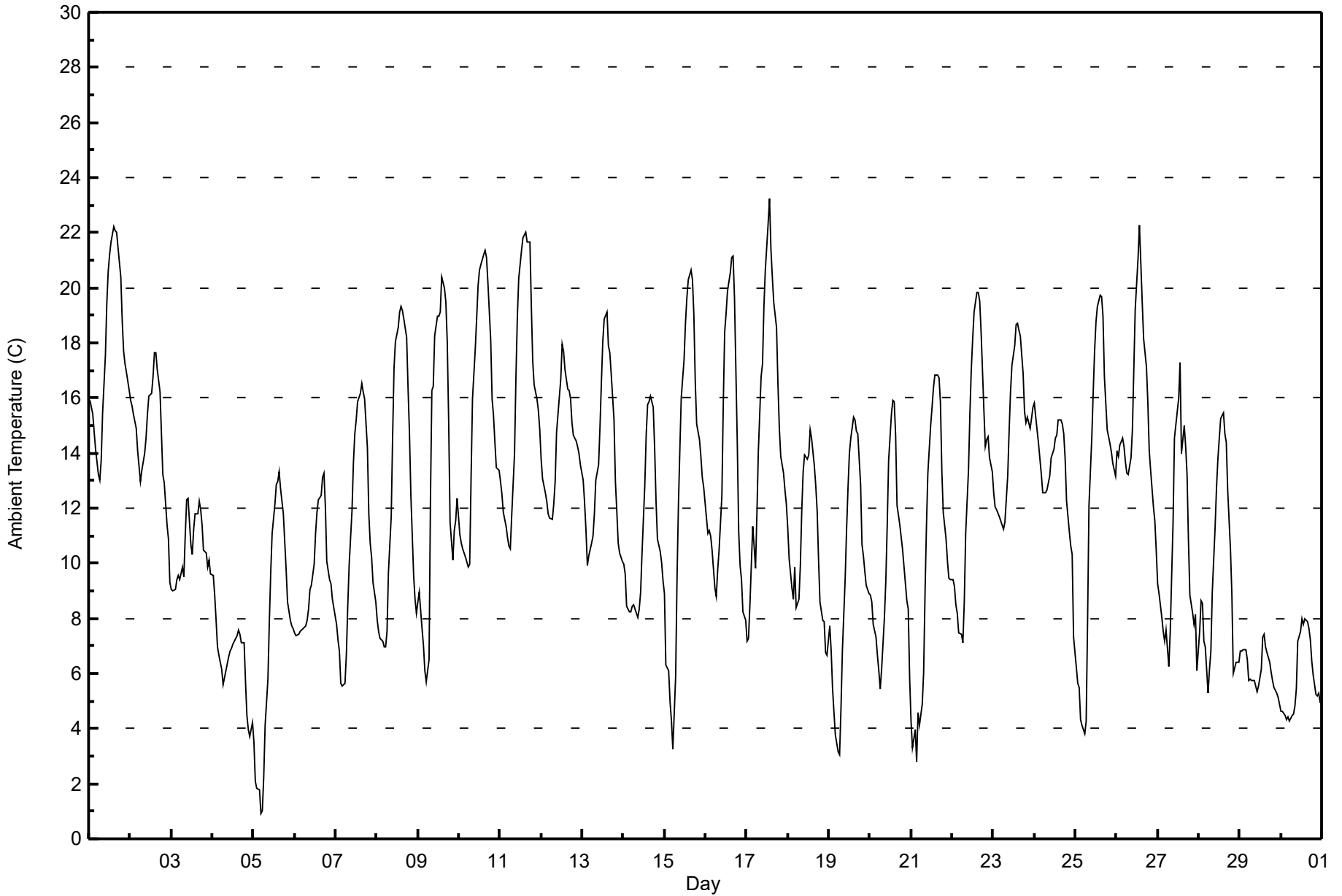
Ambient Temperature (AT) - C
Kirby South - September 2023

Maximum Value: 23.2 C on Sep 17 14:00		Maximum Daily Average: 17.8 C on Sep 1		Hours in Service: 720																																												
Minimum Value: 0.9 C on Sep 5 05:00		Minimum Daily Average: 5.8 C on Sep 30		Hours of Data: 720																																												
Maximum Diurnal Average: 16.6 C at hour 15		Minimum Diurnal Average: 7.9 C at hour 6		Hours of Missing Data: 0																																												
Monthly Average: 11.96 C		Percentiles: P ₁ = 3.1 P ₁₀ = 6.0 Q ₁ = 8.2 Median = 11.8 Q ₃ = 15.3 P ₉₀ = 18.7 P ₉₉ = 21.9		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-Sep	15.9	15.7	15.4	14.7	14.1	13.2	13.0	13.7	15.4	17.5	19.4	20.6	21.2	21.7	22.2	22.1	22.0	21.4	20.4	18.8	17.7	17.2	16.9	16.3	17.8	22.2																						
2-Sep	15.9	15.7	15.4	14.9	14.1	13.5	13.0	13.4	14.0	14.6	15.4	16.0	16.2	16.8	17.6	17.7	17.0	16.2	14.7	13.2	12.9	11.4	10.9	9.3	14.6	17.7																						
3-Sep	9.1	9.0	9.1	9.4	9.6	9.4	9.9	9.5	11.1	12.3	12.3	10.7	10.3	11.3	11.8	11.8	12.3	11.9	11.4	10.5	10.4	9.9	10.1	9.6	10.5	12.3																						
4-Sep	9.5	8.8	7.9	7.0	6.6	6.1	5.6	5.9	6.1	6.6	6.8	6.9	7.1	7.2	7.4	7.6	7.4	7.1	7.1	5.7	4.5	4.0	3.7	4.2	6.5	9.5																						
5-Sep	3.5	2.1	1.8	1.8	0.9	1.0	2.3	4.1	5.8	7.9	9.7	11.1	12.2	12.9	13.0	13.3	12.7	11.8	10.8	9.8	8.6	7.9	7.7	7.6	7.5	13.3																						
6-Sep	7.5	7.4	7.4	7.5	7.6	7.6	7.7	8.0	8.4	9.1	9.2	10.0	11.1	11.8	12.3	12.5	13.1	13.3	12.1	10.1	9.4	9.3	8.7	8.4	9.6	13.3																						
7-Sep	7.8	7.2	6.8	5.6	5.6	5.6	6.7	8.5	10.0	11.9	13.7	14.7	15.2	15.9	16.1	16.5	16.2	16.0	14.2	11.8	10.7	10.2	9.3	8.6	11.0	16.5																						
8-Sep	7.9	7.5	7.3	7.2	7.0	7.0	7.5	9.7	11.7	14.6	17.1	18.1	18.6	19.1	19.3	19.2	18.9	18.2	16.4	14.7	12.5	9.6	8.7	8.2	12.7	19.3																						
9-Sep	8.6	8.9	7.6	7.0	6.1	5.7	6.5	12.3	16.3	16.4	18.3	19.0	19.0	19.1	20.4	20.0	19.5	18.0	15.1	11.5	10.1	11.2	11.5	12.3	13.4	20.4																						
10-Sep	11.0	10.7	10.5	10.4	10.2	9.9	10.0	13.1	16.0	17.8	18.9	20.1	20.6	20.8	21.2	21.3	21.1	20.2	18.1	16.0	15.4	14.4	13.5	13.4	15.6	21.3																						
11-Sep	13.0	12.5	11.8	11.3	10.9	10.6	10.5	11.8	14.0	16.7	18.9	20.3	21.4	21.8	21.9	22.0	21.7	21.7	19.3	17.3	16.5	16.0	15.5	14.8	16.4	22.0																						
12-Sep	13.8	13.1	12.6	12.3	11.8	11.6	11.6	12.2	13.0	14.8	15.4	16.7	18.0	17.7	17.0	16.3	16.3	16.0	15.1	14.6	14.5	14.3	14.0	13.6	14.4	18.0																						
13-Sep	13.0	12.2	11.2	9.9	10.3	10.7	11.0	11.8	13.0	13.6	14.9	16.6	18.0	18.9	19.1	17.9	17.6	16.9	15.2	13.0	11.9	10.7	10.4	10.1	13.7	19.1																						
14-Sep	10.0	9.6	8.5	8.2	8.3	8.4	8.5	8.3	8.0	8.3	9.0	10.4	12.8	14.7	15.8	15.8	16.1	15.7	14.2	12.3	10.9	10.4	10.0	9.3	11.0	16.1																						
15-Sep	8.9	6.3	6.1	5.0	4.3	3.3	5.9	9.5	12.1	14.1	16.0	17.4	18.7	19.7	20.3	20.7	20.3	19.0	16.6	15.1	14.5	13.9	13.1	12.8	13.1	20.7																						
16-Sep	11.6	11.1	11.2	11.0	10.5	9.1	8.8	9.7	10.5	12.5	15.8	18.4	19.1	19.9	20.6	21.1	21.2	19.6	14.3	11.1	9.9	9.4	8.2	7.9	13.4	21.2																						
17-Sep	7.2	7.3	8.5	11.3	10.6	9.8	11.8	14.0	16.8	17.2	19.3	20.6	22.3	23.2	21.4	20.4	19.5	18.6	16.5	14.9	13.9	13.3	12.6	12.2	15.1	23.2																						
18-Sep	11.3	10.2	9.1	8.7	9.8	8.4	8.7	9.9	11.9	13.3	13.9	13.8	13.9	14.9	14.6	13.5	12.8	11.9	10.1	8.6	7.9	7.9	6.8	6.7	10.8	14.9																						
19-Sep	7.7	6.8	5.4	4.6	3.8	3.2	3.0	4.7	6.8	9.4	11.2	12.7	14.0	14.6	15.3	15.2	14.8	14.7	12.9	10.7	10.3	9.7	9.2	8.9	9.6	15.3																						
20-Sep	8.9	8.6	7.8	7.3	6.7	6.1	5.5	6.2	8.0	9.4	11.4	13.7	15.4	15.9	15.9	14.7	12.1	11.4	10.9	10.5	9.9	8.6	8.3	5.8	10.0	15.9																						
21-Sep	4.3	3.3	4.0	2.8	4.6	4.1	4.9	6.0	9.0	11.4	13.2	15.0	15.6	16.4	16.8	16.9	16.7	15.8	13.3	11.9	10.9	10.1	9.5	9.4	10.2	16.9																						
22-Sep	9.4	9.1	8.5	8.2	7.5	7.4	7.1	8.6	11.1	13.3	15.4	17.0	18.2	19.1	19.8	19.9	19.5	18.4	15.5	14.2	14.5	14.6	13.8	13.3	13.5	19.9																						
23-Sep	12.5	12.0	12.0	11.7	11.6	11.4	11.2	11.5	13.2	14.8	16.2	17.2	17.9	18.7	18.7	18.5	18.3	16.9	15.5	15.1	15.3	14.9	15.2	15.7	14.8	18.7																						
24-Sep	15.8	15.3	14.3	13.8	13.2	12.6	12.5	12.7	12.9	13.1	13.8	14.1	14.5	14.6	15.2	15.2	15.0	14.7	13.8	12.3	11.1	10.6	10.3	7.3	13.3	15.8																						
25-Sep	6.2	5.7	5.5	4.3	4.1	3.8	4.3	7.9	12.1	14.6	16.2	17.7	18.8	19.3	19.8	19.7	19.0	16.8	14.9	14.6	14.4	14.0	13.6	13.2	12.5	19.8																						
26-Sep	14.1	13.9	14.3	14.6	14.2	13.7	13.3	13.2	13.8	14.8	17.0	19.2	21.0	22.3	20.9	19.5	18.1	17.1	15.9	14.1	13.4	12.0	11.6	10.5	15.5	22.3																						
27-Sep	9.3	8.9	8.0	7.5	7.2	7.6	6.3	7.5	9.5	11.4	14.5	15.5	16.0	17.3	14.0	15.0	14.2	13.2	10.8	8.8	8.2	7.8	8.2	6.1	10.5	17.3																						
28-Sep	7.5	8.6	8.5	7.2	6.9	5.3	6.2	6.8	8.9	11.3	12.7	13.8	14.5	15.3	15.5	14.7	14.4	12.6	10.5	8.8	6.0	6.2	6.4	6.4	9.8	15.5																						
29-Sep	6.8	6.8	6.8	6.9	6.5	5.7	5.8	5.7	5.8	5.5	5.3	5.5	6.2	7.3	7.4	7.0	6.8	6.4	6.0	5.7	5.5	5.3	5.1	4.9	6.1	7.4																						
30-Sep	4.6	4.6	4.5	4.3	4.4	4.3	4.5	4.5	4.8	5.4	7.1	7.5	8.0	7.8	8.0	7.9	7.6	7.2	6.5	6.0	5.2	5.2	5.3	4.9	5.8	8.0																						
																								9.8	9.3	8.9	8.5	8.3	7.9	8.1	9.4	11.0	12.5	13.9	15.0	15.9	16.5	16.6	16.5	16.1	15.3	13.6	12.1	11.2	10.7	10.3	9.7	Diurnal Average
																								15.9	15.7	15.4	14.9	14.2	13.7	13.3	14.0	16.8	17.8	19.4	20.6	22.3	23.2	22.2	22.1	22.0	21.7	20.4	18.8	17.7	17.2	16.9	16.3	Diurnal Maximum



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Kirby South - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Kirby South - September 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	272	37.78	37.78
10 - 20	411	57.08	94.86
> 20	37	5.14	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association

Summary of Hour Averages

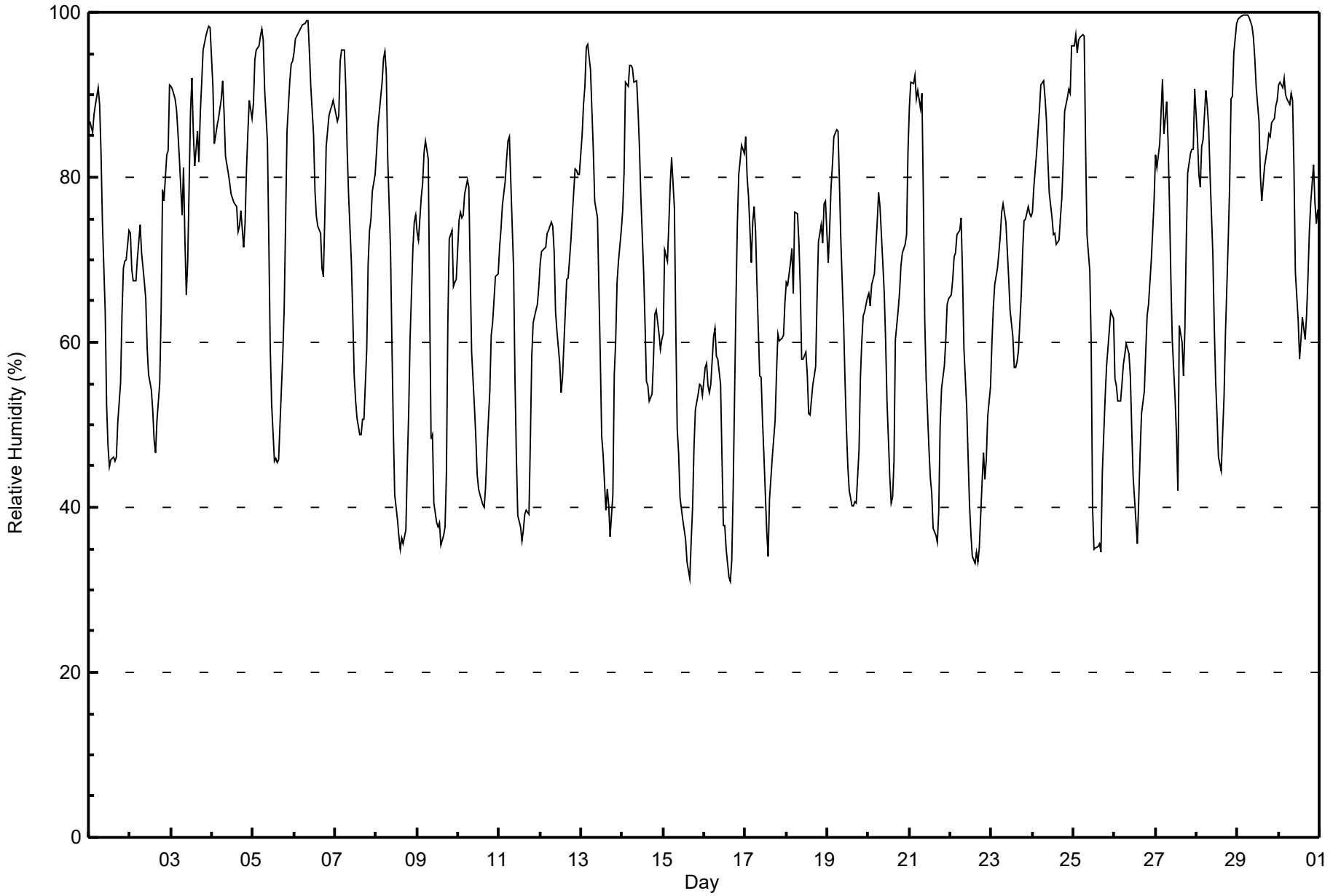
**Relative Humidity (RH) - %
Kirby South - September 2023**

Maximum Value: 99.6 % on Sep 29 05:00 Maximum Daily Average: 91.1 % on Sep 29																						Hours in Service: 720 Hours of Data: 720																											
Minimum Value: 31.0 % on Sep 16 16:00 Minimum Daily Average: 52.2 % on Sep 22																						Hours of Missing Data: 0 Hours of Calibration: 0																											
Maximum Diurnal Average: 84.5 % at hour 6 Minimum Diurnal Average: 49.5 % at hour 15																						Percent Operational Time: 100.0																											
Monthly Average: 68.57 % Percentiles: P₁ = 34.1 P₁₀ = 42.0 Q₁ = 55.0 Median = 70.5 Q₃ = 83.1 P₉₀ = 91.2 P₉₉ = 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-Sep	86.9	86.0	85.4	87.7	88.9	90.8	88.8	83.0	74.5	63.7	52.4	47.5	44.9	45.7	46.1	45.7	46.0	50.3	55.0	63.5	69.0	69.8	70.1	73.5	67.3	90.8																							
2-Sep	73.2	68.8	67.5	67.5	70.2	72.2	74.2	70.9	67.2	65.3	59.4	56.0	54.2	51.6	48.2	46.7	50.5	55.0	63.9	78.4	77.1	82.7	83.2	91.3	66.5	91.3																							
3-Sep	91.1	90.8	89.5	88.2	85.5	82.3	75.4	81.1	72.3	65.7	69.9	88.0	92.1	85.4	81.3	85.6	81.9	87.8	91.5	95.4	97.1	97.8	98.3	98.2	86.3	98.3																							
4-Sep	91.0	84.1	85.2	86.3	87.1	89.4	91.7	87.8	82.5	80.5	79.4	78.0	77.5	76.9	76.5	73.4	74.1	75.9	71.6	74.5	80.9	85.4	89.3	87.2	81.9	91.7																							
5-Sep	89.0	94.2	95.5	95.9	97.1	98.0	96.7	90.7	84.2	72.3	59.3	52.6	45.6	46.0	45.4	45.7	50.2	58.7	64.3	74.7	85.6	91.7	93.7	94.1	75.9	98.0																							
6-Sep	95.1	96.8	97.5	97.8	98.2	98.5	98.6	99.0	99.1	95.2	91.0	85.0	78.2	75.3	74.1	73.1	69.0	68.0	75.1	83.7	87.5	88.2	88.6	89.3	87.6	99.1																							
7-Sep	87.6	86.8	87.5	94.0	95.4	95.4	91.0	83.3	78.0	69.9	63.3	56.1	53.1	50.9	48.8	48.8	50.7	50.7	59.2	69.5	73.6	74.9	78.4	80.3	72.0	95.4																							
8-Sep	83.0	86.1	88.0	91.6	94.4	95.3	92.5	82.4	71.2	59.9	49.7	41.5	38.4	36.5	34.9	36.2	35.5	37.4	45.2	51.6	60.5	71.3	74.5	75.5	63.9	95.3																							
9-Sep	73.5	72.4	77.6	79.4	83.1	84.4	82.2	64.5	48.3	48.8	40.6	38.2	37.6	38.2	35.4	36.6	37.7	44.2	62.5	72.5	73.6	66.7	67.4	67.6	59.7	84.4																							
10-Sep	74.8	75.7	75.1	75.4	77.9	79.7	78.8	68.7	58.7	52.2	48.4	44.0	42.2	41.4	40.3	40.0	42.6	47.0	54.0	60.9	62.3	65.1	67.9	68.4	60.1	79.7																							
11-Sep	71.5	73.7	76.6	79.5	82.2	84.4	85.0	79.5	69.0	55.6	46.1	39.0	37.6	36.0	37.3	39.1	39.7	39.1	48.1	58.2	62.3	63.9	64.6	66.5	59.8	85.0																							
12-Sep	69.5	71.0	71.3	71.5	73.3	73.5	74.6	74.1	71.0	63.7	61.4	57.4	54.0	55.8	59.9	67.6	67.7	70.0	72.4	75.4	81.0	80.9	80.3	80.4	69.9	81.0																							
13-Sep	85.1	88.8	91.0	95.7	96.1	93.0	88.2	83.4	77.2	75.0	66.6	58.1	48.6	46.5	39.7	42.1	40.4	36.4	41.6	56.2	60.2	67.3	69.8	73.5	67.5	96.1																							
14-Sep	76.0	80.6	91.5	91.0	93.6	93.5	93.2	91.6	91.8	88.1	83.5	77.6	68.5	62.2	55.3	54.7	52.9	53.7	57.7	63.4	63.8	60.9	59.2	60.4	73.5	93.6																							
15-Sep	61.1	71.2	69.8	74.2	79.1	82.3	76.3	61.5	49.5	46.6	41.1	38.5	37.4	36.1	33.4	31.3	35.9	40.0	47.3	51.8	53.8	55.0	54.8	53.5	53.4	82.3																							
16-Sep	57.0	57.4	54.7	54.0	55.0	60.7	61.6	58.3	58.0	55.0	46.1	37.7	37.8	35.0	31.6	31.0	33.5	42.1	64.7	74.4	80.3	82.0	83.8	83.0	55.6	83.8																							
17-Sep	85.0	80.0	77.6	69.6	74.5	76.5	73.5	67.1	56.0	55.7	50.5	46.2	37.1	34.1	41.0	43.5	46.1	50.5	56.2	60.9	60.2	60.5	60.9	64.8	59.5	85.0																							
18-Sep	67.3	67.0	69.6	71.4	66.0	75.8	75.6	72.2	66.7	57.9	58.0	58.8	56.2	51.4	51.1	54.9	56.0	57.0	65.4	72.2	74.2	72.1	76.7	77.1	65.4	77.1																							
19-Sep	69.6	73.7	78.8	81.5	84.8	85.8	85.7	79.2	72.3	62.3	55.3	49.4	44.9	42.1	40.2	40.1	40.6	40.6	47.0	55.8	60.1	63.3	63.7	65.5	61.8	85.8																							
20-Sep	65.9	64.3	67.0	68.2	71.5	74.6	78.2	76.4	69.7	66.2	60.3	52.9	43.7	40.4	41.2	45.6	60.4	63.8	66.1	69.3	70.9	71.9	73.0	83.1	64.4	83.1																							
21-Sep	88.5	91.6	91.3	92.4	89.5	90.5	88.4	90.1	77.4	62.7	55.6	47.0	43.6	41.7	37.5	36.7	35.8	39.5	49.8	54.5	57.1	60.2	64.6	65.2	64.6	92.4																							
22-Sep	65.7	67.7	70.3	70.8	73.1	73.6	75.0	68.2	59.3	52.1	46.2	40.4	36.8	34.1	33.2	34.6	33.3	35.0	43.0	46.6	43.5	45.8	50.9	54.6	52.2	75.0																							
23-Sep	59.9	64.1	66.9	69.1	70.9	72.8	75.8	76.8	74.6	71.2	67.8	63.9	60.7	56.9	57.0	57.7	59.0	65.7	71.0	74.7	75.0	76.4	75.6	75.3	68.3	76.8																							
24-Sep	75.8	78.8	83.1	85.6	88.2	91.2	91.7	89.7	86.9	82.3	78.2	75.0	73.0	73.3	71.8	72.3	75.0	77.5	82.0	88.0	89.6	90.7	90.2	95.9	82.7	95.9																							
25-Sep	96.0	97.4	95.1	96.6	96.9	97.3	97.1	83.7	73.1	68.6	59.8	39.8	35.0	35.1	35.3	35.7	34.5	44.5	53.4	57.2	59.3	61.6	63.7	62.8	65.8	97.4																							
26-Sep	55.6	54.7	52.9	53.0	54.9	57.3	58.5	59.8	58.6	55.9	49.5	43.7	38.3	35.6	40.8	46.6	51.3	54.1	58.8	63.3	64.5	70.0	73.6	77.3	55.4	77.3																							
27-Sep	82.8	81.2	84.0	87.9	91.9	85.3	89.1	84.3	76.7	67.6	60.2	53.3	48.7	42.1	62.0	59.9	56.0	61.5	72.3	80.5	83.0	83.4	83.4	90.7	73.6	91.9																							
28-Sep	84.7	80.4	78.8	83.7	84.6	90.6	88.7	86.0	80.4	70.8	62.1	55.2	51.0	46.1	44.4	48.9	53.3	61.1	72.4	79.0	89.5	89.9	95.1	98.6	74.0	98.6																							
29-Sep	99.2	99.4	99.5	99.6	99.6	99.6	99.6	99.3	98.3	96.9	94.4	90.9	86.7	80.1	77.2	79.3	81.3	83.6	85.2	84.8	86.6	87.1	88.6	89.3	91.1	99.6																							
30-Sep	91.1	91.5	90.9	92.0	90.0	89.5	88.9	90.1	89.3	81.1	68.5	62.6	58.0	60.3	63.0	60.3	63.2	67.8	73.4	77.0	81.5	77.0	74.5	76.0	77.4	92.0																							
																								78.4	79.2	80.3	81.7	83.1	84.5	83.8	79.4	73.1	67.0	60.8	55.8	52.1	49.8	49.5	50.5	51.8	55.3	62.3	68.9	72.1	73.8	75.3	77.3	Diurnal Average	
																								99.2	99.4	99.5	99.6	99.6	99.6	99.6	99.3	99.1	96.9	94.4	90.9	92.1	85.4	81.3	85.6	81.9	87.8	91.5	95.4	97.1	97.8	98.3	98.6	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Kirby South - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Relative Humidity (RH) - %
Kirby South - September 2023**

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	54	7.50	7.50
40 - 60	182	25.28	32.78
60 - 80	265	36.81	69.58
80 - 100	219	30.42	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Maximum Speed: 28 km/h on Sep 13 23:00	Maximum Daily Speed Average: 18.7 km/h on Sep 11	Hours in Service: 720
Minimum Speed Value: 1 km/h on Sep 25 07:00	Minimum Daily Speed Average: 1.8 km/h on Sep 9	Hours of Data: 720
Maximum Diurnal Speed Average: 7.8 km/h at hour 12	Minimum Diurnal Speed Average: 4.6 km/h at hour 20	Hours of Missing Data: 0
Monthly Average Velocity: 6.3 km/h 235.8 deg	Percentiles: $P_1 = 2$ $P_{10} = 5$ $Q_1 = 8$ Median = 11 $Q_3 = 15$ $P_{90} = 18$ $P_{99} = 25$	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-Sep	NW13	NW13	NW11	NW11	WNW10	WNW10	W11	W13	W14	WNW17	WNW19	W21	W22	WSW21	WSW22	WSW23	WSW23	WSW24	SW20	SW15	SW14	SW15	SW15	WSW14	W14.2	WSW24
2-Sep	WSW14	W15	W17	W17	W15	W14	W13	WNW14	WNW14	WNW14	WNW15	WNW13	WNW16	W16	WNW17	WNW16	WNW13	W17	W12	WSW12	W13	WSW12	WSW9	SW10	W13.6	W17
3-Sep	SW11	SW10	SW9	SW9	SW9	SW9	SSW10	SW11	SW12	SW15	WSW15	WSW13	WSW11	WNW7	WSW2	SSW4	SSW5	SW8	SW8	SW10	WSW10	WSW9	W11	WNW8	WSW8.6	SW15
4-Sep	NW11	NW10	NW13	NNW10	NW11	WNW12	WNW11	NW15	NW14	NW16	NW16	NW16	NW15	NW16	NW13	NW12	WNW15	NW11	NW11	W8	W9	W10	W12	NW11.7	NW16	
5-Sep	W10	WSW7	WSW6	SW9	SW9	SW8	SW9	SW9	SSW9	SSW13	SSW13	S13	S15	S13	S11	SSW11	SSE11	SE11	SSE7	ESE4	E8	E7	ESE7	SE9	S7.1	S15
6-Sep	SE10	SE10	SSE9	SSE10	SSE8	S6	SSW8	SW8	W9	WNW11	W13	W14	W17	W14	WSW12	WSW13	WSW14	WSW12	SW7	SW7	SW9	SW8	SW9	WSW9	SW7.7	W17
7-Sep	W7	W8	W8	SW10	SW9	SW6	WNW7	WNW7	W7	WSW8	WSW13	W16	W18	WSW16	W16	WSW16	WSW14	W14	WSW9	SW6	WSW8	WSW8	WSW9	WSW8	WSW10.0	W18
8-Sep	SW9	SW10	SW9	SW9	SW8	SW9	SW8	SW8	SW10	SW9	WSW11	W15	W15	W15	WNW16	WNW16	W18	W15	W10	WNW8	WNW7	WNW7	WNW7	W6	W9.7	W18
9-Sep	WNW8	WNW6	W5	WNW4	W5	WNW3	W3	NNW2	NE6	ENE5	NE6	SE4	SE4	NNE4	NE9	NE9	ENE7	E6	ENE3	E3	E4	ESE7	SE11	SSE10	ENE1.8	SE11
10-Sep	SSE9	S10	S10	S10	SSW8	SSW7	S7	SSW7	S9	S11	S15	SSE16	S17	S17	S17	SSE15	S14	SSE14	SSE11	SSE11	SSE15	SSE16	SSE14	S17	S12.3	S17
11-Sep	SSE18	S17	S16	S17	S17	S18	S17	S18	S18	S20	SSW21	S25	S25	S26	S26	S24	S20	S17	SSE13	SSE15	S17	S17	S15	S16	S18.7	S26
12-Sep	S16	S16	S16	S15	S13	S10	S12	SSW13	SSW11	SW12	SW9	WSW6	SW8	SSW11	SW9	SW7	SW10	SW8	SW10	WSW10	W13	W10	WNW9	W13	SW9.5	S16
13-Sep	W10	W10	WSW10	SW11	WSW13	W12	WNW11	WNW13	WNW16	W16	W19	W20	WNW20	WNW20	W25	W25	W24	W24	WNW19	WNW16	W26	W21	WNW28	WNW25	W17.8	WNW28
14-Sep	W21	WNW18	W13	WNW21	WNW21	WNW21	NW19	NW18	WNW18	NW19	NW19	WNW21	WNW22	NW22	NW21	NW20	WNW19	WNW13	WNW9	WNW9	W10	WNW9	WNW8	WNW9	WNW16.4	NW22
15-Sep	WNW8	WNW8	W7	WSW7	SW7	SW8	SW10	SW9	SSW9	SSW13	SSW14	SSW15	SSW15	S16	SSW15	S14	S15	S11	S14	W19	S19	SSW17	SSW17	SSW11.1	S19	
16-Sep	SSW16	SSW15	SSW16	SSW17	SSW19	SW14	SW14	SW12	SW11	WSW9	W4	WNW4	WNW5	WNW5	WNW8	WNW7	W5	SW5	SSW6	SW7	SW5	WSW2	SSW4	WSW2	SW7.6	SSW19
17-Sep	SE3	SSE4	SSE6	SSE8	SSE7	SE8	SSE11	SSE13	S16	S17	SSW17	SW13	SW11	WSW10	WNW17	WNW16	WNW12	WNW13	WNW13	WNW13	WNW10	W11	W13	W11	SW6.0	WNW17
18-Sep	W11	WSW6	WSW7	SW9	SW11	SW9	SW8	WSW7	SW10	W12	WNW11	WNW14	WNW16	WNW21	WNW18	W20	W20	W18	WSW10	SW12	SW11	WSW12	SW10	WSW11	W11.2	WNW21
19-Sep	W14	W12	WSW12	WSW12	SW12	SW12	SW11	SW11	SW13	WSW14	WSW15	WSW18	W17	W16	W15	WNW13	W10	W12	W6	W3	SW6	SW7	W7	WNW8	WSW11.0	WSW18
20-Sep	NW6	NW7	WNW7	WNW9	NW10	NW10	WNW10	NW10	NW9	N8	NNW7	N9	NNE10	NE11	NE11	NNW11	WNW13	WNW8	WNW7	WNW7	NW6	NW7	NW7	WNW5	NW7.0	WNW13
21-Sep	WNW3	WSW3	WSW7	WSW4	WSW9	SW9	SW8	SW9	SW9	SW12	SW14	SW17	SW20	SW18	SW19	SW19	SW17	SW14	SSW10	SSW11	SSW11	SSW12	SSW12	SSW13	SW11.5	SW20
22-Sep	SW14	SW16	SW16	SW15	SW14	SW15	SW14	SSW15	SW16	SSW18	SSW19	SSW20	SSW18	SSW17	S18	S16	S15	S12	SSE9	SSE12	SSE14	S15	S15	S15	SSW14.4	SSW20
23-Sep	S15	S16	S14	S15	S16	S15	S16	SSE14	S17	S21	S23	S24	S22	S21	SSE21	S19	SSE18	SSE14	SSE11	SSE13	SSE15	SE14	SSE16	SSE19	S16.7	S24
24-Sep	S20	S17	S16	SSE17	S13	S13	S13	S13	S13	SSW12	SW11	SW8	W5	WNW6	NE2	E2	SW6	SW6	SW7	WSW7	WSW5	W5	WNW6	SSE2	SSW7.6	S20
25-Sep	NW1	S4	W3	S2	SW1	WSW2	SW1	ENE3	ESE8	SE10	SE11	SE11	SE10	SE12	ESE14	ESE15	SE14	ESE8	ESE9	ESE11	ESE13	ESE13	SE13	SE14	SE7.6	ESE15
26-Sep	SSE17	SE16	SSE16	S18	S19	S15	S13	S14	S17	S17	S16	SSW15	S9	S13	S14	SSW12	SSW10	WSW4	WSW5	W4	WSW8	WSW10	WSW11	WSW10	S10.8	S19
27-Sep	SW10	WSW9	SW9	WSW9	SW13	W9	WSW8	W11	WNW11	NW9	N12	NNE11	NE7	NW3	WNW10	NNW7	WNW5	WNW6	WSW4	SW6	WSW4	WSW5	WNW4	W6	W5.4	SW13
28-Sep	WNW9	NW8	NW7	NW7	NW7	WNW7	NW7	WNW7	NW6	NW6	NNW9	NNW8	N5	NNW8	WNW13	NNW6	NNE6	NW7	NNE5	NNE5	ENE3	NE5	NE10	NE7	NNW5.4	WNW13
29-Sep	NE8	ENE10	NE10	NNE11	NNE10	NE11	NNE11	NNE12	NNE12	NNE13	NNE13	N11	NNE10	NNE11	N12	N12	N10	N10	N10	N7	N6	NNW6	NNW6	NNW7	NNE9.4	NNE13
30-Sep	NNW6	NW6	NNW7	NW6	N4	NNE4	NNW4	N4	NNE5	NNE3	NE4	NE4	NE6	E5	NE8	ENE5	NE6	NE7	ENE4	ESE4	ESE4	SE7	SE8	SE7	NE3.0	SE8

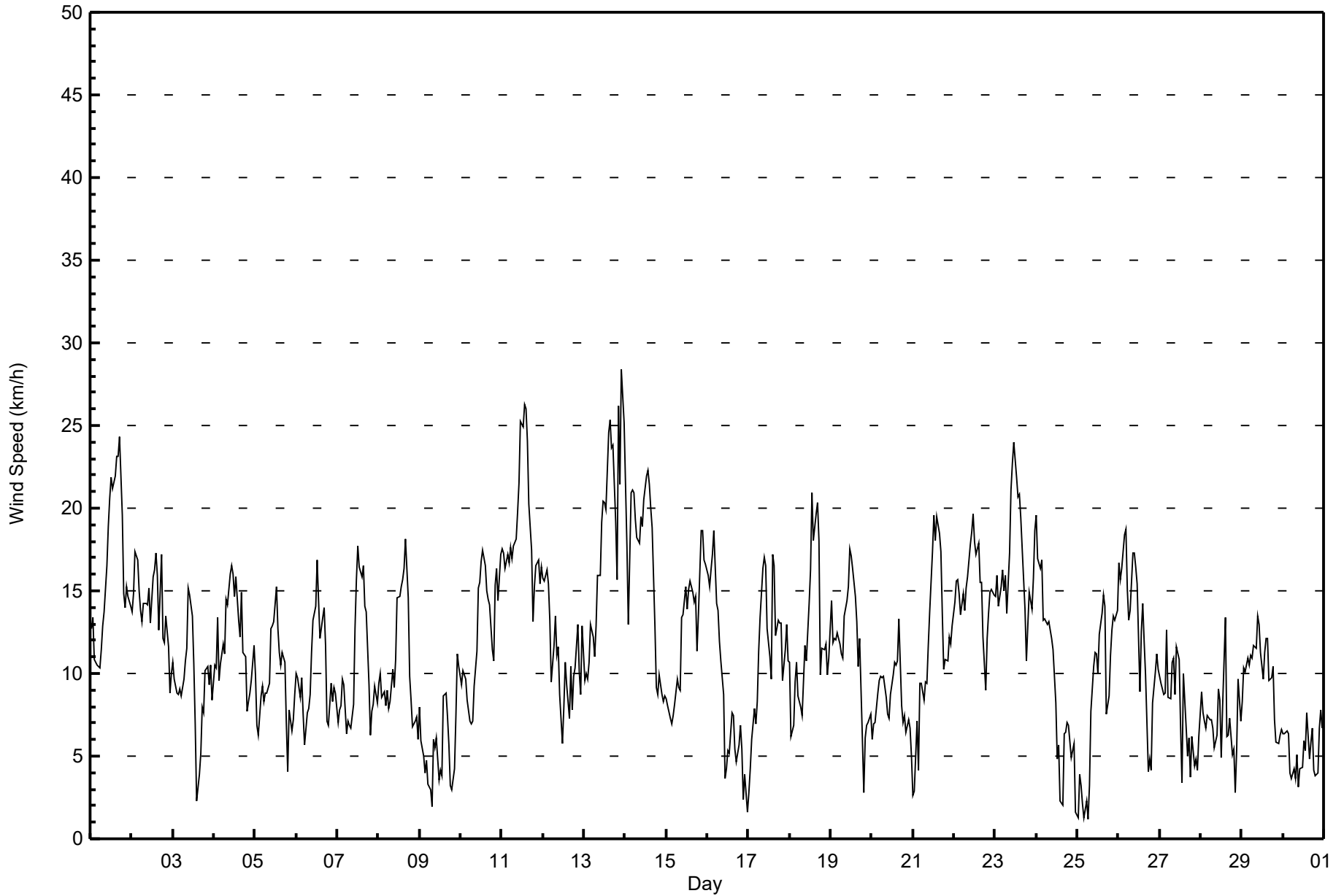
SW6.0 SW5.6 SW6.0 SW6.7 SW7.1 SW6.4 SW6.3 SW6.1 SW6.5 SW7.1	WSW7.3 WSW7.8 WSW7.5 WSW7.2 WSW7.1 WSW6.8 WSW7.2 WSW6.7	SW4.7 SW4.6 SW5.4 SW5.5 SW5.5 SW6.1	Diurnal Average																					
W21	WNW18	W17	WNW21	WNW21	WNW21	NW19	NW18	S18	S21	S23	S25	S25	S26	S26	W25	W24	WSW24	SW20	WNW16	W26	W21	WNW28	WNW25	Diurnal Maximum

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Kirby South - September 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Kirby South - September 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	75	10.42	10.42
6 - 11	316	43.89	54.31
12 - 19	281	39.03	93.33
20 - 28	48	6.67	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Wind Speed (WS) - km/h
Kirby South - September 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	6	4	6	4	3	3	2	2	3	4	12	10	9	2	2	75
6 - 11	8	8	16	2	3	6	13	16	11	14	72	37	28	42	27	13	316
12 - 19	3	4	0	0	0	4	6	25	66	30	30	21	41	35	16	0	281
20 - 28	0	0	0	0	0	0	0	1	13	2	2	5	12	10	3	0	48
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	18	20	8	7	13	22	44	92	49	108	75	91	96	48	15	720

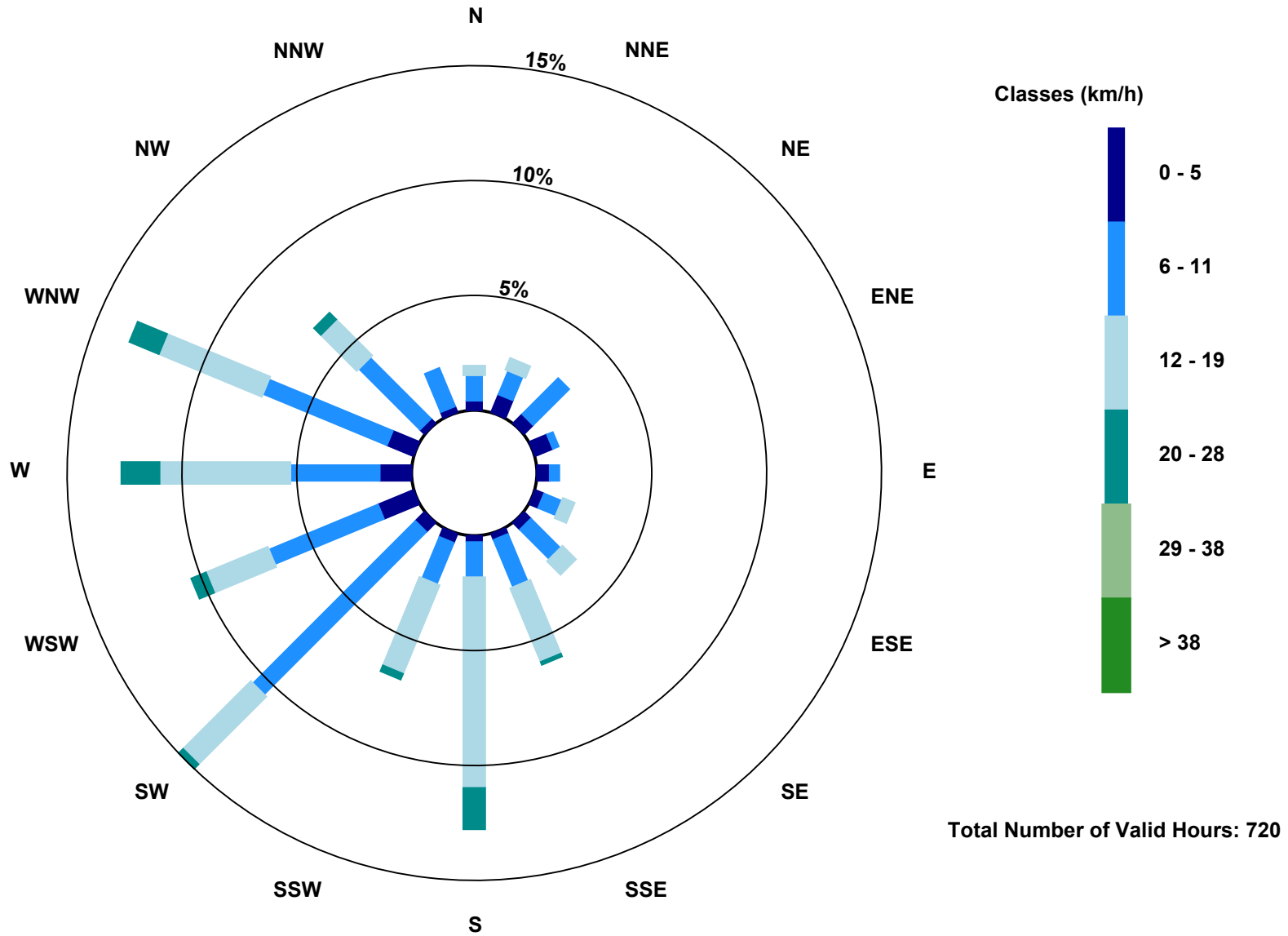
Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Sep 2023

Wind Speed (WS) - km/h
Kirby South





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Kirby South - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Sep 13 23:00														Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0											
Minimum Value: 0 km/h on Sep 9 05:00																									
Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 3 Q ₃ = 4 P ₉₀ = 5 P ₉₉ = 6																									
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Sep	2	3	2	2	2	2	3	2	3	4	4	4	5	5	5	6	6	6	5	3	3	3	3	3	6
2-Sep	3	3	3	4	3	2	2	2	3	2	3	3	3	3	4	3	3	3	3	3	3	2	2	2	4
3-Sep	2	2	1	1	2	1	2	3	4	6	5	3	3	2	2	2	2	2	2	2	2	2	2	6	
4-Sep	3	2	3	2	2	3	3	3	4	4	3	3	3	3	3	3	4	3	3	2	2	3	2	4	
5-Sep	2	1	2	1	1	1	1	2	2	4	4	4	3	4	3	3	3	3	3	1	2	2	2	4	
6-Sep	3	2	2	2	2	1	2	2	2	3	3	3	4	3	3	3	3	3	2	1	1	1	1	4	
7-Sep	2	2	1	2	1	2	2	1	2	2	3	3	4	4	4	5	4	4	2	2	2	1	1	5	
8-Sep	2	1	1	1	1	1	2	2	3	2	3	4	4	4	5	4	4	3	3	2	1	1	1	5	
9-Sep	1	2	1	1	0	1	1	1	2	2	2	3	2	2	3	3	1	1	1	1	1	1	2	3	
10-Sep	1	1	1	1	1	1	1	2	2	3	3	4	5	5	4	4	3	4	3	3	4	4	3	5	
11-Sep	4	4	4	4	4	4	4	4	4	5	6	7	7	6	7	6	6	5	3	3	4	4	4	7	
12-Sep	3	3	3	3	3	2	3	3	3	3	2	2	3	2	2	3	2	2	2	2	3	3	2	3	
13-Sep	3	2	2	2	3	2	2	2	3	3	4	4	5	5	5	6	5	6	5	5	6	5	7	7	
14-Sep	5	5	2	5	5	4	5	4	4	4	5	4	5	6	5	5	4	3	2	2	1	2	1	6	
15-Sep	1	2	2	1	1	1	1	2	2	3	4	4	3	3	4	4	4	4	2	3	4	5	4	5	
16-Sep	3	3	3	4	4	3	3	3	3	3	2	2	2	2	2	2	2	1	1	1	1	1	1	4	
17-Sep	2	1	2	1	2	2	2	3	4	4	5	3	3	4	3	3	2	3	3	2	1	2	2	5	
18-Sep	2	1	1	2	1	2	2	1	2	3	3	4	4	4	4	6	5	4	2	2	2	3	1	6	
19-Sep	3	2	2	2	2	2	2	2	3	3	4	4	5	5	4	5	4	4	2	1	2	2	2	5	
20-Sep	1	1	1	1	2	2	2	2	2	2	2	3	4	3	4	4	3	2	1	1	1	1	2	4	
21-Sep	1	2	1	1	1	2	1	1	2	3	3	4	5	5	5	5	5	4	2	2	2	3	2	5	
22-Sep	3	3	3	3	3	3	3	3	4	4	5	5	5	5	5	4	4	3	1	2	3	3	4	5	
23-Sep	3	3	4	3	4	4	4	3	5	5	6	6	6	6	5	5	5	4	2	4	4	4	5	6	
24-Sep	5	5	4	4	3	3	3	4	3	3	2	2	2	2	2	2	2	2	1	1	1	1	4	5	
25-Sep	1	2	0	1	1	1	1	1	2	3	3	3	3	4	4	4	4	2	2	2	4	3	3	4	
26-Sep	4	4	4	4	4	4	3	3	4	4	4	4	3	3	4	4	3	3	3	2	4	1	2	4	
27-Sep	2	1	1	2	2	2	2	2	3	2	4	3	2	3	5	2	2	2	2	1	2	2	2	5	
28-Sep	1	1	1	2	1	1	1	1	2	1	2	3	3	2	4	3	2	5	1	1	1	3	2	5	
29-Sep	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	1	1	1	3	
30-Sep	1	1	1	1	1	1	1	1	1	1	2	2	3	2	2	2	2	1	1	1	1	1	2	3	
														Diurnal Maximum											



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Kirby South - September 2023

Direction of Maximum Speed: 290 deg on Sep 13 23:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 180.3 deg on Sep 11	Hours of Data: 720
Direction of Minimum Speed: 215 deg on Sep 25 07:00	Hours of Missing Data: 0
Direction of Minimum Daily Speed Average: 1.8 deg on Sep 9	Percent Operational Time: 100.0
Monthly Average Direction: 235.8 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-Sep	307	322	325	315	300	286	271	269	276	288	290	278	263	248	243	242	237	238	234	226	227	232	234	239	260.7
2-Sep	251	264	267	266	272	278	277	285	290	283	289	285	282	281	291	297	285	275	265	253	266	247	248	233	273.6
3-Sep	230	229	227	226	224	220	211	222	221	225	252	251	239	299	255	192	212	229	236	229	251	250	277	295	237.4
4-Sep	309	320	321	331	320	302	297	311	308	315	314	312	313	314	312	322	297	311	307	281	266	265	267	270	305.8
5-Sep	269	238	237	236	236	223	222	217	207	195	194	189	183	176	183	162	153	145	149	123	91	100	117	134	185.9
6-Sep	136	145	152	164	168	191	204	217	267	285	278	268	274	259	239	243	245	241	222	218	220	233	234	251	233.2
7-Sep	267	266	266	234	228	228	291	295	259	247	255	259	266	257	265	248	241	264	239	236	240	238	238	243	253.3
8-Sep	231	228	226	230	232	232	229	231	236	228	237	262	271	276	296	287	269	262	265	286	299	292	284	273	259.0
9-Sep	288	296	278	299	268	288	277	327	51	60	44	124	129	24	39	54	68	96	73	89	89	106	143	159	70.2
10-Sep	168	175	181	183	193	197	189	192	176	174	171	163	174	171	173	167	169	166	153	150	154	155	161	169	169.6
11-Sep	168	170	172	173	177	180	179	177	178	177	192	189	189	188	190	186	183	184	167	162	169	175	183	189	180.3
12-Sep	188	189	185	189	190	182	183	195	203	214	232	250	233	208	226	222	217	235	233	237	264	277	282	272	216.0
13-Sep	265	265	255	236	252	273	284	286	283	272	275	278	287	284	277	274	281	274	282	283	276	279	290	286	277.3
14-Sep	278	291	280	285	290	303	305	305	301	304	305	295	301	314	313	308	303	302	296	289	280	285	290	290	298.0
15-Sep	296	282	269	253	227	225	225	224	212	207	207	211	205	197	189	200	185	182	179	169	177	186	193	196	203.2
16-Sep	197	198	199	203	210	223	217	224	225	251	268	300	291	287	289	292	269	235	202	217	219	243	209	237	224.7
17-Sep	145	164	163	167	151	144	156	150	169	182	193	224	215	258	301	303	301	292	293	291	288	276	274	267	236.0
18-Sep	274	254	237	233	235	232	229	237	234	259	282	295	299	285	287	274	267	275	242	234	231	240	226	255	260.5
19-Sep	267	264	250	238	230	230	230	231	233	257	248	258	260	269	266	288	270	279	264	273	220	236	272	291	255.2
20-Sep	315	308	301	297	306	311	296	307	319	350	339	357	27	36	42	342	294	294	290	300	308	309	309	300	322.1
21-Sep	293	245	239	244	241	231	224	220	218	225	224	224	232	230	234	230	231	223	205	205	207	209	213	211	224.5
22-Sep	217	220	220	221	216	214	215	211	214	211	211	207	206	196	189	190	189	179	160	156	160	172	176	183	199.0
23-Sep	178	178	183	175	169	176	169	167	179	173	176	178	184	179	168	171	166	161	154	150	152	145	158	168	170.1
24-Sep	172	170	169	166	171	183	179	177	190	212	223	224	268	291	38	98	223	226	216	221	249	260	283	156	194.5
25-Sep	322	184	261	188	230	245	215	73	121	141	141	137	144	144	117	123	124	115	109	112	114	120	128	135	129.6
26-Sep	148	145	156	171	177	186	182	180	182	189	191	203	171	173	187	204	208	253	257	277	256	247	256	246	189.9
27-Sep	236	252	226	241	236	267	248	276	284	315	358	18	49	310	292	340	283	283	252	227	243	256	298	276	277.0
28-Sep	288	311	307	310	308	299	306	303	319	309	330	338	355	335	289	340	32	321	33	33	61	34	50	51	332.2
29-Sep	35	57	40	30	14	35	30	33	24	24	18	9	22	13	354	357	357	354	1	9	358	346	338	332	15.2
30-Sep	328	326	338	321	350	16	345	354	25	27	46	38	40	90	37	65	54	54	76	104	112	145	130	141	42.1

234.3 229.5 227.5 225.1 228.9 233.3 230.5 234.3 232.5 235.4 243.4 245.7 245.9 246.5 252.2 250.6 241.1 245.5 233.6 221.7 222.7 222.9 229.0 227.8

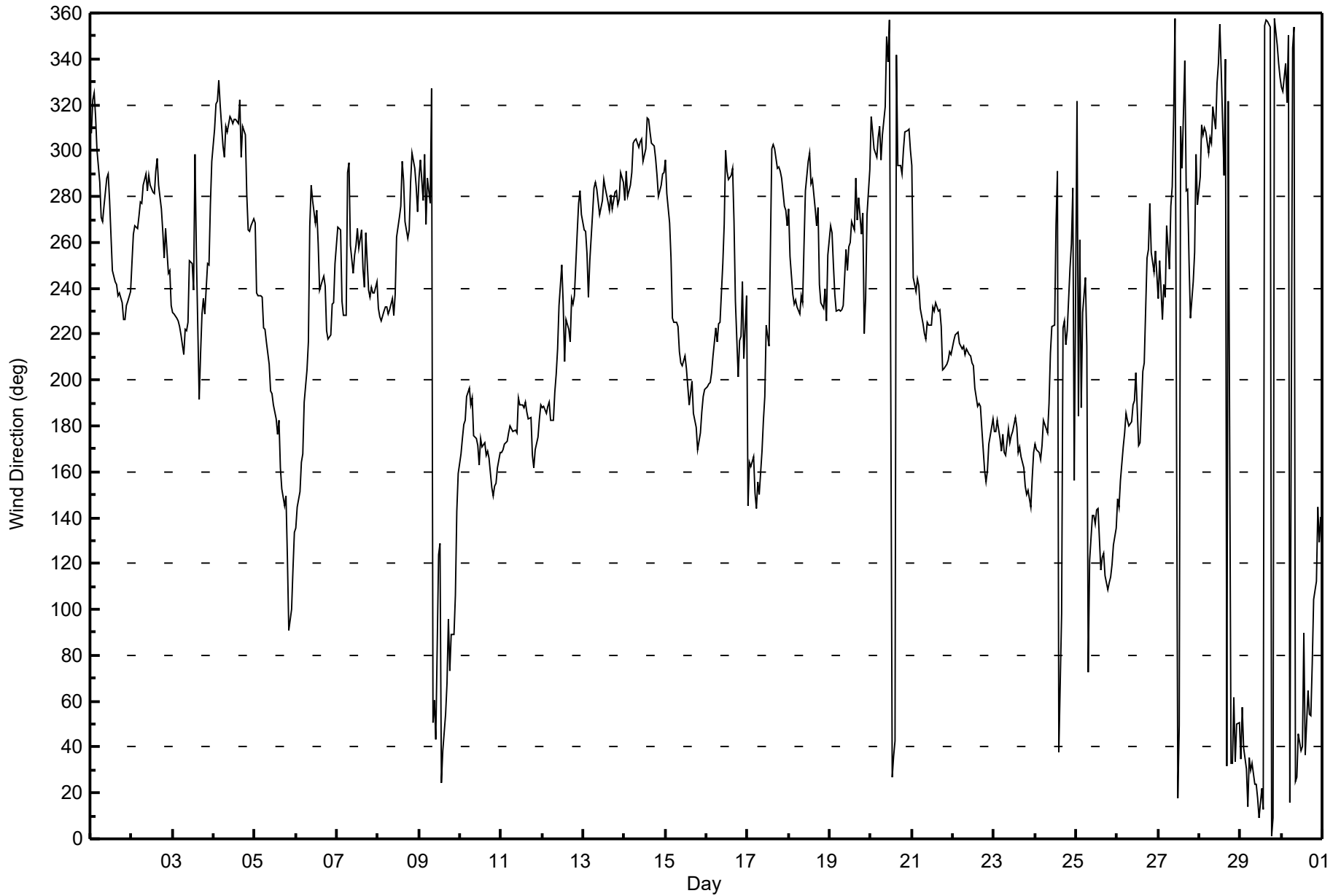
Diurnal Average

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Kirby South - September 2023





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Kirby South - September 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 86 deg on Sep 26 18:00 Minimum Value: 6 deg on Sep 8 22:00 Percentiles: P ₁ = 7 P ₁₀ = 10 Q ₁ = 13 Median = 15 Q ₃ = 20 P ₉₀ = 27 P ₉₉ = 61																			Hours in Service: 720 Hours of Data: 720 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-Sep	14	14	15	14	15	13	11	11	12	14	13	17	18	20	18	18	16	16	15	14	14	13	13	13	20
2-Sep	14	13	11	11	12	10	11	11	12	12	12	13	12	14	14	14	13	10	16	16	12	13	21	7	21
3-Sep	11	10	10	10	10	7	12	13	20	26	26	20	23	17	57	52	19	14	16	13	14	15	11	15	57
4-Sep	13	14	14	19	16	16	15	14	16	15	15	14	17	16	17	18	14	15	15	13	14	15	12	10	19
5-Sep	19	11	11	7	9	8	10	14	18	20	27	23	21	24	25	26	16	16	43	43	16	16	15	15	43
6-Sep	15	15	16	15	17	17	14	14	30	13	16	21	15	19	17	15	17	16	12	8	8	13	10	17	30
7-Sep	14	14	25	8	8	10	16	18	25	33	26	21	21	18	18	16	20	16	14	23	11	11	10	12	33
8-Sep	9	7	7	9	9	8	12	15	15	17	22	25	23	24	20	19	14	18	18	9	10	6	6	9	25
9-Sep	11	31	21	12	11	24	30	45	24	33	40	78	57	76	29	21	22	12	21	15	8	13	13	12	78
10-Sep	10	8	8	9	11	9	7	14	18	18	18	21	22	20	20	21	19	16	14	14	14	14	14	14	22
11-Sep	14	14	15	14	14	14	14	15	15	16	19	18	18	18	17	17	18	17	14	15	14	15	15	14	19
12-Sep	14	13	14	14	15	17	15	16	17	20	23	51	34	18	27	35	16	16	11	13	13	10	10	9	51
13-Sep	14	12	13	10	14	10	12	11	12	10	11	16	16	18	16	13	14	12	13	12	12	13	13	18	18
14-Sep	12	15	11	11	12	14	15	14	14	13	15	14	16	16	17	15	15	13	11	11	9	10	11	10	17
15-Sep	8	10	8	14	7	6	9	10	18	15	19	20	22	22	20	20	18	15	13	15	15	15	14	14	22
16-Sep	14	13	13	14	15	14	12	16	14	23	53	61	29	42	23	23	24	21	16	6	12	31	8	28	61
17-Sep	38	16	8	10	24	13	15	15	20	16	21	21	28	39	18	14	15	12	12	10	10	7	7	11	39
18-Sep	8	15	12	7	8	10	8	12	16	20	21	16	18	16	13	15	15	12	16	10	10	13	12	21	21
19-Sep	11	13	12	13	11	10	10	13	14	21	16	19	23	22	23	24	28	15	19	28	26	14	11	13	28
20-Sep	15	13	12	8	11	10	9	15	24	23	34	35	39	27	25	32	13	12	9	10	10	8	11	14	39
21-Sep	24	26	8	19	7	9	6	10	14	16	19	19	17	21	18	20	17	17	12	13	13	14	13	14	26
22-Sep	13	14	13	13	13	14	12	14	14	15	18	18	19	21	23	21	18	14	10	11	13	15	15	16	23
23-Sep	14	13	15	15	14	15	14	15	17	16	17	16	19	21	18	18	18	15	14	15	15	16	17	15	21
24-Sep	15	15	16	14	19	15	16	16	18	19	21	25	49	26	67	69	17	16	9	7	19	22	44	44	69
25-Sep	63	29	14	44	51	33	61	31	14	19	21	25	35	23	20	19	17	14	13	16	16	15	15	16	63
26-Sep	15	15	16	15	14	15	14	15	15	15	17	21	32	22	19	18	21	86	54	35	25	10	14	14	86
27-Sep	9	13	16	16	10	16	15	9	12	27	21	22	49	81	47	33	43	48	37	12	17	32	20	8	81
28-Sep	8	9	9	11	8	8	8	14	27	24	24	33	61	31	20	57	19	32	22	17	35	23	17	26	61
29-Sep	18	14	15	15	21	17	16	15	17	17	19	19	20	20	20	20	21	19	21	19	19	20	18	15	21
30-Sep	16	14	16	15	27	31	28	30	22	60	57	48	43	36	22	23	14	12	16	17	9	12	17	14	60
	63	31	25	44	51	33	61	45	30	60	57	78	61	81	67	69	43	86	54	43	35	32	44	44	
	Diurnal Maximum																								



Appendix 1 - Summary of Ambient Air Quality Objectives (AAAQOs) and Ambient Air Quality Guidelines (AAAQGs) in
September 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>
Bertha Ganter	PM2.5	1Sep23, 01:00	418914	1-hr	230	229.7	exc
Buffalo Viewpoint	PM2.5	1Sep23, 01:00	418915	1-hr	197	196.7	exc
Patricia McInnes	PM2.5	1Sep23, 01:00	418916	1-hr	175	174.6	exc
Athabasca Valley	PM2.5	1Sep23, 01:00	418917	1-hr	212	211.8	exc
Fort Chip	PM2.5	1Sep23, 01:00	418918	1-hr	306	305.7	exc
Barge Landing	PM2.5	1Sep23, 01:00	418919	1-hr	233	232.6	exc
Ft. McKay S	PM2.5	1Sep23, 01:00	418920	1-hr	205	205.2	exc
Anzac	PM2.5	1Sep23, 01:00	418921	1-hr	229	229.1	exc
Wapasu	PM2.5	1Sep23, 01:00	418922	1-hr	529	529.1	exc
Stony Mtn.	PM2.5	1Sep23, 01:00	418923	1-hr	250	250.3	exc
Conklin	PM2.5	1Sep23, 01:00	418924	1-hr	275	275.1	exc
Janvier	PM2.5	1Sep23, 01:00	418925	1-hr	260	259.6	exc
Fort Hills	PM2.5	1Sep23, 01:00	418722	1-hr	308	308.3	exc
Ells River	PM2.5	1Sep23, 01:00	418723	1-hr	196	195.6	exc
Bertha Ganter	PM2.5	1Sep23, 02:00	418914	1-hr	224	224.0	exc
Buffalo Viewpoint	PM2.5	1Sep23, 02:00	418915	1-hr	188	187.6	exc
Patricia McInnes	PM2.5	1Sep23, 02:00	418916	1-hr	162	161.7	exc
Athabasca Valley	PM2.5	1Sep23, 02:00	418917	1-hr	202	202.0	exc
Fort Chip	PM2.5	1Sep23, 02:00	418918	1-hr	295	295.0	exc
Barge Landing	PM2.5	1Sep23, 02:00	418919	1-hr	217	216.9	exc
Ft. McKay S	PM2.5	1Sep23, 02:00	418920	1-hr	201	200.7	exc
Anzac	PM2.5	1Sep23, 02:00	418921	1-hr	196	195.8	exc
Wapasu	PM2.5	1Sep23, 02:00	418922	1-hr	546	545.7	exc
Stony Mtn.	PM2.5	1Sep23, 02:00	418923	1-hr	217	217.3	exc
Conklin	PM2.5	1Sep23, 02:00	418924	1-hr	250	250.1	exc
Janvier	PM2.5	1Sep23, 02:00	418925	1-hr	257	257.0	exc
Fort Hills	PM2.5	1Sep23, 02:00	418722	1-hr	247	246.9	exc
Ells River	PM2.5	1Sep23, 02:00	418723	1-hr	189	189.2	exc
Bertha Ganter	PM2.5	1Sep23, 03:00	418914	1-hr	200	200.1	exc
Buffalo Viewpoint	PM2.5	1Sep23, 03:00	418915	1-hr	153	152.5	exc
Patricia McInnes	PM2.5	1Sep23, 03:00	418916	1-hr	129	129.2	exc
Athabasca Valley	PM2.5	1Sep23, 03:00	418917	1-hr	181	180.6	exc
Fort Chip	PM2.5	1Sep23, 03:00	418918	1-hr	282	282.3	exc
Barge Landing	PM2.5	1Sep23, 03:00	418919	1-hr	206	206.4	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Ft. McKay S	PM2.5	1Sep23, 03:00	418920	1-hr	175	174.5	exc
Anzac	PM2.5	1Sep23, 03:00	418921	1-hr	163	163.4	exc
Wapasu	PM2.5	1Sep23, 03:00	418922	1-hr	555	554.6	exc
Stony Mtn.	PM2.5	1Sep23, 03:00	418923	1-hr	188	187.9	exc
Conklin	PM2.5	1Sep23, 03:00	418924	1-hr	221	221.2	exc
Janvier	PM2.5	1Sep23, 03:00	418925	1-hr	226	226.2	exc
Fort Hills	PM2.5	1Sep23, 03:00	418722	1-hr	234	233.6	exc
Ells River	PM2.5	1Sep23, 03:00	418723	1-hr	157	157.3	exc
Bertha Ganter	PM2.5	1Sep23, 04:00	418914	1-hr	147	147.1	exc
Buffalo Viewpoint	PM2.5	1Sep23, 04:00	418915	1-hr	94	94.5	exc
Patricia McInnes	PM2.5	1Sep23, 04:00	418916	1-hr	80	80.4	exc
Athabasca Valley	PM2.5	1Sep23, 04:00	418917	1-hr	119	118.6	exc
Fort Chip	PM2.5	1Sep23, 04:00	418918	1-hr	285	285.4	exc
Barge Landing	PM2.5	1Sep23, 04:00	418919	1-hr	154	154.1	exc
Ft. McKay S	PM2.5	1Sep23, 04:00	418920	1-hr	108	108.5	exc
Anzac	PM2.5	1Sep23, 04:00	418921	1-hr	115	115.2	exc
Wapasu	PM2.5	1Sep23, 04:00	418922	1-hr	544	543.6	exc
Stony Mtn.	PM2.5	1Sep23, 04:00	418923	1-hr	146	145.5	exc
Conklin	PM2.5	1Sep23, 04:00	418924	1-hr	178	177.6	exc
Janvier	PM2.5	1Sep23, 04:00	418925	1-hr	194	193.7	exc
Fort Hills	PM2.5	1Sep23, 04:00	418722	1-hr	206	206.0	exc
Ells River	PM2.5	1Sep23, 04:00	418723	1-hr	107	107.2	exc
Bertha Ganter	PM2.5	1Sep23, 05:00	418914	1-hr	93	93.2	exc
Athabasca Valley	PM2.5	1Sep23, 05:00	418917	1-hr	90	90.3	exc
Fort Chip	PM2.5	1Sep23, 05:00	418918	1-hr	284	284.4	exc
Barge Landing	PM2.5	1Sep23, 05:00	418919	1-hr	107	107.3	exc
Anzac	PM2.5	1Sep23, 05:00	418921	1-hr	84	83.7	exc
Wapasu	PM2.5	1Sep23, 05:00	418922	1-hr	529	528.6	exc
Stony Mtn.	PM2.5	1Sep23, 05:00	418923	1-hr	107	107.1	exc
Conklin	PM2.5	1Sep23, 05:00	418924	1-hr	142	142.5	exc
Janvier	PM2.5	1Sep23, 05:00	418925	1-hr	175	175.1	exc
Fort Hills	PM2.5	1Sep23, 05:00	418722	1-hr	135	134.9	exc
Ells River	PM2.5	1Sep23, 05:00	418723	1-hr	86	86.1	exc
Fort Chip	PM2.5	1Sep23, 06:00	418918	1-hr	301	300.6	exc
Wapasu	PM2.5	1Sep23, 06:00	418922	1-hr	355	355.1	exc
Stony Mtn.	PM2.5	1Sep23, 06:00	418923	1-hr	83	83.2	exc
Conklin	PM2.5	1Sep23, 06:00	418924	1-hr	88	88.5	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Janvier	PM2.5	1Sep23, 06:00	418925	1-hr	152	152.3	exc
Fort Hills	PM2.5	1Sep23, 06:00	418722	1-hr	103	103.3	exc
Fort Chip	PM2.5	1Sep23, 07:00	418918	1-hr	337	337.1	exc
Wapasu	PM2.5	1Sep23, 07:00	418922	1-hr	178	177.8	exc
Janvier	PM2.5	1Sep23, 07:00	418925	1-hr	114	114.3	exc
Fort Hills	PM2.5	1Sep23, 07:00	418722	1-hr	114	114.0	exc
Fort Chip	PM2.5	1Sep23, 08:00	418918	1-hr	215	215.3	exc
Wapasu	PM2.5	1Sep23, 08:00	418922	1-hr	81	81.1	exc
Surmont 2	PM2.5	1Sep23, 01:00	418926	1-hr	260	260.0	exc
Surmont 2	PM2.5	1Sep23, 02:00	418926	1-hr	239	238.9	exc
Surmont 2	PM2.5	1Sep23, 03:00	418926	1-hr	177	176.7	exc
Surmont 2	PM2.5	1Sep23, 04:00	418926	1-hr	148	148.4	exc
Surmont 2	PM2.5	1Sep23, 05:00	418926	1-hr	106	105.5	exc
Surmont 2	PM2.5	1Sep23, 06:00	418926	1-hr	83	82.7	exc
Fort Chip	PM2.5	1Sep23, 09:00	418918	1-hr	95	95.4	exc
Fort Chip	PM2.5	1Sep23, 10:00	418918	1-hr	82	81.8	exc
Fort Chip	PM2.5	1Sep23, 11:00	418918	1-hr	86	85.7	exc
Fort Chip	PM2.5	1Sep23, 12:00	418918	1-hr	81	81.4	exc
Fort Chip	PM2.5	1Sep23, 18:00	418918	1-hr	100	100.4	exc
Fort Chip	PM2.5	1Sep23, 19:00	418918	1-hr	89	88.7	exc
Bertha Ganter	PM2.5	1Sep23, 20:00	418914	1-hr	87	86.6	exc
Buffalo Viewpoint	PM2.5	1Sep23, 20:00	418915	1-hr	83	83.5	exc
Ft. McKay S	PM2.5	1Sep23, 20:00	418920	1-hr	95	94.9	exc
Fort Hills	PM2.5	1Sep23, 20:00	418722	1-hr	90	89.5	exc
Ells River	PM2.5	1Sep23, 20:00	418723	1-hr	88	88.1	exc
Barge Landing	PM2.5	1Sep23, 20:00	418919	1-hr	88	88.4	exc
Bertha Ganter	PM2.5	1Sep23, 21:00	418914	1-hr	83	82.9	exc
Buffalo Viewpoint	PM2.5	1Sep23, 21:00	418915	1-hr	88	88.2	exc
Fort Chip	PM2.5	1Sep23, 21:00	418918	1-hr	106	106.2	exc
Ft. McKay S	PM2.5	1Sep23, 21:00	418920	1-hr	91	90.9	exc
Wapasu	PM2.5	1Sep23, 21:00	418922	1-hr	81	81.1	exc
Fort Hills	PM2.5	1Sep23, 21:00	418722	1-hr	98	98.1	exc
Ells River	PM2.5	1Sep23, 21:00	418723	1-hr	87	87.0	exc
Barge Landing	PM2.5	1Sep23, 21:00	418919	1-hr	86	86.1	exc
Buffalo Viewpoint	PM2.5	1Sep23, 22:00	418915	1-hr	81	80.8	exc
Ft. McKay S	PM2.5	1Sep23, 22:00	418920	1-hr	81	81.3	exc
Wapasu	PM2.5	1Sep23, 22:00	418922	1-hr	80	80.1	exc
Fort Hills	PM2.5	1Sep23, 22:00	418722	1-hr	103	102.6	exc
Fort Chip	PM2.5	1Sep23, 22:00	418918	1-hr	178	178.3	exc
Fort Hills	PM2.5	1Sep23, 23:00	418722	1-hr	94	94.1	exc
Fort Chip	PM2.5	1Sep23, 23:00	418918	1-hr	117	116.9	exc



<u>Site</u>	<u>Parameter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Bertha Ganter	PM2.5	1Sep23, 24:00	418914	24-hr	78	77.5	exc
Buffalo Viewpoint	PM2.5	1Sep23, 24:00	418915	24-hr	74	73.9	exc
Patricia McInnes	PM2.5	1Sep23, 24:00	418916	24-hr	60	60.1	exc
Athabasca Valley	PM2.5	1Sep23, 24:00	418917	24-hr	72	71.6	exc
Stony Mtn.	PM2.5	1Sep23, 24:00	418923	24-hr	74	74.0	exc
Conklin	PM2.5	1Sep23, 24:00	418924	24-hr	83	82.9	exc
Janvier	PM2.5	1Sep23, 24:00	418925	24-hr	86	85.9	exc
Fort Hills	PM2.5	1Sep23, 24:00	418722	1-hr	90	90.5	exc
Fort Hills	PM2.5	1Sep23, 24:00	418722	24-hr	100	99.6	exc
Fort Chip	PM2.5	1Sep23, 24:00	418918	1-hr	84	84.2	exc
Fort Chip	PM2.5	1Sep23, 24:00	418918	24-hr	147	146.8	exc
Barge Landing	PM2.5	1Sep23, 24:00	418919	24-hr	80	80.3	exc
Ft. McKay S	PM2.5	1Sep23, 24:00	418920	24-hr	74	74.0	exc
Anzac	PM2.5	1Sep23, 24:00	418921	24-hr	65	65.0	exc
Wapasu	PM2.5	1Sep23, 24:00	418922	24-hr	172	172.1	exc
Surmont 2	PM2.5	1Sep23, 24:00	418926	24-hr	70	70.1	exc
Ells River	PM2.5	1Sep23, 24:00	418723	24-hr	70	70.0	exc
Fort Hills	PM2.5	2Sep23, 01:00	418775	1-hr	81	81.3	exc
Fort Chip	PM2.5	2Sep23, 01:00	418918	1-hr	123	123.1	exc
Fort Chip	PM2.5	2Sep23, 02:00	418918	1-hr	305	304.7	exc
Buffalo Viewpoint	PM2.5	2Sep23, 03:00	418915	1-hr	85	85.0	exc
Fort Chip	PM2.5	2Sep23, 03:00	418918	1-hr	349	349.1	exc
Wapasu	PM2.5	2Sep23, 03:00	418922	1-hr	92	91.6	exc
Fort Hills	PM2.5	2Sep23, 03:00	418775	1-hr	163	162.5	exc
Bertha Ganter	PM2.5	2Sep23, 04:00	418914	1-hr	176	176.4	exc
Buffalo Viewpoint	PM2.5	2Sep23, 04:00	418915	1-hr	111	111.2	exc
Fort Chip	PM2.5	2Sep23, 04:00	418918	1-hr	313	313.2	exc
Ft. McKay S	PM2.5	2Sep23, 04:00	418920	1-hr	148	147.9	exc
Wapasu	PM2.5	2Sep23, 04:00	418922	1-hr	133	133.4	exc
Fort Hills	PM2.5	2Sep23, 04:00	418775	1-hr	337	337.4	exc
Ells River	PM2.5	2Sep23, 04:00	418776	1-hr	206	206.2	exc
Barge Landing	PM2.5	2Sep23, 04:00	418919	1-hr	153	152.9	exc
Bertha Ganter	PM2.5	2Sep23, 05:00	418914	1-hr	321	320.7	exc
Buffalo Viewpoint	PM2.5	2Sep23, 05:00	418915	1-hr	231	230.8	exc
Patricia McInnes	PM2.5	2Sep23, 05:00	418916	1-hr	249	248.9	exc
Fort Chip	PM2.5	2Sep23, 05:00	418918	1-hr	282	282.2	exc
Ft. McKay S	PM2.5	2Sep23, 05:00	418920	1-hr	248	248.4	exc
Anzac	PM2.5	2Sep23, 05:00	418921	1-hr	113	112.8	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Wapasu	PM2.5	2Sep23, 05:00	418922	1-hr	214	213.6	exc
Fort Hills	PM2.5	2Sep23, 05:00	418775	1-hr	409	409.1	exc
Ells River	PM2.5	2Sep23, 05:00	418776	1-hr	396	396.2	exc
Barge Landing	PM2.5	2Sep23, 05:00	418919	1-hr	345	344.7	exc
Bertha Ganter	PM2.5	2Sep23, 06:00	418914	1-hr	405	405.3	exc
Buffalo Viewpoint	PM2.5	2Sep23, 06:00	418915	1-hr	319	319.4	exc
Patricia McInnes	PM2.5	2Sep23, 06:00	418916	1-hr	349	349.1	exc
Fort Chip	PM2.5	2Sep23, 06:00	418918	1-hr	308	308.2	exc
Ft. McKay S	PM2.5	2Sep23, 06:00	418920	1-hr	391	391.1	exc
Anzac	PM2.5	2Sep23, 06:00	418921	1-hr	228	228.5	exc
Wapasu	PM2.5	2Sep23, 06:00	418922	1-hr	334	334.0	exc
Fort Hills	PM2.5	2Sep23, 06:00	418775	1-hr	433	432.9	exc
Surmont 2	PM2.5	2Sep23, 06:00	418926	1-hr	137	137.1	exc
Ells River	PM2.5	2Sep23, 06:00	418776	1-hr	412	412.4	exc
Athabasca Valley	PM2.5	2Sep23, 06:00	418917	1-hr	118	118.4	exc
Barge Landing	PM2.5	2Sep23, 06:00	418919	1-hr	413	412.5	exc
Bertha Ganter	PM2.5	2Sep23, 07:00	418914	1-hr	422	421.6	exc
Buffalo Viewpoint	PM2.5	2Sep23, 07:00	418915	1-hr	398	398.0	exc
Patricia McInnes	PM2.5	2Sep23, 07:00	418916	1-hr	397	396.6	exc
Fort Chip	PM2.5	2Sep23, 07:00	418918	1-hr	320	319.7	exc
Ft. McKay S	PM2.5	2Sep23, 07:00	418920	1-hr	440	439.7	exc
Anzac	PM2.5	2Sep23, 07:00	418921	1-hr	308	308.0	exc
Wapasu	PM2.5	2Sep23, 07:00	418922	1-hr	439	439.2	exc
Stony Mtn.	PM2.5	2Sep23, 07:00	418923	1-hr	124	124.3	exc
Conklin	PM2.5	2Sep23, 07:00	418924	1-hr	102	101.7	exc
Fort Hills	PM2.5	2Sep23, 07:00	418775	1-hr	418	418.5	exc
Surmont 2	PM2.5	2Sep23, 07:00	418926	1-hr	274	273.8	exc
Ells River	PM2.5	2Sep23, 07:00	418776	1-hr	417	416.8	exc
Athabasca Valley	PM2.5	2Sep23, 07:00	418917	1-hr	256	255.8	exc
Barge Landing	PM2.5	2Sep23, 07:00	418919	1-hr	429	429.1	exc
Bertha Ganter	PM2.5	2Sep23, 08:00	418914	1-hr	436	435.5	exc
Buffalo Viewpoint	PM2.5	2Sep23, 08:00	418915	1-hr	480	479.9	exc
Patricia McInnes	PM2.5	2Sep23, 08:00	418916	1-hr	420	419.8	exc
Fort Chip	PM2.5	2Sep23, 08:00	418918	1-hr	297	296.8	exc
Ft. McKay S	PM2.5	2Sep23, 08:00	418920	1-hr	466	466.4	exc
Anzac	PM2.5	2Sep23, 08:00	418921	1-hr	370	369.8	exc
Wapasu	PM2.5	2Sep23, 08:00	418922	1-hr	487	486.6	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Stony Mtn.	PM2.5	2Sep23, 08:00	418923	1-hr	265	265.1	exc
Conklin	PM2.5	2Sep23, 08:00	418924	1-hr	234	233.8	exc
Janvier	PM2.5	2Sep23, 08:00	418925	1-hr	102	104.5	exc
Fort Hills	PM2.5	2Sep23, 08:00	418775	1-hr	422	422.0	exc
Surmont 2	PM2.5	2Sep23, 08:00	418926	1-hr	360	360.1	exc
Ells River	PM2.5	2Sep23, 08:00	418776	1-hr	421	421.1	exc
Athabasca Valley	PM2.5	2Sep23, 08:00	418917	1-hr	408	408.1	exc
Barge Landing	PM2.5	2Sep23, 08:00	418919	1-hr	433	432.7	exc
Bertha Ganter	PM2.5	2Sep23, 09:00	418914	1-hr	405	405.0	exc
Buffalo Viewpoint	PM2.5	2Sep23, 09:00	418915	1-hr	493	492.5	exc
Patricia McInnes	PM2.5	2Sep23, 09:00	418916	1-hr	408	407.7	exc
Fort Chip	PM2.5	2Sep23, 09:00	418918	1-hr	252	252.0	exc
Ft. McKay S	PM2.5	2Sep23, 09:00	418920	1-hr	464	464.3	exc
Anzac	PM2.5	2Sep23, 09:00	418921	1-hr	420	420.3	exc
Wapasu	PM2.5	2Sep23, 09:00	418922	1-hr	453	453.0	exc
Stony Mtn.	PM2.5	2Sep23, 09:00	418923	1-hr	357	357.3	exc
Conklin	PM2.5	2Sep23, 09:00	418924	1-hr	338	338.3	exc
Janvier	PM2.5	2Sep23, 09:00	418925	1-hr	245	244.7	exc
Fort Hills	PM2.5	2Sep23, 09:00	418775	1-hr	347	347.4	exc
Surmont 2	PM2.5	2Sep23, 09:00	418926	1-hr	404	403.7	exc
Ells River	PM2.5	2Sep23, 09:00	418776	1-hr	362	362.4	exc
Athabasca Valley	PM2.5	2Sep23, 09:00	418917	1-hr	444	444.4	exc
Barge Landing	PM2.5	2Sep23, 09:00	418919	1-hr	402	401.8	exc
Bertha Ganter	PM2.5	2Sep23, 10:00	418914	1-hr	341	341.3	exc
Buffalo Viewpoint	PM2.5	2Sep23, 10:00	418915	1-hr	442	442.0	exc
Patricia McInnes	PM2.5	2Sep23, 10:00	418916	1-hr	363	363.0	exc
Fort Chip	PM2.5	2Sep23, 10:00	418918	1-hr	285	284.7	exc
Ft. McKay S	PM2.5	2Sep23, 10:00	418920	1-hr	447	446.7	exc
Anzac	PM2.5	2Sep23, 10:00	418921	1-hr	435	435.3	exc
Wapasu	PM2.5	2Sep23, 10:00	418922	1-hr	392	391.8	exc
Stony Mtn.	PM2.5	2Sep23, 10:00	418923	1-hr	386	386.3	exc
Conklin	PM2.5	2Sep23, 10:00	418924	1-hr	392	391.6	exc
Janvier	PM2.5	2Sep23, 10:00	418925	1-hr	382	382.1	exc
Fort Hills	PM2.5	2Sep23, 10:00	418775	1-hr	278	277.8	exc
Surmont 2	PM2.5	2Sep23, 10:00	418926	1-hr	444	444.0	exc
Ells River	PM2.5	2Sep23, 10:00	418776	1-hr	293	292.9	exc



<u>Site</u>	<u>Parameter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Athabasca Valley	PM2.5	2Sep23, 10:00	418917	1-hr	425	425.5	exc
Barge Landing	PM2.5	2Sep23, 10:00	418919	1-hr	342	342.4	exc
Bertha Ganter	PM2.5	2Sep23, 11:00	418914	1-hr	334	333.6	exc
Buffalo Viewpoint	PM2.5	2Sep23, 11:00	418915	1-hr	506	505.9	exc
Patricia McInnes	PM2.5	2Sep23, 11:00	418916	1-hr	441	441.1	exc
Fort Chip	PM2.5	2Sep23, 11:00	418918	1-hr	295	294.9	exc
Barge Landing	PM2.5	2Sep23, 11:00	418919	1-hr	305	305.2	exc
Ft. McKay S	PM2.5	2Sep23, 11:00	418920	1-hr	421	420.9	exc
Anzac	PM2.5	2Sep23, 11:00	418921	1-hr	483	482.8	exc
Wapasu	PM2.5	2Sep23, 11:00	418922	1-hr	360	359.8	exc
Stony Mtn.	PM2.5	2Sep23, 11:00	418923	1-hr	393	393.4	exc
Conklin	PM2.5	2Sep23, 11:00	418924	1-hr	414	413.7	exc
Janvier	PM2.5	2Sep23, 11:00	418925	1-hr	400	399.9	exc
Fort Hills	PM2.5	2Sep23, 11:00	418775	1-hr	265	264.6	exc
Surmont 2	PM2.5	2Sep23, 11:00	418926	1-hr	411	411.0	exc
Ells River	PM2.5	2Sep23, 11:00	418776	1-hr	304	304.3	exc
Athabasca Valley	PM2.5	2Sep23, 11:00	418917	1-hr	459	459.4	exc
Buffalo Viewpoint	PM2.5	2Sep23, 12:00	418915	1-hr	501	500.8	exc
Patricia McInnes	PM2.5	2Sep23, 12:00	418916	1-hr	441	440.9	exc
Fort Chip	PM2.5	2Sep23, 12:00	418918	1-hr	280	279.5	exc
Barge Landing	PM2.5	2Sep23, 12:00	418919	1-hr	396	396.1	exc
Ft. McKay S	PM2.5	2Sep23, 12:00	418920	1-hr	450	450.0	exc
Anzac	PM2.5	2Sep23, 12:00	418921	1-hr	471	471.2	exc
Wapasu	PM2.5	2Sep23, 12:00	418922	1-hr	327	327.4	exc
Stony Mtn.	PM2.5	2Sep23, 12:00	418923	1-hr	379	378.5	exc
Conklin	PM2.5	2Sep23, 12:00	418924	1-hr	395	395.2	exc
Janvier	PM2.5	2Sep23, 12:00	418925	1-hr	390	389.8	exc
Fort Hills	PM2.5	2Sep23, 12:00	418775	1-hr	341	341.1	exc
Surmont 2	PM2.5	2Sep23, 12:00	418926	1-hr	401	401.2	exc
Ells River	PM2.5	2Sep23, 12:00	418776	1-hr	366	366.2	exc
Bertha Ganter	PM2.5	2Sep23, 12:00	418914	1-hr	413	412.7	exc
Athabasca Valley	PM2.5	2Sep23, 12:00	418917	1-hr	513	512.7	exc
Bertha Ganter	PM2.5	2Sep23, 13:00	418914	1-hr	420	419.6	exc
Buffalo Viewpoint	PM2.5	2Sep23, 13:00	418915	1-hr	468	467.8	exc
Fort Chip	PM2.5	2Sep23, 13:00	418918	1-hr	367	366.7	exc
Barge Landing	PM2.5	2Sep23, 13:00	418919	1-hr	433	432.5	exc
Ft. McKay S	PM2.5	2Sep23, 13:00	418920	1-hr	448	448.4	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Anzac	PM2.5	2Sep23, 13:00	418921	1-hr	417	417.5	exc
Wapasu	PM2.5	2Sep23, 13:00	418922	1-hr	306	306.4	exc
Stony Mtn.	PM2.5	2Sep23, 13:00	418923	1-hr	376	375.8	exc
Conklin	PM2.5	2Sep23, 13:00	418924	1-hr	387	386.7	exc
Janvier	PM2.5	2Sep23, 13:00	418925	1-hr	383	383.3	exc
Fort Hills	PM2.5	2Sep23, 13:00	418775	1-hr	405	405.3	exc
Surmont 2	PM2.5	2Sep23, 13:00	418926	1-hr	391	391.3	exc
Ells River	PM2.5	2Sep23, 13:00	418776	1-hr	408	407.5	exc
Patricia McInnes	PM2.5	2Sep23, 13:00	418916	1-hr	424	423.8	exc
Athabasca Valley	PM2.5	2Sep23, 13:00	418917	1-hr	459	459.0	exc
Bertha Ganter	PM2.5	2Sep23, 14:00	418914	1-hr	346	345.7	exc
Buffalo Viewpoint	PM2.5	2Sep23, 14:00	418915	1-hr	439	439.0	exc
Fort Chip	PM2.5	2Sep23, 14:00	418918	1-hr	403	402.9	exc
Barge Landing	PM2.5	2Sep23, 14:00	418919	1-hr	357	356.7	exc
Ft. McKay S	PM2.5	2Sep23, 14:00	418920	1-hr	377	377.0	exc
Anzac	PM2.5	2Sep23, 14:00	418921	1-hr	418	417.9	exc
Wapasu	PM2.5	2Sep23, 14:00	418922	1-hr	374	373.7	exc
Stony Mtn.	PM2.5	2Sep23, 14:00	418923	1-hr	437	436.9	exc
Conklin	PM2.5	2Sep23, 14:00	418924	1-hr	434	433.6	exc
Janvier	PM2.5	2Sep23, 14:00	418925	1-hr	371	371.4	exc
Fort Hills	PM2.5	2Sep23, 14:00	418775	1-hr	324	323.5	exc
Surmont 2	PM2.5	2Sep23, 14:00	418926	1-hr	376	376.0	exc
Ells River	PM2.5	2Sep23, 14:00	418776	1-hr	327	327.1	exc
Patricia McInnes	PM2.5	2Sep23, 14:00	418916	1-hr	414	413.9	exc
Athabasca Valley	PM2.5	2Sep23, 14:00	418917	1-hr	455	455.2	exc
Bertha Ganter	PM2.5	2Sep23, 15:00	418914	1-hr	240	240.3	exc
Buffalo Viewpoint	PM2.5	2Sep23, 15:00	418915	1-hr	433	433.1	exc
Fort Chip	PM2.5	2Sep23, 15:00	418918	1-hr	325	324.9	exc
Barge Landing	PM2.5	2Sep23, 15:00	418919	1-hr	258	257.8	exc
Ft. McKay S	PM2.5	2Sep23, 15:00	418920	1-hr	268	267.8	exc
Anzac	PM2.5	2Sep23, 15:00	418921	1-hr	440	440.4	exc
Wapasu	PM2.5	2Sep23, 15:00	418922	1-hr	380	379.5	exc
Stony Mtn.	PM2.5	2Sep23, 15:00	418923	1-hr	524	524.0	exc
Conklin	PM2.5	2Sep23, 15:00	418924	1-hr	519	519.3	exc
Janvier	PM2.5	2Sep23, 15:00	418925	1-hr	408	408.0	exc
Fort Hills	PM2.5	2Sep23, 15:00	418775	1-hr	253	253.3	exc



<u>Site</u>	<u>Parameter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Surmont 2	PM2.5	2Sep23, 15:00	418926	1-hr	422	422.5	exc
Ells River	PM2.5	2Sep23, 15:00	418776	1-hr	229	228.6	exc
Patricia McInnes	PM2.5	2Sep23, 15:00	418916	1-hr	400	400.3	exc
Athabasca Valley	PM2.5	2Sep23, 15:00	418917	1-hr	431	431.2	exc
Bertha Ganter	PM2.5	2Sep23, 16:00	418914	1-hr	155	154.7	exc
Buffalo Viewpoint	PM2.5	2Sep23, 16:00	418915	1-hr	415	414.5	exc
Barge Landing	PM2.5	2Sep23, 16:00	418919	1-hr	187	187.5	exc
Ft. McKay S	PM2.5	2Sep23, 16:00	418920	1-hr	242	242.1	exc
Anzac	PM2.5	2Sep23, 16:00	418921	1-hr	402	402.2	exc
Wapasu	PM2.5	2Sep23, 16:00	418922	1-hr	203	202.5	exc
Stony Mtn.	PM2.5	2Sep23, 16:00	418923	1-hr	489	489.1	exc
Conklin	PM2.5	2Sep23, 16:00	418924	1-hr	507	507.0	exc
Janvier	PM2.5	2Sep23, 16:00	418925	1-hr	380	380.4	exc
Fort Hills	PM2.5	2Sep23, 16:00	418775	1-hr	228	227.8	exc
Surmont 2	PM2.5	2Sep23, 16:00	418926	1-hr	396	396.3	exc
Ells River	PM2.5	2Sep23, 16:00	418776	1-hr	150	150.3	exc
Patricia McInnes	PM2.5	2Sep23, 16:00	418916	1-hr	360	359.9	exc
Athabasca Valley	PM2.5	2Sep23, 16:00	418917	1-hr	380	379.6	exc
Bertha Ganter	PM2.5	2Sep23, 17:00	418914	1-hr	231	231.3	exc
Buffalo Viewpoint	PM2.5	2Sep23, 17:00	418915	1-hr	376	376.0	exc
Barge Landing	PM2.5	2Sep23, 17:00	418919	1-hr	229	229.4	exc
Ft. McKay S	PM2.5	2Sep23, 17:00	418920	1-hr	232	231.8	exc
Anzac	PM2.5	2Sep23, 17:00	418921	1-hr	426	425.5	exc
Wapasu	PM2.5	2Sep23, 17:00	418922	1-hr	169	169.3	exc
Stony Mtn.	PM2.5	2Sep23, 17:00	418923	1-hr	467	467.5	exc
Conklin	PM2.5	2Sep23, 17:00	418924	1-hr	488	488.4	exc
Janvier	PM2.5	2Sep23, 17:00	418925	1-hr	394	394.1	exc
Fort Hills	PM2.5	2Sep23, 17:00	418775	1-hr	255	255.4	exc
Surmont 2	PM2.5	2Sep23, 17:00	418926	1-hr	393	393.1	exc
Ells River	PM2.5	2Sep23, 17:00	418776	1-hr	253	252.8	exc
Patricia McInnes	PM2.5	2Sep23, 17:00	418916	1-hr	385	385.3	exc
Athabasca Valley	PM2.5	2Sep23, 17:00	418917	1-hr	386	385.8	exc
Bertha Ganter	PM2.5	2Sep23, 18:00	418914	1-hr	301	301.5	exc
Buffalo Viewpoint	PM2.5	2Sep23, 18:00	418915	1-hr	335	335.0	exc
Fort Chip	PM2.5	2Sep23, 18:00	418918	1-hr	100	99.6	exc
Barge Landing	PM2.5	2Sep23, 18:00	418919	1-hr	318	318.3	exc
Ft. McKay S	PM2.5	2Sep23, 18:00	418920	1-hr	312	312.0	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Anzac	PM2.5	2Sep23, 18:00	418921	1-hr	426	425.8	exc
Wapasu	PM2.5	2Sep23, 18:00	418922	1-hr	233	232.7	exc
Stony Mtn.	PM2.5	2Sep23, 18:00	418923	1-hr	453	452.7	exc
Conklin	PM2.5	2Sep23, 18:00	418924	1-hr	468	467.8	exc
Janvier	PM2.5	2Sep23, 18:00	418925	1-hr	377	377.1	exc
Fort Hills	PM2.5	2Sep23, 18:00	418775	1-hr	312	312.4	exc
Surmont 2	PM2.5	2Sep23, 18:00	418926	1-hr	383	382.7	exc
Ells River	PM2.5	2Sep23, 18:00	418776	1-hr	305	304.8	exc
Patricia McInnes	PM2.5	2Sep23, 18:00	418916	1-hr	421	421.0	exc
Athabasca Valley	PM2.5	2Sep23, 18:00	418917	1-hr	466	466.3	exc
Bertha Ganter	PM2.5	2Sep23, 19:00	418914	1-hr	302	301.9	exc
Buffalo Viewpoint	PM2.5	2Sep23, 19:00	418915	1-hr	426	425.5	exc
Athabasca Valley	PM2.5	2Sep23, 19:00	418917	1-hr	397	397.1	exc
Fort Chip	PM2.5	2Sep23, 19:00	418918	1-hr	165	165.0	exc
Barge Landing	PM2.5	2Sep23, 19:00	418919	1-hr	316	316.5	exc
Ft. McKay S	PM2.5	2Sep23, 19:00	418920	1-hr	320	319.6	exc
Anzac	PM2.5	2Sep23, 19:00	418921	1-hr	415	414.5	exc
Wapasu	PM2.5	2Sep23, 19:00	418922	1-hr	308	307.6	exc
Stony Mtn.	PM2.5	2Sep23, 19:00	418923	1-hr	432	432.3	exc
Conklin	PM2.5	2Sep23, 19:00	418924	1-hr	446	445.6	exc
Janvier	PM2.5	2Sep23, 19:00	418925	1-hr	373	372.9	exc
Fort Hills	PM2.5	2Sep23, 19:00	418775	1-hr	305	304.5	exc
Surmont 2	PM2.5	2Sep23, 19:00	418926	1-hr	382	382.4	exc
Ells River	PM2.5	2Sep23, 19:00	418776	1-hr	278	277.9	exc
Patricia McInnes	PM2.5	2Sep23, 19:00	418916	1-hr	352	351.6	exc
Bertha Ganter	PM2.5	2Sep23, 20:00	418914	1-hr	298	297.7	exc
Buffalo Viewpoint	PM2.5	2Sep23, 20:00	418915	1-hr	362	361.5	exc
Athabasca Valley	PM2.5	2Sep23, 20:00	418917	1-hr	345	345.0	exc
Fort Chip	PM2.5	2Sep23, 20:00	418918	1-hr	188	188.0	exc
Barge Landing	PM2.5	2Sep23, 20:00	418919	1-hr	317	316.9	exc
Ft. McKay S	PM2.5	2Sep23, 20:00	418920	1-hr	319	319.2	exc
Anzac	PM2.5	2Sep23, 20:00	418921	1-hr	390	390.4	exc
Wapasu	PM2.5	2Sep23, 20:00	418922	1-hr	316	316.2	exc
Stony Mtn.	PM2.5	2Sep23, 20:00	418923	1-hr	417	416.7	exc
Conklin	PM2.5	2Sep23, 20:00	418924	1-hr	432	431.5	exc
Janvier	PM2.5	2Sep23, 20:00	418925	1-hr	373	373.3	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Fort Hills	PM2.5	2Sep23, 20:00	418775	1-hr	276	276.0	exc
Surmont 2	PM2.5	2Sep23, 20:00	418926	1-hr	382	382.2	exc
Ells River	PM2.5	2Sep23, 20:00	418776	1-hr	250	250.1	exc
Patricia McInnes	PM2.5	2Sep23, 20:00	418916	1-hr	314	313.8	exc
Bertha Ganter	PM2.5	2Sep23, 21:00	418914	1-hr	284	284.2	exc
Buffalo Viewpoint	PM2.5	2Sep23, 21:00	418915	1-hr	316	315.8	exc
Athabasca Valley	PM2.5	2Sep23, 21:00	418917	1-hr	305	305.2	exc
Fort Chip	PM2.5	2Sep23, 21:00	418918	1-hr	144	144.0	exc
Barge Landing	PM2.5	2Sep23, 21:00	418919	1-hr	295	294.9	exc
Ft. McKay S	PM2.5	2Sep23, 21:00	418920	1-hr	295	294.9	exc
Anzac	PM2.5	2Sep23, 21:00	418921	1-hr	423	423.3	exc
Wapasu	PM2.5	2Sep23, 21:00	418922	1-hr	303	302.7	exc
Stony Mtn.	PM2.5	2Sep23, 21:00	418923	1-hr	448	447.8	exc
Conklin	PM2.5	2Sep23, 21:00	418924	1-hr	444	443.9	exc
Janvier	PM2.5	2Sep23, 21:00	418925	1-hr	378	378.2	exc
Fort Hills	PM2.5	2Sep23, 21:00	418775	1-hr	274	273.5	exc
Surmont 2	PM2.5	2Sep23, 21:00	418926	1-hr	409	409.0	exc
Ells River	PM2.5	2Sep23, 21:00	418776	1-hr	249	248.8	exc
Patricia McInnes	PM2.5	2Sep23, 21:00	418916	1-hr	286	286.1	exc
Bertha Ganter	PM2.5	2Sep23, 22:00	418914	1-hr	278	278.0	exc
Athabasca Valley	PM2.5	2Sep23, 22:00	418917	1-hr	337	337.2	exc
Fort Chip	PM2.5	2Sep23, 22:00	418918	1-hr	107	107.1	exc
Barge Landing	PM2.5	2Sep23, 22:00	418919	1-hr	288	287.9	exc
Ft. McKay S	PM2.5	2Sep23, 22:00	418920	1-hr	314	314.0	exc
Anzac	PM2.5	2Sep23, 22:00	418921	1-hr	457	457.2	exc
Wapasu	PM2.5	2Sep23, 22:00	418922	1-hr	288	288.4	exc
Stony Mtn.	PM2.5	2Sep23, 22:00	418923	1-hr	446	445.7	exc
Conklin	PM2.5	2Sep23, 22:00	418924	1-hr	460	460.0	exc
Janvier	PM2.5	2Sep23, 22:00	418925	1-hr	377	376.6	exc
Fort Hills	PM2.5	2Sep23, 22:00	418775	1-hr	284	283.6	exc
Surmont 2	PM2.5	2Sep23, 22:00	418926	1-hr	439	438.7	exc
Ells River	PM2.5	2Sep23, 22:00	418776	1-hr	269	269.1	exc
Buffalo Viewpoint	PM2.5	2Sep23, 22:00	418915	1-hr	335	334.9	exc
Patricia McInnes	PM2.5	2Sep23, 22:00	418916	1-hr	304	303.6	exc
Bertha Ganter	PM2.5	2Sep23, 23:00	418914	1-hr	305	304.8	exc
Athabasca Valley	PM2.5	2Sep23, 23:00	418917	1-hr	437	436.9	exc
Fort Chip	PM2.5	2Sep23, 23:00	418918	1-hr	114	114.2	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Barge Landing	PM2.5	2Sep23, 23:00	418919	1-hr	309	309.0	exc
Ft. McKay S	PM2.5	2Sep23, 23:00	418920	1-hr	350	350.1	exc
Anzac	PM2.5	2Sep23, 23:00	418921	1-hr	383	382.7	exc
Wapasu	PM2.5	2Sep23, 23:00	418922	1-hr	291	290.9	exc
Stony Mtn.	PM2.5	2Sep23, 23:00	418923	1-hr	408	407.8	exc
Conklin	PM2.5	2Sep23, 23:00	418924	1-hr	457	456.9	exc
Janvier	PM2.5	2Sep23, 23:00	418925	1-hr	367	366.5	exc
Fort Hills	PM2.5	2Sep23, 23:00	418775	1-hr	297	297.4	exc
Surmont 2	PM2.5	2Sep23, 23:00	418926	1-hr	408	407.6	exc
Ells River	PM2.5	2Sep23, 23:00	418776	1-hr	286	285.6	exc
Buffalo Viewpoint	PM2.5	2Sep23, 23:00	418915	1-hr	392	391.8	exc
Patricia McInnes	PM2.5	2Sep23, 23:00	418916	1-hr	377	376.6	exc
Bertha Ganter	PM2.5	2Sep23, 24:00	418914	1-hr	329	329.0	exc
Bertha Ganter	PM2.5	2Sep23, 24:00	418914	24-hr	288	288.4	exc
Athabasca Valley	PM2.5	2Sep23, 24:00	418917	1-hr	422	421.6	exc
Fort Chip	PM2.5	2Sep23, 24:00	418918	1-hr	144	144.3	exc
Barge Landing	PM2.5	2Sep23, 24:00	418919	1-hr	333	332.6	exc
Ft. McKay S	PM2.5	2Sep23, 24:00	418920	1-hr	370	369.9	exc
Ft. McKay S	PM2.5	2Sep23, 24:00	418920	24-hr	313	313.3	exc
Anzac	PM2.5	2Sep23, 24:00	418921	1-hr	289	289.5	exc
Anzac	PM2.5	2Sep23, 24:00	418921	24-hr	326	326.3	exc
Wapasu	PM2.5	2Sep23, 24:00	418922	1-hr	302	302.5	exc
Wapasu	PM2.5	2Sep23, 24:00	418922	24-hr	285	284.9	exc
Stony Mtn.	PM2.5	2Sep23, 24:00	418923	1-hr	380	379.9	exc
Stony Mtn.	PM2.5	2Sep23, 24:00	418923	24-hr	308	308.2	exc
Conklin	PM2.5	2Sep23, 24:00	418924	1-hr	428	427.8	exc
Conklin	PM2.5	2Sep23, 24:00	418924	24-hr	316	316.0	exc
Janvier	PM2.5	2Sep23, 24:00	418925	1-hr	371	370.9	exc
Janvier	PM2.5	2Sep23, 24:00	418925	24-hr	263	262.9	exc
Fort Hills	PM2.5	2Sep23, 24:00	418775	1-hr	334	333.8	exc
Fort Hills	PM2.5	2Sep23, 24:00	418775	24-hr	297	296.7	exc
Surmont 2	PM2.5	2Sep23, 24:00	418926	1-hr	329	329.4	exc
Surmont 2	PM2.5	2Sep23, 24:00	418926	24-hr	303	303.3	exc
Ells River	PM2.5	2Sep23, 24:00	418776	1-hr	298	297.8	exc
Ells River	PM2.5	2Sep23, 24:00	418776	24-hr	278	278.1	exc
Buffalo Viewpoint	PM2.5	2Sep23, 24:00	418915	1-hr	410	410.3	exc
Buffalo Viewpoint	PM2.5	2Sep23, 24:00	418915	24-hr	350	349.8	exc
Patricia McInnes	PM2.5	2Sep23, 24:00	418916	1-hr	402	402.4	exc
Patricia McInnes	PM2.5	2Sep23, 24:00	418916	24-hr	321	321.2	exc
Athabasca Valley	PM2.5	2Sep23, 24:00	418917	24-hr	321	321.0	exc
Fort Chip	PM2.5	2Sep23, 24:00	418918	24-hr	231	230.8	exc
Barge Landing	PM2.5	2Sep23, 24:00	418919	24-hr	293	293.2	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Bertha Ganter	PM2.5	3Sep23, 01:00	418914	1-hr	356	356.2	exc
Athabasca Valley	PM2.5	3Sep23, 01:00	418917	1-hr	428	428.4	exc
Fort Chip	PM2.5	3Sep23, 01:00	418918	1-hr	167	166.9	exc
Barge Landing	PM2.5	3Sep23, 01:00	418919	1-hr	362	362.0	exc
Ft. McKay S	PM2.5	3Sep23, 01:00	418920	1-hr	392	391.8	exc
Anzac	PM2.5	3Sep23, 01:00	418921	1-hr	260	260.0	exc
Wapasu	PM2.5	3Sep23, 01:00	418922	1-hr	322	321.9	exc
Stony Mtn.	PM2.5	3Sep23, 01:00	418923	1-hr	377	377.4	exc
Conklin	PM2.5	3Sep23, 01:00	418924	1-hr	405	405.5	exc
Janvier	PM2.5	3Sep23, 01:00	418925	1-hr	374	373.8	exc
Fort Hills	PM2.5	3Sep23, 01:00	418815	1-hr	355	355.0	exc
Surmont 2	PM2.5	3Sep23, 01:00	418926	1-hr	261	260.8	exc
Ells River	PM2.5	3Sep23, 01:00	418816	1-hr	328	327.9	exc
Buffalo Viewpoint	PM2.5	3Sep23, 01:00	418915	1-hr	385	384.7	exc
Patricia McInnes	PM2.5	3Sep23, 01:00	418916	1-hr	366	366.0	exc
Bertha Ganter	PM2.5	3Sep23, 02:00	418914	1-hr	364	363.6	exc
Athabasca Valley	PM2.5	3Sep23, 02:00	418917	1-hr	394	394.4	exc
Fort Chip	PM2.5	3Sep23, 02:00	418918	1-hr	160	160.3	exc
Barge Landing	PM2.5	3Sep23, 02:00	418919	1-hr	379	379.2	exc
Ft. McKay S	PM2.5	3Sep23, 02:00	418920	1-hr	391	390.5	exc
Anzac	PM2.5	3Sep23, 02:00	418921	1-hr	250	250.2	exc
Wapasu	PM2.5	3Sep23, 02:00	418922	1-hr	341	341.4	exc
Stony Mtn.	PM2.5	3Sep23, 02:00	418923	1-hr	399	399.5	exc
Conklin	PM2.5	3Sep23, 02:00	418924	1-hr	404	403.7	exc
Janvier	PM2.5	3Sep23, 02:00	418925	1-hr	380	380.0	exc
Fort Hills	PM2.5	3Sep23, 02:00	418815	1-hr	384	383.8	exc
Surmont 2	PM2.5	3Sep23, 02:00	418926	1-hr	265	264.8	exc
Ells River	PM2.5	3Sep23, 02:00	418816	1-hr	339	339.5	exc
Buffalo Viewpoint	PM2.5	3Sep23, 02:00	418915	1-hr	336	335.7	exc
Patricia McInnes	PM2.5	3Sep23, 02:00	418916	1-hr	322	321.9	exc
Bertha Ganter	PM2.5	3Sep23, 03:00	418914	1-hr	335	335.0	exc
Athabasca Valley	PM2.5	3Sep23, 03:00	418917	1-hr	348	348.2	exc
Fort Chip	PM2.5	3Sep23, 03:00	418918	1-hr	155	155.2	exc
Barge Landing	PM2.5	3Sep23, 03:00	418919	1-hr	351	351.1	exc
Ft. McKay S	PM2.5	3Sep23, 03:00	418920	1-hr	373	373.4	exc
Anzac	PM2.5	3Sep23, 03:00	418921	1-hr	246	246.3	exc
Wapasu	PM2.5	3Sep23, 03:00	418922	1-hr	359	358.8	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Stony Mtn.	PM2.5	3Sep23, 03:00	418923	1-hr	394	393.6	exc
Conklin	PM2.5	3Sep23, 03:00	418924	1-hr	407	407.0	exc
Janvier	PM2.5	3Sep23, 03:00	418925	1-hr	374	373.7	exc
Fort Hills	PM2.5	3Sep23, 03:00	418815	1-hr	380	380.2	exc
Surmont 2	PM2.5	3Sep23, 03:00	418926	1-hr	265	264.6	exc
Ells River	PM2.5	3Sep23, 03:00	418816	1-hr	358	357.8	exc
Buffalo Viewpoint	PM2.5	3Sep23, 03:00	418915	1-hr	271	271.0	exc
Patricia McInnes	PM2.5	3Sep23, 03:00	418916	1-hr	299	299.4	exc
Buffalo Viewpoint	PM2.5	3Sep23, 04:00	418915	1-hr	256	255.7	exc
Patricia McInnes	PM2.5	3Sep23, 04:00	418916	1-hr	279	278.6	exc
Athabasca Valley	PM2.5	3Sep23, 04:00	418917	1-hr	329	329.0	exc
Fort Chip	PM2.5	3Sep23, 04:00	418918	1-hr	213	213.3	exc
Barge Landing	PM2.5	3Sep23, 04:00	418919	1-hr	300	300.2	exc
Ft. McKay S	PM2.5	3Sep23, 04:00	418920	1-hr	317	316.9	exc
Anzac	PM2.5	3Sep23, 04:00	418921	1-hr	239	239.4	exc
Wapasu	PM2.5	3Sep23, 04:00	418922	1-hr	349	349.3	exc
Stony Mtn.	PM2.5	3Sep23, 04:00	418923	1-hr	368	368.5	exc
Bertha Ganter	PM2.5	3Sep23, 04:00	418914	1-hr	290	289.5	exc
Conklin	PM2.5	3Sep23, 04:00	418924	1-hr	401	400.9	exc
Janvier	PM2.5	3Sep23, 04:00	418925	1-hr	357	357.0	exc
Fort Hills	PM2.5	3Sep23, 04:00	418815	1-hr	383	383.3	exc
Surmont 2	PM2.5	3Sep23, 04:00	418926	1-hr	272	272.1	exc
Ells River	PM2.5	3Sep23, 04:00	418816	1-hr	349	348.9	exc
Bertha Ganter	PM2.5	3Sep23, 05:00	418914	1-hr	277	277.0	exc
Buffalo Viewpoint	PM2.5	3Sep23, 05:00	418915	1-hr	279	278.8	exc
Patricia McInnes	PM2.5	3Sep23, 05:00	418916	1-hr	268	268.4	exc
Athabasca Valley	PM2.5	3Sep23, 05:00	418917	1-hr	325	325.3	exc
Fort Chip	PM2.5	3Sep23, 05:00	418918	1-hr	416	416.2	exc
Barge Landing	PM2.5	3Sep23, 05:00	418919	1-hr	286	286.3	exc
Ft. McKay S	PM2.5	3Sep23, 05:00	418920	1-hr	289	288.7	exc
Anzac	PM2.5	3Sep23, 05:00	418921	1-hr	246	246.1	exc
Wapasu	PM2.5	3Sep23, 05:00	418922	1-hr	322	321.9	exc
Stony Mtn.	PM2.5	3Sep23, 05:00	418923	1-hr	367	366.5	exc
Conklin	PM2.5	3Sep23, 05:00	418924	1-hr	391	391.5	exc
Janvier	PM2.5	3Sep23, 05:00	418925	1-hr	351	350.7	exc
Fort Hills	PM2.5	3Sep23, 05:00	418815	1-hr	381	381.4	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Surmont 2	PM2.5	3Sep23, 05:00	418926	1-hr	282	281.6	exc
Ells River	PM2.5	3Sep23, 05:00	418816	1-hr	320	319.8	exc
Bertha Ganter	PM2.5	3Sep23, 06:00	418914	1-hr	264	264.2	exc
Buffalo Viewpoint	PM2.5	3Sep23, 06:00	418915	1-hr	295	295.3	exc
Patricia McInnes	PM2.5	3Sep23, 06:00	418916	1-hr	271	270.7	exc
Athabasca Valley	PM2.5	3Sep23, 06:00	418917	1-hr	331	330.7	exc
Fort Chip	PM2.5	3Sep23, 06:00	418918	1-hr	523	522.6	exc
Barge Landing	PM2.5	3Sep23, 06:00	418919	1-hr	276	275.9	exc
Ft. McKay S	PM2.5	3Sep23, 06:00	418920	1-hr	275	275.3	exc
Anzac	PM2.5	3Sep23, 06:00	418921	1-hr	255	254.6	exc
Wapasu	PM2.5	3Sep23, 06:00	418922	1-hr	302	302.4	exc
Stony Mtn.	PM2.5	3Sep23, 06:00	418923	1-hr	363	363.3	exc
Conklin	PM2.5	3Sep23, 06:00	418924	1-hr	384	384.2	exc
Janvier	PM2.5	3Sep23, 06:00	418925	1-hr	342	342.4	exc
Fort Hills	PM2.5	3Sep23, 06:00	418815	1-hr	342	342.1	exc
Surmont 2	PM2.5	3Sep23, 06:00	418926	1-hr	276	275.7	exc
Ells River	PM2.5	3Sep23, 06:00	418816	1-hr	280	280.2	exc
Buffalo Viewpoint	PM2.5	3Sep23, 07:00	418915	1-hr	286	285.8	exc
Patricia McInnes	PM2.5	3Sep23, 07:00	418916	1-hr	281	281.0	exc
Athabasca Valley	PM2.5	3Sep23, 07:00	418917	1-hr	332	332.4	exc
Fort Chip	PM2.5	3Sep23, 07:00	418918	1-hr	429	429.2	exc
Barge Landing	PM2.5	3Sep23, 07:00	418919	1-hr	250	250.0	exc
Ft. McKay S	PM2.5	3Sep23, 07:00	418920	1-hr	251	251.4	exc
Anzac	PM2.5	3Sep23, 07:00	418921	1-hr	271	271.1	exc
Wapasu	PM2.5	3Sep23, 07:00	418922	1-hr	273	273.3	exc
Stony Mtn.	PM2.5	3Sep23, 07:00	418923	1-hr	356	356.1	exc
Conklin	PM2.5	3Sep23, 07:00	418924	1-hr	377	377.1	exc
Janvier	PM2.5	3Sep23, 07:00	418925	1-hr	328	328.5	exc
Fort Hills	PM2.5	3Sep23, 07:00	418815	1-hr	289	289.0	exc
Surmont 2	PM2.5	3Sep23, 07:00	418926	1-hr	258	258.0	exc
Ells River	PM2.5	3Sep23, 07:00	418816	1-hr	252	251.7	exc
Bertha Ganter	PM2.5	3Sep23, 07:00	418914	1-hr	246	245.7	exc
Buffalo Viewpoint	PM2.5	3Sep23, 08:00	418915	1-hr	294	294.0	exc
Patricia McInnes	PM2.5	3Sep23, 08:00	418916	1-hr	297	296.9	exc
Athabasca Valley	PM2.5	3Sep23, 08:00	418917	1-hr	328	328.4	exc
Fort Chip	PM2.5	3Sep23, 08:00	418918	1-hr	420	420.2	exc
Barge Landing	PM2.5	3Sep23, 08:00	418919	1-hr	252	252.2	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Ft. McKay S	PM2.5	3Sep23, 08:00	418920	1-hr	242	242.0	exc
Anzac	PM2.5	3Sep23, 08:00	418921	1-hr	264	263.7	exc
Wapasu	PM2.5	3Sep23, 08:00	418922	1-hr	260	259.6	exc
Stony Mtn.	PM2.5	3Sep23, 08:00	418923	1-hr	362	361.6	exc
Conklin	PM2.5	3Sep23, 08:00	418924	1-hr	371	370.8	exc
Janvier	PM2.5	3Sep23, 08:00	418925	1-hr	315	315.4	exc
Fort Hills	PM2.5	3Sep23, 08:00	418815	1-hr	271	270.9	exc
Surmont 2	PM2.5	3Sep23, 08:00	418926	1-hr	238	237.7	exc
Ells River	PM2.5	3Sep23, 08:00	418816	1-hr	237	236.5	exc
Bertha Ganter	PM2.5	3Sep23, 08:00	418914	1-hr	235	235.4	exc
Buffalo Viewpoint	PM2.5	3Sep23, 09:00	418915	1-hr	310	309.8	exc
Patricia McInnes	PM2.5	3Sep23, 09:00	418916	1-hr	289	289.0	exc
Athabasca Valley	PM2.5	3Sep23, 09:00	418917	1-hr	312	311.9	exc
Fort Chip	PM2.5	3Sep23, 09:00	418918	1-hr	427	426.8	exc
Barge Landing	PM2.5	3Sep23, 09:00	418919	1-hr	266	265.7	exc
Ft. McKay S	PM2.5	3Sep23, 09:00	418920	1-hr	245	244.9	exc
Anzac	PM2.5	3Sep23, 09:00	418921	1-hr	263	263.0	exc
Wapasu	PM2.5	3Sep23, 09:00	418922	1-hr	261	261.5	exc
Stony Mtn.	PM2.5	3Sep23, 09:00	418923	1-hr	339	339.4	exc
Conklin	PM2.5	3Sep23, 09:00	418924	1-hr	353	352.7	exc
Janvier	PM2.5	3Sep23, 09:00	418925	1-hr	313	312.6	exc
Fort Hills	PM2.5	3Sep23, 09:00	418815	1-hr	253	253.2	exc
Surmont 2	PM2.5	3Sep23, 09:00	418926	1-hr	237	237.3	exc
Ells River	PM2.5	3Sep23, 09:00	418816	1-hr	217	217.0	exc
Bertha Ganter	PM2.5	3Sep23, 09:00	418914	1-hr	252	252.0	exc
Buffalo Viewpoint	PM2.5	3Sep23, 10:00	418915	1-hr	315	314.6	exc
Patricia McInnes	PM2.5	3Sep23, 10:00	418916	1-hr	281	280.5	exc
Athabasca Valley	PM2.5	3Sep23, 10:00	418917	1-hr	303	302.7	exc
Fort Chip	PM2.5	3Sep23, 10:00	418918	1-hr	447	447.3	exc
Barge Landing	PM2.5	3Sep23, 10:00	418919	1-hr	286	285.8	exc
Ft. McKay S	PM2.5	3Sep23, 10:00	418920	1-hr	295	295.2	exc
Anzac	PM2.5	3Sep23, 10:00	418921	1-hr	224	224.5	exc
Wapasu	PM2.5	3Sep23, 10:00	418922	1-hr	273	273.2	exc
Stony Mtn.	PM2.5	3Sep23, 10:00	418923	1-hr	288	288.2	exc
Conklin	PM2.5	3Sep23, 10:00	418924	1-hr	336	336.3	exc
Janvier	PM2.5	3Sep23, 10:00	418925	1-hr	304	303.6	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Fort Hills	PM2.5	3Sep23, 10:00	418815	1-hr	251	251.1	exc
Surmont 2	PM2.5	3Sep23, 10:00	418926	1-hr	195	194.3	exc
Ells River	PM2.5	3Sep23, 10:00	418816	1-hr	229	229.0	exc
Bertha Ganter	PM2.5	3Sep23, 10:00	418914	1-hr	278	278.4	exc
Buffalo Viewpoint	PM2.5	3Sep23, 11:00	418915	1-hr	303	302.6	exc
Patricia McInnes	PM2.5	3Sep23, 11:00	418916	1-hr	260	259.7	exc
Athabasca Valley	PM2.5	3Sep23, 11:00	418917	1-hr	280	279.9	exc
Fort Chip	PM2.5	3Sep23, 11:00	418918	1-hr	466	465.7	exc
Barge Landing	PM2.5	3Sep23, 11:00	418919	1-hr	289	289.4	exc
Ft. McKay S	PM2.5	3Sep23, 11:00	418920	1-hr	294	293.8	exc
Anzac	PM2.5	3Sep23, 11:00	418921	1-hr	199	198.9	exc
Wapasu	PM2.5	3Sep23, 11:00	418922	1-hr	205	204.5	exc
Stony Mtn.	PM2.5	3Sep23, 11:00	418923	1-hr	187	187.4	exc
Conklin	PM2.5	3Sep23, 11:00	418924	1-hr	234	234.1	exc
Janvier	PM2.5	3Sep23, 11:00	418925	1-hr	294	294.0	exc
Fort Hills	PM2.5	3Sep23, 11:00	418815	1-hr	259	259.0	exc
Surmont 2	PM2.5	3Sep23, 11:00	418926	1-hr	180	179.5	exc
Ells River	PM2.5	3Sep23, 11:00	418816	1-hr	222	221.8	exc
Bertha Ganter	PM2.5	3Sep23, 11:00	418914	1-hr	273	273.2	exc
Buffalo Viewpoint	PM2.5	3Sep23, 12:00	418915	1-hr	282	281.8	exc
Patricia McInnes	PM2.5	3Sep23, 12:00	418916	1-hr	223	222.7	exc
Athabasca Valley	PM2.5	3Sep23, 12:00	418917	1-hr	282	282.3	exc
Fort Chip	PM2.5	3Sep23, 12:00	418918	1-hr	468	467.9	exc
Barge Landing	PM2.5	3Sep23, 12:00	418919	1-hr	283	283.3	exc
Ft. McKay S	PM2.5	3Sep23, 12:00	418920	1-hr	277	277.2	exc
Anzac	PM2.5	3Sep23, 12:00	418921	1-hr	177	177.3	exc
Wapasu	PM2.5	3Sep23, 12:00	418922	1-hr	234	233.8	exc
Stony Mtn.	PM2.5	3Sep23, 12:00	418923	1-hr	146	146.4	exc
Conklin	PM2.5	3Sep23, 12:00	418924	1-hr	147	146.5	exc
Janvier	PM2.5	3Sep23, 12:00	418925	1-hr	250	249.8	exc
Fort Hills	PM2.5	3Sep23, 12:00	418815	1-hr	250	250.4	exc
Surmont 2	PM2.5	3Sep23, 12:00	418926	1-hr	170	170.1	exc
Ells River	PM2.5	3Sep23, 12:00	418816	1-hr	208	207.6	exc
Bertha Ganter	PM2.5	3Sep23, 12:00	418914	1-hr	258	257.8	exc
Buffalo Viewpoint	PM2.5	3Sep23, 13:00	418915	1-hr	233	232.8	exc
Patricia McInnes	PM2.5	3Sep23, 13:00	418916	1-hr	209	209.0	exc
Athabasca Valley	PM2.5	3Sep23, 13:00	418917	1-hr	268	268.2	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Fort Chip	PM2.5	3Sep23, 13:00	418918	1-hr	378	378.2	exc
Barge Landing	PM2.5	3Sep23, 13:00	418919	1-hr	235	235.0	exc
Ft. McKay S	PM2.5	3Sep23, 13:00	418920	1-hr	225	224.6	exc
Anzac	PM2.5	3Sep23, 13:00	418921	1-hr	174	174.2	exc
Wapasu	PM2.5	3Sep23, 13:00	418922	1-hr	222	222.3	exc
Stony Mtn.	PM2.5	3Sep23, 13:00	418923	1-hr	137	137.1	exc
Conklin	PM2.5	3Sep23, 13:00	418924	1-hr	134	134.1	exc
Janvier	PM2.5	3Sep23, 13:00	418925	1-hr	174	173.7	exc
Fort Hills	PM2.5	3Sep23, 13:00	418815	1-hr	256	255.6	exc
Surmont 2	PM2.5	3Sep23, 13:00	418926	1-hr	160	159.5	exc
Ells River	PM2.5	3Sep23, 13:00	418816	1-hr	211	211.4	exc
Bertha Ganter	PM2.5	3Sep23, 13:00	418914	1-hr	209	208.9	exc
Buffalo Viewpoint	PM2.5	3Sep23, 14:00	418915	1-hr	211	210.8	exc
Patricia McInnes	PM2.5	3Sep23, 14:00	418916	1-hr	194	194.0	exc
Athabasca Valley	PM2.5	3Sep23, 14:00	418917	1-hr	244	244.1	exc
Fort Chip	PM2.5	3Sep23, 14:00	418918	1-hr	339	339.0	exc
Barge Landing	PM2.5	3Sep23, 14:00	418919	1-hr	234	233.7	exc
Ft. McKay S	PM2.5	3Sep23, 14:00	418920	1-hr	250	249.7	exc
Anzac	PM2.5	3Sep23, 14:00	418921	1-hr	188	188.3	exc
Wapasu	PM2.5	3Sep23, 14:00	418922	1-hr	218	217.8	exc
Stony Mtn.	PM2.5	3Sep23, 14:00	418923	1-hr	122	121.6	exc
Conklin	PM2.5	3Sep23, 14:00	418924	1-hr	127	126.7	exc
Janvier	PM2.5	3Sep23, 14:00	418925	1-hr	154	153.6	exc
Fort Hills	PM2.5	3Sep23, 14:00	418815	1-hr	247	246.9	exc
Surmont 2	PM2.5	3Sep23, 14:00	418926	1-hr	173	173.1	exc
Ells River	PM2.5	3Sep23, 14:00	418816	1-hr	280	280.1	exc
Bertha Ganter	PM2.5	3Sep23, 14:00	418914	1-hr	247	247.4	exc
Buffalo Viewpoint	PM2.5	3Sep23, 15:00	418915	1-hr	202	201.6	exc
Patricia McInnes	PM2.5	3Sep23, 15:00	418916	1-hr	185	185.2	exc
Athabasca Valley	PM2.5	3Sep23, 15:00	418917	1-hr	206	206.1	exc
Fort Chip	PM2.5	3Sep23, 15:00	418918	1-hr	321	321.1	exc
Barge Landing	PM2.5	3Sep23, 15:00	418919	1-hr	267	266.6	exc
Ft. McKay S	PM2.5	3Sep23, 15:00	418920	1-hr	291	290.6	exc
Anzac	PM2.5	3Sep23, 15:00	418921	1-hr	188	187.6	exc
Wapasu	PM2.5	3Sep23, 15:00	418922	1-hr	210	209.6	exc
Conklin	PM2.5	3Sep23, 15:00	418924	1-hr	112	112.2	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Janvier	PM2.5	3Sep23, 15:00	418925	1-hr	133	133.3	exc
Fort Hills	PM2.5	3Sep23, 15:00	418815	1-hr	338	338.3	exc
Surmont 2	PM2.5	3Sep23, 15:00	418926	1-hr	182	181.7	exc
Ells River	PM2.5	3Sep23, 15:00	418816	1-hr	288	288.1	exc
Bertha Ganter	PM2.5	3Sep23, 15:00	418914	1-hr	278	278.3	exc
Buffalo Viewpoint	PM2.5	3Sep23, 16:00	418915	1-hr	240	240.4	exc
Patricia McInnes	PM2.5	3Sep23, 16:00	418916	1-hr	183	183.3	exc
Athabasca Valley	PM2.5	3Sep23, 16:00	418917	1-hr	194	194.0	exc
Fort Chip	PM2.5	3Sep23, 16:00	418918	1-hr	276	276.1	exc
Barge Landing	PM2.5	3Sep23, 16:00	418919	1-hr	272	272.1	exc
Ft. McKay S	PM2.5	3Sep23, 16:00	418920	1-hr	290	290.1	exc
Anzac	PM2.5	3Sep23, 16:00	418921	1-hr	187	186.9	exc
Wapasu	PM2.5	3Sep23, 16:00	418922	1-hr	207	206.5	exc
Stony Mtn.	PM2.5	3Sep23, 16:00	418923	1-hr	97	97.0	exc
Conklin	PM2.5	3Sep23, 16:00	418924	1-hr	97	96.9	exc
Janvier	PM2.5	3Sep23, 16:00	418925	1-hr	121	121.3	exc
Fort Hills	PM2.5	3Sep23, 16:00	418815	1-hr	303	303.0	exc
Surmont 2	PM2.5	3Sep23, 16:00	418926	1-hr	151	150.6	exc
Ells River	PM2.5	3Sep23, 16:00	418816	1-hr	292	291.5	exc
Bertha Ganter	PM2.5	3Sep23, 16:00	418914	1-hr	284	283.5	exc
Buffalo Viewpoint	PM2.5	3Sep23, 17:00	418915	1-hr	327	326.5	exc
Patricia McInnes	PM2.5	3Sep23, 17:00	418916	1-hr	151	151.4	exc
Athabasca Valley	PM2.5	3Sep23, 17:00	418917	1-hr	165	164.9	exc
Fort Chip	PM2.5	3Sep23, 17:00	418918	1-hr	281	281.5	exc
Barge Landing	PM2.5	3Sep23, 17:00	418919	1-hr	280	279.9	exc
Ft. McKay S	PM2.5	3Sep23, 17:00	418920	1-hr	286	285.8	exc
Anzac	PM2.5	3Sep23, 17:00	418921	1-hr	141	140.9	exc
Wapasu	PM2.5	3Sep23, 17:00	418922	1-hr	218	217.6	exc
Stony Mtn.	PM2.5	3Sep23, 17:00	418923	1-hr	88	87.9	exc
Conklin	PM2.5	3Sep23, 17:00	418924	1-hr	93	93.0	exc
Janvier	PM2.5	3Sep23, 17:00	418925	1-hr	114	113.7	exc
Fort Hills	PM2.5	3Sep23, 17:00	418815	1-hr	291	291.4	exc
Surmont 2	PM2.5	3Sep23, 17:00	418926	1-hr	107	106.8	exc
Ells River	PM2.5	3Sep23, 17:00	418816	1-hr	279	278.9	exc
Bertha Ganter	PM2.5	3Sep23, 17:00	418914	1-hr	283	282.5	exc
Buffalo Viewpoint	PM2.5	3Sep23, 18:00	418915	1-hr	310	309.9	exc
Patricia McInnes	PM2.5	3Sep23, 18:00	418916	1-hr	138	138.2	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Athabasca Valley	PM2.5	3Sep23, 18:00	418917	1-hr	148	147.6	exc
Fort Chip	PM2.5	3Sep23, 18:00	418918	1-hr	268	268.0	exc
Barge Landing	PM2.5	3Sep23, 18:00	418919	1-hr	291	291.1	exc
Ft. McKay S	PM2.5	3Sep23, 18:00	418920	1-hr	275	275.1	exc
Anzac	PM2.5	3Sep23, 18:00	418921	1-hr	125	125.3	exc
Wapasu	PM2.5	3Sep23, 18:00	418922	1-hr	215	214.8	exc
Stony Mtn.	PM2.5	3Sep23, 18:00	418923	1-hr	81	81.2	exc
Conklin	PM2.5	3Sep23, 18:00	418924	1-hr	84	83.6	exc
Janvier	PM2.5	3Sep23, 18:00	418925	1-hr	110	109.8	exc
Fort Hills	PM2.5	3Sep23, 18:00	418815	1-hr	286	286.2	exc
Surmont 2	PM2.5	3Sep23, 18:00	418926	1-hr	109	109.2	exc
Ells River	PM2.5	3Sep23, 18:00	418816	1-hr	273	272.7	exc
Bertha Ganter	PM2.5	3Sep23, 18:00	418914	1-hr	271	271.5	exc
Buffalo Viewpoint	PM2.5	3Sep23, 19:00	418915	1-hr	312	312.2	exc
Patricia McInnes	PM2.5	3Sep23, 19:00	418916	1-hr	217	217.1	exc
Athabasca Valley	PM2.5	3Sep23, 19:00	418917	1-hr	138	138.1	exc
Fort Chip	PM2.5	3Sep23, 19:00	418918	1-hr	229	229.0	exc
Barge Landing	PM2.5	3Sep23, 19:00	418919	1-hr	274	273.9	exc
Ft. McKay S	PM2.5	3Sep23, 19:00	418920	1-hr	279	278.7	exc
Anzac	PM2.5	3Sep23, 19:00	418921	1-hr	121	121.0	exc
Wapasu	PM2.5	3Sep23, 19:00	418922	1-hr	227	227.1	exc
Conklin	PM2.5	3Sep23, 19:00	418924	1-hr	82	81.5	exc
Janvier	PM2.5	3Sep23, 19:00	418925	1-hr	102	102.3	exc
Fort Hills	PM2.5	3Sep23, 19:00	418815	1-hr	289	288.9	exc
Surmont 2	PM2.5	3Sep23, 19:00	418926	1-hr	110	109.5	exc
Ells River	PM2.5	3Sep23, 19:00	418816	1-hr	282	282.5	exc
Bertha Ganter	PM2.5	3Sep23, 19:00	418914	1-hr	267	267.1	exc
Buffalo Viewpoint	PM2.5	3Sep23, 20:00	418915	1-hr	299	298.8	exc
Patricia McInnes	PM2.5	3Sep23, 20:00	418916	1-hr	241	240.9	exc
Athabasca Valley	PM2.5	3Sep23, 20:00	418917	1-hr	195	194.9	exc
Fort Chip	PM2.5	3Sep23, 20:00	418918	1-hr	188	188.3	exc
Barge Landing	PM2.5	3Sep23, 20:00	418919	1-hr	277	276.6	exc
Ft. McKay S	PM2.5	3Sep23, 20:00	418920	1-hr	294	294.0	exc
Anzac	PM2.5	3Sep23, 20:00	418921	1-hr	120	120.0	exc
Wapasu	PM2.5	3Sep23, 20:00	418922	1-hr	240	239.9	exc
Stony Mtn.	PM2.5	3Sep23, 20:00	418923	1-hr	82	81.6	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Conklin	PM2.5	3Sep23, 20:00	418924	1-hr	80	80.0	nae
Janvier	PM2.5	3Sep23, 20:00	418925	1-hr	89	88.8	exc
Fort Hills	PM2.5	3Sep23, 20:00	418815	1-hr	323	323.2	exc
Surmont 2	PM2.5	3Sep23, 20:00	418926	1-hr	117	117.4	exc
Ells River	PM2.5	3Sep23, 20:00	418816	1-hr	251	251.1	exc
Bertha Ganter	PM2.5	3Sep23, 20:00	418914	1-hr	285	285.1	exc
Buffalo Viewpoint	PM2.5	3Sep23, 21:00	418915	1-hr	222	222.1	exc
Patricia McInnes	PM2.5	3Sep23, 21:00	418916	1-hr	204	203.8	exc
Athabasca Valley	PM2.5	3Sep23, 21:00	418917	1-hr	221	220.9	exc
Fort Chip	PM2.5	3Sep23, 21:00	418918	1-hr	133	132.6	exc
Barge Landing	PM2.5	3Sep23, 21:00	418919	1-hr	244	244.3	exc
Ft. McKay S	PM2.5	3Sep23, 21:00	418920	1-hr	218	217.7	exc
Anzac	PM2.5	3Sep23, 21:00	418921	1-hr	134	133.5	exc
Wapasu	PM2.5	3Sep23, 21:00	418922	1-hr	238	237.5	exc
Stony Mtn.	PM2.5	3Sep23, 21:00	418923	1-hr	90	89.5	exc
Conklin	PM2.5	3Sep23, 21:00	418924	1-hr	84	83.9	exc
Fort Hills	PM2.5	3Sep23, 21:00	418815	1-hr	169	169.2	exc
Surmont 2	PM2.5	3Sep23, 21:00	418926	1-hr	115	114.8	exc
Ells River	PM2.5	3Sep23, 21:00	418816	1-hr	159	159.2	exc
Bertha Ganter	PM2.5	3Sep23, 21:00	418914	1-hr	199	199.4	exc
Buffalo Viewpoint	PM2.5	3Sep23, 22:00	418915	1-hr	198	198.4	exc
Patricia McInnes	PM2.5	3Sep23, 22:00	418916	1-hr	162	162.1	exc
Athabasca Valley	PM2.5	3Sep23, 22:00	418917	1-hr	179	179.4	exc
Barge Landing	PM2.5	3Sep23, 22:00	418919	1-hr	159	159.0	exc
Ft. McKay S	PM2.5	3Sep23, 22:00	418920	1-hr	168	168.1	exc
Anzac	PM2.5	3Sep23, 22:00	418921	1-hr	157	156.6	exc
Wapasu	PM2.5	3Sep23, 22:00	418922	1-hr	173	173.4	exc
Stony Mtn.	PM2.5	3Sep23, 22:00	418923	1-hr	103	102.6	exc
Conklin	PM2.5	3Sep23, 22:00	418924	1-hr	98	98.4	exc
Fort Hills	PM2.5	3Sep23, 22:00	418815	1-hr	156	155.6	exc
Surmont 2	PM2.5	3Sep23, 22:00	418926	1-hr	126	125.6	exc
Ells River	PM2.5	3Sep23, 22:00	418816	1-hr	132	132.5	exc
Bertha Ganter	PM2.5	3Sep23, 22:00	418914	1-hr	152	151.9	exc
Buffalo Viewpoint	PM2.5	3Sep23, 23:00	418915	1-hr	107	106.6	exc
Patricia McInnes	PM2.5	3Sep23, 23:00	418916	1-hr	168	168.3	exc
Athabasca Valley	PM2.5	3Sep23, 23:00	418917	1-hr	170	169.8	exc
Barge Landing	PM2.5	3Sep23, 23:00	418919	1-hr	98	97.8	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Ft. McKay S	PM2.5	3Sep23, 23:00	418920	1-hr	133	133.4	exc
Anzac	PM2.5	3Sep23, 23:00	418921	1-hr	158	157.7	exc
Wapasu	PM2.5	3Sep23, 23:00	418922	1-hr	136	136.2	exc
Stony Mtn.	PM2.5	3Sep23, 23:00	418923	1-hr	120	119.9	exc
Conklin	PM2.5	3Sep23, 23:00	418924	1-hr	118	117.8	exc
Janvier	PM2.5	3Sep23, 23:00	418925	1-hr	82	82.2	exc
Fort Hills	PM2.5	3Sep23, 23:00	418815	1-hr	82	81.6	exc
Surmont 2	PM2.5	3Sep23, 23:00	418926	1-hr	146	145.6	exc
Patricia McInnes	PM2.5	3Sep23, 24:00	418916	1-hr	122	122.3	exc
Athabasca Valley	PM2.5	3Sep23, 24:00	418917	1-hr	135	135.4	exc
Barge Landing	PM2.5	3Sep23, 24:00	418919	24-hr	261	260.5	exc
Ft. McKay S	PM2.5	3Sep23, 24:00	418920	24-hr	268	267.7	exc
Anzac	PM2.5	3Sep23, 24:00	418921	1-hr	161	160.7	exc
Anzac	PM2.5	3Sep23, 24:00	418921	24-hr	198	197.8	exc
Wapasu	PM2.5	3Sep23, 24:00	418922	1-hr	134	134.3	exc
Stony Mtn.	PM2.5	3Sep23, 24:00	418923	1-hr	135	135.2	exc
Stony Mtn.	PM2.5	3Sep23, 24:00	418923	24-hr	216	216.5	exc
Conklin	PM2.5	3Sep23, 24:00	418924	1-hr	133	133.1	exc
Conklin	PM2.5	3Sep23, 24:00	418924	24-hr	227	227.1	exc
Janvier	PM2.5	3Sep23, 24:00	418925	1-hr	98	98.5	exc
Janvier	PM2.5	3Sep23, 24:00	418925	24-hr	221	221.3	exc
Fort Hills	PM2.5	3Sep23, 24:00	418815	24-hr	274	274.2	exc
Surmont 2	PM2.5	3Sep23, 24:00	418926	1-hr	156	155.7	exc
Surmont 2	PM2.5	3Sep23, 24:00	418926	24-hr	189	189.4	exc
Ells River	PM2.5	3Sep23, 24:00	418816	24-hr	245	245.1	exc
Bertha Ganter	PM2.5	3Sep23, 24:00	418914	24-hr	251	251.1	exc
Buffalo Viewpoint	PM2.5	3Sep23, 24:00	418915	24-hr	264	263.9	exc
Patricia McInnes	PM2.5	3Sep23, 24:00	418916	24-hr	234	233.8	exc
Athabasca Valley	PM2.5	3Sep23, 24:00	418917	24-hr	261	260.7	exc
Fort Chip	PM2.5	3Sep23, 24:00	418918	24-hr	289	288.7	exc
Wapasu	PM2.5	3Sep23, 24:00	418922	24-hr	247	247.4	exc
Patricia McInnes	PM2.5	4Sep23, 01:00	419198	1-hr	93	93.5	exc
Athabasca Valley	PM2.5	4Sep23, 01:00	419205	1-hr	96	96.3	exc
Anzac	PM2.5	4Sep23, 01:00	419206	1-hr	151	150.6	exc
Wapasu	PM2.5	4Sep23, 01:00	419207	1-hr	96	95.8	exc
Stony Mtn.	PM2.5	4Sep23, 01:00	419208	1-hr	153	153.3	exc
Conklin	PM2.5	4Sep23, 01:00	419209	1-hr	153	152.6	exc
Janvier	PM2.5	4Sep23, 01:00	419210	1-hr	138	137.8	exc
Surmont 2	PM2.5	4Sep23, 01:00	419211	1-hr	162	162.4	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Anzac	PM2.5	4Sep23, 02:00	419206	1-hr	137	137.5	exc
Stony Mtn.	PM2.5	4Sep23, 02:00	419208	1-hr	171	171.1	exc
Conklin	PM2.5	4Sep23, 02:00	419209	1-hr	168	168.0	exc
Janvier	PM2.5	4Sep23, 02:00	419210	1-hr	159	158.7	exc
Surmont 2	PM2.5	4Sep23, 02:00	419211	1-hr	156	155.6	exc
Buffalo Viewpoint	PM2.5	4Sep23, 03:00	419212	1-hr	90	90.4	exc
Patricia McInnes	PM2.5	4Sep23, 03:00	419198	1-hr	94	94.1	exc
Athabasca Valley	PM2.5	4Sep23, 03:00	419205	1-hr	85	85.3	exc
Anzac	PM2.5	4Sep23, 03:00	419206	1-hr	110	110.3	exc
Stony Mtn.	PM2.5	4Sep23, 03:00	419208	1-hr	165	164.9	exc
Conklin	PM2.5	4Sep23, 03:00	419209	1-hr	170	170.3	exc
Janvier	PM2.5	4Sep23, 03:00	419210	1-hr	160	160.3	exc
Surmont 2	PM2.5	4Sep23, 03:00	419211	1-hr	125	125.2	exc
Patricia McInnes	PM2.5	4Sep23, 04:00	419198	1-hr	84	83.7	exc
Athabasca Valley	PM2.5	4Sep23, 04:00	419205	1-hr	94	94.0	exc
Anzac	PM2.5	4Sep23, 04:00	419206	1-hr	111	110.8	exc
Stony Mtn.	PM2.5	4Sep23, 04:00	419208	1-hr	135	135.4	exc
Conklin	PM2.5	4Sep23, 04:00	419209	1-hr	151	150.5	exc
Janvier	PM2.5	4Sep23, 04:00	419210	1-hr	145	145.5	exc
Surmont 2	PM2.5	4Sep23, 04:00	419211	1-hr	116	116.4	exc
Stony Mtn.	PM2.5	4Sep23, 05:00	419208	1-hr	107	107.1	exc
Conklin	PM2.5	4Sep23, 05:00	419209	1-hr	112	111.8	exc
Janvier	PM2.5	4Sep23, 05:00	419210	1-hr	89	88.7	exc
Stony Mtn.	PM2.5	4Sep23, 06:00	419208	1-hr	108	107.5	exc
Conklin	PM2.5	4Sep23, 06:00	419209	1-hr	99	98.6	exc
Stony Mtn.	PM2.5	4Sep23, 07:00	419208	1-hr	102	101.9	exc
Conklin	PM2.5	4Sep23, 07:00	419209	1-hr	101	100.6	exc
Conklin	PM2.5	4Sep23, 08:00	419209	1-hr	80	80.4	exc
Stony Mtn.	PM2.5	4Sep23, 24:00	419208	24-hr	46	45.5	exc
Conklin	PM2.5	4Sep23, 24:00	419209	24-hr	47	47.4	exc
Janvier	PM2.5	4Sep23, 24:00	419210	24-hr	36	36.4	exc
Surmont 2	PM2.5	4Sep23, 24:00	419211	24-hr	35	35.1	exc
Fort Hills	PM2.5	5Sep23, 21:00	418933	1-hr	150	149.9	exc
Fort Hills	PM2.5	5Sep23, 22:00	418933	1-hr	95	95.3	exc
Fort Hills	PM2.5	5Sep23, 23:00	418933	1-hr	132	131.7	exc
Fort Hills	PM2.5	5Sep23, 24:00	418933	1-hr	166	165.6	exc
Fort Hills	PM2.5	5Sep23, 24:00	418933	24-hr	33	32.7	exc
Wapasu	PM2.5	7Sep23, 09:00	419207	1-hr	86	85.9	exc
Wapasu	PM2.5	7Sep23, 10:00	419207	1-hr	92	92.1	exc



<u>Site</u>	<u>Parameter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Fort Hills	PM2.5	7Sep23, 15:00	419035	1-hr	92	92.3	exc
Wapasu	PM2.5	7Sep23, 11:00	419207	1-hr	92	91.6	exc
Wapasu	PM2.5	7Sep23, 12:00	419207	1-hr	95	94.6	exc
Wapasu	PM2.5	7Sep23, 13:00	419207	1-hr	90	90.4	exc
Wapasu	PM2.5	7Sep23, 14:00	419207	1-hr	92	91.7	exc
Wapasu	PM2.5	7Sep23, 15:00	419207	1-hr	84	84.4	exc
Fort Hills	PM2.5	7Sep23, 16:00	419035	1-hr	104	104.4	exc
Fort Hills	PM2.5	7Sep23, 21:00	419035	1-hr	81	80.7	exc
Fort Hills	PM2.5	7Sep23, 22:00	419035	1-hr	83	83.0	exc
Fort Hills	PM2.5	7Sep23, 23:00	419035	1-hr	84	83.8	exc
Bertha Ganter	PM2.5	7Sep23, 24:00	419199	24-hr	59	59.5	exc
Barge Landing	PM2.5	7Sep23, 24:00	419202	24-hr	64	63.6	exc
Ft. McKay S	PM2.5	7Sep23, 24:00	419203	24-hr	61	60.6	exc
Anzac	PM2.5	7Sep23, 24:00	419206	24-hr	43	43.3	exc
Stony Mtn.	PM2.5	7Sep23, 24:00	419208	24-hr	49	48.7	exc
Conklin	PM2.5	7Sep23, 24:00	419209	24-hr	38	37.8	exc
Janvier	PM2.5	7Sep23, 24:00	419210	24-hr	36	35.9	exc
Fort Hills	PM2.5	7Sep23, 24:00	419035	1-hr	83	82.5	exc
Fort Hills	PM2.5	7Sep23, 24:00	419035	24-hr	73	73.3	exc
Buffalo Viewpoint	PM2.5	7Sep23, 24:00	419212	24-hr	63	62.7	exc
Patricia McInnes	PM2.5	7Sep23, 24:00	419198	24-hr	46	46.0	exc
Athabasca Valley	PM2.5	7Sep23, 24:00	419205	24-hr	42	42.0	exc
Wapasu	PM2.5	7Sep23, 24:00	419207	24-hr	66	66.3	exc
Ells River	PM2.5	7Sep23, 24:00	419037	24-hr	60	60.4	exc
Surmont 2	PM2.5	7Sep23, 24:00	419211	24-hr	36	36.1	exc
Fort Hills	PM2.5	8Sep23, 19:00	419084	1-hr	101	100.9	exc
Fort Hills	PM2.5	8Sep23, 20:00	419084	1-hr	91	91.0	exc
Buffalo Viewpoint	PM2.5	8Sep23, 24:00	419212	24-hr	31	31.4	exc
Ft. McKay S	PM2.5	8Sep23, 24:00	419203	24-hr	36	36.0	exc
Fort Hills	PM2.5	8Sep23, 24:00	419084	24-hr	46	46.4	exc
Ells River	PM2.5	8Sep23, 24:00	419085	24-hr	36	36.6	exc
Bertha Ganter	PM2.5	8Sep23, 24:00	419199	24-hr	35	35.4	exc
Barge Landing	PM2.5	8Sep23, 24:00	419202	24-hr	32	32.4	exc
Fort Hills	PM2.5	9Sep23, 16:00	419114	1-hr	93	93.2	exc
Fort Hills	PM2.5	9Sep23, 19:00	419114	1-hr	287	286.9	exc
Conklin	PM2.5	9Sep23, 20:00	419209	1-hr	103	102.7	exc
Fort Hills	PM2.5	9Sep23, 20:00	419114	1-hr	172	171.7	exc
Fort Hills	PM2.5	9Sep23, 21:00	419114	1-hr	122	122.1	exc
Fort Hills	PM2.5	9Sep23, 22:00	419114	1-hr	100	100.3	exc
Fort Hills	PM2.5	9Sep23, 23:00	419114	1-hr	225	224.5	exc
Buffalo Viewpoint	PM2.5	9Sep23, 24:00	419212	24-hr	30	29.6	exc
Ft. McKay S	PM2.5	9Sep23, 24:00	419203	24-hr	32	32.2	exc
Conklin	PM2.5	9Sep23, 24:00	419209	24-hr	34	34.0	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Fort Hills	PM2.5	9Sep23, 24:00	419114	1-hr	586	585.7	exc
Fort Hills	PM2.5	9Sep23, 24:00	419114	24-hr	95	95.2	exc
Fort Chip	PM2.5	9Sep23, 24:00	419204	24-hr	34	34.0	exc
Barge Landing	PM2.5	9Sep23, 24:00	419202	24-hr	35	34.7	exc
Ells River	PM2.5	9Sep23, 24:00	419115	24-hr	31	30.8	exc
Bertha Ganter	PM2.5	9Sep23, 24:00	419199	24-hr	32	32.1	exc
Fort Hills	PM2.5	10Sep23, 01:00	419133	1-hr	347	346.6	exc
Fort Hills	PM2.5	10Sep23, 02:00	419133	1-hr	129	129.0	exc
Fort Hills	PM2.5	10Sep23, 19:00	419133	1-hr	136	136.4	exc
Fort Hills	PM2.5	10Sep23, 20:00	419133	1-hr	161	161.2	exc
Fort Hills	PM2.5	10Sep23, 21:00	419133	1-hr	119	118.8	exc
Fort Hills	PM2.5	10Sep23, 23:00	419133	1-hr	83	82.9	exc
Fort Hills	PM2.5	10Sep23, 24:00	419133	1-hr	95	95.2	exc
Fort Hills	PM2.5	10Sep23, 24:00	419133	24-hr	65	64.9	exc
Fort Hills	PM2.5	11Sep23, 02:00	419254	1-hr	176	176.3	exc
Fort Hills	PM2.5	11Sep23, 03:00	419254	1-hr	279	279.2	exc
Fort Hills	PM2.5	11Sep23, 04:00	419254	1-hr	127	127.5	exc
Fort Hills	PM2.5	11Sep23, 07:00	419254	1-hr	233	232.9	exc
Fort Hills	PM2.5	11Sep23, 20:00	419254	1-hr	177	176.5	exc
Fort Hills	PM2.5	11Sep23, 23:00	419254	1-hr	169	168.7	exc
Fort Hills	PM2.5	11Sep23, 24:00	419254	1-hr	213	212.9	exc
Fort Hills	PM2.5	12Sep23, 01:00	419288	1-hr	128	127.6	exc
Fort Hills	PM2.5	11Sep23, 24:00	419254	24-hr	80	78.5	exc
Patricia McInnes	PM2.5	12Sep23, 14:00	419610	1-hr	101	101.4	exc
Fort Hills	PM2.5	12Sep23, 14:00	419288	1-hr	85	84.5	exc
Buffalo Viewpoint	PM2.5	12Sep23, 15:00	419611	1-hr	98	98.2	exc
Patricia McInnes	PM2.5	12Sep23, 15:00	419610	1-hr	90	90.0	exc
Athabasca Valley	PM2.5	12Sep23, 15:00	419612	1-hr	85	84.5	exc
Ft. McKay S	PM2.5	12Sep23, 15:00	419613	1-hr	85	85.4	exc
Wapasu	PM2.5	12Sep23, 15:00	419614	1-hr	137	136.9	exc
Bertha Ganter	PM2.5	12Sep23, 16:00	419615	1-hr	88	88.4	exc
Buffalo Viewpoint	PM2.5	12Sep23, 16:00	419611	1-hr	89	88.6	exc
Patricia McInnes	PM2.5	12Sep23, 16:00	419610	1-hr	85	84.9	exc
Athabasca Valley	PM2.5	12Sep23, 16:00	419612	1-hr	84	84.1	exc
Barge Landing	PM2.5	12Sep23, 16:00	419616	1-hr	88	88.2	exc
Ft. McKay S	PM2.5	12Sep23, 16:00	419613	1-hr	100	100.4	exc
Wapasu	PM2.5	12Sep23, 16:00	419614	1-hr	106	105.9	exc
Fort Hills	PM2.5	12Sep23, 16:00	419288	1-hr	80	80.2	exc
Ells River	PM2.5	12Sep23, 16:00	419289	1-hr	90	90.1	exc
Bertha Ganter	PM2.5	12Sep23, 17:00	419615	1-hr	106	106.0	exc
Buffalo Viewpoint	PM2.5	12Sep23, 17:00	419611	1-hr	116	116.2	exc
Athabasca Valley	PM2.5	12Sep23, 17:00	419612	1-hr	81	81.5	exc
Barge Landing	PM2.5	12Sep23, 17:00	419616	1-hr	101	101.2	exc
Ft. McKay S	PM2.5	12Sep23, 17:00	419613	1-hr	114	114.3	exc
Wapasu	PM2.5	12Sep23, 17:00	419614	1-hr	85	85.2	exc



<u>Site</u>	<u>Parameter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Fort Hills	PM2.5	12Sep23, 17:00	419288	1-hr	91	90.8	exc
Ells River	PM2.5	12Sep23, 17:00	419289	1-hr	124	124.3	exc
Bertha Ganter	PM2.5	12Sep23, 18:00	419615	1-hr	146	145.6	exc
Buffalo Viewpoint	PM2.5	12Sep23, 18:00	419611	1-hr	222	221.6	exc
Patricia McInnes	PM2.5	12Sep23, 18:00	419610	1-hr	144	144.0	exc
Athabasca Valley	PM2.5	12Sep23, 18:00	419612	1-hr	105	105.1	exc
Fort Chip	PM2.5	12Sep23, 18:00	419617	1-hr	103	103.1	exc
Barge Landing	PM2.5	12Sep23, 18:00	419616	1-hr	147	146.5	exc
Ft. McKay S	PM2.5	12Sep23, 18:00	419613	1-hr	165	164.8	exc
Fort Hills	PM2.5	12Sep23, 18:00	419288	1-hr	135	134.8	exc
Ells River	PM2.5	12Sep23, 18:00	419289	1-hr	139	138.6	exc
Bertha Ganter	PM2.5	12Sep23, 19:00	419615	1-hr	147	147.3	exc
Buffalo Viewpoint	PM2.5	12Sep23, 19:00	419611	1-hr	226	225.7	exc
Patricia McInnes	PM2.5	12Sep23, 19:00	419610	1-hr	187	186.7	exc
Athabasca Valley	PM2.5	12Sep23, 19:00	419612	1-hr	146	146.2	exc
Fort Chip	PM2.5	12Sep23, 19:00	419617	1-hr	124	123.7	exc
Barge Landing	PM2.5	12Sep23, 19:00	419616	1-hr	148	147.9	exc
Ft. McKay S	PM2.5	12Sep23, 19:00	419613	1-hr	172	172.0	exc
Wapasu	PM2.5	12Sep23, 19:00	419614	1-hr	91	91.5	exc
Fort Hills	PM2.5	12Sep23, 19:00	419288	1-hr	118	118.2	exc
Ells River	PM2.5	12Sep23, 19:00	419289	1-hr	136	135.7	exc
Bertha Ganter	PM2.5	12Sep23, 20:00	419615	1-hr	165	165.2	exc
Buffalo Viewpoint	PM2.5	12Sep23, 20:00	419611	1-hr	217	217.4	exc
Patricia McInnes	PM2.5	12Sep23, 20:00	419610	1-hr	209	208.6	exc
Athabasca Valley	PM2.5	12Sep23, 20:00	419612	1-hr	141	141.2	exc
Fort Chip	PM2.5	12Sep23, 20:00	419617	1-hr	127	127.3	exc
Barge Landing	PM2.5	12Sep23, 20:00	419616	1-hr	161	161.1	exc
Ft. McKay S	PM2.5	12Sep23, 20:00	419613	1-hr	196	196.2	exc
Wapasu	PM2.5	12Sep23, 20:00	419614	1-hr	112	112.2	exc
Fort Hills	PM2.5	12Sep23, 20:00	419288	1-hr	135	134.8	exc
Ells River	PM2.5	12Sep23, 20:00	419289	1-hr	155	155.0	exc
Bertha Ganter	PM2.5	12Sep23, 21:00	419615	1-hr	181	180.8	exc
Buffalo Viewpoint	PM2.5	12Sep23, 21:00	419611	1-hr	219	218.6	exc
Patricia McInnes	PM2.5	12Sep23, 21:00	419610	1-hr	201	200.6	exc
Athabasca Valley	PM2.5	12Sep23, 21:00	419612	1-hr	157	157.1	exc
Fort Chip	PM2.5	12Sep23, 21:00	419617	1-hr	149	148.8	exc
Barge Landing	PM2.5	12Sep23, 21:00	419616	1-hr	180	179.9	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Ft. McKay S	PM2.5	12Sep23, 21:00	419613	1-hr	198	198.3	exc
Anzac	PM2.5	12Sep23, 21:00	419618	1-hr	166	165.5	exc
Wapasu	PM2.5	12Sep23, 21:00	419614	1-hr	154	154.2	exc
Fort Hills	PM2.5	12Sep23, 21:00	419288	1-hr	143	142.9	exc
Surmont 2	PM2.5	12Sep23, 21:00	419619	1-hr	130	130.0	exc
Ells River	PM2.5	12Sep23, 21:00	419289	1-hr	168	167.9	exc
Bertha Ganter	PM2.5	12Sep23, 22:00	419615	1-hr	186	186.3	exc
Buffalo Viewpoint	PM2.5	12Sep23, 22:00	419611	1-hr	216	216.1	exc
Patricia McInnes	PM2.5	12Sep23, 22:00	419610	1-hr	196	196.4	exc
Athabasca Valley	PM2.5	12Sep23, 22:00	419612	1-hr	142	141.9	exc
Fort Chip	PM2.5	12Sep23, 22:00	419617	1-hr	148	147.8	exc
Barge Landing	PM2.5	12Sep23, 22:00	419616	1-hr	186	185.5	exc
Ft. McKay S	PM2.5	12Sep23, 22:00	419613	1-hr	201	201.3	exc
Anzac	PM2.5	12Sep23, 22:00	419618	1-hr	205	204.8	exc
Stony Mtn.	PM2.5	12Sep23, 22:00	419622	1-hr	145	145.3	exc
Fort Hills	PM2.5	12Sep23, 22:00	419288	1-hr	158	158.4	exc
Surmont 2	PM2.5	12Sep23, 22:00	419619	1-hr	182	182.2	exc
Ells River	PM2.5	12Sep23, 22:00	419289	1-hr	177	177.0	exc
Wapasu	PM2.5	12Sep23, 22:00	419614	1-hr	188	187.5	exc
Bertha Ganter	PM2.5	12Sep23, 23:00	419615	1-hr	193	192.7	exc
Buffalo Viewpoint	PM2.5	12Sep23, 23:00	419611	1-hr	216	216.4	exc
Patricia McInnes	PM2.5	12Sep23, 23:00	419610	1-hr	192	192.1	exc
Athabasca Valley	PM2.5	12Sep23, 23:00	419612	1-hr	164	163.8	exc
Fort Chip	PM2.5	12Sep23, 23:00	419617	1-hr	127	126.6	exc
Barge Landing	PM2.5	12Sep23, 23:00	419616	1-hr	192	192.2	exc
Ft. McKay S	PM2.5	12Sep23, 23:00	419613	1-hr	196	196.2	exc
Anzac	PM2.5	12Sep23, 23:00	419618	1-hr	194	194.3	exc
Wapasu	PM2.5	12Sep23, 23:00	419614	1-hr	186	186.0	exc
Stony Mtn.	PM2.5	12Sep23, 23:00	419622	1-hr	167	167.0	exc
Fort Hills	PM2.5	12Sep23, 23:00	419288	1-hr	166	165.9	exc
Surmont 2	PM2.5	12Sep23, 23:00	419619	1-hr	162	162.2	exc
Ells River	PM2.5	12Sep23, 23:00	419289	1-hr	190	190.0	exc
Bertha Ganter	PM2.5	12Sep23, 24:00	419615	1-hr	194	193.7	exc
Buffalo Viewpoint	PM2.5	12Sep23, 24:00	419611	1-hr	220	219.8	exc
Buffalo Viewpoint	PM2.5	12Sep23, 24:00	419611	24-hr	88	87.8	exc
Patricia McInnes	PM2.5	12Sep23, 24:00	419610	1-hr	192	191.9	exc
Patricia McInnes	PM2.5	12Sep23, 24:00	419610	24-hr	82	82.0	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Athabasca Valley	PM2.5	12Sep23, 24:00	419612	1-hr	182	182.4	exc
Athabasca Valley	PM2.5	12Sep23, 24:00	419612	24-hr	64	63.9	exc
Fort Chip	PM2.5	12Sep23, 24:00	419617	1-hr	136	136.2	exc
Barge Landing	PM2.5	12Sep23, 24:00	419616	1-hr	197	196.7	exc
Ft. McKay S	PM2.5	12Sep23, 24:00	419613	1-hr	197	196.8	exc
Ft. McKay S	PM2.5	12Sep23, 24:00	419613	24-hr	82	82.5	exc
Anzac	PM2.5	12Sep23, 24:00	419618	1-hr	185	185.0	exc
Anzac	PM2.5	12Sep23, 24:00	419618	24-hr	45	44.8	exc
Wapasu	PM2.5	12Sep23, 24:00	419614	1-hr	190	190.4	exc
Wapasu	PM2.5	12Sep23, 24:00	419614	24-hr	64	64.3	exc
Stony Mtn.	PM2.5	12Sep23, 24:00	419622	1-hr	156	156.3	exc
Stony Mtn.	PM2.5	12Sep23, 24:00	419622	24-hr	34	34.1	exc
Fort Hills	PM2.5	12Sep23, 24:00	419288	1-hr	189	188.6	exc
Fort Hills	PM2.5	12Sep23, 24:00	419288	24-hr	76	76.2	exc
Surmont 2	PM2.5	12Sep23, 24:00	419619	1-hr	176	176.2	exc
Surmont 2	PM2.5	12Sep23, 24:00	419619	24-hr	38	38.1	exc
Ells River	PM2.5	12Sep23, 24:00	419289	1-hr	187	186.8	exc
Ells River	PM2.5	12Sep23, 24:00	419289	24-hr	75	74.9	exc
Bertha Ganter	PM2.5	12Sep23, 24:00	419615	24-hr	75	74.7	exc
Fort Chip	PM2.5	12Sep23, 24:00	419617	24-hr	62	62.4	exc
Barge Landing	PM2.5	12Sep23, 24:00	419616	24-hr	76	75.6	exc
Bertha Ganter	PM2.5	13Sep23, 01:00	419615	1-hr	194	194.3	exc
Buffalo Viewpoint	PM2.5	13Sep23, 01:00	419611	1-hr	215	215.2	exc
Patricia McInnes	PM2.5	13Sep23, 01:00	419610	1-hr	201	201.1	exc
Athabasca Valley	PM2.5	13Sep23, 01:00	419612	1-hr	197	196.8	exc
Fort Chip	PM2.5	13Sep23, 01:00	419617	1-hr	138	138.3	exc
Barge Landing	PM2.5	13Sep23, 01:00	419616	1-hr	200	199.8	exc
Ft. McKay S	PM2.5	13Sep23, 01:00	419613	1-hr	197	196.6	exc
Anzac	PM2.5	13Sep23, 01:00	419618	1-hr	195	195.1	exc
Wapasu	PM2.5	13Sep23, 01:00	419614	1-hr	196	195.8	exc
Stony Mtn.	PM2.5	13Sep23, 01:00	419622	1-hr	193	193.4	exc
Janvier	PM2.5	13Sep23, 01:00	419623	1-hr	97	96.9	exc
Fort Hills	PM2.5	13Sep23, 01:00	419353	1-hr	211	211.3	exc
Surmont 2	PM2.5	13Sep23, 01:00	419619	1-hr	173	172.9	exc
Ells River	PM2.5	13Sep23, 01:00	419354	1-hr	185	184.6	exc
Bertha Ganter	PM2.5	13Sep23, 02:00	419615	1-hr	196	196.2	exc
Buffalo Viewpoint	PM2.5	13Sep23, 02:00	419611	1-hr	217	217.4	exc
Patricia McInnes	PM2.5	13Sep23, 02:00	419610	1-hr	203	202.9	exc
Athabasca Valley	PM2.5	13Sep23, 02:00	419612	1-hr	201	200.9	exc
Fort Chip	PM2.5	13Sep23, 02:00	419617	1-hr	148	147.6	exc
Barge Landing	PM2.5	13Sep23, 02:00	419616	1-hr	198	198.3	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Ft. McKay S	PM2.5	13Sep23, 02:00	419613	1-hr	193	192.5	exc
Anzac	PM2.5	13Sep23, 02:00	419618	1-hr	214	214.3	exc
Wapasu	PM2.5	13Sep23, 02:00	419614	1-hr	194	194.4	exc
Stony Mtn.	PM2.5	13Sep23, 02:00	419622	1-hr	173	173.0	exc
Conklin	PM2.5	13Sep23, 02:00	419624	1-hr	94	93.9	exc
Janvier	PM2.5	13Sep23, 02:00	419623	1-hr	134	133.6	exc
Fort Hills	PM2.5	13Sep23, 02:00	419353	1-hr	181	181.2	exc
Surmont 2	PM2.5	13Sep23, 02:00	419619	1-hr	180	179.9	exc
Ells River	PM2.5	13Sep23, 02:00	419354	1-hr	186	186.3	exc
Bertha Ganter	PM2.5	13Sep23, 03:00	419615	1-hr	192	192.3	exc
Buffalo Viewpoint	PM2.5	13Sep23, 03:00	419611	1-hr	229	228.5	exc
Patricia McInnes	PM2.5	13Sep23, 03:00	419610	1-hr	209	209.0	exc
Athabasca Valley	PM2.5	13Sep23, 03:00	419612	1-hr	209	209.3	exc
Fort Chip	PM2.5	13Sep23, 03:00	419617	1-hr	135	134.6	exc
Barge Landing	PM2.5	13Sep23, 03:00	419616	1-hr	199	199.1	exc
Ft. McKay S	PM2.5	13Sep23, 03:00	419613	1-hr	195	194.6	exc
Anzac	PM2.5	13Sep23, 03:00	419618	1-hr	215	215.1	exc
Wapasu	PM2.5	13Sep23, 03:00	419614	1-hr	193	193.0	exc
Stony Mtn.	PM2.5	13Sep23, 03:00	419622	1-hr	106	105.9	exc
Conklin	PM2.5	13Sep23, 03:00	419624	1-hr	129	128.6	exc
Janvier	PM2.5	13Sep23, 03:00	419623	1-hr	138	138.3	exc
Fort Hills	PM2.5	13Sep23, 03:00	419353	1-hr	187	186.6	exc
Surmont 2	PM2.5	13Sep23, 03:00	419619	1-hr	177	177.2	exc
Ells River	PM2.5	13Sep23, 03:00	419354	1-hr	185	184.5	exc
Bertha Ganter	PM2.5	13Sep23, 04:00	419615	1-hr	197	197.1	exc
Buffalo Viewpoint	PM2.5	13Sep23, 04:00	419611	1-hr	226	225.6	exc
Patricia McInnes	PM2.5	13Sep23, 04:00	419610	1-hr	210	210.3	exc
Athabasca Valley	PM2.5	13Sep23, 04:00	419612	1-hr	218	218.1	exc
Fort Chip	PM2.5	13Sep23, 04:00	419617	1-hr	135	135.5	exc
Barge Landing	PM2.5	13Sep23, 04:00	419616	1-hr	200	199.9	exc
Ft. McKay S	PM2.5	13Sep23, 04:00	419613	1-hr	192	191.8	exc
Anzac	PM2.5	13Sep23, 04:00	419618	1-hr	207	206.9	exc
Wapasu	PM2.5	13Sep23, 04:00	419614	1-hr	197	197.5	exc
Stony Mtn.	PM2.5	13Sep23, 04:00	419622	1-hr	91	90.8	exc
Conklin	PM2.5	13Sep23, 04:00	419624	1-hr	136	135.8	exc
Janvier	PM2.5	13Sep23, 04:00	419623	1-hr	125	125.1	exc



<u>Site</u>	<u>Parameter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Fort Hills	PM2.5	13Sep23, 04:00	419353	1-hr	187	187.3	exc
Surmont 2	PM2.5	13Sep23, 04:00	419619	1-hr	178	178.4	exc
Ells River	PM2.5	13Sep23, 04:00	419354	1-hr	187	187.4	exc
Bertha Ganter	PM2.5	13Sep23, 05:00	419615	1-hr	208	207.7	exc
Buffalo Viewpoint	PM2.5	13Sep23, 05:00	419611	1-hr	227	226.7	exc
Patricia McInnes	PM2.5	13Sep23, 05:00	419610	1-hr	218	218.3	exc
Athabasca Valley	PM2.5	13Sep23, 05:00	419612	1-hr	217	217.1	exc
Fort Chip	PM2.5	13Sep23, 05:00	419617	1-hr	138	137.6	exc
Barge Landing	PM2.5	13Sep23, 05:00	419616	1-hr	213	213.4	exc
Ft. McKay S	PM2.5	13Sep23, 05:00	419613	1-hr	197	197.4	exc
Anzac	PM2.5	13Sep23, 05:00	419618	1-hr	178	177.6	exc
Wapasu	PM2.5	13Sep23, 05:00	419614	1-hr	208	208.0	exc
Stony Mtn.	PM2.5	13Sep23, 05:00	419622	1-hr	80	80.3	exc
Conklin	PM2.5	13Sep23, 05:00	419624	1-hr	118	118.2	exc
Janvier	PM2.5	13Sep23, 05:00	419623	1-hr	129	128.6	exc
Fort Hills	PM2.5	13Sep23, 05:00	419353	1-hr	181	180.6	exc
Surmont 2	PM2.5	13Sep23, 05:00	419619	1-hr	171	171.5	exc
Ells River	PM2.5	13Sep23, 05:00	419354	1-hr	193	192.8	exc
Bertha Ganter	PM2.5	13Sep23, 06:00	419615	1-hr	218	218.0	exc
Buffalo Viewpoint	PM2.5	13Sep23, 06:00	419611	1-hr	234	233.7	exc
Patricia McInnes	PM2.5	13Sep23, 06:00	419610	1-hr	216	216.0	exc
Athabasca Valley	PM2.5	13Sep23, 06:00	419612	1-hr	195	195.1	exc
Fort Chip	PM2.5	13Sep23, 06:00	419617	1-hr	157	156.8	exc
Barge Landing	PM2.5	13Sep23, 06:00	419616	1-hr	227	227.3	exc
Ft. McKay S	PM2.5	13Sep23, 06:00	419613	1-hr	207	206.6	exc
Anzac	PM2.5	13Sep23, 06:00	419618	1-hr	136	136.3	exc
Wapasu	PM2.5	13Sep23, 06:00	419614	1-hr	216	215.8	exc
Janvier	PM2.5	13Sep23, 06:00	419623	1-hr	117	117.5	exc
Fort Hills	PM2.5	13Sep23, 06:00	419353	1-hr	179	179.4	exc
Surmont 2	PM2.5	13Sep23, 06:00	419619	1-hr	160	159.9	exc
Ells River	PM2.5	13Sep23, 06:00	419354	1-hr	203	203.2	exc
Bertha Ganter	PM2.5	13Sep23, 07:00	419615	1-hr	229	229.1	exc
Buffalo Viewpoint	PM2.5	13Sep23, 07:00	419611	1-hr	227	227.1	exc
Patricia McInnes	PM2.5	13Sep23, 07:00	419610	1-hr	200	200.3	exc
Athabasca Valley	PM2.5	13Sep23, 07:00	419612	1-hr	182	182.4	exc
Fort Chip	PM2.5	13Sep23, 07:00	419617	1-hr	168	167.9	exc
Barge Landing	PM2.5	13Sep23, 07:00	419616	1-hr	232	232.5	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Ft. McKay S	PM2.5	13Sep23, 07:00	419613	1-hr	211	210.7	exc
Anzac	PM2.5	13Sep23, 07:00	419618	1-hr	132	131.8	exc
Wapasu	PM2.5	13Sep23, 07:00	419614	1-hr	219	218.6	exc
Janvier	PM2.5	13Sep23, 07:00	419623	1-hr	103	103.4	exc
Fort Hills	PM2.5	13Sep23, 07:00	419353	1-hr	183	183.3	exc
Surmont 2	PM2.5	13Sep23, 07:00	419619	1-hr	114	114.1	exc
Ells River	PM2.5	13Sep23, 07:00	419354	1-hr	202	201.8	exc
Bertha Ganter	PM2.5	13Sep23, 08:00	419615	1-hr	224	223.8	exc
Patricia McInnes	PM2.5	13Sep23, 08:00	419610	1-hr	166	166.1	exc
Athabasca Valley	PM2.5	13Sep23, 08:00	419612	1-hr	166	165.7	exc
Fort Chip	PM2.5	13Sep23, 08:00	419617	1-hr	175	174.7	exc
Barge Landing	PM2.5	13Sep23, 08:00	419616	1-hr	221	220.6	exc
Ft. McKay S	PM2.5	13Sep23, 08:00	419613	1-hr	203	203.0	exc
Wapasu	PM2.5	13Sep23, 08:00	419614	1-hr	208	208.3	exc
Janvier	PM2.5	13Sep23, 08:00	419623	1-hr	86	86.0	exc
Fort Hills	PM2.5	13Sep23, 08:00	419353	1-hr	176	176.2	exc
Surmont 2	PM2.5	13Sep23, 08:00	419619	1-hr	81	80.6	exc
Ells River	PM2.5	13Sep23, 08:00	419354	1-hr	195	194.8	exc
Bertha Ganter	PM2.5	13Sep23, 09:00	419615	1-hr	175	174.5	exc
Patricia McInnes	PM2.5	13Sep23, 09:00	419610	1-hr	102	102.1	exc
Athabasca Valley	PM2.5	13Sep23, 09:00	419612	1-hr	142	142.2	exc
Fort Chip	PM2.5	13Sep23, 09:00	419617	1-hr	181	181.1	exc
Barge Landing	PM2.5	13Sep23, 09:00	419616	1-hr	172	172.0	exc
Ft. McKay S	PM2.5	13Sep23, 09:00	419613	1-hr	195	195.4	exc
Wapasu	PM2.5	13Sep23, 09:00	419614	1-hr	170	170.0	exc
Fort Hills	PM2.5	13Sep23, 09:00	419353	1-hr	164	163.6	exc
Ells River	PM2.5	13Sep23, 09:00	419354	1-hr	163	163.1	exc
Bertha Ganter	PM2.5	13Sep23, 10:00	419615	1-hr	96	95.6	exc
Athabasca Valley	PM2.5	13Sep23, 10:00	419612	1-hr	81	80.6	exc
Fort Chip	PM2.5	13Sep23, 10:00	419617	1-hr	175	175.0	exc
Barge Landing	PM2.5	13Sep23, 10:00	419616	1-hr	106	106.5	exc
Ft. McKay S	PM2.5	13Sep23, 10:00	419613	1-hr	105	105.3	exc
Wapasu	PM2.5	13Sep23, 10:00	419614	1-hr	107	107.2	exc
Fort Hills	PM2.5	13Sep23, 10:00	419353	1-hr	128	127.5	exc
Ells River	PM2.5	13Sep23, 10:00	419354	1-hr	117	116.9	exc
Fort Chip	PM2.5	13Sep23, 11:00	419617	1-hr	171	171.0	exc
Fort Chip	PM2.5	13Sep23, 12:00	419617	1-hr	154	153.5	exc



<u>Site</u>	<u>Parameter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Fort Chip	PM2.5	13Sep23, 13:00	419617	1-hr	136	135.8	exc
Fort Chip	PM2.5	13Sep23, 14:00	419617	1-hr	118	117.9	exc
Fort Chip	PM2.5	13Sep23, 15:00	419617	1-hr	108	108.3	exc
Fort Chip	PM2.5	13Sep23, 16:00	419617	1-hr	103	102.9	exc
Fort Chip	PM2.5	13Sep23, 17:00	419617	1-hr	95	95.5	exc
Fort Chip	PM2.5	13Sep23, 18:00	419617	1-hr	92	91.6	exc
Fort Chip	PM2.5	13Sep23, 19:00	419617	1-hr	91	90.9	exc
Fort Chip	PM2.5	13Sep23, 20:00	419617	1-hr	96	95.6	exc
Fort Chip	PM2.5	13Sep23, 21:00	419617	1-hr	93	93.4	exc
Fort Chip	PM2.5	13Sep23, 22:00	419617	1-hr	281	281.1	exc
Fort Chip	PM2.5	13Sep23, 23:00	419617	1-hr	178	177.9	exc
Bertha Ganter	PM2.5	13Sep23, 24:00	419615	24-hr	92	92.4	exc
Buffalo Viewpoint	PM2.5	13Sep23, 24:00	419611	24-hr	92	90.6	exc
Patricia McInnes	PM2.5	13Sep23, 24:00	419610	24-hr	85	85.3	exc
Athabasca Valley	PM2.5	13Sep23, 24:00	419612	24-hr	85	85.0	exc
Fort Chip	PM2.5	13Sep23, 24:00	419617	1-hr	112	111.8	exc
Fort Chip	PM2.5	13Sep23, 24:00	419617	24-hr	141	140.7	exc
Barge Landing	PM2.5	13Sep23, 24:00	419616	24-hr	95	95.1	exc
Ft. McKay S	PM2.5	13Sep23, 24:00	419613	24-hr	92	91.9	exc
Anzac	PM2.5	13Sep23, 24:00	419618	24-hr	69	68.5	exc
Wapasu	PM2.5	13Sep23, 24:00	419614	24-hr	96	95.7	exc
Stony Mtn.	PM2.5	13Sep23, 24:00	419622	24-hr	46	46.3	exc
Conklin	PM2.5	13Sep23, 24:00	419624	24-hr	43	43.0	exc
Janvier	PM2.5	13Sep23, 24:00	419623	24-hr	51	50.7	exc
Fort Hills	PM2.5	13Sep23, 24:00	419353	24-hr	91	90.9	exc
Surmont 2	PM2.5	13Sep23, 24:00	419619	24-hr	64	64.2	exc
Ells River	PM2.5	13Sep23, 24:00	419354	24-hr	90	89.6	exc
Fort Chip	PM2.5	14Sep23, 01:00	419617	1-hr	92	91.8	exc
Fort Chip	PM2.5	14Sep23, 02:00	419617	1-hr	89	88.8	exc
Fort Chip	PM2.5	14Sep23, 03:00	419617	1-hr	106	105.8	exc
Fort Chip	PM2.5	14Sep23, 04:00	419617	1-hr	146	145.8	exc
Fort Chip	PM2.5	14Sep23, 05:00	419617	1-hr	268	268.4	exc
Fort Chip	PM2.5	14Sep23, 06:00	419617	1-hr	244	244.4	exc
Fort Chip	PM2.5	14Sep23, 07:00	419617	1-hr	163	162.5	exc
Fort Chip	PM2.5	14Sep23, 08:00	419617	1-hr	192	192.3	exc
Fort Chip	PM2.5	14Sep23, 09:00	419617	1-hr	251	251.0	exc
Fort Chip	PM2.5	14Sep23, 10:00	419617	1-hr	274	273.8	exc
Fort Chip	PM2.5	14Sep23, 11:00	419617	1-hr	216	215.6	exc
Wapasu	PM2.5	14Sep23, 11:00	419614	1-hr	85	85.2	exc
Fort Hills	PM2.5	14Sep23, 11:00	419412	1-hr	84	84.3	exc
Ells River	PM2.5	14Sep23, 11:00	419413	1-hr	83	83.1	exc
Fort Chip	PM2.5	14Sep23, 12:00	419617	1-hr	166	166.4	exc
Wapasu	PM2.5	14Sep23, 12:00	419614	1-hr	148	147.7	exc
Fort Hills	PM2.5	14Sep23, 12:00	419412	1-hr	104	104.0	exc
Ells River	PM2.5	14Sep23, 12:00	419413	1-hr	91	90.5	exc
Barge Landing	PM2.5	14Sep23, 12:00	419616	1-hr	94	94.5	exc
Ft. McKay S	PM2.5	14Sep23, 12:00	419613	1-hr	88	88.1	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Fort Chip	PM2.5	14Sep23, 13:00	419617	1-hr	144	143.7	exc
Ft. McKay S	PM2.5	14Sep23, 13:00	419613	1-hr	88	87.5	exc
Wapasu	PM2.5	14Sep23, 13:00	419614	1-hr	134	133.6	exc
Barge Landing	PM2.5	14Sep23, 13:00	419616	1-hr	86	85.8	exc
Fort Chip	PM2.5	14Sep23, 14:00	419617	1-hr	136	135.9	exc
Wapasu	PM2.5	14Sep23, 14:00	419614	1-hr	108	108.0	exc
Fort Chip	PM2.5	14Sep23, 15:00	419617	1-hr	178	177.5	exc
Wapasu	PM2.5	14Sep23, 15:00	419614	1-hr	91	90.7	exc
Fort Chip	PM2.5	14Sep23, 16:00	419617	1-hr	152	152.4	exc
Fort Chip	PM2.5	14Sep23, 17:00	419617	1-hr	127	127.5	exc
Fort Chip	PM2.5	14Sep23, 18:00	419617	1-hr	124	124.4	exc
Fort Chip	PM2.5	14Sep23, 19:00	419617	1-hr	127	126.8	exc
Fort Chip	PM2.5	14Sep23, 20:00	419617	1-hr	129	129.4	exc
Fort Chip	PM2.5	14Sep23, 21:00	419617	1-hr	133	133.1	exc
Fort Chip	PM2.5	14Sep23, 22:00	419617	1-hr	141	140.5	exc
Fort Chip	PM2.5	14Sep23, 23:00	419617	1-hr	142	141.6	exc
Buffalo Viewpoint	PM2.5	14Sep23, 24:00	419611	24-hr	35	35.3	exc
Patricia McInnes	PM2.5	14Sep23, 24:00	419610	24-hr	32	31.9	exc
Fort Chip	PM2.5	14Sep23, 24:00	419617	1-hr	144	144.0	exc
Fort Chip	PM2.5	14Sep23, 24:00	419617	24-hr	162	161.8	exc
Fort Hills	PM2.5	14Sep23, 24:00	419412	24-hr	37	37.5	exc
Ells River	PM2.5	14Sep23, 24:00	419413	24-hr	31	30.7	exc
Barge Landing	PM2.5	14Sep23, 24:00	419616	24-hr	31	31.2	exc
Ft. McKay S	PM2.5	14Sep23, 24:00	419613	24-hr	32	31.5	exc
Wapasu	PM2.5	14Sep23, 24:00	419614	24-hr	50	50.5	exc
Fort Chip	PM2.5	15Sep23, 01:00	419617	1-hr	140	139.6	exc
Fort Chip	PM2.5	15Sep23, 02:00	419617	1-hr	141	140.9	exc
Fort Chip	PM2.5	15Sep23, 03:00	419617	1-hr	136	135.6	exc
Fort Chip	PM2.5	15Sep23, 04:00	419617	1-hr	108	108.3	exc
Fort Chip	PM2.5	15Sep23, 24:00	419617	24-hr	47	47.4	exc
Fort Chip	PM2.5	16Sep23, 07:00	419617	1-hr	127	127.0	exc
Fort Chip	PM2.5	16Sep23, 08:00	419617	1-hr	172	171.7	exc
Fort Chip	PM2.5	16Sep23, 09:00	419617	1-hr	156	156.4	exc
Fort Chip	PM2.5	16Sep23, 10:00	419617	1-hr	165	165.2	exc
Buffalo Viewpoint	PM2.5	16Sep23, 11:00	419611	1-hr	86	85.9	exc
Fort Chip	PM2.5	16Sep23, 11:00	419617	1-hr	176	176.0	exc
Wapasu	PM2.5	16Sep23, 11:00	419614	1-hr	80	80.5	exc
Bertha Ganter	PM2.5	16Sep23, 12:00	419615	1-hr	82	81.7	exc
Buffalo Viewpoint	PM2.5	16Sep23, 12:00	419611	1-hr	149	149.1	exc
Fort Chip	PM2.5	16Sep23, 12:00	419617	1-hr	161	161.3	exc
Barge Landing	PM2.5	16Sep23, 12:00	419616	1-hr	95	94.6	exc
Wapasu	PM2.5	16Sep23, 12:00	419614	1-hr	133	133.2	exc
Fort Hills	PM2.5	16Sep23, 12:00	419514	1-hr	93	93.0	exc
Ells River	PM2.5	16Sep23, 12:00	419515	1-hr	88	88.1	exc
Ft. McKay S	PM2.5	16Sep23, 12:00	419613	1-hr	117	116.5	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Bertha Ganter	PM2.5	16Sep23, 13:00	419615	1-hr	150	150.3	exc
Buffalo Viewpoint	PM2.5	16Sep23, 13:00	419611	1-hr	113	113.0	exc
Fort Chip	PM2.5	16Sep23, 13:00	419617	1-hr	152	151.7	exc
Barge Landing	PM2.5	16Sep23, 13:00	419616	1-hr	152	151.8	exc
Wapasu	PM2.5	16Sep23, 13:00	419614	1-hr	194	194.1	exc
Fort Hills	PM2.5	16Sep23, 13:00	419514	1-hr	111	110.8	exc
Ells River	PM2.5	16Sep23, 13:00	419515	1-hr	132	132.1	exc
Ft. McKay S	PM2.5	16Sep23, 13:00	419613	1-hr	220	219.5	exc
Bertha Ganter	PM2.5	16Sep23, 14:00	419615	1-hr	146	146.4	exc
Buffalo Viewpoint	PM2.5	16Sep23, 14:00	419611	1-hr	88	87.9	exc
Patricia McInnes	PM2.5	16Sep23, 14:00	419610	1-hr	88	87.9	exc
Fort Chip	PM2.5	16Sep23, 14:00	419617	1-hr	186	185.8	exc
Barge Landing	PM2.5	16Sep23, 14:00	419616	1-hr	179	179.0	exc
Wapasu	PM2.5	16Sep23, 14:00	419614	1-hr	133	132.7	exc
Fort Hills	PM2.5	16Sep23, 14:00	419514	1-hr	140	139.6	exc
Ft. McKay S	PM2.5	16Sep23, 14:00	419613	1-hr	147	146.8	exc
Ells River	PM2.5	16Sep23, 14:00	419515	1-hr	125	125.0	exc
Buffalo Viewpoint	PM2.5	16Sep23, 15:00	419611	1-hr	84	84.3	exc
Barge Landing	PM2.5	16Sep23, 15:00	419616	1-hr	93	92.6	exc
Ft. McKay S	PM2.5	16Sep23, 15:00	419613	1-hr	87	86.7	exc
Wapasu	PM2.5	16Sep23, 15:00	419614	1-hr	129	129.2	exc
Stony Mtn.	PM2.5	16Sep23, 15:00	419622	1-hr	108	107.8	exc
Conklin	PM2.5	16Sep23, 15:00	419624	1-hr	105	105.4	exc
Fort Hills	PM2.5	16Sep23, 15:00	419514	1-hr	80	80.4	exc
Ells River	PM2.5	16Sep23, 15:00	419515	1-hr	83	82.8	exc
Fort Chip	PM2.5	16Sep23, 16:00	419617	1-hr	198	198.4	exc
Wapasu	PM2.5	16Sep23, 16:00	419614	1-hr	81	80.9	exc
Stony Mtn.	PM2.5	16Sep23, 16:00	419622	1-hr	119	119.2	exc
Conklin	PM2.5	16Sep23, 16:00	419624	1-hr	124	123.6	exc
Fort Hills	PM2.5	16Sep23, 16:00	419514	1-hr	94	93.7	exc
Fort Chip	PM2.5	16Sep23, 17:00	419617	1-hr	232	232.3	exc
Stony Mtn.	PM2.5	16Sep23, 17:00	419622	1-hr	114	114.0	exc
Conklin	PM2.5	16Sep23, 17:00	419624	1-hr	128	128.1	exc
Fort Chip	PM2.5	16Sep23, 18:00	419617	1-hr	285	284.6	exc
Stony Mtn.	PM2.5	16Sep23, 18:00	419622	1-hr	109	109.4	exc
Conklin	PM2.5	16Sep23, 18:00	419624	1-hr	216	216.0	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Surmont 2	PM2.5	16Sep23, 18:00	419619	1-hr	92	92.1	exc
Fort Chip	PM2.5	16Sep23, 19:00	419617	1-hr	350	350.5	exc
Stony Mtn.	PM2.5	16Sep23, 19:00	419622	1-hr	99	98.9	exc
Conklin	PM2.5	16Sep23, 19:00	419624	1-hr	146	145.7	exc
Patricia McInnes	PM2.5	16Sep23, 20:00	419610	1-hr	84	83.7	exc
Fort Chip	PM2.5	16Sep23, 20:00	419617	1-hr	367	367.3	exc
Ft. McKay S	PM2.5	16Sep23, 20:00	419613	1-hr	92	91.9	exc
Conklin	PM2.5	16Sep23, 20:00	419624	1-hr	136	136.4	exc
Patricia McInnes	PM2.5	16Sep23, 21:00	419610	1-hr	82	81.7	exc
Fort Chip	PM2.5	16Sep23, 21:00	419617	1-hr	377	376.8	exc
Ft. McKay S	PM2.5	16Sep23, 21:00	419613	1-hr	93	92.8	exc
Conklin	PM2.5	16Sep23, 21:00	419624	1-hr	129	128.6	exc
Janvier	PM2.5	16Sep23, 21:00	419623	1-hr	82	82.0	exc
Patricia McInnes	PM2.5	16Sep23, 22:00	419610	1-hr	86	86.3	exc
Fort Chip	PM2.5	16Sep23, 22:00	419617	1-hr	365	364.8	exc
Conklin	PM2.5	16Sep23, 22:00	419624	1-hr	101	101.4	exc
Janvier	PM2.5	16Sep23, 22:00	419623	1-hr	83	83.2	exc
Patricia McInnes	PM2.5	16Sep23, 23:00	419610	1-hr	87	87.5	exc
Fort Chip	PM2.5	16Sep23, 23:00	419617	1-hr	336	335.9	exc
Conklin	PM2.5	16Sep23, 23:00	419624	1-hr	89	88.8	exc
Janvier	PM2.5	16Sep23, 23:00	419623	1-hr	84	84.1	exc
Fort Hills	PM2.5	16Sep23, 23:00	419514	1-hr	105	104.6	exc
Bertha Ganter	PM2.5	16Sep23, 24:00	419615	24-hr	58	58.0	exc
Buffalo Viewpoint	PM2.5	16Sep23, 24:00	419611	24-hr	60	60.1	exc
Patricia McInnes	PM2.5	16Sep23, 24:00	419610	1-hr	87	86.8	exc
Patricia McInnes	PM2.5	16Sep23, 24:00	419610	24-hr	57	57.3	exc
Athabasca Valley	PM2.5	16Sep23, 24:00	419612	24-hr	43	43.3	exc
Fort Chip	PM2.5	16Sep23, 24:00	419617	1-hr	339	338.9	exc
Fort Chip	PM2.5	16Sep23, 24:00	419617	24-hr	189	190.2	exc
Ft. McKay S	PM2.5	16Sep23, 24:00	419613	1-hr	86	86.0	exc
Stony Mtn.	PM2.5	16Sep23, 24:00	419622	24-hr	56	55.7	exc
Conklin	PM2.5	16Sep23, 24:00	419624	1-hr	82	81.6	exc
Conklin	PM2.5	16Sep23, 24:00	419624	24-hr	69	69.0	exc
Janvier	PM2.5	16Sep23, 24:00	419623	1-hr	81	80.8	exc
Janvier	PM2.5	16Sep23, 24:00	419623	24-hr	42	42.0	exc
Fort Hills	PM2.5	16Sep23, 24:00	419514	24-hr	60	60.4	exc
Barge Landing	PM2.5	16Sep23, 24:00	419616	24-hr	64	63.7	exc
Ft. McKay S	PM2.5	16Sep23, 24:00	419613	24-hr	69	69.0	exc
Anzac	PM2.5	16Sep23, 24:00	419618	24-hr	43	42.8	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Wapasu	PM2.5	16Sep23, 24:00	419614	24-hr	62	61.6	exc
Surmont 2	PM2.5	16Sep23, 24:00	419619	24-hr	44	44.3	exc
Ells River	PM2.5	16Sep23, 24:00	419515	24-hr	55	54.8	exc
Buffalo Viewpoint	PM2.5	17Sep23, 01:00	419611	1-hr	80	80.3	exc
Patricia McInnes	PM2.5	17Sep23, 01:00	419610	1-hr	90	90.2	exc
Fort Chip	PM2.5	17Sep23, 01:00	419617	1-hr	276	276.0	exc
Ft. McKay S	PM2.5	17Sep23, 01:00	419613	1-hr	94	94.3	exc
Fort Hills	PM2.5	17Sep23, 01:00	419552	1-hr	80	80.1	exc
Buffalo Viewpoint	PM2.5	17Sep23, 02:00	419611	1-hr	83	82.9	exc
Patricia McInnes	PM2.5	17Sep23, 02:00	419610	1-hr	87	87.5	exc
Fort Chip	PM2.5	17Sep23, 02:00	419617	1-hr	251	250.8	exc
Ft. McKay S	PM2.5	17Sep23, 02:00	419613	1-hr	97	96.8	exc
Wapasu	PM2.5	17Sep23, 02:00	419614	1-hr	88	87.8	exc
Fort Hills	PM2.5	17Sep23, 02:00	419552	1-hr	87	87.0	exc
Bertha Ganter	PM2.5	17Sep23, 03:00	419615	1-hr	84	84.1	exc
Buffalo Viewpoint	PM2.5	17Sep23, 03:00	419611	1-hr	82	81.6	exc
Patricia McInnes	PM2.5	17Sep23, 03:00	419610	1-hr	81	80.7	exc
Ft. McKay S	PM2.5	17Sep23, 03:00	419613	1-hr	99	98.8	exc
Wapasu	PM2.5	17Sep23, 03:00	419614	1-hr	87	87.3	exc
Fort Hills	PM2.5	17Sep23, 03:00	419552	1-hr	89	89.3	exc
Surmont 2	PM2.5	17Sep23, 03:00	419619	1-hr	83	82.5	exc
Fort Chip	PM2.5	17Sep23, 03:00	419617	1-hr	257	257.4	exc
Bertha Ganter	PM2.5	17Sep23, 04:00	419615	1-hr	83	82.5	exc
Buffalo Viewpoint	PM2.5	17Sep23, 04:00	419611	1-hr	82	81.5	exc
Fort Chip	PM2.5	17Sep23, 04:00	419617	1-hr	243	242.8	exc
Ft. McKay S	PM2.5	17Sep23, 04:00	419613	1-hr	101	101.0	exc
Wapasu	PM2.5	17Sep23, 04:00	419614	1-hr	93	92.6	exc
Stony Mtn.	PM2.5	17Sep23, 04:00	419622	1-hr	81	81.3	exc
Barge Landing	PM2.5	17Sep23, 04:00	419616	1-hr	86	85.8	exc
Fort Hills	PM2.5	17Sep23, 04:00	419552	1-hr	88	88.5	exc
Surmont 2	PM2.5	17Sep23, 04:00	419619	1-hr	84	83.8	exc
Ells River	PM2.5	17Sep23, 04:00	419553	1-hr	80	80.0	nae
Buffalo Viewpoint	PM2.5	17Sep23, 05:00	419611	1-hr	84	84.3	exc
Fort Chip	PM2.5	17Sep23, 05:00	419617	1-hr	207	206.6	exc
Ft. McKay S	PM2.5	17Sep23, 05:00	419613	1-hr	92	91.9	exc
Wapasu	PM2.5	17Sep23, 05:00	419614	1-hr	112	111.8	exc



<u>Site</u>	<u>Parameter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Stony Mtn.	PM2.5	17Sep23, 05:00	419622	1-hr	81	80.9	exc
Surmont 2	PM2.5	17Sep23, 05:00	419619	1-hr	81	81.1	exc
Barge Landing	PM2.5	17Sep23, 05:00	419616	1-hr	96	96.0	exc
Bertha Ganter	PM2.5	17Sep23, 06:00	419615	1-hr	80	80.4	exc
Buffalo Viewpoint	PM2.5	17Sep23, 06:00	419611	1-hr	86	86.2	exc
Fort Chip	PM2.5	17Sep23, 06:00	419617	1-hr	185	184.8	exc
Ft. McKay S	PM2.5	17Sep23, 06:00	419613	1-hr	87	87.1	exc
Wapasu	PM2.5	17Sep23, 06:00	419614	1-hr	138	138.2	exc
Barge Landing	PM2.5	17Sep23, 06:00	419616	1-hr	89	89.4	exc
Buffalo Viewpoint	PM2.5	17Sep23, 07:00	419611	1-hr	84	84.0	exc
Fort Chip	PM2.5	17Sep23, 07:00	419617	1-hr	151	150.9	exc
Ft. McKay S	PM2.5	17Sep23, 07:00	419613	1-hr	85	84.6	exc
Anzac	PM2.5	17Sep23, 07:00	419618	1-hr	80	80.2	exc
Wapasu	PM2.5	17Sep23, 07:00	419614	1-hr	144	144.2	exc
Fort Hills	PM2.5	17Sep23, 07:00	419552	1-hr	88	88.2	exc
Ells River	PM2.5	17Sep23, 07:00	419553	1-hr	81	80.8	exc
Barge Landing	PM2.5	17Sep23, 07:00	419616	1-hr	91	91.2	exc
Fort Chip	PM2.5	17Sep23, 08:00	419617	1-hr	114	114.1	exc
Ft. McKay S	PM2.5	17Sep23, 08:00	419613	1-hr	84	84.2	exc
Wapasu	PM2.5	17Sep23, 08:00	419614	1-hr	120	120.3	exc
Fort Hills	PM2.5	17Sep23, 08:00	419552	1-hr	98	98.3	exc
Barge Landing	PM2.5	17Sep23, 08:00	419616	1-hr	81	81.1	exc
Buffalo Viewpoint	PM2.5	17Sep23, 09:00	419611	1-hr	82	81.8	exc
Fort Chip	PM2.5	17Sep23, 09:00	419617	1-hr	113	113.1	exc
Ft. McKay S	PM2.5	17Sep23, 09:00	419613	1-hr	96	95.9	exc
Wapasu	PM2.5	17Sep23, 09:00	419614	1-hr	89	89.0	exc
Fort Hills	PM2.5	17Sep23, 09:00	419552	1-hr	90	90.1	exc
Ells River	PM2.5	17Sep23, 09:00	419553	1-hr	87	87.1	exc
Patricia McInnes	PM2.5	17Sep23, 09:00	419610	1-hr	90	89.6	exc
Bertha Ganter	PM2.5	17Sep23, 10:00	419615	1-hr	82	81.7	exc
Buffalo Viewpoint	PM2.5	17Sep23, 10:00	419611	1-hr	87	87.1	exc
Fort Chip	PM2.5	17Sep23, 10:00	419617	1-hr	117	117.1	exc
Ft. McKay S	PM2.5	17Sep23, 10:00	419613	1-hr	91	91.2	exc
Wapasu	PM2.5	17Sep23, 10:00	419614	1-hr	90	89.9	exc
Fort Hills	PM2.5	17Sep23, 10:00	419552	1-hr	91	91.0	exc
Ells River	PM2.5	17Sep23, 10:00	419553	1-hr	85	85.0	exc
Patricia McInnes	PM2.5	17Sep23, 10:00	419610	1-hr	94	94.1	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Barge Landing	PM2.5	17Sep23, 10:00	419616	1-hr	84	83.6	exc
Bertha Ganter	PM2.5	17Sep23, 11:00	419615	1-hr	82	82.3	exc
Buffalo Viewpoint	PM2.5	17Sep23, 11:00	419611	1-hr	94	93.8	exc
Fort Chip	PM2.5	17Sep23, 11:00	419617	1-hr	120	119.9	exc
Ft. McKay S	PM2.5	17Sep23, 11:00	419613	1-hr	93	92.7	exc
Wapasu	PM2.5	17Sep23, 11:00	419614	1-hr	88	87.7	exc
Fort Hills	PM2.5	17Sep23, 11:00	419552	1-hr	82	81.8	exc
Ells River	PM2.5	17Sep23, 11:00	419553	1-hr	84	84.0	exc
Patricia McInnes	PM2.5	17Sep23, 11:00	419610	1-hr	95	94.6	exc
Barge Landing	PM2.5	17Sep23, 11:00	419616	1-hr	84	84.0	exc
Bertha Ganter	PM2.5	17Sep23, 12:00	419615	1-hr	83	82.9	exc
Fort Chip	PM2.5	17Sep23, 12:00	419617	1-hr	130	129.8	exc
Barge Landing	PM2.5	17Sep23, 12:00	419616	1-hr	84	83.7	exc
Ft. McKay S	PM2.5	17Sep23, 12:00	419613	1-hr	94	93.8	exc
Fort Hills	PM2.5	17Sep23, 12:00	419552	1-hr	92	92.3	exc
Ells River	PM2.5	17Sep23, 12:00	419553	1-hr	84	84.2	exc
Fort Chip	PM2.5	17Sep23, 13:00	419617	1-hr	137	137.2	exc
Fort Hills	PM2.5	17Sep23, 13:00	419552	1-hr	90	89.9	exc
Fort Chip	PM2.5	17Sep23, 14:00	419617	1-hr	150	150.4	exc
Fort Chip	PM2.5	17Sep23, 15:00	419617	1-hr	141	141.1	exc
Fort Chip	PM2.5	17Sep23, 16:00	419617	1-hr	134	133.7	exc
Fort Chip	PM2.5	17Sep23, 17:00	419617	1-hr	133	132.8	exc
Fort Chip	PM2.5	17Sep23, 18:00	419617	1-hr	119	119.0	exc
Stony Mtn.	PM2.5	17Sep23, 18:00	419622	1-hr	94	93.9	exc
Buffalo Viewpoint	PM2.5	17Sep23, 18:00	419611	1-hr	119	119.0	exc
Patricia McInnes	PM2.5	17Sep23, 18:00	419610	1-hr	101	100.6	exc
Bertha Ganter	PM2.5	17Sep23, 19:00	419615	1-hr	117	117.4	exc
Athabasca Valley	PM2.5	17Sep23, 19:00	419612	1-hr	104	104.3	exc
Fort Chip	PM2.5	17Sep23, 19:00	419617	1-hr	114	113.7	exc
Barge Landing	PM2.5	17Sep23, 19:00	419616	1-hr	125	125.3	exc
Ft. McKay S	PM2.5	17Sep23, 19:00	419613	1-hr	172	171.6	exc
Stony Mtn.	PM2.5	17Sep23, 19:00	419622	1-hr	151	151.1	exc
Conklin	PM2.5	17Sep23, 19:00	419624	1-hr	140	140.1	exc
Surmont 2	PM2.5	17Sep23, 19:00	419619	1-hr	94	94.3	exc
Ells River	PM2.5	17Sep23, 19:00	419553	1-hr	99	98.8	exc
Buffalo Viewpoint	PM2.5	17Sep23, 19:00	419611	1-hr	176	176.3	exc
Patricia McInnes	PM2.5	17Sep23, 19:00	419610	1-hr	168	168.4	exc
Bertha Ganter	PM2.5	17Sep23, 20:00	419615	1-hr	173	172.9	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Athabasca Valley	PM2.5	17Sep23, 20:00	419612	1-hr	118	118.2	exc
Fort Chip	PM2.5	17Sep23, 20:00	419617	1-hr	114	114.1	exc
Barge Landing	PM2.5	17Sep23, 20:00	419616	1-hr	180	180.4	exc
Ft. McKay S	PM2.5	17Sep23, 20:00	419613	1-hr	195	195.4	exc
Anzac	PM2.5	17Sep23, 20:00	419618	1-hr	95	95.2	exc
Stony Mtn.	PM2.5	17Sep23, 20:00	419622	1-hr	172	171.8	exc
Conklin	PM2.5	17Sep23, 20:00	419624	1-hr	173	173.2	exc
Janvier	PM2.5	17Sep23, 20:00	419623	1-hr	95	94.8	exc
Fort Hills	PM2.5	17Sep23, 20:00	419552	1-hr	139	138.7	exc
Surmont 2	PM2.5	17Sep23, 20:00	419619	1-hr	115	114.9	exc
Ells River	PM2.5	17Sep23, 20:00	419553	1-hr	160	160.4	exc
Buffalo Viewpoint	PM2.5	17Sep23, 20:00	419611	1-hr	182	182.3	exc
Patricia McInnes	PM2.5	17Sep23, 20:00	419610	1-hr	180	180.3	exc
Bertha Ganter	PM2.5	17Sep23, 21:00	419615	1-hr	171	171.1	exc
Athabasca Valley	PM2.5	17Sep23, 21:00	419612	1-hr	136	136.2	exc
Fort Chip	PM2.5	17Sep23, 21:00	419617	1-hr	122	121.7	exc
Barge Landing	PM2.5	17Sep23, 21:00	419616	1-hr	175	175.4	exc
Ft. McKay S	PM2.5	17Sep23, 21:00	419613	1-hr	182	182.3	exc
Anzac	PM2.5	17Sep23, 21:00	419618	1-hr	143	142.9	exc
Wapasu	PM2.5	17Sep23, 21:00	419614	1-hr	160	159.8	exc
Stony Mtn.	PM2.5	17Sep23, 21:00	419622	1-hr	181	180.8	exc
Conklin	PM2.5	17Sep23, 21:00	419624	1-hr	178	177.8	exc
Janvier	PM2.5	17Sep23, 21:00	419623	1-hr	115	115.1	exc
Fort Hills	PM2.5	17Sep23, 21:00	419552	1-hr	160	160.4	exc
Surmont 2	PM2.5	17Sep23, 21:00	419619	1-hr	135	135.4	exc
Ells River	PM2.5	17Sep23, 21:00	419553	1-hr	163	162.7	exc
Buffalo Viewpoint	PM2.5	17Sep23, 21:00	419611	1-hr	179	178.8	exc
Patricia McInnes	PM2.5	17Sep23, 21:00	419610	1-hr	174	173.5	exc
Bertha Ganter	PM2.5	17Sep23, 22:00	419615	1-hr	170	169.7	exc
Athabasca Valley	PM2.5	17Sep23, 22:00	419612	1-hr	145	144.7	exc
Fort Chip	PM2.5	17Sep23, 22:00	419617	1-hr	138	137.9	exc
Barge Landing	PM2.5	17Sep23, 22:00	419616	1-hr	171	171.2	exc
Ft. McKay S	PM2.5	17Sep23, 22:00	419613	1-hr	176	175.6	exc
Anzac	PM2.5	17Sep23, 22:00	419618	1-hr	143	143.0	exc
Wapasu	PM2.5	17Sep23, 22:00	419614	1-hr	168	168.1	exc
Stony Mtn.	PM2.5	17Sep23, 22:00	419622	1-hr	155	155.0	exc
Conklin	PM2.5	17Sep23, 22:00	419624	1-hr	162	161.6	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Janvier	PM2.5	17Sep23, 22:00	419623	1-hr	125	125.3	exc
Fort Hills	PM2.5	17Sep23, 22:00	419552	1-hr	160	160.3	exc
Surmont 2	PM2.5	17Sep23, 22:00	419619	1-hr	142	141.8	exc
Ells River	PM2.5	17Sep23, 22:00	419553	1-hr	167	166.8	exc
Buffalo Viewpoint	PM2.5	17Sep23, 22:00	419611	1-hr	175	174.7	exc
Patricia McInnes	PM2.5	17Sep23, 22:00	419610	1-hr	166	166.0	exc
Bertha Ganter	PM2.5	17Sep23, 23:00	419615	1-hr	169	168.7	exc
Athabasca Valley	PM2.5	17Sep23, 23:00	419612	1-hr	149	149.2	exc
Fort Chip	PM2.5	17Sep23, 23:00	419617	1-hr	174	173.7	exc
Barge Landing	PM2.5	17Sep23, 23:00	419616	1-hr	179	179.4	exc
Ft. McKay S	PM2.5	17Sep23, 23:00	419613	1-hr	175	174.6	exc
Anzac	PM2.5	17Sep23, 23:00	419618	1-hr	137	136.9	exc
Wapasu	PM2.5	17Sep23, 23:00	419614	1-hr	154	154.0	exc
Stony Mtn.	PM2.5	17Sep23, 23:00	419622	1-hr	164	164.8	exc
Conklin	PM2.5	17Sep23, 23:00	419624	1-hr	157	156.6	exc
Janvier	PM2.5	17Sep23, 23:00	419623	1-hr	134	133.9	exc
Fort Hills	PM2.5	17Sep23, 23:00	419552	1-hr	161	160.7	exc
Surmont 2	PM2.5	17Sep23, 23:00	419619	1-hr	127	126.8	exc
Ells River	PM2.5	17Sep23, 23:00	419553	1-hr	162	162.2	exc
Buffalo Viewpoint	PM2.5	17Sep23, 23:00	419611	1-hr	171	171.2	exc
Patricia McInnes	PM2.5	17Sep23, 23:00	419610	1-hr	175	174.7	exc
Bertha Ganter	PM2.5	17Sep23, 24:00	419615	1-hr	163	162.7	exc
Bertha Ganter	PM2.5	17Sep23, 24:00	419615	24-hr	91	91.0	exc
Patricia McInnes	PM2.5	17Sep23, 24:00	419610	1-hr	177	176.9	exc
Athabasca Valley	PM2.5	17Sep23, 24:00	419612	1-hr	148	147.8	exc
Fort Chip	PM2.5	17Sep23, 24:00	419617	1-hr	165	165.0	exc
Barge Landing	PM2.5	17Sep23, 24:00	419616	1-hr	176	176.5	exc
Ft. McKay S	PM2.5	17Sep23, 24:00	419613	1-hr	169	168.8	exc
Ft. McKay S	PM2.5	17Sep23, 24:00	419613	24-hr	103	103.3	exc
Anzac	PM2.5	17Sep23, 24:00	419618	1-hr	114	114.0	exc
Anzac	PM2.5	17Sep23, 24:00	419618	24-hr	68	68.0	exc
Wapasu	PM2.5	17Sep23, 24:00	419614	1-hr	150	149.9	exc
Wapasu	PM2.5	17Sep23, 24:00	419614	24-hr	87	87.4	exc
Stony Mtn.	PM2.5	17Sep23, 24:00	419622	1-hr	150	150.4	exc
Stony Mtn.	PM2.5	17Sep23, 24:00	419622	24-hr	77	77.4	exc
Conklin	PM2.5	17Sep23, 24:00	419624	1-hr	162	161.9	exc
Janvier	PM2.5	17Sep23, 24:00	419623	1-hr	135	135.1	exc
Janvier	PM2.5	17Sep23, 24:00	419623	24-hr	66	66.2	exc
Fort Hills	PM2.5	17Sep23, 24:00	419552	1-hr	151	150.7	exc
Fort Hills	PM2.5	17Sep23, 24:00	419552	24-hr	90	90.3	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Surmont 2	PM2.5	17Sep23, 24:00	419619	1-hr	99	98.7	exc
Surmont 2	PM2.5	17Sep23, 24:00	419619	24-hr	68	68.3	exc
Ells River	PM2.5	17Sep23, 24:00	419553	1-hr	147	147.2	exc
Ells River	PM2.5	17Sep23, 24:00	419553	24-hr	88	87.7	exc
Buffalo Viewpoint	PM2.5	17Sep23, 24:00	419611	1-hr	160	159.9	exc
Buffalo Viewpoint	PM2.5	17Sep23, 24:00	419611	24-hr	98	98.3	exc
Patricia McInnes	PM2.5	17Sep23, 24:00	419610	24-hr	97	97.2	exc
Athabasca Valley	PM2.5	17Sep23, 24:00	419612	24-hr	73	73.1	exc
Fort Chip	PM2.5	17Sep23, 24:00	419617	24-hr	158	158.5	exc
Barge Landing	PM2.5	17Sep23, 24:00	419616	24-hr	95	95.4	exc
Conklin	PM2.5	17Sep23, 24:00	419624	24-hr	77	77.2	exc
Bertha Ganter	PM2.5	18Sep23, 01:00	420077	1-hr	157	156.9	exc
Patricia McInnes	PM2.5	18Sep23, 01:00	420007	1-hr	169	169.4	exc
Athabasca Valley	PM2.5	18Sep23, 01:00	420011	1-hr	144	143.9	exc
Fort Chip	PM2.5	18Sep23, 01:00	420012	1-hr	162	162.2	exc
Barge Landing	PM2.5	18Sep23, 01:00	420013	1-hr	146	146.0	exc
Ft. McKay S	PM2.5	18Sep23, 01:00	420014	1-hr	156	156.4	exc
Anzac	PM2.5	18Sep23, 01:00	420015	1-hr	107	106.9	exc
Wapasu	PM2.5	18Sep23, 01:00	420016	1-hr	144	143.8	exc
Stony Mtn.	PM2.5	18Sep23, 01:00	420017	1-hr	145	144.9	exc
Conklin	PM2.5	18Sep23, 01:00	420018	1-hr	151	151.2	exc
Janvier	PM2.5	18Sep23, 01:00	420019	1-hr	138	138.2	exc
Fort Hills	PM2.5	18Sep23, 01:00	419620	1-hr	143	143.4	exc
Surmont 2	PM2.5	18Sep23, 01:00	420020	1-hr	102	102.2	exc
Ells River	PM2.5	18Sep23, 01:00	419621	1-hr	136	135.6	exc
Buffalo Viewpoint	PM2.5	18Sep23, 01:00	420021	1-hr	147	146.8	exc
Bertha Ganter	PM2.5	18Sep23, 02:00	420077	1-hr	146	146.1	exc
Buffalo Viewpoint	PM2.5	18Sep23, 02:00	420021	1-hr	139	138.9	exc
Patricia McInnes	PM2.5	18Sep23, 02:00	420007	1-hr	159	159.4	exc
Athabasca Valley	PM2.5	18Sep23, 02:00	420011	1-hr	137	136.9	exc
Fort Chip	PM2.5	18Sep23, 02:00	420012	1-hr	159	159.4	exc
Barge Landing	PM2.5	18Sep23, 02:00	420013	1-hr	139	138.7	exc
Ft. McKay S	PM2.5	18Sep23, 02:00	420014	1-hr	147	146.6	exc
Wapasu	PM2.5	18Sep23, 02:00	420016	1-hr	130	130.3	exc
Stony Mtn.	PM2.5	18Sep23, 02:00	420017	1-hr	175	174.5	exc
Conklin	PM2.5	18Sep23, 02:00	420018	1-hr	145	145.4	exc
Janvier	PM2.5	18Sep23, 02:00	420019	1-hr	142	142.5	exc
Fort Hills	PM2.5	18Sep23, 02:00	419620	1-hr	134	134.4	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Surmont 2	PM2.5	18Sep23, 02:00	420020	1-hr	122	121.7	exc
Ells River	PM2.5	18Sep23, 02:00	419621	1-hr	132	132.1	exc
Bertha Ganter	PM2.5	18Sep23, 03:00	420077	1-hr	135	135.5	exc
Buffalo Viewpoint	PM2.5	18Sep23, 03:00	420021	1-hr	138	137.9	exc
Patricia McInnes	PM2.5	18Sep23, 03:00	420007	1-hr	151	150.8	exc
Athabasca Valley	PM2.5	18Sep23, 03:00	420011	1-hr	134	133.6	exc
Fort Chip	PM2.5	18Sep23, 03:00	420012	1-hr	155	154.9	exc
Barge Landing	PM2.5	18Sep23, 03:00	420013	1-hr	131	130.7	exc
Ft. McKay S	PM2.5	18Sep23, 03:00	420014	1-hr	135	135.3	exc
Anzac	PM2.5	18Sep23, 02:00	420015	1-hr	132	132.2	exc
Anzac	PM2.5	18Sep23, 03:00	420015	1-hr	156	156.3	exc
Wapasu	PM2.5	18Sep23, 03:00	420016	1-hr	120	120.1	exc
Stony Mtn.	PM2.5	18Sep23, 03:00	420017	1-hr	182	182.0	exc
Conklin	PM2.5	18Sep23, 03:00	420018	1-hr	148	148.3	exc
Janvier	PM2.5	18Sep23, 03:00	420019	1-hr	140	140.1	exc
Fort Hills	PM2.5	18Sep23, 03:00	419620	1-hr	119	119.3	exc
Surmont 2	PM2.5	18Sep23, 03:00	420020	1-hr	147	147.3	exc
Ells River	PM2.5	18Sep23, 03:00	419621	1-hr	121	120.8	exc
Bertha Ganter	PM2.5	18Sep23, 04:00	420077	1-hr	125	124.6	exc
Buffalo Viewpoint	PM2.5	18Sep23, 04:00	420021	1-hr	139	139.4	exc
Patricia McInnes	PM2.5	18Sep23, 04:00	420007	1-hr	149	148.8	exc
Athabasca Valley	PM2.5	18Sep23, 04:00	420011	1-hr	127	127.2	exc
Fort Chip	PM2.5	18Sep23, 04:00	420012	1-hr	148	148.4	exc
Barge Landing	PM2.5	18Sep23, 04:00	420013	1-hr	130	130.4	exc
Ft. McKay S	PM2.5	18Sep23, 04:00	420014	1-hr	126	126.0	exc
Wapasu	PM2.5	18Sep23, 04:00	420016	1-hr	127	127.4	exc
Stony Mtn.	PM2.5	18Sep23, 04:00	420017	1-hr	184	184.0	exc
Conklin	PM2.5	18Sep23, 04:00	420018	1-hr	144	144.2	exc
Janvier	PM2.5	18Sep23, 04:00	420019	1-hr	140	140.5	exc
Fort Hills	PM2.5	18Sep23, 04:00	419620	1-hr	110	109.8	exc
Surmont 2	PM2.5	18Sep23, 04:00	420020	1-hr	161	160.9	exc
Ells River	PM2.5	18Sep23, 04:00	419621	1-hr	117	117.1	exc
Bertha Ganter	PM2.5	18Sep23, 05:00	420077	1-hr	127	126.9	exc
Buffalo Viewpoint	PM2.5	18Sep23, 05:00	420021	1-hr	150	149.8	exc
Patricia McInnes	PM2.5	18Sep23, 05:00	420007	1-hr	151	151.3	exc
Athabasca Valley	PM2.5	18Sep23, 05:00	420011	1-hr	130	129.7	exc
Fort Chip	PM2.5	18Sep23, 05:00	420012	1-hr	147	147.5	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Barge Landing	PM2.5	18Sep23, 05:00	420013	1-hr	145	144.7	exc
Ft. McKay S	PM2.5	18Sep23, 05:00	420014	1-hr	126	126.2	exc
Wapasu	PM2.5	18Sep23, 05:00	420016	1-hr	145	145.0	exc
Stony Mtn.	PM2.5	18Sep23, 05:00	420017	1-hr	185	185.1	exc
Conklin	PM2.5	18Sep23, 05:00	420018	1-hr	150	150.2	exc
Janvier	PM2.5	18Sep23, 05:00	420019	1-hr	142	141.8	exc
Fort Hills	PM2.5	18Sep23, 05:00	419620	1-hr	108	108.3	exc
Surmont 2	PM2.5	18Sep23, 05:00	420020	1-hr	165	165.3	exc
Ells River	PM2.5	18Sep23, 05:00	419621	1-hr	122	121.9	exc
Buffalo Viewpoint	PM2.5	18Sep23, 06:00	420021	1-hr	148	147.5	exc
Patricia McInnes	PM2.5	18Sep23, 06:00	420007	1-hr	151	151.3	exc
Athabasca Valley	PM2.5	18Sep23, 06:00	420011	1-hr	129	129.0	exc
Fort Chip	PM2.5	18Sep23, 06:00	420012	1-hr	135	135.4	exc
Barge Landing	PM2.5	18Sep23, 06:00	420013	1-hr	154	154.3	exc
Ft. McKay S	PM2.5	18Sep23, 06:00	420014	1-hr	127	127.1	exc
Anzac	PM2.5	18Sep23, 04:00	420015	1-hr	157	157.1	exc
Anzac	PM2.5	18Sep23, 05:00	420015	1-hr	155	154.7	exc
Anzac	PM2.5	18Sep23, 06:00	420015	1-hr	154	154.5	exc
Wapasu	PM2.5	18Sep23, 06:00	420016	1-hr	155	154.9	exc
Stony Mtn.	PM2.5	18Sep23, 06:00	420017	1-hr	179	178.8	exc
Conklin	PM2.5	18Sep23, 06:00	420018	1-hr	152	151.6	exc
Janvier	PM2.5	18Sep23, 06:00	420019	1-hr	141	140.5	exc
Fort Hills	PM2.5	18Sep23, 06:00	419620	1-hr	115	115.0	exc
Surmont 2	PM2.5	18Sep23, 06:00	420020	1-hr	153	152.7	exc
Ells River	PM2.5	18Sep23, 06:00	419621	1-hr	126	126.0	exc
Bertha Ganter	PM2.5	18Sep23, 06:00	420077	1-hr	141	141.3	exc
Buffalo Viewpoint	PM2.5	18Sep23, 07:00	420021	1-hr	147	147.1	exc
Patricia McInnes	PM2.5	18Sep23, 07:00	420007	1-hr	158	158.1	exc
Athabasca Valley	PM2.5	18Sep23, 07:00	420011	1-hr	123	123.4	exc
Fort Chip	PM2.5	18Sep23, 07:00	420012	1-hr	136	135.6	exc
Barge Landing	PM2.5	18Sep23, 07:00	420013	1-hr	150	150.5	exc
Ft. McKay S	PM2.5	18Sep23, 07:00	420014	1-hr	137	137.1	exc
Anzac	PM2.5	18Sep23, 07:00	420015	1-hr	162	162.3	exc
Wapasu	PM2.5	18Sep23, 07:00	420016	1-hr	164	163.5	exc
Stony Mtn.	PM2.5	18Sep23, 07:00	420017	1-hr	167	166.9	exc
Conklin	PM2.5	18Sep23, 07:00	420018	1-hr	179	178.9	exc
Janvier	PM2.5	18Sep23, 07:00	420019	1-hr	139	139.0	exc



<u>Site</u>	<u>Parameter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Fort Hills	PM2.5	18Sep23, 07:00	419620	1-hr	126	125.5	exc
Surmont 2	PM2.5	18Sep23, 07:00	420020	1-hr	154	153.8	exc
Ells River	PM2.5	18Sep23, 07:00	419621	1-hr	139	138.6	exc
Bertha Ganter	PM2.5	18Sep23, 07:00	420077	1-hr	144	143.9	exc
Buffalo Viewpoint	PM2.5	18Sep23, 08:00	420021	1-hr	146	146.3	exc
Patricia McInnes	PM2.5	18Sep23, 08:00	420007	1-hr	164	164.4	exc
Athabasca Valley	PM2.5	18Sep23, 08:00	420011	1-hr	124	123.6	exc
Fort Chip	PM2.5	18Sep23, 08:00	420012	1-hr	143	143.2	exc
Barge Landing	PM2.5	18Sep23, 08:00	420013	1-hr	153	153.0	exc
Ft. McKay S	PM2.5	18Sep23, 08:00	420014	1-hr	145	144.6	exc
Anzac	PM2.5	18Sep23, 08:00	420015	1-hr	158	157.8	exc
Wapasu	PM2.5	18Sep23, 08:00	420016	1-hr	167	167.1	exc
Stony Mtn.	PM2.5	18Sep23, 08:00	420017	1-hr	167	167.1	exc
Conklin	PM2.5	18Sep23, 08:00	420018	1-hr	159	158.9	exc
Janvier	PM2.5	18Sep23, 08:00	420019	1-hr	142	142.0	exc
Fort Hills	PM2.5	18Sep23, 08:00	419620	1-hr	133	133.3	exc
Surmont 2	PM2.5	18Sep23, 08:00	420020	1-hr	150	149.9	exc
Ells River	PM2.5	18Sep23, 08:00	419621	1-hr	143	142.6	exc
Bertha Ganter	PM2.5	18Sep23, 08:00	420077	1-hr	144	144.1	exc
Buffalo Viewpoint	PM2.5	18Sep23, 09:00	420021	1-hr	147	147.0	exc
Patricia McInnes	PM2.5	18Sep23, 09:00	420007	1-hr	170	170.3	exc
Athabasca Valley	PM2.5	18Sep23, 09:00	420011	1-hr	126	125.7	exc
Fort Chip	PM2.5	18Sep23, 09:00	420012	1-hr	143	143.1	exc
Barge Landing	PM2.5	18Sep23, 09:00	420013	1-hr	153	152.9	exc
Ft. McKay S	PM2.5	18Sep23, 09:00	420014	1-hr	151	150.8	exc
Anzac	PM2.5	18Sep23, 09:00	420015	1-hr	167	167.1	exc
Wapasu	PM2.5	18Sep23, 09:00	420016	1-hr	166	166.1	exc
Stony Mtn.	PM2.5	18Sep23, 09:00	420017	1-hr	167	167.2	exc
Conklin	PM2.5	18Sep23, 09:00	420018	1-hr	170	170.2	exc
Janvier	PM2.5	18Sep23, 09:00	420019	1-hr	142	141.9	exc
Fort Hills	PM2.5	18Sep23, 09:00	419620	1-hr	132	132.1	exc
Surmont 2	PM2.5	18Sep23, 09:00	420020	1-hr	158	157.7	exc
Ells River	PM2.5	18Sep23, 09:00	419621	1-hr	141	140.8	exc
Bertha Ganter	PM2.5	18Sep23, 09:00	420077	1-hr	145	144.8	exc
Buffalo Viewpoint	PM2.5	18Sep23, 10:00	420021	1-hr	143	143.4	exc
Patricia McInnes	PM2.5	18Sep23, 10:00	420007	1-hr	170	169.9	exc
Fort Chip	PM2.5	18Sep23, 10:00	420012	1-hr	139	138.7	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Barge Landing	PM2.5	18Sep23, 10:00	420013	1-hr	158	157.5	exc
Ft. McKay S	PM2.5	18Sep23, 10:00	420014	1-hr	172	171.9	exc
Anzac	PM2.5	18Sep23, 10:00	420015	1-hr	161	160.8	exc
Wapasu	PM2.5	18Sep23, 10:00	420016	1-hr	165	165.1	exc
Stony Mtn.	PM2.5	18Sep23, 10:00	420017	1-hr	173	172.5	exc
Conklin	PM2.5	18Sep23, 10:00	420018	1-hr	155	155.1	exc
Janvier	PM2.5	18Sep23, 10:00	420019	1-hr	138	138.0	exc
Fort Hills	PM2.5	18Sep23, 10:00	419620	1-hr	121	121.2	exc
Surmont 2	PM2.5	18Sep23, 10:00	420020	1-hr	163	163.5	exc
Ells River	PM2.5	18Sep23, 10:00	419621	1-hr	126	126.3	exc
Bertha Ganter	PM2.5	18Sep23, 10:00	420077	1-hr	140	139.9	exc
Athabasca Valley	PM2.5	18Sep23, 10:00	420011	1-hr	127	127.4	exc
Buffalo Viewpoint	PM2.5	18Sep23, 11:00	420021	1-hr	129	128.9	exc
Patricia McInnes	PM2.5	18Sep23, 11:00	420007	1-hr	93	93.2	exc
Athabasca Valley	PM2.5	18Sep23, 11:00	420011	1-hr	113	113.3	exc
Fort Chip	PM2.5	18Sep23, 11:00	420012	1-hr	126	125.6	exc
Barge Landing	PM2.5	18Sep23, 11:00	420013	1-hr	115	115.4	exc
Ft. McKay S	PM2.5	18Sep23, 11:00	420014	1-hr	115	115.2	exc
Anzac	PM2.5	18Sep23, 11:00	420015	1-hr	126	126.1	exc
Wapasu	PM2.5	18Sep23, 11:00	420016	1-hr	138	137.7	exc
Stony Mtn.	PM2.5	18Sep23, 11:00	420017	1-hr	137	136.7	exc
Conklin	PM2.5	18Sep23, 11:00	420018	1-hr	152	152.4	exc
Janvier	PM2.5	18Sep23, 11:00	420019	1-hr	141	141.4	exc
Fort Hills	PM2.5	18Sep23, 11:00	419620	1-hr	99	99.3	exc
Surmont 2	PM2.5	18Sep23, 11:00	420020	1-hr	141	140.8	exc
Ells River	PM2.5	18Sep23, 11:00	419621	1-hr	109	109.0	exc
Bertha Ganter	PM2.5	18Sep23, 11:00	420077	1-hr	108	108.5	exc
Fort Chip	PM2.5	18Sep23, 12:00	420012	1-hr	91	90.6	exc
Barge Landing	PM2.5	18Sep23, 12:00	420013	1-hr	80	80.3	exc
Wapasu	PM2.5	18Sep23, 12:00	420016	1-hr	106	106.3	exc
Conklin	PM2.5	18Sep23, 12:00	420018	1-hr	87	86.7	exc
Janvier	PM2.5	18Sep23, 12:00	420019	1-hr	132	131.5	exc
Surmont 2	PM2.5	18Sep23, 12:00	420020	1-hr	92	91.6	exc
Janvier	PM2.5	18Sep23, 13:00	420019	1-hr	84	84.4	exc
Fort Chip	PM2.5	18Sep23, 24:00	420012	1-hr	82	82.0	exc
Ft. McKay S	PM2.5	18Sep23, 24:00	420014	24-hr	79	79.3	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Anzac	PM2.5	18Sep23, 24:00	420015	24-hr	80	80.3	exc
Wapasu	PM2.5	18Sep23, 24:00	420016	24-hr	86	85.6	exc
Stony Mtn.	PM2.5	18Sep23, 24:00	420017	24-hr	89	89.4	exc
Conklin	PM2.5	18Sep23, 24:00	420018	24-hr	86	86.4	exc
Janvier	PM2.5	18Sep23, 24:00	420019	24-hr	82	81.7	exc
Fort Hills	PM2.5	18Sep23, 24:00	419620	24-hr	70	69.6	exc
Bertha Ganter	PM2.5	18Sep23, 24:00	420077	24-hr	77	77.0	exc
Buffalo Viewpoint	PM2.5	18Sep23, 24:00	420021	24-hr	81	81.0	exc
Patricia McInnes	PM2.5	18Sep23, 24:00	420007	24-hr	85	84.6	exc
Athabasca Valley	PM2.5	18Sep23, 24:00	420011	24-hr	71	70.7	exc
Fort Chip	PM2.5	18Sep23, 24:00	420012	24-hr	89	88.8	exc
Barge Landing	PM2.5	18Sep23, 24:00	420013	24-hr	82	81.6	exc
Surmont 2	PM2.5	18Sep23, 24:00	420020	24-hr	81	81.4	exc
Ells River	PM2.5	18Sep23, 24:00	419621	24-hr	73	72.9	exc
Fort Chip	PM2.5	19Sep23, 01:00	420012	1-hr	89	89.5	exc
Fort Chip	PM2.5	19Sep23, 04:00	420012	1-hr	85	85.3	exc
Fort Chip	PM2.5	19Sep23, 12:00	420012	1-hr	83	83.1	exc
Fort Chip	PM2.5	19Sep23, 13:00	420012	1-hr	85	85.4	exc
Fort Chip	PM2.5	19Sep23, 14:00	420012	1-hr	163	162.6	exc
Fort Chip	PM2.5	19Sep23, 15:00	420012	1-hr	142	141.9	exc
Fort Chip	PM2.5	19Sep23, 16:00	420012	1-hr	187	187.4	exc
Fort Chip	PM2.5	19Sep23, 17:00	420012	1-hr	188	188.4	exc
Fort Chip	PM2.5	19Sep23, 18:00	420012	1-hr	143	142.8	exc
Fort Chip	PM2.5	19Sep23, 19:00	420012	1-hr	125	125.4	exc
Lower Camp	H2S	19Sep23, 19:00	419679	1-hr	25	24.6	exc
Lower Camp	SO2	19Sep23, 19:00	419680	1-hr	219	218.4	exc
Fort Chip	PM2.5	19Sep23, 20:00	420012	1-hr	119	118.6	exc
Conklin	PM2.5	19Sep23, 20:00	420018	1-hr	150	150.1	exc
Fort Chip	PM2.5	19Sep23, 21:00	420012	1-hr	117	117.3	exc
Conklin	PM2.5	19Sep23, 21:00	420018	1-hr	99	99.0	exc
Fort Chip	PM2.5	19Sep23, 22:00	420012	1-hr	124	123.5	exc
Fort Chip	PM2.5	19Sep23, 23:00	420012	1-hr	123	123.2	exc
Buffalo Viewpoint	PM2.5	19Sep23, 24:00	420021	1-hr	84	83.9	exc
Buffalo Viewpoint	PM2.5	19Sep23, 24:00	420021	24-hr	30	30.2	exc
Fort Chip	PM2.5	19Sep23, 24:00	420012	1-hr	127	127.1	exc
Conklin	PM2.5	19Sep23, 24:00	420018	24-hr	31	30.8	exc
Fort Chip	PM2.5	19Sep23, 24:00	420012	24-hr	101	100.5	exc
Ells River	PM2.5	19Sep23, 24:00	419693	24-hr	30	30.1	exc
Buffalo Viewpoint	PM2.5	20Sep23, 01:00	420021	1-hr	96	96.2	exc
Fort Chip	PM2.5	20Sep23, 01:00	420012	1-hr	128	127.6	exc
Fort Hills	PM2.5	20Sep23, 01:00	419746	1-hr	87	86.6	exc
Ells River	PM2.5	20Sep23, 01:00	419747	1-hr	94	94.0	exc
Bertha Ganter	PM2.5	20Sep23, 02:00	420077	1-hr	85	84.6	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Buffalo Viewpoint	PM2.5	20Sep23, 02:00	420021	1-hr	117	117.2	exc
Fort Chip	PM2.5	20Sep23, 02:00	420012	1-hr	135	135.4	exc
Ft. McKay S	PM2.5	20Sep23, 02:00	420014	1-hr	94	93.7	exc
Ells River	PM2.5	20Sep23, 02:00	419747	1-hr	102	102.4	exc
Bertha Ganter	PM2.5	20Sep23, 03:00	420077	1-hr	89	88.9	exc
Buffalo Viewpoint	PM2.5	20Sep23, 03:00	420021	1-hr	121	120.6	exc
Fort Chip	PM2.5	20Sep23, 03:00	420012	1-hr	147	147.2	exc
Ft. McKay S	PM2.5	20Sep23, 03:00	420014	1-hr	97	97.4	exc
Ells River	PM2.5	20Sep23, 03:00	419747	1-hr	95	95.3	exc
Bertha Ganter	PM2.5	20Sep23, 04:00	420077	1-hr	87	87.2	exc
Buffalo Viewpoint	PM2.5	20Sep23, 04:00	420021	1-hr	132	132.0	exc
Fort Chip	PM2.5	20Sep23, 04:00	420012	1-hr	187	186.6	exc
Ft. McKay S	PM2.5	20Sep23, 04:00	420014	1-hr	92	91.9	exc
Ells River	PM2.5	20Sep23, 04:00	419747	1-hr	99	99.3	exc
Bertha Ganter	PM2.5	20Sep23, 05:00	420077	1-hr	82	81.9	exc
Buffalo Viewpoint	PM2.5	20Sep23, 05:00	420021	1-hr	131	130.9	exc
Patricia McInnes	PM2.5	20Sep23, 05:00	420007	1-hr	83	82.7	exc
Fort Chip	PM2.5	20Sep23, 05:00	420012	1-hr	201	200.5	exc
Ft. McKay S	PM2.5	20Sep23, 05:00	420014	1-hr	95	95.5	exc
Anzac	PM2.5	20Sep23, 05:00	420015	1-hr	82	82.2	exc
Ells River	PM2.5	20Sep23, 05:00	419747	1-hr	102	102.2	exc
Bertha Ganter	PM2.5	20Sep23, 06:00	420077	1-hr	83	83.0	exc
Buffalo Viewpoint	PM2.5	20Sep23, 06:00	420021	1-hr	118	117.7	exc
Patricia McInnes	PM2.5	20Sep23, 06:00	420007	1-hr	92	92.2	exc
Fort Chip	PM2.5	20Sep23, 06:00	420012	1-hr	185	185.0	exc
Ft. McKay S	PM2.5	20Sep23, 06:00	420014	1-hr	97	97.3	exc
Ells River	PM2.5	20Sep23, 06:00	419747	1-hr	98	98.2	exc
Bertha Ganter	PM2.5	20Sep23, 07:00	420077	1-hr	88	88.4	exc
Buffalo Viewpoint	PM2.5	20Sep23, 07:00	420021	1-hr	125	124.6	exc
Patricia McInnes	PM2.5	20Sep23, 07:00	420007	1-hr	98	98.4	exc
Fort Chip	PM2.5	20Sep23, 07:00	420012	1-hr	217	216.9	exc
Ft. McKay S	PM2.5	20Sep23, 07:00	420014	1-hr	102	101.6	exc
Wapasu	PM2.5	20Sep23, 07:00	420016	1-hr	121	120.5	exc
Fort Hills	PM2.5	20Sep23, 07:00	419746	1-hr	91	90.5	exc
Ells River	PM2.5	20Sep23, 07:00	419747	1-hr	104	103.8	exc
Bertha Ganter	PM2.5	20Sep23, 08:00	420077	1-hr	96	95.9	exc



<u>Site</u>	<u>Parameter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Buffalo Viewpoint	PM2.5	20Sep23, 08:00	420021	1-hr	121	121.2	exc
Patricia McInnes	PM2.5	20Sep23, 08:00	420007	1-hr	106	106.3	exc
Fort Chip	PM2.5	20Sep23, 08:00	420012	1-hr	235	235.0	exc
Ft. McKay S	PM2.5	20Sep23, 08:00	420014	1-hr	104	103.7	exc
Wapasu	PM2.5	20Sep23, 08:00	420016	1-hr	194	193.6	exc
Fort Hills	PM2.5	20Sep23, 08:00	419746	1-hr	93	92.9	exc
Ells River	PM2.5	20Sep23, 08:00	419747	1-hr	106	106.3	exc
Bertha Ganter	PM2.5	20Sep23, 09:00	420077	1-hr	112	112.1	exc
Buffalo Viewpoint	PM2.5	20Sep23, 09:00	420021	1-hr	152	152.4	exc
Patricia McInnes	PM2.5	20Sep23, 09:00	420007	1-hr	128	128.5	exc
Fort Chip	PM2.5	20Sep23, 09:00	420012	1-hr	272	271.8	exc
Barge Landing	PM2.5	20Sep23, 09:00	420013	1-hr	112	112.3	exc
Ft. McKay S	PM2.5	20Sep23, 09:00	420014	1-hr	119	119.0	exc
Wapasu	PM2.5	20Sep23, 09:00	420016	1-hr	211	210.7	exc
Fort Hills	PM2.5	20Sep23, 09:00	419746	1-hr	106	105.8	exc
Ells River	PM2.5	20Sep23, 09:00	419747	1-hr	128	128.1	exc
Bertha Ganter	PM2.5	20Sep23, 10:00	420077	1-hr	115	115.3	exc
Buffalo Viewpoint	PM2.5	20Sep23, 10:00	420021	1-hr	181	181.4	exc
Patricia McInnes	PM2.5	20Sep23, 10:00	420007	1-hr	146	146.5	exc
Fort Chip	PM2.5	20Sep23, 10:00	420012	1-hr	201	201.4	exc
Barge Landing	PM2.5	20Sep23, 10:00	420013	1-hr	132	131.7	exc
Ft. McKay S	PM2.5	20Sep23, 10:00	420014	1-hr	102	101.7	exc
Wapasu	PM2.5	20Sep23, 10:00	420016	1-hr	259	259.2	exc
Fort Hills	PM2.5	20Sep23, 10:00	419746	1-hr	108	108.4	exc
Ells River	PM2.5	20Sep23, 10:00	419747	1-hr	151	150.7	exc
Bertha Ganter	PM2.5	20Sep23, 11:00	420077	1-hr	118	117.7	exc
Buffalo Viewpoint	PM2.5	20Sep23, 11:00	420021	1-hr	187	187.4	exc
Patricia McInnes	PM2.5	20Sep23, 11:00	420007	1-hr	188	188.2	exc
Athabasca Valley	PM2.5	20Sep23, 11:00	420011	1-hr	97	97.1	exc
Fort Chip	PM2.5	20Sep23, 11:00	420012	1-hr	171	170.9	exc
Barge Landing	PM2.5	20Sep23, 11:00	420013	1-hr	135	135.0	exc
Ft. McKay S	PM2.5	20Sep23, 11:00	420014	1-hr	114	114.4	exc
Wapasu	PM2.5	20Sep23, 11:00	420016	1-hr	283	283.2	exc
Fort Hills	PM2.5	20Sep23, 11:00	419746	1-hr	145	144.6	exc
Ells River	PM2.5	20Sep23, 11:00	419747	1-hr	170	170.3	exc
Bertha Ganter	PM2.5	20Sep23, 12:00	420077	1-hr	148	147.9	exc
Buffalo Viewpoint	PM2.5	20Sep23, 12:00	420021	1-hr	181	181.5	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Patricia McInnes	PM2.5	20Sep23, 12:00	420007	1-hr	213	212.8	exc
Athabasca Valley	PM2.5	20Sep23, 12:00	420011	1-hr	141	140.9	exc
Fort Chip	PM2.5	20Sep23, 12:00	420012	1-hr	124	124.2	exc
Barge Landing	PM2.5	20Sep23, 12:00	420013	1-hr	156	156.3	exc
Ft. McKay S	PM2.5	20Sep23, 12:00	420014	1-hr	171	171.1	exc
Anzac	PM2.5	20Sep23, 12:00	420015	1-hr	87	87.1	exc
Wapasu	PM2.5	20Sep23, 12:00	420016	1-hr	253	253.1	exc
Fort Hills	PM2.5	20Sep23, 12:00	419746	1-hr	138	138.1	exc
Ells River	PM2.5	20Sep23, 12:00	419747	1-hr	177	176.9	exc
Bertha Ganter	PM2.5	20Sep23, 13:00	420077	1-hr	141	140.7	exc
Buffalo Viewpoint	PM2.5	20Sep23, 13:00	420021	1-hr	158	157.7	exc
Patricia McInnes	PM2.5	20Sep23, 13:00	420007	1-hr	200	200.0	exc
Athabasca Valley	PM2.5	20Sep23, 13:00	420011	1-hr	161	160.8	exc
Barge Landing	PM2.5	20Sep23, 13:00	420013	1-hr	149	148.6	exc
Ft. McKay S	PM2.5	20Sep23, 13:00	420014	1-hr	149	148.6	exc
Anzac	PM2.5	20Sep23, 13:00	420015	1-hr	102	102.2	exc
Wapasu	PM2.5	20Sep23, 13:00	420016	1-hr	236	235.6	exc
Fort Hills	PM2.5	20Sep23, 13:00	419746	1-hr	126	125.6	exc
Ells River	PM2.5	20Sep23, 13:00	419747	1-hr	128	127.7	exc
Bertha Ganter	PM2.5	20Sep23, 14:00	420077	1-hr	133	133.3	exc
Buffalo Viewpoint	PM2.5	20Sep23, 14:00	420021	1-hr	152	152.0	exc
Patricia McInnes	PM2.5	20Sep23, 14:00	420007	1-hr	154	154.4	exc
Athabasca Valley	PM2.5	20Sep23, 14:00	420011	1-hr	138	138.3	exc
Barge Landing	PM2.5	20Sep23, 14:00	420013	1-hr	139	139.3	exc
Ft. McKay S	PM2.5	20Sep23, 14:00	420014	1-hr	145	145.1	exc
Anzac	PM2.5	20Sep23, 14:00	420015	1-hr	124	123.8	exc
Wapasu	PM2.5	20Sep23, 14:00	420016	1-hr	213	213.6	exc
Fort Hills	PM2.5	20Sep23, 14:00	419746	1-hr	156	156.0	exc
Ells River	PM2.5	20Sep23, 14:00	419747	1-hr	132	132.1	exc
Bertha Ganter	PM2.5	20Sep23, 15:00	420077	1-hr	146	146.0	exc
Buffalo Viewpoint	PM2.5	20Sep23, 15:00	420021	1-hr	138	138.4	exc
Patricia McInnes	PM2.5	20Sep23, 15:00	420007	1-hr	152	152.4	exc
Athabasca Valley	PM2.5	20Sep23, 15:00	420011	1-hr	137	137.1	exc
Barge Landing	PM2.5	20Sep23, 15:00	420013	1-hr	153	152.6	exc
Ft. McKay S	PM2.5	20Sep23, 15:00	420014	1-hr	147	147.0	exc
Anzac	PM2.5	20Sep23, 15:00	420015	1-hr	139	138.7	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Wapasu	PM2.5	20Sep23, 15:00	420016	1-hr	183	182.6	exc
Fort Hills	PM2.5	20Sep23, 15:00	419746	1-hr	156	156.2	exc
Ells River	PM2.5	20Sep23, 15:00	419747	1-hr	154	153.8	exc
Bertha Ganter	PM2.5	20Sep23, 16:00	420077	1-hr	144	143.6	exc
Buffalo Viewpoint	PM2.5	20Sep23, 16:00	420021	1-hr	133	133.3	exc
Patricia McInnes	PM2.5	20Sep23, 16:00	420007	1-hr	128	127.6	exc
Athabasca Valley	PM2.5	20Sep23, 16:00	420011	1-hr	113	112.7	exc
Fort Chip	PM2.5	20Sep23, 16:00	420012	1-hr	127	125.4	exc
Barge Landing	PM2.5	20Sep23, 16:00	420013	1-hr	157	156.9	exc
Ft. McKay S	PM2.5	20Sep23, 16:00	420014	1-hr	148	147.7	exc
Anzac	PM2.5	20Sep23, 16:00	420015	1-hr	162	161.6	exc
Wapasu	PM2.5	20Sep23, 16:00	420016	1-hr	142	142.4	exc
Surmont 2	PM2.5	20Sep23, 12:00	420020	1-hr	86	85.6	exc
Surmont 2	PM2.5	20Sep23, 13:00	420020	1-hr	89	89.4	exc
Surmont 2	PM2.5	20Sep23, 14:00	420020	1-hr	89	89.3	exc
Surmont 2	PM2.5	20Sep23, 15:00	420020	1-hr	95	95.3	exc
Ells River	PM2.5	20Sep23, 16:00	419747	1-hr	155	155.2	exc
Fort Hills	PM2.5	20Sep23, 16:00	419746	1-hr	156	155.7	exc
Surmont 2	PM2.5	20Sep23, 16:00	420020	1-hr	99	99.3	exc
Bertha Ganter	PM2.5	20Sep23, 17:00	420077	1-hr	149	148.9	exc
Buffalo Viewpoint	PM2.5	20Sep23, 17:00	420021	1-hr	139	138.5	exc
Patricia McInnes	PM2.5	20Sep23, 17:00	420007	1-hr	117	116.9	exc
Athabasca Valley	PM2.5	20Sep23, 17:00	420011	1-hr	104	104.4	exc
Fort Chip	PM2.5	20Sep23, 17:00	420012	1-hr	150	149.8	exc
Barge Landing	PM2.5	20Sep23, 17:00	420013	1-hr	147	147.1	exc
Ft. McKay S	PM2.5	20Sep23, 17:00	420014	1-hr	151	150.8	exc
Anzac	PM2.5	20Sep23, 17:00	420015	1-hr	158	158.4	exc
Wapasu	PM2.5	20Sep23, 17:00	420016	1-hr	115	114.8	exc
Fort Hills	PM2.5	20Sep23, 17:00	419746	1-hr	135	135.2	exc
Ells River	PM2.5	20Sep23, 17:00	419747	1-hr	162	161.8	exc
Surmont 2	PM2.5	20Sep23, 17:00	420020	1-hr	100	100.5	exc
Bertha Ganter	PM2.5	20Sep23, 18:00	420077	1-hr	112	112.2	exc
Buffalo Viewpoint	PM2.5	20Sep23, 18:00	420021	1-hr	160	160.2	exc
Patricia McInnes	PM2.5	20Sep23, 18:00	420007	1-hr	106	106.0	exc
Athabasca Valley	PM2.5	20Sep23, 18:00	420011	1-hr	103	102.8	exc
Fort Chip	PM2.5	20Sep23, 18:00	420012	1-hr	143	143.0	exc
Barge Landing	PM2.5	20Sep23, 18:00	420013	1-hr	112	112.4	exc
Ft. McKay S	PM2.5	20Sep23, 18:00	420014	1-hr	135	134.8	exc



<u>Site</u>	<u>Parameter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Anzac	PM2.5	20Sep23, 18:00	420015	1-hr	120	120.3	exc
Wapasu	PM2.5	20Sep23, 18:00	420016	1-hr	107	106.8	exc
Janvier	PM2.5	20Sep23, 18:00	420019	1-hr	88	87.6	exc
Fort Hills	PM2.5	20Sep23, 18:00	419746	1-hr	98	98.1	exc
Surmont 2	PM2.5	20Sep23, 18:00	420020	1-hr	122	122.2	exc
Ells River	PM2.5	20Sep23, 18:00	419747	1-hr	81	80.7	exc
Buffalo Viewpoint	PM2.5	20Sep23, 19:00	420021	1-hr	156	156.3	exc
Patricia McInnes	PM2.5	20Sep23, 19:00	420007	1-hr	110	109.5	exc
Athabasca Valley	PM2.5	20Sep23, 19:00	420011	1-hr	97	97.3	exc
Fort Chip	PM2.5	20Sep23, 19:00	420012	1-hr	144	144.2	exc
Anzac	PM2.5	20Sep23, 19:00	420015	1-hr	93	93.2	exc
Wapasu	PM2.5	20Sep23, 19:00	420016	1-hr	101	100.6	exc
Surmont 2	PM2.5	20Sep23, 19:00	420020	1-hr	135	135.1	exc
Janvier	PM2.5	20Sep23, 19:00	420019	1-hr	88	87.7	exc
Buffalo Viewpoint	PM2.5	20Sep23, 20:00	420021	1-hr	95	94.9	exc
Patricia McInnes	PM2.5	20Sep23, 20:00	420007	1-hr	114	113.6	exc
Athabasca Valley	PM2.5	20Sep23, 20:00	420011	1-hr	96	95.8	exc
Fort Chip	PM2.5	20Sep23, 20:00	420012	1-hr	149	149.1	exc
Anzac	PM2.5	20Sep23, 20:00	420015	1-hr	85	84.7	exc
Wapasu	PM2.5	20Sep23, 20:00	420016	1-hr	97	96.9	exc
Conklin	PM2.5	20Sep23, 20:00	420018	1-hr	85	85.1	exc
Janvier	PM2.5	20Sep23, 20:00	420019	1-hr	91	91.1	exc
Surmont 2	PM2.5	20Sep23, 20:00	420020	1-hr	129	129.4	exc
Buffalo Viewpoint	PM2.5	20Sep23, 21:00	420021	1-hr	101	100.5	exc
Patricia McInnes	PM2.5	20Sep23, 21:00	420007	1-hr	130	130.3	exc
Athabasca Valley	PM2.5	20Sep23, 21:00	420011	1-hr	92	92.0	exc
Fort Chip	PM2.5	20Sep23, 21:00	420012	1-hr	138	138.4	exc
Anzac	PM2.5	20Sep23, 21:00	420015	1-hr	81	80.9	exc
Wapasu	PM2.5	20Sep23, 21:00	420016	1-hr	98	98.4	exc
Conklin	PM2.5	20Sep23, 21:00	420018	1-hr	88	87.9	exc
Janvier	PM2.5	20Sep23, 21:00	420019	1-hr	90	89.8	exc
Surmont 2	PM2.5	20Sep23, 21:00	420020	1-hr	130	130.3	exc
Buffalo Viewpoint	PM2.5	20Sep23, 22:00	420021	1-hr	107	107.2	exc
Patricia McInnes	PM2.5	20Sep23, 22:00	420007	1-hr	132	132.0	exc
Athabasca Valley	PM2.5	20Sep23, 22:00	420011	1-hr	96	95.9	exc
Fort Chip	PM2.5	20Sep23, 22:00	420012	1-hr	134	134.0	exc
Anzac	PM2.5	20Sep23, 22:00	420015	1-hr	82	81.6	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Wapasu	PM2.5	20Sep23, 22:00	420016	1-hr	98	97.6	exc
Stony Mtn.	PM2.5	20Sep23, 22:00	420017	1-hr	88	87.9	exc
Surmont 2	PM2.5	20Sep23, 22:00	420020	1-hr	123	123.3	exc
Ells River	PM2.5	20Sep23, 22:00	419747	1-hr	85	85.3	exc
Buffalo Viewpoint	PM2.5	20Sep23, 23:00	420021	1-hr	121	121.4	exc
Patricia McInnes	PM2.5	20Sep23, 23:00	420007	1-hr	128	128.3	exc
Athabasca Valley	PM2.5	20Sep23, 23:00	420011	1-hr	104	103.9	exc
Fort Chip	PM2.5	20Sep23, 23:00	420012	1-hr	144	143.6	exc
Anzac	PM2.5	20Sep23, 23:00	420015	1-hr	86	86.1	exc
Wapasu	PM2.5	20Sep23, 23:00	420016	1-hr	105	105.1	exc
Stony Mtn.	PM2.5	20Sep23, 23:00	420017	1-hr	100	100.5	exc
Surmont 2	PM2.5	20Sep23, 23:00	420020	1-hr	119	119.3	exc
Ells River	PM2.5	20Sep23, 23:00	419747	1-hr	80	80.2	exc
Bertha Ganter	PM2.5	20Sep23, 24:00	420077	24-hr	98	98.5	exc
Buffalo Viewpoint	PM2.5	20Sep23, 24:00	420021	1-hr	121	120.8	exc
Buffalo Viewpoint	PM2.5	20Sep23, 24:00	420021	24-hr	135	135.2	exc
Patricia McInnes	PM2.5	20Sep23, 24:00	420007	1-hr	136	136.1	exc
Patricia McInnes	PM2.5	20Sep23, 24:00	420007	24-hr	118	117.5	exc
Athabasca Valley	PM2.5	20Sep23, 24:00	420011	1-hr	96	95.7	exc
Athabasca Valley	PM2.5	20Sep23, 24:00	420011	24-hr	75	74.8	exc
Fort Chip	PM2.5	20Sep23, 24:00	420012	1-hr	140	139.6	exc
Fort Chip	PM2.5	20Sep23, 24:00	420012	24-hr	156	157.4	exc
Barge Landing	PM2.5	20Sep23, 24:00	420013	24-hr	91	90.9	exc
Ft. McKay S	PM2.5	20Sep23, 24:00	420014	24-hr	106	105.5	exc
Anzac	PM2.5	20Sep23, 24:00	420015	1-hr	84	84.1	exc
Anzac	PM2.5	20Sep23, 24:00	420015	24-hr	88	88.1	exc
Wapasu	PM2.5	20Sep23, 24:00	420016	1-hr	108	107.9	exc
Wapasu	PM2.5	20Sep23, 24:00	420016	24-hr	128	128.2	exc
Stony Mtn.	PM2.5	20Sep23, 24:00	420017	1-hr	121	121.0	exc
Stony Mtn.	PM2.5	20Sep23, 24:00	420017	24-hr	44	44.0	exc
Surmont 2	PM2.5	20Sep23, 24:00	420020	1-hr	108	108.5	exc
Surmont 2	PM2.5	20Sep23, 24:00	420020	24-hr	79	78.9	exc
Ells River	PM2.5	20Sep23, 24:00	419747	1-hr	85	84.7	exc
Conklin	PM2.5	20Sep23, 24:00	420018	24-hr	44	43.8	exc
Janvier	PM2.5	20Sep23, 24:00	420019	24-hr	52	52.3	exc
Fort Hills	PM2.5	20Sep23, 24:00	419746	24-hr	99	98.7	exc
Ells River	PM2.5	20Sep23, 24:00	419747	24-hr	112	112.1	exc
Bertha Ganter	PM2.5	21Sep23, 01:00	420077	1-hr	98	97.7	exc
Buffalo Viewpoint	PM2.5	21Sep23, 01:00	420021	1-hr	115	114.7	exc
Patricia McInnes	PM2.5	21Sep23, 01:00	420007	1-hr	131	131.1	exc



<u>Site</u>	<u>Parameter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Athabasca Valley	PM2.5	21Sep23, 01:00	420011	1-hr	103	103.1	exc
Fort Chip	PM2.5	21Sep23, 01:00	420012	1-hr	127	126.8	exc
Anzac	PM2.5	21Sep23, 01:00	420015	1-hr	86	85.8	exc
Wapasu	PM2.5	21Sep23, 01:00	420016	1-hr	108	107.5	exc
Stony Mtn.	PM2.5	21Sep23, 01:00	420017	1-hr	154	154.2	exc
Surmont 2	PM2.5	21Sep23, 01:00	420020	1-hr	96	96.5	exc
Ells River	PM2.5	21Sep23, 01:00	419797	1-hr	86	86.2	exc
Bertha Ganter	PM2.5	21Sep23, 02:00	420077	1-hr	87	87.4	exc
Buffalo Viewpoint	PM2.5	21Sep23, 02:00	420021	1-hr	114	114.4	exc
Patricia McInnes	PM2.5	21Sep23, 02:00	420007	1-hr	119	119.4	exc
Athabasca Valley	PM2.5	21Sep23, 02:00	420011	1-hr	126	126.4	exc
Fort Chip	PM2.5	21Sep23, 02:00	420012	1-hr	112	111.7	exc
Ft. McKay S	PM2.5	21Sep23, 02:00	420014	1-hr	85	84.6	exc
Anzac	PM2.5	21Sep23, 02:00	420015	1-hr	89	88.7	exc
Wapasu	PM2.5	21Sep23, 02:00	420016	1-hr	107	107.3	exc
Stony Mtn.	PM2.5	21Sep23, 02:00	420017	1-hr	171	171.2	exc
Fort Hills	PM2.5	21Sep23, 02:00	419798	1-hr	84	83.5	exc
Ells River	PM2.5	21Sep23, 02:00	419797	1-hr	95	95.2	exc
Surmont 2	PM2.5	21Sep23, 02:00	420020	1-hr	89	88.6	exc
Bertha Ganter	PM2.5	21Sep23, 03:00	420077	1-hr	90	89.9	exc
Buffalo Viewpoint	PM2.5	21Sep23, 03:00	420021	1-hr	116	116.3	exc
Patricia McInnes	PM2.5	21Sep23, 03:00	420007	1-hr	113	113.4	exc
Athabasca Valley	PM2.5	21Sep23, 03:00	420011	1-hr	124	124.3	exc
Fort Chip	PM2.5	21Sep23, 03:00	420012	1-hr	102	102.4	exc
Ft. McKay S	PM2.5	21Sep23, 03:00	420014	1-hr	88	87.6	exc
Anzac	PM2.5	21Sep23, 03:00	420015	1-hr	91	91.0	exc
Wapasu	PM2.5	21Sep23, 03:00	420016	1-hr	104	103.9	exc
Stony Mtn.	PM2.5	21Sep23, 03:00	420017	1-hr	173	173.1	exc
Janvier	PM2.5	21Sep23, 03:00	420019	1-hr	86	86.1	exc
Fort Hills	PM2.5	21Sep23, 03:00	419798	1-hr	88	87.5	exc
Surmont 2	PM2.5	21Sep23, 03:00	420020	1-hr	83	82.6	exc
Ells River	PM2.5	21Sep23, 03:00	419797	1-hr	95	95.0	exc
Bertha Ganter	PM2.5	21Sep23, 04:00	420077	1-hr	88	88.1	exc
Buffalo Viewpoint	PM2.5	21Sep23, 04:00	420021	1-hr	120	120.4	exc
Patricia McInnes	PM2.5	21Sep23, 04:00	420007	1-hr	130	130.4	exc
Athabasca Valley	PM2.5	21Sep23, 04:00	420011	1-hr	111	111.4	exc
Fort Chip	PM2.5	21Sep23, 04:00	420012	1-hr	98	97.9	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Barge Landing	PM2.5	21Sep23, 04:00	420013	1-hr	85	84.8	exc
Ft. McKay S	PM2.5	21Sep23, 04:00	420014	1-hr	87	87.1	exc
Anzac	PM2.5	21Sep23, 04:00	420015	1-hr	92	92.2	exc
Wapasu	PM2.5	21Sep23, 04:00	420016	1-hr	113	112.9	exc
Stony Mtn.	PM2.5	21Sep23, 04:00	420017	1-hr	173	172.7	exc
Fort Hills	PM2.5	21Sep23, 04:00	419798	1-hr	84	84.4	exc
Surmont 2	PM2.5	21Sep23, 04:00	420020	1-hr	83	82.6	exc
Ells River	PM2.5	21Sep23, 04:00	419797	1-hr	90	89.9	exc
Bertha Ganter	PM2.5	21Sep23, 05:00	420077	1-hr	85	85.4	exc
Buffalo Viewpoint	PM2.5	21Sep23, 05:00	420021	1-hr	134	133.8	exc
Patricia McInnes	PM2.5	21Sep23, 05:00	420007	1-hr	134	134.1	exc
Athabasca Valley	PM2.5	21Sep23, 05:00	420011	1-hr	99	99.5	exc
Fort Chip	PM2.5	21Sep23, 05:00	420012	1-hr	102	102.0	exc
Barge Landing	PM2.5	21Sep23, 05:00	420013	1-hr	100	99.6	exc
Ft. McKay S	PM2.5	21Sep23, 05:00	420014	1-hr	90	90.5	exc
Anzac	PM2.5	21Sep23, 05:00	420015	1-hr	95	95.0	exc
Wapasu	PM2.5	21Sep23, 05:00	420016	1-hr	117	116.7	exc
Stony Mtn.	PM2.5	21Sep23, 05:00	420017	1-hr	129	128.6	exc
Janvier	PM2.5	21Sep23, 05:00	420019	1-hr	85	84.6	exc
Fort Hills	PM2.5	21Sep23, 05:00	419798	1-hr	84	84.2	exc
Surmont 2	PM2.5	21Sep23, 05:00	420020	1-hr	81	80.7	exc
Ells River	PM2.5	21Sep23, 05:00	419797	1-hr	88	87.8	exc
Bertha Ganter	PM2.5	21Sep23, 06:00	420077	1-hr	105	104.9	exc
Buffalo Viewpoint	PM2.5	21Sep23, 06:00	420021	1-hr	138	137.9	exc
Patricia McInnes	PM2.5	21Sep23, 06:00	420007	1-hr	133	133.2	exc
Athabasca Valley	PM2.5	21Sep23, 06:00	420011	1-hr	97	97.2	exc
Fort Chip	PM2.5	21Sep23, 06:00	420012	1-hr	109	108.7	exc
Barge Landing	PM2.5	21Sep23, 06:00	420013	1-hr	119	118.5	exc
Ft. McKay S	PM2.5	21Sep23, 06:00	420014	1-hr	94	94.5	exc
Anzac	PM2.5	21Sep23, 06:00	420015	1-hr	107	106.9	exc
Wapasu	PM2.5	21Sep23, 06:00	420016	1-hr	127	126.6	exc
Stony Mtn.	PM2.5	21Sep23, 06:00	420017	1-hr	109	109.3	exc
Janvier	PM2.5	21Sep23, 06:00	420019	1-hr	84	83.8	exc
Fort Hills	PM2.5	21Sep23, 06:00	419798	1-hr	89	88.7	exc
Ells River	PM2.5	21Sep23, 06:00	419797	1-hr	93	93.3	exc
Bertha Ganter	PM2.5	21Sep23, 07:00	420077	1-hr	123	122.8	exc



<u>Site</u>	<u>Parameter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Buffalo Viewpoint	PM2.5	21Sep23, 07:00	420021	1-hr	132	131.8	exc
Patricia McInnes	PM2.5	21Sep23, 07:00	420007	1-hr	123	122.6	exc
Athabasca Valley	PM2.5	21Sep23, 07:00	420011	1-hr	93	93.4	exc
Fort Chip	PM2.5	21Sep23, 07:00	420012	1-hr	120	119.9	exc
Barge Landing	PM2.5	21Sep23, 07:00	420013	1-hr	131	131.1	exc
Ft. McKay S	PM2.5	21Sep23, 07:00	420014	1-hr	128	127.7	exc
Anzac	PM2.5	21Sep23, 07:00	420015	1-hr	115	114.7	exc
Wapasu	PM2.5	21Sep23, 07:00	420016	1-hr	130	130.4	exc
Conklin	PM2.5	21Sep23, 07:00	420018	1-hr	93	93.2	exc
Fort Hills	PM2.5	21Sep23, 07:00	419798	1-hr	98	98.5	exc
Surmont 2	PM2.5	21Sep23, 07:00	420020	1-hr	93	93.2	exc
Ells River	PM2.5	21Sep23, 07:00	419797	1-hr	96	95.8	exc
Bertha Ganter	PM2.5	21Sep23, 08:00	420077	1-hr	124	123.6	exc
Buffalo Viewpoint	PM2.5	21Sep23, 08:00	420021	1-hr	119	118.6	exc
Patricia McInnes	PM2.5	21Sep23, 08:00	420007	1-hr	112	112.3	exc
Athabasca Valley	PM2.5	21Sep23, 08:00	420011	1-hr	92	91.7	exc
Fort Chip	PM2.5	21Sep23, 08:00	420012	1-hr	124	123.8	exc
Barge Landing	PM2.5	21Sep23, 08:00	420013	1-hr	125	124.6	exc
Ft. McKay S	PM2.5	21Sep23, 08:00	420014	1-hr	124	123.6	exc
Anzac	PM2.5	21Sep23, 08:00	420015	1-hr	107	106.5	exc
Wapasu	PM2.5	21Sep23, 08:00	420016	1-hr	110	109.9	exc
Fort Hills	PM2.5	21Sep23, 08:00	419798	1-hr	106	106.1	exc
Surmont 2	PM2.5	21Sep23, 08:00	420020	1-hr	96	95.7	exc
Ells River	PM2.5	21Sep23, 08:00	419797	1-hr	97	96.7	exc
Bertha Ganter	PM2.5	21Sep23, 09:00	420077	1-hr	112	111.8	exc
Buffalo Viewpoint	PM2.5	21Sep23, 09:00	420021	1-hr	89	88.5	exc
Patricia McInnes	PM2.5	21Sep23, 09:00	420007	1-hr	83	83.0	exc
Athabasca Valley	PM2.5	21Sep23, 09:00	420011	1-hr	84	84.2	exc
Fort Chip	PM2.5	21Sep23, 09:00	420012	1-hr	131	131.4	exc
Barge Landing	PM2.5	21Sep23, 09:00	420013	1-hr	107	107.1	exc
Ft. McKay S	PM2.5	21Sep23, 09:00	420014	1-hr	114	114.5	exc
Wapasu	PM2.5	21Sep23, 09:00	420016	1-hr	105	105.3	exc
Fort Hills	PM2.5	21Sep23, 09:00	419798	1-hr	109	108.7	exc
Ells River	PM2.5	21Sep23, 09:00	419797	1-hr	99	98.6	exc
Bertha Ganter	PM2.5	21Sep23, 10:00	420077	1-hr	83	83.1	exc
Athabasca Valley	PM2.5	21Sep23, 10:00	420011	1-hr	81	80.8	exc
Fort Chip	PM2.5	21Sep23, 10:00	420012	1-hr	151	151.4	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Barge Landing	PM2.5	21Sep23, 10:00	420013	1-hr	81	80.6	exc
Ft. McKay S	PM2.5	21Sep23, 10:00	420014	1-hr	89	89.2	exc
Fort Hills	PM2.5	21Sep23, 10:00	419798	1-hr	87	86.8	exc
Ells River	PM2.5	21Sep23, 10:00	419797	1-hr	82	82.2	exc
Fort Chip	PM2.5	21Sep23, 11:00	420012	1-hr	145	144.7	exc
Fort Chip	PM2.5	21Sep23, 12:00	420012	1-hr	95	95.3	exc
Bertha Ganter	PM2.5	21Sep23, 24:00	420077	24-hr	53	52.2	exc
Buffalo Viewpoint	PM2.5	21Sep23, 24:00	420021	24-hr	56	55.8	exc
Patricia McInnes	PM2.5	21Sep23, 24:00	420007	24-hr	58	57.6	exc
Athabasca Valley	PM2.5	21Sep23, 24:00	420011	24-hr	53	53.2	exc
Fort Chip	PM2.5	21Sep23, 24:00	420012	24-hr	75	75.1	exc
Conklin	PM2.5	21Sep23, 24:00	420018	24-hr	35	35.5	exc
Janvier	PM2.5	21Sep23, 24:00	420019	24-hr	42	42.3	exc
Surmont 2	PM2.5	21Sep23, 24:00	420020	24-hr	42	41.9	exc
Ells River	PM2.5	21Sep23, 24:00	419797	24-hr	48	48.3	exc
Barge Landing	PM2.5	21Sep23, 24:00	420013	24-hr	53	52.5	exc
Ft. McKay S	PM2.5	21Sep23, 24:00	420014	24-hr	54	53.9	exc
Anzac	PM2.5	21Sep23, 24:00	420015	24-hr	44	44.5	exc
Wapasu	PM2.5	21Sep23, 24:00	420016	24-hr	53	53.3	exc
Stony Mtn.	PM2.5	21Sep23, 24:00	420017	24-hr	56	56.3	exc
Fort Hills	PM2.5	21Sep23, 24:00	419798	24-hr	48	47.5	exc
Fort Hills	PM2.5	23Sep23, 08:00	419902	1-hr	190	189.7	exc
Fort Chip	PM2.5	24Sep23, 21:00	420012	1-hr	80	80.4	exc
Fort Chip	PM2.5	24Sep23, 22:00	420012	1-hr	86	86.0	exc
Fort Chip	PM2.5	24Sep23, 23:00	420012	1-hr	103	103.1	exc
Fort Chip	PM2.5	24Sep23, 24:00	420012	1-hr	106	105.8	exc
Fort Chip	PM2.5	24Sep23, 24:00	420012	24-hr	44	44.1	exc
Fort Chip	PM2.5	25Sep23, 01:00	420257	1-hr	257	257.5	exc
Fort Chip	PM2.5	25Sep23, 02:00	420257	1-hr	562	562.4	exc
Fort Chip	PM2.5	25Sep23, 03:00	420257	1-hr	687	687.4	exc
Fort Chip	PM2.5	25Sep23, 04:00	420257	1-hr	523	523.2	exc
Fort Chip	PM2.5	25Sep23, 05:00	420257	1-hr	400	400.2	exc
Fort Chip	PM2.5	25Sep23, 06:00	420257	1-hr	322	322.3	exc
Fort Chip	PM2.5	25Sep23, 07:00	420257	1-hr	217	217.3	exc
Fort Chip	PM2.5	25Sep23, 08:00	420257	1-hr	170	169.8	exc
Fort Chip	PM2.5	25Sep23, 09:00	420257	1-hr	87	87.3	exc
Ells River	PM2.5	25Sep23, 11:00	419959	1-hr	100	100.2	exc
Bertha Ganter	PM2.5	25Sep23, 12:00	420258	1-hr	120	120.2	exc
Buffalo Viewpoint	PM2.5	25Sep23, 12:00	420259	1-hr	96	95.8	exc
Barge Landing	PM2.5	25Sep23, 12:00	420260	1-hr	112	111.8	exc
Ft. McKay S	PM2.5	25Sep23, 12:00	420261	1-hr	82	81.7	exc
Fort Hills	PM2.5	25Sep23, 12:00	419958	1-hr	163	163.1	exc
Ells River	PM2.5	25Sep23, 12:00	419959	1-hr	169	168.5	exc
Bertha Ganter	PM2.5	25Sep23, 13:00	420258	1-hr	102	102.1	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Buffalo Viewpoint	PM2.5	25Sep23, 13:00	420259	1-hr	83	82.5	exc
Barge Landing	PM2.5	25Sep23, 13:00	420260	1-hr	91	91.0	exc
Fort Hills	PM2.5	25Sep23, 13:00	419958	1-hr	219	219.3	exc
Ells River	PM2.5	25Sep23, 13:00	419959	1-hr	167	168.5	exc
Bertha Ganter	PM2.5	25Sep23, 14:00	420258	1-hr	81	80.8	exc
Barge Landing	PM2.5	25Sep23, 14:00	420260	1-hr	95	95.5	exc
Fort Hills	PM2.5	25Sep23, 14:00	419958	1-hr	219	218.5	exc
Ells River	PM2.5	25Sep23, 14:00	419959	1-hr	176	176.0	exc
Bertha Ganter	PM2.5	25Sep23, 15:00	420258	1-hr	109	109.2	exc
Barge Landing	PM2.5	25Sep23, 15:00	420260	1-hr	104	104.3	exc
Ft. McKay S	PM2.5	25Sep23, 15:00	420261	1-hr	90	90.2	exc
Fort Hills	PM2.5	25Sep23, 15:00	419958	1-hr	186	185.7	exc
Ells River	PM2.5	25Sep23, 15:00	419959	1-hr	177	177.5	exc
Bertha Ganter	PM2.5	25Sep23, 16:00	420258	1-hr	105	104.8	exc
Bertha Ganter	PM2.5	25Sep23, 17:00	420258	1-hr	139	138.6	exc
Fort Chip	PM2.5	25Sep23, 16:00	420257	1-hr	88	87.8	exc
Fort Chip	PM2.5	25Sep23, 17:00	420257	1-hr	93	93.2	exc
Barge Landing	PM2.5	25Sep23, 16:00	420260	1-hr	92	91.9	exc
Barge Landing	PM2.5	25Sep23, 17:00	420260	1-hr	136	135.8	exc
Ft. McKay S	PM2.5	25Sep23, 16:00	420261	1-hr	93	92.8	exc
Ft. McKay S	PM2.5	25Sep23, 17:00	420261	1-hr	121	121.5	exc
Fort Hills	PM2.5	25Sep23, 16:00	419958	1-hr	167	166.7	exc
Fort Hills	PM2.5	25Sep23, 17:00	419958	1-hr	158	158.2	exc
Ells River	PM2.5	25Sep23, 16:00	419959	1-hr	163	163.3	exc
Ells River	PM2.5	25Sep23, 17:00	419959	1-hr	143	143.0	exc
Bertha Ganter	PM2.5	25Sep23, 18:00	420258	1-hr	116	116.0	exc
Buffalo Viewpoint	PM2.5	25Sep23, 18:00	420259	1-hr	88	87.6	exc
Fort Chip	PM2.5	25Sep23, 18:00	420257	1-hr	91	91.4	exc
Barge Landing	PM2.5	25Sep23, 18:00	420260	1-hr	113	112.6	exc
Ft. McKay S	PM2.5	25Sep23, 18:00	420261	1-hr	131	131.1	exc
Fort Hills	PM2.5	25Sep23, 18:00	419958	1-hr	178	178.1	exc
Ells River	PM2.5	25Sep23, 18:00	419959	1-hr	161	160.9	exc
Bertha Ganter	PM2.5	25Sep23, 19:00	420258	1-hr	165	165.0	exc
Buffalo Viewpoint	PM2.5	25Sep23, 19:00	420259	1-hr	85	84.7	exc
Mannix	H2S	25Sep23, 19:00	419922	1-hr	10	10.3	exc
Fort Chip	PM2.5	25Sep23, 19:00	420257	1-hr	114	113.7	exc
Barge Landing	PM2.5	25Sep23, 19:00	420260	1-hr	203	203.1	exc
Ft. McKay S	PM2.5	25Sep23, 19:00	420261	1-hr	151	150.7	exc
Fort Hills	PM2.5	25Sep23, 19:00	419958	1-hr	212	212.3	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Ells River	PM2.5	25Sep23, 19:00	419959	1-hr	187	187.5	exc
Bertha Ganter	PM2.5	25Sep23, 20:00	420258	1-hr	276	275.9	exc
Bertha Ganter	PM2.5	25Sep23, 21:00	420258	1-hr	299	298.8	exc
Bertha Ganter	PM2.5	25Sep23, 22:00	420258	1-hr	281	280.6	exc
Bertha Ganter	PM2.5	25Sep23, 23:00	420258	1-hr	245	245.0	exc
Bertha Ganter	PM2.5	25Sep23, 24:00	420258	1-hr	247	246.9	exc
Bertha Ganter	PM2.5	26Sep23, 01:00	420258	1-hr	214	214.4	exc
Bertha Ganter	PM2.5	26Sep23, 02:00	420258	1-hr	156	155.9	exc
Bertha Ganter	PM2.5	26Sep23, 03:00	420258	1-hr	120	120.0	exc
Bertha Ganter	PM2.5	26Sep23, 04:00	420258	1-hr	88	88.0	exc
Bertha Ganter	PM2.5	25Sep23, 24:00	420258	24-hr	101	100.5	exc
Buffalo Viewpoint	PM2.5	25Sep23, 24:00	420259	24-hr	39	38.6	exc
Fort Chip	PM2.5	25Sep23, 20:00	420257	1-hr	131	130.9	exc
Fort Chip	PM2.5	25Sep23, 21:00	420257	1-hr	192	191.7	exc
Fort Chip	PM2.5	25Sep23, 22:00	420257	1-hr	224	224.0	exc
Fort Chip	PM2.5	25Sep23, 23:00	420257	1-hr	283	283.0	exc
Fort Chip	PM2.5	25Sep23, 24:00	420257	1-hr	295	295.4	exc
Fort Chip	PM2.5	26Sep23, 01:00	420257	1-hr	268	268.5	exc
Fort Chip	PM2.5	26Sep23, 02:00	420257	1-hr	204	204.0	exc
Fort Chip	PM2.5	26Sep23, 03:00	420257	1-hr	142	142.1	exc
Fort Chip	PM2.5	26Sep23, 04:00	420257	1-hr	143	142.9	exc
Fort Chip	PM2.5	26Sep23, 05:00	420257	1-hr	115	115.3	exc
Fort Chip	PM2.5	26Sep23, 06:00	420257	1-hr	110	110.2	exc
Fort Chip	PM2.5	25Sep23, 24:00	420257	24-hr	214	214.1	exc
Barge Landing	PM2.5	25Sep23, 20:00	420260	1-hr	286	286.3	exc
Barge Landing	PM2.5	25Sep23, 21:00	420260	1-hr	300	300.4	exc
Barge Landing	PM2.5	25Sep23, 22:00	420260	1-hr	291	290.7	exc
Barge Landing	PM2.5	25Sep23, 23:00	420260	1-hr	292	292.0	exc
Barge Landing	PM2.5	25Sep23, 24:00	420260	1-hr	280	280.1	exc
Barge Landing	PM2.5	26Sep23, 01:00	420260	1-hr	240	240.2	exc
Barge Landing	PM2.5	26Sep23, 02:00	420260	1-hr	183	182.7	exc
Barge Landing	PM2.5	26Sep23, 03:00	420260	1-hr	132	132.1	exc
Barge Landing	PM2.5	26Sep23, 04:00	420260	1-hr	100	99.7	exc
Barge Landing	PM2.5	26Sep23, 05:00	420260	1-hr	88	88.4	exc
Barge Landing	PM2.5	25Sep23, 24:00	420260	24-hr	106	105.7	exc
Ft. McKay S	PM2.5	25Sep23, 20:00	420261	1-hr	247	246.8	exc
Ft. McKay S	PM2.5	25Sep23, 21:00	420261	1-hr	279	278.5	exc
Ft. McKay S	PM2.5	25Sep23, 22:00	420261	1-hr	273	273.0	exc
Ft. McKay S	PM2.5	25Sep23, 23:00	420261	1-hr	250	250.4	exc
Ft. McKay S	PM2.5	25Sep23, 24:00	420261	1-hr	256	256.4	exc
Ft. McKay S	PM2.5	26Sep23, 01:00	420261	1-hr	240	240.3	exc
Ft. McKay S	PM2.5	26Sep23, 02:00	420261	1-hr	197	196.9	exc
Ft. McKay S	PM2.5	26Sep23, 03:00	420261	1-hr	166	165.6	exc
Ft. McKay S	PM2.5	26Sep23, 04:00	420261	1-hr	135	135.5	exc
Ft. McKay S	PM2.5	26Sep23, 05:00	420261	1-hr	101	101.3	exc
Ft. McKay S	PM2.5	26Sep23, 06:00	420261	1-hr	82	81.7	exc
Ft. McKay S	PM2.5	25Sep23, 24:00	420261	24-hr	95	95.0	exc
Anzac	PM2.5	25Sep23, 21:00	420262	1-hr	133	132.7	exc
Fort Hills	PM2.5	25Sep23, 20:00	419958	1-hr	296	296.4	exc
Fort Hills	PM2.5	25Sep23, 21:00	419958	1-hr	278	278.1	exc
Fort Hills	PM2.5	25Sep23, 22:00	419958	1-hr	295	294.9	exc
Fort Hills	PM2.5	25Sep23, 23:00	419958	1-hr	272	271.9	exc
Fort Hills	PM2.5	25Sep23, 24:00	419958	1-hr	231	231.5	exc
Fort Hills	PM2.5	26Sep23, 01:00	420008	1-hr	165	164.5	exc
Fort Hills	PM2.5	26Sep23, 02:00	420008	1-hr	121	121.1	exc
Fort Hills	PM2.5	26Sep23, 03:00	420008	1-hr	102	101.6	exc
Fort Hills	PM2.5	26Sep23, 04:00	420008	1-hr	96	95.5	exc
Fort Hills	PM2.5	25Sep23, 24:00	419958	24-hr	125	124.7	exc
Ells River	PM2.5	25Sep23, 20:00	419959	1-hr	240	240.0	exc
Ells River	PM2.5	25Sep23, 21:00	419959	1-hr	287	287.0	exc
Ells River	PM2.5	25Sep23, 22:00	419959	1-hr	315	315.1	exc
Ells River	PM2.5	25Sep23, 23:00	419959	1-hr	294	293.6	exc
Ells River	PM2.5	25Sep23, 24:00	419959	1-hr	243	243.3	exc
Ells River	PM2.5	26Sep23, 01:00	420010	1-hr	176	176.0	exc
Ells River	PM2.5	26Sep23, 02:00	420010	1-hr	119	119.4	exc



<u>Site</u>	<u>Parameter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Ells River	PM2.5	26Sep23, 03:00	420010	1-hr	81	81.1	exc
Ells River	PM2.5	25Sep23, 24:00	419959	24-hr	121	121.3	exc
Fort Hills	PM2.5	26Sep23, 07:00	420008	1-hr	84	84.0	exc
Barge Landing	PM2.5	26Sep23, 09:00	420260	1-hr	80	80.2	exc
Fort Chip	PM2.5	26Sep23, 23:00	420257	1-hr	80	80.4	exc
Ft. McKay S	PM2.5	26Sep23, 24:00	420261	24-hr	63	63.8	exc
Fort Hills	PM2.5	26Sep23, 24:00	420008	24-hr	49	48.8	exc
Ells River	PM2.5	26Sep23, 24:00	420010	24-hr	40	40.1	exc
Bertha Ganter	PM2.5	26Sep23, 24:00	420258	24-hr	51	51.4	exc
Fort Chip	PM2.5	26Sep23, 24:00	420257	24-hr	79	79.4	exc
Barge Landing	PM2.5	26Sep23, 24:00	420260	24-hr	61	60.7	exc
Fort Chip	PM2.5	27Sep23, 03:00	420257	1-hr	104	104.2	exc
Fort Chip	PM2.5	27Sep23, 04:00	420257	1-hr	299	298.7	exc
Ells River	PM2.5	27Sep23, 05:00	420080	1-hr	82	82.2	exc
Fort Chip	PM2.5	27Sep23, 05:00	420257	1-hr	359	358.7	exc
Fort Hills	PM2.5	27Sep23, 06:00	420079	1-hr	88	88.5	exc
Fort Chip	PM2.5	27Sep23, 06:00	420257	1-hr	351	350.8	exc
Fort Chip	PM2.5	27Sep23, 07:00	420257	1-hr	316	316.1	exc
Fort Hills	PM2.5	27Sep23, 07:00	420079	1-hr	85	85.3	exc
Fort Chip	PM2.5	27Sep23, 08:00	420257	1-hr	300	299.9	exc
Fort Hills	PM2.5	27Sep23, 08:00	420079	1-hr	90	89.8	exc
Fort Chip	PM2.5	27Sep23, 09:00	420257	1-hr	327	327.3	exc
Fort Hills	PM2.5	27Sep23, 09:00	420079	1-hr	82	81.6	exc
Fort Chip	PM2.5	27Sep23, 10:00	420257	1-hr	304	304.1	exc
Wapasu	PM2.5	27Sep23, 10:00	420263	1-hr	93	93.0	exc
Fort Chip	PM2.5	27Sep23, 11:00	420257	1-hr	247	246.9	exc
Wapasu	PM2.5	27Sep23, 11:00	420263	1-hr	108	108.1	exc
Fort Hills	PM2.5	27Sep23, 11:00	420079	1-hr	93	92.9	exc
Fort Chip	PM2.5	27Sep23, 12:00	420257	1-hr	202	201.6	exc
Wapasu	PM2.5	27Sep23, 12:00	420263	1-hr	89	88.7	exc
Fort Hills	PM2.5	27Sep23, 12:00	420079	1-hr	81	81.0	exc
Fort Chip	PM2.5	27Sep23, 13:00	420257	1-hr	176	175.5	exc
Fort Chip	PM2.5	27Sep23, 14:00	420257	1-hr	164	164.1	exc
Fort Chip	PM2.5	27Sep23, 15:00	420257	1-hr	151	150.7	exc
Fort Chip	PM2.5	27Sep23, 16:00	420257	1-hr	148	148.1	exc
Fort Chip	PM2.5	27Sep23, 17:00	420257	1-hr	168	167.8	exc
Fort Chip	PM2.5	27Sep23, 18:00	420257	1-hr	205	204.6	exc
Fort Hills	PM2.5	27Sep23, 18:00	420079	1-hr	117	117.0	exc
Bertha Ganter	PM2.5	27Sep23, 19:00	420258	1-hr	83	83.2	exc
Fort Chip	PM2.5	27Sep23, 19:00	420257	1-hr	190	189.8	exc
Barge Landing	PM2.5	27Sep23, 19:00	420260	1-hr	121	120.8	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Fort Hills	PM2.5	27Sep23, 19:00	420079	1-hr	130	129.9	exc
Ells River	PM2.5	27Sep23, 19:00	420080	1-hr	107	106.7	exc
Bertha Ganter	PM2.5	27Sep23, 20:00	420258	1-hr	95	95.0	exc
Fort Chip	PM2.5	27Sep23, 20:00	420257	1-hr	170	170.4	exc
Barge Landing	PM2.5	27Sep23, 20:00	420260	1-hr	113	112.8	exc
Fort Hills	PM2.5	27Sep23, 20:00	420079	1-hr	145	145.3	exc
Ells River	PM2.5	27Sep23, 20:00	420080	1-hr	109	109.4	exc
Bertha Ganter	PM2.5	27Sep23, 21:00	420258	1-hr	104	104.1	exc
Fort Chip	PM2.5	27Sep23, 21:00	420257	1-hr	148	147.8	exc
Barge Landing	PM2.5	27Sep23, 21:00	420260	1-hr	112	111.8	exc
Fort Hills	PM2.5	27Sep23, 21:00	420079	1-hr	218	217.7	exc
Ells River	PM2.5	27Sep23, 21:00	420080	1-hr	130	130.1	exc
Bertha Ganter	PM2.5	27Sep23, 22:00	420258	1-hr	115	115.4	exc
Fort Chip	PM2.5	27Sep23, 22:00	420257	1-hr	149	148.9	exc
Barge Landing	PM2.5	27Sep23, 22:00	420260	1-hr	109	109.2	exc
Fort Hills	PM2.5	27Sep23, 22:00	420079	1-hr	192	192.0	exc
Ells River	PM2.5	27Sep23, 22:00	420080	1-hr	160	159.7	exc
Bertha Ganter	PM2.5	27Sep23, 23:00	420258	1-hr	188	187.7	exc
Fort Chip	PM2.5	27Sep23, 23:00	420257	1-hr	147	147.2	exc
Barge Landing	PM2.5	27Sep23, 23:00	420260	1-hr	147	147.0	exc
Ft. McKay S	PM2.5	27Sep23, 23:00	420261	1-hr	101	101.2	exc
Fort Hills	PM2.5	27Sep23, 23:00	420079	1-hr	186	186.0	exc
Ells River	PM2.5	27Sep23, 23:00	420080	1-hr	188	188.2	exc
Bertha Ganter	PM2.5	27Sep23, 24:00	420258	1-hr	192	192.3	exc
Bertha Ganter	PM2.5	27Sep23, 24:00	420258	24-hr	55	54.8	exc
Fort Chip	PM2.5	27Sep23, 24:00	420257	1-hr	137	137.3	exc
Barge Landing	PM2.5	27Sep23, 24:00	420260	1-hr	142	142.1	exc
Barge Landing	PM2.5	27Sep23, 24:00	420260	24-hr	59	58.6	exc
Ft. McKay S	PM2.5	27Sep23, 24:00	420261	1-hr	131	131.2	exc
Ft. McKay S	PM2.5	27Sep23, 24:00	420261	24-hr	40	40.3	exc
Wapasu	PM2.5	27Sep23, 24:00	420263	24-hr	31	31.2	exc
Fort Hills	PM2.5	27Sep23, 24:00	420079	1-hr	195	195.0	exc
Fort Hills	PM2.5	27Sep23, 24:00	420079	24-hr	88	87.7	exc
Ells River	PM2.5	27Sep23, 24:00	420080	1-hr	241	240.7	exc
Fort Chip	PM2.5	27Sep23, 24:00	420257	24-hr	201	201.4	exc
Ells River	PM2.5	27Sep23, 24:00	420080	24-hr	66	65.7	exc
Bertha Ganter	PM2.5	28Sep23, 01:00	420258	1-hr	229	229.0	exc
Buffalo Viewpoint	PM2.5	28Sep23, 01:00	420259	1-hr	102	102.3	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Fort Chip	PM2.5	28Sep23, 01:00	420257	1-hr	127	126.7	exc
Barge Landing	PM2.5	28Sep23, 01:00	420260	1-hr	153	152.6	exc
Ft. McKay S	PM2.5	28Sep23, 01:00	420261	1-hr	159	159.3	exc
Fort Hills	PM2.5	28Sep23, 01:00	420136	1-hr	231	231.4	exc
Ells River	PM2.5	28Sep23, 01:00	420137	1-hr	258	258.2	exc
Bertha Ganter	PM2.5	28Sep23, 02:00	420258	1-hr	206	205.7	exc
Buffalo Viewpoint	PM2.5	28Sep23, 02:00	420259	1-hr	130	129.8	exc
Fort Chip	PM2.5	28Sep23, 02:00	420257	1-hr	120	119.5	exc
Barge Landing	PM2.5	28Sep23, 02:00	420260	1-hr	173	173.5	exc
Ft. McKay S	PM2.5	28Sep23, 02:00	420261	1-hr	162	162.0	exc
Fort Hills	PM2.5	28Sep23, 02:00	420136	1-hr	184	183.9	exc
Ells River	PM2.5	28Sep23, 02:00	420137	1-hr	249	249.4	exc
Bertha Ganter	PM2.5	28Sep23, 03:00	420258	1-hr	190	189.6	exc
Buffalo Viewpoint	PM2.5	28Sep23, 03:00	420259	1-hr	93	92.8	exc
Fort Chip	PM2.5	28Sep23, 03:00	420257	1-hr	133	133.0	exc
Barge Landing	PM2.5	28Sep23, 03:00	420260	1-hr	177	177.1	exc
Fort Hills	PM2.5	28Sep23, 03:00	420136	1-hr	171	170.9	exc
Ells River	PM2.5	28Sep23, 03:00	420137	1-hr	212	212.5	exc
Ft. McKay S	PM2.5	28Sep23, 03:00	420261	1-hr	141	141.2	exc
Bertha Ganter	PM2.5	28Sep23, 04:00	420258	1-hr	201	200.9	exc
Fort Chip	PM2.5	28Sep23, 04:00	420257	1-hr	164	164.4	exc
Barge Landing	PM2.5	28Sep23, 04:00	420260	1-hr	171	170.8	exc
Ft. McKay S	PM2.5	28Sep23, 04:00	420261	1-hr	140	139.7	exc
Fort Hills	PM2.5	28Sep23, 04:00	420136	1-hr	151	151.4	exc
Ells River	PM2.5	28Sep23, 04:00	420137	1-hr	187	187.4	exc
Bertha Ganter	PM2.5	28Sep23, 05:00	420258	1-hr	182	181.7	exc
Fort Chip	PM2.5	28Sep23, 05:00	420257	1-hr	162	161.7	exc
Barge Landing	PM2.5	28Sep23, 05:00	420260	1-hr	166	165.6	exc
Ft. McKay S	PM2.5	28Sep23, 05:00	420261	1-hr	129	128.9	exc
Fort Hills	PM2.5	28Sep23, 05:00	420136	1-hr	134	134.2	exc
Ells River	PM2.5	28Sep23, 05:00	420137	1-hr	180	179.6	exc
Bertha Ganter	PM2.5	28Sep23, 06:00	420258	1-hr	175	175.5	exc
Buffalo Viewpoint	PM2.5	28Sep23, 06:00	420259	1-hr	88	88.3	exc
Fort Chip	PM2.5	28Sep23, 06:00	420257	1-hr	161	160.6	exc
Barge Landing	PM2.5	28Sep23, 06:00	420260	1-hr	170	170.4	exc
Ft. McKay S	PM2.5	28Sep23, 06:00	420261	1-hr	126	126.3	exc
Fort Hills	PM2.5	28Sep23, 06:00	420136	1-hr	123	123.0	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Ells River	PM2.5	28Sep23, 06:00	420137	1-hr	159	159.0	exc
Bertha Ganter	PM2.5	28Sep23, 07:00	420258	1-hr	184	184.3	exc
Buffalo Viewpoint	PM2.5	28Sep23, 07:00	420259	1-hr	152	152.4	exc
Fort Chip	PM2.5	28Sep23, 07:00	420257	1-hr	135	135.2	exc
Barge Landing	PM2.5	28Sep23, 07:00	420260	1-hr	153	153.2	exc
Ft. McKay S	PM2.5	28Sep23, 07:00	420261	1-hr	123	123.3	exc
Fort Hills	PM2.5	28Sep23, 07:00	420136	1-hr	106	105.5	exc
Ells River	PM2.5	28Sep23, 07:00	420137	1-hr	131	131.1	exc
Bertha Ganter	PM2.5	28Sep23, 08:00	420258	1-hr	160	159.8	exc
Buffalo Viewpoint	PM2.5	28Sep23, 08:00	420259	1-hr	170	170.2	exc
Fort Chip	PM2.5	28Sep23, 08:00	420257	1-hr	107	106.5	exc
Barge Landing	PM2.5	28Sep23, 08:00	420260	1-hr	124	123.8	exc
Ft. McKay S	PM2.5	28Sep23, 08:00	420261	1-hr	127	126.8	exc
Wapasu	PM2.5	28Sep23, 08:00	420263	1-hr	81	80.5	exc
Fort Hills	PM2.5	28Sep23, 08:00	420136	1-hr	85	84.7	exc
Ells River	PM2.5	28Sep23, 08:00	420137	1-hr	114	114.3	exc
Bertha Ganter	PM2.5	28Sep23, 09:00	420258	1-hr	114	114.4	exc
Buffalo Viewpoint	PM2.5	28Sep23, 09:00	420259	1-hr	168	167.7	exc
Fort Chip	PM2.5	28Sep23, 09:00	420257	1-hr	92	91.5	exc
Barge Landing	PM2.5	28Sep23, 09:00	420260	1-hr	103	102.9	exc
Ft. McKay S	PM2.5	28Sep23, 09:00	420261	1-hr	135	135.4	exc
Wapasu	PM2.5	28Sep23, 09:00	420263	1-hr	119	119.3	exc
Ells River	PM2.5	28Sep23, 09:00	420137	1-hr	91	91.3	exc
Fort Hills	PM2.5	28Sep23, 09:00	420136	1-hr	83	82.9	exc
Bertha Ganter	PM2.5	28Sep23, 10:00	420258	1-hr	96	96.1	exc
Buffalo Viewpoint	PM2.5	28Sep23, 10:00	420259	1-hr	152	151.8	exc
Patricia McInnes	PM2.5	28Sep23, 10:00	420264	1-hr	102	102.2	exc
Barge Landing	PM2.5	28Sep23, 10:00	420260	1-hr	96	96.2	exc
Ft. McKay S	PM2.5	28Sep23, 10:00	420261	1-hr	101	101.1	exc
Wapasu	PM2.5	28Sep23, 10:00	420263	1-hr	125	125.3	exc
Ells River	PM2.5	28Sep23, 10:00	420137	1-hr	94	94.2	exc
Fort Hills	PM2.5	28Sep23, 10:00	420136	1-hr	89	88.5	exc
Bertha Ganter	PM2.5	28Sep23, 11:00	420258	1-hr	99	99.4	exc
Buffalo Viewpoint	PM2.5	28Sep23, 11:00	420259	1-hr	123	123.1	exc
Patricia McInnes	PM2.5	28Sep23, 11:00	420264	1-hr	131	130.6	exc
Barge Landing	PM2.5	28Sep23, 11:00	420260	1-hr	100	99.8	exc



<u>Site</u>	<u>Parameter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Ft. McKay S	PM2.5	28Sep23, 11:00	420261	1-hr	107	107.2	exc
Wapasu	PM2.5	28Sep23, 11:00	420263	1-hr	114	114.2	exc
Ells River	PM2.5	28Sep23, 11:00	420137	1-hr	98	98.2	exc
Fort Hills	PM2.5	28Sep23, 11:00	420136	1-hr	90	89.8	exc
Bertha Ganter	PM2.5	28Sep23, 12:00	420258	1-hr	97	97.3	exc
Buffalo Viewpoint	PM2.5	28Sep23, 12:00	420259	1-hr	111	110.6	exc
Patricia McInnes	PM2.5	28Sep23, 12:00	420264	1-hr	145	145.0	exc
Athabasca Valley	PM2.5	28Sep23, 12:00	420265	1-hr	126	125.8	exc
Barge Landing	PM2.5	28Sep23, 12:00	420260	1-hr	97	97.1	exc
Ft. McKay S	PM2.5	28Sep23, 12:00	420261	1-hr	106	106.1	exc
Wapasu	PM2.5	28Sep23, 12:00	420263	1-hr	103	102.9	exc
Ells River	PM2.5	28Sep23, 12:00	420137	1-hr	101	100.8	exc
Fort Hills	PM2.5	28Sep23, 12:00	420136	1-hr	89	89.5	exc
Bertha Ganter	PM2.5	28Sep23, 13:00	420258	1-hr	99	98.6	exc
Buffalo Viewpoint	PM2.5	28Sep23, 13:00	420259	1-hr	108	107.9	exc
Patricia McInnes	PM2.5	28Sep23, 13:00	420264	1-hr	122	122.1	exc
Athabasca Valley	PM2.5	28Sep23, 13:00	420265	1-hr	140	139.9	exc
Barge Landing	PM2.5	28Sep23, 13:00	420260	1-hr	97	97.4	exc
Ft. McKay S	PM2.5	28Sep23, 13:00	420261	1-hr	105	105.1	exc
Wapasu	PM2.5	28Sep23, 13:00	420263	1-hr	110	110.0	exc
Ells River	PM2.5	28Sep23, 13:00	420137	1-hr	95	94.6	exc
Bertha Ganter	PM2.5	28Sep23, 14:00	420258	1-hr	84	83.6	exc
Buffalo Viewpoint	PM2.5	28Sep23, 14:00	420259	1-hr	108	107.9	exc
Patricia McInnes	PM2.5	28Sep23, 14:00	420264	1-hr	105	105.4	exc
Athabasca Valley	PM2.5	28Sep23, 14:00	420265	1-hr	127	126.9	exc
Barge Landing	PM2.5	28Sep23, 14:00	420260	1-hr	87	87.1	exc
Ft. McKay S	PM2.5	28Sep23, 14:00	420261	1-hr	96	96.0	exc
Anzac	PM2.5	28Sep23, 14:00	420262	1-hr	101	100.8	exc
Wapasu	PM2.5	28Sep23, 14:00	420263	1-hr	101	100.6	exc
Buffalo Viewpoint	PM2.5	28Sep23, 15:00	420259	1-hr	103	103.1	exc
Patricia McInnes	PM2.5	28Sep23, 15:00	420264	1-hr	91	91.3	exc
Athabasca Valley	PM2.5	28Sep23, 15:00	420265	1-hr	112	111.6	exc
Anzac	PM2.5	28Sep23, 15:00	420262	1-hr	131	130.6	exc
Wapasu	PM2.5	28Sep23, 15:00	420263	1-hr	85	85.4	exc
Buffalo Viewpoint	PM2.5	28Sep23, 16:00	420259	1-hr	87	86.5	exc
Patricia McInnes	PM2.5	28Sep23, 16:00	420264	1-hr	87	87.2	exc
Athabasca Valley	PM2.5	28Sep23, 16:00	420265	1-hr	92	91.7	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Anzac	PM2.5	28Sep23, 16:00	420262	1-hr	125	125.1	exc
Surmont 2	PM2.5	28Sep23, 16:00	420266	1-hr	101	100.6	exc
Patricia McInnes	PM2.5	28Sep23, 17:00	420264	1-hr	80	80.3	exc
Athabasca Valley	PM2.5	28Sep23, 17:00	420265	1-hr	89	88.8	exc
Barge Landing	PM2.5	28Sep23, 17:00	420260	1-hr	86	86.0	exc
Anzac	PM2.5	28Sep23, 17:00	420262	1-hr	108	108.0	exc
Fort Hills	PM2.5	28Sep23, 17:00	420136	1-hr	112	112.4	exc
Surmont 2	PM2.5	28Sep23, 17:00	420266	1-hr	110	110.3	exc
Bertha Ganter	PM2.5	28Sep23, 18:00	420258	1-hr	106	106.4	exc
Athabasca Valley	PM2.5	28Sep23, 18:00	420265	1-hr	89	88.6	exc
Barge Landing	PM2.5	28Sep23, 18:00	420260	1-hr	125	125.0	exc
Ft. McKay S	PM2.5	28Sep23, 18:00	420261	1-hr	102	101.5	exc
Anzac	PM2.5	28Sep23, 18:00	420262	1-hr	102	102.2	exc
Fort Hills	PM2.5	28Sep23, 18:00	420136	1-hr	136	135.6	exc
Surmont 2	PM2.5	28Sep23, 18:00	420266	1-hr	102	102.0	exc
Ells River	PM2.5	28Sep23, 18:00	420137	1-hr	127	127.1	exc
Bertha Ganter	PM2.5	28Sep23, 19:00	420258	1-hr	138	138.5	exc
Buffalo Viewpoint	PM2.5	28Sep23, 19:00	420259	1-hr	122	122.0	exc
Barge Landing	PM2.5	28Sep23, 19:00	420260	1-hr	150	150.5	exc
Ft. McKay S	PM2.5	28Sep23, 19:00	420261	1-hr	151	150.7	exc
Anzac	PM2.5	28Sep23, 19:00	420262	1-hr	86	86.5	exc
Fort Hills	PM2.5	28Sep23, 19:00	420136	1-hr	129	128.8	exc
Surmont 2	PM2.5	28Sep23, 19:00	420266	1-hr	98	97.9	exc
Ells River	PM2.5	28Sep23, 19:00	420137	1-hr	122	121.8	exc
Bertha Ganter	PM2.5	28Sep23, 20:00	420258	1-hr	138	137.9	exc
Buffalo Viewpoint	PM2.5	28Sep23, 20:00	420259	1-hr	144	143.9	exc
Barge Landing	PM2.5	28Sep23, 20:00	420260	1-hr	155	155.3	exc
Ft. McKay S	PM2.5	28Sep23, 20:00	420261	1-hr	152	151.6	exc
Janvier	PM2.5	28Sep23, 20:00	420267	1-hr	103	103.1	exc
Fort Hills	PM2.5	28Sep23, 20:00	420136	1-hr	124	123.6	exc
Surmont 2	PM2.5	28Sep23, 20:00	420266	1-hr	88	87.8	exc
Ells River	PM2.5	28Sep23, 20:00	420137	1-hr	129	129.4	exc
Bertha Ganter	PM2.5	28Sep23, 21:00	420258	1-hr	109	108.9	exc
Buffalo Viewpoint	PM2.5	28Sep23, 21:00	420259	1-hr	159	159.4	exc
Patricia McInnes	PM2.5	28Sep23, 21:00	420264	1-hr	96	95.9	exc
Barge Landing	PM2.5	28Sep23, 21:00	420260	1-hr	111	111.5	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Ft. McKay S	PM2.5	28Sep23, 21:00	420261	1-hr	134	134.2	exc
Wapasu	PM2.5	28Sep23, 21:00	420263	1-hr	137	137.1	exc
Janvier	PM2.5	28Sep23, 21:00	420267	1-hr	104	103.7	exc
Ells River	PM2.5	28Sep23, 21:00	420137	1-hr	103	102.8	exc
Buffalo Viewpoint	PM2.5	28Sep23, 22:00	420259	1-hr	132	132.4	exc
Patricia McInnes	PM2.5	28Sep23, 22:00	420264	1-hr	120	119.6	exc
Athabasca Valley	PM2.5	28Sep23, 22:00	420265	1-hr	127	126.5	exc
Wapasu	PM2.5	28Sep23, 22:00	420263	1-hr	91	90.6	exc
Stony Mtn.	PM2.5	28Sep23, 22:00	420268	1-hr	96	96.2	exc
Conklin	PM2.5	28Sep23, 22:00	420269	1-hr	99	99.3	exc
Janvier	PM2.5	28Sep23, 22:00	420267	1-hr	105	105.1	exc
Patricia McInnes	PM2.5	28Sep23, 23:00	420264	1-hr	115	114.8	exc
Athabasca Valley	PM2.5	28Sep23, 23:00	420265	1-hr	148	147.7	exc
Stony Mtn.	PM2.5	28Sep23, 23:00	420268	1-hr	112	112.3	exc
Conklin	PM2.5	28Sep23, 23:00	420269	1-hr	107	107.3	exc
Janvier	PM2.5	28Sep23, 23:00	420267	1-hr	85	85.0	exc
Bertha Ganter	PM2.5	28Sep23, 24:00	420258	24-hr	120	119.7	exc
Buffalo Viewpoint	PM2.5	28Sep23, 24:00	420259	24-hr	107	107.5	exc
Patricia McInnes	PM2.5	28Sep23, 24:00	420264	24-hr	63	62.7	exc
Athabasca Valley	PM2.5	28Sep23, 24:00	420265	1-hr	99	99.4	exc
Athabasca Valley	PM2.5	28Sep23, 24:00	420265	24-hr	62	62.3	exc
Fort Chip	PM2.5	28Sep23, 24:00	420257	24-hr	78	77.8	exc
Barge Landing	PM2.5	28Sep23, 24:00	420260	24-hr	113	112.8	exc
Ft. McKay S	PM2.5	28Sep23, 24:00	420261	24-hr	109	109.1	exc
Stony Mtn.	PM2.5	28Sep23, 24:00	420268	1-hr	106	106.4	exc
Conklin	PM2.5	28Sep23, 24:00	420269	1-hr	103	102.7	exc
Janvier	PM2.5	28Sep23, 24:00	420267	1-hr	82	82.1	exc
Anzac	PM2.5	28Sep23, 24:00	420262	24-hr	45	45.2	exc
Wapasu	PM2.5	28Sep23, 24:00	420263	24-hr	65	64.7	exc
Fort Hills	PM2.5	28Sep23, 24:00	420136	24-hr	99	98.6	exc
Surmont 2	PM2.5	28Sep23, 24:00	420266	24-hr	39	38.6	exc
Ells River	PM2.5	28Sep23, 24:00	420137	24-hr	116	116.5	exc
Stony Mtn.	PM2.5	29Sep23, 01:00	420268	1-hr	92	92.3	exc
Conklin	PM2.5	29Sep23, 01:00	420269	1-hr	92	91.9	exc
Anzac	PM2.5	29Sep23, 02:00	420262	1-hr	81	80.5	exc
Stony Mtn.	PM2.5	29Sep23, 02:00	420268	1-hr	85	85.1	exc
Conklin	PM2.5	29Sep23, 02:00	420269	1-hr	83	82.6	exc



<u>Site</u>	<u>Paramter</u>	<u>Date/Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Wapasu	PM2.5	29Sep23, 07:00	420263	1-hr	86	85.8	exc
Wapasu	PM2.5	29Sep23, 08:00	420263	1-hr	98	97.6	exc
Wapasu	PM2.5	29Sep23, 09:00	420263	1-hr	85	84.6	exc
Bertha Ganter	PM2.5	29Sep23, 24:00	420258	24-hr	35	35.4	exc
Fort Chip	PM2.5	29Sep23, 24:00	420257	24-hr	36	35.7	exc
Barge Landing	PM2.5	29Sep23, 24:00	420260	24-hr	39	39.2	exc
Ft. McKay S	PM2.5	29Sep23, 24:00	420261	24-hr	38	38.1	exc
Surmont 2	PM2.5	29Sep23, 24:00	420266	24-hr	32	32.0	exc
Buffalo Viewpoint	PM2.5	29Sep23, 24:00	420259	24-hr	48	47.5	exc
Patricia McInnes	PM2.5	29Sep23, 24:00	420264	24-hr	34	34.2	exc
Athabasca Valley	PM2.5	29Sep23, 24:00	420265	24-hr	45	45.4	exc
Anzac	PM2.5	29Sep23, 24:00	420262	24-hr	39	39.2	exc
Wapasu	PM2.5	29Sep23, 24:00	420263	24-hr	42	42.3	exc
Stony Mtn.	PM2.5	29Sep23, 24:00	420268	24-hr	38	37.5	exc
Conklin	PM2.5	29Sep23, 24:00	420269	24-hr	37	37.2	exc
Janvier	PM2.5	29Sep23, 24:00	420267	24-hr	34	34.2	exc
Fort Hills	PM2.5	29Sep23, 24:00	420181	24-hr	39	39.1	exc
Ells River	PM2.5	29Sep23, 24:00	420182	24-hr	36	36.1	exc
Patricia McInnes	PM2.5	30Sep23, 24:00	420264	24-hr	34	34.0	exc
Athabasca Valley	PM2.5	30Sep23, 24:00	420265	24-hr	41	41.0	exc
Wapasu	PM2.5	30Sep23, 24:00	420263	24-hr	30	30.2	exc
Fort Hills	PM2.5	30Sep23, 24:00	420199	24-hr	35	35.5	exc
Ells River	PM2.5	30Sep23, 24:00	420200	24-hr	31	31.4	exc
Bertha Ganter	PM2.5	30Sep23, 24:00	420258	24-hr	36	36.3	exc
Buffalo Viewpoint	PM2.5	30Sep23, 24:00	420259	24-hr	43	42.5	exc
Barge Landing	PM2.5	30Sep23, 24:00	420260	24-hr	43	43.2	exc
Ft. McKay S	PM2.5	30Sep23, 24:00	420261	24-hr	32	32.2	exc
Ells River	TSP	2Sep23, 24:00	420936	24-hr	224	224	exc
Bertha Ganter	Dustfall		421130	30-day	71.8	71.8	exc
Conklin	Dustfall		421132	30-day	57	57	exc

***status legend:**

late

exc

nae

ret

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.

exceedance, raw values reported in real time were confirmed to be in exceedance after data processing.

not an exceedance, raw values reported in real time were found not in exceedance after data processing.

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**

August 31, 2023
4:43:55 PM
Request # 4586415

Submitted by: EN6138_BAS
Submission Date: Aug 31, 2023 4:38:59 PM

File Type
Airshed Monitoring Report

File Name
WBEA-202307.pdf

Total Number of Files: 1

*** End of Report ***

**ELECTRONIC TRANSFER SYSTEM
AIRDATA
SUBMISSION REPORT**

October 30, 2023
3:24:55 PM
Request # 4606717

Submitted by: EN6138_BAS
Submission Date: Oct 30, 2023 3:24:48 PM

File Type
Airshed Monitoring Report

File Name
WBEA-202309.pdf

Total Number of Files: 1

*** End of Report ***

**ELECTRONIC TRANSFER SYSTEM
AIRDATA
SUBMISSION REPORT**

October 30, 2023
3:25:34 PM
Request # 4606720

Submitted by: EN6138_BAS
Submission Date: Oct 30, 2023 3:25:27 PM

File Type

Calibration Report

File Name

CAL-WBEA-202309.pdf

Total Number of Files: 1

*** End of Report ***

**ELECTRONIC TRANSFER SYSTEM
AIRDATA
SUBMISSION REPORT**

November 02, 2023
2:05:34 PM
Request # 4610236

Submitted by: EN6138_BAS
Submission Date: Nov 02, 2023 2:05:23 PM

File Type

Calibration Report

File Name

CAL-WBEA-202309-V01.pdf

Total Number of Files: 1

*** End of Report ***



End of Report